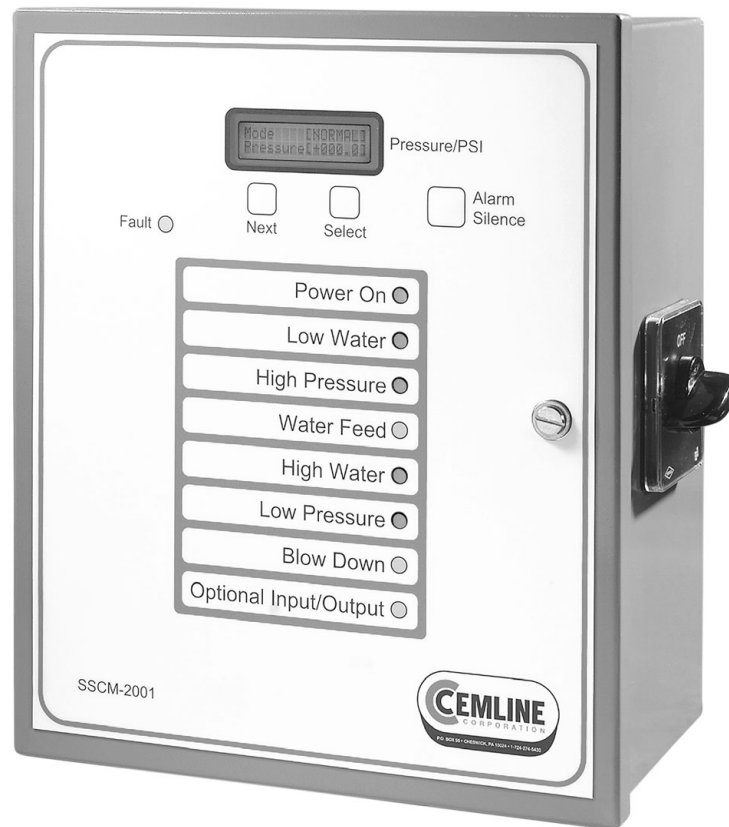

Installation, Operation, and Maintenance Manual

CEMLINE CORPORATION®

Series 2001 SSCM Solid State Control Module



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Disclaimers

This Installation, Operation, and Maintenance Manual is intended to be as complete and up to date as possible. It covers the installation, operation, and maintenance procedures for CEMLINE CORPORATION's 2001 SSCM control module. CEMLINE® reserves the right to update this manual and other product information concerning installation, operation, and/or maintenance, at any time and without obligation to notify product owners of such changes.

CEMLINE is not responsible for inaccuracies in specifications, procedures and/or the content of other product literature, supplied by the manufacturers of components used in CEMLINE 2001 SSCM control module. CEMLINE strives to use only the highest quality components; however, CEMLINE has no direct control over their manufacture, or their consistent quality.

CEMLINE is not responsible for injury to personnel or product damage due to the improper installation, operation, and/or maintenance of CEMLINE Electronic Controls. All installation, operation, and maintenance procedures should only be performed by trained/certified personnel. All personnel performing these procedures should completely and carefully read and understand all supplied materials before attempting the procedures. All personnel should pay strict attention to all Notes, Cautions, and Warnings that appear within the procedures detailed in this manual.

CEMLINE welcomes user input as to suggestions for product or manual improvement.

Contact Information

For information concerning warranties, or for questions pertaining to the installation, operation or maintenance of CEMLINE products, contact:

CEMLINE CORPORATION
P.O. Box 55
Cheswick, PA 15024

USA Phone: (724) 274-5430
USA Fax: (724) 274-5448
www.cemline.com

To order replacement parts, contact CEMLINE CORPORATION at the address listed above, or call toll free:

USA/Canada/Caribbean Phone: (800) 245-6268

Note: Please include the model and serial number of the unit for which the parts are being ordered. If ordering by phone, please have this information readily available.

General Notes and Warnings

Notes

- ❖ This manual is intended to cover installation, operation, and maintenance procedures for CEMLINE CORPORATION 2001 SSCM control module.

If questions are not answered by this manual, or if specific installation, operation, and/or - maintenance procedures are not clearly understood, contact CEMLINE CORPORATION for clarification before proceeding.
- ❖ All installation, operation, and maintenance procedures should be performed only by - experienced, trained and certified personnel. Personnel should be trained in and familiar with correct piping and electrical procedures and methods, and should be experienced in working with hot/boiler water systems and steam systems.
- ❖ CEMLINE CORPORATION 2001 SSCM 2001 control module and other electronic controls are designed for indoor use only, unless otherwise required by design specifications.
- ❖ If the unit is damaged during installation, operation, or maintenance, complete the following steps:
 1. Turn off and lock out the electric power supply to the unit in an approved manner.
 2. Turn off all incoming steam/hot water valves.
 3. Contact in-house maintenance personnel or CEMLINE CORPORATION for instructions.

Warnings

As with any piece of equipment that utilizes hot/boiler water or steam and electricity, **the potential exists for severe personal injury** if proper installation, operation, and maintenance procedures are not followed. Listed on the following pages are specific warnings pertaining to CEMLINE Electronic Controls. **All warnings should be carefully read and understood.** All precautions contained in the warnings should be carefully followed to reduce the chance of injury.

Note: Throughout this manual, warnings will be denoted by the symbol ▼ .

All documentation for each major component has been included with the unit. It is strongly recommended that each document be reviewed before attempting any installation, operation, or maintenance procedures.

The documentation for each major component may also contain warnings and cautions identified by the manufacturer of each component. These warnings and cautions may be specific for the particular component, and therefore not covered in this general Installation, Operation, and Maintenance Manual. They should also be carefully reviewed before attempting installation, operation, or maintenance procedures.

- ▼ The combination of electricity and water can pose a **very dangerous situation**. Assure that all power has been **shut off/disconnected and locked out** in an appropriate manner, before attempting any installation or maintenance procedures.
- ▼ Areas of potential danger:
 1. all electric power leads and connections;
 2. all hot/boiler water lines, steam lines, joints, valves, and relief valves; and
 3. all joints at valve, gauges, etc.
- ▼ Before attempting any installation, operation, or maintenance procedures pertaining to the unit.
 1. assure that the electric power supply has been turned off and locked out in an approved manner;
- ▼ Hot/boiler water and steam present a situation that can be very dangerous due to the fact it is under pressure and at very high temperatures. To avoid possible injury or death, use common sense and follow all accepted and recommended procedures when performing installation, operation, and maintenance procedures.

Connecting the Electric Power Source

- ▼ All installation procedures involving electric power connection should only be performed by trained, certified electricians.
- ▼ Hot/boiler water and steam present a situation that can be very dangerous because of the high temperatures and pressures. Use common sense and follow all accepted and recommended procedures when performing installation, operation, and maintenance procedures to avoid possible injury or death.
- ▼ The combination of electricity and water can pose a very dangerous situation. Assure that all power has been shut off/disconnected and locked out in an approved manner, before attempting any installation or maintenance procedures.

The CEMLINE Steam Generators have been wired during assembly. Connecting the electric power supply to the unit consists of connecting the correct voltage, phase, and amperage power leads to the terminal strip or circuit breaker. The exact voltage, phase, and amperage requirements for the unit can be determined from the rating plate affixed to the jacket of the unit, or from the Submittal Sheet and Wiring Diagrams supplied with the unit.

The Controller - Overview

Cemline SSCM 2001 control module is a solid state controller designed to control limit, water feed, alarm, and timed blowdown functions for Cemline unfired steam generators.

The Solid State Control Module is supplied with a LED backlit LCD display. LED pilot lights are supplied to indicate On-Off, high pressure, low pressure, low water, high water, water feed, and blow down. The solid state control module allows the owner to set pressure limits on the display screen. The solid state control module has a flashing red alarm light and alarm horn with built in alarm silence relay. The solid state control module is supplied with dry contact closure outputs to indicate to building automation control (BAC) Power on, Low water, High pressure, Water feed, High water, Low pressure and Blow down occurring. The control module allows the BAC to turn the Unfired Steam Generator on or off through a remote relay suitable for 24 VAc, 1 amp. The control module allows the BAC to remotely monitor the operating pressure. The control module is supplied with an on-off switch and is mounted in a NEMA 4 enclosure.

Built in remote start stop: This feature allows the Unfired Steam Generator to be started or stopped from a remote location. Typically this would be accomplished from the Building Automation Control (BAC). Requires a dry contact suitable for 24 VAc and 1 amp. Terminals P2 on the panel are where the BAC on-off is wired.

Built in On-Off Switch: Allows for local on-off and is convenient for service in the unlikely event service is required. This switch is mounted in the side of the panel.

Built in Alarm Horn: The alarm horn will sound and fault LED will light (blinking red) on low water or high pressure. If either high water or low pressure options are selected the alarm horn will also sound and the alarm light will light (blinking red) in the event of high water or low pressure. The 2001 Solid State Control Module also features an alarm silence relay which will silence the alarm but not the fault light when the generator is being serviced. When the fault is cleared both the alarm and fault light will automatically reset.

Built in timer for timed blow down: If the timed blowdown option is selected the time and duration of blow down can be easily selected in the 2001 Solid State Control Module.

Built in relay for water feed: the Cemline 2001 Solid State Control Module operates in conjunction with the level control to signal the feed water solenoid or feed water pump to maintain the correct water level in the unfired steam generator.

Built in operating pressure readout: The 2001 Solid State Control Module features an easy to read LED digital readout of the operating pressure.

Built in high pressure cut off and alarm: In the event of high pressure the 2001 Solid State Control Module will close the source steam or HTHW supply valve and sound an alarm.

Built in low water cut off and alarm: In the event of low water the 2001 Solid State Control Module will close the source steam or HTHW supply valve and sound an alarm.

Built in low pressure alarm: If activated, the 2001 Solid State Control Module will sound an alarm if a low pressure condition occurs.

Built in optional input / output.

Built in LED display of functions and alarms: The 2001 Solid State Control Module is designed for the user to tell at a glance how the system is operating. The built in LED displays make troubleshooting simple.

| Function | LED Indicator 1 | LED Indicator 2 |
|-----------------------|-----------------------------|------------------------------|
| Power ON | Green = Power On | Blank = No power |
| Low water | Green = Water level not low | Red = Low water |
| High pressure | Green = Normal pressure | Red = High pressure |
| Water feed | Green = Water feeding | Blank = Water not called for |
| High water | Green = Water level normal | Red = High water |
| Low pressure | Green = Pressure not low | Red = Low pressure |
| Blow down operating | Green=Blowdown occurring | Blank = No blowdown |
| Optional input/output | | |

Built in contacts to notify BAC (Building Automation Control) of functions and alarms: This control allows for simple and reliable interface from a remote location. The BAC can also start and stop the unfired steam generator.

| |
|--|
| Power ON |
| Low water |
| High water |
| Water feed |
| High pressure |
| Low pressure |
| Blow down operating |
| Optional input / output |
| Alarm |
| Operating pressure (via a 0-10 Vdc signal) |

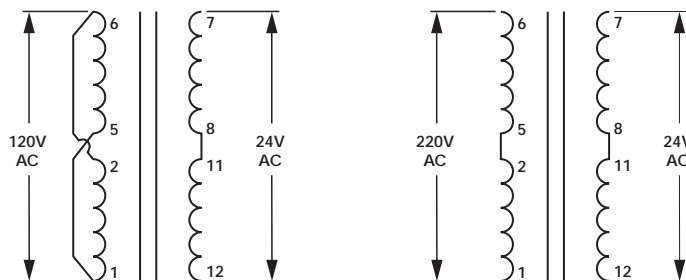
Contractor Wiring

All Power Connections should be performed by a trained , certified electrician. Be sure the factory supplied on-off switch is in the OFF position before connecting to building power.

Field wiring: Installer must run feed wires to terminals on panel mounted on-off disconnect switch and green ground wire to ground lug. *Units are normally wired for 120 volt single phase input.*

Warning: Before drilling hole in panel for conduit connection of power carefully open door and verify that nothing in panel will be interfered with. BE CAREFUL not to get any drill shavings or metal slug on board or transformer or disconnect switch.

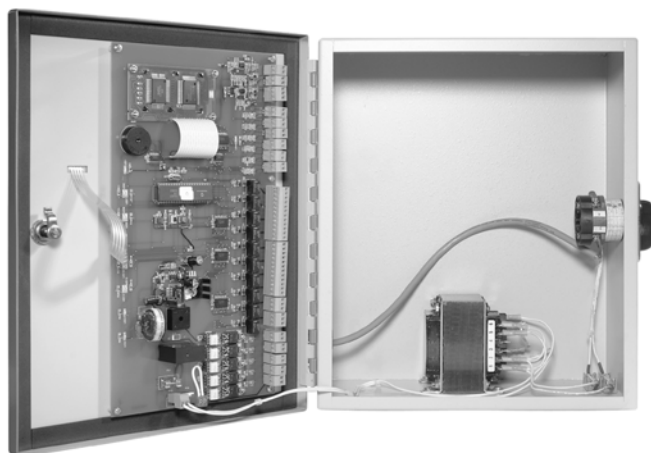
Panel is normally factory shipped for 120 Volt/ 1 phase/60/50 Hz. If so desired 220/1/50 or 60 Hz power can be used. To convert to 220 volt input it is necessary to reconfigure the 24 volt output transformer. Below is the wiring diagram for 120 volt and 220 volt input.



▼ **CAUTION: Before attempting to rewire the transformer be sure power coming to the unit is turned off and locked out in an approved manor.**

Ratings

Input: selectable 120/220 VAC – 50/60 Hz
@120 Vac min 90 volt max 130 volt
Output Contacts: 1 amp at 24 Vac
Building Automation outputs: Dry contacts,
NO/NC .5 amp maximum, non inductive
Display: LED display with resolution of
.3 % of scale
Available pressure ranges: 0-30 PSI, 30 –
150 PSI in 10 PSI increments
Operating ambient temperature: Min 32
Deg F max 140 deg F
Operating Humidity: 5% to 95% relative
humidity (RH) non condensing
Alarm approximately 103 db.
NEMA 4 enclosure



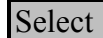
The Celine 2001 SCCM is a self contained board and can not be field repaired. For a replacement board contact Celine Corporation at the address shown on page one of this manual.

Controller Screens

Controller screens:

There are two tactile keys on the front of the panel. The left key, labeled NEXT, is pushed to select the desired function. The right key, labeled SELECT, is pushed to access the desired screen. Both the function and setting are read on the LED backlit LCD display.

Pushing the left key will display, in sequence, the following screens :



Screen 1 (Home)

| | |
|--------------|----------|
| MODE | [NORMAL] |
| PRESSURE PSI | [XXX] |

Screen 2

| |
|-----------------|
| B-DOWN DURATION |
|-----------------|

Screen 3

| |
|-----------------|
| B-DOWN INTERVAL |
|-----------------|

Screen 4

| |
|---------------|
| HIGH PRESSURE |
|---------------|

Screen 5

| |
|--------------|
| LOW PRESSURE |
|--------------|

Screen 6

| |
|--------------|
| DIFFERENTIAL |
|--------------|

Screen 7

| |
|-----------------|
| PRESSURE SENSOR |
|-----------------|

Screen 8

| |
|---------------|
| LEVEL CONTROL |
|---------------|

Screen 9

| |
|------------------|
| INITIAL SETTINGS |
|------------------|

Screen 10

| |
|-------------|
| DIAGNOSTICS |
|-------------|

Screen 11

| |
|-------|
| ABOUT |
|-------|

Screen 12

| |
|------|
| QUIT |
|------|

After 60 seconds in any screen "Home" screen will be displayed

Setting the Controller

Setting the controller

There are two tactile keys on the front of the panel. The left key, labeled NEXT, is pushed to select the desired function. The right key, labeled SELECT, is pushed to access the desired screen. Both the function and setting are read on the LED backlit LCD display. The sequence to access and change any screen is as follows:

1. Press “NEXT” (left key) key until desired function appears on the screen.
2. Press “SELECT” (right key) and a setting will appear on the second line of the screen.
3. Press “NEXT” key to change setting . Continue pressing “NEXT” key, which will scroll through available settings until desired setting is on screen.
4. Press “SELECT” key which will store last screen setting into memory and return to controller screen to “HOME”

Instructions for setting each screen:

Home Screen

This is the screen which should be displayed during normal operation:

Screen 1
Home

| | |
|--------------|----------|
| MODE | [NORMAL] |
| PRESSURE PSI | [XXX] |

MODE can be either NORMAL or ALARM. The mode will read normal in normal operation and alarm if any alarm condition occurs. If an alarm condition is cleared the mode will switch back to normal reading.

Pressure psi: This is the pressure of the generated steam.

Timed Blow down

If timed blow down is a option which was purchased the duration and interval of the blow down can be selected. Duration is the length of time the blow down occurs (in seconds) and interval is the number of hours between blow downs.

To set the duration of blow down:

1. Press the NEXT key once and the following screen will appear

Screen 2

| |
|-----------------|
| B-DOWN DURATION |
|-----------------|

2. Press the SELECT key and the screen will read.

Screen 3

| |
|----------------------------------|
| B-DOWN DURATION SECONDS [xxx] |
|----------------------------------|

3. Press the NEXT key to scroll through the various seconds settings until the desired number of seconds of blow down appears on the screen. The seconds will read 0-250 seconds in 10 second increments.
4. Press SELECT key to place setting in memory and to return to home screen.
NOTE: To disable the timed blow down set duration to zero (0)

To set the interval:

1. Press the NEXT key twice and the following screen will appear:

Screen 3

| |
|-----------------|
| B-DOWN INTERVAL |
|-----------------|

2. Press the SELECT key and the screen will read:

Screen 3

| |
|---------------------------------|
| B-DOWN INTERVAL HOURS [xxx] |
|---------------------------------|

3. Press the NEXT key to scroll through the various hour settings until the desired number of hours between blow downs appears on the screen. The hours will read 0-30 hours in one hour increments and 40 through 160 hours in 10 hour increments.
4. Press SELECT key to place the setting in memory and return to home screen.

NOTE: To disable the timed blow down set interval to zero (0)

High pressure cut out

This is the pressure limit which is set 10-20% higher than the desired operating pressure. When the high pressure cut out pressure is reached the controller will cause the main control valve to close.

- ▼ **CAUTION:** The operating pressure is set by the control valve controller, see USG I O & M manual for setting the operating pressure.

1. Press the NEXT key three times and the following screen will appear:

Screen 4

HIGH PRESSURE

2. Press the SELECT key and the screen will read:

Screen 4

HIGH PRESSURE
CUT OFF PSI [xxx]

3. Press the NEXT key to scroll through the pressure settings until the desired pressure setting appears on the screen.. The settings from 0-50 psi are in 1 psi increments and from 50 through 150 psi in 5 psi increments. NOTE: THE MAXIMUM SETTING IS LIMITED BY THE RANGE OF THE PRESSURE SENSOR. **The high pressure setting should be set lower than the relieving pressure the ASME relief valve supplied with the generator.** The pressure rating of the relief valve is labeled on the relief valve body.
4. Press SELECT key to place the setting in memory and return to the home screen.

Low pressure alarm

If desired a low pressure alarm can be set. This will alarm if the generated steam pressure falls below the low pressure setting.

To set the low pressure alarm:

1. Press the NEXT key four times and the following screen will appear:

Screen 5

LOW PRESSURE

2. Press the SELECT key and the screen will read:

Screen 5

LOW PRESSURE
ALARM PSI [xxx}

3. Press the NEXT key to scroll through the pressure settings until the desired low pressure setting appears on the screen.. The settings from 0-50 psi are in 1 psi increments. The maximum low pressure setting is equal to the high pressure setting set on screen 4.
4. Press SELECT key to place setting in memory and return to home screen.

NOTE: To disable the low pressure alarm set the pressure to zero (0).

High and low pressure reset differential

This is the pressure differential from the set point at which the high or low pressure will reset. Normally it is set at 2 psi but can be set from 1 to 10 psi. NOTE: There is only one differential setting and it will be the same for both high and low pressure.

To set the pressure differential:

1. Press the NEXT key five times and the following screen will appear:

Screen 6

| |
|--------------|
| DIFFERENTIAL |
|--------------|

2. Press the SELECT key and the screen will read:

Screen 6

| |
|--|
| DIFFERENTIAL RESET PSI [xxx] |
|--|

3. Press the NEXT key to scroll through the psi settings until the desired psi differential is displayed.. The range is 1-10 psi.
4. Press the SELECT key to place setting in memory and return to the home screen.

Setting Pressure Sensor Range

The pressure sensor supplied with the Unfired Steam Generator will have a specific range, normally 0-30 psi or 0-60 psi or 0-150 psi. **It is extremely important that the range of the pressure sensor and the range listed in the solid state controller be the same range.** The generator is factory shipped with matched ranges. The range of the sensor will be printed on the body of the sensor. The range of the controller can be determined and if necessary changed as follows:

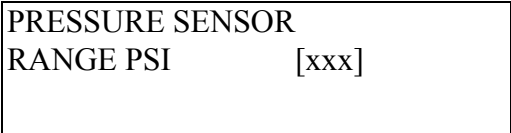
1. Press the NEXT key six times and the following screen will appear:

Screen 7



2. Press the SELECT key and the screen will read:

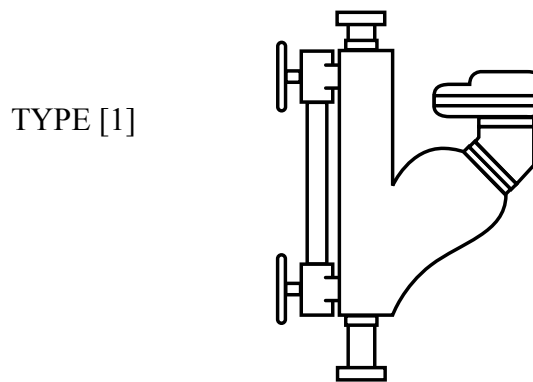
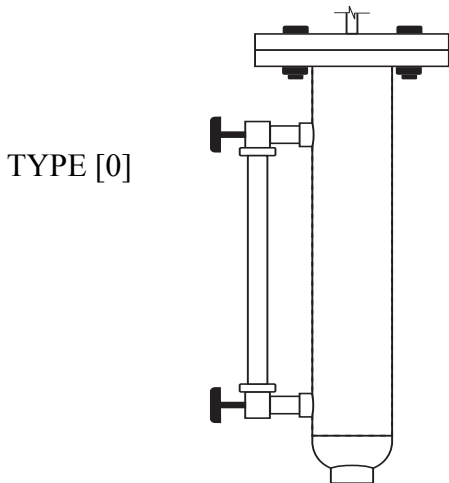
Screen 7



3. Verify that the psi range shown is equal to the range of the supplied sensor. The range shown on screen is the upper end of the range. 0-30 will appear as 30 on the screen, 0-60 will appear as 60 on the screen, etc. IF AND ONLY IF the range of the sensor is different than the screen setting should the screen setting be changed. To change the screen setting press the NEXT key to scroll through the various pressure settings. Available ranges are 30-150 psi in 10 psi increments. When the desired pressure range appears on the screen verify that this matches the pressure of the sensor.
4. If both pressures match press the SELECT key to place the setting in memory and return to home screen

Level control type

There are two types of level controllers, either one of which may be supplied with the Unfired Steam Generator. The first type is a 4 ball float assembly type mounted in a stainless steel body with a shape as shown below. This is TYPE [0]. The second type is a one ball float type with multiple switches in a cast iron body with a shape as shown below. This is TYPE [1].



It is extremely important that the type of level control supplied and type listed in the solid state controller be the same. The generator is factory shipped with matched types.

1. Press NEXT key 7 times and the following screen will appear:

Screen 8

| |
|---------------|
| LEVEL CONTROL |
|---------------|

2. Press SELECT key and the screen will read:

Screen 8

| |
|---------------|
| LEVEL CONTROL |
| TYPE [xxx] |

3. Verify that the type listed on screen and type supplied on Unfired Steam Generator are the same. IF AND ONLY IF the type of level control is different than the screen setting should the screen setting be changed. To change the screen setting press the NEXT key to scroll through the two types.
4. If both types match press the SELECT key to place the setting in memory and return to the home screen

Initial Settings

The initial settings are for factory use only and can not be accessed

Diagnostics

Are used for factory testing and are not field useable. To go to “home” screen press Alarm Silence.

Screen 10

| |
|-------------|
| DIAGNOSTICS |
|-------------|

About

This screen lists the version of the controller. When contacting the factory about the controller be sure to mention the version.

1. Press the NEXT key 10 times and the following screen will appear:

Screen 11

| |
|-------|
| ABOUT |
|-------|

2. Press the SELECT key and the screen will read:

Screen 11

| |
|---------------------------------|
| ABOUT CEMLINE VER [xxx] |
|---------------------------------|

3. Be sure to note the version when contacting the factory.
4. Press the SELECT key to return to the home screen.

Quit screen

This screen is **only** used to return to the home screen

1. Press NEXT key eleven times and the following screen will appear:

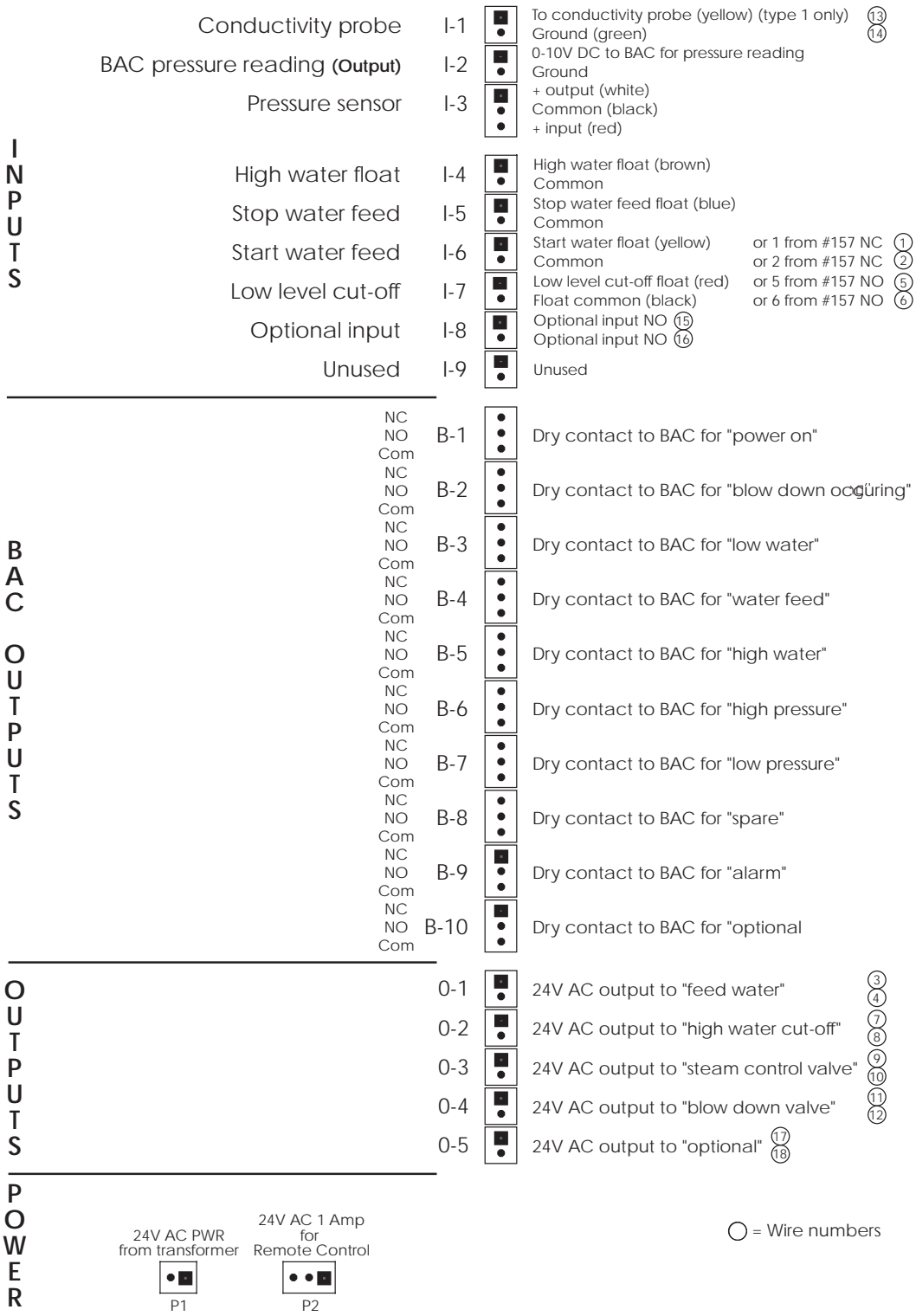
Screen 12

| |
|------|
| QUIT |
|------|

2. Press Select key and the program will return to the home screen

Note: After 60 seconds in any screen “home” screen will be displayed

Terminal Board Layout



Building Automation Control (BAC) Interface

The Cemline 2001 SSCM has built in contacts to interface with the building automation control (BAC).

Remote On-Off:

Terminal block P-2 is a three pole block with the two outside poles connected in series with the 24 VAc incoming power from the supply transformer. The Unfired Steam Generator is shipped with a jumper installed between terminals 1- 3 of terminal block P-2. To wire for remote on-off remove this jumper and install a switch or relay contacts connecting terminals 1 and 3. Do not connect anything to terminal 2 of P-2.

- ▼ **CAUTION: TERMINALS 1 -3 ARE 24 VAC AND WILL HAVE A LOAD OF 1 AMP. BE SURE THE SWITCH OR RELAY CONNECTED TO THESE TERMINALS IS RATED FOR A MINIMUM OF 24 VAc 1 AMP.**

Built in contacts to notify BAC of functions and alarms: This control allows for simple and reliable interface with the BAC via dry contact to enable the BAC to monitor the following functions from a remote location:

| |
|-------------------------|
| Power ON |
| Low water |
| High water |
| Water feed |
| High pressure |
| Low pressure |
| Blow down operating |
| Optional input / output |
| Alarm |

Refer to the “Terminal Board Layout” page of this manual for the key to and location of terminal connections to the BAC. Note that all of the function relays give either a COM-NO or COM-NC dry contact output. The rating of the dry contacts are 1 amp at 24 VAc or .5 amp at 120 VAC.

- ▼ **CAUTION: Do not connect any voltage above 120 volts across the BAC contacts on terminal block.**

Contact closure as follows:

| | |
|---------------------|---|
| Power ON | COM - NO contact made when power is on |
| Low water | COM - NO contact made when in low water condition |
| High water | COM - NO contact made when high water occurs |
| Water feed | COM - NO contact made when water is feeding |
| High pressure | COM - NO contact made when high pressure occurs |
| Low pressure | COM - NO contact made when low pressure occurs |
| Blow down operating | COM - NO contact made when blow down occurs |
| Optional input | COM - NO contact made when optional contact close |
| Alarm | COM - NO contact made when any alarm occurs |

Operating pressure (via a 0-10 Vdc signal);

Terminal block I-2 will output a 0-10 VDC signal. This signal will be scaled to the pressure range of the supplied pressure sensor. To scale the BAC : Determine the the pressure range printed on the body of the supplied sensor and scale the 0-10 Vdc output signal to this range. This range should also be listed in the submittal supplied for the generator.

- ▼ **CAUTION: The bottom terminal of I-2 is connected to an isolated chassis ground. This may interfere with the BAC system. BAC engineering should determine if BAC needs isolation for this signal.**

- ▼ **CAUTION: No current should be applied to terminals I-2.**

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