

Series 962 Electronic Stager Control

AquaMatic® SERIES 962

○ TIME OF DAY
○ TIME OF REGEN
○ HARDNESS

○ CAPACITY
○ REGEN TIME REMAINING

DAY (CYCLE) FLOW PM 1 12:01

← ↑ ↓ SET

REGEN

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Series 962 Electronic Stager Controls

The Series 962 Electronic Stager Controls provide sophisticated, demand-based water conditioning by combining a microprocessor with a flow meter to electronically monitor the amount of water used. This fully programmable series of controls provide the ability to fine tune the operation to meet the application requirements. There are several 962 Stager models available.

| Single Unit Controls | Model No. |
|-----------------------------|-----------|
| Basic Softeners & Filters | E948 |
| Complex Softeners & Filters | E951 |

| Multiple Unit Controls | Model No. |
|--------------------------------------|-----------|
| Twin Alternating Softeners & Filters | E958-TA |
| Sequential Filters (Backwash Only) | E948 |
| 2 Unit Sequential Filters | E951 |
| 3 or 4 Unit Sequential Filters | E958 |

Special Features of the Series 962 Stagers

Memory Retention

During a power outage, critical operating information is stored in nonvolatile memory. This information includes the time of day, water usage, all programming data and the number of days since the last regeneration. When power is restored, the information is returned to the microprocessor and operation resumes as if an outage never occurred. The time of day will be late by the length of the power outage. The time of day should be reset after an extended power outage. No other reprogramming is necessary. An optional rechargeable battery backup will allow the control to keep track of time and water usage for up to 8 hours during a power outage. *The control will not initiate a regeneration while on battery backup.*

Programmable Cycles

The control is flexible in defining the appropriate cycles of operation.

Double Regeneration

For single tank applications, the control automatically calls for a second regeneration the following day if the current operation cycle exceeds the programmed capacity by 150% or more.

Capacity Setting Lockout

The control can be programmed to lock the capacity so it cannot be altered after installation.

Selectable Reserve Options

To meet the application requirements, the control allows selection of one of two reserve types:

Fixed Reserve – The reserve is fixed at a programmable percentage (30% factory preset) of the total capacity.

Variable Reserve – The controller monitors the daily water usage and at the programmed time of regeneration, calculates the average water used for each day of the week. The reserve capacity is set to 120% of the average water usage for the next day.

U.S. or Metric Units of Measure

To meet your display and programming requirements, the 962 Stager uses grains per gallon of hardness and kilograins of capacity for U.S. units; or parts per million of hardness and kilograms of capacity for metric units. The 962 Stager control displays capacity as gallons or cubic meters.

Calendar Override

If the volume of water used has not caused a regeneration, the 962 Stager can be set to regenerate every one to thirty days.

Manual Regeneration

A separate REGEN button is provided for manual regenerations. A double manual regeneration feature is included that allows back-to-back regenerations.

Operating Histories

Important operating data is stored in memory and is retrievable upon demand. The historical data includes peak flow data as well as average daily water usage for each day of the week.

Remote Regeneration

A set of input terminals with a programmable delay are provided as a standard feature of the 962 Stager control that allows regeneration to be initiated from a remote location. This feature can be used to facilitate remote manual regeneration requirements or assist in further automating the control system such as the use of a differential pressure switch.

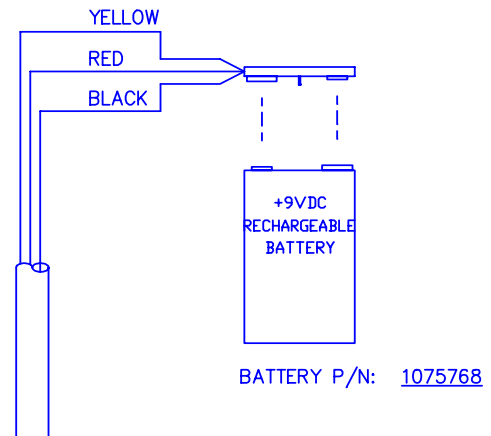
Selectable Automatic Regenerations

There are four automatic regeneration methods; “delayed with immediate override”, “delayed only”, “day of week”, and “calendar override”. Immediate regeneration is used to start an automatic regeneration immediately when the capacity remaining in a tank is reduced to zero. Delayed regeneration is used to start an automatic regeneration at a predetermined time of day when the capacity remaining is below a defined reserve. The reserve capacity may be fixed or variable. The variable reserve is determined by past usage history. Regeneration can be accomplished based on the day of the week at a specific time of day or after a programmable number of days since the last regeneration.

Optional Battery Backup

A battery backup can be provided so that the Time of Day and water usage will be maintained for up to 8 hours during a power outage. The control has a trickle charge circuit that will recharge the battery in the event it is depleted by a power outage. If the optional battery backup is provided with the Series 962 Stager control, make sure that it is properly connected.

BATTERY BACKUP CONNECTIONS



NOTE: A standard 9V Alkaline battery may be used as a substitute, but will not be rechargeable.

Flow Rate Display

In the normal operating mode the series 962 Stager control will alternate between Capacity Remaining (gallons or m³) and Flow Rate (gallons per minute or m³/hr). In the event of power loss, (including battery power) the display will alternate between Time of Day and Capacity Remaining once power has been restored. The control will remain in this display mode until the Time of Day is reset or until any button is pressed.

Programming the Series 962 Stager

This section contains common aspects of programming the 962 Stager control and retrieving historical operating data. A label is provided with the control to be filled out with programming parameters on start-up.

Factory Default Values

The control is shipped from the factory pre-programmed with the correct operation type.

Capacity and Hardness values are set to 0 and must be changed to appropriate values before the control will operate. “Err 4” will be displayed until a valid number is entered for each of these items.

Program variable P12 is preset at the factory to define U.S. units of measure for 60 Hz configurations or metric units of measure for 50 Hz configurations.

Program Levels

The Series 962 Stager controls have been designed to facilitate different levels of programming requirements. Level I includes program variables that are frequently referenced by users, operators, installers and service personnel and are accessible without the requirement of codes. Level II includes variables that are most typically used at the time of installation and initial setup and are accessible with access codes. Level III locations are used primarily for accessing operation history information. Level IV locations are used to set the user defined cycle times (“C” Values) and days of the week (See Page 4 for details). Level III and IV parameters also require access codes. Programming levels are further defined in Tables I, II, and III.

| Levels | Access Code |
|--------|--|
| I | None Required |
| II | Press and hold the ↑ and ↓ arrow buttons for 3 seconds |
| III | Press and hold the ← and ↑ arrow buttons for 3 seconds |
| IV | Press and hold the ← and ↓ arrow buttons for 3 seconds |

Level I Programming

Level I Program Values are identified by the legend on the faceplate of the control. Each Level I “P” value has a green LED that is illuminated when displayed. Following are the Level I “P” values:

| | |
|------------------------|-----|
| · TIME OF DAY | P 1 |
| · TIME OF REGENERATION | P 2 |
| · HARDNESS | P 3 |
| · CAPACITY | P 5 |

P4 is used to program the salt amount. The 962 Stager does not require a salt amount.

Setting Time of Day

Press the SET button. The display will show the time of day with the minutes digit blinking. Press the UP [↑] arrow button to increase the number or the DOWN [↓] arrow button to decrease the number. To skip the number without changing, press the LEFT [←] arrow button. The first digit will stop flashing and the next digit will start flashing. When the far left digit is reached, pressing the LEFT [←] arrow button returns the flashing to the far right digit. Continue changing numbers until the desired Time of Day is obtained. Press the SET button to enter the value. The PM indicator will toggle when the “tens digit” of the hours is increased. The far left digit is used to indicate the day of week. Number 1 being Sunday and number 7 being Saturday.

The Time of Regeneration, Hardness, and Capacity are set in a similar manner.

The control will automatically enter Level II programming if P19 or P20 have not been set.

Level II Programming

Press and hold the [↑] and [↓] arrow buttons for 3 seconds to enter the Level II programming mode. The display will show the letter “P” in the far left display digit. The parameter “P-number” is displayed in the far right display digit. See Table I for Level I and II programming values.

Changing a Program Value

Once the P value you want to change is displayed, press the [←] arrow button to display the current entry for that value. To change or modify the value, press the SET button. The digit on the right hand side of the display will begin to flash. Use the [↑] or [↓] arrow buttons to select the desired entry. Once the desired entry is obtained, press the [←] button to move to the next digit and change as needed. Once you have completed the appropriate changes, press the [SET] button. When you press the [SET] button the new entry is stored and the control automatically scrolls to the next P value. If a beep sounds, the new entry was not accepted. Table I lists the range available for a specific program value.

Level III Programming

Press and hold the [←] and [↑] arrow buttons for 3 seconds to enter the Level III programming mode. The display will show the letter “L” in the far left display digit. The parameter “L-number” is displayed in the far right display digit. The [SET] button is inactive except for L4. If [SET] is pressed when L4 is displayed, *Peak Flow* is reset to zero. If [SET] is pressed when any other location is displayed the control will beep.

Level IV Programming

Press and hold the [←] and [↓] arrow buttons for 3 seconds to enter the Level IV programming mode. Level IV programming is used to enter the user defined cycle times and day of week regeneration. All controllers have default settings for 4 cycle softener or 3 cycle filter operation. **The operation type is determined by the value that is programmed in “P17”.**

Entering “C” Values

“C” values are used to define a specific number of cycles to meet the application needs and are accessible through level IV programming mode.

Example: If the control is used in a system that has a total of 10 cycles of operation, select 6 for P17 and program C1-C10 for the amount of time desired for each cycle (up to 255 minutes).

Each “C” value represents 1 position of the rotary pilot stager that is being used. A maximum of 15 cycles may be used, each programmable from 0-255 minutes.

While the controller is in regeneration the display will show a “C” value in the far left display and the time remaining (in minutes) for that “C” value.

Example: [C1 15] = 15min remaining in C1.

Entering “d” Values

“d” values are used to start a regeneration on a certain day of the week. There are seven “d” values numbered from 1 to 7, with 1 representing Sunday and 7 representing Saturday. Set a 1 in “d7” to initiate an automatic every Saturday at the *Time of Regeneration (P2)*. The automatic regenerations will occur at the time set in P2 regardless of the capacity remaining in the system. A value of “0” indicates no regeneration on that day. The default value is “0” for all “d values”.

Viewing a Program Value

Programmed values may be viewed at any time. Program values may not be changed during a regeneration. A regeneration in process may be aborted by manually rotating the stager to the home position. Programmed values may be changed once the stager is in the home position.

Level I - To locate and display a P value in Level I press the [↑] or [↓] arrow button until the desired value is displayed. Level I parameters are indicated by the legend on the face plate of the control.

Level II - To locate and display a P value in Level II, simultaneously press the [↑] and [↓] arrow buttons for 3 seconds to gain access. Press the [↑] or [↓] arrow buttons until the desired location is displayed. Press [←] to display value in the P location.

Level III - To locate and display an L value in Level III, simultaneously press the [←] and [↑] arrow buttons for 3 seconds to gain access and then press the [↑] or [↓] arrow buttons until the desired location is displayed. Press [←] to display value in the L location.

Level IV - To locate and display a “C” or “d” value in Level VI, simultaneously press the [←] and [↓] arrow buttons for 3 seconds to gain access and then press the [↑] or [↓] arrow buttons until the desired location is displayed. Press [←] to display value in the location.

Manual Regeneration

To initiate a manual regeneration, simply press and hold the REGEN button for 3 seconds. If an immediate second regeneration is desired, wait for at least **one minute** after the first regeneration begins and then press and hold the REGEN button for 3 seconds. A second regeneration will be performed immediately following the first. The display will freeze and only show the Regeneration Time Remaining as an indication that the second regeneration will be initiated. When the first regeneration is

complete, the second regeneration will begin and the display will alternate between Flow Rate and Regeneration Time Remaining. The second regeneration will be performed on the offline tank in twin alternating applications.

Lock-out Feature

The lock-out feature may also be used to prevent regenerations when a signal is present at the lock-out terminals. Two or more 962 Stager controls can be connected together (see figure 1) to prevent one from regenerating while another is in regeneration. This signal can also come from external equipment that can provide a dry contact closure. (**CONNECTION MUST BE A DRY CONTACT**)

Note: When using the Relay Output Option (see page 14), the lockout feature cannot be used.

Flow Sensor Select Options

P19 is used to select the flow sensor type. Numbers 1 and 2 are for the Autotrol 1 inch and 2 inch turbine type flow sensors. The number in P20 will be ignored when P19 is programmed with a 1 or 2.

Other flow sensors can be used by entering a “3” in P19 and entering the correct “K-factor” in P20. The K-factor is defined as pulses per gallon for US units or pulses per liter for metric units. The K-factor can be obtained from the flow sensor manufacturer.

If a “4” is entered in P19 then the definition of the number in P20 becomes gallons or liters per pulse depending on the units of measure selected.

Capacity Based Regeneration Start Options

The following is an explanation of the regeneration start options for single tank 962 Stager controls:

At the time of regeneration (time set in P2) the control will check to see if a regeneration should start. This check depends on the value programmed in P15.

P15 = 0 or 2 Variable Reserve:

The control calculates an average water usage for each day of the week when it is using variable reserve. A regeneration will start if the capacity remaining is less than 1.2 times the average water usage for the next day.

P15 = 1 or 3 Fixed Reserve:

The reserve capacity is calculated using the fixed reserve capacity programmed in P16. The value in P16 is the percentage of the calculated system capacity used for the reserve.

Example: if the programmed capacity is 10,000 grains and the hardness is 10 grains/gallon the calculated system capacity is 1000 gallons. The reserve capacity is 300 gallons if the fixed reserve is set to 30%. A regeneration will start if the capacity remaining at the time of regeneration is less than 300 gallons.

The parameter P15 is also used to select immediate regenerations or delayed regenerations only.

P15 = 0 or 1 Delayed Regeneration Only:

Automatic regenerations will occur at the time of regeneration only. The control will delay the start of regeneration until the time of regeneration even if the capacity remaining is reduced to zero gallons.

P15 = 2 or 3 Immediate Regeneration Override:

In addition to delayed regenerations automatic regenerations will occur at any time during the day if the capacity remaining reaches zero.

Immediate Regeneration only Option:

Automatic regenerations performed at the time of regeneration (P2) can be eliminated by setting the control for fixed reserve with immediate regeneration override (P15 = 3) and setting the reserve capacity percentage (P16) to 0%. This will create a reserve capacity of zero gallons. These are the preferred settings for a twin alternating softener system.

Advance Cycle Function:

While in a regeneration cycle, you can advance the stager to the next cycle by pressing and holding the left arrow key [←] for 2.5 seconds. The stager and controller will then advance to the next regeneration cycle.

Cancel Regeneration Function:

To cancel (abort) a regeneration, press and hold the left arrow [←] and SET keys for 2.5 seconds. The control will display an ERROR 3 and return the stager to the service (Home) position. Once in the service position, ERROR 3 will be cleared.

Table I Level I and II Parameters

| P# | Description of Parameter | Range of Values | Minimum Increment | Default | Units of Measure | Notes |
|-----|---|---|---------------------|-------------------------|---------------------------|---|
| P1 | Day of Week and Time of day | (1-7) 1:00 - 12:59 AM or PM (1-7) 0:00 - 23:59 | (1 day) 1 minute | None | hour:minute | Range depends on value selected for P13 For day of week SUN=1, MON=2, TUE=3, WED=4, THU=5, FRI=6, SAT=7. |
| P2 | Time of day to start regeneration | 1:00 - 12:59 AM or PM 00:00 - 23:59 | 1 minute | 2:00am | hour:minute | Range depends on value selected for P13 Use only if P15 = 1 |
| P3 | Hardness of water | 3-250 30-2500 | 1 10 | 0 0 | grains/gallon ppm | Unit of measure depends value selected for P12 |
| P4 | | | | | | Not Used for the AquaMatic Stager Control |
| P5 | Capacity of unit | 1-5100 .1-510.0 | 1 .1 | 0 | Kilograins* Kilograms* | Unit of measure depends value selected for P12. |
| P6 | | | | | | Not Used for the AquaMatic Stager Control |
| P7 | | | | | | Not Used for the AquaMatic Stager Control |
| P8 | | | | | | Not used. |
| P9 | Backwash time | 1-30 | 1 | 14 | minutes | If P17=6 or 9, Do Not Program P9 |
| P10 | Rinse/Draw time | 1-125 | 1 | 40 | minutes | If P17=3, 6 or 7 Do Not Program P10 |
| P11 | Rinse time | 1-19 | 1 | 4 | minutes | If P17=6 or 9 Do Not Program P11 |
| P12 | Units of measure | 0-1 | 1 | 0 | | 0 = US 1 = Metric |
| P13 | Clock mode | 0-1 | 1 | 0 | | 0 = 12 hour clock 1 = 24 hour clock |
| P14 | Calendar override | 0-30 | 1 | 0 | days | 0 = no calendar override |
| P15 | Reserve Type | 0-3 | 1 | 0 | | 0 = variable reserve 1 = fixed reserve 2 = variable reserve with immediate regeneration. 3 = fixed reserve with immediate regen |
| P16 | Initial average usage or fixed reserve | 0-70 | 1 | 30 | % of capacity | Description depends on value entered for P15 |
| P17 | Operation type *(When using options 6 or 9, programming "C" values per table III eliminates the need to program P9-P11) | 3-9 | 1 | 4 | | 0 – 2 = Not Used 7 = 3 Cycle Filter <u>Twin Alt.</u> 3 = 3 Cycle Filter 8 = 4 Cycle Softener <u>Twin Alt.</u> 4 = 4 Cycle Softener 9 = *User Defined <u>Twin Alt.</u> 5 = 4 Cycle (180/182) Butterfly Config. 6 = *User Defined Cycle Times. *(Program "C" values per table III) |
| P18 | Capacity Change Lock Out | 0-1 | 1 | 0 | | 0 = none 1 = Capacity Change Locked Out |
| P19 | Flow Sensor Select | 1-4 | 1 | 3 | | 1 = 1.0" Autotrol Turbine 2 = 2.0" Autotrol Turbine 3 = User Defined K-factor 4 = User Defined Pulse Equivalent |
| P20 | K-factor or Pulse Equivalent | 0.01-255.00 | .01 | 0.01 | | Number Used for Meter K-factor or Pulse Equivalent |
| P21 | Remote Regeneration Switch Delay | 1-254 | 1 | 60 | Seconds | Time remote switch must be active to start a regeneration. |
| | * | To Convert Capacity in | | Into Capacity in | | Multiply by |
| | | kilograms (kg) | | kilograins (kgr) | | 15.43 |
| | | kilograins (kgr) | | kilograms (kg) | | 0.0648 |
| | | moles of CaCO ₃ | | kilograms (kg) | | 0.10 |
| | | equivalents of CaCO ₃ | | kilograms (kg) | | 0.05 |

Table II Level III History Data

| Location | Range | Description |
|-----------------|-----------------------|---|
| L 1 | 1 - 7 | Day of Week (Sun=1, Sat=7) |
| L 2 | 0 - 255 | Days since last regeneration |
| L 3 | 1:00-12:59/0:00-23:59 | Time that peak flow occurred |
| L 4 | 0-200/0-50.0 | Peak Flow gallons per minute/cubic meters (M ³) per hour since location reset |
| L 5 | 0-655360/0-6553.6 | Water used today in gallons / M ³ since Time of Regeneration |
| L 6 | 0-655360/0-6553.6 | Water used since last regeneration in gallons / M ³ |
| L 7 | 0-655360/0-6553.6 | Average water usage for Sunday in gallons / M ³ |
| L 8 | 0-655360/0-6553.6 | Average water usage for Monday in gallons / M ³ |
| L 9 | 0-655360/0-6553.6 | Average water usage for Tuesday in gallons / M ³ |
| L 10 | 0-655360/0-6553.6 | Average water usage for Wednesday in gallons / M ³ |
| L 11 | 0-655360/0-6553.6 | Average water usage for Thursday in gallons / M ³ |
| L 12 | 0-655360/0-6553.6 | Average water usage for Friday in gallons / M ³ |
| L 13 | 0-655360/0-6553.6 | Average water usage for Saturday in gallons / M ³ |
| L 14 | 0-999990/0-99999.9 | Total water used since NOVRAM test in gallons / M ³ (LSD) |
| L 15 | 0-167/0-16 | Total water used since NOVRAM test in gallons / M ³ x 10 ⁶ (MSD) |
| | | |

Table III Level IV Parameters

| # | Description of Parameter | Range of Values | Minimum Increment | Default | Notes |
|-----|--------------------------|-----------------|-------------------|---------|-----------------------------------|
| C1 | Position 1 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C2 | Position 2 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C3 | Position 3 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C4 | Position 4 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C5 | Position 5 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C6 | Position 6 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C7 | Position 7 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C8 | Position 8 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C9 | Position 9 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C10 | Position 10 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C11 | Position 11 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C12 | Position 12 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C13 | Position 13 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C14 | Position 14 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| C15 | Position 15 Cycle Time | 0 min – 255 min | 1 min | 0 | Stager Cycle Time (P17=5) |
| d1 | Sunday | 0-1 | 1 | 0 | 0 = no day of week regen this day |
| d2 | Monday | 0-1 | 1 | 0 | 0 = no day of week regen this day |
| d3 | Tuesday | 0-1 | 1 | 0 | 0 = no day of week regen this day |
| d4 | Wednesday | 0-1 | 1 | 0 | 0 = no day of week regen this day |
| d5 | Thursday | 0-1 | 1 | 0 | 0 = no day of week regen this day |
| d6 | Friday | 0-1 | 1 | 0 | 0 = no day of week regen this day |
| d7 | Saturday | 0-1 | 1 | 0 | 0 = no day of week regen this day |

***NOTE: The number of “C” values MUST equal Exactly the number of stager regeneration cycles.**

Table IV Error Code Identification

| Error Code | Description |
|------------|---|
| 1 | Data stored in NOVRAM has been corrupted and is incorrect. |
| 2 | Home switch closed when it should be open. |
| 3 | Home switch open when it should be closed. |
| 4 | One or more parameters are below the minimum value in Table I. |
| 5 | System capacity less than 10 gallons or 0.1 m ³ (Capacity is set too <u>low</u> or Hardness is set too <u>high</u> .) |

Installation Programmed Values Chart

| Installation Date: | | | | | | |
|---------------------------|---|-----------------------|--|----------------------|-------------------------|-----------------------|
| "P" Value | Description | Install Values | | "C" Value | Description | Install Values |
| P1 | Day of Week/Time of Day | | | C1 | Position 1 Cycle Time | |
| P2 | Time of Regeneration | | | C2 | Position 2 Cycle Time | |
| P3 | Hardness of Water | | | C3 | Position 3 Cycle Time | |
| P4 | <i>Not Used</i> | | | C4 | Position 4 Cycle Time | |
| P5 | Capacity of Unit | | | C5 | Position 5 Cycle Time | |
| P6 | <i>Not Used</i> | | | C6 | Position 6 Cycle Time | |
| P7 | <i>Not Used</i> | | | C7 | Position 7 Cycle Time | |
| P8 | <i>Not Used</i> | | | C8 | Position 8 Cycle Time | |
| P9 | Backwash Time | | | C9 | Position 9 Cycle Time | |
| P10 | Rinse/Draw Time | | | C10 | Position 10 Cycle Time | |
| P11 | Purge Time | | | C11 | Position 11 Cycle Time | |
| P12 | Units of Measure | | | C12 | Position 12 Cycle Time | |
| P13 | Clock Mode | | | C13 | Position 13 Cycle Time | |
| P14 | Calendar Override | | | C14 | Position 14 Cycle Time | |
| P15 | Reserve Type | | | C15 | Position 15 Cycle Time | |
| P16 | Initial Average Value Or Fixed Reserve Capacity | | | d1 | Regenerate on Sunday | |
| P17 | Operation Type | | | d2 | Regenerate on Monday | |
| P18 | Capacity Change Lock Out | | | d3 | Regenerate on Tuesday | |
| P19 | Turbine Select | | | d4 | Regenerate on Wednesday | |
| P20 | K-factor or Pulse Equivalent | | | d5 | Regenerate on Thursday | |
| P21 | Remote Regeneration Switch Delay | | | d6 | Regenerate on Friday | |

Parallel Operation

The 962 Stager control can be used for twin and triple tank applications, operating in a parallel mode. Parallel systems can be implemented with up to 3 individual controls by using the lock-out feature. Each control will provide a lock-out signal when it is in regeneration. This lock-out signal will prevent other controls from starting a regeneration when the controls are connected as seen below.

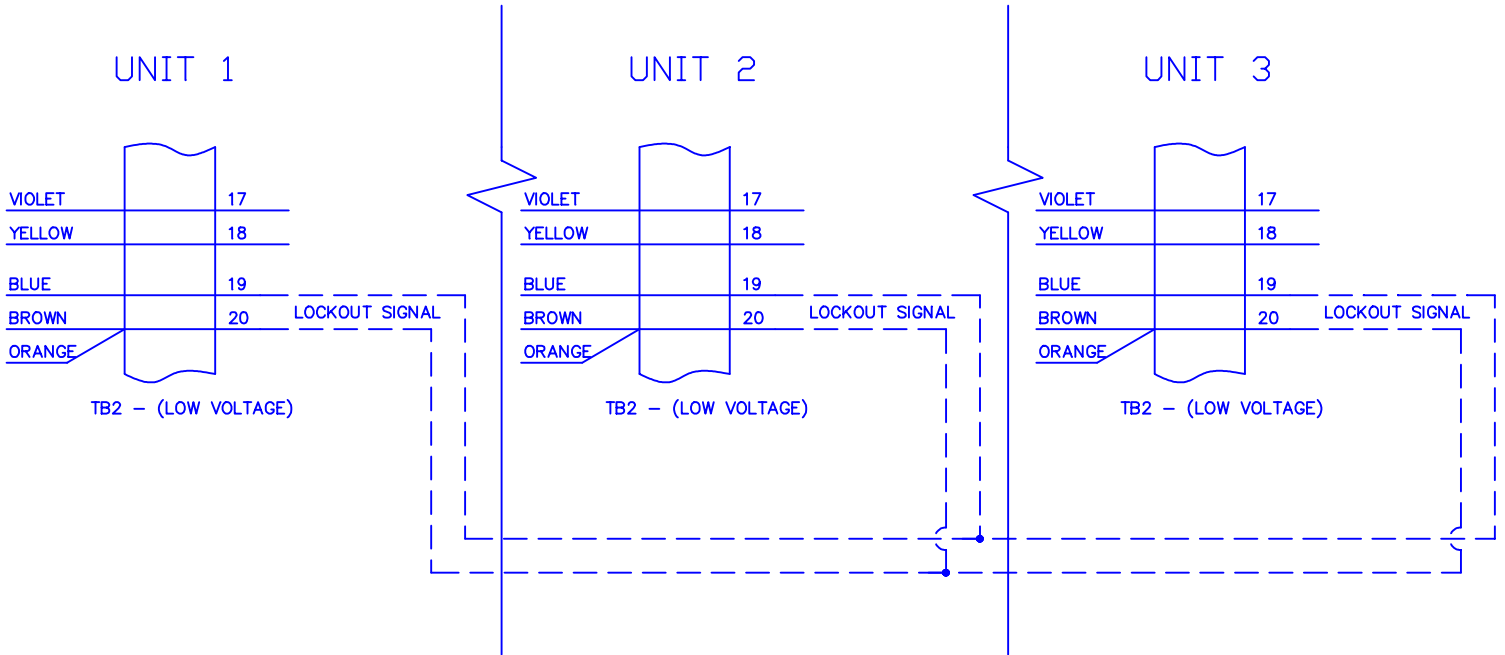


Figure 1 Parallel/Interlock Connections

NOTE: The lockout feature is void when using the relay output option (see page 14)

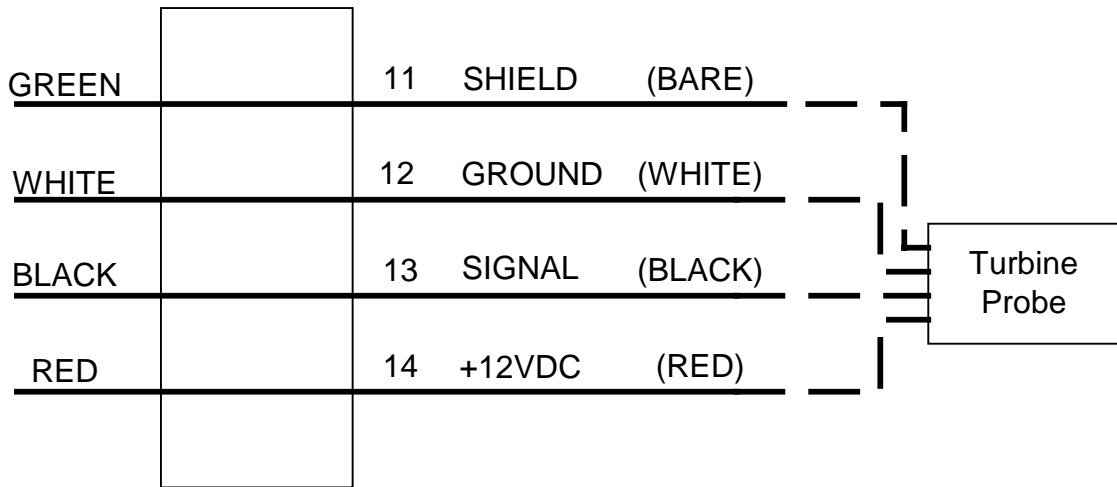
Twin Alternating (TA) Operation

The 962 Stager control can be used for Twin Alternating applications by combining a single 962 controller with a model 58 Twin Alternating stager. The alternating of the system is performed by the model 58 stager and is independent of the controller. The controller is set for Twin Alternating mode by programming P17 to a 7,8 or 9 (See Table I).

The controller will display the “Tank in Service” in the leftmost digit of the 6-digit display. It will display a 1 or 2 depending on which tank is in service. Flow is also displayed during this time. If any error condition occurs, the “Tank in Service” display will be set to a 2 by default. The controller will reset the display to the proper tank in service once a regeneration is performed on any tank.

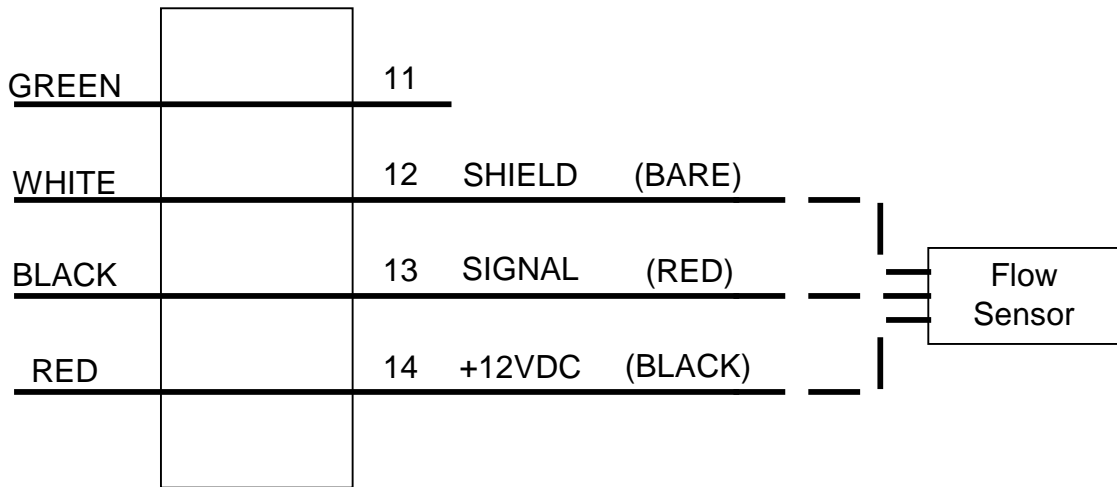
Flow Sensor Connections

The 962 Stager control may be connected to a number of different flow sensing devices. Figure 2 shows the connections for the Autotrol turbine type flow sensor. Figure 3 shows the connections for the Signet flow sensor. Most of the flow sensors that are used will be wired similarly, though the wire colors may vary.



TB2 - (LOW VOLTAGE)

Figure 2 Autotrol Flow Sensor Connections



TB2 - (LOW VOLTAGE)

Figure 3 Signet Flow Sensor Connections

AC Power Wiring

The 962 Stager controls have standard voltage configurations of 115VAC 50/60Hz. or 230VAC 50/60Hz. Power requirements must be specified when ordering. For 115VAC jumpers are placed between terminals 1 & 3 and 2 & 4. For 230VAC jumpers are placed between terminals 2 & 3 **only**. Line voltage and neutral inputs are always on terminals 1 & 4, respectively.

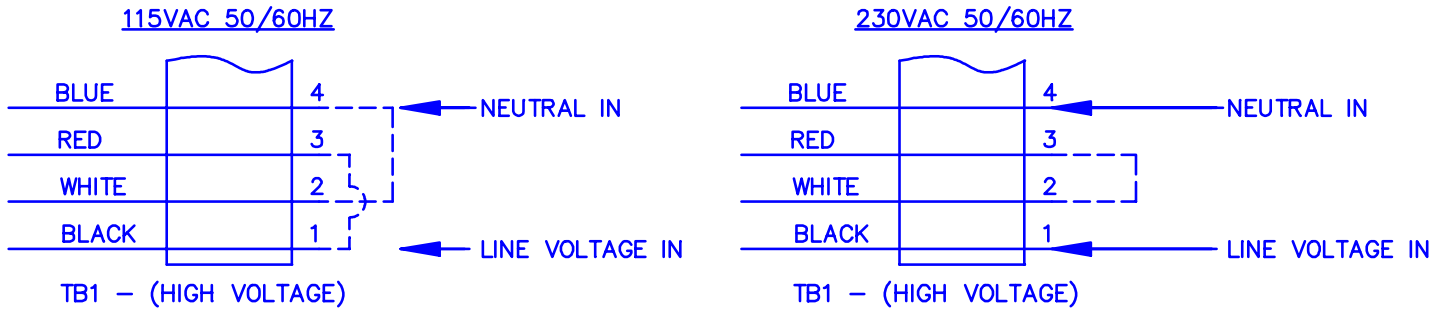


Figure 4 AC Power Connections

Remote Regeneration

A set of terminals with a programmable delay (P21) are provided as a standard feature of the 962 Stager control. This feature allows for a regeneration to be initiated from a remote location. This feature can also be used to accommodate a differential pressure switch input or any dry contact closure from external equipment. Programmable value “P21” is used to monitor this input for the amount of time that is programmed (in seconds).

P21 is the length of time (in seconds) that the remote input signal will be ignored before starting a regeneration. **(CONNECTION MUST BE A DRY CONTACT)**

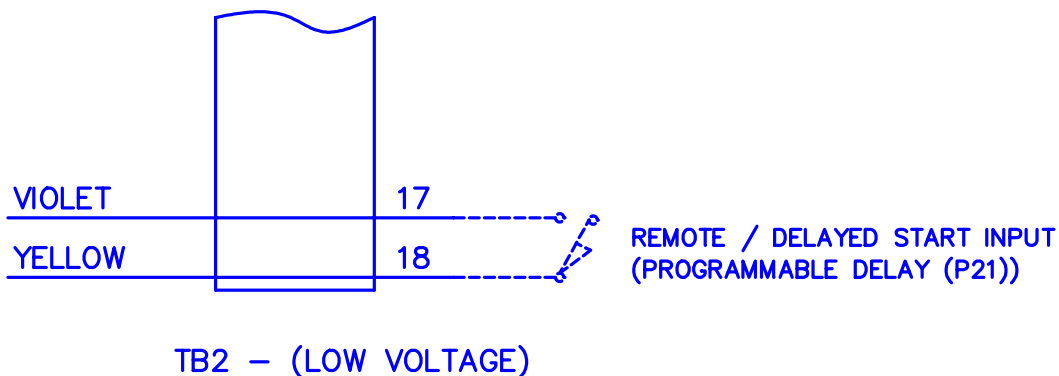


Figure 5 Remote Regeneration Start Connections

Relay Output Option

A single pole double throw (SPDT) relay may be added for outputs during “Regeneration” and “Service” mode. The relay output option is available on single unit and Twin Alternating models only. This feature may not be used however, with the parallel multi-tank systems utilizing the lockout feature. The contacts of this relay are supplied as “Dry Contacts” (un-powered). (See Figure 6 and 7 for wiring information)

NOTE: The lockout feature is void when using the relay output option.

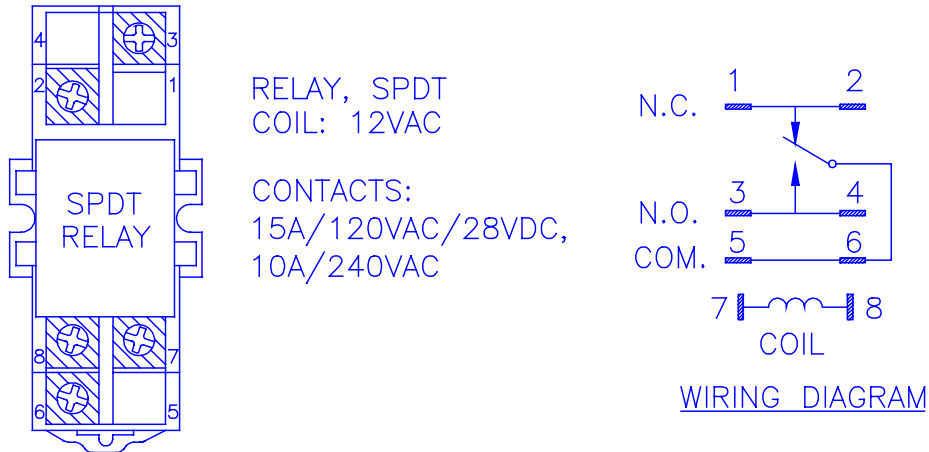
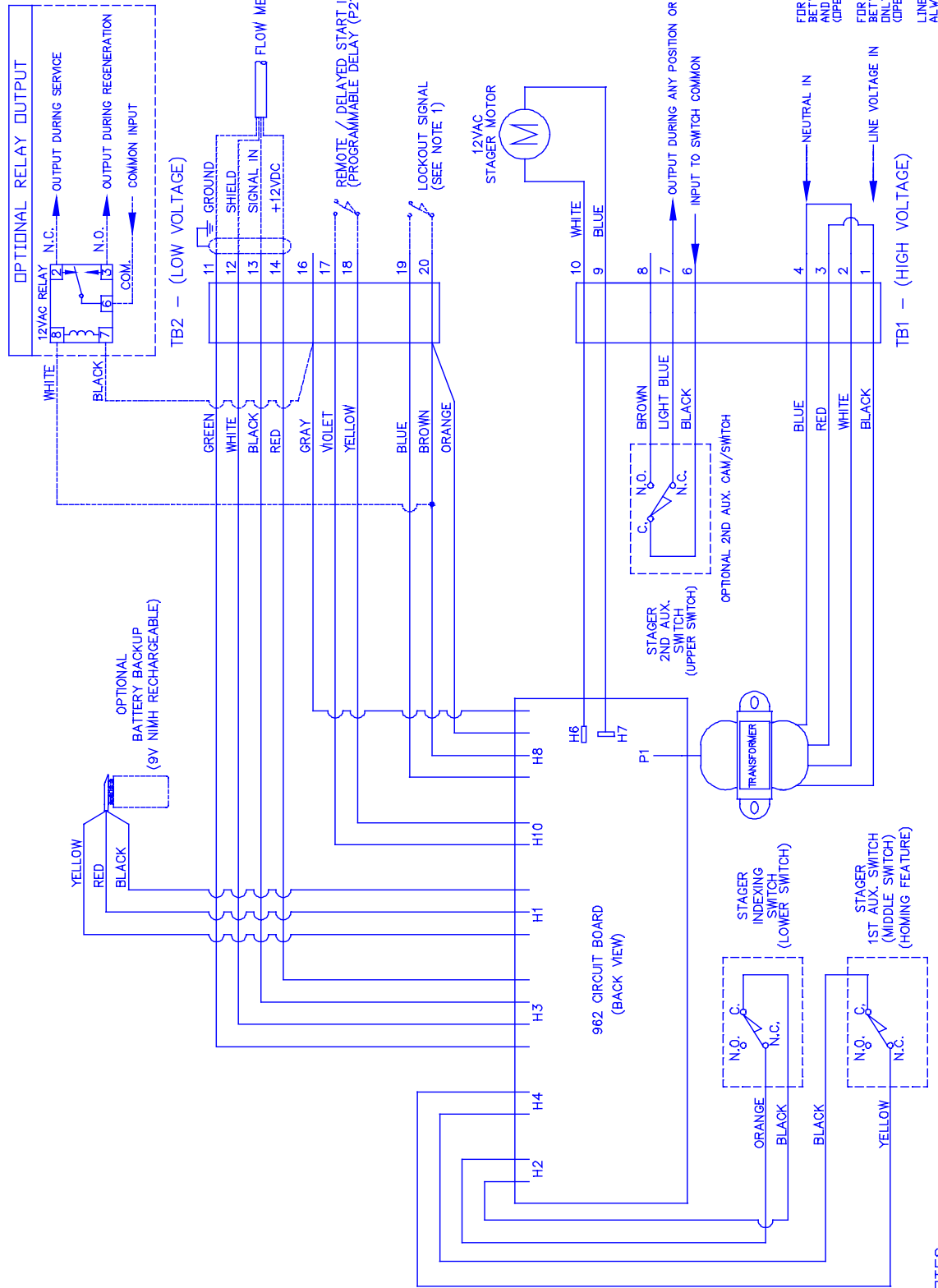


Figure 6 Relay Output Option



FOR 115VAC PLACE JUMPERS BETWEEN TERMINALS 1 & 3 AND 2 & 4. (OPERATION IS 50/60 HZ.)
 FOR 230VAC PLACE JUMPERS BETWEEN TERMINALS 2 & 3 ONLY. (OPERATION IS 50/60 HZ.)
 LINE AND NEUTRAL INPUTS ARE ALWAYS ON TERMINALS 1 & 4.

NOTES:

1 LOCKOUT FUNCTION IS VOID WHEN USING OPTIONAL RELAY OUTPUT.

Figure 7 E948 / E951 / E958 Standard Wiring Diagram



OSMONICS

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