

# *norweco*® SERVICE PRO®

## CONTROL CENTER WITH MCD TECHNOLOGY

# INSTALLATION AND OPERATION INSTRUCTIONS

The advanced integrated circuitry of the Service Pro control center simplifies the Singulair installation, improves system performance and allows for communication with the Service Pro website. The control center insert and enclosure provide space for power and communication wiring connections. The integrated circuitry continually monitors both motor over current and under current conditions and minimizes nuisance alarm conditions using the automatic restart feature. To reduce unnecessary service calls, the control center shuts down the Singulair aerator in the event of an over current or an under current alarm condition, illuminates the alarm light and begins an automatic two hour aerator restart attempt sequence before activating the audible alarm and telemetry system.

Service Pro MCD and TNT control centers are equipped with an automatic telemetry system designed to communicate through a toll free telephone number or an Internet connection. In the event of an alarm condition that cannot be corrected by the control center's self-diagnostic sequence, the telemetry system contacts the Service Pro remote monitoring center. The monitoring center identifies the alarming control center and logs the time that the message was received and specific alarm condition reported. The monitoring center then automatically updates the website and notifies the responsible Norweco distributor or service provider by email, fax or telephone. In addition to documenting alarm conditions, the website tracks the date, time and duration of service visits, service contract renewals and maintains a complete database for every Singulair system registered. Access to the information is password protected and available to licensed distributors, sponsored service providers, health departments and system owners.

These instructions are not intended to be a complete electrical, telecommunication or network system installation reference. Telecommunication and network system policies as well as electrical code requirements vary according to geographic area. Consult your local policies and regulations prior to installing the Service Pro control center. Refer to the Electrical Wiring and Control Center Installation instructions for additional details.

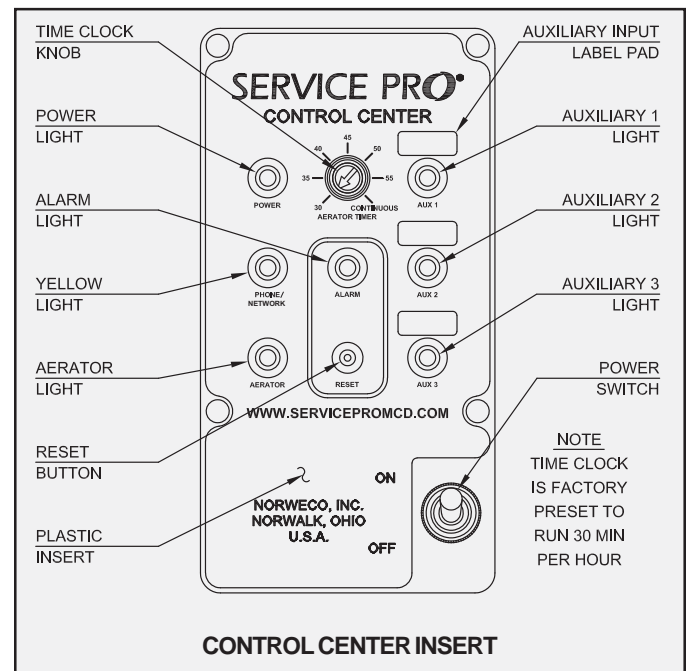
### INSTALLATION OF ELECTRICAL CONTROL CENTER

Although the aerator is not installed until system start-up, the Service Pro control center should be wired for operation when the tank and underground electrical cable are installed. Complete steps 1 through 10 of the "Underground Electrical Cable Installation" section of the Electrical Wiring and Control Center Installation instructions. The control center should be located so the warning light can be seen and the audible alarm heard. The mounting location should minimize exposure to direct sunlight, freezing rain or conditions that might prevent routine inspection or access. The control center should always be mounted out of the reach of children. If the Singulair system is to be remotely monitored, the steps in the Getting Started Website Instructions can be completed either before or after Service Pro control center installation.

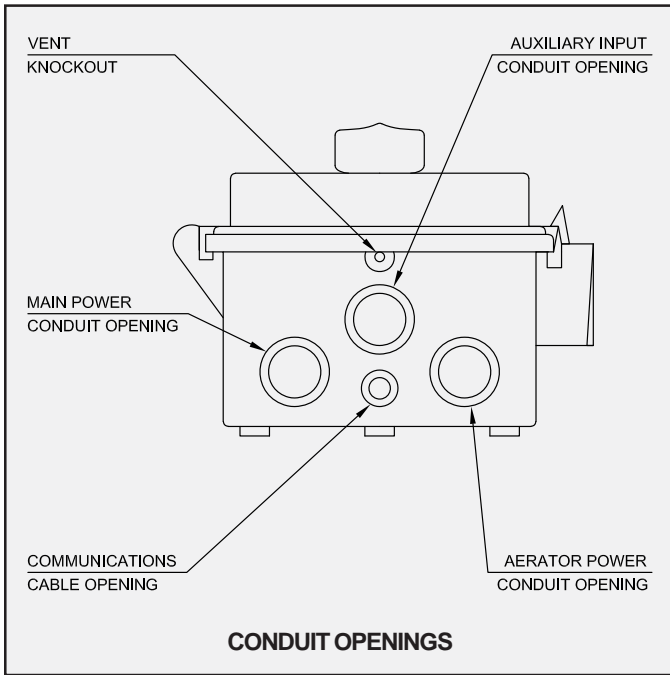
Detach the control center cover from the enclosure, remove the insert from the mounting posts and set the control center insert aside. Remove two of the three 1/2" knockouts in the bottom of the control center enclosure if you are not using any auxiliary alarm inputs. Remove all three of the knockouts in the bottom of the control center enclosure if you are using the auxiliary alarm inputs. **NOTE:** All alarm wires must be in a conduit separate from the power lines. Install a conduit connector into each of the openings. Remove the knockout for the communications cable only if the communication

grommet will be used. For installations requiring a NEMA 3R rated enclosure, remove the 1/8" drain opening knockout to vent moisture from the enclosure. Exposed wiring to or from the control center should always be enclosed in conduit.

**NOTE:** Be sure to assemble the hub to the conduit before



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connecting the hub to the enclosure. Mount the enclosure securely. The following steps should be performed by the installing electrician to complete system wiring:

1. Use a dedicated 115 volt AC, single-phase, 15 amp (maximum) circuit breaker in the main electrical panel for service to each Singlair aerator.

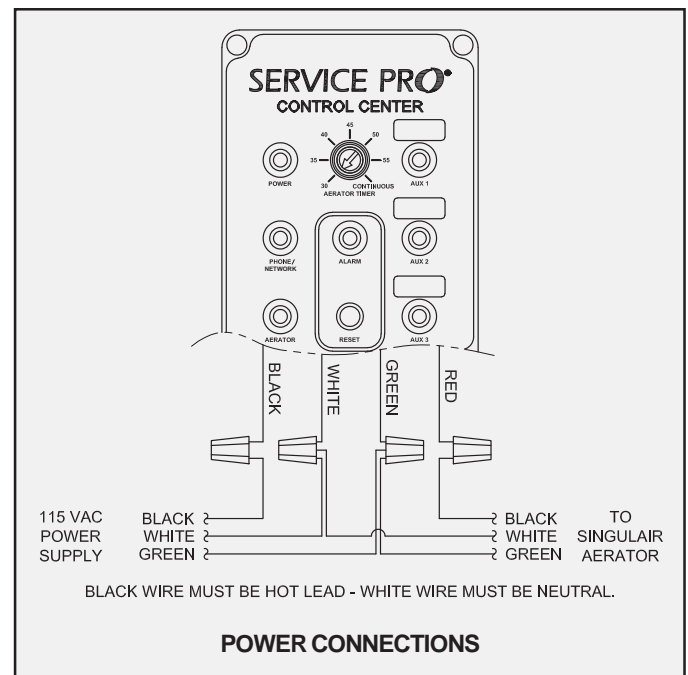
**CAUTION: Make sure the circuit is de-energized. Check it with an electrician's test light before proceeding. Remember that other circuits in the service panel may remain energized as you are working. Use only tools with insulated handles, stand in a dry location and work with extreme care.**

2. Connect the black wire from the dedicated breaker in the main service panel to the black wire provided on the circuit board. Use at least #14 AWG black solid copper wire. To connect to the wire leads, strip off the insulation jacket  $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the stripped leads together and secure the connection with a yellow wire nut connector.
3. Wire from the neutral in the main service panel to both the neutral wire in the underground electrical cable from the Singlair aerator and the white wire provided on the circuit board. Use at least #14 AWG white solid copper wire. Strip off the insulation jacket  $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the three stripped leads together and secure the connection with a yellow wire nut connector.
4. Install a grounding conductor from the ground lug in the main service panel to the control center. This wire, along with the non-insulated ground lead in the aerator underground electrical cable and the green ground wire attached to the optional telephone communications module, if equipped, must all be connected to the green wire provided on the circuit board. Strip off the insulation

jacket  $\frac{7}{16}$ " from the end of the insulated wire lead. Twist the four ground leads together and secure the connection with a yellow wire nut connector.

**CAUTION: Never allow the white neutral leads and ground leads to be spliced together or connected to common terminals. Failure to connect the Service Pro control center to a proper ground will void the Singlair system warranty.**

5. Connect the black lead of the underground electrical cable from the aerator to the red wire provided on the circuit board. Use at least #14 AWG black solid copper wire. To connect to the power connector lead, strip off the insulation jacket  $\frac{7}{16}$ " from the end of each wire lead. Twist the stripped leads together and secure the connection with a yellow wire nut connector.
6. If auxiliary alarm inputs are being used, skip to AUXILIARY ALARM INPUTS.
7. Inspect your work to make sure there are no breaks in the wiring insulation and that all connections are secure.
8. Before installing the control center insert, energize the circuit breaker in the main electrical service panel and, with your electrical multi-meter, test the voltage being supplied. Set up the meter to read AC voltage on the 0-150 volt scale. Place one probe of the meter into the yellow wire nut connector attached to the black lead and one probe into the yellow wire nut connector attached to the white lead. It should read between 109 volts and



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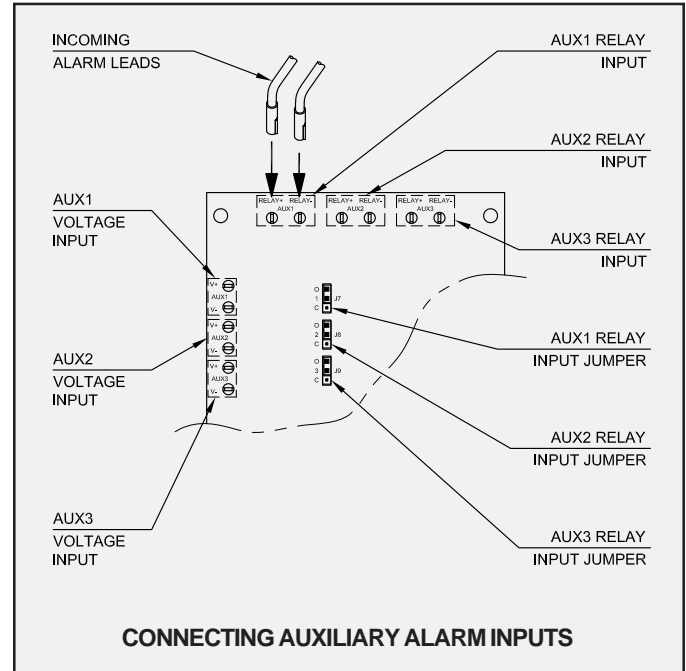
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121 volts. If it is within these limits, place one probe of the multi-meter into the yellow wire nut connector attached to the red lead and one probe on the power connector pin attached to the white lead. The meter should read zero volts. Once these readings are confirmed, place the dedicated circuit breaker in the main service panel in the "off" position.

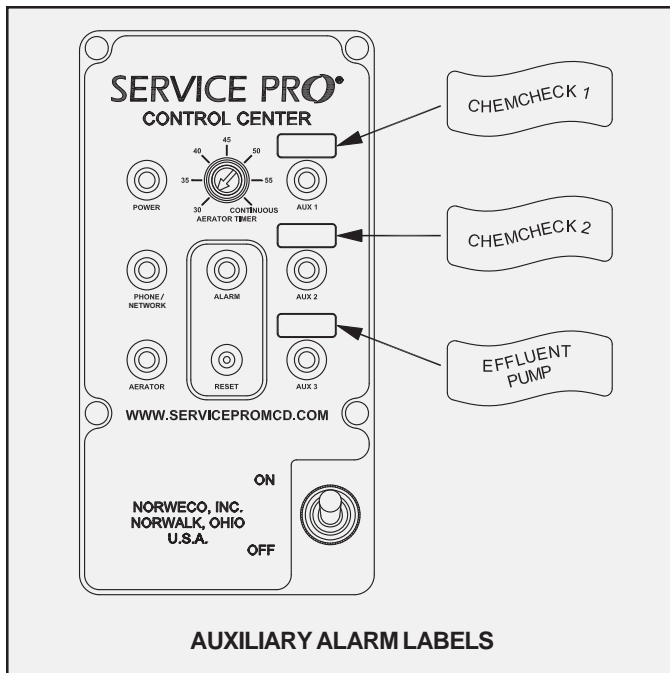
9. The conduit openings in the control center must now be sealed. Expanding foam sealant is recommended for this purpose. Insure sealant complies with local code requirements. Follow manufacturer's instruction when adding expanding foam sealant into the conduits. **IMPORTANT:** The conduit openings must be sealed to prevent moisture and corrosive gas from entering the control center enclosure which could result in a fire, explosion or damage to the control center. Failure to properly seal all conduit openings will void the Singularir system warranty.
10. Close the insulator and snap the insert into position.
11. When the auxiliary inputs are used, label the corresponding auxiliary alarm light located on the front of the Service Pro control center insert using the labels provided.



**AUXILIARY ALARM INPUTS**

The Service Pro control center will accept alarm inputs that generate several different types of output: a 5 to 120 volt AC or DC signal, a normally open relay circuit or a normally closed relay circuit. The inputs on the control center are male 0.110" quick connect terminals and accept standard female 0.110" insulated quick connect receptacles. When connecting to the three auxiliary alarm inputs:

1. Determine the type of output that is generated by the alarm device you wish to connect.
2. Route the leads through one of the conduits not being used for power lines into the bottom of the enclosure. Be sure to pull enough wire to comfortably reach the two auxiliary terminals you will be connecting to on the back of the control center insert.
3. Crimp the insulated female 0.110" quick connect receptacles to the ends of the alarm leads.
4. Connect the leads to the corresponding auxiliary alarm inputs. When connecting a relay circuit, connect to the "RELAY +" and "RELAY -" terminals. For a voltage input, connect the leads to the auxiliary alarm terminals marked "V+" and "V-".
5. When connecting a device that uses a relay contact setting, you will need to set the jumper for the correct relay configuration. If the alarm circuit is normally closed, place the jumper over the bottom two jumper pins closest to the 'C' label. If the alarm circuit is normally open, place the jumper over the top two jumper pins closest to the 'O' label (see CONNECTING AUXILIARY ALARM INPUTS on Page 3 for reference).



12. Clearly label the dedicated circuit used for each Singularir aerator on the door of the main electrical service panel in the home. Replace the service panel dead front and enclosure cover.
13. Make sure the selector switch in the control center is in the "off" position.
14. Complete the steps outlined in the "Before Leaving" section of the Electrical Wiring and Control Center Installation instructions.

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## COMMUNICATION CABLE INSTALLATION REQUIREMENTS

If a telephone connection will be utilized, a telephone line must be installed unspliced from the telephone box to the Service Pro control center. Before installing the telephone line, familiarize yourself with the equipment and policies of the local telephone service provider. The Service Pro control center is not compatible with digital telephone service. With DSL Internet service, a DSL filter will need to be connected to the telephone jack on the Service Pro controls to insure proper operation of the monitoring feature. If a telephone line is not available, one will need to be installed by the local telephone service provider or an Internet communication module should be utilized.

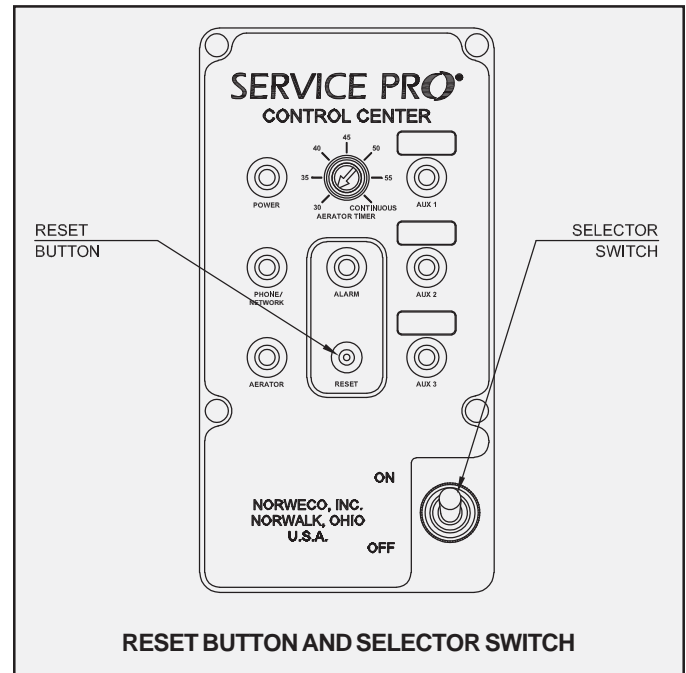
If an Internet connection will be utilized, a network cable must be installed from the home Internet connection to the Service Pro control center. The network cable will typically be plugged into a switch or router that distributes Internet service in the home. Regardless of whether the communications will take place through a phone line or the Internet, the following steps must be performed to complete system wiring:

1. Make sure the dedicated circuit breaker in the main service panel is in the "off" position. Using the auxiliary input conduit or one of the grommets provided, run the telephone or network cable into the bottom of the enclosure. **NOTE:** The telephone or network cable cannot be installed into a conduit with any power lines. Crimp the appropriate phone or network jack on the communications cable in the control center.
2. Connect the telephone or network cable into the jack provided on the control panel. Connect the other end of the communications cable to the existing telephone system or home Internet service.
3. Snap the control center insert into position. Close the control center cover.

### RESET BUTTON

The reset button on the Service Pro control center is used to perform multiple tasks during installation and operation. To activate the reset button, apply pressure with your index finger. The button is activated when a "click" is heard. The reset button can be used to silence the audible alarm, turn on the aerator when it is in an off cycle or restart the run cycle when the aerator is currently running. The reset button is also used to test the control center audible and visual alarms and telemetry system. **NOTE:** Excessive pressure on the reset button should be avoided.

To test the alarms, press and hold the reset button for approximately five seconds until the alarms activate and then release. After five seconds, the panel will call out and deliver an alarm test message to the Service Pro monitoring system. Once the communication is complete, the control center will return to normal operation.



The reset button can also be used to record service visits. When arriving on site, press and hold the reset button for five seconds until the alarm test feature activates, then release the button. After the control panel has completed the alarm test call, routine service should be performed on the Singulair system. Once system service has been completed, press and hold the reset button again for five seconds until the alarm test feature activates. The Service Pro control center will register two alarm test calls received within a four hour period as a service visit. The date, time and duration of the service visit will be logged in the database for future reference.

### TELEMETRY SYSTEM COMMISSIONING

Each control center is shipped with the integrated telemetry system disabled. All other monitoring, diagnostic and local alarm functions will operate as designed. The reset button is used to enable the integrated telemetry system once the communications cable has been connected. This process is referred to as commissioning the control center. Commissioning notifies the Service Pro monitoring center that the control center is functional and ready to transmit information.

To commission the control center, insure the dedicated circuit breaker in the main service panel is in the "on" position and the communications cable is properly installed. Place the control center selector switch in the "off" position. While

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holding in the reset button, place the selector switch in the “on” position. Continue to hold the reset button until the red alarm light illuminates. Release the reset button and allow the telemetry system up to sixty seconds to call out and complete the commissioning process. The yellow light will illuminate during the call out process.

If commissioning is successful, the alarm light will flash 5 short flashes and stop as verification. If commissioning is unsuccessful, the alarm light will flash a pattern that indicates the cause of the failed communication. The pattern will display repeatedly. If the commissioning is not successful, refer to the table below for troubleshooting information. Conduct an alarm test to confirm commissioning was successful. If the yellow light does not illuminate during the alarm test, recommission the panel and refer to the table below for troubleshooting information.

#### AERATOR TIMER

Each control center is supplied with an adjustable timer that determines the run time of the aerator. The timer is adjustable in 5 minute increments up to continuous operation and will not permit the aerator to run less than 30 minutes out of each hour. Full time operation is achieved by turning

the dial so that the arrow points to the “continuous” position. Use a small blade screwdriver to rotate the adjustment dial to the desired position. The timer is factory preset and should only be adjusted after carefully reviewing the Time Clock Setting and Service Instructions.

#### ALARM CONDITION OPERATING SEQUENCE

When the control center detects an over current or an under current alarm condition, the alarm light will activate and flash a code that specifies the alarm condition that was detected. If an under current or open motor condition is detected, the alarm light will flash two short flashes. If a high water or over current condition is detected, the alarm light will flash steadily. If either an over current or an under current alarm condition is detected, the Singulair aerator is shut down and an automatic system restart sequence begins. With the alarm light flashing, the control center will automatically attempt to restart the aerator every five minutes for a period of two hours (24 restart attempts). The control center monitors motor current during each restart attempt. If the proper level of current is detected, the control center returns the aerator to normal operation and turns off the alarm light. Pressing the reset button while the alarm light is flashing causes the control center to attempt to restart the aerator

RED ALARM LIGHT DIAGNOSTIC CODES	
CONDITION	RED ALARM LIGHT FLASH PATTERN
Successful commissioning	Flash 5 short and stop
Alarm test	Flash 10 short and stop
Service visit start	
Service visit end	
Communications cable not plugged in	Flash 1 short, 1 long - pause 3 seconds & repeat
Phone line in use in home	Flash 2 short, 1 long - pause 3 seconds & repeat
Number called is busy	Flash 3 short, 1 long - pause 3 seconds & repeat
Remote monitoring center error	Flash 4 short, 1 long - pause 3 seconds & repeat
Phone service terminated	
Service Pro panel communication error	Flash 5 short, 1 long - pause 3 seconds & repeat
Control failure	Illuminate continuous
Aerator under current	Flash 2 short - pause 3 seconds & repeat
Aerator open motor	Flash 2 short - pause 3 seconds & repeat
Aerator over current	Flash evenly until serviced
Auxiliary one, two and three	

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and counts toward the 24 restart attempts. If the aerator does not restart after 24 attempts, the audible alarm and the alarm light activate.

After both audible and visual alarms are activated, press the reset button and the control center will attempt to restart the aerator again. If the proper current level is not detected, the audible alarm beeps three times, then silences. The alarm light continues to flash and the control center interrupts power to the aerator. If the alarm condition is not corrected and the control center resets after 48 hours, the audible alarm will automatically reactivate. If a control failure is detected, the alarm light will illuminate continuously and the audible alarm will activate. If an auxiliary alarm condition is detected, the audible alarm and the corresponding auxiliary alarm light will activate.

If the telemetry system on the Service Pro control center has been commissioned, the system will then attempt to call out after a five minute delay and deliver an alarm message. The system will call the Service Pro monitoring center every 48 hours until the alarm condition is corrected and the control center is reset. The Service Pro control center uses advanced diagnostic technology to monitor the Singulair system for proper operation. In the event an alarm condition is encountered, the control center will display a series of flashes from the alarm light located in the center of the control panel (refer to the Red Alarm Light Diagnostic Codes chart on Page 5 for further reference).

## SYSTEM HEARTBEAT FEATURE

The Service Pro control center contains a system heartbeat feature that will call out every 30 days to inform the monitoring center that the Singulair system is functioning as designed. If the heartbeat call is not received, the monitoring center will notify the distributor or service provider that service is required at that location.

## FCC COMPLIANCE

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. The label on the inside of the control center cover contains, among other information, a product identifier in the format US:S2KMM00BMCD. If requested, this number must be provided to the telephone company.

If the Service Pro control center causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the

operations of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with the Service Pro control center, for repair or warranty information, please contact Norweco, Inc. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

## SERVICE PRO WEBSITE & REGISTRATION

The telemetry system, standard with Service Pro MCD and TNT control centers, is engineered to interface with the Service Pro monitoring center. The Service Pro monitoring center allows the homeowner, service provider, licensed Norweco distributor and authorized regulatory entities online access to Singulair wastewater treatment system records. Records generated by the Service Pro control center (heartbeat record, alarm conditions, service records) can be accessed at [www.servicepromcd.com](http://www.servicepromcd.com). For access to the website, contact your local distributor or Norweco, Inc.

Permanent record retention and remote monitoring of the Singulair system will begin when the following steps have been completed:

- The "Add New Subscriber" section of the website has been completed by the Singulair distributor or service provider
- The system is started up and the Service Pro control center is commissioned
- Three copies of the signed Service Pro Subscriber Monitoring Agreement are received by Norweco

A control center can be commissioned either before or after the new account has been registered with the Service Pro monitoring center. However, if the commissioning step is performed first, the registration of the new account must be completed within 30 days of commissioning.

The Getting Started Website Instructions provide details on registering a new account on the Service Pro website. Add each new account by using the information recorded on the Monitoring Agreement form.

The Monitoring Agreement is completed with the owner of each system to be monitored by the website. The top three copies of the Agreement should be submitted to Norweco. This activates monitoring and satisfies Norweco's warranty registration procedure. Refer to the Subscriber Monitoring Agreement Guide for further information.

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