SENTINEL M96
AUTOMATIC SAMPLER

OPERATIONS MANUAL

CONTENTS

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SENTINEL M96 AUTOMATIC REFRIGERATED SAMPLER

PRODUCT DESCRIPTION

Scope of Manual

This manual contains a product description, installation, and operating instructions together with maintenance procedures for the SENTINEL M96 Automatic Sampler. A description of operation, list of replaceable parts, wiring diagrams and schematics are provided.

Purpose of Equipment

The SENTINEL M96 samplers are used to automatically collect, composite, and preserve by refrigeration, samples of sewage or industrial wastes.

General Description of Equipment

Liquid to be sampled flows into the sampling chamber through a 2" NPT line. After thorough mixing, it flows over an adjustable weir to waste through a 3" NPT line. Flow into the sample chamber may be by either gravity flow or by pumping and is exhausted to waste by gravity in either case. Flow through the sample chamber should be from ten to twenty gallons per minute. Samples are collected from the flowing liquid in the sample chamber by an oscillating, constant volume dipper. Control is provided by an on-board Programmable Logic Controller (PLC) which may be programmed for time cycle sampling or proportional sampling with an external contact making or 4-20 mA flow meter. The dipper periodically enters the liquid and removes a 25 ml sample at which point it returns to the raised position. Collected sample flows out of the dipper, through the sample transfer tube to the sample storage container. Sampler may be purchased with factory refrigeration or with user provided refrigeration

Sample Control Programmer:

The sample control programmer is located in a NEMA 4-X (IP65) housing mounted on the front of the sampler.

PLC (Programmable Logic Control):

This control may be programmed as either a timer or counter. In the timer modes it is set with the required period between samples. In the flow mode it will totalize up to 9999 counts or impulses from a remote flowmeter (by others) or 4-20 mA signals from flowmeter (by others.).

TEST push button:

Test push button on the PLC is the yellow +/-. to check sampler operation or to collect grab samples. It does not affect the automatic operation settings.

Sample Counter located on PLC

Sample counter indicates number of samples collected**. <u>It must be reset at start of each new composite.</u>** To reset count, press down arrow or the reset button on the outside of the control when new sample container is installed.

Sample Chamber:

The sample chamber is fabricated of virgin, unplasticized PVC plate. This is welded by a combination of hot nitrogen and chemical welding. The chamber is divided into two parts by an adjustable weir. Chamber turbulence keeps liquid well mixed for collection by the sampling dipper.

Sample Dipper:

Individual samples are collected by an oscillating, constant volume (25 ml) unplasticized PVC dipper which enters the liquid only at the moment of sampling and then is raised clear of the liquid to transfer sample to the sample container. Programmer may be set to multiple dips per cycle if a larger sample size is required.

Sample Delivery Tube.

Collected sample is delivered to the sample container by a straight through sample delivery tube that permits easy observation of tube condition and easy cleaning.

Dipper Drive Mechanism:

The dipper is raised and lowered by hermetically sealed, oil immersed motor.

Sampler Technical Specifications

Inlet connection: 2 ″NPS with flexible connector

Effluent connection: 3 ″NPS with flexible connector

Dimensions12.5"H x 19"W x 9.5"D

Weight: 55 lbs. (without refrigerator)

Materials of Construction:

Sample Chamber: Rigid, unplasticized PVC

Sampler Control Housing: Compression Molded Fiberglass

Programmer Housing Rating: NEMA-4X

INSTALLATION

Unpacking:

Sentinel Sampler: The Sentinel M96 sampler(s) and accessories are shipped separately from the optional refrigerator. Remove packaging materials and recycle.

CAUTION: The sample delivery tube extends from the bottom of the sample chamber.

Optional Refrigeration System: The refrigeration system is drop shipped from the manufacturer with mounting holes and inserts installed. Bolts to attach the sample chamber to the top are in the carton with the sample chamber and control. If damage is noted, notify carrier, and retain all shipping materials for hidden damage to samplers not inspected within 10 days of receipt.

BE SURE THE REFRIGERATOR IS UPRIGHT FOR AT LEAST 24 HOURS BEFORE OPERATING. IF REFRIGERATOR HAS BEEN ON SIDE OR BACK DURING SHIPPING, DAMAGE TO THE REFRIGERATION COMPRESSOR WILL OCCUR.

Sampler location and mounting:

The Sentinel M96 sampler(s) should be located in an area protected from temperature extremes, such as a pipe gallery or laboratory. A suitable weatherproof shelter must be provided if a particular installation requires outdoor location.

Installation of sampler on refrigerator:

Install sampler on refrigerator using four (4) ¼-20 x 1” slotted screws (if purchased with optional refrigerator). Be sure not to over tighten. If purchased without refrigeration, use the template included in the Self-Install Kit to adapt your refrigerator to accept the sample delivery tube.

Hydraulic Connections

General:

Inlet (2” NPT) and exhaust (3” NPT) connections are made to the sampler using suitable pipe. PIPE MUST BE SUITABLY BRACED TO MAINTAIN PROPER ELEVATION AND SEPARATION **WITHOUT** THE SUPPORT OF THE SAMPLER.

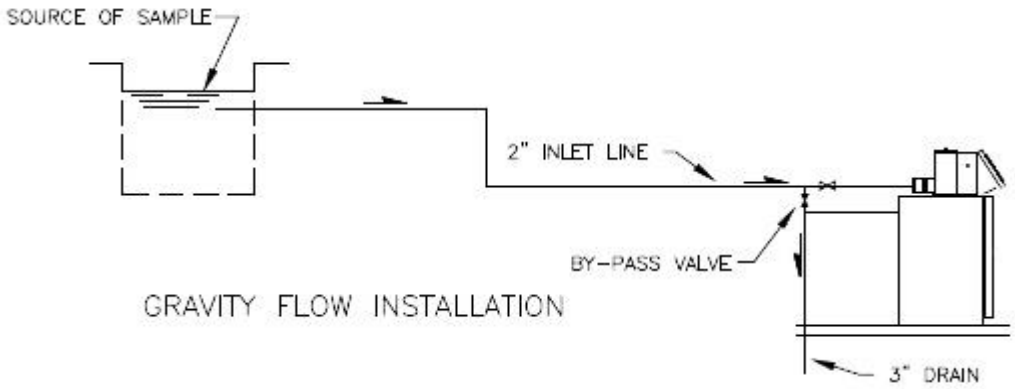
For ease of cleaning, it is suggested the installation include flanged sections (about 24” long) in the inlet and exhaust piping. It is best to keep the inlet line as short as possible, especially in the sampling of raw sewage.

A gate or plug valve should be installed in each end of the inlet line and a by-pass valve of the same type installed if flow regulation is desired.

Particular attention must be given to the layout of the exhaust line. Exhaust may be returned to any suitable waste line, preferably downstream from the inlet. Consideration must be given to easy flow of liquid from the sampler at all possible liquid levels at the point at which it is discharged to waste.

Hydraulic Connections - Gravity Flow:

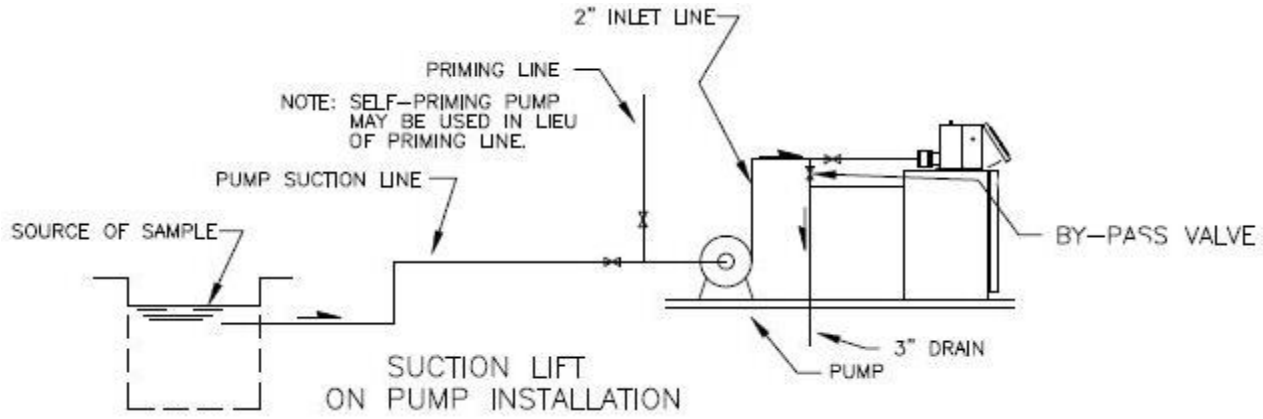
Under gravity flow conditions, sewage to be sampled must flow from the source thorough the inlet line at flow rate of 10 to 20 GPM and back downstream or to suitable waste without being pumped. If flow exceeds 20 GPM, a control or limiting device is required on the inlet.



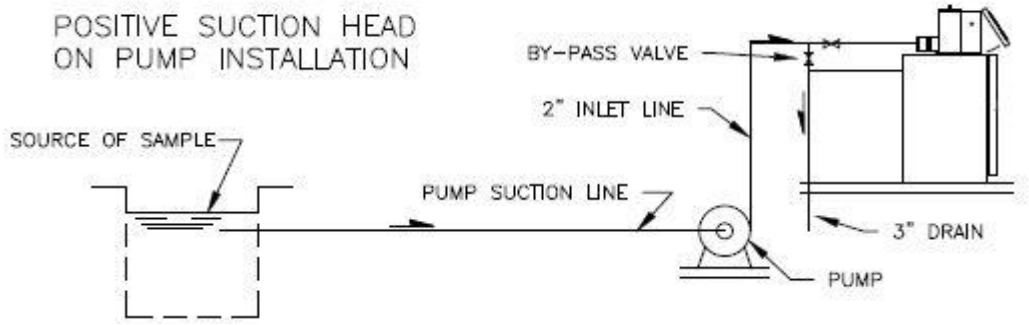
GRAVITY FLOW INSTALLATION

Hydraulic Connections ±Forced Flow:

In forced flow installations, the sewage is delivered to the sampler by a suitable pump and exhausted by gravity. A layout drawing showing the location of the sampler relative to the source to be sampled should be prepared. From this layout, the length of the suction and discharge line, as well as the size, type and number of pipe fittings required can be determined.



The maximum and minimum static heads on the pump and the friction loss in the influent line should be calculated and a suitable open impeller sewage pump with capacity to deliver 10 to 20 gallons per minute at total head incident to the installation installed. If higher flows are anticipated, a by-pass line in the pump discharge will provide an easy means of flow regulation.

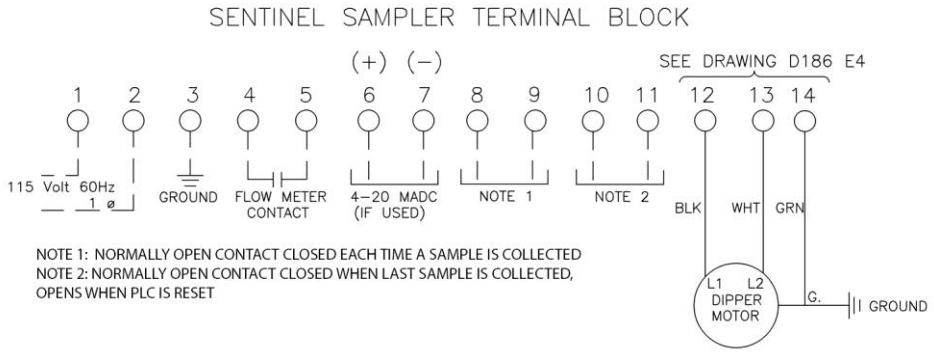


Electrical Connections:

WARNING THE SAMPLER MUST HAVE AN UNINTERUPTED OR UNBROKEN GROUND ACCORDING TO NEC, ANSI/NFPA 70 AND APPLICABLE LOCAL CODES TO MINIMIZE PERONAL INJURY IF AN ELECTRICAL FAULT SHOULD OCCUR. THE GROUND MAY CONSIST OF ELECTRICAL WIRE OR METAL CONDUIT IN ACCORDANCE WITH EXISTING ELECTRICAL CODE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN ELECTRICAL SHOCK, FIRE OR DEATH.

ALL INSTALLATIONS MUST INCLUDE A SUITABLE GROUND FAULT INTERUPTER (GFI)

A numbered terminal strip is provided for all sampler power, and remote signal connections. Depending on local codes, connections may be made with either flexible or rigid conduit. In either case the conduit sheath should be grounded by running a wire from terminal #3 in the sampler to the conduit hub or connector. A suitable fused disconnect should be provided for the sampler (by others).



Flow-meter Connections:

An access port is provided on the control housing for flow-meter wiring.

An **unpowered** flow-meter contact from an integrating (contact making/pulse) flow-meter should be made to terminals 4 & 5 (See Section 3 Programming the Sampler).

For 4-20 mA input connect input to terminals **6 (+) and 7.(-).**

POLARITY MUST BE OBSERVED

Start up and Test Procedures

Verify all electrical and hydraulic connections.

Be sure to check that no installation debris is left in the inlet or exhaust line.

Open valve in inlet (turn on pump if used) and with bypass adjust flow to about ½ inch crest over weir. Recheck all connections for leaks.

Turn control switch ON.

After a brief pause, the display will light and display the program version number and will then return to the previous sample mode.

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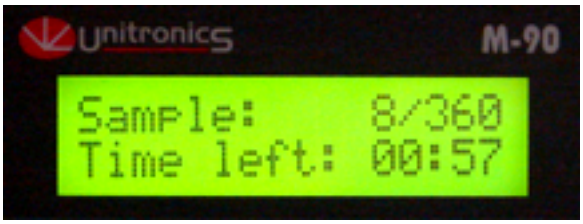
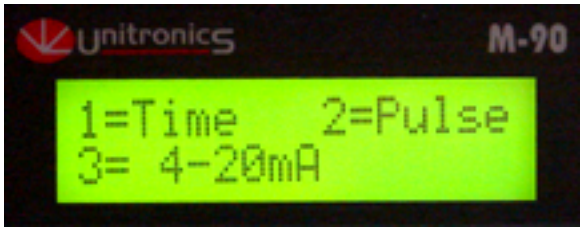
PROGRAMMING PLC CONTROL

The Programmable Logic Controller (PLC) allows programming the N-CON Sentinel for three different sampling modes of operation: Time-based, Pulse Input or 4-20 mA Current Loop input. For each mode, the operator may select the sample rate appropriate to the mode. The PLC also provides for the operator to manually initiate a sample and allows the operator to reset the sample count upon sample collection. Operator prompts are provided in each screen and limited “help” is available for operating limits and key options.

When the sampler is first powered up, the backlit LCD display on the PLC controller will show a Welcome Screen indicating the sampler type (N-CON Sentinel) and the program version number and date. After 1-2 seconds, the display will advance to the previously selected mode of operation and will continue normal sampling:

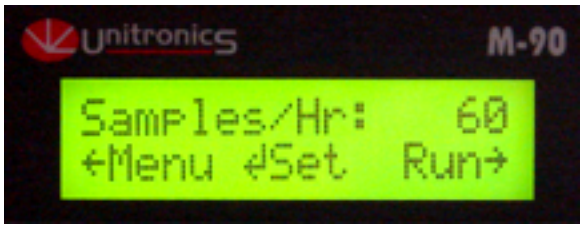


To change the sampling mode, press the Left Arrow key until the Mode Select screen is displayed:



Press one of the indicated number keys to select a Sample Mode: Press the “1” key to advance to the Time Mode setup screen, press the “2” key to advance to the Pulse Input setup screen, or press “3” to advance to the 4-20 mA Current Loop setup screen.

TIME-BASED MODE

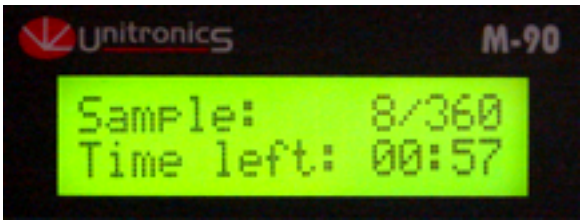


When the “1” key is pressed in the Mode Select menu, the Time Mode setup screen appears. The currently selected sample rate in Samples/Hour is displayed. Press the € key to change the current value. When the blinking cursor appears, enter the number of samples per hour to be sampled. Pressing the (i)nformation key will display the range of valid values, in this case 1 to 60. Enter the desired sample rate, then press the € key again to confirm the displayed value. To leave the current rate unchanged, just press the € key.

Examples: 04 = sample every 15 minutes, 08 = sample every 7.5 minutes, 180 = sample every 20 seconds.

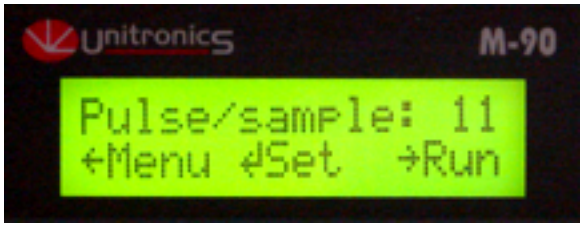
Pressing the LEFT arrow key will return to the Mode Select screen; the RIGHT arrow key advances to the Time Mode Sampling screen.

Time Mode Sampling Screen



After the sample rate has been entered, and the Right Arrow key pressed to select Time Mode, the Time Mode Sampling screen appears. This screen displays three pieces of information: the current sample count, the maximum sample count and the time remaining until the next sample. In the example shown above, 8 samples (of a maximum of 360) have already been collected, and there are 57 seconds remaining until the next scheduled sample. As with most screens, pressing the LEFT arrow key will return to the Time Mode setup screen, in the event you wish to change the sample rate.

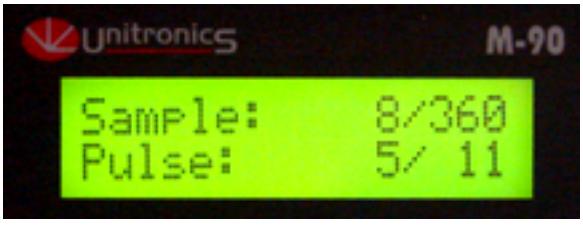
PULSE-BASED MODE



When the “2” key is pressed in the Mode Select menu, the Pulse Mode setup screen appears. The currently selected number of Pulses/Sample is displayed. Press the € key to change the current value. When the blinking cursor appears, enter the desired number of pulses per sample. Pressing the (i)nformation key will display the range of valid values, in this case 1 to 9999. Enter the desired pulse count, then press the € key again to confirm the displayed value. To leave the current rate unchanged, just press the € key.

Pressing the LEFT arrow key will return to the Mode Select screen; the RIGHT arrow key advances to the Pulse Mode Sampling screen.

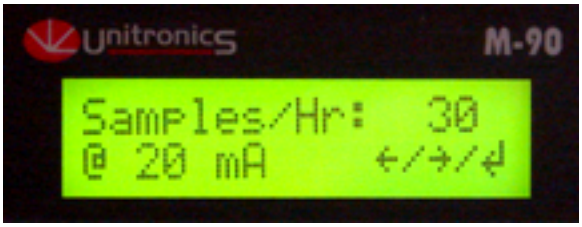
PULSE MODE Sampling Screen



After the number of pulses per sample has been entered, and the Right Arrow

key pressed to select Run Mode, the Pulse Mode Sampling screen appears. Similar to the Time Mode, this screen displays four pieces of information: the current sample count, the maximum sample count, the current input pulse count, and the number of pulses per sample (entered in the previous setup screen). In the example shown above, 8 samples (of a maximum of 360) have already been collected and 5 pulses of a total 11 pulses/sample have been received. As with other screens, pressing the LEFT arrow key will return to the Pulse Mode setup screen, in the event you wish to change the pulse count.

4-20 mA CURRENT LOOP MODE



When the "3" key is pressed in the Mode Select menu, the 4-20 mA Mode setup screen appears. (Consult the wiring diagram drawing # D400E2 for proper connection.) Here, the number of samples/hour is entered which corresponds to the *maximum flow rate indicated by 20 mA* on the analog input.

As the flow decreases (and thus the current decreases), the sample rate will decrease accordingly. The currently selected sample rate is displayed. Press the ↵ key to change the current value. When the blinking cursor appears, enter the desired number of samples/hour. Pressing the (i)nformation key will display the range of valid values, in this case 1 to 60. Enter the desired sample rate, then press the ↵ key again to confirm the displayed value. To leave the current rate unchanged, just press the ↵ key.

Pressing the LEFT arrow key will return to the Mode Select screen; the RIGHT arrow key advances to the 4-20 mA Sampling screen.

4-20 mA MODE Sampling Screen

After the maximum number of samples per hour has been entered in the setup screen, and the Right Arrow key pressed to select Run Mode, the 4-20 mA Mode Sampling screen appears. As in the Pulse Mode, this screen displays four pieces of information: the current sample count, the maximum sample count, the current flow rate percentage (0-100%), and the progress towards the next reading (on a scale of 00-100).

The Flow Percent value is directly related to the current being read on the 4-20 mA input. A current of 20 mA is 100%, 4 mA is 0%, 12 mA is 50%. The display changes in 1% increments. At any value of 4 mA or below, the Flow value will show 0% and sampling will stop.

The value to the right indicates the percent complete of the current sample. Since the flow rate may vary during a sample interval, the controller measures the flow rate every 1 second, scales the reading and adds the result into an accumulator. When the accumulator reaches a set point (calculated from the maximum samples/hour @ 20 mA), the sample is taken. Thus at higher sample rates, the accumulator fills fasters and the samples are taken closer to the maximum rate.

The “filling bucket” symbol indicates whether there is any measurable flow and that flow values are being accumulated. (It is similar to the little hourglass in Windows.) The bucket symbol does not have a direct relationship to the time remaining until the next sample, but merely indicates that the unit is monitoring flow.

In the example shown above, 8 samples (of a maximum of 360) have already been collected. The current flow rate is 25% of full scale, or 8.00 mA. The current sample is 66% complete. As with other screens, pressing the LEFT arrow key will return to the 4-20 mA Mode setup screen, in the event you wish to change the maximum flow value.

Sampling Complete Screen

When the maximum sample count is reached, the controller will indicate:

Sample: XXX/YYY
Sample Complete!

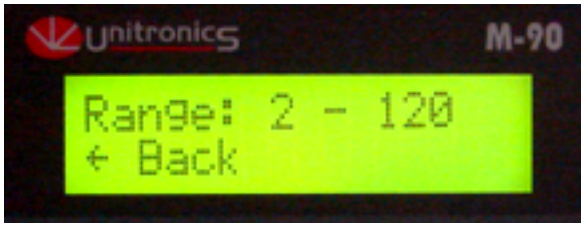
where XXX is the completed sample count, and YYY is the maximum sample count.

If the Sentinel is equipped with a float switch in the sample container, when the float switch is activated the controller will indicate:

Sample: XXX/YYY
Bottle Full!

The “Sample Complete” or “Bottle Full” message will alternate with “↵ to Reset” as a prompt. Pressing the ↵ key (or the Reset button on the side of the case) will reset the sample counter and resume the selected sampling mode. The sample count MUST be reset for the system to resume sampling. Even after the sample container is emptied, the controller MUST be reset to enable sampling.

(i)nformation Screens



Pressing the "i" key during setup screens will display the range of values appropriate for that setup mode. The LEFT arrow key returns to the setup screen. The setup screens will not allow values outside the valid range; the (i)nformation displays are just provided as a reminder.

During the three Sampling Modes, pressing the "i" key will display two available options: the (+/-) key causes a sample to be taken immediately; the (↵) key resets the sample counter to 000. The sample timer, pulse counter or flow accumulator are also reset. This screen displays for 1-2 seconds and then the display returns to the regular sampling mode. Again, this is just provided as a reminder of available options.

To Test The Signal To The Dipper Motor (Take A Test Sample)

Press the yellow (+/-) key on the PLC to collect a sample immediately. The dipper will go down, pick up sample and return to raised position. If the maximum sample count has already been reached, or the sample container is full, the dipper will not activate in order to prevent overflow of the container.

The sample taken will be "counted" in the total number of samples. If you do not want to count the test sample, press the ( ) key to restart the count cycle.

Resetting the Sample Count: When the Composite Sample Is Picked Up

The system **MUST** be reset when the composite sample is picked up. Press the ( ) key on the PLC or the Reset button on the housing to reset the unit.

The Sample Count may also be reset at any time during normal operation by pressing the ↵ key and following the prompt: pressing ↵ again will reset all counters & timers; pressing the left arrow will return to normal operation.

The sample counter default maximum setting is 300 samples. This will provide an approximately filled sample container, without overflow.

Changing Password-protected operating parameters

There are four parameters which may be changed using a multi-key sequence which is not displayed on front panel instructions or in any (i)nformation screens. The Password screen is activated by simultaneously pressing the Right Arrow and Left Arrow keys. The screen will prompt for "Password: " Enter the number "**1234**" followed by (↵).

The next screen will prompt for a value for "Max Samples", and will display the current setting. The factory default is generally 300. The minimum value is 1, the maximum is 999.

Press (↵) to change the current value, enter the desired number of samples, and then press (↵) again.

The default value was chosen to limit the amount of fluid collected in the sample bottle. Increasing this value should only be done together with a change in the size of the sample bottle. If a smaller bottle is used, the Max Samples value should be reduced accordingly. *An incorrect value of Max Samples may cause overfilling of the sample bottle and result in partial loss of samples.*

To advance to the next parameter, press the Right Arrow key. The display will prompt for a Dip Time and display the current setting. This is the time in seconds that the dipper motor is energized. This value is set at the factory based on Sentinel model and should only be changed after consulting the factory.

Pressing the Right arrow again will advance to Dip Off. This sets the interval between each dipper cycle and, as with the Dip Time, is set at the factory based on Sentinel model.

Again press the Right arrow to advance to Dip Count. This value sets the number of dip cycles performed for each sample. The default is 1, the maximum is 6. The Dip Count can be used to increase the volume of fluid collected at each sample. Each dipper cycle deposits 25mL into the sample container. For example, with a Dip Count of 2 a total of 50 mL will be collected at each sample. A Dip Count of 6 will deposit 150 mL of fluid.

When done with the Dip Count programming, press the Right arrow key to return to normal operation.

SAMPLER MAINTENANCE

Daily Maintenance

- Clean up any spills.
- Check sample dipper; clean with paper towel, as necessary.
- Check sample delivery tube. Clean, as necessary.
- Check operating temperature of refrigerator. Adjust, as necessary.
- Check sampler operation by pressing yellow +/- TEST button.
  Be sure to have a container in the refrigerator to collect sample
- Reset the counter by pressing ↵ or the external reset button
- Replace filled sample container with a clean, empty container

Weekly Maintenance

- Defrost refrigerator as needed. NEVER use sharp tool to remove ice from evaporator.
- Clean condensate or any spills from refrigerator.

Monthly Maintenance

- Clean entire sampler with FANTASTIC, 409 or other non-abrasive cleaner

Infrequently Used Samplers.

Special maintenance procedures must be followed when a sampler is used only occasionally.

- Drain sample chamber, inlet line and pump, if used.
- Dry the sample chamber and delivery tube and leave sample chamber cover off.
- Refrigerator (if used) should be restarted at least three hours before sampling is to start.

Lubrication

- The Sentinel M96 requires no lubrication.

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SERVICE PROCEDURES

Dipper Replacement

- Loosen set screw and remove dipper.
- When replacing, see that dipper section nearest hub is vertical.

Refrigeration Service

- Normal defrosting is by automatic defrost system in refrigerator
- If additional defrosting is required, DO NOT use sharp tools to scrape ice accumulations off the evaporator.

Condenser Cleaning

(if purchased with Refrigeration System)

- Digital temperature control will display cL to indicate condenser must be cleaned.
- Unplug refrigerator and remove lower grill to access the condenser fins.
- Carefully vacuum condenser fins taking care not to bend fins.

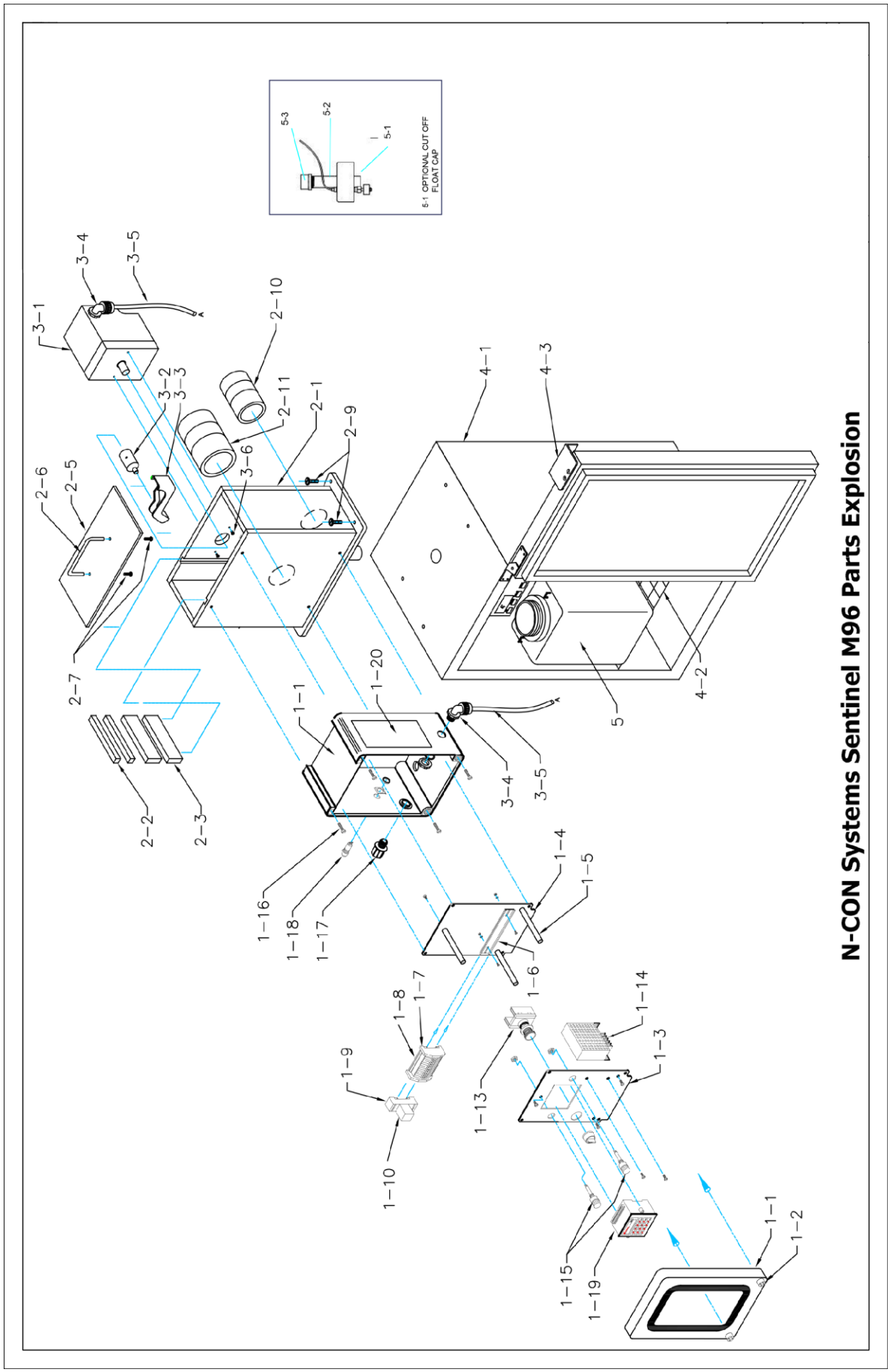
TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CHECK	REQUIRED ACTION
Sampler totally inoperative	Unit disconnected from power source Programmer disconnected Open circuit to control	Fuse or circuit breaker Check connection Check wire and connection continuities	Reconnect Reconnect Repair/reconnect, as necessary
Sampler shuts down prematurely	PLC was not reset when the sample picked up.	PLC reads “Finished”	Reset PLC
Timer operates but dipper does not return	Relay 1CR inoperative Open circuit in motor operator Open circuit in wiring	Observe relay operation or replace Check for resistance across motor operator circuits	Replace relay if defective Replace motor operator if defective Reconnect where necessary
Sample storage temperature too high	Refrigerator unplugged Thermostat set too high Thermostat contacts open	Check refrigerator plug Test by setting temperature as cold as it can go and see it compressor comes on.	Connect plug Have refrigeration repair service check
Sample storage temperature too cold	Thermostat contacts stuck closed Slow leak of gas from refrigerator		Have unit checked by refrigeration repair service

CAUTION: Control contains 115 VAC components.
Be sure to disconnect sampler from power before attempting service.

M96 PARTS EXPLOSION - N-CON PART NUMBERS

LABEL	N-CON #	DESCRIPTION
1-1	01-837	CASE, PROG M96 WITH GLASS DOOR
1-2	01-837-LK	CASE, PROG M96 LOCK SET
1-3	01-332	M96 FRONT PANEL
1-4	01-133	M96 LOWER PANEL
1-5	09-50-4HEX	STANDOFF - 4"
1-6	18-DIN AL	DIN RAIL
1-7	06-521	TERMINAL BLOCK 2 POLE
1-8	06-520	TERMINAL BLOCK 1 POLE
1-9	04-126	RELAY SOCKET
1-10	04-129	120V RELAY
1-12	06-047	2 CORD LIQUID TIGHT CORD GRIP (NOT SHOWN)
1-13	03-304	SWITCH 2 POS 2NO
1-14	15-524	POWER SUPPLY, 24 VDC
1-15	06-168	FUSE HOLDER, 3AG
1-17	06-096	RIGID ALUMINUM CONDUIT FITTING 1/2"
1-18	03-741	PUSH BUTTON SWITCH, SPDT NO
1-19	21-360	PLC
1-20	02-335	OPERATING INSTRUCTIONS
2-1	12-339	M96 SAMPLE CHAMBER
2-2	12-342	WEIR BAR, .5"
2-3	12-341	WEIR BAR, 1"
2-5	09-346	SAMPLE CHAMBER COVER
2-6	01-316	HANDLE
2-9	23-1420-16-7	SHUTTERHEAD BOLTS (1/4-20)
2-10	12-302	FLEX COUPLING 2"
2-11	12-303	FLEX COUPLING 3"
3-1	07-002	MOTOR OPERATOR
3-2	09-146	M96 DIPPER SHAFT
3-3	12-075LP	PVC DIPPER (LT)
3-4	06-045	CABLE GRIP, RT
3-5	NA	MOTOR CABLE
4-1	17-054	REFRIGERATOR, WHITE
4-2	NA	REFRIGERATOR WIRE SHELF
4-3	01-021	REFRIGERATOR DOOR HANDLE
5	09-003	2 GAL. NALGENE CARBOY
5-1	20-059	OVERFLOW FLOAT CAP
5-2	12-050	TUBING, 1" ID
5-3	12-005	FEMALE ADAPTER, BARBED, 1"


N-CON Systems Sentinel M96 Parts Explosion
5-1 OPTIONAL CUT OFF FLOAT CAP
5-1
5-2
5-3
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WARRANTY

N-CON SYSTEMS CO., INC. WARRANTY

WHAT IS COVERED

N-CON Systems, Co. Inc. warrants this product to be free of defects in materials and workmanship. This warranty is non-transferable.

FOR HOW LONG

Warranty covers all defects in materials and workmanship for a period of TWELVE MONTHS OF DELIVERY.

WHAT N-CON SYSTEMS WILL DO

If your N-CON product is defective we will, solely at our discretion, repair or replace the defective product or refund the purchase price, excluding original shipping and handling charges. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original product warranty period. If UPS Blue or RED air is required, you will be charged the difference between air service and ground service to the same destination.

HOW TO GET SERVICE

N-CON Systems Company, Inc.
Warranty Repair Service
130 Old Edwards Road
Arnoldsville, GA 30619

In any correspondence with us, or if you send part but not all of the product, please include both Model and Serial # of the product.

WHAT THIS WARRANTY DOES NOT COVER

Your rights and remedies are specifically limited to those set forth in this warranty. N-CON Systems disclaims any and all implied warranties including those of merchantability or fitness for a specific purpose. N-CON Systems shall not be liable for any special, incidental, or consequential damages. In no event shall N-CON Systems liability to you exceed the purchase of your N-CON product.

Please call 1-800-932-6266 to OBTAIN RETURN AUTHORIZATION. You must return your N-CON product within one year of the date of purchase, shipping prepaid, to our factory at this address:
N-Con Systems Co., Inc. 130 Old Edwards Road ~ Arnoldsville, GA 30619

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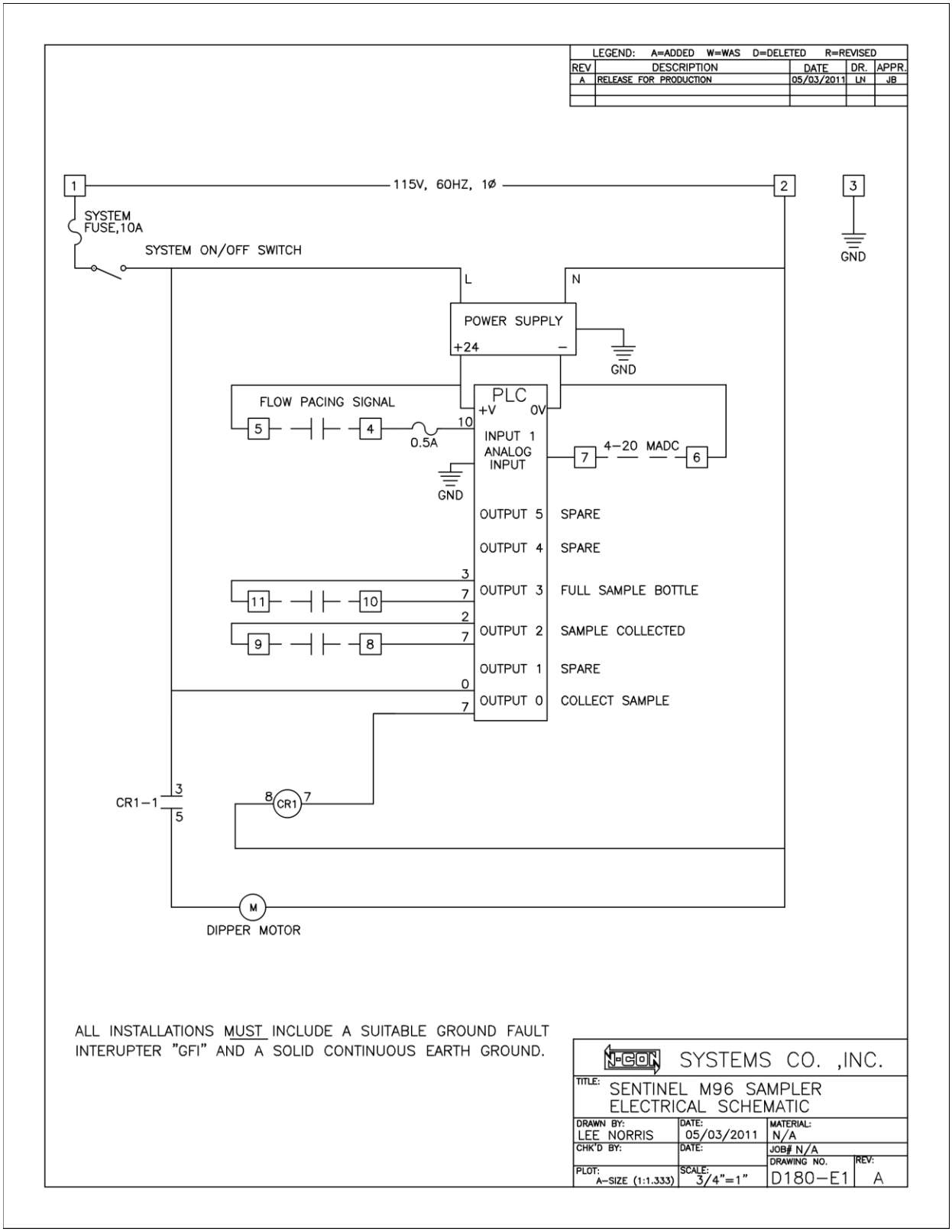
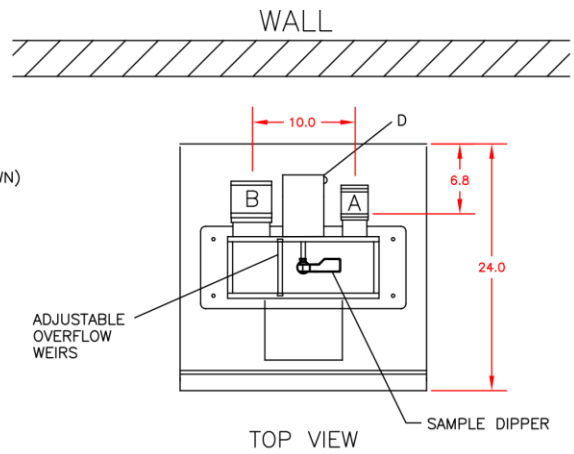
APPENDIX I - DRAWINGS

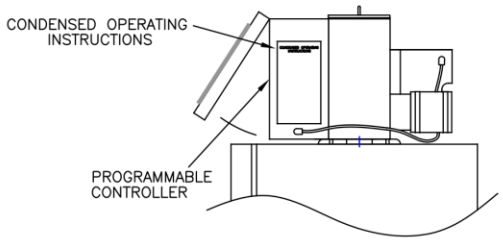


A=FLEXIBLE CONNECTOR, 2" N.P.S. (INFLUENT)
B=FLEXIBLE CONNECTOR, 3" N.P.S. (EFFLUENT)
C=CONTROL HOUSING NEMA 4-X, 6 IP 65
D=DIPPER DRIVE MOTOR
NEMA 4-X, 6 IP 65, OIL IMMERSED.
E=NON CFC REFRIGERATION SYSTEM.
F=MOUNTING BASE WITH LEVELING FEET.
G=2.5 GALLON HDPE SAMPLE CONTAINERS (2 PER SAMPLER)
2.5 GALLON GLASS OR 5 GALLON HDPE OPTIONAL (NOT SHOWN)
H=PROGRAMMABLE LOGIC CONTROLLER

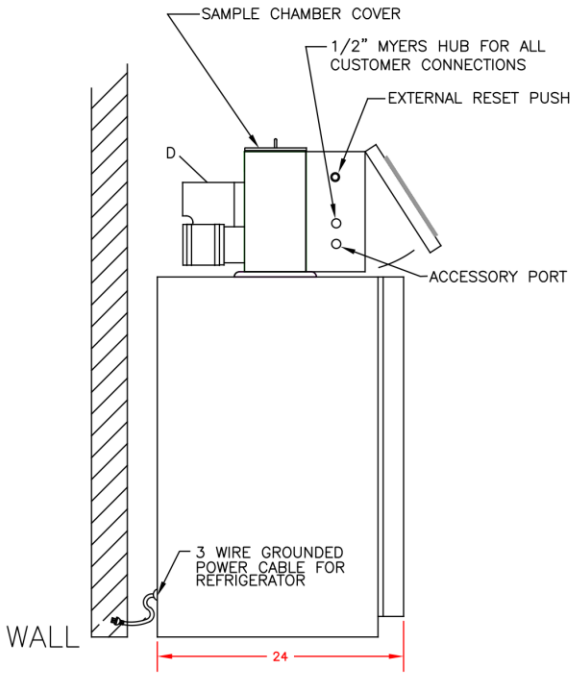
REV	DESCRIPTION	DATE	DR.	APPR.
A	RELEASE FOR PRODUCTION	03/16/2011	LN	JB
B	ECO 151014-1 Pipe locations	10/15/2015	KH	BH
C	ECO 160418-1	04/18/2016	KH	BH
D	ECO 200702-2	07/02/2020	KH	BH



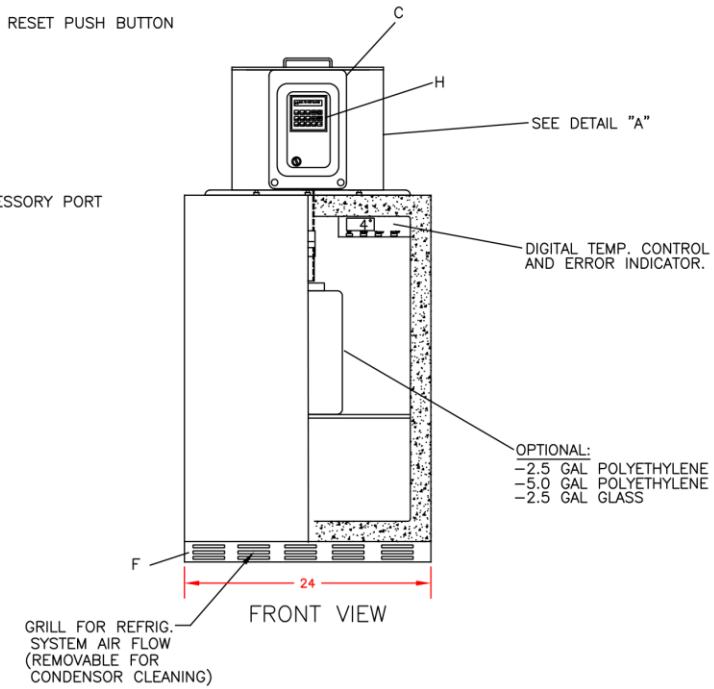
TOP VIEW



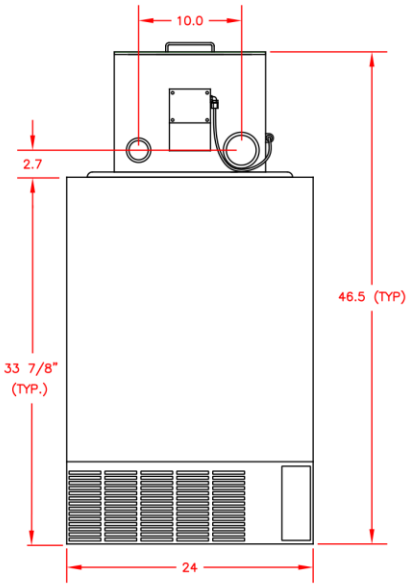
DETAIL "A"



LEFT VIEW



FRONT VIEW

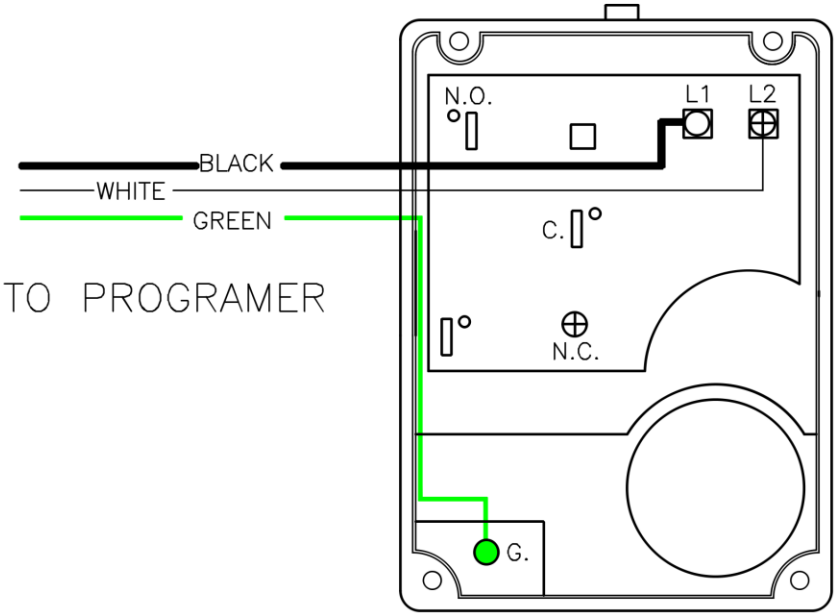


BACK VIEW

REFRIGERATOR U.L. COMMERCIAL LISTED.

N-CON SYSTEMS CO., INC.		
TITLE: SENTINEL M96 INSTALLATION DIMENSIONS		
DRAWN BY: LEE NORRIS	DATE: 03/16/2011	MATERIAL: N/A
CHK'D BY:	DATE:	JOB# N/A
PLOT: C-SIZE 1:8	SCALE: 1/8"=1"	DRAWING NO. D186-M1 REV: D

LEGEND: A=ADDED W=WAS D=DELETED R=REVISED				
REV	DESCRIPTION	DATE	DR.	APPR.
A	RELEASE FOR PRODUCTION	03/16/2011	LN	JB



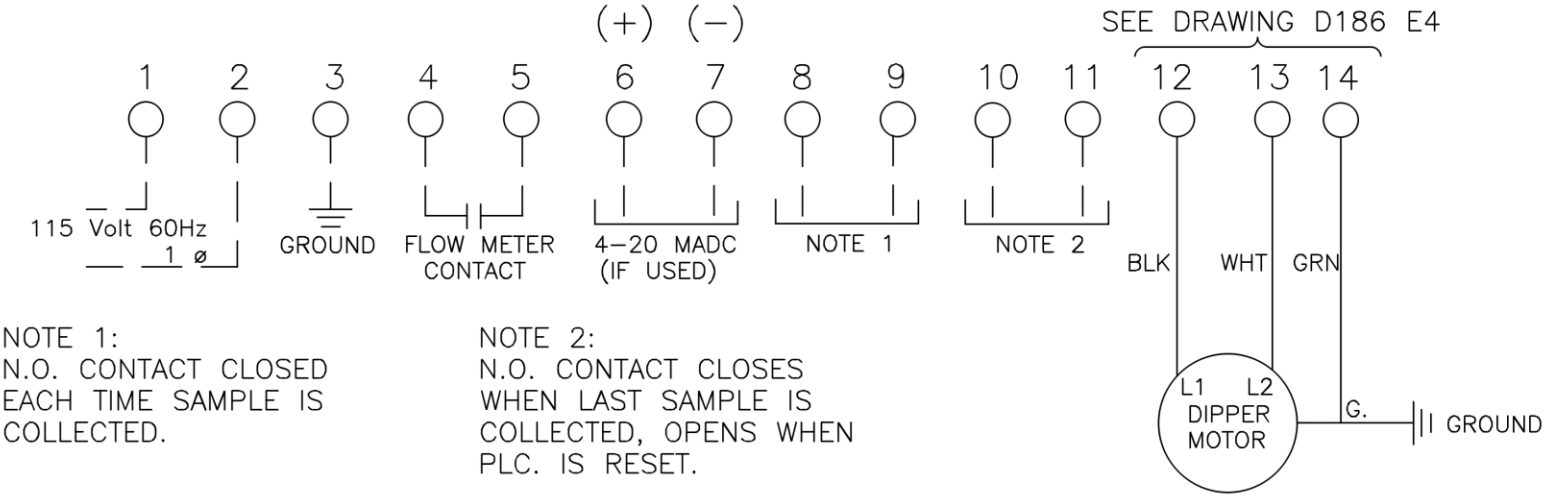
CONNECTIONS TO PROGRAMER

N-CON SYSTEMS CO. ,INC.

TITLE: SENTINEL SAMPLER M96 HOOKUP DIPPER DRIVE MOTOR		
DRAWN BY: LEE NORRIS	DATE: 03/16/2011	MATERIAL: N/A
CHK'D BY:	DATE:	JOB# N/A
PLOT: 1:8	SCALE: 1/8"=1"	DRAWING NO. D186 E5 / REV: A

LEGEND: A=ADDED W=WAS D=DELETED R=REVISED				
REV	DESCRIPTION	DATE	DR.	APPR.
A	RELEASE FOR PRODUCTION	05/03/2011	LN	JB

SENTINEL SAMPLER TERMINAL BLOCK



NOTE 1:
N.O. CONTACT CLOSED EACH TIME SAMPLE IS COLLECTED.

NOTE 2:
N.O. CONTACT CLOSES WHEN LAST SAMPLE IS COLLECTED, OPENS WHEN PLC. IS RESET.

NOTE 3:
TERMINAL #3 MUST BE COLLECTED TO SOLID, CONTINUOUS EARTH GROUND.

NOTE 4:
TERMINALS #1 & #2 MUST BE PROTECTED BY A SUITABLE GROUND FAULT INTERUPTER (G.F.I.)

NOTE 5:
ALL CONNECTIONS SHOULD BE MADE WITH COPPER CONDUCTORS.

N-CON SYSTEMS CO. ,INC.

TITLE: SENTINAL SAMPLER M96 CUSTOMER INTERCONNECT			
DRAWN BY: LEE NORRIS	DATE: 05/03/2011	MATERIAL: N/A	
CHK'D BY:	DATE:	JOB# N/A	
PLOT: 1:1 (11 x 8.5)	SCALE: 1"=1"	DRAWING NO. D 180 E2	REV: A