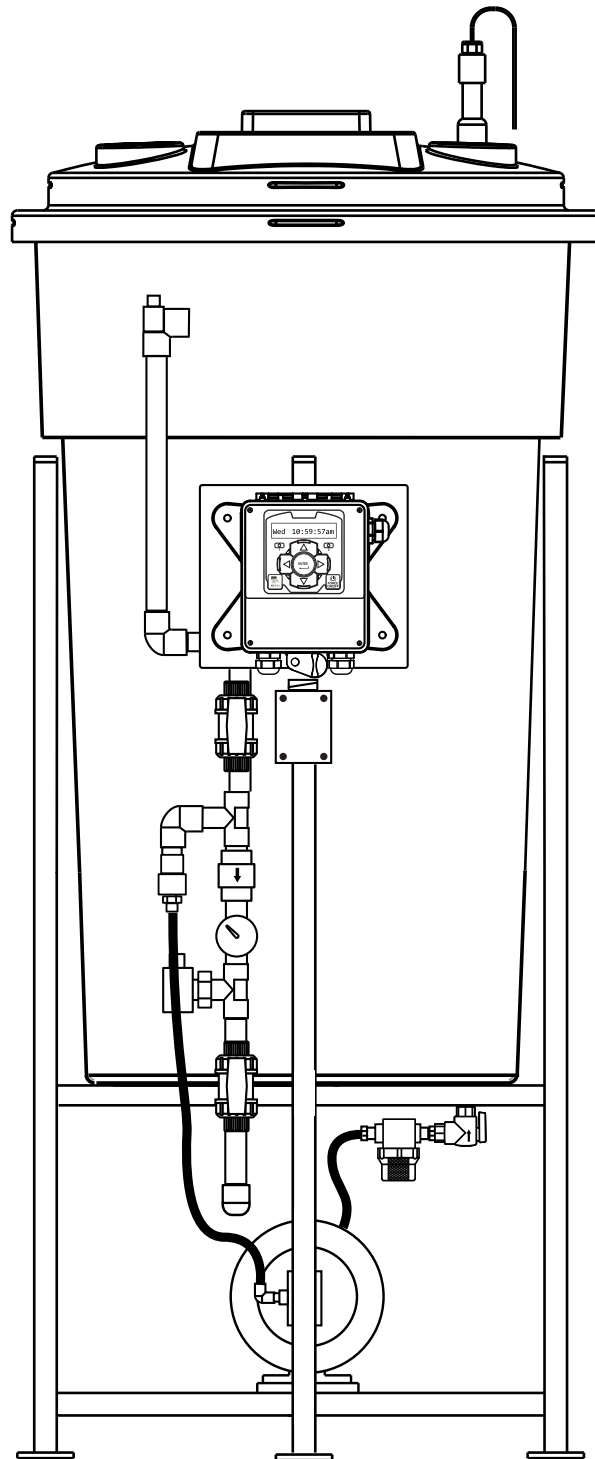


Model GF Digital Glycol Feeder with NANO

Installation Maintenance Repair Manual

Advantage Controls
P.O. Box 1472
Muskogee, OK 74402
Phone: 800-743-7431
Fax: 888-686-6212
www.advantagecontrols.com



7/2016

Table of Contents

I.	Introduction	2
II.	Model Numbering and General Specifications.....	3
III.	Installation.....	4
	Electrical Wiring	4
	Mounting Instructions	4
	Typical Installation and Measurements	5
	Relay and Logic Cards.....	6
	Start Up and Test Procedure / Recommendations.....	7
IV.	Front Panel Description	7
V.	System Operation Overview	7
	Description of Set Up Menus	7
VI.	NanoTron mA Menu Map.....	8
VII.	Parts List.....	10
VIII.	Troubleshooting and Maintenance.....	12
IX.	Warranty	14
	Reference Chart % Propylene Glycol.....	15
	Reference Chart % Ethylene Glycol.....	15

I. Introduction

The Advantage Controls Glycol Feed Systems are design to regulate pressure in closed loop Hydronic Heating and Cooling applications.

Advantage Controls micro-processor base controller reads a solid state pressure transducer, displays system pressure, and uses a 16 character keyboard for the entry of control parameters. The micro-processor has built in real-time clock and EEPROM back-up for all user settings, in case of power interruptions. Setting for all functions are made using the keyboard, readings are displayed on a back lit 16 character alphanumeric display.

Advantage Controls Glycol Feeders are stand alone pre-wired, pre-plumbed systems designed for ease of installation. Our systems are mounted on a powder coated steel frame with anchor points.

Advantage Controls Model Designation allows for a wide variety of configurations, operation and function of each Glycol Feed Systems this is dependent on your specific model number. Please check your model number against the selection guide for better understanding of your system.

Please read this instruction manual to become familiar with your system.

II. Model Numbering and General Specifications

BUILD A MODEL

GF - - - - -

TANK SELECTION

- 0 = No tank
- 1 = 55 gallon poly
- 2 = 100 gallon poly
- 3 = 30 gallon poly
- 7 = 150 gallon poly

STAND SELECTION

- A = Powder Coated steel stand
- B = Powder Coated steel stand w/ mixer bracket
- C = Tank top mount (no tank included)
- D = Portable stand with built in rollers

PUMP SELECTION

- 0 = No pump
- 1 = 1.5 gpm at 100 PSI; 1/3 hp
- 2 = 3.75 gpm at 100 PSI; 1/2 hp
- 3 = 6.1 gpm at 60 PSI; 1/3 hp
- 4 = 9.9 gpm at 60 PSI; 1.5 hp
- 5 = 30 gpd at 100 PSI; solenoid driven

PUMP CONFIGURATION

- A = Standard configuration
- B = Alternating pumps for single loops
(requires 2 pump selections)
- C = Pump plumbed for transfer duty into tank

LOOP SELECTION

- 0 = No loop
- 1 = Sch 80 PVC loop; 100 PSI max; 100°F max
- 2 = Copper/brass loop; 100 PSI max; 180°F max
- 3 = Carbon steel loop; 100 PSI max

CONTROL SELECTION

- M = ETL listed NANO-N with alarm buzzer for relay 2
(single loops)
- N = ETL listed NANO-N controller with timer for relay 2
(single loops)

OPTIONS

- 1 = 240V
- 2 = 4-20mA output of pressure on digital controller
- 3 = Solenoid valve for pressure relief on digital units
- 4 = 30-50 PSI pressure switch for analog units
- 5 = Position backcheck to use tank for expansion
- H = 1/4" PVC pipe instead of pump suction tubing
- M = Mixer controls (order mixer separate)
- Y = ETL approval (only on units with controller option D)

Most units include poly tank and stand, low level switch with audible alarm (100db) with silence switch, dry contact alarm, pressure relief valve and plumbing assembly with pressure gauge.

III. Installation

Electrical Wiring

The standard digital glycol feeder controller has an internal regulated power supply that will operate in the range of approximately 100 to 250 VAC on the incoming wiring. Output relay(s) are protected with a replaceable fuse. Each relay's output voltage will equal incoming line voltage. The Standard prewired units are supplied with a 8 foot, 16 AWG, 3 wire grounded, 120 VAC USA power cord for incoming power.

NOTE: Liquid tight fittings and labeled signal lead cables are provided for all signal (low voltage) connections, low drum level and pressure transducer.



WARNINGS:

1. **The controller should be connected to its own isolated circuit breaker, and for best results, the ground should be a true earth ground, not shared. Wiring must be done according to all applicable local codes.**
2. **Power (line voltage) must be disconnected while making any connections. If power is supplied to the unit, line voltage will be present on the relay cards.**
3. **Low voltage signal wires (transducer, level, alarm, etc.) should never be run in conduit with high voltage wires.**

Mounting Instructions

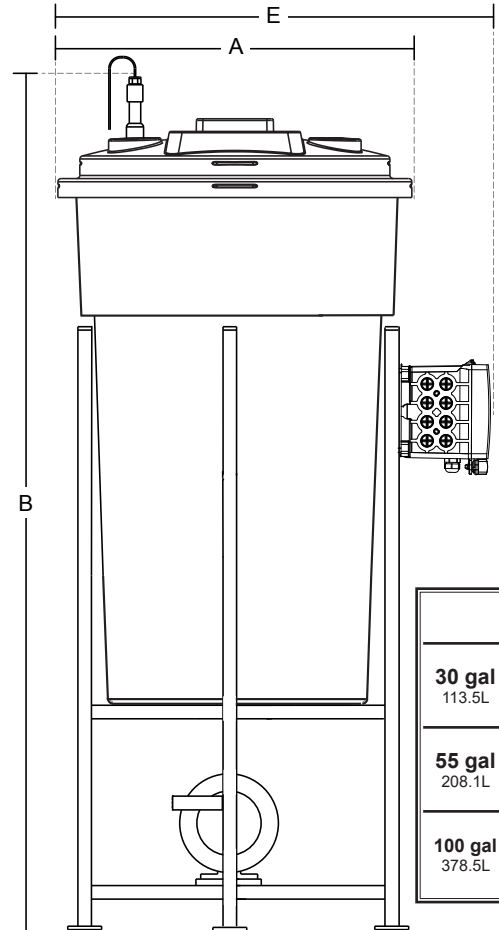
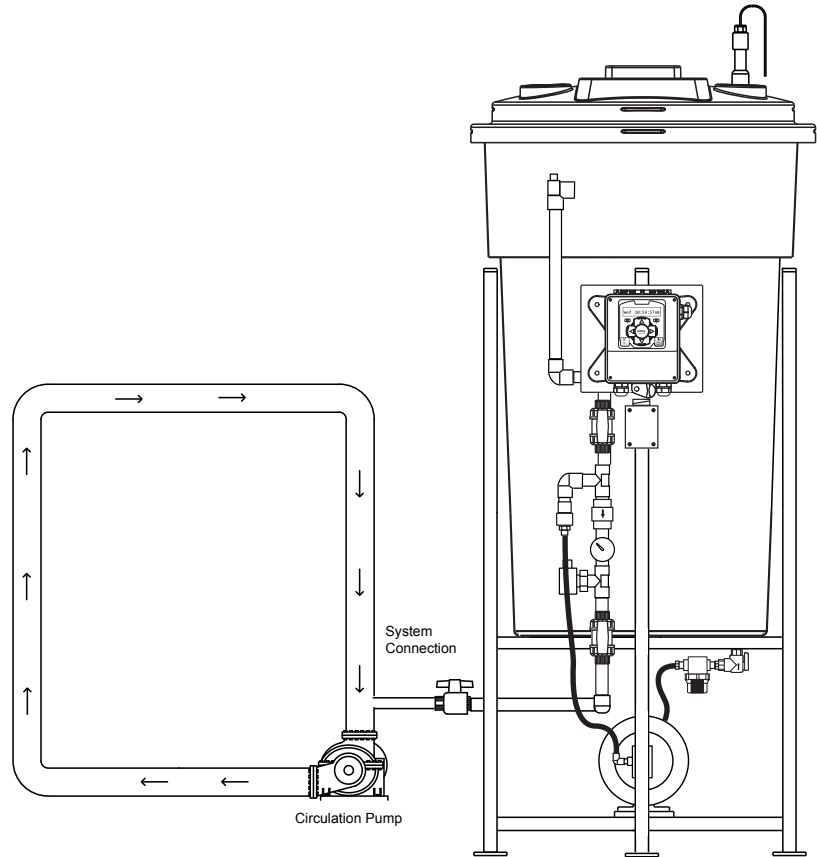
Select a mounting location that provides the operator easy access to the unit and a clear view of the controller. The location should be convenient to grounded electrical connections and system plumbing connections. Mount the glycol feeder stand to a level concrete pad using the ½" mounting holes in the base of the stand. Concrete pad construction and anchoring bolts must comply with local building codes. The required sample line plumbing should be connected to the return header of the Hydronic system



WARNING:

Avoid locations that expose the controller to direct sunlight, vapors, vibration, liquid spills or extreme temperatures; less than 0°F (-17.8°C) or greater than 120°F (50°C). EMI(electromagnetic interference) from radio transmissions and electric motors can also cause damage or interference and should be avoided.

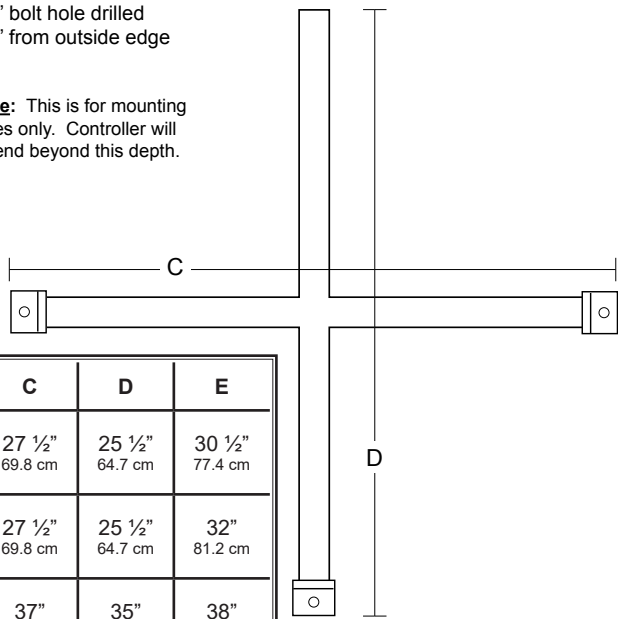
Typical Installation and Measurements



GLYCOL STAND FOOT PRINT

1/4" bolt hole drilled
3/4" from outside edge

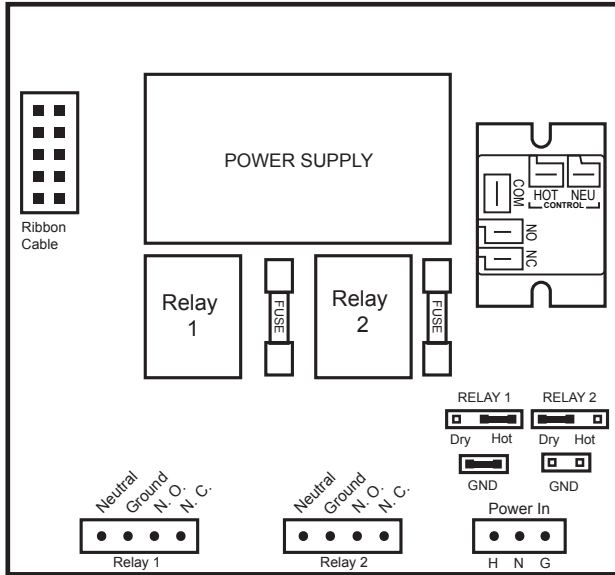
Note: This is for mounting
holes only. Controller will
extend beyond this depth.



	A	B	C	D	E
30 gal 113.5L	23 3/4" 60.3 cm	51" 129.5 cm	27 1/2" 69.8 cm	25 1/2" 64.7 cm	30 1/2" 77.4 cm
55 gal 208.1L	27 1/2" 69.8 cm	65" 165.1 cm	27 1/2" 69.8 cm	25 1/2" 64.7 cm	32" 81.2 cm
100 gal 378.5L	31 1/4" 79.3 cm	66" 167.6 cm	37" 93.9 cm	35" 88.9 cm	38" 96.5 cm

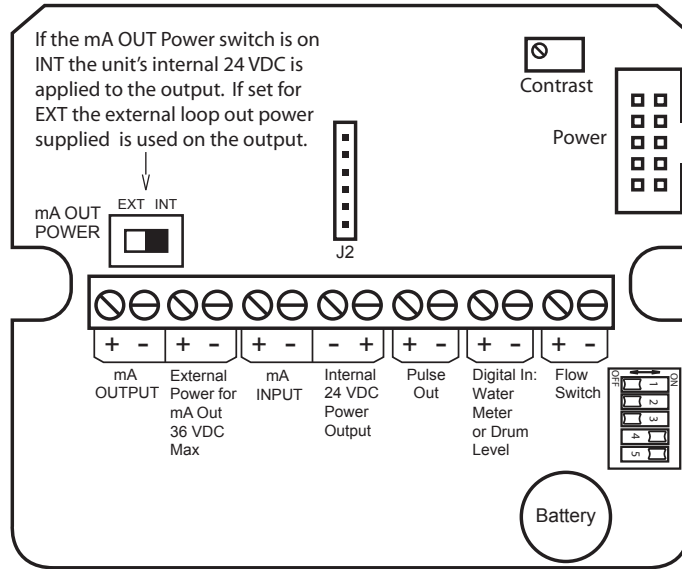
Side View Shown

Relay Card for W Option

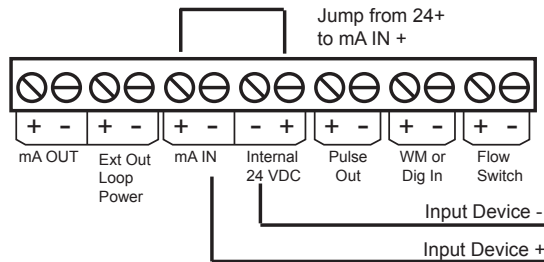


Switch #	Position	Function
1	OFF	Backlight off; flashes on w/ alarm
1	ON	Backlight on; flashes off w/ alarm
2	OFF	Normal Operation
2	ON	“Burn-in” Mode
3	OFF	Normal Operation
3	ON	Resets to factory defaults

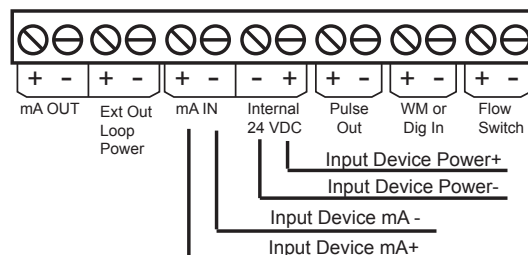
NanoTron-N Logic Card



Wiring for two-wire input sensors that need 12-24 VDC on the loop.



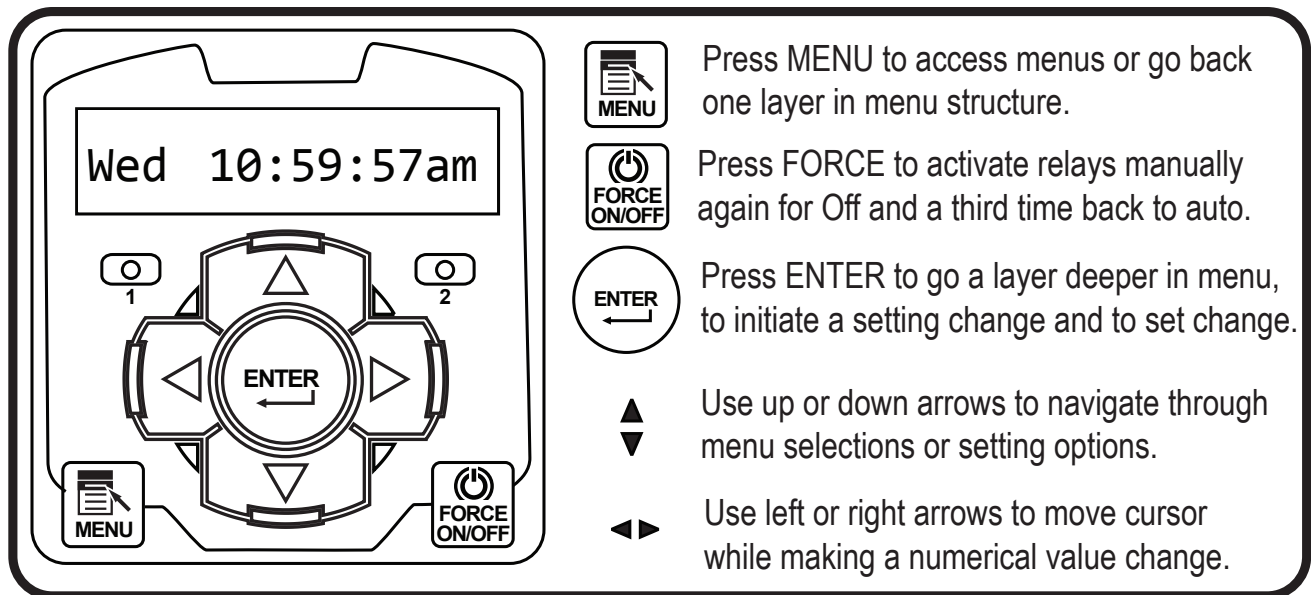
Wiring for four-wire input sensors that need 12-24 VDC on power input.



Start Up and Test Procedure / Recommendations

1. Before filling tank, be sure that the tank and the filter bowl are free of packing material and or construction debris.
2. Check plumbing as it may have become loose from vibrations during shipping.
3. Fill Tank
4. Open isolation valve to system.
5. If there are no leaks verify that the pressure gauge agrees with system pressure. This value may vary do to connection to Hydronic systems placement.
6. Before applying power to the controller, remove fuse from lower relay enclosure. (There will be two (2) fuses on dual pump system) Reasoning behind this is, factory settings may not agree with your system and this gives time for you to set your parameters before applying power to the pump or pumps.
7. Apply power to your system. Plug it in.
8. Once you are familiar with the controller from either reading the instruction manual or trial and error. Proceed with setting perimeters that are correct for your hydronic system.

IV. Front Panel Description



V. System Operation Overview

Description of Menus

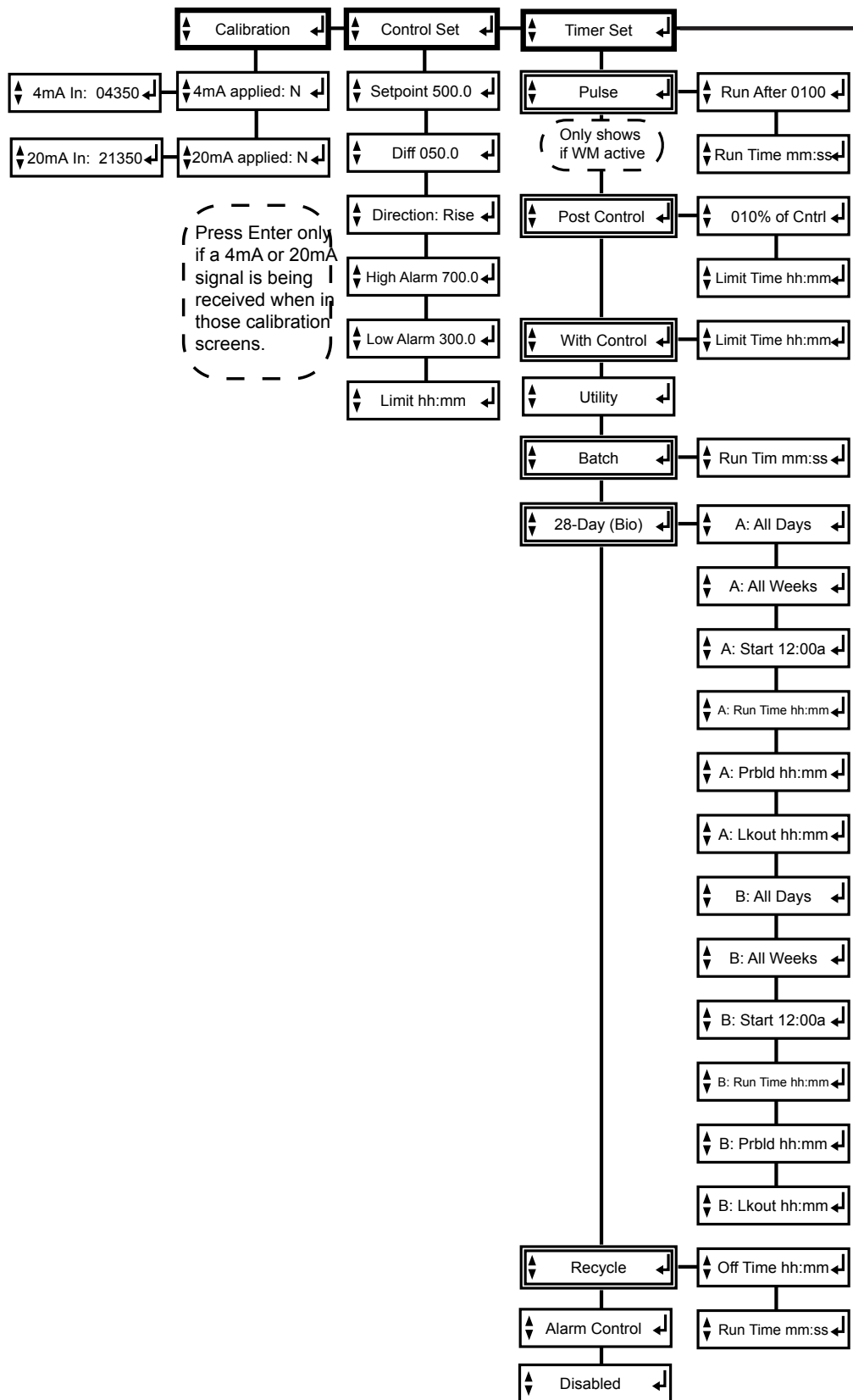
NanoTron controllers have three modes of operation, Run, Menu and Force. All menus are circular. Pressing the DOWN key will display the next line of information on the display.

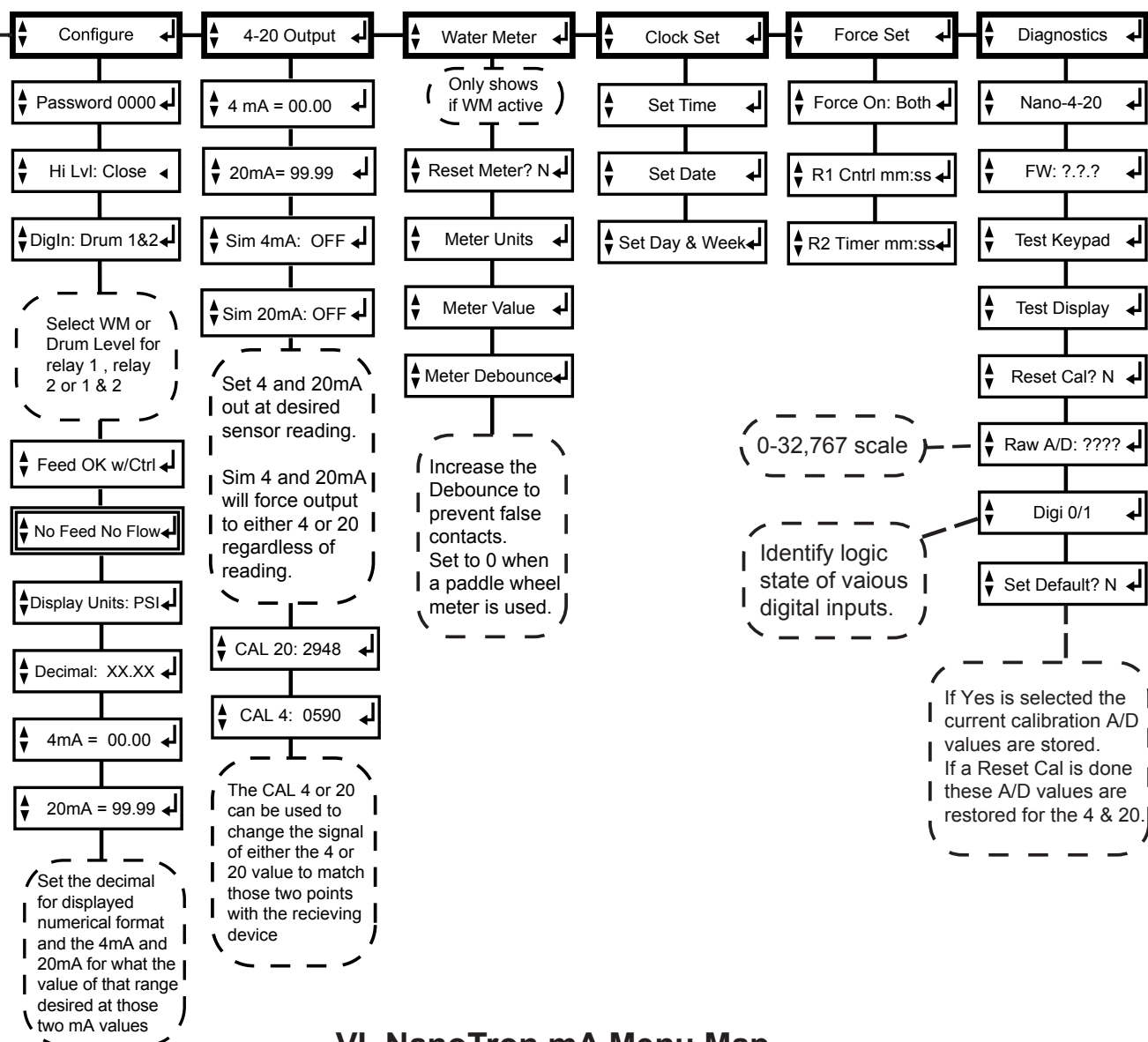
Run - This mode is for normal operation. The control relays will only be automatically active in this mode. In the Run mode, the display will read system values. If an alarm is present, the display flashes with the alarm status.

The Run menu will display values such as day, time, date and other values depending upon the features present on the unit. The unit will automatically return to the Run mode if no keys are pressed for three minutes.

Menu - This mode is used to make adjustments to settings and readings on the controller. To access the Menu mode from the run screen, press the Menu key. Use the up or down arrow to scroll through the various menus. When you want to access a specific menu, press the Enter key. Once you have entered a sub-menu you will be able to step through that menu's options with the up or down arrow key.

Force - Relays may be forced on or off for a user defined amount of time. Press the Force key to force relays on for the time configured in the Menu's force sub-menu. Press it a second time to force them off for the same amount of time. Press a third time to go back to automatic Run mode. Unit returns to the Run mode automatically when the force time has elapsed.



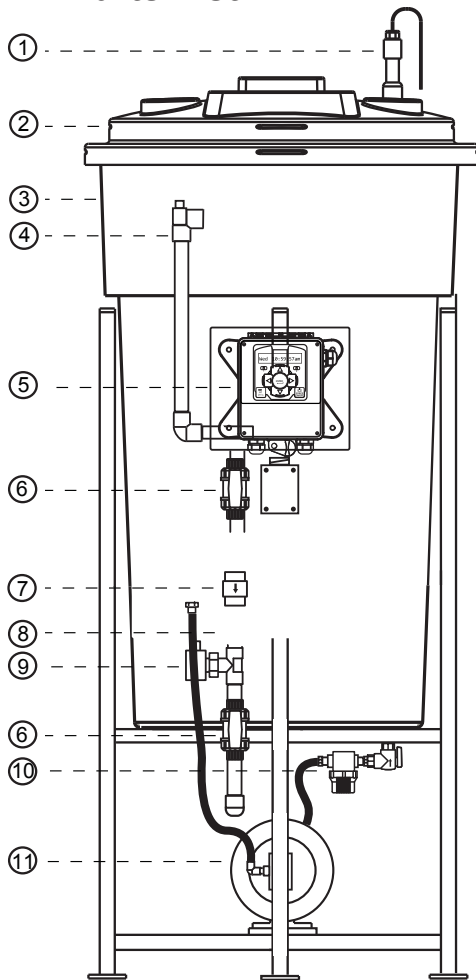


VI. NanoTron mA Menu Map

NanoTron conductivity units have a main menu circle that includes:

- | | |
|---------------------|--|
| Calibration | - Calibrating the reading |
| Control Set | - Setting the set point, sample method and alarms |
| Timer Set | - Select the timer type and run values |
| Configure | - Password, flow switch direction, units of measure and more |
| 4-20 Output | - Calibrate and set the range of the mA output |
| Pulse Output | - Set the range and speed of the pulse output |
| Water Meter | - Reset totalizer and setting contact value |
| Clock Set | - Set time, date and week |
| Force Set | - Set the force on time for manual relay activations |
| Diagnostics | - Tests and calibration reset |

VII. Parts List



Parts List

1. Level wand for 30 gl = **ALL-S30**; 55 gl = **ALL-S42**
2. Tank lid for 30 gl = **LID-30-C1D**; 55 gl = **LID-55-C1D**
3. Tank for 30gl = **AGF-APCT-30**; for 55 gl = **AGF-APCT-55**
4. Pressure relief valve = **AGF-PRV**
5. Nano-N-W Controller
6. Isolation valve = **BV-3/4** for PVC; **GV-3/4** for copper
7. Back check = **CKV-3/4PP** for PVC; **CKV-3/4B** for copper
8. Pressure gauge = **AGF-PG**
9. Pressure transducer = **AGF-PTD**
10. Suction shut-off and strainer assembly = **AGF-SUCTION**
11. Pump = **991F41** (for selection 1); **992MJ07** (for selection 2)

Note: This list covers most of our popular models.
For models not covered, consult factory.

No. 530

Calibrated Pressure Relief Valve

Features

- A calibrated adjustment feature for setting the valve to the relief pressure required.
- All Bronze construction
- All stainless steel springs

Specifications

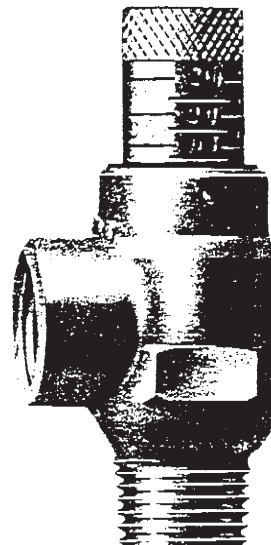
Sizes 1/2" and 3/4" (15 and 20 MM)
Inlet (bottom) is male threaded, NPT
Outlet (side) is female threaded, NPT.

Design

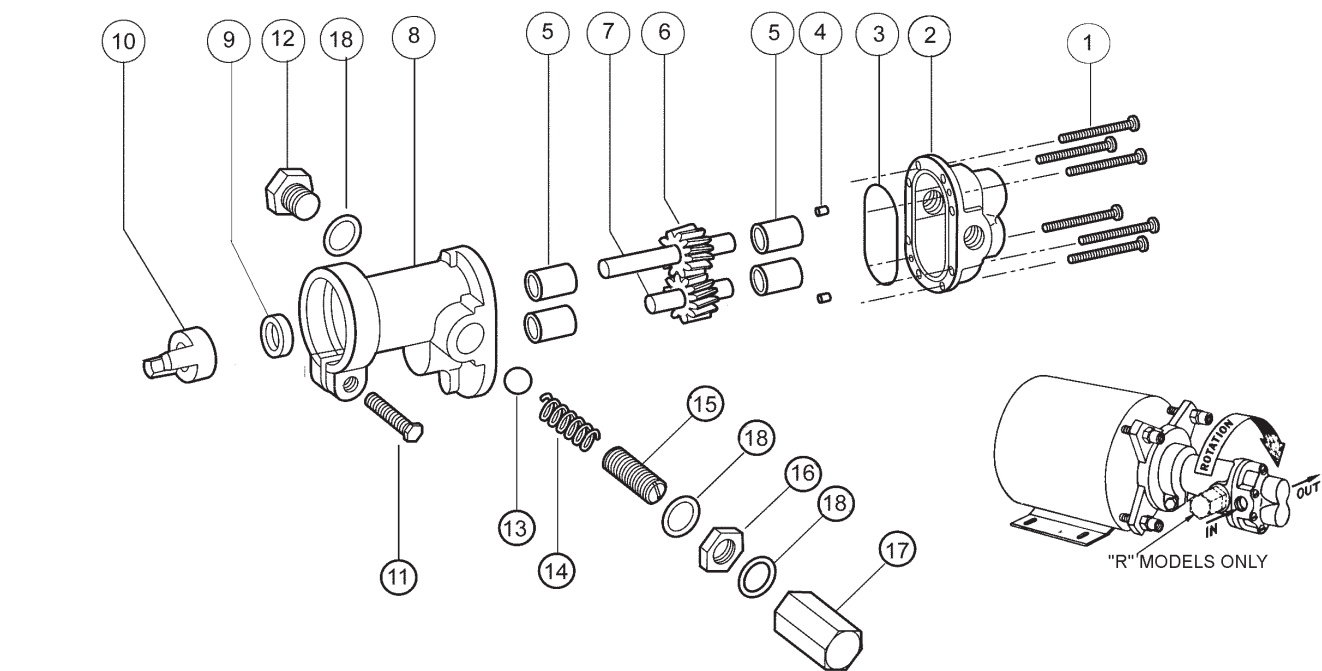
Wats No. 530 is spring operated bronze relief valve designed to be used as protection against excessive pressure of water, oil or air.
This device is designed for emergency safety relief and shall not be used as an operation control.
Buna-N disc on machined body seat.

Application

Ideally suited as a by-pass thermal expansion relief valve.
There are a wide variety of applications where the valve is used as a protective device. One such application would be on various pipelines.



Parts List



	1	2	3*	4	5*	6*	7*	8	9*#	10	11	12	13	14	15	16	17	18
	Screw	Body	O-Ring	Dowel Pin	Bearing	Drive Gear Assy	Idle Gear Assy	Cover	Lip Seal	Coupling	Screw	Plug Nut	Ball	Spring	Adj. Screw	Locknut	Bypass Nut	Fiber Washer
Pump No.	6 Req'd	1 Req'd	1 Req'd	2 Req'd	4 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	1 Req'd	3 Req'd
N991	7733	9300NB5N	9797-033	8885	5024	32149	32110	9303NN2N	5007	5604	5595	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N991R	7733	9300NB5N	9797-033	8885	5024	32149	32110	9303NN2B	5007	5604	5595	1838	5803	1840	5237	5240	5239	6533

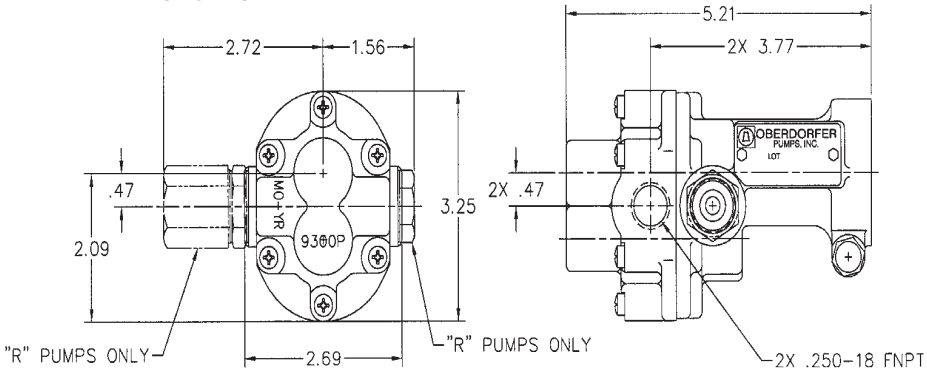
#Seal #5007 is Standard Buna N, #7580 is Viton(R)**-Teflon (R)**
*Repair Kit contains items 3, 5, 6, 7 & 9. Repair Kit for N991(R) is #10640.

VARIATIONS

Pump No.	g ^{1,2}	Repair Kit ²
	Lip Seal	
	1 Req'd	
N991S5	7580	11318
N991RS5	7580	11318

Adapter Kit	Kit Number	Description
M	10562	48 Frame
N	10816	56 Frame
P	11722	S56 Frame
Q	11331	56C Frame (to ¼ HP)
F	11332	IEC71
----	-----	Adapterless- Modified 48

DIMENSIONS



*Viton® or equivalent FKM will be used.
Viton® is a registered trademark of DuPont Dow Elastomers.
*Teflon® or equivalent PTFE will be used. Teflon® is a registered trademark of DuPont.

Specifications are subject to change without notice.

VIII. Troubleshooting & Maintenance

The Advantage Glycol Feeder is designed for many years of trouble free operation. Should a problem occur, refer to the following chart to help identify the problem. If replacement is required, follow the procedures listed in the Warranty and Factory Service portion of this manual.

NO POWER TO UNIT, POWER PRESENT AT RECEPTACLE

This happens if the power cord is tripped over or gets caught and pulled by accident.

1. First disconnect plug from live receptacle.
2. Next you will need Phillips #2 driver to remove face plate
3. Face plates are snug fitting and it may require a small standard driver in the slot at the side of the panel to get it moving.
4. Once the panel is free, let it hang down out of view of the enclosure opening.
5. Locate the connector inside of the enclosure for power this is a GREEN three (3) terminal with screw downs.
6. Reconnect to RELAY / POWER BOARD (Drawing on page 20)
7. Before replacing the panel, do a quick visual of all connections and wiring to ensure no other damage has occurred.
8. Replace panel and secure.
9. Plug in power cord and proceed with Start-up.
10. Your power issue was not corrected.
Record Model /Serial Numbers and Call Customer Service 1 (800) 743-7431.

PUMP WILL NOT RUN. BLOWS FUSE WHEN ENERGIZED

This usually is caused by having some debris in the gears of the pump.

1. Before removing the pump head loosen the six head screw a half turn.
2. Replace blown fuse and energize pump.
3. If this corrects issue, de-energize pump, tighten six screw, proceed with Star-Up.
4. If this doesn't solve issue the pump head should be removed and inspected for particles.
Because of tolerance in the gears it doesn't take a big particle to freeze the motor.
5. Before removing the head be sure to close the suction line valve.
6. It is not necessary to remove tubing.
7. Remove the six (6) head screws.
8. Be aware of the seal ring as you remove the head.
9. With your fingers turn the gears to insure that the motor is not seized.
10. If the gears turn freely you may power the pump for a short period to prove rotation.
11. If the gears do not turn freely, but they do turn, try powering the pump for short period.
12. If there is rotation. Replace the Pump Head, being careful to align gasket.
13. If the pump motor is frozen, it is best to replace the entire pump.

PUMP DOES NOT RUN WHEN INDICATOR IS ILLUMINATED

1. Check fuse and that the fuse holder cap is secure
2. Check pump wiring.
3. Check level of fluid / depth of level wand.
4. Does power down and up fix issue?
 - If Yes, there is a limit time set in the CONTROL SET Menu.
 - If No, the most likely cause is a loose wire inside of control enclosure. (See NO POWER TO UNIT, POWER PRESENT AT RECEPTACLE 1 thru 10 above)

PUMP DOES NOT SHUT OFF WHEN TANK IS EMPTY

1. Under the configuration menu, confirm that DigIN is set to Drum 1&2
2. Disconnect level wand connection. Alarm should sound and pump stop.

- If Yes, inspect end of level wand for debris or damage, replace if needed. (The float at bottom of the wand should have free movement, up and down.
- If No, inspect wire for damage. If no damage visible inspect internal wiring. (See NO POWER TO UNIT. POWER PRESENT AT RECEPTACLE 1 thru 10 above)

4. If no resolution is found, record Serial / Model numbers and call customer service

LOW LEVEL ALARM STAYS ON

1. Disconnect level wand connection and short across connectors with screw driver. (this is low voltage and not dangerous)
2. This turns off the alarm. There is a problem with the wand itself.
3. Inspect the float end of the level wand.
4. If the float is free moving replace wand.
5. Shorting the connector does not turn off alarm. Inspect internal wiring. (See NO POWER TO UNIT. POWER PRESENT AT RECEPTACLE 1 thru 10 above)
6. Still no resolution record Model / Serial numbers and call customer service.

Maintenance

Maintenance and care will depend upon the usage and environment in which the system is subjected to. The following is the suggested regular maintenance required to keep the glycol feed system operating properly:

TANK AND PLUMBING

Periodically check the piping and tubing to insure proper discharge of the glycol solution. The strainer should be periodically checked for clogging and wear. The level wand should be removed and cleaned to prevent clogging.

GEAR PUMP

Check for proper operation. If any pump/motor noises, leaks or changes in operation are detected, the pump should be removed and examined by a certified technician. Gear pump repairs can be difficult and should only be attempted by qualified personnel. Improper repairs or assembly can result in pump failure and nullification of the warranty. No lubrication is required.

PRESSURE RELIEF VALVE

Periodic checking and replacement of the adjustment seal is the only maintenance required.

IX. Manufacturer's Product Warranty

Advantage Controls warrants units of its manufacture to be free of defects in material or workmanship. Liability under this policy extends for 12 months from date of installation for all aspects of the glycol feeder with the controller only covered for an additional 12 months. Liability is limited to repair or replacement of any failed equipment or part proven defective in material or workmanship upon manufacturer's examination. Removal and installation costs are not included under this warranty. Manufacturer's liability shall never exceed the selling price of equipment or part in question. Advantage disclaims all liability for damage caused by its products by improper installation, maintenance, use or attempts to operate products beyond their intended functionality, intentionally or otherwise, or any unauthorized repair. Advantage is not responsible for damages, injuries or expense incurred through the use of its products.

The above warranty is in lieu of other warranties, either expressed or implied. No agent of ours is authorized to provide any warranty other than the above.

30 Day Billing Memo Policy

Advantage Controls maintains a unique factory exchange program to ensure uninterrupted service with minimum downtime. If your unit malfunctions, call 1-800-743-7431, and provide our technician with Model and Serial Number information. If we are unable to diagnose and solve your problem over the phone, a fully warranted replacement unit will be shipped, usually within 48 hours, on a 30 Day Billing Memo.

This service requires a purchase order and the replacement unit is billed to your regular account for payment. The replacement unit will be billed at current list price for that model less any applicable resale discount. Upon return of your old unit, credit will be issued to your account if the unit is in warranty. If the unit is out of warranty or the damage not covered, a partial credit will be applied based upon a prorated replacement price schedule dependent on the age of the unit. Any exchange covers only the controller or pump. Electrodes, liquid end components and other external accessories are not included.

Reference Chart % Propylene Glycol

Weight % Propylene Glycol	Volume % Propylene Glycol	Freeze Point°F	Refractive Index N _D 77°F	Degree Brix	Boiling Point °F @760MM Hg
20	19.4	19.9	1.3565	15.4	213°F
21	20.4	19.0	1.3575	16.0	
22	21.4	28.0	1.3586	16.7	
23	22.4	17.4	1.3598	17.0	
24	23.4	16.0	1.3611	18.4	214°F
25	24.4	15.0	1.3621	18.8	
26	25.3	14.0	1.3632	19.6	
27	26.4	13.0	1.3643	20.2	
28	27.4	12.0	1.3654	20.8	
29	28.4	11.0	1.3664	21.4	
30	29.4	9.1	1.3674	22.0	216°F
31	30.4	8.0	1.3685	22.7	
32	31.4	7.0	1.3700	23.6	
33	32.4	6.0	1.3714	24.4	
34	33.5	4.0	1.3729	25.3	217°F
35	34.4	3.0	1.3742	26.1	
36	35.5	1.0	1.3755	26.9	
37	36.5	0	1.3765	27.5	
38	37.5	-2.0	1.3775	28.0	219°F
39	38.5	-4.0	1.3785	28.5	
40	39.6	-5.0	1.3796	29.1	
41	40.6	-7.0	1.3806	29.6	
42	41.6	-9.0	1.3816	30.2	220°F
43	42.6	-11.0	1.3826	30.7	
44	43.7	-13.00	1.3837	31.3	
45	44.7	-15.0	1.3847	31.8	
46	45.7	-17.0	1.3857	32.4	220°F
47	46.8	-19.0	1.3868	33.0	
48	47.8	-22.0	1.3878	33.5	
49	48.9	-25.0	1.3889	34.1	
50	49.9	-29.0	1.3899	34.7	222°F
51	50.9	-31.0	1.3911	35.5	
52	51.9	-33.0	1.3922	35.9	
53	53.0	-37.0	1.3936	36.6	
54	54.0	-40.00	1.3947	37.2	227°F
55	55.0	-43.6	1.3961	38.0	
56	56.0	-46.0	1.3968	38.4	
57	57.0	-50.0	1.3891	39.1	
58	58.0	-53.0	1.3911	39.6	230°F
59	59.0	-57.0	1.4002	40.3	

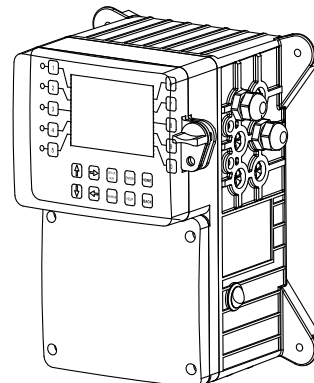
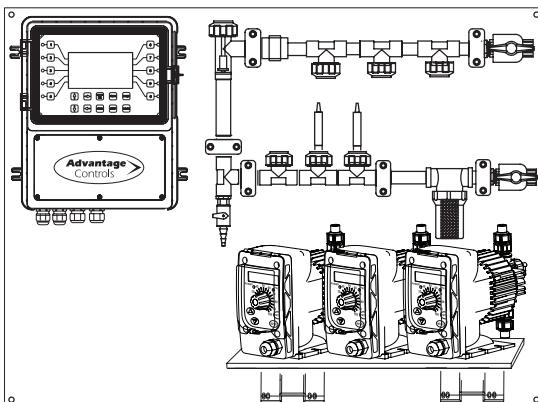
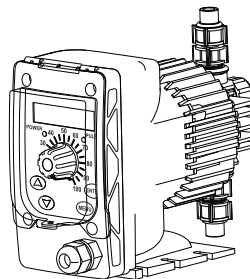
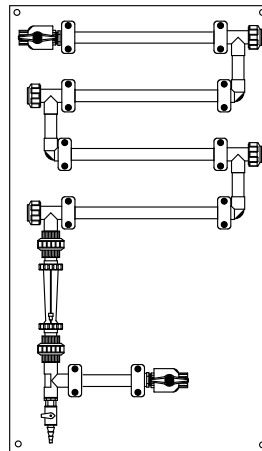
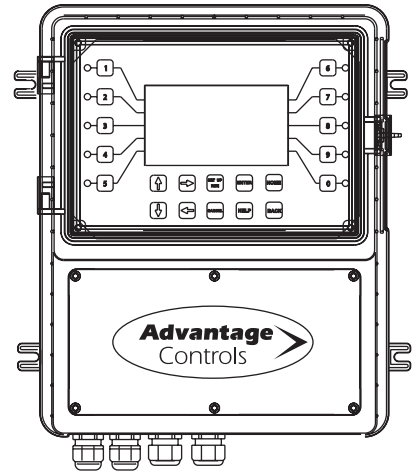
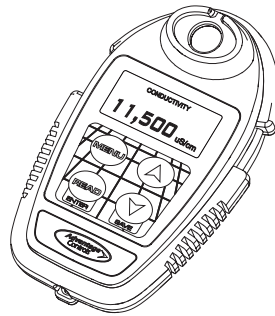
Reference Chart % Ethylene Glycol

Weight % Ethylene Glycol	Volume % Ethylene Glycol	Freeze Point°F	Refractive Index N _D 77°F	Degree Brix	Boiling Point °F @760MM Hg
20	18.1	17.0	1.3525	13.0	216°F
21	19.2	16.5	1.3536	13.7	
22	20.1	16.0	1.3546	14.3	
23	21.0	14.0	1.3555	14.8	
24	22.0	13.0	1.3565	15.4	218°F
25	22.9	12.0	1.3575	16.0	
26	23.9	11.0	1.3585	16.6	
27	24.8	10.0	1.3590	17.0	
28	25.8	9.0	1.3606	17.7	
29	26.7	8.0	1.3615	18.5	
30	27.7	7.0	1.3625	19.0	220°F
31	28.7	5.0	1.3636	22.8	
32	29.6	4.0	1.3645	23.4	
33	30.6	2.0	1.3645	20.9	
34	31.6	1.0	1.3666	21.5	221°F
35	32.6	0.0	1.3677	22.2	
36	33.5	-1.0	1.3686	22.8	
37	34.5	-3.0	1.3696	23.4	
38	35.5	-4.0	1.3707	24.0	224°F
39	36.5	-5.0	1.3718	24.6	
40	37.5	-8.0	1.3728	28.2	
41	38.5	-9.0	1.3729	29.1	
42	42	-11.0	1.3750	26.5	225°F
43	40.5	-13.0	1.3760	27.2	
44	41.5	-15.0	1.3770	27.7	
45	42.5	-17.0	1.3780	28.2	
46	44.0	-20.0	1.3796	29.1	227°F
47	45.0	-22.0	1.3806	29.6	
48	46.0	-24.0	1.3818	30.2	
49	47.1	-26.0	1.3828	30.8	
50	48.0	-28.0	1.3837	31.3	227°F
51	49.1	-31.0	1.3848	31.9	
52	50.1	-35.0	1.3858	32.5	
53	51.2	-36.0	1.3869	33.1	
54	52.2	-38.0	1.3880	33.6	227°F
55	53.2	-43.0	1.3889	34.1	
56	54.3	-45.0	1.3968	38.4	
57	55.3	-50.0	1.3909	35.2	
58	56.3	-52.0	1.3919	35.7	230°F
59	57.4	-54.0	1.3930	36.4	
60	68.4	-58.4	1.3939	36.8	230°F

Get the Advantage in Water Treatment Equipment

Advantage Controls can give you the *Advantage* in products, knowledge and support on all of your water treatment equipment needs.

- Cooling Tower Controllers
- Boiler Blow Down Controllers
- Blow Down Valve Packages
- Solenoid Valves
- Water Meters
- Chemical Metering Pumps
- Corrosion Coupon Racks
- Chemical Solution Tanks
- Solid Feed Systems
- Feed Timers
- Filter Equipment
- Glycol Feed Systems
- Pre Fabricated Systems



Get the Advantage

Advantage
Controls