

American Onsite Engineering

American Automated Controls

1-800-345-3132

www.americanonsite.com

www.automatedcontrolsystemsinc.com

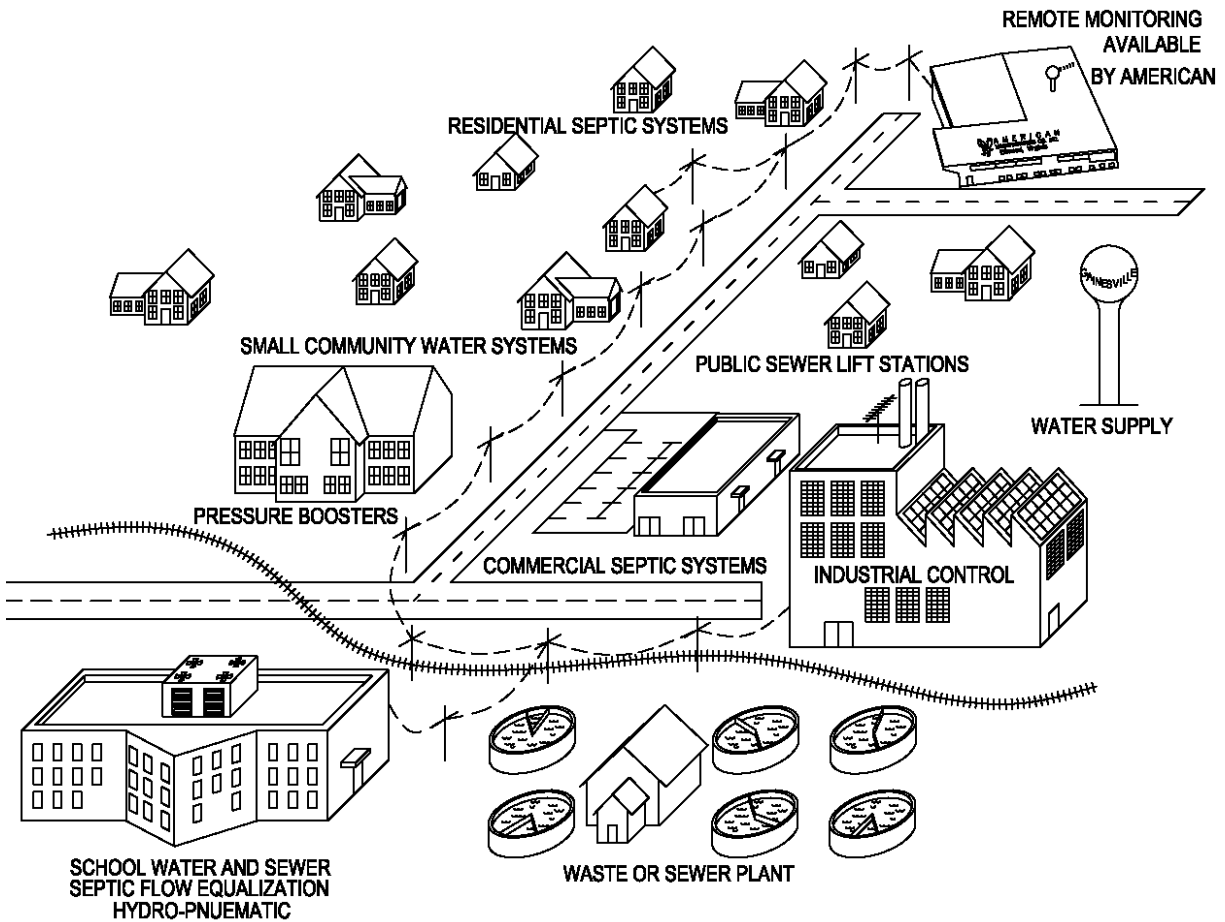
American Manufacturing Company, Inc.
P.O. Box 97, Elkwood, VA 22718
800-345-3132

ACSICO, LLC (Automated Control Systems)
1511 Route 22, Suite 211, Brewster, NY 10509
845-278-7367



AMERICAN AUTOMATED CONTROLS

CONTROLS FOR ALL WATER & SEWER APPLICATIONS



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AMERICAN AUTOMATED CONTROLS

INNOVATIVE TECHNOLOGY FOR THE ENVIRONMENTAL AGE

CONTROLS

American Manufacturing will design and build most any onsite wastewater or water system controller that is typically used today. American Manufacturing becomes involved with the entire operation of the system whether potable water, process water, or wastewater. American has on-staff Professional Engineers, designers, soils scientists, and trained sales people with state-of-the-art experience in control systems.

Our objective is to provide the most practical, economical, and efficient control device for fluid handling. We inventory many standard application controls and are able to manufacture special application panels in a very timely manner due to our modular design and manufacturing methods.

PACKAGES

American Manufacturing Company, Inc. manufactures many specialty On-Site Wastewater system packages including Recirculation Sand Filter components, pump station equipment, and State-Of-The-Art Perc-Rite® Drip Dispersal Systems incorporating automatic field flushing, disc filter backflushing, data logging, and pressure compensating emitters. American can fabricate from plans most any skid mounted pump control system, test it in house and ship the complete assembly.

CATALOG

American Manufacturing Company, Inc. manufactures many specialty On-Site Wastewater products including the Perc-Rite®, Bull Run™ Valve, Dial-A-Flow™, Cool Guide™, Distribution Boxes, accessories and Controls. American also supplies as an Original Equipment Manufacturer (OEM) many other products unique to the On-Site Industry.

The American On-Site Products Catalog is used throughout the industry not only for purchasing, but for reference and education. If an individual desires a product not shown in the catalog, a toll free call to our 800 number will normally result in getting information about the desired product.

1-800-345-3132



AMERICAN AUTOMATED CONTROLS

Design, Assembly & Custom Fabrication

Control System Design

Due to our extensive knowledge of water and wastewater systems American Manufacturing Company, Inc. can work with your design team to design a control system to automate any hydro-electrical process. Upon completion of the design you will be provided with AutoCAD drawings, backplate layouts and a complete sequence of operation.

Mass Production and Assembly

In order to save cost, improve quality and lower operational expenses, many companies outsource their mass production and assembly of standard control systems to American Manufacturing. Because of the volume of components purchased by American for our own production we can typically supply the raw materials at a lower cost than most distributors.



Custom Fabrication

With our two state of the art manufacturing facilities located in Elkwood, VA and Brewster, NY, American Manufacturing can provide specialized production of your custom-designed control system. With our 5 Ton overhead crane, American's manufacturing capabilities have been expanded to allow for complete assembly and testing of filtration and control systems within a controlled environment.





AMERICAN AUTOMATED CONTROLS

Table of Contents

Section	1:	Sewage Controls
		A. Design & Specification Information
		B. Timer Control Model Options
		C. Simplex & Duplex Demand Controls
		D. Simplex & Duplex Timer Controls
		E. Multiplex
Section	2:	Water System Controls
		A. Design & Specification Information
		B. (HAC) Hydro-pneumatic Controls
		C. (PAC) Pre-charged Controls
		D. (LAC) Level Control for Storage
		E. (HAC/LAC) Combination Control
		F. Water Control Accessories
Section	3:	Water System Design Information
		A. Introduction to HAC Controls
		B. HAC, PAC & LAC Sequence of Operations
		C. Hydro-Pneumatic Tank Design
		D. Tank Volume Low/Cut-in Pressure Table 1
		E. HAC Tank Detail
Section	4:	Level & Temperature Sensing
		A. Float Switches & Electrodes
		B. Transducers – Pressure & Sonic
		C. Temperature Probes
Section	5:	Telemetry, Dialers & Web Based Reporting
Section	6:	VFD & Soft Starts
Section	7:	TVSS & Packages
Section	8:	Estimating

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AMERICAN AUTOMATED CONTROLS

Ordering Information

AMERICAN AUTOMATED CONTROLS, INC. IS A DIVISION OF AMERICAN MANUFACTURING COMPANY, INC. AND ACSICO, LLC.

FREIGHT TERMS - All materials shipped f.o.b. Elkwood, Virginia or Brewster New York via UPS or common carrier. Please consult factory for freight allowances.

TERMS OF PAYMENT - With an approved credit account, terms are 2% 10 days, net 30 days from date of invoice. A 2% service charge will be applied to all past due invoices. Customer agrees to pay all reasonable collection fees incurred by American Manufacturing. All other orders will be shipped C.O.D. Deposits on some special orders may be required.

PRODUCT CHANGES - We reserve the right to change prices and modify or redesign any product without prior notice.

ERRORS AND CLAIMS - All shipping errors must be reported within 10 days. American Manufacturing will not be responsible for damages, shortages or delays caused by shipper. Claims that are the responsibility of American Manufacturing will be expedited immediately, but are limited to credit on or replacement of merchandise involved.

AMERICAN MANUFACTURING LIMITED WARRANTY - For one year (12 months) after date of purchase, American Manufacturing will repair or replace any product or portion thereof that proves to be defective due to materials or workmanship of American Manufacturing. We reserve the right to repair or replace defective materials at our discretion.

This warranty does not cover the following conditions:

- Defects or problems caused by improper installation or maintenance of materials.
- Abuse, neglect or accidental damage of products.
- Normal maintenance or upkeep of products.
- Lightning, war, floods, or other acts beyond our control.
- Misapplication of our products for their designed purpose, or misapplication according to local, state or national codes when in effect.
- American Manufacturing Company or its representatives are not responsible for labor for replacement of defective parts.

Defective or warranty items must be returned to American or a place designated by American. All returns must be accompanied by a return goods authorization number (RGA#) supplied by American.

American Manufacturing will in no way be responsible for any losses or damages incurred by failure of equipment, parts, or service. NOTE: Some states do not allow exclusion of damages so this may not apply to you.

There are no other warranties written or implied.

ORDER ENTRY FOR AMERICAN AUTOMATED CONTROLS:

VIRGINIA OFFICE

PHONE: (800) 345-3132

FAX: (540) 829-1031

E-MAIL: sales@americanonsite.com

NEW YORK OFFICE

PHONE: (825) 278-7367

FAX: (825) 278-7379

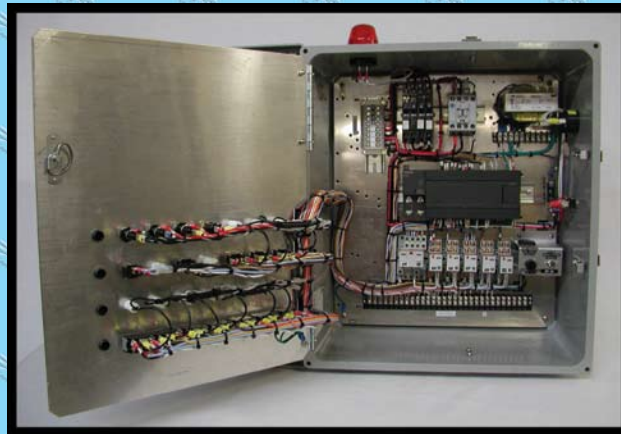
E-MAIL: automatedcontrols@hotmail.com



AMERICAN MANUFACTURING COMPANY, INC.

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WASTEWATER & WATER SYSTEM CONTROL PANELS



THE LEADER IN INNOVATIVE ONSITE WASTEWATER PRODUCTS AND SYSTEMS

- *Equalization Panels*
- *Simplex and Duplex Pump Panels*
- *Drip Dispersal Control Panels*
- *Water System Control Panels*
- *Accessories including Tank Alarms, Bull Run™ Valves, Float Switches, Cool Guides™ and more*

MISSION STATEMENT

American Manufacturing Company, Inc. is dedicated to providing state-of-the-art onsite control products and systems with a highly trained technical support staff. We will maintain our leadership position in the industry by offering quality products, superior technical services and sustainable decentralized onsite systems for distributed wastewater management.

HISTORY

Over the last 25 years, American Manufacturing Company, Inc. has become a leader in the onsite wastewater industry; developing products and systems for economically viable and environmentally friendly applications. American's engineers, soil scientists, and electrical designers, have been working with regulators, educators and engineering firms, to create industry standards that are considered the benchmarks for creating optimal water and wastewater systems.

From innovative onsite products, such as the Bull Run Valve™, The Cool Guide™, Dial-a-Flow™ and Perc-Rite® Drip Equipment, to off-the-shelf Drip Dispersal Systems and Custom Engineered, Large Flow Drip Systems with Telemetry and SCADA capabilities, American leads the way in achieving long-term, successful applications. With multiple manufacturing, customer service and technical support centers, along with a network of stocking distributors and specification representatives, American's ability to assist you with your control needs, ranging from alarm panels to large flow drip dispersal systems, is unparalleled.

PRODUCTS AND SERVICES

- ***Control Panels***
- ***Onsite Products and Accessories***
- ***Pre-Engineered Drip Systems***
- ***Telemetry and SCADA Services***
- ***Operating and Maintenance Services***
- ***Start-Up and Technical Support***

Timer Pump Controls



Model # DEPRAB124-AJLP(C)RX(12)

Timer pump control panels are designed to provide flow equalization to any pressure dosed system utilizing a repeat cycle timer and float switch inputs. When a float switch indicates to the control panel that there is sufficient water to begin a dosing sequence, the system cycles between a rest time (pump off time) and a run time (pump on time). Hand-Off-Auto (HOA) switches are provided to allow the system to be manually operated. The controller is flexible and may be used with two to four float switches. Timer controls can be easily configured to automatically manage peak flow events and demand dose overrides.

Specifications:

- Simplex or Duplex
- NEMA 1 Steel or NEMA 4X Fiberglass Enclosures w/ Hinged Door
- Removable Aluminum Back Plate for Component Mounting
- Duty Rated Pump Contactor 16A @ 115V/230V
- Adjustable Pump Run Timer
- High Level Alarm w/ Light & Horn (40W Red Lexan Alarm Light w/ NEMA 4X Only)
- Timer Override Circuit (w/ Optional Counter)
- Hand-Off-Auto Toggle Switch
- Power, Alarm & Pump Run Indicator Lights
- 2A Alarm Fuse & 2A Control Fuse
- 110V Control Circuit Breakers
- 120/240V Pump Circuit Breakers
- Finger-Safe Terminal Blocks
- 115V Control Transformer w/ Fused Secondary (3 Phase Units Only)
- UL Listed

Options:

- 24 Hour, 15 Minute, Time Of Day or Weekly Time Clock
- Alarm Horn 85 db @ 10 ft.

ITEM	MODEL	DESCRIPTION
SEQ-B4196P	SEQAB124-ACEFJL	Simplex Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breaker, 120/240V Pump, Counter, ETM, Redundant Low Level Off
SEPR-B4669	SEPRAB124-AJLR	Simplex Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breaker, 120/240V Pump, PLC, Locking Hasp, Redundant Low Level Off
DEPR-B4666	DEPRAB124-AJLP(C)R	Duplex Repeat Cycle Timer Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breakers, Counters, 120/240V Pumps, PLC, Locking Hasp, Pump Fail Circuit (Current Sensor), Redundant Low Level Off
DEQ-B4656P	DEQAB124-CEJOP(C)	Duplex Control w/ NEMA 4X Enclosure, Alarm, Breakers, 120/240V Pumps, Counters, ETMs, Override Switch, Pump Fail Circuit (Current Sensor)
DEQ-B4658P	DEQAB124-ACEJLOP(C)	Duplex Repeat Cycle Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breakers, 120/240V Pumps, Counters, ETMs, Locking Hasp, Override Switch, Pump Fail Circuit (Current Sensor)

Simplex Pump Controls



Model # SAB124-AFJ1LX

Simplex pump controllers manage each dose based on volume of wastewater as signaled by float switches. Simplex Pump Controls are equipped with Hand-Off-Auto (HOA) switches which allow the pump to be manually operated. Separate control and pump circuits are provided in order ensure notification in the event of a high water condition.

Specifications:

- NEMA 1 Steel or NEMA 4X Fiberglass Enclosures w/ Hinged Door
- Removable Aluminum Back Plate for Component Mounting
- Duty Rated Pump Contactor (except SA4-B1432) 16A @ 115V/230V
- Hand-Off-Auto Toggle Switch
- Power Alarm & Pump Run Indicator Lights
- 2A Alarm Fuse & 2A Control Fuse
- Finger-Safe Terminal Blocks
- 115V Control Transformer w/ Fused Secondary (3 Phase Units)
- UL Listed

Options:

- Alarm Horn 85 db @ 10 ft.
- 110V Control Circuit Breakers
- 120/240V Pump Circuit Breakers
- Test-Off-Normal Toggle Switch
- High Level Indicator Light, 40W Red Lexan Alarm Light (Outdoor Units Only)

ITEM	MODEL	DESCRIPTION
SA1-B1250P	SA1-AJ	Simplex Control w/ NEMA 1 Enclosure, Auto Reset Alarm, 120/240V Pump
SA4-B1432	SA4-AFLX	Simplex Control w/ NEMA 4X Enclosure, Auto Reset Alarm, 120V Pump, Flasher, Locking Hasp, Loaded HOA Switch, Diff. Float Receptacle
SA4-B1528P	SA4-AFJL	Simplex Control w/ NEMA 4X Enclosure, Auto Reset Alarm, 120/240V
SAB-B1101P	SAB121-J	Simplex Control w/ NEMA 1 Enclosure, Alarm, Breakers, 120/240V Pump
SAB-B1559P	SAB124-AFJL	Simplex Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breakers, 120/240V Pump, Flasher, Locking Hasp

Duplex Pump Controls



Model # DAB124-ACFJL

Duplex pump controllers manage two pumps and each dose based on volume of wastewater as signaled by float switches. Duplex Controls are equipped with Hand-Off-Auto (HOA) switches which allow the pump to be manually operated. Separate control and pump circuits are provided in order to ensure notification in the event of a high water condition. If one pump fails, the control may be operated as a simplex system by simply placing the demand pump's H-O-A switch in the "Off" thus allowing normal simplex operation to continue until repairs can be made.

Specifications:

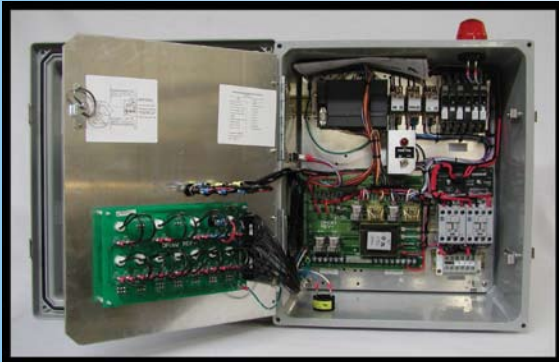
- NEMA 1 Steel or NEMA 4X Fiberglass Enclosures w/ Hinged Door
- Removable Aluminum Back Plate for Component Mounting
- Duty Rated Pump Contactor 16A @ 115V/230V
- High Level Alarm w/ Light & Horn (40W Red Lexan Alarm Light w/ NEMA 4X Only)
- Electro-Mechanical Pump Alternator
- Lag Pump Float Terminals
- Hand-Off-Auto Toggle Switch
- Power Alarm & Pump Run Indicator Lights
- 2A Alarm Fuse & 2A Control Fuse
- 110V Control Circuit Breakers
- 120/240V Pump Circuit Breakers
- Finger-Safe Terminal Blocks
- 115V Control Transformer w/ Fused Secondary (3 Phase Units Only)
- UL Listed

Alarm Option:

- Alarm Horn 85 db @ 10 ft.
- Test-Off-Normal Toggle Switch

ITEM	MODEL	DESCRIPTION
DAB-B2221P	DAB111-J	Duplex Control w/ NEMA 1 Enclosure, Alarm, Breaker, 120/240V Pump
DAB-B2248P	DAB121-CJ	Duplex Control w/ NEMA 1 Enclosure, Alarm, Breaker, 120/240V Pump, Counter
DAB-B2431P	DAB124-ACEFJL	Duplex Control w/ NEMA 4 Enclosure, Auto Reset Alarm, Breaker, 120/240V Pump, Counter, ETMs, Flasher, Locking Hasp
DAB-B2500P	DAB124-AFJL	Duplex Control w/ NEMA 4 Enclosure, Auto Reset Alarm, Breaker, 120/240V Pump, Flasher, Locking Hasp

Drip Dispersal System Controls



Model # DP124-DAB124-AHJLP(C)RX (DVC/ZM)

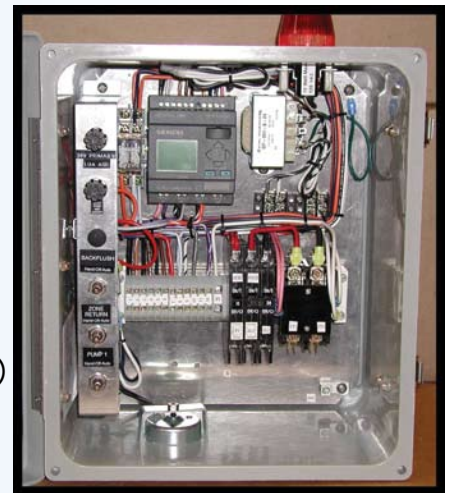
Drip pump control panels are based on the American Perc-Rite® Patent operating sequence. Simplex and duplex panels are available that operate on a single or multi-zone configuration. Drip controls provide for flow equalization with peak flow management and are designed on a repeat cycle timer basis. When a float signal tells the control panel there is enough water to begin a dose, the timer cycles between a rest time (off time) and a run time (pump on time). Hand-Off-Auto (H-O-A) switches allow running of the pump in hand in the event the microprocessor becomes inoperable. The controller is flexible to use with either three or four floats. All American drip controls automatically control field flushing of the drip tubing and filters.

Specifications:

- NEMA 4X Fiberglass Enclosures w/ Hinged Door
- Removable Aluminum Back Plate for Component Mounting
- Duty Rated Pump Contactor 16A @ 115V/230V/460V
- High Level Alarm w/ Light & Horn (40W Red Lexan Alarm Light w/ NEMA 4X Only)
- Hand-Off-Auto Toggle Switch
- Power, Alarm & Pump Run Indicator Lights
- 2A Alarm Fuse & 2A Control Fuse
- Finger-Safe Terminal Blocks
- 115V Control Transformer w/ Fused Secondary (3 Phase Units Only)
- UL Listed

Alarm Option:

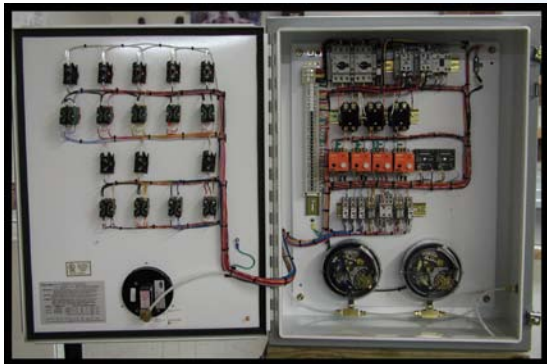
- Alarm Horn 85 db @ 10 ft.
- Test-Off-Normal Toggle Switch



Model # DP011-SAB124-AJL

ITEM	MODEL	DESCRIPTION
DP0-B9114	DP011-SAB124-AJL	One Zone Simplex Drip (Multi-Zone w/ Sequence Valve) Timed Dosing & Process Control w/ NEMA 4 Enclosure, Auto Reset Alarm, Breakers, 120/240V Pump, Locking Hasp, LCD Display, Auto Flushing
DP1-B9140P	DP122-SAB124-AHJLR	Two Zone Simplex Drip Timed Dosing & Process Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breakers, Hinged Inner Door, Locking Hasp, Redundant Low Level Off, Auto Flushing, 120/240V Pump, Internally Accessible Counters/ETMs
DP1-B9159	DP124-SAB124-AHJLRX (DVC/ZM)	Four Zone Simplex Drip Timed Dosing & Process Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breakers, 120/240V Pump, Hinged Inner Door, Locking Hasp, Redundant Low Level Off, Auto Flushing, Internally Accessible Counters/ETMs, Direct Voltage Cutout & Zone Master
DP1-B9146P	DP124-DAB124-AHJ1LP(C)R	Four Zone Duplex Drip Timed Dosing & Process Control w/ NEMA 4X Enclosure, Auto Reset Alarm, Breakers, 120/240V Pump, Hinged Inner Door, Locking Hasp, Pump Fail (Current Sensor), Redundant Low Level Off, Auto Flushing, Internally Accessible Counters/ETMs
DP1-B9163P	DP124S-SAB124-AHJLRX (2T/Vault)	Combination Four Zone Simplex Pretreat to Drip Timed Dosing & Process Control w/ NEMA 4X Enclosure, Auto Reset Alarm, 120/240V Pump, Breakers, Hinged Inner Door, Locking Hasp, Redundant Low Level Off, Treatment Unit/Sand Filter, Vaulted 2 Tank Configuration, Auto Flushing, Internally Accessible Counters/ETMs

Water System Controls



Model # H2P34-ST1-A7-2-J1LP(F)X(11)

Hydro-Pneumatic water system controls are designed to automatically control the air/water ratio in community water distribution systems. They are customized to meet individual needs and are designed with hard wired logic or may include Programmable Logic Control (PLC) applications. Storage and multiple well or booster pump controls are standard designs.

A variety of Telemetry Systems are available to monitor and control pumps or water tank levels over dedicated phone lines, wire, fiber optic cable, or wirelessly with radio signal communications.

The "P" series controls maintain proper water pressure in tanks with internally installed bladders (no air compressor or external air supply required). The system utilizes bourdon tube type pressure switches for precise pressure measurement and no other external components or sensors are necessary. The "H" Series controls maintain proper water pressure in tanks using external air supply. Variable Frequency Drive (VFD) systems can maintain constant pressure over a wide range of flows while maximizing energy conservation.

Specifications:

- NEMA 12 Steel or NEMA 4X Fiberglass Enclosures w/ Hinged Door
- Removable Aluminum Back Plate for Component Mounting
- Duty Rated Pump Contactor 16A @ 115V/230V
- 2A Alarm Fuse & 2A Control Fuse
- Finger-Safe Terminal Blocks
- 115V Control Transformer w/ Fused Secondary (3 Phase Units)
- Breakers and/or Motor Protectors
- UL Listed

Alarm Option:

- Low Hydro Level
- High Hydro Level
- Low Hydro Pressure
- High Hydro Pressure
- Low Suction Pressure w/ Cutout
- Low Well Level w/ Cutout
- Low Storage Level w/ Cutout
- High Storage Level



Model # H2AB32-A3-2-J3LL30XZ

Call American Manufacturing for a quotation at 1-800-345-3132.

Alarm Panels and Onsite Products



Model # A4-AFL (w/ AO10)

The Auto Reset Alarm Panels sound an alarm when water level rises due to a pump failure. The buzzer can be silenced by pushing the silence switch. Once the alarm condition has been corrected and the alarm float turned down, the buzzer will automatically reset to make the system fully operational again.

ITEM	MODEL	DESCRIPTION
A1-B0001P	A1-A	Alarm Control w/ NEMA 1 Enclosure (w/ AO10 Float)
A1-B0013P	A1-AX	Alarm (Latching) Control w/ NEMA 1 Enclosure (No Float)
A4-B0510P	A4-AFL	Alarm Control w/ NEMA 4 Enclosure, Flasher & Locking Hasp (w/ AO10 Float)
TA1	TA1	Tank Alarm w/ Float
TA3	TA3	Outdoor Tank Alarm w/ Float

ITEM	DESCRIPTION
BRV4	Bull Run Valve 4"
BRVBULK	Bull Run Valve & Key Only
BRVCIRISER	Bull Run Valve Riser w/ Cast Cover
BRVKEY28	Bull Run Valve Key 28"
BRVKEY36	Bull Run Valve Key 36"
BRVKEY48	Bull Run Valve Key 48"
BRVKEY60	Bull Run Valve Key 60"
BRVKIT	Bull Run Valve Kit Complete (Valve, Key 28", Plug & Adapter)
BRVMOTOR4	Bull Run Valve Motorized

Bull Run® Valve

The Bull Run® Valve is designed to split flows to septic fields or systems. The leak-proof and external operating design ensures no contact with wastewater.



Item # BRV4



Item # COOLGUIDE25

Cool Guide®

The Cool Guide® distributes the flow of effluent around a motor in a wastewater pumping application in a manner that allows motor cooling without the mixing of residual solids.

ITEM	DESCRIPTION
COOLGUIDE15	Laminar Flow Collar 6", 15 GPM
COOLGUIDE25	Laminar Flow Collar 8", 25 GPM
COOLGUIDE40	Laminar Flow Collar 8", 40 GPM

ITEM	DESCRIPTION
DIAL4BLACK	Dial-A-Flow Black 4" for ADS
DIAL4GRAY	Dial-A-Flow Gray 4" for SDR35 SCH40 & ASTM3034 Pipe
DIAL4GREEN	Dial-A-Flow Green 4" for S&D

Dial-A-Flow®

The Dial-A-Flow® is a device used to equally distribute flow out of distribution boxes. With the eccentrically located opening, the installer can rotate the Dial-A-Flow® to balance all discharge ports for



Item # DIAL4GRAY

American Onsite Products & Accessories



Item # AO10

Float Switches

Float switches are utilized to signify specific liquid levels and provide an indication to the control panel. They are enclosed in durable and chemically stable polypropylene or Acrylonitrile Butadiene Styrene (ABS). They are available with pump duty or control duty amp ratings, normally open (NO) or normally closed (NC) switches and various lengths, with or without plug connectors.

ITEM	DESCRIPTION
PO15 MECHNA	Float, Pilot Duty, Mechanical, Normally Open, Narrow Angle 15'
PO15 MECHNAW	Float, Pilot Duty, Mechanical, Normally Open, Narrow Angle 15', Weight
DHO15	Float, Pump Duty, Mechanical, Normally Open, ABS, 15A, 15'
DHO15P1	Float, Pump Duty, Mechanical, Normally Open, ABS, 15A, 15', 110V Plug
DO15P1	Float, Pump Duty, Mechanical, Normally Open, ABS, 13A, 15', 110V Plug
DO15P2	Float, Pump Duty, Mechanical, Normally Open, ABS, 13A, 15', 230V Plug
DO30	Float, Pump Duty, Mechanical, Normally Open, ABS, 13A, 30'
DO30P1	Float, Pump Duty, Mechanical, Normally Open, ABS, 13A, 30', 110V Plug
DC15	Float, Pump Duty, Mechanical, Normally Closed, ABS, 13A, 15'
DC15P1	Float, Pump Duty, Mechanical, Normally Closed, ABS, 13A, 15', 110V Plug
DC15P2	Float, Pump Duty, Mechanical, Normally Closed, ABS, 13A, 15', 230V Plug
PO15	Float, Pilot Duty, Mercury, Normally Open, Polypropylene, 10A, 15'
PO15W	Float, Pilot Duty, Mercury, Normally Open, Polypropylene, 10A, 15', Weight
PO20	Float, Pilot Duty, Mercury, Normally Open, Polypropylene, 10A, 20'
PO20W	Float, Pilot Duty, Mercury, Normally Open, Polypropylene, 10A, 20', Weight
PO30	Float, Pilot Duty, Mercury, Normally Open, Polypropylene, 10A, 30'
DC30	Float, Pump Duty, Mercury, Normally Closed, Polypropylene, 13A, 30'
DC30P1	Float, Pump Duty, Mercury, Normally Closed, ABS, 13A, 30', 110V Plug

Float Accessories

Float bars, pipe clamps and weights for float switch applications.



Item # SWITCHBARDRIP4



Item # SWITCHCLAMP

ITEM	DESCRIPTION
FLOATBAR	4 Float Stainless Steel Float Bar
FLOATBAR3	3 Float Stainless Steel Float Bar
SWITCHBARVERT2	Float Bar 2 w/ (2) DO15 Floats
SWITCHBARVERT3	Float Bar 3 w/ (3) DO15 Floats
SWITCHBARVERT4	Float Bar 4 w/ (4) DO15 Floats
SWITCHCLAMP	Float Wire Pipe Clamp (Stainless Steel)
WH	Float Weight (Half Only)

Control Panel Model Selection Guide

This catalog lists American's Standard Control Panel offerings. The next two pages explain the product numbering system. For non-standard panel offerings, assemble a model number using the following tables and call American for price and delivery information at 1-800-345-3132.

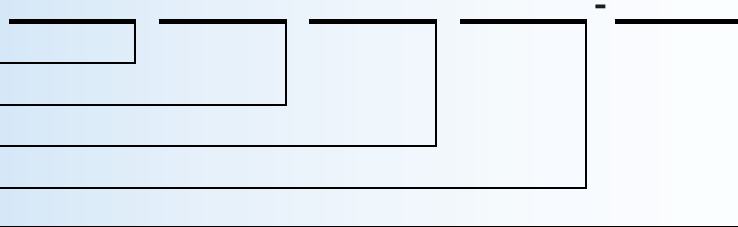
CONTROL SERIES

A-ALARM OPTION

B-BREAKER OPTION

ENCLOSURE TYPE

CONTROL PANEL OPTIONS



Control Series:

S	Simplex	SEQ	Simplex Equalization
D	Duplex	SEPR	Simplex Equalization RCT (w/ PLC)
T	Triplex	SEPT	Simplex Equalization TOD (w/ PLC)
Q	Quadplex	DEPR	Duplex Equalization RCT (w/ PLC)
M	Multiplex (five or more)	DEPT	Duplex Equalization TOD (w/ PLC)
MET	Multiplex Equalization TOD	MT	Multiplex Timed Dose On Demand
CSEPR	Combination Simplex Equalization RCT (w/ PLC)	CSEPT	Combination Simplex Equalization TOD (w/ PLC)

RCT = Repeat Cycle Timer

TOD = Time Of Day Timer

PLC = Programmable Logic Control

Alarm Option:

(A) Indicator Light & Buzzer On Indoor Units, Red Lexan Top Mounted Light & Buzzer On Outdoor Units

Breaker Option:

Place "B" for Breaker in designated space followed by the desired phase and voltage code.

PHASE:	1—Single phase	3—Three phase		
VOLTAGE:	1—120V	2—240V	4—460V	8—208v

On 3 phase systems, motor protectors are substituted for breakers and require a "P" instead of the "B". If fusible disconnects for pumps are desired in place of pump breakers then replace the "P" with an "F", followed by the desired phase and voltage.

Enclosure Option:

1—NEMA 1	2—NEMA 12	3—NEMA 3R
4—NEMA 4X	4S—NEMA 4 (steel)	4SS—NEMA 4X (stainless steel)
7—NEMA 7 (explosion proof)		

STANDARD OPTIONS LIST

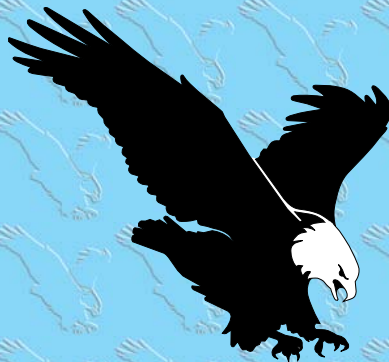
* A	Auto Reset Alarm Circuit	P(C)	Pump Fail Circuit By Current Sensor
B	Bell/Horn (4" weatherproof)	P(F)	Pump Fail Circuit By Flow Switch
* C	Cycle Counter	Q	Quick Disconnect Operator
D	Delayed Lag Pump Timer	* R	Redundant Off Float Switch
* E	Elapsed Time Meter	R(A)	Redundant Off With Alarm
* F	Flasher	S	Seal Fail Indicator
F(L)	Flashing Light	S(R)	Seal Fail Relay W/ Indicator
F(S)	Flashing Strobe Light	S(A)	Seal Fail Relay W/ Alarm
F(C)	Flashing Light W/ Protective Cage	T	Thermal Cut-out
G	Gell Cell Battery	T(I)	Thermal Cut-out W/ Indicator
H	Hinged Inner Door	T(A)	Thermal Cut-out W/ Alarm
I(5)	Intrinsically Safe Float Switch Relays (508)	U	Utility Receptacle
I(9)	Intrinsically Safe Float Switch Relays (913)	U(G)	Utility Receptacle (GFI)
* J	Contactors/Breaker Upgrade	U(W)	Utility Receptacle (Weatherproof)
K	External Capacitor Installation	V	Voltage Monitor
L	Locking Hasp	V(P)	Voltage/Phase Monitor
L(1)	Lightning Arrestor 1 Wire W/ Gnd	W	Weather Heater
L(2)	Lightning Arrestor 2 Wire W/ Gnd	W(1)	Weather Heater W/ Blower (100W)
L(3)	Lightning Arrestor 3 Wire W/ Gnd	W(2)	Weather Heater (200W)
L(4)	Lightning Arrestor 3 Wire W/ Gnd (460)	X	Extra Options
M	Main Breaker/Disconnect	Y	24 Volt Float Switch Circuit
N	Nema Rated Starter	Z	Oil tight Lights & Switches
O	Override Switch For Alternator		

* Standard Options

Other options are available. For a complete description of all options, see specifications. Any option not listed above requires an "X" at the end of the model number and the appropriate description.

EXTRA OPTIONS: A list of standard additional options provided by American Onsite Controls, but any user-selected option is also available.

- | | |
|---|-----------------------------------|
| 1. Overload Reset Buttons (22mm) Through Door | 11. 120 Volt Solenoid Circuit |
| 2. Float Switch Indicator Lights | 12. Ball Valve Actuator Circuit |
| 3. Plexiglas Enclosure Window | 13. Sand Filter High Level |
| 4. Branch Power Circuit | 14. Telephone Dialer Installation |
| 5. Manual Emergency Transfer Switch | 15. Drip Shield Kit |
| 6. Generator Receptacle/Plug | 16. Floor Stand Kit |
| 7. Electrode Level Control | 17. Transformer Upgrade |
| 8. Aerator Fail Circuit | 18. Circuit Breaker Padlock |
| 9. 24 Hour Clock Timer | 19. Full Frame Breakers |
| 10. Pump Run Timer | 20. Power Fail Circuit |



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AMERICAN AUTOMATED CONTROLS

DESIGN AND SPECIFICATION INFORMATION SEWAGE

Standard and custom control panels are easily specified by following the simple panel guide below. Panel pricing can be obtained by using the control calc tool found in the design section of the web page.

CONTROL SERIES

A-ALARM OPTION

B-BREAKER OPTION

ENCLOSURE TYPE

CONTROL PANEL OPTIONS

Control Series:

S	Simplex	SEQ	Simplex Equalization
D	Duplex	SET	Simplex Equalization w/ TOD
T	Triplex	SEPR	Simplex Equalization w/ PLC
Q	Quadplex	SEPT	Simplex Equalization w/ PLC & TOD
M	Multiplex (five or more)	DEQ	Duplex Equalization
MT	Multiplex Timer On Demand	DET	Duplex Equalization w/ TOD
MET	Multiplex Equalization	DEPR	Duplex Equalization w/ PLC
CSEQ	Combin. Simplex Equalization	DEPT	Simplex Equalization w/ PLC & TOD
CSEPR	Combin. Simplex Equalization w/ PLC		

Note: PLC = Programmable Logic Control & TOD = Time-of-Day Timer (24-hr or 7-day)

Alarm Option:

(A) Indicator Light & Buzzer On Indoor Units, Red Top Mounted Light & Buzzer On Outdoor Units

Breaker Option:

Place "B" for Breaker in designated space followed by the desired phase and voltage code.

PHASE:	1-Single phase	3-Three phase		
VOLTAGE:	1-120V	2-240V	4-460V	8-208v

On 3 phase systems, motor protectors are substituted for breakers and require a "P" instead of the "B". If fusible disconnects for pumps are desired in place of pump breakers then replace the "P" with an "F", followed by the desired phase and voltage.

Enclosure Option:

1-NEMA 1	2-NEMA 12	3-NEMA 3R
4-NEMA 4X	4S-NEMA 4 (steel)	4SS-NEMA 4X (stainless steel)
7-NEMA 7 (explosion proof)		

Note: American makes a full line of drip dispersal control panels. American's Perc-Rite® Drip Systems are fully described in the Drip Dispersal Engineering Catalog available to specifying engineers.

AMERICAN AUTOMATED CONTROLS

STANDARD OPTIONS LIST

* A-	Auto Reset Alarm Circuit	O-	Override Switch For Alternator
B-	Bell/Horn (4" weatherproof)	P(C)-	Pump Fail Circuit By Current Sensor
* C-	Cycle Counter	P(F)-	Pump Fail Circuit By Flow Switch
D-	Delayed Lag Pump Timer	Q-	Quick Disconnect Operator
* E-	Elapsed Time Meter	* R-	Redundant Off Float Switch
* F-	Flasher	R(A)-	Redundant Off With Alarm
F(L)-	Flashing Light	S-	Seal Fail Indicator
F(S)-	Flashing Strobe Light	S(R)-	Seal Fail Relay W/ Indicator
F(C)-	Flashing Light W/ Protective Cage	S(A)-	Seal Fail Relay W/ Alarm
G-	Gell Cell Battery	T-	Thermal Cut-out
H-	Hinged Inner Door	T(I)-	Thermal Cut-out With Indicator
I(5)-	Intrinsically Safe Float Switch Relays (508)	T(A)-	Thermal Cut-out With Alarm
I(9)-	Intrinsically Safe Float Switch Relays (913)	U-	Utility Receptacle
* J-	Contactor/Breaker Upgrade (J = 2P DP) J1=18 FLA, J2=25 FLA, J3=32 FLA, J4=40 FLA, J5=50 FLA	U(G)-	Utility Receptacle (GFI)
K-	"K" Pack Installation Kit	U(W)-	Utility Receptacle (Weatherproof)
* L-	Locking Hasp	V-	Voltage Monitor
L(1)-	Lightning Arrestor 1 Wire W/ Gnd	V(P)-	Voltage/Phase Monitor
L(2)-	Lightning Arrestor 2 Wire W/ Gnd	W-	Weather Heater
L(3)-	Lightning Arrestor 3 Wire W/ Gnd	W(1)-	Weather Heater W/ Blower (100W)
L(4)-	Lightning Arrestor 3 Wire W/ Gnd (460)	W(2)-	Weather Heater (200W)
M-	Main Breaker/Disconnect	X-	Extra Options
N-	NEMA Rated Starter	Y-	24 Volt Float Switch Circuit
		Z-	Oil-tight Lights & Switches

* Standard Options

Other options are available. For a complete description of all options, see specifications. Any option not listed above requires an "X" at the end of the model number and the appropriate description and list price adder.

EXTRA OPTIONS: A list of standard additional options provided by American Onsite Controls, but any user-selected option is also available.

- | | |
|-----------------------------------|---|
| 1. Overload reset buttons (22mm) | 17. Transformer upgrade |
| 2. Float switch indicator | 18. Circuit breaker padlock |
| 3. Plexiglas enclosure window | 19. Full frame breakers |
| 4. Branch power circuit | 20. Power fail circuit |
| 5. Manual emergency transfer | 21. Dry alarm contacts |
| 6. Generator receptacle/plug | 22. Latching alarm |
| 7. Electrode level control | 23. Differential float receptacle |
| 8. Aerator fail circuit | 24. Conduit hub |
| 9. 24-hour clock timer | 25. High level alarm w/ remote alarm indicator |
| 10. Pump run timer | 26. Separate control/alarm/pump supply breakers |
| 11. 120 volt solenoid circuit | 27. Enclosure size upgrade |
| 12. Ball valve actuator | 28. Web-based Telemetry Reporting Service (TRS) |
| 13. Sand filter high level | 29. Temperature Monitoring |
| 14. Telephone dialer installation | 30. 30-day data logging |
| 15. Drip shield kit | 31. 7-day 24-hour clock timer |
| 16. Floor stand kit | |

* Other options or modifications available upon request

AMERICAN AUTOMATED CONTROLS

CONTROL PANEL OPTIONS LIST (DESCRIPTION)

Any of the following options can be added to a base unit to create a control panel that will meet and/or exceed virtually any specifications or application. To modify a listed option or add an unlisted option to the panel please consult the factory for pricing and availability. The addition of certain options will require an enclosure upgrade. Please consult enclosure pricing sheet for more details.

- _____ A- **AUTO RESET ALARM:** Allows user to silence the audible portion of the alarm circuit with a spring-loaded switch. The visual portion of the alarm circuit will remain lit until the alarm condition clears, at which time the alarm circuit will automatically reset. Outdoor units include an external booted switch.
- _____ B- **BELL/HORN:** 4" 85 db @ 10 ft. weatherproof alarm bell or horn mounted on front of enclosure door.
- _____ C- **CYCLE COUNTER:** 6 digit, non-resetable counter gives visual indication of the number of pump events.
- _____ D- **DELAYED LAG PUMP TIMER:** Adjustable timer prevents 2 or more pumps from starting simultaneously after power restoration. Each lag pump in a multi-pump system requires one timer. Each timer is adjustable to 100 seconds.
- _____ E- **ELAPSED TIME METER:** 6-digit, non-resetable hour-meter gives visual indication of total pump run time.
- _____ F- **FLASHER:** Add to panel with top-mounted alarm light as standard. Flash rate=75/min. Standard flasher for use on panels less than 20" X 20". Custom flasher required on all larger enclosures.
- _____ F(L)- **FLASHING LIGHT:** Add to panel w/out top-mounted alarm light as standard. Includes flasher and standard 40-watt red lexan lens light.
- _____ F(S)- **FLASHING STROBE:** Can be added in place of top mounted light. 3 joule light output at 65 flashes/min.
- _____ F(C)- **FLASHING LIGHT W/CAGE:** Flashing light includes protective metal guard.
- _____ G- **GELL CELL BATTERY:** 12VDC/12AH sealed lead-acid battery with solid-state trickle charger for alarm indication during power loss.
- _____ H- **HINGED INNER DOOR:** 14G aluminum inner door with left-hand hinge, pull knob, and 90-degree turn latch (large doors only). Locking latches available.
- _____ I- **INTRINSIC BARRIER RELAY:** For use in hazardous atmospheres to isolate float switch circuits from explosive gases. Requires one relay for each float switch (on/off can be combined). Available in UL508 or UL913 standard.
- _____ J- **JUMBO CONTACTOR:** Upgraded contactor to handle higher amperage draw. J=2P DP (16 FLA), J1=18 FLA, J2=25 FLA, J3=32 FLA, J4=40 FLA, J5=50 FLA.
- _____ K- **K-PACK:** Installation kit designed to install customer-supplied capacitors and start relays into any AOC pump control panel. Installation is color coded to match pump manufacturer's wire colors.
- _____ L- **LOCKING HASP:** Padlockable hasp can be added to any enclosure that requires limited access. Padlock not included.
- _____ L1- **LIGHTNING ARRESTOR:** 1 wire plus neutral/ground.
- _____ L2- **LIGHTNING ARRESTOR:** 2 wire plus neutral/ground.
- _____ L3- **LIGHTNING ARRESTOR:** 3 wire plus neutral/ground.
- _____ L4- **LIGHTNING ARRESTOR:** 3 wire plus neutral/ground. (460-V)
- _____ M- **MAIN BREAKER/DISCONNECT:** Fusible or non-fusible disconnect switch or circuit breaker for shutting off power to entire control panel. Requires the "Q" option in order to extend and interlock through the door.

- _____ N- **NEMA RATED STARTER:** Full voltage starter sized to pump full load amps, includes overload relay with non-adjustable thermal heater elements.
N(0)=18 FLA, N(1)=27 FLA, N(2)=45 FLA, N(3)=90 FLA, N(4)=135 FLA.
- _____ O- **OVERRIDE SWITCH:** Allows selection of standard pump alternation or fixed lead/lag sequence. Duplex systems have 1 switch: Pump 1-Auto-Pump 2. Triplex systems have 2 switches: Manual-Automatic, 1-2-3.
- _____ P(C)- **PUMP FAIL (Current Sensor):** Pump fail circuit by current sensor cuts out failed pump and activates audio/visual alarm.
- _____ P(F)- **PUMP FAIL (Flow Switch):** Pump fail circuit by flow switch (flow switch not included) cuts out failed pump and activates audio/visual alarm.
- _____ Q- **QUICK DISCONNECT OPERATOR:** Allows external operation of main and/or pump disconnect switches. Handles are interlocked with door to prevent opening while disconnect is in the "on" position, and are padlockable in the "off" position.
- _____ R- **REDUNDANT LOW LEVEL OFF:** Assures guaranteed pump submergence by cutting out control circuit when liquid level reaches critically low level.
- _____ R(A)- **REDUNDANT OFF W/ALARM:** Same as above but activates audio/visual alarm.
- _____ S- **SEAL FAIL:** Indicator light for direct connection to pump seal leak probes.
- _____ S(R)- **SEAL FAIL:** Same as above except with low voltage induction relay with adjustable sensitivity level.
- _____ S(A)- **SEAL FAIL:** Same as above & includes relay and activates the audio/visual alarm.
- _____ T- **THERMAL OVERTEMP C/O:** Hooks directly to motor overtemp terminals inside of motor to protect the pump by cutting out the starter coil circuit. The starter circuit will reset when the thermal sensor cools and returns to normal.
- _____ T(I)- **THERMAL OVERTEMP C/O:** Same as above except also includes indicator light for aid in troubleshooting.
- _____ T(A)- **THERMAL OVERTEMP C/O:** Same as above except also includes indicator light and alarm relay that activates and latches the audio/visual alarm until manually reset.
- _____ U- **UTILITY RECEPTACLE:** 120V Convenience outlet w/ 20 amp breaker mounted inside control panel, for indoor use only. Requires neutral wire on 208/230-volt applications (no charge), and upgraded transformer on 3-phase 460 volt applications.
- _____ U(G)- **UTILITY RECEPTACLE:** Same as above except with GFI receptacle. Required for outdoor control panels.
- _____ U(W)- **UTILITY RECEPTACLE:** Same as above except with GFI receptacle mounted on outside of enclosure with weatherproof cover.
- _____ V- **VOLTAGE MONITOR:** Protects pump(s) from over/under voltage, by cutting out control circuit. Includes time delay and automatic reset.
- _____ V(P)- **VOLTAGE/PHASE MONITOR:** Same as above but also includes phase loss and phase reversal protection.
- _____ W- **WEATHER HEATER:** Thermostatically controlled heater mounted in control panel to prevent condensation build-up. W=100 watt strip heater (non-adj.)
- _____ W(1)- **WEATHER HEATER (1):** W(1)=100 watt coil heater with blower.
- _____ W(2)- **WEATHER HEATER (2):** W(2)=200 watt coil heater with blower.
- _____ X- **EXTRA OPTIONS:** Special options listed in (X) extra options list or specified by customer. Please contact factory for pricing and availability for options not listed.
- _____ Y- **LOW VOLTAGE FLOAT CIRCUIT:** Low voltage transformer to provide safe voltage levels to exposed float switches and terminals. 24 VAC is standard; other voltages are available.
- _____ Z- **Z-SERIES LIGHTS/SWITCHES:** 22mm oil-tight full voltage indicator lights and 10 amp pushbutton/selector switches.
- _____ Z(T)- **Z-SERIES LIGHTS/SWITCHES:** Same as above except lights are transformer type.
- _____ Z(P)- **Z-SERIES LIGHTS/SWITCHES:** Same as above except lights are push-to-test type.

AMERICAN AUTOMATED CONTROLS

CONTROL PANEL OPTIONS LIST: (X) EXTRA OPTIONS

- 1 ___ 22mm Overload reset buttons mounted through enclosure door or inner door to allow manual reset of tripped starter overloads without opening door.
- 2 ___ Float switch level indicators to give visual indication of float switch position.
- 3 ___ Plexiglas window (available in steel or stainless steel frame) in enclosure door to view internal lights, switches, and other components without opening enclosure door.
- 4 ___ Branch power and control circuits.
- 5 ___ Manual power transfer switch to switch for transferring power from main supply to backup generator or other emergency supply.
- 6 ___ Generator receptacle and matching plug for easy hook-up and removal of backup generator or other emergency supply. Receptacle is pre-wired and mounted on outside of enclosure for easy access.
- 7 ___ Liquid level relay for electrode based level control system. Price one relay for pump On/Off control and one relay for each additional function thereafter.
- 8 ___ Aerator fail circuit for use on systems with continuous running blower. Utilizes internal current sensor that trips audio/visual alarm when blower stops.
- 9 ___ 24-hour time clock adjustable in 15-minute increments to regulate activation periods for pumps, auxiliary power equipment, or other control devices.
- 10 ___ Pump run timer, adjustable from 1 second to 30 hours to control timed doses for each pump.
- 11 ___ Solenoid activation circuit to energize 120v remote solenoid; includes switch and indicator light (solenoid not included). Other voltages are available.
- 12 ___ Ball valve activation circuit to energize motor-driven ball valve with position indicating limit switches; includes 9 amp contactor, fuse, switch and indicator lights.
- 13 ___ Sand filter high-level alarm circuit for use on recirculating sand filter systems. Activates audio/visual alarm when float switch(es) in sand filter(s) close on high level.
- 14 ___ Telephone dialer installed within control panel to monitor up to 4 separate alarm conditions and notify up to 8 separate telephone numbers. More alarm conditions are available.
- 15 ___ Drip shield kit, to be added to NEMA 12 enclosure to create an industrial grade Nema 3R enclosure.
- 16 ___ Floor stand kit to allow mounting of control panel enclosure to floor, available in steel or stainless steel in various dimensions.
- 17 ___ Transformer upgrade to allow for operation of auxiliary power equipment, receptacles, light circuits, etc.
- 18 ___ Circuit breaker padlock attachment to allow circuit breakers to be padlocked in on or off position.
- 19 ___ Full frame industrial grade circuit breakers for use in heavy-duty applications or high amperage situations. Call for sizing.
- 20 ___ Power fail alarm circuit to notify personnel of power interruptions. Dry contacts only or complete latching alarm circuit (requires gell cell battery option "G").
- 21 ___ Dry alarm contacts used to activate a remote indicator alarm circuit (120v/1 amp max)
- 22 ___ Latching alarm circuit stays activated after the alarm input has been removed; requires alarm to be manually reset.
- 23 ___ Differential float receptacle supplied with pump feed supply to be actuated by a differential float.
- 24 ___ Conduit hub on bottom of enclosure (NEMA 4X rated)
- 25 ___ High-level alarm with remote alarm indicator activated by alarm circuit voltage.
- 26 ___ Separate control/alarm/pump supply breakers.
- 27 ___ Enclosure size upgrade to give extra room for installation.
- 28 ___ Telemetry Reporting Service (TRS) allows for web-based data reporting for alarms and conditions.
- 29 ___ Temperature Control/Monitoring with digital display and temperature probe.
- 30 ___ 30-day data logging program for PLC controller (includes 7-day & monthly avg. log)
- 31 ___ 7-day 24-hour time clock adjustable in 2-hour increments that can vary daily for specified time windows to regulate activation periods for pumps, auxiliary power equipment, or other control devices.

AMERICAN AUTOMATED CONTROLS

NEMA CONTROL ENCLOSURE RATINGS

ENCLOSURE TYPE DESCRIPTION

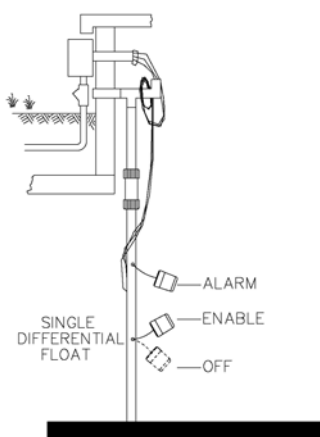
NEMA TYPE 1 GENERAL PURPOSE	Enclosures are intended for indoor use primarily to provide a degree of protection against accidental contact with the enclosed equipment or locations where unusual service conditions do not exist.
NEMA TYPE 2 DRIPTIGHT	Enclosure are intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt.
NEMA TYPE 3 WEATHER RESISTANT	Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet; undamaged by the formation of ice on the enclosure.
NEMA TYPE 3R RAINTIGHT	Enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice on the enclosure.
NEMA TYPE 4 WATERTIGHT Steel	Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water; undamaged by the formation of ice on the enclosure.
NEMA TYPE 4X CORROSION RESISTANT Standard: fiberglass (Also available in stainless steel)	Enclosures are intended for outdoor use primarily to provide a degree of protection against corrosion, wind blown dust and rain, splashing water and hose directed water; undamaged by the formation of ice on the enclosure.
NEMA TYPE 5 DUST TIGHT	Enclosures are intended for indoor use primarily to provide a degree of protection against falling dust.
NEMA TYPE 6 SUBEMERSIBLE	Enclosures are intended for outdoor use primarily to provide a degree of protection against submersion in water at a specified pressure and time.
NEMA TYPE 7 HAZARDOUS LOCATIONS CLASS I AIR BREAK	Enclosures are intended for hazardous use, designed to meet application requirements of the National Electrical Code for Class I, hazardous locations (explosive atmosphere). Circuit interruption occurs in air.
NEMA TYPE 8 HAZARDOUS LOCATIONS CLASS II-OIL-IMMERSED GROUP A,B,C, AND D	Enclosures are intended for hazardous use, designed to meet application requirements of the National Electrical Code for Class II hazardous locations (explosive atmosphere). Circuit interruption occurs in oil.
NEMA TYPE 9 HAZARDOUS LOCATIONS CLASS II, GROUP E,F,OR G	Enclosures are intended for hazardous use, designed to meet application requirements of National Electrical code for Class II Hazardous Locations (combustible dusts, grains, etc.).
NEMA TYPE 10 BUREAU OF MINES	Enclosures are intended for hazardous use, designed to meet requirements of U.S. Bureau of Mines. Suitable for use in coal mines.
NEMA TYPE 11 ACID & FUME RESISTANT OIL IMMERSSED	Enclosures are intended for use in corrosive atmospheres, provide oil immersion of apparatus such that it is suitable for applications where equipment is subject to acid or their corrosive fumes.
NEMA TYPE 12 INDUSTRIAL USE	Enclosures are intended for heavy duty indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids.

AMERICAN AUTOMATED CONTROLS

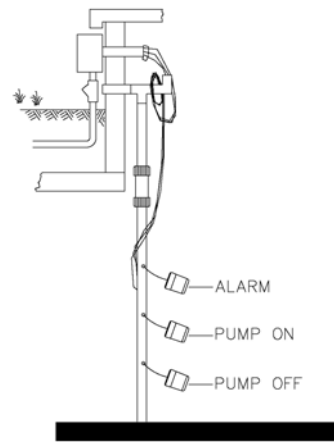
TIMER CONTROL – FLOAT OPTIONS

Flow Equalization, the timer-controlled disposal of wastewater, increases field reliability and system life expectancy, while maximizing the utilization of available acreage. Peak flow events, such as church services or school functions, are measured out to increase field and control component life. In addition, many pretreatment systems also operate more efficiently with balanced regular dosing.

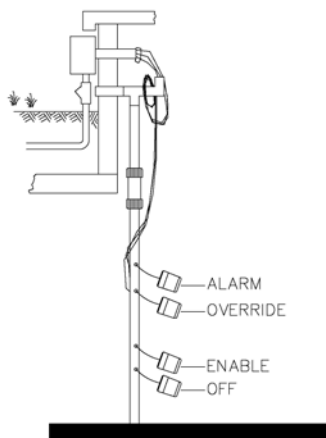
Float Operation Options



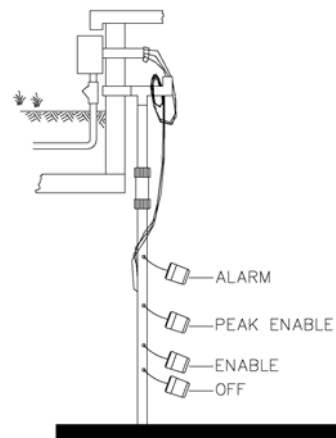
Two Float



Three Float



Four Float w/ Override



Four Float w/ Peak Enable

American Automated Controls **Timed Dose Control Panels**, lead the industry in reliability and versatility. Common features include high level alarm, alarm on override switch, auto-switch to simplex on pump fail, complete dosing, (normal and peak enable), as well as local and remote monitoring.

“SEQ” and “DEQ”

The “SEQ” and “DEQ” panels are Simplex and Duplex equalization control panels that provide economical, repeat cycle, time-based dosing control. When the water level enables the timer, the “REST” time is initiated for equalization periods of up to thirty hours. The pump run time can be controlled from a few seconds to 12 hours. The “OFF/ENABLE” float allows the timer to turn the pump on or off and will shut the pump(s) off when a low level condition is indicated.

“SET” and “DET”

The “SET” and “DET” panels are Simplex and Duplex equalization control panels designed to equally distribute flow throughout the day during predetermined time frames, utilizing either a 24-hour Time-of-Day or 7-day 24-hour clock, coupled with a repeat cycle timer.

“SEPR” and “DEPR”

The “SEPR” and “DEPR” panels are Simplex and Duplex equalization control panels that utilize programmable relay logic to considerably enhance process control. The control is provided with both a “REDUNDANT OFF” and a “DOSE ENABLE” float control. When the rest time elapses and the “DOSE ENABLE” float switch rises to the “on” position, a “RUN” time is initiated for a customizable time period, providing enhanced management of wastewater storage. When the “DOSE ENABLE” float is de-energized during a pumping cycle, the pump will continue to operate until the timer elapses or the “REDUNDANT OFF” float is de-energized. The “REDUNDANT OFF” float protects the system by disabling the pumps in the event of low water.

“SEPT” and “DEPT”

The “SEPT” and “DEPT” panels are Simplex and Duplex equalization repeat cycle timer based control panels designed to only operate within a specified window throughout the day, utilizing either a 24-hour Time-of-Day or 7-day 24-hour clock. Through the PLC display screen, one can monitor float status and view system data, including elapsed pump run time and pump cycle counts for trending and flow management purposes.

Prefix “C”

The prefix “C” in a part number designates a “COMBINATION CONTROL” panel. These controllers operate multiple separate but integrated pump stations such as the timed dosing of a pretreatment unit and a final lift pump to a dispersal site. Any combination of controls can be provided in either simplex or duplex configurations.

“DP”

The “DP” series control panels are used for Drip Dispersal applications, both residential and commercial. “DP0” series controls are the most cost-effective means of controlling small residential (manual or semi-automatic) filtration units. They commonly control a single zone unit, but can control up to 6 zones with the use of a multi-zone sequencing valve in the field. “DP1” series controls are commonly used for residential drip dispersal applications, controlling up to four drip zones and up to two filters. Zone and pump counters, as well as elapsed time meters, are provided within the PLC. “DP2” series controls are commonly used for small to medium-sized commercial drip dispersal applications, controlling up to 24 zones and up to three filters. “DP3” series controls are commonly used for larger commercial drip dispersal applications, controlling up to 64 zones and up to six filters, and are capable of SCADA integration.

AMERICAN AUTOMATED CONTROLS

TIMER CONTROL - MULTIPLE PUMP OR ZONE

As with the simplex and duplex timer based control systems, the multiplex systems are ideal for managing and monitoring daily flow of wastewater, but are intended for use in larger commercial and industrial systems. The multiplex systems contain many of the same features found in the smaller systems but are typically microprocessor controlled to allow for a greater amount of flexibility. Any combination of pumps and/or zone valves may be left out of service, at the flip of a switch, without affecting panel operation. Pump and/or zone valve fail circuits allow for easy detection and alarm of failed equipment or lines. The space-saving microprocessor based control utilizes a door-mounted keypad for easy, user-friendly data entry and collection. Standard programs can be customized to meet your specific application. Hard-wired relay type controls are also available upon request. Call factory for details and pricing information.

"MET" MULTIPLEX EQUALIZATION CONTROLS

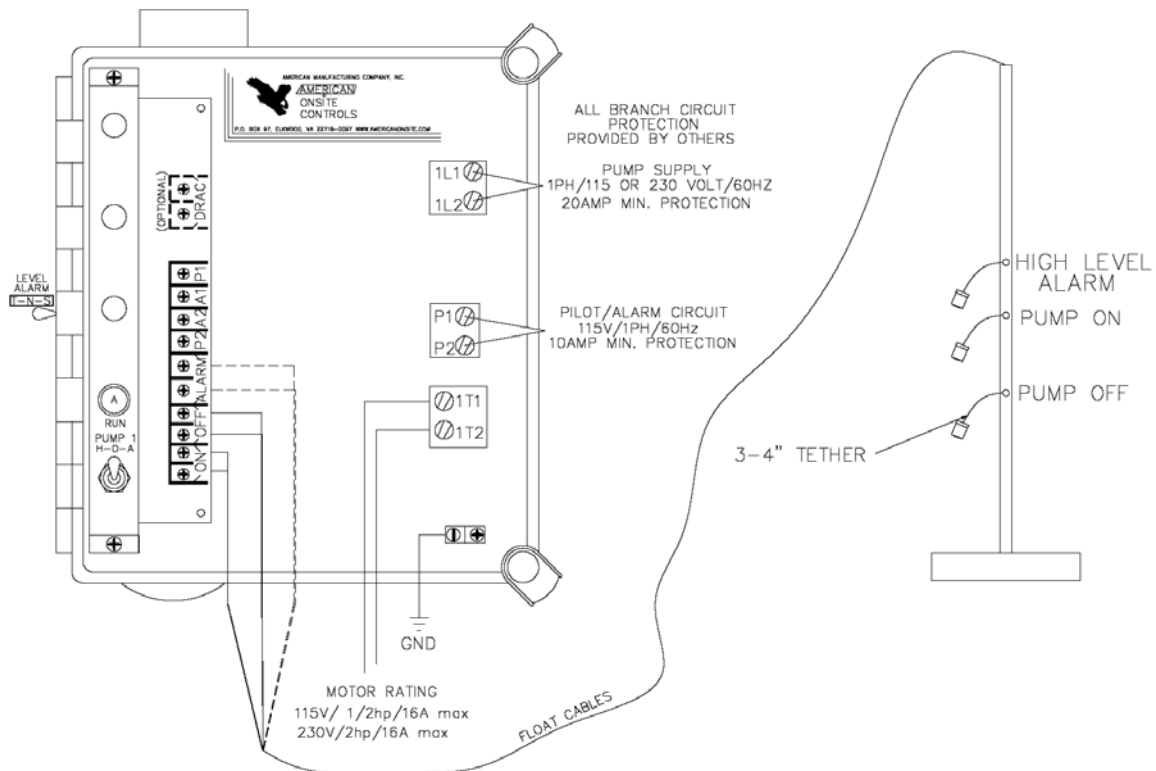
This series of controls are typically used on larger or multiple zoned systems when longer cycles and time of day pump events are desired. They are designed to provide flow equalization and provide an alarm condition for excess wastewater flow. The standard "MET" time of day ("T" series) timed dose panels are configured with a 24-hour time clock or 7-day 24-hour clock and pump run timer for each pump for selective interval dosing or for evenly spaced timed dosing. Time enabled dosing can occur as frequently as every half hour in 15 minute increments, or as infrequently as once every 24 hours. The control will allow a pump (or zone) to be taken out of service without interfering with the operation of the other zones or creating nuisance alarm conditions. Standard units are designed to operate multiple pumps for light and heavy commercial flow equalization systems, up to 100 HP, single and three phase.

"MT" MULTIPLEX TIMED DOSE ON DEMAND CONTROLS

This series of controls is recommended when larger systems with multiple zones are used and minimum wastewater storage is available. The units are designed to operate more than two pumps for residential and light commercial dose on demand systems, single and three phase. Each unit operates on four (differential) float switches, three for pump control, plus one float switch for alarm indication. The full dosing volume is determined by the distance between the "Pump Off" and "Pump On" float switches. The pumps are alternated after each individual timed pumping cycle until the full specified dosing volume has been pumped. "Lag Pump" float terminals are provided for heavy flows, and the control automatically rotates the lead pump past the lag pump on the next cycle so that it is not dosed twice. This series of controls can also be configured for multiple zone valves rotating in sequence with each pump, time dosing as described above. These zone valves can be electro-mechanical rotating ball valves, or hydraulically actuated solenoid valves. Standard units are designed to operate multiple pumps for light and heavy commercial non timed demand dose systems, up to 100 HP, single and three phase.

AMERICAN AUTOMATED CONTROLS

"S" Series – Simplex Demand Dose



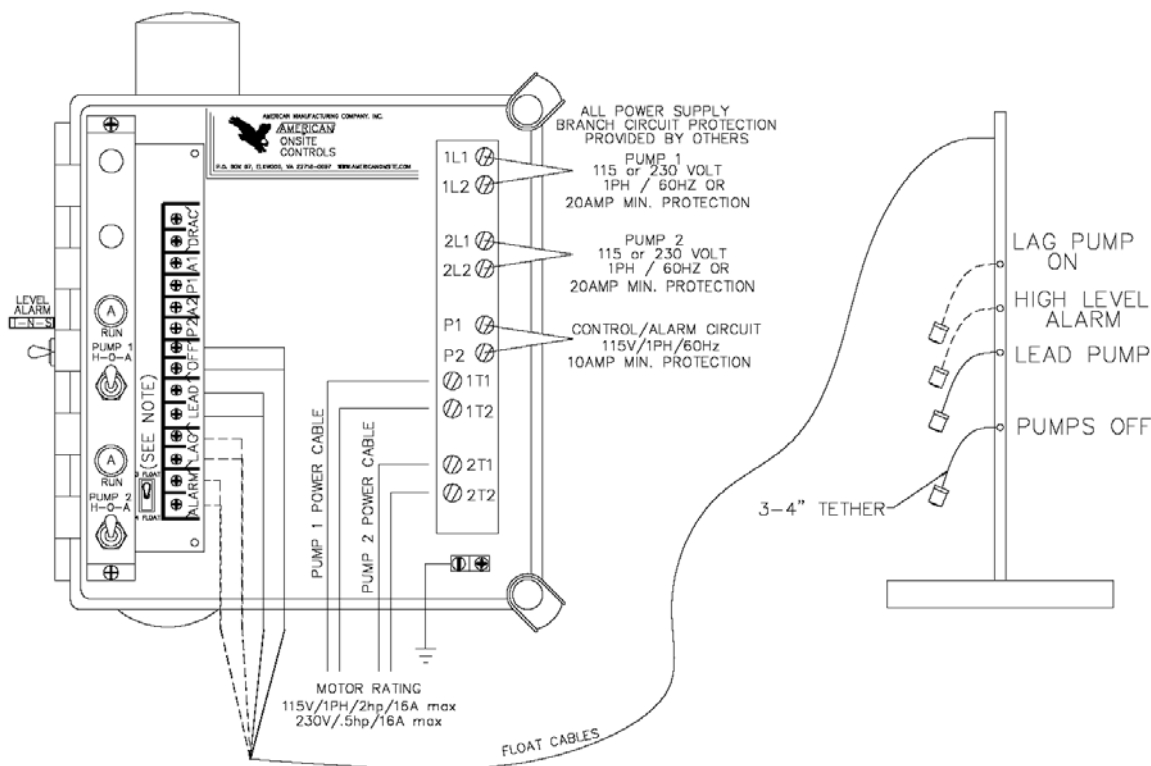
Typical Model Number: SAB124-AFJL.

Simplex (**S**) control with alarm (**A**), breakers (**B**), 1ph (**1**), 115 or 230 volt (**2**), NEMA 4X enclosure (**4**), auto-reset alarm (**A**), flashing light (**F**), upgraded contactor (**J**), locking hasp (**L**) (locking hasp standard with NEMA 4X enclosures).

The pump control panel shall be equipped with three float switches to control, by volume, each dose to be discharged. The dosing volume is adjustable by increasing or decreasing the distance between the "Pump Off" (Bottom) and "Pump On" (Middle) floats. When the water level rises high enough to overcome the "Pump On" float, the pump will activate and continue to run until the water level drops below the "Pump Off" float. If the water level continues to rise and reaches the "High Level"(Top) float, the audio/visual alarms will activate until the silence switch is depressed, at which time the audible alarm shall be silenced. The visual alarm shall remain lit until the water level drops below the "High Level" float, at which time the alarm circuit will automatically reset.

AMERICAN AUTOMATED CONTROLS

"D" Series – Duplex Demand Dose



Typical Model Number: DAB124-AFJL.

Duplex (**D**) control with alarm (**A**), breakers (**B**), 1ph (**1**), 115 or 230 volt (**2**), NEMA 4X enclosure (**4**), auto-reset alarm (**A**), flashing light (**F**), upgraded contactor (**J**), locking hasp (**L**) (Locking hasp standard with NEMA 4X enclosures).

THREE FLOAT OPERATION

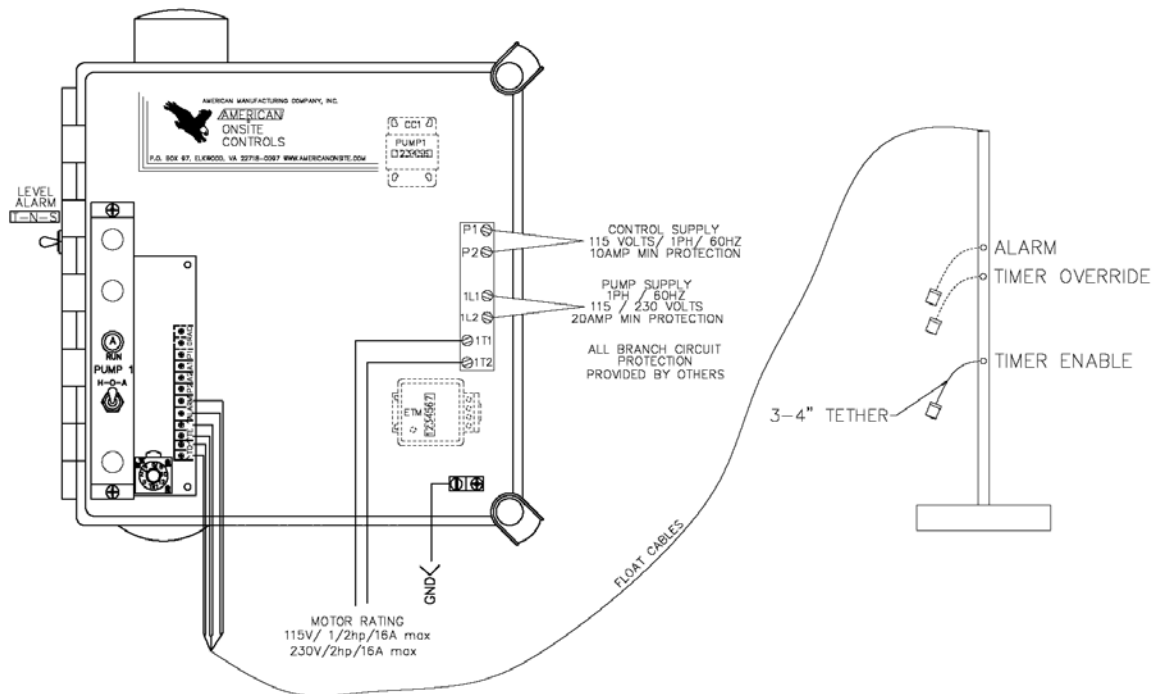
The pump control panel shall be equipped with three float switches to control, by volume, each dose to be discharged. The dosing volume is adjustable by increasing or decreasing the distance between the "Pumps Off" (Bottom) and "Pump On" (Second) floats. When the water level rises high enough to overcome the "Pump On" float, the lead pump will activate and continue to run until the water level drops below the "Pumps Off" float. The control will then alternate the lead pump. If the water level continues to rise and reaches the "Lag Pump/Alarm" (Third) float, the lag pump and alarm will activate and both pumps will continue to run until the water level drops below the "Pumps Off" float. The audio/visual alarm will be continue to be activated "latched in" until the alarm silence switch is pressed, at which time the audio alarm will be silenced. The visual alarm will remain lit until the liquid level drops below the "Lag/Alarm" float. Refer to depiction above for 4 float configuration.

SIMPLEX OPERATION

In the event a pump is not operable, the pump shall be taken out of service by turning that pump's H-O-A (Hand-Off-Auto) switch to the "Off" position. This shall signal the control to operate as a simplex pump control enabling the high level alarm to operate as normal.

AMERICAN AUTOMATED CONTROLS

"SEQ/DEQ" Series – Simplex & Duplex Equalization



Typical Control Model Number: SEQAB124-ACEFJL.

Simplex (**S**) equalization (**EQ**) control with alarm (**A**), breakers (**B**), 1ph (**1**), 115 or 230 volt (**2**), NEMA 4X enclosure (**4**), auto-reset alarm (**A**), cycle counter (**C**), elapsed time meter (**E**), flashing light (**F**), upgraded contactor (**J**), locking hasp (**L**) (locking hasp standard with NEMA 4X enclosures).

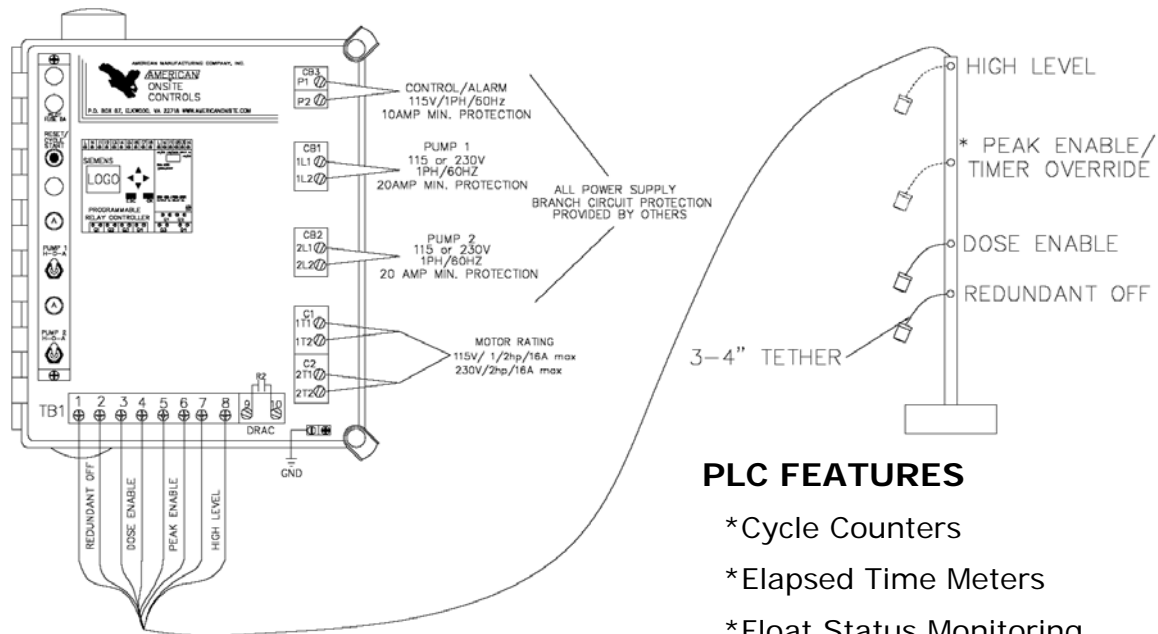
The pump control panel shall be equipped with two float switches to control the timed doses to be discharged. When the water level rises high enough to overcome the "Timer Enable" (first) float the repeat cycle timer will begin timing the "off" period. When the "off" period has timed out, the pump will activate and the timer will begin timing the "on" period. The pump shall continue to run for the length of time as programmed on the "on" period. When the timer has finished timing out the "on" period, the pump will shut off and the timer will begin timing out the "off" period again. This cycle will repeat itself until the water level drops below the "Timer Float".

If the water level continues to rise enough to overcome the "High Level" (second) float, the audio/visual alarm shall activate until silenced by pressing the silence switch. The alarm circuit shall automatically reset when the "High Level" float returns to its normal position.

Featuring excess water use alarming!

AMERICAN AUTOMATED CONTROLS

"SEPR/DEPR" Series – Simplex & Duplex Equalization w/ PLC



PLC FEATURES

- * Cycle Counters
- * Elapsed Time Meters
- * Float Status Monitoring
- * Programmable Timers

Typical Model Number: SEPRAB124-AJLR

Simplex (**S**) equalization by programmable relay (**EPR**) control with alarm (**A**), breakers (**B**), 1ph (**1**) 115 or 230 volt (**2**), NEMA 4X enclosure (**4**), auto-reset alarm (**A**), upgraded contactor (**J**), and locking hasp (**L**) (locking hasp standard with NEMA 4X enclosures), redundant off float switch (**R**).

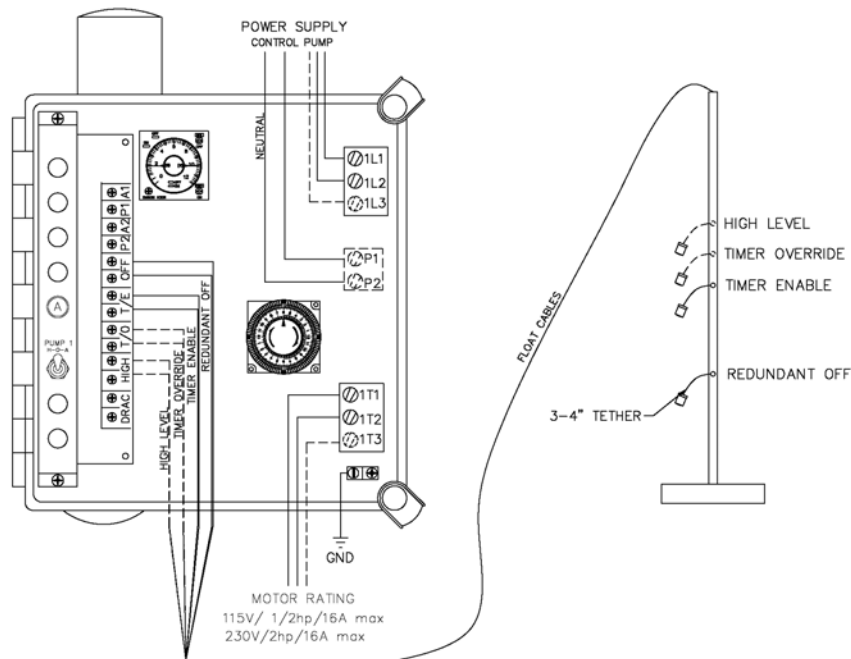
The water level must be high enough to overcome the "Redundant Off" (bottom) float in order for the pump to be permitted to run. When the water level rises high enough to overcome the "Dose Enable" (second) float and the rest timer has timed out, the pump will activate and the dose will begin. The pump will continue to run for the length of time as adjusted on the pump run timer and then shut off. The pump will remain off until the internal rest timer again times out, after which the pump will again activate (as long as the "Dose Enable" float is still up) and will run until the pump run timer finishes timing out. This process will repeat until the water level drops below the "Dose Enable" float and the pump run timer has timed out or water drops below the "Redundant Off" float, which will stop the pump immediately to prevent damage.

The control system shall be equipped with a "Peak Enable" function to manage peak flows and excess water use. If the rising water level activates the "Peak Enable" (third) float and the peak rest time has timed out, the control will dose. When the peak function is deactivated, the normal pumping cycle will resume. The peak function comes standard with user selectable peak and alarm mode.

If the water level rises enough to overcome the "High Level" (fourth) float, the audiovisual alarm will activate. The audio portion of the alarm may be silenced by pressing the "Test-Normal-Silence" switch. The alarm circuit will be reset when the "High Level" float returns to its normal (down) position and the "Reset/Cycle Start" button has been pressed.

AMERICAN AUTOMATED CONTROLS

"SET/DET" Series – Simplex & Duplex Equalization Time-of-Day



Typical Model Number: SETAB124-ACFJLRX(9).

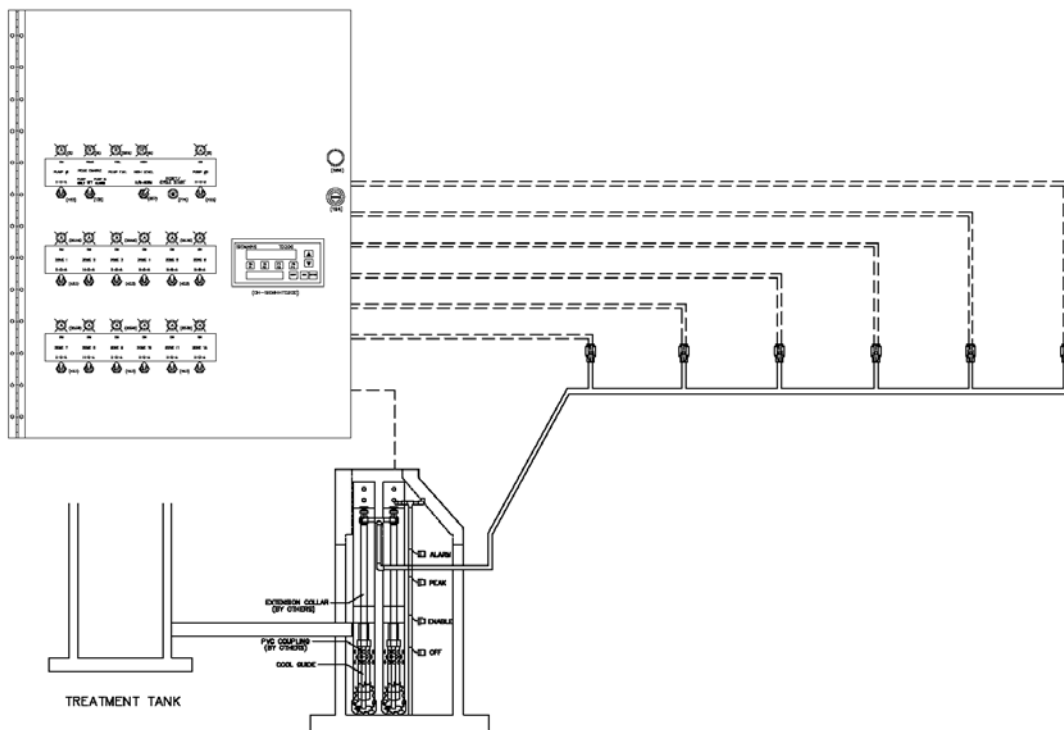
Simplex (**S**) equalization Time-of-Day (**ET**) control with alarm (**A**), breakers (**B**), 1ph (**1**) - 115 or 230 volt (**2**), NEMA 4X enclosure (**4**), auto-reset alarm (**A**), cycle counter (**C**), flashing light (**F**), upgraded contactor (**J**), locking hasp (**L**) (locking hasp standard with NEMA 4X encl.), redundant off (**R**), 24-hour clock timer (**X9**).

The pump control panel shall be equipped with either a 24-hour Time-of-Day or 7-day 24-hour clock and four float switches to control the timed doses to be discharged. The water level must be high enough to overcome the "Redundant Off" (Bottom) float in order for the pump to be permitted to run. When the water level rises high enough to overcome the "Dose Enable" (second) float and the time clock is in a pump enable mode, the pump will activate. The pump shall continue to run for the length of time as programmed on the pump run timer, and shall then shut off. The pump shall remain off until the time clock enters a new pump enable mode, at which time the pump shall activate (as long as the "Dose Enable" float is still up) and will run until the pump run timer finishes timing out. This process shall continue until the water level drops below the "Dose Enable" float and the pump run timer has timed out or the Time-of-Day clock has passed the dosing window.

The control system shall be equipped with a timer override circuit to manage peak flows and excess water use. If the water level continues to rise enough to overcome the "Timer Override" (third) float and the override selector switch is on, the pump shall be activated, regardless of the time clock position. The pump will continue to run until deactivated by the override circuit, at which time the pump will shut off and the normal pumping cycle shall resume. If the water level continues to rise enough to overcome the "High Level" (fourth) float, the audio/visual alarm shall activate until silenced by pressing the Test-Normal-Silence switch to the silence position. The alarm circuit shall automatically reset when the "High Level" float returns to its normal position.

AMERICAN AUTOMATED CONTROLS

Multi-Zone Solenoid Control – Duplex (2 pump)



Typical Model Number: MERAB124-AHJ1LRX(11)

Multiplex (**M**) equalization repeat cycle timer (**ER**) control with alarm (**A**), breakers (**B**), 1ph (**1**) - 115 or 230 volt (**2**), NEMA 4X enclosure (**4**), auto-reset alarm (**A**), hinged inner door (**H**), upgraded 18 FLA contactor (**J1**), locking hasp (**L**) (locking hasp standard with NEMA 4X enclosures), redundant off (**R**), 120 volt solenoid circuit **X(11)**.

The system is fully automated and controlled by a microprocessor. All "Hand-Off-Auto" switches must be placed in the "auto" position for microprocessor control. To override the automation process, place the desired Hand-Off-Auto switches into the "hand" position to force desired operations of the control panel.

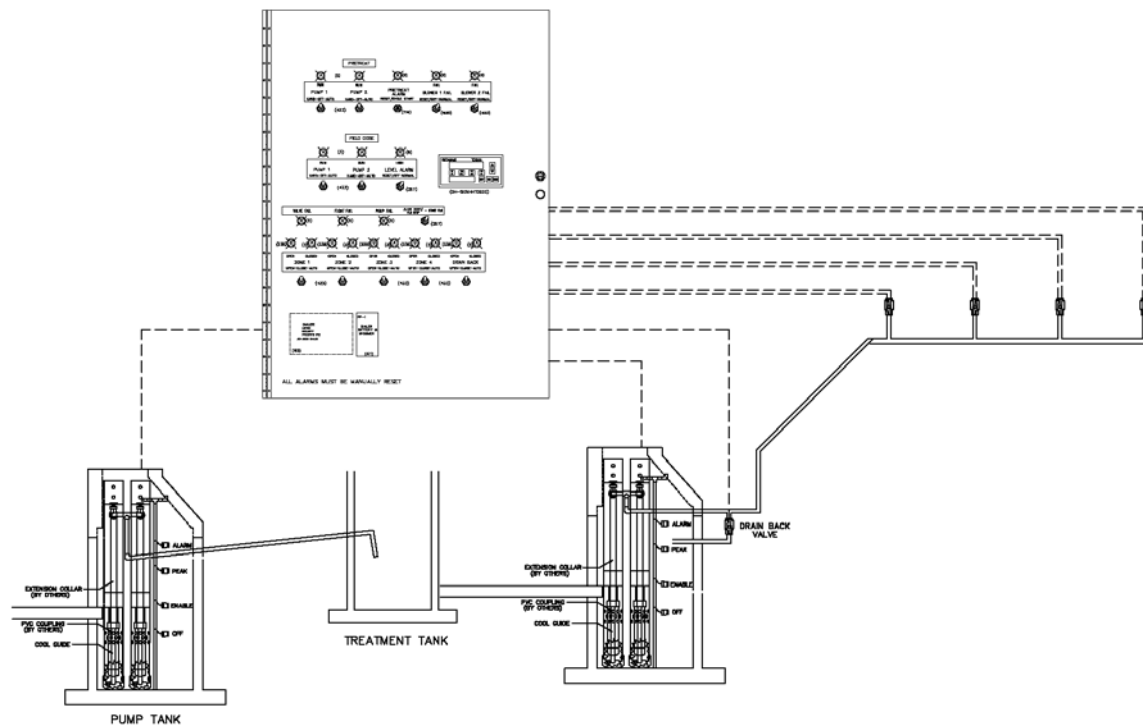
The wastewater is discharged into a pump tank which houses four float-switches to control "timed" zone-dosing intervals through a duplex pumping process. The "Redundant Off Float" needs to be in the "up" or enabled position to allow the pump to run. The "Dose Enable Float" allows the timer to run the after the rest period elapses. After each cycle, the pumps will alternate and the zones will rotate to the next available. A (customizable) delay is initiated upon starting and stopping a dose sequence to ensure all valves in the field are properly seated.

If the "Peak Enable Float" is made, the peak rest timer will manage excessive water usage to minimize high-level conditions. The "Peak Enable Float" has three settings: "Off", "Pump Only" & "Pump and Alarm".

When the water reaches the "High Level Float", an audio/visual alarm will activate. The alarm will continue to sound until the system is acknowledge or repaired. The spring loaded Test-Normal-Silence alarm switch may be pushed to the silence position to silence the audible portion of the alarm. The visual portion will remain lit until the float has returned to a normal level and the "High-level Reset/Off-Normal" switch is manually reset and returned to the "normal" position.

AMERICAN AUTOMATED CONTROLS

Multiplex – Combo Dose to Motorized Zone Control



Typical Model Number: CDEPR/MTAB124-AFHJ2LL2P(C)RW2X(5,6,8,12,14,17)

Combination **(C)** Duplex **(D)** equalization by programmable relay **(EPR)** / to Multiplex **(M)** Time-of-Day **(T)** control with alarm **(A)**, breakers **(B)**, 1ph **(1)** - 115 or 230 volt **(2)**, NEMA 4X enclosure **(4)**, auto-reset alarm **(A)**, flashing light **(F)**, hinged inner door **(H)**, upgraded 25 FLA contactor **(J2)**, locking hasp **(L)** (locking hasp standard with NEMA 4X enclosures), lightning arrestor 2 wire **(L2)**, pump fail by current sensor **(PC)**, redundant off **(R)**, weather heater 200 watt **(W2)**, manual emergency transfer **(X5)**, generator receptacle plug **(X6)**, aerator fail circuit **(X8)**, ball valve actuator **(X12)**, telephone dialer installation **(X14)**, transformer upgrade **(X17)**.

The pumps and valves are controlled by level inputs into the plc. This system is designed to operate motorized valves with status indicating limit switches. When a dose is called for, the next available zone will be activated and the controller will wait for the return signal from the valve limit switch, indicating that the valve has fully opened. If the valve open signal is not received by the controller within the program delay time, the controller will de-activate the valve output, lock the valve out of rotational sequence, activate the valve fail alarm output, and attempt to open the next available valve in rotational sequence immediately. Once the controller receives the valve open signal, it will immediately turn on the next available pump. Once the dose is complete, the controller will de-activate the pump and will leave the zone valve open for an adjustable delay period for drain back. The controller will then close the zone valve and wait for the return signal from the valve limit switches, indicating that the valve is fully closed. If the controller does not receive the closed signal within the delay time, the controller will lock the failed valve out of the rotational sequence and activate the valve fail alarm output.

Drain Back Mode - This input is selectable from the operator interface (TD-200) unit. By enabling this feature/mode, the processing unit operates a valve used to drain the excess water out of the pipes after a dose. The drain back valve activation will be started when the "pump off" float deactivates. When a dose ends, the valve rotates for a period of time programmed by the user. Once the timer elapses, the valve rotates closed and is ready for the next dosing sequence.

AMERICAN AUTOMATED CONTROLS

DESIGN AND SPECIFICATION INFORMATION WATER SYSTEM

Water Systems control panels are easily specified and ordered by completing the simple panel guide below. Panel pricing can be obtained by starting with a base panel list price found in the pricing section and adding the list prices of the desired options.

CONTROL SERIES¹ _____

A-ALARM OPTION² _____

B-BREAKER OPTION _____

ENCLOSURE TYPE _____

CONTROL PANEL OPTIONS _____

Control Series:

- ____ HAC(#) Hydro-Pneumatic control
- ____ PAC(#) Pre-Charged control
- ____ LAC#)(E,T) Level control for Storage Tank (E=electrode, T=transducer)

designates number of pumps (1=simplex, 2=duplex, 3=triplex)

Alarm Option: Place "A" in the designated space followed by desired alarms from the list below. Indoor panels include alarm horn, Test-Off-Normal switch/indicator light (ea. alarm), powered remote alarm contacts, and dry alarm contacts as standard equipment. Outdoor panels also include top mounted alarm light w/ red Lexan lens.

- | | | |
|------------------------|------------------------------|--------------------------------|
| 1. Low Hydro-level | 2. High Hydro-level (E) | 3. Low Hydro-pressure |
| 4. High Hydro-pressure | 5. Low Suction cut-out | 6. Low Well cut-out |
| 7. Low Level cut-out | P(C) . Pump Fail (CT) | P(F) . Pump Fail (Flow) |

Breaker Option:

No.	VOLTAGE ²	PHASE	HP	No.	VOLTAGE ²	PHASE	HP	No.	VOLTAGE ²	PHASE	HP
1	230V	1	2	6	460V	3	5	11	208v	3	3
2	230V	1	3	7	460V	3	10	12	208v	3	7.5
3	230V	1	5	8	460V	3	25	13	208v	3	10
4	230V	1	7.5	9	460V	3	50	14	208v	3	30
5	230V	1	10	10	460V	3	>50				

Enclosure Type: Place desired enclosure code in designated space.

- 1 - NEMA 1 2 - NEMA 12 3 - NEMA 3R 4 - NEMA 4X(fiberglass)

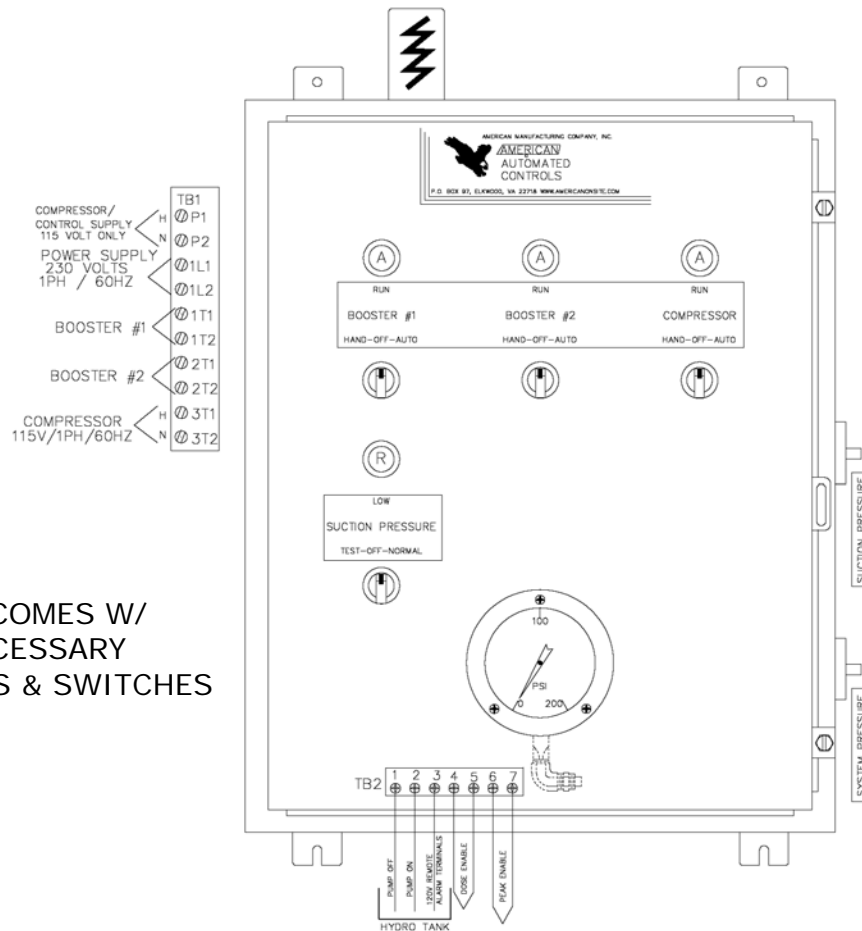
Control Panel Options: See options list in the design section and place selected options in designated space in alphabetical order.

¹ For combination controls, repeat control series and breaker option for second control type before going on to alarm option. (Ex: HAC2B12-LAC1B12)

² Phase and voltage code must be specified on all panels, even if no breakers are desired. See factory for availability of desired voltages not shown.

AMERICAN AUTOMATED CONTROLS

"HAC" Series – Hydro-Pneumatic Automatic Control



* PANEL COMES W/
ALL NECESSARY
GUAGES & SWITCHES

Typical Control Model Number: HAC2-A5-B1-2-J1

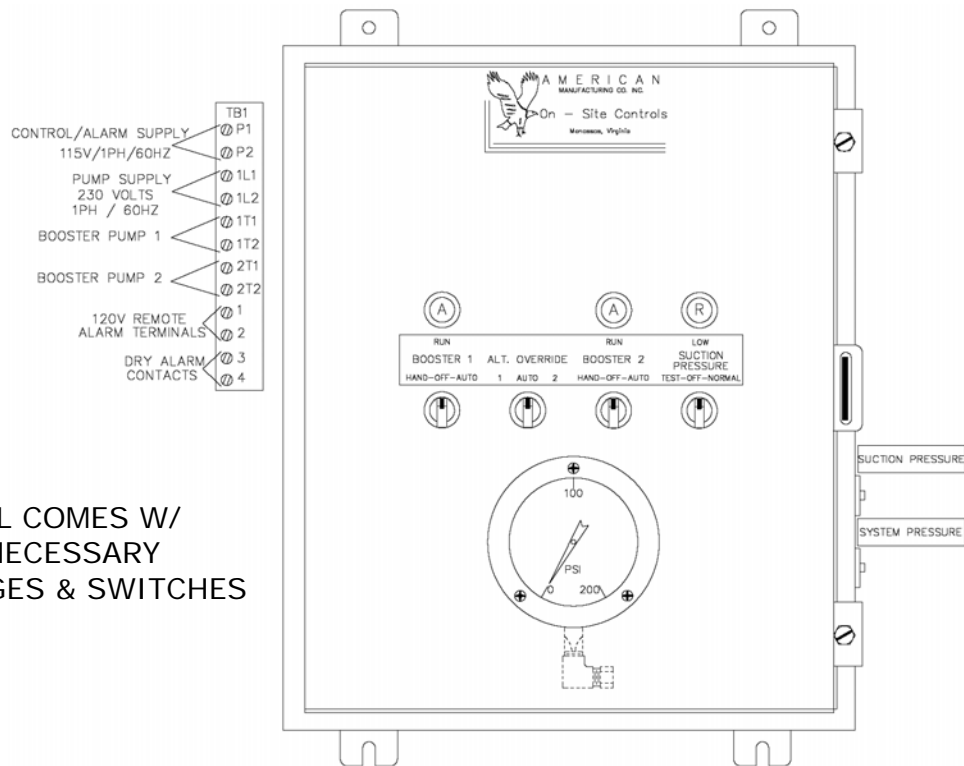
Hydro-pneumatic (**H**) automatic control (**AC**), two pump (**2**) - low suction cut-out alarm (**A5**) - breakers (**B**) for 1ph, 230 volt, 2 HP pump (**1**) - NEMA 12 enclosure (**2**) - upgraded 18 FLA contactor (**J1**).

The pump control panel is equipped with pressure switches and liquid level relays to automatically control the air-water ratio contained within the hydro-pneumatic tank. The water level in the hydro tank will normally range between the "Pump Off" high-level electrode and the "Pump On" low-level electrode attached to the hydro tank. In the event the pressure drops below the "Pump On" water pressure and the "Pump Off" high-level electrode is indicating a full water tank, the air compressor will activate to restore the proper air-water ratio in the tank. The compressor will remain on until the "Pump Off" pressure is reached or the "Pump Off" electrode is uncovered at which time the air compressor will stop and the lead pump will start and fill the tank while continuing to restore the proper air-water ratio.

The control panel is typically equipped with a "Low Suction Pressure" alarm. If the "Low Suction Pressure" set-point is reached, the pressure booster pump(s) will cut out and an audio/visual alarm will activate. The control may be specified with a high pressure alarm or other safety factor protocols.

AMERICAN AUTOMATED CONTROLS

"PAC" Series – Pre-Charged Automatic Control



* PANEL COMES W/
ALL NECESSARY
GUAGES & SWITCHES

Typical Control Model Number: PAC2-A5-B1-2-J1X(21)

Pre-Charged (**P**) automatic control (**AC**), two pump (**2**) - low suction cut-out alarm (**A5**) - breakers (**B**) for 1ph, 230 volt, 2 HP pump (**1**) - NEMA 12 enclosure (**2**) - upgraded 18 FLA contactor (**J1**), extra option dry alarm contacts for remote indicator (**X21**).

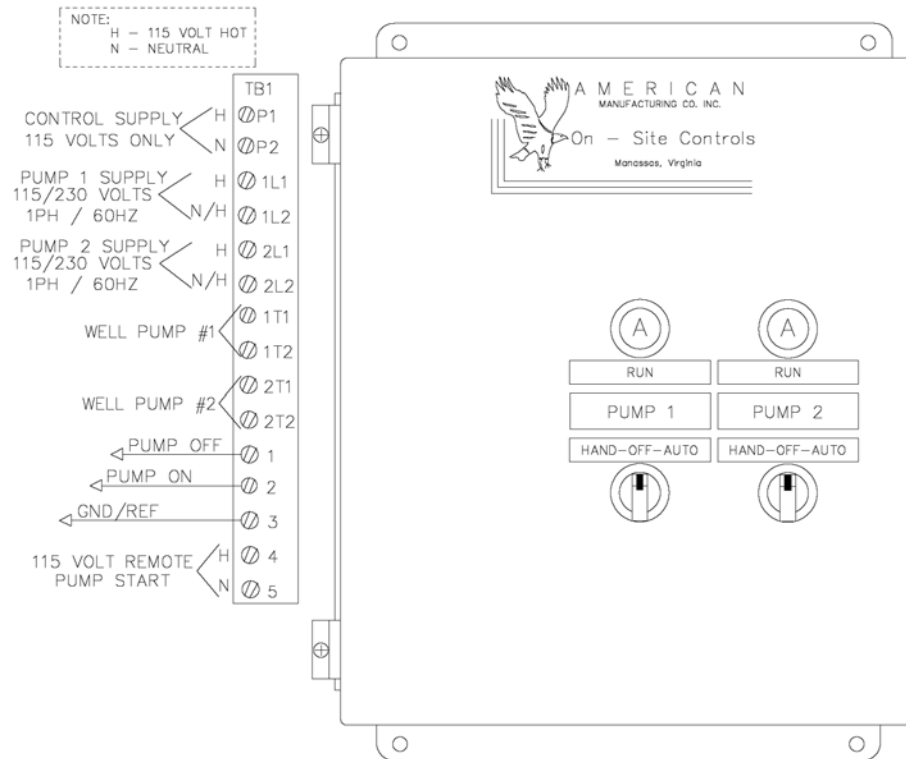
Water shall be pumped from two booster pumps to pressurize the distribution network and to be controlled by a PAC series control panel. The pressure switch tube is connected to the distribution network piping at the pre charged pressure tank location and senses the water pressure. When the water pressure drops below the Pump On water pressure, the lead booster pump will be activated. When the High Pressure is achieved the pump will turn off and the lead pump will alternate.

In the event a low suction pressure is sensed (and indication that the system may be running out of water) the alarm shall sound. The alarm may be silenced by turning the Test-Off-Normal switch to the off position.

In the event the operator desires to select one of the pumps to always be the lead pump, the operator shall place the Alternator Override switch in the position pointing to the selected pump.

AMERICAN AUTOMATED CONTROLS

"LAC" Series – Level Automatic Control



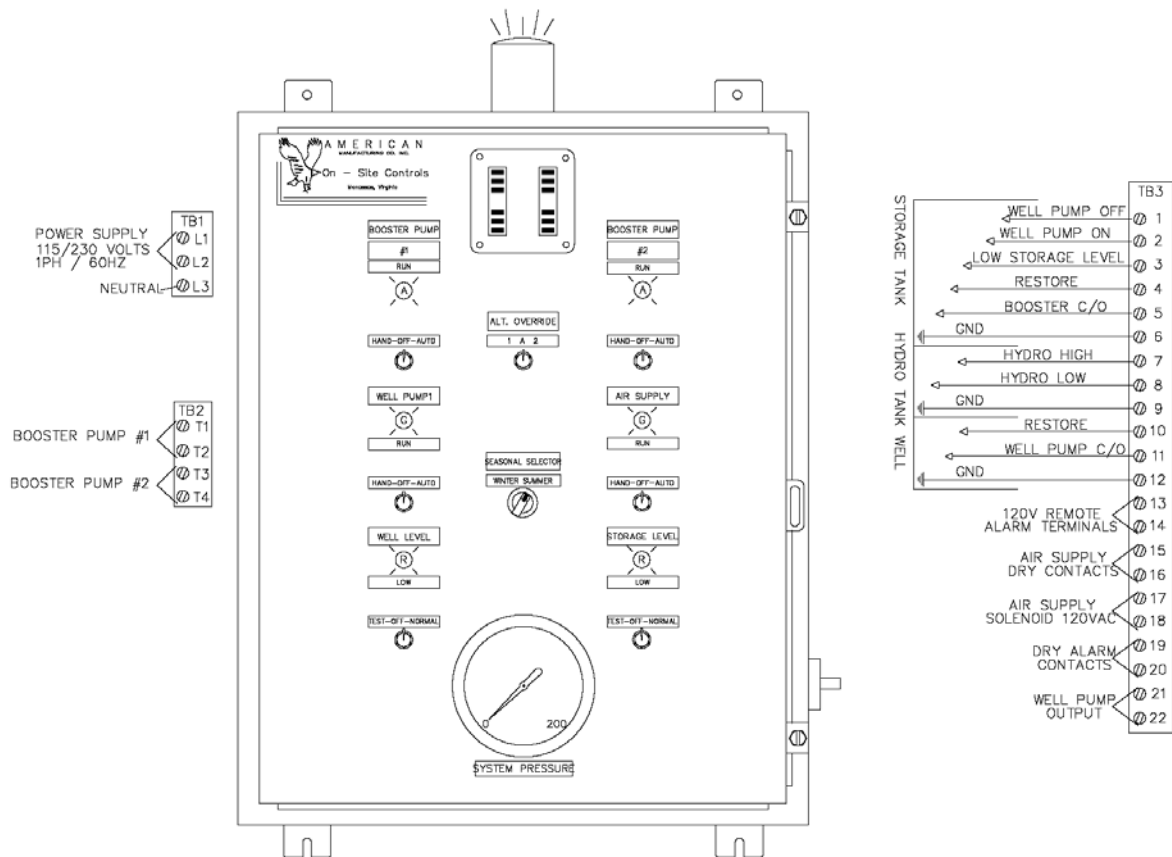
Typical Control Model Number: LAC2(E)-B1-2-J1XZ

Level (**L**) automatic control (**AC**), two pump (**2**), electrode sensor (**E**) - no alarm () - breakers (**B**) for 1ph, 230 volt, 2 HP pump (**1**) - NEMA 12 enclosure (**2**) - upgraded 18 FLA contactor (**J1**), extra option remote start (**X**), oil-tight switches (**Z**).

Water shall be pumped from two well locations to fill the storage tank and to be controlled by a LAC series control panel. The ground reference electrode must be in the water. Under normal operating conditions with a full tank, all three electrodes will be in the water. As the water drops below the Pump Off elevation nothing will happen. When the water level drops below the Pump On elevation, the lead pump will activate and continue to operate until the Pump Off electrode is again in the water. The lead pump will then deactivate and lead pump will alternate.

AMERICAN AUTOMATED CONTROLS

Combination Water System Controls



Typical Control Model Number: HAC2/LAC1(E)-A6,7-B1-2-BFJ5OX(11,21)

Combination Hydro-pneumatic (**H**) automatic control (**AC**), two booster pumps (**2**) and Level (**L**) automatic control (**AC**), one pump (**1**) electrode sensor (**E**) - low well cut-out alarm (**A6**) & low level cut-out alarm (**7**) - breakers (**B**) for 1ph, 230 volt, 2 HP pump (**1**), NEMA 12 enclosure (**2**) - bell/horn (**B**), flashing light (**F**), upgraded 50 FLA contactor (**J5**), override switch (**O**), 120v solenoid circuit (**X11**), dry alarm contacts (**X21**).

Water shall be pumped from the well location(s) to fill the storage tank and to be controlled by a LAC series control panel. The ground reference electrode must be in the water. Under normal operating conditions with a full tank, all three electrodes will be in the water. As the water drops below the Pump Off (Storage) elevation nothing will happen. When the water level drops below the Pump On (Storage) elevation, the lead pump will activate and continue to operate until the Pump Off electrode is again in the water. The lead pump will then deactivate and lead pump (if present) will alternate.

The pump control panel is equipped with pressure switches and a liquid level relay to automatically control the air/water ratio contained within the hydro-tank. The panel is typically equipped with "Low Hydro Pressure" and "Low Suction Pressure" alarms. If the pressure drops and reaches the "Low Pressure" set-point on Pressure Switch, audio/visual alarms will activate. If the "Low Suction Pressure" set-point is reached on the Pressure booster pump(s), cut out and audio/visual alarms will activate.

AMERICAN AUTOMATED CONTROLS

WATER SYSTEM CONTROL ACCESSORIES

Part#

BEH#

Suspended electrode holder for mounting in threaded holes in storage tanks or other types of applications. Substitute number of electrodes desired in place of (#) in part number.

O3176

Ice-free 5-probe electrode holder with heater.

ESKIT

Electrode adapter kit for attaching suspended electrode wire to standard electrode holders.

ESWIRE

Water resistant suspension cable for use with suspended electrodes, can be cut to desired lengths or shipped in bulk rolls.

SSROD14

1/4" stainless steel rod for use in storage tanks or other liquid level monitoring applications, can be cut to any length and threaded on 1 or both ends.

SSELECTRODE

Stainless steel suspended electrode for monitoring liquid level in storage tanks or wells, includes plastic sheath.

BRELECTRODE

Brass suspended electrode for monitoring liquid level in storage tanks or wells, includes plastic sheath.

HT2X18

Hydro sensor assembly for monitoring liquid level in Hydro-Tanks includes three stainless steel rods suspended within a 2" clear pvc pipe, and two 3/4" female npt openings for mounting on side of tank.

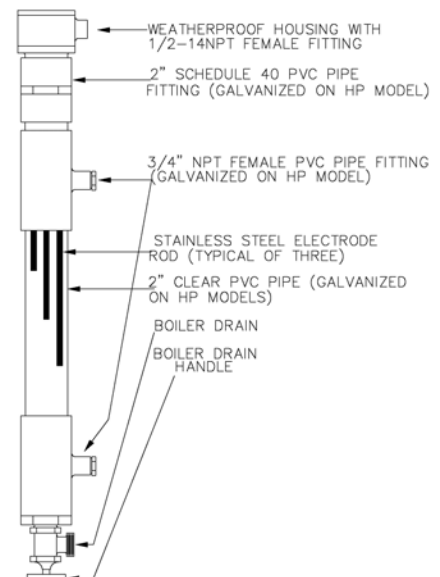
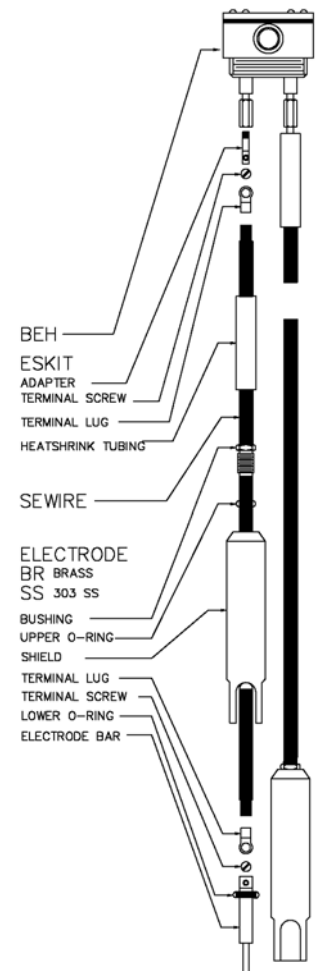
HT2X18HP

Same as above for high-pressure applications, uses 2" galvanized pipe instead of pvc pipe.

COMPRESSORS/VALVES

A wide variety of air supply components are available including solenoid valves, filters, regulators, gauges, and air compressors. Any of the above are available for mounting inside control panels, or can be shipped separately for external mounting. Call factory for details and/or ordering information.

Other water system control accessories such as pressure switches, gauges, transducers, pressure snubbers, valves, brass fittings and more are available upon request. Check factory for pricing and availability.



AMERICAN AUTOMATED CONTROLS

WATER SYSTEM DESIGN

INTRODUCTION TO WATER SYSTEM CONTROLS

There are several basic types of pump control for water distribution systems. Section two shows hydro-pneumatic, pre-charged tank, and level control.

This design guide section is intended to aid the engineering designer to select an economical control configuration and to appropriately size a hydro-pneumatic tank. This guidance section is not intended to instruct the designer on demand analysis, pump selection, distribution network design or other necessary engineering design requirements associated with a water system.

This section describes the available control types for use in typical designs. Each control series can be specified as a stand-alone system or may be specified in combination to create a fully automatic control multipurpose control.

Hydro-pneumatic Automated Controls (HAC) & Pre-charged Automated Controls (PAC)

This series of controls is typically used in community water distribution systems to provide even pressure without surges or water hammer within the distribution network. A Hydro (water) pneumatic (air) control automatically balances the air and water ratio in the water delivery system. The Pre-charged Automated control uses a tank where the air is separated by an internal membrane. These systems are traditionally designed with constant speed pumps.

Air is absorbed by the water in direct proportion to the pressure and surface area to which it is exposed, therefore the higher the systems' pressure and the larger the tank, the more rapidly air will be absorbed; thus the necessity of an air/water control to prevent water logging of the tank. Oil-less type air compressors are preferred.

Two keys to successful water design is to understand that under pressure, air will dissolve in water more rapidly and to a higher concentration than at atmospheric pressure and there is no storage for low yield wells in a basic system. If storage is required due to peak demands being greater than the well water supply, it must be designed into the system using Booster Pumps.

Variable Frequency Drives (VFD)

VFD's are very economical and reliable and can be used to reduce but probably not eliminate the need for an air cushion tank in the water delivery system. The difference between a traditional hydro-pneumatic design and using VFD's is that booster pumps were traditionally designed for maximum efficiency and are started and stopped to maintain a pressure range. The hydro-pneumatic tank provides the cushion for surges and by compressing the air under the higher pressure range, appropriate pump run times are achieved.

VFD's have become increasingly popular for booster systems due to their reliability and efficient use of electrical energy. Care must be taken in selecting the pump for these applications to insure that the pump curve will permit a wide flow range at the desired system pressure with a turn down in speed to achieve the desired economy of operation. A pressure transducer is used to provide a signal to the VFD to increase or decrease speed to maintain system pressure as demand varies. Several pump manufacturers are producing vertical, multistage pumps that have ideal pump curves for this application. Electrical surge protection is a must for VFD installations to prevent damage by lightning or other electrical surges.

HYDRO-PNEUMATIC CONTROL SPECIFICATION STEPS

1. Determine what type of control your system needs, hydro-pneumatic (HAC), pre-charged tanks (PAC), and/or storage level control (LAC).
2. Select the type of level sensing float, electrode or transducer.
3. Reference the hydro-pneumatic water tank design sheet for tank sizing and layout.
4. Reference the model number specification sheet for control selection.

Level Automated Controls (LAC)

Water Storage control is essential when storage is needed to provide for varying flows which at times exceed the instantaneous capacity of the source water. Control of water storage tanks is essentially the control of water level using electrodes, float switches or transducers as the level-sensing device. Electrodes are metal rods installed in the tank which are connected to a special relay which applies a voltage to the electrode and is able to detect a small current flow through the water from the electrode to a ground rod thus activating the relay when the current is present and deactivating the relay when the electrode is no longer in water.

Transducers are generally installed at or near the bottom of the tank and transmit a signal proportional to water level to a digital meter or PLC which can be programmed to provide outputs to operate the various system components as desired.

Float switches, more readily associated with and similar to sewage control floats, may also be used and are the least expensive for level control.

Telemetry

Telemetry systems are frequently used in storage tank control, particularly in larger municipal systems that have large elevated storage tanks or standpipes located at higher elevations at some distance from the water source. Although any level detection device could be used in these applications, the most common is the transducer. The transducer signal is converted to a pulse width or frequency (FSK), which is sent over a dedicated phone line to a receiver that reconverts the signal for acceptance by a digital meter or PLC, which is programmed to provide the desired outputs. Radio telemetry using the spread spectrum frequencies (902 to 928 Mhz) is also becoming more popular in this application due to the ongoing cost of phone line charges. Radio telemetry is cost effective within its limitations such as line of sight and maximum distance. It does not require an FCC license but is limited to an output of 1 watt, which makes the distance from the transmitter to the receiver a factor in its use.

Combination Storage/Booster Systems (HAC/LAC), (PAC/LAC)

Any configuration of the systems described above can be integrated into a single control scheme. The most common is a well or wells which fill a storage tank from which booster pumps draw to supply the system using a hydro-pneumatic tank (HAC) or pre-charged tanks (PAC) or to maintain level in additional large storage tanks at higher elevations using telemetry.

Typical system options are available from American. In most jurisdictions the Health Department exercises a review process of the engineer's plans and specifications and may dictate on or more of these options such as;

Chlorination	U.V. disinfection
Standby Power	Filtration
Peak Hour demand flow	Minimum Storage Capacity
Minimum flow w/pump fail	

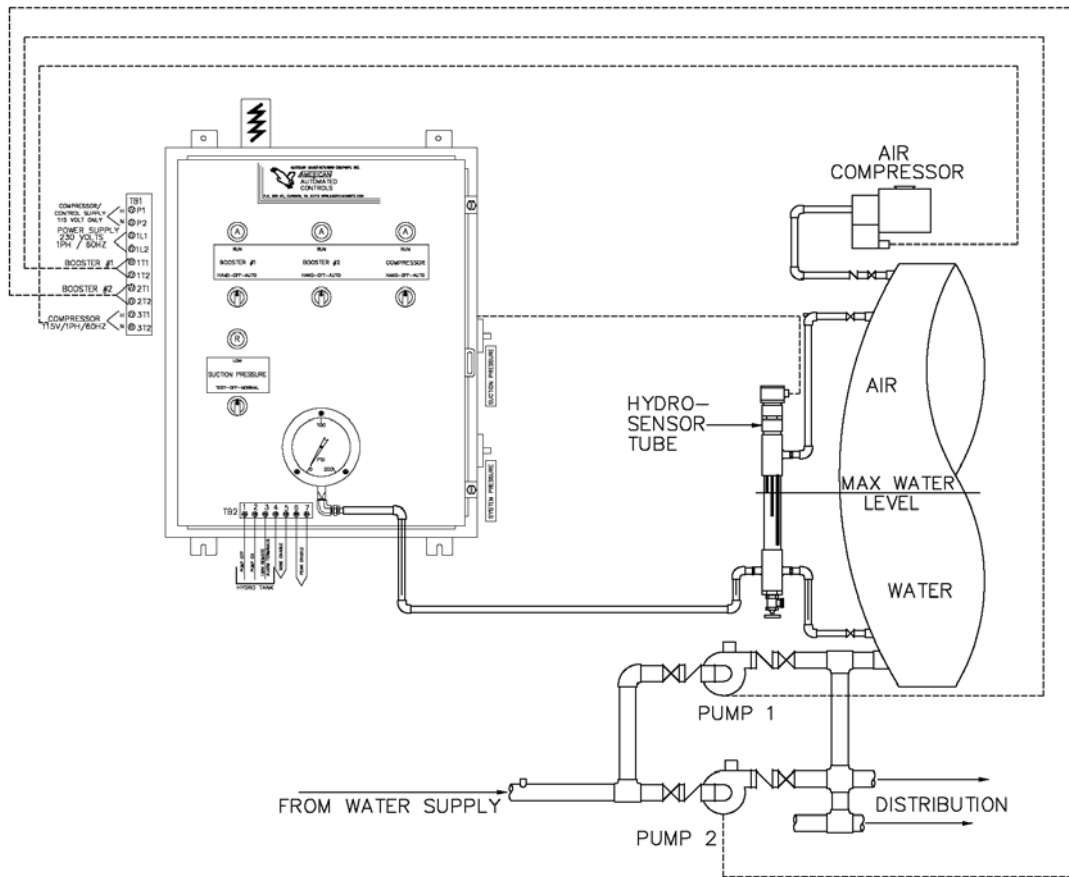
Many other options are available. The local utility usually exercises control over the kind of electrical power supply it will furnish in a given local. Typical power supplies furnished by a utility are:

- 120/208 Volt Single phase
- 120/240 Volt Single phase
- 120/208 Volt Three Phase
- 120/240 Volt Three Phase
- 277/480 Volt Three Phase

The type of power supply available may determine pump motor size and /or whether additional equipment is required. The largest single phase motor for practical purposes is 7-1/2 HP. However, if only single phase is available, then a phase converter or VFD used as a phase converter may be required. Also, large horsepower motors (15hp or 20hp and up) may require reduced voltage starters (soft starts) by the utility. VFD starters are recommended in many instances due to the additional advantage of having programmable ramp-up and ramp-down for starting and stopping, thus aiding in control of water hammer.

AMERICAN AUTOMATED CONTROLS

HYDRO-PNEUMATIC CONTROLS (HAC-Series)



HAC-SERIES HYDRO-PNEUMATIC PUMP CONTROLS

U.L. APPROVED & LABELED
MANY OPTIONS AVAILABLE

HAC-SERIES HYDRO-PNEUMATIC PUMP CONTROL SEQUENCE OF OPERATION

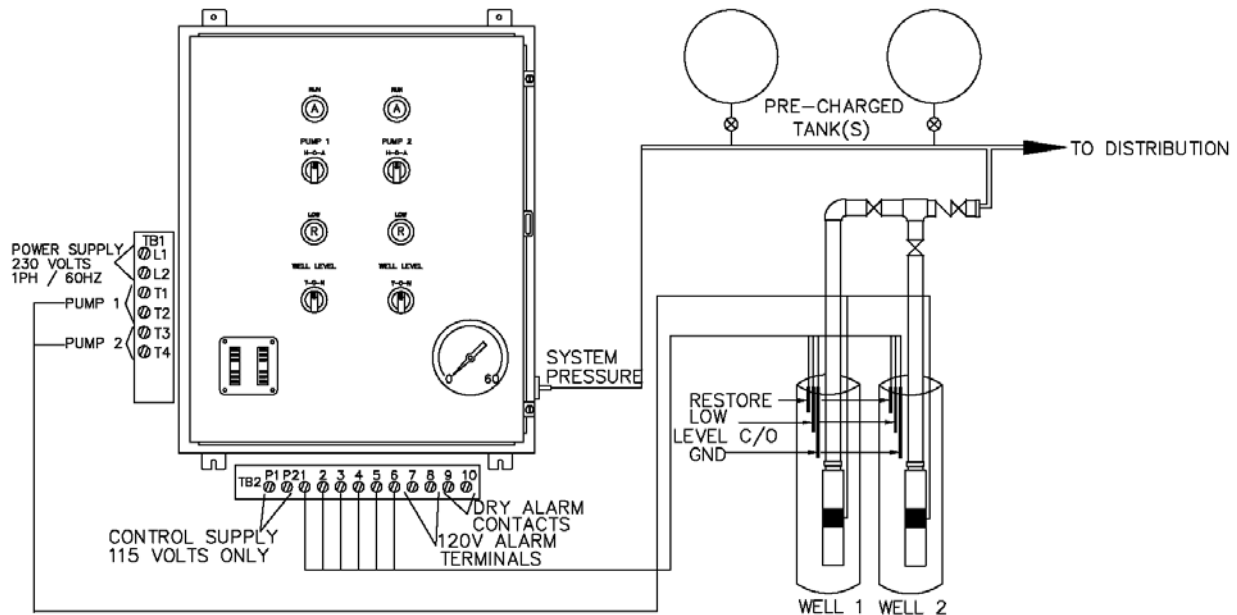
The pump control panel is equipped with pressure switches and liquid level relays to automatically control the air-water ratio contained within the hydro-pneumatic tank. Reference Section 2 of this catalog for sequence of operation.

The pump and the source water must have the capacity, even at the low water and pressure setting, to service the system demand for water. The basic hydro-pneumatic control automatically maintains the air and water balance in a hydro-tank but provides no storage at the pump cut in pressure and water level.

Reference the hydro-pneumatic tank-sizing sheet in this section for guidance in design of hydro tank. If source flow equalization is necessary, a combination control should be specified as represented in the combination control sheet also in this section.

AMERICAN AUTOMATED CONTROLS

PRE-CHARGED TANK CONTROLS (PAC-SERIES)



PAC-SERIES PRE-CHARGED TANK(S) PUMP CONTROLS

U.L. APPROVED & LABELED

MANY OPTIONS AVAILABLE

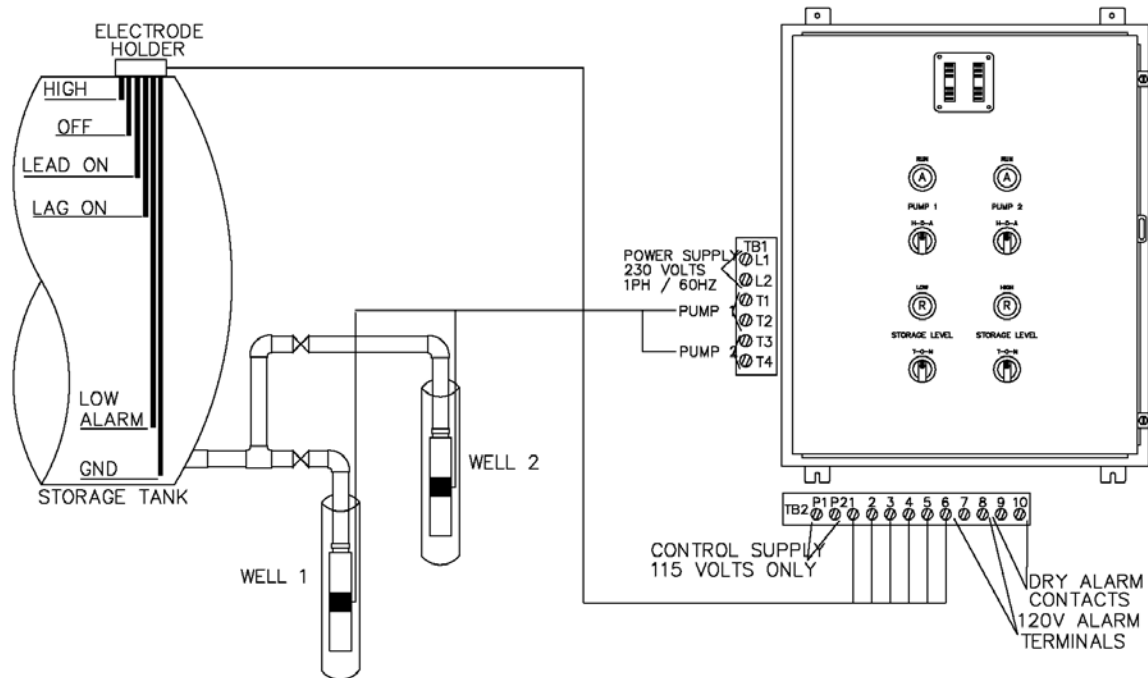
PAC-SERIES PRE-CHARGED TANK PUMP CONTROL SEQUENCE OF OPERATION

The pump control panel shall be equipped with three pressure switches to automatically control the water pressure level of the pre-charged tank and two liquid level relays for low well cut off if required. As water is removed from the tank, the pressure will drop until it reaches the "Lead Pump On" set-point on Pressure Switch No.1. The lead well pump will activate and continue to run until the pressure reaches the "Pumps Off" set-point on Pressure Switch No. 1, at which time the pump will cut off. The control will then alternate the lead pump. If the pressure continues to drop and reaches the "Lag Pump On" set-point on Pressure Switch No. 2, the lag pump will activate and both pumps will continue to run until the pressure reaches the "Pumps Off" set-point again on Pressure Switch No.1.

The panel shall be equipped with "Low Hydro Pressure" and "Low Well Level" alarms unless otherwise noted. The "Low Hydro Pressure" alarm shall be sensed by a third bourdon tube type pressure switch contained within the panel. If the pressure continues to drop and reaches the "Low Pressure" set-point on Pressure Switch No. 3, the audio/visual alarms will activate and be latched in until manually reset. The "Low Well Level" alarm shall be sensed by three suspended electrodes in each well. If the well level drops below the "Low Well Level" (Middle) electrode, the well pump(s) will cut out and the audio/visual alarms will activate and be latched in until manually reset. The well pump(s) will remain locked out until the well level reaches the "Restore" (Top) electrode, at which time the well pumps will be allowed to run again. The "Gnd" (Bottom) probe is for reference purposes only. Do not run electrode wires in the same conduit as the pump power wiring.

AMERICAN AUTOMATED CONTROLS

LEVEL CONTROLS for STORAGE TANK (LAC-SERIES)



LAC-SERIES LEVEL PUMP CONTROLS

U.L. APPROVED & LABELED
MANY OPTIONS AVAILABLE

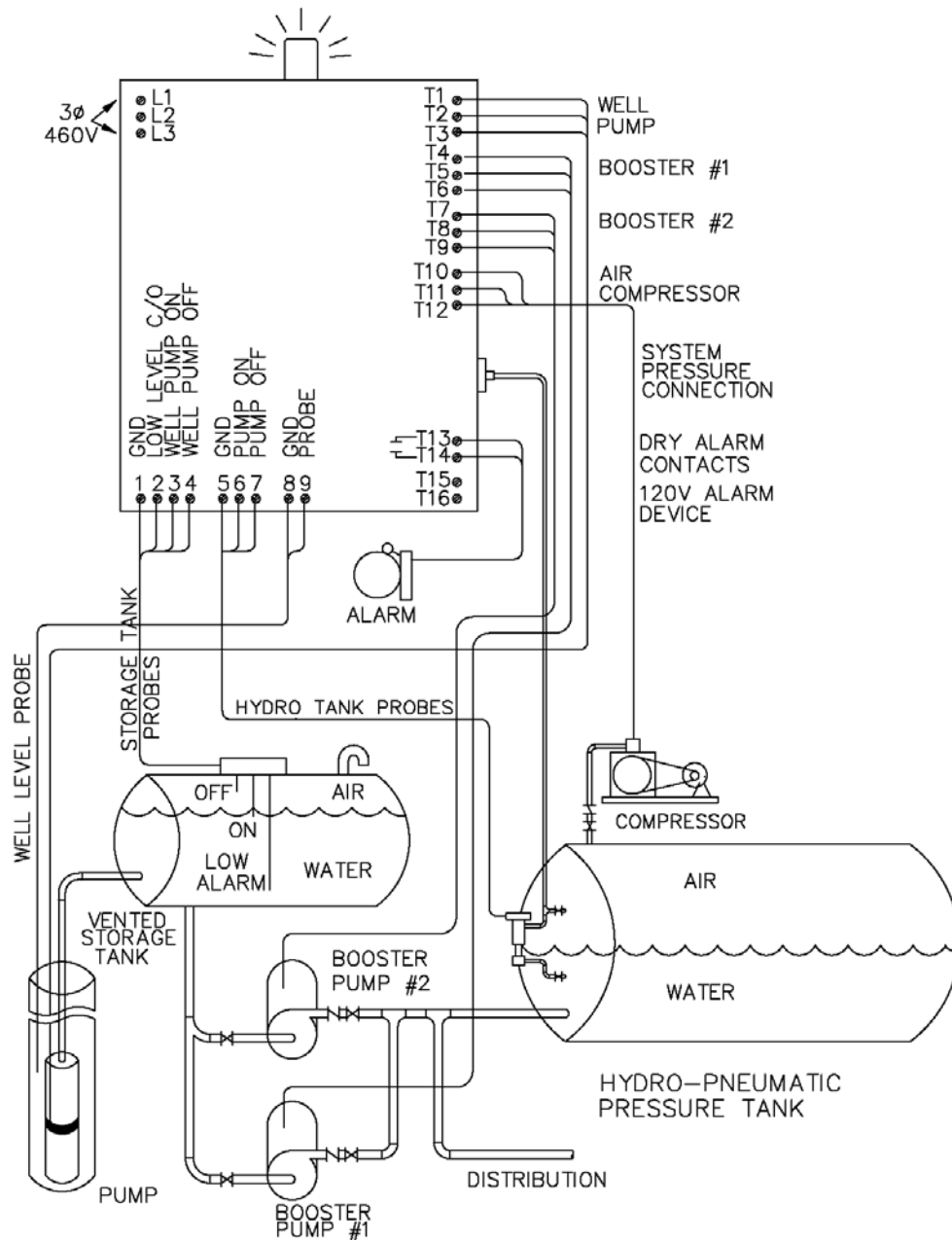
LAC-SERIES LEVEL PUMP CONTROL SEQUENCE OF OPERATION

The pump control panel shall be equipped with four solid-state low-voltage liquid-level relays to automatically control the water level of the storage tank. As water is removed from the tank, the liquid level will drop until it reaches the "Lead Pump On" (third from top) electrode. The lead well pump will activate and continue to run until the liquid level reaches the "Pumps Off" (second from top) electrode, at which time the pump will cut off. The control will then alternate the lead pump. If the liquid level continues to drop and reaches the "Lag Pump On" (fourth from top) electrode, the lag pump will activate and both pumps will continue to run until the liquid level reaches the "Pumps Off" electrode again.

The panel shall be equipped with "Low Storage Level" and "High Storage Level" alarms. When the liquid level reaches the "Low Storage Level" (fifth) electrode, the audio/visual alarms will activate and be latched in until manually reset. If the liquid level continues to rise and reaches the "High Storage Level" (top) electrode the audio/visual alarms will activate and be latched in until manually reset. The "Gnd" (sixth) probe is for reference purposes only.

AMERICAN AUTOMATED CONTROLS

COMBINATION CONTROLS (HYDRO-PNEUMATIC – LEVEL)



Model# HAC2/LAC1-A7-B1-2-JKLX

To create a specification for a combination control such as the one shown above, combine the component description and sequence of operation for the hydro-pneumatic control with those of the level control. Add descriptions of any additional options desired to the base sequence.

AMERICAN AUTOMATED CONTROLS

(HAC) HYDRO-PNEUMATIC WATER TANK DESIGN

The purpose of a Hydro-pneumatic tank is to provide an air cushion for the hydraulic network to give the pump sufficient run time for extended life and to eliminate water hammer from shock demands and pump on/off events. Providing the proper water and air ratio is required to ensure acceptable run times in a network friendly pressure range.

REMEMBER !!!

HYDRO-PNEUMATIC TANKS DON'T PROVIDE ANY PEAK FLOW STORAGE!!!

Network pressures vary due to vertical elevation differences in the system and selected pumps. Both the pump on pressure and the pump off pressure affect the operation of the system. A good ratio of air and water will assure the pump will operate each cycle and not place excess air in the tank. Table 1 may be used to set electrode locations for the hydro-pneumatic tank. The table estimates the drawdown and proper electrode level settings for conventional systems. The following procedures should provide an adequate air to water ratio for most system configurations.

TABLE 1 USAGE INSTRUCTIONS:

1. The system designer should provide an acceptable pressure operating range.
2. Determine the high level location by following the "On" pressure column down from the top and the "Off" pressure row from the left to the intersecting cell.
3. The top figure in the selected cell is the high level setting as a portion of tank volume.
4. The bottom figure in the selected cell is the estimated drawdown volume for the selected pressure range.
5. Follow the "Low/Cut-in" pressure column selected down to the "Air Charge Time" portion of the table.
6. Select the desired charge time at the left and determine the free air capacity required for the air compressor to initially charge the system.

EXAMPLE: Cut in pressure 50 psi
 Cut off pressure 70 psi

1. Top level setting = .43 of tank volume = 44.5% tank dia.
(21-3/8" above the bottom of a 48" dia. tank)
2. Drawdown volume = .18 as % of tank volume (180 gallon in a 1000 gallon tank)
3. For a 4 hour startup charge time, provide a 1.84 SCFM air compressor



AMERICAN MANUFACTURING COMPANY, INC.

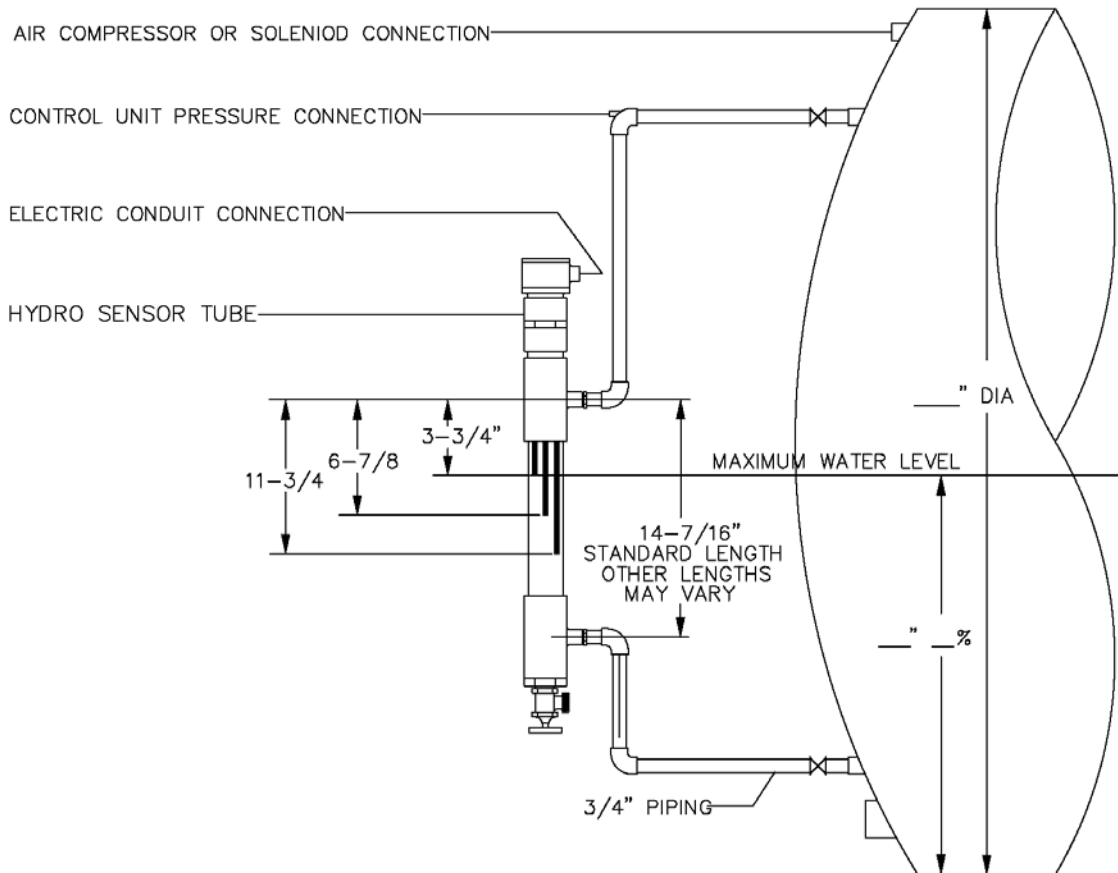
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 1-800-345-3132 www.americanonsite.com

TABLE 1
 LOW/CUT-IN PRESSURE (P.S.I.)
 AT 25% OF TANK VOLUME LEVEL

	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	
25	.35 .10																					
30	.42 .17	.33 .08																				
35	.48 .23	.40 .15	.33 .08																			
40	.52 .27	.46 .21	.39 .14	.32 .07																		
45	.56 .31	.50 .25	.44 .19	.38 .13	.31 .06																	
50	.60 .35	.54 .29	.48 .23	.42 .17	.36 .11	.31 .16																
55	.63 .38	.57 .32	.52 .27	.47 .22	.41 .16	.36 .11	.30 .05															
60	.65 .40	.60 .35	.55 .30	.50 .25	.45 .20	.40 .15	.35 .10	.30 .05														
65		.63 .38	.58 .33	.53 .28	.49 .24	.44 .19	.39 .14	.34 .09	.30 .05													
70			.60 .35	.56 .31	.52 .27	.47 .22	.43 .18	.38 .13	.34 .09	.29 .04												
75				.58 .33	.54 .29	.50 .25	.46 .21	.42 .17	.38 .13	.33 .08	.29 .04											
80					.57 .32	.53 .28	.49 .24	.45 .20	.41 .16	.37 .12	.33 .08	.29 .04										
85						.55 .30	.51 .26	.48 .23	.44 .19	.40 .15	.36 .11	.33 .08	.29 .04									
90							.54 .29	.50 .25	.47 .22	.43 .18	.39 .14	.36 .11	.32 .07	.29 .04								
95								.52 .27	.49 .24	.46 .21	.42 .17	.39 .14	.35 .10	.32 .07	.28 .03							
100									.51 .26	.48 .23	.45 .20	.41 .16	.38 .13	.35 .10	.32 .07	.28 .03						
105										.50 .25	.47 .22	.44 .19	.41 .16	.38 .13	.34 .09	.31 .06	.28 .03					
110											.49 .24	.46 .21	.44 .19	.40 .15	.37 .12	.34 .09	.31 .06	.28 .03				
115												.48 .23	.45 .20	.42 .17	.39 .14	.36 .11	.33 .08	.30 .05	.28 .03			
120													.47 .22	.44 .19	.41 .16	.38 .13	.35 .10	.33 .08	.30 .05	.28 .03		
125														.47 .22	.44 .19	.41 .16	.38 .13	.35 .10	.33 .08	.30 .05	.28 .03	
130															.46 .21	.43 .18	.40 .15	.37 .12	.34 .09	.31 .06	.28 .03	
135																.45 .20	.43 .18	.40 .15	.38 .13	.35 .10	.33 .08	
140																	.44 .19	.42 .17	.40 .15	.37 .12	.35 .10	
145																		.44 .19	.41 .16	.39 .14	.37 .12	
150																			.43 .18	.41 .16	.39 .14	
155	AIR COMPRESSOR C.F.M. (FREE AIR DELIVERED)																				.43 .18	.40 .15
160	REQUIRED FOR EACH 1000 GALLON TANK CAPACITY																				.42 .17	
INITIAL CHARGE TIME	4HR	.99	1.27	1.56	1.84	2.13	2.41	2.69	2.95	3.26	3.55	3.83										
	6HR	.66	.85	1.04	1.23	1.42	1.61	1.80	1.99	2.18	2.37	2.55										
	8HR	.49	.64	.78	.92	1.06	1.21	1.35	1.49	1.63	1.77	1.92										

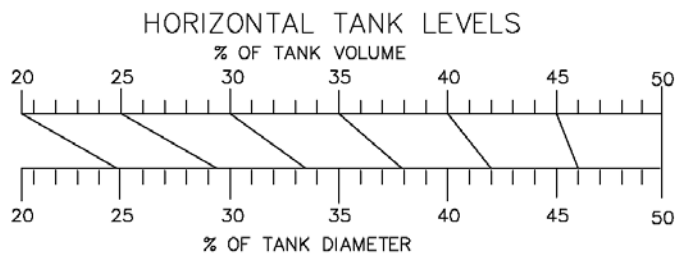
AMERICAN AUTOMATED CONTROLS

HAC TANK DETAILS



RECOMMENDED MAXIMUM WATER LEVELS IN HORIZONTAL TANKS
(25 % OF VOLUME AT LOW PRSSURE)

OPERATING RANGE	MAXIMUM WATER LEVEL
20-40 P.S.I.	52 % OF TANK DIAMETER
30-50 P.S.I.	48 % OF TANK DIAMETER
40-60 P.S.I.	46 % OF TANK DIAMETER
50-70 P.S.I.	44 % OF TANK DIAMETER
70-90 P.S.I.	42 % OF TANK DIAMETER
100-120 P.S.I.	39 % OF TANK DIAMETER



FORMULA FOR SIZING A HYDROPNEUMATIC TANK TO OBTAIN
NOMINAL 6 PUMP STARTS PER HOUR OPERATION:

$$\frac{\text{AVERAGE PUMP RATE (GPM)} \times 2.5}{\% \text{ VOL. DRAWDOWN FROM CHART}} = \text{TANK SIZE IN GALLONS}$$

AMERICAN AUTOMATED CONTROLS, INC.

FLOAT SWITCHES

INTRODUCTION

There are several types of float switches and different applications for these switches. Some switches may be used for several applications while others are only for specific duty. Float switches may be used for pilot duty, to operate control devices such as relays and contactors thereby never seeing a significant electrical load, or direct duty when they carry a full motor load. Float switches are manufactured to handle from light to heavy electrical current in a normally open or normally closed application. Some are narrow angle while others are wide angle. The higher amp wide angle float switches are called motor rated, differential, or sometimes piggyback switches when they are manufactured with a special plug on the end.



NARROW ANGLE PILOT DUTY FLOAT SWITCHES

The narrow angle pilot duty switch has been made from an encapsulated mercury switch enclosed in a plastic float. The non-corrosive float may be either solid or hollow and it keeps the switch inside positioned to make contact when the float either floats up (normally open) or hangs down (normally closed). This type of float will typically have an amperage rating of 1 to 2 amps. The typical load on this type of switch will be less than half of that, which allows the float to last longer. In the event that a larger control panel with considerable built-in logic is serviced by the switch, a heavier switch (frequently around 7 amps) may be used. In all cases, these switches should be protected in the control circuit with a properly rated fuse or breaker.

WIDE ANGLE PILOT DUTY FLOAT SWITCHES

The wide angle pilot duty float switch is a low rated differential switch constructed much the same way as the narrow angle but with a differential mechanism inside. This requires the float to rotate a specific distance before actuating. The travel distance is around four inches minimum. For pilot duty applications, this may decrease the control cost by reducing the number of relays required in the control, as well as the number of floats. The limiting factor is the accuracy of the vertical differential. With a four-inch tether for differential control, a reasonable repeatability can be approached. Designers try to increase the volume pumped by increasing the tether length, which sacrifices repeatability. If the system under design is sensitive to dose volumes it becomes almost impossible to control them with a single differential float switch.

WIDE ANGLE MOTOR CONTROL SWITCH

Whenever using a single float switch for pump control it must be a wide angle to provide sufficient run time for the pump and to prevent short cycling. If a narrow angle switch were used the motor would be turned on and off with the slightest wave action in the tank. The motor and/or float would fail prematurely. Wide angle motor control switches were first designed to provide a reliable and inexpensive on/off switch for sump pumps. The switches were manufactured as part of the pump and incorporated an adapter allowing the pump to be piggybacked to the float plug for power. The independent switches have become most popular because they can be replaced without removing the pump.

Pumps usually last much longer than these types of switches. These switches when used with bigger pumps require special consideration in both design and installation. In some cases, the use of this type of switch is not suitable. The switch must be designed to carry the full load amperage of the pump. These switches open and close one wire and can pose potential safety risks in the event a pump is wired incorrectly. For systems with a Hand-Off-Auto (HOA) switch, the HOA switch must also be rated to carry the full load amperage of the pump. Switches that use mercury are not recommended for direct motor starting because of high inrush current.

TWO FLOAT PILOT DUTY CONTROL

Two float pilot duty control provides the safest and most accurate control method possible. Two floats are tethered with a 4" cord length. The drawdown between these two floats will always be the same to the best possible tolerance (typically 1/2" to 1"). The floats are exposed to very low amperage for the control circuit. The pump is provided electricity only when a definite duty contactor connects all wires to the pump. The two floats can be set any distance apart without sacrificing the accurate control of the drawdown. For many systems this is critical. When sensing liquid level with two switches the addition of other components for better operational control, such as counters or elapsed time meters, is safer and less expensive.

GENERAL FLOAT SWITCH INSTALLATION

Float switches in general should be installed on a separate support from the pump. This support may be a non-corrosive rack using weighted float switches or a vertical float bar. In the event of a failure of the pump or control, the device still in operation does not need to be removed. This is of great benefit from a service point of view. The best option is to use a removable float bar so that the floats may be removed while maintaining their separation distance. This will allow checking of the drawdown as well as checking operation of the system without disconnecting the floats or changing the drawdown.

Don't Abuse Your Wide Angle Switch!

Sump pumps are designed to cycle on and off more frequently. With these smaller motors, the heat generated by startup is not excessive. The larger the motor, the more the designer would want to provide a minimum run time before it shuts off. For demand-dosed systems, this is done by increasing the drawdown volume in the wet well. If the required drawdown exceeds 4", then the single switch option becomes less favorable due to the increased chance of tether wandering.

Installation of sump pumps have traditionally been indoors in basements. This has kept the electrical plug-in cord safe from the weather. Larger pumps and effluent pumps are typically out away from the house. This puts the plug-in connection either in the weather or in a more hazardous location, inside the pump pit. Corroded plugs have caused more alarm conditions than any other type of failures in this type of installation. Codes have gone to requiring not only alarms to indicate a system failure but also hard wiring of pumps, override switches, and other safety and system monitoring accessories. The hard wiring allows the pump to be wired into a definite duty contactor with connections free from corrosion and with a contactor that will break both legs when not in use. The override switch allows the operator to start and stop the pump without pulling on a wet electrical connection in use.

AMERICAN AUTOMATED CONTROLS

SUBMERSIBLE LEVEL TRANSDUCERS

FEATURES

- Custom Level Ranges up to 700 ft (210 m) H₂O
- Accuracy of up to $\pm 0.05\%$
- Analog Outputs of 4-20 mA, 0-5 VDC or mV
- Welded 316 SS or Titanium Construction
- Optional Lifetime Lightning Protection
- Optional Temperature Measurement Output
- Custom Cable Lengths



APPLICATIONS

- Well Monitoring
- Level Control
- Oceanographic Research
- Lift Stations
- Ground Water Monitoring
- Surface Water Monitoring
- Slug Tests
- Pump Control
- Soil Remediation

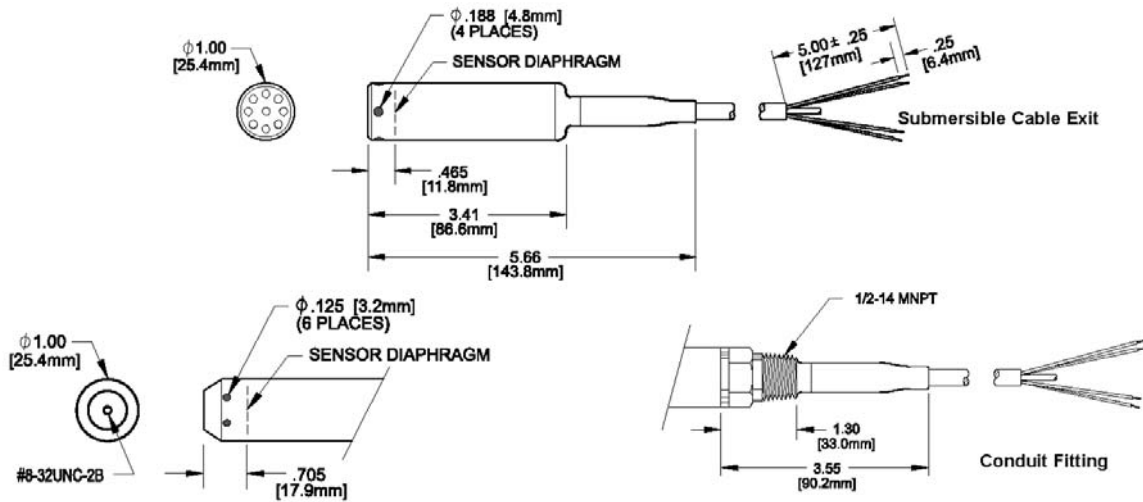
These submersible hydrostatic level transducers are specifically designed to meet the rigorous environments encountered in liquid level measurement and control. They can be configured to perform to specifications under most adverse, reactive conditions.

The transducers utilize a highly accurate pressure sensor assembly specifically designed for hostile fluids and gases. The assembly is integrated with supporting electronics in a durable waterproof housing constructed of stainless steel or titanium. The attached electrical cabling is designed to protect against the elements and to prevent measuring errors due to cable elongation. The cabling includes a unique water block feature that self-seals in the event of accidental cuts to the cable. Each transducer comes standard with vent filter that prevents moisture from entering the vent tube for at least one year without maintenance, even in the most humid environments.

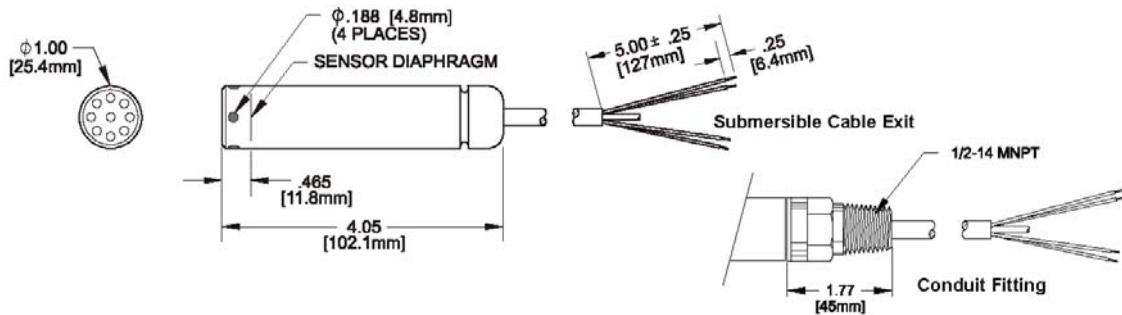
These units are designed for installation in a Class I, Division 1, Groups A, B, C, and D, Class II, Division 1, Groups E, F and G, Class III, Division 1 hazardous location when connected to appropriate apparatus. The transducers are type approved by the American Bureau of Shipping (ABS), are UL, CUL, and FM approved, have a IP 68 and NEMA 6P housing protection rating, and are CE compliant to EN 61000-6-4:2001 and EN 61000-6-2:2001.

AMERICAN AUTOMATED CONTROLS

Submersible Level Transducers – Technical Data

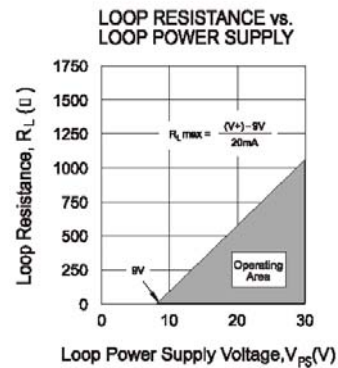


Molded Cable Seal



Gland Cable Seal

ELECTRICAL TERMINATION		
22AWG CONDUCTORS IN A SHIELDED CABLE WITH VENT TUBE		
4-20 mA	RED	+ EXCITATION
	BLACK	- EXCITATION
0-5 VDC	RED	+ EXCITATION
	BLACK	- EXCITATION
	WHITE	+ SIGNAL
mV	RED	+ OUTPUT
	BLACK	+ EXCITATION
	WHITE	- EXCITATION
	GREEN	- OUTPUT
ALL	DRAIN WIRE	SHIELD



AMERICAN AUTOMATED CONTROLS

Submersible Level Transducers – Specification Info

MODEL	SUBMERSIBLE LEVEL TRANSDUCER
7 3 5	±0.05% FSO Static Accuracy
7 3 0	±0.10% FSO Static Accuracy
7 2 0	±0.25% FSO Static Accuracy
7 1 0	±0.50% FSO Static Accuracy
7 0 0	±1.00% FSO Static Accuracy
↓ ↓ ↓	MATERIAL
	S Stainless Steel
	T Titanium
↓	REFERENCE FORMAT
	1 Vented gage
	3 Sealed gage (except 735)
	4 Absolute (except 735)
↓	OUTPUT
	2 mV, non-ratiometric
	3 0-5 VDC
	4 4-20 mA
	5 mV, ratiometric (not IS approved)
	6 4-20 mA, temp. measurement option, -20 to 60°C (not IS approved)
	7 4-20 mA, temp. measurement option, 0 to 50°C (not IS approved)
	E Custom VDC output
↓	PRESSURE CONNECTION
	A Open-face nose cap
	B Closed-face nose cap
	E Piezometer nose cap
	2 1/4" - 18 NPT male fitting
	7 1/2" - 14 NPT male fitting
	F G 1/4 male fitting, BSP
	G M14 x 1.5 – 60° Internal cone male fitting
↓	ELECTRICAL CONNECTION
	0 Molded cable seal
	4 1/2" - 14 NPT male conduit fitting with molded cable seal
	A Gland cable seal
	B 1/2" - 14 NPT male conduit fitting with gland cable seal
↓	LIGHTNING PROTECTION
	A None
	B Lightning Protection
↓	LEVEL RANGE (at MAX output)¹
	x x x . x x x
	↓ ↓ ↓ ↓ ↓ ↓ ↓
	LEVEL RANGE (at MIN output)¹
	x x x . x x x
	↓ ↓ ↓ ↓ ↓ ↓ ↓
	MOISTURE PROTECTION
	A None (sealed/absolute only)
	B Vent Filter
	C Aneroid Bellows
↓	CABLE TYPE
	1 Polyurethane
	2 Tefzel
↓	CABLE LENGTH
	x x x x (in feet)
	↓ ↓ ↓ ↓
	LABEL²
	A psi
	B ft H ₂ O
	C m H ₂ O
	↓

Notes:

- The part number requires two level range limits, corresponding to the maximum and minimum analog outputs of the transducer, to be specified in **pounds per square inch (psi)** to three decimal places. The lower level range is typically 000.000 unless otherwise required. For reverse output requirements, enter the lower level range for the maximum output signal and the upper range for the minimum output. Use the following conversion factors:
 Examples: 10 ft H₂O / 2.3073 = 4.334 psi (enter 004.334 in the part number)
 10m H₂O / 0.703265 = 14.219 psi (enter 014.219 in the part number)
 For sealed gage reference add local atmosphere when converting to psi. Contact PSI for assistance.
 Example: 10 ft H₂O / 2.3073 + 14.7 = 19.034 psi (enter 019.034 in the part number)
- Units of measure on standard PSI label. Contact PSI if private labeling is required.

Warranty: The Series 700 product is warranted against defects in material and workmanship for 2 years from date of shipment. Products not subjected to misuse will be repaired or replaced. THE FOREGOING IS IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES. We reserve the right to make changes to any product herein and assume no liability arising out of applications or use of any product or circuit described. Products described in this Specification are not intended for life support applications.

AMERICAN AUTOMATED CONTROLS

TEMPERATURE MONITORING

OVERVIEW:

Any water barring equipment in northern climates with heating or cooling criteria can be at risk. American Manufacturing now offers temperature monitoring and alarm control to reduce the chances of failure due to inclement weather. Two versions are being offered, the **TCA** (Temperature Control with Alarm) and the **TAS** (Temperature Alarm Switch).

THE TCA

American Manufacturing's **TCA** model combines dual set points for temperature control and alarming capabilities with the use of a temperature probe and a heating element without a thermostat. The two user-defined set points allow customizable control in the most diverse weather conditions. The first set point controls the heating element "On-Off" temperatures for precise regulation. The second user-defined set point allows for an audible visual alarm onsite, or remote alarm through an auto-dialer or American's **TRS System** in the event the temperature falls below the "safe" limit (close to freezing). The **TCA** unit comes equipped with an internal buzzer to differentiate from other onsite alarm conditions. In the event the temperature probe fails or becomes disconnected, a failure code will be displayed, and an audible alarm is emitted from the unit.



THE TAS

American Manufacturing's **TAS** model combines the use of a temperature probe and a heating element requiring a built in thermostat. Unlike the **TCA**, the **TAS** has only one set point for alarming capabilities, and no built in auxiliary alarm. The Alarm functionality can be utilized onsite to engage the standard panel alarm, or remotely via an auto-dialer or American's **TRS System**. In the event the temperature probe fails or becomes disconnected, a failure code will be displayed, and an audible alarm is emitted from the unit.



FEATURES

- Easy to read Digital display
- User-defined set-points(s) for alarming conditions
- User-defined set-point(s) for full temperature control (**TCA only**)
- Reduces risk of freezing
- Distinct audible alarm (**TCA only**)
- Alarm notification onsite or remote
- Exposes failed/failing heating elements before catastrophe occurs
- Temperature Probe Failure alarm standard
- Works in conjunction with American's **TRS System**

AMERICAN AUTOMATED CONTROLS

REMOTE / ONSITE DATA RETRIEVAL

RESIDENTIAL & LIGHT COMMERCIAL APPLICATIONS

American Manufacturing has developed various applications to allow the user to link up to the Drip controller via laptop or remotely through a standard phone line to retrieve data and view system parameters through our line of Siemens PLC units. All cycle counter and elapsed time information can be easily downloaded to the PC by the click of a button.

Zone	Counter	ETM
1	854	1189
2	17	42
3	17	42
4	16	44

Zone	Counter
1	0
2	0
3	0
4	0

Pump	Name	Counter	ETM
1	Drip Tank	145	1410

Name	Counter	ETM
High Level Float	8	13
Peak Drip Float		64

Name	Counter	ETM
Peak Drip Cycle	16	39

Buttons: Change Zone Data Path, Log Zone Data, Change Drip Tank Path, Log Drip Tank Data

Applications are available for the following residential applications:

- 2Tank/Vault (X9163P)
- All four-zone simplex models (X9141P, X9157P, X9159)

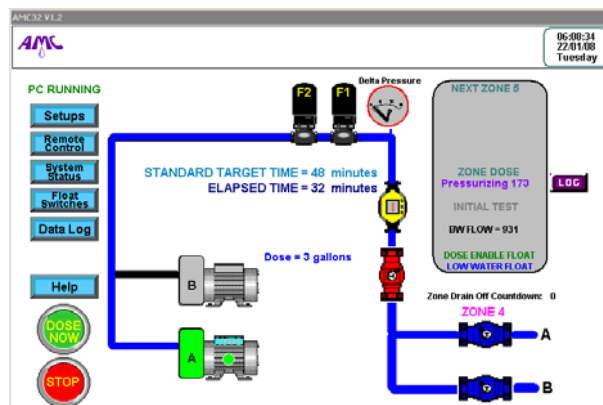
Applications available for Light Industrial are:

- Duplex Pump, 3 filter up to 24 zones, with the ability to obtain data from a duplex pump pretreatment configuration and a sludge/auxiliary pump configuration.

HEAVY COMMERCIAL/COMMUNITY APPLICATIONS

Two product lines for process control have been developed for large commercial/community applications, OPTO 22 and Unitronics. The OPTO 22 platform offers a proprietary (stand alone) communication through an On-site PC, while the Unitronics offers a Touch-screen interface or basic controls through a standard PLC display and has modbus protocol allowing for seamless integration with the majority of SCADA packages available.

These systems allow the user to interface with the equipment remotely to retrieve all system data including failures, warnings, cycle counts, elapsed time meters, field flushes and filter backwashes. The user also has the ability to take any parameter or component in the system and disable/enable it remotely, such as zones, and pumps. The system also does daily and monthly data dumps to individual databases to log all information for future reference and trending purposes.



AMERICAN AUTOMATED CONTROLS

WIRELESS DATA TRANSFER / PROCESS CONTROL

WIRELESS OPERATION:

Wireless data transfer/process control can be utilized when it is not economical or possible to bring hard lines to the desired areas. Wireless technology can consist of Blue Tooth (for shorter distances) or full wireless radios with remote I/O (longer distances). Line of sight is always recommended for maximum bandwidth, but in instances where it is not possible to have full line of sight, an analysis can be performed to determine if wireless control is feasible for the application. Wireless operation can be point-to-point, or master/slave control, and typically consists of an MCU (main control unit) and an RCU (remote control unit).



Point-to-point is when I/O is replicated from the MCU to the RCU. Master/Slave control is when 1 or more PLC's function and control a process based on data received from the MCU. This type of control allows for the user to enter parameters and control each RCU from the MCU interface screen. All data can be logged back to the MCU to have a central control station with multiple substations used for maintenance purposes only. All radio systems provided by American Manufacturing come standard with surge suppression to avoid/limit transients from being induced into the system via the antenna, and are all UL approved/tested. Any customized application can be developed on an as needed basis.

FIBER OPTICS:

Fiber Optics can be utilized when radio telemetry is not an option. Using fiber allows for larger distances between the MCU and the RTU(s) without using conventional copper. Fiber Optic cable reduces the possibility of inducing transients into the transmission lines because they are not susceptible to lightning. Fiber Optic runs can be either aerial or underground/direct burial. It is recommended that all lines even those with a jacket suited for direct burial be placed in conduit to avoid accidental damage.



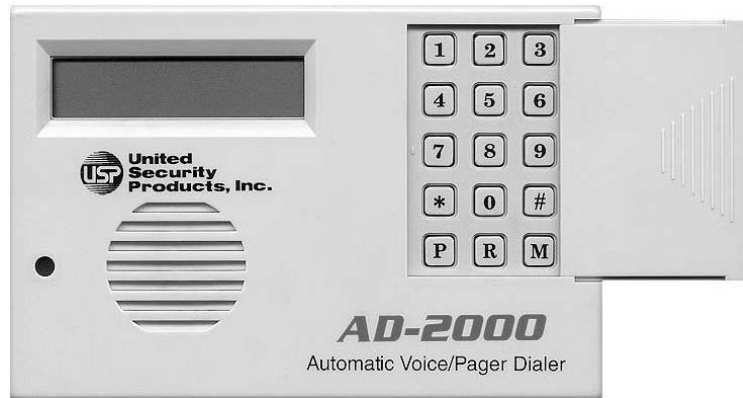
Point-to-point control and OPTO coupling are currently the standard Fiber Optic solutions provided by American Manufacturing. Any customized application can be developed on an as needed basis. The Fiber Optic converters and switches specified in our designs are rugged, reliable, real-time, and secure with ratings consisting of UL, CE, Marine, Hazardous Locations, etc.

AMERICAN AUTOMATED CONTROLS

UNITED SECURITIES AD-2000 AUTO DIALER

AD-2000

The AD-2000 dialer features busy-line and no-answer detection to ensure prompt transmission of up to 4 Pre-recorded messages delivered sequentially to as many as 8 standard telephones, cellular phones, voice and/or numeric pagers.



Messages to both local and long-distance calls can be transmitted. When activated, the dialer instantly begins calling the numbers in sequence, delivering each message 1 to 3 times in a row, in accordance with the pre-selected number of dialing attempts.

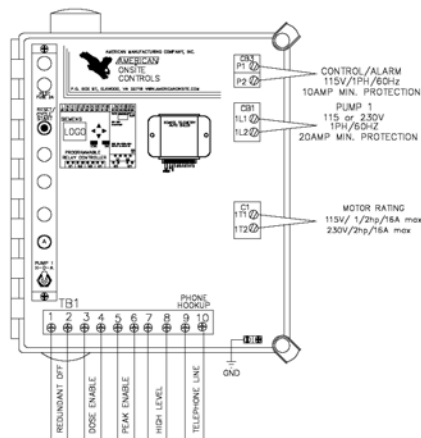
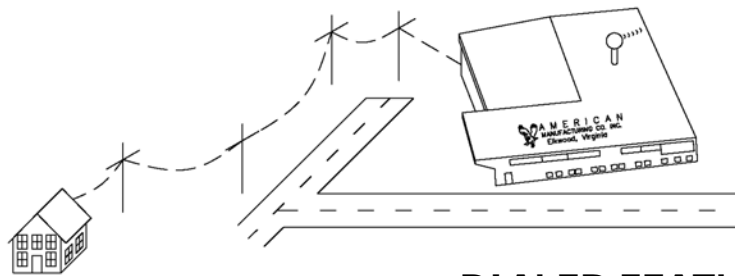
The AD-2000 is extensively programmable, offering personalized customization to fulfill virtually any residential or business requirement. Plain-English prompts walk the user through the process in a timely manner. Each unit comes Standard with battery backup to allow for monitoring of power to the system.

The multitude of programming options allowing the user to:

- Store up to 8 telephone/pager numbers.
- Choose 1- 9 calling efforts for the numbers dialed.
- Select 1-3 message repeats.
- Record a variable combination (maximum: 7) of instructional outgoing messages (total elapsed time: 51 seconds).
- Program up to 4 separate input channels with individually selectable enable/disable of the each input, entry/exit delays and activation options
- Capable of using Normally Open (N.O.), Normally Closed (N.C.) dry contact or voltage activation including momentary (must be user reset before next occurrence of alarm) and continuous (auto resetting) activation for each.
- Further individualize each channel by selecting the delay times, telephone/pager numbers to be dialed and the specific outgoing messages to be played.

AMERICAN AUTOMATED CONTROLS

WEB-BASED TELEMETRY REPORTING SERVICE (TRS)



DIALER FEATURES

- *Connect to any extension
- *Does not call on busy line
- *Actively reports monthly



PRODUCT OVERVIEW:

The American Onsite **Telemetry Reporting Service (TRS)** is a cost-effective means of receiving and responding to alarm conditions remotely through a **web-based** delivery system. The "TRS" option can be utilized with any control panel. Standard onsite control panels are specified with high level only, but any panel can be customized to suit the specific needs of any site requiring up to 8 independent alarm conditions. A 30-day status check is also a standard function of the unit to inform the user the unit is still operational in the absence of alarm conditions.

Each panel ordered with the "TRS" feature comes with the auto-dialer unit preinstalled. Retrofits can be ordered for the field by means of an additional "jockey" panel, which ties into the existing, or if space and constraints permit, installed in the original application. Standard features are as follows:

- 8 dry-contact input channels
- Quick disconnect plugs for easy wiring as a field retrofit
- No local programming - just complete and return the supplied ID request form to American Manufacturing, and the unit is initialized from the Tracking server
- LED display for power, phone and each input channel
- Integral mounting feet for easy installation
- UL listed power supply is included with unit
- Alarm notification via text-messaging and/or email
- Alarm events become historical data
- Connects to any standard phone line (land based phone line)
- Only connects to the line when it needs to call
- Automatically retries if the call is unsuccessful or the line is in use
- "All Clear" signal is sent when on site alarm condition clears
- Will send an automated status check every 30 days after the last alarm condition to verify the unit is still functioning

HOW "TRS" WORKS

The auto-dialer connects to a standard phone line and has the ability to monitor up to 8 critical conditions, such as "Pump Fail", "Low Water Alarm", or "High Level Alarm". When an "Alarm" condition or an "All Clear" condition is received, the unit contacts the American Manufacturing Tracking server via a **toll-free** exchange and transmits the specified data.

Standard control panels are normally specified with the high-level alarm notification and reset functions. Monthly status reporting is a standard feature to acknowledge the system is still on line. However, any site specification can be modified to announce up to eight conditions or alarms.

Each unit that leaves the factory comes with an I.D. request form. Once the end-user completes and returns the form to AMC, the "TRS" Tracking server will be loaded with the site-specific information, linking the "TRS" server to the auto-dialer. An automated email will be sent to the end-user when the unit has been loaded.

Once the "TRS" equipped control panel is installed, the auto-dialer will remain inactive until an "Alarm" condition activates. When an alarm state trips the appropriate input, the unit will come on-line and check whether the phone is available. If the line is not available, the unit will wait a few minutes and initiate another attempt. The unit will continue to try until the line becomes available.

The unit will proceed to dial the AMC "TRS" tracking server, input the site I.D. along with the alarm condition, and wait to receive a signal from the server to acknowledge all information has transferred properly. If the auto-dialer does not receive this signal within a few seconds of transmission, it will disconnect, and try again in a few minutes. This form of "handshaking" helps to ensure a critical alarm does not go by unanswered.

Once the data is transferred to the "TRS" tracking server, and the auto-dialer receives the acknowledgement that all data has been recorded, the dialer disconnects, and the "TRS" server then processes the data.

The email address(s)/text message number(s) supplied from the completed I.D. form, will then be sent the site information and alarm event. The alarm will be also displayed on the web-based portion of the server.

Once the alarm condition subsides, the auto-dialer will contact the "TRS" tracking server and transmit an all-clear status. The same protocol as described before takes place to make sure the data is transmitted properly. Once the on site alarm is cleared, the user can log in to the web-based portion of the "TRS" server and clear any open/outstanding alarm conditions. At any time, the user can log into the "TRS" tracking server via any web-based browser, and get alarm information pertinent to any site that has utilized/ is utilizing a "TRS" enabled auto-dialer. This can be very useful for trending problematic sites, and generating reports.

ALARM NOTIFICATION

Each site/remote location will have it's own I.D. and can be uniquely programmed with various alarming conditions which will be transmitted to the end user via e-mail and/or text-messages. Users have the ability to log in to the TRS system via the Internet through any web-browser with a secure username and password. Once logged in, users can view present/past alarm data and establish trends accordingly.

This service is provided to subscribers for a nominal annual service fee. This fee grants access to unlimited usage of web-based browsing of alarm conditions, unlimited callouts from the auto-dialer for "Alarm" or "All Clear" conditions for the duration of the service agreement, and up to 2 email addresses for alarm notifications.

STANDARD PANEL FEATURES

Simplex Control Panel	High Level Alarm
Duplex Control Panel	High Level Alarm, Pump Fail
Drip System Control Panel	High Level Alarm

AMERICAN AUTOMATED CONTROLS

REMOTE MONITORING SYSTEM

SENSAPHONE® *EXPRESS II*



*The Remote Telemetry System
For Environmental and Industrial Monitoring,
Communication, and Control*

The Sensaphone Express II features advanced monitoring capabilities, plus allows for expansion of up to 40 input/output channels. Easy to install, program, and expand, Express II can meet the needs of your system both today and tomorrow.

The Express II is as flexible as your application requires, with features like built-in power failure monitoring, 8 universally configurable alarm inputs, and an on-board relay output for manual or automatic switching.

It offers a wide range of temperature sensing, 48 user-programmable dial out numbers, and complete remote touch-tone programming capability.

Descriptive messages can be recorded for site identification and for each alarm input. Alarm-specific dialing and programmable call schedules allow users to customize the Express II's dialing process.

The Express II is equipped with a gel-cell rechargeable battery that will provide 12 hours of backup time. The unit is housed in a NEMA 4X fiberglass enclosure with a front panel LCD and dual-color LEDs to indicate input status to on-site personnel. All programming settings and voice message are stored in nonvolatile memory.

AMERICAN AUTOMATED CONTROLS

MOTOR CONTROLLING DEVICES

Motor Soft Starters and Variable Frequency Drives are commonly used in starting and stopping motors to prolong the life of equipment. Motor controlling devices are used to reduce the load and torque of the motor during startup (and sometime stopping as well). This reduces the mechanical stress on the motor as well as electro-dynamic stresses on the attached cabling and power distribution network, thus extending the lifespan of the system and it's components. Heat is a major cause of motor failure, and the amount of heat generated by stopping and starting a motor with such a device is greatly reduced. Not only do motor controlling devices prolong the life of the system, but they factor in to energy saving potential (cost per kW hour and yearly operating costs).

MOTOR SOFT STARTERS

Motor Soft Starters are a cost effective, economical way to reduce the torque of a motor during starting by temporarily reducing the voltage or current applied to the motor. By reducing the torque and limiting voltage/current, stresses on the motor windings and components are reduced, prolonging the life of the motor. There are many curves associated with soft starters, such as ramp to start/ramp to stop, and pump curve. Always consult the pump manufacturer in deciding which Soft Start curve is right for the application at hand.



VARIABLE FREQUENCY DRIVES

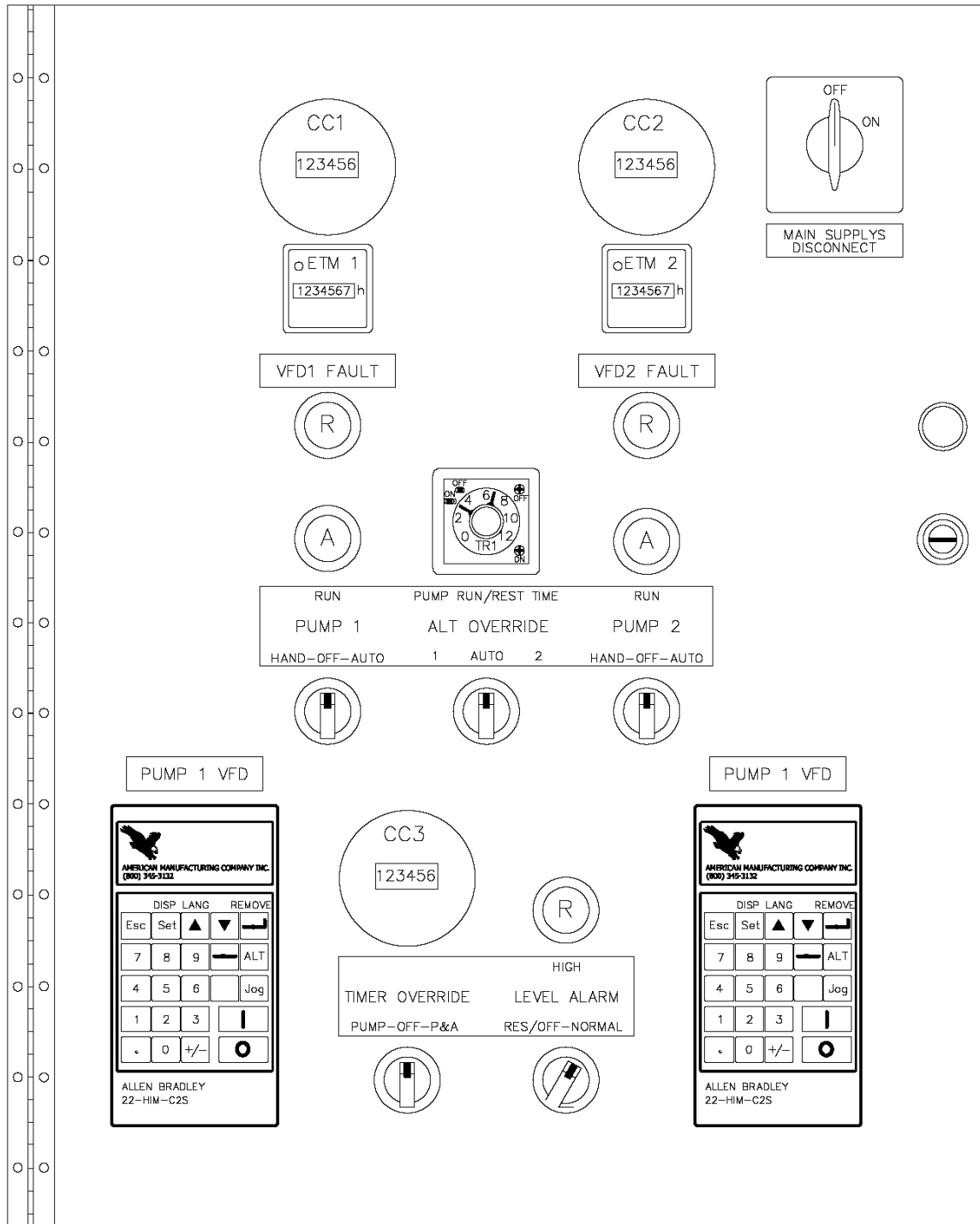
Variable Frequency Drives (VFD) offers the user with more control over a standard, fixed speed system. They allow for a longer starting/stopping period and can match pump performance to a changing job requirement. VFD's can be integrated into PLC's and into SCADA/telemetry systems for reporting data and controlling features. While a common Soft Starter can assist in eliminating water hammer and pressure surges, a VFD is better suited in pumping applications where heavy dynamic loads are encountered, and ensuring the pump motors stop progressively to avoid unwanted fluid shocks.



VFD's can also be used as phase converters when 3 phase power is not available but a 3 phase motor is required. In this application, they are superior to other types of phase converters because they automatically balance the current in each phase of the motor, thereby increasing motor life.

AMERICAN AUTOMATED CONTROLS

VFD CONTROL PANEL: Typical Inner Door Layout



Model # : DERAB124-ACEFHLL3M(D)ORXZ(XF)

AMERICAN AUTOMATED CONTROLS

CONTROLS - ESTIMATING

American Manufacturing Company, Inc. has developed the model numbering system to describe to the specifier and owner what is included in the control. The "Control Panel Model Number Builder & Estimating Tool" is an Excel Spread sheet developed for the specifier to compare the cost of options for specific projects. A similar tool is used by American sales associates for quoting panels.

To receive a copy of the "Control Panel Model Number Builder & Estimating Tool", send request to info@americanonsite.com.

To obtain firm quotes for specific projects, contact American's sales department via phone or email. Due to the frequently changing costs for electrical components and changing design configurations, costs can only be guaranteed for a limited amount of time. However, the estimating tool will still represent good comparisons even if only updated annually.

How to use the Estimating Tool

1. Load the Excel spread sheet, click on the series option and from the drop down menus select simplex, duplex, or other available series of panels.
2. Select other options in the same manner making sure that the "no" answer is present for unwanted options.
3. Select enclosure size. It is very important to check the enclosure tab at the bottom of the sheet and adjust size according to the highlighted enclosure type.
4. Go to the "final printout" page and fill out job name and contact information for the estimate prior to saving or e-mailing to American for a final quote.

Call American or email
info@americanonsite.com

to obtain a copy of the

"Control Panel Model Number Builder & Estimating Tool"

American Manufacturing Company, Inc.
P.O. Box 97, Elkwood, VA 22718
800-345-3132

ACSICO, LLC (Automated Control Systems)
511 Route 22, Suite 211, Brewster, NY 10509
845-278-7367

AMERICAN AUTOMATED CONTROLS

EXAMPLE: Control Panel Model Number Builder



AMERICAN MANUFACTURING COMPANY, INC.

Control Panel Model Number Builder & Estimating Tool - VERSION 1.7

1-800-345-3132 ~ www.americanonsite.com

CONTROL SERIES:

ALARM:

BREAKER OPTION: If "yes", you must select phase & voltage. If "no", leave phase & voltage set to "n/a".

Phase: Select Phase

Voltage: Select Voltage

ENCLOSURE OPTION: *Remember to select Enclosure Size after selecting options.

STANDARD OPTIONS:			
* A	Auto Reset Alarm Circuit		yes
B	Bell/Horn (weatherproof)		no
* C	Cycle Counter		no
D	Delayed Lag Pump Time		no
* E	Elapsed Time Meter		no
* F	Flasher		Flasher
G	Gell Cell Battery		no
H	Hinged Inner Door		no
I	Intrinsically Safe Float Switch Relays		no
* J	Contact/Breaker Upgrade		Standard Contactor
K	External Capacitor Installation		no
* L	Locking Hasp	*REQUIRED	yes
L(f)	Lightning Arrestor		no
M	Main Breaker/Disconnect		no
N	NEMA Rated Starter		no
O	Override Switch for Alternator		no
P	Pump Fail Circuit		no
Q	Quick Disconnect Operator		no
* R	Redundant Off Float Switch		no
S	Seal Fail		no
T	Thermal Cutout		no
U	Utility Receptacle		no
V	Voltage Monitor		no
W	Weather Heater		no
X	Extra Option		SEE EXTRA OPTIONS BELOW
Y	24V Float Switch Circuit		no
Z	Oil Tight Lights & Switches		no

EXTRA OPTIONS:			
1	Overload Reset Buttons (22mm)		no
2	Float Switch Indicator		no
3	Plexiglass Enclosure Window		no
4	Branch Power Circuit		no
5	Manual Transfer Switch		no
6	Generator Receptacle/Plug		no
7	Electrode Level Control		no
8	Aerator Fail Circuit		no
9	24 Hour Clock Timer		no
10	Pump Run Timer		no
11	120 Volt Solenoid Circuit		no
12	Ball Valve Actuator		no
13	Sand Filter High Level		no
14	Telephone Dialer		no
15	Dnp Shield Kit		no
16	Floor Stand Kit		no
17	Transformer Upgrade		no
18	Circuit Breaker Padlock		no
19	Full Frame Breakers		no
20	Power Fail Circuit		no
21	Dry Alarm Contacts		no
22	Latching Alarm		no
23	Differential Float Receptacle		no
24	Conduit Hub (2 inch)		no
25	High Level Alarm Float w/ Remote Alarm Indicator		no
26	Separate Control/Alarm/Pump Supply Breakers		no

Minimum Enclosure Size Required: *See 'Enclosures' tab to check if this size is available, then make a selection.

Selected Enclosure: *This is selected by the user from the 'Enclosures' tab. **DO NOT FORGET TO MAKE SELECTION.**

Model #: **SAB124-AFJL**

List Price: \$ 341.49

This is a STANDARD PANEL.

Base Description: S - Simplex Control, Alarm, Breaker, 1 Phase, 240V in a NEMA 4X Enclosure.

Selected Standard Options: Auto Reset Alarm Circuit, Flasher, Standard Contactor (2P Definite Purpose), Locking Hasp.

Selected Extra Options:

AMERICAN AUTOMATED CONTROLS

EXAMPLE: 'Enclosure Selection' Tab

ENCLOSURE TYPES					
NEMA 1	NEMA 12	NEMA 3R	NEMA 4X	NEMA 4S	NEMA 4SS
10 X 10	8 X 6	8 X 6	8 X 6	8 X 6	8 X 6
12 X 12	10 X 8	10 X 8	10 X 8	10 X 8	10 X 8
16 X 14	12 X 10	12 X 10	12 X 10	12 X 10	12 X 10
16 X 16	14 X 12	12 X 12	14 X 12	14 X 12	14 X 12
20 X 16	16 X 14	16 X 16	16 X 14	16 X 14	16 X 14
20 X 20	20 X 16	20 X 16	18 X 16	20 X 16	16 X 16
24 X 20	24 X 20	24 X 20	24 X 20	24 X 20	20 X 16
30 X 24	30 X 24	30 X 24	30 X 24	30 X 24	24 X 20
36 X 30	36 X 30	36 X 30	36 X 30	36 X 30	30 X 24
	48 X 36	48 X 36	48 X 36	48 X 36	36 X 30
	60 X 36	60 X 36	60 X 36	60 X 36	48 X 36
					60 X 36

Select Enclosure Size for the NEMA Type Specified (highlighted below) that meets or exceeds the Minimum Required Size.

Selected Type: NEMA 4X

Leave all other drop-down boxes blank.

Min Req'd Size: 10 X 8

NEMA 1	NEMA 12	NEMA 3R	NEMA 4X	NEMA 4S	NEMA 4SS
			10 X 8		

- NEMA 1** General Purpose: Enclosures are intended for indoor use primarily to provide a degree of protection against accidental contact with the enclosed equipment or locations where unusual service conditions do not exist.
- NEMA 12** Drip-tight: Enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt.
- NEMA 3R** Weather Resistant: Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet; undamaged by the formation of ice on the enclosure.
- NEMA 4X** Corrosion Resistant: Enclosures are intended for outdoor use primarily to provide a degree of protection against corrosion, wind blown dust and rain, splashing water and hose directed water; undamaged by the formation of ice on the enclosure; made of fiberglass.
- NEMA 4S** Watertight: Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water; undamaged by the formation of ice on the enclosure; made of steel.
- NEMA 4SS** Same as NEMA 4X, except made of stainless steel.

AMERICAN AUTOMATED CONTROLS

EXAMPLE: 'Standard Panels' Tab

STANDARD AMC CONTROL PANELS

<u>MODEL #</u>	<u>ITEM #</u>	<u>DESCRIPTION</u>	<u>LIST (\$)</u>
A1-A	A1-B0001P	Alarm Control, Nema 1 Enclosure, Auto-reset Alarm (Comes with AO10 Float Switch)	126.22
A1-AX(21)	A1-B0002R	Alarm Control, Nema 1 Enclosure, Auto-reset Alarm, Dry Alarm Contacts	194.67
A1-X(22)	A1-B0013P	Alarm Control, Nema 1 Enclosure, Latching Alarm	153.99
A4-AFL	A4-B0510P	Alarm Control, Nema 4X Enclosure, Auto-reset Alarm, Flasher, Locking Hasp	216.51
DA4-JL	DA4-B2621P	Duplex Control, Nema 4X Enclosure, Alarm, Contactor, Locking Hasp	555.25
DAB111-J	DAB-B2221P	Duplex Control, 1 Phase, 120V, Nema 1 Enclosure, Alarm, Breaker, Contactor	577.32
DAB121-J	DAB-B2240P	Duplex Control, 1 Phase, 240V, Nema 1 Enclosure, Alarm, Breaker, Contactor	583.47
DAB121-CJ	DAB-B2248P	Duplex Control, 1 Phase, 240V, Nema 1 Enclosure, Alarm, Breaker, Counter, Contactor	799.00
DAB124-AEFJL	DAB-B2267P	Duplex Control, 1 Phase, 240V, Nema 4X Enclosure, Alarm, Breaker, ETM, Flasher, Contactor, Locking Hasp	838.40
DAB111-CJ	DAB-B2356P	Duplex Control, 1 Phase, 120V, Nema 1 Enclosure, Alarm, Breaker, Counter, Contactor	775.00
DAB124-ACEFJL	DAB-B2431P	Duplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, Flasher, Contactor, Locking Hasp	899.00
DAB124-AFJL	DAB-B2500P	Duplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Flasher, Contactor, Locking Hasp	619.46
DEPRAB124-AJLP(C)R	DEPR-B4666	Duplex Equalization (Repeat Cycle Timer w/ PLC) Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Contactor, Locking Hasp, Pump Fail Circuit by Current Sensor, Redundant Off Float Switch	1,363.95
DEPRAB124-AJLP(C)RX(12)	DEPR-B4667	Duplex Equalization (Repeat Cycle Timer w/ PLC) Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Contactor, Locking Hasp, Pump Fail Circuit by Current Sensor, Redundant Off Float Switch, Ball Valve Actuator Circuit	1,446.90
DEPTAB124-AJLP(C)R	DEPT-B4678	Duplex Equalization (Time of Day Timer w/ PLC) Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Contactor, Locking Hasp, Pump Fail Circuit by Current Sensor, Redundant Off Float Switch	1,596.38
DEQAB111-CEJOP(C)	DEQ-B4656P	Duplex Equalization Control, 1 Phase, 120V, Nema 1 Enclosure, Alarm, Breaker, Counter, ETM, Contactor, Override Switch for Alternator, Pump Fail Circuit by Current Sensor	1,599.00
DEQAB114-ACEJLOP(C)	DEQ-B4658P	Duplex Equalization Control, 1 Phase, 120V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, Contactor, Locking Hasp, Override Switch for Alternator, Pump Fail Circuit by Current Sensor	1,649.00
DEQAB124-ACEJLOP(C)	DEQ-B4677P	Duplex Equalization Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, Contactor, Locking Hasp, Override Switch for Alternator, Pump Fail Circuit by Current Sensor	1,699.00
DEQAB124-ACEJLO	DEQ-B4692P	Duplex Equalization Control, 1 Phase, 240V, Nema 4 Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, Contactor, Locking Hasp, Override Switch for Alternator	1,258.95
SA1-AJ	SA1-B1250P	Simplex Control, Nema 1 Enclosure, Auto-reset Alarm, Contactor	242.28
SA4-AFLX(23)X(24)	SA4-B1432	Simplex Control, Nema 4X Enclosure, Auto-reset Alarm, Flasher, Locking Hasp, Differential Float Receptacle, Conduit Hub (2 inch)	259.00
SA4-AFJL	SA4-B1528P	Simplex Control, Nema 4X Enclosure, Auto-reset Alarm, Flasher, Contactor, Locking Hasp	281.07
SA4-AEHJLMO	SA4-B1712P	Simplex Control, Nema 4X Enclosure, Auto-reset Alarm, ETM, Hinged Inner Door, Contactor, Locking Hasp, Main Breaker/Disconnect, Quick Disconnect Operator	795.00
SAB121-J	SAB-B1101P	Simplex Control, 1 Phase, 240V, Nema 1 Enclosure, Alarm, Breaker, Contactor	309.99
SAB121-JX(26)	SAB-B1103	Simplex Control, 1 Phase, 240V, Nema 1 Enclosure, Alarm, Breaker, Contactor, Separate Control/Alarm/Pump Supply Breakers	382.50
SAB124-AFJL	SAB-B1559P	Simplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Flasher, Contactor, Locking Hasp	341.49
SAB124-AEFJL	SAB-B1569P	Simplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, ETM, Flasher, Contactor, Locking Hasp	416.25
SAB124-ACEFJL	SAB-B1686P	Simplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, Flasher, Contactor, Locking Hasp	474.00
SAB124-AEFJLX(14)X(25)	SAB-B1698P	Simplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, ETM, Flasher, Contactor, Locking Hasp, Telephone Dialer, High Level Alarm Float w/ Remote Alarm Indicator	913.50
SAB124-AFJLX(21)X(22)X(26)	SAB-B1711	Simplex Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Flasher, 18 FLA Contactor, Locking Hasp, Dry Alarm Contacts, Latching Alarm, Separate Control/Alarm/Pump Supply Breakers	574.83
SEPRAB124-AJLR	SEPR-B4669	Simplex Equalization (Repeat Cycle Timer w/ PLC) Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Contactor, Locking Hasp, Redundant Off Float Switch	838.95
SEPTAB124-AJLR	SEPT-B4672	Simplex Equalization (Time of Day Timer w/ PLC) Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Contactor, Locking Hasp, Redundant Off Float Switch	1,034.25
SEQAB124-AJL	SEQ-B4192P	Simplex Equalization Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Flasher, Contactor, Locking Hasp	606.31
SEQAB124-ACEJ1LRX(21)X(22)X(26)	SEQ-B4195	Simplex Equalization Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, 18 FLA Contactor, Locking Hasp, Redundant Off Float Switch, Dry Alarm Contacts, Latching Alarm, Separate Control, Alarm & Pump Supply Breakers	899.00
SEQAB124-ACEFJL	SEQ-B4196P	Simplex Equalization Control, 1 Phase, 240V, Nema 4X Enclosure, Auto-reset Alarm, Breaker, Counter, ETM, Flasher, Contactor, Locking Hasp	815.06

Note: This list is just a portion of what American considers to be "Standard" control panels. The prices in the right column are not necessarily the current list prices. American reserves the right to change pricing at any time without notice. Call us at 1-800-345-3132 if you don't see what you are looking for or need a current list price.

AMERICAN AUTOMATED CONTROLS

EXAMPLE: 'Final Printout' Tab



AMERICAN MANUFACTURING COMPANY, INC.

Control Panel Model Number Builder & Estimating Tool - VERSION 1.7

1-800-345-3132 ~ www.americanonsite.com

CONTROL PANEL SPECS

Quote Date: 2/13/2008

Model #: **SAB124-AFJL**

List Price: **\$ 341.49**

Base Description: S - Simplex Control, Alarm, Breaker, 1 Phase, 240V in a NEMA 4X Enclosure.

Selected Standard Options: Auto Reset Alarm Circuit, Flasher, Standard Contactor (2P Definite Purpose), Locking Hasp,

Selected Extra Options:

Selected Enclosure Size: *This is selected by the user from the 'Enclosures' tab (unless panel is standard).

Company:

Contact:

Phone:

Fax:

Job Name:

Comments:

Instructions: Upon completion of the Control Panel Model Number Builder, fill in contact information above and fax this sheet to (540) 829-1031. We will contact you and give you an official AMC Quote Number that will be valid for a 30 day period.

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