Control Series	A-Alarm Option	"B"-Motor Protect	Enclosure Type	Options
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CONTROL SERIES

S	Simplex	SEQ	Simplex equalization	
D	Duplex	SEPR	Simplex equalization	
Т	Triplex	SEPRT	Simplex equalization	
Q	Quadplex	DEPR	Duplex equalization	
M	lulti-plex(five or more) DEPRT Duplex equalization		Duplex equalization	
MET	Multi-plex Equalization	MT	Multiplex Timer on demand	
CSEPR	Combination Repeat Cycle Time	CSEPRT	Combination equalization	

ALARM OPTION

(A) Indicator Light & Buzzer On Indoor Units, Red 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 a "B".

When fusible disconnects are required in place of pump breakers replace the "B" with an "F", followed by the desired phase and voltage.

ENCLOSURE OPTION

1-NEMA 1 2-NEMA 12 3-NEMA 3R 4-NEMA 4X

OPTIONS

See following pages for standard and X (Extra) options

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STANDARD OPTIONS

*	Α-	Auto Reset Alarm Circuit

B- Bell/Horn (4" weatherproof)

* C- Cycle Counter

D- Delayed Lag Pump Timer

* E- Elapsed Time Meter

* F- Flasher

F(L)- Flashing Light

F(S)- Flashing Strobe Light

F(C)- Flashing Light W/ Protective Cage

G- Gell Cell Battery

H- Hinged Inner Door

I(5)- Intrinsically Safe Float Switch Relays (508)

I(9)- Intrinsically Safe Float Switch Relays (913)

* J- Contactor/Breaker Upgrade

K- "K" Pack Installation Kit

L- Locking Hasp

L(1)- Lightning Arrestor 1 Wire W/ Gnd

L(2)- Lightning Arrestor 2 Wire W/ Gnd

L(3)- Lightning Arrestor 3 Wire W/ Gnd

L(4)- Lightning Arrestor 3 Wire W/ Gnd(460)

M- Main Breaker/Disconnect

N- Nema Rated Starter

O- Override Switch For Alternator

P(C)- Pump Fail Circuit By Current Sensor

P(F)- Pump Fail Circuit By Flow Switch

Q- Quick Disconnect Operator

* R- Redundant Off Float Switch

R(A)- Redundant Off With Alarm

S- Seal Fail Indicator

S(R)- Seal Fail Relay W/ Indicator

S(A)- Seal Fail Relay W/ Alarm

T- Thermal Cut-out

T(I)- Thermal Cut-out With Indicator

T(A)- Thermal Cut-out With Alarm

U- Utility Receptacle

U(G)- Utility Receptacle (GFI)

U(W)- Utility Receptacle (Weatherproof)

V- Voltage Monitor

V(P)- Voltage/Phase Monitor

W- Weather Heater

W(1)- Weather Heater W/ Blower(100W)

W(2)- Weather Heater(200W)

X- Extra Options

Y- 24 Volt Float Switch Circuit

Z- Oiltight Lights & Switches

* STANDARD OPTIONS

Many other options and modifications are available. Please contact our electrical engineering team for design support.

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STANDARD OPTION DESCRIPTIONS

- 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 the of 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 quard.
- 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=18 FLA, J(2)=25 FLA, J(3)=32 FLA J(4)=40 FLA, J(50)=50 FLA.
- 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.

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STANDARD OPTION DESCRIPTIONS

- 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.

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STANDARD OPTION DESCRIPTIONS

- 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
- 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
- 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.

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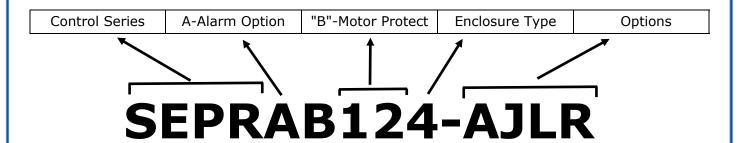
X (EXTRA) OPTIONS

- 22mm Overload reset buttons mounted through enclosure door or inner door to allow 1. manual reset of tripped starter overloads without opening door.
- 2. Float switch level indicators to give visual indication of float switch position.
- 3. Plexiglass window (available in steel or stainless steel frame) in enclosure door to view internal lights, switches, and other components without opening enclosure door.
- Branch power and control circuits. 4.
- 5. Manual power transfer switch to switch for transfering 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.
- Liquid level relay for electrode based level control system. Price one relay for pump On/Off 7. control and one relay for each additional function thereafter.
- Aerator fail circuit for use on systems with continuous running blower. Utilizes internal 8. 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, auxillary power equipment, or other control devices.
- 10. Pump run timer, adjustable from 1 second to 10 hours to control timed doses for each pump.
- Solenoid activation circuit to energize 120v remote solenoid, includes switch and indicator 11. light (solenoid not included). Other voltages are available.
- Ball valve activation circuit to energize motor-driven ball valve with position indicating 12. limit switches, includes 9 amp contactor, fuse, switch and indicator lights.
- Sand filter high level alarm circuit for use on recirculating sand filter systems. Activates 13. 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 8 separate alarm conditions and notify up to 8 separate telephone numbers.
- Drip shield kit, to be added to Nema 12 enclosure to create an industrial grade Nema 3R 15. enclosure.
- Floor stand kit to allow mounting of control panel enclosure to floor, available in steel or 16. stainless steel in various dimensions.
- Transformer upgrade to allow for operation of auxiliary power equipment, receptacles, light 17. circuits, etc.
- Circuit breaker padlock attachment to allow circuit breakers to be padlocked in on or off 18.
- 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 interuptions. Dry contacts only or complete latching alarm circuit (requires gell cell battery option "G"). Auto Reversing circuit for Zoller "840" Series Grinder Pumps.
- 21.

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DESIGN EXAMPLE



SEPR = Simplex equalization control

A = Alarm

B = Circuit Breakers

1 = Single Phase

2 = 240 volt Pump Motor

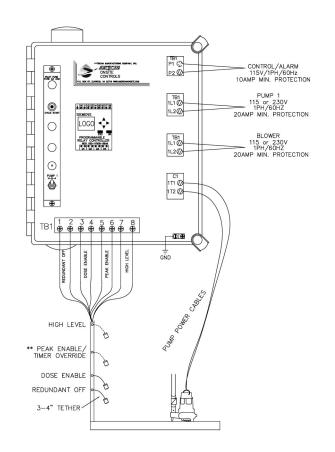
4 = NEMA 4x Enclosure

A = Auto Reset Alarm Circuit

J = Contactor/Breaker Upgrade 18FLA

L = Locking Hasp

R = Redundant Off Float Switch



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