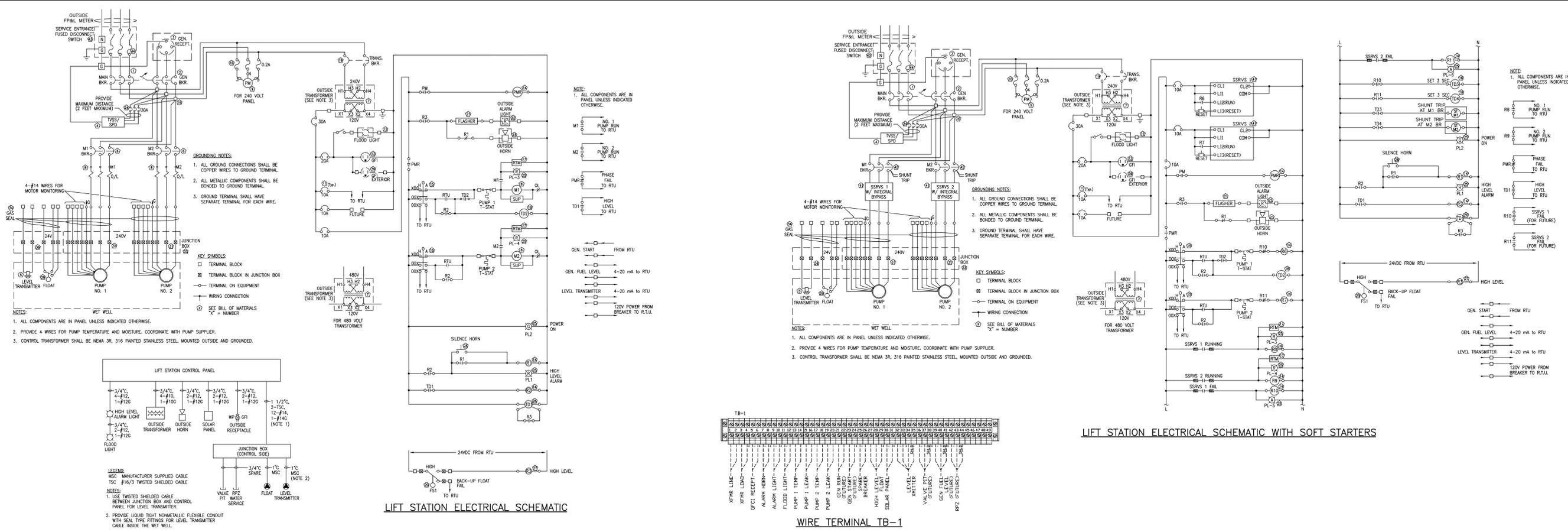


68S-74S



LIFT STATION ELECTRICAL SCHEMATIC

LIFT STATION ELECTRICAL SCHEMATIC WITH SOFT STARTERS

WIRE TERMINAL TB-1

LIFT STATION CONTROL PANEL RISER

ITEM	NAME	DESCRIPTION	MANUFACTURER	QTY	UNIT
1	Main Breaker	30-100 Amp, 240 volt, 25k AC (minimum)	Powerpact H-Frame	1	Breaker
2	Generator Breaker	4-wire, 100 Amp (Same as Main)	RussellStoll	1	Breaker
3	Generator Receptacle	4-wire, 100 Amp high leg delta (connect high leg to terminal L3)	Atlantic Scientific	1	Receptacle
4	Level Transmitter	Level sensor w/ float. Cable length 30 feet	Pulsar	1	Transmitter
6	Motor Circuit Breaker	Magnetic only 30 600 volt size per motor (25k AC min.)	Square D	2	Breaker
7	120V Transformer	3 kVA, 240/480 to 120/240 Panel, 316 Stainless Steel w/Transient Suppression Module	Square D	2	Transformer
8	Motor Starter	3p, NEMA size 1 (min.)	Square D	2	Starter
9	Phase Monitor	Plug-in 8 pin 240 volt, 3p	Diversified Busman	1	Monitor
10	Fuse	600 volt, 25k AC (min.)	Hubbell	1	Fuse
11	120V Circuit Breakers	Thermal Magnetic, 20A, Spec Grade	Square D	2	Breaker
12	Outside Floodlight	Per 30, 100W	Sibco	2	Floodlight
13	Panel Outlet	120V GFI Duplex, 20A, Spec Grade	Hubbell	1	Outlet
14	Control Relay 120vac	Ph with LED light, 120V, 120V	Square D	2	Relay
15	Pump Selector	DPDT 8 Cylindrical Pin, Round base with LED light, 24VDC	Square D	2	Selector
16	Block	3p - (2) 300KCM - #4	Marathon	1	Block
17	Running Time	2 inch Square, 120 volt	Redington	1	Relay
18	Time Delay Relay	1 to 1023 Seconds, 8 Pin Base, TBC-120-ABA	Square D	1	Relay
19	Transformer Breaker	120 volt, 25k AC (Min.)	Diversified	1	Breaker
20	Motor Temperature and Moisture Detector	Relay - 120vac or 24VDC As Specified by Pump Supplier	SSAC	1	Detector
21	Flasher	FS127	SSAC	1	Flasher
22	Outside Alarm Light	Phd. 30W with Guard, 100W Lamp	Edwards Signals	1	Light
23	Outside Alarm Horn	120 volt Weatherproof	HCL 36030	1	Horn
24	VSS/SPD Breaker	3p-30 Amps, 25k AC (Min.)	Square D	1	Breaker
25	Phase Monitor	Plug-in 8 pin 240 volt, 3p	SSAC	1	Monitor
26	Time Delay Relay	1 to 1023 Seconds, 11 Pin Base, DPDT 8 Cylindrical Pin, Round base with LED light, 24VDC	Square D	2	Relay
27	Control Relay 24Vdc	DPDT 8 Cylindrical Pin, Round base with LED light, 24VDC	Square D	2	Relay
28	Silencing Horn	Encapsulated Switch, Integral cond w/ NO and NC Contacts	Anchor Scientific	1	Horn
29	Float Switch	Max. 40' cord	Phenix	1	Switch
30	RTU Wire Terminal	Feed-Through Modular Block	Monitron	1	Terminal
31	Junction Box Power	Insulated, 300V Power Splitter	Phenix	1	Box
32	Terminal Blocks	16, 3P, 14x1.75x1.75	Phenix	1	Block
33	Control Panel	16, 3P, 14x1.75x1.75	Phenix	1	Panel
34	Junction Box	24VDC, 14x1.75x1.75	Phenix	1	Box
35	Gas Sealing Hub	1/2" Sealing Hub	O.Z. Seelony	1	Hub
36	Reinight Conduit Hub	3/4" x 3/4" x 3/4"	Square D	1	Hub
37	Control Wire Terminal	Box Lug Type - Roll Mount	Square D	1	Terminal
38	RTU	Copper Tin Plated Remote Telemetry Unit	Curry Control Co.	1	Unit
39	Exterior Outlet	120V GFI Duplex, 20A, Spec Grade w/Weatherproof box and cover	Hubbell	1	Outlet
40	DC Miniature Breaker	Pole and Amp As Shown	Square D	1	Breaker
41	Soft Starter/SSRC	w/ Integral bypass and fan	Square D	2	Starter
42	Motor Circuit Breaker	Magnetic only 30 600 volt size per motor (25k AC min.)	Square D	2	Breaker
43	Service Entrance Fused Disconnect Switch	600V, 3p, Nema 4x 316SS w/ class 101 lugs (Nema same as Main)	Square D	1	Switch
44	Service Fuse	600V, Dual element, time delay fuses class RR1 (See same as Main)	Busman	1	Fuse

BILL OF MATERIALS (CONTROL PANEL)

(ALL ELECTRICAL COMPONENTS AND ASSEMBLIES MUST BE UL LISTED/APPROVED)

NOTE: ALL ELECTRICAL COMPONENTS AND ASSEMBLIES MUST BE UL LISTED/APPROVED

LIFT STATION CONTROL PANEL BILL OF MATERIALS

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NOTES ON 240V PANELS:

- This is the minimum size pump station panel for under 15 hp at 240 volts, 3p, larger than 15 hp items 1, 2, 6, and 8 change. Minimum service size 100 AMP. Minimum service wires and conduit 3-#4, 1-#4, 2". Minimum wires and conduit for motors between control panel and junction box 3-#8, 1-#10, 1/2" plus 4-#14 for motor temperature and moisture sensors.
- Short circuit amps rating of circuit breaker and panel shall equal or exceed system S.C. amps. Contractor shall confirm this value with the power company and order the panel accordingly. In addition, the minimum S.C. amp rating of the panel shall be as follows:

For 100 amps	25,000 amps
For 101 to 250 amps	42,000 amps
- For two (2) motors 15 h.p. and up, size components per the following table for 240 volt 3 phase services. Soft Starters shall be provided for motors 20 h.p. and up.

MOTOR H.P.	MOTOR AMPS	SERVICE MINIMUM	MAIN BREAKER	CIRCUIT BREAKER	MOTOR STARTER	SERVICE WIRES AND CONDUIT	MOTOR WIRES AND CONDUIT (BETWEEN C.P. AND J-BOX)
15	42	107	100	NEMA-2	3-#1/0, 1-#4, 2"	3-#6, 1-#8, 1/2"	
20	54	134	175	100	ATS22D7556U	3-#2/0, 1-#4, 2"	3-#4, 1-#8, 1/2"
25	68	165.5	200	100	ATS22D8856U	3-#1/0, 1-#4, 2"	3-#2, 1-#6, 1/2"
30	80	192.5	250	125	ATS22C1156U	3-250KCM, 1-#2, 3"	3-#2, 1-#6, 1/2"

NOTES ON 480 VOLT PANELS:

- The following components shall change:

ITEM	NAME	DESCRIPTION	MANUFACTURER	TYPE
3	Generator Receptacle	4 wire 200 amp	RussellStoll	ZoneSentinel 34HR
4	VSS/SPD	277/480v, 3 phase, 4 wire	Atlantic Scientific	ZoneSentinel 12104
9	Phase Monitor	8 pin 480 volt, 3p	MPE	601-480-118
19	Transformer Breaker	2p-115 Amps, 25k AC (Min.)	Square D	HCL 28015
- The 480 volt short circuit rating of panel shall equal or exceed system S.C. amps. Contractor shall confirm this value with the power company and order the panel accordingly. In addition, the minimum S.C. amp rating of the panel shall be as follows:

For 100 amp service	18,000 amps
For 200 to 250 amp service	42,000 amps

LIFT STATION CONTROL PANEL 240V & 480V PANEL NOTES

LIFT STATION ELECTRICAL STANDARD DETAILS 1 OF 3

67S

CONSULTANT:

DESIGNED BY: WUD

DRAWN BY: WUD_CADD

CHECKED BY: A. GALICKI

APPROVED BY: WUD

Palm Beach County Water Utilities Department P.O. Box 16097 West Palm Beach, FL 33416-6097

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UTILITIES NOTIFICATION CENTER

63S-65S

ELECTRICAL PANEL SPECIFICATIONS

- Panel Builder**
 - The panel builder shall be experienced in the construction of lift station control panels, shall have a UL approved shop. Panel shall be UL listed and UL labeled as service entrance equipment.
 - The panel builder shall warrant the panel for one (1) full year minimum from the date of final project certification.
 - The panel builder or qualified technical representative shall check-out and test the panel as part of the lift station start-up.
- Panel Components**
 - The panel components are specified on the drawings with the exception of items described in these specifications. Items are listed by manufacturer and catalog numbers, other equal quality components may be substituted but they must be fully interchangeable with those specified in size, function, mounting dimensions, plug-in connections, and ampacity. Any substitutions or changes must be approved in advance and in writing by the utility department. All components shall be new with no signs of evidence of corrosion.
- Enclosure**
 - The panel with size 1, or 2 starters shall be minimum 36 inch wide x 60 inch high x 12 inch deep (36"W x 60"H x 12"D). The panel with soft starters shall be minimum 36 inch wide x 66 inch high x 18 inch deep (36"W x 66"H x 18"D). Larger panel may be installed if required by UL and NEC specifications for service intended. A shop drawing must be submitted prior to preconstruction meeting. Top of panel shall not be higher than 6" above slab, unless approved in advance by the department. The panel shall be of a modified NEMA 3R construction with the following features:
 - Constructed of 304 stainless steel 14 gauge. Enclosure shall have powder coated white stainless steel body and door. All seams to be continuously welded, spot welded panels will not be accepted.
 - All external hardware shall be stainless steel with piano hinge, three-point latch with roller fitting top and bottom and single handle with padlock fitting and stainless steel external parts.
 - Full length welded drip shield to deflect water from the door, a continuous closed cell neoprene gasket on the door.
 - Blank outer door with dead front inner door of 1/8" thick aluminum hinged on the left with the operators controls mounted on or projecting through it.
 - Provide stainless steel or Aluminum back mounting plate for heavy components (min. .090 thickness).
 - A removable min. 1/8 inch thick lexan cover shall be provided on the incoming line terminals.
 - The outer door is to have nine inch by eleven inch (9" x 11") stainless steel or aluminum pocket for log book, tack weld to door.
 - Arms and latches shall hold both outer door and inner door in an open position, these must be sufficiently rigid and secure to hold doors open under windy weather conditions any may be placed one on top and one on bottom.
 - Sliding locking bar to allow only main or emergency breaker to be closed. Bar shall be aluminum with stainless steel hardware.
 - No penetration through the panel will be allowed except for conduits on bottom, and for generator receptacle and transformer conduit on the side, i.e. no screws through panel, outer door or frame.
 - The enclosure shall be the product of a UL approved manufacturer and shall be a modified NEMA-3R enclosure. Manufacturer shall be Hoffman or approved equal. Enclosure shall have lugs for mounting.

PUMP	MOTOR
a. Brand	a. Horsepower
b. Catalog number	b. Speed
c. Impeller number and size	c. Voltage
d. Design head	d. Full load amps
e. G.P.M.	e. Catalog number
f. Serial numbers	f. Serial numbers
- Wiring**
 - All wiring shall be copper THWN or approved equal, AWG 14 minimum. Color code wires as follows:

Ground	Green
Grounded Neutral	White
120 Volt Power	Black
Control	Red
24 Volt Control	Blue

 Different control wiring colors are acceptable if clearly identified. Power wiring shall be kept separate from control wiring, and shall be identified by phase. The high leg shall be the center terminal on the main breaker.
 - All wires shall be numbered with machine made plastic wrap around labels at both ends.
 - All external connection and internal connections, where shown on the drawings, shall be brought to the numbered terminals.
 - Wiring shall be enclosed in conduit or equivalent wireways and wiring between the doors and the panel shall be enclosed in a spiral wrap or approved equal with sufficient slack to allow full opening of the door.
 - Wiring shall be secured with screw-on tabs, tabs with adhesives shall not be used.
 - All wiring shall be front accessible.
 - All electrical wiring must meet or exceed National Electric Code and Local Code Standards.
 - Any place that electrical wire passes through a metal cover or shield, insulating grommet is required to protect the wire.
- Component Mounting**
 - All components shall be securely mounted with stainless steel hardware. Self tapping screws are not acceptable.
 - All relay bases shall be front mounted with screw terminals, no soldered connections shall be used. All base terminals shall be numbered to correspond to relay numbers. Where plug-in components are not firmly secured in bases, hold down clamps shall be provided.
- Identification**
 - All components shall be identified in accordance with the schematic diagram, using permanent name tags on the panel of laminated mica or approved equal. The permanent name tags shall be securely attached and in a position where they are clearly visible.
 - Alarm Light - Item 22
 - Outside Floodlight - Item 12
 - 120 Volt Transformer - Item 7
 - Junction Box - Item 33
 - Alarm Horn - Item 23
 - Outlet 120v - Item 39
 - All operator's controls shall be provided with laminated mica or name tags attached with stainless steel screws, with minimum lettering height of 1/8 inch.
 - Provide a laminated schematic drawing attached to the inside of the outer door - minimum size 11 inches by 17 inches (11" x 17").
 - Attach a separate stick-on label showing the following details:
 - Soft Starters shall be provided in the control panel for the lift stations which have 20HP motors and larger. Soft Starters shall be solid state reduced voltage starter type with integral bypass, fan and display. Soft starters line voltage shall be rated from 240V to 480V, 3p. Control supply voltage, control logic inputs and fan supply voltage for soft starters shall be 120V. Soft Starters shall be rated to operate at higher ambient temperature. Oversize soft starter rating minimum one size higher than motor HP. All soft starter settings shall be set and adjusted properly for functional operation of lift station. Set ramp up time to "5 sec", ramp down time to "Off", overload protection to "On", over current time delay to "5 sec", under and over voltage time delay to "10 sec", the line voltage, and motor full load amp per motor nameplate, etc. Disable all the protection features including phase loss, phase reverse, under, unbalance and ground current. Only overload protection shall be enable.
- Loose Components**
 - Ship the following for mounting by the site electrician.
 - Alarm Light - Item 22
 - Outside Floodlight - Item 12
 - 120 Volt Transformer - Item 7
 - Junction Box - Item 33
 - Alarm Horn - Item 23
 - Outlet 120v - Item 39
- Soft Starters (SSRVs - Item 41)**
 - Soft Starters shall be provided in the control panel for the lift stations which have 20HP motors and larger. Soft Starters shall be solid state reduced voltage starter type with integral bypass, fan and display. Soft starters line voltage shall be rated from 240V to 480V, 3p. Control supply voltage, control logic inputs and fan supply voltage for soft starters shall be 120V. Soft Starters shall be rated to operate at higher ambient temperature. Oversize soft starter rating minimum one size higher than motor HP. All soft starter settings shall be set and adjusted properly for functional operation of lift station. Set ramp up time to "5 sec", ramp down time to "Off", overload protection to "On", over current time delay to "5 sec", under and over voltage time delay to "10 sec", the line voltage, and motor full load amp per motor nameplate, etc. Disable all the protection features including phase loss, phase reverse, under, unbalance and ground current. Only overload protection shall be enable.