

PUMPING SYSTEM CONTROLLERS

TYPE FTA

SIMPLEX, DUPLEX, AND TRIPLEX



Peerless Pump Company

4851358

Rev. 2/92

**PUMPING SYSTEM CONTROLLERS
TYPE FTA
SIMPLEX, DUPLEX, AND TRIPLEX**

A general Description of the FTA Controller is as follows:

Simplex Motor Controllers

FTA 610

- FTA610-LF Peerless Standard Simplex Controller
- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
 - B. One main disconnect with external handle and door interlock.**
 - C. Motor fuse block, fuses, motor starter, H-O-A switch and RUNNING pilot light for one motor.

- D. One 120 volt control circuit transformer with primary and secondary fuses.
- E. Requires one incoming feeder circuit sized for the motor horsepower and any other included loads.

- FTA610-LG Peerless Simplex Controller
- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
 - B. One main circuit breaker with external handle and door interlock.**
 - C. Motor starter, H-O-A switch and RUNNING pilot light for one motor.

- D. One 120 volt control circuit transformer with primary and secondary fuses.
- E. Requires one incoming feeder circuit sized for the motor horsepower and any other included loads.

Duplex Motor Controllers

FTA 620

- FTA620-LF Peerless Standard Duplex Controller
- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
 - B. One main disconnect with external handle and door interlock.**
 - C. Motor fuse block, fuses, motor starter, H-O-A switch and RUNNING pilot light for each of two motors.

- D. One 120 volt control circuit transformer with primary and secondary fuses.
- E. Requires one incoming feeder circuit sized for the motor horsepower and any other included loads.

- FTA620-LA Peerless Duplex Controller
- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
 - B. One main disconnect with external handle and door interlock.**
 - C. Motor circuit breakers (Std AIC), motor starters, H-O-A switches and RUNNING pilot light for each of two motors.

- D. One 120 volt control circuit transformer with primary and secondary fuses.
- E. Requires one incoming feeder circuit sized for the motor horsepower and any other included loads.

FTA620-LG Peerless Standard Duplex Controller

- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor application.
- B. Two motor circuit breakers (STD AIC) with external handles and door interlocks.**
- C. Motor starters, H-O-A switches and RUNNING pilot lights for each of two motors.

FTA620-LM Peerless Duplex Pump Controller

- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
- B. Two disconnect switches with external handle and door interlock.**
- C. Motor fuse blocks, fuses, starters, H-O-A switches and RUNNING pilot lights for each of two motors.

- D. One 120 volt control circuit transformer with fused primary and secondary.
- E. Requires two incoming feeder circuits, each sized for its assigned motor horsepower and any other included loads.

- D. One 120 volt control circuit transformer with fused primary and secondary.
- E. Requires two incoming feeder circuits, each sized for its assigned motor horsepower and any other included loads.

Triplex Motor Controllers

FTA 630

FTA630-LF Peerless Standard Triplex Pump Controller

- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
- B. One main disconnect with external handle and door interlock.**
- C. Motor fuse blocks, fuses, motor starters, H-O-A switch and RUNNING pilot light for each of three motors.

- D. One 120 volt control circuit transformer with fused primary and secondary.
- E. Requires one incoming feeder circuit sized for the total motor horsepower and any other included loads.

FTA630-LA Peerless Triplex Pump Controller

- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
- B. One main disconnect with external handle and door interlock.**
- C. Motor circuit breakers (Std AIC), motor starters, H-O-A switches and RUNNING pilot lights for each of three motors.

- D. One 120 volt control circuit transformer with fused primary and secondary.
- E. Requires one incoming feeder circuit sized for the total motor horsepower and any other included loads.

FTA630-LG Peerless Triplex Pump Controller

- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
- B. Three motor circuit breakers (STD AIC) with external handles and door interlocks.**
- C. Motor starters, H-O-A switches and RUNNING pilot light for each of three motors.

- D. One 120 volt control circuit transformer with fused primary and secondary.
- E. Requires three incoming feeder circuits, each sized for its assigned total motor horsepower and any other included loads.

FTA630-LM Peerless Triplex Pump Controller

- A. NEMA 3R, single compartment, raintight enclosure suitable for indoor/outdoor applications.
- B. Three disconnect switches with external handle and door interlock.**
- C. Motor fuse blocks, fuses, motor starters, H-O-A switches and RUNNING pilot light for each of three motors.

- D. One 120 volt control circuit transformer with fused primary and secondary.
- E. Requires three incoming feeder circuits, each sized for its assigned total motor horsepower and any other included loads.

OPERATION DESCRIPTION OF THE FTA CONTROLLER IS AS FOLLOWS:

INSTALLATION: Before installation, check the controller horsepower, voltage and phase information to see that it agrees with the incoming power available and pumping equipment supplied. Check system pressure to make sure it is compatible with the controller. See "Selection Data Sheet" for "options" and design parameters of controller. If not compatible, contact the pump supplier and do not proceed with installation. The controller electrical specifications are located on a silver and black identification plate mounted inside the controller door.

Check to see that the disconnect switch and Hand-Off-Automatic (H-O-A) switches are "OFF" prior to installation. Check inside the controller for bolts, nuts and electrical connections which may have loosened or been damaged during shipment.

The controller was shipped with dual element fuses or circuit breakers. Replacement fuses or circuit breakers should be of the same type, current and voltage rating. Adequately sized wiring, based upon National Electric Code requirements, is to be connected to the top of the disconnect switch and between the overload relays and the individual pump motors.

START-UP: Energize the incoming power to the controller by turning the disconnect switch "ON".

CAUTION: Measure the line voltage at the disconnect switch and confirm that the voltage readings between all three line phases are equal and agree with the controller nameplate rated voltage.

Turn the disconnect switch "OFF".

Close and secure the enclosure door with the locking door handle. Confirm the selectors switches are "OFF" then turn the disconnect switch handle "ON".

Refer to the pump instruction manual for the proper procedure for checking pump motor rotation. When that procedure is complete, motor rotation may be checked by momentarily turning the individual H-O-A selector switches to "HAND". Motor rotation may be reversed by first turning the disconnect switch "OFF", opening the enclosure door, and reversing two of the three motor leads at the point where they connect to the overload relay. Confirm correct rotation by securing the enclosure door, turning the disconnect switch "ON" and energizing the motors using the "HAND" position. When correct motor rotation has been established, follow the pump instruction manual procedure for returning the pumps to an operable condition.

With the incoming power "ON" and pump rotation verified, the controller is ready for initial start-up operation. Consult the pump installation instruction manual to see that the pumps and system piping are ready for proper operation.

The control circuit power for sequencing and alarm functions is provided by a 120 volt control circuit transformer connected between L1 and L2 on LOAD side of disconnect switch. The transformer is sized for

the specified line voltage and has two fuses located in its primary circuit. The 120 volt output of the transformer is also fused and connected to terminals 2 and 3 of the control circuit. 120 volt power is available to the control circuit whenever the disconnect switch is "ON".

CAUTION: Controllers may be supplied with automatic operating devices such as pressure switches of transducers, timers and alarms. These devices must be "SET" before attempting operation. No inspection, service or maintenance work should be attempted on the pumps, motors or controls without first turning the disconnect switch "OFF". The **FTA Controller** has the system pressure, delay on start and minimum run timers located in an electric sequencing control. Refer to **Instructions: Electronic Sequencing Control**, bulletin FTA 461 for these adjustments which is included in this manual.

After electronic sequencing control settings are completed, the **FTA Controller** may be placed in manual or automatic position.

MANUAL OPERATION: Controllers are furnished with an individual H-O-A switch for each pump motor. Either one or multiple pumps may be run manually by turning their individual selector switches to "HAND". They may be stopped by turning the switches to "OFF". Controllers equipped with one or more alarms and shutdown options may be prevented from operating due to the alarm actuation. Refer to the appropriate alarm option for their operation and adjustment.

AUTOMATIC OPERATION: Automatic operation is accomplished by turning both H-O-A switches to "AUTO". Equipment operation is determined by the type of options included in the controller. Refer to options 4 through 65.1 for description.

OPTIONS, GENERAL: Controllers are supplied with options which meet pumping systems requirements.

REFER TO THE SELECTION DATA SHEET FOR OPTIONS SUPPLIED WITH THIS CONTROLLER. The functional description of each option is located by its numerical designation. The wiring diagrams furnished for this controller will provide the proper instructions for field installation and trouble-shooting of the controller. Also, options supplied are stamped on inside of enclosure door.

NOTES FOR SIMPLEX, DUPLEX AND TRIPLEX CONTROLLERS:

1. All controls are furnished in accordance with the National Electric Code.
2. Motor overload device sizes supplied in magnetic starters are furnished in accordance with the full load ampere ratings for motors as specified by the correct National Electric Code.
3. For pump systems where the pump may be run at shutoff, it is recommended that a temperature controlled purge valve be ordered for the pump. Failure to comply with this recommendation will void equipment warranty.

**OPTIONS: PUMPING SYSTEM CONTROLLERS
PEERLESS PUMP TYPE FTA**

OPTION NO.	OPTION NAME	DESCRIPTION
4	NEMA 4 water-tight	Type 4 enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water and hose directed water. They are not intended to protect against internal icing. Enclosures are painted steel.
12	NEMA 12 outlight enclosure	Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids. They are intended to provide protection against internal icing.
13	Thermostat and anti-condensation space heater	Space heater, thermostat and line circuit breaker mounted in controller and wired to terminal strip for connection to external power source. Specify 120 or 240V, 1 phase power.
14	Humidistat and anti-condensation space heater	Space heater, humidistat and line circuit breaker mounted in controller and wired to terminal strip for connection to external power source. 120 or 240V, 1 phase power.
15	External overload reset pushbutton	Reset pushbutton mounted through controller door for external operation of motor overload relays.
18	Floor mounting feet	External mounting feet, factory installed on standard wall mount type enclosure. Feet add 18 inch additional height to controller. Feet are painted steel.

OPTION NO.	OPTION NAME	DESCRIPTION SEQUENCING OPERATIONS
20	Manual alternation (Duplex)	Pump lead-lag status is determined by manual selector switch mounted on the controller.
20.1	Manual alternation (Triplex)	Pumps 1 and 2 lead-lag status is determined by a 2-position manual selector switch mounted on the controller.
20.2	Manual alternation (Triplex)	Pumps 2 and 3 lead-lag status is determined by a 2-position manual selector switch mounted on the controller.
20.3	Manual sequence alternation (Triplex)	Pumps lead-lag status is determined by 3-position selector switch mounted on controller for alternating pumps as follows: 1-2-3, 2-3-1, 3-1-2.
23	24 hour clock alternation (Duplex)	Clock motor driven alternator switches pump lead-lag status once each 24 hours.
23.1	24 hour clock alternation (Triplex)	Clock motor driven alternator switches pump lead-lag status of pumps 1 and 2 once each 24 hours.
23.2	24 hour clock alternation (Triplex)	Clock motor driven alternator switches pump lead-lag status of pumps 2 and 3 once each 24 hours.

**OPTIONS: PUMPING SYSTEM CONTROLLERS
PEERLESS PUMP TYPE FTA**

OPTION NO.	OPTION NAME	DESCRIPTION SEQUENCING OPERATIONS
23.3	24 hour clock alternation (Triplex)	Pumps lead-lag status changes every 24 hours by clock motor driven alternator as follows: 1-2-3, 2-3-1, 3-1-2. Changes once every 24 hours.
24	7 day clock (same time, any day) alternation (Duplex)	Clock motor driven alternator switches pump lead-lag status at one specified time on any of 7 days.
24.1	7 day clock (same time, any day) alternation (Triplex)	Clock motor driven alternator switches pump lead-lag status of pumps 1 and 2 at one specified time on any of 7 days.
24.2	7 day clock (same time, and day) Alternation (Triplex)	Clock motor driven alternator switches pump lead-lag status of pumps 2 and 3 at one specified time on any of 7 days.
24.3	7 day clock (same time, any day) alternation (Triplex)	Pump lead-lag status changes due to 7-day clock motor alternator. Alternates pumps as follows: 1-2-3, 2-3-1, 3-1-2. Changes are specified time on any of 7 days.
25	7 day programmed Clock (any time, any day) alternation (Duplex)	Clock motor driven alternator switches pump lead-lag status at different times on different days of a 7-day week.
25.1	7 day programmed clock (any time, any day) alternation (Triplex)	Clock motor driven alternator switches lead-lag status of pumps 1 and 2 at different times on different days of a 7-day week.
25.2	7 day programmed clock (any time, any day) alternation (Triplex)	Clock motor driven alternator switches lead-lag status of pumps 2 and 3 at different times on different days of a 7-day week.
25.3	7 day programmed clock (any time, any day) alternation (Triplex)	Pumps lead-lag status changes due to 7-day programmable clock motor alternator. Alternates pumps as follows: 1-2-3, 2-3-1, 3-1-2. Changes pump sequence at different times on different days of a 7-day week.
25.4	Automatic Alternator (Duplex)	Use Book Description
26	Automatic Sequence Alternation (Triplex)	3-stage automatic alternator sequences lead-lag status of pump each time lead pump pressure switch calls for pump operation. Alternates as follows: 1-2-3, then 2-3-1, then 3-1-2 each pressure cycle.

**OPTIONS: PUMPING SYSTEM CONTROLLERS
PEERLESS PUMP TYPE FTA**

OPTION NO.	OPTION NAME	DESCRIPTION SEQUENCING OPERATIONS
27	Non-additive automatic start-stop by pressure & minimum run timer. 250 psi working pressure	One selected pump is started by adjustable pressure transducer with digital pressure readout. Pump starts on pressure drop after 0-60 second adjustable time delay. Pump stops when pressure reaches higher adjustable set point and minimum run timer (programmable from 15 seconds to 127 minutes) has completed timed period. H-O-A switch selects active pump. This option may be combined with either manual or time clock alternations options.
27.1	Non-additive automatic start-stop by pressure & minimum run timer. 250 psi max. working pressure.	One selected pump is started by adjustable pressure transducer with digital pressure readout. Pump starts on pressure drop after 0-60 second adjustable time delay. Pump stops when system reaches Low Flow conditions by flow switch * and minimum run timer (programmable from 15 seconds to 127 minutes) has completed timed period. H-O-A switch selects active pump. This option may be combined with either manual or time clock alternations options.
28	Additive, automatic start-stop by pressure & minimum run timer; v continuous duty lead pump 250 psi maximum working pressure	Lead pump runs continuously. Lag pump(s) started by adjust point(s) pressure transducer with digital readout. Lag pump(s) start on pressure drop after 0-60 second adjustable time delay. Lag pump(s) stop when system pressure reaches higher adjustable set point(s) and min. run timer(s)-programmable from 15 second to 127 minutes-have completed time period(s). This option may be combined with either manual or time clock alternation options.
28.1	Additive, auto. start by pressure auto. stop by flow switch, pressure and minimum run timer. Continuous duty lead pump. 250 psi maximum working pressure	Lead pump runs continuously. Lag pump(s) started by adjustable point(s) pressure transducer with digital readout. Lag pump(s) start on pressure drop after 0-60 second adjustable time delay. Lap pump(s) stop when pressure is satisfied and system falls to a pre-determined flow rate by flow switch(es) and minimum running period timer(s)-programmable from 15 seconds to 127 minutes-have completed time period(s). This option may be combined with either manual or time clock alternation options.
29	Additive, automatic start-stop by pressure and minimum run timer; lead pump shutdown 250 psi maximum working pressure	Lead and lag pumps are started and stopped by pressure transducer with individual start-stop set point. Pressure displayed on digital readout. Pumps start on pressure drop after set point is reached and an adjustable 0-60 second time delay has elapsed. Pumps stop on higher pressure when individual stop set points are reached and individual minimum run timers-programmable form 15 seconds to 127 minutes-have completed time periods. All start-stop and timer settings adjustable. This option may be combined with either manual or time clock alternation options.
29.1	Additive, auto. start by press. Automatic stop by flow switch, pressure and minimum run timers; lead pump shut down 250 psi maximum working pressure	Lead and lag pumps are started and stopped by pressure transducer with individual start-stop set point. Pressure displayed on digital readout. Pumps start on pressure drop after set point is reached and an adjustable 0-60 second time delay has elapsed. Pumps stop when pressure setpoint is reached and flow falls to a pre-determined flow rate via flow switch(es) and individual minimum run times-programmable from 15 seconds to 127 minutes-have completed time period(s). All start-stop and timer settings are adjustable. This option may be combined with either manual or time clock alternating options.

*Flow switch(es) will be mounted on a flanged spool piece and shipped separately for field mounting and wiring. Customer must specify spool piece diameter that is required for discharge piping.

**OPTIONS: PUMPING SYSTEM CONTROLLERS
PEERLESS PUMP TYPE FTA**

OPTION NO.	OPTION NAME	DESCRIPTION
30	500 psi maximum working pressure	500 psi maximum working pressure transducers furnished.
31.1	4-1/2 inch dia. pressure gauges	Suction, discharge or system pressure gauges.
31.2	Wing panel**	Wing panel for gauges or pressure switches.

**Peerless will mount wing panels on controller enclosure only when furnished as "Packaged" unit. Unmounted controllers will have wing panels shipped unmounted.

OPTION NO.	OPTION NAME	DESCRIPTION OPERATORS AND INDICATOR OPTIONS
40	Power On pilot light	Pilot light with white lens mounted on controller indicates power "on" at controller disconnect switch.
41	Pump running pilot lights	Pilot lights with green lenses mounted on standard controller indicated power applied to individual pump motors.
43	Visible low pressure alarm automatic reset (for suction or discharge)	Pressure switch* and pilot light with red lens mounted and wired for visible indications of low suction or low discharge pressure. Switch actuates at adjustable set point and automatically resets at adjustable higher set point. Pumps run.
43.1	Pump shut-down	Pumps shut down when alarm is actuated.
44	Visible high pressure alarm, automatic reset (for suction or discharge)	Pressure switch* and pilot light with red lens mounted and wired for visible indication of high suction or high discharge pressure. Switch actuates at adjustable set point and automatically resets at adjustable lower pressure set point. Pumps run.
44.1	Pump shut-down	Pumps shut down when alarm is actuated.
46	Audible & visible low pressure alarm, manual reset (for suction or discharge)	Pressure switch*, pilot light with red lens, relay, audible device and silence/reset pushbutton, factory mounted and wired. Switch actuates at adjustable set point indicating low pressure. Alarm is manually reset when pressure reaches adjustable higher set point and silence/reset button is depressed. Pumps run.
46.1	Pump shut-down	Pumps shut down when alarm is actuated.
47	Audible & visible high pressure alarm manual reset (for suction or discharge)	Pressure switch*, pilot light with red lens, relay, audible device and silence/reset pushbutton, factory mounted and wired. Switch actuates at adjustable set point indicating high pressure. Alarm is manually reset when pressure reaches adjustable, lower set point and silence/reset button is depressed. Pumps run.
47.1	Pump shut-down	Pumps shut down when alarm is actuated.

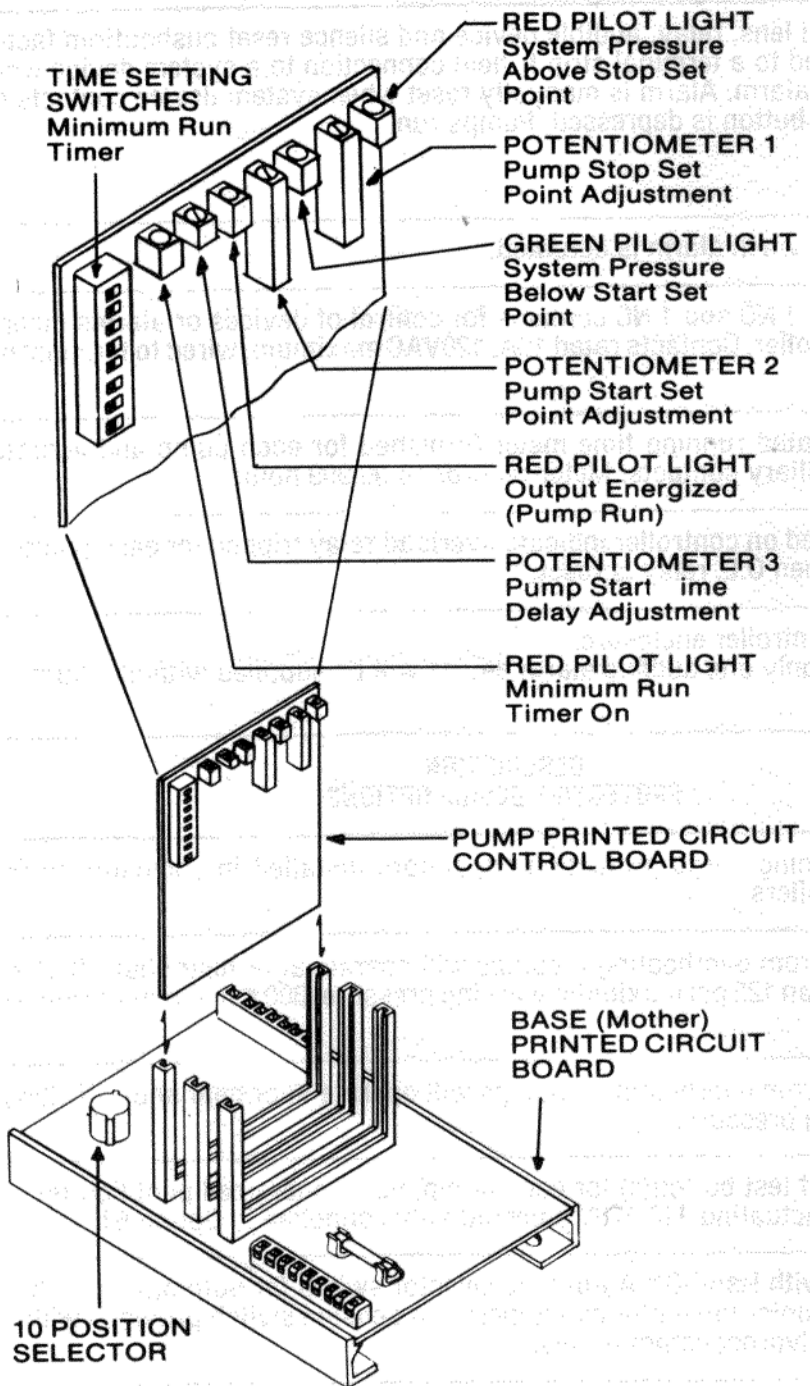
**OPTIONS: PUMPING SYSTEM CONTROLLERS
PEERLESS PUMP TYPE FTA**

OPTION NO.	OPTION NAME	DESCRIPTION OPERATORS AND INDICATOR OTIONS
48	Audible & visible alarm for switches provided by others (remotely mounted high or low water level or pressure switch)**	Pilot light with red lens, relay, audible device silence reset pushbutton factory mounted and wired to a terminal strip fr field connection to a system device when contact closes to alarm. Alarm is manually reset when system device contacts open and silence/reset button is depressed. Pumps run.
48.1	Pump shut-down	Pumps shut down when alarm is actuated.
49	Remote Alarm Contacts	Control relay with 1 NO and 1 NC contacts for control of devices or alarms mounted remote from controller. Contacts rated 10A, 120VAC maximum, wired to terminal blocks in controller.
50	Elapsed Time Meter	Clock motor operated running time meter furnished for each pump and actuated by motor starter auxiliary contacts. Meter records to 99,999 hours.
51	Visible motor Overload	Pilot lights mounted on controller indicate overload relay tripped for each pump motor started. Resets when O.L. relay is reset.

* Pressure switches are mounted on the side of the controller enclosure.

* * If more than one audible alarm function is ordered, only one audible alarm device will be supplied with all alarm

OPTION NO.	OPTION NAME	DESCRIPTION PROTECTIVE DEVICE OPTIONS
60	Lighting Arrestors	Three phase lightning surge protection capacitors installed in enclosure to protect motors and controllers.
61	Pump Thermal Safety Valves, Electric Operated	To prevent pump from overheating if pumps will operate at or near shut-off at a pressure higher than 125 psi maximum working pressure. 300 psi maximum working pressure.
62	Pump Thermal Safety Valves, Self Operating	To prevent pump from overheating if pumps will operate at or near shut-off. 125 psi maximum working pressure.
63	Pump Thermal Protection Test Circuit	Controller mounted test button(s) for each pump, valve energized pilot light(s) and terminal strip for actuating 110-120V solenoid valve supplied in Option 61.
64	Air/Oil Cooler Fan starting equipment	Magnetic starter with Hand-Off-Automatic selector switch for automatic on-off control of air/oil cooler fan motor by temperature sensing switch provided with air/oil cooler for Hydroconstant drives.
64.1	Alarm with or without pump shut-down	Alarm for high oil temperature for air/oil coolers controlled by a separate set of NO/NC contacts in temperature sensing switch furnished with air/oil coolers. May be noted as option 48 on model number plate.



-NOTE-

After all adjustments have been made, place the 10 position selector switch in position 2 which is the normal run position. Position 1 is used to calibrate the readout. Positions 9 and 10 are not used.

INTRODUCTION

The FTA461 Electronic Sequencing Control is designed to control pump operation in single or multi-pump applications. The sequencing control includes one or more printed circuit pump control boards, a base (mother) printed circuit board, a strain gauge pressure transducer, and a digital readout showing system pressure. The pump printed circuit control board includes the necessary controls to adjust the pump start and stop pressure set points, the pump start time delay and minimum run time delay. Also included are pilot lights to signal various operating conditions. Listed below are the number of pump printed circuit control boards supplied on various pump applications:

- Simplex Controllers – One Pump
 - One Pump Circuit Control Board
- Duplex Controller – Two Pumps
 - With Continuous Duty Lead Pump – One Pump Printed Circuit Control Board (For Controlling The Lag Pump)
 - With Lead Pump Shutdown – Two Pump Printed Circuit Control Boards (For Controlling Both Pumps)
- Triplex Controllers – Three Pumps
 - With Continuous Duty Lead Pump- Two Pump Printed Circuit Control Boards (For Controlling the Lag Pumps)
 - With Lead Pump Shutdown – Three Pump Printed Circuit Control Boards (For Controlling All Pumps)

The lead pump printed circuit control board is the first board to the right of the 10 position selector switch located on the base (mother) printed circuit board.

SETTING START AND STOP PRESSURE SET POINTS

The instructions for setting the start and stop pressure set points apply to all the pump printed circuit control boards.

1. Turn all “Hand-Off-Auto” selector switches, mounted on the enclosure to the “Off” position.
2. Energize the controller by placing the disconnect switch handle in the “On” position.

3. To adjust the lead pump stop pressure set point rotate the 10 position selector switch located on the base (mother) printed circuit board, to Position 3. Adjust the stop pressure set point using Potentiometer 1. Rotating the potentiometer counterclockwise will increase the pressure set point. Rotating the potentiometer clockwise will decrease the pressure set point. The digital display will show the stop pressure set point.

To adjust the lead pump start pressure set point rotate the selector switch to Position 4. Adjust the start pressure setting point using Potentiometer 2. Rotating the potentiometer counterclockwise will increase the pressure set point. Rotating the potentiometer clockwise will decrease the pressure set point.

4. To adjust the first lag pump rotate the selector switch located on the base (mother) printed circuit board to Position 5 to set the stop pressure set point and Position 6 to set the start pressure set point.

5. To adjust the second lag pump rotate the selector switch located on the base (mother) printed circuit board to Position 7 to set the stop pressure set point and Position 8 to set the start pressure set point.

MINIMUM RUN PERIOD TIMER

In order to prevent too frequent cycling of the lead and lag pumps due to momentary pressure changes, a minimum run period timer is provided on each pump printed circuit control board. The minimum run period is adjustable from 15 seconds to 127 minutes.

The minimum run period timer begins its timing cycle when the pump start signal is received, hence, both pressure and minimum run time must be satisfied in order to stop the pump.

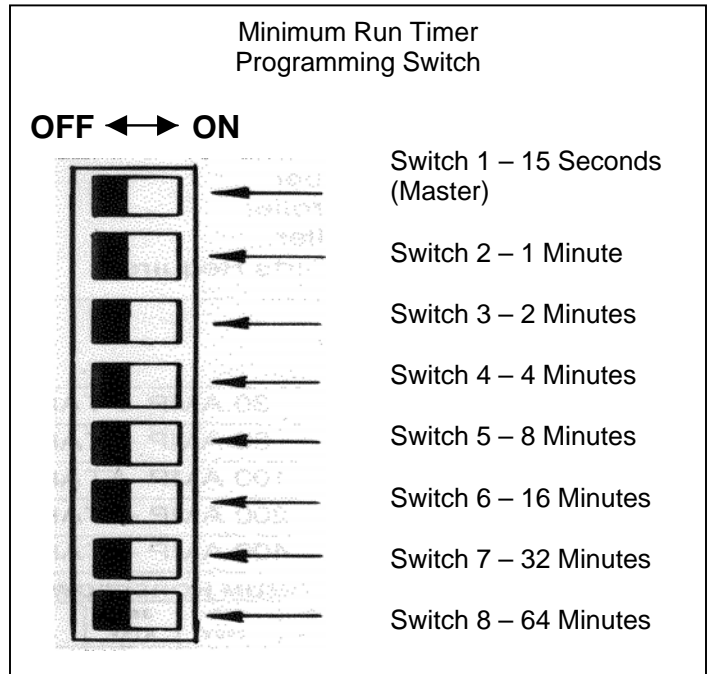
PUMP START DELAY TIMER

In order to prevent starting of lead and lag pumps due to momentary pressure drops, there is a pump start delay timer on each pump printed circuit control board. Adjustment of this start delay time is accomplished by using Potentiometer 3. The delay is adjustable from 0-60 seconds. Rotating the potentiometer clockwise will increase the delay time and rotating the potentiometer counterclockwise will decrease the delay time.

Note-This pump start delay time is factory set for approximately 15 seconds.

ADJUSTING MINIMUM RUN TIMER

The time setting for the minimum run timer is set by the programming switch mounted on each pump printed circuit control board. The programming switch consists of eight (8) indi-



vidual switches each of which controls a different time period. The closing of two or more switches gives a minimum run time equal to the addition of the time settings of all closed switches.

Examples:

To obtain a minimum run time of 10 minutes the following switches must be put in the “On” position. Switch 1 = 15 Sec., Switch 3 = 2 Min., Switch 5 = 8 Min., for a total of 10 minutes 15 seconds.

To obtain a minimum run time of 30 minutes the following switches must be put in the “On” position. Switch 1 = 15 Sec., Switch 3 = 2 Min., Switch 4 = 4 Min., Switch 5 = 8 Min., Switch 6 = 16 Min., for a total of 30 Minutes 15 seconds.

Switch 1 is the master “On-Off” switch. In the “Off” position a fixed 15 seconds minimum run time will occur. All the other switch settings are disabled. With Switch 1 in the “On” position all the other switch settings are activated.

Note – Since a 15 second delay occurs with Switch 1 in either the “On” or “Off” position, this 15 seconds must be added to the time settings obtained by placing the various individual switches in the “On” position. The 15 second delay can be used for testing the system.

After the minimum run timer has timed out there is a 15 second off delay to prevent excessive On/Off cycling of the pumps.

INFORMATION REQUIRED WITH ORDER

- | | |
|--|-------------------------------|
| 1) Peerless Pump Job Number | 5) Part Number |
| 2) Catalog Number of Controller | 6) Quantity of Parts Required |
| 3) Serial Number of Controller | 7) Horsepower, Voltage, Phase |
| 4) Description of Renewal Parts Required | |

DESCRIPTION		PART NUMBER	SPARE PARTS FOR 2 YEARS					
			SIMPLEX	DUPLEX	TRIPLEX			
DISCONNECT SWITCH	30 AMP –FT A811	DC-0056	-	-	-			
	60 AMP –FT A812	DC-0057						
	100 AMP –FT A813	DC-0077						
	200 AMP –FT A814	DC-0089						
	400 AMP –FT A 804	AS-0804						
MAIN FUSES DUAL ELEMENT (SET OF 3) F1, F2, F3 F4, F5, F6 F7, F8, F9	MAXIMUM HORSEPOWER				1	1	3	3
	200-208V	220-240V	380-415V	440-480V				
	5	7 ½	15	20				
	10	15	30	40				
	20	25	50	50				
	40	50	100	100				
CONTACTORS (M)	FT A330-A	CT-0050	1	1	1			
	FT A300-B	CT-0054						
	FT A330-C	CT-0058						
	FT A330-D	CT-0063						
	FT A330-E	CT-0091						
	FT A330-G	CT-0095						
	OVERLOAD RELAYS (OL) Specify horsepower, voltage and full load current of motor when ordering.	TH-20UL				RL-1014	1	1
TH-60UL		RL-1015						
TH-120UL		RL-1016						
Current Transformer		TF-0191						
PRESSURE READOUT		NS-0630						
PRESSURE TRANSDUCER	0-250 psi	SW-0099	-	-	-			
	0-500 psi	2	-	-	-			
FTA461 ELECTRONIC SEQUENCING CONTROL BASE PRINTED CIRCUIT BOARD (Mother Board) Pump Control Printed Circuit Board	0-250 psi	PC-0101	-	-	-			
	0-500 psi	2						
		PC-0102						
TIME CLOCK	24 Hour	TM-0030	N/A	1	1			
	7 Day – Same Time – Any Time	TM-0022	N/A	1	1			
	7 Day – Any Day- Any Time	TM-1000	N/A	1	1			

1) Specify ampere rating when ordering or supply part number of fuses now in used. Select fuses in accordance with the National Electric Code.

2) Refer to factory for information.

Renewal Parts Peerless Pump Controllers

**FTA
610L
620L
630L**

DESCRIPTION		PART NUMBER	SPARE PARTS FOR 2 YEARS			
			SIMPLEX	DUPLEX	TRIPLEX	
CONTROL CIRCUIT TRANSFORMER	200-208 Volts	.050KVA	TF -0215	1	1	1
		.150KVA	TF -0212			
		.250KVA	TF -0206			
		.350KVA	TF -1004			
		.500KVA	TF -1005			
	220-240 440-480 Volts	.050KVA	TF -0200			
		.150KVA	TF -0202			
		.250KVA	TF -0204			
		.350KVA	TF -0205			
		.500KVA	TF -1006			
CONTROL CIRCUIT FUSES	Primary F10, F11	10 AMP	FU-0060	6	6	6
		5 AMP	FU-0103			
		10 AMP	FU-0110			
	Secondary F12	0.5 AMP	FU-0048	3	3	3
		1.4 AMP	FU-0051			
		2.25 AMP	FU-0054			
		3.2 AMP	FU-0055			
		4.5 AMP	FU-0056			
CONTROL RELAYS 4CR, 5CR, 6CR, 7CR, 8CR, 9CR, 10CR	1CR, 2CR, 3 CR	RL-0121	-	-	-	
		RL-0679	1	1	1	
	Green	LM-0704	-	-	-	
	Red	LM-0703				
	White	LM-0706				
	1 Bulb	For Pilot Lights	LM-0577	5	5	5
PUSHBUTTON (SILENCE-RESET)	Complete	AS-1012	-	-	-	
	N.O. Contact Block (Green)	CB-0500	1	1	1	
	N.C. Contact Block (Red)	CB-0501	1	1	1	
SELECTOR SWITCHES	Hand-Off-Auto	AS-1011	-	-	-	
	Lead Pump 1-2 or 2-3	AS-1013	N/A	-	-	
	N.O. Contact Block (Green)	CB-0500	2	2	2	
	N.C. Contact Block (Red)	CB-0501	1	1	1	
AUDIBLE ALARM	120 Volt	AL-0005	1	1	1	
PRESSURE SWITCH	5-150 psi	PS-0229	1	1	1	

1 Sylvania Part No. 755.

CONTACTOR COILS

CON-TACTOR	PART NUMBER						SPARE PARTS FOR 2 YEARS	
	110-220 VOLTS	200-208 VOLTS	220-240 VOLTS	380-415 VOLTS	440-480 VOLTS	550-600 VOLTS	CONTI-NENTAL USA	OUTSIDE USA
FTA 330-A	CL-0355	CL-0386	CL-0356	CL-0358	CL-0357	CL-0359	1	1
FTA 330-B	CL-0360	CL-0387	CL-0361	CL-0363	CL-0362	CL-0364	1	1
FTA 330-C FTA 330-D	CL-0365	CL-0389	CL-0366	CL-0368	CL-0367	CL-0369	1	1
FTA 330-E	CL-0111	CL-0112	CL-0112	CL-0113	CL-0114	CL-0114	1	1
FTA 330-G	CL-0115	CL-0116	CL-0116	CL-0117	CL-0118	CL-0118	1	1
FTA 330-H	CL-0119	CL-0120	CL-0120	CL-0121	CL-0122	CL-0122	1	1
FTA 330-J	CL-0123	CL-0124	CL-0124	CL-0125	CL-0126	CL-0126	1	1
FTA 330-K	CL-0306	CL-0316	CL-0326	CL-0350	CL-0336	CL-0346	1	1

POWER CONTACT KITS ¹

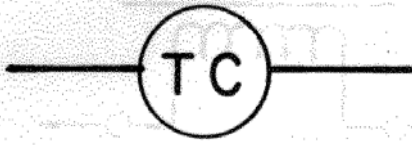
CON-TACTOR	PART NUMBER	SPARE PARTS FOR TWO YEARS	
		CONTI-NENTAL USA	OUTSIDE USA
FTA330-A	CK-400	1	1
FTA330-B	CK-401	1	1
FTA330-C	CK-0402	1	1
FTA330-D	CK-0403	1	1
FTA330-E	CK-0135	1	1
FTA330-G	CK-0136	1	1
FTA330-H	CK-0137	1	1
FTA330-J	CK-0138	1	1
FTA330-K	CK-0255	1	1

AUXILIARY CONTACTS

CON-TACTOR	PART NUMBER	SPARE PARTS	
		CONTI-NENTAL	OUTSIDE USA
FTA330-E FTA330-G FTA330-H	CB-0132	1	1

¹ All power contact kits except CK-255 include 3 movable contacts, 3 contact springs and 6 stationary contacts. Kit number CK-255 includes 6 movable contacts, 6 contact springs and 12 stationary contacts.

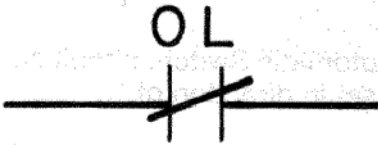
ELECTRICAL SYMBOLS



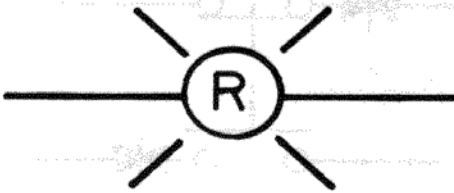
Clock Motor, automatic alternation clock for 24 hour or 7 day devices.



Contactor Coil, motor starter.



Overload Relay Contact, normally closed.



Pilot Light, letter indicated lens color.



Audible Alarm Device, emits sound when power applied.



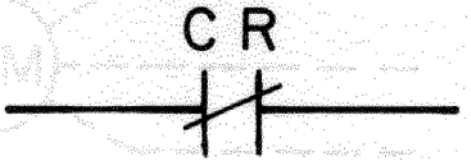
Terminal Points, with jumper connected.



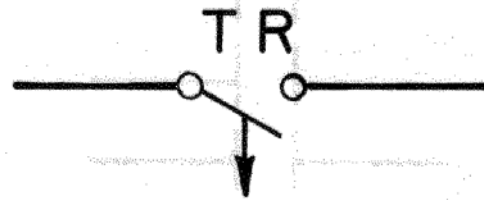
Relay Coil.



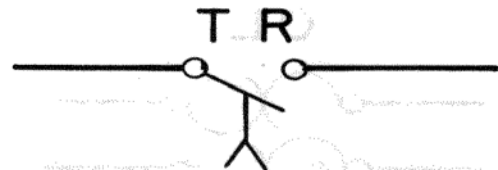
Relay Contact, normally open.



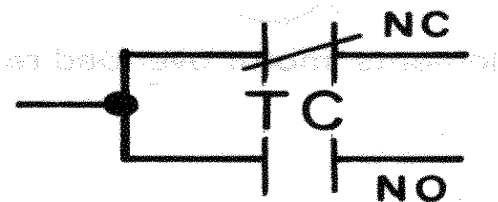
Relay contact, normally closed.



Timed Contact, closes instantaneously, times open.



Timed Contact, normally open, times closed.



Alternation Contact
NC – Normally Closed
NO – Normally Open