



TORNATECH

LISTEN DEVELOP LEAD

INSTALLATION AND MAINTENANCE MANUAL FOR JOCKEY PUMP CONTROLLERS



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Tornatech Jockey Pump Controllers are built to NEMA industrial standards and are UL listed. These controllers are intended for use with fire pump systems.

Except in some cases, the controller is also seismic approved and has been tested in accordance with the ICC-ES AC156, IBC 2015 & CBC 2013 standards. Proper installation, anchoring and mounting is required to validate this compliance report. Refer to this manual and drawings to determine the seismic mounting requirements and location of the center of gravity (you may need to contact factory). The equipment manufacturer is not responsible for the specification and performance of anchorage systems. The structural engineer of record on the project shall be responsible for anchorage details. The equipment installation contractor shall be responsible for ensuring the requirements specified by the structural engineer of record are satisfied. If detailed seismic installation calculations are required, please contact the manufacturer for the performance of this work.

Jockey pumps are small, motor driven pumps used in conjunction with main fire pumps to compensate for minor leaks in the fire protection system and automatically maintain stand-by pressure. This reduces wear on the main pump and controller caused by unnecessary, frequent operation.

Types of Jockey Pump Controllers

JOCKEY PUMP CATALOG NUMBER
MODEL No. EXAMPLE: JP3 - 460 / 2 / 3 / 60
Model Prefix: JP3
Voltage: 460 V
HP Rating: 2 HP
Phase: 3
Frequency: 60 Hz

MODEL JP:

This jockey pump controller with across-the-line starter is specifically designed to the control jockey pump that maintains the designed water pressure in fire pump serviced systems. A jockey pump installation prevents short cycling of the fire pump due to small leaks.

MODEL JPY

This jockey pump controller with a Wye-Delta open transition starter is specifically designed to the control jockey pump that maintains the designed water pressure in fire pump serviced systems. A jockey pump installation prevents short cycling of the fire pump due to small leaks.

MODEL DJP

This dual power source jockey pump controller is designed to accept two separate power sources (i.e. normal & alternate) and to control jockey pumps for maintaining the designed water pressure in fire pump serviced systems and therefore prevent short cycling of the fire pump due to small leaks. An automatic switchover device automatically connects the jockey pump to alternate power in case of normal power failure. This system maintains the jockey pump operational under all circumstances and eliminates unnecessary starting of the fire pump with all associated consequences (i.e. high power drain, load shedding, undesirable alarms,)

MODEL JPD

This duplex jockey pump controller is designed to alternatively control two jockey pumps (lead & standby) for maintaining the designed water pressure in fire pump serviced systems and therefore prevent short cycling of the fire pump due to small leaks.

The presence of a 100% standby jockey pump associated with a circuit that alternates lead & standby jockey pumps each time, provides full back up and easy maintenance of the system (any pump can be manually selected as lead).

MODEL DJPD

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Methods of Starting/Stopping

METHODS OF STARTING

AUTOMATIC START

The controller will start automatically on low pressure detection by the pressure sensor when the pressure drops below the cut-in threshold.

MANUAL START

The motor can be started by pressing the START push button, regardless of the system pressure.

METHODS OF STOPPING

MANUAL STOP

Manual stop is done by pressing the priority STOP push button. Note that pressing the stop push button will prevent the motor from restarting as long as the button is pressed, plus a two second delay.

AUTOMATIC STOP

The motor is automatically stopped after the restoration of the pressure (above the cut-out threshold), after a programmable run period timer.

EMERGENCY STOP

The emergency stop is always possible in any starting condition and is done by using the disconnect switch located on the door.

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Storage

If the controller is not installed and energized immediately, Tornatech recommend following the instructions from the chapter 3 of the NEMA ICS 15 standard.

Procedure (See corresponding steps in Technical Documentation)

STEP 1 : IMPORTANT PRECAUTIONS

Prior to mounting the controller and making any field connections:

1. Verify that the following information is compatible with other related equipment on the project:
 - Controller rating label informations (AC line voltage, phase and frequency)
 - Motor horse power, voltage, phase and frequency
 - System pressure
2. Open the door of the enclosure. After removing the cardboard protections, inspect the internal components and wiring for any signs of frayed or loose wires or other visible damage.

STEP 2A : MOUNTING

Consult job plans to determine the controller mounting location. For seismic applications, mounting arrangement should be rigid wall only. The structural engineer of record on the project shall be responsible for anchorage details.

Tools and materials (wall mounting) required:

- Assortment of common hand tools of the type used to service electromechanical equipment
- Drill for drilling wall anchor holes
- Hand level
- Tape Measure
- Four anchors with bolts and washers, per enclosure

STEP 2B : ELECTRICAL CONNECTIONS

All field connections and AC wiring are brought into the enclosure through the bottom or top conduit entrances. Refer to the National Electrical Code, the local electrical code or any other authority having jurisdiction for proper conduit entrance location. Use a hole punch, not a torch nor a drill, to punch a hole in the enclosure for the size conduit being used. Pull all wires necessary for field connections, remote alarm functions, AC power and all other optional features. Allow enough excess wire inside the enclosure to make up connections to the appropriate line, load and control terminal block points. Be sure to consult the appropriate field connection diagram included with the manual. Make all field connections to the remote alarm functions and any other optional features.

AC POWER WIRING

Connect the AC power. Check to see that all connections are both correctly wired and tight (see torque label).

MOTOR WIRING

Connect the motor cable. Check to see that all connections are both correctly wired and tight (see torque label).

STEP 3 : FULL LOAD AMPERAGE (FLA)

Verify the FLA on the motor nameplate and rectify the overload relay settings if needed.

STEP 4 : CLOSE THE DOOR AND POWER ON

The disconnect switch handle must be in OFF position to close the door properly.

Put the disconnect switch in ON position. The controller is automatically in manual mode when powered for the first time to avoid any motor start

STEP 5 : MOTOR ROTATION

Press START, check the motor rotation for 1 second, and Press STOP.

WRONG MOTOR ROTATION

In case of wrong rotation; put the disconnect switch in OFF position, open the door and swap two wires on motor feeder only. Go back to STEP 5 and check the motor rotation again.

GOOD MOTOR ROTATION

When you have a good motor rotation, put the disconnect switch in OFF position.

STEP 6 : WATER CONNECTION

The controller must be connected to the pipe system according to NFPA20. The water connection is on the bottom of the controller.

DANGER

HAZARDOUS VOLTAGE IS PRESENT IN THE ENCLOSURE WHICH WILL CAUSE SEVERE PERSONAL INJURY OR DEATH. MAINTENANCE OR START UP SHOULD BE PERFORMED ONLY BY EXPERIENCED LICENSED ELECTRICIANS. ONLY QUALIFIED PERSONNEL SHOULD WORK ON OR AROUND THIS EQUIPMENT.

STEP 7 : POWER ON AND SET IPD+ BOARD

The front door mounted IPD+ membrane is described here from top to bottom, and from left to right.

- The upper right green LED is activated when the IPD is powered.
- The digital screen shows the pressure value, the Non-Auto mode, as well as all the parameters. A small Red dot will appear on the lower right part of the screen when a timer is counting.
- The 3 vertical LED just right of the screen represent the pressure status. The upper Led is ON when the pressure is above the cut-out, the middle LED is ON when the pressure is between the cut-out and the cut-in, and the bottom LED is ON when the pressure is below the cut-in.
- The 2 motor images show the motor run cause, whether it is HAND or AUTO.
- The Green button creates a HAND run cause. It is always ready to start the pump.
- The Red button stops the engine and has a latency of 2 seconds, to prevent jogging the pump.
- The UP/+ button is use to increase a parameter value. It is also a shortcut to show the cut-out value when in NORMAL mode.
- The DOWN/- button is use to decrease a parameter value. It is also a shortcut to show the cut-in value when in NORMAL mode.
- The LEFT button is use to navigate between the parameters.
- The LEFT button + the UP button is a shortcut to show the Timer-ON value when in NORMAL mode.
- The LEFT button + the DOWN button is a shortcut to show the Timer-OFF value when in NORMAL mode.
- The right button is use to navigate between the parameters.
- The right button + the up button is a shortcut to show the start count value when in normal mode.
- The right button + the down button is a shortcut to show the elapsed time meter value when in normal mode.
- The middle/enter/config button is use to confirm and save a parameter value. It is also a shortcut to navigate between the modes.
- The button in the lower right corner is the off button.

- The IPD is always in 1 of its 3 modes: Normal, Non-Auto, or Configuration.
- Normal: The controller will start if the pressure is below the cut-in. The controller will start if the start button is pressed. To activate the Non-automatic mode, press the off button for 2 seconds. To activate the Configuration mode, press the config button for 5 seconds.
- Non-automatic: The controller will not start on a pressure drop. This is the maintenance mode. The controller will start if the start button is pressed. To activate the Configuration mode, press the config button for 2 seconds. To revert to Normal mode, press the off button for 2 seconds.

Configuration: The controller will not start on a pressure drop. This is the configuration mode. The controller will start if the start button is pressed. Use the left/right buttons to navigate between the parameters. Press the enter/config button to select parameter. This will display the current value. Use the up+ / down- buttons to change the selected parameter value. The speed of the changing values will accelerate if the buttons are maintained. Press the enter/config button to save a value. Press the off button to quit without saving, and to revert to normal mode.

STEP 8 : SET PARAMETERS

Cut-in: Pressure start value. The controller will start if the pressure is below this value. It can be set from 0 to the Cut-out value.

Cut-out: Pressure stop value. The controller will stop if the pressure is over this value. It can be set from the cut-in value to the system maximum pressure.

Unit: Sets the pressure unit between PSI, BAR, KPA, FEET WATER, METER WATER.

Timer ON: Sets the timer between the pressure being below the cut-in and the motor start request.

Timer OFF: Sets the timer between the pressure being above the cut-out and the motor stop request.

STEP 9 : PUT JOCKEY PUMP IN SERVICE

Turn the disconnect switch to ON position and keep pressing on the OFF button until the Normal mode is activated.

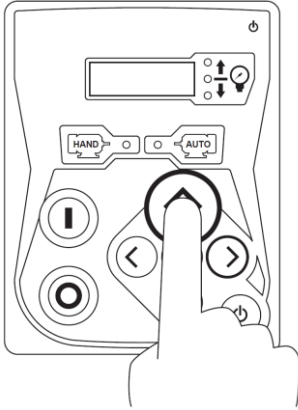
Preventive maintenance and test

Jockey pump controllers are an important part of the fire protection system. They require a minimum preventive maintenance but must be periodically inspected and their operation simulated to assure constant performance.

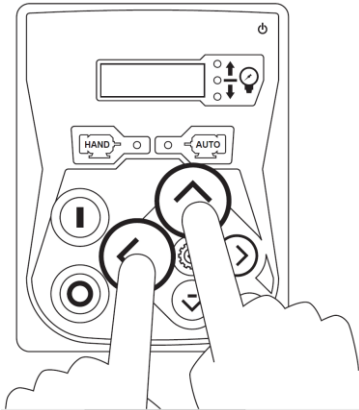
NOTE: Qualified and authorized personnel only must do this maintenance.

VISUAL INSPECTION	YES	NO
Inspect cleanliness of controller.		
Remove any object from the top of controller.		
Dust and clean the controller.		
Inspect controller for any evidence of corrosion outside.		
Inspect controller for any evidence of corrosion inside.		
Check for leaks on pressure transducer and piping.		
Inspect door for proper alignment and function of door locks		
Inspect tightness of all connections		
Inspect tightness of all terminal jumpers		
Inspect controller grounding		
Inspect relays, contactors, and timers for any evidence of damage.		
Inspect motor contactor power contacts.		
Inspect tightness of all mounting nuts and screws.		
OPERATIONAL INSPECTION	YES	NO
Check motor rotation.		
Start from water pressure control.		

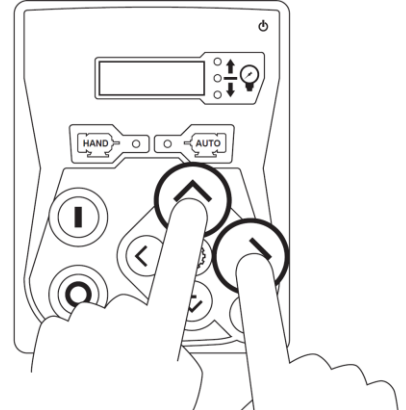
SHORTCUTS FOR DISPLAYING VALUES



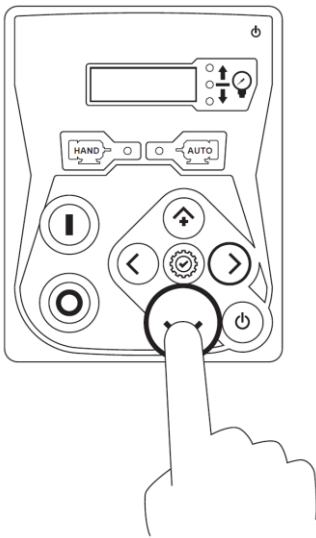
Cut-Out



Run Period Timer



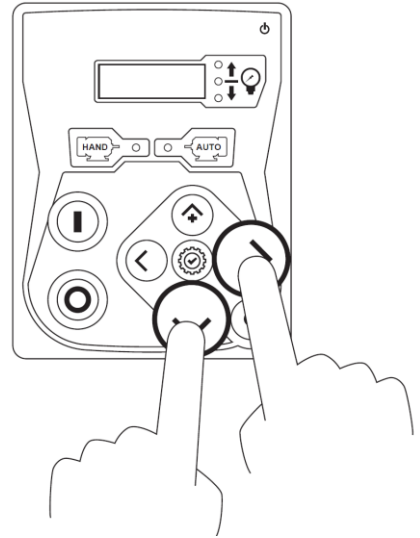
Start Count



Cut-In



Sequential Start Timer



Elapsed Time Meter (Hours)

Patents

Country	Title	Grant No
CA	Mechanical activator for contactor	2741881
US	Mechanical activator for contactor	US8399788B2
CA	Mechanical activator for electrical contactor	165512
CA	Mechanical activator for electrical contactor	165514
US	Mechanical activator for electrical contactor	D803794
US	Mechanical activator for electrical contactor	Patent pending
EP	Mechanical activator for electrical contactor	002955393-0001/2
AE	Mechanical activator for electrical contactor	Patent pending
AE	Mechanical activator for electrical contactor	Patent pending
CA	Fire pump digital operator	163254
US	Fire pump digital operator interface	D770313
AE	Fire pump digital operator interface	Patent pending
EP	Fire pump digital operator interface	002937250-0001
CA	System and method for detecting failure in a pressure sensor of a fire pump system	Patent pending
US	System and method for detecting failure of a pressure sensor in a fire pump system	Patent pending

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