



**AURORA<sup>®</sup>**

Standard 770 Duplex System with Horizontal Pumps

Standard 090 Packaged System

# MODELS 770 and 790 **BOOSTER SYSTEMS**

## **INSTRUCTION AND INSTALLATION MANUAL**

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

**ATTENTION: SAFETY WARNINGS:**

Read and understand all warnings before installation or servicing pump.

**SYSTEM RECEIPT INSPECTION:**

## MODELS 770-790

needed for the field condition. (See Controller Operation, Appendix A)

When flow demands increase beyond the pump design point the system pressure will begin to decrease.

The low system pressure switch is typically set at the factory at 10 psi below system pressure. The pressure switch setting can be changed as needed for the field conditions.

When system pressure reaches the pre-determined set point, the lag pump starts in response to the lower pressure. The lag pump will run as required until flow demand decreases and system pressure rises above the set point. When system pressure reaches the set point the lag pump will shutdown automatically and the lead pump will continue to run. During periods of low system demand/shutoff operation both pumps are provided with a thermal relief valve for protection. (See Controller Operation, Appendix A)

### **OPERATION (WITH OPTIONAL TANK):**

When pump H-O-A switches are placed in AUTO, the tank pressure switch sequences the lead pump under no flow condition. The tank fills to its capacity and tank pressure starts to build up. This increase in tank pressure will stop the lead pump when the pre-determined set point is reached and after the minimum run time is satisfied. The tank will supply all "leak" loads. As tank pressure drops due to further system demands the lead pump will start after a time delay. The tank switch will continue to cycle the lead pump off and on as required to maintain tank/system pressure.

### NOTE

Tank pressure switch high set point must be lower than the pump shutoff head.

Set the tank pressure switch high set point 5 psi above system

## **APPENDIX A (continued) MODELS 770-790**

ally after a minimum running interval. A low pressure alarm and shutdown is included in standard systems to protect the pump(s) from running dry or cavitating on absent or low inlet pressure.

### **OPTIONAL SYSTEMS**

Pressure T

## APPENDIX A (continued) MODELS 770-790

Pressure switch (PS-1). When the pressure drops to less than the trip setting of this pressure switch, its contacts close. This signals the PLC that the condition has occurred. The PLC activates the Low Suction Audible Alarm. The standard audible device is a solid state (Sonalert) annunciator. The PLC also activates a Low Suction alarm signal light. The alarm can be silenced by momentarily operating the Alarm Silence switch (SW-1) which signals the PLC to de-activate the audible alarm. The alarm light stays lit until the Low Suction Pressure switch resets. The alarm circuit resets itself and re-activates on the next occurrence of low suction pressure.

General: In the AUTO position, motor operation is under the control of the PLC. The PLC utilizes an internally stored program to control the operation (starting and stopping) of the motor. The PLC responds to the Low Suction Pressure switch and to System Pressure Switch as a minimum. The PLC program also includes various timing functions as outlined below.

Pressure Sensing: The standard unit is pressure controlled by sensing either the system pressure or by sensing the pressure in a tank, if supplied. Multiple pump systems (Duplex & Triplex) may employ equal size pumps or one pump may be smaller than the others.

Alternation: The standard system employs one smaller pump and one or more larger pumps. If there is more than one larger pump (Triplex) they are usually equal in size to one another. The small pump is meant to run continuously. The controller cycles the larger pump or pumps as needed to maintain system pressure. Alternation of the pumps is not used in Duplex systems of this type. The smaller pump which runs continuously is considered the "Lead" pump and the other pump or pumps are considered the "Lag" pump or pumps.

When all pumps are of the same size, a duplex controller may be set up to alternate which of the two, or more) pumps operates as the Lead pump and which pump or pumps operates as the Lag pump or pumps.

Minimum Run Timing: The standard unit includes timers to control the Minimum Running time of the pump or pumps to prevent short cycling of the pump motor(s). This avoids overheating the motors which can occur if they are started too frequently. This allows the motor fan to cool down the motor windings from the last start before the pump is shut down.

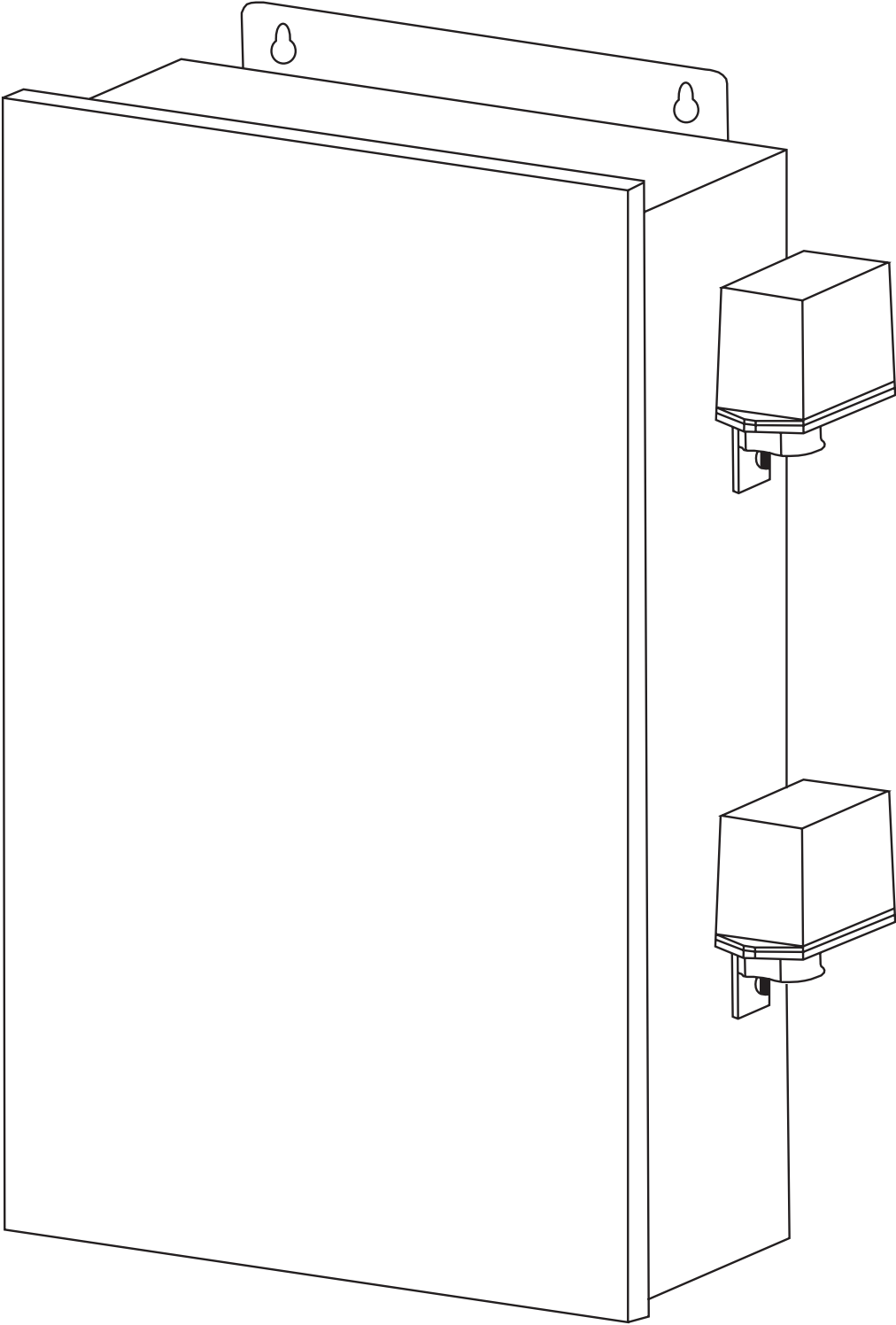
Restart Delay Timing: The Restart delay prevents starting a pump which is still spinning down from the last running. This can occur when the demand is less than needed for the pump but more than what can be supplied by the other pump(s). In this case, when the pump shuts down, the pressure can drop rapidly enough to immediately signal the pump to start again (or )4 002(s). In

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**APPENDIX A (continued) MODELS 770-790**

**REPLACEMENT P**

APPENDIX A (continued) MODELS 770-790



**APPENDIX A (continued) MODELS 770-790**



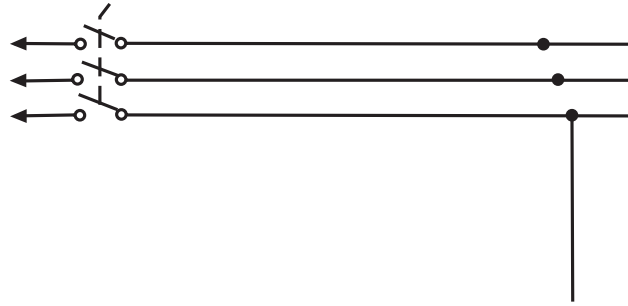




APPENDIX A (continued) MODELS 770-790



APPENDIX A (continued) MODELS 770-790



## APPENDIX B MODELS 770-790

UL LISTED and CSA Approved

**Dimensions:** 4-3/4"W x 2-1/4"D x 4-3/8"H

**Enclosure:** NEMA Type 4 for indoor or outdoor use. Cover –



## APPENDIX C (continued) MODELS 770-790

### Piping Schemes

- 2-way (T to cover)
  - Supply Line
    - \*Restriction in line
    - \*Location of Speed Control
- Control/Discharge Line
  - 2-way pilot control in line
    - \*On/Off
    - \*Variable restriction
      - Valve position varies or modulates
- Supply to Discharge relationship
  - Supply restriction is required for valve to regulate

### 3-Way Piping

- Operation
  - #1 – Routes fluid into cover-valve closed
  - #2 – Blocks supply – routes fluid out of cover-valve opens
  - Control typically used with low capacity pilots or valves smaller than 4"
    - \*Solenoids
    - \*Altitude
    - \*Float
    - \*Accelerator control

## APPENDIX D MODELS 770-790

**Listing/Approvals:** UL Standard 508 Guide (NKPZ) and CSA Standard C22.2 No. 14-M Class (321106) for Pressure Operated Industrial Control Equipment.

UL Standard 873 Guide (XAPX) and CSA Standard C22.2 No. 24 Class (481302) for Temperature Indicating and Regulating Equipment.

CE Marked

**Ambient/Media Temperature Range:**

-4°F to 180°F (-20°C to 82°C)

**Construction:**

- NEMA Type 4X Enclosure for indoor or outdoor use. (To maintain 4X rating, use appropriate Type 4 conduit hub.)
- Forged Brass or 316 S.S. Pressure Connections.
- Aluminum Diecast Base with Polymer Enclosure.
- Beryllium Copper Diaphragm (Stainless steel isolator diaphragm included for protection of beryllium copper diaphragm on models with stainless steel pressure connection.)
- Nitrile Pressure Sealing O-ring.

**Switch Contact:**

Snap Action SPDT (Form C)



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## WARRANTY