

IVS BOOSTER PACKAGE COMMISSION | CHECK SHEET

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The following is a step-by-step guide to starting up and commissioning Armstrong booster packages. **One check sheet is to be completed per system!** You must follow and fill out all fields below to ensure that all aspects of the booster is checked and set up for proper operation. Once complete, this sheet requires

that end-user / general contractor sign off on the work rendered as final approval that the pump is functioning as intended. Please submit this commissioning check sheet along with your work invoice / startup claim to warrantyclaims@armstrongfluidtechnology.com

Project name: _____

Building address: _____

Contractor name: _____

Site contact name: _____ Site contact tel. #: _____

Your company: _____ Your name: _____

Pump model: _____ Booster serial #: _____

Pump serial #(s): _____ Sales order #: _____

NOTES:
 GC = General Contractor BAS = Building Automation System

PRE-STARTUP PACKAGE

- | YES | NO | N/A | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do you have the booster order Annexe? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do you have a copy of the electrical wiring diagram? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | OPTIONAL: Do you have the pump-specific variable speed curve with duty point indicated? |

PRE-STARTUP ARRANGEMENT

- | YES | NO | N/A | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Verify with GC that water and power is available and ready to the pump |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Verify with GC that pumps can be run without damage to system |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Verify with GC that BAS is wired to 6800ivs controller and ready to go (if applicable) |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Verify with GC that BAS contractor will be there on site to meet you (if applicable) |

BEFORE POWER UP CHECKLIST

DONE

- Check booster installation for proper mounting as per Installation & Operation Manual instructions
- Check that drawdown tank connected to booster discharge line is properly installed and charged to an air pressure that is 2-3 psi below water inlet pressure to the tank - record tank pressure here: _____ psi
- Check incoming voltage across the lines and record here: L1/L2 _____ L1/L3 _____ L2/L3 _____
NOTE: Voltage should be no more than ±10% of design voltage
- Check if booster set is to be controlled remotely by BAS start/stop contact with BAS contractor:
 - YES:** Check if BAS dry contact is wired across terminals 5 & 6 inside control panel.
 - NO:** Move on to the next step.
- NOTE:** Contacts close = booster runs. Contacts open = booster stops.
- Open up and bleed pump seal flush line to verify no air is locked inside seal/seal lines. If the pumps are Vertical multi stage (VMS) pumps, make sure the vertical column is bled for air by cracking open the bolt located at the top of the stages.
- Check alignment of pump (horizontally mounted pumps only)
- Record the actual suction pressure from the gauge here: Suction _____ psi. Verify if suction pressure is within range of design suction pressure on order Annex.

Unit is now safe to turn power on. Once on, make sure all VFDs are in the AUTO position and place all pumps in the 6800 IVS panel are in the OFF position to prevent pumps from running!

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BOOSTER PANEL PARAMETER CHECKLIST

Begin the commissioning by logging into the **SETUP** screen with the Level 2 password. Go through all parameters, verify against the order annex and record below.

IMPORTANT: Each screen has a **SAVE** function on the bottom left corner. Make sure all changes are saved in each screen when made! Once setup is complete, make sure the **SAVE DEFAULT** is performed!

PARAMETER NAME	ENTERED VALUE
System setup - No. Of pumps	
System setup - Standby pump	
System setup 2 - Sressure units	
System setup 2 - No. Of lvl sw	
Discharge press setup - Sensor (enabled default)	ENABLED/DISABLED (circle one)
Discharge press setup - Range (0-300psi default)	
Suction press setup - Sensor (enabled default)	ENABLED/DISABLED (circle one)
Suction press setup - Range (0-300psi default)	
System pressure - Setpoint	
System pressure - Update limits*	DONE/NOT DONE (circle one)
Discharge press limits - High	
Discharge press limits - Enabled? (Enabled default)	ENABLED/DISABLED (circle one)
Discharge press limits - Low	
Factory high system shutdown pressure	
Pump stage setup - Stage on spd	
Pump stage setup - Stage factor	
Staging delays setup - On delay (60s default)	
Staging delays setup - Off delay (60s default)	
Staging setup - Min run time (1min default)	
Soft fill mode (disabled default)	ENABLED/DISABLED (circle one)
No flow shutdown - No flow (enabled default)	ENABLED/DISABLED (circle one)
No flow shutdown - Delay (300s default)	ENABLED/DISABLED (circle one)
No flow shutdown - Set speed	
No flow shutdown - Wait time	
No flow shutdown - Pressure boost	
Speed setup 1 - Min (30% default)	
Speed setup 1 - Max (100% default)	
Speed setup 1 - Ramp (30s default)	
Speed setup 2 - Dflt speed (70% default)**	
Speed setup 2 - Rated rpm	
Pump rated power - Rated power	
Emergency power mode	
Pump pid - Kc (8000 default)**	
Pump pid - Ti (50 default)**	
Pump pid - Td (0 default)	Leave at zero
Lead pump switch time setup - Sw after (24h default)	
Eoc protection setup - eoc head (50% default)	
Pressure setback (100% default)	
BAS interface setup - Protocol**	
BAS interface setup - Node	1
BAS interface setup - Baud	19200

Remember to save all as default and set all pumps back to the auto position!

* This parameter needs to be changed when changing the setpoint. Once you change it to **OK** and press the return key, it will revert to **YES** and take effect immediately.

** This parameter is based on site conditions/data. Please consult with appropriate parties (General contractor, BMS contract, etc.) and perform tests to see if system behavior is acceptable.

PID TUNING

DONE

- Turn the system main disconnect OFF
- Wait for the discharge pressure to equalize with suction pressure
- Turn the system main disconnect ON
- Time how long system takes to reach within 95% of discharge pressure setpoint - _____ minutes
- If above time is greater than 2 min, adjust PID values no more than 5% at a time and repeat test again

Final system ramp time from suction pressure to 95% of discharge pressure setpoint: _____ minutes

NOTES ON PID TUNING:

Kc controls the step size - decreasing this value will increase the reaction magnitude, increasing this value will decrease the reaction magnitude.

Ti controls the step rate - decreasing this value will speed up the reaction speed, increasing this value will slow down the reaction speed.

Td adds delay into the system. **DO NOT USE THIS**

If in doubt, start with Kc = 7000 and Ti = 7

NO FLOW SHUTDOWN (NFS) TEST

DONE

- Check and make sure all pumps are in the AUTO position (on PLC and VFD)
- When system is running, isolate booster system from building loop (run it against a deadhead)
- Pumps should continue to maintain set point while ramping down and eventually shutting down to one pump only
- The single pump after 300s (default) will ramp up to your NFS Pressure Boost setpoint and then shut down

SIGNOFF

By signing off on this startup checklist, both parties hereby accept that the equipment listed in this checklist has been properly verified to be fully operational and functioning as per the sales order for the equipment listed.

Startup technician name (please print):

Customer name (please print):

Startup technician signature:

Customer signature:

Date (mm/dd/yyyy):

Date (mm/dd/yyyy):

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Submit complete documents to Armstrong via fax at 416-759-9101 or via email at warrantyclaims@armstrongfluidtechnology.com

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