

DESIGN ENVELOPE PUMP CONTROLLER (DEPC) RETROFIT PROCEDURE | GUIDE

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PROCEDURES FOR A DESIGN ENVELOPE PUMP CONTROLLER (DEPC) RETROFIT

This procedure describes the steps to convert an eligible Design Envelope pumps to one with the new DEPC controller.

GETTING STARTED

Before you begin your retrofit, make sure you have all the required parts and data:

- 1 DEPC controller
- 2 Wiring harness
- 3 Gen 5 cover
- 4 Mapping files
- 5 Original order annex or pump specs

STEP 1 CONFIGURE THE IVS (INTELLIGENT VARIABLE SPEED) DRIVE FOR DEPC CONTROL

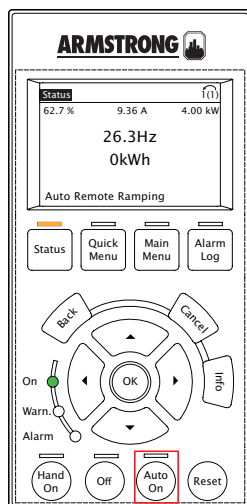
Using the manual controls, gradually increase the pump speed until it reaches duty speed. When the pump is operating at duty speed record the following data:

- Flow
- Head
- Power
- Speed in rpm

It is important to log these data points, since they will be used to verify the sensorless data at the conclusion of the retrofit.

Also, record the use of any digital and analog I/Os or relays so the DEPC can be configured properly once the retrofit is complete.

Use the Danfoss LCP (local control panel) to change/confirm the following parameters:



PARAMETER NUMBER	DEFAULT SETTINGS
0-02	RPM
0-03	Regional Settings. 0 for International (metric 50 Hz countries) and 1 for North America (60 Hz)
0-60	0
0-61	Full Access
1-00	Open Loop
1-25	Motor Speed (rpm)
3-03	Motor Speed × 1.05
3-15	No Operation
3-16	No Operation
3-17	No Operation
4-13	Motor Speed × 1.05
4-16	(set to 100%) adding.
5-01	Output
5-40.1	Alarm
5-40.2	Running
8-01	Control Word Only
8-30 *	Modbus RTU
8-31 *	1
8-32 *	19200
8-33*	No parity/1 stop bit

* If the IVS is connected to a building automation system (BAS), be sure to copy these parameters so they can be re-entered on the DEPC when the retrofit is complete.

IMPORTANT: Set the LCP in **Auto ON** when completed.

STEP 2 REMOVE THE DRIVE COVER

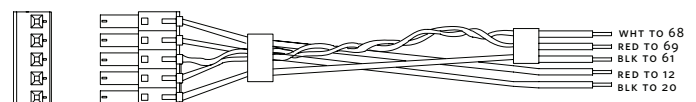
- Stop the pump.
- Before removing the cover, the system must be disconnected from the mains supply. After switching off, wait for at least 15 minutes for the capacitors to discharge before opening the cover.
- Remove the cover with a screw driver.

STEP 3 INSTALL THE DEPC CONTROLLER

Remove LCD display/cradle assembly. Place the DEPC in the cradle's location.

Connect the wiring harness into the terminal block as per **FIG.1** below:

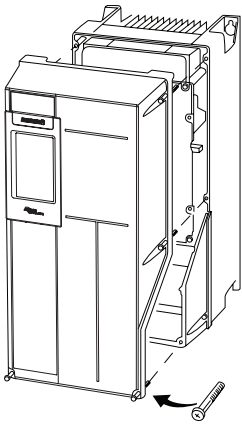
FIG.1



If the existing BAS is connected to terminals 68 and 69, remove these wires and reconnect them to terminals A (+) and G (-) on the side of the DEPC controller.

STEP 4 CONVERT THE DRIVE COVER

All applications will require a completely new cover. Before installing it, check to ensure that all the required wiring connections are complete. Carefully position the cover to align with the DEPC. If required, swivel the cover vertically from bottom of the drive. **Do not swivel or rotate the cover horizontally, as this will damage components.**



Replace the cover assembly by tightening the screws using the torques specified in TABLE 1

TABLE 1

(Unit: ft/lb)

ENCLOSURE	IP55	IP66
A5	2	2
B1/B2	2.2	2.2
C1/C2	2.2	2.2

STEP 5 PROGRAM THE DEPC FOR COMMUNICATION WITH THE IVS

Turn on the drive and wait for the DEPC to reboot. To begin the programming process, refer to the Installation and Operating Manual or the following video:

<https://www.youtube.com/watch?v=WPnI8a96A5M>

Access the Armstrong Web Interface using the Level 2 password provided:

- Under Settings, open the **Communication** tab
- Set VFD type to IVS 102
- Click submit

VFD Communication Setup

Modbus ID:

Baud Rate: 1200 2400 4800 9600 14400 19200

Number of Data Bits: 7 8

VSD Type: iECM IVS 102

Cycle power to the DEPC, and place in OFF mode.

STEP 6 DOWNLOAD SENSORLESS DATA

Using the web interface, under **Settings** open the **Pump** tab. Scroll to the end of the page and under **Choose File** browse the *.map file created for the pump and click on **Import Sensorless Map**.

Choose File No file chosen

[Factory Sensorless Map Entry](#)

Points from Excel:

Or, if an Excel spreadsheet map is available, simply copy the required cells and paste them under the **Points from Excel** area and then click **Update**.

STEP 7 CONFIGURE PUMP SETTINGS

Remain on the pump menu and scroll up to the beginning of the page. Update the pump tag, serial number, low and high speed limits (rpm), any inputs and outputs required for the application, and the Control Mode to operate the pump.

Control Mode

Parallel Inputs Manual Automatic Remote

Operational Limits

Design Flow (GPM)

Design Head (FT)

Zero Flow Head (FT)

Operational Mode

Constant Flow Constant Pressure Linear Pressure Quad Pressure

(NOTE: Automatic Control Mode refers to sensorless operation.)

Carefully enter the operational limits for the pump as per the nameplate or current values. Click **Update** when done.

STEP 8 CONFIRM SENSORLESS DATA AND ACCURACY

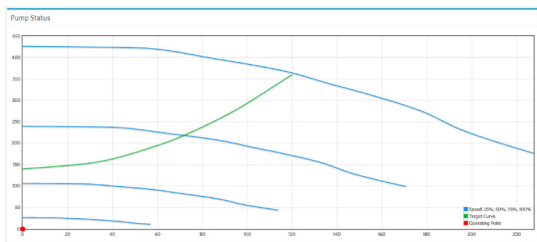
Proceed to the **Dashboard** menu. Scroll down and verify the pump curve matches the programmed control mode. For QPC (Quadratic Pump Control) it should look like this:

From the DEPC, manually ramp up the pump to duty speed and compare values with the ones taken in **STEP 1**. Discrepancies should be within 10% of the original readings.

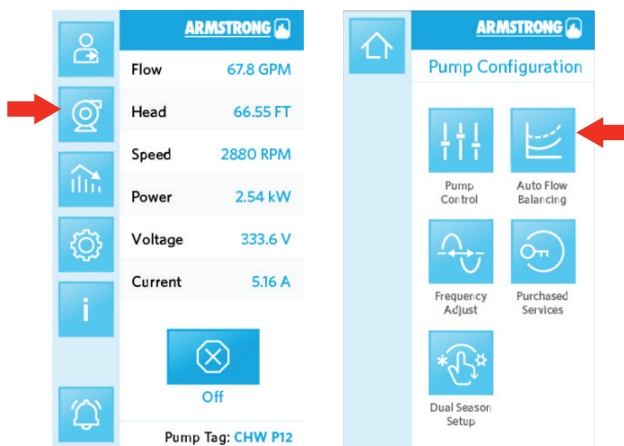
STEP 9 RE-COMMISSION THE PUMP AND TEST THE PERFORMANCE

Follow the Gen 5 Commissioning check sheet to program the required setup on the DEPC. Include analog inputs, outputs, relay functions and BAS control settings.

For Sensorless Operation, go to the DEPC's Pump Configuration menu and perform the Autoflow Balancing function.



Test in Auto Mode to confirm operation.



STEP 10 SET PUMP MANAGER ROUTER

To integrate the DEPC with the pump manager router, follow the steps in the **Router Integration Guide** document.

(NOTE: Security certificates are pre-loaded for firmware versions of 1.05 or newer.)

STEP 11 RE-LABEL DRIVE

- Remove the existing label located on top of the drive.



- Place this label inside the VFD chassis, by removing the front cover.



- Clean surface and Place new label on top of the drive



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