

Level Control for AQUAVAR® Intelligent Pump Controller (IPC) - Start-Up Guide:

SETUP AND CONFIGURATION FOR LEVEL CONTROL APPLICATION ON THE INTELLIGENT PUMP CONTROLLER

What is level control?

In level control mode, an IPC will adjust speed to maintain the fluid level in a tank, pit or well. The level controlled can be on either the suction or discharge side of a pump. The setup Genie asks users to select between "fill" or "empty" mode when programming a level application. All other features and pump protection of the IPC, including the Start-up Genie will work in level mode.

Required equipment and installation:

Level transducer (ultrasonic or static) supplied by others; Ultrasonic will set above the water table/level and measure fluid level without submerging inside. Static transducer will be submerged on the tank bottom or your minimum reference point. Transducers should output 4-20 mA or 0-10 V signal.

- If you use an amperages output transducer (4-20mA) use either AI53 or AI54; analog input A53 is a dedicated amperage input signal. If using AI54 make sure to select dip switch for amperage (on the right "I").
- If using a voltage output transducer (0-10V) use AI54 and make sure it is on voltage position (on the left "U"); the A54 comes already from factory on "U" position.
 - Amperage (on the right "I")
 - Voltage (on the left "U")
- Amperage signal range should be 4 - 20 mA
- Voltage signal range should be 0-10 Volts
- Make sure you have proper installation per IOM before programming

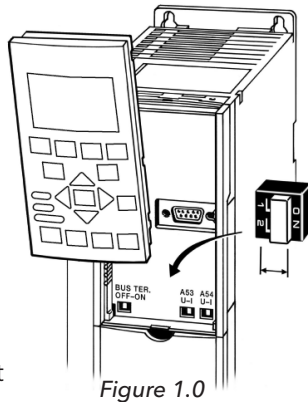


Figure 1.0

Operation in Level Mode

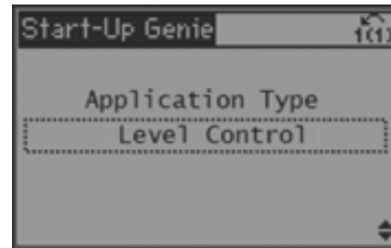
- IPC will start when setpoint + restart difference is reach (either low or high level)
- IPC will adjust speed to reach and maintain setpoint level.
- IPC may change speed as demand/flow fluctuates. This allows the desired level to be maintained without overshooting
- When the IPC stays at minimum frequency for the duration of the sleep delay time (22-24) the drive will ramp down and go into sleep mode.

Programming:

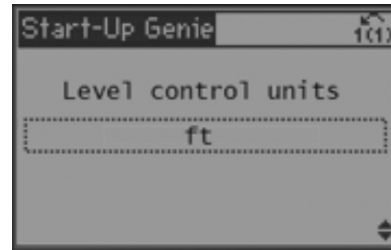
- Follow the startup Genie/IOM through the standard menus to setup the motor parameters

Application Type:

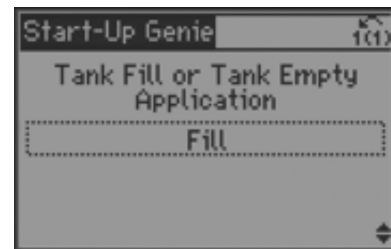
- Select Level Control:



- Select Level control units: 20-12 (Ft, m/WG, m, ft/Wg, in/Wg)



- Select Tank Fill or Tank Empty:



Fill Mode: the pump will speed up when the level drops below the setpoint level.

Empty Mode: the pump will speed up when the level increases above the setpoint level.

NOTE: The PID Normal/Inverse Control [20-81] parameter is set to Inverse for the "Empty" application and to Normal for the "Fill" application.

- Ramp Time:

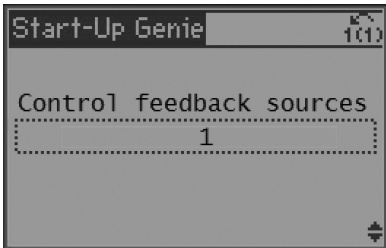


"Slow" (20 sec acceleration and 15 sec deceleration)
"Medium" (10 sec acceleration and 10 sec deceleration)
"Fast" (5 sec acceleration and 8 sec deceleration)

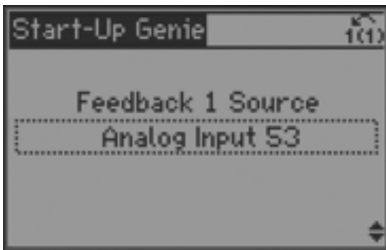
- Would you like to Auto set the rest of the settings?
Click "NO"
- Continue to the Feedback Setup? Click "Yes"

Feedback Range Reference

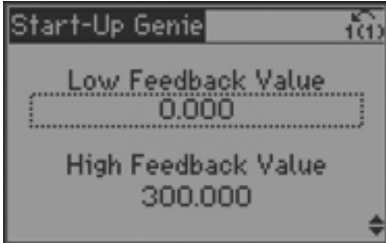
- Control feedback source:
 - 1



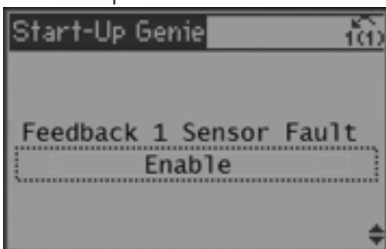
- Feedback source:
 - Select input that transducer is wired into: AI53 or AI54



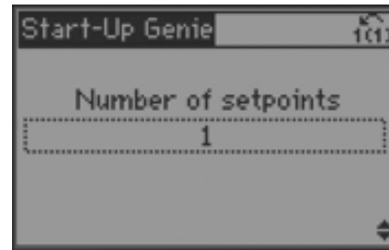
- Low Feedback 1 Value: Always will be 0



- High Feedback 1 Value:
 - High feedback is Full scale of level transducer;
Consult your sensor label/nameplate to see maximum reference (i.e., you can see 0-5, 0-300, 0-100 etc.)
- Feedback 1 Sensor Fault:
 - Select "Enable". In the case the sensor fault, the drive will stop.



- Continue to the setpoint Setup? Click "Yes" to continue
- Number of setpoints: You can select 1 or 2 setpoints controlling by a switch on the DI 33 (See IOM for details)



Setpoint Setup: Select Setpoint (on the units previously selected). This is the level that the IPC will maintain.

Pump Protection setup:

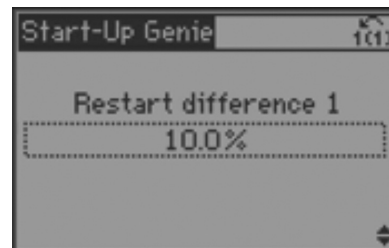
Sleep Mode:

- Enable

Minimum Sleep Frequency:

- Consult pump and system curve to determine minimum speed required by system to allow flow through pump
- You can do it manually by increasing the Hertz up and see where your gauge peak (psi)
- 30 Hz is the defaulted minimum speed on the IPC and is mandatory for submersible motors. Minimum speed can be set above 30 Hz if the application requires higher minimum speed for flow.

Restart Difference:



- "Restart difference" will be the % below/above the setpoint level where the IPC will restart; get the % value by subtracting minimum/maximum level from setpoint level and then divide by the max scale value (consult label); test and see if satisfies system preference.
- For further pump protection parameter follow the startup Genie/IOM through the standard menus on **"Pump Protection Setup"**.