

ACQ550 WITH SUBMERSIBLE PUMPS AND L527 JUMPER KIT APPLICATION NOTE

The ACQ550 Drive offers an optional +L527 jumper kit when used with the ACQ550 drive and built in submersible pump set up assistant , assists in easy setup and control of submersible pump designs that require an initial rapid acceleration in order to lubricate and protect the thrust bearing. The requirements vary between pump designs and manufacturers, but a common minimum frequency (i.e. speed) of the pump is 30 Hz – and the VFD must ramp to motor to that minimum frequency in 3 seconds or less. Once the pump has achieved 30 Hz, a slower, more gradual ramp can often be used. Also when stopping, there may be the need to quickly decelerate the pump from minimum frequency to a stop condition, again often 3 seconds or less. ABB recommends coordinating with the submersible pump manufacturer on their requirement for:

- Minimum Frequency
- Acceleration Time from 0 Hz to Minimum Frequency
- Acceleration Time from Minimum Frequency to Full Frequency (typically 60 Hz)
- Deceleration Time from Full Frequency to Minimum Frequency
- Deceleration Time from Minimum Frequency to 0 Hz.

The ACQ550 offers two different acceleration & deceleration times, along with a minimum frequency setting, thus the above information can be easily programmed into the ACQ550.

The addition of +L527 jumper kit, along with the pump set up assistant in the ACQ550 keypad simplifies the control wiring, fully utilizing the two independent acceleration & deceleration times.

Parameters that need to be changed

Install the jumper kit and then adjust the following parameters to enable the dual acceleration/deceleration feature of the ACQ550, along with the minimum frequency setting.

Note 1: The ACQ550 keypad is equipped with a pump set up assistant that will adjust the majority of the parameters needed for basic startup of submersible pump applications.

Note 2: The parameters listed are only intended to configure the acceleration, deceleration, and minimum frequency. There will be additional parameters that are set up as part of setting up a VFD, most notably entering the motor data into Group 99 of the ACQ550.

Author: David Levine		Date: June, 2017
	Industrial	Document #: ACQ550-EOTN01U-EN
		Revision: A
Product Categories: ACQ550		

1. Parameter **1201 Constant Speed**
 - a. If you do not require constant speed set to “Not Sel”
 - b. If constant speed is required make sure DI4 is not programmed.
2. Parameter **2007 Minimum Frequency**
 - a. Defines the minimum limit for the drive output frequency. Consult submersible pump manufacturer data sheet for this value. Values near 30 Hz are typical.
3. Parameter **2008 Maximum Frequency**
 - a. Defines the maximum limit for the drive output frequency. Consult submersible pump manufacturer data sheet for this value. Values near 60 Hz are typical.
4. Parameter **2202 Acceleration Time 1**
 - a. Sets the rapid acceleration time for the operation range between zero to minimum frequency. Consult submersible pump manufacturer data sheet for this value. Values near 1 to 3 seconds are typical. Reference Note 2 below.
5. Parameter **2205 Acceleration Time 2**
 - a. Sets the standard acceleration time for the operation range between minimum frequency to maximum frequency. Consult submersible pump manufacturer data sheet for this value. Reference Note 2 below.
6. Parameter **2203 Deceleration Time 1**
 - a. Sets the rapid deceleration time for the operation range between minimum to zero frequency. Consult submersible pump manufacturer data sheet for this value. Values near 1 to 3 seconds are typical. Reference Note 2 below.
7. Parameter **2206 Deceleration Time 2**
 - a. Sets the standard deceleration time used for the operation range between maximum frequency to minimum frequency. Consult submersible pump manufacturer data sheet for this value. Reference Note 2 below.

Note 3: *Applicable for Steps 3 through 6. The ACQ550 acceleration and deceleration times are based on 0 to 60 Hz operation. For example, a setting of a 6 second acceleration results in the drive taking 6 seconds to go from 0 Hz to 60 Hz. Using this same example, the VFD went from 0 to 30 Hz in 3 seconds. Apply scaling as appropriate for Steps 3 through 6.*

8. Parameter **1403 Relay Output 3** – Change to “Suprv1 Over”
 - a. Used in conjunction with DI-4, to toggle the VFD between acceleration/deceleration time 1 and acceleration/deceleration time 2.
9. Parameter **2201 ACC/DEC 1/2 Sel** – Change to “DI-4”
 - a. Used in conjunction with relay output 3, to toggle the VFD between acceleration/deceleration time 1 and acceleration/deceleration time 2.
10. Parameter **3201 Superv 1 Param.** – Change to “Output Freq”
 - a. Configures toggling between acceleration/deceleration time 1 and acceleration/deceleration time 2.

Author: David Levine		Date: June, 2017
	Industrial	Document #: ACQ550-EOTN01U-EN
		Revision: A
Product Categories: ACQ550		

11. Parameter **3202 Superv 1 Lim Lo**

- a. Set this value to 2 Hz lower than the 3203 setting. I.e. if 3203 was set to 30 Hz, set 3202 to 28 Hz.

12. Parameter **3203 Superv 1 Lim Hi**

- a. Set this value to the minimum frequency the VFD should run the motor. This is also the frequency at which the VFD will switch between the rapid acceleration time and standard acceleration time. Consult submersible pump manufacturer data sheet for this value. Values near 30 Hz are typical.

13. Parameter **2102 Stop Function** – Verify set to “Ramp”

- a. The VFD will ramp the motor to a stop, instead of allowing it to coast to a stop.

Documents or other reference material:

- ACQ550-U1 User Manual Document Number 3AUA0000145616
- L527 ACQ550 Jumper Kit Document Number 3AUA0000151661

Author: David Levine		Date: June, 2017
	Industrial	Document #: ACQ550-EOTN01U-EN
		Revision: A
Product Categories: ACQ550		