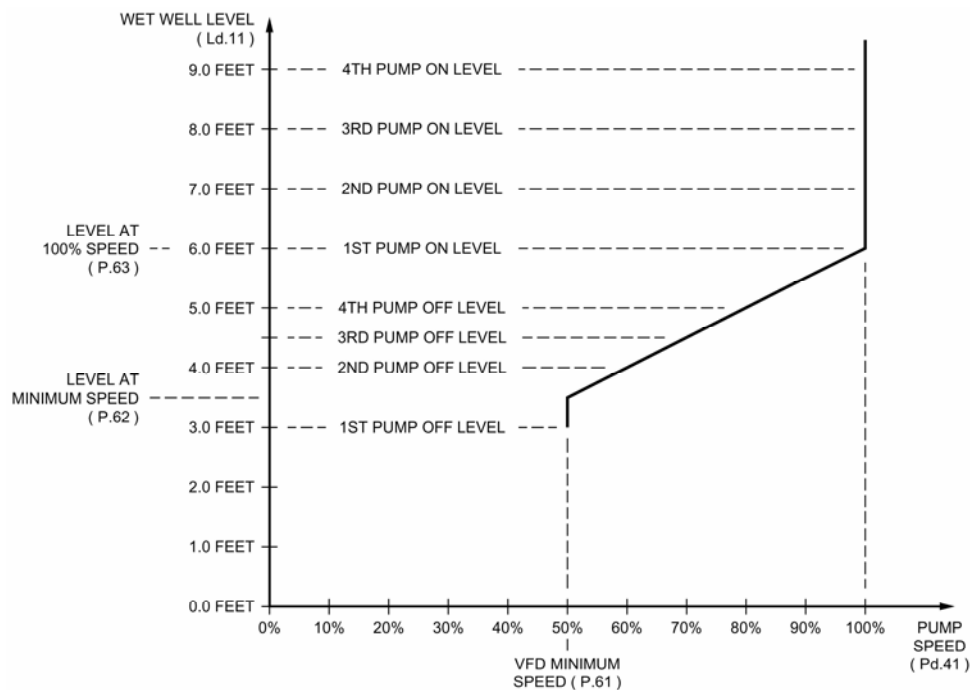


Pump Down Application - Example Shown With All Setup Parameters Set On Their Default Values

Pump Speed Versus Wet Well Level



User / Operator Info.			SCADA	Description of Parameters and SCADA Notes
Parameter	Default Value	Current Value	Register Address	
VFD Speed Reference Setup				
P.61	50%		40161	VFD - Minimum Speed (Percent of Full Speed) Range: 0% - 95%
P.62	3.5 feet		40162	VFD - Level at Minimum Speed Range: 0.1 - 231.0 feet
P.63	6.0 feet		40163	VFD - Level at 100% Speed Range: 0.1 - 231.0 feet
P.64	0 sec.		40164	Pump Start Speed Boost Time Range: 0 - 60 seconds Note: Set for 0 seconds to Disable Feature. See Note 6 below.
P.65	100%		40046	VFD - Speed of Pump Remotely Forced On Range: 0% - 100%
Pump Speed Reference Data				
Pd.41	-		40024	Pump Speed Reference Data Range: 0.0 - 100.0 percent Note: This parameter is the Calculated Pump Speed Reference as a percent of full speed.

Notes:

- A drawing should be made similar to the one above in order to coordinate the Pump Call On and Off Levels with the Pump Speed Versus Wet Well Level Curve.
- For each application there is usually a Minimum Speed, below which pump operation is undesirable.
- The Minimum Speed may be set on either the Pump Controller using Parameter P.61 or on the VFD, but not on both.
- For cases where some pumps are operated on a VFD, and others are operated at full speed, care should be taken to setup the system so that the speed of the pumps on VFDs are not allowed to go unacceptably low while being run with the other pumps at full speed.
- Care should be taken not to set the Level At 100% Speed parameter and the Level At Minimum Speed Parameters too close together. The Fault Indicator on the front of the controller will be turned on if these two Parameters are set too close together, or are accidentally switched around. See Fault Code 1015 on the Fault Code Table, in Section F.
- Pump Start Speed Boost Time - This feature causes the Speed Reference of all pumps to temporarily increase to 100% when a pump is called, and each time an additional pump is called. The pump speed stays at 100%, for the time set on the Parameter P.64. The pump speed then returns to normal. This feature may be used in cases where a pump is started at a speed that is significantly less than 100%, to ensure that the Check Valve opens.

VFD SPEED CONTROL - ANALOG OUTPUTS

User / Operator Info.			SCADA	Description of Parameters and SCADA Notes
Parameter	Default Value	Current Value	Register Address	
Analog Output Setup				
Analog Output Function			Analog Output	
F.50	6		40350	Analog Output - AOX1
F.51	1		40351	Analog Output - AO1
F.52	2		40352	Analog Output - AO2
F.53	3		40353	Analog Output - AO3
F.54	4		40354	Analog Output - AO4

Function of Analog Output:

0 = No Function
1 = Pump 1 Speed Reference
2 = Pump 2 Speed Reference
3 = Pump 3 Speed Reference
4 = Pump 4 Speed Reference
5 = Pump X Speed Reference
6 = Copy of Wet Well Level

Notes:

1. Function 0 - “No Function”, turns off the Analog Output.

2. Functions 1-4 - “Pump 1-4 Speed Reference” Analog Outputs are active only when the respective pump is called to run.

3. Function 5 - “Pump X Speed Reference” Analog Output is always active, even when no pumps are called to run.

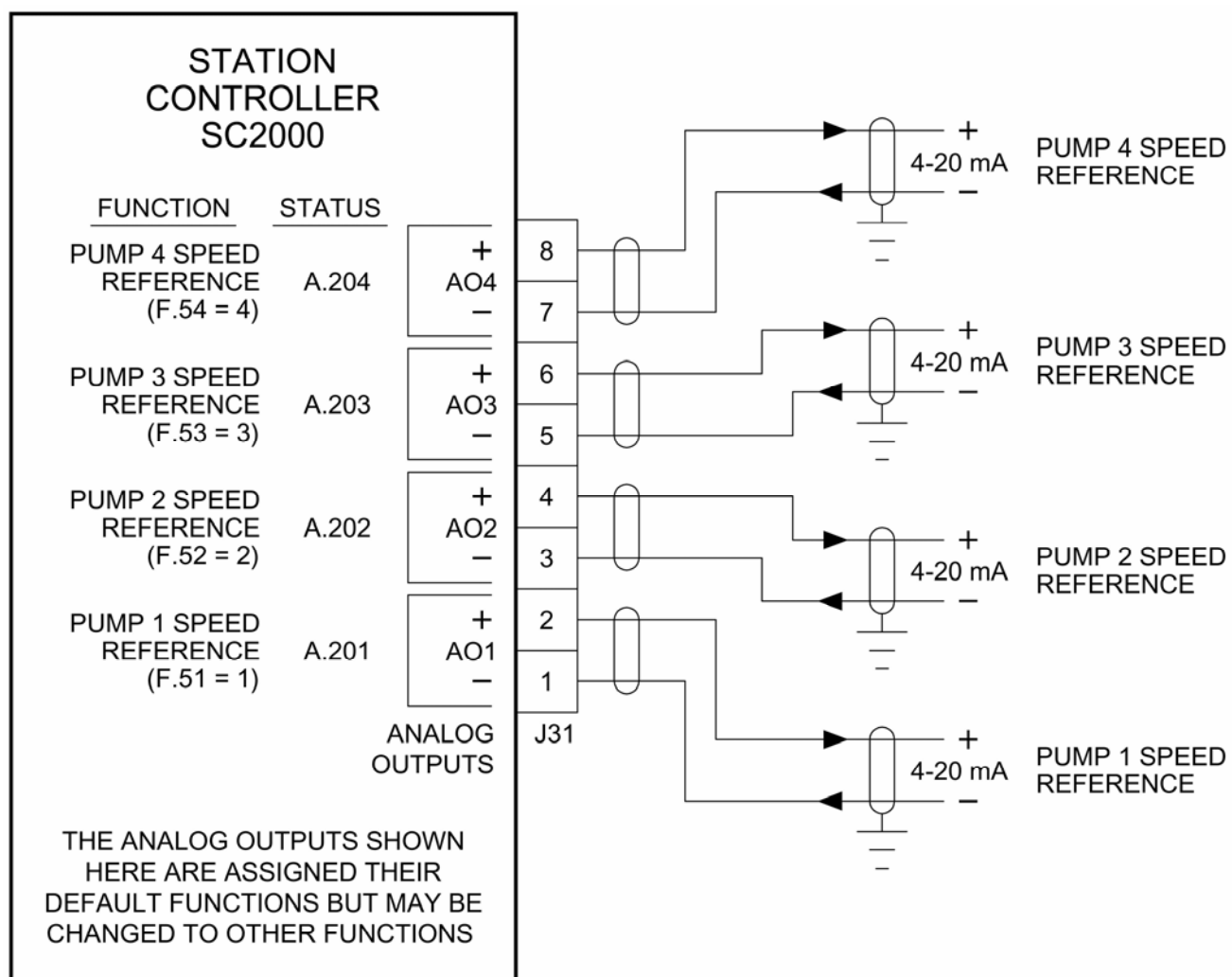
4. Function 6 - This Function makes the Analog Output send out a 4-20mA signal that is proportional to the Wet Well Level.

If the Level input Select (Parameter P.22) is set for the “Analog Level Meter - ALM1”, then the Analog Output will be scaled to match the Analog Input AIX1 using the “Level Input Span” (Parameter P.24).

If the Level input Select (Parameter P.22) is set for the “Level Probe Meter - LPM1”, then the Analog Output will be scaled to match the span of the Level Probe using the “Level Probe Meter Electrode Spacing” (Parameter P.27). The Analog Output starts at 4.0mA with no Electrodes covered and increases in 1.6mA steps to 20mA with all Electrodes covered.

User / Operator Info.	SCADA	Description of Parameters and SCADA Notes	
Parameter	Register Address		
Analog Output Status - 12-bit			
A.200	40066	Analog Output - AOX1	Note: Parameters A.200 - A.204 are 12-bit Digital to Analog Converter output control values that are factory calibrated to the following: 819 @ 4.0 mA 4095 @ 20 mA
A.201	40067	Analog Output - AO1	
A.202	40068	Analog Output - AO2	
A.203	40069	Analog Output - AO3	
A.204	40070	Analog Output - AO4	
Analog Output Status - 12-bit (Legacy)			
—	40075	Analog Output - AO1	Note: These are the Legacy 12-bit Digital to Analog Converter output control values that are factory calibrated to the following: 0 @ 4.0 mA 4095 @ 20 mA
—	40076	Analog Output - AO2	
—	40077	Analog Output - AO3	
—	40078	Analog Output - AO4	

VFD SPEED CONTROL - SPEED REFERENCE CONNECTION DIAGRAM



VFD SPEED CONTROL - DUPLEX LEVEL CONTROL EXAMPLE

