SECTION N
LEVEL PROBE BACKUP

Revision Date: 4-30-24

Backup Pump Control

The Level Probe Backup Pump Control feature, using Level Probe Inputs, may be used when the Analog Level Meter - ALM1 (Transducer Input) is selected as the primary level input (Level Input Select Parameter P.22 = 1) or when the Remote Control Level Input is selected as the primary input (Level Input Select Parameter P.22 = 4).

If the Level Probe is to be the primary level input see the LEVEL PROBE METER LPM1 in Section L.

The Backup Pump Control feature may only be used for Pump Down - Empty a Tank (Pump Up or Down Mode Parameter P.31 =1). It will not function for Pump Up applications.

The Backup Pump Control logic uses the values set on Parameters b.01 - b.10 to assign functions (Off Level, 1st On Level, 2nd On Level, etc.) to operator selected Electrode Inputs (E1 - E10).

The Backup Pump Control logic does not use the Electrode Spacing (Parameter P.27) and does not determine the wet well level. It only determines how many “Pump Call to Run” commands are required based on the status of the selected Electrode Inputs (E1 - E10), being covered or not covered with liquid.

Whenever the Backup Pump Control is active calling pumps to run the Fault indicator will be on and fault code 1049 will be present in Parameter FLC. The status of the Fault is also available through SCADA from Modbus Coil 15 (Register 40001 Bit 14).

The liquid being measured, must be grounded to the Control Panel Ground.

The Status of the Test Signals for each of the Level Probe Inputs (as an analog value) may be viewed from Parameters L.01 - L.10. The status of the Level Probe Inputs (as a discrete value) may be viewed from Parameters n.21 - n.30. See pages N-2 and N-3.

Please note that the Level Probe Inputs are designed to read sewage very effectively but will not reliably read storm water or well water.

LEVEL PROBE BACKUP

User / Operator Info.			SCADA	
Parameter	Default Value	Current Value	Register Address	Description of Parameters and SCADA Notes
Level Probe Backup Setup				
P.28	100		40128	Level Probe Input Sensitivity — Range: 90 - 210 100 = Standard Sensitivity 150 = Extra Sensitive

Level Probe Electrode Function				Electrode Input
b.01	0		40251	Electrode - E1
b.02	0		40252	Electrode - E2
b.03	0		40253	Electrode - E3
b.04	0		40254	Electrode - E4
b.05	0		40255	Electrode - E5
b.06	0		40256	Electrode - E6
b.07	0		40257	Electrode - E7
b.08	0		40258	Electrode - E8
b.09	0		40259	Electrode - E9
b.10	0		40260	Electrode - E10

Function of Level Probe Electrodes:

0 = No Function

1 = Backup Pump Control – High Level
2 = Backup Pump Control – 4th On Level
3 = Backup Pump Control – 3rd On Level
4 = Backup Pump Control – 2nd On Level
5 = Backup Pump Control – 1st On Level
6 = Backup Pump Control – Off Level

Notes:

1. The Backup Pump Control feature will be disabled when the Level Probe is selected as the primary Level Input (Parameter P.22 = 2).
2. The Backup Pump Control feature will operate in the Pump Down Mode (Parameter P.31 = 1), and will not operate in the Pump Up Mode.
3. When an Electrode Input is not used it should be set for Function 0.
4. Electrode Function 1 will activate the High Level Alarm and will call all available pumps to run until the Off Level Electrode is uncovered.
5. Whenever the Backup Pump Control is active calling one or more pumps to run the Fault indicator will be on and fault code 1049 will be present in Parameter FLC. The status of the Fault is also available through SCADA from Modbus Coil 15 (Register 40001 Bit 14).
6. The status of the Level Probe Inputs is made available to be read by SCADA and is available in the menu from Parameters n.21 - n.30.

Parameter	Coil Address	Description of Parameters and SCADA Notes
Level Probe Input - Discrete Status		
n.21	Coil 583	Electrode - E1
n.22	Coil 584	Electrode - E2
n.23	Coil 585	Electrode - E3
n.24	Coil 586	Electrode - E4
n.25	Coil 587	Electrode - E5
n.26	Coil 588	Electrode - E6
n.27	Coil 589	Electrode - E7
n.28	Coil 590	Electrode - E8
n.29	Coil 591	Electrode - E9
n.30	Coil 592	Electrode - E10

Level Probe Input Status:

0 = Input Open
1 = Input Closed

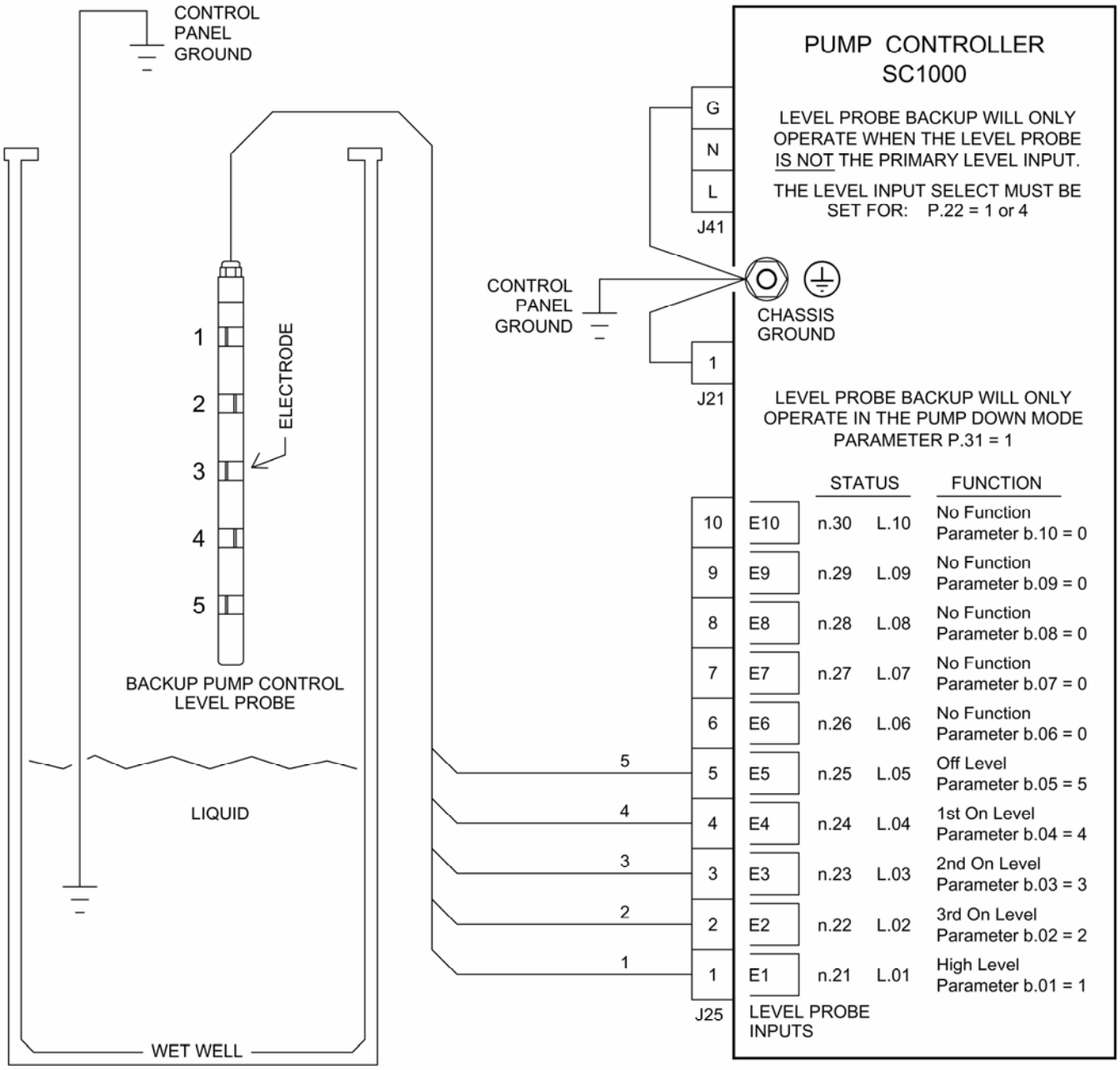
LEVEL PROBE STATUS

Parameter	Register Address	Description of Parameters and SCADA Notes
Level Probe Input - Analog Status		
L.01	41801	Electrode - E1
L.02	41802	Electrode - E2
L.03	41803	Electrode - E3
L.04	41804	Electrode - E4
L.05	41805	Electrode - E5
L.06	41806	Electrode - E6
L.07	41807	Electrode - E7
L.08	41808	Electrode - E8
L.09	41809	Electrode - E9
L.10	41810	Electrode - E10
L.11	41811	Clock Signal for Level Probe Inputs: E1 - E10

Notes:
1. Each of the Discrete Inputs send out a low voltage (+/- 6 V), low current (0.6 mA), AC (60 Hz) square wave as a Test Signal to determine the status of the input, either Open or Closed. The Status of the Test Signals for each of the Discrete Input (as an analog value) may be viewed from Parameters L.01 - L.10.
2. The Controller compares each of the Test Signal analog values with the Level Probe Input Sensitivity set on Parameter P.28.
   The Discrete Input is considered to be:
   Open - When the Test Signal is above the Sensitivity setting.
   Closed - When the Test Signal is below the Sensitivity setting.
3. The status of all the Level Probe Inputs as a discrete value may also be read by SCADA. See below.

Register Address	Description of Register Contents (Where a Modbus Coil is represented by a Bit in a Register)																
40001	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Coil
		Level Probe Backup Active Calling Pump(s) to Run														High Level Alarm Status From All Source	
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Bit
40008	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	Coil
							High Level Alarm Status From Level Probe Backup										
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Bit
40037	592	591	590	589	588	587	586	585	584	583	582	581	580	579	578	577	Coil
	Level Probe Electrode E10 Status	Level Probe Electrode E9 Status	Level Probe Electrode E8 Status	Level Probe Electrode E7 Status	Level Probe Electrode E6 Status	Level Probe Electrode E5 Status	Level Probe Electrode E4 Status	Level Probe Electrode E3 Status	Level Probe Electrode E2 Status	Level Probe Electrode E1 Status							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Bit

LEVEL PROBE BACKUP CONNECTION EXAMPLE



Note:

The liquid in the wet well must be grounded to the control panel ground.

Where a submersible pump is present the grounded housing of the pump is sufficient to ground the water to the control panel.