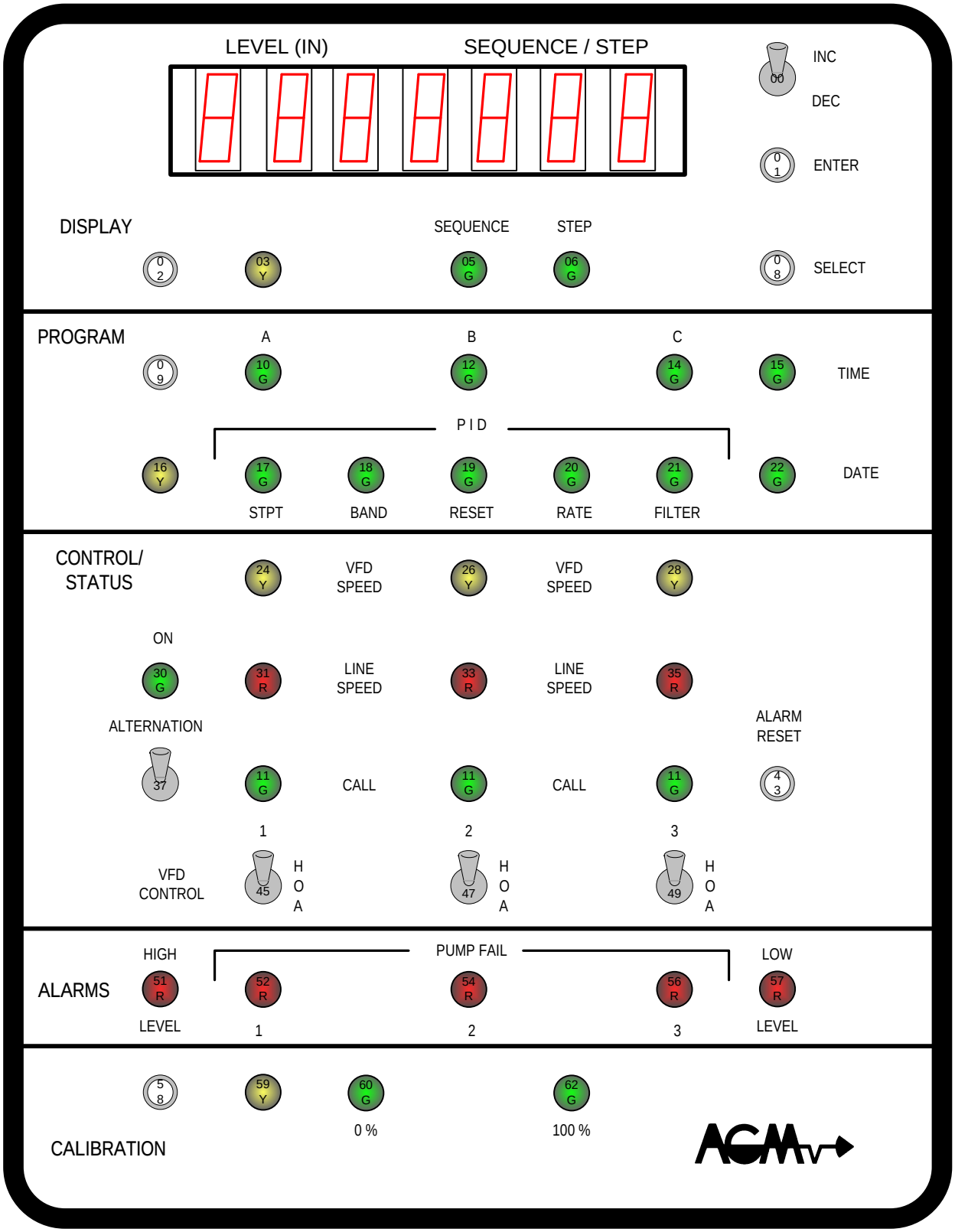

AGM Electronics, Inc.			
Tucson,Arizona			
Knowledge Map - Front Panel			
3 VDF Controller			
AGM Electronics			
	Signature	Date	PRO-yymmdd-0000 Rev NC
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Checked By	xx	__/__/__	SO# yxxxx Sheet 2 of 3
Cust Approval		__/__/__	yxxxxFP

DISPLAY MODE
THE DISPLAY MODE IS ENTERED UPON POWER UP, OR BY PRESSING SWITCH (S02P), LIGHT (L03) WILL BE ACTIVE USE SWITCH (08) TO SELECT THE RIGHT DISPLAY (L05 PUMP SEQUENCE) (L06 SETPOINT STEP). TO EXIT DISPLAY MODE ENTER THE PROGRAM OR CALIBRATION MODE. * PRESS ENTER TO SEE THE P I D STPT.

PROGRAM MODE
THE PROGRAM MODE IS ENTERED BY PRESSING SWITCH (09) WITH DIGITAL INPUT #15 CLOSED, LIGHT (16) WILL BE ON IN THIS MODE. TO MOVE THROUGH THE SETPOINT MODE USE SWITCH (08) . TO ENTER A SETPOINT SELECT THE CORRECT POINTER LIGHT USING THE SELECT SWITCH (08) AND USE SWITCH (00) TO INCREMENT OR DECREMENT THE DISPLAY VALUE. USE SWITCH (01) TO SAVE THE DISPLAY VALUE, A FLASHING SETPOINT LIGHT INDICATES AN UNSAVE VALUE WHILE A CONSTANT LIGHT DENOTES A SAVED VALUE.

STEP	LIGHT	DISPLAY	DESCRIPTION
01	L10	on 99.9	STEP 1 VFD ON STPT (LEVEL)
02	L10	oF 99.9	STEP 1 VFD OFF STPT (LEVEL)
03	L17	99.9	STEP 1 P I D STPT (LEVEL)
04	L12	on 99.9	STEP 1 LINE ON STPT (LEVEL)
05	L12	of 99.9	STEP 1 LINE OFF STPT (LEVEL)
06	L17	99.9	STEP 2 PID STPT (LEVEL)
07	L14	on 99.9	STEP 2 LINE ON STPT (LEVEL)
08	L14	oF 99.9	STEP 2 LINE OFF STPT (LEVEL)
09	L17	99.9	STEP 3 P I D STPT (LEVEL)
10	L51	on 99.9	HIGH LEVEL ON STPT (LEVEL)
11	L51	oF 99.9	HIGH LEVEL OFF STPT (LEVEL)
12	L51	on 99.9	LOW LEVEL ON STPT (LEVEL)
13	L51	oF 99.9	LOW LEVEL OFF STPT (LEVEL)
14	L52	DEL99.9	PUMP FAIL DELAY (SECONDS)
15	L21	DEL99.9	ANALOG FILTER DELAY (SECONDS)
16	L38	DEL99.9	ON OFF PUMP DELAY (SECONDS)
17	L15	9999	TIME (HR/MN)
18	L22	9999	DATE (MO/DT)
19	L22	9999	DATE (YR/DOW)
20	L18	99.9	PROPORTIONAL STPT (GAIN)
21	L19	999	DERIVATIVE STPT (GAIN)
22	L20	999	INTEGRAL STPT (SECONDS)
23	L60	999	MIN PID 0% LIMIT (PERCENT)
24	L62	999	MAX PID 100% LIMIT (PERCENT)
25	L30	9999	ALTERNATION TIME (HR/MN)
26	L30	999	ALTERNATION DAY OF WEEK (D.O.W.)

CONTROL/STATUS
THE SYSTEM IS A ONE VFD, THREE LINE SPEED PUMP CONTROL. THE VFD PUMPS WILL BE CALLED FIRST AND THE LINE SPEED PUMPS WILL ONLY BE USED IF THE VFD FAILS. THE VFD SEQUENCE IS DETERMINED BY THE ORDER THE PUMPS ARE PLACES IN THE AUTO POSITION. THE LINE SPEED PUMPS ARE CONTROLLED BY THE ON/OFF SETPOINTS FOR EACH PUMP INDIVIDUALLY ** IF THE VFD FAILS IN ALL POSITIONS THEN THE LINE SPEED PUMPS WILL ONLY BE ABLE TO TURN ON TWO PUMPS BECAUSE THE LEAD PUMP IS ALWAYS THE VFD.

ALARMS
THE ALARMS SHOWN: HIGH (51) , LOW (57) AND PUMP FAILURE (52-56). THE PUMP FAILURE ALARMS WILL HAVE AN ADJUSTABLE ALARM DELAY BETWEEN BEING CALLED AND RECEIVING A EEDBACK (D1-D6).

CALIBRATION
TO ENTER THE CALIBRATION MODE FOR CALIBRATING THE INCOMING ANALOG SIGNAL TO ENGINEERING DISPLAY UNITS (FEET), CLOSE DIGITAL INPUT # 16.

TO CALIBRATE :

1> USE THE SELECT SWITCH (S08P) TO SELECT THE 0% LIGHT (L60)
2> APPLY 0% ANALOG SIGNAL TO ANALOG INPUT.
3> USE THE INC/DEC SWITCH TO SET THE DISPLAY FOR DESIRED 0% UNITS.
4> PRESS THE ENTER SWITCH TO SAVE THE 0% CALIBRATION
5> USE THE SELECT SWITCH TO SELECT THE 100% LIGHT (L62).
6> APPLY 100% ANALOG SIGNAL TO ANALOG INPUT.
7> USE THE INC/DEC SWITCH TO SET THE DISPLAY FOR DESIRED 100% UNITS.
8> PRESS THE ENTER SWITCH TO SAVE THE 100% CALIBRATION
9> CALIBRATION COMPLETE, PRESS (S02P) TO RETURN TO NORMAL MODE.

	Signature	Date	PRO-xxxxxx-0000	Rev
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AGM Electronics, Inc.
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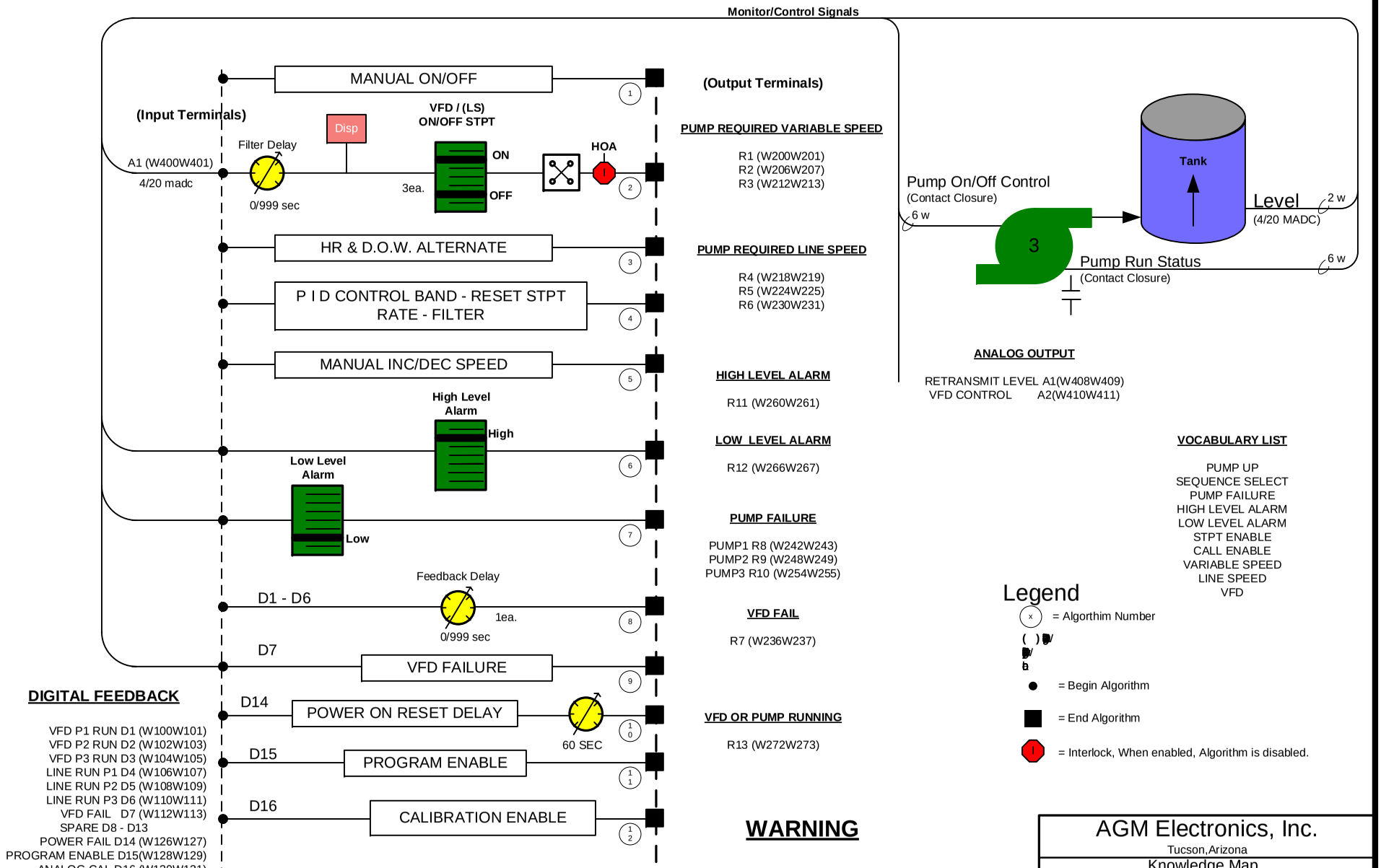
Front Panel Notes
3 VFD Control
AGM Electronics

Algorithms

Field-Equipment



DIGITAL FEEDBACK

VFD P1 RUN D1 (W100W101)
VFD P2 RUN D2 (W102W103)
VFD P3 RUN D3 (W104W105)
LINE RUN P1 D4 (W106W107)
LINE RUN P2 D5 (W108W109)
LINE RUN P3 D6 (W110W111)
VFD FAIL D7 (W112W113)
SPARE D8 - D13
POWER FAIL D14 (W126W127)
PROGRAM ENABLE D15(W128W129)
ANALOG CAL D16 (W130W131)

VOCABULARY LIST

PUMP UP
SEQUENCE SELECT
PUMP FAILURE
HIGH LEVEL ALARM
LOW LEVEL ALARM
STPT ENABLE
CALL ENABLE
VARIABLE SPEED
LINE SPEED
VFD

Legend

= Algorthim Number

= Begin Algorithm

= End Algorithm

= Interlock, When enabled, Algorithm is disabled.

WARNING

For SCADA oveall system disign must incorporate other safeguards in addition to the ICS for operating conditions hazardous to personnel, equipment, or property; such as the use of "deadman" or "suresafe interlocks" and red tag aaccess etc.

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Knowledge Map
3 VFDControl
AGM Electronics

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			yxxxxKM	