SRKH - 09-SEPT-2010

www.AppleLogic.org

USE FILE: PPPDRxxx.BIT/.RBT

PRESSURE GAUGE

SSI TECHNOLOGY INC
DIGITAL MEDIA GAUGE

MODEL: MG-300-A-MD-R
300PSI/LCD/ANNUNCIATOR/4-20MA
12VDC SUPPLY

4-20mA CURRENT LOOP (TO GROUND)
SUPPLY = 12V - CURRENT RESISTOR = 220R

FS = 300PSI = 12v/0.020A = 600 - 220R
FS = 300PSI = 380R = 20mA (4.4V)

ZS = 0PSI = 12v/0.004A = 3000 - 220R
ZS = 0PSI = 2780R = 4mA (0.88V)

ZS (4mA) = 0.88V OFFSET

4.4V - 0.88V = 3.52
3.52 / 300 (FS) = 0.011733 per PSI
0.011733 (PSI) + 0.88V (OFFSET) = 1 PSI or 0.891733V

0.891733 / 0.012890625 = d69.17 or 0x45
1 PSI = d69.17 (DECIMAL) or 0x45 (HEX)

0PSI = 0.88V (OFFSET)
0.88 / 0.012890625 = d68.26 or 0x44
Offset d68.26 or 0x44 from ADC output to logic multiplier

NORMAL RUNNING = ~5PSI (4.39PSI)
5PSI = 0.011733 x 5 = 0.058665 + 0.88 = 0.938665
0.938665 / 0.012890625 = d72.8 or 0x48

BACKWASH TRIGGER = ~10PSI (9.88PSI)
10PSI = 0.011733 x 10 = 0.11733 + 0.88 = 0.99733
0.99733 / 0.012890625 = d77.3 or 0x4D

FILTER MAXIMUM = ~30PSI (29.66PSI)
30PSI = 0.011733 x 30 = 0.35199 + 0.88 = 1.23199
1.23199 / 0.012890625 = d95.5 or 0x5F

DIVISOR FOR ADC BIT BOUNDRY AND GAUGE RESOLUTION
5x 0.012890625 = 0.064453125 / 0.011733 = 5.49332 / 5 = 1.09866
SET MULTIPLIER TO 109866 (109)

EQUIPOTENTIAL BONDING POINT

EB EARTH

24VAC
63W/2.6AMP
SAFETY TRANSFORMER

RCD240VAC
800mA
EARTH
NEUTRAL

LEGRAND 442-32
EN60742 + EN61558

NANOBOARD
3000
XN/AL

1A

SHIELD

RS485 TXD+
RS485 TXD-
RS485 RXD+
RS485 RXD-

RELAY - NO3
RELAY - COM3
RELAY - NC3
RELAY - NO2
RELAY - COM2
RELAY - NC2
RELAY - NO1
RELAY - COM1
RELAY - NC1
RELAY - NO0
RELAY - COM0
RELAY - NC0

WHITE
BLACK
RED

J14 - ISOLATED NO/NC RELAYS

GROUND (GND)
PWM - CH3
PWM - CH2
PWM - CH1
PWM - CH0
PWM - +5VDC

J16 - PWM PORTS

GROUND (GND)
ADC - CH3
ADC - CH2
ADC - CH1
ADC - CH0
ADC - +5VDC

2200R
4.7uF/25V
LOW ESR
x4

J15 - ADC PORTS

RELAY
20A

RCD240VAC
FROM
RCD/GFCI

PAD240VAC
TO
PUMP PAD

12VAC
150WATT/12.5AMP
SAFETY TRANSFORMER

1.5A
NEUTRAL

POOL LIGHT

NUVOTEM 150-60015P1S1
EN60742 + EN61558

PUMP PAD

PRESSURE GAUGE
SSI TECH.
MG-300-A-MD-R

A12V
+R
AOUT
SW
GROUND

FILTER1
SPHERE, FILTRAX, OMEGA 700

FILTER OUT
WASTE
FILTER IN
IN
OUT

MPV1
BACKWASH VALVE, JANDY, 8034+2440

CV2
CHECK VALVE

RELAY
40A

PAD240VAC
EB
NEUTRAL
EZ100

C1
CHLORINATOR, WATERMAID, EZ300

T1
TEE

V2
JANDY 4715+2440

PAD240VAC
PWR
COM
EB
NEUTRAL
OUT
IN
VF

P1
PUMP, PENTAIR VF

V1
JANDY 4715+2440

CV1
CHECK VALVE

CV3
CHECK VALVE

V3
JANDY 4715+2440

SV1
STOP VALVE, BALL

SV2
STOP VALVE, BALL

SV3
STOP VALVE, BALL

SV4
STOP VALVE, BALL

SV5
STOP VALVE, BALL

EB

TO
WATER FEATURE

TO
POOL JETS

FROM
SOLAR COLLECTOR

TO
SOLAR COLLECTOR

FROM
SKIMMER BOX

FROM
VAC PORT

TO
SEWER

SOLAR TRIGGER = 30° Celsius
1° Celsius = 10.0mV (NatSemi LM35DT)
ADC RESOLUTION = 0.012890625v = 1 LSB BIT @ 3.3V FS REF
0.012890625v = 1 LSB BIT
30° Celsius = 300mV (0.30V)
0.30 / 0.012890625 = 23.27 or d23 or 0x17

LM35DT

SOLAR PANEL
ONE

SOLAR PANEL
TWO

EB

TO
PUMP PAD

FROM
PUMP PAD

LM35DT

EB

PPP OPERATORS RF KEY FOB (v1.06)

PUMP ON (3HRS)
1 LONG PRESS ON

TIMERS START
1 LONG PRESS ON
3 SHORT PRESS OFF

VAC
1 LONG PRESS ON
3 SHORT PRESS OFF

POOL LIGHT
1 LONG PRESS ON
3 SHORT PRESS OFF

PUMP OFF
3 SHORT PRESS OFF

BACKWASH
1 LONG PRESS ON
3 SHORT PRESS OFF

WATER FEATURE
1 LONG PRESS ON
3 SHORT PRESS OFF

ALL OFF
1 LONG PRESS ALL OFF

DIRECT SETUP

POOL PAD PARTNER

PUMP PAD INTERFACE FOR DIRECT CONNECTION AND PLUMBING LAYOUT DIAGRAM

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USE FILE: PPPWJxxx.BIT/.RBT

PRESSURE GAUGE

SSI TECHNOLOGY INC
DIGITAL MEDIA GAUGE

MODEL: MG-300-A-MD-R
300PSI/LCD/ANNUNCIATOR/4-20MA
12VDC SUPPLY

4-20mA CURRENT LOOP (TO GROUND)
SUPPLY = 12V - CURRENT RESISTOR = 220R
FS = 300PSI = 12v/0.020mA = 600 - 220R
FS = 300PSI = 3200R = 20mA (4-20)

ZS = 0PSI = 12v/0.004A = 3000 - 220R
ZS = 0PSI = 2780R = 4mA (0.88V)

ZS (4mA) = 0.88V OFFSET

4 4V - 0.88V = 3.52
3.52 / 300 (FS) = 0.011733 per PSI
0.011733 (PSI) + 0.88V (OFFSET) = 1 PSI or 0.891733V

0.891733 / 0.012890625 = d69.17 or 0x45
1 PSI = d69.17 (DECIMAL) or 0x45 (HEX)

0PSI = 0.88V (OFFSET)
0.88 / 0.012890625 = d68.26 or 0x44
Offset d68.26 or 0x44 from ADC output to logic multiplier

NORMAL RUNNING = ~5PSI (4.35PSI)
5PSI = 0.011733 x 5 = 0.058665 + 0.88 = 0.938665
0.938665 / 0.012890625 = d72.8 or 0x48

BACKWASH TRIGGER = ~30PSI (9.08PSI)
30PSI = 0.011733 x 30 = 0.35199 + 0.88 = 1.23199
1.23199 / 0.012890625 = d95.5 or 0x5F

DIVISOR FOR ADC BIT BOUNDRY AND GAUGE RESOLUTION
5x 0.012890625 = 0.064453125 / 0.011733 = 5.49332 / 5 = 1.09866
SET MULTIPLIER TO 109866 (109)

EQUIPOTENTIAL BONDING POINT

EB

EARTH

WEJB - WET END JUNCTION BOX

PUMP PAD

PRESSURE GAUGE SSI TECH. MG-300-A-MD-R

R
AOUT
SW
GROUND

FILTER1 SPHERE, FILTRAX, OMEGA 700

FILTER OUT
FILTER IN
WASTE
IN
OUT

MPV1 BACKWASH VALVE, JANDY, 8034+2440

CV2 CHECK VALVE

RELAY 40A

C1 CHLORINATOR, WATERMAID, EZ300

E.CON

T1 TEE

V2 JANDY 4713+2440

PADZ40VAC
PWR
COM
RS485+
RS485-
P1 PUMP, PENTAIR VF

V1 JANDY 4713+2440
CV1 CHECK VALVE
CV2 CHECK VALVE
V3 JANDY 4713+2440

SV1 STOP VALVE, BALL
SV2 STOP VALVE, BALL
SV3 STOP VALVE, BALL
SV4 STOP VALVE, BALL
SV5 STOP VALVE, BALL

TO WATER FEATURE
TO POOL JETS
FROM SOLAR COLLECTOR
TO SOLAR COLLECTOR
FROM SKIMMER BOX
FROM VAC PORT
TO SEWER

POOL TEMPERATURE SENSOR

RELAY 5A

WEJB POWER ON INDICATOR (GREEN)

24VAC 63W/2.6AMP SAFETY TRANSFORMER
RCD40VAC
1A
800mA
NEUTRAL
EARTH

LEGRAND 4424
EN60742 + EN61558

FROM RCD/GFCI
TO PUMP PAD

RELAY 20A

12VAC 150WATT/12.5AMP SAFETY TRANSFORMER
POOL LIGHT
1.5A

NUVOTEM 150-60/05PS15
EN60742 + EN61558

CAT5 BRN W/BRN PAIR
CAT5 ORG PAIR
CAT5 W/BLU BLU PAIR
CAT5 GRN W/GRN PAIR
SHIELD

NANOBOARD 3000 XN/AL

RS485 TXD+
RS485 TXD-
RS485 RXD+
RS485 RXD-

RELAY - NO1
RELAY - COM1
RELAY - NC1
RELAY - NO2
RELAY - COM2
RELAY - NC2
RELAY - NO1
RELAY - COM1
RELAY - NC1
RELAY - NO0
RELAY - COM0
RELAY - NC0

J14 - ISOLATED NO/NC RELAYS

GROUND-(GND)
PWM - CH3
PWM - CH2
PWM - CH1
PWM - CH0
PWM - +5VDC

J16 - PWM PORTS

GROUND-(GND)
ADC - CH7
ADC - CH6
ADC - CH5
ADC - CH4
ADC - +5VDC

4.7nF/25V LOW ESR x4

J15 - ADC PORTS

SOLAR TRIGGER = 30° Celsius
1° Celsius = 10.0mV (NatSemi LM35DT)
ADC RESOLUTION = 0.012890625v = 1 LSB BIT @ 3.3V FS REF
0.012890625v = 1 LSB BIT
30° Celsius = 300mV (0.3V)
0.30 / 0.012890625 = 23.27 or d23 or 0x17

LM3407

SOLAR PANEL ONE
SOLAR PANEL TWO

TO PUMP PAD
FROM PUMP PAD

PPP
WEJB
PCB1.0

WEJB SETUP

POOL PAD PARTNER

PUMP PAD INTERFACE FOR CONNECTION WITH WEJB AND PLUMBING LAYOUT DIAGRAM

PPP OPERATORS RF KEY FOB (v1.06)