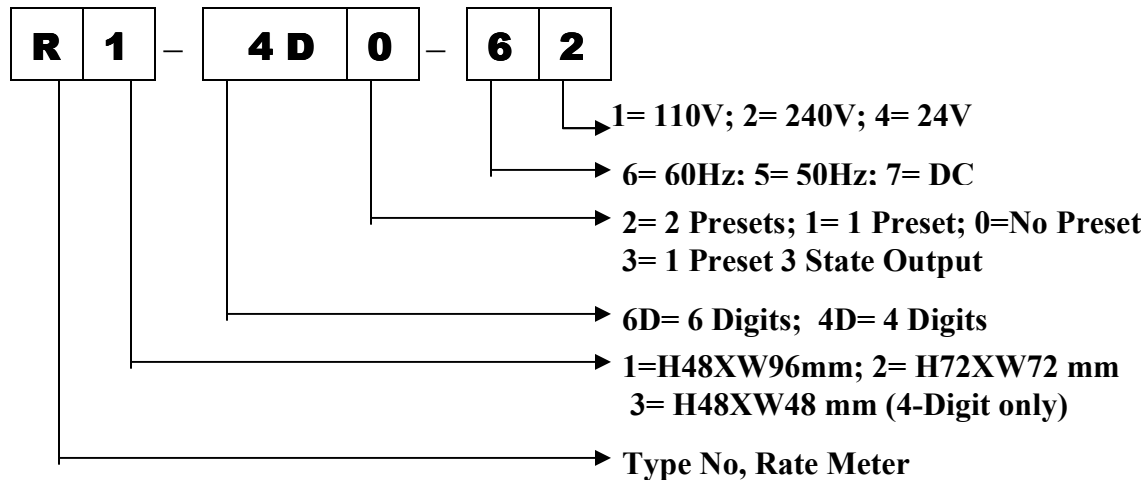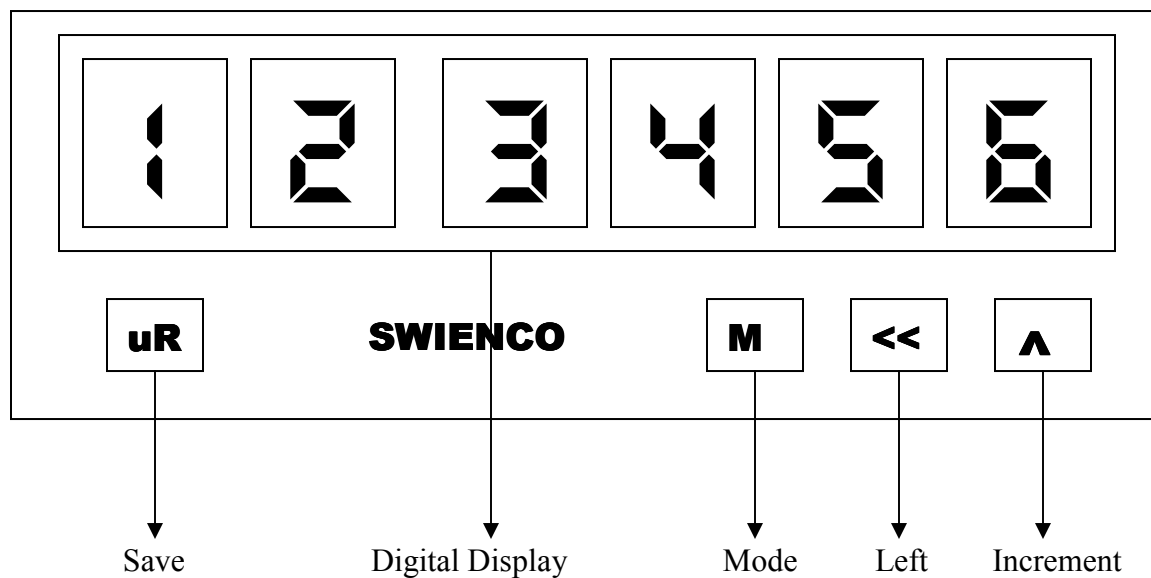# R1- SAINT WIEN
PROGRAMMABLE RATE METER

R-Series is a programmable indication and control meter with features like Pre-Scale Factor, Hysteresis, Delay Time, Offset, and Display Hold. Its powerful single chip CPU and excellent software design provides users a high flexibility for a variety of applications.

1. Ordering Information:

| R | 1 | – | 4D | 0 | – | 6 | 2 |

1= 110V; 2= 240V; 4= 24V

6= 60Hz: 5= 50Hz: 7= DC

2= 2 Presets; 1= 1 Preset; 0=No Preset
3= 1 Preset 3 State Output

6D= 6 Digits; 4D= 4 Digits

1=H48XW96mm; 2= H72XW72 mm
3= H48XW48 mm (4-Digit only)

Type No, Rate Meter

2. Front Panel[*]:

| 1 | 2 | 3 | 4 | 5 | 6 |

| uR | SWIENCO | M | << | ^ |

Save   Digital Display   Mode   Left   Increment
                                                  Shift
*For R1-6DO-XXXX

## 3. Electrical and General Specifications:

1. Supply voltage: 24/110/220 (±10%) VAC 50/60Hz
2. Power consumption: 3~7VA approx.
3. Ambient conditions: -10~55°C, 35~85% RH
4. Weight: 300~600g approx.
5. Display: Model R1-6DXXXX--- 6 digits
   Model R1-4DXXXX--- 4 digits
6. Protection:
   - EEPROM memory backup
   - Watchdog Timer
7. Indication Accuracy: 0~999999 ±0.01%; ±1 count; ±50ppm/°C;Range 4~300,000RPM

8. Sampling time: 100ms to 16.5 s. Varies according to input signal frequency
9. Resolution: 0.01~10RPM , depending on display range
10. Delay time: 0~99s. Turns the output ON after the delay time is elapsed
11. Offset: 0~999999 (R1-6DXXXX), or 0~9999 (R1-4DXXXX). Display starts from the offset value, instead of 0.
12. Hysteresis: 0~9999
13. Decimal Point: 3 positions for PV, P1, p2, Offset and Hysteresis

4. Input and Output Specifications:

1. Signal Input CP1 : 5~30VDC input. Single or Multiple pulses per revolution
2. Hold Input CP2: A high input on CP2 will hold the display count until CP2 input goes low.
3. Power for Sensor: 12VDC (±15%) 60mA(R1, R2); 20mA(R3)
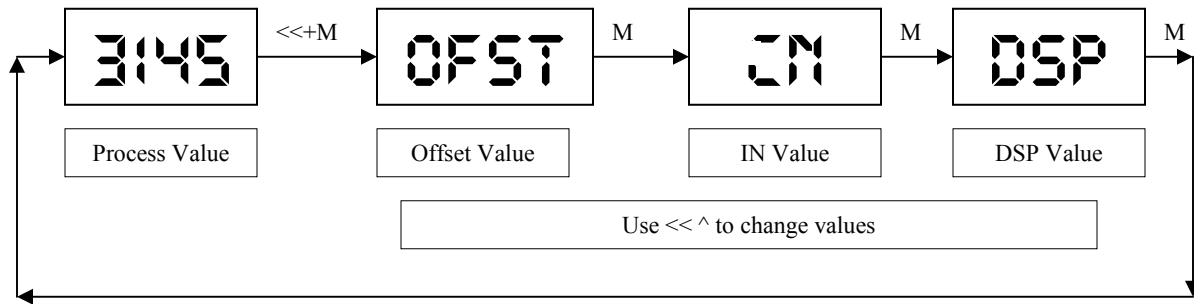
5. Configuration of R1:

5.1 Setting Preset Values:
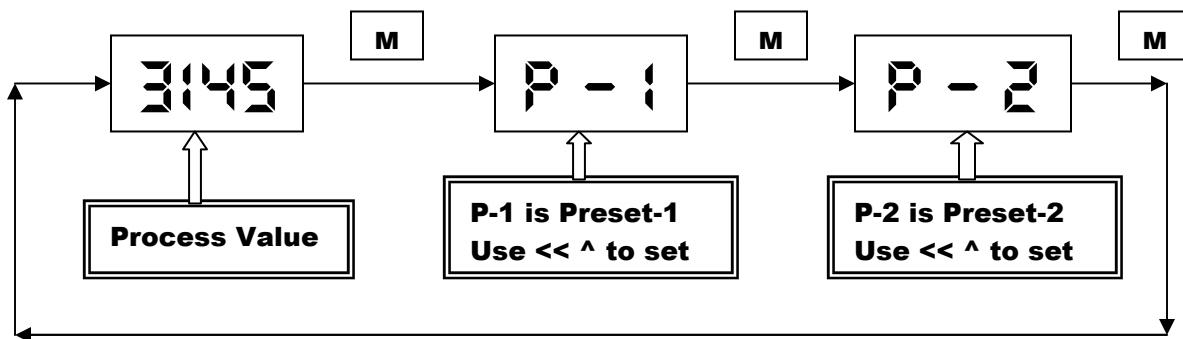
i. Press [M] at the Process value screen to enter Preset-1 screen.
ii. Press [<] to select the required digit. The selected digit flashes
iii. Press [^] to increment the value.
iv. Repeat steps ii, iii to all digits of Preset-1.
v. Press [M] to enter Preset-2 screen.
vi. Repeat steps ii, iii to all digits of Preset-2.
vii. Press [M] to save presets and return to Process Value screen.

viii.   Press [uR] to save the settings to the CPU.
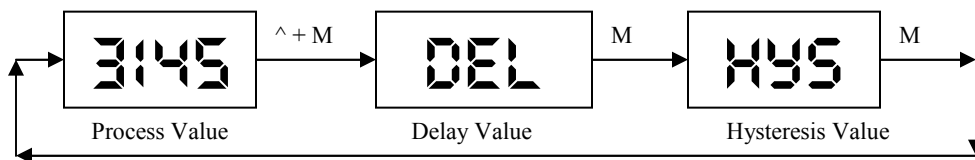
5.2 Configuring Offset and Prescalers:

```
┌─────────┐  <<+M   ┌─────────┐  M   ┌─────────┐  M   ┌─────────┐  M
│  3145   │ ──────> │  OFST   │ ───> │   IN    │ ───> │  DSP    │ ───>
└─────────┘         └─────────┘      └─────────┘      └─────────┘
Process Value       Offset Value      IN Value         DSP Value

            Use << ^ to change values
```

i.   Press [M] while holding [<] at the process value screen to enter OFFSET screen. OFFSET defines the starting value for the rate meter. The value specified in OFFSET is always added to the actual process value.

ii.   The OFFSET value and the display 'OFST' swap every 3 seconds.

iii.   Press [<<] to select the required digit.

iv.   Press [^] to increment the value at the selected digit.

v.   Repeat steps iii, iv for every digit in OFFSET screen.

vi.   Press [M] to save the OFFSET value and enter 'IN' screen.
IN and DSP decide the input prescale. The Process value is given by

$$\text{Process Value} = \frac{DSP}{IN} \text{ X Number of Pulses received per minute}$$

More information on DSP, IN has been provided in Appendix-1.

vii.   Repeat steps iii, iv to set the IN value

viii.   Press [M] to save 'IN' value and enter 'DSP' screen.

ix.   Again, repeat steps iii, iv to set DSP value.

x.   Press [M] to save DSP and return to process value screen.

xi.   Press [uR] to save the settings to the CPU

5.3 Configuring Delay and Hysteresis of Output:

```
┌─────────┐  ^ + M   ┌─────────┐  M   ┌─────────┐  M
│  3145   │ ──────>  │  DEL    │ ───> │  HYS    │ ───>
└─────────┘          └─────────┘      └─────────┘
Process Value         Delay Value      Hysteresis Value
```

i.   At the Process Value screen, press [M] while holding [^] to enter into Delay screen.

ii.   Use [<<] to select the required digit.

iii.   Press [^] to change the value at selected digit.

iv.   Repeat steps ii, iii for all digits in the Digit screen.

v.   Press [M] to save the Delay value and enter Hysteresis screen.

vi.   Again, repeat steps ii, iii to enter a Hysteresis value.

vii.   Press [M] to save the Hysteresis value and return to Process value screen.

viii.   Press [uR] to save the settings to the CPU.

5.4 Adjusting the decimal point:

i. At Process Value screen, press [uR] repeatedly while holding [<] key to   change the decimal
   point to the desired position.
ii. Press [uR] to save the settings to the CPU.

5.5 CPU Reset:
      NB: Resetting the CPU will erase all the programmed parameters.

i. Power up the R1 while holding [M],[^],[<] keys simultaneously. This resets the CPU erasing all
   the programmed parameters. Re-configure R1 for new function.

Appendix-1: Configuring R1 to display RPM:

If 'n' pulses are produced for every 'r' rotations, then to display RPM, set
OFST=0
DSP=r
IN=n

Example: If 10 pulses are produced for 1 rotation of the shaft, then settings are as follows.
OFST=0
DSP=1
IN=10

This would configure R1 to display RPM. Adjust the decimal point appropriately.

Appendix-2: Configuring R2 to display line speed:

R1 could be configured to display the line speed of a conveyor belt system.

Measure the diameter of the shaft.
 Let Diameter of shaft = d
So, Distance traveled in 1 rotation of the shaft = 3.14 x d

Let, Number of pulses received for one rotation = x

The parameters to display line speed are as shown below.

OFST = 0
DSP = 3.14 x d
IN = x