Design Features

- Supports up to 29 Engineering Units (including User Defined).
- Two programmable Totalizers (main and pilot) indicate total liquid volume.
- Programmable High and Low Flow Alarm limits with preset delay interval.
- Programmable High and Low Temperature Alarm limits with preset delay interval (optional).
- Two sets of user programmable optically isolated outputs.
- User selectable (via jumpers) analog 0-5 Vdc or 4-20mA flow and temperature (optional) outputs.
- Flow Pulse output (3.3Vdc CIMOS).
- Digital Interface (RS-232 or RS-485).
- Multi-Drop Capability of up to 256 units (RS-485 option).
- Extensive Self Diagnostics with LCD (optional) indication.
- Local key pad and 2x16 characters LCD display with adjustable back light (optional).
- Enclosure weather tight to IP65 standards.
- Free AALBORG configuration and calibration software (RS-232/RS-485).

Principles of Operation

Fluid flowing through the unit causes the paddle wheel to spin. As the magnets embedded in the paddle spin past the sensor, electrical pulses are produced in which frequency is proportional to the flow rate. The number of pulses per desired time interval and the K-factor (number of pulses/Gallon) make it is possible to calculate the flow rate and volume passing through the unit.

On board CPU and signal conditioner circuitry perform accurate flow and total computation, digital communication and analog 0-5 Vdc or 4-20 mA output signals. Non-volatile memory stores all hardware specific and user programmable variables, including flow linearization table.

The flow rate can be displayed in 29 different volumetric or mass flow engineering units. Flow meter parameters and functions can be programmed locally via key pad and LCD* or remotely via the RS-232/RS-485 interface.

PWE flow meters support various functions including: two independently programmable flow totalizers, user programmable low, high or range flow and temperature* alarm, two sets of user programmable optically isolated outputs, self diagnostic alarm, flow pulse output.

Optional local 2x16 LCD* readout with adjustable back light provides flow rate, temperature*, total volume reading in currently selected engineering units, diagnostic events indication and feature a password protected access to the process parameters to ensure against tampering or resetting.

(- optional feature)*

Totalizer

The total volume of the liquid is calculated by integrating the actual liquid flow rate with respect to time. The optional LCD/keypad and digital interface commands are provided to:

- set the totalizer to ZERO
- start the totalizer at a preset flow
- assign action at a preset total volume
- start/stop totalizing the flow
- read totalizer

Totalizer conditions become true, when the totalizer reading and the "Stop at Total" volumes are equal. Main Totalizer reading is stored in the non volatile memory (EEPROM). The pilot Totalizer reading is stored in volatile memory (SRAM) and will be lost if flow meter is powered down.

Flow and Temperature* Alarms

High and Low flow ALARM limits can be preprogrammed via digital interface or optional LCD/Keypad. ALARM conditions become true when the current reading is equal or higher/lower than corresponding values of high and low alarm levels. Alarm action can be assigned with preset delay interval (0-3600seconds) to activate the optically isolated output (separate for High and Low alarm). Latch Mode control feature allows each optical output to be latched on or follow the corresponding alarm status.

Optically Isolated Outputs

Two sets of optically isolated outputs are provided to actuate user supplied equipment. These are programmable via digital interface or optional LCD/Keypad such that the outputs can be made to switch when a specified event occurs (e.g. when a low or high flow alarm limit is exceeded or when the totalizer reaches a specified value) or may be directly controlled by user.

Engineering Units

The measured flow and associated totalizer data are scaled directly in engineering units via the digital interface.

WETTED MATERIALS	
BODY	Polypropylene
LID	Acrylic
PADDLE WHEEL	PVDF
SHAFT	Nickel Tungsten Carbide
BEARINGS	Sapphire Jewels
O-RINGS	EPDM
PLATINUM RTD	316 stainless steel

The following 29 units of measure are supported:

UNITS OF MEASURE				
NUMBER	INDEX	FLOW RATE ENGINEERING UNITS	TOTALIZER ENGINEERING UNITS	DESCRIPTION
1	0	%	%s	Percent of full scale
2	1	mL/sec	mL	Milliliter per second
3	2	mL/min	mL	Milliliter per minute
4	3	mL/hr	mL	Milliliter per hour
5	4	L/sec	Ltr	Liter per second
6	5	L/ min	Ltr	Liter per minute
7	6	L/hr	Ltr	Liter per hour
8	7	m^3/sec	m^3	Cubic meter per second
9	8	m^3/ min	m^3	Cubic meter per minute
10	9	m^3/hr	m^3	Cubic meter per hour
11	10	ft^3/sec	ft^3	Cubic feet per second
12	11	ft^3/min	ft^3	Cubic feet per minute
13	12	ft^3/hr	ft^3	Cubic feet per hour
14	13	Gl/sec	Gal	Gal per sec
15	14	Gl/min	Gal	Gal per minute
16	15	Gal/hr	Gal	Gal perhour
17	16	g/sec	g	Grams per second
18	17	g/min	g	Grams per minute
19	18	g/hr	g	Grams per hour
20	19	kg/sec	kg	Kilograms per second
21	20	kg/min	kg	Kilograms per minute
22	21	kg/hr	kg	Kilograms per hour
23	22	Lb/sec	Lb	Pounds per second
24	23	Lb/min	Lb	Pounds per minute
25	24	Lb/hr	Lb	Pounds per hour
26	25	t/sec	Ton	Ton (metric) per sec
27	26	t/min	Ton	Ton (metric) per minute
28	27	t/hr	Ton	Ton (metric) per hour
29	28	User	UD	User defined

DIGITAL PADDLE WHEEL MODEL NUMBERS			
METER ONLY	WITH RTD	WITH LCD AND KEY PAD	WITH LCD, KEYPAD AND RTD
PWE4P	PWE4PR	PWE4PL	PWE4PK
PWE6P	PWE6PR	PWE6PL	PWE6PK
PWE8P	PWE8PR	PWE8PL	PWE8PK
PWE10P	PWE10PR	PWE10PL	PWE10PK

FLOW RATE FOR PWE					
METER SIZES	FLOW RATE H_2O		Inlet/Outlet Ports Female NPT	Maximum Pressure Drop	
	[L/min]	Gal/min		Bar	PSI
PWE4	0.15-18.9	0.04-5	3/8"	1	15
PWE6	0.3-37.6	0.08-10	1/2"	1.4	20
PWE8	0.6-64.4	0.15-17	3/4"	1.4	20
PWE10	1.3-132.5	0.35-35	1"	1.4	20

SPECIFICATIONS FOR PWE

FLOW MEDIUM:	Please note that PWE Flow Meters are designed to work only with liquids. Never try to measure flow rates of dry gas.
CALIBRATIONS:	Performed at standard conditions [14.7 psia (101.4 kPa) and 70F F (21.1FC)] unless otherwise requested or stated.
VISCOSITY:	Calibrated to 1 cSt (water) meters with display can be used for fluids up to 50 cSt with field calibration (maximum flow range may be affected).
ENVIRONMENTAL (PER IEC 664):	Installation Level II; Pollution Degree II.
FLOW ACCURACY (INCLUDING LINEARITY):	±1% of FS.
REPEATABILITY:	±0.25% of full scale.
FLUID TEMPERATURE MEASUREMENT RANGE*:	-10 to 70 C.
TEMPERATURE ACCURACY (INCLUDING LINEARITY)*:	±0.5 °C
FLOW RESPONSE TIME:	Approximately 1 seconds (above 10% of full scale flow), approximately 2 seconds (below 10% of full scale flow).
MAXIMUM PRESSURE:	10 bar (150 psi).
MAXIMUM PRESSURE DROP:	1.4 bar (20 psi) at 132.5 L/min flow. See table on page 2 for pressure drops associated with various models and flow rates.
FLUID AND AMBIENT TEMPERATURE:	14° F to 160°F (-10° C to 70° C).
OUTPUT SIGNALS:	Linear 0-5 Vdc (3000 ohms min load impedance; Linear 4-20 mA (500 ohms maximum loop resistance. Maximum noise 20mV peak to peak (for 0-5 Vdc output.
FLOW PULSE OUTPUT:	3.3 Vdc amplitude (3000 ohms min load impedance).
OPTICALLY ISOLATED OUTPUTS:	UCE @ 40Vdc, ICE @ 150 mA.
FLOW METER INPUT POWER:	11 to 26 Vdc, 100 mV maximum peak to peak output noise.
	Power consumption: +12Vdc (150 mA maximum); +24Vdc (100 mA maximum);
	Circuit board have built-in polarity reversal protection, 300mA resettable fuse provide power input protection.
COMMUNICATIONS PARAMETERS (RS-232/RS-485):	Baud rate: ..... 9600 baud. Stop bit: ..... 1. Data bits: ..... 8. Parity: ..... None. Flow Control: ..... None.
DISPLAY*:	Optional local 2x16 characters LCD with adjustable backlight (2 lines of text).
KEY PAD*:	Optional 4 push button key pad.
CE COMPLIANT:	EMC Compliance with 89/336/EEC as amended. Emission Standard: EN 55011:1991, Group 1, Class A Immunity Standard: EN 55082-1:1992

** - Optional feature.*