

Condensate Recovery Meter CRM 485R

OVERVIEW

The Condensate Recovery Meter CRM 485R is a device that works along with the Pressure Powered Pump from Forbes Marshall, to determine the total condensate pumped and thereby recovered and savings achieved over a period of time. The CRM 485R takes inputs from the sensor probe mounted on the pump. Based on these inputs and user configurable data such as fuel type and fuel cost the CRM 485R computes the energy and fiscal savings for the user. It has a Modbus communication port over which all important parameter values are transmitted to a host computer. The user interface includes a keypad with three tactile keys and a backlit LCD display. The CRM 485R is mains power operated and has a wall mountable enclosure.



FEATURES

- Compact design
- Ease of installation using installation template
- Separate terminations compartment
- Retains data in case of power failure
- Supports Modbus communication

SPECIFICATIONS

System Components

- **CRM 485R Control Unit**
 - Mains powered: UPS recommended to avoid loss of run time data
 - Inputs: Condensate temperature and pump stroke
 - Communication: Modbus over RS485R
- Sensor (mounted on and supplied with Pressure Powered Pump from Forbes

Marshall)

- Float-magnet operated reed-switch
- PT100 RTD
- Fixed length cable

Computed and displayed parameters

Parameter	Description
Totalised Flow	Totalised flow since first power-up or last Reset or last Preset
Temperature	Temperature of the condensate in the pump
Power - on Duration	Time elapsed since last Reset
Pump-on Duration	Time for which pump has been on since last Reset
Last Cycle Time	Time between last two valid strokes
Energy Saving	Total energy saved since last reset
Fuel Saving	Total fuel saved since last reset
Fiscal Saving	Total money saved since last reset

■ Details

Parameter	Value		Updating Rate
	Min	Max	
Totalised Flow	0	4294967296 kg	At each pump stroke
Power on Duration	0	999999 days	Daily
Pump on Duration	0	999999 days 23Hr	Hourly
Energy Saving ^[1]	0	99999999.999x10 ³ Kcal	With Totalised Flow
Fuel Saving ^[1]	0	99999999.999 Tons	With Energy Saved
Fiscal Saving ^[1]	0	9999999.99999x10 ⁵ currency	With Totalised Flow
Temperature	30 °C	200 °C, accuracy ±1°C	1 sec
Last Cycle Time	0	9999 sec	As it occurs
Flow Rate (Y - Axis)	0	49 TPH	Hourly

[1]: In case of over temperature or temperature sensor fault, the savings continue to be computed based on the Average Condensate Temperature set in Service Mode.

Configurable parameters

Configurable Currency

Currency	Description
INR	India Rupee
LKR	Sri Lanka Rupee
BDT	Bangladesh Taka
USD	US Dollar
CCUR	Custom Currency to be used when none of above apply

Configurable Pump Model

Pump Model	Discharge per stroke - settable in Service mode
CPPPU	25 to 37 kg
PPPPU-40NB	25 to 37 kg
PPPPU-50NB	25 to 37 kg
PPPPU-80NB	25 to 37 kg
PPPPU-MV55	50 to 59 kg

Configurable Fuel Type

Fuel Type	Description
Rice Husk	Rice husk
Indian Coal	Standard coal
Lignite	Lignite
FO	Furnace oil
LDO	Light diesel oil
NG	Natural gas
OTHER	Use when none of above apply

Configurable Fuel Rate

Fuel Rate	Description
<currency> / kg	This is the rate in terms of the (selected currency per kg of fuel) for fuels like Indian Coal that are sold by weight
<currency> / lit	This is the rate in terms of the (selected currency per lit of fuel) for fuels like LDO that are sold by volume

Configurable Cable Length

Sensor Cable Length	Description
5mtr	Standard length (default)
5 – 9mtr	Set the actual length

Other configurable parameters

Parameter	Min	Max	Units
Fuel Rate	0.01	599.99	Currency units
Modbus Slave ID	1	247	Number
Temperature Alarm setpoint	30	200	°C
Average Condensate Temperature	70	130	°C
Preset Totalised Flow	0	999999999	kg

- Configurable Pump Stroke Time Alarm
This is the maximum time interval that is expected to elapse between 2 successive pump strokes during normal operation of the pump and the process. If this is exceeded the ALARM LED begins to blink until the next stroke occurs.
- Configurable High Temperature Alarm
The CRM 485R is supposed to measure condensate temperature of between 30 and 200 °C. The alarm limit can be set to a value within this range. If this is exceeded the ALARM LED begins to blink until the temperature falls below the set limit.
- Configurable Device ID (Modbus)
In case one or multiple units of CRM 485R have been installed in your plant and have been connected to a host computer over Modbus, you need to assign a unique device ID to each.
- Configurable Display Scrolling Mode
The RUN mode has multiple screens to display various parameters and messages if any. If set to Manual Mode you can switch between successive screens using the DOWN key. In the Auto Mode, the display will automatically switch between successive screens at a preset time interval of about 8 secs.
- Configurable Average Condensate Temperature
The CRM 485R computes the savings based on the actual condensate temperature measured. In case of a sensor fault, the savings computations are done considering the value of Configurable Average Condensate Temperature set. This value can be set by the FM Service Engineer.
- Preset Totalised Flow (In Service mode only)
The FM Service Engineer can preset the Totalised Flow to a certain value as desired by the user. The maximum value settable is 999999999.

Communication: with host computer via Modbus over RS485R

Human Machine Interface

- Backlit LCD for display
 - o Alpha numeric indications
 - o Graphical indications
- Flow rate (TPH, Y-Axis) v/s Time (hours, X-Axis)
- Each screen represents data of current 24 hrs
- Data of last 3days can be retrieved and displayed
- Each power interruption indicated by a break in the graph
- ALARM indicator LED: blinks under a fault condition
- POWER indicator LED: indicates presence of Mains power
- 3 keys with tactile feedback

Access passwords: separate for

- Configuration mode
- Service mode

Electrical Specifications

- UPS supply strongly recommended to prevent loss of run time data
- Power Input
 - Mains
 - 230VAC +10% -15% (default, factory set)
 - 110VAC +10% -15% (if specified, factory set)
 - Consumption < 2VA
 - Fuse 20x5mm glass 200mA slow blow
 - 2 spare fuse-links provided
- Cable Glands
 - Mains power: PG9
 - Sensor, Modbus: PG7 each
 - Spare: PG7 (not to be used)
- Cables
 - Mains: 3 core mm² with pin type lugs, cable OD 4-8 mm
 - Sensor: supplied with Sensor
 - Modbus: shielded twisted pair, cable OD 3-6.5 mm
- Terminal Connections
 - Screw type terminal blocks
 - Suitable for 1 mm² pin type lugs
 - Housed in terminal section of enclosure

Mechanical Specifications

- Mounting
 - Control Unit: wall mounted
 - Sensor: pump mounted
- Enclosure
 - Aluminum die cast
- Operating Temperature
 - 0 °C to +70 °C
- Dimension of the Unit (with cable glands)
 - Height 198mm
 - Width 194mm
 - Depth 86mm

Environment

- EMI/EMC compliance
- Ingress Protection IP65
- Operating temperature 0-70 °C



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