



AN INTELLIGENT COMPANION FOR FLOW LOADING SYSTEMS

OVERVIEW

FlowSmart (FS8000) is an intelligent microprocessor-based Flow Batch Controller for Metering Installations. It has been designed to perform various loading applications, such as Tank Trucks, Rail Cars, Industrial Barrel Filling, Barge for Petroleum Liquids, Aviation Fuel, LPG, LNG, Lube Oils, Chemicals, etc. It communicates with Loading Rack Computer, Mobile handheld devices / Printers, with other Peripheral / Host devices. It has an ex-proof and weatherproof housing.



It Provides Pulse Verification to API and ISO Standards. The intelligent menu driven options provide access to a user configurable display that ensures all-important function parameters are displayed. Including additional features to help seamlessly connect, interact and integrate with existing SCADA/PLC system architecture.

SALIENT FEATURES

- Self-intuitive Graphic display for easy operator interaction.
- Elaborate and user-friendly alpha numeric keys for local operation.
- Light weight and easy installation.
- Accurate measurement & control of main product, blending as well as additive dosing.
- Pulse security conformity to IP252 / ISO 6551
- Can be used for volumetric as well mass flow measurement.
- Can control variety of the types of flow control valves.
- Can be used in conjunction with Personnel Identification System (e.g. Card Reader) connected locally.
- Weights & Measure switch sealing.
- 10-point flow meter linearization
- Dual redundant communication with the host system over industry standard MODBUS RTU protocol.
- 16 permissive inputs, 6 analog inputs & 16 control outputs
- Capacity to archive up to 600 transactions
- OTP and Encryption enabled
- Large Viewing area.
- Explosion proof as per Div. 1, Gr. IIA & IIB; T6 & Weather Proof to IP66
- Conforms to OIML R117 for custody Transfer applications.

COMMUNICATION & PERIPHERALS

Normal operation of FlowSmart is always performed by configuring it to be in Auto mode. In Auto mode, the preset volume (product quantity to be delivered) is communicated by the remote host Loading Rack Computer (LRC) system. On receipt of the product quantity to be delivered, FlowSmart takes in to account the percentage of blending as well as dosing and employs internal algorithm to arrive at the volumetric quantities of individual products to be delivered. FlowSmart also has the state-of-the-art algorithms employed to ensure correct flow rate during the delivery of individual products and the profile is so maintained as to ensure a smooth and accurate cutoff at the preset quantity without causing the pressure and ESD jerks to the hydraulic system.

When the remote host is not available, FlowSmart can be put in to local mode using appropriate user privileges. In the local mode, the quantity of the main product to be delivered can be preset in to the equipment using the keyboard.

COMMUNICATIONS

The state-of-the-art design of FlowSmart, facilitates dual redundant communication with the host LRC and also with the Card Reader used for personnel identification. FlowSmart is also incorporated with all the permissive interlocks like Loading Arm Position, Tank overflow sensing, Vehicle Earthing etc. to ensure smooth and safe loading operation.

CONFIGURATION:

State of the art design of FlowSmart makes is extremely easy to configure the equipment for the loading operation. A menu driven and user-friendly user interface makes it easy to configure the equipment for various parameters responsible to ensure smooth and accurate loading the products. Although the configuration of the product is a one-time activity, it becomes necessary at times to revisit and adjust the operational parameters to ensure optimum loading efficiency. With FlowSmart it is the most secured and easy to employ task to assigned user.

FlowSmart can also be integrated with AVICR, an explosion proof card reader, which acts as a personnel identification and authorization gateway to initiate the loading operation. FlowSmart communicates with the card reader to receive the unique identity of the RFID card allocated for the loading operation. The identification data programmed in to the card is communicated to the LRC which in turn verifies the authenticity and correctness of the data and send the preset quantity to be delivered.

Upon receipt of the present quantity, FlowSmart continues to execute the batch loading operation by employees the respective blend and additive algorithms to arrive at the net quality of individual products to be delivered. FlowSmart is a smart flow computer which derives the percentage of blending and dosing products based on the configured data and adjust individual quantities so as to deliver the preset quantity accurately

TROUBLESHOOTING & DIAGNOSTICS

FlowSmart also provide exhaustive self-diagnostic feature that ensure the loading operation is not only carried out in open loop form but also provides all the requisite alarms and error condition prevalent to a loading of white petroleum products. All of these self-diagnostic alarms and errors are communicated to the remote LRC to create an audit trail and logs.

CALIBRATION:

FlowSmart is equipped with industry's most exhaustive meter linearization curve by providing to adjust 10 different meter coefficients appended over the operating range of the flow meter. The meter coefficients are spaced equally at 10% interval over the entire span of the operating flow rate range. Such an exhaustive meter curve linearization, makes it possible to achieve industry's best accuracy guaranteed across the operating flow rate range. To access them for editing, W&M switch which is sealed by the department of Metrology, must be actuated by breaking the seal. A tamper-proof sealing mechanism is employed to ensure consistent accuracy and unaltered performance at all the times.

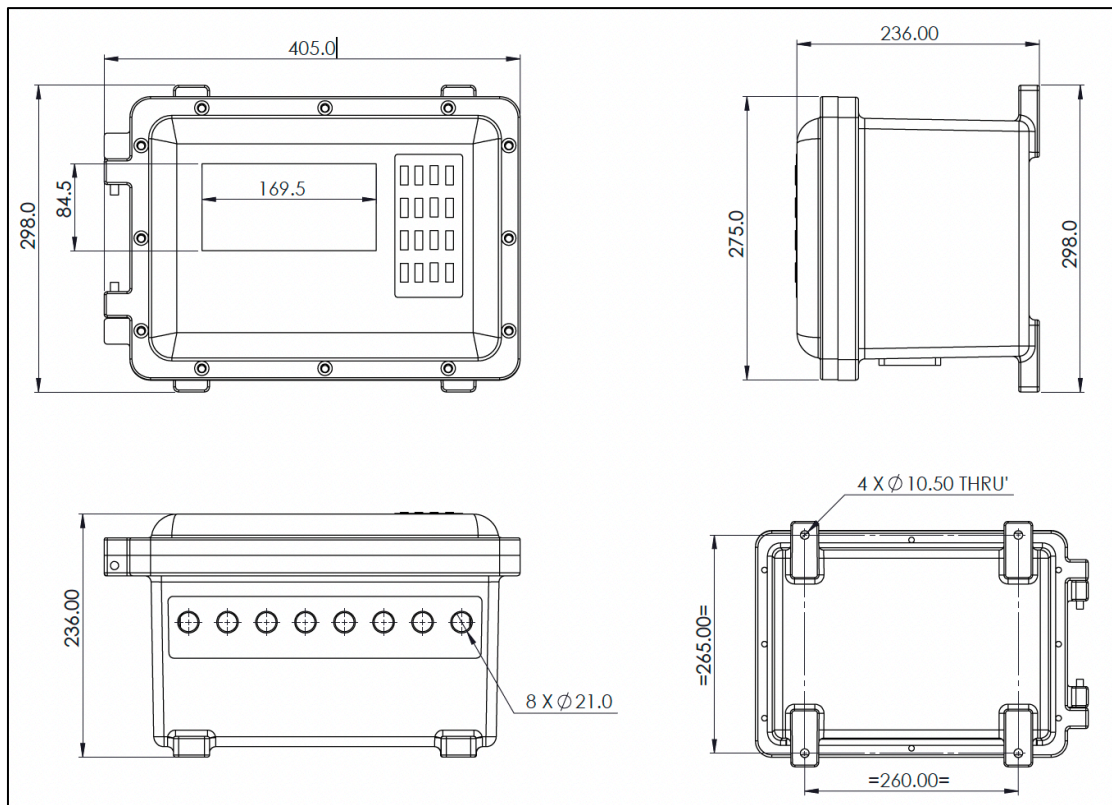
TECHNICAL SPECIFICATIONS

EQUIPMENT		
TYPE	Intelligent Batch Controller	
POWER	24 V DC, 90 V AC – 265 V AC, 50 Hz	
	24 V DC + 10%	90 V AC – 264 V AC 50 Hz
	Power Consumption	80 W
PHYSICAL	Construction	Flame-Proof per IEC 60079 - 1
ENVIRONMENTAL	Operating Temperature	-5° C – +60° C
	Storage Temperature	-20° C – +85° C
	Ambient Humidity	5% - 95% (Non condensing)
SAFETY	Ingress Protection	IP 66 per IEC 60529
	Classification	Gr. IIA & IIB
DISPLAY	6” Graphic LCD	
KEYBOARD	24 keys Alpha-numeric, Multi-Function	
INPUTS / OUTPUTS		
FLOW METER INPUTS	Flow meter	4 (Blending – 2 with Dual Pulse 90 Degree Phase Shifted) (Additive – 2 Nos with Single Pulse Input)
	Type	Dual channel, 90 phase shift
PERMISSIVE INPUTS	Permissive	16
ANALOG INPUTS	Temperature	2
	Type	RTD, PT – 100
	Density	2
	Type	4 – 20 mA
	Differential Pressure	2
	Type	4 – 20 mA
NO. OF OUTPUTS	17 (11 Potential free Normally open O/P & 6 Nos SSR outputs for Valve operations) Analogue Output: 2 Nos 4-20 mA w.r.t Flow Rate	
TYPE	230 V AC, 50 Hz, / 24 V DC	
CAPACITY	0.5 A	
COMMUNICATION		
HOST COMMUNICATION (LRC)	No. of Ports	02
	Compliance	EIA RS 485
	Port Type	Half Duplex
	Port Parameters	Settable
	Comm. Protocol	MODBUS (Slave)
	Port Redundancy	Hot Stand By
PERIPHERAL COMMUNICATION	No. of Ports	02
	Compliance	EIA RS 232
	Port Type	Full Duplex
	Port Parameters	Settable
	Comm. Protocol	Proprietary
OPERATIONAL		
TRANSACTION STORAGE	300 Transactions / Upto 1500 batches	
MODE OF OPERATION	Auto / Manual	
MODE CHANGE OVER	Manual (password protected)	
EXTERNAL CONNECTIONS	Over all cable entry management provides reliable and robust connectivity to all sensors, controls and communications	
METER LINEARIZATION	10 points	
PERFORMANCE	Accuracy	0.05%
	Linearity	0.05%
	Resolution	0.05%
DELIVERY CONFIGURATION	Main Product	
	Main Product + Blend	
	Main Product + Additive dosing	
	Main Product + Blend + Additive dosing	
LEGAL METROLOGY	W&M Sealing of critical system parameters	
PASSWORD PROTECTION	3 Levels	
OPERATIONAL PARAMETERS DISPLAYED	Personnel Identification status (Cards)	
	Percentage - Blend & Additive	
	Batch – Filled as well as remaining quantity	
	Cumulative Totalizer	
	Flow Rate	
	Product Temperature & Density	
	Operational Mode – Remote / Local	
	Hot Communication Status	
	Over flow due to valve failure	
	Valve failed to open	
	Flow rate below permissible limit	
	Flow rate higher than permissible limit	

VERMONT TAURUS SERIES METER WITH FLOWSMART BATCH CONTROLLER



FLOWSMART BATCH CONTROLLER UNIT ENCLOSURE DIMENSIONS



- Specifications are subject to change without notice.
- All dimensions are in mm unless otherwise specified.

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Vermont Technologies Pvt, Ltd.

Corporate Office & Operations:

Plot No: PAP-A-8/6, "A" Block, Phase IV, MIDC Chakan, Opp Mahindra Vehicle, Dist:Pune- 410501

Tel. : +91 9168179461 / +91 9168176683 / +91 9892990225

Email: ho@vermonttechnologies.co.in

Website : www.vermonttechnologies.co.in

