+ MEASUREMENT SOLUTIONS

+ JISKOOT InSpec and InSpec EX Blender

Safe-area and hazardous-area system controllers

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Rockwell Automation + Schlumberger

JISKOOT InSpec and InSpec EX Blender Controllers

The JISKOOT InSpec Blender* safe-area system controller and JISKOOT InSpec EX Blender* hazardous-area system controller can control a two-stream blending system in controlled-rate or flow-responsive modes. This ability enables either the regulation of both streams to achieve the required flow, quantity, and ratio or to respond to a wildstream to maintain a second or additive stream to the required ratio with respect to the wild or unregulated stream.

The units also have the ability to trim the blend ratio to achieve a desired variable measured in the blended product line. Typically, the oil industry may require density, viscosity, Reid vapor pressure (RVP), or sulfur to be the key quality factor, but any other parameter that can be reliably measured and influenced by the adjustment of the component ratios can be employed.

Temperature corrections are available for various fluid groups. These are applied to each stream whereby the blended product is also produced at a referred temperature. Ratio, flow, and batch control can be independently selected from gross or net volume or mass depending on the flow transmitters used.

The units have multicolored LEDs to indicate the status of the blending process and alarm conditions, together with user-configurable bar-graph indicators. A simple user interface with batch-parameter prompting enables the operator to enter the batch data and control the blending process. The display will scroll configurable parameters for operator information with alarms in clear text.

Batch parameters and commands can be entered from the local operator interface, downloaded from a supervisory system (e.g., distributed control system [DCS]) or, if networked, via a web interface. The local control can be locked out if required.

The controllers feature configurable user names and passwords to enable access at the required security level, safe-guarding sensitive configuration settings.

Alarms can be configured as warnings or to stop the process and are announced by front LEDs, display text, digital output, e-mail, or web page.

If preferred, the controller front panel can be remotely mounted up to 0.6 mi [1 km] from the main instrument, and additional remote displays can be connected to the unit's serial ports.

PUMP AND VALVE CONTROL
The addition of a low-cost programmable logic controller (PLC) enables dedicated control and sequencing of routing valves and pump starters. The controllers can communicate these actions via Modbus® or use permissive hardware inputs to synchronize the blending process and control of peripheral devices.

BATCH QUALITY CALCULATIONS
Flow-weighted averaging of any parameters can be reported for the overall batch quantity.

AUTOFLOW
If enabled, the flow rate is adjusted automatically within confines of the stream limitations. This feature dynamically compensates for stream inlet pressure changes (i.e., gravity-fed systems) to optimize throughput.

PRINT
A serial or network printer can be attached to print various data such as an automated report at the end of the batch and logging throughout the batch. Reports are stored on a secure digital (SD) card and are accessible until deleted. The logging frequency can be adjusted, and up to 20 parameters can be recorded.

RECIPES
Up to 20 formulations can be stored for operator recall. These can hold the ratio, quantity, flow rate, and trim target. Recipe names are used for ease of operation.

MODBUS NETWORKING
Modbus access enables full remote access for monitoring and control of the blending process. Modbus main and subsidiary modes are available for supporting commands 03, 04, 06, and 16 using a serial port or the RJ45 Ethernet connection for Modbus TCP or web interface.

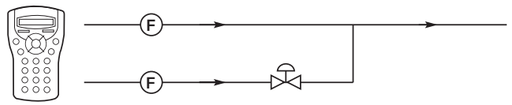
CONTROL
Three-term proportional-integral-derivative (PID) control is used to regulate the stream ratios and trim adjustments. Initial, minimum, and fallback valve control positions enable a configuration to resolve pressure buildup due to positive displacement pumps, hydraulic shock, etc.

COMPATIBLE SYSTEMS
+ Volumetric or mass blending
+ Blend optimization
+ Additive injection
+ Wildstream blending

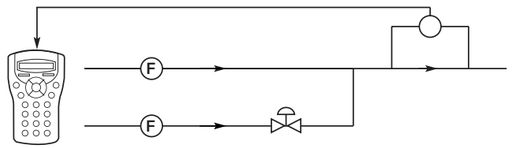
EQUIPMENT APPLICATIONS
+ Crude oils
+ Bunker fuels
+ LNG and liquefied petroleum gas (LPG)
+ Refined products
+ Industrial alcohols

FEATURES
+ Entered or automatic flow target
+ Full PID control, including the trim action
+ Tunable response and ramp-up and ramp-down rates
+ Configuration backup and restoring
+ Can be integrated into the site distributed control system (DCS)
+ Three-level alarm structure
+ User-configurable logic (UCL) that enables programming extra tasks
+ PID blocks for user control loops
+ Storage of configurable reports and logs using text and comma-separated-value (CSV) files
+ FTP file access
+ Network time protocol (NTP) time synchronization
+ E-mail support for reports and notifications
+ Remote support using Telnet
+ Flow-weighted averaging
+ Secure logins and record of actions (configurable user names and passwords)
+ Easy in-system reprogramming
+ HTTP web interface
+ Configurable alarms

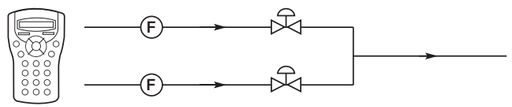
Typical Blending Methods



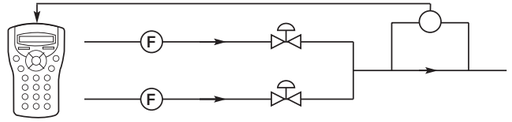
Wildstream—Control of the required addition of a component to a flowing stream, (i.e., flow responsive).



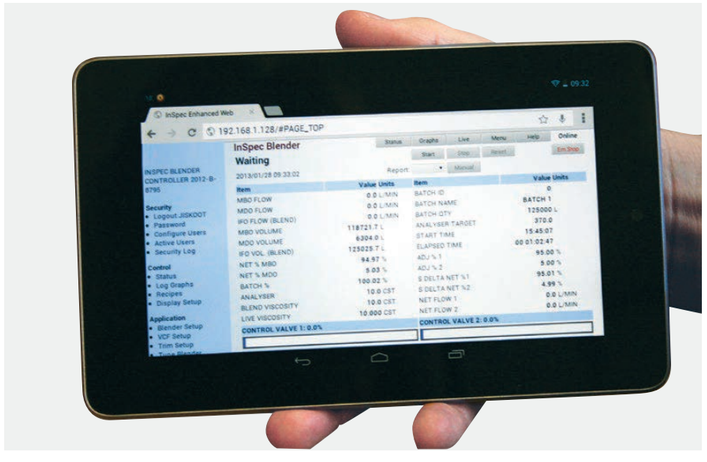
Wildstream with trim—Wildstream blender with analyzer feedback to control quality.



Controlled rate—Control of the blending of two components to preset parameters, (e.g., ratio, rate, and quantity).



Controlled rate with trim—Controlled rate blender with analyzer feedback to control quality.



Web interface on tablet.

Specifications

JISKOOT InSpec Controller Specifications			
	Dimension	**InSpec Blender Controller**	**InSpec EX Blender Controller**
Physical	Size (W × H × D), in [mm]	15.1 × 8.7 × 6.7 [130 × 220 × 170]	17.3 × 22.2 × 9.4 [440 × 565 × 240]
	Weight, lbm [kg]	4 [1.8]	110 [50]
Environment	Operating temperature, degF [degC]	41–104 [5–40]	41–104 [5–40]
Approvals (typical)	ATEX versions	–	II 2 (1) G Ex d[ia Ga] IIB +H2 T6 Gb Ta −4 to 122 degF [−20 to 50 degC]
	UL	–	Class 1, Division 1, Groups C and D
Power supplies	AC	100–240 V, 50/60 Hz	100–240 V, 50/60 Hz
	DC	24 V ±10%	24 V ±10%
	Maximum power consumption, W	15	85 (including power supply unit (PSU) options)
Relay outputs	Quantity	Four single-pole single-throw normally open	Four single-pole single-throw normally open
	Maximum switching voltage, V	250 AC, 30 DC	250 AC, 30 DC
	Maximum switching current, A	2	2
Digital I/O points	Quantity	Four	Four
	Contact form	Solid-state relay	Solid-state relay
Output	Maximum load voltage, V	24 DC	24 DC
	Maximum load current, A	0.12	0.12
Input	Input type	Volt-free contact	Volt-free contact
Analog outputs	Quantity	Two	Two
	Output type, mA	4–20, current source—active output	4–20, current source—active output
	Accuracy, % of forecast standard deviation (FSD)	± 0.05 (12-bit resolution)	± 0.05 (12-bit resolution)
Analog inputs	Quantity	Three	Three
	Input type, mA	4–20	4–20
	Accuracy, % of FSD	± 0.05 (12-bit resolution)	± 0.05 (12-bit resolution)
Pulse inputs	Quantity	Two	Two
	Input type	0–24 V, DC voltage pulse	0–24 V, DC voltage pulse
		4–20 mA, DC current pulse	4–20 mA, DC current pulse
	Maximum frequency, kHz	10	10
	Accuracy	±1 count in any given sampling period	±1 count in any given sampling period
Communications	Quantity	Five	Five
	Type	One-off RS422 port for user interface	One-off RS422 port for user interface
		Two-off configurable RS232, RS422, or RS485 ports	Two-off configurable RS232, RS422, or RS485 ports
		One-off dedicated shell port	One-off dedicated shell port
		One-off Ethernet port	One-off Ethernet port
Mass data storage	Type	SD card	SD card

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