



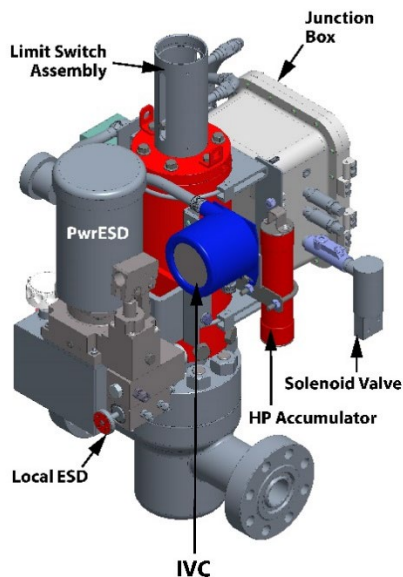
# Stream-Flo ESD-EHX

Powered by SmartVue™ and PwrESD



## Surface Safety Valve Monitoring System

ESD-EHX is a self-contained valve monitoring system powered by SmartVue™ intelligent valve controller (IVC). It integrates to surface safety valves to provide a variety of features for remote opening and closing, and partial stroke testing. The system is connected remotely through Modbus RTU protocol and locally through a human machine interface (HMI) screen and a Wi-Fi interface.



ESD-EHX Assembly in a Class 1 Division 1/Zone1 Environment



Intelligent Valve Controller; (a) SmartVue™ SVX and (b) SmartVue™

## Features and Benefits:

### Intelligent Valve Controller (IVC)

ESD-EHX is powered by SmartVue™ for data acquisition, local user interface, and edge computing to run condition monitoring and autonomous operations. The controller can be offered as an explosion-proof/flameproof Class 1 Division 1/Zone 1 or Class 1 Division 2/Zone 2 solution.

### Electro-hydraulic Power Pack (PwrESD)

ESD-EHX integrates with Stream-Flo's PwrESD compact electro-hydraulic power (EHP) system for local or remote operation. It offers a range of flow rates and hydraulic operating pressures using AC or DC powered electric motors. The hydraulic circuit is self-contained with safety features including relief valves, fusible element, and manual ESD valve.

### Condition Monitoring

ESD-EHX includes several condition monitoring features capable of evaluating the system health and identifying potential faults. It offers local and remote diagnostics during four main operational events; opening, opened, closing, and closed states. It is also capable of conducting partial stroke testing (PST) diagnostics to evaluate the valve and actuator health. Moreover, diagnostic logic is used to identify sensor limits/faults and hydraulic fluid leakage.

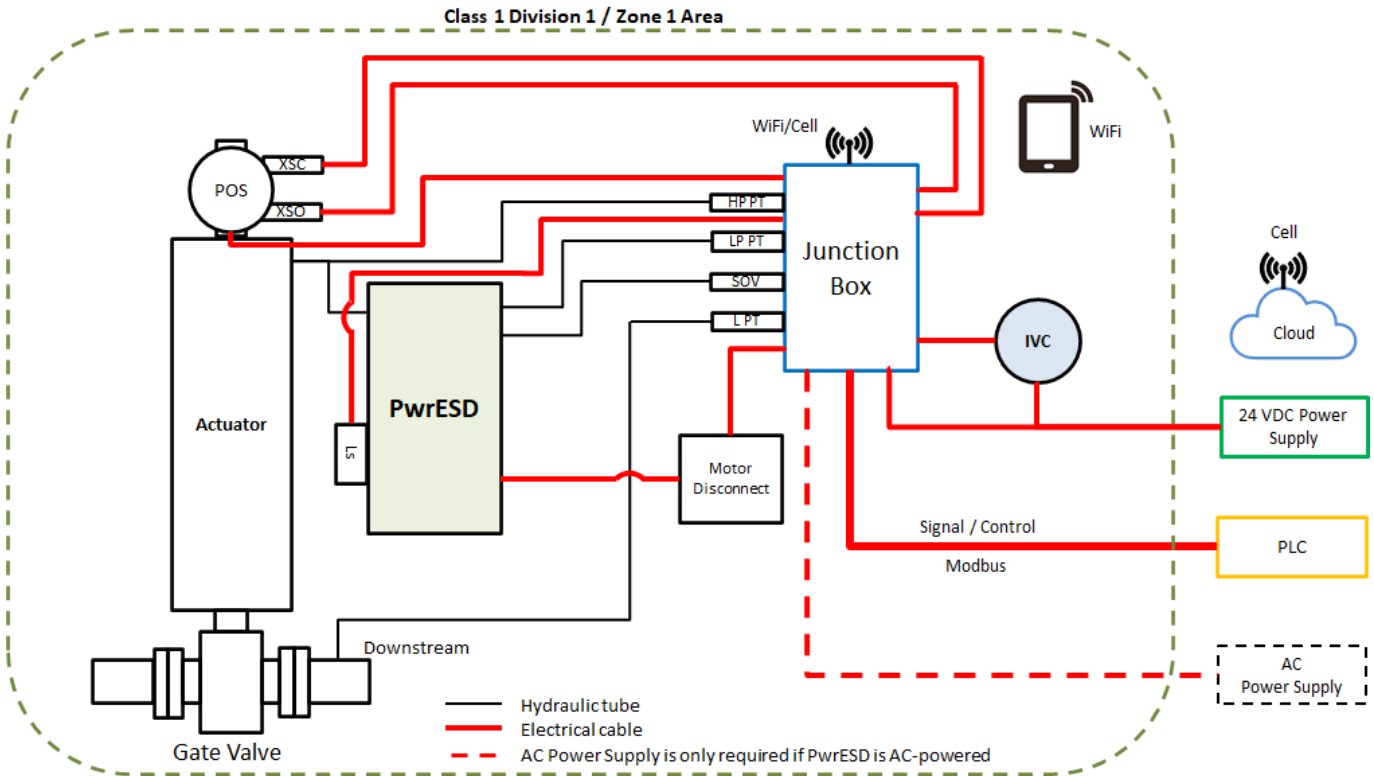
### Automatic Control

ESD-EHX can autonomously conduct ESD events using built-in logic algorithms. This includes line pressure variation, hydraulic pressure leakage, abnormal sensor readings, increased valve drag, and low hydraulic fluid. In addition, the system can automatically cycle the pump to maintain hydraulic actuator pressure.

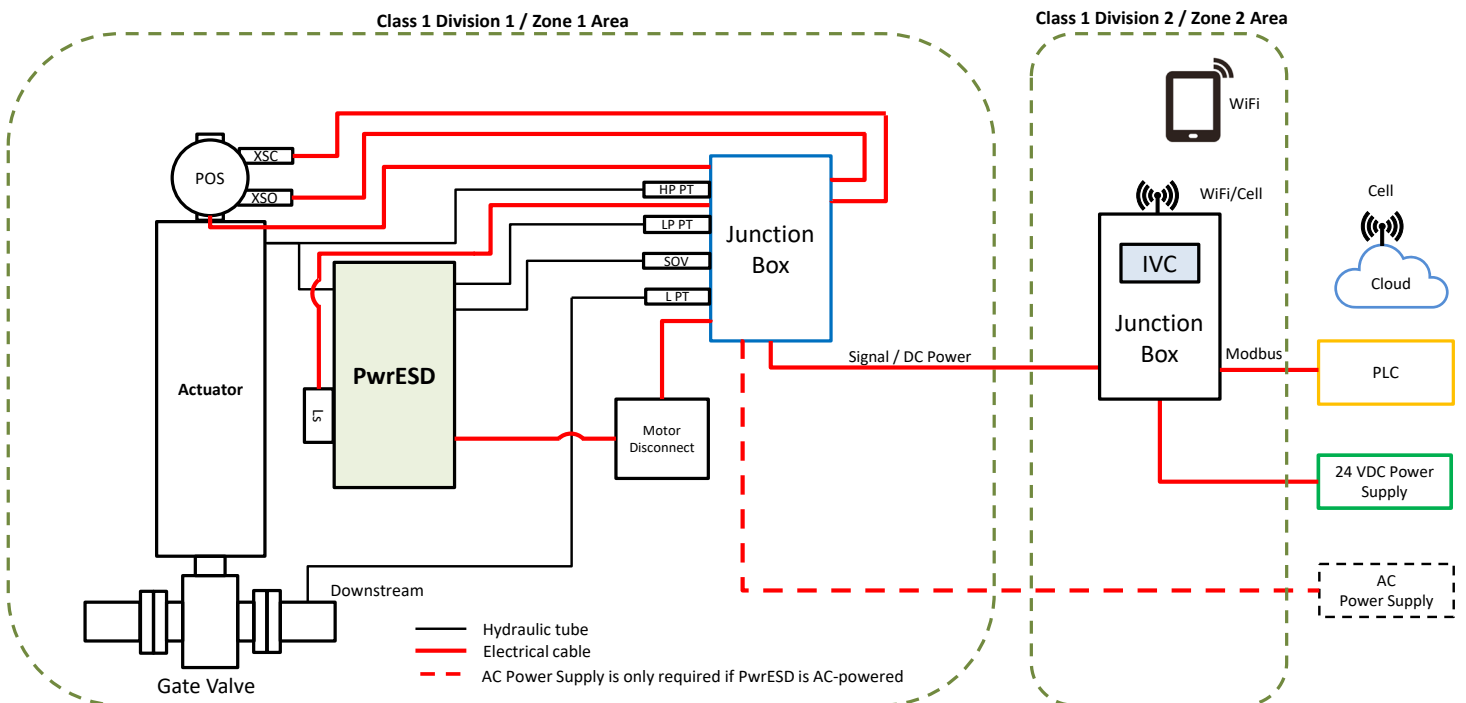
### User Interface and Connectivity

ESD-EHX can be configured with three types of user interface; (1) local screen, (2) remote wired, and (3) local Wi-Fi. The remote wired data connections can be made to the controller's Modbus serial (RTU or ASCII) server. A local Wi-Fi connection provides webpage user interface access.

## Class 1 Division 1/Zone 1



## Class 1 Division 2/Zone 2



## Product Configurations

### ESD-EHX

<b>Feature</b>	<b>Description</b>
<i>User Control</i>	Local and remote reset/trip
<i>Automatic Control</i>	ESD fire trip
<i>Valve Controller</i>	Class 1 Division 1/Zone1 or Class 1 Division 2/Zone2
<i>Power Unit</i>	PwrESD
<i>Control Elements</i>	Low-pressure (LP) solenoid valve and electric motor relay
<i>Sensors</i>	High-pressure (HP) pressure switch
<i>Connectivity</i>	Local screen and remote wired

### ESD-EHX-CM

Includes all ESD-EHX features, plus:

<b>Feature</b>	<b>Description</b>
<i>Condition Monitoring</i>	Opening and closing event diagnostics, auto pump diagnostics, sensor limits and faults, communication faults, and electronic Hi/Lo pilot
<i>Automatic Control</i>	ESD on electronic pilot, sensor limits and faults, and opening time-out. Auto pump cycling and electric pump time-out.
<i>Sensors</i>	LP and HP pressure transmitters, downstream line pressure transmitter, and limit switches.

### ESD-EHX-CMX

Includes all ESD-EHX-CM features, plus:

<b>Feature</b>	<b>Description</b>
<i>User Control</i>	Local and remote partial stroke testing (PST)
<i>Condition Monitoring</i>	PST diagnostics and hydraulic circuit leakage detection
<i>Automatic Control</i>	ESD on hydraulic circuit leakage and low hydraulic fluid
<i>Sensors</i>	Position transmitter, temperature transmitter, and level switch
<i>Connectivity</i>	Local Wi-Fi interface

## Options

Available for any of the above product configurations.

<b>Feature</b>	<b>Description</b>
<i>Motor disconnect switch</i>	Manually turns off power to electric motor
<i>Quick exhaust valve</i>	Reduces tripping time during an ESD event
<i>HP Accumulator</i>	Limits electric pump cycling due to ambient temperature fluctuations
<i>Cloud Interface</i>	Display real-time data and control SSV remotely using a cell/cloud interface

## Specifications

### Class 1 Division 1/Zone 1 Intelligent Valve Controller (IVC)

Processor	32-bit microprocessor
Display	LCD display with 4 button touch interface
Input power range	10 - 30 VDC
Power consumption	< 2.5W
Operating temperature range	-40°F to +140°F (-40°C to +60°C)
Hazardous area approvals	CSA/FM Class 1 Division 1 Groups C, D ATEX/IEC Ex d IIB Gb



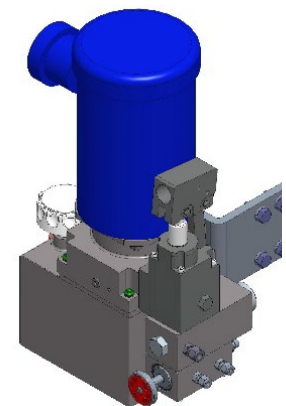
### Class 1 Division 2/Zone 2 Intelligent Valve Controller (IVC)

Processor	32-bit microprocessor
Display	¼ VGA color LCD daylight viewable with LED backlighting
Input power range	10 - 30 VDC
Power consumption	< 1A (no load), < 1.5A (max load)
Operating temperature range	-40°F to +158°F (-40°C to +70°C)
Hazardous area approvals	CSA/UL Class 1 Division 2 Groups C, D



### PwrESD Electro-Hydraulic Power Unit

Electric Motor	115/230 VAC single-phase or 24 VDC Power options: ¼, ⅓, ½, or ¾ HP (0.18, 0.25, 0.37, or 0.56 kW)
Motor-Operated Pump	Micro gear pump Displacement: 0.006 to 0.092 in <sup>3</sup> /rev (0.1 to 1.5 cm <sup>3</sup> /rev) Flow rate: 0.036 to 0.344 gpm (0.14 to 1.30 l/min)
Manual Pump	Plunger pump Displacement: 0.66 to 1.18 in <sup>3</sup> /stroke (10.8 to 19.3 cm <sup>3</sup> /stroke)
Reservoir Size	150 and 300 in <sup>3</sup> (2.5 to 4.9 liters)
Hydraulic Fluid	Industrial hydraulic fluid up to -40 °F (-40 °C) ambient temperature
Operating Pressure	2000 psi (13,790 kPa) 3500 psi (24,132 kPa)
Safety	Pressure relief valves, fusible element, and manual ESD valve
Operating temperature range	CSA/UL -40°F to +104°F (-40°C to +40°C) ATEX/IEC Ex -4°F to +140°F (-20°C to +60°C)
Hazardous area approvals	CSA/UL Class 1 Division 1, Groups C, D ATEX/IEC Ex db IIB T4 Gb



### Solenoid Valve

Power Consumption	0.85 watts
Operating temperature range	-76°F to +122°F (-60°C to +50°C)
Number of ports	3/2
Operating pressure	0 to 174 psi (0 to 1,200 kPa)
Hazardous area approvals	CSA/UL Class 1 Division 1, Groups B, C, D ATEX/IEC Ex d IIC



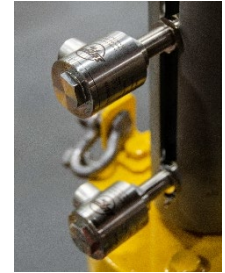
## Position Transmitter

<i>Measurement Type</i>	Non-contact (Hall-effect)
<i>Input Voltage</i>	10-30 VDC
<i>Output</i>	4-20 mA
<i>Operating temperature range</i>	-40°F to +185°F (-40°C to +85°C)
<i>Hazardous area approvals</i>	CSA/FM Class 1 Division 1, Groups B, C, D ATEX/IEC Ex d IIB+H2



## Limit Switches

<i>Measurement Type</i>	Non-contact (Magnetic)
<i>Contact Arrangement/Material</i>	SPDT (Form C) Tungsten
<i>Operating temperature range</i>	CSA/UL -40°F to +221°F (-40°C to +105°C) ATEX/IEC Ex -4°F to +158°F (-20°C to +70°C)
<i>Hazardous area approvals</i>	CSA/UL Class 1 Division 1, Groups A, B, C, D ATEX/IEC Ex d IIC



## Pressure Transmitters

<i>Input voltage</i>	10-30 VDC
<i>Output</i>	4-20 mA
<i>Operating temperature range (Medium)</i>	-40°F to +212°F (-40°C to +100°C)
<i>Operating temperature range (Ambient)</i>	-40°F to +221°F (-40°C to +105°C)
<i>Hydraulic low-pressure range</i>	0 to 200 psi (0 to 1,379 kPa)
<i>Hydraulic high-pressure range</i>	0 to 5,000 psi (0 to 34,474 kPa)
<i>Line pressure range</i>	0 to 15,000 psi (0 to 103,421 kPa)
<i>Hazardous area approvals</i>	CSA/FM Class 1 Division 1, Groups A, B, C, D ATEX/IEC Ex d IIC T6...T1 Gb



## Junction Box

<i>Features</i>	Motor contactor, terminal blocks, ground bar, RTD converter, and drain breather
<i>Temperature Sensor</i>	RTD probe
<i>Operating temperature range</i>	-40°F to +176°F (-40°C to +80°C)
<i>Hazardous area approvals</i>	CSA/UL Class 1 Division 1, Groups A, B, C, D ATEX/IEC Ex d IIB+H2



## Level Switch

<i>Measurement/Switch Type</i>	Non-contact (Magnetic) Reed switch
<i>Contact Arrangement/Material</i>	SPDT (Form C) Rhodium
<i>Wire Termination</i>	Wireable connection head with 360° full rotation and removable terminal block
<i>Operating temperature range</i>	-40°F to +212°F (-40°C to +100°C)
<i>Hazardous area approvals</i>	CSA/UL Class 1 Division 1, Groups A, B, C, D ATEX/IEC Ex db IIB+H2 Gb





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