

FEATURES

- Electro-hydraulic system provides high level of motive power to operate ICVs
- Three control lines for up to 12 downhole devices or four control lines for up to 24 downhole devices
- Minimal use of only passive and no active electrical components
- Can remain pressured when operating any of the ICVs in the same direction, significantly decreasing ICV actuation times
- Can be deployed with non-integrated systems and fiber optics
- Supports “fail-as-is” device types
- Independent of tubing or annulus pressure
- Can be used to position ICVs in choking applications

BENEFITS

- Helps reduce multi-valve completions costs
- Faster activation time for valves
- Reduces rig time through greater facilitation of completion installation and retrieval
- Allows the ICV to be closed to any choking position in a single step

WELL COMPLETIONS | INTELLIGENT COMPLETIONS

SmartPlex® downhole control system

Accurately manage multiple interval control valves with minimal lines

Overview

The SmartPlex® downhole control system is an electro-hydraulic multi-drop system that provides simple and reliable zonal control of multiple valves in a single wellbore with a minimum number of control lines. The SmartPlex downhole control system uses two hydraulic and one electric line from the surface to remotely and selectively actuate multiple downhole flow control devices, such as interval control valves (ICVs). This makes a significant number of tubing hanger penetrations unnecessary and reduces operational complexity and risk. The SmartPlex system can control any flow control tool in the field-proven Halliburton portfolio. The SmartPlex control system has been successfully deployed and field trialed in a multi-zone completion. Thanks to this system, the operator can now achieve maximum reservoir control from multiple laterals with minimum system complexity.

Applications

The SmartPlex downhole control system is applicable for any dry-tree multizone completion that requires more than two valves. The SmartPlex system not only helps reduce the overall cost of an intelligent completion, but also reduces the complexity involved by minimizing the number of control lines required. Ideally suited for long horizontal, compartmentalized completions (as deep as 30,000 ft), in both cased or open hole, where selective control of each interval is desired. Typically, this can be advantageous for selective stimulation control in tight-gas applications or in combination with a choking ICV for drawdown optimization in production applications.



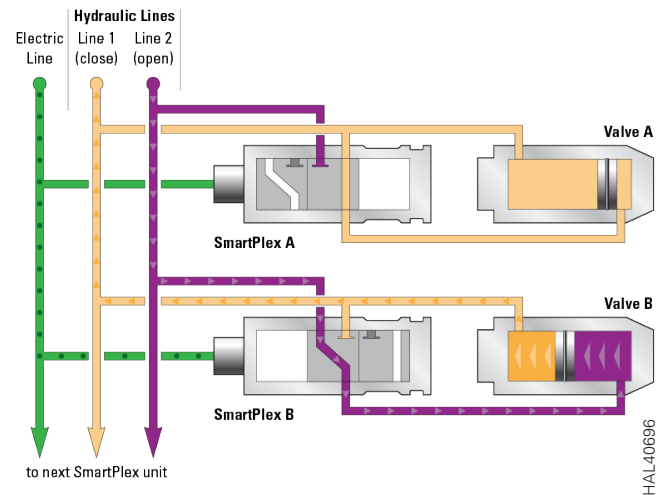
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Operation

The SmartPlex® system uses a simple passive electrical switching method. Each valve is coupled with a SmartPlex actuator module, which allows selective and remote control of each valve. Control lines consisting of one electrical and two hydraulic lines run from surface and are networked to each SmartPlex module.

A signal down the electrical line switches a solenoid at a desired module, allowing hydraulic communication between the surface control unit and the valve. By regulating the fluid volume in combination with a time-domain control method, valves can be incrementally positioned (choking) to allow for advanced reservoir management.



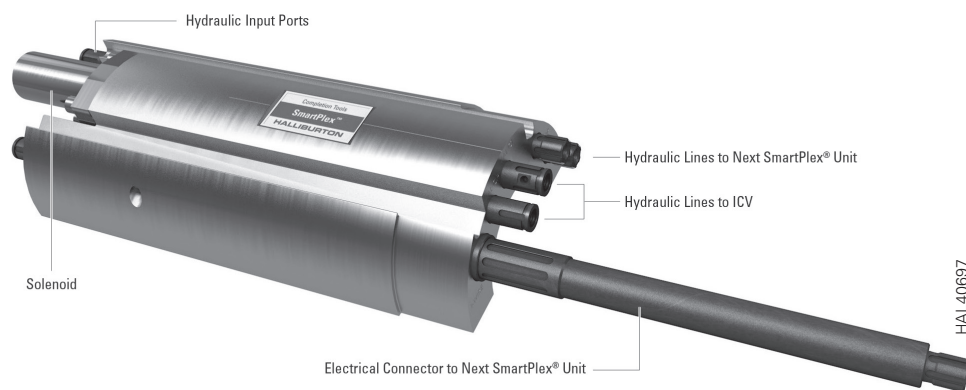
Electrically selecting SmartPlex® system B creates the hydraulic circuit to operate valve B while all the other valves remain balanced

Qualification and field testing

The SmartPlex control system successfully passed extensive in-house deep well simulation testing. The tool was cycled more than 10,000 times at high temperatures and pressures. A nine-valve system integration test with 15,000-ft control line was also successfully conducted.

SmartPlex® system specifications

MAXIMUM TEMPERATURE RATING	MAXIMUM WORKING PRESSURE	MAXIMUM HYDRAULIC CHAMBER RATING	CONTROL LINE CONNECTION	SIZES AVAILABLE
275°F (135°C)	10,000 psi	10,000 psi	FMJ	2 7/8, 3 1/2, 4 1/2, and 5 1/2 in.



Electrically selecting SmartPlex system B creates the hydraulic circuit to operate valve B while all the other valves remain balanced

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