

Surface Hydraulic Control System

One-touch actuation of flow control valves

APPLICATIONS

- Completions with one or more hydraulic flow control valves (FCVs)
- Onshore and offshore production and injection wells
- Hazardous and nonhazardous areas

ADVANTAGES

- Automated or manual actuation
- Closed-loop fluid circuitry that eliminates the need to frequently replenish the hydraulic fluid
- Software indication of downhole FCV positions and fluid volumes pumped and returned
- High-resolution digital recording of all valve actuations
- Customization to various environmental and functional specifications
- User-configurable pressures
- Expansion-ready design
- Configurable pressure and fluid-level alarms

The surface hydraulic control system is used to operate multiple downhole FCVs, automatically or manually. It actuates the selected valve and indicates its position—for both on-off and multiposition valves—enabling effective production or injection management.

System components

Each surface hydraulic control system comprises a hydraulic power unit (HPU) and an integrated hydraulic manifold unit (HMU) that directs fluid pressure to different FCVs. Modular HMUs are available for expansion.

The HPU accommodates the pump and hydraulic circuitry that deliver the required pressure. It also includes a remotely actuated programmable logic controller (PLC), which receives orders from the human machine interface (HMI) via control software and directs the actuation of the selected FCV.

Actuation of the downhole FCVs can be controlled from the HPU or from the control and instrumentation room by leveraging the connectivity between the PLC and the customer's SCADA system. More advanced features are available with RTAC* real-time acquisition and control software.

Configurable design

For automated operations, the hydraulic pump can incorporate a pneumatic drive or an electric



Surface hydraulic control system, comprising a hydraulic power unit and an integrated hydraulic manifold unit.

motorized drive, together with the PLC. Hydraulic fluid pressure is field adjustable from 2,000 psi to 10,000 psi, and the number of control lines ranges from 2 to 25 (one per FCV). In addition, the system construction can be customized for the environment (e.g., extreme temperature ranges and hazardous areas with flammable gas or risk of water ingress).

Specifications for Surface Hydraulic Control System

Dedicated control line outlets	2 to 25
Enclosure type	NEMA 4X
Pump	Pneumatic or electric drive Optional backup pump available
Hydraulic fluid	Oil based or water-glycol based
Filtration	1-um inline filter (NAS 6)
Fittings	Double ferrule compression or medium-pressure fittings or both
Fluid return volume monitoring	Visual indication (or optional flowmeter)
Air supply gauge pressure	100 to 200 psi [689 to 1,379 kPa]
Air supply flow rate	25 ft ³ /min [0.71 m ³ /min]
Hazardous area certification	Industrial Safe Area classification
Operating temperature	32 to 149 degF [0 to 65 degC]
Storage temperature	-4 to 149 degF [-20 to 65 degC]
Operating fluid pressure	0 to 10,000 psi [0 to 68,948 kPa]

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