

IntelliZone Compact II

Modular multizonal management system



Rated to 5,000 psi
[34 MPa]



Rated to 250 degF
[121 degC]

APPLICATIONS

- Brownfield wells with bypassed reserves requiring affordable zonal management
- Alternative to sliding sleeve completions to eliminate disruptions and interventions
- Commingled-flow completions to accelerate well productivity and provide back allocation
- Compartmentalized horizontal wells for improved recovery
- Wells with water-cut issues
- Multizone intelligent completions
- Zonal control in artificially lifted wells
- Cost-effective alternative for efficient extended multizone well testing
- Polymer injection operations

BENEFITS

- Enables optimization of well production performance by
 - reducing unwanted water and gas
 - providing better drawdown control and reservoir drainage
 - increasing reservoir understanding through periodic zonal tests
- Eliminates cost and risk of interventions
- Reduces installation time and accelerates well commissioning

FEATURES

- Fully integrated compact system that works as a single unit
- Max. length approximately 32 ft per zone
- System preassembly and testing at manufacturing stage
- Absolute position sensing of the flow control valve choke
- User-friendly surface control system and visualization software

IntelliZone Compact II* modular multizonal management system is a single unit that enables operators to maximize production control, reduce well costs, and simplify well planning. By enabling efficient zonal control and management across a wide range of conventional applications, it accelerates well commissioning and minimizes later interventions.

The system brings together an advanced design and production modeling engine; fully integrated completion module; and powerful, user-friendly, remote monitoring and control system.

Completion system design software

WellBuilder* completion system design software integrates and streamlines system deployment and operation. It uses well and reservoir data to recommend optimal completion designs, simulate individual zonal production and explore flow control valve (FCV) choke sizes and positions, verify equipment operating envelopes, and determine response times. It also generates equipment lists for direct upload to Schlumberger manufacturing centers to minimize potential human error and programs surface control equipment, including alarm trip values.

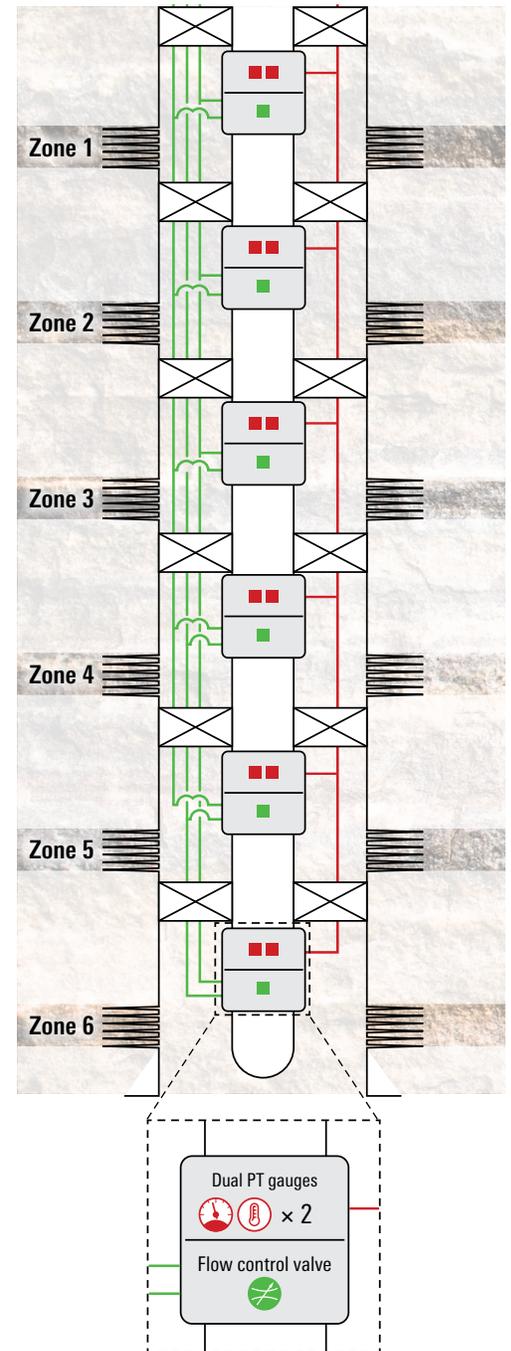
Integrated completion module

The downhole IntelliZone Compact II system integrates an on-off or four-position TRFC-IZ FCV, a valve position sensor, ESP-noise-immune pressure and temperature gauges, a packer, and an optional multidrop module in one compact unit that ranges in length from 17 to 32 ft, depending on the functionality required. The modular components are engineered, preassembled, and pretested to work together as a single unit, ready for fast, reliable deployment.

FCV with built-in safety features

The TRFC-IZ choke position is monitored at surface in real time via an absolute position sensor embedded in the FCV, identifying the choke position with certainty. A built-in collet

■ Hydraulic line ■ Electric line



In wells with multiple IntelliZone Compact II systems deployed, the optional hydraulic multidrop module reduces the number of hydraulic control lines required. For example, it is possible to control six zones with just three hydraulic lines. WellBuilder software guides the downhole tool configuration and number of control lines.

IntelliZone Compact II

mechanism ensures that the valve position does not change unintentionally during operations, while a special protective sleeve prevents exposure of the choke seals to erosive wellbore fluids. The TRFC-IZ design includes an integral shifting profile for contingency mechanical operations.

Fewer hydraulic and electric lines

Use of n IntelliZone Compact II systems to manage n zones requires $n+1$ hydraulic control lines. Alternatively, the optional multidrop module can be used to reduce installation complexity by enabling actuation of the FCVs with fewer hydraulic lines.

Just one electrical cable is needed to acquire pressure and temperature data and FCV choke positions from up to eight zones with permanent downhole gauges providing annulus and tubing measurements. Intellitite* downhole dual-seal dry-mate connectors ensure the reliability of the monitoring system.

Dependable zonal isolation

An ISO-rated multiport packer provides annular zonal isolation while enabling control line feedthrough. These versatile, highly reliable packers are available with two retrieval options: cut to release or straight pull to release. A slipless version can be run if the packer is only required to provide zonal isolation without withstanding any loads.

Data gathering and control platform

The surface control system comprises a hydraulic power unit (HPU) and a logic-programmed control and operating system—WellWatcher Instruct* multiwell acquisition unit—that automatically directs hydraulic pressure

sequences to the appropriate control lines for reliable, remote operation of the FCVs. In addition, the WellWatcher Instruct unit acquires and stores downhole gauge and choke data as well as data from the surface HPU; it also detects alarms. Operators can easily interface with the surface system to view zone data in real time, quickly control the downhole valves and fine-tune well production, store historical data, and manage authorizations. The surface system's remote communication capabilities facilitate well testing, diagnostics, and production optimization through either a local SCADA system or a remote connection.

WellWatcher Instruct Unit Specifications

Operating environment

Humidity	Max. relative humidity of 80% (noncondensing) at 88 degF [31 degC], decreasing linearly to 50% at 104 degF [40 degC]
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Operating temperature range, degF [degC]	-4 to 149 [-20 to 65]
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Storage temperature range, degF [degC]	-22 to 149 [-30 to 65]
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Equipment

Mounting	Indoor use only External applications must be mounted in NEMA 3R- or NEMA 4X-rated enclosure
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Operating

Power supply rated input (AC)	100–240 V, 50 or 60 Hz, 75 W
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Typical power supply (AC)	100–240 V, 50 or 60 Hz, 15 W
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Maintenance port	USB-B
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IntelliZone Compact II System Specifications

Nominal completion size, in [mm]	5½ × 2⅝ [139.700 × 73.025]	5½ × 2⅝ [139.700 × 73.025]	7 × 3½ [177.800 × 88.900]	7 × 3½ [177.800 × 88.900]
Casing weight, lbm/ft [kg/m]	17 [25.3]	20 [29.8]	23–26 [34.2–38.7]	26–29 [38.7–43.2]
Max. OD, in [mm]	4.710 [119.634]	4.595 [116.713]	6.090 [154.686]	6.000 [152.400]
Min. ID, in [mm]	2.312 [58.725]	2.312 [58.725]	2.813 [71.450]	2.813 [71.450]
Drift ID, in [mm]	2.305 [58.547]	2.305 [58.547]	2.805 [71.247]	2.805 [71.247]
Max. makeup length, ft [m] (varies depending on configuration)	32 [9.754]	32 [9.754]	28 [8.534]	28 [8.534]
Max. flow rate, bbl/d [m³/d]	17,000 [2,703]	17,000 [2,703]	44,000 [6,995]	44,000 [6,995]
Feedthrough port size, in [mm]	0.25 [6.35]	0.25 [6.35]	0.25 [6.35]	0.25 [6.35]
Differential working pressure, psi [kPa]	5,000 [34,474]	5,000 [34,474]	5,000 [34,474]	5,000 [34,474]
Max. equalization differential pressure, psi [kPa]	1,000 [6,895]	1,000 [6,895]	1,000 [6,895]	1,000 [6,895]
Operating temperature range, degF [degC]	68–250 [20–121]	68–250 [20–121]	68–250 [20–121]	68–250 [20–121]
Min. storage temperature, degF [degC]	-40 [-40]	-40 [-40]	-40 [-40]	-40 [-40]

System options

Annular isolation packer	Cut to release (ISO V3), straight pull to release (ISO V3), or slipless (ISO V6)
Flow control valve	On-off or four-position TRFC-IZ
Monitoring system	Tubing and annulus pressure and temperature gauges and valve position sensor
Optional hydraulic multidrop module	2, 4, or 8 pulse

Materials

Metallurgy options	4140 and 13Cr
Material specification	NACE MR0175

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