Intelligent Remote Control Layered Injection and Production System

—— Wireless Intelligent Remote Control

Working principle

The wireless intelligent remote control layered injection and production system uses a microprocessor as the control core, and operates a micro motor to drive the adjustable water nozzle opening, achieving refined layered injection and production. The control program can monitor the real-time flow rate based on the opening of the water nozzle and the pressure difference between the front and back of the device, and regularly correct errors according to design requirements. The intelligent remote control layered injection and production system can also achieve bidirectional data transmission through the connection of steel pipe cables, and can measure and store formation flow, temperature, and pressure parameters for a long time.

Main structure

The wireless intelligent remote control layered injection and production system is mainly composed of an upper connector, a sleeve, a body, a lower connector, and a blending tester. (See Fig 1 and 2)

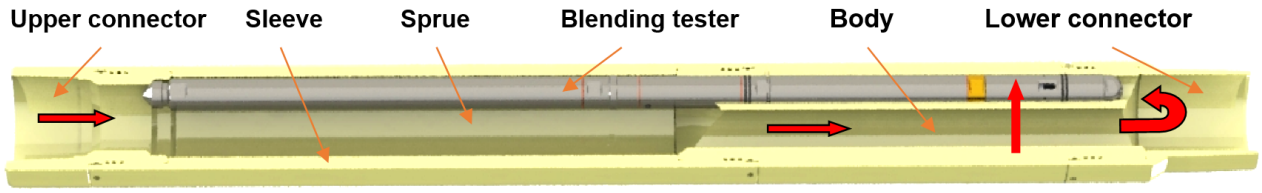

Fig 1 Structure diagram of wireless water distributor

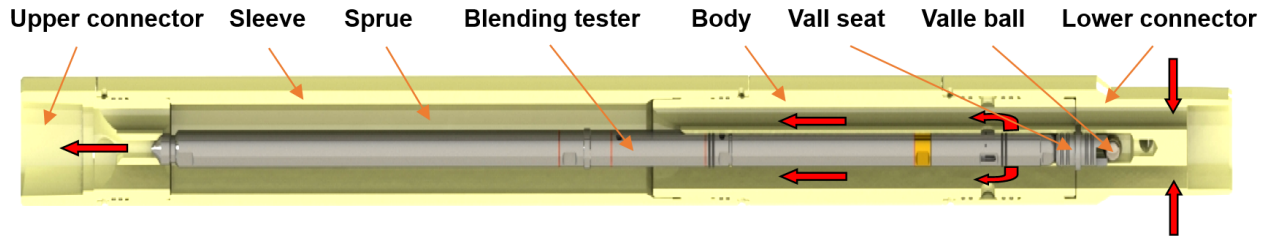

Fig 2 Structure diagram of wireless production equipment

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Intelligent Remote Control Layered Injection and Production System

—— Cable Intelligent Remote Control

Main structure

The intelligent remote control layered injection and production system with cables is mainly composed of upper connector, a sleeves, a body,a lower connector, and a blending tester, a Nipple, a steel pipe cables, etc. (See Fig 4, 5, and 6)

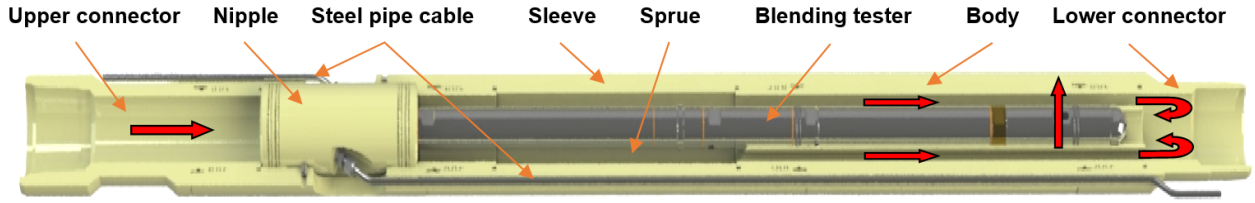

Fig 4 Structural diagram of cable water distributor

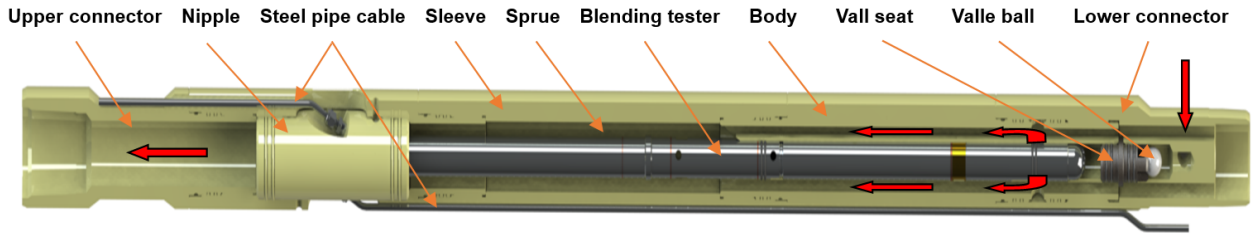

Fig 5 Structure diagram of cable production equipment

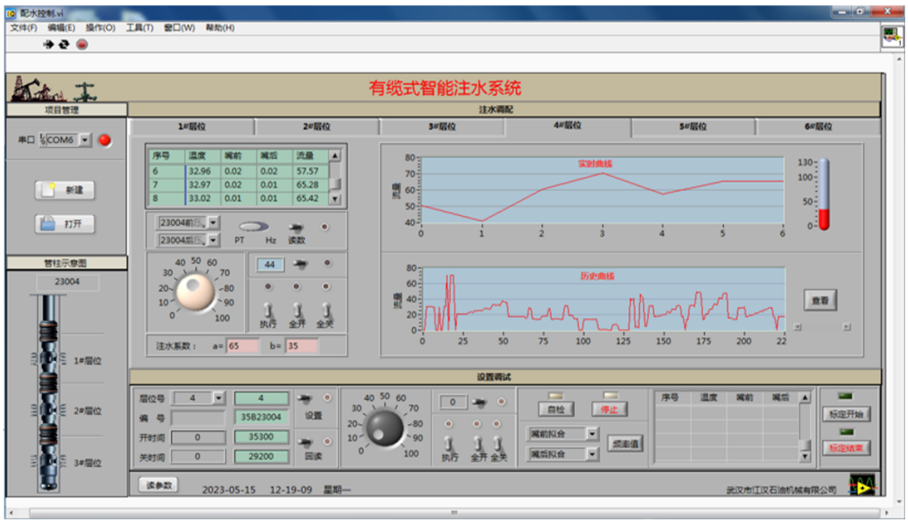

Fig 6 Remote Control System Operation Interface

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Equipment features - Wireless Intelligent Remote Control

Adopting a timed pulse pressure release method to generate negative pressure pulse waves in the wellbore of the production well; The negative pressure wave coding command curve is shown in Figure 3, which controls the underground intelligent switches at different levels according to time periods. The instructions that the underground intelligent switch needs to execute are shown in the pressure wave remote control command coding table.

The opening of the plunger type water nozzle regulating valve is controlled by a precision brushless motor, and the driving voltage of the brushless motor is a microsecond pulse generated by a specific microcontroller. Therefore, the opening of the water nozzle can be controlled very accurately.

Pressure Wave Remote Control Command Function Table

Layer command		Action command	
8 min		7 min	
Layer	Pulse count	Function	Pulse count
0	1	Full open	2
1	2	Full closed	3
2	3	Half-open	4
3	4	Half-closed	5
4	5	Sampling	6
5	6	Injection allocation	7
6	7		
Whole	8		

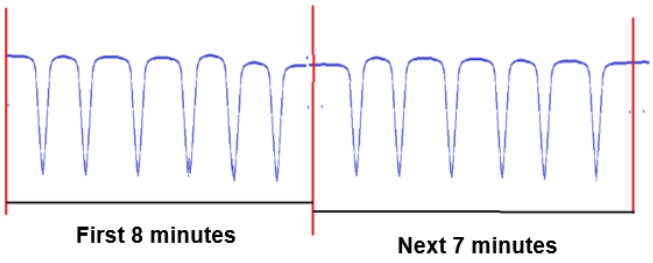

Fig 3 Negative Pressure Wave Command Number Curve (Control the layer for the first 8 minutes and control the action for the next 7 minutes)

Equipment features - Intelligent remote control with cables

★ Adopting a single core 1/4 "steel pipe cable with a pressure resistance of 70MPa, it can withstand high pressure immersion and erosion.

★ Adopting proprietary technology to handle cable joints, it is easy to operate, with high sealing and insulation levels.

★ Similar to the construction of hydraulic control pipelines or chemical dosing pipelines, the traditional dispensing tools only need to be replaced with cable passing tools, making the construction simple.

★ The sealing effect of the pipe column seat can be determined by comparing the pressure data behind the water nozzle in adjacent layers.

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智能遥控分层注采系统

Intelligent remote control layered injection and production system

Equipment features - Intelligent remote control with cables

★ The cable serves as a signal transmission carrier and can be deployed remotely to complete; Realized monitoring of underground flow, temperature, and pressure data.

★ Remote one click deployment, directly obtaining water absorption profile based on changes in wellhead flow rate and downhole pressure data

Specification parameter table

Name	Code	Parameters	Notes
Wireless intelligent remote control water distributor	LDPZ135	OD：Φ135mm；ID：Φ62mm；Plunger type water nozzle	
	LDPZ110	OD：110mm；ID：Φ44mm；Plunger type water nozzle	
	LDPZ95	OD：95mm； ID：Φ40mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPZ79	OD：79mm； ID：Φ28mm；Plunger type water nozzle	The overflow hole is a waist circular hole
Wireless intelligent remote control production equipment	LDPC135	OD：135mm； ID：Φ70mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPC110	OD：110mm； ID：Φ47mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPC95	OD：95mm； ID：Φ30mm；Plunger type water nozzle	The overflow hole is a waist circular hole
Intelligent remote control water distributor with cable	LDPZ135-Y	OD：Φ135mm； ID：Φ50mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPZ110-Y	OD：110mm； ID：Φ32mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPZ95-Y	OD：95mm； ID：Φ28mm；Plunger type water nozzle	The overflow hole is a waist circular hole
Intelligent remote control production equipment with cable	LDPC135-Y	OD：Φ135mm； ID：Φ50mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPC110-Y	OD：110mm； ID：Φ32mm；Plunger type water nozzle	The overflow hole is a waist circular hole
	LDPC95-Y	OD：95mm； ID：Φ28mm；Plunger type water nozzle	The overflow hole is a waist circular hole
Intelligent switch pressure wave generator	LDZNMC-II		

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