

eMotion®-HS Remotely Operated Circulating Valve

PROVIDES HIGH CIRCULATION RATES WITHOUT ANY INTERVENTIONS ABOVE A SET PACKER



HAL112153

OVERVIEW

The eMotion®-HS valve is a computer-controlled, gas-tight (V0 rated) circulating valve that can be repeatedly opened or closed by remote command. No surface connections or interventions are required to communicate with or operate the valve.

Permanently deployed above the production packer as part of the tubing string, the eMotion-HS valve controls the flow of well fluids between the tubing and annulus without the need for any interventions or surface control lines - saving rig-time, costs and helping to reduce risk.

HOW IT WORKS

The eMotion-HS valve is an integrated assembly of two existing devices. The first is the eMotion® electronic control unit. This is used to provide surface communication and the motive force to operate the second device – a Halliburton HS-ICV circulating valve.

The assembly has integrated pressure and temperature sensors which it uses to monitor the well conditions and is pre-programmed to either open or close whenever a specified condition (known as a trigger) is detected.

The triggers use a variety of well parameters including ambient pressure, temperature, time or surface applied pressure. Each time a trigger is detected the valve will either open or close as per its instructions. This process can be repeated time-and-time again without the need for any form of intervention or any control lines to surface.

FEATURES

- » Remotely operated time-after-time
- » Large tubing to annulus ports
- » Run open or closed
- » No dedicated personnel required
- » Metal-to-metal carbide seal

BENEFITS

- » Eliminates multiple interventions during completion operations – saving time, money and helping reduce risk
- » Allows for faster pump rates, providing safer and more efficient circulation of well fluids
- » Provides flexible deployment options and well control while running-in-hole
- » Reduces the number of operations personnel – saving costs and helping reduce risk
- » Debris tolerant, V0 rated seal is capable of withstanding high circulation rates

Controlling the eMotion-HS Valve Remotely

By applying a defined pressure for a defined time at surface, the operator can activate the pressure window trigger. This allows direct communication to the eMotion-HS valve so it can be remotely operated. For example, applying between 1,000 - 1,500 psi for 10 minutes could instruct it to open.

Any pressure applied outside the defined values will be ignored. This means that pressure can be applied to the tubing (for tubing integrity tests or packer setting, etc.) without any risk of inadvertent activation.

Onboard data analysis allows the eMotion-HS valve to distinguish its own commands from other external factors such as naturally fluctuating hydrostatic or reservoir pressure. This enables the valve to behave as planned, even if the downhole conditions change unexpectedly.

eMotion-HS Valve Autonomous Operation

A range of other triggers consisting of ambient well pressure, ambient well temperature and a timer are also available. These triggers are used to provide a pre-programmed sequence for the eMotion-HS valve to follow without any input from the surface.

Each trigger can be used independently or combined to build more elaborate instructions. For example, the eMotion-HS valve could be set to close when it detects pressure below 2,000 psi, but only after 100 days downhole. The pressure window trigger can also be used to manually cancel or override any trigger or permanently lock the valve in its current position.

Specifications

Size (to suit thread size)	5.5-in.
Temperature Range	4 - 140°C (39 - 284°F)
Maximum Differential Pressure While Opening	5,000 psi (345 bar)

The eMotion-HS valve is available in the size and specifications shown above. Due to the high number of design variables, the information given above is for guidance only.

APPLICATION

The eMotion-HS valve has been designed specifically to offer a safe and highly efficient method of circulating well fluids during a well completion operation.

It is deployed as an integrated part of the tubing string, positioned above the main production packer. This configuration eliminates the need to circulate across the unset packer, reducing the risk of damaging the elements and preventing the circulation pressure from impacting on the reservoir.

Normally, the eMotion-HS valve is run-in-hole in the closed position and subsequently opened by remote command after the packer has been set. The valve is commanded to open by applying pressure at surface (for example 2,000 psi for 10 minutes) against a deep-set barrier such as a reservoir isolation barrier.

When open, well fluids can be circulated to under-balance the well ready for production; the large flow ports allowing faster pump rates to be used, saving on rig-time.

With the circulation successfully completed, the eMotion-HS valve is commanded to re-close and/or permanently lock using another pressure window trigger. Each time the valve is operated this way, an intervention is eliminated from the operation, saving rig-time, costs and helping to reduce risk.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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