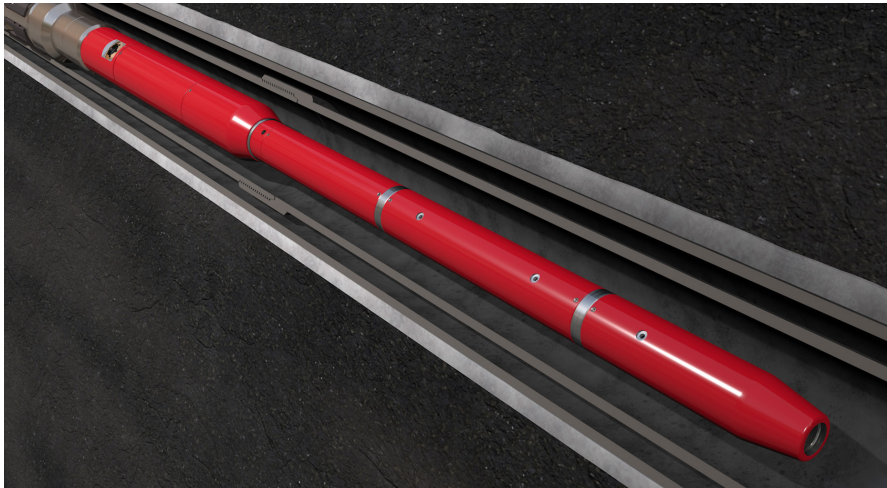


eRED[®] Electronic Remote Equalizing Device

**REMOTELY OPERATED MULTI-CYCLE BALL VALVE
ELIMINATES INTERVENTIONS DURING WELL OPERATIONS**



HCT1779-097a

OVERVIEW

The eRED[®] valve is an electro-mechanical ball valve that can be remotely opened and closed multiple times using remote commands. The eRED valve functions remotely without the need of cables, control lines, or intervention as preprogrammed trigger commands are used to communicate and operate the valve.

The valve can be deployed below any lock mandrel, bridge plug, or on a three-way tubing crossover, and used as a downhole barrier or flow control device. Each time the ball valve opens or closes, an intervention is eliminated from the operation, saving significant rig time while reducing operation and personnel risks.

HOW IT WORKS: A TYPICAL OPERATION

The valve has integrated pressure and temperature sensors to monitor well conditions, and is preprogrammed to either open or close when a specified condition (trigger) is detected.

The trigger commands use various well parameters, including hydrostatic pressure, surface-applied pressure, time, or temperature. Each time a trigger is detected, the eRED valve reacts by either opening or closing according to preprogrammed trigger instructions. This process can be repeated multiple times without any form of intervention.

FEATURES

- » Remotely operated electro-mechanical ball valve
- » Market-leading electronic multi-cycle ball valve, multiple open and close actuations
- » Metal-to-metal ball and seat sealing mechanism
- » Extensive battery life—up to 41 months
- » Pressure and temperature logging
- » Large flow area
- » Reliable field-proven electronics
- » Deployed opened or closed

BENEFITS

- » Remote activations reduce the number of interventions and pressure control equipment (PCE) rig up, saving time and cost and reducing the potential risk of HSE exposure
- » Flexible deployment options: slickline, wireline, coiled tubing, or preinstalled inside tubing offline
- » Prepared onshore or offshore either preinstalled or run in hole using intervention
- » Large flow area allows well fluids to wash through the assembly, aiding deployment and retrieval
- » Flexible programming tailored for each operation performed at the base or wellsite
- » Reliable, field-proven technology with more than 1,000 installations
- » Reduces personnel onboard, minimizing costs and reducing the potential risk of HSE exposure
- » Tested in accordance with ISO 14310 barrier standards
- » Greenhouse gas reduction with rig time savings

Applying a defined pressure at surface for a predetermined time enables the operator to activate the pressure window trigger, which allows direct communication with the eRED® valve for remote control. For example, applying between 1,000 and 1,500 psi for 10 minutes could instruct the eRED valve to open.

The eRED valve will ignore any pressure applied outside the defined values; therefore, pressure can be applied to the tubing (for tubing integrity tests, packer setting, etc.) without the risk of inadvertently activating the valve.

Onboard data analysis allows the eRED valve to distinguish its own commands from other external factors (i.e., naturally fluctuating hydrostatic or reservoir pressure), so it can operate as planned, regardless of unexpected changes in downhole conditions.

Other triggers consisting of absolute well pressure, timers, and well temperature provide a preprogrammed logic flow sequence for the eRED valve to follow without input from the surface. The various trigger types can be used independently or in conjunction with each other to develop more elaborate instructions. The eRED valve can be set to wake on a predetermined hydrostatic pressure command at a certain depth and then close hours later, allowing time to circulate, reach setting depth, and land the hanger.

For example, when running in hole with the eRED valve, it searches for hydrostatic pressure greater than 4,500 psi, and once it reaches the depth of this pressure, the valve wakes up. After meeting the hydrostatic parameter, the valve closes immediately after the five-hour timer elapses.

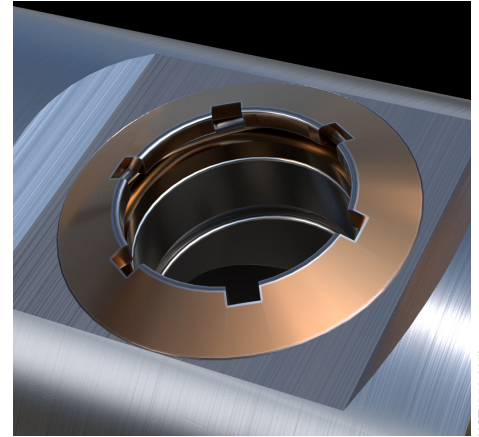
In addition, the pressure window trigger can be used to manually cancel or override any trigger or permanently lock the eRED valve in its current position, disabling the electronics. For example, if there are delays reaching final depth and the valve closes early, a contingency open/close loop trigger pressure command can be used, allowing flexibility in reopening the valve for a period before closing again.

eRED® Electronic Remote Equalizing Device Specifications*

Available Sizes (Valve OD)	2.25, 3.25, 4.25, 5.5 in.
Maximum Differential Across Ball	Up to 10,000 psi (689 bar)
Temperature Range	32 to 284°F (0 to 140°C)
Maximum Differential Pressure While Opening	Up to 5,000 psi (345 bar)
Maximum Flow Rate	Up to 10 bbl/min
Battery Life	Up to 41 months
Test Standard	ISO 14310 up to V0

*Available in a range of specifications, because of the high number of design variables, the information provided is for guidance only. Always refer to the latest product data sheet.

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



eRED® valve flow port

APPLICATIONS

Any application in which an intervention plug is used can be replaced by an eRED valve to achieve enhanced results using remote open/close functions, without intervention, reducing rig-time and associated costs and risks. Multiple eRED valves can be deployed in a single operation. For example, for dual barrier well suspension, a shallow- and deep-set eRED plug can be utilized for this application.

- » Packer setting
- » Deep-set barrier
- » Shallow-set barrier for blowout preventer (BOP)/Christmas tree change out
- » Annular barrier in short string during completion deployment
- » Liner deployment
- » Barrier in temporary abandonments or light well intervention operations
- » Barrier in tubing-conveyed perforating gun firing and stimulation operations
- » Ball drop replacement in highly deviated and horizontal wells
- » Self-actuating flow control device
- » Shut-in tool for pressure buildup tests during well testing allows data logging through the valve transducers or via anchored gauges

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