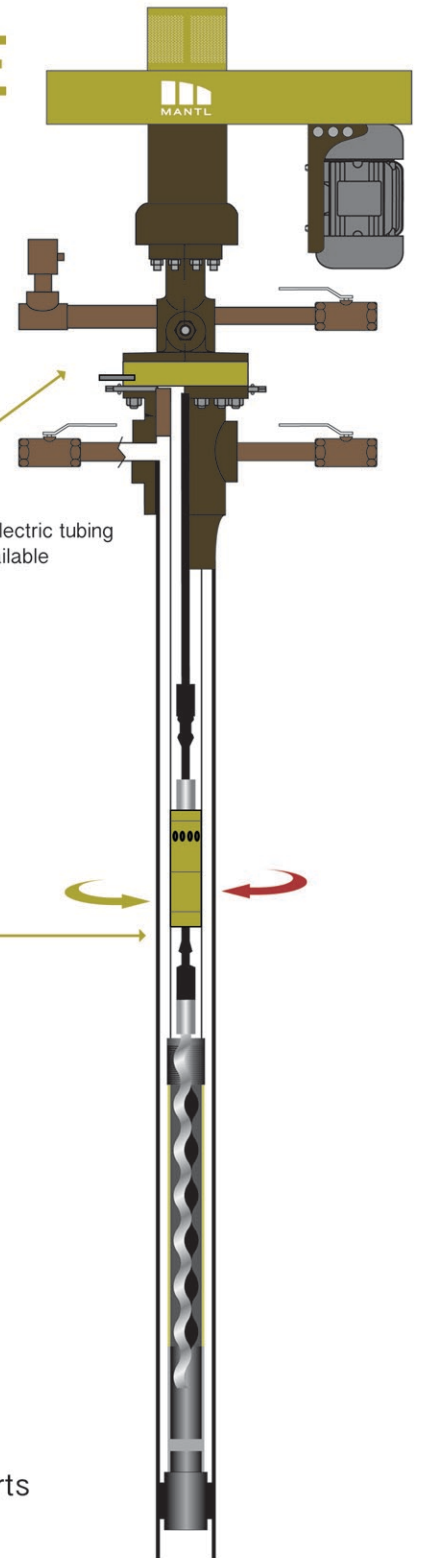


MECHANICAL CIRCULATION VALVE

MANTL's surface driven mechanical circulation valve is a unique technology that allows the well to be circulated/unloaded anytime it is desired. A forward or reverse rotation of the tubing allows the valve to be opened or closed while still allowing for conventional rod tubing wear prevention. The wide operating range of the drain ports allows for tubing drainage without needing a precise number of rotations.



Manual or electric tubing rotators available

BI-DIRECTIONAL ACTION ENABLES THE OPENING AND CLOSING OF DOWNHOLE VALVE ASSEMBY

OPEN VALVE PUMP OPERATING

Circulate using the pump during operation to disperse solids
Before shut down to allow sand settling to flush directly to annulus

OPEN VALVE PUMP OFF

Pump down tubing to flush
Circulate chemical above the pump (hot oil, etc)

OPEN VALVE BEFORE STARTING PUMP

Reduce / eliminate residual fluid head reducing torque requirement on restarts
(stuck pump scenario)

PATENT PENDING