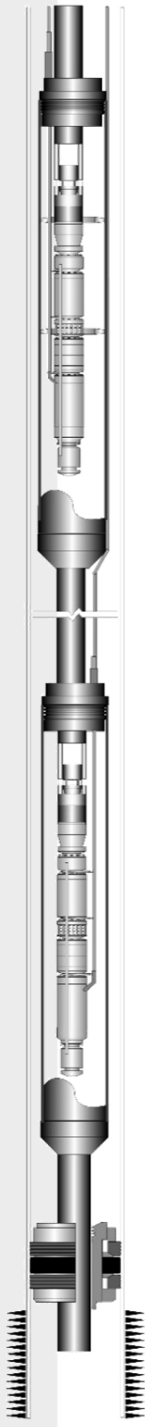
Equipment Datasheet	
Document #	033
Revision	AA

Dual ESPs for redundancy to extend well production



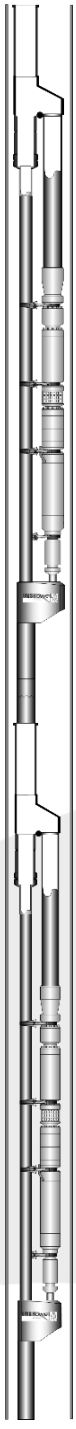
Dual ESPs are a common term for an electrical submersible pump (ESP) completion that has two ESPs in a single well. One ESP is run as a primary system until failure, and the other as a backup which is run after the primary ESP fails. This extends production time and to allows a workover to be planned to eliminate deferred production.

Typically, dual ESPs are used in high value wells to increase run life and where workover costs are high.

The attached drawings show different combinations of dual ESP arrangements using UMS Flowell Y-tools and Pod systems. These are split into;

- Reservoir access systems with intervention and interventionless methods to switch between primary and backup ESP
- Production casing isolation systems to protect the well casing from produced fluids and protect the production zone from kill fluid
- Dual systems without casing isolation or reservoir access

The system preference is down to the end user operating philosophy and objectives. Some of the advantages and disadvantages are listed in each section.



Casing Isolation (no reservoir access with ESP installed)

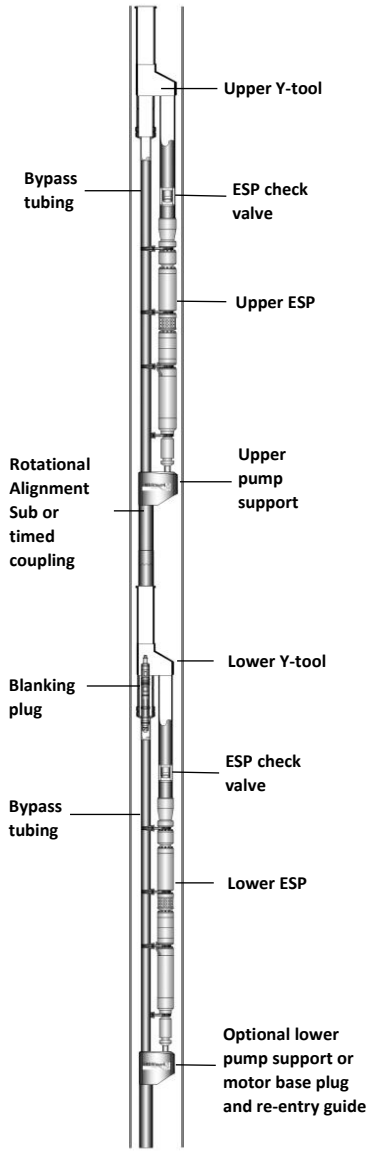
Reservoir access with ESP installed (no casing isolation)

Turriff : +44 (0)1888 568771 East Kilbride: +44 (0)1355 222611 sales@umsflowell.com

www.umsflowell.com

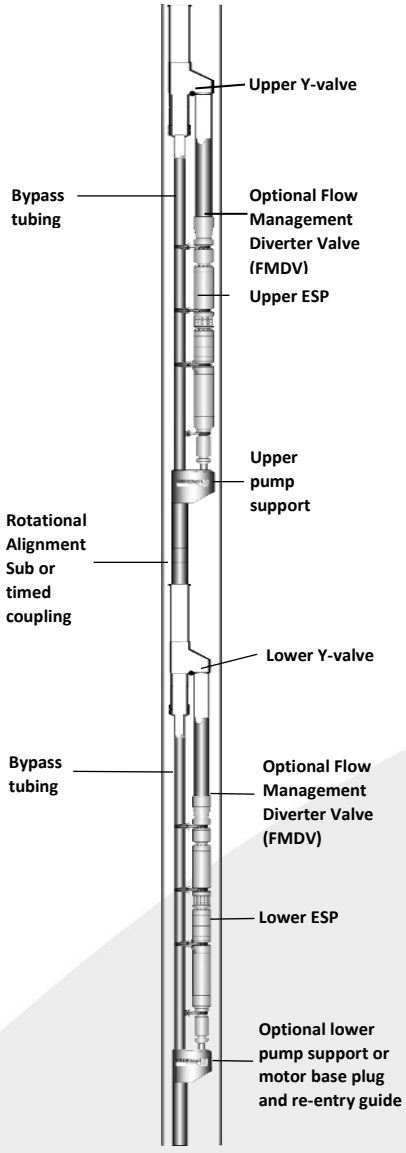
Equipment Datasheet	
Document #	033
Revision	AA

Dual ESPs with reservoir access – automatic switchover between primary and backup



Dual Y-tool with check valves and blanking plug

- Automatic switchover between ESPs
- Pull blanking plug for draining fluid for workover, and for access to reservoir
- Possible build up above blanking plug or check valve
- ESP Packer
- Mechanical slickline plugs as contingency for upper system



Dual Y-valves

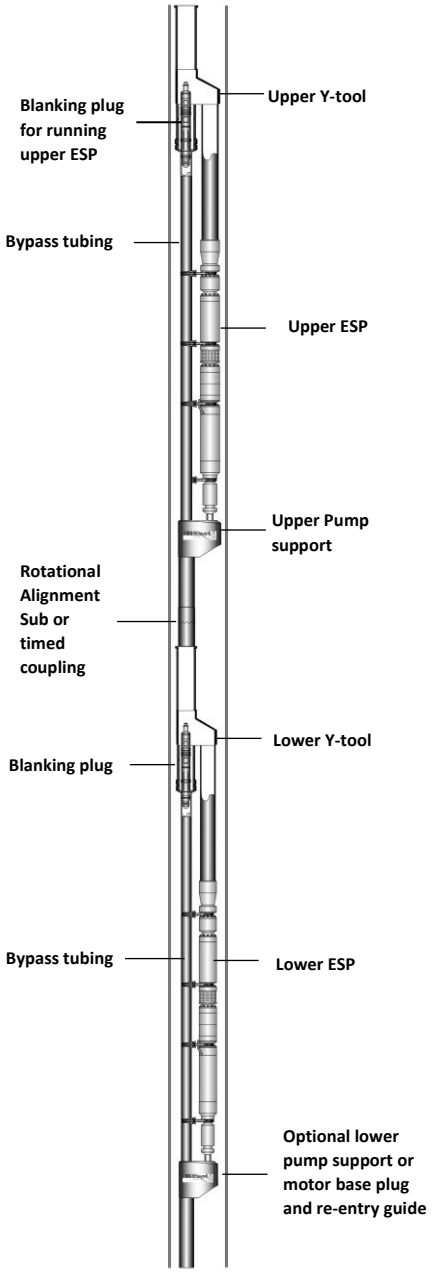
- Automatic switchover between ESPs
- Optional FMDV to equalize Y-valve and prevent backspin on pumps
- ESP Packer
- Mechanical slickline plugs as contingency

Turriff : +44 (0)1888 568771 East Kilbride: +44 (0)1355 222611 sales@umsflowell.com

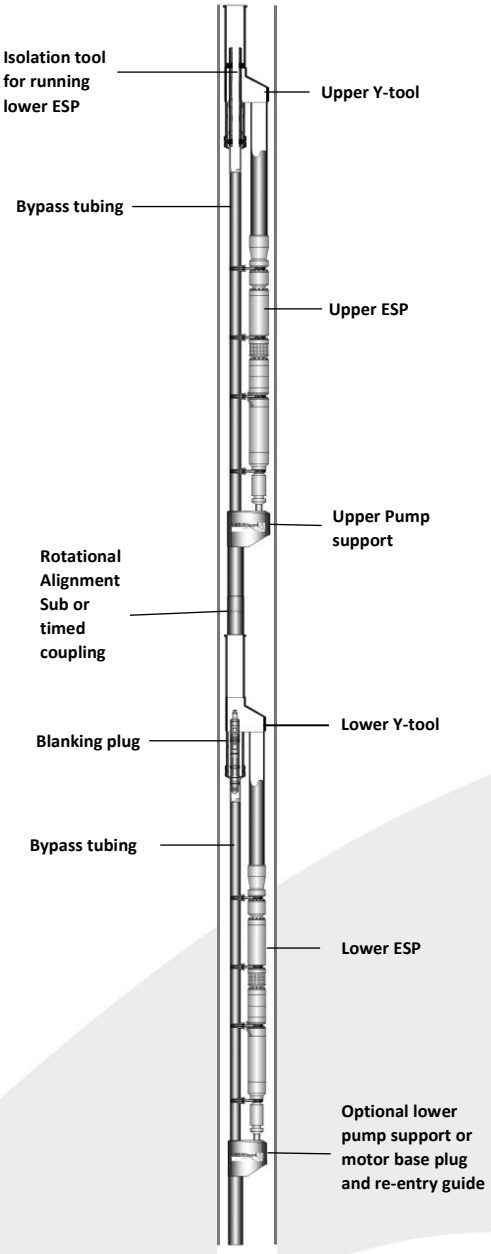
www.umsflowell.com

Equipment Datasheet	
Document #	033
Revision	AA

Dual ESPs with reservoir access – slickline intervention for switchover between primary and backup



Running the upper ESP



Running the lower ESP

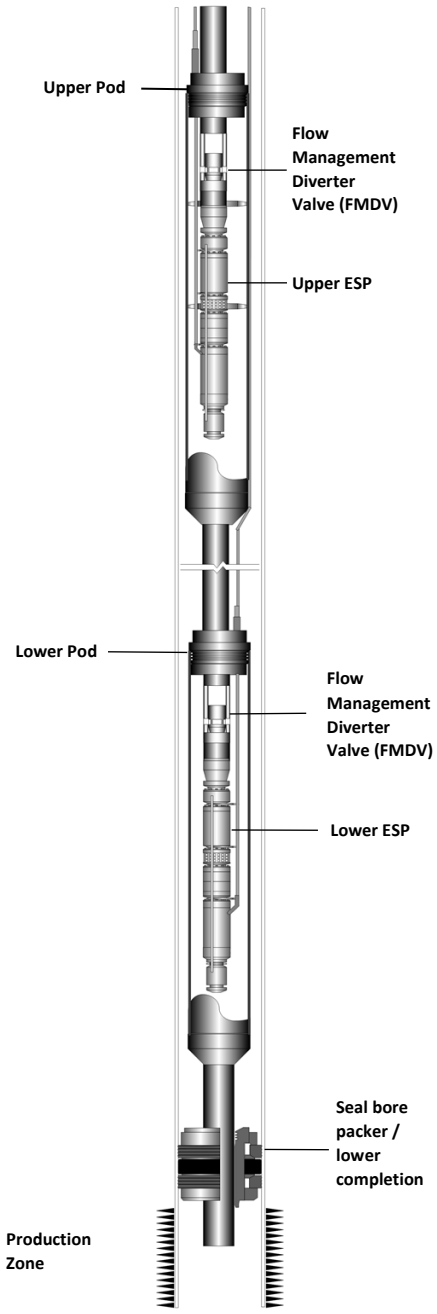
- Requires slickline to changeover between upper and lower ESP
- Conventional equipment
- ESP Packer

Turriff : +44 (0)1888 568771 East Kilbride: +44 (0)1355 222611 sales@umsflowell.com

www.umsflowell.com

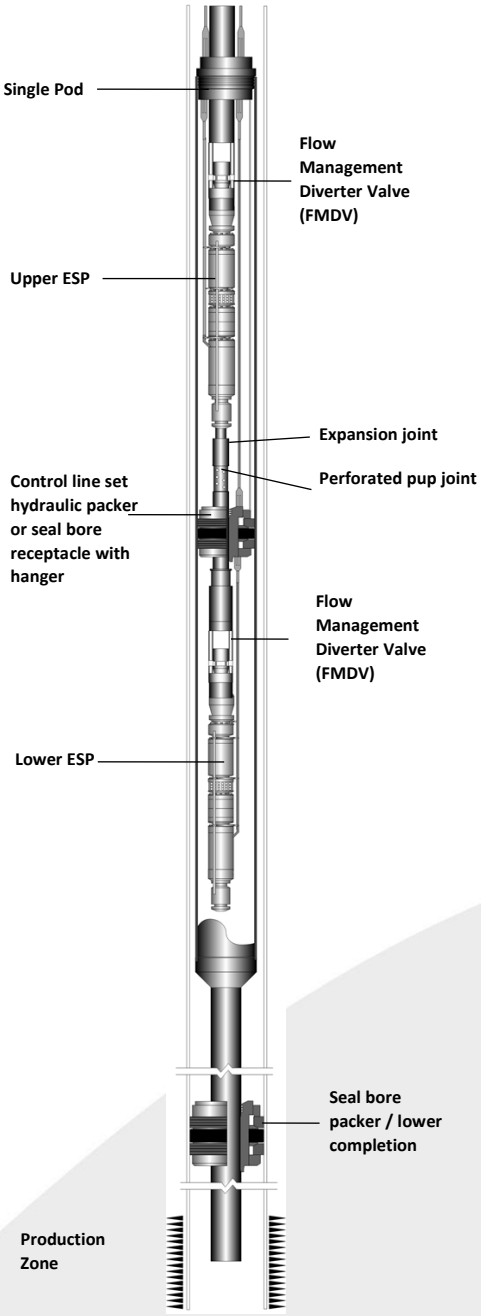
Equipment Datasheet	
Document #	033
Revision	AA

Dual ESPs with production casing isolation



Dual Pod, Dual ESP

- Automatic switchover between upper and lower ESP
- No reservoir access with ESP installed
- No ESP packer required
- Protects well casing from produced fluids
- MLE for lower ESP goes past outside of upper pod
- Production zone protected from kill fluid with use of formation isolation valve in lower completion



Single Pod, Dual ESP

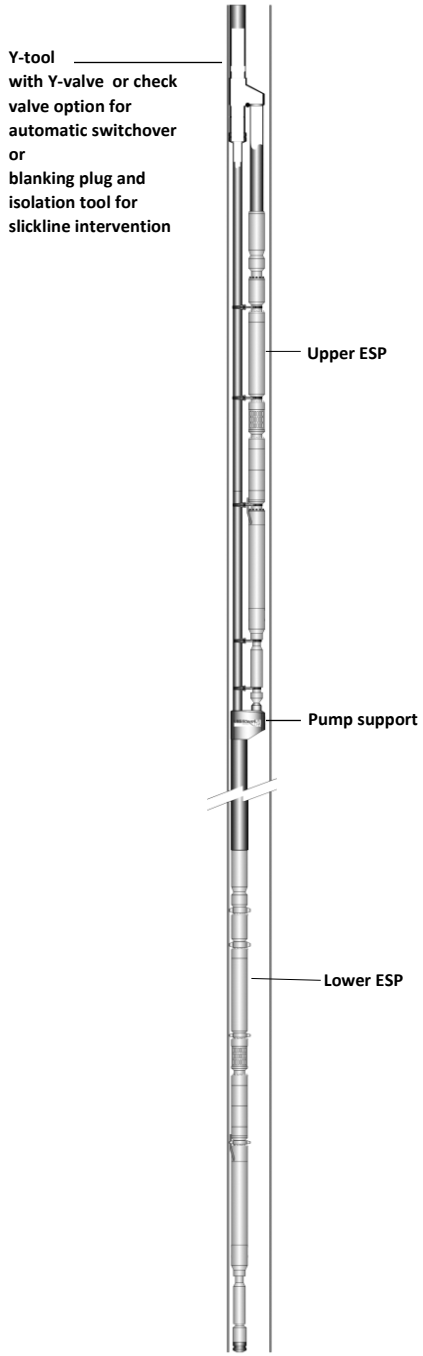
- Automatic switchover between upper and lower ESP
- No reservoir access with ESP installed
- No ESP packer required
- Protects well casing from produced fluids
- MLE for lower ESP goes inside single pod
- Space limitations inside single pod with additional lines
- Production zone protected from kill fluid with use of formation isolation valve in lower completion

Turriff : +44 (0)1888 568771 East Kilbride: +44 (0)1355 222611 sales@umsflowell.com

www.umsflowell.com

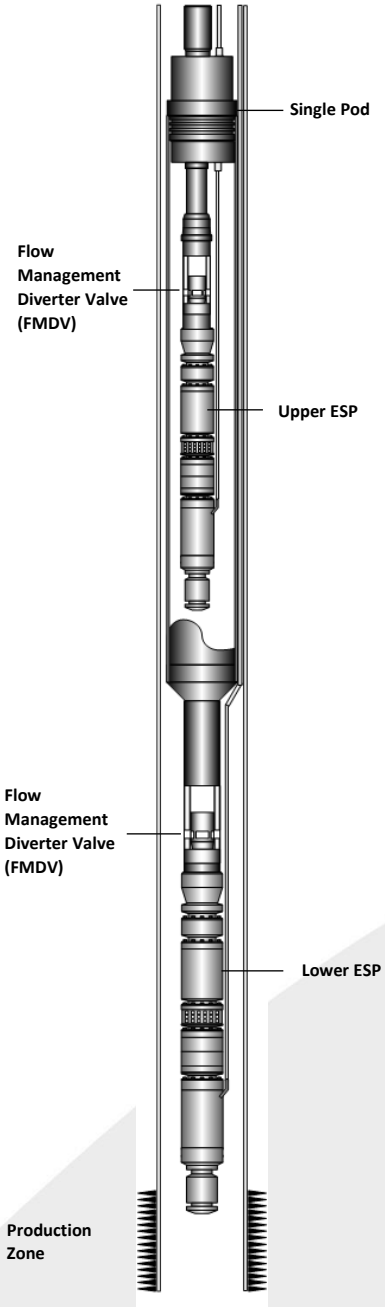
Equipment Datasheet	
Document #	033
Revision	AA

Dual ESPs with no production casing isolation and no reservoir access



Single Bypass, Dual ESP

- No reservoir access or casing isolation
- Low cost solution
- Conventional equipment
- Automatic switchover between upper and lower ESP or slickline intervention option
- Lower ESP flow path through bypass tubing



Single Pod, Dual ESP

- No reservoir access or casing isolation
- Low cost solution
- Conventional equipment
- Automatic switchover between upper and lower ESP
- Lower ESP flow path through pod (flow area typically greater than bypass tubing)

Turriff : +44 (0)1888 568771 East Kilbride: +44 (0)1355 222611 sales@umsflowell.com

www.umsflowell.com