GEONIK

Research and production firm

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CONTEST

CHAPTER 1.

INTELLIGENT COMPLETION SYSTEMS FOR MULTI-RESERVOIR PRODUCTION

- MRP-2CEV-2TMU-TMS
- MRP-2CEV-2BT-TMU WITH SHROUD
- MRP-1CEV-1TMU
- MRP-1CEV-1TMU
- MRP – ESP – ESM – ESP – TMU
- MRP – 2ESP – 2CEV – 2TMU -TMS
- MRP – ESP – ESM – ESP - 1CEV – 1TMU
- MRP- 3CEV- 3TMU
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- MRP – 2ESP – 2TMU – ST
- MRP – 2ESP – 2CEV -2TMU – ST
- PIM-CI - MRP-ESP/BHP
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CHAPTER 2.

INTELLIGENT COMPLETION SYSTEMS FOR MULTI-RESERVOIR INJECTION

- MRI-2CEV-2TMU
- MRI-3CEV-3TMU
- MRI – DFT -1
- MRI-DFT-2

MRP-2CEV-2TMU-TMS

Remotely controlled well completion system used in multi-reservoir production (MRP) includes two packers and an ESP unit for simultaneous production from two reservoirs through a single tubing string. The well completion system provides parameter measurement and flow control separately for each fluid flows entering the section of an ESP.

APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits or negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• The entire completion is controlled in real time remotely and locally from control station;

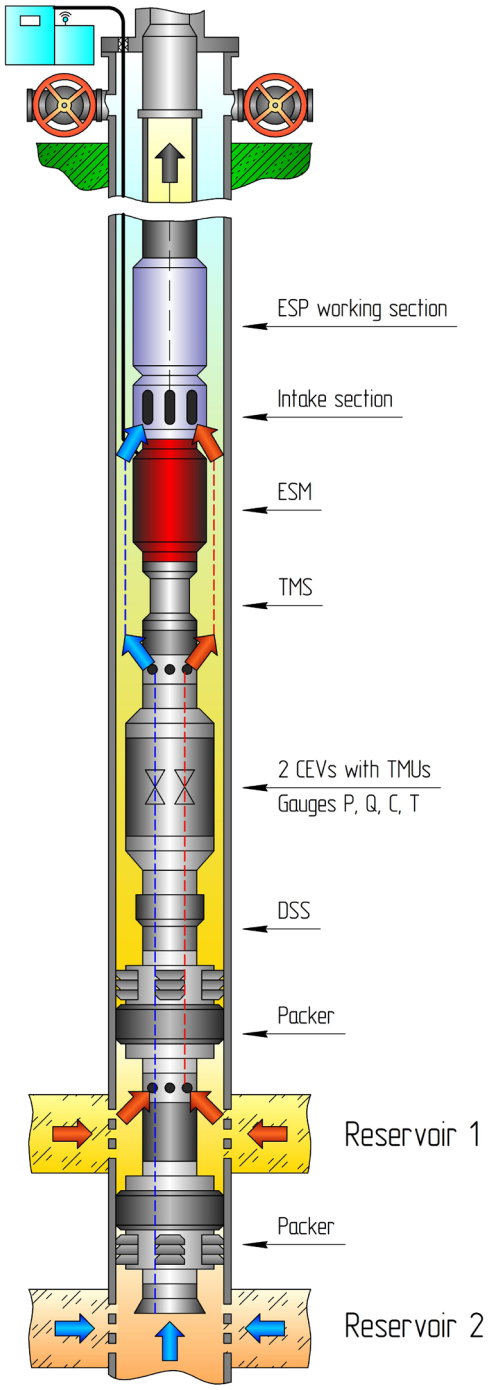
• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during an ESP operation from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• Dynamic testing of each reservoir during ESP operation with recording of pressure build-up curves;

• The completion is run and set in two stages: (1) setting a two-packer system; (2) running an ESP with 2CEVs and 2TMUs;

• To change an ESP, the system is retrieved from the well without two packers;

• No additional tubing is required due to ease of installation and high performance of the completion.



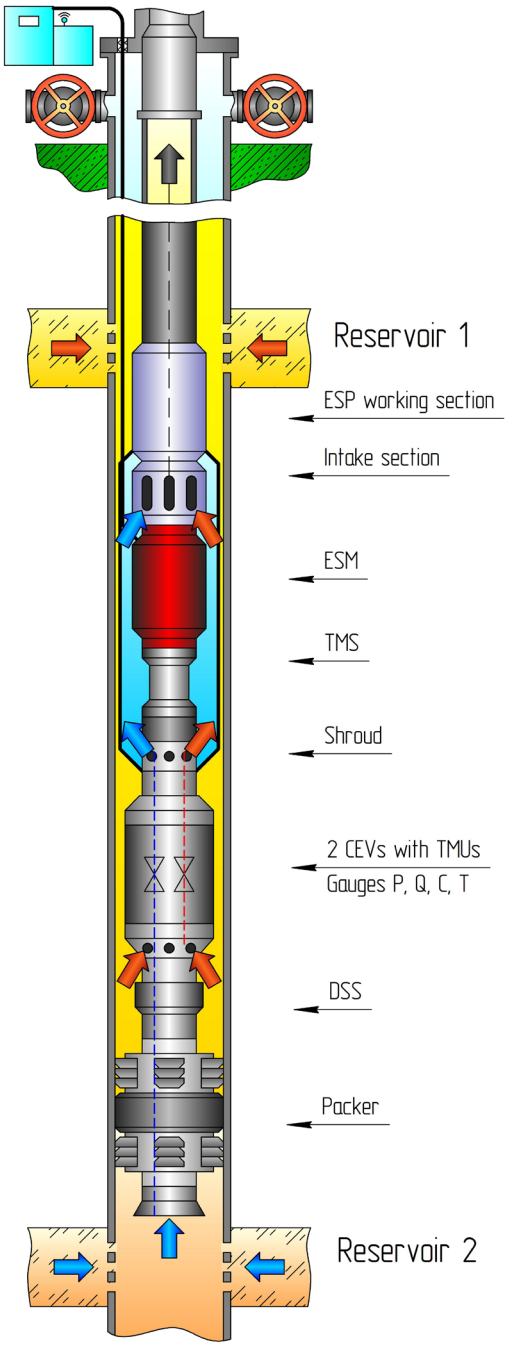
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	Pressure differences at CEV, MPa/psi	Maximum T, °C/F		Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS		
MRP-2CEV-2TMU -TMS-118	140/5.51	6-8/0.2-0.3	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43						
MRP-2CEV-2TMU – TMS-120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
MRP-2CEV-2TMU – TMS - 140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	13-15/0.51-0.59						
MRP-2CEV-2TMU -TMS - 145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47						

*by personal request

MRP-2CEV- 2TMU WITH SHROUD

Remotely controlled well completion system used in multi-reservoir production (MRP) includes one-packer and ESP unit with shroud for simultaneous production from two reservoirs through a single tubing string. The well completion system provides parameter measurement and flow control separately for each fluid flows entering the section of an ESP.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• Production wells with two different properties and significant differences in stratum depth;

• For solving problems with drawdown pressure limits or negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during an ESP operation from Geonik's dedicated telemetry system (TMS) or through power or logging cable*;

• Dynamic testing of each reservoir during ESP operation with recording of pressure build-up curves;

• The completion is run and set in two stages: (1) setting packer system; (2) running an ESP with 2CEVs and 2TMUs;

• To change an ESP, the system is retrieved from the well without packer;

• No additional tubing is required due to ease of installation and high performance of the completion.

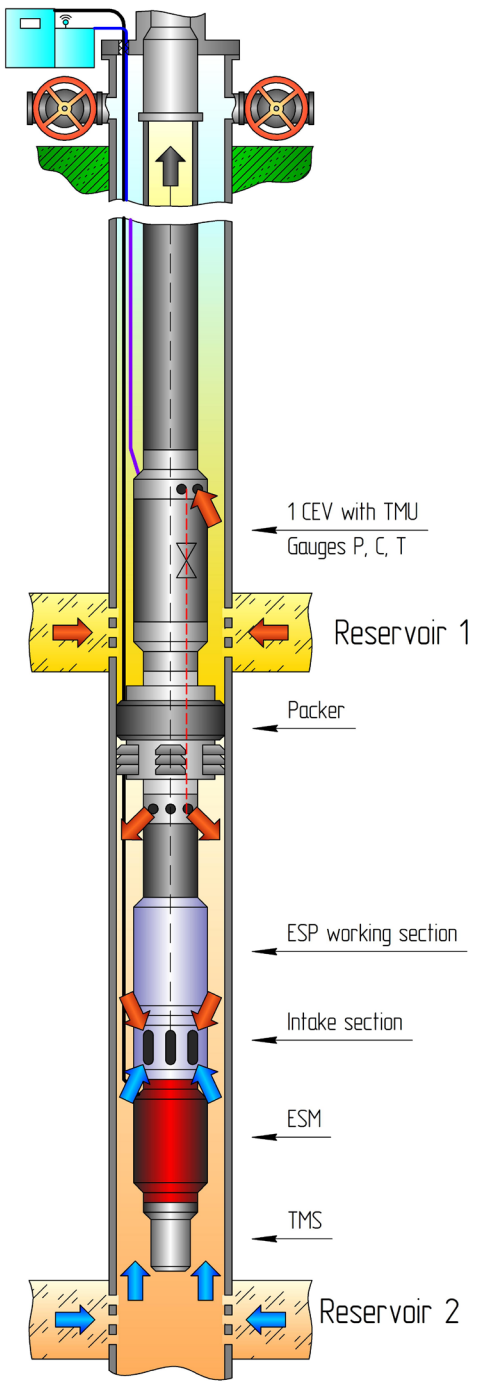
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	Pressure differences at CEV, MPa/psi	Maximum T, °C/F		ESM shroud diameter, mm	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS			
MRP-2CEV-2TMU – with shroud -118	140/5.51	6/0.2	12/0.47; 20*/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9/0.35							
MRP-2CEV-2TMU with shroud -120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20*/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128	73/2.87	
MRP-2CEV-2TMU with shroud -140	168/6.61	8-11/0.3-0.43	12/0.47; 20*/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	13-15/0.51-59							
MRP-2CEV-2TMU with shroud -145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20*/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47							

*by personal request

MRP-1CEV-1TMU-UR

Remotely controlled well completion system used in multi-reservoir production (MRP) includes an ESP unit with packer for simultaneous production from two reservoirs through a single tubing string. The well completion system provides parameter measurement and flow control coming from the upper reservoir into under packer zone to the section of an ESP.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties;

• For possibility to use the completion with shroud to prevent overheating of ESM.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during operation of an ESP unit from Geonik's dedicated telemetry system (TMS) or through logging cable;

• Dynamic testing of upper reservoir during ESP operation with recording of pressure build-up curves;

• The completion is run and set in the well in one stage;

• No additional tubing is required due to ease of installation and high performance of the completion.

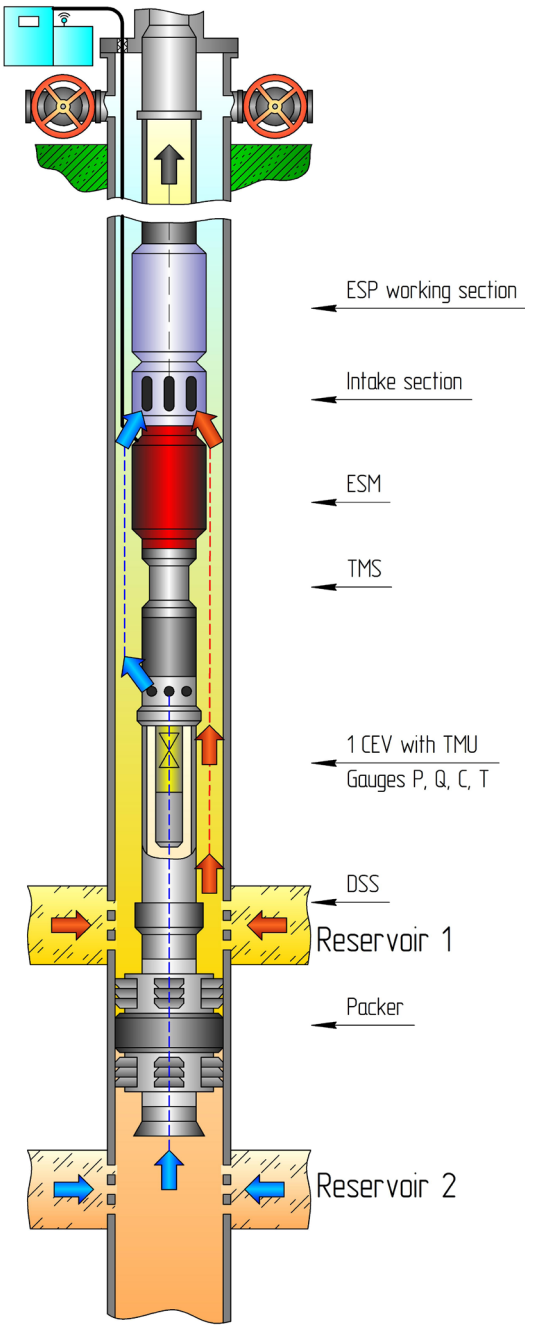
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	Pressure differences at CEV, MPa/psi	Maximum T, °C/F		Shroud diameter, mm	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS			
MRP-1CEV-1TMU –118	140/5.51	6/0.2	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9/0.35							
MRP-1CEV-1TMU-120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128	73/2.87	
MRP-1CEV-1TMU-140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	13-15/0.51-59							
MRP-1CEV-1TMU-145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47							

*by personal request

MRP-1CEV-1TMU-LR

Remotely controlled well completion system used in multi-reservoir production (MRP) includes one impulse mechanical double-grip packer and an ESP unit for simultaneous production from two reservoirs through a single tubing string. The well completion system provides parameter measurement and flow control coming from the lower reservoir to the section of an ESP.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical characteristics;

• For possibility to use the completion with shroud to prevent overheating of ESM.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during an ESP operation from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• The completion is run and set in two stages: (1) setting packer system; (2) running an ESP with CEV and TMU;

• Dynamic testing of lower reservoir during ESP operation with recording of pressure build-up curves;

• To change an ESP, the system is retrieved from the well without the packer;

• No additional tubing is required due to ease of installation and high performance of the completion.

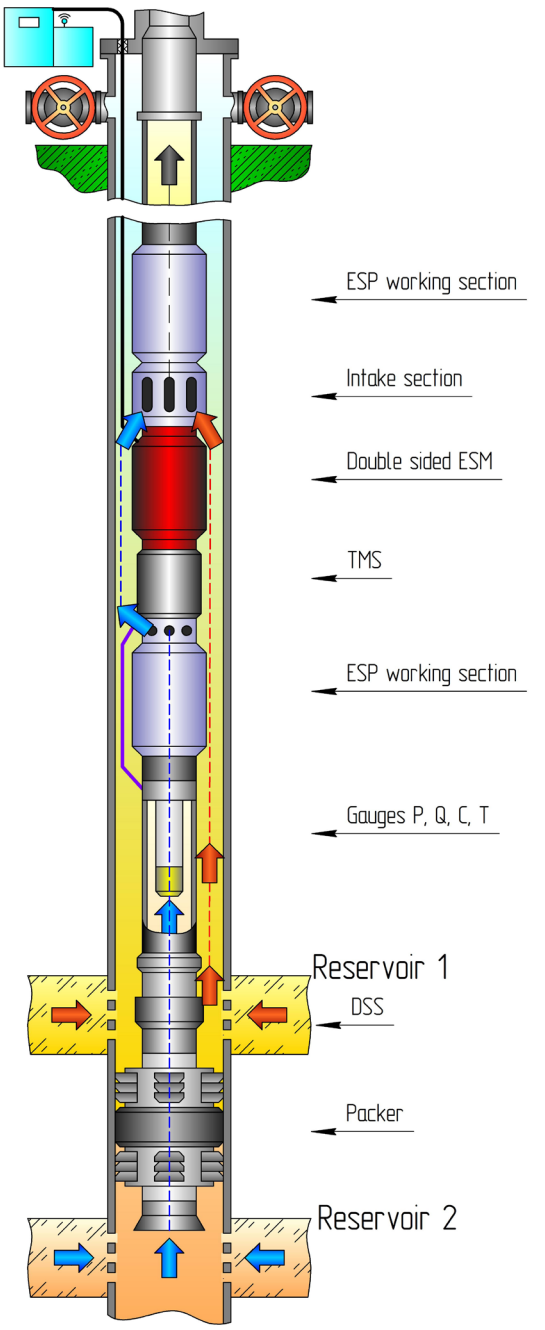
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	CEV working pressure, MPa/psi	Maximum T, °C/F		Shroud diameter, mm	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS			
MRP-1CEV-1TMU –118	140/5.51	6/0.2	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9/0.35							
MRP-1CEV-1TMU-120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128	73/2.87	
MRP-1CEV-1TMU-140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	13-15/0.51-59							
MRP-1CEV-1TMU-145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47							

*by personal request

MRP – ESP – ESM – ESP – TMU

Remotely controlled well completion system used in multi-reservoir production (MRP) includes one double-grip packer and double-sided ESP unit for simultaneous production from two reservoirs through a single tubing string. The well completion system provides parameter measurement of the flow coming from the lower reservoir.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties;

• For possibility to use the completion with shroud to prevent overheating of ESM.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data of lower reservoir from Telemetry units (TMU) during operation of an ESP from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• The completion is run and set in two stages: (1) setting packer system; (2) running double-sided ESP with gauges.

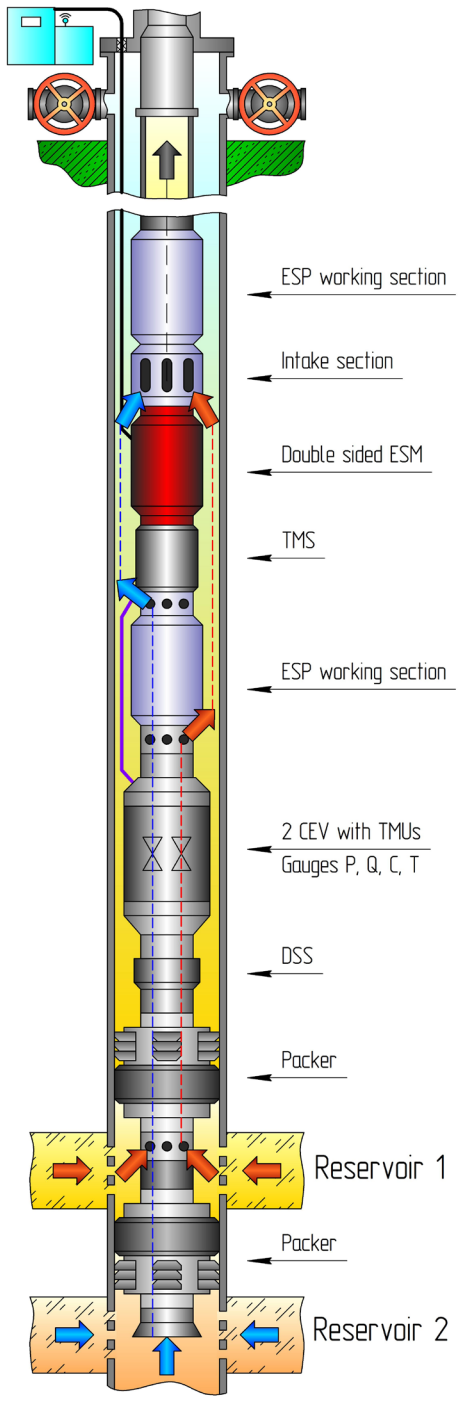
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		Maximum T, °C/F		ESM shroud diameter, mm	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness	TMU w/gauges	TMS			
MRP- ESP– ESM-ESP-TMU –118	140/5.51	6-8/0.2-0.3	120/248; 150/302 *	150/302	124;125	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.4					
MRP- ESP– ESM-ESP-TMU -120	146/5.74	6,5-10/0.23-0.39	120/248; 150/302 *	150/302	124;125; 128	73/2.87	
MRP- ESP– ESM-ESP-TMU -140	168/6.61	8-11/0.3-0.43	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	13-15/0.51-0.59					
MRP- ESP– ESM-ESP-TMU -145	168/6.61	7,3-8/0.27-0.31	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47					

*by personal request

MRP – 2ESP – 2CEV – 2TMU -TMS

Remotely controlled well completion system used in multi-reservoir production (MRP) includes two packers and double-sided ESM unit for simultaneous production from two reservoirs through a single tubing string. The well completion system provides separate parameter measurement and flows control coming from reservoirs to an ESP section.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and regulation of electrovalves during operation of an ESP from Geonik's dedicated telemetry system (TMS) or through logging cable*;

•Dynamic testing of each reservoir during ESP operation with recording of pressure build-up curves;

• The completion is run and set in two stages: (1) setting two- packers system;
(2) running an ESP with 2CEVs and 2TMUs;

•To change an ESP, the system is retrieved from the well without packer-systems;

• No additional tubing is required due to ease of installation and high performance of the completion.

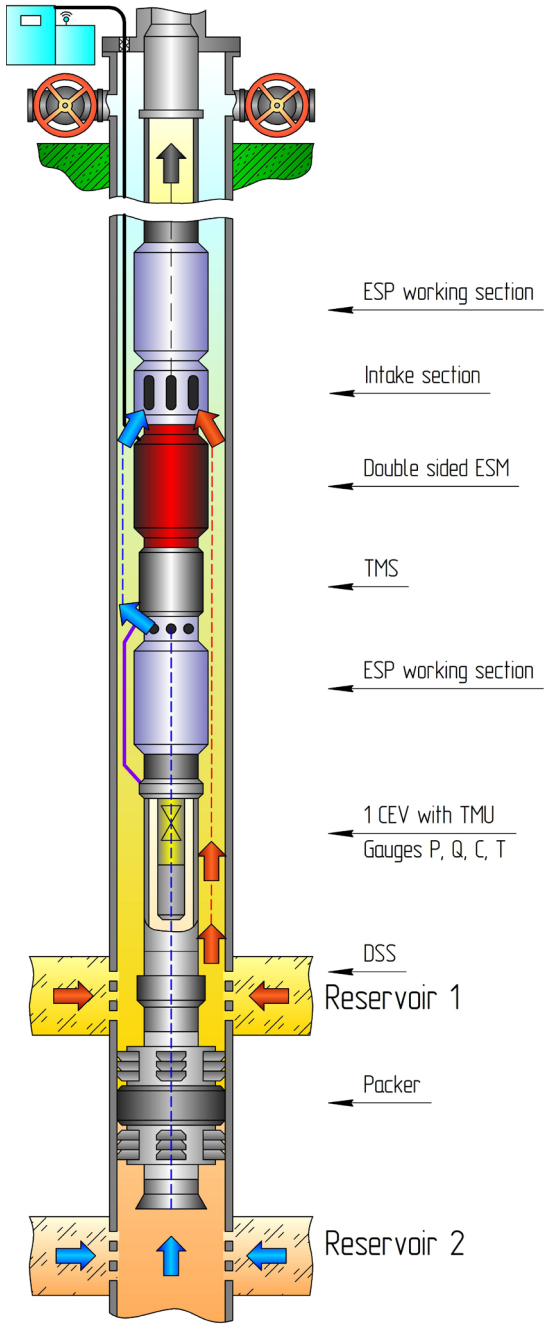
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	CEV working pressure, MPa/psi	Maximum T, °C/F		Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS		
MRP – 2ESP – 2CEV – 2TMU-TMS –118	140/5.51	6-8/0.2-0.3	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43						
MRP – 2ESP – 2CEV – 2TMU-TMS -120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
MRP – 2ESP – 2CEV – 2TMU-TMS -140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	13-15/0.51-0.59						
MRP – 2ESP – 2CEV – 2TMU-TMS -145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47						

*by personal request

MRP – ESP – ESM – ESP - 1CEV – 1TMU

Remotely controlled well completion system used in multi-reservoir production (MRP) includes one double-grip packer and double-sided ESP for simultaneous production from two reservoirs through a single tubing string. The well completion system provides parameter measurement and flows control coming from lower reservoir via lower section to an ESP intake.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical characteristics;

• For possibility to use the completion with shroud to prevent overheating of ESM.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during operation of an ESP from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• The completion is run and set in two stages: (1) setting packer system; (2) running double-sided ESP with TMU and CEV;

•Dynamic testing of each reservoir during ESP operation with recording of pressure build-up curves;

•To change an ESP, the system is retrieved from the well without packers;

• No additional tubing is required due to ease of installation and high performance of the completion system.

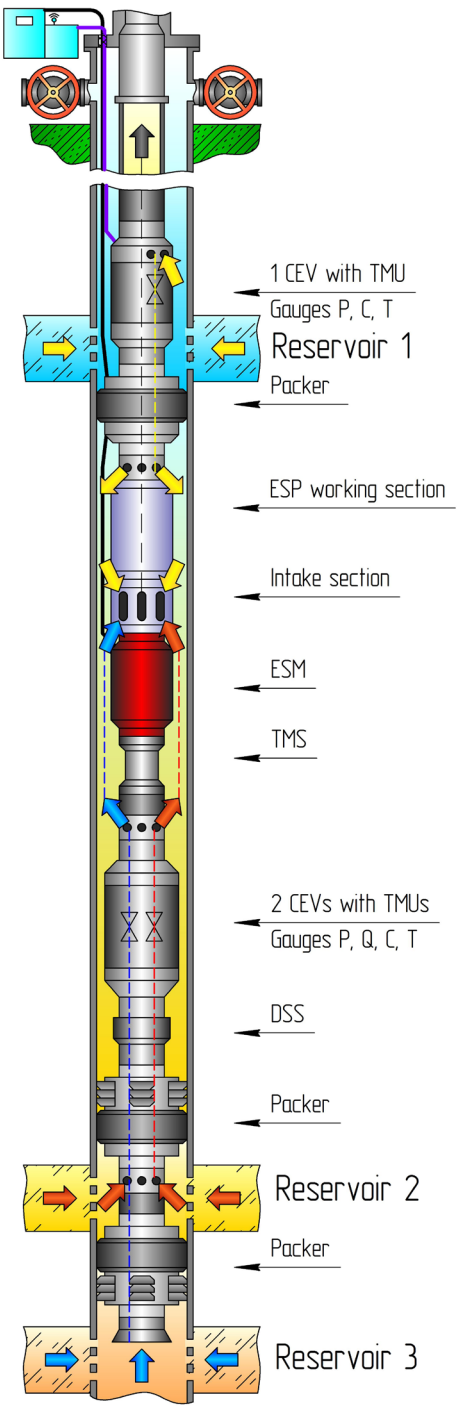
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	CEV working pressure, MPa/psi	Maximum T, °C/F		ESM shroud diameter, mm	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS			
MRP – ESP – ESM – ESP - 1CEV – 1TMU –118	140/5.51	6/0.2	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9/0.35							
MRP – ESP – ESM – ESP - 1CEV – 1TMU -120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128	73/2.87	
MRP – ESP – ESM – ESP - 1CEV – 1TMU -140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	13-15/0.51-59							
MRP – ESP – ESM – ESP - 1CEV – 1TMU -145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	124;125; 128;140	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47							

*by personal request

MRP-3CEV-3TMU

Remotely controlled well completion system used in multi-reservoir production (MRP) includes three packers and an ESP unit for simultaneous production from three reservoirs through a single-tubing string. The well completion system provides parameter measurement and flow control separately for each fluid flows entering the section of an ESP.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• The entire system is controlled in real time remotely and locally from control station;

• Two-way communication to obtain fluid data from the two lower telemetry units (TMU) and precise regulation of electrovalves during operation of an ESP unit from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• Dynamic testing of each reservoir during ESP operation with recording of pressure build-up curves;

• The system is run and set in two stages: (1) setting the lower two-packer system; (2) running an ESP with 3CEVs and 3TMUs and one-packer system;

• To change an ESP, the system with the upper packer is retrieved from the well without the lower two-packer system;

• No additional tubing is required due to ease of installation and high performance of the system.

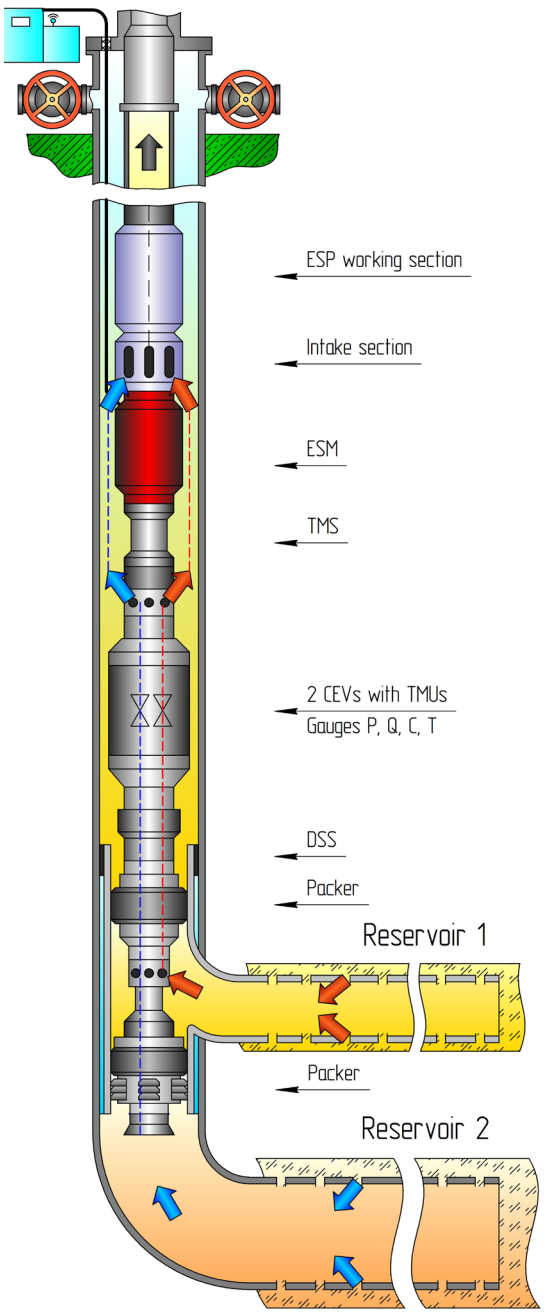
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	CEV working pressure MPa/psi	Maximum T, °C/F		Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter mm/in	Wall thickness mm/in			TMU w/ gauges	TMS		
MRP-3CEV-3TMU-118	140/5.51	6-8/0.2-0.3	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43						
MRP-3CEV-3TMU-120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
MRP-3CEV-3TMU-140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	13-15/0.51-0.59						
MRP-3CEV-3TMU-145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47						

*by personal request

MRP – 2CEV – 2TMU – ST

Remotely controlled well completion system used in multi-reservoir production (MRP) includes two packers and an ESP unit for simultaneous production from two reservoirs of horizontal side-tracks (ST) through a single tubing string. The well completion system provides separate parameter measurement and flows control coming from side tracks to an ESP intake.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems associated with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during operation of an ESP from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• Dynamic testing of each reservoir during ESP operation with recording of pressure build-up;

• The completion is run and set in two stages: (1) setting two-packers system; (2) running an ESP with 2CEVS and 2TMUs;

•To change an ESP, the system is retrieved from the well without the packer system;

• No additional tubing used due to ease of installation and high performance of the completion system.

TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	CEV working pressure, MPa/psi	Maximum T, °C/F		Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS		
MRP – 2CEV – 2TMU – 2ST –118	140/5.51	6-8/0.2-0.3	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43						
MRP – 2CEV – 2TMU – 2ST -120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
MRP – 2CEV – 2TMU – 2ST -140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	13-15/0.51-0.59						
MRP – 2CEV – 2TMU – 2ST -145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47						

*by personal request

MRP – 2ESP – 2TMU – ST

Remotely controlled well completion system used in multi-reservoir production (MRP) includes two packers and double-sided ESP unit for simultaneous production from two reservoirs of horizontal side-tracks (ST) through a single tubing string. The completion system provides separate parameter measurement and fluid flow coming from two reservoirs of one side-track liner to an ESP intake.

APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems associated with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

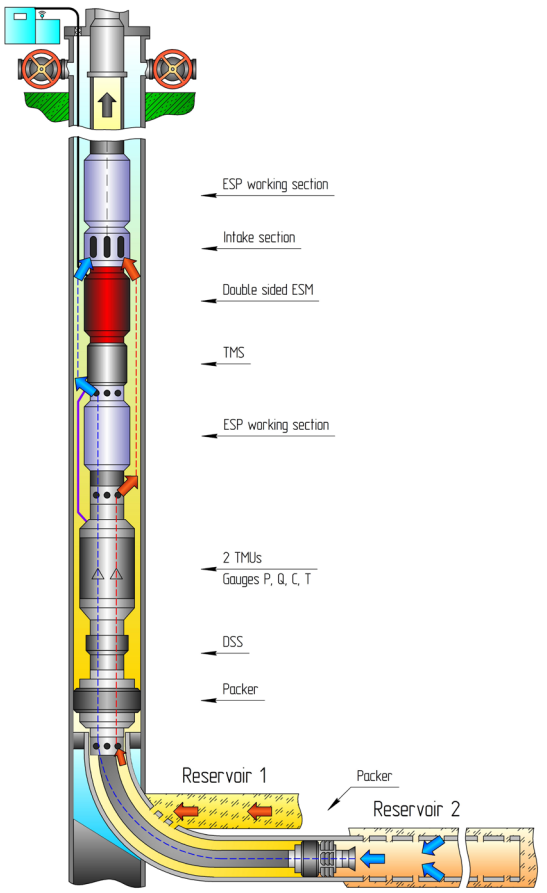
• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) during operation of an ESP from Geonik's dedicated telemetry system (TMS) or through logging cable*;

• The completion is run and set in two stages: (1) setting two-packers system; (2) running double-sided ESP with 2TMUs;

•To change an ESP, the system is retrieved from the well without the packer system;

• No additional tubing is required due to ease of installation and high performance of the completion system.



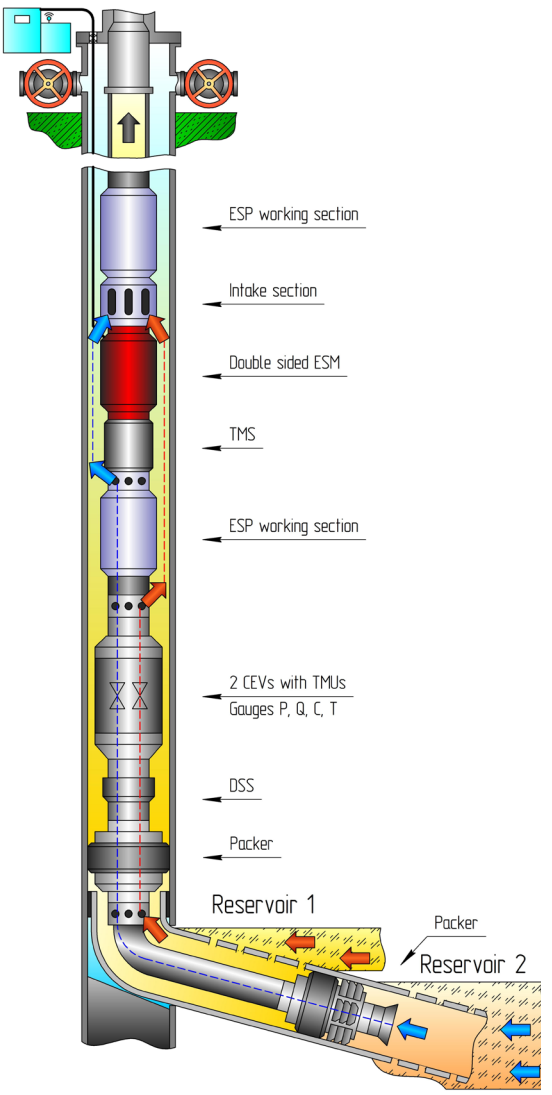
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		Maximum T, °C/F		Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness	TMU w/gauges	TMS		
MRP – 2ESP – 2TMUs – ST –118	140/5.51	6-8/0.2-0.3	120/248; 150/302 *	150/302	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43				
MRP – 2ESP – 2TMUs – ST -120	146/5.74	6,5-10/0.23-0.39	120/248; 150/302 *	150/302	73/2.87	
MRP – 2ESP – 2TMUs – ST -140	168/6.61	8-11/0.3-0.43	120/248; 150/302 *	150/302	73/2.87	
	178/7	13-15/0.51-0.59				
MRP – 2ESP – 2TMUs – ST -145	168/6.61	7,3-8/0.27-0.31	120/248; 150/302 *	150/302	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47				

*by personal request

MRP – 2ESP – 2CEV -2TMU – ST

Remotely controlled well completion system used in multi-reservoir production (MRP) includes two packers and double-sided ESP unit for simultaneous production from two reservoirs of horizontal side-track (ST) through a single tubing string. The completion system provides separate parameter measurement and flows control coming from reservoirs of side-track liner to an ESP intake.



APPLICATIONS:

• For cost reduction in multi-reservoirs with different properties;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• The entire completion is controlled in real time remotely or locally from control station;

• Two-way communication to obtain fluid data from Telemetry units (TMU) and precise regulation of electrovalves during operation of an ESP from Geonik's dedicated telemetry system (TMS) or through logging cable*;

•Dynamic testing of each reservoir during ESP operation with recording of pressure build-up curves;

• The completion is run and set in two stages: (1) setting two-packers system into the side-track's tail; (2) running an ESP unit with 2CEVs and 2TMUs;

•To change an ESP, the system is retrieved from the well without the packer system;

• No additional tubing is required due to ease of installation and high performance of the completion system.

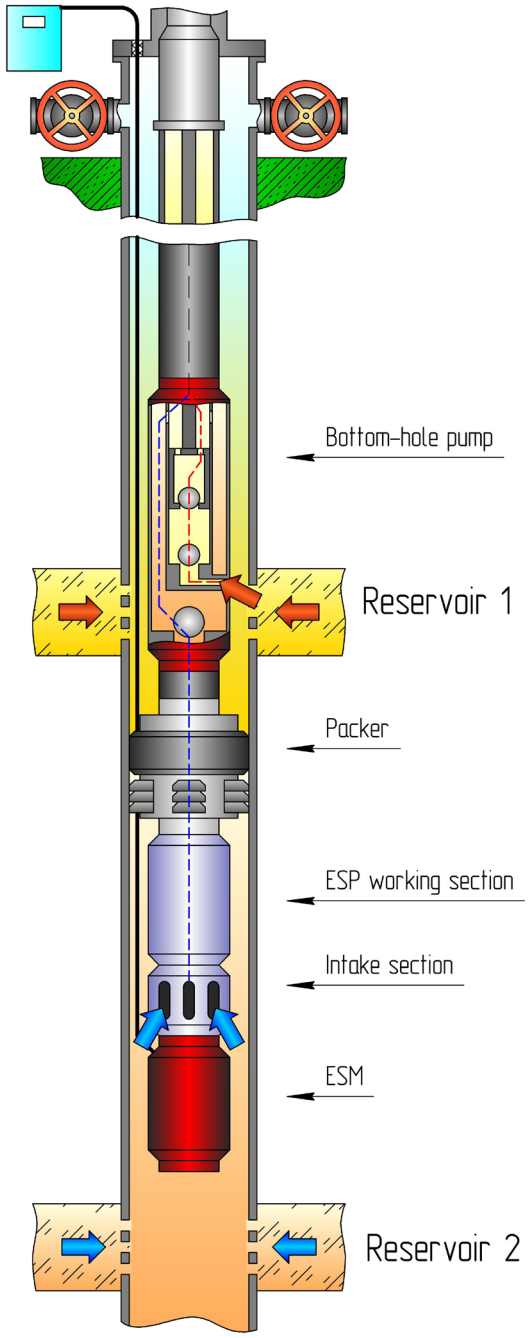
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	CEV working pressure, MPa/psi	Maximum T, °C/F		Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness			TMU w/ gauges	TMS		
MRP – 2ESP – 2CEVs -2TMUs – ST –118	140/5.51	6-8/0.2-0.3	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43						
MRP – 2ESP – 2CEVs -2TMUs – ST -120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
MRP – 2ESP – 2CEVs -2TMUs – ST -140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	13-15/0.51-0.59						
MRP – 2ESP – 2CEVs -2TMUs – ST -145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	150/302	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47						

*by personal request

PIM-CI - MRP-ESP/BHP

This patented completion system used in multi-reservoir production (MRP) includes packer with cable inlet (CI) and two pumps (lower ESP and upper bottom-hole) for simultaneous production from two reservoirs through a single tubing string. The completion system provides independent operation of two pumps.



APPLICATIONS:

• For cost reduction in multi-reservoir fields;

• Production wells with two different properties and significant differences in stratum depth;

• For solving problems with drawdown pressure limits, negative mutual interference between reservoirs and simultaneous production from multiple reservoirs with different physicochemical properties.

BENEFITS:

• Application of standard downhole and wellhead equipment;

• No additional tools and equipment are required due to ease of installation and high performance of the completion system;

• Possibility to conduct sequential control of recovered fluids from each reservoir;

• The completion is run and set in two stages: (1) setting CI packer system with ESP and (2) running a bottom-hole pump (BHP);

• BHP is retrieved from the well by lift rods without packer and an ESP unit.

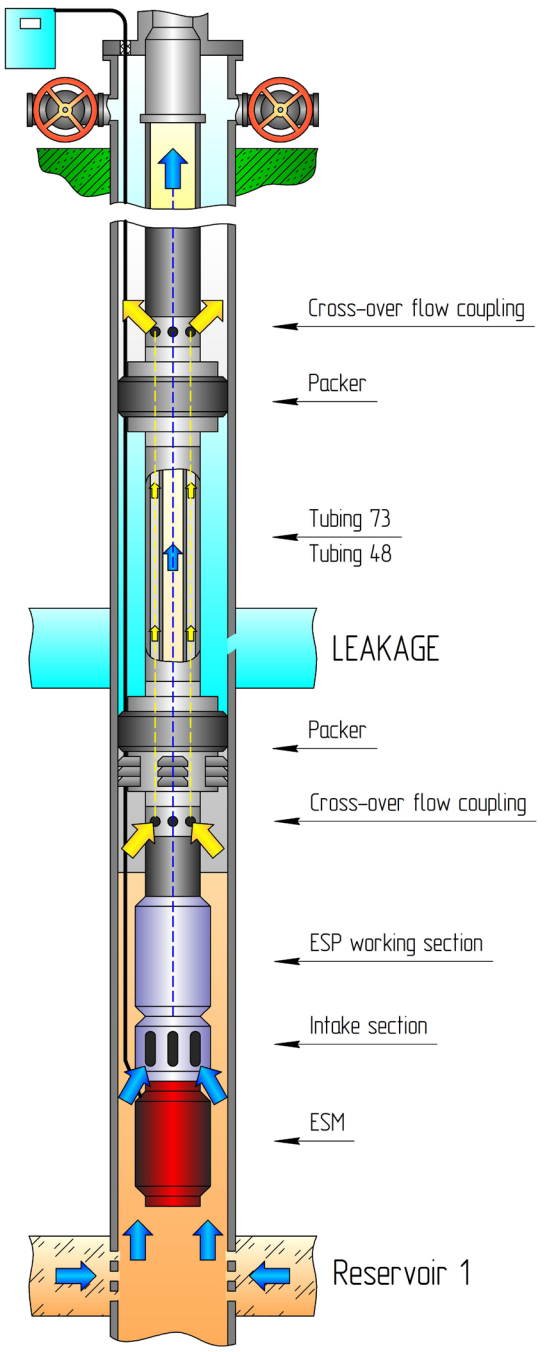
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		Maximum T, °C/F	Types of BHP	Downhole environment
	Nominal diameter	Wall thickness			
MRP-ESP/BHP-120	146/5.74	6,5-10/0.23-0.39	120/248; 150/302 *	HB-32	Oil Associated gas Gas Condensate Natural gas Formation water
MRP-ESP/BHP-140	168/6.61	8-11/0.3-0.43	120/248; 150/302 *	HB-38	
	178/7	13-15/0.51-0.59			
MRP-ESP/BHP-145	168/6.61	7,3-8/0.27-0.31	120/248; 150/302 *	HB-44	
	178/7	11,5-12,7/ 0.43-0.47			

*by personal request

2PIM-CI - GP

This patented well completion system used for isolation upper reservoir of a casing providing optimal operation of tubing in wells with high gas-oil ratio. It includes two packers with cable inlet (CI) and gas pipe (GP) with an ESP unit.



APPLICATIONS:

• For cost reduction in multi-reservoir fields;

• Shutting in upper reservoir with minimal production costs;

• Interval isolation with a leaking production casing in production wells with a high gas-oil ratio.

BENEFITS:

• Ease of installation and high performance of the completion system for isolation of complicated reservoir and quick operation of the well without conducting multistage run and set operations;

• Stable operation of the ESP without cuttings-off the flow in a well with a high gas-oil ratio and with a leaking production casing above the productive reservoir;

• The completion is run and set in the well in one stage.

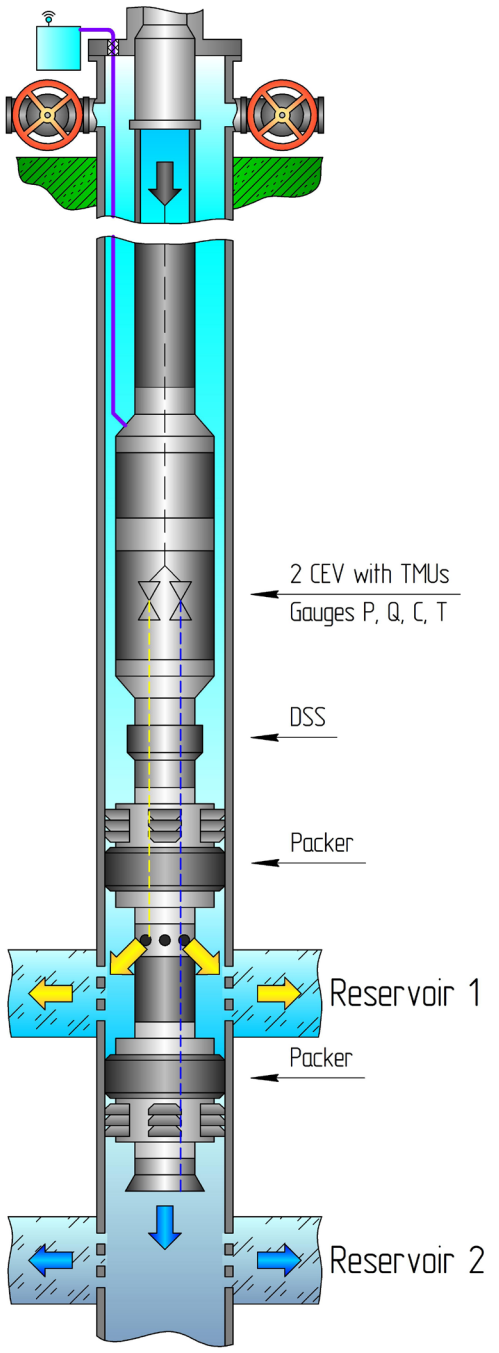
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		Min. drift diameter, mm/in	Max.working pressure, Mpa/psi	Maximum T, °C/F	Packer thread diameter, mm	Downhole environment
	Nominal diameter	Wall thickness					
2PIM-CI - GP -120	146/5.74	6,5-11/0.23-0.39	27/1.06	35/5076	120/248; 150/302 *	Upper 60 Lower 73	Oil Associated gas
2PIM-CI - GP -140	168/6.61	7-11/0.3-0.43	27/1.06	35/5076	120/248; 150/302 *	Upper 60 Lower 73	Gas Condensate Natural gas Formation water
	178/7	13-15/0.51-0.59					
2PIM-CI - GP -145	168/6.61	7,3-8/0.27-0.31	27/1.06	35/5076	120/248; 150/302 *	Upper 60 Lower 73	
	178/7	11,5-12,7/ 0.43-0.47					

*by personal request

MRI-2CEV-2TMU

Remotely controlled completion used in waterflood injection wells for reservoir pressure maintenance includes two packers and two controlled electric valves (CEV) for simultaneous multi-reservoir injection (MRI) into two reservoirs through a single tubing string. The reservoirs are isolated by two packers, and a reagent is injected through the wellhead and a single tubing string into a telemetry units (TMUs) for real-time measurement of pressure, flow rate and temperature (P, Q and T) and flow-rate control using CEVs separately for two reservoirs.



APPLICATIONS:

• For cost reduction in multi-reservoir fields with different properties;

• To use currently inactive wells and reservoirs for reservoir pressure maintenance;

• To shut in a reservoir in an injection well for maintenance and workover operations in responding production wells with no well killing cost.

BENEFITS:

• The entire system is controlled in real time remotely and locally from control station;

• Two-way communication to obtain injection data from telemetry units (TMU) and precise regulation of CEVs through logging cable;

• Dynamic testing of each reservoir with recording of pressure fall-off curves;

• The system is run and set in two stages: (1) setting a two-packer system; (2) running 2CEVs and 2TMUs on tubing for connection to the two-packer system;

• No additional tubing is required due to ease of installation and high performance of the system.

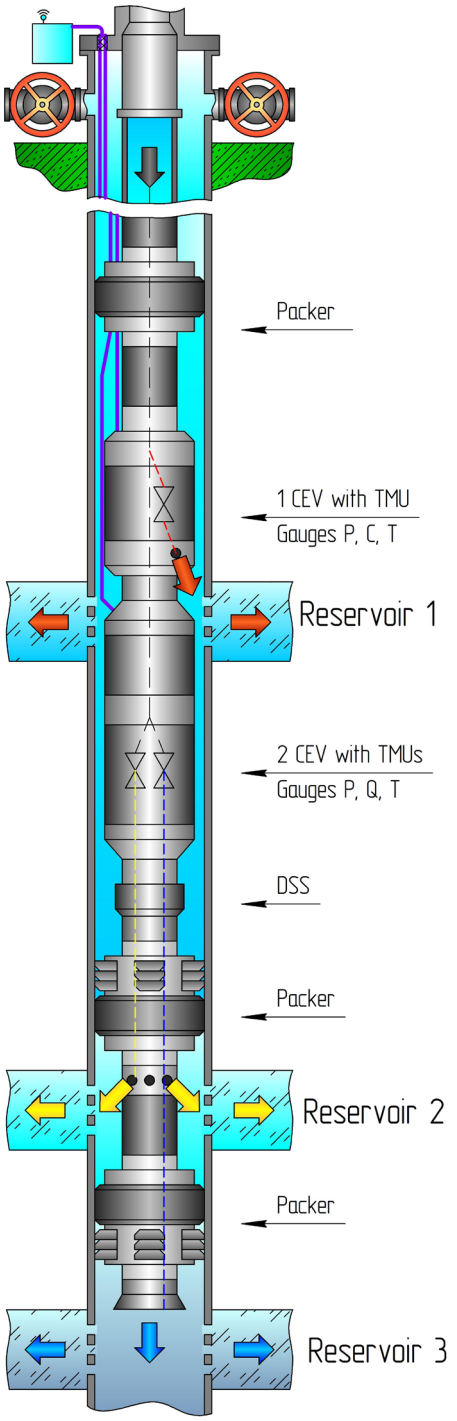
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	Pressure differences at CEV, MPa/psi	Maximum temperature (°C/F) TMU w/gauges	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness					
MRI-2CEV-2TMU-118	140/5.51	6/0.2	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9/0.35					
MRI-2CEV-2TMU-120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	
MRI-2CEV-2TMU-140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	
	178/7	13-15/0.51-0.59					
MRI-2CEV-2TMU-145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	
	178/7	11.5–12.7					

*by personal request

MRI-3CEV-3TMU

Remotely controlled completion system used in three-reservoir waterflood injection wells for reservoir pressure maintenance includes three packers with their controlled electric valves (CEV) for simultaneous multi-reservoir injection (MRI) into three reservoirs through a single tubing string. A reagent is injected through the wellhead and a single tubing string into three TMUs with CEVs for real-time measurement of pressure, flow rate and temperature (P, Q and T) and flow-rate control using CEVs separately for three reservoirs.



APPLICATIONS:

• For cost reduction in multi-reservoir fields with different properties;

• To use currently inactive wells and reservoirs for reservoir pressure maintenance;

• To shut in a reservoir in an injection well for maintenance and workover operations in responding production wells with no well killing cost.

BENEFITS:

• The entire system is controlled in real time remotely or locally from control station;

• Two-way communication to obtain injection data from telemetry units (TMU) and precise regulation of CEVs through logging cable;

• Dynamic testing of each reservoir with recording of pressure fall-off curves;

• The system is run and set in two stages: (1) setting a two-packer system; (2) running 3CEVs with 3TMUs and the upper packer on tubing for connection to the two-packer system;

• No additional tubing used is required due to ease of installation and high performance of the system.

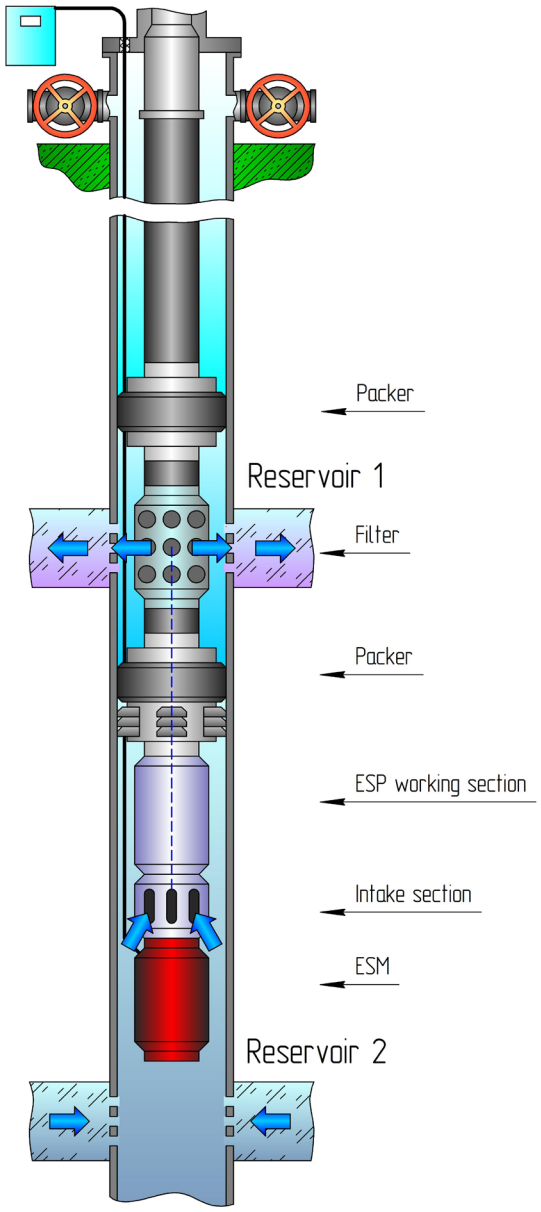
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		CEV seat diameter, mm/in	Pressure differences at CEV, MPa/psi	Maximum temperature (°C/F) TMU w/gauges	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness					
MRI-3CEV-3TMU-118	140/5.51	6-8/0.2-0.3	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43					
MRP-3CEV-3TMU-120	146/5.74	6,5-10/0.23-0.39	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	
MRP-3CEV-3TMU-140	168/6.61	8-11/0.3-0.43	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	
	178/7	13-15/0.51-0.59					
MRP-3CEV-3TMU-145	168/6.61	7,3-8/0.27-0.31	12/0.47; 20/0.78 *	30/4351	120/248; 150/302 *	73/2.87	
	178/7	11.5–12.7/0.43-0.47					

*by personal request

MRI – DFT -1

The completion system includes two packers used for simultaneous-separate withdrawal of formation water from the lower reservoir and injection into the upper reservoir of one well using ESP. The reservoirs are isolated by two mechanical packers with a cable inlet, that ensures the connection of the logging cable of electric submersible motor (ESM) and downhole fluid transfer (DFT) between the reservoirs.



APPLICATIONS:

•For cost reduction in multi-reservoir fields and waterflood injection wells penetrating reservoirs with different properties;

•To use currently inactive wells and reservoirs for reservoir pressure maintenance;

• Organization of reservoir pressure maintenance at remote fields;

• Location of waterflood injection wells in areas with difficult terrain;

• Absence of water treatment points for reservoir pressure maintenance in the very area.

BENEFITS:

• Ability to control flow rates of injected liquids;

• No additional equipment for well operation is required due to ease of installation and high performance of the system;

• Creation of pressure maintenance system without installation of high-pressure water pipelines and construction of pumping stations;

• The system is run and set in the well in one stage.

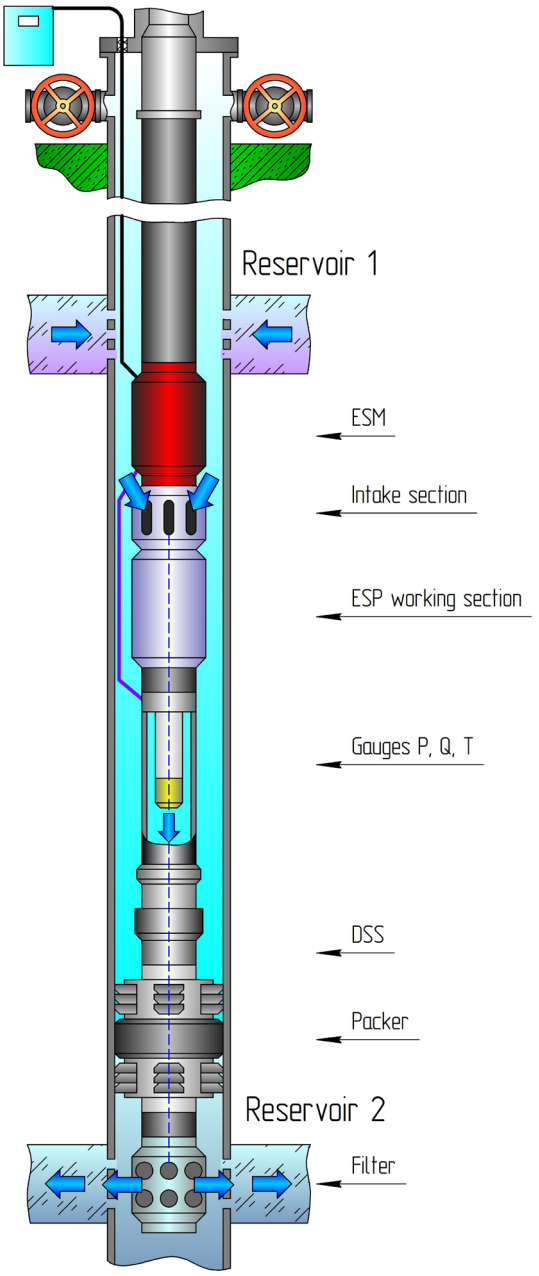
TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		Pressure differences at CEV, MPa/psi	Maximum T, °C/F TMU w/gauges	Tubing thread size, mm/in	Downhole environment
	Nominal diameter	Wall thickness				
MRI – DFT -1-118	140/5.51	6-8/0.2-0.3	35/5076	120/248; 150/302 *	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43				
MRI – VDFT-1-120	146/5.74	6,5-10/0.23-0.39	35/5076	120/248; 150/302 *	73/2.87	
MRI – DFT -1-140	168/6.61	8-11/0.3-0.43	35/5076	120/248; 150/302 *	73/2.87	
	178/7	13-15/0.51-0.59				
MRI – DFT -1-145	168/6.61	7,3-8/0.27-0.31	35/5076	120/248; 150/302 *	73/2.87	
	178/7	11,5-12,7/ 0.43-0.47				

*by personal request

MRI-DFT-2

This well completion system includes upside down ESP used for simultaneous water formation from the upper reservoir and its injection into the lower in one well. The reservoirs are isolated by packer, lower over tubing there is an ESP with telemetry unit and P, Q and T gauges to receive flow-rates from the upper reservoir to the lower.



APPLICATIONS:

• For cost reduction in multi-reservoir fields with different properties;

• To use currently inactive wells and reservoirs for reservoir pressure maintenance;

• Organization of reservoir pressure maintenance at remote fields, location of injected wells in areas with difficult terrain;

• Absence of water treatment points for reservoir pressure maintenance in the very area.

BENEFITS:

• Two-way communication to obtain remotely in real time and locally injection data from telemetry units (TMU) with P, Q and T gauges;

• No additional tubing is required due to ease of installation and high performance of the system;

• Creation of pressure maintenance system without installation of high-pressure water pipelines and construction of pumping stations;

• The system is run and set in two stages: (1) setting packer system; (2) running an ESP with gauges.

TECHNICAL SPECIFICATIONS

Item code	Casing string, mm./in.		Pressure differences at CEV, MPa/psi	Maximum temperature (°C/F) TMU w/gauges	Tubing thread diameter, mm/in	Downhole environment
	Nominal diameter	Wall thickness				
MRI-DFT-2-118	140/5.51	6-8/0.2-0.3	35/5076	120/248; 150/302 *	73/2.87	Oil Associated gas Gas Condensate Natural gas Formation water
	146/5.74	9-11/0.35-0.43				
MRI-DFT-2-120	146/5.74	6,5-10/0.23-0.39	35/5076	120/248; 150/302 *	73/2.87	
MRI-DFT-2-140	168/6.61	8-11/0.3-0.43	35/5076	120/248; 150/302 *	73/2.87	
	178/7	13-15/0.51-0.59				
MRI-DFT-2-145	168/6.61	7,3-8/0.27-0.31	35/5076	120/248; 150/302 *	73/2.87	
	178/7	11,5-12,7/0.43-0.47				

*by personal request

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