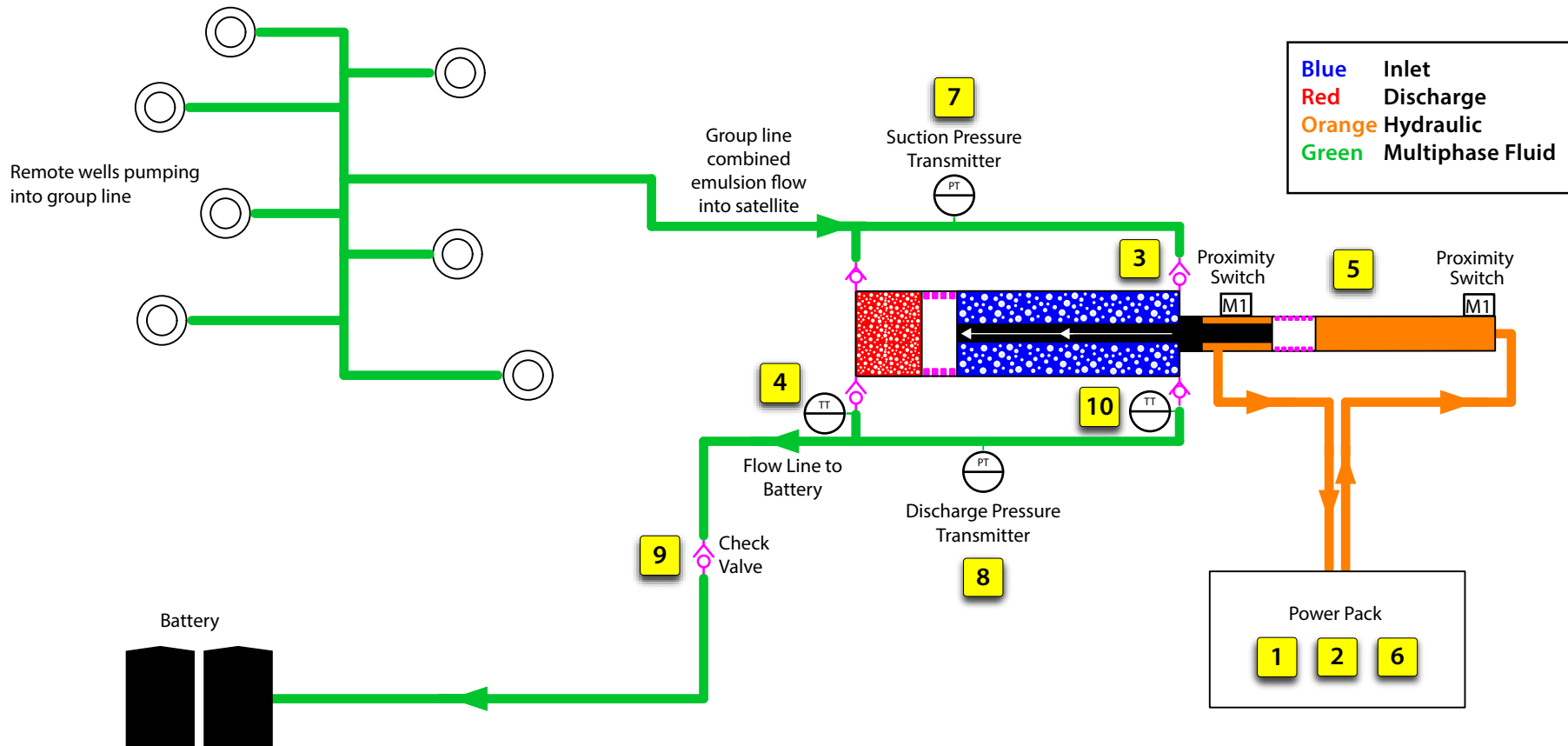


Multiphase Transfer Pump (MPTP) Schematic



- 1** Power pack provides hydraulic power for the MPTP. Control panel governs the operation of the pump using proprietary algorithms developed by CCI.
- 2** Hydraulic fluid supply and return lines pass through a directional valve which directs flow of power fluid to the Left or Right side of the actuator. In this example, fluid is being supplied to the Right side and returned from the Left side.
- 3** As the piston is driven from Right to Left (R-L), gas and emulsion enters the Right side of the compression cylinder through the suction check valve.
- 4** At the same time, gas is compressed and pressure is boosted on the Left side of the cylinder, the multiphase fluid exits through the discharge check valve which opens when flowline pressure is reached during the cycle.
- 5** At the end of stroke, the piston rod triggers the proximity switch.
- 6** This reverses the direction of flow of hydraulic fluid through the directional valve. The piston now moves from Left to Right (L-R) and the second part of a single pump cycle starts.
- 7** Suction pressure is relayed to the control panel by the suction pressure transmitter.
- 8** Discharge pressure is relayed to the control panel by the discharge pressure transmitter. The control panel logic ensures that maximum pressure differential for the cylinder is not exceeded. Two additional levels of redundancy exist so that maximum differential pressure is not exceeded: hydraulic system relief valve and PSV set at 400 psi
- 9** Pressure boosted multiphase fluid passes through a check valve into the production flowline. A plunger or ball check valve is recommended over a flapper check valve due to the reliability.
- 10** Liquids are easily processed through the MPTP because of the following characteristics:
 - Long stroke and slow cycle rate
 - Large check valve port openings
 - Gravity assist from horizontal layout and orientation of suction and discharge ports.