

Sensors for Home Dialysis Systems

Many companies are now finding solutions to overcome the technical and cost challenges to create home based hemodialysis systems for chronic kidney failure.



Home hemodialysis is a very patient-centric solution which avoids the significant cost and inconvenience of patients regularly traveling to dialysis centers. Clinic based intensive treatment is typically conducted for three to six hours three times a week to treat the blood and remove fluid build-up, thus allowing regularized treatment optimizing the use of the expensive systems. Home dialysis for suitable patients gives the flexibility to conduct treatment on a daily or nightly basis or for longer periods to better reflect the kidneys correct functioning, reduce patient fluid build-up and potentially improve clinical outcomes. The portability of such devices also offers patients the opportunity to travel.

The challenge of designing a home based system is to ensure it is simple, robust, compact and easily serviceable. Fluid sensors play a big part in the safety and control of these systems, especially for sensing flow, level and pressure as well as and valve controls.

The requirement for ultra-pure water in the dialysis process is an obstacle for home systems where this needs to be either supplied in replacement containers or increasingly produced by the either the dialysis system or a separate purification system directly from tap water. The level and flow of the feeder and ultra-pure water is critical to the safe operation of the system, and therefore sensing these accurately and reliably over time is a must. The choice of sensor materials is also important so that they do not affect the pure water and the water does not degrade the sensor over time.

For home systems to be successful, they also have to meet quite aggressive cost targets so the selected sensors must be affordable.

Gems Sensors & Controls works with companies creating home based hemodialysis systems, delivering custom solutions to match their specific needs. They combine a unique array of intelligent sensors, lean manufacturing tools and ISO certificated quality processes to significantly increase efficiency, productivity and quality. Some of the projects Gems Sensors & Controls currently support use multi-point level sensing with their robust reed/float LS-300, point level sensing





with the ELS-950 and low flow-rate sensing with FT-110 turboflow sensor. Gems Sensors ISO13485 certification and over 20 years of medical experience, means that robust quality procedures are followed from design through to production and post-production support as well as on-going traceability.

Gems Sensors & Controls also take a systems engineering approach to these challenges and step back to understand the system level requirements and interactions with other sub-systems. Ensuring that nothing is missed in the design and specification of the sensors, this approach also enables Gems to develop and supply customized, tested sub-systems and manifolds which reduce potential leak points, increase quality and reduce overall costs which are vital in safety critical dialysis systems. These benefits are felt directly by the OEMs as well as reducing their demands on the regulatory approval process and Design History File as a complete subsystem is designed and supplied by an ISO13485 certified partner.

For more information about how Gems Sensors & Controls finds solutions for the medical device industry, please contact us by phone 1.800.378.1600, email info@gemssensors.com or visit our website www.GemsSensors.com.