



Maximum Flexibility and Control in Medical Applications

Introducing Power-Packer's
Electro Hydraulic Multi-Cylinder Actuation System

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PROGRESS IN MOTION



Introduction

For many years, Power-Packer has delivered innovative hydraulic actuation systems to meet the demanding needs of medical applications. When compared to other actuation technologies, hydraulic systems offer key advantages, especially when evaluating the possibility to provide high energy in a compact volume.

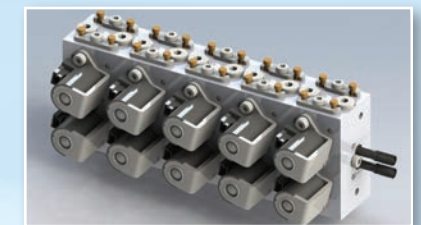
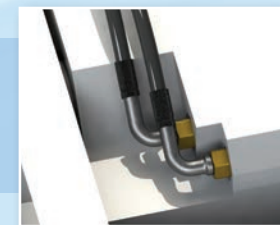
Many medical applications demand small actuation systems, not only due to ergonomic and aesthetic reasons, but also for practicality, as in the case with imaging equipment.

In this paper, we share the many advantages of Power-Packer's Electro Hydraulic Multi-Cylinder (EH-MC) system, which features multiple cylinders, one central electrical pump and electric valves. This modular concept system allows you to select up to 12 separate movements, each with one or two cylinders, in a variety of forces and strokes. For added functionality, the control system, including several sensors, is also part of the system. Power-Packer's innovative EH-MC system gives you maximum flexibility and control in medical applications.

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Power-Packer's EH-MC System and Components

Table-top system with patented leakage-free quick connect system for hydraulic lines



Modular valve block build with five valve sections, can be easily expanded up to 12 valve sections



Column interior with integrated connections for hydraulic and electrical power



Cylinder with integrated safety device



Control system offers easy configuration



Speed-controlled, quiet gear pump



Integrated sensors for position measurement

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Quiet and Safe

In a healthcare setting, an environment must be calm and serene to promote the greatest patient comfort. Our EH-MC system features a very quiet gear pump with an electric 24 VDC motor. It has five standard movements, which can easily be expanded to twelve, if needed. Movement possibilities include: high/low; tilt; Trendelenburg; leg; and back.

An Efficient Path

The pump's hydraulic power is transferred from the foot of the column, through the column to the table top. From there, the hydraulic power travels through our patented leakage-free quick connectors to the modular valve block. From the valve block, power is distributed to the cylinders to propel the various functions. Each cylinder has a safety device to ensure it remains locked in position, even in the very unlikely chance that a hose is damaged. If more movements are required, one or two cylinders and a valve block can easily be added to meet your needs.

Construction Advantages

- **Ergonomic Efficiency** – Since the column is small and obstacle-free, physicians can get as close as needed to patients. Only two cylinders are attached to the outside of the column.
- **Easy to Clean** – With full access to all areas, the column is easy to clean.
- **Smart Design** – All components are fully integrated inside the column, including the special cylinder to reach the table top's low and high positions, as well as a position measurement system. No messy exterior hoses and wires.
- **Simple Assembly** – Hose distribution from the modular valve block to the cylinders is easy. Only short, easy-to-assemble hoses are needed.

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You're In Control

In our EH-MC system, Power-Packer integrates four angle measurement sensors to allow for the leg, back, tilt and Trendelenburg movements, as well as one position sensor for high/low movements. To give you maximum control, these sensors are connected to one central system. With the push of a button on a handheld terminal, you can easily manage all movements through the simple activation of a valve and speed-controlled pump, which extends or retracts a cylinder, or a pair of cylinders. The speed-controlled pump offers smooth start and stop of every movement.

Through simple configuration, you can also control:

- Starting and stopping speed
- Time of starting and stopping speed
- Ramp up curve to maximum speed, ramp down curve to minimum speed
- Maximum speed

When the integrated sensors detect a movement's mechanical limits, the intuitive system will automatically reduce its speed. This built-in control helps to ensure the comfort of your patient at all times.

The integrated sensors and control system also allow you to easily place the table in your choice of programmable positions. How many depends upon the availability of unused buttons on your hand-held terminal. You have the option of using your own hand-held terminal, which Power-Packer can program, or using one supplied by Power-Packer customized to your needs.

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Conclusion

Power-Packer is your one stop source for actuation needs in the medical market, including sensors and control systems. We invite you to work with our engineers, early in the development process, so that we can support you with the design and create an actuation system that meets your specific needs.

About the Author

Marcel Nieuwenhuis is the Engineering Team leader of the New Concepts & Technologies group of Power-Packer Europa B.V. He has extensive experience in control systems, mechanical engineering and hydraulics. Marcel has studied Applied Physics at Saxion University in Enschede The Netherlands.

Power-Packer is a leading supplier in customized hydraulic motion control systems. We serve a broad range of markets, including automotive; truck; medical; marine; construction; agriculture; mining; and other special vehicles and equipment. Power-Packer proudly supplies all major OEMs in these markets.

For more information, please visit power-packer.com or contact us at +31 541 584 500.

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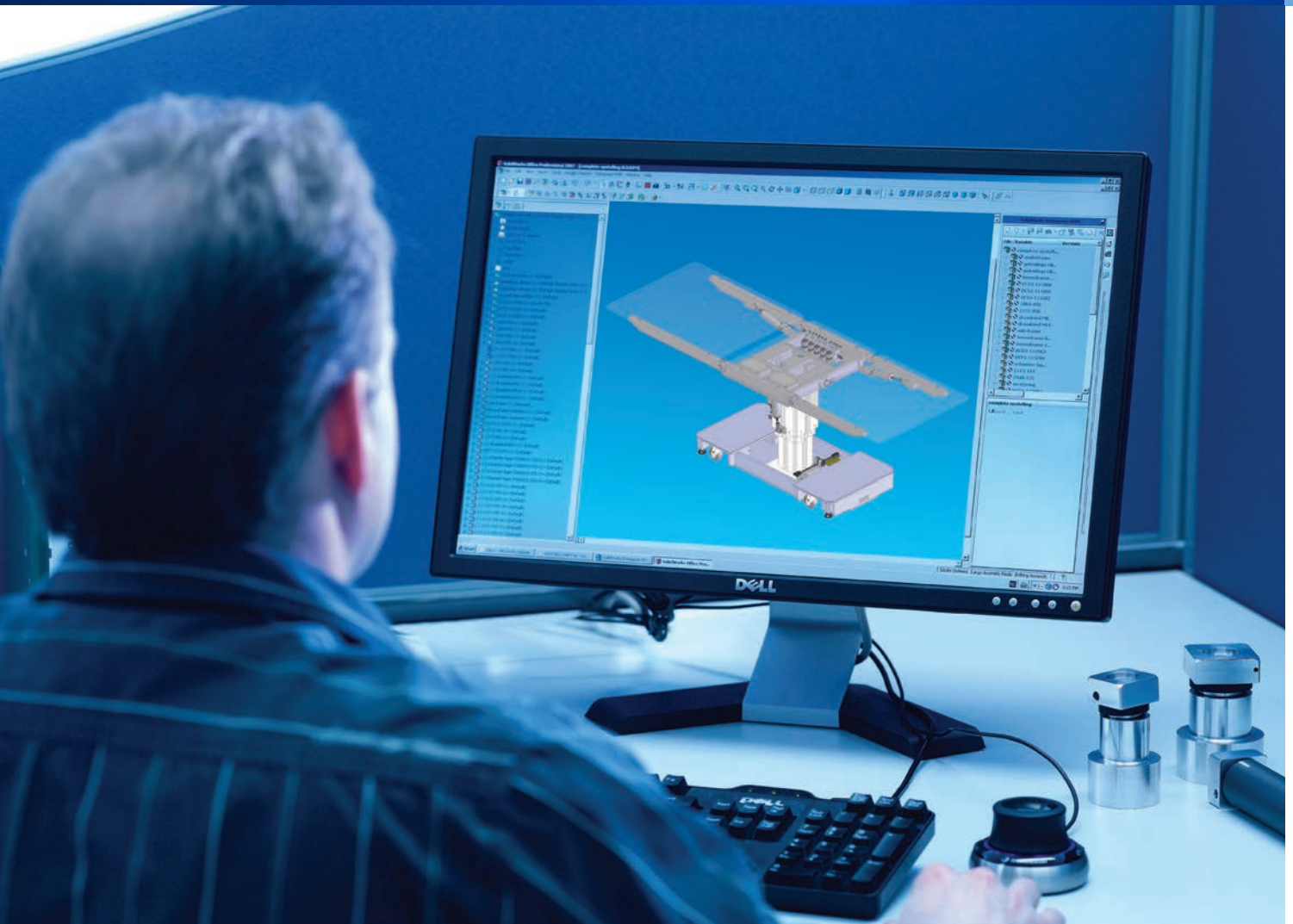
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Discover all that we bring to the table.

Power-Packer is an industry leader in innovative, high-quality motion control solutions for medical applications. We offer:

- Customer-focused product optimization
- Best-in-class practices
- Cost-effective, custom solutions
- Continuous improvement and innovation
- Design and engineering expertise
- Exceptional service
- Financial stability
- International manufacturing footprint
- Global sales offices
- Proven, tested quality
- Reliability
- Volume flexibility