

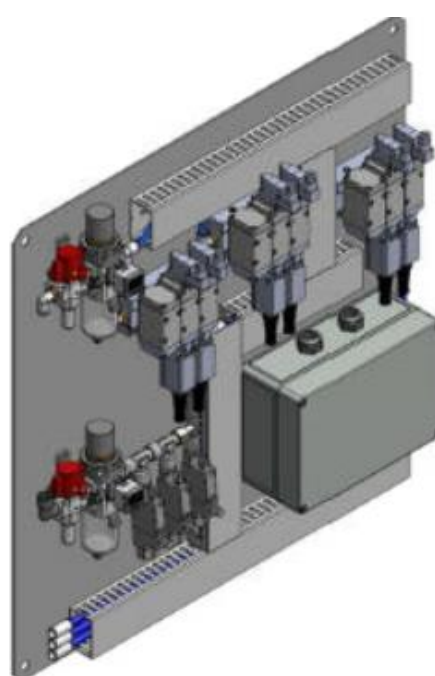
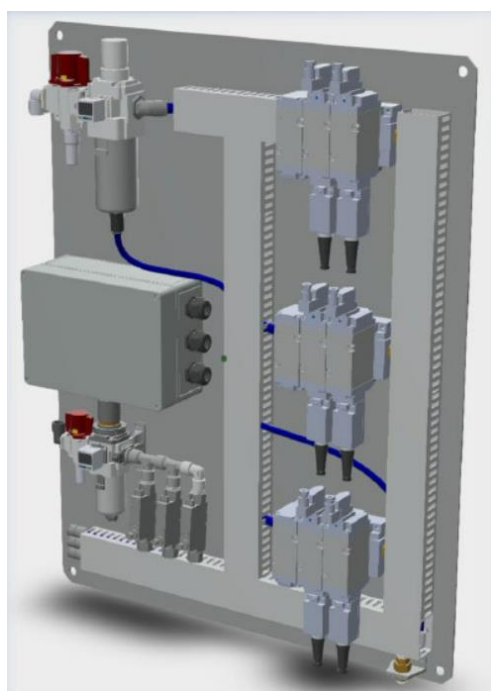
SMC Expert Article – Robotics

Modular media control saves time and cost in robotic welding

By Zdenek Velfl, Business Consultant, SMC Czech Republic

We all know that high-volume automotive applications such as welding have numerous demands, not least high productivity and reliability. Any failures or inconsistencies with the robotic solutions deployed in these processes can lead to costly production stoppages and expensive maintenance or repairs. For this reason, a growing number of robot OEMs are choosing to work with our team of expert engineers here at SMC, which can offer a highly effective and convenient modular solution for handling welding-specific media such as air, gases and water.

Arc, laser and spot welding are all commonplace in the automotive sector, where media requirements for the robot can include compressed air, water and welding gases such as N₂ or CO₂. We are able to adapt each of our panel-based modular solutions to suit different configurations, controlling the pressure and flow of media in line with specific application demands. For instance, many welding tasks need pressure between 2 and 6 bar, and flow rate between 200 and 500 l/min.



SMC's Customised media control panel replicas

We help robotics engineers tap into the 'language' of pneumatics, helping to translate or interpret the requirements of air-driven motion control and the benefits it can bring. By way of example, what type of solenoid valve is required to meet the demands of specific robotic welding tasks? Perhaps the robot arm needs to move at different speeds during the welding process, so how is it best to reduce or increase the flow of media accordingly? Pneumatics is our language and we can help find the answers to these important questions and many more.

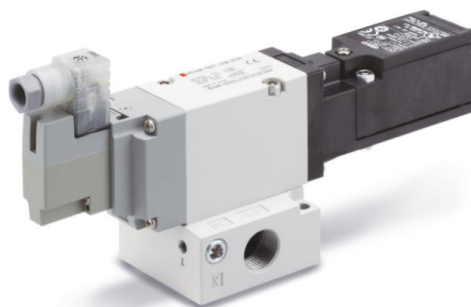
By way of example, we've recently developed a pneumatic panel for a major robot OEM that is ideal for laser welding cells. The panel features separate compressed air and gas circuits to deliver precise welding control. We can ensure that the filtration and adjustment of compressed air and welding gas pressure provides repeatable quality of the finished product, which is of paramount importance in the high-scrutiny automotive industry. The panel houses a safety start-up valve for low-speed air supply that gradually raises initial pressure in the air system. This valve also facilitates quick exhaust by cutting off the air supply.

Our modular media-handling solutions are also ideal for painting operations in the automotive industry, where quality is again essential. Typical media might include silicone-free products, which are popular in automotive applications as silicone has a detrimental effect on paint adhesion.

Alongside precise control, adopting a modular media handling solution provides energy efficiency, with media delivery only taking place when needed via a proportional regulator. Safety is a further advantage as the integral valves ensure the whole system stops working if anyone steps inside the protective barrier.



SMC's Electro-Pneumatic Regulator – ITV Series



SMC's Residual Pressure Relief Valve ISO 13849-1 – VP544-X536 Series

To make life easy for robot OEMs, we make sure that every panel comprises all the components necessary to provide a complete solution, including FRL units with residual pressure release valve and soft start-up function, as well as cooling water pipes (if needed), fittings, hoses and accessories. The robust design of the panels ensures their suitability for use in all welding and painting applications, where extremely demanding environmental operating conditions are prevalent.

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