No more spaghetti, please

Integrated robot dress packs, or umbilicals, combine power and data cables, as well as pneumatic and hydraulic hoses, into a single protective jacket. The units are slowly replacing conventional "spaghetti" methods of dressing industrial robots with loose bundles of individual cables and hoses.

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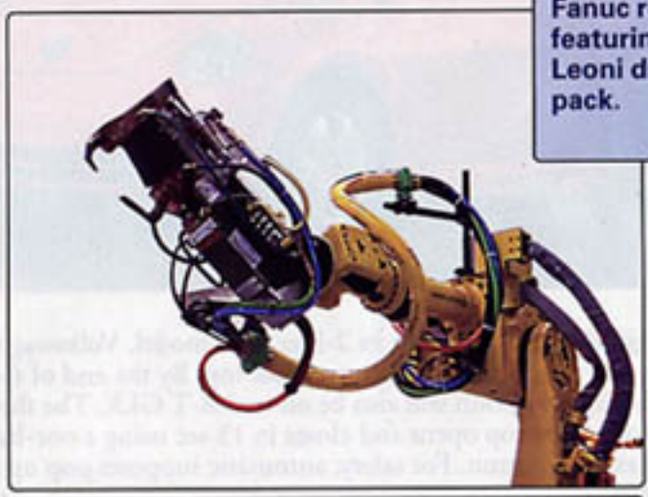
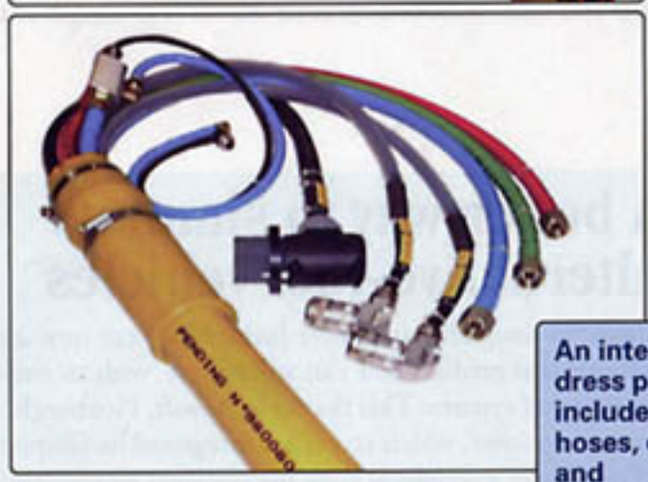


Fanuc robot featuring a Leoni dress pack.



An integrated dress pack includes hoses, cables, and connectors.

Dress packs, or umbilicals, supply spot welding and material-handling robots with water, air, vacuum, power, and communications. Each flexible umbilical includes boots which mount on the robot with a patented bracket system. The entire system (posts, brackets, boots, and polyurethane-covered umbilical) absorbs kinetic energy generated by the robot and welding operations.

The 35,000 to 40,000 spot welding and material-handling robots in North American automotive body shops have historically been outfitted or dressed with a hodgepodge of customized brackets, hoses, and cables. This is changing with the development of standardized dress-out products.

The Fanuc project

Fanuc Robotics America Inc., Rochester Hills, Mich. (*www.fanucrobotics.com*) , was one of the first robotics companies to provide a robot with a complete dress package for a large project at one of the Big Three automakers. The retooling project was for a new vehicle and would encompass over 350 robots which handled spot welding, material handling, and a combination of both functions.

"Although we had been dressing robots for major automotive customers for more than 10 years, this is the first customer requirement for a common dress-out that could be adapted to any configuration of an end of the arm tool, from servo guns to material handlers," says Joe Gazzarato, manager of the Fanuc engineering body shop. "It's also the first time a customer required a warranty that covers cables and hoses, normally considered consumables." In today's aggressive body shops, it's difficult to protect cables and hoses from wear.

Standardization and savings

For the retooling project, Fanuc Robotics relied on three basic dress-packs from **Leoni EPS**: one for spot welding; a second for handling, and a third that combined welding and handling. While each umbilical includes the proper hoses, control cables, and power cables, standardization was the major requirement in the Fanuc project. For example, all the packages use the same basic mounting and support components, so the parts list is streamlined. This also reduces inventory and total system costs.

Traditionally, standardization is difficult within a single robot. There are hundreds of different servo weld-gun configurations, welding hundreds of varying parts at any one of the major automakers. This creates problems when it comes to routing and containing a set of cables and hoses in the same fashion from weld gun to weld gun.

By working closely with their supplier, Fanuc standardized the dress packages for each type of robot. Fanuc uses the same umbilical components for each welding robot, but changes the configuration so that technicians can easily maintain the equipment. "The modular system can be easily adjusted and fine tuned for specific applications, letting us meet requirements of OEM clients," states Gazzarato.

Traditionally, robot companies dress robots up to the midpoint, ending at the shoulder of the robot. System integrators then complete the job, putting customized equipment from the shoulder to the end of the arm tool. With its new approach, Fanuc dresses robots right to the end of their arms, and integrators only need to make final connections when debugging the robot program. This saves up to 8 hr/robot during the integration phase of major automotive projects when time is critical. Key to the new standardized approach are the supplier-built dress packages (umbilical and bracket systems). Considering the cost-saving benefits, all-inclusive dress packs are well suited for industrial robotics in today's tough economic environment. ■