Pneumatic solenoid pilots on display

Talking about innovative technology, compact size, sturdiness, flexibility and energy benefits

It's been the first time. For anything, the first time brings difficulties, emotions, hopes and creativity. Along the way, you come across walls and hindrances and you have to find suitable tools to tear them down or walk around.
In 2004, METAL WORK SpA decided it was high time to face the issue of electromagnetism, hence pneumatic solenoid pilots. Until then, these products had been purchased from Italian and Swiss specialists, while Metal Work lacked both the know-how and the manufacturing technology.
To face the problem Fausto Rodella and Piero Ferretti were encharged , released them from all other tasks and entrusted them with the development of a new product line and the related processes.
The work team followed a "lean thinking" approach. In detail, design, engineering and testing were developed in parallel, with no rigid sequence of stages, nor tight divisions of roles among people. The activity was located in the Metal Work industrial site at Concesio Roncaglie, to avoid interfering with other projects and industrial production.
In mid 2006, the production of the first solenoid pilot was started.
In order to respond to market requirements, this was the most complicated and sophisticated product in the family, as it incorporates special electronics called "speed-up".
The current production line can output some two million pieces annually. At the same time, our engineers are designing other models, that will be installed on Multimach, HDM, ONE and Mach11 products, as well as used for other applications.

What is a pneumatic solenoid pilot?

Pneumatic solenoid pilots are devices that, using the electromagnetic power generated by a coil, move a cursor that opens and closes the passage of compressed air or other fluids. They are used extensively in many industries: textile machinery, industrial automation, fluid control, dosing systems, electro-medical equipment. At Metal Work, they are mounted on solenoid valves, they are the pilot stage of the valve itself.
Solenoid pilots used in our industry have different dimensions and features. Over time, we have seen a progressive trend to lower size and power. In the 1980's, most solenoid pilots had a 30 mm wide coil and 5 W power. Starting from the 1990's, instead, the most popular coil was 22 mm, power decreased between 5 W and 2 W (as in our valves series 70). Later on, the 15 mm wide solenoid pilot found increasing application, where coil and pilot are incorporated in one single piece (mounted on Mach 16). Finally, since 2000, the 10 mm wide solenoid pilot has started to spread, with 1 W or lower power (used on Multimach).
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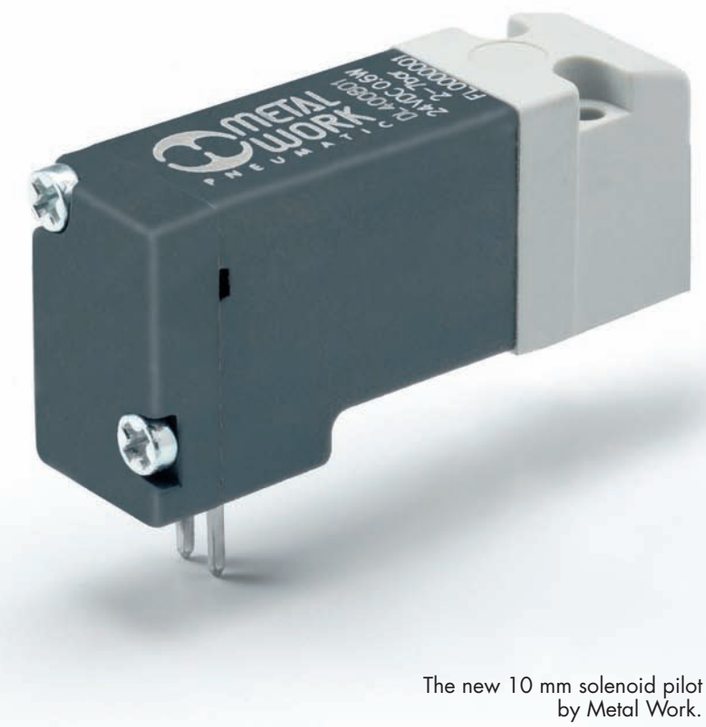

The new 10 mm solenoid pilot by Metal Work.

Metal Work has developed a product in the 10 mm size, which is becoming the reference size for the pneumatic industry. Due to compact dimensions, there are some construction issues, as dimension and electric tolerances are very tight.

Advanced technology and excellent performance

The Metal Work solenoid pilots stand out among other products on the market for some interesting design features. First of all, great sturdiness: the product can be dropped several times without damage.
This result is achieved through a number of factors, including the most evident one: the product parts (body, coil and cover) are assembled by means of two screws that fasten everything stiffly. Conventional products, instead, use snap connections between plastic parts or metal clips, which have limited resistance and are subject to air leaks.
Another feature is the small number of pieces required for the final product. The components of the Metal Work pilot are 30% less than the other in the market. The production process is very accurate and strict. Each piece is 100% tested for electric, pneumatic and response speed parameters.
Testing is redundant and restrictive, meaning that it checks more than it is necessary and stricter acceptance parameters are adopted than normally required.
Each piece is identified through laser marking, indicating code, functional specification and an individual ID number. All assembly and testing information is stored in a PC to offer total traceability: starting from the ID number, you can trace back any time to the production date and all values recorded during the test.
The assembly and testing line is based on the principles of total flexibility: it can process a piece with a code and, immediately afterwards, a different piece with a different code, with no retooling or manual modification of a cycle.

Environmental safeguard: energy benefits

To complete the presentation of the new Metal Work solenoid pilots, we cannot forget the energy benefits of this product.
Comparing our 10 mm miniature pilot with a conventionl 22 mm solenoid pilot, you can see a six-fold reduction of the quantity of used material (steel, plastics, copper). Electric power has dropped from 2 to 5 W in 22 mm coils to 0.6 W in standard 10 mm solenoid pilots or even 0.2 W in models with speed-up electronics.
Considering that millions of 10 mm pilots will be around in few years, we have calculated an energy saving in excess of 400 tons of oil per year.