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Air Motors Stir It Up In Automotive Paint Shops



An Altra Industrial Motion Company

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A number of automotive manufacturers have adopted Huco Dynatork Air Motors to drive the agitators in their paint shops, with hundreds already in use operating around the clock in plants across the UK, mainland Europe, North America and Asia. Piston air motors offer many advantages over electric or vane type air motors, including energy efficiency, simple installation, easy maintenance, longevity, controllability and spark-free operation.

The main purpose of paint agitators is to keep wafer thin metallic particles evenly distributed in suspension in the paint. The speed of stirring is critical: too slow and the particles will settle and form thick clusters at the bottom of the container, too fast and the particles collapse, becoming globular instead of flat, resulting in a granular paint finish. At the automotive paint plants stirring speed can be controlled directly through the air motors, because the chosen units have variable-speed capability.

David Lockett, Managing Director with supplier, Huco Dynatork, an Altra Industrial Motion company, explains: “With piston air motors, power is related to the supply pressure and volume air flow, so an inlet valve can be adjusted to control both speed and torque. The motors can also be fitted with torque sensors for closed loop feedback. With a simple arrangement like this, a Huco Dynatork motor will hold its set speed steadily, almost indefinitely.

“To achieve this with an electric motor you would need a variable speed drive – which is expensive, requires installing on site and has to be programmed and commissioned.”

Lockett continues that piston air motors are significantly different from rotary vane type motors.

“The free-floating piston design of the Huco Dynatork air motor is intrinsically efficient and consumes far less compressed air than a conventional vane-type motor, usually needing less than a quarter of the air supply for the same power output. Furthermore, the dynamic characteristics of the motor, including instant start/stop under load, mean that

it can be used in indexing applications, just like a stepper motor.”

In operation, air at up to 100 psi is supplied to each of three pistons in turn via an integral rotary valve. The free-floating pistons transmit maximum torque on start-up, which can be adjusted via a pressure regulator. The resulting performance features high torque, even at low speed; variable speed control; and very low noise operation.



In the paint shop, the stirring speed can be controlled directly via the air motors, because the models used here are variable speed.

Because they are supplied only with compressed air and no electrical cables are required, there is no possibility of sparking; making the motors intrinsically safe for use in ATEX Zone 1 applications. Due to the flammable nature of paint vapors, this feature is a significant benefit to modern high-throughput paint shops.

“They can even be used completely submerged and are fine for high pressure washdown,” comments Lockett.

The simplicity of both the air motors and their air supply system, compared to an electric drive equivalent, makes installation and maintenance very easy. They are lightweight and compact, making them easy to lift and maneuver during routine maintenance. Connecting and disconnecting the air supply is straightforward.

Furthermore, there is normally no need for a step-down gearbox between the motor and stirrer; while an electric motor would require a gearbox, as would a vane-type air motor. Even without a step-down gearbox, the Huco Dynatork motor can run comfortably at output speeds below 100 rpm, the typical range for stirring applications.

“Our motors typically run for many years,” says Lockett, “...and replacement piston and seal kits can be fitted to extend motor life almost indefinitely.”

He also notes that service and back-up are fast and efficient, with components available in the UK direct from the manufacturer, and through distributors in Europe, Japan and the USA.

Huco Dynatork motors are available with aluminium, stainless steel or acetal bodies. Stainless steel and acetal versions are ideal for use in industries such as food processing, pharmaceuticals and medical equipment manufacturing. Three standard sizes are offered, with maximum torques of up to 16 Nm in direct drive, or up to 550 Nm through a gearbox.



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