

Han's Laser – world class laser equipment manufacturer chooses Renishaw RGH24 series encoder system



Customer:

Han's Laser Group

Industry:

Electronics

Challenge:

To control the movement of laser beams.

Solution:

RGH24 encoder series for its compact size and excellent dynamic performance.

Han's Laser Group is a global leader in the design and manufacture of professional laser equipment and supplies more than 10 000 laser markers, cutters, welders and engravers every year to highly demanding international customers including Nokia and Volkswagen.

Based in Shenzhen, China, but with branches in more than 20 countries around the world, Han's is listed on the Shenzhen Stock Exchange with revenues of over \$0.5 bn and has been elected by Forbes magazine as one of the "100 Most Promising Small and Medium Size Enterprises (SMEs)" no less than three times.

Voice Coil Motors (VCMs) in laser marking machines

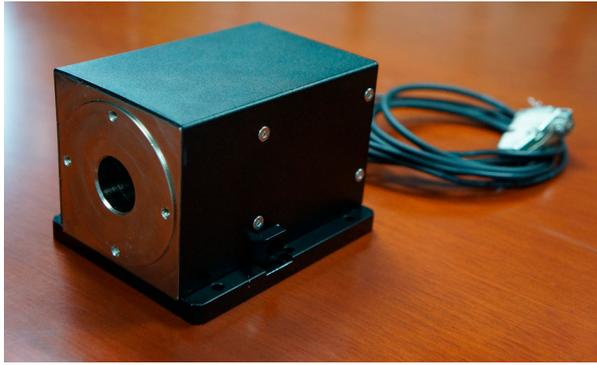
Han's Motor is a member of the Group and develops and supplies linear motors, torque motors, Voice Coil Motors (VCMs), servo drives and motion control systems, many of which are used in Han's Laser products.

Renishaw's RGH24 series incremental encoder system (not recommended for new designs, alternative upgrade: VIONiC™ encoder with RKLC20 scale) combines compact size and excellent dynamic performance with easy installation and high reliability to make it an integral part of the VCM's used to control the movement of the laser beam in Han's own laser marking products. "In order to project the laser beam at the desired position on the target material we have to control mirror position by using the linear motion of VCMs. To ensure this happens we need an encoder Han's Voice Coil Motor (VCM) system to feed back the position of the VCM to the controller", explains Mr Wang, Vice President of R&D at Han's Motor.

VCMs use a current passing through a lightweight moving coil in a fixed magnetic housing to generate a motive force on the coil. If a conductor carrying a current (the moving coil) is placed in a magnetic field (the housing), then the force that will be exerted upon it is proportional to the direction and magnitude of the current and the flux density of the magnetic field.

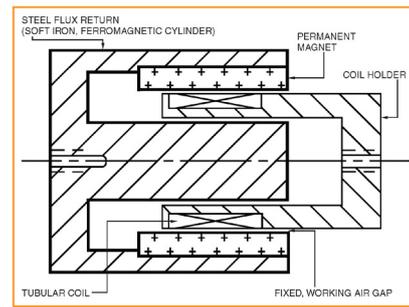
Not only do Renishaw provide products that help make our VCMs better, but their service and support is also great.

Han's Laser Group (China)



Han's Voice Coil Motor (VCM) with built-in Renishaw RGH24 encoder system

Mechanism of Voice Coil Motor



Mechanism of Voice Coil Motor

Compact size and low mass

Since the permanent magnet is fixed, the direction and the amount of the force on the coil depends on the polarity and the magnitude of the input current.

VCMs give excellent dynamic characteristics in a compact package and allow very high acceleration and precise positional control without cogging or hysteresis, and their simple construction ensures cost effectiveness and long term reliability. To complement these features, VCMs need a non-contact position sensor with low moving mass and repeatability and accuracy to match. Mr Wang says, "The mass of the scale is always the first priority our designers consider when they choose an encoder system. We compared scales from different suppliers and found Renishaw's RGS20-S to be the lightest one. The scale length we use weighs less than 0.15 g so it's almost zero loading on the VCM and can be mounted directly onto the moving part."

He continues, "Renishaw readheads are designed with compact size providing us with a good selection. As you know, the VCM must be tiny due to its application, so we must seek a compact readhead to suit our design."

Simple installation

Excellent performance must be matched with easy installation to ensure cost effective assembly and again Renishaw's RGH24 series meets Han's exacting requirements. The RGS20-S scale is supplied on a reel, allowing Han's assembly staff to cut the exact length required for each motor to give flexibility and zero waste. "The design is highly flexible, we can decide the travel range of the scale exactly as we want", Mr Wang explains.

The self-adhesive backing on the scale allows it to be fixed directly to the moving coil without any extra weight from mounting bolts or clamps and the readhead itself features a unique set-up LED that allows it to be installed without the need for complex or costly set-up equipment. "The installation process is simple and fast," explains Mr Wang. "We found it easy to perform ourselves after the demonstration by a Renishaw engineer and by inspecting the LED on the readhead we can immediately know that what we have done is successful."

Supporting the future

Han's Motor has a bright future and is looking forward to a long and successful partnership with Renishaw to help take it there. "Not only do Renishaw provide products that help make our VCMs better, but their service and support is also great. We will keep developing new products and applications in the laser industry and in a new chapter we will invest and focus on new technology and energy sources such as LED and solar."



Han's Voice Coil Motor (VCM) with built-in Renishaw RGH24 encoder system

For more information, visit www.renishaw.com/encoders

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