

Andreas Naß

A Milestone in Connection Technology

High contact-packing Densities thanks to radially symmetrical Spring Terminal

New connection technologies are required today in order to meet the ever increasing demands for efficient processing, high reliability, compactness and non-permanent cable connections. Han Quick Lock is a connector technology solution that fully meets these requirements.

If we take a look at market trends, we see that connectivity requirements are based on the various phases in the manufacture and construction of systems, facilities and machines. Since systems, facilities and machinery are becoming smaller, the amount of space available for connectors is also decreasing accordingly. As a result of both physical demands and standards, there is limited design freedom for the cross-sections to be used, as well as for clearance and creepage. However, the area around the cable connection still offers potential for size reductions.

Other requirements are based on connector utilization and assembly. When and where the connector is actually assembled is also a crucial factor.

PLUG-AND-PLAY

“Time is money” – which is why connectors have to be used efficiently in the factory. Plug-and-play is both a fast and safe connection method that is crucial to modern processing. The technology also has to be fully automated, depending on the number of connectors.

Despite extensive quality inspections, problems can nevertheless occur that may necessitate either maintenance work or concept modification. It's important that conductors that have already been connected can be taken apart quickly and later reconnected, if possible, without the use of any special tools.

These requirements apply equally for efficient processing in the factory and simple maintenance on the building site. Consequently, the plug connection has to feature two different connection technologies. This forms the basis for the specification for a new connection technology.

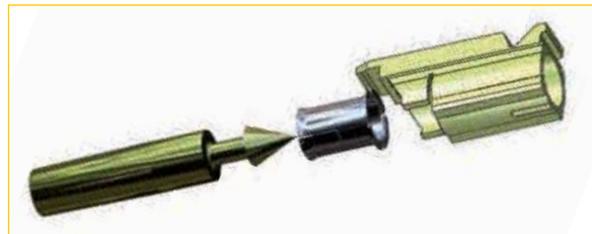


Fig. 1: Female contact with Han Quick Lock Connection

THE NEW SOLUTION

If we compare existing connection technologies, we see that the spring connection is an optimum non-permanent connection, as demonstrated by its handling and safety. The only disadvantage is the large amount of space required. This is a result of the arrangement of the springs, which is not ideal for connectors.

From this, we can derive the basic requirements for the new connector, namely it should be based on the spring principle and also enable mating compatibility with crimp connectors with a high pin count.

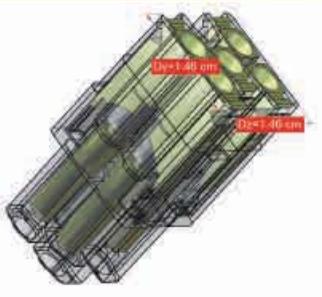


Fig. 2: Five pole power connector with Han Quick Lock connection

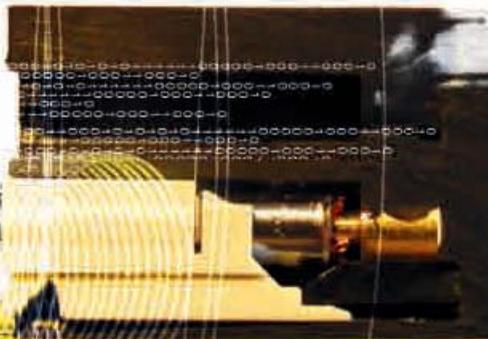
Han Quick Lock features a round spring that encloses the conductor strands. The mating forms a specially shaped mandrel

and the necessary contact pressure is created on a surrounding edge. The connection is opened by means of an actuator. The conductor can be inserted without the application of force. This ensures that thin strands can also be introduced into the connection without becoming distorted. Pressing the actuator fixes the conductor into position. Since the actuator closes flush with the connector, it is possible to perform a visual check to ensure that all connections are fixed. The conductor is released by retracting the actuator. The conductor can then easily be removed from the connection. The same conductor can be connected a number of times. As this connection technology is extremely compact, connector types that, due to their contact density, could previously only be crimped, can now be

disconnected. Figure 2 shows a plug connector with five contacts to which a cross-sectional area of 2.5 mm² can be connected. The particular feature of this new connection technology is that it is compatible with types that are already established on the market.

SUMMARY

Whereas customers formerly had no choice other than to accept the various disadvantages associated with crimping technology, the new plug connections facilitate maintenance work without the need to redesign systems, facilities and machinery.



Andreas Naß
 Director Engineering
 HARTING Electric GmbH & Co. KG
 andreas.nass@HARTING.com