



Spring Clamp Terminals The solution for secure, reliable connections

by Michael Raspotnig

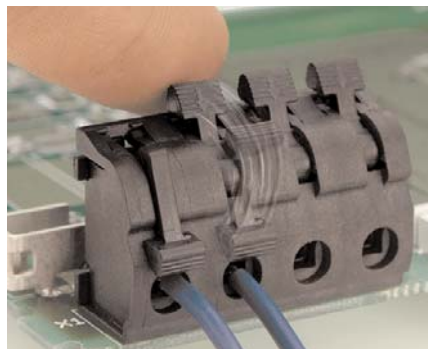
copper is soft and “flows” over the course of time, the clamping force decreases steadily. As a result, the contact resistance increases and the terminal becomes hot, which in the worst case can cause it to burn up. The speed of this process increases with the amount of current flowing through the terminal and the frequency of its exposure to temperature changes. These conditions

plus shock and vibration can cause the terminal to become loose. There’s a good reason why many service manuals contain the instruction to regularly check and re-tighten screw terminals. However, this is often overlooked in practice, which leads to a potential increased risk of failure.

The current design of spring clamp terminals offer many advantages relative to screw terminals.

If you’re not familiar with this new connection technology, you may not recognize the benefits of this innovation at first glance and may lead you to choose traditional screw terminals. Here is what you’ve been missing.

Copper is soft which under pressure has practically no elastic recovery. As a result, using a screw to secure a copper conductor in a terminal, which is the traditional method involves several compromises. The mechanical tension between the conductor and the clamping element is very small because copper offers only slight resistance to the clamping force. Besides, because



Soft copper conductors can easily be damaged when screw terminals are tightened.

Even though tightening torques for screw terminals are usually specified in installation instructions, in practice they are often tightened “by feel”. Soft copper conductors can easily be damaged in this manner, and in the worst case the wire may break causing another potential failure source. Spring clamp terminals have a clear advantage with regards to these effects. A properly formed spring provides the contact pressure necessary to ensure a durable and reliable connection. There’s no need for regular re-tightening like with screws. An installation error such as an excessively low or high tightening torque is avoided, because the spring characteristics determine the contact force. Many different types of spring clamp terminals are commercially available for relatively low currents. However, compact quick-connect spring clamp terminals for high currents and large conductors, particularly ones that are easy to use, were unavailable up to now. In partnership with a well-known manufacturer of wiring terminals, an innovative quick-connect spring clamp terminal for this application area has now been developed as a new product.

Two hands are all it takes to clamp the wire in place.

With many types of spring clamp terminals, you need one hand to hold the terminal or the unit, a second hand to operate the opening mechanism, and a third hand (from a friendly co-worker) to fit the wire into the terminal. To eliminate this awkward situation, the terminals used in the Dimension Q-series have a mechanism with two stable positions. So the terminal remains in either the open or the closed position. This means you can use both hands to hold the unit and feed the wire into the terminal. The terminals used in the Q-series are actuated using an integrated lever, which can be moved either directly with your fingers or with the assistance of a small flat-bladed screwdriver (for mass production). The terminals on the power supplies are delivered in the open position, which saves time during installation. Removing a wire is just as easy as installing it – simply lift the lever and

remove the wire. The terminals comply with the pull out force requirements of the relevant IEC and UL standards and are approved for field wiring.

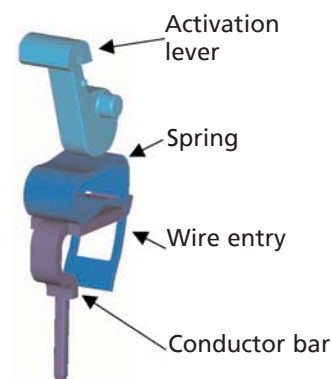
In specific terms, this means that a force of 60N (approximately 6kg of weight) can be applied to a wire with a cross-sectional area of 2.5mm² (AWG 12) without causing it to come loose. The rotational load specification in accordance with the UL requirements are also met.

Quick-connect spring clamp terminals save time in installation and maintenance.

Various studies conducted by well-known manufacturers have demonstrated a savings potential of approximately 50 percent compared to screw terminals. Users benefit directly from this cost saving and the compact, design allows more connection points to be provided for each supply terminal. Dimension power supply units have dual terminals for the output voltage which makes wiring easier in many cases. The results with the new terminals are something to be proud of. It's a successful product: technically innovative, functionally sound, and ideally matched to the Dimension Q series.

Spring clamp terminals have been used for some time in markets such as ship construction, vehicle engineering and lift engineering, due to their superior reliability. Previous applications that required relatively high output currents could only be fitted with conventional

screw terminals. The new PULS power supplies create new possibilities and provide enhanced reliability.



Internal construction:
Terminal plastic housing



The voltage can be measured from the front when the terminal is closed.

Key features of the Dimension Q-series quick-connect spring clamp terminals:

- Conductor size up to:
 - 4mm² stranded wire
 - 6mm² solid wire
 - AWG 10 (stranded or solid)
- Bi-stable mechanism: Stable in either the open or closed position
- Supplied with mechanism open
- Integrated actuation lever
- Integrated test point
- Pull-out force > 60N for 2.5mm² (AWG 12)
- IEC- and UL-approved
- Maintenance-Free



How to use the terminal (shown in open position): Insert wire, flip the lever – ready with a secure and reliable connection.