APPLICATIONS NOTICE

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Form NS 006

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APPLIC. NOTICE GENERAL LIST

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FROM : T King/K Edwards

SUBJECT: WAGO TERMINAL BLOCK CONNECTIONS

UNITS: VARIOUS

With the introduction of the new R410A units, **temperzone** have introduced a new type of electrical terminal block including the mains terminal connection.

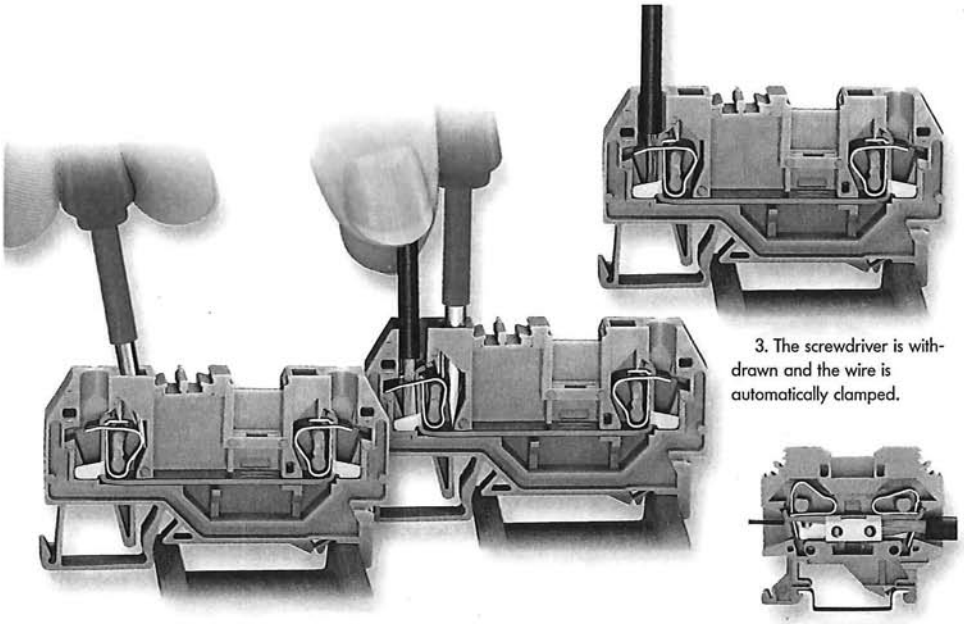
Most electricians will already be familiar with this type of terminal but it may be new to refrigeration service people with limited electrical licenses and for this reason we attach some technical information showing how to make the connections in case anyone is unsure.

The most critical issue seems to be the use of the right size screwdriver and ensuring it is levered to a fully vertical position which may require the removal of the unit top to achieve. The recommended screwdriver blade width is 3.5mm.

The benefit of these terminals is that they do not loosen over time like screwed terminals.

The advantages of the CAGE CLAMP®

How is the operation of CAGE CLAMP® different from screw-clamp blocks?



3. The screwdriver is withdrawn and the wire is automatically clamped.

▶ 1. The screwdriver is inserted with a rocking motion to the stop

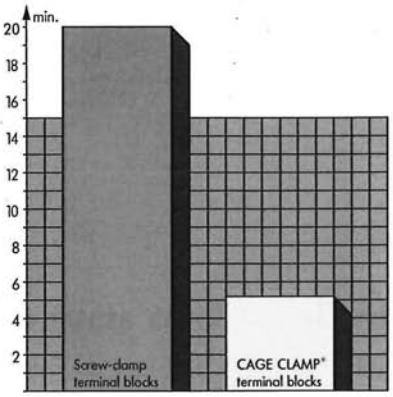
▶ 2. The screwdriver is captivated, holding the CAGE CLAMP® open, while the wire is inserted.

▶ Side entry: Operation of the CAGE CLAMP® from the top, wire entry from the side.

■ Screw connections are "operator-dependent". In other words, they require judgment on the part of the installer as to the tightness of the srew. This can be somewhat controlled in a factory setting with trained personnel, or with special torque screwdrivers. With field wiring, proper screw connections are more difficult to ensure. CAGE CLAMP®s automatic clamping feature allows less skilled labor to make quality connections. A precise, uniform contact is made regardless of who makes the connection. CAGE CLAMP® requires no special tools and is operated with a standard straight-bladed screwdriver. Two styles of terminal blocks are available: side-entry and front-entry. ■

How does the wiring time for CAGE CLAMP® compare to screw-clamp blocks?

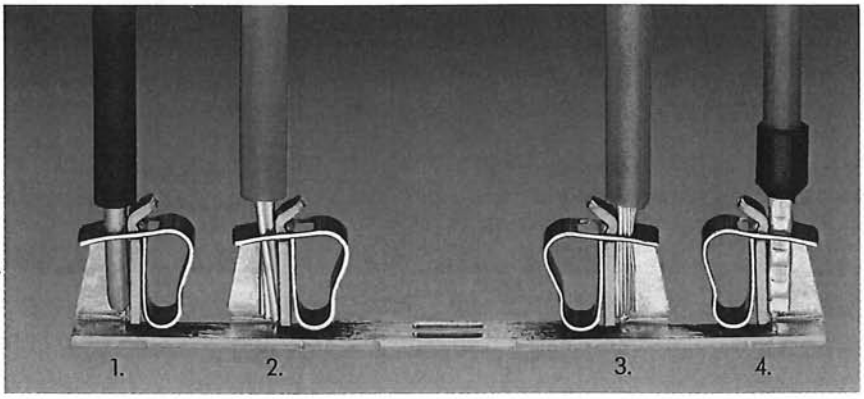
■ Public wiring competitions and major customer time studies have proven a reduction of wiring time by 75 % when comparing manual wiring of screw-type terminals with CAGE CLAMP® terminals. Even when powered screwdrivers are used for tightening the clamping scews, there is still a time savings advantage for CAGE CLAMP®. In cases where wire preparation such as crimps, ferrules or tinning can be eliminated, there are additional savings. ■



▶ Average wiring time for 100 connections each.

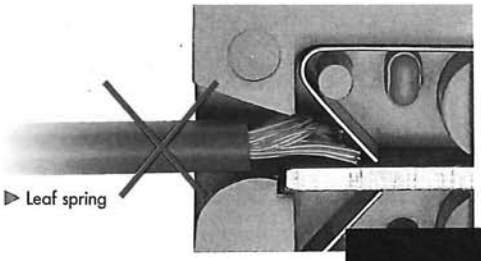
The CAGE CLAMP®

Suitable for all copper conductors – 1 conductor per clamping unit



■ A universal system:
suitable for all copper conductors from AWG 26 (0.08 mm²) up to AWG 2 (35 mm²).
Special conductor preparation not necessary – but possible. In many standards and specifications "1 conductor per clamping unit" is prescribed or recommended.

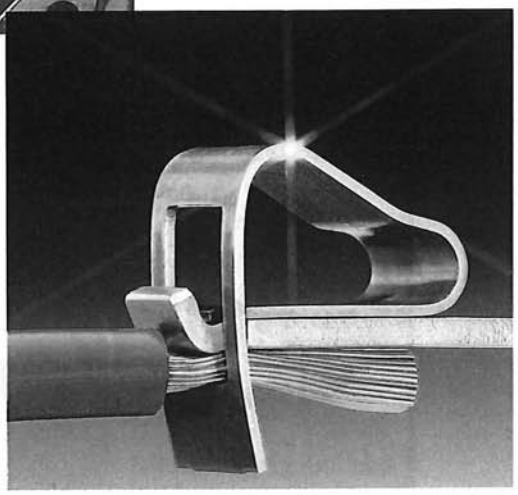
◀ Several clamping units per current bar but nevertheless "1 conductor per clamping unit"
1. solid
2. stranded
3. flexible
4. flexible with ferrule (gastight crimped)



▶ Leaf spring

What is CAGE CLAMP® and how is it different from other screwless systems?

■ CAGE CLAMP® is a unique, patented, stainless steel clamping mechanism designed to automatically connect solid or stranded wires. Various CAGE CLAMP® sizes are available to accommodate wire sizes from 0.08 mm ² – 35 mm². Other than stripping the wire, no special wire preparation such as crimps, ferrules or tinning is necessary. Most screwless systems offered by other manufacturers are based on the leaf-spring principle. This type of connection is found in the back of many electrical outlets. Leaf-spring is only recommended for larger, solid wire since it has no sides to contain the strands and because of the sharp angle in which the wire is contacted. ■

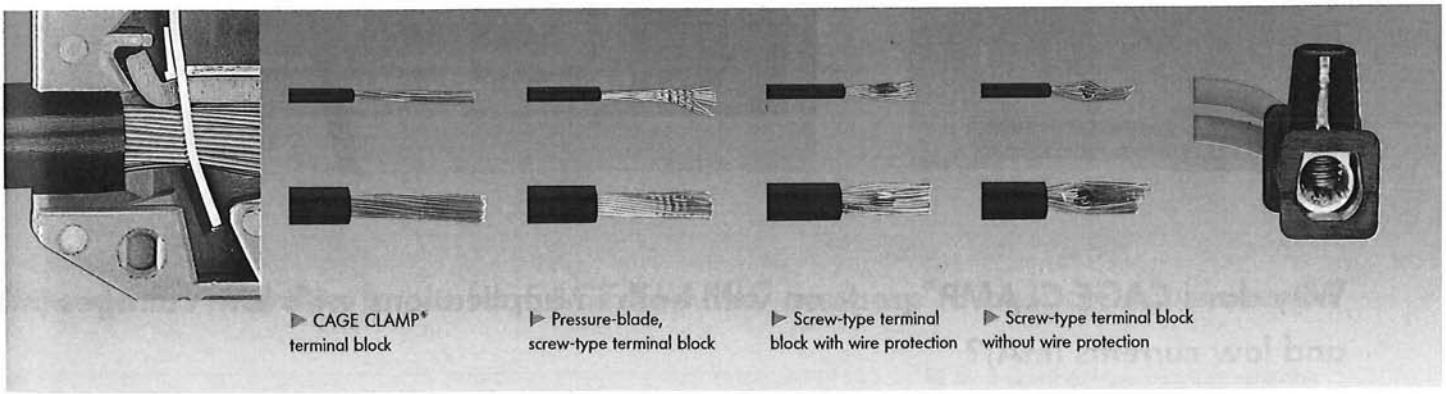


▶ The WAGO CAGE CLAMP®

How does the CAGE CLAMP® secure the wire without wire damage?

■ The CAGE CLAMP® is designed to give proportional clamping, dependent upon the wire size. The larger the wire, the higher the clamping force. The flat surface area of the CAGE CLAMP® coupled with the uniquely curved current bar provides a secure connection. Also, the angle in which the CAGE CLAMP® is positioned, increases the retention force when a pullout force is applied. Each of the photos below show an 0.18 mm 2 and 1.5 mm 2 wire that was connected to the terminal block indicated.

The tightening torque used for the screw-type terminal blocks was the torque specified by VDE 0609. In practical use this value varies and is dependent upon the operator, whereas, the CAGE CLAMP® connection is automatic and consistent everytime. ■



▶ CAGE CLAMP® terminal block

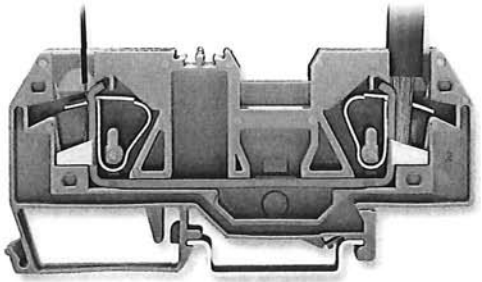
▶ Pressure-blade, screw-type terminal block

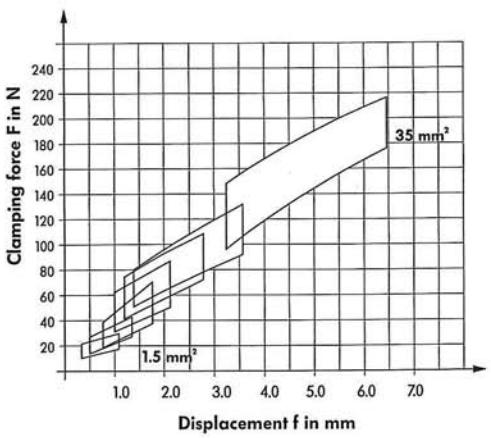
▶ Screw-type terminal block with wire protection

▶ Screw-type terminal block without wire protection

■ The clamping force adjusts automatically to the conductor cross section. The flat clamping face of the CAGE CLAMP® spring presses the conductor against the current bar without damage. Any deformation or movement of the conductor is compensated, thus eliminating the risk of a loose connection. ■

▶ An unlikely connection demonstrates the capability: a conductor of AWG 24 (0.2 mm²) at the left and the nominal cross section of AWG 6 (16 mm²) at the right in an AWG 6 (16 mm²) terminal block.





WAGO®