



**PRE-TENSIONING**

**SYSTEMS**



CCL has been at the forefront of the design and construction of prestressed concrete for more than 70 years. The Company's prestressing systems are used extensively in high-calibre structures around the world including bridges, oil platforms, sports stadia, nuclear power stations, commercial and residential buildings.

### CCL Design

CCL provides outstanding pre-tensioning solutions for clients across the globe. With its vast experience and a proven ability to innovate, it offers both standard and bespoke products.

Delivering quality at every stage, CCL components are designed using the latest 3D parametric modelling and FEA software to ensure total product integrity. All new components are type-tested either at external test facilities or within CCL's own premises. The CCL range of pre-tensioning systems is fully integrated into the company's business system, ensuring full product traceability can be provided from the acceptance of raw materials, to final despatch to the end user.

### CCL Quality

CCL operates from world-class facilities. A focus on quality and continuous improvement has led to major investments in automation, increasing product integrity and performance. All CCL products are manufactured from specially selected materials, which are fully inspected throughout each process. Prior to despatch, the product is 100% inspected automatically to check dimensions and heat treatment. Sample components are also type tested for additional security.

All CCL components are marked with their batch number in order to ensure traceability. The Company is unique within the industry as it includes batch and heat treatment numbers on its packaging to facilitate traceability.

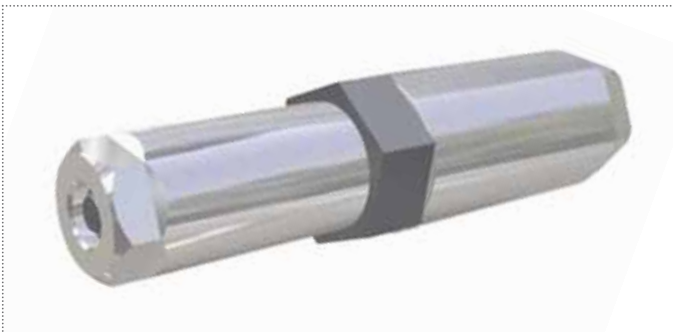
CCL equipment is designed, manufactured and assembled with the same attention to detail as that used in the production of its components. An experienced team, which also provides customer support on technical issues, assembles, calibrates and certifies all equipment before despatch to the customer. All equipment is designed and tested to meet the appropriate CE Machinery Directives, which are statutory requirements for all factories in Europe, and good practice for those elsewhere.

CCL is an ISO registered company operating a quality management system compliant with ISO 9001:2008 for both the design and manufacture of its components. CCL holds ETA approval in line with ETAG 013, UK CARES approval for manufacture/supply, in line with BS: EN 13391 and holds an EC Certificate of Conformity which allows CE marking of products. It is also an active member of specialist international bodies, including the International Federation for Structural Concrete (fib) and the Post-Tensioning Institute (PTI).

### CCL Commitment

Supply of components is only part of the CCL service. A dedicated team of engineers and technicians is always available to help customers select the most appropriate equipment for their needs and advise on any related product issues. The team can also provide practical support and guidance in the development of new systems and products to suit specific applications. CCL also offers full maintenance and calibration of equipment at its UK facilities.

Committed to providing a first-class service around the world, CCL has sister companies and a network of agents who can meet the needs of local markets through their own supply points and offer other services specifically for prestressing plants.



# CCL grips...

For more than 50 years, CCL has pioneered the use of advanced post and pre-tensioning solutions worldwide. CCL grips are accepted as the industry standard and represent more than five decades of continuous development. They are designed and manufactured to the highest standards using the latest technologies at CCL's own facility.

CCL is continuously adapting its range based on customer feedback, international regulations and advances in material technologies. A team of experienced engineers uses the latest computer controlled design programs to develop and improve products, to exceed customer requirements and to provide an unparalleled level of safety.

The Company's engineering expertise and robust quality systems provide plant managers with the reassurance and advice required when dealing with the high forces involved in pre-tensioning. That is why CCL will never compromise on quality.

CCL pre-tensioning grips consist of either an open or closed barrel (chuck) and a wedge (jaw). They are manufactured in line with the Company's ISO 9001:2008 certification and follow the same factory production controls set out for the CCL post-tensioning range, which complies with ETAG 013 - the benchmark for post-tensioning components.

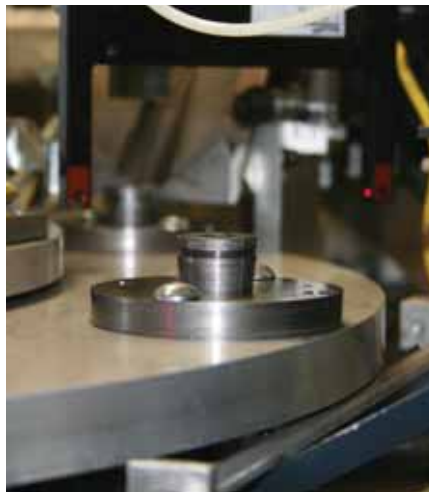
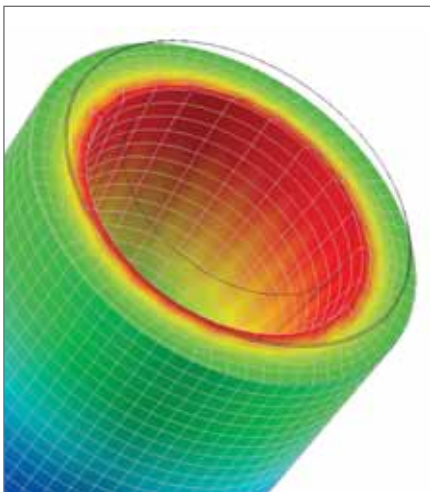
**CCL Grips have many features developed by CCL to improve performance and safety:**

#### **Wedges (Jaws)**

- Counter bores to assist with fitting of grips and avoid wear on the teeth
- Thread lead-in to avoid strand/wire shearing
- Reverse buttress threads to prolong life and increase efficiency
- 100% batch marking for full traceability
- 100% visual/laser inspection on dimensions
- 100% laser inspection on threads
- 100% heat treatment inspection on wedges
- 100% certified raw material from European mills

#### **Barrels (Chucks)**

- 100% batch marking of components for full traceability
- Counter bore for stress relief prolonging the life of the wedge
- Ultrasonic crack detection on barrel material prior to manufacture



# CCL jacks...

CCL Stressing Jacks have been the world's leading jacks for more than 40 years. First developed in the 1960s, they combine advanced design with uncompromising quality to deliver the ultimate in high performance. CCL Jacks are designed and assembled in the UK by CCL engineers to the highest standards, offering optimum safety and many years of reliable operation.

The Stressomatic jack range is tested at CCL's UK facility to deliver fast and consistent stressing forces of up to 300kN. Jacks incorporate power lock-off and internal oil transfer to avoid the dangers of external hydraulics during stressing.

## CCL Jacks offer the following unique features:

- Power lock-off to provide safe efficient seating of the wedge
- Anti-roll mechanism to prevent dangerous rotation of jack when strand twists during stressing
- Internal oil transfer to avoid external damage to the transfer mechanism
- Quick release connections eliminate the danger of dirt and damage to the threads on screw type couplings
- Male/female in/out couplers to avoid expensive mistakes by mixing connections
- Front mounted wedges to minimise strand usage
- Automatic power lock off for safe and efficient stressing
- Fast removal of jack wedges for rapid change over and ease of maintenance
- Readily available spares
- Exceptionally long life components using special CCL specification raw materials
- Remote stressing operation for safety through a hand control unit

Robust, efficient and highly effective, CCL Jacks are easy to maintain and, if serviced regularly, can provide years of reliable service.

CCL Jacks are CE marked in accordance with European factory regulations. Full technical records are maintained which demonstrate compliance of equipment with safety criteria, and the Company carries out both traceability and cyclical pressure testing on each jack, prior to release to the customer.

CCL Jacks are the world's leading stressing product, giving users the reassurance of robust engineering and an unrivalled after-sales service, provided by experienced engineers. This comprehensive support includes supply of spares, fault finding and the repair and calibration of jacks, and helps to ensure the whole life cost of the jack remains low.



# CCL pumps...

CCL Pumps are no-compromise power packs designed and manufactured to work hard in the world's most challenging environments. Using the best hydraulic components on the market, CCL Pumps are built at our UK facility to provide unrivalled performance and reliability. CCL Pumps have been used for more than 50 years, by both our external clients and within the CCL group of companies, on the most demanding construction projects worldwide.

CCL Pumps deliver multiple pressures to speed up the stressing operation, while maintaining control for precise stressing when needed. State-of-the-art force control systems give accurate multiple input and allow downloading of output to Laptop or Palmtop computers for storage, analysis and printing. Remote push button control allows simple and safe operation, enabling the user to take up a safe position while stressing. CCL offers both analogue and digital readouts for their pumps, subject to customer need.

## CCL Pumps offer performance and safety:

- Bespoke manifold systems to reduce risk of faults on complex pipe work
- Two-speed pump increases speed at low pressure and slows when accuracy is required upon reaching required load
- All steel pressure system for a quiet, robust, reliable operation
- Seated valves which allow a lighter/smaller oil reservoir and less heat generation
- Innovative integrated pump/motor giving smaller, more compact, lightweight designs
- Power lock-off to provide safe stressing operation
- High quality gauges accurate to 1% provide instant visual display
- EC thermoplastic pipes fitted with anti-kink springs for safety

CCL Pumps are fully CE marked to meet European factory regulations whether supplied as separate units or as part of a system with the CCL Jack. All CCL pumps come with the same high quality after-sales service as our jacks, and can also be calibrated to jacks before despatch.

CCL Pumps have a full technical record to prove equipment safety compliance requirements and are checked for traceability and tested for pressure before release to the customer. All pumps are EMC tested to ensure there is no electrical interference with the environment and they do not disrupt other electrical devices, such as meters or medical appliances.

CCL Pumps are available in two ranges. SR3000 pumps are of a robust design and come complete with a protection frame as standard. The high build quality and specifications of the parts used ensure a high reliability and low maintenance life for the unit. SR3000 pumps offer rapid, reliable two speed stressing operations up to 18mm strand.

The SRX pump is designed as a compact lightweight alternative to the SR3000 unit and is capable of delivering excellent performance on small strand diameters. Supplied in various voltages, it is ideal for site work or where pumps are regularly relocated within factories.

Both types of CCL Pump come in various sizes and voltages and have many interchangeable features, providing a comprehensive drive unit for any jack.

"CCL equipment provides solid performance and reliability as standard."



# CCL accessories...

## Lubrication

The correct lubrication of jack wedges is essential to prolong life and ease dismantling of the grip after stressing. Two lubrication products are available. A molybdenum-based aerosol release agent dries to form a hard coating on the wedge around ten minutes after application, while Super Dippy lubricant remains in a fluid state after being liberally applied to the components of the grip.

## Cleaning

A range of brushes is available for the cleaning of wedges and barrels. These are designed to fit standard drill chucks. The barrel brushes are specially tapered to effectively clean the inside body of the barrel.



## Force Control

Force control systems are available which allow the programming of the pump to automatically deliver accurate and consistent prestressing force. The units also allow for the download of data from the prestressing operation, for recording or analysis.

## Calibration Units

Digital Calibration Units can be supplied to allow Jacks and pumps to be calibrated quickly and economically on site. They feature a clear digital readout, a rechargeable battery and mains operation. Calibration services can also be carried out by CCL at its premises in Leeds.

## Grip release tools

CCL Grip release tools are precision-machined alloy products used to aid the release of wedges from barrels. The tool is inserted into the bearing end of the barrel until in contact with the wedge. A sharp hammer blow is then delivered to the tool to break the contact between the wedge and barrel without damaging either component.



## Replacement Parts

Approved spare parts and maintenance kits are available from CCL. In order to maintain equipment in good working order, CCL recommends the carrying of a small stock of CCL replacement parts such as jack wedges and seal spares kits. This also avoids interruption in the prestressing process when it becomes necessary to change a jack wedge and nose.

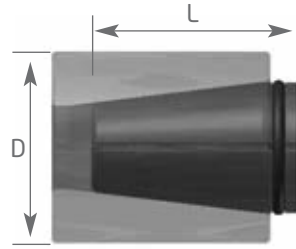
## Repairs, fault finding and after-sales service

CCL offers a comprehensive after-sales service covering repairs, fault finding, general advice and assistance. Highly experienced CCL engineers can help you keep CCL equipment in optimum working condition, prolonging its life and reducing the need to reinvest in new products and equipment.

# CCL Pre-Tensioning Range

## Open Grips Barrels & Wedges

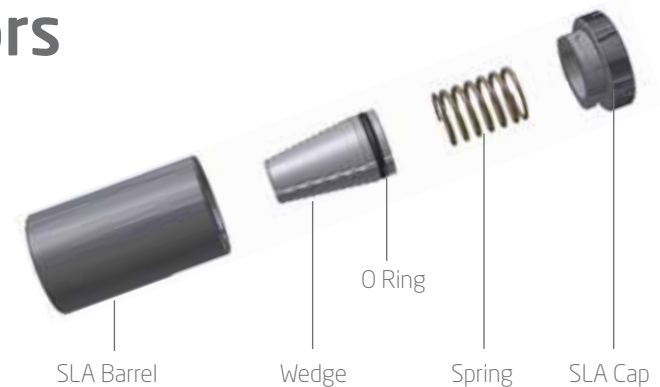
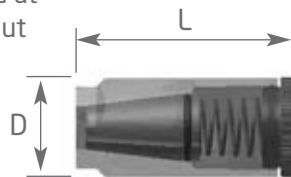
Open grips should only be used at the stressing end (live end) of the bed with a hydraulic jack incorporating power lock-off. If power lock-off is not available then spring-loaded grips should be used. The wedges are made up of two segments for use with wire and three for use with strand.



| Dia. Wire/Strand | 3      | 4      | 5      | 6      | 7      | 8      | 9.6    | 11     | 13     | 15     |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| O/DIA (D)        | 24     | 24     | 24     | 24     | 24     | 35     | 35     | 41     | 44     | 50     |
| LENGTH (L)       | 27     | 27     | 27     | 27     | 27     | 40     | 40     | 43     | 51     | 54     |
| MAX LOAD         | 64     | 64     | 64     | 64     | 64     | 102    | 102    | 139    | 209    | 300    |
| WEIGHT Kg        | 0.10   | 0.10   | 0.09   | 0.09   | 0.09   | 0.27   | 0.26   | 0.41   | 0.54   | 0.81   |
| BARREL CODE      | 603510 | 603510 | 603510 | 603510 | 603510 | 604101 | 604101 | 604103 | 604104 | 604145 |
| WEDGE CODE       | 603700 | 603701 | 603703 | 603704 | 603705 | 604201 | 604202 | 604203 | 604204 | 604225 |
| O RING           | 603245 | 603245 | 603245 | 603245 | 603245 | 604248 | 604248 | 604248 | 604249 | 604261 |

## SLA Spring Loaded Anchors

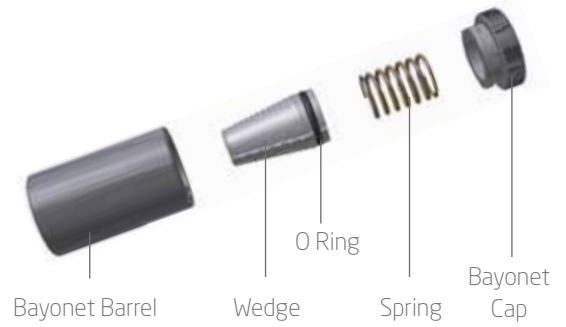
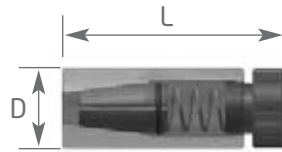
Spring-loaded anchors or grips should always be used at the non-stressing end of the bed. They should also be used at the stressing end where jacks without power lock-off are being used.



| Dia. Wire/Strand | 3      | 4      | 5      | 6      | 7      | 8      | 9.6    | 13     | 15     |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| O/DIA (D)        | 25     | 25     | 25     | 25     | 25     | 35     | 35     | 45     | 51     |
| LENGTH (L)       | 66     | 66     | 66     | 66     | 66     | 78     | 78     | 97     | 103    |
| MAX LOAD         | 64     | 64     | 64     | 64     | 64     | 102    | 102    | 209    | 300    |
| WEIGHT Kg        | 0.15   | 0.15   | 0.15   | 0.15   | 0.15   | 0.37   | 0.37   | 0.69   | 0.99   |
| SPRING CODE      | 603420 | 603420 | 603420 | 603420 | 603420 | 604416 | 604416 | 604419 | 604435 |
| CAP CODE         | 603320 | 603320 | 603320 | 603320 | 603320 | 604316 | 604316 | 604317 | 604320 |
| BARREL CODE      | 603520 | 603520 | 603520 | 603520 | 603520 | 604143 | 604143 | 604141 | 604140 |
| WEDGE CODE       | 603700 | 603701 | 603703 | 603704 | 603705 | 604201 | 604202 | 604204 | 604225 |
| O RING           | 603245 | 603245 | 603245 | 603245 | 603245 | 604248 | 604248 | 604249 | 604261 |
| COMPLETE GRIP    | 603600 | 603601 | 603603 | 603604 | 603605 | 604041 | 604017 | 604044 | 604073 |

# Bayonet Grip

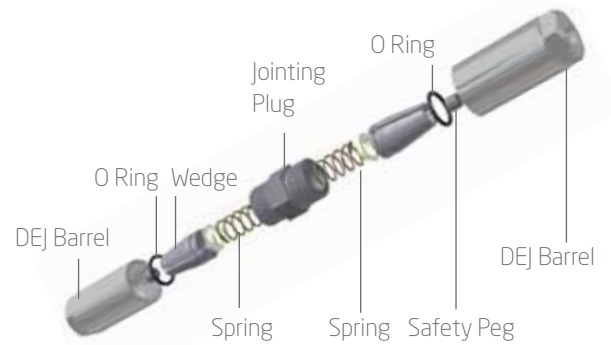
Bayonet grips are similar to SLA grips but have a quick release twist cap. They should always be used at the non-stressing end of the bed and should also be used at the stressing end where jacks without power lock-off are being used.



| Dia. Wire/Strand | 3      | 4      | 5      | 6      | 7      | 8      | 9.6    | 13     | 15     |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| O/DIA (D)        | 25     | 25     | 25     | 25     | 25     | 35     | 35     | 45     | 50     |
| LENGTH (L)       | 69     | 69     | 69     | 69     | 69     | 84     | 84     | 88     | 109    |
| MAX LOAD         | 64     | 64     | 64     | 64     | 64     | 102    | 102    | 209    | 300    |
| WEIGHT Kg        | 0.20   | 0.19   | 0.19   | 0.19   | 0.19   | 0.45   | 0.44   | 0.79   | 1.15   |
| SPRING CODE      | 603421 | 603421 | 603421 | 603421 | 603421 | 604415 | 604415 | 604424 | 604435 |
| CAP CODE         | 603325 | 603325 | 603325 | 603325 | 603325 | 604325 | 604325 | 604328 | 604322 |
| BARREL CODE      | 603515 | 603515 | 603515 | 603515 | 603515 | 604132 | 604132 | 604124 | 604129 |
| WEDGE CODE       | 603700 | 603701 | 603703 | 603704 | 603705 | 604201 | 604202 | 604204 | 604225 |
| O RING           | 603245 | 603245 | 603245 | 603245 | 603245 | 604248 | 604248 | 604249 | 604261 |
| COMPLETE GRIP    | 603610 | 603611 | 603613 | 603614 | 603615 | 604081 | 604068 | 604024 | 604049 |

# DEJ Double Ended Joint

DEJ/DEJ reducers can be used to connect wire/strand together mid-span. Where a reducing joint is used, the prestressing force should never exceed 80% of the manufacturer's specified minimum breaking load for the smallest wire or strand being used.



| Dia. Wire/Strand | 3      | 4      | 5      | 6      | 7      | 8      | 9.6    | 13     | 15     |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| O/DIA (D)        | 25     | 25     | 25     | 25     | 25     | 35     | 35     | 44     | 50     |
| LENGTH (L)       | 118    | 118    | 118    | 118    | 118    | 157    | 157    | 198    | 210    |
| MAX LOAD         | 64     | 64     | 64     | 64     | 64     | 102    | 102    | 209    | 300    |
| WEIGHT Kg        | 0.37   | 0.36   | 0.36   | 0.36   | 0.36   | 0.94   | 0.94   | 1.76   | 2.46   |
| SPRING CODE      | 603422 | 603422 | 603422 | 603422 | 603422 | 604401 | 604401 | 604424 | 604424 |
| SPRING CAP CODE  | -      | -      | -      | -      | -      | 604539 | 604539 | 604537 | 604537 |
| BARREL CODE      | 603520 | 603520 | 603520 | 603520 | 603520 | 604143 | 604143 | 604141 | 604140 |
| WEDGE CODE       | 603700 | 603701 | 603703 | 603704 | 603705 | 604201 | 604202 | 604204 | 604225 |
| PLUG CODE        | 603340 | 603340 | 603340 | 603340 | 603340 | 604353 | 604353 | 604339 | 604338 |
| O RING           | 603245 | 603245 | 603245 | 603245 | 603245 | 604248 | 604248 | 604249 | 604261 |
| SAFETY PLUG CODE | -      | -      | -      | -      | -      | 604364 | 604363 | 604361 | 604360 |
| COMPLETE GRIP    | 603650 | 603651 | 603653 | 603654 | 603655 | 604067 | 604066 | 604064 | 604062 |

# Grip Accessories



The correct lubrication of jack wedges is essential to prolong life and ease dismantling of the grip after stressing. Two lubrication products are available. A molybdenum based release agent comes in aerosol form and dries to form a hard coating on the wedge around ten minutes after application. Also available is Super Dippy lubricant which remains in a fluid state after being liberally applied to the wedge components of the grip.



Shock detensioning can cause undue stresses on the grips resulting in damage that will significantly reduce the working life. CCL provides detensioning kits to allow the safe detensioning of tendons.



A range of brushes is available for the cleaning of wedges and barrels. These are designed to fit standard drill chucks. The barrel brushes are specially tapered to effectively clean the inside body of the barrel.



CCL grip release tools are precision machined alloy products used to aid the release of wedges from barrels. The tool is inserted into the bearing end of the barrel until in contact with the wedge. A sharp hammer blow is then delivered to the tool to break the contact between the wedge and barrel without damaging either component.



## Product Selection

| Dia. Wire/Strand  | 3      | 4      | 5      | 6      | 7      | 8      | 9.6    | 11     | 13     | 15     |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| OPEN WEDGE        | 603700 | 603701 | 603703 | 603704 | 603705 | 604201 | 604202 | 604203 | 604204 | 604225 |
| OPEN BARREL       | 603510 | 603510 | 603510 | 603510 | 603510 | 604101 | 604101 | 604103 | 604104 | 604145 |
| O RING            | 603245 | 603245 | 603245 | 603245 | 603245 | 604248 | 604248 | 604248 | 604249 | 604261 |
| SLA GRIP          | 603600 | 603601 | 603603 | 603604 | 603605 | 604041 | 604017 | -      | 604044 | 604073 |
| BAYONET GRIP      | 603610 | 603611 | 603613 | 603614 | 603615 | 604081 | 604068 | 604023 | 604024 | 604049 |
| DEJ               | 603650 | 603651 | 603653 | 603654 | 603655 | 604067 | 604066 | -      | 604064 | 604062 |
| JACK SHORT STROKE | -      | -      | -      | -      | -      | 106400 | 106401 | 106402 | 106403 | 107401 |
| JACK LONG STROKE  | 105400 | 105400 | 105401 | 105401 | 105401 | 106401 | 106411 | 106412 | 106413 | 107411 |
| JACK WEDGE        | 101028 | 101028 | 101035 | 101035 | 101035 | 101004 | 101003 | 101002 | 101001 | 101013 |
| JACK NOSE         | 105015 | 105015 | 105015 | 105015 | 105015 | 106030 | 106030 | 106031 | 106029 | 107016 |
| TOOL KIT          | 102120 | 102120 | 102120 | 102120 | 102120 | 102126 | 102126 | 102126 | 102126 | 102100 |
| PUMP SRX*         | 171002 | 171002 | 171002 | 171002 | 171002 | 171002 | 171002 | 171002 | 171002 | -      |
| PUMP SR3000*      | 170102 | 170102 | 170102 | 170102 | 170102 | 170102 | 170102 | 170102 | 170102 | 170102 |


\*380/415V version. Other voltages are available.

# Safe Working Practices

- The wire/strand must be cut square and ragged edges removed.
- Kinked or deformed strand must never be used for stressing.
- In the general interests of safety, grips holding wire/strand under load should be sheltered with material of adequate strength to prevent injury or damage in the event of a wire/strand failure.
- Before stressing, the dead end should be sheltered.
- The live end should be sheltered immediately after stressing.
- Double ended joints (DEJs) should be sheltered before stressing and whilst under load.
- During the tensioning process all non essential personnel should leave the stressing area.
- Stressing should be carried out in a sequence to ensure that the jack operator never stands behind a stressed or unsheltered wire or strand during stressing.
- Operators should not stand in line with any stressed wire/strand or stand directly behind the jack during tensioning.
- Never walk on stressed strands.
- Protect open stressing beds with chains or other substantial and suitably constructed guards to protect persons from injury due to sudden wire/strand release.
- Signs warning of the potential danger should be placed around stressed beds.
- Any load/elongation remaining in the wire/strand must be removed in a controlled manner prior to cutting or burning the wire/strand to remove the grips.
- Consult CCL before attempting any prestressing or load/elongation removal procedure that may affect the performance of the grips.

[www.cclint.com](http://www.cclint.com)





CCL was established in 1935 to provide cutting-edge engineering solutions. Since then, the company has grown and diversified to become one of the world's leading engineering companies specialising in prestressed concrete.

For decades CCL has been designing, supplying and continually developing systems for the international prestressed concrete industry, establishing a global reputation as an expert in its field through its technical expertise, advanced manufacturing techniques and knowledge of local markets.

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