Thomson Engineering Design Ltd
Cable Handling Equipment

A Technical Guide to the Range of Cable Handling Equipment Available 2013 and an overview of our bespoke product development capability
Introduction

Thomson Engineering Design Ltd has been designing, refurbishing and manufacturing cable handling equipment since 2004. This document gives technical details of the existing equipment range and a short introduction to our bespoke design and build service.

Our range of equipment goes from the simple cable thimble - used for threading and manipulating cables - to bespoke cable pulling machines capable of dragging and installing cables up to 60 tonnes in weight.

All our equipment is designed and built at our factory in the West of England and all our processes and procedures are covered by ISO 9001 certification including our in-house CE marking system.

More than 60% of our business involves the design and construction of bespoke equipment for industry and we are proud of our customer base which includes most of the key players in the rail and plant hire industries.
Part 1: Established Cable Handling Products

On the following pages you will find details of products already proven within industry for the handling, storage and laying of cables.

All of these may be modified to suit special requirements and we will be pleased to discuss this in more detail.
The Thomson Cable Drum Carrier is designed for use on rail trailers to provide a high strength, low rolling resistance support for cable drums up to 8,000 kg.

The special adapter cones, which can be used with drum shaft holes from 90mm to 200mm, sit on ball bearing rollers making it exceptionally easy to load and unload drums.

Because of the low rolling resistance of this arrangement our Drum Carrier is frequently specified for delicate cables such as fibre optics.

**SPECIFICATIONS**

- Weight (Complete with shaft) 480 kg
- Shaft Diameter 80 mm
- Drum shaft hole 90 mm to 200 mm
- WLL (Safe Working Load) 8,000 kg
- Proof Load (Factory test) 12,000 kg
- Mechanism Low Resistance Roller

**Features**

- Simple to load and unload
- Adaptable to a wide range of drum sizes
- Braked and powered versions available
- Very low rolling resistance for delicate cables
- Full Factory Parts Backup
- CE Marked

A VERSATILE AND EASY TO USE CABLE DRUM STAND FOR TRAILER AND WAGON APPLICATIONS

**Benefits**

- Low rolling resistance
- 8,000kg capacity
- Wide range of drum sizes

**Documentation**

- Operator’s / Maintenance Manual
- LOLER Test Certificate

**Features**

- Simple to load and unload
- Adaptable to a wide range of drum sizes
- Braked and powered versions available
- Very low rolling resistance for delicate cables
- Full Factory Parts Backup
- CE Marked

A VERSATILE AND EASY TO USE CABLE DRUM STAND FOR TRAILER AND WAGON APPLICATIONS

**Benefits**

- Low rolling resistance
- 8,000kg capacity
- Wide range of drum sizes

**Documentation**

- Operator’s / Maintenance Manual
- LOLER Test Certificate

Specifications given may be subject to change due to our policy of continuous improvement
Technical Details

This product is designed to be mounted on an RRV trailer. Up to 3 units may be placed on a standard 6m trailer.

The base frame, which is lashed down on to the trailer deck, supports a carriage frame. The carriage frame can be rotated on the centre point of the base frame so that the drum shaft can be angled up to 35 degrees in either direction.

Two drum support frames are mounted on the carriage frame. These can be rolled across the carriage frame to adjust for different drum widths and to allow the drum to be offset to either side of the trailer.

The upper part of the drum support frames can be raised and lowered to cope with the largest drums. Integrated into this section are two rollers mounted on sealed ball bearings. These rollers are used to support the drum shaft and give it a very low friction rolling function.

Cable drums are pre-fitted into the drum shaft and secured with specially designed grooved cones. Using a lifting beam which can also be supplied by Thomson Engineering Design the shaft is lifted into the drum supports and placed so that the groove in each cone is placed on the rollers.

A simple cross pin is then inserted above the grooved cones to secure the drum and shaft for transport.

Accessories supplied for this device include:

- Shaft braking
- Drum braking
- Powered drum drive system
- Drum lifting beam

For further details please contact Thomson Engineering Design Ltd on 01594 82 66 11
Thomson Cable Thimbles are designed to be suspended from the lifting hook of an excavator crane to guide the cable off the drum.

A soft polyurethane roller running on low friction bearings ensures that the cable is carefully handled.

To disconnect the thimble without cutting the cable the roller can be easily removed from the frame.

Single, twin and multiple roller versions are available to order.

**Specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (Single)</td>
<td>11 kg</td>
</tr>
<tr>
<td>Weight (Twin)</td>
<td>14 kg</td>
</tr>
<tr>
<td>WLL (Safe Working Load /cable)</td>
<td>30 kg</td>
</tr>
<tr>
<td>Proof Load (Factory test)</td>
<td>45 kg</td>
</tr>
</tbody>
</table>

**Features**

- Strong and Light
- Designed to protect cable
- Soft urethane rollers
- 45kg Proof Load
- Full Factory Parts Backup
- CE Marked

**Specifications given may be subject to change due to our policy of continuous improvement**

**Benefits**

- Fully certificated and tested.
- Simple to use.
- Light weight.
- Low rolling resistance.

**Documentation**

- Operator’s / Maintenance Manual
- LOLER Test Certificate

---

**Signal Heads**

**Junction Indicators**

**Post platform rails**
Technical Details

Typically fitted to the lifting point on the boom of an RRV, our cable thimbles are frequently used in conjunction with our trailer mounted drum carrier to help prevent the cable dragging on the ground.

Cable thimbles consist of a fabricated steel frame and polyurethane rollers. The rollers have oil impregnated bronze bushes running on a smooth steel shaft so that they turn easily.

This combination supports the cable and minimises the risk of damage to the cable outer sheath.

The shaft can be quickly and easily removed to allow the rollers to be removed to release the cable.

Single roller, twin roller and triple roller designs are available.
The Thomson Cable Trailer is an ideal solution for laying cable in restricted working locations such as tunnels. Manually operated hydraulic lift arms mean that this trailer is totally self-contained.

The Cable Trailer can load itself with drums placed in the four-foot and it incorporates the same low rolling resistance drum shaft supports as our other drum handlers making it ideal for delicate cables as well as heavy power lines.

Automatic, fail-safe brakes are fitted as standard.

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>1,900 kg</td>
</tr>
<tr>
<td>Brakes</td>
<td>Fail-safe on 2 wheels</td>
</tr>
<tr>
<td>Shaft Size</td>
<td>80mm diam.</td>
</tr>
<tr>
<td>Safe Working Load</td>
<td>3,000 kg</td>
</tr>
<tr>
<td>Proof Load (Factory test)</td>
<td>4,500 kg</td>
</tr>
<tr>
<td>System Hyd. Pressure</td>
<td>210 Bar</td>
</tr>
<tr>
<td>Body Colour</td>
<td>08E81 Yellow</td>
</tr>
<tr>
<td>Moving Parts</td>
<td>Signal Red</td>
</tr>
</tbody>
</table>

**Features**

- Self Loading
- Precision Height Control
- Low Rolling Resistance Shaft
- Powered and braked versions available
- 3,000 kg WLL
- 4,500 kg Proof Load
- Full Factory Parts Backup
- CE Marked

A FAST AND EASY WAY TO LAY CABLES IN RESTRICTED AREAS

**Benefits**

- Precision drum control
- Low rolling resistance for delicate cables
- Fail-safe brakes

**Documentation**

- Operator’s Manual
- Parts Manual
- Maintenance Plan
- LOLER Test Certificate

Specifications given may be subject to change due to our policy of continuous improvement.
Technical Details

For single drums up to 3,000kg the Cable Handling Trailer provides a rapid handling and delivery solution.

Drums are lifted into the four-foot by a crane and fitted with the specially designed drum shaft. The trailer is then moved into position and the hand pump used to raise the arms, picking up the drum shaft in low rolling friction roller supports.

The trailer is then quickly towed to the work site and cable laying off can begin immediately.

These units were built exclusively for use on the extension to London Underground lines into Terminal 5 at Heathrow where precise control of the drum height was required to avoid collision with temporary ventilation and power systems.

For use elsewhere Vehicle Acceptance would be required but this can be arranged during manufacture through our close association with Atkins Rail Vehicle Acceptance.

A wide range of accessories including lighting systems, powered drum and braked drum systems as well as a variety of service and parking braking systems can be specified.
The Thomson Cable Handling Yoke is the most efficient way to handle cable drums and to lay cable using an excavator crane. By withdrawing two retaining pins the drum shaft is released from the Yoke.

Fit the drum shaft to the cable drum and pick it up with the Yoke. Lock the retaining pins and you are ready to lay the cable.

The Yoke can even be fitted with a hydraulic rotator to help position the drum when used just for drum handling. Can be made to suit any range of drum sizes and weights.

**Specifications (std.)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (typical)</td>
<td>145 kg</td>
</tr>
<tr>
<td>Shaft Diameter</td>
<td>80 mm</td>
</tr>
<tr>
<td>Max drum width</td>
<td>1,200 mm</td>
</tr>
<tr>
<td>Safe Working Load</td>
<td>3,000 kg</td>
</tr>
<tr>
<td>Proof Load (Factory test)</td>
<td>6,000 kg</td>
</tr>
</tbody>
</table>

**Rotator Version**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Hyd. Pressure</td>
<td>210 Bar</td>
</tr>
<tr>
<td>Min. Hyd. Pressure</td>
<td>50 Bar</td>
</tr>
<tr>
<td>Body Colour</td>
<td>08E81 Yellow</td>
</tr>
</tbody>
</table>

**Features**

- Strong and Robust
- Very quick and simple to use
- All Steel Welded Construction
- High Resistance to Dynamic Loads
- High Resistance to Abuse
- Versions for any range of drum sizes and weights can be supplied
- 6,000 kg Proof Load
- Full Factory Parts Backup
- CE Marked

A REALLY EASY TO USE AND QUICK SOLUTION TO CABLE LAYING

**Benefits**

- Minimises handling time
- Maximises productivity
- High reliability through robust construction

**Documentation**

- Operator's Manual
- Parts Manual
- Maintenance Plan
- LOLER Test Certificate

Specifications given may be subject to change due to our policy of continuous improvement.
Technical Details

*Using the Cable Yoke minimises handling time and gives the most efficient solution to laying cable from drums up to 3,000kg.*

Simply suspended from the lifting point of a RRV or excavator crane the yoke is fitted with the same low rolling friction cable shaft support used on our heavy duty trailer mounted drum carriers.

This device can also be mounted on a hydraulic rotator giving the machine operator complete control on the angle of the cable drum during laying off.

The Cable Handling Yoke can be built to any required size compatible with the lifting capacity of the host crane.
The Thomson Cable Tunnel Tractor is a unique solution to the installation of high capacity power cables in round bore or flat bottomed tunnels. The machine has many unique features including bidirectional operation, cleating workstations, computerised interlocked control systems and hydraulic installation arms.

Cables up to 60 tonnes can be towed into the tunnel and installed onto supports in hours rather than days.

The machine breaks down into sections for installation and removal.

**Specifications (std.)**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (typical)</td>
<td>18,000 kg</td>
</tr>
<tr>
<td>Min Shaft Diameter</td>
<td>3000 mm</td>
</tr>
<tr>
<td>Max cable weight</td>
<td>60,000 kg</td>
</tr>
<tr>
<td>Max cable diameter</td>
<td>200 mm</td>
</tr>
<tr>
<td>Drawbar pull</td>
<td>35 kN</td>
</tr>
<tr>
<td>Maximum speed</td>
<td>6,000 m/hr</td>
</tr>
<tr>
<td>Control system</td>
<td>PLC based</td>
</tr>
</tbody>
</table>

**Assembly**

Sectional design allows the machine to be lowered through a 2m x 1.5m aperture.

Unique manipulator system allows the machine to be assembled and commissioned in under 2 hours.

**Features**

- Sectional design
- Central workstations for cleating
- Hydraulic manipulator arms both ends
- Drivers cab both ends
- PLC control system
- Safety interlocks
- Wheels gimbal mounted for use in circular tunnels
- Full Factory Parts Backup
- CE Marked

A REALLY EASY TO USE AND QUICK SOLUTION TO CABLE LAYING

**Benefits**

- Reduced risk and reduced manpower requirement
- Higher output
- Simple to assemble sectional design

**Documentation**

- Operator’s Manual
- Parts Manual
- Maintenance Plan
- LOLER Test Certificate

Specifications given may be subject to change due to our policy of continuous improvement.
Technical Details

Heavy power cables have traditionally been installed by using winches to pull the cable into position and then manually lifting them onto cable support brackets.

This is a slow and dangerous process which can be radically improved by the use of our cable tractor.

To begin the cable tractor is lowered into a tunnel shaft in five sections. These sections are quickly and easily joined and connected using a specially designed powered manipulation system. Typically it takes less than two hours to complete this entire process and have the tractor ready to work.

The tractor can be driven from either end and manipulator arms used to lift and install the cable.

A team of just four men is all that is required and a 1,000m cable weighing up to 60 tonnes can be towed 10km and installed in just a few hours.

Power comes from a low emission diesel engine controlled by a PLC system to minimise engine speed, maximise efficiency and monitor all control stations to ensure that the machine cannot be moved until all personnel are in a position of safety.
Client List

Thomson Engineering Design Ltd works with some of the main players in the rail and construction industries including these:

- Colas Rail
- Network Rail
- Balfour Beatty Rail
- Babcock Rail
- Sersa Group
- Tata Steel
- Track Partnership
- Signalling Solutions

All our products are proudly designed and built in the United Kingdom.
Part 2: Concept and Bespoke Designs

*The majority of our designs come from customer requests but others come from our own observations of working practices. A typical example of this is the Troughing Cable Installer shown overleaf.*

We work with our clients to ensure that their precise requirements are understood and realised in the finished design.

Our processes and procedures are monitored by TUV and our ISO 9001 approval scope expands year by year.
The Thomson Cable Installer is designed for the automated installation of cables into concrete troughing routes.

The machine lifts and relays the troughing lids, automatically feeding the cable into place, in one continuous action.

Hydraulically powered for smooth, powerful operation the cable installer drives itself along the top edges of the troughing.

Lids are handled carefully by the special mechanism to ensure that no damage is done.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (machine only)</td>
<td>110 kg</td>
</tr>
<tr>
<td>Weight (power pack)</td>
<td>50 kg</td>
</tr>
<tr>
<td>Output</td>
<td>up to 30 troughs/min.</td>
</tr>
<tr>
<td>Trough Width</td>
<td>200mm - 600mm</td>
</tr>
<tr>
<td>Max Cable Size</td>
<td>50 mm</td>
</tr>
<tr>
<td>System Hyd. Pressure</td>
<td>120 Bar</td>
</tr>
<tr>
<td>Body Colour</td>
<td>Customer Livery</td>
</tr>
<tr>
<td>Moving Parts</td>
<td>Signal Red</td>
</tr>
</tbody>
</table>

**FEATURES**

- Powered lid removal and re-fitting
- Semi-automatic operation
- Soft contact with trough and lids
- Infinitely variable speed
- Trough cleaning option available
- Full Factory Parts Backup
- CE Marked

A FAST AND EASY WAY TO INSTALL CABLES IN CONCRETE TROUGHING

**BENEFITS**

- Reduced manpower
- Higher output
- Reduced fatigue
- Single pass operation

**DOCUMENTATION**

- Operator’s Manual
- Parts Manual
- Maintenance Plan
- Factory Test Certificate

Specifications given may be subject to change due to our policy of continuous improvement.
Concept Design Details

*The Troughing Cable Installer is a concept design for the semi-automatic installation of cables into concrete troughing.*

The device design uses toothed rubber belts to lift the troughing lids and pass them over the body of the machine to replace them behind. The belts are driven by a small hydraulic motor controlled and powered by a hydraulic pack remotely mounted on a standard P-way trolley.

The same trolley would carry the cable drum on a roller stand.

The belts will ‘dip’ slightly into the top of the troughing and the concept may not be suitable where troughing is fully packed with cables.

Polyurethane rollers fitted to the corners of the machine chassis run along the top edge of the troughs to guide the machine but it is the belts which drive it along as the troughing lids are replaced pushing against the finished lids to drive the machine forwards.

A variable width chassis allows the machine to be used on different trough sections.

**Current stage of development**

A great deal of work was done on proving the feasibility and effectiveness of the various element of the design and we are extremely confident that a working machine can be built within a ten to twelve-week time frame.

We are looking for a client who will commit to buying a working machine so that we can commit the required development funding.

Like all our products it would be CE marked and we will provide full documentation, including maintenance documentation, and training can also be given at our Cinderford premises.
Bespoke Product Design System

Our system for the design and development of new products - like the Troughing Cable Installer - is approved by TUV to ISO 9001:2008 and is encapsulated in the flow chart opposite.

The key to any product development is the development of a realistic design brief which captures all the necessary and all the desirable features of the proposed product. Changes to the design brief during development are costly and time consuming so it is vital that the specification is carefully though out.

To do this we usually start with a kick-off meeting with all the stakeholders - not just the client’s engineers, managers and purchasing authority but the personnel who will end up using the product daily.

Nothing gets people talking and thinking like a picture so we spend a lot of time in the early stages developing photo-realistic concept images of new products to ensure that everybody is in agreement about the key features of the proposed design.

Many products which we have designed are manufactured by our clients and to ensure that this is achieved with the minimum of difficulty all engineering drawings and technical documentation is produced by a qualified and experienced engineer.

In this way we have successfully brought more than sixty products successfully into the workplace in the last eight years.

Thomson Engineering Design Ltd
Valley Road
Cinderford
Gloucestershire
GL14 2NZ
Tel: 01594 82 66 11
Fax: 01594 82 55 60
Email: sales@thomsondesignuk.com