Fluid Filled Cable Systems
Connections, Fittings & Services

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About Elmeridge Cable Services

ecs provides specialist bespoke solutions for High Voltage power cable systems for Transmission and Distribution network operators in the UK and Overseas. Covering both Land & Subsea, ecs has a wealth of experience in a variety of cabling applications and environments.

Existing fluid filled cable systems require regular monitoring and maintenance. ecs offers all the services necessary to assist in the maintenance of your system and a fast response in the event of a fault or repair situation.

ecs provide services for new installations and also transitions from existing fluid/gas filled cables to new XLPE cable, including all the accessories, materials and support staff to complete the hydraulic connections.

All fluid filled systems need to maintain a constant pressure and ecs can provide all the essential components to achieve this.

From new or reconditioned oil tanks to specialist fittings, ecs are able to offer a complete service or supply of accessories.

ecs can undertake specialist jobs; with over 420 years combined experience in the high voltage cable industry and close working relationships with a number of the major suppliers in the industry.

ecs has expertise in the design, manufacture, installation and jointing of cable systems up to 400kV, with particular expertise in fluid filled systems.

The extensive knowledge resident in the company, and global network of manufacturing partners, ecs provides a complete service from design, supply, jointing, commissioning and testing as the customer requires.

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Specialist Fluid Filled System Fittings

ecs have been involved with the design and development of specialist fluid fittings for over 15 years. All are manufactured from brass, bronze or stainless steel of the highest quality. After nearly two decades re-searching and modifying specialised fluid fittings, ecs are the industry leaders for the supply and installation of connections. ecs are able to design and manufacture special individual orders.

Test Slide Valve

Item No: SP121

Providing an isolated connection point for measuring the cable fluid pressure. With two ports connected, cable fluid pressure is maintained through the valve, the spring loaded third port is only active with an instrument connected.

Used with ecs pressure gauges (refer to page 9). Mounting plates are available to provide easy access to test slide valve in tank pits.

Special Pumping Valve

Item No: SP117

Provides a non intrusive method for pressurising a system. The spring loaded pin only allows fluid to flow once a connection is made, ensuring no unintentional loss of fluid from the system.

Insulated Link

Item No: SP112

Maintains continuous fluid pressure through an insulator. It is used on joints and flushing points provides a break in the electrical connection, eliminating any standing voltage on pipe and providing a safe area to work.

Independently electrically and leakage tested. Available with any combination of male and female fittings.

Compression Fitting

Item No: SP106

Used to make a connection to ecs stainless steel feed pipe (refer to page 11). The compression ring ensures a complete seal without the need for plumbing.

Traditionally, the connection interface is a 60° Male or Female Cone with ½” BSP thread. However alternative thread, cone, dome and stem designs can be supplied as required.

This fitting offers a quicker easier alternative to plumbing. ecs can supply pre-cut lengths with terminations already fitted which can be particularly useful for temporary connections and are re-usable.
**Inline Control Valve**  
*Item No: SP111*

Inline on-or-off, with lock-off facility for added security if required. Quick and efficient method of shutting down and controlling the flow of oil.

Requires valve adapter & valve union adapter to join to **ECS** oil pipe, or **ECS** end cap (see Item No's: ST231 & ST232 on right)

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**Valve Adapter (top)**  
*Item No: ST231*

Adapter union for on/off valve (item No: SP111)

**Fits onto ECS end cap to control flow during jointing**

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**Valve Adapter Union (bottom)**  
*Item No: ST232*

For use with On/Off valve (item SP111), providing a connection to a cone fitting.

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**Flowmeter**  
*Item No: PG403*

Metering unit measuring the amount of fluid passing through the unit.

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**ECS End Caps**  
*Item No: EC800*

Three way valve adapter. Brass and bronze adapter with cone fitting, connecting fluid filled line as required. Also available with any combination of male or female ends.

Brass end caps are plumbed onto the metallic sheath to permanently seal the end of the cable. Various diameters and lengths are available to cater for all applications, including fittings to allow for connection of oil lines and bonding lead.

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**Tee Piece**  
*Item No: SP105*

Three way valve adapter. Brass and bronze adapter with cone fitting, connecting fluid line as required. Available in all combinations of male and female.

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**3 Way Adapter (Cone)**  
*Item No: SP104*

Three way valve adapter. Brass and bronze adapter with cone fitting, for connecting fluid line as required. Available with any combination of male or female ends.

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**Cone Elbow**  
*Item No: SP111*

Elbow joints for connecting fluid filled line at a right angle. Available in all combinations of male and female.

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**Straight Plumbing Liner**  
*Item No: SP118*

Used to make a connection to lead feed pipe. This plumbing joint is used with the traditional feed pipe and is designed to be plumbed straight onto to make a seal.

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**Double cone elbow**  
*Item No: SP107*

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**Double union elbow**  
*Item No: SP109*

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**Cone union elbow**  
*Item No: SP108*

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**Double cone elbow**  
*Item No: SP107*

---

**Double union elbow**  
*Item No: SP109*

---

**Cone union elbow**  
*Item No: SP108*

---

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### Standard Fluid Filled System Fittings

#### Triple Test Slide Valve Mounting Bracket
- **Item No:** ST230
  - Mounting plate for use with test slide valve (see item SP121 on page 3).
  - Provides a neat and accessible method of mounting the test slide valve for pressure monitoring.
  - Also available as a Single Mounting Bracket (Item No: ST229)

#### Various Size Liners

<table>
<thead>
<tr>
<th>Type</th>
<th>Item No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liner nipple (long/short)</td>
<td>ST215</td>
</tr>
<tr>
<td>Long liner grooved</td>
<td>ST218</td>
</tr>
<tr>
<td>ecs stepped liner (o-ring)</td>
<td>ST212</td>
</tr>
<tr>
<td>Stepped liner (short)</td>
<td>ST227</td>
</tr>
<tr>
<td>Short nipple 7mm bore</td>
<td>ST226</td>
</tr>
<tr>
<td>Gauge liner</td>
<td>ST214</td>
</tr>
<tr>
<td>Short liner grooved</td>
<td>ST224</td>
</tr>
</tbody>
</table>

#### Various Size Nipples

<table>
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<tr>
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<th>Item No</th>
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<tr>
<td>Blanking nipple</td>
<td>ST203</td>
</tr>
<tr>
<td>Cone blanking nipple</td>
<td>ST208</td>
</tr>
<tr>
<td>Gauge fitting nipple</td>
<td>ST213</td>
</tr>
<tr>
<td>Short nipple (stepped bore)</td>
<td>ST225</td>
</tr>
<tr>
<td>O-ring nipple (stepped bore)</td>
<td>ST223</td>
</tr>
<tr>
<td>Valve blanking nipple</td>
<td>ST219</td>
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</table>

#### Brass Blanking Plug
- **Item No:** ST209
  - Blanking plug for sealing the end of a connection point or oil line.

#### Double End Union
- **Item No:** ST210
  - Necessary for joining two cone end fittings together.
  - In particular after using a 3 way adapter or cone elbow.

#### Nut Union
- **Item No:** SP220
  - All nuts available in brass or bronze.
  - 1/2" BSP
  - 3/8" BSP
  - 3/8" BSP (long)

#### Copper Pipe Fittings

<table>
<thead>
<tr>
<th>Type</th>
<th>Item No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible Copper Tubing</td>
<td>FP704</td>
</tr>
<tr>
<td>ecs can also provide smaller bore flexible copper tubing</td>
<td></td>
</tr>
<tr>
<td>Suitable to use with ecs liners &amp; in gauge pillars</td>
<td></td>
</tr>
</tbody>
</table>

#### Rigid Copper Pipe
- **Item No:** FP703
  - Specialist pipe with a thicker outer wall.

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ecs have been supplying new and reconditioned pressure tanks for over 10 years and have invested heavily in the
research and development of new designs. The maintenance of existing circuits, including transitions
to XLPE will often require additional tanks to maintain fluid pressure, either temporarily or permanently.
Using the circuit profiles ecs are able to calculate the optimum size, PP rating and quantity of tanks required for
the new hydraulic section.

ecs Pressure Feed Tanks
Standard tanks are available in sizes from 44 to 300 litres and rated from 1 (Normal) to 3 ATM, although
other variants can be provided if required.
All tanks are manufactured from Stainless Steel and
can be directly buried without the need for traditional
reinforced, spun concrete, bitumen filled sleeves.
All tanks are supplied complete with a GRP lid, sealing
grommets for all pipework entries and an engraved
circuit identification label.
The tanks are fully tested and filled with new degasified
oil. Each tank is RGP tested and a PV Curve is recorded.

A typical test curve recorded for each tank.

cs Shepherd’s Crook Item No: PT303
Used with the ecs oil tank, it completes the
connection from the oil tank top valve to the oil line.

ecs Shepherd’s Crook Liner Item No: PT304
Fitting to join shepherd’s crook (left) to pipe line.

ecs Pressure Feed Tanks
Pressure monitoring
gauges.
Various gauges are
available in different
diameters, pressure
ranges and stem types.

Item No: PG402

Item No: PG404

3 Way Adaptor Item No: PG401
Three way valve adapter with flat gauge fitting.
Required when mounting a gauge at a mid point
within the oil circuit.
Dependant on the type of gauge required.

ecs Alarm Panel
The ecs alarm panel contains alarm gauge terminal
box & provision for pressure transducer, where required.
Provides a visual display of the circuit pressure and, if
specified, can alert Control to any sudden or gradual
loss of pressure through Hard Wired Alarms, Transducer
or even SMS notification.
The alarm panel is suitable for universal fitting, in a pit,
In a kiosk, On free standing steel work or wall mounted
as required.
Should there be a leak in your system ecs are
able to offer a leak detection service.
**ecs Mobile Fluid Treatment Unit & TankTrailers**

The need for processing and deploying small to medium quantities of cable fluid on site has led **ecs** to design & build self-contained mobile facilities that fit into conventional vehicles and trailers. This allows Operators to use their current fleet of vehicles without the burden of owning and maintaining a traditional HGV unit.

The **ecs** designed units are more cost effective and, in smaller vehicles/trailers, have the intrinsic ability of being more manoeuvrable on site or in substations where access is often limited. **ecs** can provide a full on-site service for processing oil with its own mobile units or can build mobile treatment units to order. These may include Degasification Plant, Pressure Feed Tanks, Vacuum Pumps, Oil Pumps, Hose Reels, etc.

**ECS Tank Trailer (bottom right)** can offer an even more cost effective way of maintaining circuits when multiple users need degasified oil. The processed oil can be decanted into pressure feed tanks mounted in a trailer which enables work to continue at a remote end or different site. The size, rating & quantity of tanks can be specified to suit each Operators’ needs. **ecs** can build the unit in an existing free-issue trailer or supply the complete unit ready to tow away as required.

**Leak Location**

Using PFT technology **ecs** can search for leaks on fluid filled cable systems, the highly accurate method can detect leaks as low as 0.3 litres/day. To date **ecs** have been 100% accurate in identifying the leak. Leak located within 1.5m of the identified position.

Having located the leak **ecs** can supply the resources to repair the cable. From a single sheath repair to a full cable replacement.

**Cable and Transition Joints**

**ecs** can supply both Single and Three core fluid filled cable designs, as well as the latest XLPE products to complete any repair or diversion required on an existing pre-pressurised circuit. **ecs** has close working relationships & long term agreements with major cable manufacturers throughout the world. This gives **ecs** access to an extensive range of type tested products, stock and additional technical support to help in any situation.

**ecs** has its own teams of highly qualified and experienced cable technicians and jointers, who are fully qualified for all joint types and carry out a thorough and professional job from start to finish. **ecs** are experts in transition joint technology for oil & gas filled systems, from 33kV to 132kV both single core and three core. From sourcing the joints, right through to installation and testing, **ecs** will ensure the job is completed successfully and to the highest standard.

**ecs** are industry leaders in fault location and repair with the simple aim:-
keeping the supply network operating.
**ecs** will manage your job from start to finish with the least disruption possible.

**Transition Joint Top Bolts**

Ready-to-machine top bolts are designed for use with transition joints. Any size and combination of copper or aluminium can be prepared. In an emergency top bolts can be machined to match cables and top bolts, with minimum lead time.

**ECS Stainless Steel Feed Pipe**

Traditional fluid feed pipe is heavy and cumbersome. Lead pipe is difficult to work with & awkward to install. With this in mind **ecs** identified an alternative:-

**ecs** offers a stainless steel feed pipe that is lighter and more manoeuvrable. It has hassle free fittings in the form of the **ecs** Compression fitting ([Item no. SP106, see page 3]). With this feed pipe, there is no need for plumbing - making a quicker and more reliable seal.
**Other Services**

**ecs** have spent over 15 years building a industry wide reputation as the leading provider of high voltage power cable solutions. Should you have any cable or accessory problems **ecs** WILL be able to help you.

**ecs** supplies all cables, accessories, joints & terminations, link boxes, bonding leads, lugs, sheath testing, AC testing, fault location and repair, freezing of fluid filled cables, specialist projects, subsea projects, overhead line.

**ecs** operates a professional service that strives to maintain the reputation for being ‘the best in the industry’.

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**Vision**

To be the leading solutions provider for the design, supply and installation of specialised high voltage cable systems in the UK and worldwide.

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**Mission statement**

As experts in the design, supply, jointing & installation of high voltage cable systems, **ecs** aspires to be the global supplier & employer of choice working alongside the electricity network owners & major civil contractors both onshore and offshore.

**ecs** are committed to achieving this by recruiting & developing staff of the highest calibre & by behaving with integrity and honesty in every relationship, so that we can continue to deliver safe, reliable & cost effective results for our customers.

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