

# Screw Piling Equipment

## Our Screw Piling equipment can be used for various jobs!

### Wind Turbines

Wind Turbine foundations have to cope with a combination of alternating vertical, overturning moment and lateral loads. The Conical Anchors can resist lateral and axial loadings of 5kN and 120kN respectively. They can be installed quickly, in multiples of three or four, in most soils ranging from very soft peat to hard chalk. Measuring the installation torque is a reliable and proven method of establishing the capacity of a screw pile and gives great confidence to Specifiers.

- ✓ Cone shape can resist lateral loadings up to 5kNm.
- ✓ 60mm Anchors can resist axial loadings up to 120kN.
- ✓ Specially designed plates allow adjustments to ensure vertical towers, with around 75mm movement in all directions.
- ✓ Anchors can be extended up or down to achieve desired installation torque.
- ✓ Ideal for road sign bases, wind turbines and small towers.
- ✓ Also available is model 90, which can resist 25kNm.



### Solar Panels

For the installation of Solar Arrays we offer screw pile or vibrated foundation solutions. Mini diggers can utilise our Mini-Postmaster to install posts of up to 150mm diameter.

Screw Piles offer fast, accurate and versatile method of foundations for solar farms. They resist both uplift and compressive loads. With our wide range of hydraulic torque heads and vibrating post installers, we offer the complete package.

In general, pull out forces are greater than augered holes due to lack of ground disturbance around the post. This force will increase over time.





## Under Pinning

Screw Piles offer an excellent method of stabilising and restoring failed foundations.

- Piles can be installed quickly with little disruption to surrounding areas.
- Under-pinning brackets are fitted to pre-load the foundations and eliminate any further movement.
- Small extensions and conservatories can sometimes be restored to their original levels.



## New Eco Friendly Buildings

Screw Piles offer huge advantages to Builders of ECO friendly structures, as seen on [Grand Designs UK](#). They can be installed quickly and accurately to produce foundations of known capacity. There is no 'muck away' or the need for large amounts of concrete. Screw piles can also be removed easily leaving a clean and clear site.



## Bridge Foundations

Some bridge installations can be in an area that is very difficult to access with plant machinery or extremely boggy. Restrictions such as these mean that the majority of the foundations would have to be installed by hand and all the equipment would have to be brought to site manually. Our hand held torque heads can easily complete the job.



## Caterpillar Walkways





**Conservatories or Home Extensions**



## Hand Held Torque Heads

One of the biggest issues surrounding underpinning projects is that of access. There is often limited room for equipment, and for home owners there is understandable concern if the work must be carried out from within the building. For these jobs, work has been made easier through the introduction of handheld drivers for the installation of screw piles. Our handheld hydraulic anchor drivers utilise a separate powerpack, allowing the product to be used in confined spaces or areas of limited access such as inside buildings.

Existing drivers use a heavy motor/gearbox unit at the top of the pile, this means that not only do operators have to lift the heavy pile into a near vertical position, but the drive and torque reaction arm has to be lifted 2m in the air as well. This procedure is potentially hazardous and usually taxes the strength of operators to the limit.

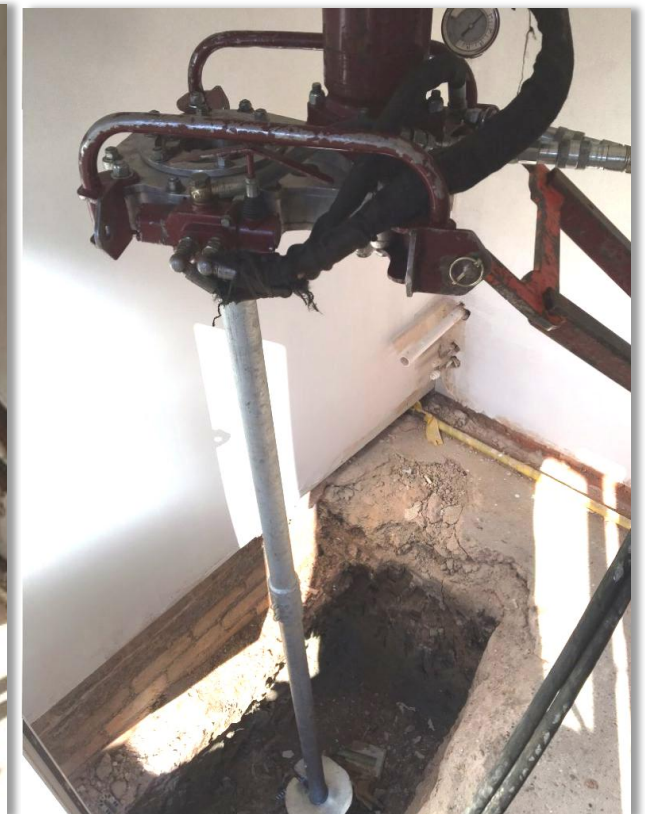
While the 400H or the 650H Hydraulic Drivers still aren't super light, but are much easier to operate. The handheld controls permit logical operation and offer immediate control, making for safer and more accurate installation rather than chasing foot controls in sometimes muddy trenches, which can be dangerous. The new driver permits the installation of 3m or even longer piles in one piece without the use of extensions, saving money and time.

Because the handheld hydraulic control is so sensitive too, piles can be installed within +/-1.5mm of correct depth. This makes the formation of precision foundations much easier.

### Features:

- Hydraulic power permits continuous operation.
- Ideal for 60R, 76R and 76RL screw piles - max capacity 190KN.
- Instant Torque readout from calibrated gauge.
- Unique 'Through Head' pile driving system allows installation of long piles in one piece.
- Quiet operation - powerpack can be remote from operation.
- Compact design allows installation close to existing foundation.
- High torque reversible motor.
- Telescopic torque arm is lightweight for ease of use.

### Underpinning from within a building



## House Subsidence

Screw piles can be used to stabilise and in some cases lift subsiding properties with very little disruption to surrounding areas.

Subsidence usually occurs because foundations have been installed on poor quality clay soils or where tree roots dry out the surrounding soils. Screw Piles can be installed to depths that reach good quality soils that are unaffected by moisture change and soil heave.



## 400H Portable Hand-held Screw Pile Installer

The 400H Hydraulic Hand-held through head 4kNm pile installer uses an industry standard powerpack and is made of high strength steel construction. There is an easy forward and reverse control on the unit itself with a telescopic torque reaction arm to hold itself steady while in operation. Max working pile load is 60kN.



## 650H Portable Hand-held Screw Pile Installer






The 650H Hydraulic Hand-held through head 6.5kNm pile installer also uses an industry standard powerpack and is made of high strength steel construction. Again there is an easy forward and reverse control on the unit itself with a telescopic torque reaction arm. Max working pile load is 97kN.



### Specifications

<b>Model</b>	400H	650H
<b>Housing</b>	Aluminium	Swedish Steel
<b>Maximum Torque</b>	4,000Nm	6,500Nm
<b>Ultimate Pile capacity (un-factored) torque</b>	120kN	180kN
<b>Bearings</b>	Precision ball bearings - sealed for life	
<b>Output</b>	Hollow Shaft drive socket to suit round or square shafts	
<b>Controls</b>	Forward & Reverse spool valve located on handle, relief valve set @140BAR	
<b>Power</b>	30 litres/min Hydraulic power pack with oil cooler, 13hp Honda Petrol engine and power on demand system.	



	<b>60R</b>		<b>76R</b>		<b>89R</b>
<b>Screw Pile Range</b>					
<b>Torque Head Model</b>	<u>400H</u>	<u>500X</u>	<u>650H</u>	<u>1600X</u>	<u>2500X</u>
					
<b>Max Torque</b>	<u>4kNm</u>	<u>5kNm</u>	<u>6.5kNm</u>	<u>16kNm</u>	<u>25kNm</u>
<b>Machine Type</b>	<u>Hand-held</u>	<u>Excavator</u>	<u>Hand-held</u>	<u>Excavator</u>	<u>Excavator</u>
<b>Ultimate Pile capacity (un-factored) torque</b>	<u>120kN</u>	<u>150kN</u>	<u>180kN</u>	<u>450kN</u>	<u>625kN</u>
<b>Safe Working Load (2.5 FOS)</b>	<u>48kN</u>	<u>60kN</u>	<u>73kN</u>	<u>180kN</u>	<u>250kN</u>

**Un-factored Load** - A Maximum load that the Pile will take before deflection exceeds standard limits.

**FOS - Factor of Safety** - is the ratio between the un-factored load and the working load

**Safe Working Load** -The actual load the pile is taking when the building is in place

## Screw Pile Specifications

SPECIFICATION	DEFINITION	60R	76R	89R
Wall Thickness	Thickness of the screw pile tube wall	6.35mm	9.5mm	9.5mm
Torque Limited	The ability of the pile to transmit torque is always the limiting factor. This is therefore the ultimate practical pile install torque capacity.	4kNm	16kNm	25kNm
Ultimate Strength Single Helix	This figure shows the load which can be supported by a single helix- most piles use multiple helixes, but if a single one has to support more load, although non standard, this can be accommodated.	90kN	160kN	220kN
Empirical torque factor $KtKt\ m^{-1}$	This is the "Empirical Torque Factor" expressed in metric units when torque is measured in kNm and force in kN. Its value decreases as pile diameter and helix plate thickness increases. This is due to a combination of skin friction and the energy needed to displace the soil.	$30m^{-1}$	$28m^{-1}$	$25m^{-1}$
Tube Specification		S355 HFS	DIN1629 ST52 or Equal	S355 HFS
Helix Specification		BS4360 43A	BS4360 43A HRMS	BS4360 43A
Fasteners Specification		Metric M16 GR8.8	ISOM20GR8.8	Metric M22 GR 8.8

## Pile Life/Corrosion

In most conditions, provided the top 2 metres are galvanised the pile life will be in excess of 100years. Where the soil resistivity is less than 10 Ohm– further steps must be taken. This means salt water, wet peat and where soils are subject to saturation. For more information please download the soil corrosion chart.

The estimated life is based on the assumption that a loss of 40% in thickness is acceptable without adverse effect on structural integrity. The atmospheric exposed areas of the piles are coated with high build zinc rich coating system or galvanised. There is a safety factor of x2 included for the anode design to take account of variances in corrosion conditions and ground resistivity.

Ground Resistivity(Ohm-m)	Corrosion rate based on Uhlig data mm/yr	Estimates life with corrosion protection (years)	Corrosion protection methods, required for top 2m section of Pile. (Min 9.35mm wall thickness)	Estimated life with additional corrosion protection* (years)
Less than 5	0.1-0.2	18-37	Zinc rich coating 4 x 20kg galvanic zinc bracelet	100
5-10	0.033	80+	Zinc rich coating 4 x 20kg galvanic zinc bracelet	100+
10-50	0.025	100	Zinc rich coating	100+
50-100	0.018	100+	n/a	100+
Greater than 100	0.014	100+	n/a	100+

## Screw Pile Installation

All torque heads come equipped with torque gauge for driving screw piles to the correct installation torque.

## Soil Test Probe

This 'Golf Bag' size kit allows the user to determine approximate soil SPT values and allocate soil classification numbers to the strata.

A blunt auger is screwed into the soil and rotational torque values measured at 0.5m depth intervals. Reference to the chart will give SPT values.

Being hand held or driven with a high torque battery drill, the equipment produces data allowing the engineer to design the most suitable pile configuration for the calculated pile loads. Measurements of the actuals during pile installation and correlation with the data collected using the soil test probe will allow the design for the best economy.

On many small projects this can result in overall price reduction while conferring a high level of confidence in the finished result.



## Soil Classification Data

Class	Common Soil Type	Geological Soil Class	Probe Values Nm	Typical Blow Count "N" per ASTM-D1586
0	Sound hard rock - unweathered	Granite, Basalt, Massive Limestone	N/A	N/A
1	Very dense and/or cemented sands; coarse gravel & cobbles	Caliche (Nitrate-bearing gravel/rock)	85-181	60-100+
2	Dense fine sands; very hard silts and clays (may be preloaded)	Basal till; boulder clay; caliche; weathered laminated rock	68-85	45-60
3	Dense sands and gravel; hard silts & clays	Glacial till; weathered shales; schist; gneiss & siltstone	56-68	35-50
4	Medium dense sand gravel; very stiff to hard silts & clays	Glacial till; hardpan; marls	45-56	24-40
5	Medium dense coarse sands & sandy gravels; stiff to very stiff silts & clays	Saprolites, residual soils	34-45	14-25
6	Loose to medium dense fine to coarse sands to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils	23-34	7-14
7	Loose fine sands; alluvium; loess; medium - stiff and varied clays; fill **	Flood plain soils; lake clays; abode; gumbo, fill	11-23	4-8
8	Peat, organic silts; inundated silts, fly ash very loose sands, very soft to soft clays **	Miscellaneous fill, swamp marsh	0-11	0-5

The torque to capacity equation –  $Q_u = K_t \times T$  where  $Q_u$  = uplift (or compression) capacity in kN,  $K_t$  = torque factor  $m^{-1}$  and  $T$  = torque in kNm. This equation has been proven to be a very reliable predictor of pile/anchor capacity, especially for piles with a shaft diameter less than 150mm. A simple test can establish a site specific value for  $K_t$ , generally starting at 30 for small diameter piles and reducing as the shaft gets bigger.



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