



Installation



Grouting



Completion



TITAN Preventer System

- Ground engineering installations without dewatering

TITAN Preventer System

The TITAN Preventer is used to install micropiles and tie-back anchors in areas where water ingress is a distinct possibility, for example in existing or new basements and underground structures.

By using the Preventer system, dewatering is often not required.

Features and benefits

- Allows the installation of micropiles and tie back anchors without the need for dewatering
- Safe, controlled and efficient installation
- Economical installation, when compared to dewatering
- Simple operating procedures



Description

The Preventer system is essentially a valve system that is connected to a compressor via an airline. The system is operated by opening and closing the rubber insert, by applying air pressure to inflate and deflate the rubber insert. When the rubber insert is in the 'closed' (inflated) position, it restricts the ingress of water, whilst pressing tight against the micropile/anchor, allowing the installation and grouting to be completed.

The Preventer is fixed securely to the structure prior to commencing the installation. It is removed once the grout has completely cured, exposing the top of the micropile/anchor ready for the head detail to be constructed.

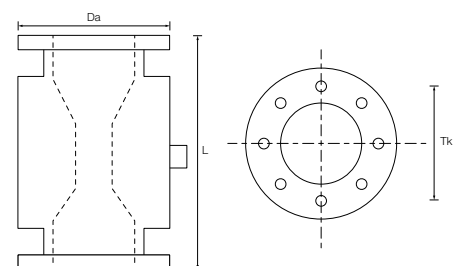
Typical applications

- Tension micropiles to resist uplift
- Tie-back anchors for secant piled walls, diaphragm walls and sheet piled walls
- Compression micropiles



Product specification

Type	Di	Da	L	Tk	P max.	Weight	Max. TITAN drill bit
	mm	mm	mm	mm	bar	kg	mm
DN150	145	285	420	240	6	17.5	130
DN250	250	395	610	350	3	55	220



Typical Preventer Method Statement

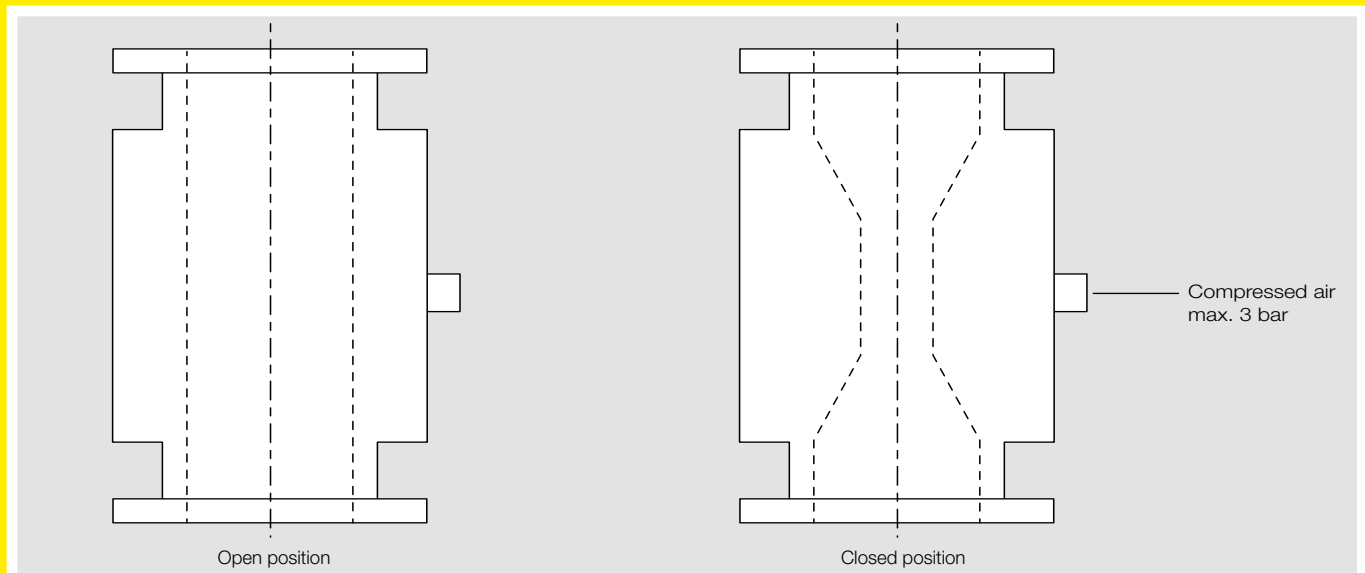


Core holes

- All drilling/micropile positions are marked on the basement concrete slab.
- The micropile positions are diamond core drilled, using a water lubricant.
- The concrete slab is core drilled to a pre-determined depth, passing through the last row of steel reinforcement within the concrete slab.
- It is very important that you do not penetrate through the concrete slab or waterproof membrane.
- As a precaution a mechanical packer should be positioned close to the core hole to control any groundwater caused by over coring.
- Once the core drilling is completed, the walls of the core hole are roughened up using an electric hammer to improve the friction/bond capacity between the existing concrete slab and the new head detail.
- The core hole should then be cleaned of any concrete debris.

Preventer set up

- Four mechanical anchor bolts are installed into the concrete basement slab, positioned in line with the holes at the base of the Preventer.
- A rubber gasket is then positioned over the four bolts, sitting directly on to the concrete slab.
- The flange head plate and gate valve are installed directly over the core hole/gasket arrangement and bolted to the slab with the anchor bolts.
- The Preventer is then fixed and secured to the flange head plate using four M12 bolts.
- The Preventer is essentially a valve system, which is connected to a compressor via an airline. The system is operated by opening and closing the rubber insert, by applying air pressure to inflate (close) or deflate (open) the rubber inserts.



Gate valve



Preventer with blank flange



Micropile installation

Micropile installation

- Adjust the Preventer pressure to allow a 'gentle' backflow, to lubricate the rubber insert.
- It is the responsibility of the preventer engineer to determine the required pressure during the installation process.
- Use a weak grout flush as a flushing fluid.
- The quality of the cement grout body and bond are improved by adopting a slower drilling rate and frequently cleaning out the drill hole.
- This procedure allows the debris to be flushed from the drill hole to the surface and should be continually monitored by the drilling operative.

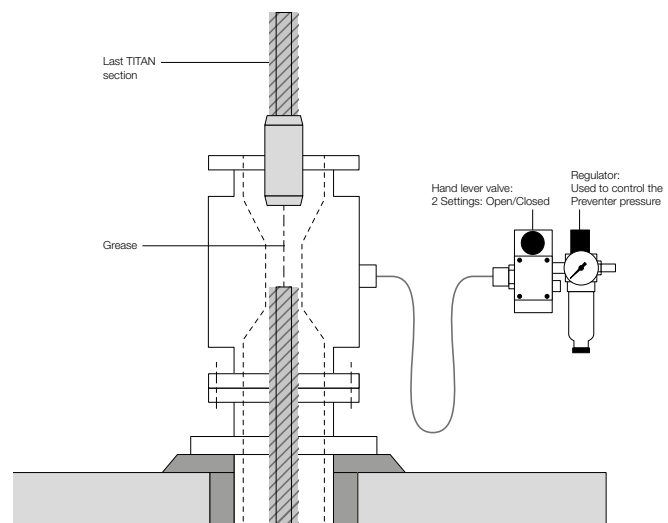
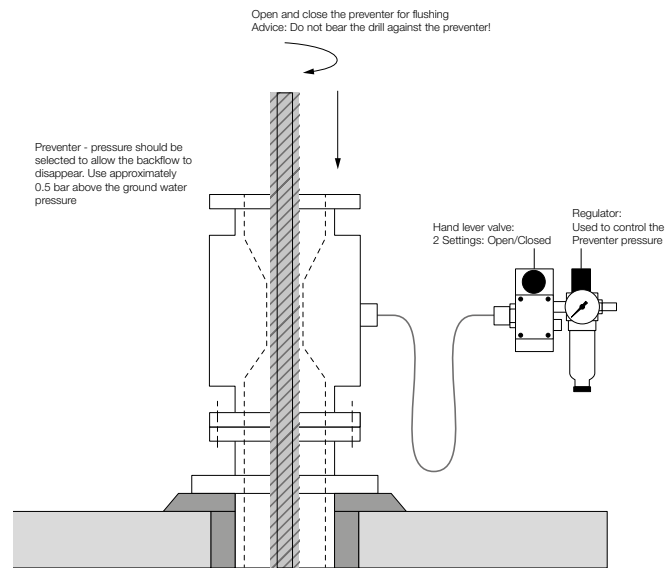
Grouting

- Once the micropile has reached the design depth, dynamic pressure grouting is carried out.
- The cement grout used for the micropile should have a typical water/cement ratio of 0.4, with a strength = 35N/mm² after 28 days.
- The stiff grout mix displaces the thinner flushing medium used to support the drill hole, encouraging it to return to the surface.
- The drilling operator monitors the consistency of the grout mix and is responsible for determining when the dynamic grouting process should be stopped.
- The micropile is installed to its final design depth by using a recoverable extension bar and coupling nut.
- The assembly is loosened and flushed with water, inside the Preventer to clean it.
- The last section of the micropile is then pushed to a pre-determined depth below the top of the basement slab.
- The gate valve is then closed, and non-shrink grout is injected, to fill the micropile head, which provides contact to the existing concrete slab.
- Once the grouting procedure is completed, a blank flange plate and gasket is bolted to the top of the Preventer to close the unit completely.
- The compressed air is set to allow the disassembly and cleaning process.
- After 6 – 12 hours from installation the Preventer can be removed, leaving the flange and gate valve in place.
- Once the grout is cured, the flange/gate valve assembly can be removed.
- The head detail arrangement is constructed (if required).
- The local slab area is cleaned, and non-shrink grout is injected into the core hole up to the slab surface.

Notes:

Please note that the above is purely an indicative method statement, which will vary according to the site and ground conditions experienced.

It is the responsibility of the contractor to compile the method statement in line with the expected site conditions.





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