Embedded Grout Injection Pipe System

In recent years, Shield Tunnel Boring Machines or STBM's have been utilized for tunnel construction in deep elevations, high water pressure conditions, at or below sea level and in high density metropolitan areas. The tail skin grout injection system, utilized during the advancement of the TBM, has been adapted to include an embedded grout injection system. Sagami Servo's Embedded Grout Injection System (SEGIS) Type D-32 has a B liquid nozzle designed for trouble-free loading and a parallel cylinder structure which is easy to maintain and saves normal maintenance time.

【Features】

1) Up to ten (10) B liquid nozzles can be loaded inside the injection pipe, saving time to replace or maintain the nozzle. These nozzles are disposable and when ejected can easily be replaced by the next preloaded nozzle.

2) Replacing the B liquid nozzle under high pressurize conditions is easily achieved because the nozzle can be ejected out and detached from the SEGIS while under pressure.

3) When the Gelly grout, a mixture of A and B grout components, is extruded out of the chamber, the ejector head creates a seal isolating the tail void, thereby preventing the System from clogging and the invasion of outer soil and grout into the system.

4) Clogging can occur in the mixing chamber during breaks between grouting operations. The B liquid nozzle, which includes a one way valve and is surrounded by the ejector head, is designed to be ejected out of the SEGIS and cast off into the grout zone. A seal is created between the grout zone and the SEGIS, which prevents leaks, clogging and backflow and the inadvertent mixture of A and B liquids inside the mixture chamber.

5) Stable and consistent grout injection is achieved by flushing the A Liquid supply line with water when grouting begins, reducing interruptions in operations for maintenace.

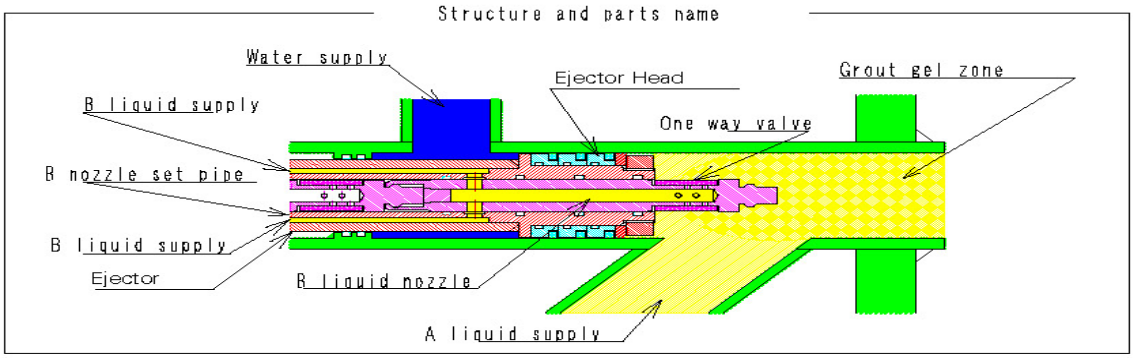
6) Water injection and discharge into the tail void is reduced because water flushing is not required after every grout operation process .

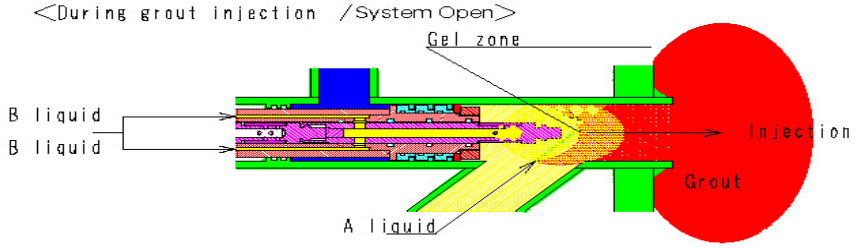
Grout Injection Pipe overall view

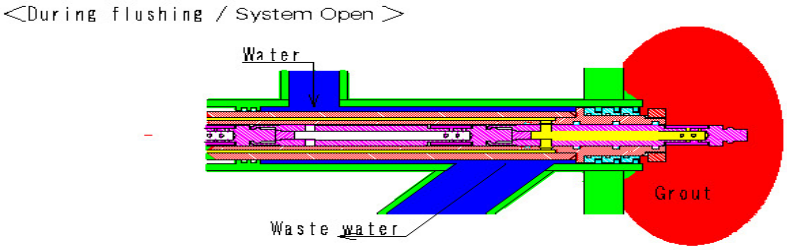
Closed position

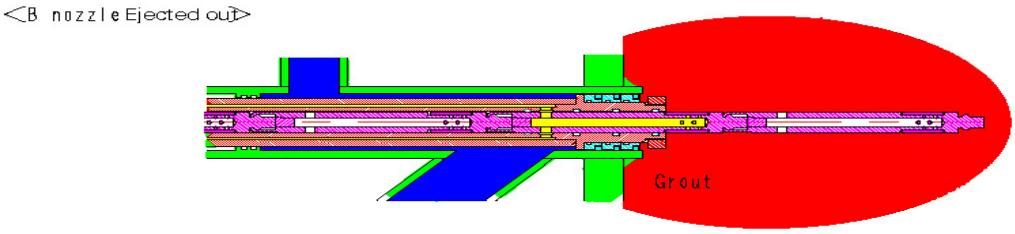
Open position

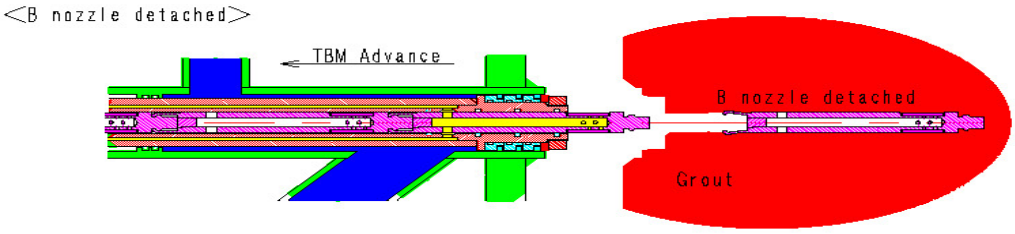
Grout Embedded Injection System - Motion flow



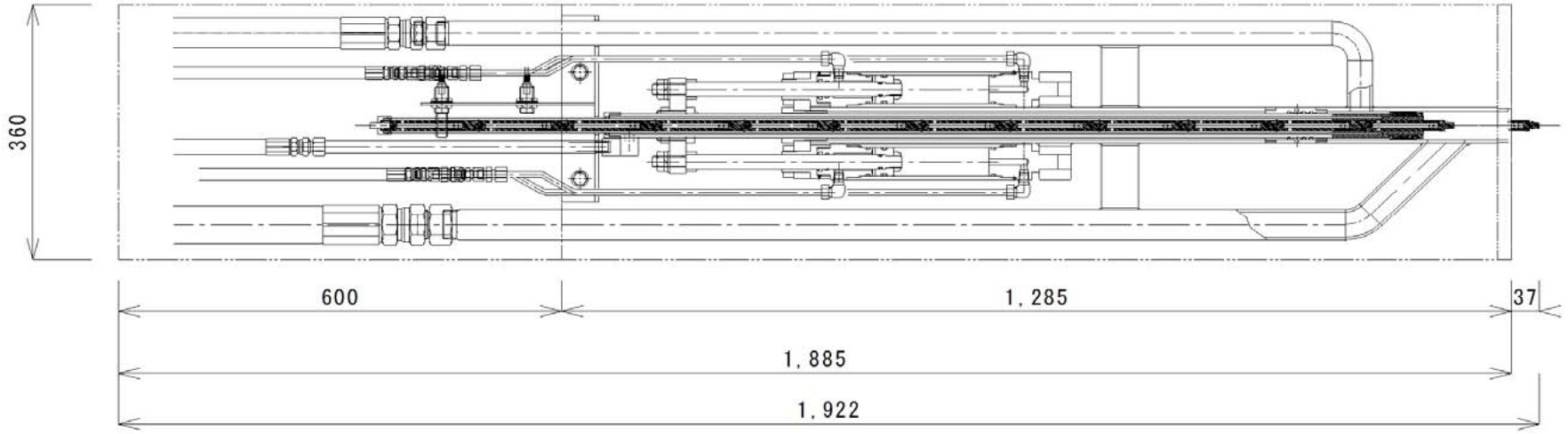


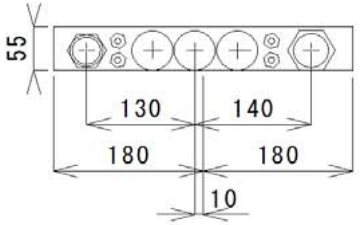






Dimensions (For reference)





＜Specification (For reference)＞

Water flush line	: 25A (Press resistance : 3.5MPa)
A liquid line	: 32A (Press resistance : 3.5MPa)
B liquid line	: 15A (Press resistance : 3.5MPa)
Advance load	: 8A 52.7kN (At 21MPa) (Hydraulic Press resistance : 31.5MPa)
Retract load	: 8A 39.6kN (At 21MPa) (Hydraulic Press resistance : 31.5MPa)
Jack Stroke	: 120mm -
Oil volume	: 0.15L×2
Proximity Sensor	: 24VDC, 2wires