



ROTARY EQUIPMENT FOR TUNNELLING

The main features of ST-120 is that there are 2 drilling guides, mounted and controlled independently of each other and supported by 2 telescoping rams, which are connected to the main frame by means of 2 slewing rings.

The main frame of the rig is of crawler type complete with 4 outriggers and sliding frame for positioning slew rings at different heights and levels to meet the requirements of the tunnel to be excavated. The mast is equipped with an hydraulic telescoping foot pad wich can be placed against the excavating face. This allows the use of rope operated crowd system/pull back to be applied to drill string. Once the mast has been positioned as required, the consolidation treatment can be completed. Connected to the slew rings are the supports for the mast. This configuration allows drilling to be carried out through 180°.

This allows for the drill guides to be positioned at different heights and levels to meet the requirements of the tunnel to be excavated. The drilling guides are equipped with hydraulic telescoping foot pads wich can be placed against the face of the excavation. This allows the use of a rope operated crowd system/pull back to be applied to drill string. Once the drill guides have been positioned as required, the consolidation treatment can be completed.

The following drilling techniques can be applied using the SM-605DT/AV:

- Rotation (with or without casing)
- Rotopercussion by means of Top Hammer (with or without casing)
- Rotopercussion by means of Down the Hole Hammer (with Tubex system or without casing)

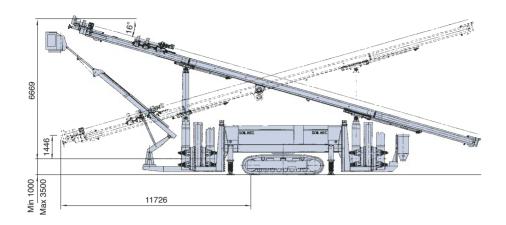
In addition to the ST-120 development the 605 series has a new interesting features, which is:

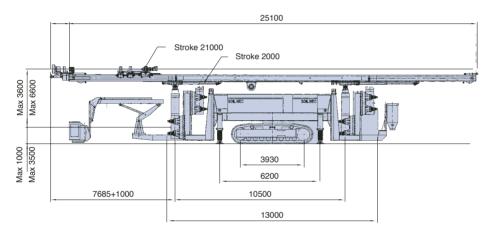
- Increased ability to work up to 12m away from the tunnel face.
- Can be manufactured in explosion proof version, to meet stringent legislation.
- The design of the machines allows for a working platform to be fitted in addition to the shorter boom which facilitates operation of the machine on inclines from 16° to a maximum of 37°.

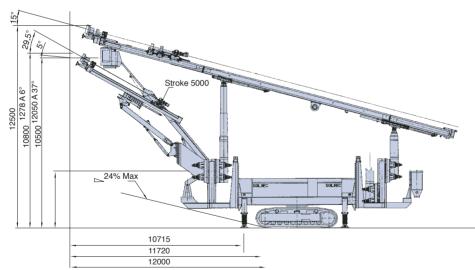
The DT model, i.e. Double Boom, has been specially designed to work with 2 drilling units, which can be operated complete indipendently of each other, as they are powered and controlled by two separate control boards and power packs. Each drill guide can cover the whole tunnel vault to consolidate.

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Gear box ratios 1 Max. nominal torque (31.5 MPa) daNm 852 @ 76 rpm Hoist & feed system Rod lenght type (c/w one rotary head) m 12 Feed type Winch type Feed stroke mm 16000 - 18000 - 21000 Maximum hoist pull kN 84 Maximum feed force kN 84 Maximum speed (fast/low operation) m/min 30 - 5 Clamp & hydraulic joint breaker Nominal size mm 60-225 Maximum clamping force (28 MPa) kN 159 Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa)	MPa I/min MPa I	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm
Gear box ratios 1 Max. nominal torque (31.5 MPa) daNm 852 @ 76 rpm Hoist & feed system Rod lenght type (c/w one rotary head) m 12 Feed type Winch type Feed stroke mm 16000 - 18000 - 21000 Maximum hoist pull kN 84 Maximum feed force kN 84 Maximum speed (fast/low operation) m/min 30 - 5 Clamp & hydraulic joint breaker Nominal size mm 60-225 Maximum clamping force (28 MPa) kN 159 Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa)	MPa I/min MPa I daNm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm
Max. nominal torque (31.5 MPa)daNm852 @ 76 rpmHoist & feed system Rod lenght type (c/w one rotary head)m12Feed typeWinch typeFeed strokemm16000 - 18000 - 21000Maximum hoist pullkN84Maximum feed forcekN84Maximum speed (fast/low operation)m/min30 - 5Clamp & hydraulic joint breaker Nominal sizemm60-225Maximum clamping force (28 MPa)kN159Maximum breaking torquedaNm3830	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed	MPa I/min MPa I daNm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm
Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force Maximum speed (fast/low operation) Clamp & hydraulic joint breaker Nominal size Maximum clamping force (28 MPa) Maximum breaking torque Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head	MPa I/min MPa I daNm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm
Rod lenght type (c/w one rotary head) m 12 Feed type Feed stroke mm 16000 - 18000 - 21000 Maximum hoist pull kN 84 Maximum feed force kN 84 Maximum speed (fast/low operation) m/min 30 - 5 Clamp & hydraulic joint breaker Nominal size mm 60-225 Maximum clamping force (28 MPa) kN 159 Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios	MPa I/min MPa I daNm rpm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457
Feed type Feed stroke Maximum hoist pull Maximum feed force kN Maximum speed (fast/low operation) Clamp & hydraulic joint breaker Nominal size Maximum clamping force (28 MPa) Maximum breaking torque Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa)	MPa I/min MPa I daNm rpm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457
Feed stroke mm 16000 - 18000 - 21000 Maximum hoist pull kN 84 Maximum feed force kN 84 Maximum speed (fast/low operation) m/min 30 - 5 Clamp & hydraulic joint breaker Nominal size mm 60-225 Maximum clamping force (28 MPa) kN 159 Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system	MPa I/min MPa I daNm rpm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm
Maximum hoist pullkN84Maximum feed forcekN84Maximum speed (fast/low operation)m/min30 - 5Clamp & hydraulic joint breakermm60-225Nominal sizemm60-225Maximum clamping force (28 MPa)kN159Maximum breaking torquedaNm3830Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head)	MPa I/min MPa I daNm rpm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm
Maximum feed forcekN84Maximum speed (fast/low operation)m/min30 - 5Clamp & hydraulic joint breakermm60-225Nominal sizemm60-225Maximum clamping force (28 MPa)kN159Maximum breaking torquedaNm3830	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type	MPa I/min MPa I daNm rpm daNm	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm
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Clamp & hydraulic joint breaker Nominal size mm 60-225 Maximum clamping force (28 MPa) kN 159 Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force	MPa I/min MPa I daNm rpm daNm m mm kN	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84
Nominal size mm 60-225 Maximum clamping force (28 MPa) kN 159 Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force	MPa I/min MPa I daNm rpm daNm m mm kN kN	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84 84
Maximum clamping force (28 MPa)kN159Maximum breaking torquedaNm3830	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force Maximum speed (fast/low operation)	MPa I/min MPa I daNm rpm daNm m mm kN kN	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84 84
Maximum breaking torque daNm 3830 Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force Maximum speed (fast/low operation) Clamp & hydraulic joint breaker	MPa I/min MPa I daNm rpm daNm m mm kN kN kN m/min	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84 84 84 30 - 5
Mass	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force Maximum speed (fast/low operation) Clamp & hydraulic joint breaker Nominal size Maximum clamping force (28 MPa)	MPa I/min MPa I daNm rpm daNm m mm kN kN kN m/min	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84 84 30 - 5
Total weight (theoretical) kg 110000 - 120000	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force Maximum speed (fast/low operation) Clamp & hydraulic joint breaker Nominal size Maximum clamping force (28 MPa)	MPa I/min MPa I daNm rpm daNm m mm kN kN kN m/min mm kN	30/28 47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84 84 30 - 5
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	Main pumps: variable displacement axial pumps Set pressure main pumps Auxiliary pumps: gear pumps Set pressure auxiliary pumps Hydraulic oil tank capacity Standard rotary head Gear box ratios Max. nominal torque (31.5 MPa) Maximum drilling speed Double rotary head Gear box ratios Max. nominal torque (31.5 MPa) Hoist & feed system Rod lenght type (c/w one rotary head) Feed type Feed stroke Maximum hoist pull Maximum feed force Maximum speed (fast/low operation) Clamp & hydraulic joint breaker Nominal size Maximum clamping force (28 MPa) Maximum breaking torque Mass	MPa I/min MPa I daNm rpm daNm m mm kN kN m/min mm kN daNm	47 / 2 x (46+24) 10 / 3 456 3 1363 @ 47 rpm 457 1 852 @ 76 rpm 12 Winch type 16000 - 18000 - 21000 84 84 30 - 5 60-225 159 3830
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ROTARY EQUIPMENT FOR TUNNELLING





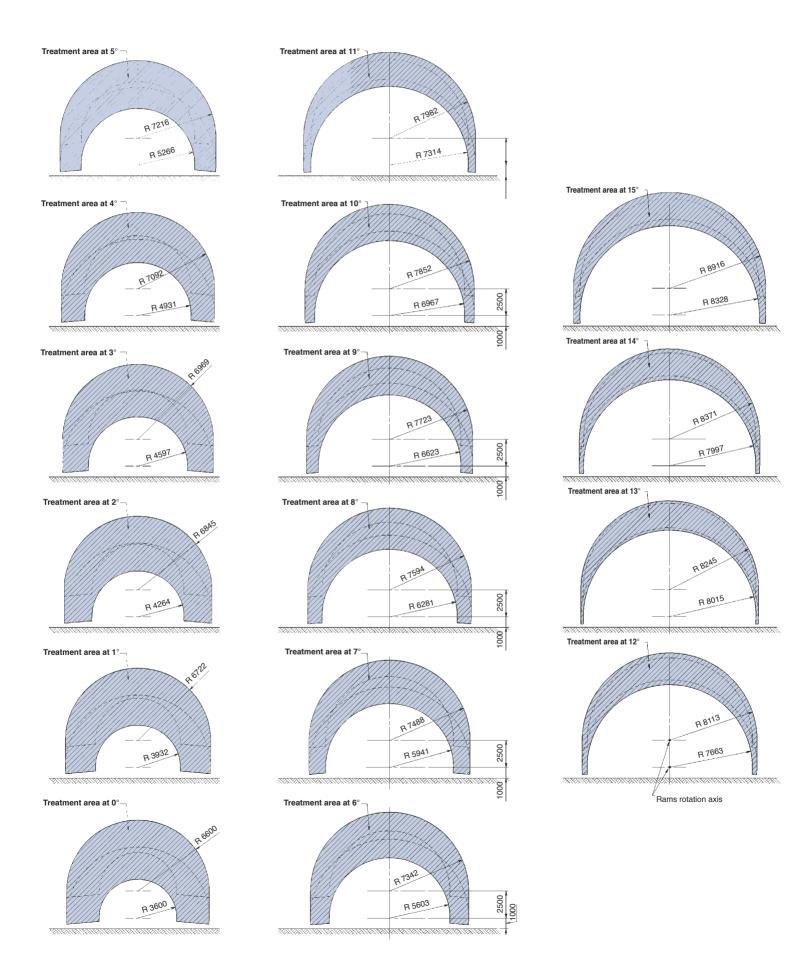








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