

**INDOOR
OPTIMIZED
EQUIPMENT**
www.sacpro.se

 **SACTOOLS®**
a product line from **SACPRO**

USER MANUAL

SACTOOLS EXTRUDER

INVERSION DRUM 350, 500, 700, 700 SLIM, 900

FOREWORD

Congratulations on your purchase of Sactools Extruder (inversion drum)! We are confident that you have chosen the best product for working with relining.

Sactools Extruders are designed for installation of flexible liners pipes in sizes 50mm to 250mm. The design and the low weight means that they are very well suited for installations inside buildings. Sactools Extruders are available in four different sizes to meet all needs. We have invested a lot of effort in the development to ensure that the user gets the best possible equipment.

The pressure vessel is made of aluminium for maximum strength combined with low weight. A sturdy but lightweight steel frame keeps the Extruder stable during use and makes it easy to fasten it in a vehicle when moving between jobs. The wheels are large and makes it easy to move and the big wheel handle gives the user maximum control of the installation. Large sight glasses provide a good overview into the pressure vessel during work. The placement of the pressure gauge and compressed air connections are thoroughly tested for maximum availability.

To complement the Extruder, we have developed a full line of accessories that further simplify operation. We now wish you good luck and many years of safe and effective installations!

SAFETY IN USE AND HANDLING

Sactools Extruders are designed with safety and accessibility in mind. Pressure and tightness is tested in each unit before shipping. We always use the best components on ball valves, safety valves and every connection. It is of importance that the user understands how to work with the equipment and how to work safely. Use only Sactools original spare parts and accessories, to obtain the high safety level of the original product.



It is not allowed to change the safety valve to one with higher opening pressure than 1 bar and thereby be able to exceed the maximum allowable pressure of 1 bar.

Always keep the equipment in good condition and immediately replace damaged parts, find out more about this in "Check before use". Always lock the wheels to avoid the Extruder from moving out of position. This may cause damage to people and furnishings.

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DIFFERENT MODELS



1. EXTRUDER 350



2. EXTRUDER 500



3. EXTRUDER 700



4. EXTRUDER 700 SLIM



5. EXTRUDER 900

1 Sactools Extruder 350

Inversion drum that holds appr. 9m of impregnated 150 liner. Storz 6" Connection. Weight 14kg. Length 55cm, width 44cm, height 48cm.

2 Sactools Extruder 500

Inversion drum that holds appr. 18m of impregnated 150mm liner. Storz 6" Connection. Weight 38kg including frame and wheels. 360° rotation. Length 86cm, width 63cm, height 112cm. Prepared for water circulation and spray lubrication.

3 Sactools Extruder 700

Inversion drum that holds appr. 38m of impregnated 150mm liner. Storz 6" Connection. Weight 50kg including frame and wheels. 360° rotation. Length 91cm, width 72cm, height 118cm. Prepared for water circulation and spray lubrication.

4 Sactools Extruder 700 Slim

Inversion drum that holds appr. 38m of impregnated 150mm liner. Storz 6" Connection. Weight 59kg including frame and wheels, 50 kg without the detachable wheelstand. 360° rotation. Length 91cm, width 59cm, height 118cm (96 cm without wheelstand). Prepared for water circulation and spray lubrication.

5 Sactools Extruder 900

Inversion drum that holds appr. 50m of impregnated 225mm liner. Storz 8" Connection. Weight 80kg including frame and wheels. 360° rotation. Length 120cm, width 82cm, height 128cm. Prepared for water circulation and spray lubrication.

SAFETY



Always wear safety glasses, protection gloves, full covered clothing and shoes with toe cap when working with relining.



The working pressure for the compressed air is adjusted with Sactools precision regulator and may under no circumstances exceed the maximum allowed pressure of 1 bar gauge pressure. At higher pressures the safety valve will open. In case of any defect on the safety valve, it may only be replaced by Sactools original spare part with the same opening pressure.

Always use the brakes to lock the front wheels when the Extruder is parked. It is important that the Extruder is standing still during installation and curing of the liner.

Fold in the handle on the centre axis wheel handle. Always keep one hand on the wheel handle when the compressed air is connected and the shaft lock is released. This is important to avoid injuries and to have control at installation procedure, that the wheel handle don't starts to spin without control.

If the Extruder has fallen, being dropped or have been exposed to other violent treatment, it should be pressure and leak tested before being put into service again. Sactools Extruder should only be used for installation of flexible liners and other hoses associated with such work.

The Extruder may not be modified without consultation and written agreement from the Technical Manager at Sacpro AB. Any other use than installing flexible liners is prohibited.

PRE USE CHECK LIST

The installer should always make sure that the Extruder is in such condition, that the work can be done safely and without unexpected interruptions.

- Check that the Storz connectors are fully tightened - both at the sight glass and at the inversion.
- Make sure the inside of the drum is clean.
- Remove any residues of epoxy and any foreign objects.
- Check that all the wheels are rolling easily and that the wheel brake works.
- The wheel handle must be undamaged and the centre axle should spin easily.

- Check that the liner guides on the centre axle inside the drum is easily adjusted and fix them in the actual measure for the current liner that is to be used.
- The liner guides must not be squinted or otherwise damaged. Otherwise the liner may tip over when it's wound up and the liner may be damaged.
- Check that the pressure gauge is undamaged and shows the correct pressure. Also check that all pneumatic connections and valves are intact and tight.
- Check the shaft bushings are tight to avoid excessive consumption of compressed air during installation and curing.

CHECKS EVERY MONTH

- Make sure that all the screws in liner guides are properly tightened.
- Check that the safety valve operates at 1 bar gauge pressure and that the safety valve cover is correctly seated.
- Check that pressure gauge shows the correct value.
- Check that it's possible to release the sight glass on the Extruder 700 and 900.

TRANSPORT AND FASTENING, LOCKING THE WHEELS

Always fasten the Extruder when it's transported in a vehicle, to avoid damage to the vehicle or other equipment. Always lock the wheels when the Extruder is parked to prevent it from moving.

CARE AND MAINTENANCE

A clean and well-maintained Extruder is safe and much nicer to work with. Wipe away any drops or stains with epoxy from both outside and inside immediately. The Extruder can be washed with hot water and / or pressure washer. Lubricate all the moving parts with viscous oil. Wipe off any excess of lubricant. Immediately replace broken parts with Sactools Original replacement parts. Always use threading sealant on fittings and connections to avoid leakage in the connections.

DESCRIPTION AND PICTURES



- 1** Vessels
- 2** Frame with handles (not 350)
- 3** Swivel castors with a brake (not 350)
- 4** Compressed air connections
- 5** Safety-Valve
- 6** Pressure gauge
- 7** Nose with Storz or Camlock connection
- 8** Sight glass for monitoring (not 350)
- 9** Sight glass for lighting (not 350)
- 10** Connection for Sactools spray

system, see accessories

- 11** Connection inlet of hot water for recirculation (not 350), see accessories
- 12** Connection for hot water outlet for recirculation (not 350), see accessories
- 13** Handle wheel for centre axle
- 14** Centre axle latch
- 15** Latch for the drum rotation adjustment (not 350)
- 16** Handle for the drum rotation adjustment (not 350)

- 17** Carrying handle (only 350)



Straight through axle with all of its features:

- 18** Water circulation with connection (not 350)
- 19** Adjustment of the axle support

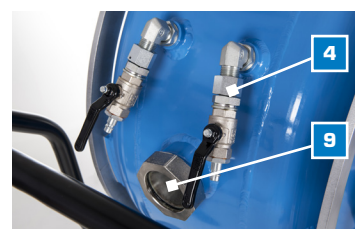
DESCRIPTION AND PICTURES SACTOOLS EXTRUDER 700 SLIM



- 1** Vessels
- 2** Frame with handles
- 3** Swivel castors with a brake
- 4** Compressed air connections
- 5** Safety-Valve
- 6** Pressure gauge
- 7** Nose with Storz or Camlock connection
- 8** Sight glass for monitoring
- 9** Sight glass for lighting
- 10** Connection inlet of hot water for

recirculation, see accessories

- 11** Connection for hot water outlet for recirculation, see accessories
- 12** Handle wheel for centre axle
- 13** Centre axle latch
- 14** Latch for the drum rotation adjustment
- 15** Extendable carrying handles
- 16** Release buttons to extend/reduce carrying handles
- 17** Detachable wheelstand
- 18** Handle to release/attach wheel-



REPLACING THE INVERSION

To facilitate the installation of the liner, we have developed various inversions for different purposes. The inversion is easy to shift.

Use two Storz hatches, one on the Extruder and one to the connector. Turn the connector ¼ turn counter clockwise to remove. Turn the connector ¼ turn clockwise for mounting. Lubricate with a little dab grease on the lugs if it's hard to attach the connector. Use a couple of drops of cooking oil or soap on the rubber sealings. Wipe off any excess. See accessories list for available inversions and utilities.

INSTALLATION STEPS

For impregnation of the liner and all necessary preparations before installation, see the instructions for Sacpipe Connection System.

Ensure that an air compressor with sufficient capacity, up to 300 l / min free air delivery at 6 bar is used for the installation. Make sure that all the valves are closed before the compressed air is connected. Only one of the valves should be connected to the compressed air. The other is used for the compressed air evacuation. It's possible to connect a hose to outlet valve if you want to evacuate the air somewhere else. Note that the hose end must be completely open.

Lubrication

The liner must be lubricated with a suitable lubricant before the installation. Apply soapy water or cooking oil on the liner. The lubrication is greatly simplified with Sactools Lubricating Spray System, see accessories list below.

Strap

The strap must be winded on the upper side of the centre axle by rotating the knob counter clockwise. Make sure to keep the strap tensed so it's tightly rolled on the centre axle. The strap length must be as least as long as the liner that is to be installed, plus at least one meter.

Reeling

The liner is fed into the Extruder through the nose with the inversion removed. Tie the short strap which is attached to the end of the liner, with the end of the strap that is wound on the centre axle. Then roll up the liner tensed on the centre axle by spinning the wheel handle counter clockwise. Make sure the liner moves easily and that it is not twisted. Activate the lubricating spray system to lubricate the liner.

Mount the inversion

When all the liner is rolled up, close the spraying, and mount the inversion. If the Extruder will be used for another installation before the curing is completed, a flexible squeeze inversion is used. Please see below! Fold the end of the lining around the end of the inversion and fix it with two hose clamps. If the distance between the Extruder and the pipe to be lined is too long, use an inversion with extension tube, see accessories list.

Squeeze inversion

If the Extruder will to be used for another installation it's possible to disconnect it from the installed liner. Please note that this is a decision that the installer have to make before the installation! Use a squeeze inversion, a clamping plier and Storz lid, see accessories list. Connect the compressed air and the precision regulator to the connector on the squeeze inversion, not to the connector on the Extruder. This connection is used during the complete process. When the liner is installed, lower the pressure down to about 0,1 bar and attach the clamping tool to the hose and squeeze. Lock the clamping tool, open the ball valve on the extruder to evacuate the compressed air, then disconnect the inversion from the Extruder. Cut the strap and mount a Storz lid to the inversion. Now the clamping tool can be released and the curing can proceed with the compressed air connected to the connector.

Installation

Always keep one hand on the wheel handle when the valve is opened and the filling of compressed air into the Extruder starts. The liner will start to extrude into the pipe as soon as the pressure starts to increase. Normally it is sufficient to use 0.2-0.3 bar gauge pressure when installing a flexible liner. Through tight bends the pressure can be slightly increased. Brake the wheel handle rotation constantly by holding a hand on it. This allows the liner to expand against the pipe wall properly. Also through bends, it is important that the liner can stretch properly towards the pipe wall.

Curing

Adjust the pressure when the liner is installed, depending on the type of liner (see instructions for the current liner). Connect Sactools Pressure Guard during the curing to insure that there will be no compressed air loss, see accessories list. The curing time can be calculated by using the epoxy sheet from each supplier.

After curing

When the curing is completed, please check the instructions for the Sacpipe Connection System.

ACCESSORIES WITH PICTURES



Sactools Strap

Sactools Strap

S5-135-025 Strap 25mm wide, 50m



Sactools Inversions with storz connection

Storz accessories

S4-603-013	Storz 6" Lock Alu.
S4-603-016	Storz 8" Female Thread 205
S4-603-003	Storz A cover 4"
S4-603-010	Storz Transitional 6"-8" 150-205
S4-603-008	Storz Adaptor 4" x 6" 133 - 160, Swivel
S4-603-021	Storz Hatch 100-150 alloy (6")
S4-603-028	Clamp Pliers 280
S4-603-030	Inversion (Straight) Storz 4" to liner Ø 75, Hose
S4-603-031	Inversion (Straight) Storz 4" to liner Ø 150, Hose
S4-603-040	Inversion (Straight) Storz 4" to liner Ø 100, Hose
S4-603-047	Inversion (Straight) Storz 6" to liner Ø 75
S4-603-048	Inversion (Straight) Storz 6" to liner Ø 100
S4-603-051	Inversion (Straight) Storz 6" to liner Ø 150
S4-603-048,5	Inversion (Angle 45°) Storz 4" to liner Ø 75
S4-603-049	Inversion (Angle 45°) Storz 4" to liner Ø 100
S4-603-052	Inversion (Angle 45°) Storz 6" to liner Ø 150
S4-603-049,5	Inversion (Angle 90°) Storz 4" to liner Ø 75
S4-603-050	Inversion (Angle 90°) Storz 4" to liner Ø 100
S4-603-053	Inversion (Angle 90°) Storz 6" to liner Ø 150

Inversion straight 50, 75, 100 and 150 also available with Camlock connection.



Sactools Storz 6" Cover



Sactools Storz Transitional



Sactools Inversion with hose and clamp pliers

Hot water circulation



Hot Box

BW-601-001 Hot Box 220 V Brawo incl. hose kit for Extruder

The Hot Box is a high performance diesel powered hot water heater that is used to shorten the curing time in lateral sewer mains.

The Hot Box is designed for SACTOOLS Extruder 500, 700 and 900 including hoses and 220V circulation pump. The hose from the circulating pump is connected to the external connector on the Extruder axle. The inner connection on the centre axle inside the drum is connected to the hose that is rolled out inside the liner. The hot water runs from the end of the liner and flows back into the Extruder. The outlet underneath the Extruder is connected to the return hose to the Hot Box.

Pressure Guard



Sactools Pressure Guard

S4-730-020 Pressure Guard

An indispensable tool for monitoring the installation during the curing process. Pressure Guard is an alarm device that sends a text message to the installer, if the pressure is lost or if the power to the compressor is disconnected. Just connect the Pressure Guard to the same power supply as the air compressor. The alarm gives an increased security if you don't have the possibility to monitor the curing. Up to 16 different mobile numbers can be pre-programmed in the alarm.

The Pressure Guard is a very cost effective insurance to avoid unpleasant surprises when returning to the installed liner!

Lubricating Spray System



Lubricating Spray System

S4-601-101 Lubricating Spray System for Sactools Extruder 500/700/900

Sactools Lubricating Spray System is used to spray the liner with soapy water or cooking oil while it is wound into the Extruder. The equipment facilitates the process as it is possible to handle dry liners.

Precision Regulator



Precision Regulator

S4-660-001 Precisions Regulator Complete.

The Precision Regulator is complete with air connectors and pressure gauge. The range is from 0 to 1.6 bar gauge pressure. Maximum connection pressure is 12 bar. The regulator is used to adjust the pressure during the installation with the Extruder.

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