



► DESCRIPTION

Injection unit with vacuum tank and programmed interface for high temperature mono-component and premixed multicomponent resins. The system consists of a tank and its peripherals, which can be installed in various positions around the injection tank.

The constituent parts are as follows:

- the injection tank and its options
- the electronic measurement apparatus (measurement of injected weights)
- the vacuum pump (degassing of the resins and/or the mould)
- the electronic data processor and supervision of the machine (direct management by the PC of the injection machine, if connected with a PLC. PLC is used for a complete automation of different process phases.)

► UNIT ELEMENTS

1. The injection tank

- Each steel tank is mounted on three feet
- Material: stainless steel.

Name	Total tank volume	Approx. dimensions of each tank	Approx. weight of tanks	Load of one tank
SK1INJ1K10L	30l tank used with metallic tin 5l,10l or 15l (filling max. resin 3l, 7l or 10 l)	Ø 300 mm, height 350 mm	80 kg	min. 0,5l. - max. 10l.
SK1INJ1K25L	50l tank to use with metallic tin 20 L or 30 l (filling max. resin 15l or 25l)	Ø 400 mm, height 400 mm	100 kg	min. 0.5 l. - max. 25l.
SK1INJ1K40L	60l with direct filling of max. 40l	Ø 400 mm, height 400 mm	100 kg	min. 0.5 l. - max. 40l.
SK1INJ1K50L	90 l tank with direct filling of max. 50l	Ø 400 mm, height 450 mm	140 kg	min. 0,5l. - max. 50l.
SK1INJ1K100L	2 tanks of 90 l with direct max. filling of total 100 l	Ø 400 mm, height 450 mm	2x140 kg	min. 0,5l. - max. 100l.
SK1INJ1K200L	4 tanks of 90 l with direct max. filling of total 100 l	Ø 400 mm, height 450 mm	4x140 kg	min. 0,5l. - max. 200l.



Tank characteristics:

- Pressure: 10 bars (2 bars)
- Tested pressure: 15 bars (3 bars)
- Vacuum: up to 1 mbars.

The tank cover is closed by screw action and it is composed:

- a vacuum /pressure gauge
- a nitrogen connection with spherical valve
- an air/vacuum connection with 3 way valve for inversion
- an auxiliary connection for other functions
- two control points for temperature measurement
- two resin outlet connections
- a viewing window (diam. 80 mm).

2. Illumination of window

24V / 20watt illumination.

3. T/C K Temperature probe

Temperature probe with length 650 mm for direct measurement of resin temperature with display.

4. Electric agitation of resins

Electric motor, slow agitation, controllable speed, sealed unit, shaft and blade in steel, removable

5. Heating of container

Resin is placed in a tank for heating and degasation. For units with little volume it is possible to place resin in a tank or to use special metal containers (3l and 5l), which are installed inside the tank, for heating and degasation. In that case the volume heated in the tank can vary from 0.5 liters till possible effective volume. Attention: during degasation process resin volume is increasing, that is why the container of 5 l will have effective volume of 3, 5 l, and 90-l tank can be used for maximum of 50 l of resin.

6. Heated sole-plate

Plate for placement of peripheral equipment and tank shell.

7. Pneumatic tank-cover removal

Tank top cover may be opened using pneumatic system using air-pressure limiter. The cover is column-mounted and gives free access to the tank. Draining of the agitator is facilitated by an adjustable temporary stop device. Safety lock fitted for operator security



8. Electronic pressure measurement instrument

Electronic pressure measurement instrument in a tank. Connected to an optional data processor, 24V.

9. Mobile platform

The useful item incorporates the tank, control cubicle and accessories. Dimensions: 1500 x 750 mm

10. Pinching valve

Pneumatic pinching valve for opening and closing of supply line, as well as for speed regulating of resin stream is used for silicone tubes 7mm (ID) x 13mm (ED) in units with effective volume 5L - 50L. In units with effective volume 100L - 200L, the valve is used for opening and closing of supply line for silicone tubes 14mm (ID) x 20mm (ED). The valve is actuated by a pneumatic piston. Switch on/off is realized on control panel. The valve is heated.

11. Flexible heated connection between tank and mould

In order to avoid loss of heat, the flexible connection between the tank and the mould has isolated heating system and electric power supply. On a display the information about pre-set temperature of heated line and measured temperature is showed. The flexible connection is equipped with a disposable inner lining tube in silicone SK2RIM260-1 which can be changed after each application. Standard line length - 2,5 m.

Inner line diameter: 10 mm (in the model type 5l – 50l) and 21 mm (in the mode type 100l – 200l), 230V 50 Hz 375 W.

12. Electronic weighing device

- 230 V 50Hz,
- Maximum capacity: 150 kg,
- precision: 10 gr, digital display,
- 4\20mA signal for data recording, delivered with cables and connections
- Attached using 3 screws to tank

13. Vacuum pump

Capacity depending on packing up set: 16 or 25 m³/hour, maximum vacuum level 1mbars (no vacuum control).

Vacuum gauge measurement and display for the gauge. Value in mbars.

14. Pirani gauge

Compact and durable vacuum gauge for vacuum level measurement – is a key point of the unit, as it is important to use measuring equipment resistant for volatile resins, and pollution



resistant. The signal has a high quality and can be easily detected by control system PLC Schneider;

15. Full automated system, including PLC on 2 languages (Russian/English)

- heating the resin up to a set point
- degassing the resin during a certain time and with control of level of temperature
- injection of the resin with an applied pressure and up to a set point volume or duration
- compaction after injection with a pressure level (can be different from the injection pressure)

It is possible to memorize cycles in the PLC and this is possible with adjunction of a display. There is possibility of message during the process and the operator knows exactly the phasis in progress and set points for the phasis.

The PLC is a SCHNEIDER/TELEMECANIQUE system. Software is in 2 languages: English and Russian is included in price.

16. Data processor (can be added only with PLC) it is possible to work with PC if PLC is present.

Description: The system consists of a means of continuous measurement of the different parameters of the injection process

- Pressure conditions(Vacuum and pressurisation of the tank)
- Conditions and temperature(temperature of resin and mould)
- Weight injected into the mould (weighing scales)

These data are managed by an IBM compatible personal computer. XP / WIN 7. The machine is equipped with TACTILE colour monitor 17 inches. USB ports and integration are in control box.

- weight4/20 Ma signal
- vacuum level
- pressure levels in tank
- Pressure on mould (additional sensors not furnished 6 pressure 4/20 mamps).
- temperature of resin within the tank
- temperatures in the mould (4 T/C)

All incoming data are treated by the hard-disk loaded program, which can be set using the parameters in use by the operator. This provides the advantage of having available at all times a usable record of all parameters used in each application.

A software is included in the packages based on DASYPAL 12.0. The application records curves for the different inputs and reports with automatic printing of the reports after injection. Storage of the data of the parts (resin reference, batch numbers, tool references, operator's name).



All data are also automatically stored on Hard disk each second and a saving of ASCII file is on the disk. It is possible to work with EXCEL software.

Software is in Russian and English languages. The system also manages injection cycles of the injection pressure pot:

- name of the file;
- name of the part;
- reference resin and fabrics;
- name of saving files;
- injection flow or injection pressure selection;
- cycle data (pressure, flow , injected quantity, mould temperature for starting injection , resin temperature for starting injection, degassing duration, degassing resin temperature)

All production files are stored on the system and can be called back, renamed. The system stores automatically data s and it is possible to manage directly the machine by the PLC.

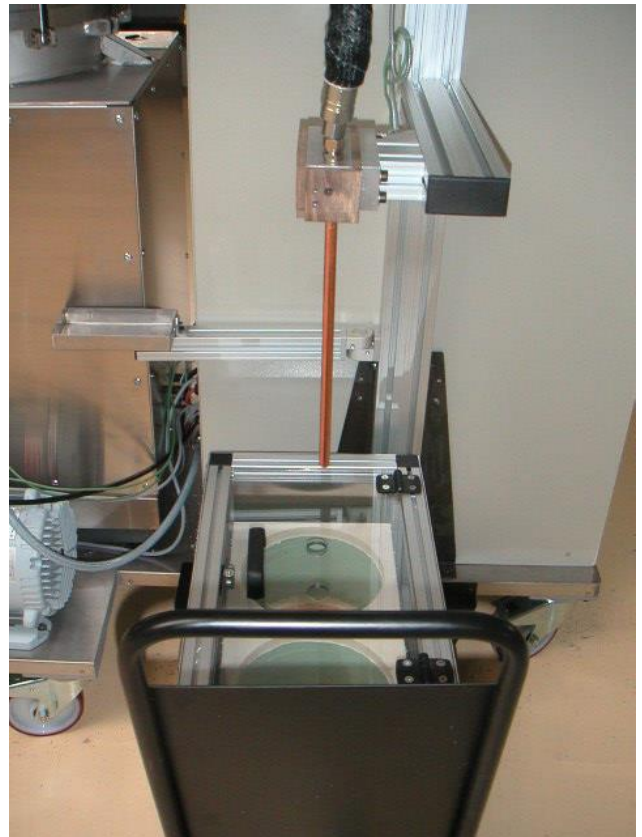
17. Installation works, customer training in Russian language

Installation works and training are accomplished by qualified stuff of our company and an engineer of ISOJET. Start up and customer training is in Russian language.

18. Filling system (option)

The system consists of device for resin preparation, filling of a tank, track, heating housing and heated filling line. (Option)

Equipment set is mounted on a track in a special box, which has two cells (thermo insulated blocks) for placing of original containers with resin. Original containers heating is made by an electrical heater, specially designed for that purpose, in the form of a band, encircling container. For heating temperature control, and heating uniformity of resin in the original container, the set include a temperature sensor, plunged in the container with resin and electric mixer, placed on the container head. Resin constantly stirred is heated till the fixed temperature. Supply of heated resin in the tank is realized by creating of vacuum in infusion unit tank with a vacuum pump, which is included in the infusion unit set (the pump is not included in delivery).





TECHNICAL DATA SHEET

SK1INJ1K Injection Unit

Heated resin from original containers is transferred at infusion unit tank by a silicone tube, one end is placed in the container, and other is switched to the filling valve, placed on the head of a tank of injection unit.

Equipment control is made by control console of infusion unit, when hardware and software are totally integrated into PLC system.

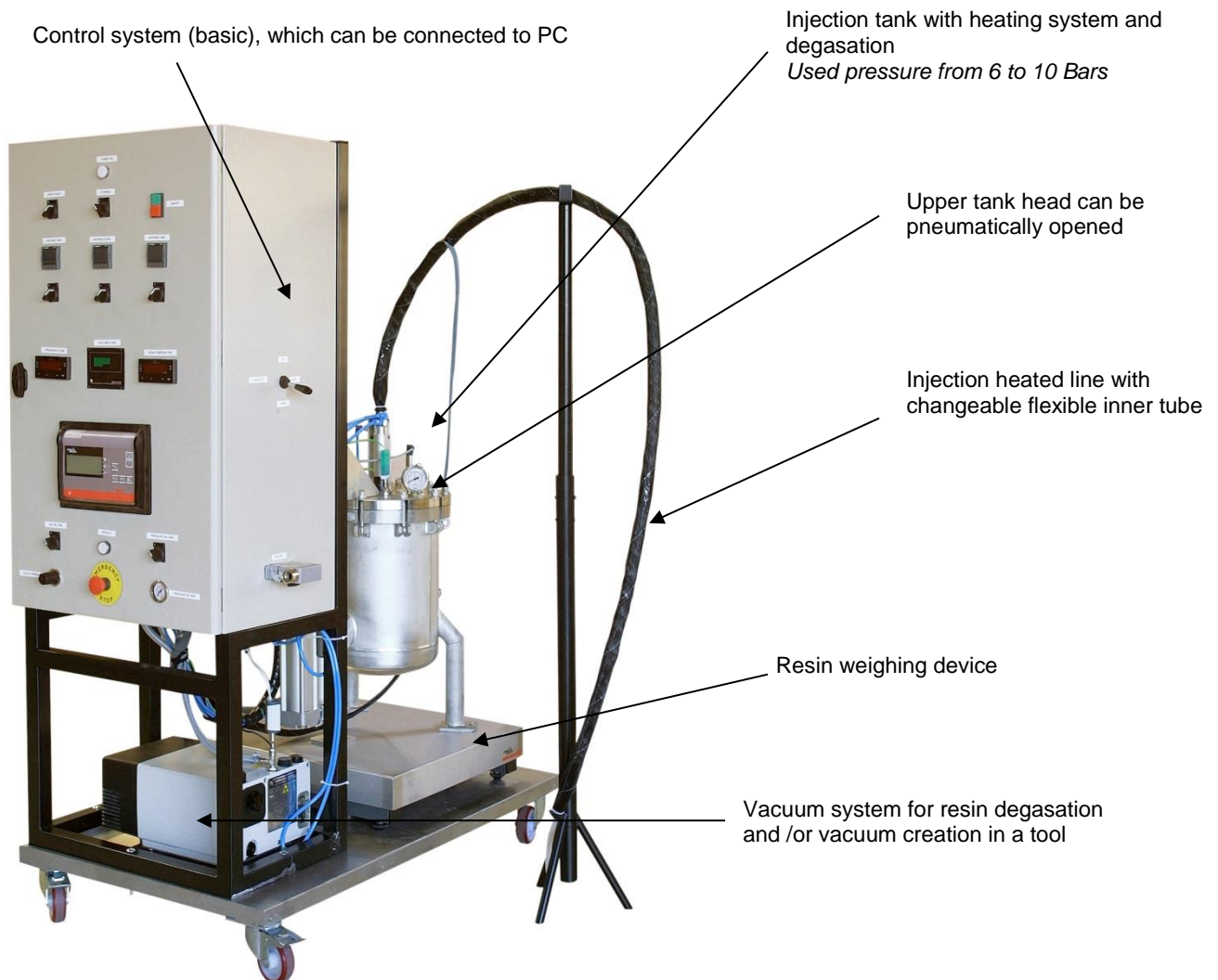


Photo 1: Basic configuration without PLC and PC.



Photo 2: Heating system

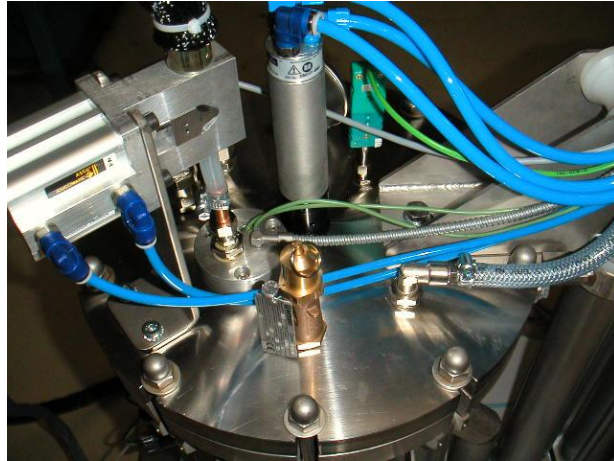
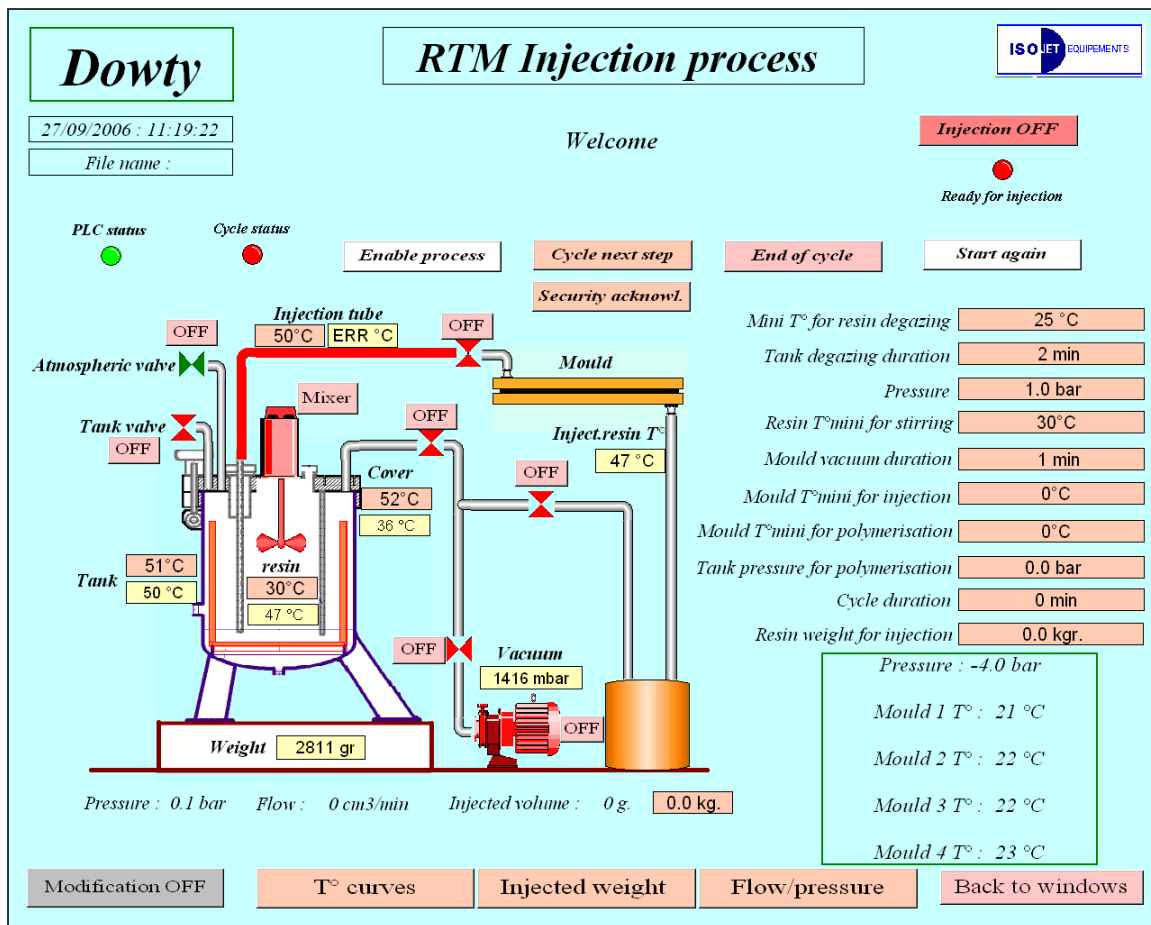


Photo 3: Pinching valve for silicone tube

▶ AUTOMATIC CYCLE REVIEW





TECHNICAL DATA SHEET

SK1INJ1K Injection Unit

► INFORMATION PAGE FOR CREATING OF TECH. MAP

Dowty

Data initialization

Order number <input type="text" value="opi"/>	Tool reference <input type="text" value="lk13"/>	Piece number <input type="text" value="56"/>
Texture 1 <input type="text" value="rtm1"/>	Texture 2 <input type="text" value="rtm2"/>	Injection resin reference <input type="text" value="dert"/>
Tool 1 <input type="text" value="by4"/>	<input type="text" value="by5"/>	Tool 2
Operator name <input type="text" value="hph"/>	<input type="text" value="TRIAL4"/>	Data file name

Process data

Injection tube T° <input type="text" value="50"/>	Degazing resin mini T° <input type="text" value="25"/>	Mini T° for injection <input type="text" value="30"/>
Tank T° <input type="text" value="51"/>	Degazing duration (min) <input type="text" value="2"/>	Injection pressure <input type="text" value="1.0"/>
Cover T° <input type="text" value="52"/>	T°mini for resin stirring <input type="text" value="30"/>	Mould vacuum duration <input type="text" value="1"/>
Mould T° mini for enable injection <input type="text" value="0"/>	Tank pressure for polymerisation <input type="text" value="0.0"/>	Mould T° mini for enable polymer. <input type="text" value="0"/>
Cycle duration (min) <input type="text" value="0"/>	Resin weight for injection (kg) <input type="text" value="0.0"/>	

Initialize process

Back to windows

File recall

C:\data_dowty\hph.INI

All data are saved under :
TRIAL4



TECHNICAL DATA SHEET

SK1INJ1K Injection Unit

► UNIT WITH CONTROL CONSOLE PLC

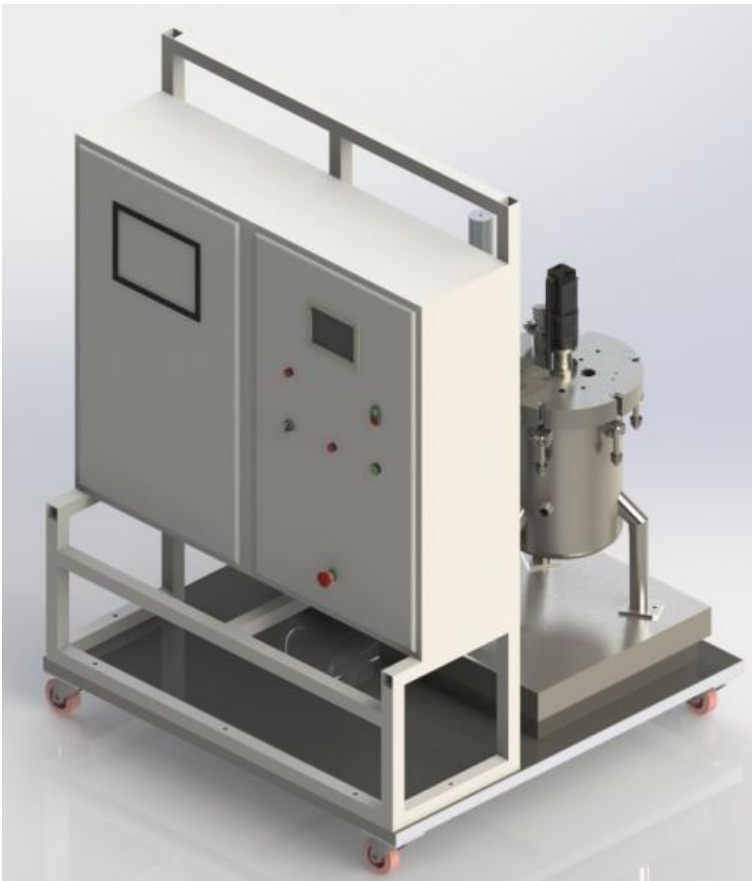




TECHNICAL DATA SHEET

SK1INJ1K Injection Unit

▶ AUTMATED UNIT FOR RTM INFUSION PROCESS WITH PC OR PLC





TECHNICAL DATA SHEET

SK1INJ1K
Injection Unit

► **NOTE**

Please contact us for more detailed information as well as for system development according to your technical specification.

Standard warranty period: 12 months.