# TECHNICAL DATA SHEET

## SK1INJ1K2K

**Infusion and Injection RTM Unit**

### ► DESCRIPTION

Injection unit with vacuum tank and programmed interface for is for use with high temperature two-component and premixed multicomponent resins. The system consists of a tanks and peripherals, which can be installed in various positions around the injection tank. This unit can operate in same equipment the resin mono components (1K resins for example RTM 6 / RTM 6-2 / PRYSM EP 2400 , PR520 , BMI 5250-4 ) and resins 2 components (2K resins even with short pot life mixing , epikote / araldite  are common  )

Injection unit types:

- Resin 2K RTM  direct (metering and mixing by unit in the mixing head)
- Resin 2K infusion with mixing by the 2K unit in the 1K tank for infusion.
- Resin 1K infusion or RTM (operation only with 1K tank for 1K resins )

Infusion tank 1K

Injection RTM tanks 2K

Preparation tank

Unit with 2 tanks – 2 gear pump

The constituent parts are as follows:

- the injection tank 1K and options
- the metering machine 2K with its tanks
- 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.)

Standard models:

| Reference for order | Possible processes | Description |
|---|---|---|
| SK1INJ2K15L5L | 1K infusion, 2K infusion, 1K RTM, 2K RTM | Tank for component A – 15l<br>Tank for componet B – 5l |
| SK1INJ2K5L5L | 1K infusion, 2K infusion, 1K RTM, 2K RTM | Tank for component A – 5l<br>Tank for componet B – 5l |
| SK1INJ2K5L2L | 1K infusion, 2K infusion, 1K RTM, 2K RTM | Tank for component A – 5l<br>Tank for componet B – 2l |

## ► UNIT ELEMENTS

### 1. The injection tank for 1K

Tank characteristics: Material: stainless steel.

- Possible applied pressure 10 bars
- Max. pressure: 15 bars (testing pressure )
- Degassing up to 2 mbars
- Vacuum: up to 1 mbars.
- Equipped with with a relief valve for safety device
- Heated and regulated with external heat belt

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 degasing. For units with
place resin in a tank or to use special metal containers, which are
heating and degasing. In that case the volume heated in the tank
possible effective volume. Attention: during degasing process resin

**6. Heated sole-plate**

Plate for placement of peripheral equipment and tank shell.

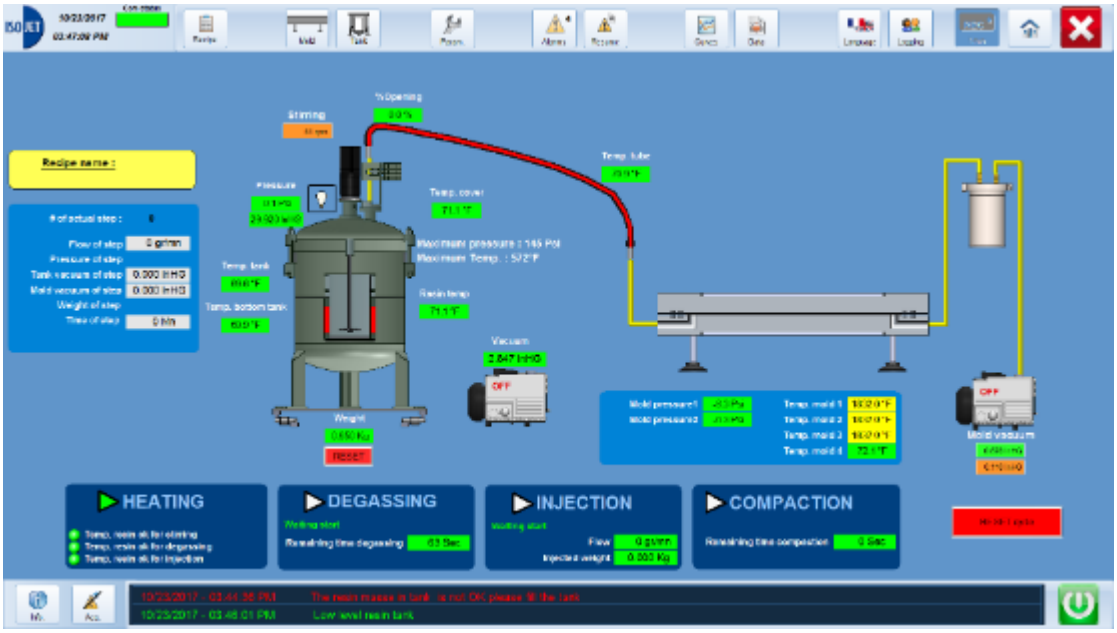
**7. Pneumatic tank-cover removal**

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. Screen control for 1K unit




## 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 tubes14mm (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. Heated injection tube

A heated element through the cover, for no cold point on injection line. Probe and heating element. Electronic regulation

**Metering unit for 2 components systems**

### 13. Mixing head and Dispense timer (For resin 2K RTM direct)

Static mixing head with 20 static mixers included

Mix head in fixed position and heated. Static plastic mixer inside with metallic jacquet for 20 bars max pressure injection. The injection line is furnished with inner tube 7x13 mm max size 2 meter length with heating and regulation

### 14. Metering Unit

For resin and hardener you have this 2 tanks are heated and with stirring . Size can de adapted to volume to be in operation . The tanks are connected to metering pumps to ensure the feeding of each pump.
Max pressure in tanks = 3 bars ,
Max temperature = 120°C .
Resin and hardener can be degassed in this tanks (5 mbars ) and a probe inside gives indication of temperature of components

The metering unit is based on 2 pumps with flow meters installed on a frame the pumps are in movement with an asynchronous motor. Flow meters measure the flow in the linea and the software collect information from flowmeters to control the injection during the process.

Pumps and lines are heated (lines to the mix head and lines from tanks).

On each pump a pressure gauge will give safety control on line for the injection (motor stops if any trouble in the lines).- Flow is 50 to 500 cc/min

Possible mixing ratio of component A : B -> 100:10 till 100:60 (limit to 100/10 if possible)
Temperature 120°C for all elements except for hardener pump. Resin pump is limited to 110°C

The motors and pumps are mounted on a frame with Plexiglas doors and walls

## 15. 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

## 16. 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.

## 17. Pirani gauge

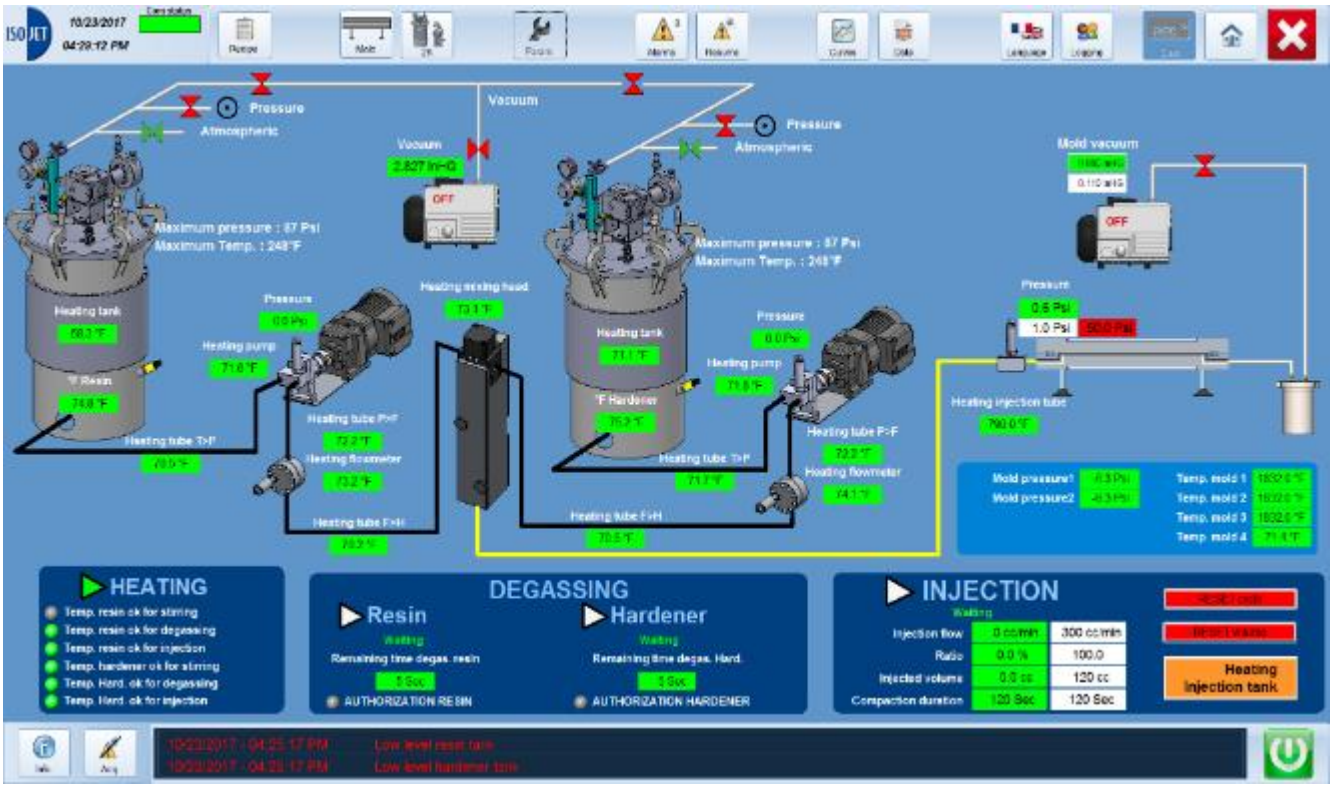
Compact and durable vacuum gauge for vacuum level measurement – is a key point of the unit, as it is important to use measuring equipment resistant for volatile resins, and pollution resistant. The signal has a high quality and can be easily detected by control system PLC Schneider.

## 18. Full automated system, including PLC on different languages (French/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 available in 3 languages. French, English and Russian is included in price.



**19. 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. WIN 7/WIN 10. The machine is equipped with TACTILE colour monitor 19 inches. USB ports and integration are in control box.

- weight 4/20 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 VIGEO CITECT (SCHNEIDER ) 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 CSV file is on the disk. It is possible to work with EXCEL software.

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.

## 20. Installation works, customer training

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

## 21. 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).

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.

► **NOTE**

Please contact us to get further information, as well as to make an equipment design according to your technical specification.

Standard warranty period: 12 months.