INTEGRATED SOLUTIONS
FOR SUGAR PLANT
CONSTRUCTION &
MODERNIZATION

JUICE PURIFICATION STATION

GREBENKY™
MACHINE-BUILDING PLANT

Techinservice™

PURIFICATION PLANT

The juice purification station is supplied in a compact single block completed with juice tanks and designed for outdoor installation behind the factory building. The automatic control system developed by **Techinservice** comes standard with the purification station scope of supply.

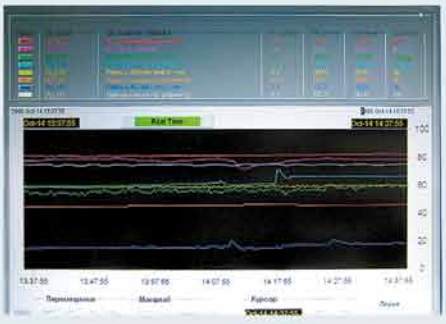
Distinctive Features of Techinservice Juice Purification Station:

- increase in the juice purification efficiency by 3-5 points if compared with a conventional scheme;
- increase of the gas utilization coefficient in 1st and 2nd carbonation tanks;
- improvement of juice sedimentation and filtration properties and decrease of total lime consumption necessary for production process;
- fully automatic mode.

Installation of the fully automated purification station developed by **Techiservice** and compliance with the suggested work procedure guarantee production of the standard juice with good sedimentation and filtration properties, required thermal stability parameters and with minimum residual calcium salt content, which ensures efficient operation of further stations of sugar plant process flow.

- Possibility to recirculate 1st and 2nd carbonation precipitate to the progressive prelimer (in the case of the stable quality of carbonation slurry concentrate).
- Process parameters:

total purification efficiency	34–38%
possibility to process sugar beets of different quality	
CaO consumption on raw juice nonsugars	80–120%
pH value of 2nd carbonation juice	8.8–9.3
pH value of thick juice after evaporation	7.8–8.3
increase in coloration at evaporator station, not more than	60%
calcium salt content in 2nd carbonation juice, % CaO on beet	0.02–0.1
content of reducing substances in clarified juice, up to	0.03%



- Fully automatic operation mode, no manually operated jobs.
- Using existing juice heating stations.

Suggested Work Procedure:

- Heating raw juice before preliming with adjustment of the retention time based on the process temperature.
- Using 1st carbonation slurry concentrate to return for preliming.
- Dosing lime milk for hot main liming in the amount corresponding to its solubility at the preset temperature.
- Dosing lime into the preliming tank before 2nd carbonation (if necessary).
- 2nd carbonation juice maturation in order to reduce the content of soluble Ca2+ salts.

Main Optimization Parameters of CaO Consumption:

- purified juice thermostability determined by the residual RS amount (not more than 0.02% on juice mass);
- juice filtration capacity (filtration rate, FK coefficient, quantity of operating equipment).

The optimal operating practice of the purification station provides for substantial reserves of minimizing the lime milk consumption required for juice purification in sugar beet production.

Suggested lime consumption for purification on raw juice nonsugars

Raw juice purity	CaO on nonsugars, %
less than 84.5	100–150
84.5–85.0	95–100
85.0–86.0	90–95
86.0–87.0	85–90
more than 88	less than 80

Service Platform

Insulation of Purification Station in Operation

Possibility to Select Purification Station Capacity

Service Platform

MORNINGDEW AUTOMATIC CONTROL SYSTEM FOR PURIFICATION STATION

JIUCE PURIFICATION

MorningDew automatic control system for purification station is developed by Techinservice in order to achieve more cost-effective and efficient performance of the juice purification section of the sugar plant.

Advantages & Features:

- Stabilization of consumption flows.
- Adjustment of the lime milk consumption and the recirculation of 1st carbonation slurry concentrate to preliming and main liming based on the raw juice consumption or based on the preset value.
- Control of the pH value of juice in the prelimer.
- Adjustment of the juice temperature for main liming, 1st carbonation slurry filters, 2nd carbonation and evaporation station.
- Stabilization of the carbonation gas pressure in the tank.
- Keeping the preset pH value of 1st and 2nd carbonation juice by injection of carbonation gas.
- Control and adjustment of levels in tanks and apparatus.
- Automatic adjustment of 1st carbonation precipitate recirculation.
- Flow control – by inverters or valves.
- Pumps and actuators alarming and signaling of deviation of process parameters from preset limit values.
- Record of process parameters and data gathering and storage for the specified time period.
- Remote control of system regulators by using the operator's panel or PC keyboard. Graphical mnemonic diagrams are the visual depiction of data about the technological process, equipment condition, operating modes and emergencies.
- No manually operated jobs.
- Integration of control systems of other sugar plant stations.

Purification Station Control System Mnemonic Diagram

Main Operator's Room at Sugar Plant

Purification Station Control Operator Panel

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