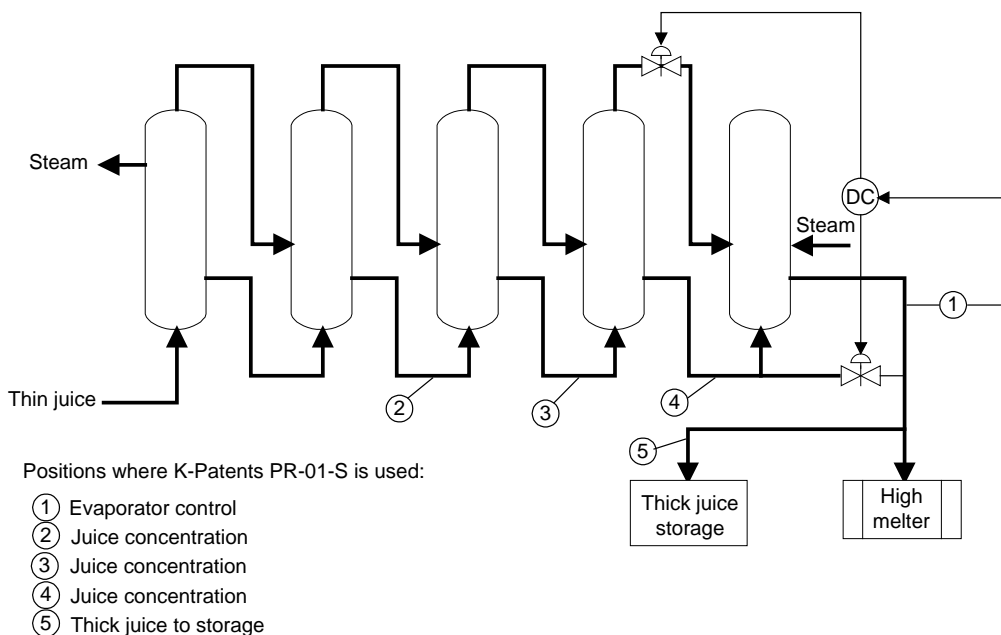


## Beet Sugar Evaporator Control



### Beet Sugar

**See also**

- Beet Sugar Production 1.01.00*
- Beet Sugar Extraction 1.01.01*
- Beet Sugar Crystallization Control. 1.01.03*
- Beet Sugar Crystallization 1.01.04*
- Beet Sugar Green Syrup and Molasses 1.01.05*
- Desugarisation of Molasses by Chromatographic Separation 1.01.06*

### Introduction

The thin juice is heated and pumped to the multiple-effect evaporator. The dissolved solids concentration is raised from an initial concentration of 10 - 15 Brix to 50 - 65 Brix. The concentrated solution is known as "thick juice".

### Application

#### Evaporator plant feed

Normally the refractometer signal is used to adapt the feed of the thin juice to the capacity of the evaporation plant (using feed-forward control).

It is also possible to use the signal to keep the feed concentration to the evaporation plant constant by mixing some thick juice into the thin juice. Hence the measurement is made after the mixing and the thick juice addition is controlled.

#### Evaporator plant outlet and intermediate effects control

Evaporation in the multiple effect evaporation plant is more cost effective than in the crystallizer, which economically justifies an evaporation control system. K-Patents Process Refractometer, PR-01-S is used after the final effect, but also after the intermediate effects. K-Patents PR-01-S is also used in a control loop that keeps the thick juice concentration constant by changing the steam flow or by changing the amount of thick juice returned to the evaporator.

#### Thick juice to storage tank

In this application the process refractometer helps to maximize the storage capacity by keeping the thick juice at as high a level as possible.

### Installation

Lime residuals and other additives may coat the prism and an automatic steam wash is recommended in the thin juice applications. Typical range is 0 - 25 Brix.

In some plants the thick juice contains supersaturated impurities (e.g. oxalic acid) that may crystallize on the prism and an automatic steam wash is necessary. In difficult cases K-Patents PR-01-S has been mounted in a small by-pass line after a small cooling heat-exchanger where the impurities crystallize.