

K-PATENTS

PROCESS INSTRUMENTS

COMPANY PROFILE

K-Patents Company

K-Patents designs and supplies specialized in-line liquid analyzers and process refractometers for industrial process instrumentation and control.

K-Patents Operations



K-Patents Process Refractometers and support services are available to customers anywhere in the world. Application, installation and technical assistance are provided both locally by the representatives and also by the headquarters in Finland and the branch in the U.S.

The range of K-Patents applications is wide as most liquid processes require continuous monitoring of concentrations to help maintain quality and reduce costs. K-Patents serves the target industries according to their different nature and technology requirements. To ensure a high standard of products and services the industries have been divided into following groups:

- Biochemical & pharmaceutical
- Chemical & miscellaneous
- Corn sweetener
- Food & beverage
- Oil refining & petrochemical
- Pulp & paper
- Metal machining & mining
- Semiconductor
- Sugar

K-Patents is close to the front-line in all its functions: production, technical support, marketing, research and development.

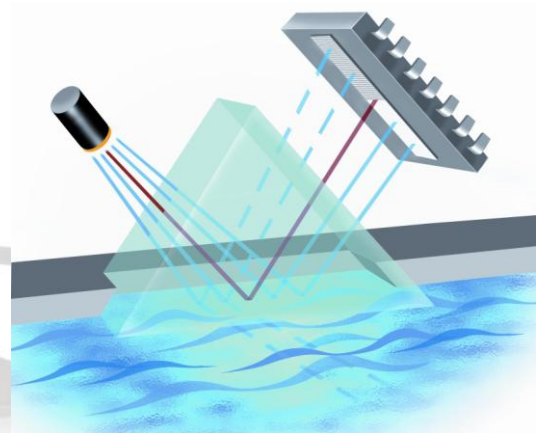
K-Patents has an ISO 9001 certified quality system, which covers all its functions. The quality performance is improved by critical self-assessment, internal auditing and feedback system. The chain of quality starts from the subcontractors with whom K-Patents maintains a quality contracting and regular auditing system. The quality contracting is currently being extended to the sales distributors and the service operations. The internal quality functions, from verification of incoming products to packing and delivery, are based on defined procedures.

Furthermore, all major K-Patents innovations are protected by patents in USA, Europe and Japan – it is a principle, which the company wants to highlight in its name.

K-Patents' Products by Industry

K-Patents Process Refractometers are commonly used to determine the concentration of a dissolved solids by making an optical measurement of a solution's refractive index (nD).

K-Patents refractometer sensor measures the refractive index nD and the temperature of the process medium. The measurement is based on the refraction of light in the process medium, i.e. the critical angle of refraction using a yellow LED light source with the same wavelength (580 nm) as the sodium D line (hence nD).



The measured refractive index nD and temperature of the process medium are sent via the interconnecting cable to the Indicating transmitter. The Indicating transmitter calculates the concentration of the process liquid based on the refractive index and temperature, taking pre-defined process conditions into account.

The output of the transmitter is a 4 to 20mA DC output signal proportional to process solution concentration, liquid density, Brix or other scale that has been selected for the instrument. Process data can also be downloaded to a computer via an Ethernet cable.

The basic Process Refractometer system consists of one or two sensors connected to an Indicating transmitter. However, there are different sensor models, each model is adapted for different industrial requirements.



PR-23 Platform

The PR-23 series is the latest addition to K-Patents Process Refractometer product line. The PR-23 includes an Ethernet based communications solution. This allows connection to computer networks, and real-time measurement data and diagnostic information on the Web and Ethernet access from anywhere in the world by an Internet (IP) address. This also makes it a valuable service tool for parameter changes and software up-dates.

The benefit of having Ethernet connectivity in a field instrument is that it is the most widely used local area network (LAN) standard with most types of computer having such a connection. Therefore, only a cross-over cable and some data acquisition software is needed for collecting the data from the PR-23 refractometer. Communication is built on standard protocols (UDP/IP) and K-Patents offers ready-to-install software for data acquisition.

Additional features include interchangeability and dual connectivity of the sensors. All PR-23 sensors have identical calibration and each sensor gives Refractive Index nD and temperature as output. These enable sensors to be freely interchanged without optical calibration or parameter changes. It is simply a matter of plug and play!

K-Patents' Applications

K-Patents Process Refractometers are commonly used to determine the concentration of a dissolved solids by making an optical measurement of a solution's refractive index.

This measurement has been an important element in the processing industries like the chemical and refining, pulp and paper, food, sugar and pharmaceutical industries for more than a century.

The performance of all types of refining, manufacturing and quality control operations can be dramatically improved with the K-Patents technology.

For instance, the in-line concentration measurement can be used as a real-time predictive tool for the final concentration. A quick and accurate response is needed to optimize production. Cost reduction is possible by reducing the variation of mean average of the product concentration. The cost saving is related to the value of the component being measured.



K-Patents History

K-Patents was founded in 1978 by Mr. Jan Kåhre and Mr. Esko Kamrat. They implemented digital camera technology (charged couple device) and microprocessors into an instrument and introduced the first truly innovative and digital process refractometer for liquid concentration measurements.

Since the beginning, K-Patents has been particularly successful in combining innovations in several different technical fields, e.g. in electronics, optics, mechanics and physics. This way it has always been able to provide superior design and new features compared to the existing products in the market.

Today, K-Patents is the technology and market leader, and the fastest grown supplier of process refractometers in the world.

Historical Events:

- 2008** Launch of Atex approved Intrinsically Safe Process Refractometer PR-23-IA for hazardous areas upto Zone 0
Launch of Semicon Refractometer PR-33-S for ultra-pure environments and integrated process tools in fabs
- 2007** Launch of Digital Divert Control System DD-23 for recovery boiler safety in kraft chemical pulp mills
Launch of Semicon Refractometer PR-23-MS for real-time monitoring of fab chemicals
- 2006** Launch of SAFE-DRIVE™ Process Refractometer PR-23-SD for black liquor dry solids % b.w. in kraft chemical pulp mills.
- 2005** Launch of Process Refractometer PR-23-GP for industrial applications
Launch of Valve Body Refractometer PR-23-W and Teflon Body Refractometer PR-23-M for chemically aggressive liquids
- 2004** Launch of PR-23, the new generation of the K-Patents process refractometers
- 2002** Launch of Valve Body Refractometer PR-03-W for chemically aggressive liquids in large scale production and in large pipe sizes
- 2001** Launch of Sanitary Probe Refractometer PR-03-P for cookers and vessels in the food industry
Launch of Compact Process Refractometer PR-03-D for in-line industrial applications with small pipe sizes
- 2000** Launch of Process Refractometer PR-03-M for chemically aggressive liquids
- 1998** Launch of Sanitary Refractometer PR-03-A for food and beverage applications
- 1997** Launch of the first Foundation Fieldbus compatible Process Refractometer PR-01-S
- 1995** Launch of the Intelligent Image Analysing of the Optical Image
- 1994** ISO 9001 Quality Certificate, certified by Det Norske Veritas
- 1993** Launch of BASEEFA and FMRC approved EExia-model (Intrinsically Safe) Founding Fieldbus Foundation (Founding member No.14)
- 1992** Launch of the Fourth Generation Process Refractometer PR-01-S for heavy-duty industrial applications
- 1991** K-Patents, Inc. in Chicago was founded
- 1989** Launch of the Third Generation Process Refractometer PR-01-B
- 1986** Launch of the Second Generation Process Refractometer PR-01-E
- 1983** Launch of the First Digital Process Refractometer PR-01
- 1981** Launch of the Laboratory Refractometer LR
- 1978** K-Patents was founded

K-Patents Environmental Statement

K-Patents Oy maintains ISO 9001 certified quality system. Environmental issues are maintained as part of the quality system. This applies especially to the areas mentioned below.

ISO 14001 and ISO 14004 standards are used as guidelines for managing the environmental issues at K-Patents Oy.

Product Packaging

K-Patents Oy uses environmentally safe packaging material. Polyurethane packaging foam is CFC and HCFC free. The foam contains nothing that could damage the ozone layer. The foam is compressible and biostable, so it can be safely used for landfill without any risk to groundwater. The package cardboard is also fully recyclable.

Documented procedures for packing are maintained. This includes specific requirements from the customers.

Materials Used in Production

K-Patents Oy production includes final assembly, calibration and testing of the products. K-Patents Oy production maintains documented procedures for material handling. The materials used are not

- harmful to the environment or
- harmful to the health of the employees.

All waste, including auxiliary material (e.g. glue, calibration liquids) used in the production, is sorted and disposed of according to national regulations and suppliers' instructions.

Samples Sent to K-Patents Oy

K-Patents Oy receives samples regularly from the customers. The procedures for receiving, marking, handling, testing and disposing of the samples are documented. All samples that are possibly harmful to the environment are considered as toxic waste, and they are disposed separately. Information from the supplier of the sample is used as a guideline for the disposal.

