

PNEUMATIC TUBE SYSTEMS INTELLIGENT SOLUTIONS FOR HOSPITALS



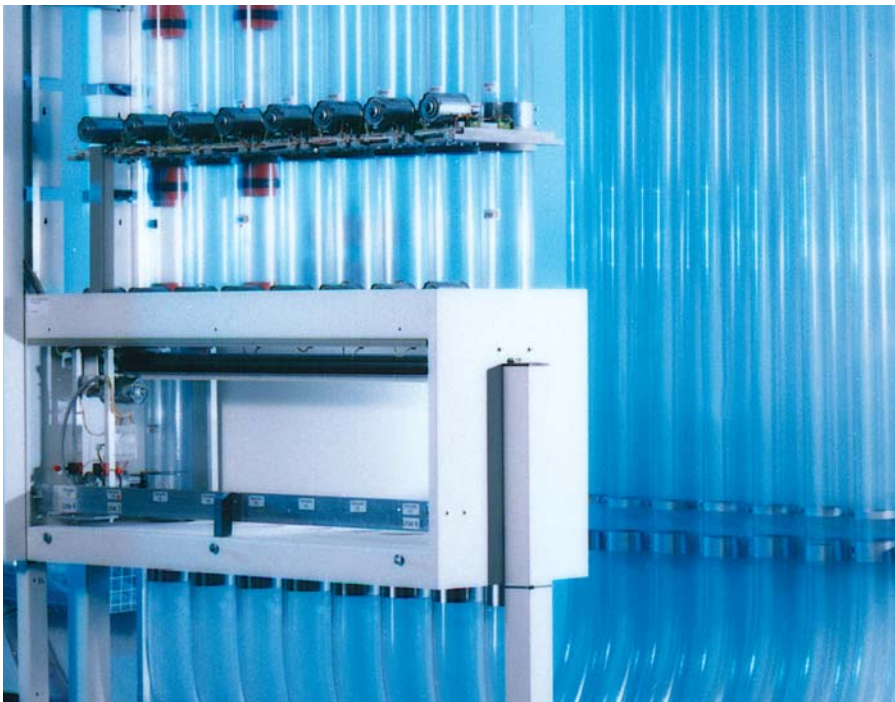
**PC-CONTROLLED
TUBE SYSTEM
SOLUTIONS**



swisslog

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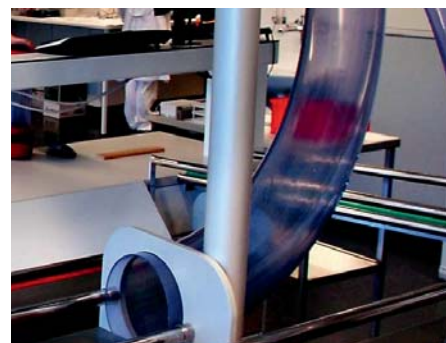
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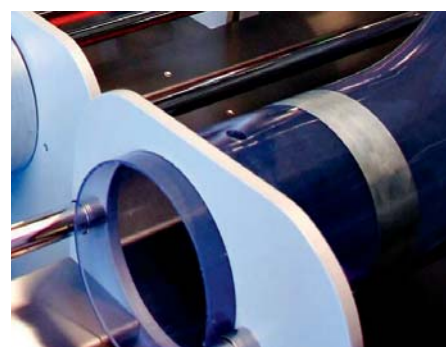
WORLDWIDE
LEADING IN
HOSPITAL LOGISTICS

CHALLENGES IN HEALTH SERVICES

The core task of hospitals lies in the improvement of the health of the patients through quality and innovative treatments and care.



After the introduction of the DRG system (Diagnosis Related Groups) and associated budget processes as well as a fledgling competitive situation hospitals are now facing new challenges: reduction of time patients spend in the hospital without loss in quality of care, reduction in staff costs and at the same time increasing results and efficiency. For these reasons the optimization of hospital logistics becomes more and more important.



More speed, less haste

The transport of goods is of paramount importance in many procedures within hospital logistics. The quality of goods transportation is of the highest importance because wrongly delivered goods or inappropriate handling during transport may have serious consequences for logistical workflows, staff efficiency and patient care.

Logistical support through efficiently implemented pneumatic tube system technology

The high demand in performance and quality in hospitals and patient oriented management strategy is being combined with a concentration on the main tasks of the hospital personnel: the focus on improvement of patient health in the highly sensitive hospital environment.

Reduction in the workload and avoidance of time intensive manual portering tasks frees staff capacity, which can be used to increase efficiency.

DECADES OF MARKET EXPERIENCE

For more than three decades we have offered individual consultation and tailor-made services for pneumatic tube system solutions. Thanks to this experience and competence Swisslog Rohrpostsysteme GmbH positions itself both nationally and internationally through the Kaizen philosophy leading through constant improvement of quality and professionalism. This is characterised by continuous innovation and communication with customers, architects, consultants and users.

This intense exchange and partnership between our customers and employees of Swisslog Rohrpostsysteme GmbH is the basis of trust in all logistical questions in the hospital.

Consultation

As a global player with an endless variety of completed projects we have the practical experience to solve all customer specific logistical challenges. Our priority is to compare technological possibilities and hospital specific requirements and to formulate a solution that provides the highest possible efficiency and maximum economical benefit.

Customer-Specific Solutions

Our solutions are integrated concepts and are tailored for each individual customer's needs. The individual analysis of organisational procedures, staffing and requirements guarantees practical and implementation oriented results. We will work out a bespoke and for the customer most advantageous logistic concept for the

effective use of the pneumatic tube system network for all connected departments.

Project Management

We assist our customers through all project stages: from first discussions on drawing basis, preparation of a transport frequency analysis, to on-time installation of the system. In addition to our user training programs Swisslog Rohrpostsysteme GmbH provides experienced project management and supervision in a qualified, personal and prompt manner.



SYSTEMATIC PROCESS OPTIMIZATION WITH SYSTEM



CONTROLLING DETAILS

During standard operation the carriers are transported with up to 8 m/sec (30 km/h) through the transport tube network. The speed can be considerably reduced for the transport of sensitive samples. These glide at a very low speed of only 2 to 3 m/sec. and this controlled transport condition allows the problem-free transport of laboratory material, blood samples, blood cell suspension, heparin blood, units of stored blood and blood plasma undamaged and intact both mechanically and kinetically.

An integrated pneumatic tube system solution is the key to optimization of distribution processes in often spread-out hospitals. Well thought through technically integrated field-proven logistic systems offer today a high potential for an increase in quality and at the same time cost reduction through efficient time and personnel planning. The pneumatic tube system guarantees fast, spontaneous safe material transport every time, even over long distances.

A matrix of general portering and transport routes is the starting point for every pneumatic tube system. This matrix dictates the routes and number of zones and diverters, the diameter the system needs to be and particular requirements to the control unit can be decided.

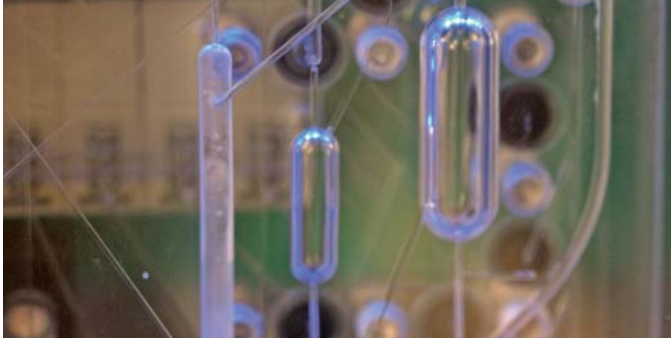
Intelligent software modules support the optimization procedure. Carriers with transponders, for example, facilitate automatic empty carrier return. Multi-send stations and connected transfer units increase sending frequencies.



Setting of priorities allows the preferred transport of especially urgent samples; so that a less urgent send can be "parked" and "overtaken" within the system network.

The blower, which produces the necessary pressure and suction, is the heart of the system. The software resembles the complex function of the brain and gives the system its intelligence.

TECHNICAL EXPERTISE



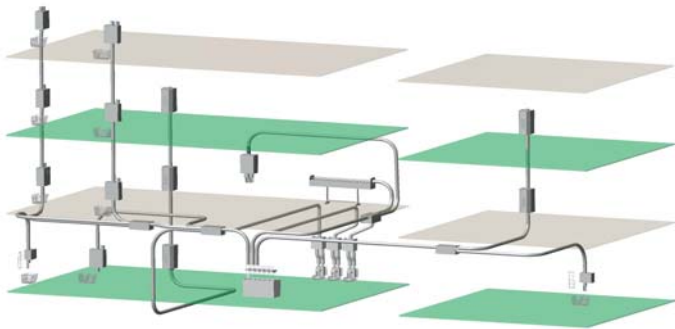
RFID – Transponder Technology (Tracking & Tracing)

Transponders can be fitted in the lids of each carrier to give the carrier its own ID, which is then stored in the carrier database. Through these transponders the system can provide information in real time about the particular items being transported, the location of the carrier within the transport network and to which destination via which route the carrier is travelling. The information is saved in the database of the pneumatic tube system control and is retrievable at any time. This eliminates the risk of losing a send – each transport can be traced at any time.



Graphic monitor

The graphic monitor offers the unique possibility to display information of up to 6 lines in clear text format. Optionally multi-language-displays and graphical symbols can be programmed and included. The user-friendly menu navigation facilitates the system operation for every user. It is programmable in various languages and graphical signs. The backlit LED-display with 240 x 64 pixels and 4 to 6 lines is equipped with a particularly economic energy-saving mode – it is only illuminated when the user panel is being used.



Software functions

- > Programmable timetable for recurring functions
- > Divert function
- > Various priority settings
- > Transport slow-run facility
- > Notification of system status
- > Urgent transport receipt notification
- > Portable, wireless arrival signal
- > System simulation



Access lock

The necessary input of an authorized access code or biometric identification (fingerprint) avoids removals of secure transport goods through non-authorized persons. The input of a code at the station, the application of a combination lock at the door and smart-card-solutions round off the security concept.

KNOW-HOW – TECHNICAL SPECIFICATIONS



Leak-proof carrier

With a load dimension of 330 mm x 120 mm this unique carrier with flip-swivel lid transports goods with a 100% leak-protection.

- > Cleaning machines safe
- > Impact resistant and crystal clear polycarbonate body
- > Absolutely metal free carrier
- > Payload up to 3,5 kg



Laboratory-horizontal-reception

Smooth pneumatic carrier damping and horizontal reception guarantee the gentle arrival of sensitive goods in the laboratory. In addition the user can remove samples at an ergonomically optimal working height while sitting down in areas with high quantities of arriving carriers.



Front-Loading-Station

At this station carriers are loaded at a universally ergonomic shoulder height. Many of our international customers appreciate the particular advantage of being able to adjust the sending height to the average body height. The visually pleasing front-loading-station, with its column design modules above and below the station, can be easily integrated in the interior design concept of the customer. This way varying ceiling heights can be incorporated in the planning development.

Further station types such as compact, mini-compact, multi-send and standard stations as well as numerous installation variations offer perfect design solutions for every customer concept.

PowerLine and PowerTrain

Specific process needs require special technical solutions. This includes the development of PowerLine and PowerTrain. Both solutions allow multi-carrier transport at the same time within one line. These dedicated zones are set up to specifically facilitate high frequency throughput over long distances. The special multi-carrier transports are one of the unique benefits offered by Swisslog Rohrpostsysteme GmbH. Whether time or event driven these functions guarantee for example continuously fast return of empty carriers.

Intense consultation and the analysis of the existing logistic structure are the basis for our success. Even if the user requirements are very particular, the pneumatic tube system TranspoNet offers a made-to-measure individual logistic-solution – based, of course, on the customer's needs.

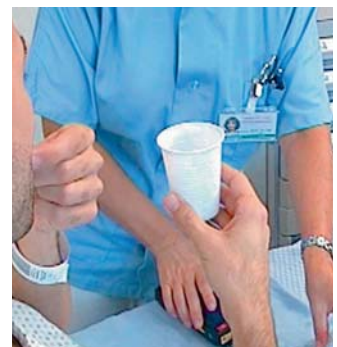
PATIENT INDIVIDUAL DRUG SUPPLY

Automated drug-logistics thanks to Unit Dose and pneumatic tube system interface

- > Reduction of medication faults
- > Increased patient security
- > Reduction in cost of drugs
- > Reduction of staff costs for supply of drugs
- > Relieving nursing staff through automatic on-demand drug transports from the pharmacy to the station
- > Reduction of drug depots at the stations through automatic connection to the central depot

The logistic of pharmaceutical products from automated packaging and storage to assembling, dispensing and application of patient specific medication includes various procedures which need to be performed with utmost precision and perfect timing.

Swisslog is the supplier of two solutions: hospital pharmacy automation plus the integration to and transport in the pneumatic tube system. This facilitates the secure and patient centred transport of the medication directly to the wards.



WITH FLEXIBILITY TO COMPLEXITY

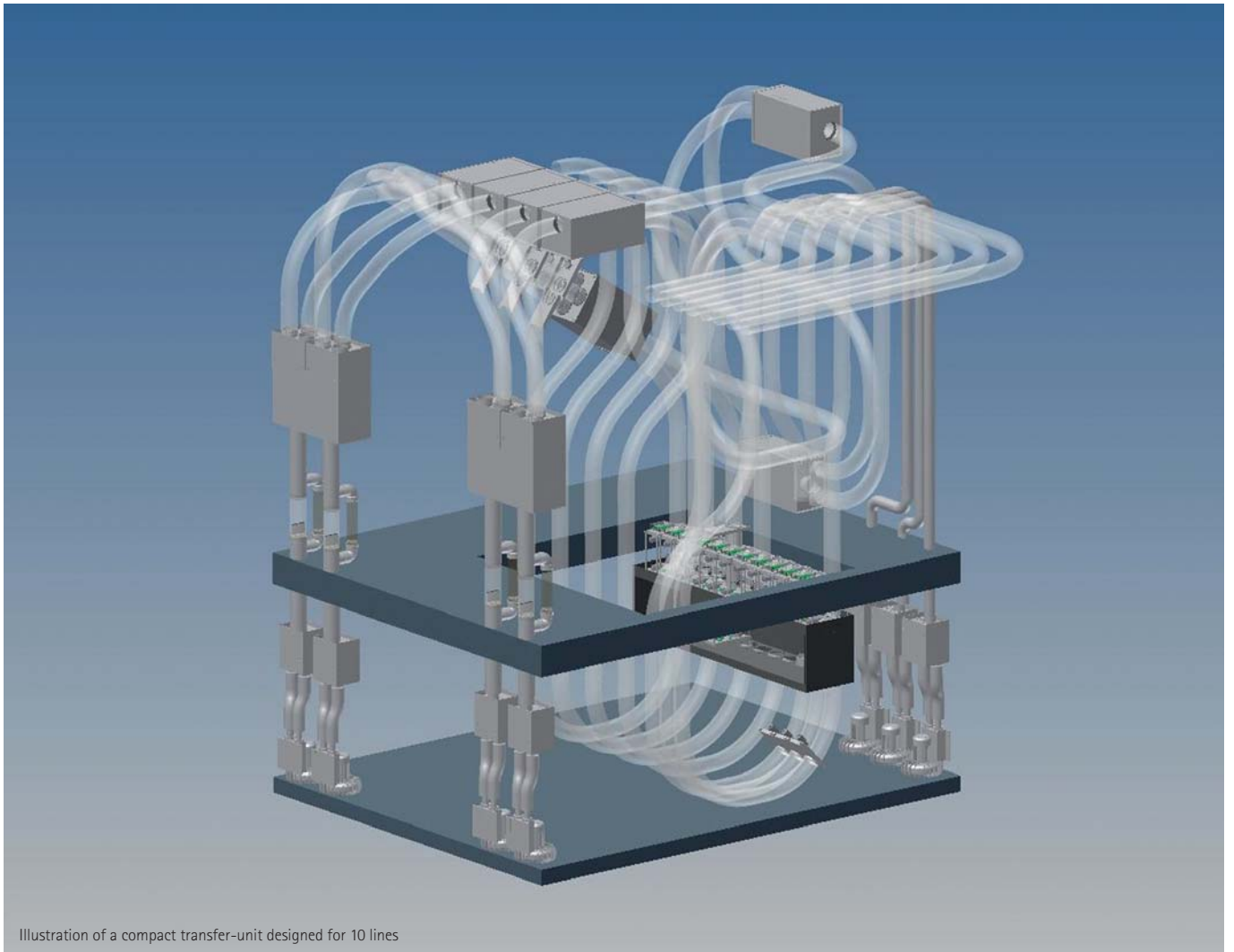


Illustration of a compact transfer-unit designed for 10 lines

Up to now Swisslog Rohrpostsysteme GmbH has successfully installed 12.000 pneumatic tube systems worldwide.

Pneumatic tube systems have been specifically developed for the complex use of hospitals. Whether on one level or many floors, short or long distances, through fire protected sections or outside, underground or in false ceilings, during construction or retrofitted within existing buildings during normal operation – there will always be a sensible route for pneumatic tube system.

Swisslog Rohrpostsysteme GmbH solutions provide an increase in flexibility, service performance and ability to react whilst minimising logistic costs at the same time.

QUALITY CHARACTERIZES OUR CUSTOMERS

The hospital 'Rechts der Isar' in Munich is an example of the whole spectrum of medical services supplied by a modern healthcare facility. This clinical centre is a so-called maximum medical service provider. The development of the pneumatic tube system began more than ten years. Today the total installation consists of more than 150 send and receive stations, all integrated through several zone transfer units and 6 km of transport tube network.

Delivery of high performance through intelligent process organisation

Many logistic processes in a hospital consist of transportation of goods for which the timing can neither be predicted nor planned. The automation of these spontaneous transports with a pneumatic tube system means a reduction of possible organisational confusion and therefore a smoother organisation of the interdependent procedures. In addition staff satisfaction is increased and all this leads to improved patient care.

High quality for maximum demands

Our long term customers consist of facilities offering both basic or standard healthcare provisions and facilities covering the complete spectrum of treatments, with the focus on medical and economical hospital management.

The transport of pharmaceuticals, blood and laboratory products, sections, urgently needed medical products as well as surgical instruments requires clear and proven hospital logistics. A range of user selectable transport speeds provide the appropriate transfer of the transport goods in the pneumatic tube system provides, depending on consistence and urgency. Hospital staff is relieved from organizational tasks as well as portering activities and can therefore concentrate on its core competence and patient care.



Long term partnerships are important to us in the realisation of any pneumatic tube system concept. This is the guarantor for quality secured ways, which see the patient in the focal point.

Active design "pro patient"

Patient centred hospital management which offers its in-patients an almost hotel like atmosphere with all amenities can guarantee together with a pneumatic tube system prompt and effective treatment and good service.

At the famous St. Olav Hospital in Trondheim, Norway this means over 100 send and receive stations, a transport tube diameter of 160 mm as well as a number of zone transfer units with separate zones for direct connection to the laboratory and in total 15 km installed pipeline network.

LASTING INCREASE IN EFFICIENCY

Optimized procedures help each clinical centre of any size to increase quality with lasting efficiency.

Non calculable performance fluctuations, unpredictable emergencies and organizational changes, but also the individual needs of patients and staff represent specific requirements for logistics.

The use of a customized pneumatic tube system concept contributes greatly to making the factors time and internal workflow more calculable. The additional and time intensive burden of on-site portering services is greatly reduced.

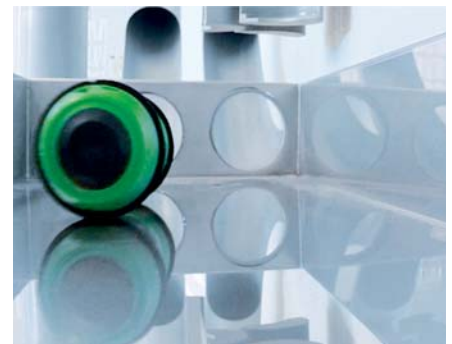
The pneumatic tube system takes over the daily transports '24/7' and transfers all transport goods smoothly, efficiently and reliably to their destination within a few minutes.

Assuming a total transport volume of up to several hundred during peak hours and thousands during the day the expenditure of time and the inherent costs are immense. In addition the employees experience a welcome reduction in their work load, which facilitates the organization of their day-to-day business.

Therefore, there is a gain in quality of work for the hospital personnel. Efficiency, motivation and productivity are increasing significantly after the installation of the pneumatic tube system.

The cost reduction achieved by the tube system offers an average amortization time of less than three years.





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