Simple - Reliable - Innovative
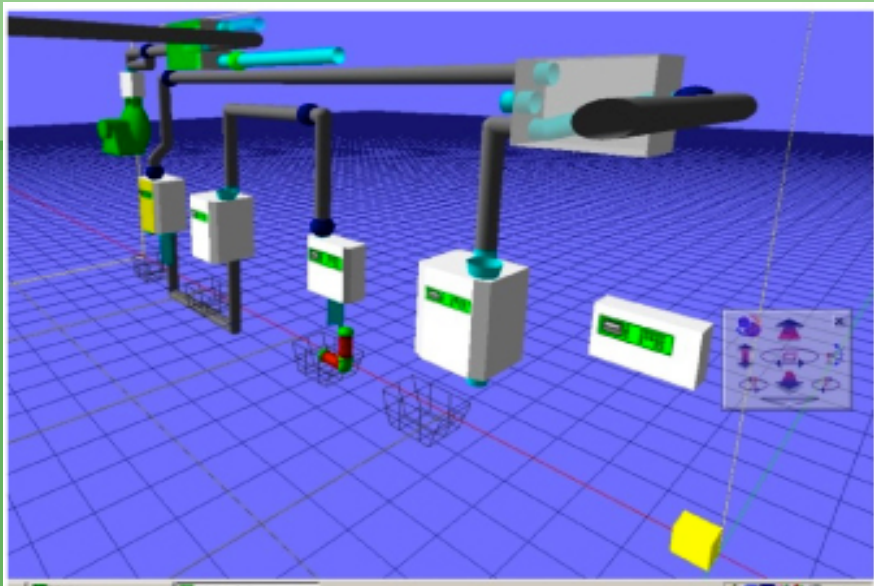
The **NETWORKING AIR TUBE**

- a new dimension in Air Tube Transport System

H61-Futuristic Technology

VIDEO

AIROX ®

Index

HÖRTIG *rohrpost* Profile

Germany

Bavaria

■ **Head office**

Sophian-Kolb-Strasse 4

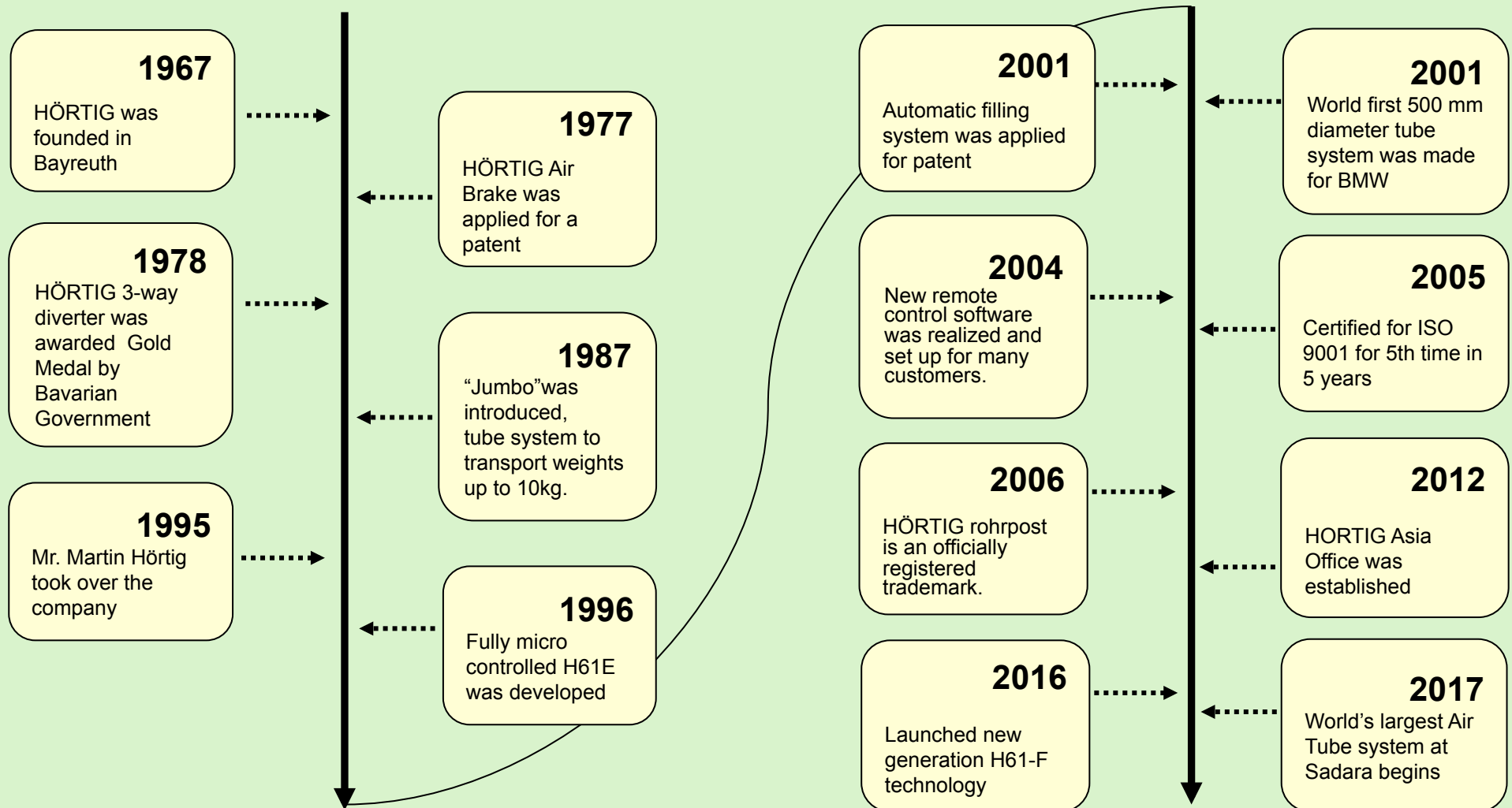**95448 Bayreuth**

Germany

Tel: +49 921 789 490

Fax: +49 921 789 4999

Quick Facts

- HÖRTIG is one of leading manufacturers of air tube transport systems.

- Mr. Bruno Hörtig founded the company in 1967.

- 1995 Mr. Martin Hörtig took over the company and leads the company in the long tradition of innovative development.

- HÖRTIG is a ISO 9001 certified company.

- Keeping long-term business and distribution relationship with more than 100 foreign partners throughout Europe and Asia.

- Has customers from all over the world in 45 countries, including large-sized triple A hospitals, supermarket chains, as well as multicorporate industrial groups.

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History – Timeline

HÖRTIG *rohrpost* ®
► Air Tube Transport Systems ►

1967
HÖRTIG was founded in Bayreuth

1977
HÖRTIG Air Brake was applied for a patent

1978
HÖRTIG 3-way diverter was awarded Gold Medal by Bavarian Government

1987
"Jumbo"was introduced, tube system to transport weights up to 10kg.

1995
Mr. Martin Hörtig took over the company

1996
Fully micro controlled H61E was developed

2001
Automatic filling system was applied for patent

2001
World first 500 mm diameter tube system was made for BMW

2004
New remote control software was realized and set up for many customers.

2005
Certified for ISO 9001 for 5th time in 5 years

2006
HÖRTIG rohrpost is an officially registered trademark.

2012
HORTIG Asia Office was established

2016
Launched new generation H61-F technology

2017
World's largest Air Tube system at Sadara begins

AIROX ®

A World-Class Air Tube System

- HÖRTIG ROHRPOST is the leader in air tube transport systems for industry:
  ...trusted by the world's largest US$ 20 billion integrated chemical complex, Sadara Chemical with an investment of US$ 18 million Air Tube system supplied by HÖRTIG ROHRPOST comprising:
  - 26 km of Do160 mm stainless steel tube
  - 98 stations, 1000 leakproof carriers
  - 12 revolver transfer units
 - designed for 600 carriers "on-the-way" and up to 480 carriers per hour

  …unrivalled Air Tube solution only from HÖRTIG ROHRPOST

- Only original manufacturer of Air tube system from Germany since 1967.
- Continuous development of innovative solutions to deliver superior quality, high performance and technological-advanced systems to our valuable clients.

H61-Futuristic

Customer (partial list)

- **Hospital**
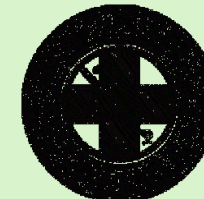
Customer (partial list)

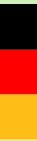- **Retail, bank and forwarding company**

Customer (partial list)

▪ **Industry**

Few Indian Customers

1. Care Hospital, Surat (110mm)

2. Breach Candy Hospital,Mumbai (110mm)

3. Jaslok Hospital,Mumbai (160 mm)

4. Breach Candy (ext.), Mumbai (110 mm)

5. Hinduja Hospital,Mumbai (160mm)

6. Samjak Hospital,Ahemadabad (160mm)

7. Eternal Heart Hospital, Jaipur (160mm)

8. NSSH, Mumbai (160mm)

9. Metropolis Healthcare Lab,Mumbai (160mm)

10. Dr. Sadiwala Clinic, Mumbai (160mm)

11. Alexis Hospital,Bhopal (160mm)

12. Apollo Hospital,Hydrabad (160mm)

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Why hospital needs an Air Tube Transport System?

- Fast Turn-Around Time (TAT)

  - speed of air tube system is 3 to 6 m/s

  - transport of samples or pharmaceutical items is just a few minutes; average delivery time is 2 to 3 minutes

  - better utilization of lab equipment with continuous workflow

  - fast and accurate delivery of test results, reports, etc.

- Improved Patient Service

  - sick patients need not walk to/fro blood collection room

  - hospital-friendly for patients

  - faster turnaround of lab-test process reduces crowding at clinics

  - one-stop service with connections to lab and pharmacy

Why hospital needs an Air Tube Transport System?

- Better Infectious Control

  - reduces potential spread of virus with less movement of sick patients / crowding at clinics

  - safe management of contaminated specimens or samples

  - prevention of cross-contamination; safe, clean and hygiene

- Efficiency

  - 24 hours/7 days operation & spontaneous transport; only possible with transport systems

  - quick connectivity from patient areas to lab, pharmacy, medical record, X-ray; improved patient service

  - better facilities management; reduces cost of operation

Why hospital needs an Air Tube Transport System?

1   Reduces Manpower cost by 5-10%

2   Help reduce electricity cost since lift usage is limited.

3   Gives advance look to the hospital if transperant tube system is installed.

4   Helps saves patient life in case of emergency since you can get medication in quick time from pharmacy.

5   In Hortig system you can maintain all transaction record with log record which will help in transparency and may be in medico legal cases.

Benefits of Air Tube Transport System

- Timely Turnaround Time of Diagnostic Lab Test

  - shorter TAT from order of lab test to diagnostic report

- Quality of Service

  - high quality of service; international benchmarking

- Higher Productivity

  - increase volume of lab test; higher revenue for hospital

- Reputation

  - international standard, efficient process, quality service

- Patients satisfaction

  - patient experience; shorter waiting time, less crowding

Hospital Departments / Units

INPATIENT
Inpatient Wards
Surgical Wards
ENT Wards
Burn unit Wards
ICU/CCU
MICI/SICU
Labour and Delivery Suites

OUTPATIENT
Emergency
Specialist Clinics
Medical Clinics
Surgical Clinics
ENT, Eye
Urology, Colorectal, Gastro
Health Screening
Day Care
Rehabilitation

DIAGNOSTIC/TREATMENT
Day Surgery
Endoscopy
Operating Theares
Radiotherapy
Imaging
Haemdialysis
Padetrics
Breast Centre
Burn Unit

CLIINICAL SUPPORT SERVICES
Clinical Lab / STAT Lab
Pathology Lab
Blood Bank
Pharmacy
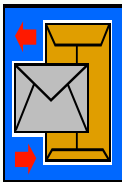Retail Phamacy
Satellite Pharmacy
Mortuary

GENERAL SUPPORT SERVICES
Adminstrative Staff Offices
Clinical Staff Offices
Info Management
Medical Records
Patient Service Centre (PSC)

OPERATIONAL SUPPORT SERVICES
Biomedical Engineering
CSSU
TSSU
Catering, Nutrition & Dietetics
Facility Management (FM)
Housekeeping/Linen Management
Materials Management
Ambulatory Care Center

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Typical Material Transports in hospital

Typical Transport Requirements in Hospital			
Item	Material Transport	From	To
A	Blood specimens, blood cultures, swabs, urine samples, stools, etc	Outpatient clinics, Wards, ICU, OT,…	Laboratory, Pathology
B	Prescription (Rx) Drugs, Medicines	Pharmacy	Inpatient wards, ICU, Operating theatres, Outpatient area
C	Document A4, test reports, forms, X-ray films (up to 400 mm),…	Various department Eg: registration area, medical record, personnel, mail room	Various department

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Common Transport Items

- Blood
- Plasma
- Tissues
- Prescription
- Patient record
- X-Ray Film
- Document
- Drugs
- Test results

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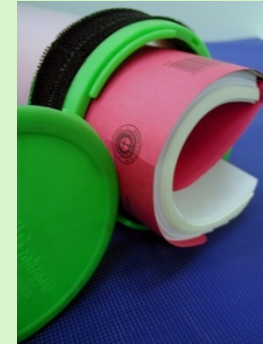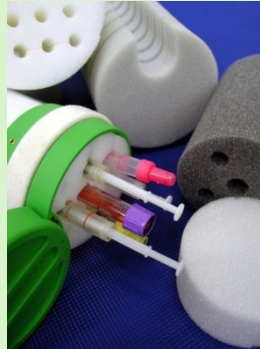
General Transport Volume

Size of hospital (beds)	No. of Stations (typical)	Average no. of carrier sending's per day	Total carrier travel distance per day	Total carrier travel distance per year
250-bed	15 to 20	600+	90 km	30,000 km
500-bed	30 to 40	1500+	225 km	70,000 km
1000-bed	60 to 80	2500+	375 km	115,000 km
1500-bed	100 to 120	3500+	525 km	160,000 km

- Based on average 150 m per sending
- Compare with walking to transport items
- Expensive staff should not loose productive time
- Focus on patient care instead of delivery tasks

Features of Air Tube System

- Speed of Air Tube system is 6 m/s
- Spontaneous Transports, payload up to 4 kg
- Faster availability of test results, 24 hours 7 days
- Reliable delivery and time saving
- Reduction of work load, concentration on patient care
- Future stations can be added onto the line, if required
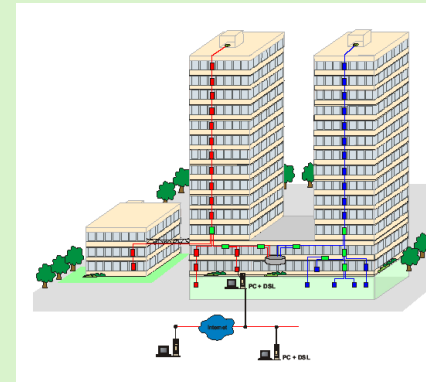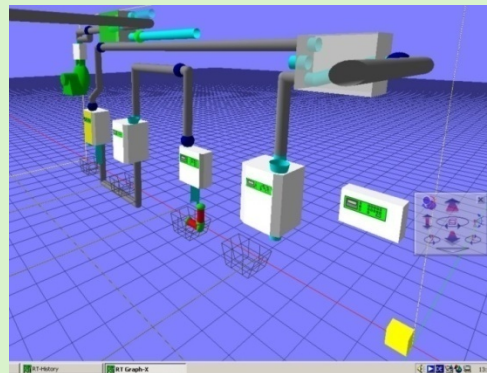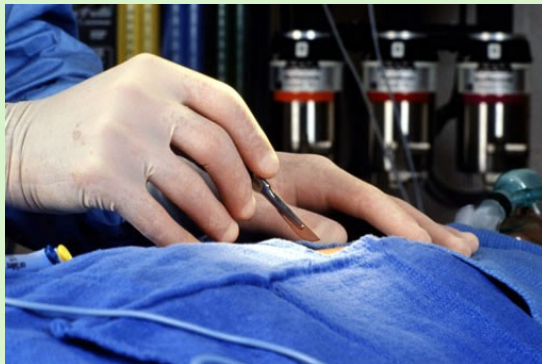
Superior Features of Hörtig Air Tube

- Manufacturer:
  - a dedicated and innovative manufacturer of Air Tube systems since 1967

- Simplicity:
  - user-friendly and easy-to-use
  - ColourSend for automatic dispatching to Lab and Pharmacy
  - optimum travel route, high efficiency

- Reliability:
  - industrial field bus: CAN-bus via Ethernet, IP-based Networking
  - 3-D display, teamviewer for remote support
  - no overloading, no obstacle, RFID reader, secure

- Innovation:
  - arrival screen, dispatch screen, networking with LIS, PIS, BMS, etc
  - revolver transfer: efficient, buffering, priority, multi-design
  - dual-blowers, dual speeds, energy saving
  - customised solutions

AIROX ®

Hörtig Rohrpost - your trusted Air Tube partner

- a dedicated manufacturer of Air Tube system over 5 decades

- awarded twice with "STATE-PRIZE" of the Bavarian Goverment with the "GOLD-MEDAL" for its innovative products

- awarded "Top 100" one of the best 100 innovative middle-class enterprises in Germany

- long tradition of innovative developments by the company:
  - "Jumbo" for up to 10 kg up @ 10 m/s
  - "Cargo" for up to 25 kg @ 6 m/s
  - "CargoPlus" for up to 50 kg @ 2 m/s
  - member of research project "CargoCap" in the University of Bochum

- DIN EN ISO 9001:2000 certified by VdS-Institute Germany

- a registered trademark known for its quality and innovation

HÖRTIG *rohrpost ist*

TOP 100

Der innovative Mittelstand
Deutschland 2002

Superior Features of Hörtig Air Tube

■ ## Simplicity:

- user-friendly, easy-to-use

- up to 20 coloured carriers for dedicated transports

- RFID for automatic dispatching to Lab and Pharmacy

- optimum travel route and time, high efficiency
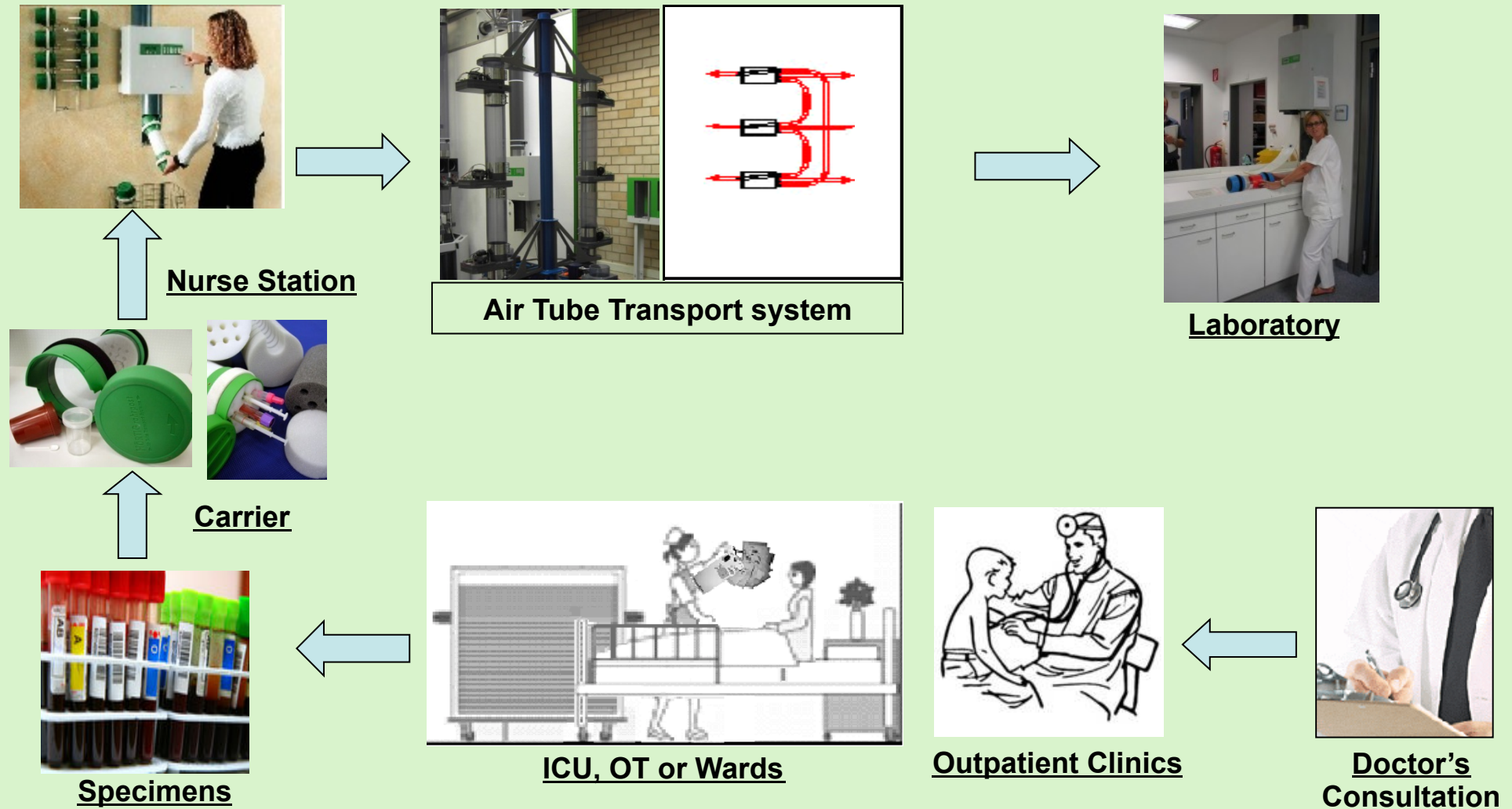
AIROX ®

Station control panel

- Wider screen display

- Up to 8 lines x 26 characters, multi-language

- Membrane keypad with cursor control

- 3 LED lamps for station status (busy, error, carrier arriving)

- day/night light sensor; display changes automatically on day or night

- 3 function-keys; Quick-Dial

- E.S.D. (electro-static discharge) protected
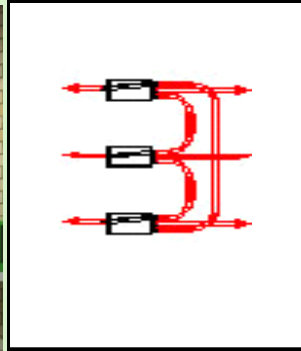
Typical Material Flow in a hospital (Specimens)

Nurse Station

Carrier

Air Tube Transport system

Laboratory

Specimens

ICU, OT or Wards

Outpatient Clinics

Doctor's Consultation

Typical Material Flow in a hospital (Pharmacy)

Pharmacy Station

Air Tube Transport system

Patient Ward

Carrier
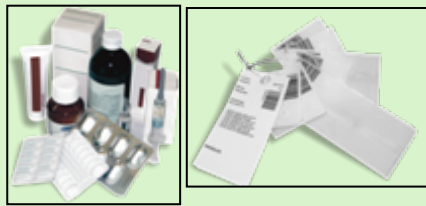
Medicine

**ICU, OT or Wards**

Doctor's Consultation

ColourSend with Materials Classification

Generally, there are 3 classification of transported materials in hospital.
Using coloured carriers for different transport items ensure a high standard of hygiene. HÖRTIG Rohrpost offers unique materials management solution:

| Transport Items			
Classification	Contaminated	Sterile	Non-contaminated
Coloured Carrier	LAB	MED	DOC

AIROX

ColourSend for Lab and Pharmacy

- **Coloured carriers** for dedicated transport management in hospital:

- **RED** carriers - automatic dispatching to Lab from all stations

- **GREEN** carriers - automatic returning to Pharmacy from all stations

- **BLUE** carriers - automatic returning to assigned stations
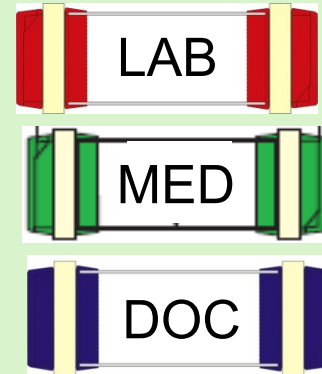
Benefits:

- easy-to-use, less steps, saves time, traceability

- either Automatic with RFID (no need to key code) or Quick-Dial

- hygiene, infectious control, prevention of cross-contamination

- With RFID - No lost carriers containing patient specimens.

- Simple, Efficient, Secure, Safe, Hygienic!
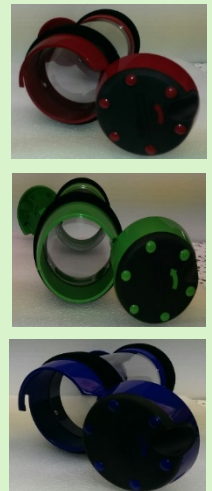
ColourSend+RFID = error-free operation assured!

Station Directory for ColourSend + RFID (sample)

AIR TUBE SYSTEM OPERATING INSTRUCTIONS
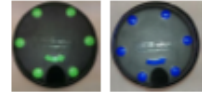
Send RED Carrier
To Laboratory

1. INSERT bags (specimens) INSIDE carrier
2. CLOSE carrier
3. PLACE carrier IN SEND PORT

⚠
1. Carrier will DISPATCH automatically to LAB.
2. Do NOT key-in station address.
3. Do NOT remove carrier.
✅ Do's
❌ Don'ts
1. Always put specimens in zip-bags.
2. Close carrier.

Send BLUE Carriers
To Other Station

1. INSERT contents INSIDE carrier
2. CLOSE carrier
3. PLACE carrier IN SEND PORT

4. KEY-IN station address. (refer to station directory)
If wrong press "F3" to cancel.

5. PRESS "OK" to send

Return EMPTY Carrier
To Pharmacy/Others

1. CLOSE carrier
2. PLACE carrier IN SEND PORT

⚠
1. Carrier will DISPATCH automatically to Pharmacy/Other Stations.
2. Do NOT key-in station address.
3. Do NOT remove carrier.
✅ Do's
❌ Don'ts
1. Always remove carriers from basket.
2. Press key-pad with your finger. Do not use pen or any sharp item.
3. Insert only one carrier into the send port.

CHONG HUA HOSPITAL MANDAUE & CANCER CENTER

General Information
Please follow instructions in this Standard Operating Procedure.
If you observe any abnormal conditions or have any questions, please contact to:

Hospital Maintenance: tel no.

STATION DIRECTORY

FLOOR	DEPARTMENT	STATION ADDRESS	QUICK DIAL
1ST	EMERGENCY	100	1
2ND	LABORATORY	221	2
	PHARMACY	231	3
	OPD	201	4
3RD	OPERATING ROOM	301	5
	MICU	302	6
	OB-GYN	303	7
	NICU	304	8
5TH	MEDICAL RECORD	501	9
	DIALYSIS	502	
6TH	WARD 6A	601	
	WARD 6B	602	
7TH	WARD 7A	701	
	WARD 7B	702	
8TH	WARD 8A	801	
	WARD 8B	802	
9TH	WARD 9A	901	
	WARD 9B	902	
10TH	WARD 10A	1001	
	WARD 10B	1002	
11TH	WARD 11A	1101	
	WARD 11B	1102	

HÖRTIG *rohrpost* ®
➤ Air Tube Transport Systems ➤

At Ward or Clinics:

➢ auto dispatching:
- RED carriers to Lab
- Return GREEN carriers to Pharmacy
- Return BLUE carriers to other stations

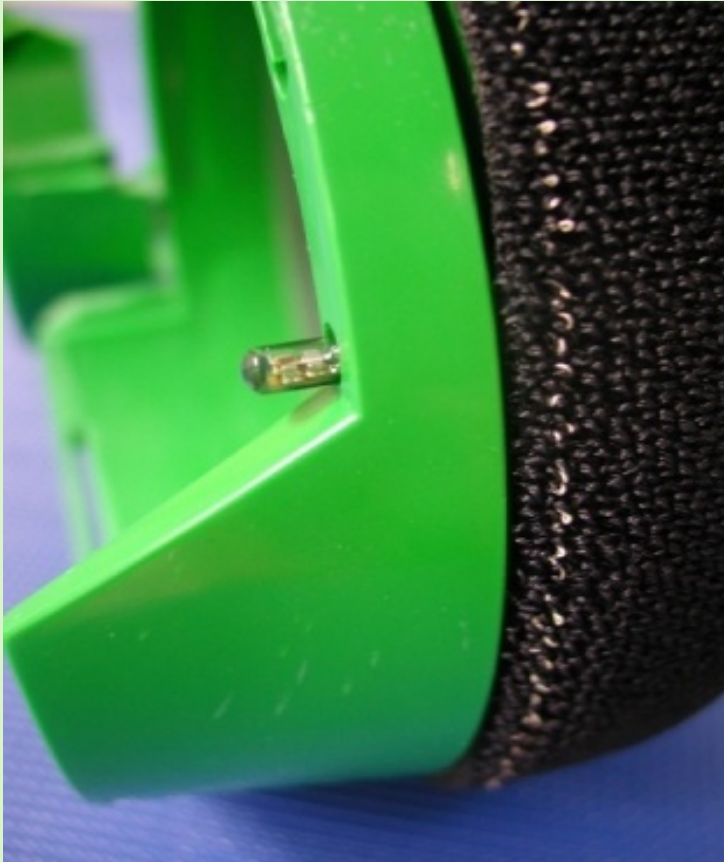➢ dial station code or Quick-dial:
- own BLUE carrier to other station

At Lab:

➢ auto-dispatching:
- Return RED carriers to other stations

➢ -dial station code or Quick-dial:
- own RED carrier to other station

At Pharmacy:

➢ dial station code or Quick-dial:
- own GREEN carrier to other station

AIROX

ColourSend with RFID

## Carrier with RFID for automatic dispatching or return back

- By implanting an ID chip, carriers can be identified through a RFID reader and dispatch to assigned departments automatically e.g. Lab or return back to their original home stations automatically; not necessary to push any button.

- Supported by RFID technology every station can work with his own carriers. In this way the carriers don't need to be held in a large number.

- Empty carrier management allows automatic refill of carriers to depleted stations.

Optimum Travel Route Planning

- **Direct dispatch to Lab**
  - from each zone
  - by Multi-carry via Transfer Unit up to 360 carriers per hour

- **Direct dispatch from Pharmacy**
  - from each zone
  - by Multi-carry via Transfer Unit up to 360 carriers per hour

Benefits:
- most efficient route planning
- high volume transports
- minimum travel time for critical transports
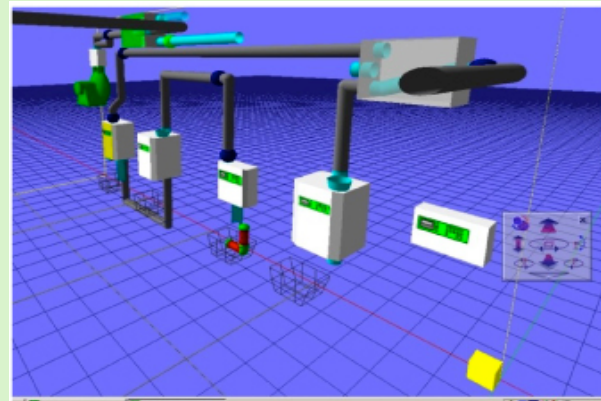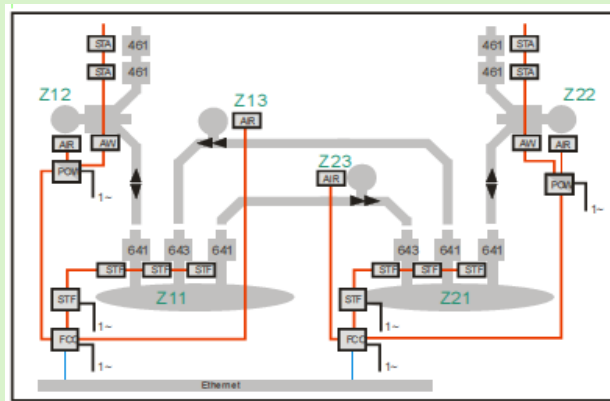- minimise traffic congestion
- optimum efficiency
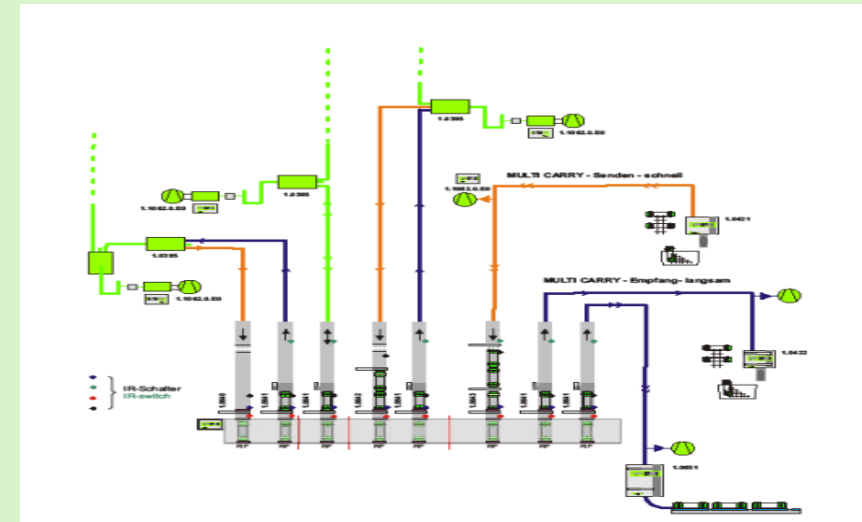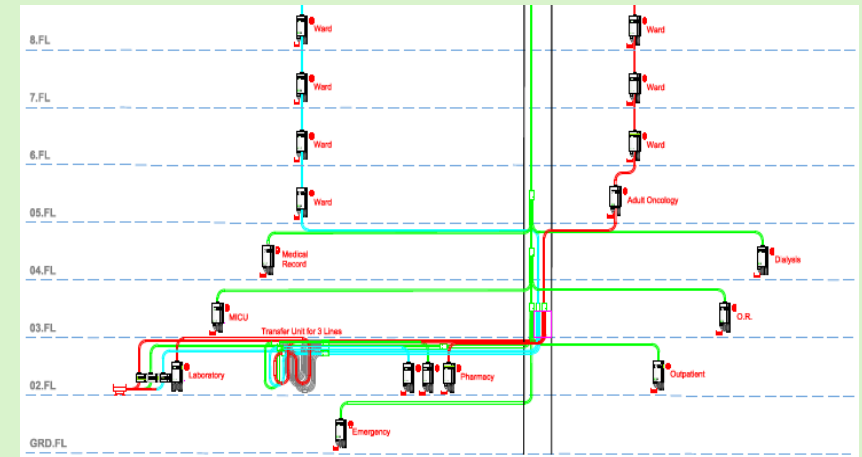
Superior Features of Hörtig Air Tube

■ ## Reliability:

- industrial field bus:
  CAN-bus via Ethernet LAN - stable, robust, and reliable
- IP-based networking
- 3-D display, teamviewer for remote support
- PC software displays mean-time-between failure (MTBF)
- no overloading, no obstacle, RFID reader, secure

Variety of Stations

Arrival Light + Buzzer

| End Station Bottom Loader | End Station With 2-send + 1 receive Bottom Loader | End Station With 3-send Bottom Loader | Through Station Bottom Loader | Station Front Loader | End-Station with bow-receiving Bottom Loader |

General Application:

General	Pharmacy / Lab	Laboratory	General	General	Laboratory

Lab station - examples

Laboratory Station Cabinet Design

Horizontal conveyors for receive & send:
- sort into Priority, Normal & Return lanes

3-send Station

+

Horizontal Receive Station

Station with receiving bow

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Protection against overloading & obstacle

- Our bottom loading stations provide the best protection against overloading thanks to their rational and optimum construction.

- Due to gravity the overloaded carriers cannot be taken into the stations because the loading port is at the bottom of the station. The overloaded carrier will stay there.

- Similar to overloading only our carrier can be accepted by bottom loading station. Absolutely no obstacle can get access in to our system

End-Station
Bottom Loader

End-Station 2-send
Bottom Loader

End-Station 3-send
Bottom Loader

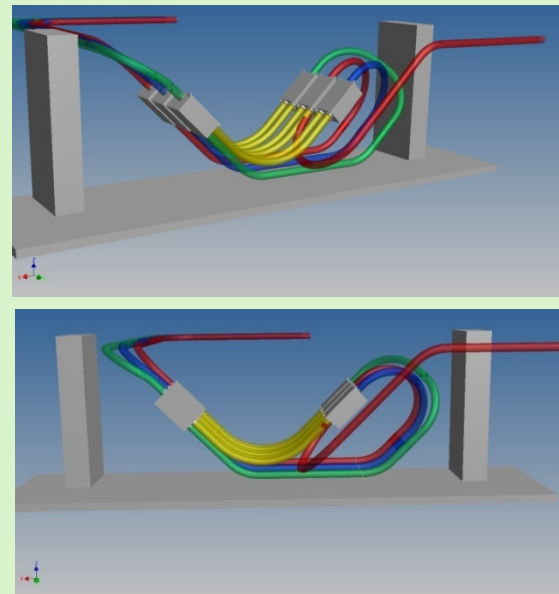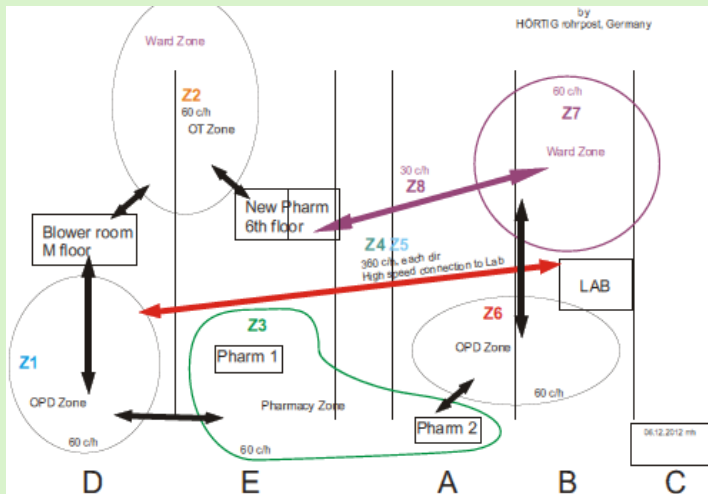Through Station
Bottom Loader

451 Station with bow-receiving
Bottom Loader

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Superior Features of Hörtig Air Tube

- # Innovation:

  - arrival screen / dispatch screen / networking
  - unique efficient multi-transport solutions
  - ICON: Air Tube gallery
  - dual-blowers, dual speeds, energy saving
  - customised solutions

Arrival and Dispatch Screens

- arrival screen (Lab)
- dispatch screen (Pharmacy)
  - touch-screen available with security-monitoring

Arrival screen

8:27			Arrival at: Lab 401			
Carr ID	Origin	P	Start	Arrival	LIS ID	Status
244302	210 Ward 10	1	8:15	8:18	12001324	ok
244401	**104 ICU**	**2**	**8:15**	**8:20**	**12001325**	**ok**
244306	211 Ward 11	1	8:18	8:21	12001326	ok
244311	304 Ward 4	1	8:19	8:23	12001327	ok
244301	210 Ward 10	1	8:21	8:24	12001328	ok
244402	**104 ICU**	**2**	**8:20**	**8:24**	**12001329**	**ok**
244406	**103 OT 1**	**2**	**8:24**	**8:26**	**12001330**	**ok**
244305	211 Ward 11	1	8:24	8:27	12001331	ok
244313	304 Ward 4	1	8:23	8:27	12001332	ok
244303	210 Ward 10	1	8:27	8:30	12001333	run
244403	**104 ICU**	**2**	**8:26**	**8:30**	**12001334**	**run**
244312	304 Ward 4	1	8:27	8:31	12001335	run
-	210 Ward 10	1	8:30	8:33	12001336	wait
-	**104 ICU**	**2**	**8:30**	**8:34**	**12001337**	**wait**
-	304 Ward 4	1	8:31	8:35	12001340	wait
-	**103 OT 1**	**2**	**8:34**	**8:36**	**12001338**	**wait**
-	211 Ward 11	1	8:33	8:36	12001339	wait

arrival history / travelling / scheduled

Dispatch screen

11:36			Dispatch at: Pharmacy 101				
Carr ID	Destination	P	Start	Arrival	PIS ID	Status	Secure
244501	210 Ward 10	1	11:23	11:26	23001332	ok	
244505	211 Ward 11	1	11:26	11:29	23001333	ok	
244503	**104 ICU**	**2**	**11:27**	**11:30**	**23001334**	**ok**	
244506	304 Ward 4	1	11:26	11:31	23001335	ok	
244502	210 Ward 10	1	11:29	11:32	23001336	ok	
244501	**104 ICU**	**2**	**11:30**	**11:33**	**23001337**	**ok**	
244503	211 Ward 11	1	11:32	11:35	23001338	ok	■
244505	**103 OT 1**	**2**	**11:33**	**11:36**	**23001339**	**ok**	■
244508	304 Ward 4	1	11:31	11:36	23001340	ok	■
244507	210 Ward 10	1	11:35	11:38	23001341	run	
244503	**104 ICU**	**2**	**11:36**	**11:39**	**23001342**	**run**	
244409	304 Ward 4	1	11:36	11:41	23001343	run	
-	**104 ICU**	**2**	**11:39**	**11:42**	**23001344**	**wait**	
-	210 Ward 10	1	11:39	11:45	23001345	wait	
-	304 Ward 4	1	11:41	11:45	23001346	wait	
-	**103 OT 1**	**2**	**11:42**	**11:45**	**23001347**	**wait**	
-	211 Ward 11	1	11:45	11:48	23001348	wait	

arrival history / travelling / scheduled

Real time information resulting in timely patient care!

AIROX ®

Unique Efficient Transport Solutions

- **One-way Transport**
  - unique Bag system from Central or designated Blood Collection room/s, Emergency, OT directly to Laboratory.
  - no carriers to manage, hygienic, authentication, safe.
  - one-way; high transport volume.
  - reduces congestion in main Air Tube system.
- **Shuttle Transport** with ColourSend+RFID
  - shuttle transport between patient stations and Lab.
- **Convoy Transport** with *Priority-Normal-Return* receiving conveyors at Lab
  - with Multicarry Express - carriers dispatch every 10 seconds.
  - up to 360 carrier per hour on single travel transport.
- **Multi-zone Transport**
  - multi-zone system for hospital-wide connecting all outpatient clinics, wards to Lab, Pharmacy, Medical Records, etc.

Multi transport solutions with One H61F control system!

One-Way Transport Solution - Bag System
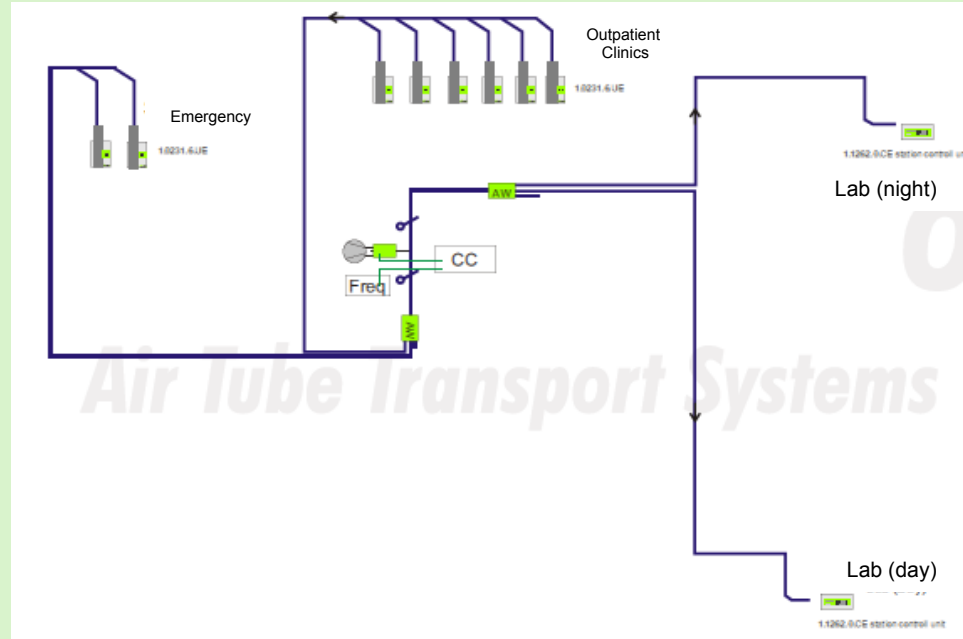
- **One-way Transport**
  - unique Bag system from Central or designated Blood Collection room/s, ER, OT, ICU directly to Lab (Day or Night) or different Labs
  - low cost investment

Shuttle Transport Solution - ColourSend+RFID

| LAB	→	MED	→	DOC	→

to / fro Lab   to Pharmacy   to Sender Station

- **Coloured carriers** for dedicated transport management in hospital:
- **RED** carriers - automatic dispatching to Lab from all stations
- **GREEN** carriers - automatic returning to Pharmacy from all stations
- **BLUE** carriers - automatic returning to assigned station
- programmable to manage up to 20 coloured carriers

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Convoy Transport Solution - Inter-zone Transfer

MultiCarry - either with diverter transfer (or revolver transfer)
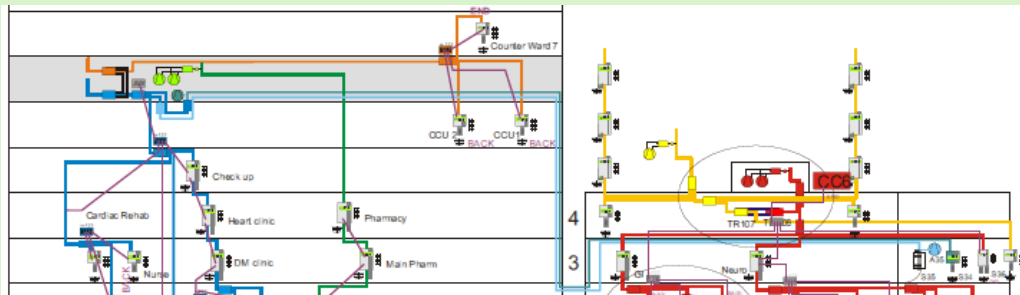
- Each zone with individual blower connection

- Each transfer zone can hold 1 carrier each from each zone; max 2 carriers per transfer

- Separate transfer zone (additional) is required for 3 zones or more

- Use Multi-carry (up to 360 carriers per hour) for high volume transport
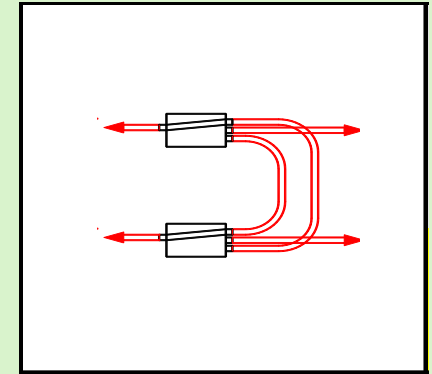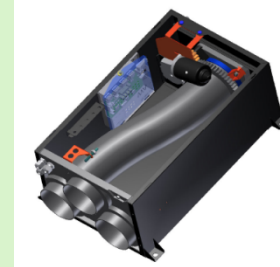

2 zones diverter transfer
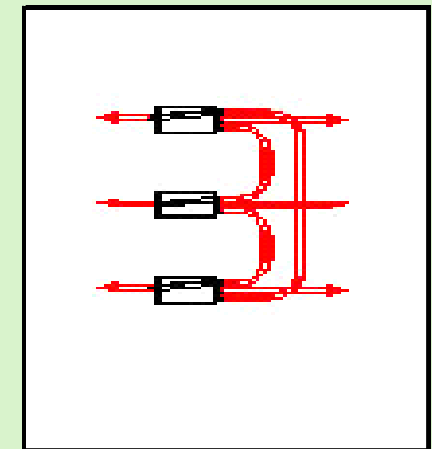
3 zones diverter transfer

Multi-zone - Revolver Transfer (2 to 16 zones)

- High efficiency; reduce waiting time at stations
- High throughput; up to 360 carriers per hour
- Buffering; up to 16 carriers storage on revolver
- Priority management; dispatch carriers with highest priority
- Interim storage; basket full at station, under service.
- Multi-designs:

  - transfer hub between zones,

  - multi-transfer hubs,

  - carrier storage on transfer revolver,

  - carrier storage on in-coming line,

  - **multi-carry express** transports to lab (upto 360 carriers per hour),

  - **multi-carry express** for returning empty carrier from lab (upto 360 carriers per hour),
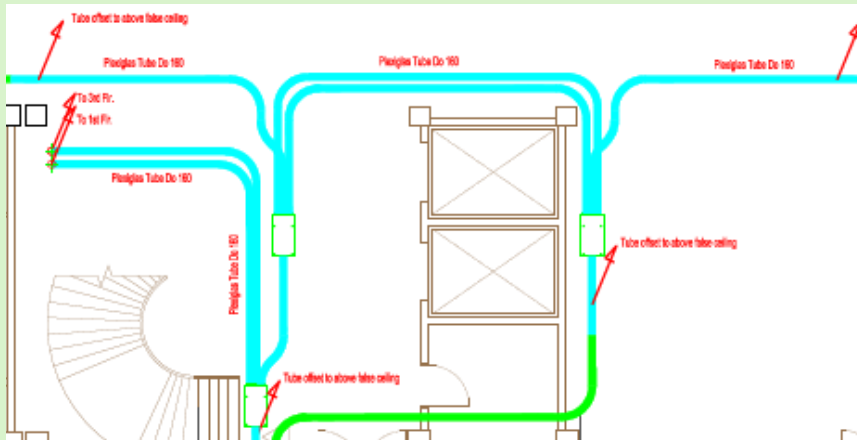
  - State-of-the-Art **revolver transfer technology**

Compact design

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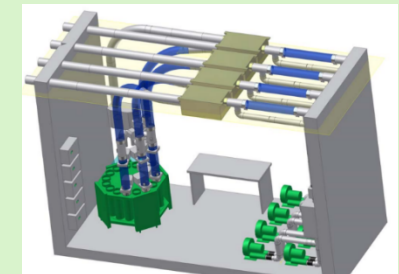
Your Hospital's ICON: Air Tube Gallery

AIR TUBE GALLERY DESIGN

- Techno-ICON
  - display in Hospital lobby
  - hospital investment in technology
- Air Tube Gallery consist:
  - diverters painted in red, green and blue (different zones)
  - Plexiglas clear tubes installed below ceiling
  - coloured carriers (RED, GREEN, BLUE) travel pass this gallery
  - enhancement to interior deco
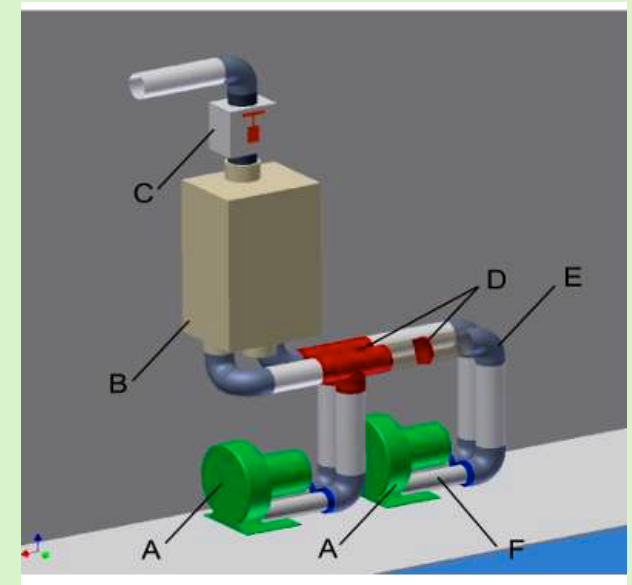 - entertaining

A delight to visitors!

AIROX ®

Hörtig Dual-blowers

- dual-blowers
- dual speeds: 3 m/s and 6 m/s

Benefits:

- energy savings up to 50% with 1 blower running for all transports to Lab
- if one blower fails, the other blower can resume system operation

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Summary of HÖRTIG Air Tube Solutions

- ERROR-FREE OPERATION
  - ColourSend+RFID, hygienic, infectious control management
  - easy-to-use, tracking, traceability, secure, safe
- RELIABILITY
  - high quality and long-life components with MTBF statistics
  - industrial-grade system
  - trouble-free system operation and energy saving
- EFFICIENT MULTI-TRANSPORTS in One Air Tube system
  - one-way, shuttle, convoy, inter-zone and multi-zone transportation
- FUTURE TECHNOLOGY IN TODAY
  - IP-based, network to LIS, PIS, sms, etc.
  - barcoding or RFID tag integration
  - monitoring screens at Lab and Pharmacy; real-time information
  - transfer revolver with buffers, priority management

Guaranteed high performance and reliable quality

AIROX ®

Thanks for your attention!

We offer wide range of systems and stations. Beside our standard systems we also develop customer specified systems with the most different requirements to the goods, the weights and the stations.

HÖRTIG *rohrpost*

a leading manufacturer of Air Tube Transport Systems

will always be a good choice!