

Blood storage and transport

Facts & figures:

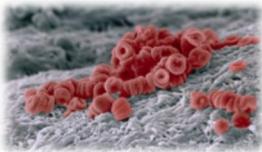
Globally 85 million units of blood are used each year.

One unit of blood is equivalent to about one pint.

Blood makes up 7% of the bodies weight.

70% of countries globally have national policies dictating the rules for collection, transport and transfusion of blood.

One microlitre of blood contains 4 - 6 million red blood cells.



Blood — the stuff of life!

Blood is the primary method by which we transport vital elements around our bodies.

From our first breath oxygen is carried in the blood from our lungs to cells throughout our body. Blood serves so many vital functions within our bodies it is no surprise that loss of blood can be extremely dangerous.

Haemorrhagic shock is a life threatening condition caused by 20% loss of blood. This level of blood loss can easily be caused by cuts, abrasions, burns, internal bleeding or even vomiting and diarrhoea.

Many medical conditions also exist that result in a reduction of the bodies ability to make blood.

In any form untreated blood loss or lack of blood is fatal .

Thankfully blood can be transfused from one individual to another. A healthy persons donated blood being used save the life of another!

Blood transfusions are collected from healthy members of the public. Most countries have national systems for the collection, processing, storage and transport of blood.

Donated blood is tested for infections, and then processed to separate out the key blood elements;

- **Red Blood Cells**
Transport oxygen
- **White Blood Cells**
Fight Infections
- **Plasma**
Nutrients and proteins
- **Platelets**
Help stop bleeding

All blood elements must be carefully stored and transported quickly to where they are needed.

Why the need to measure temperature?

Discussed in this edition:

Blood — the stuff of life	1
Why the need to measure temperature?	1
What solutions can Rotronic offer?	2
Rotronic products	2
Customer benefits	2

The same rules for the storage of food products like dairy and meat apply to the storage of blood and blood products. The key elements being controlled temperature but also the use of preservative compounds.

Low temperatures slow glycolytic activity in blood extending shelf life. Low temperatures also reduce bacterial growth which is critical as donor samples often have minor bacterial contamination.

Temperatures vary depending on the blood products.

Platelet concentrates
22°C ± 2°C.

Red blood cells
4°C ± 2°C.

General blood plasma
4°C ± 2°C.

Labile clotting factors
-25°C within 24 hours

Criticality of temperature at every stage of blood collection, processing, storage and final delivery means that all controlled environments are tightly monitored using various systems;

- Manual thermometers
- Chart recorders or electronic loggers
- Computer linked devices to central software

Manual recording is unfeasible for most applications as trained operators are required to physically check sensors every 4 hours, 7 days per week.

Electronic data loggers are the most common solution. Either running as stand-alone logging and alarming devices or with additional connectivity into a central monitoring system.

What solutions can Rotronic offer?

Rotronic continues to develop and produce a range of temperature monitoring solutions.

From single use logging devices to complete monitoring and alarming solutions as

well as calibration, mapping and validation services.

All aspects of blood transport networks require temperature monitoring. Storage and preparation areas should also be periodically mapped

for assessment of thermal gradients.

Rotronic products provide reliable data collection, backed up complaint software and Rotronic global support.

Rotronic products:

TL-CC1

- Single Use Cold Chain Logger
- 8,000 point memory
- Automated PDF report
- No software / cables required
- -30...70°C range

TL-1D / HL-1D

- Battery powered compact logger with display
- 64,000 point memory
- Up to 3 year battery life
- Programmable start /stop
- -20...70°C range

HygroLog HL-NT

- Our most advanced logger
- Unlimited memory
- USB, Ethernet, RS485, WiFi connectivity
- Fully programmable
- Local alarms

HL-RC-T

- Wireless logger
- Secure on-board memory
- 300,000 point memory
- Up to 6 year battery life
- USB / Ethernet receivers

Mapping Services

- From freezers to warehouses
- Full reporting and certification
- Traceable or ISO17025 calibrations
- Temperature and humidity mapping available

Calibrations Services

- Traceable or ISO 17025 services available
- Temperature, humidity and dew point
- Fast turnaround on request

Customer benefits:

Range of solutions:

Rotronic is renowned for high accuracy devices. But we understand that different applications have different requirements. Our range of devices ensures we can provide the right product.

Communication:

Networking with Rotronic is an easy affair! With the wide range of communication interfaces available, from conventional analogue output signals to USB, RS-485, Wireless

and Ethernet RJ-45, Rotronic can provide the required interface to your local systems.

Reliability:

Logging systems must be 100% reliable. Loss of data can result in the disposal of potentially life saving products. Compliant software and robust product design ensure your data is always available.

Calibration:

Rotronic offers a factory cali-

bration certificates, and ISO17025 certificates if required. The portable HygroGen temperature & humidity calibrator is also available for on-site calibration.

Service

Rotronic is proud of its reputation for quality service and support. Our global network of subsidiaries and distributors are available to support you and your customers.



TL-CC1 — Single use cold chain logger with automated PDF report



TL-1D — Compact and reliable battery powered data logger



HL-RC-T — Robust wireless data logger



HygroLog HL-NT — Our most advanced data logger