

Aztec 600 BROCHURE




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ABB Analytical Instrumentation Introducing the new Aztec 600 Colorimetric Range

Where Aztec fits in the ABB Instrumentation Range

ABB Analytical Instrumentation		
Power / Steam Raising	Potable Water / Municipal Wastewater	Industrial Processes
		
Navigator	Aztec	Endura

Water, our most fundamental natural resource

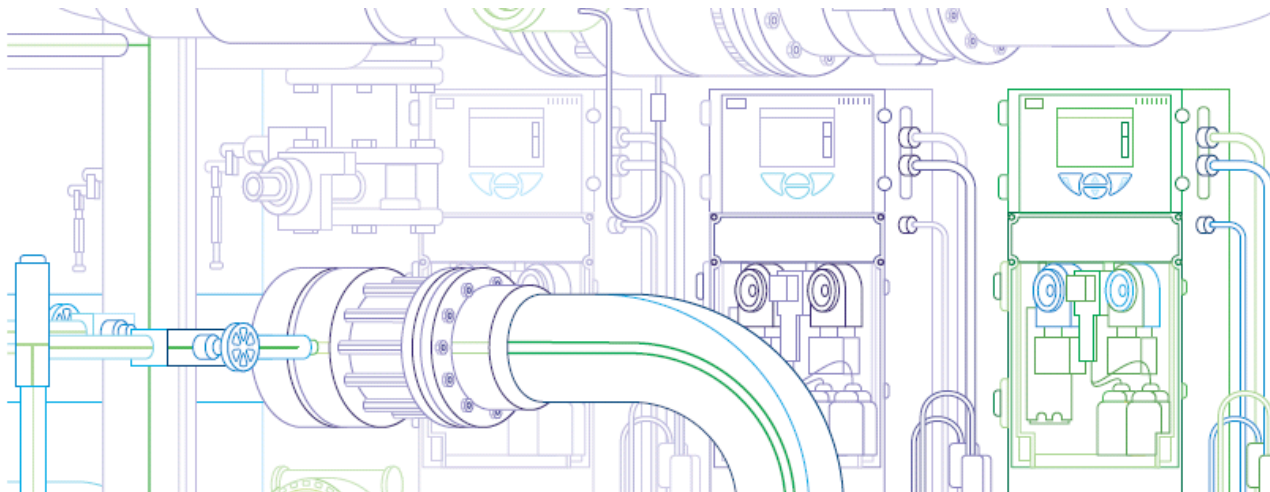
- Demand for fresh water is increasing at three times the rate of population
- Water resources around the globe are threatened by climate change, misuse and pollution
- Water supply industry is continually challenged to supply constant safe supply of drinking water.



ABB's analytical instrumentation portfolio

For when quality and accuracy matter

- ABB has been supplying online analytical instrumentation to the water industry for over 50 years
- Able to measure a wide range of parameters on-line
 - Physical, Inorganic and Organic
- Based on a number of different sensing technologies
 - Ion selective, potentiometric, amperometric, absorption, optical, colorimetric



ABB's Aztec Range



ABB's new Aztec range of water monitoring instrumentation has been specifically created to provide the water industry with the advanced analysis to continually optimize their water treatment processes to meet the growing demand for safe drinking water at an affordable price.

The Aztec 600 colorimetric range

- A compact, reliable range of on-line colorimetric analyzers that have been designed to meet the needs of the water industry.
 - Reliable Measurement
 - Simple to Operate
 - Simple to Maintain
 - Reliable Data
 - Flexible Communications



The Aztec 600 colorimetric range

- A truly common colorimetric platform
 - Aztec 600 Aluminium
 - Aztec 600 Iron
 - Aztec 600 Manganese
 - Aztec 600 Manganese Low Range
 - Aztec 600 Phosphate
 - Aztec 600 Ammonia



Parameter	Range	Application
Aluminium	0.005 ... 1.5 mg/l Al	<ul style="list-style-type: none"> ▪ Residual Coagulant Monitoring
Iron	0.005 ... 5 mg/l Fe	<ul style="list-style-type: none"> ▪ Residual Coagulant Monitoring ▪ Iron Removal
Manganese	0.020 ... 10 mg/l Mn 0.001 ... 0.1mg/l Mn	<ul style="list-style-type: none"> ▪ Manganese Removal ▪ Final Water Monitoring
Phosphate	0.050 ... 50 mg/l PO ₄	<ul style="list-style-type: none"> ▪ Plumbosolvency Schemes ▪ Monitoring municipal wastewater effluent
Ammonia	0.002 ... 3 mg/l NH ₃	<ul style="list-style-type: none"> ▪ River Monitoring/Intake Protection ▪ Final Water Monitoring

The Aztec 600 colorimetric range

Product overview

Single Stream Analyzer
for measurement of 1
sample stream

Multi-Stream Analyzer
for measurement of up to 3
sample streams



Fluid Handling

The unique Aztec 600 measurement system

Fluid handling consists of two sub-assemblies

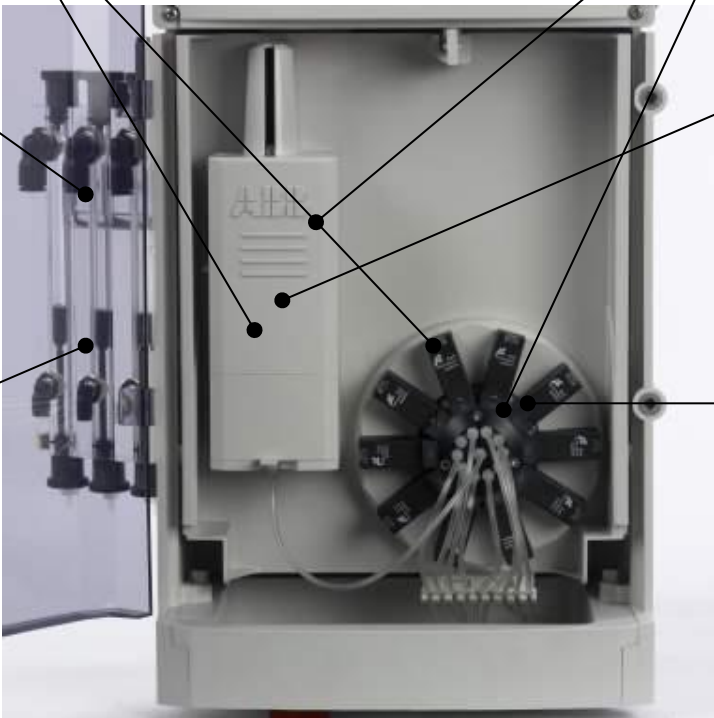
Modular parts can be easily interchanged and replaced on site

Integrated side sample pot with level sensor

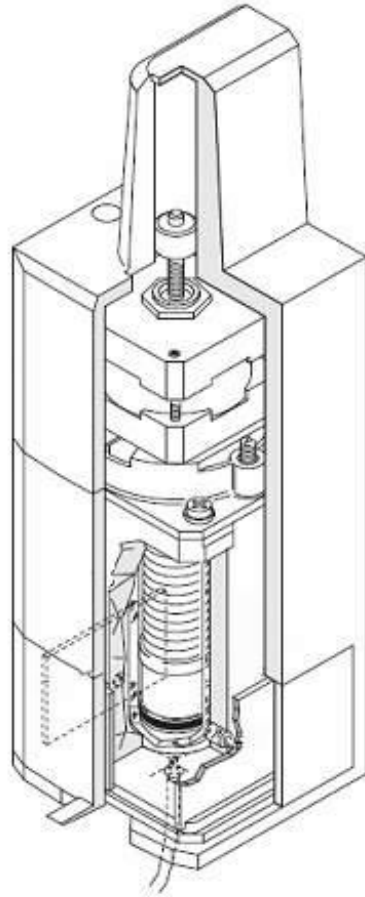
All fluid handling mixing and disposal controlled by one measurement head assembly

Measurement of up to 3 sample streams

Central valve manifold selects what is brought into measurement cell



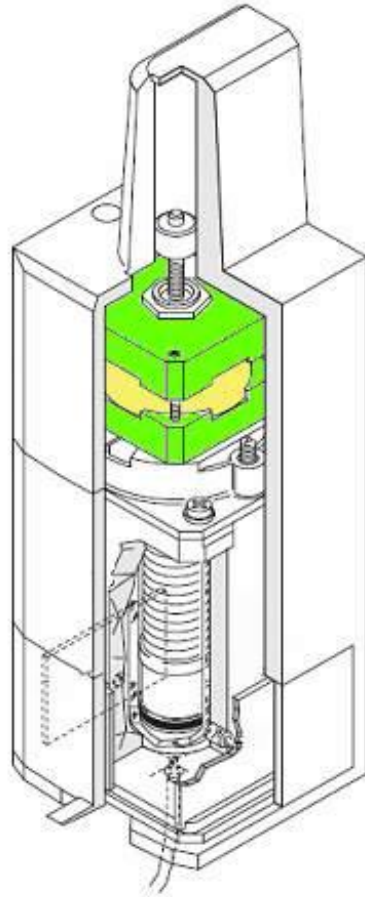
Fluid Handling Measurement head assembly



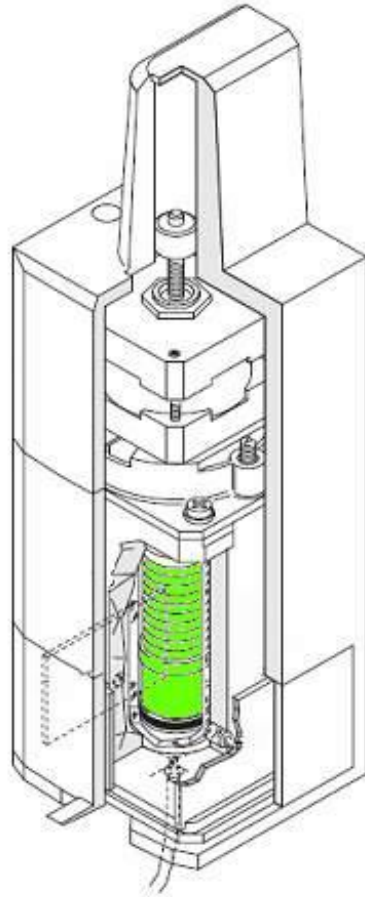
- Acts as a motorized syringe for all fluid handling

Fluid Handling Measurement head assembly

- Precisely controlled stepper motor for accurate sample/reagent addition

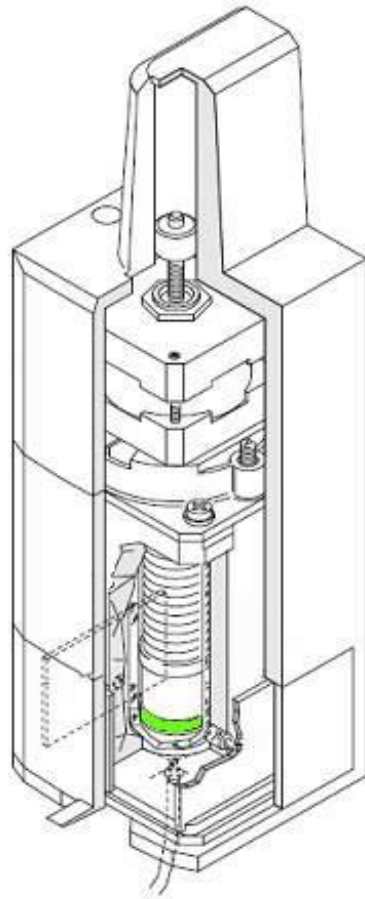


Fluid Handling Measurement head assembly



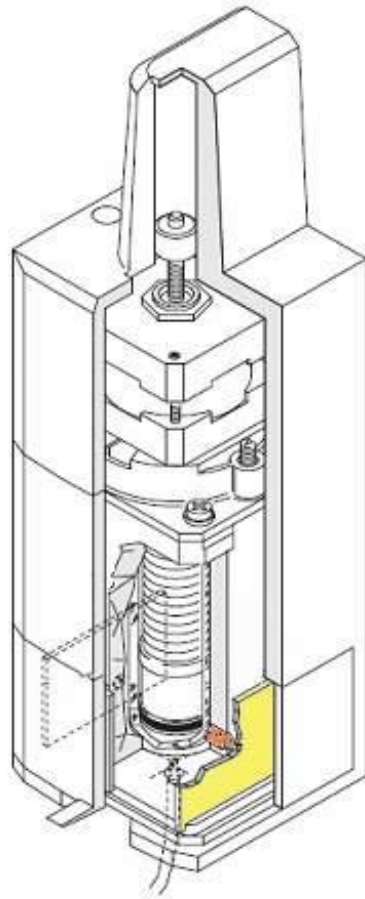
- Precisely controlled stepper motor for accurate sample/reagent addition
- PTFE cover protects leadscrew and motor assembly from chemicals

Fluid Handling Measurement head assembly



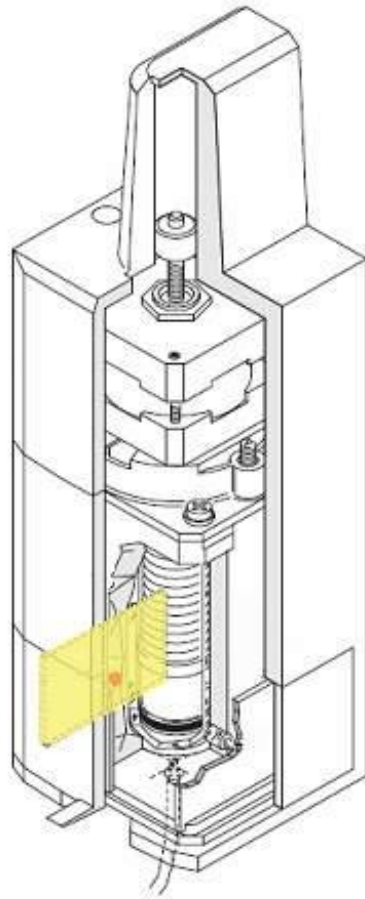
- Precisely controlled stepper motor for accurate sample/reagent addition
- PTFE cover protects leadscrew and motor assembly from chemicals
- Piston assembly movement mechanically wipes the optical cell at every measurement

Fluid Handling Measurement head assembly



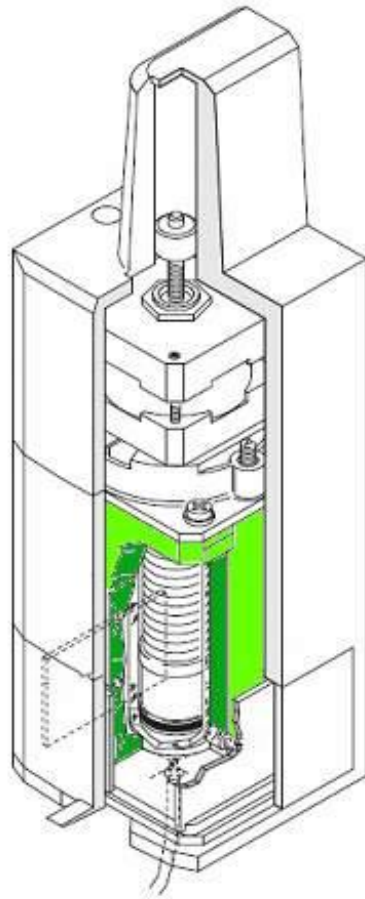
- Precisely controlled stepper motor for accurate sample/reagent addition
- PTFE cover protects leadscrew and motor assembly from chemicals
- Piston assembly movement mechanically wipes the optical cell at every measurement
- LED light source intensity automatically adjusted at calibration to eliminate drift and compensate for any cell fouling

Fluid Handling Measurement head assembly



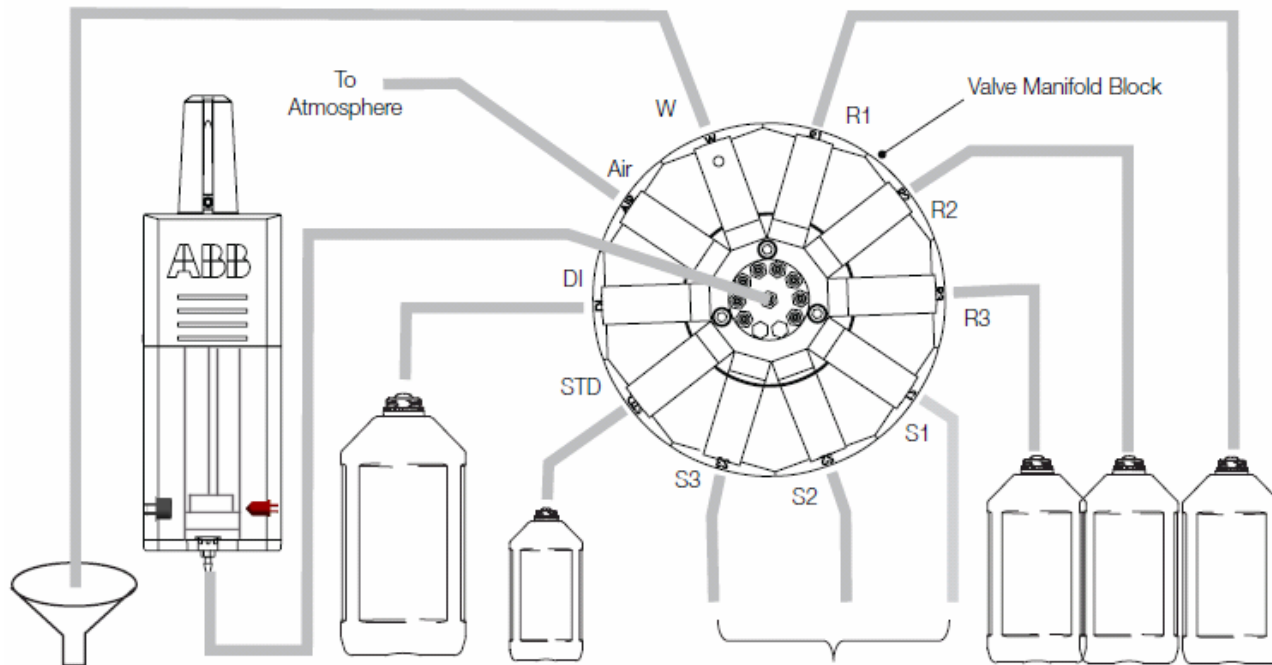
- Precisely controlled stepper motor for accurate sample/reagent addition
- PTFE cover protects leadscrew and motor assembly from chemicals
- Piston assembly movement mechanically wipes the optical cell at every measurement
- LED light source intensity automatically adjusted at calibration to eliminate drift and compensate for any cell fouling
- Detector assembly measures light passed through the sample

Fluid Handling Measurement head assembly



- Precisely controlled stepper motor for accurate sample/reagent addition
- PTFE cover protects leadscrew and motor assembly from chemicals
- Piston assembly movement mechanically wipes the optical cell at every measurement
- LED light source intensity automatically adjusted at calibration to eliminate drift and compensate for any cell fouling
- Detector assembly measures light passed through the sample
- Temperature controlled inner body increases measurement stability and certain chemical reactions

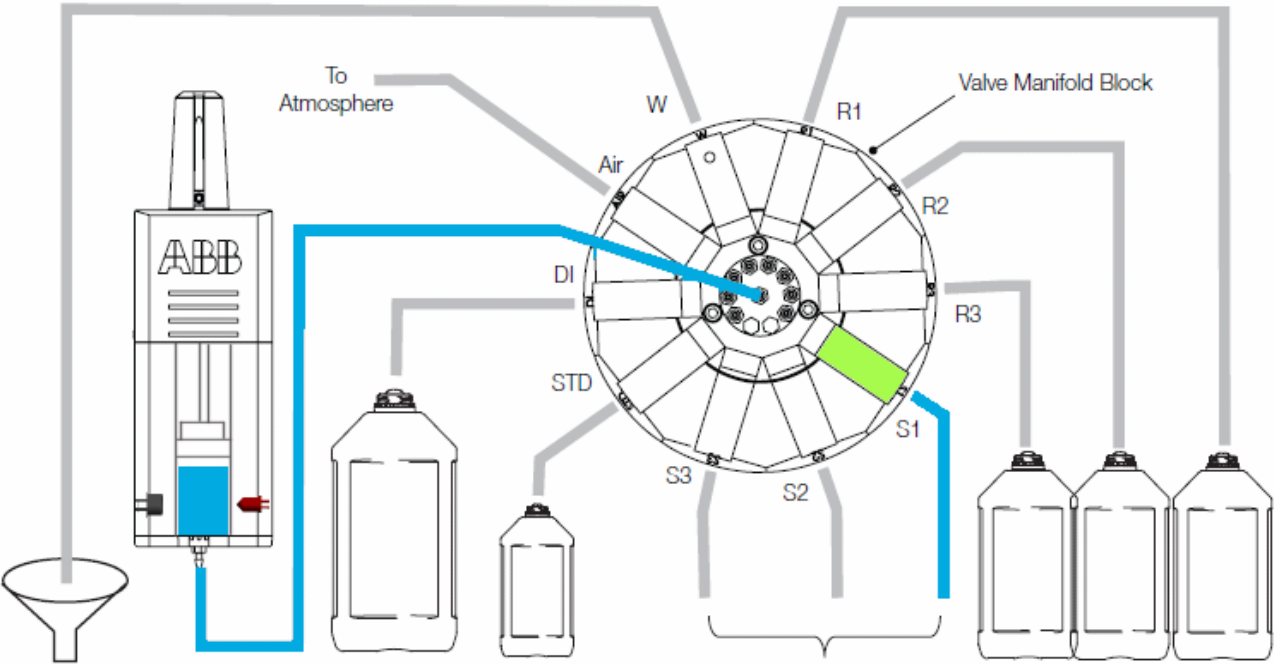
Principle of Operation



The principle of operation is the same for all Aztec 600 Colorimetric analyzers although the actual measurement sequence will vary depending upon the parameter. The following example is for aluminium.

Principle of Operation

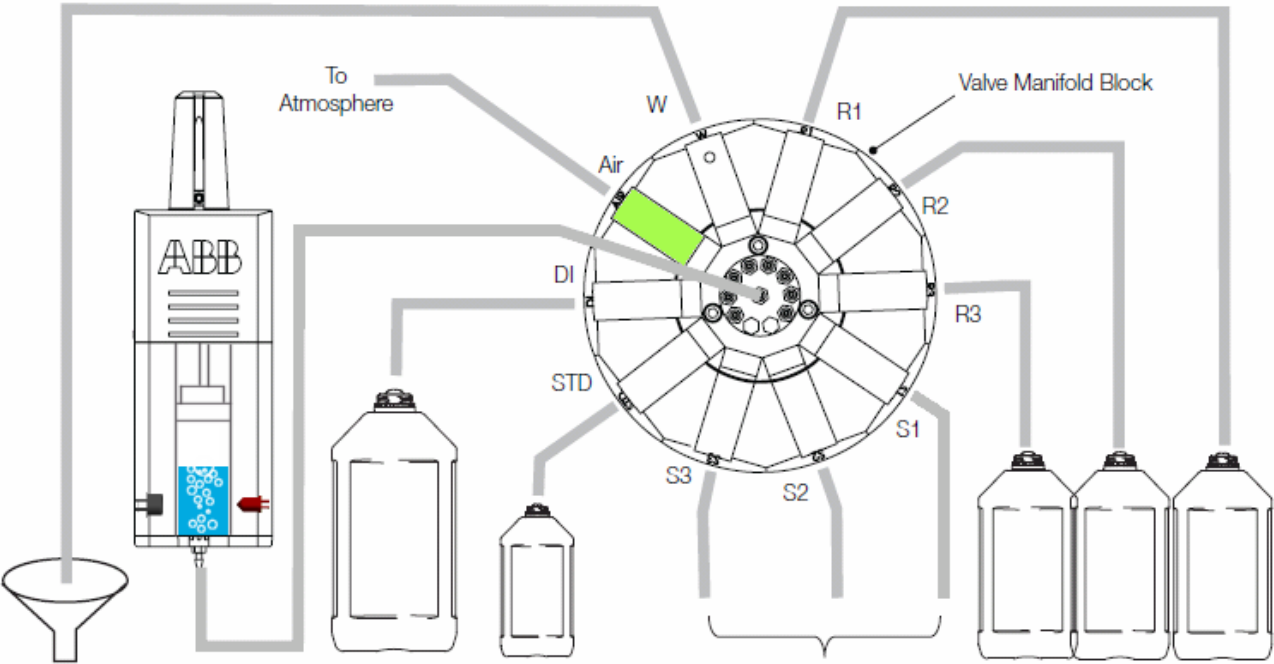
Rinse Routine



Measurement cell is rinsed with fresh sample

Principle of Operation

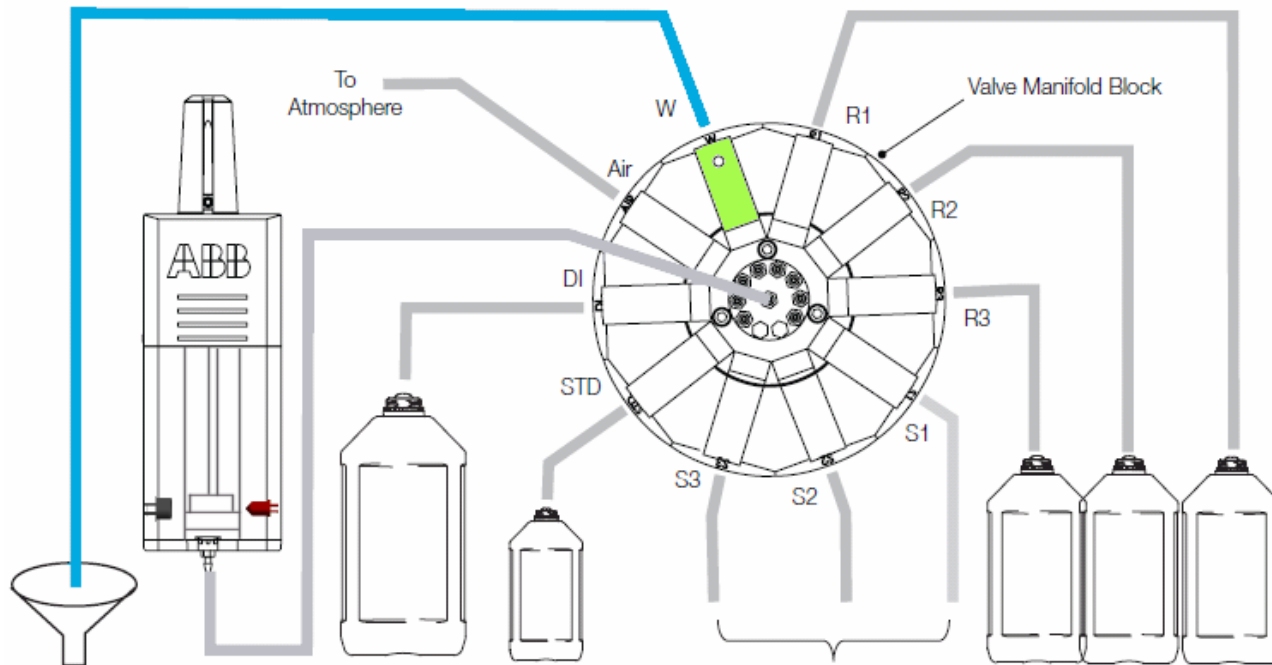
Rinse Routine



Air is brought in to purge the tubing between the measurement head and valve manifold block

Principle of Operation

Rinse Routine

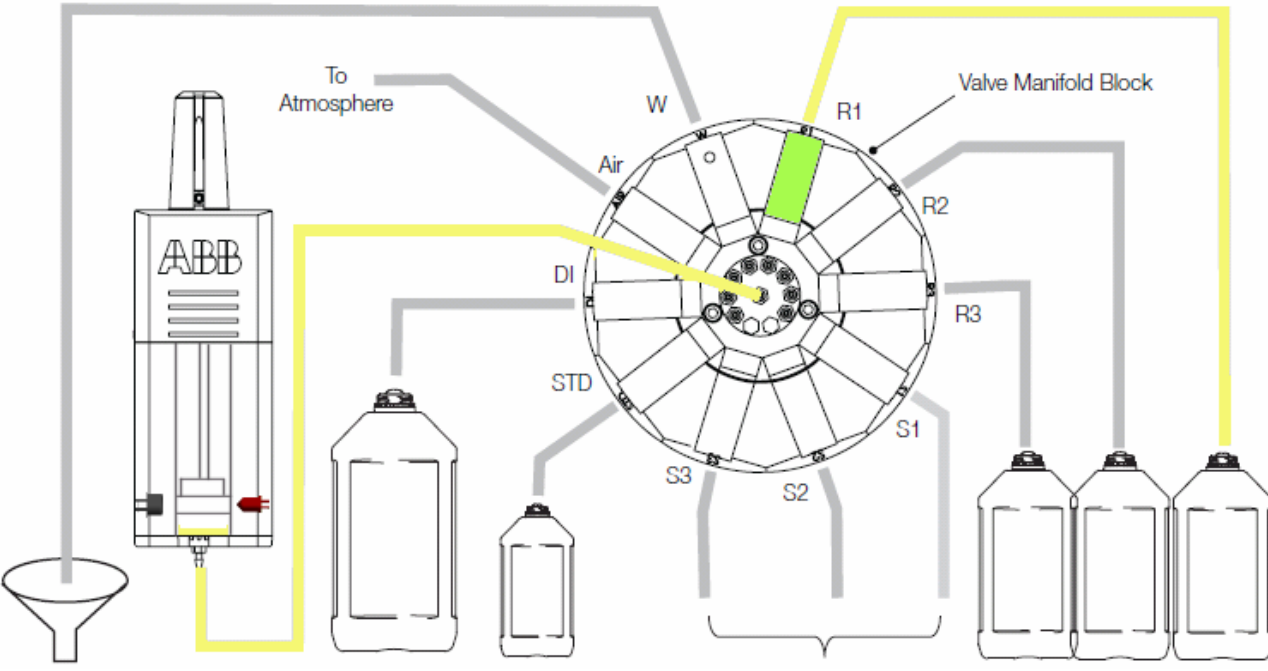


The waste valve is then opened and the piston reset allowing the solution to leave via the waste valve

The number of sample rinses is user configurable, the default is twice.

Principle of Operation

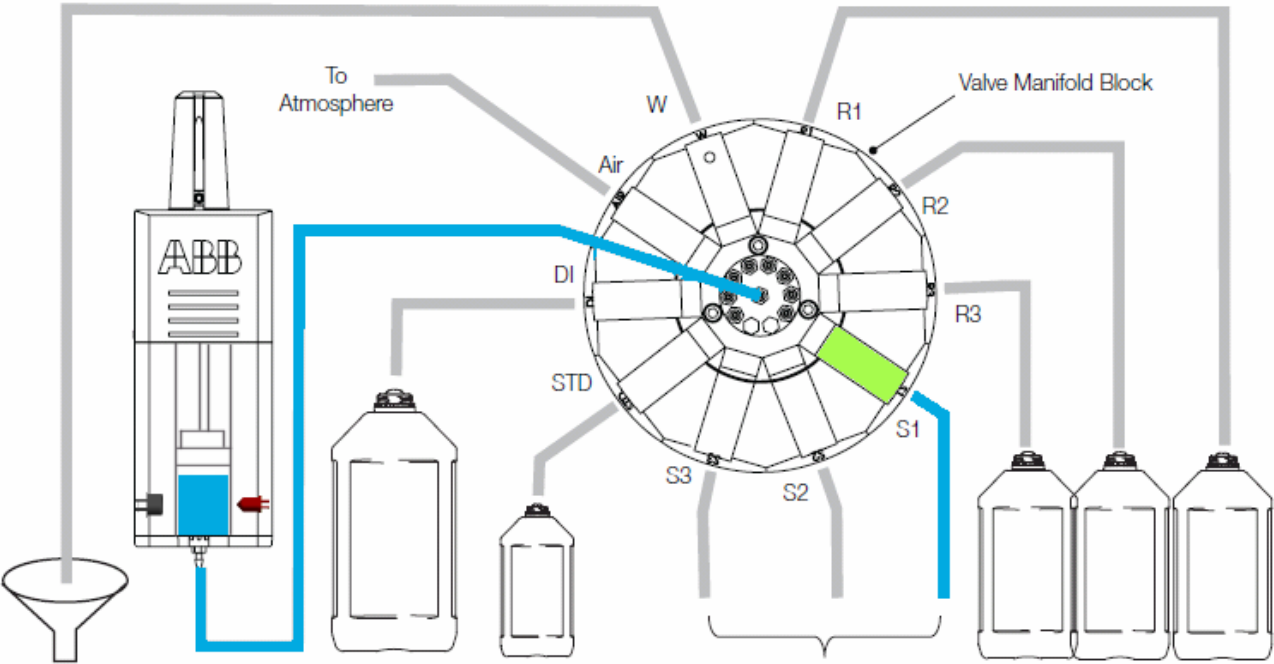
Measurement Sequence



A small amount of reagent 1 (acid reagent) is brought into the cell.

Principle of Operation

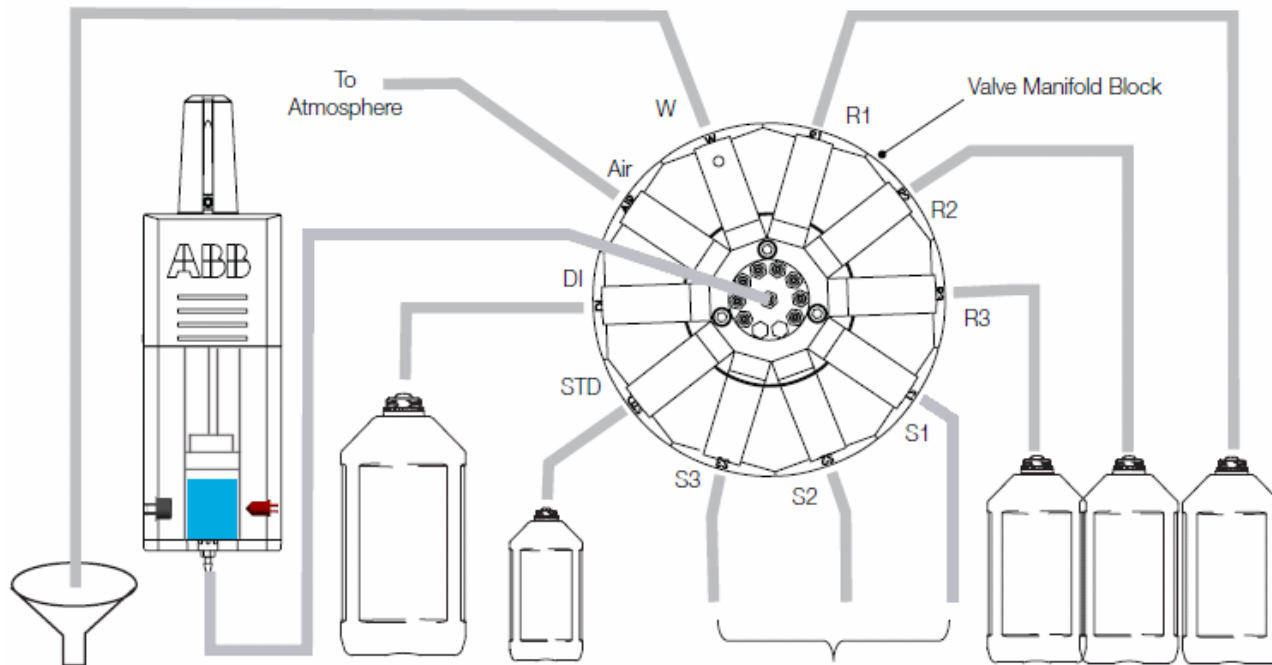
Measurement Sequence



The sample to be measured is then brought into the cell causing it to mix with reagent 1

Principle of Operation

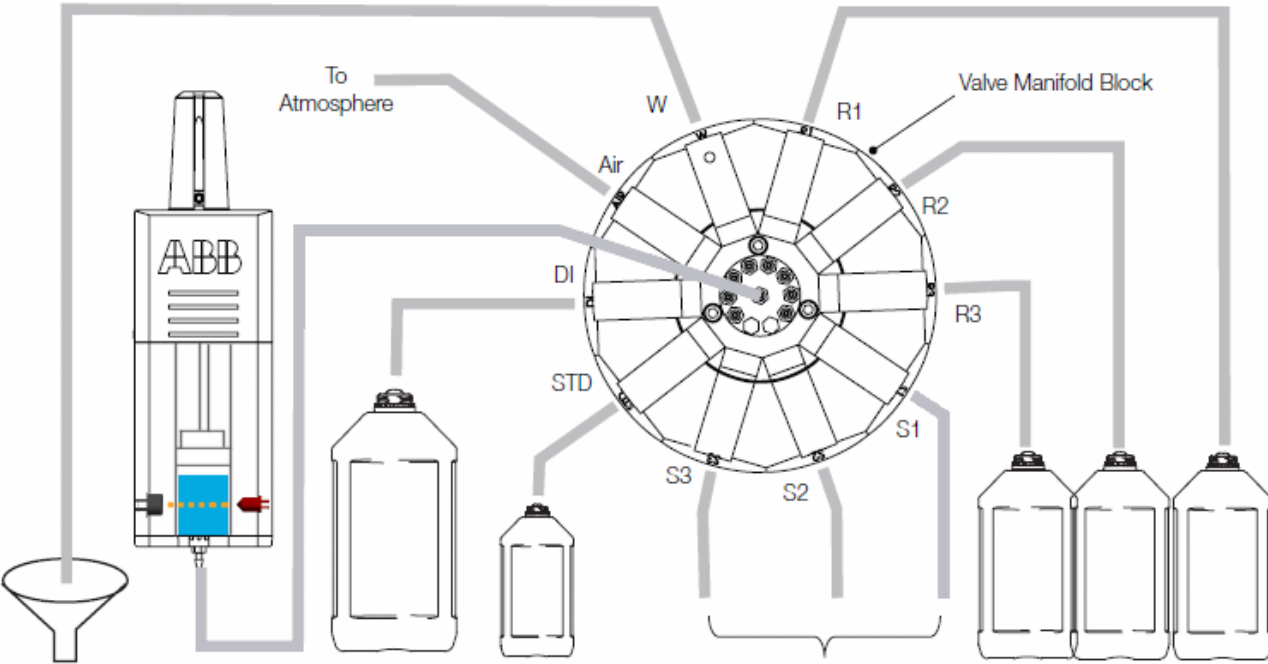
Measurement Sequence



The acidified sample solution is then held in the measurement cell for 3 minutes. This acidification is normally sufficient to convert all soluble forms of aluminium to those that will react with the colour forming reagent.

Principle of Operation

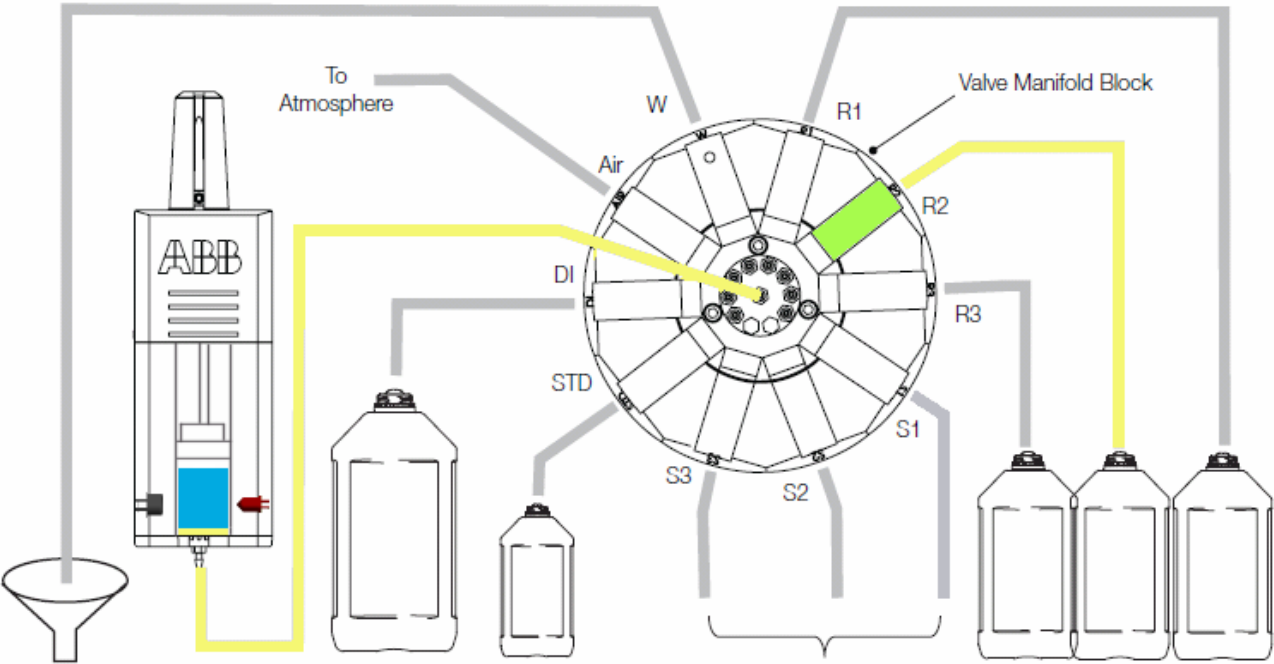
Measurement Sequence



Before any colour forming chemicals are added a measurement of the background is taken. This is to account for any natural colour of the sample.

Principle of Operation

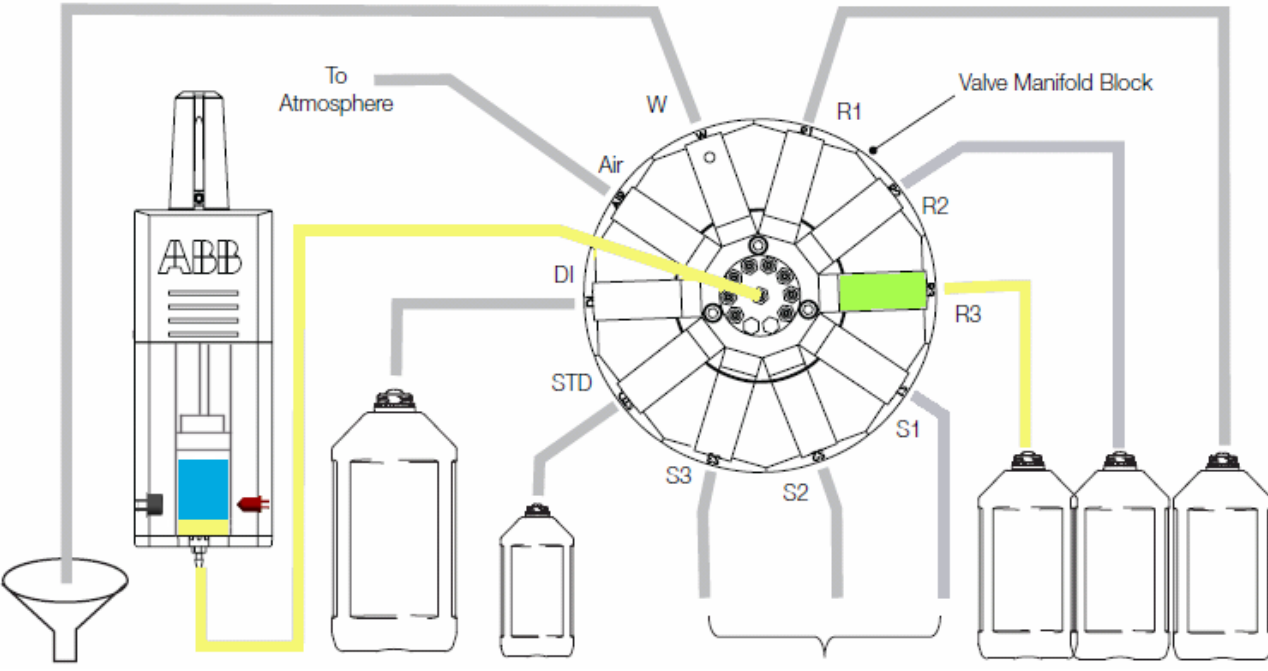
Measurement Sequence



A small amount of reagent 2 (Buffer) is brought into the cell to raise the pH of the solution so that it will react with the colour forming complex.

Principle of Operation

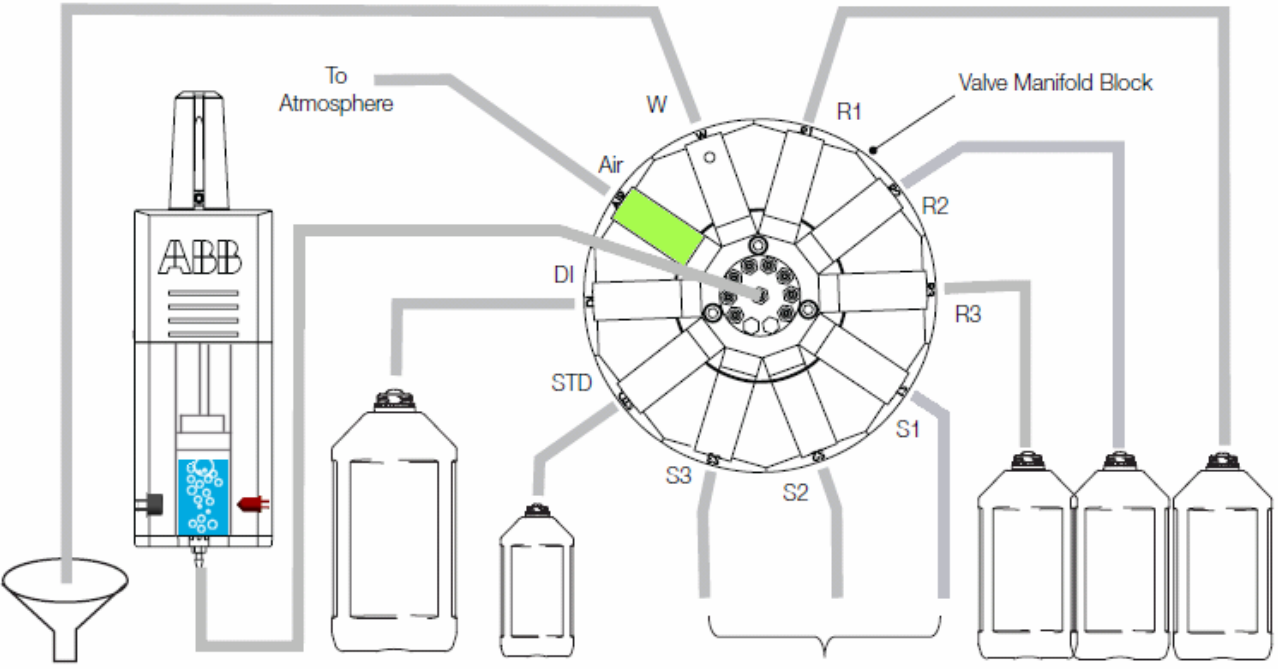
Measurement Sequence



A small amount of reagent 3 (Colour forming reagent) is brought into the cell.

Principle of Operation

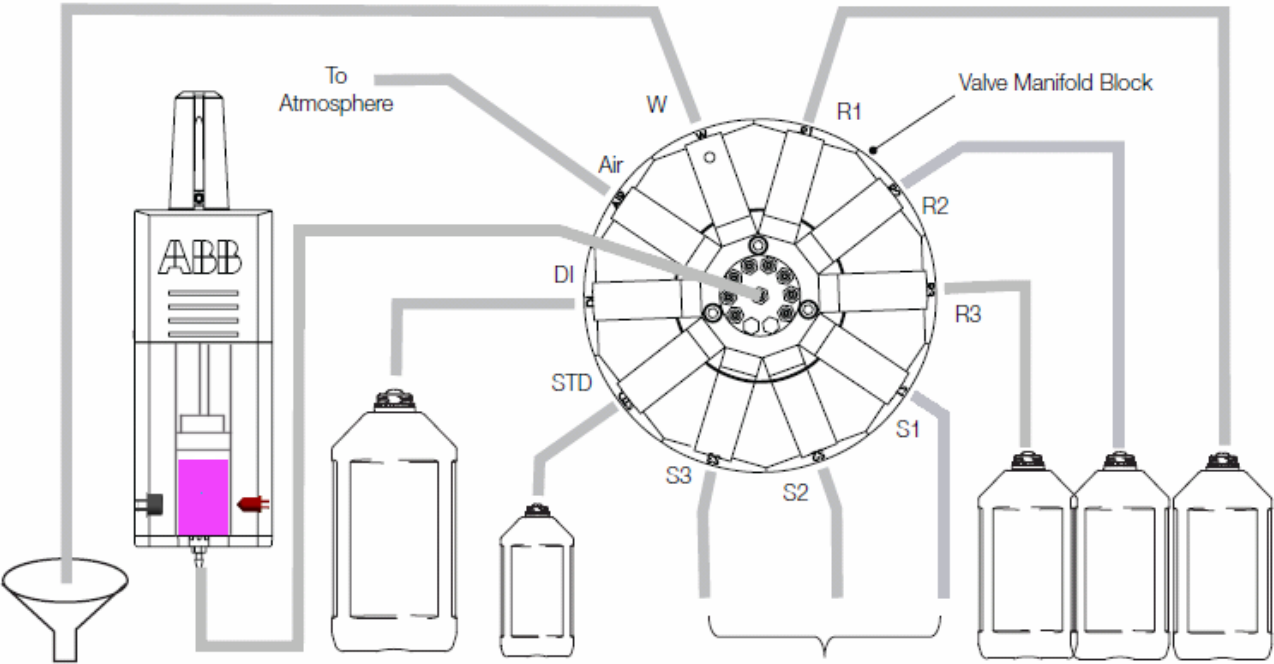
Measurement Sequence



Air is brought in to the cell which both purges the tubing and mixes the reagents with the solution in the cell.

Principle of Operation

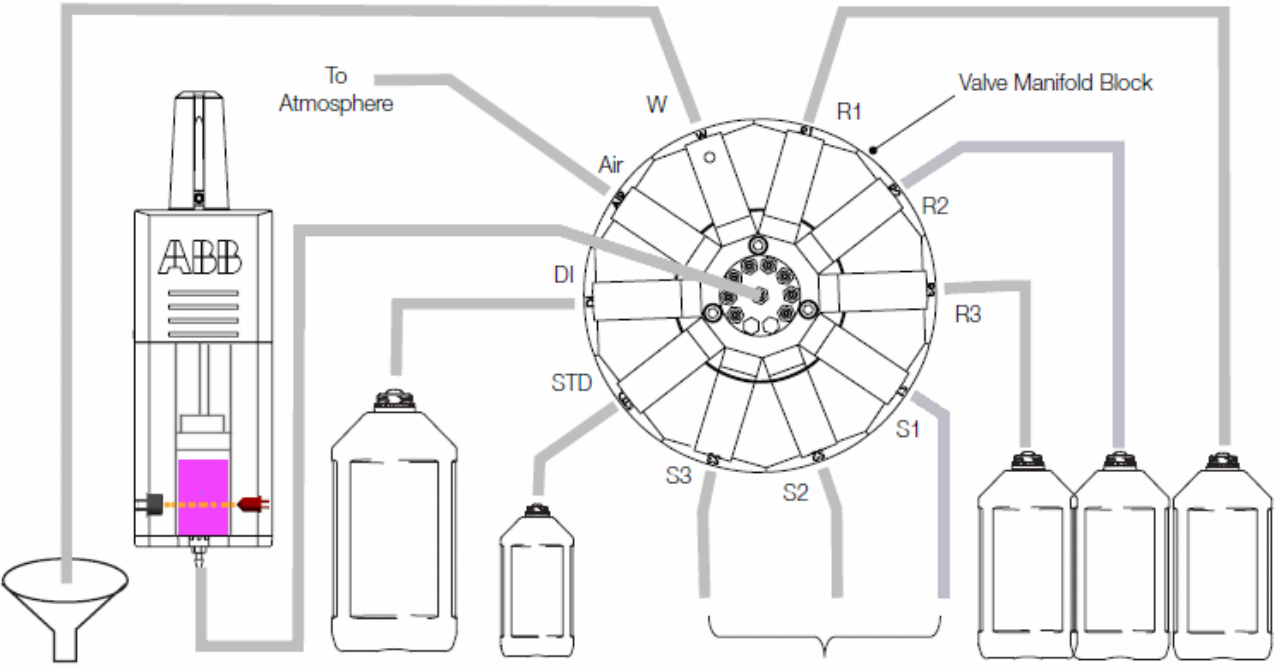
Measurement Sequence



The solution is held in the cell for a further 5 minutes to allow the colour to develop.

Principle of Operation

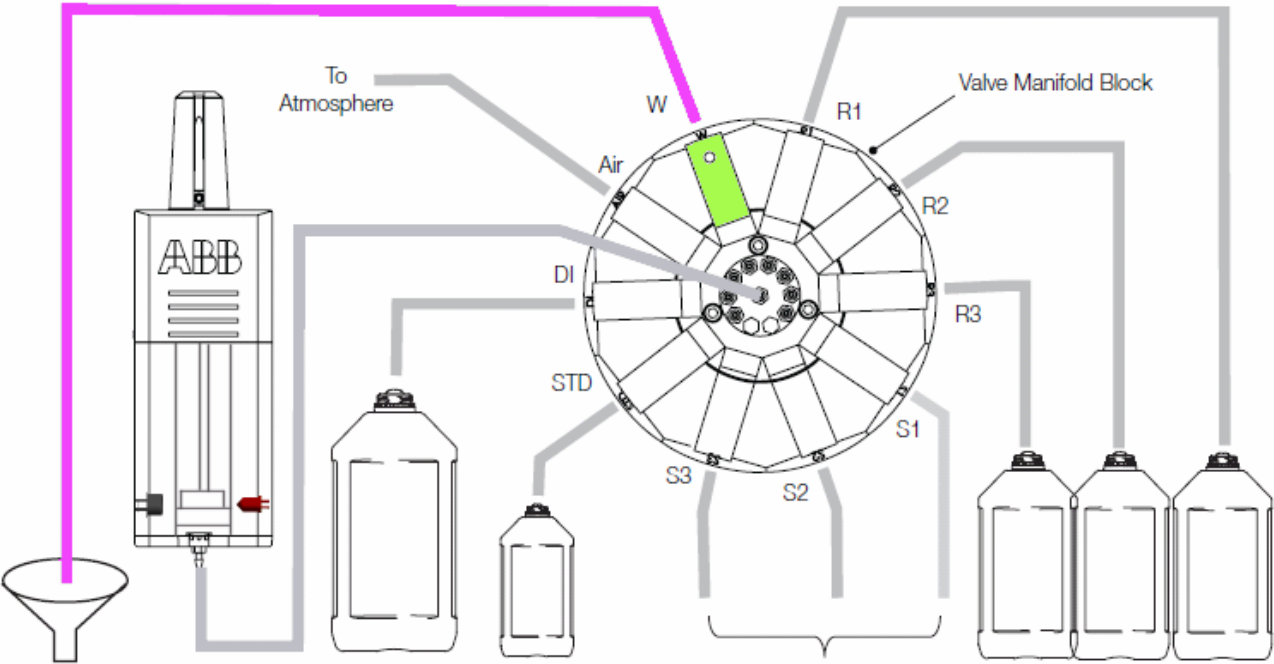
Measurement Sequence



The final absorbance of the solution is then measured. The amount of absorbance is proportional to the amount of aluminium in the sample.

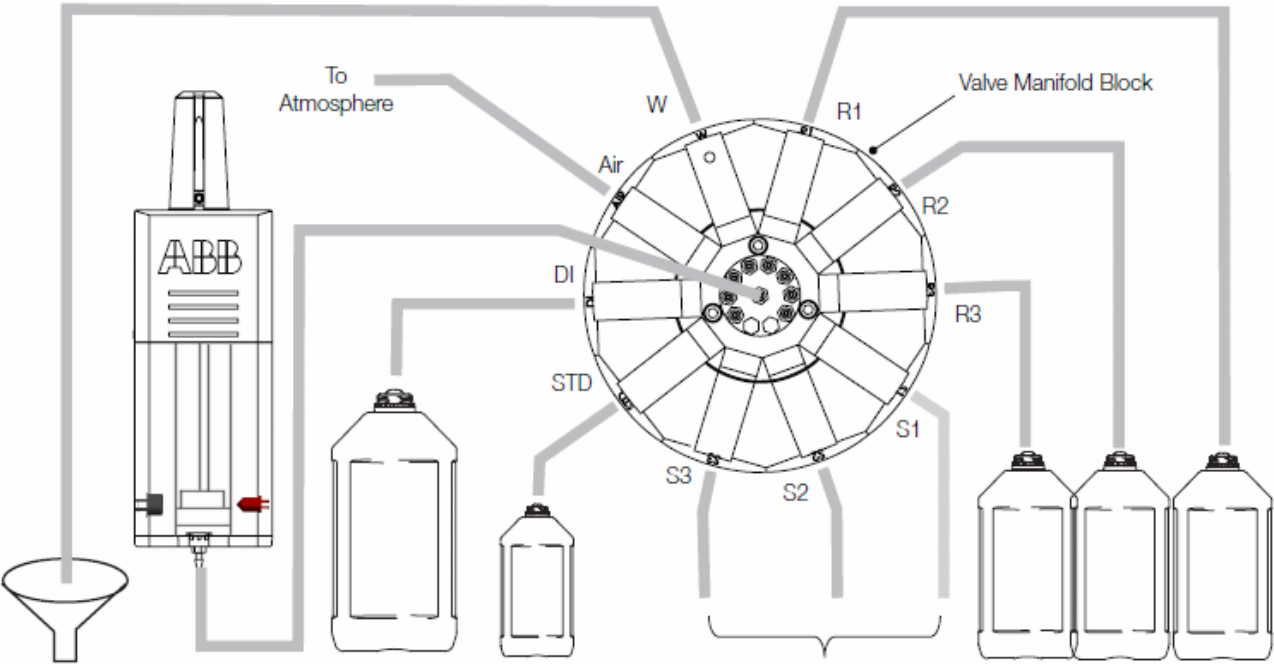
Principle of Operation

Measurement Sequence



The waste valve is then opened and the piston reset allowing the solution to leave via the waste valve.

Principle of Operation Measurement Sequence



The concentration of aluminium is automatically calculated and the analyzer display updated and the unit is ready for the next analysis.

Automatic calibration

Ensures analyzer is operating correctly

- Automatic 2 point calibration - *User Configurable*
 - Low - DI Water
 - High - Standard
- Calculates calibration gradient and compares to theoretical
- LED Calibration
 - During calibration routine the instrument checks it is achieving the optimum span on the detector and automatically adjusts if required
 - *Accounts for any drift*
 - *Cell fouling*

Automatic sample dilution

Increases measurement range

- The Aztec 600 analyzers are capable of automatic dilution to increase their range.
- If the measured value is outside the working range of the analyzer. The next time the sample is measured, the monitor dilutes the sample.
- Uses DI Water (Low Standard)
- The analyzer continues to measure the sample in dilution mode until the concentration is such that dilution is no longer necessary.
- The dilution ratio can be programmed from 1:1 to 1:4 (1 part sample to 4 parts dilution water).

Automatic cleaning

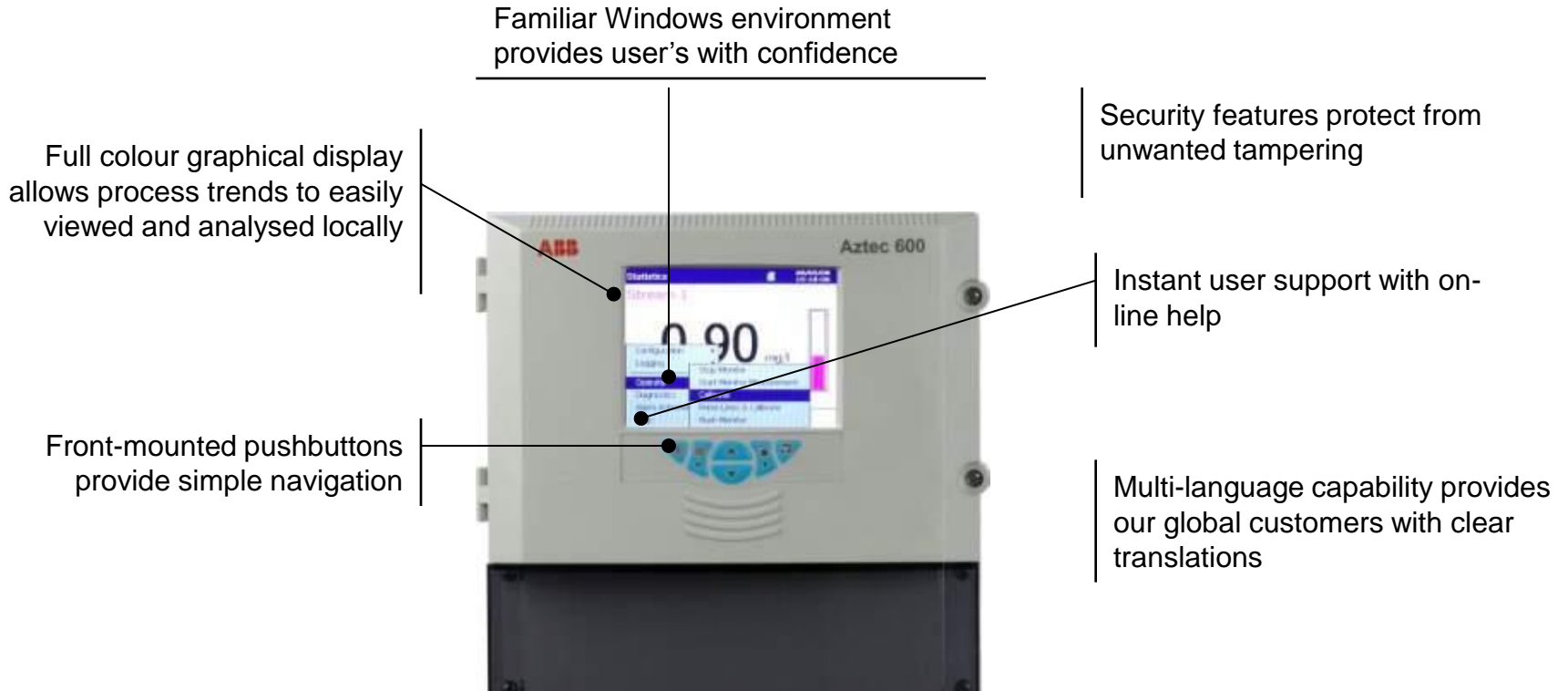
- Mechanical cleaning
 - Piston movement continually cleans measurement cell
- Cell rinsing
 - Rinses with sample before measurement to clean the cell
- Additional cleaning sequence
 - User can instigate an additional cleaning cycle
 - Rinses optical cell with cleaning solution
 - User selectable frequency

Measurement methods and ranges Designed for the water industry

Parameter	Chemical Method	Max. Sample Frequency	Instrument Measurement Range (undiluted range)
Aluminium	Pyrocatechol Violet	6/hr	0.005 - 0.3mg/l Al (0.3 – 1.5mg/l Al)
Iron	TPTZ	6/hr	0.005 - 1mg/l Fe (1 - 5mg/l Fe)
Manganese	Formaloxime	6/hr	0.020 - 2mg/l Mn (2 - 10mg/l Mn)
Manganese	Leucomalachite	6/hr	0.000 – 0.1mg/l Mn
Phosphate	Phosphomolybdenum blue	4/hr	0.005 - 50mg/l PO ₄ (0.005 - 10mg/l PO ₄)
Ammonia	Indophenol blue	4/hr	0.000 - 3mg/l NH ₃ (0.000 – 0.5mg/l NH ₃)

Simple device interaction

A key benefit of the Aztec 600 is it's ease of operation



Comprehensive Data Processing Provides improved reporting

Comprehensive graphical trending allows process data to be viewed and analysed locally

On screen statistics provide the user with a quick summary of process performance

The analyser's Audit Log automatically records any system activity to leave an audit trail

Process data and event logs can be archived to a removable SD card for storage or easy download to a PC



The Alarm Event Log provides the operator with an accurate time and date stamped record of when any alarm occurred or was cleared

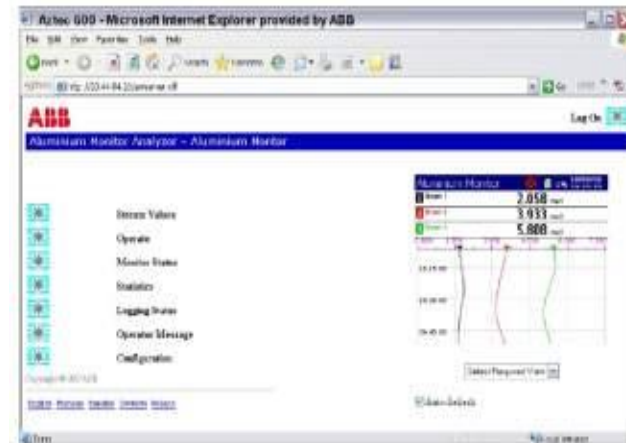
Archived data can be analyzed using ABB's DataManager review software

Configuration changes can be stored within the analyser for later reference

Flexible communications

Allows Simple Integration into process control system

- 10 Digital relays
- 6 isolated analogue outputs
- Ethernet Connection for integration into a local network using industry-standard protocols TCP/IP, FTP and HTTP
 - Webserver for remote monitoring
 - Email notification
- Optional ProfiBus DP1



Simple to maintain Due to inherent product design

Scheduled annual service

- 12 Monthly
 - Replace piston seal and sample tubing.
 - Rotate the glass cell
- 24 Monthly
 - Replace valve diaphragms, piston seal, monitor tubing and glass cell
- Annual maintenance kits provide all the necessary consumables complete with step by step guidance sheets



One basic design for all parameters

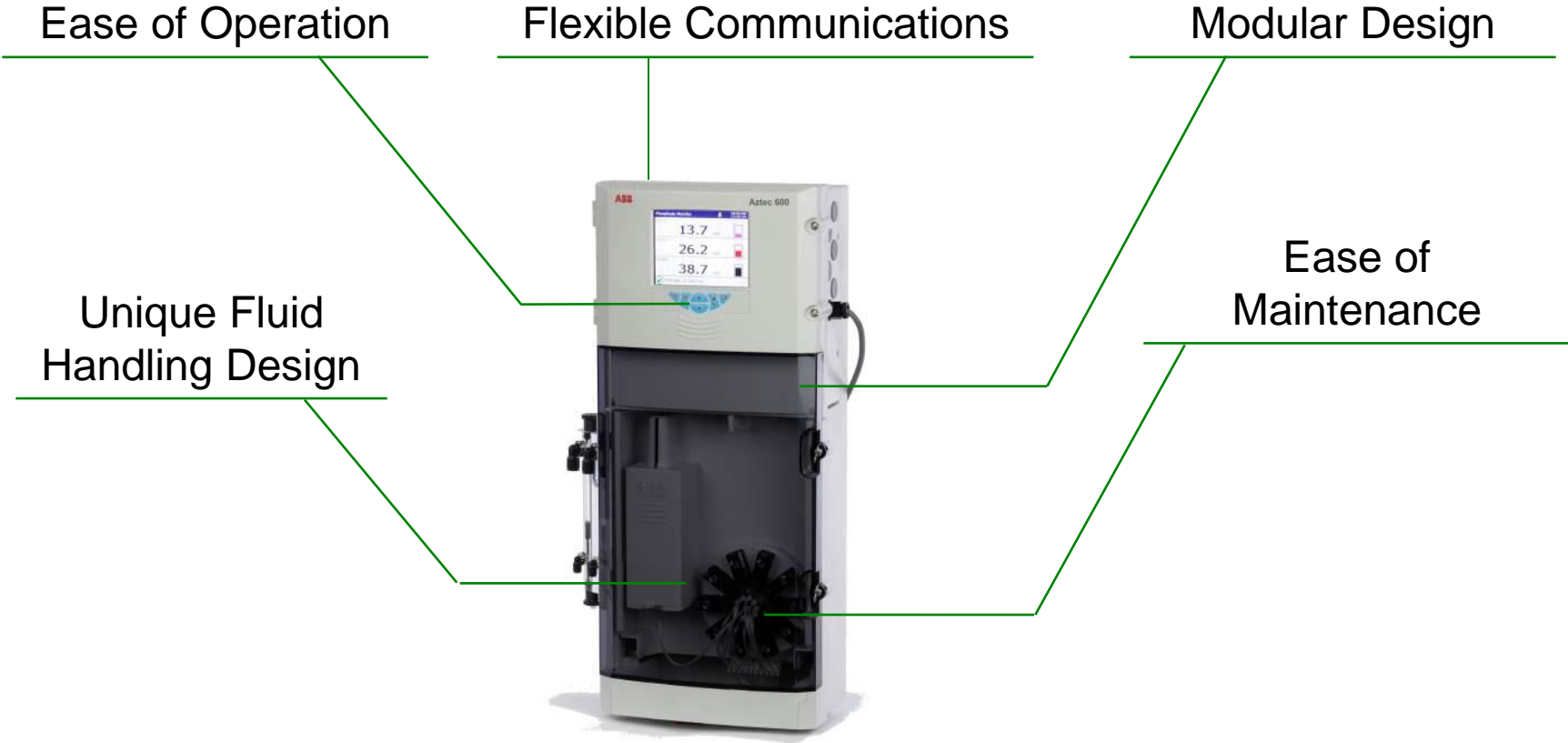
Benefits of a truly modular design

- Common Operational Procedures
- Common Maintenance Procedures
- Common Spare Parts
- Switch parameters



The Aztec 600 colorimetric range

Designed for the potable water market



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