# PAI*Titrator*

- Determination of: $Br^-$, $Cl^-$, $F^-$, $S^{2-}$, $NH_4^+$, $CN^-$, $SO_4^{2-}$ etc.
- Potentiometric or photometric titration
- Up to 8 sample streams
- Automatic cleaning
- Automatic calibration (optional)

ProzessAnalysenInstrumente GmbH

Grüner Ring 6
D-27432 Hipstedt

Tel.: (+49) 04768-922100
Fax: (+49) 04768-922101

email: info@p-a-i.de
web: www.p-a-i.de

## PAI*Titrator*

Many substances are easily measured by means of potentiometric or photometric titration. The following list just gives a few parameters:

- **Bromide – $Br^-$**
- **Chloride - $Cl^-$**
- **Iodide – $I^-$**
- **Cyanide - $CN^-$**
- **Fluoride - $F^-$**
- **Sulphide – $S^{2-}$**
- **Sulphate – $SO_4^{2-}$**
- **Alkalinity, acidity (m/p-value)**
- **etc.**

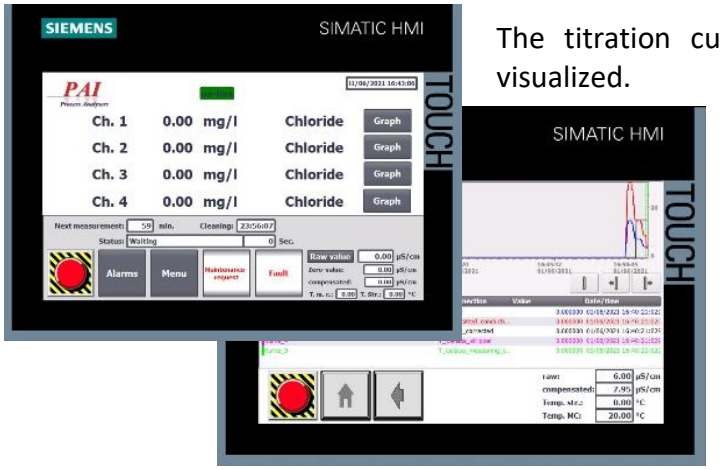
## Setup

The **PAI*Titrator*** consists of two separated housings: The upper part containing all electronic parts made of powder coated steel. Whereas the lower part is made out of plastic.

To maintain a maximum of reliability all parts are carefully chosen and thoroughly tested.

## Operation

The instrument has an inbuild touch screen that allows the configuration and control of the **PAI*Titrator***. The results are displayed in numerical values for each channel or as a hydrograph for a selected channel.




The titration curves and the 1. derivative can be visualized.

Password protected menus allow the setting of various parameters like measuring intervals, cleaning intervals, pumping times, channel selection, thresholds etc.



**Grüner Ring 6**
**D-27432 Hipstedt**

**Tel.: (+049) 04768-922100**
**Fax: (+049) 04768-922101**

**email: info@p-a-i.de**
**Web.: www.p-a-i.de**

## Temperature compensation

If necessary, the temperature can be measured and signals or results can be compensated accordingly.

## Automatic Cleaning

To keep the instrument clean and to ensure good results an automatic cleaning system is installed.

## Automatic validation or calibration

For most applications an automatic validation or calibration is available as an option.

## Signals

To transmit the results to process control systems analog outputs (4 – 20mA) are available.

System fault: in case of system failure the alarm contact is triggered.

Maintenance request (options): Signals when maintenance work is necessary.

Threshold alarm (optional): Indicates if a user settable threshold has been exceeded.

## MOBUS TCP - Communication

The MODBUS-TCP protocol allows remote access to results, error and maintenance messages and to control the analyser.

## Sm@rtServer

Sm@rtServer is a Siemens tool to remotely operate the analyser via an ethernet network. It simulates the touch-panel on the display of the remote computer.

## Multiplexer

On most analysers a maximum of 8 channels can be measured. For each channel a separate analog output is available.

Switching valves are controlled by the analyser.

## Systems for hazardous samples

If hazardous samples like concentrated acids need to be measured special measures have to be taken to protect human health and property. For those samples a special designed analyser is available.

The whole instrument is made of plastic where possible. A special cabinet contains the sampling system that ensures a maximum of protection against any leakage. During sampling the sample is confined in a loop completely made of Teflon and other inert materials in the sampling unit. From here the sample is transferred to the analytical unit.



**Grüner Ring 6**
**D-27432 Hipstedt**
**Tel.: (+049) 04768-922100**
**Fax: (+049) 04768-922101**
**email: info@p-a-i.de**
**Web.: www.p-a-i.de**

## Maintenance

| Action | Daily | Weekly | Monthly | Quarterly | Yearly |
|---|---|---|---|---|---|
| Check for leakage and alarms | X | | | | |
| Fill up reagents | | (X) | X | | |
| Check calibrations | | (X) | (X) | (X) | X |
| Fill up electrolyte (ISE) (if installed) | | (X) | X | | |
| Replace sensor of ISE or ISE (if installed) | | | | (X) | X |
| Clean tubing (if necessary) | | (X) | X | | |
| Replace pump tubing (if necessary) | | | | X | |
| Replace all tubing | | | | | X |
| Replace reference electrode (if installed) | | | | | X |
| Check photometer (if installed) | | | X | | |

Intervals and tasks may change due to application.

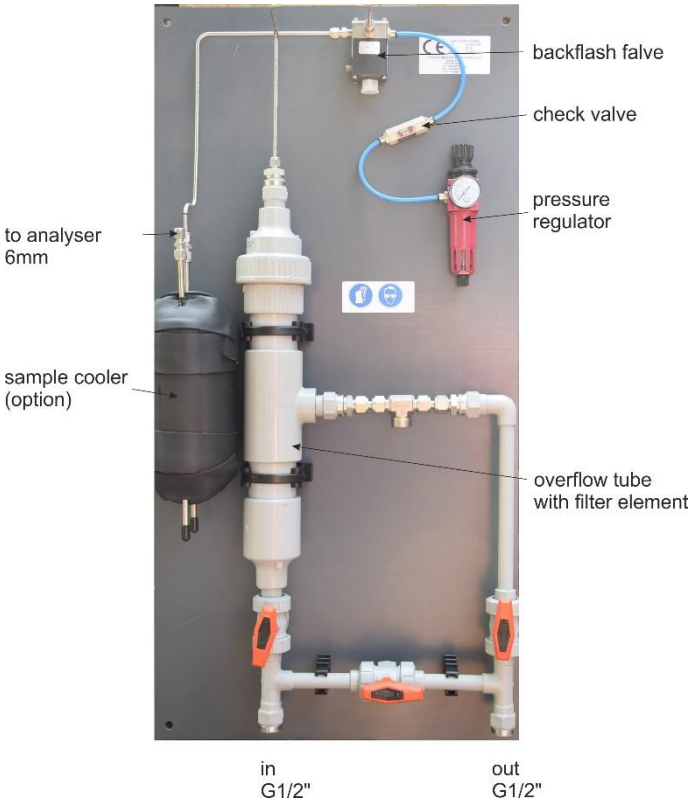
## Sample pre-treatment

Since turbity does not effect potentiometric measurements filtration is only necessary to keep out large particles. Therefore we provide a simple automatic filtration unit for applications clogging my cause trouble.

The implemented automatic back flush system keeps the filterelement clean and ensures almost maintenance free operation.

The back flushing is either controlled by the analyser or by seperated controller.

All wetted parts are made of PVC and stainless steel.






**Grüner Ring 6**
**D-27432 Hipstedt**
**Tel.: (+049) 04768-922100**
**Fax: (+049) 04768-922101**
**email: info@p-a-i.de**
**Web.: www.p-a-i.de**

# Specifications

| | | |
|---|---|---|
| Analytical method: | | Potentiometric or photometric titrations |
| Range: | | Application dependent |
| Meas. interval: | | 5 - 30 Min. (typical) |
| Max. num. channels: | | Up to 8 |
| Sample: | *Pressure:* | 0 bar with sample pump. Higher pressures on request. |
| | *Flow rate:* | 10 - 500 ml/minute |
| | *Temperature:* | >0 - 100 °C (application dependant) |
| Measurement system: | | Ion-selective electrode<br>pH-electrode |
| | | Redox-electrode |
| | | Reference electrode |
| | | T-probe (PT1000 Teflon-coated) (optional) |
| | | Photometer |
| Alarms: | *Threshold* | potential free, NC/NO, 8A@240VAC |
| | *Fault* | potential free, NC/NO, 8A@240VAC |
| Status signal: | | For remote start/stop (potential free, optional) |
| Outputs: | | Max. 8; 4 – 20mA, max. 500 Ohms |
| Digital input: | | Start/stop, others |
| Calibration/Validation: | | Manual/automatic (optional) |
| Environmental conditions.: | | Indoor mounting |
| | *Rel. humidity:* | 5 – 95% (not condensing) |
| | *Temperature:* | 10 – 50 °C |
| Housing: | | Wall mounting, stainless steel and plastic |
| | *Dimensions:* | 1000x500x320mm (HxWxD) |
| | Weight: | Approx. 42 kg |
| Infrastructure: | *Mains:* | 100 - 240 VAC, 50/60 Hz, 110/120 VAC |
| | *Instrument air:* | Dry and oil free ISA-S7.0.01-1996 (optional for air purge) |
| | *Waste:* | Atmospheric open sink |

Errors and omissions accepted! Technical data are subject to change!

06.2021

**ProzessAnalysenInstrumente** *GmbH*

**Grüner Ring 6**
**D-27432 Hipstedt**

**Tel.: (+049) 04768-922100**
**Fax: (+049) 04768-922101**

**email: info@p-a-i.de**
**Web.: www.p-a-i.de**