PRODUCT OVERVIEW PAB

water | wastewater | treatment | recycling

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Overview

MAK Water's pH Adjustment – Batch (PAB) plants are designed to automatically adjust and maintain the pH level of raw water in a batch tank prior to discharge to sewer/environment or reuse/recycling.

Dual chemical dosing pumps (alkali/acid) are available for when the raw water pH varies to allow for correction of both low and high pH raw water.

The MAK Advantage:

- High quality Australian designed and built systems
- Experienced team with >4,000 systems operating throughout Australia and internationally
- Nationwide service & maintenance capabilities
- Remote monitoring for expert process support
- Fully automated systems minimise operator attendance
- MAK standard designs for fast lead times
- Optimised designs to suit client's objectives
- Fully customisable to accommodate client specific engineering standards, vendor data requirements and site preferred electrical equipment
- Extensive hire fleet available for rapid deployment

MAK skid mounted PAB plant

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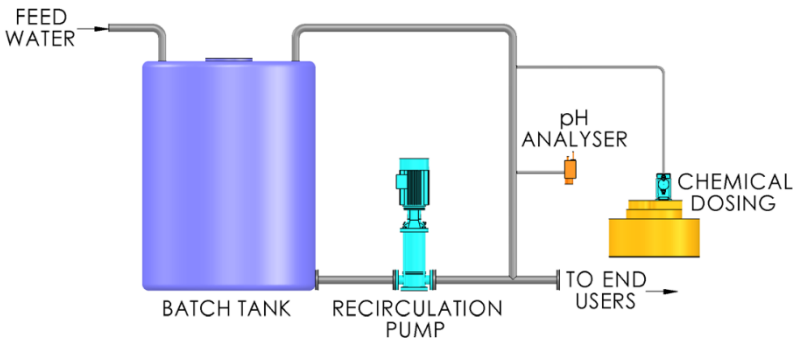
Overview



The standard treatment process includes a batch tank, a recirculation pump to turn over the contents of the batch tank, an inline pH analyser which monitors the pH level and a dosing pump to automatically dose liquid alkali/acid. The recirculation pump is also used to discharge the treated water at the end of each batch cycle.

The system components are sized to suit the batch tank and to allow for a 1 hour complete batch cycle. Chemical storage tank(s) are provided with 110% bunding in compliance with AS1940-2004 (The storage and handling of flammable and combustible liquids).

Optional equipment upgrades include; a feed pump, duty standby recirculation and dosing pumps, high/low pH levels outside the standard range, dual chemical dosing pumps (alkali/acid).

MAK PAB plants are available as skid mounted or containerised systems for easy deployment to remote locations.

Overview

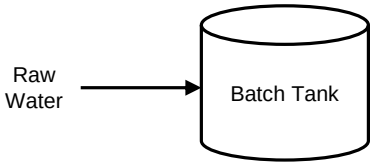
The following table summarises typical raw water and treated water values:

Parameter	Unit	Raw Water (typical)	Treated Water (typical)
pH Level	pH	4 ~ 12 (standard) 1 ~ 14 (optional)	6 ~ 8 (pH neutral) or as required
Pressure	kPa	> 15 (pressurised feed)	100 ~ 200 (recirculation & discharge)
Recirculation & Discharge Flow Rate	L/hr	-	Designed for a 1 hour complete batch cycle
Temperature	°C	15 to 35	-

An optional equipment upgrade is available for raw water pH levels outside the standard range.

NOTE: MAK Water recommends a water analysis be carried out prior to detailed design.

Process Steps



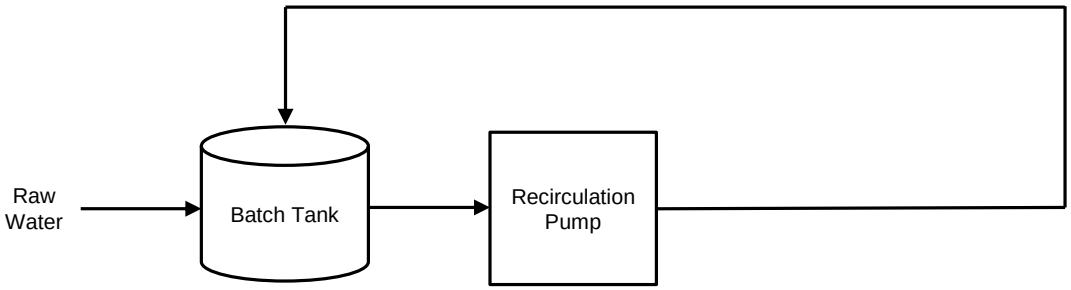
Batch Tank

Raw water enters the batch tank at the start of each cycle and treated water is discharged to sewer/environment or reuse/recycling at the end of each cycle. The batch tank is sized to allow for a 1 hour complete batch cycle.

The batch tank is fitted with a level switch for control of the batching process. Where ClearAccess™ remote monitoring is installed, a level transmitter continuously monitors the tank level.

If required, MAK Water can provide a feed pump and control system to transfer raw water to the batch tank.

Process Steps

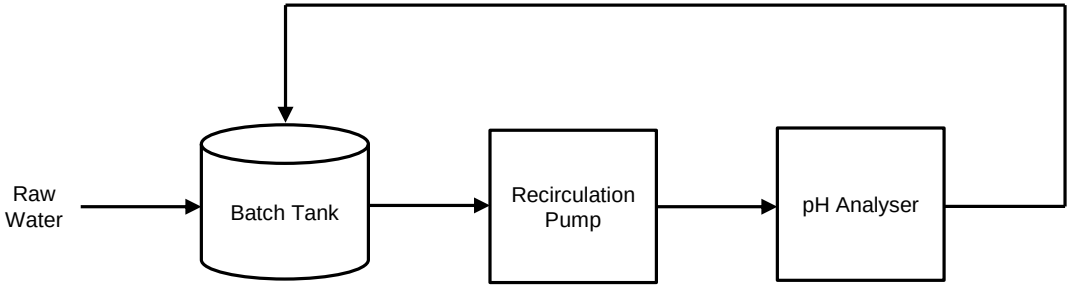


Recirculation Pump

The recirculation pump takes flooded suction from the batch tank and circulates it's contents on a continuous basis during each cycle. The recirculation pump is sized to allow for a 1 hour complete batch cycle.

The recirculation pump discharge is fitted with a pressure switch; the plant is shutdown on low discharge pressure to prevent damage to the pump.

Process Steps

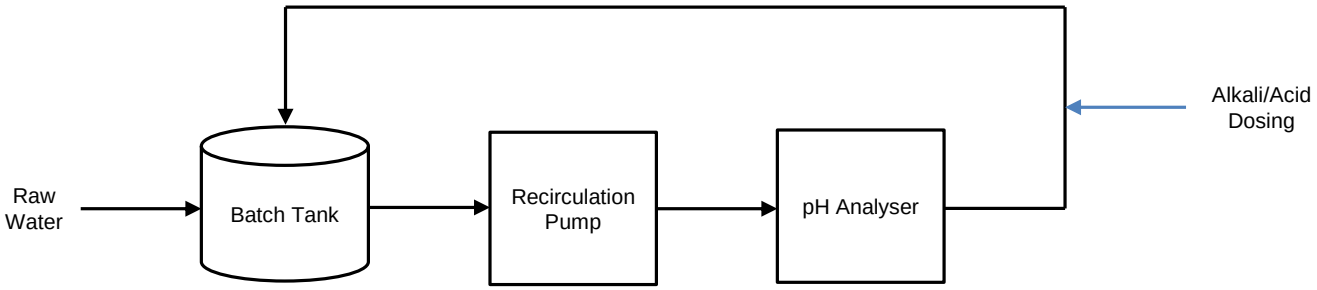


pH Monitoring

The inline pH analyser in the recirculation line monitors the pH level and provides a feedback signal to the control system.

Where ClearAccess™ remote monitoring is installed, pH level data is continuously logged.

Process Steps



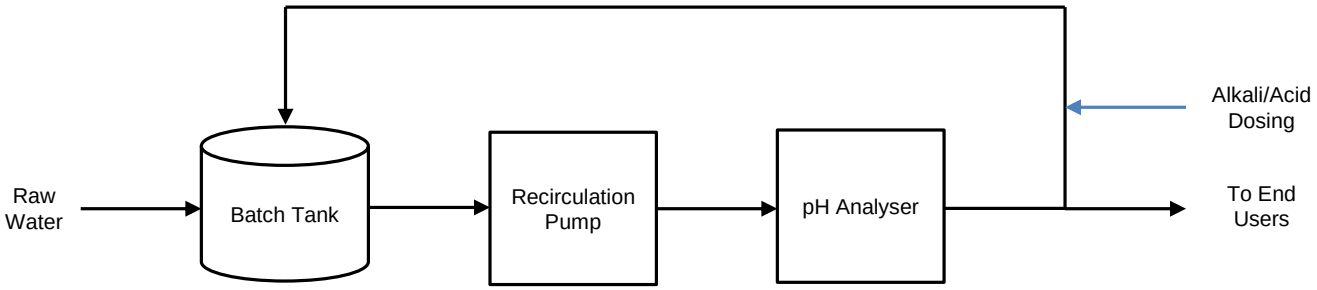
pH Adjustment

To adjust pH level up/down as required, liquid alkali/acid is dosed into the recirculation line. The requirement for dosing is based on residual trim, using the feedback signal from the pH analyser. The system will dose alkali/acid when the measured pH level is outside the programmed high/low set point and continue for as long as required to establish and maintain the pH level within the target range during each batch cycle.

The chemical storage tank(s) are fitted with a low level switch for auto-shutdown & to alert the operator of a low level condition: the tank level should be checked regularly and topped up as required.

Where ClearAccess™ remote monitoring is installed, a level transmitter continuously monitors tank levels.

Process Steps



Treated Water Discharge

At the end of each 1 hour batch cycle, the recirculation pump discharges the treated water to sewer/environment or reuse/recycling.

If required, MAK Water can provide a storage tank, distribution pump and control system for distribution of treated water to end users.

Options - ClearAccess™

Optional ClearAccess™ Remote Monitoring enables personnel to view and operate the plant remotely. This saves time in response to emergencies and assists local operators to diagnose problems. It prevents unnecessary service call-outs and improves reliability and plant uptime.

Process Support via ClearAccess™

Key Functionality:

- Remotely view and operate the plant on your PC, smart phone or tablet
- Automatic alerts (email or SMS) on alarm conditions
- Automatic report generated daily and emailed to your inbox
- Real time monitoring of process data, such as flow rates, pressure and alarm conditions/status messages
- Password protected system with two login security levels

ClearAccess™ from your Smart Phone or Tablet

Inclusions:

- Additional electrical instrumentation (premium package)
- Additional PLC hardware and programming
- Programming of email alert system

NOTE: Remote monitoring requires an internet connection or mobile network coverage (client to provide SIM card).

Options – Containerised Plant

MAK SHS plants can be installed in ISO sea container for safe, fast deployment by sea, road and rail. Installing the plant inside a sea container is an ideal way to protect the plant and equipment from harsh operating conditions in remote sites. The durable construction assures the plant is able to be transported through rough terrain and perform to the design requirements on arrival at remote sites (plug and play operation).

Standard 20' Container

Premium Fit Out (insulation, floor coating and access door)

Standard Inclusions:

- As new, freshly painted inside and out (high gloss enamel)
- Distribution board with separate circuits for lights & aircon
- Overhead internal lighting & reverse cycle air conditioning
- GPO's for maintenance work

Premium Container Fit Out Options:

- Chemically resistant, non-slip floor coverings
- Wall and ceiling insulation
- Personal access doors & windows
- Smoke detectors and alarming
- Safety shower & eyewash station with flow switch & lighting
- Winterisation for extreme climates (-40ºC/-40ºF)
- High spec/high build two-pack epoxy container painting

Containerised WTP with access door, window and safety shower & eyewash station

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Project Experience

Project	Brisbane Airport Corporation (BAC) Custom pH Adjustment Plant
Location	Brisbane, QLD
Scope	D&C, commissioning & operator training
Capacity	1,000 L/hr
Raw Water	Wastewater from laboratory
Treated Water	Discharge to sewer
Features	pH neutralisation via alkali dosing pH and temperature monitoring Environmental and trade waste compliance Custom Fiberglass batching tank Containerised system for quick and easy site installation Fully automated PLC control system

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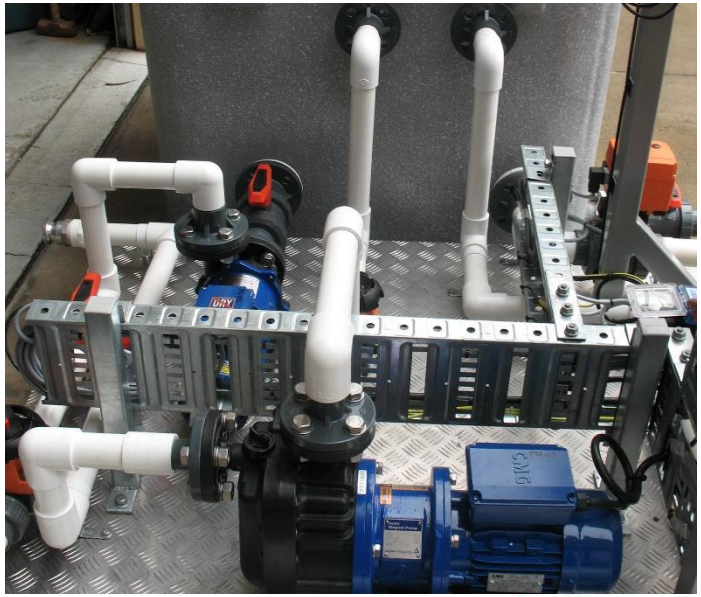
Project Experience

Project	Newcrest Mining Custom pH Adjustment Plant
Location	Orange, NSW
Scope	D&C, commissioning & operator training
Capacity	800 L/hr
Raw Water	Wastewater from laboratory sinks
Treated Water	Discharge to sewer
Features	pH neutralisation via alkali dosing pH and temperature monitoring Feed and recirculation pumps Environmental and trade waste compliance Lowest total operating cost – on site treatment rather than trucking waste off site for disposal Custom 1000L neutralisation tank Skid mounted system for quick and easy installation Fully automated PLC control system



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Project Experience

Project	CS Energy – Callide Oxyfuel Project Custom pH Adjustment Plant
Location	Callide A Power Station Biloela, QLD
Scope	D&C, commissioning & operator training
Capacity	2,500 L/hr
Raw Water	Wastewater from pre cooling scrubber
Treated Water	Discharge to ash pit
Features	pH neutralisation via alkali dosing pH and temperature monitoring Environmental compliance Skid mounted system for quick and easy installation Fully automated PLC control system

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Project Experience

Project	Genalysis Laboratory Services Custom pH Adjustment Plant
Location	Townsville, QLD
Scope	D&C, commissioning & operator training
Capacity	1,000 L/hr
Raw Water	Wastewater from laboratory sinks
Treated Water	Discharge to sewer
Features	pH neutralisation via alkali dosing pH and temperature monitoring Environmental and trade waste compliance Custom 1000L neutralisation tank and 80L acid discharge tank Skid mounted system for quick and easy installation Fully automated PLC control system

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