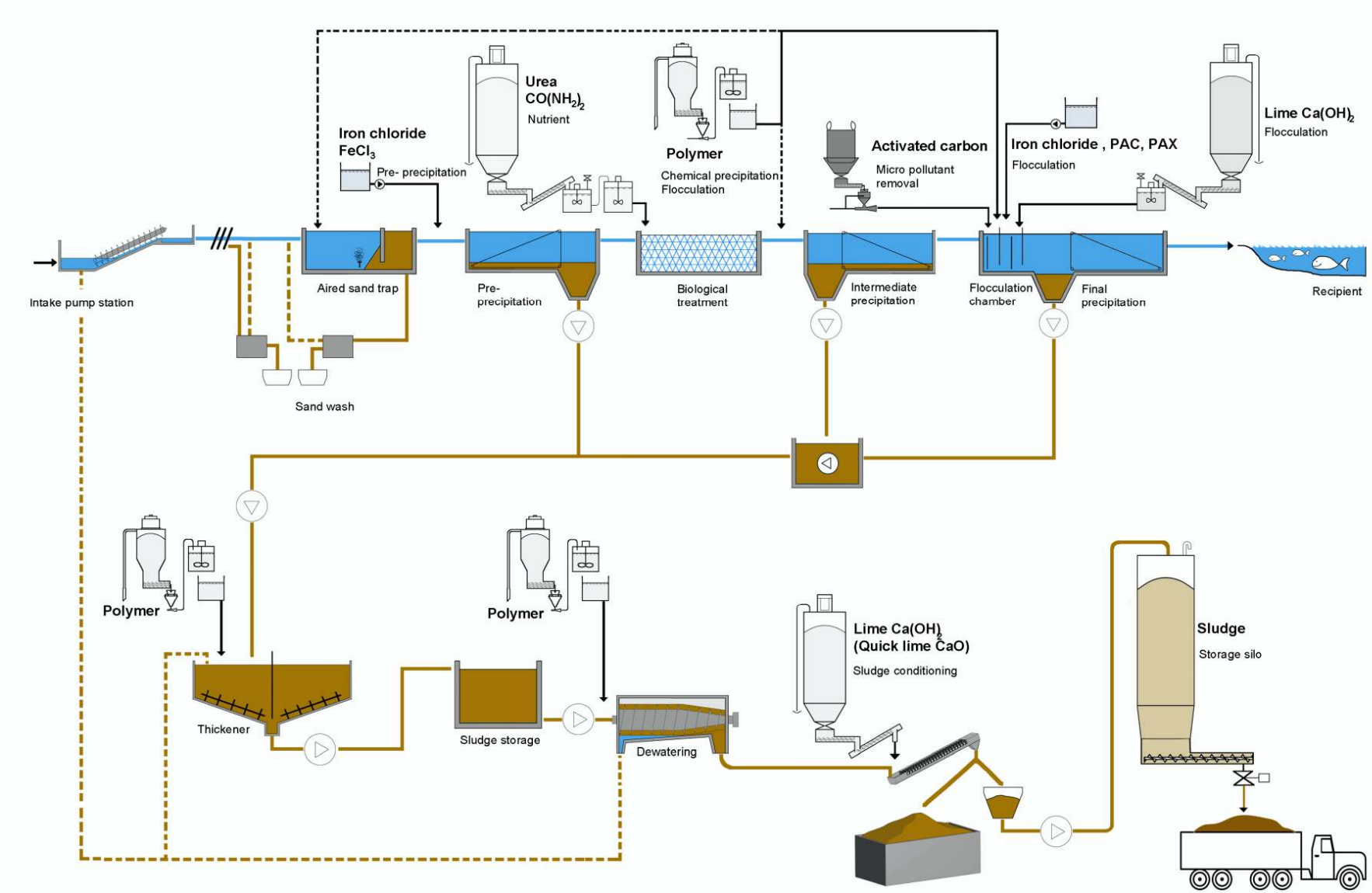
PolyRex – Polymer make-up unit

Precision+Reliability

Tomal AB
Bol 110
311 65 Vessigebro, Tel +46 (0)346 - 71 31 00

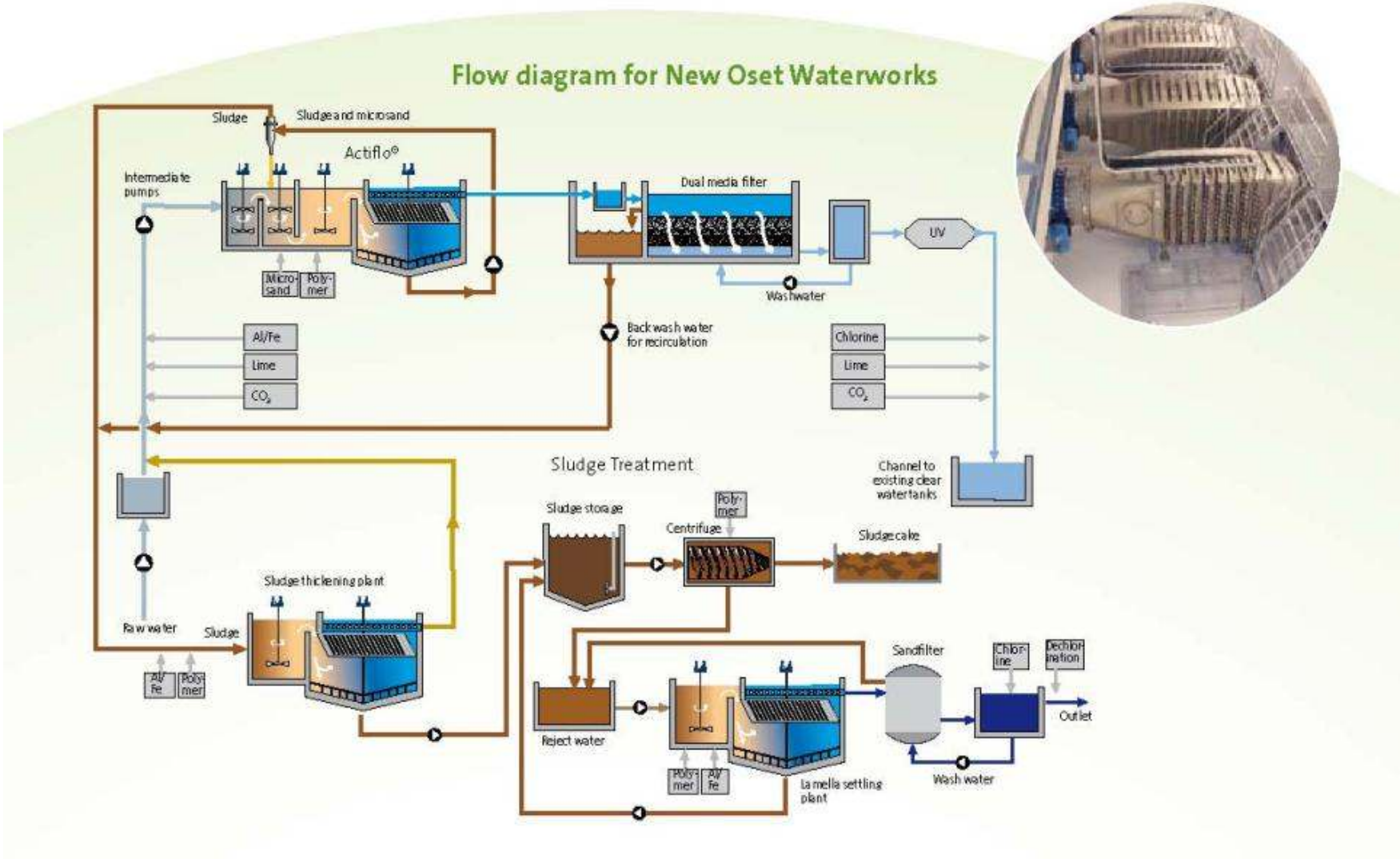
Tomal metering system in Waste water treatment

Precision+Reliability



Tomal metering system in Water treatment

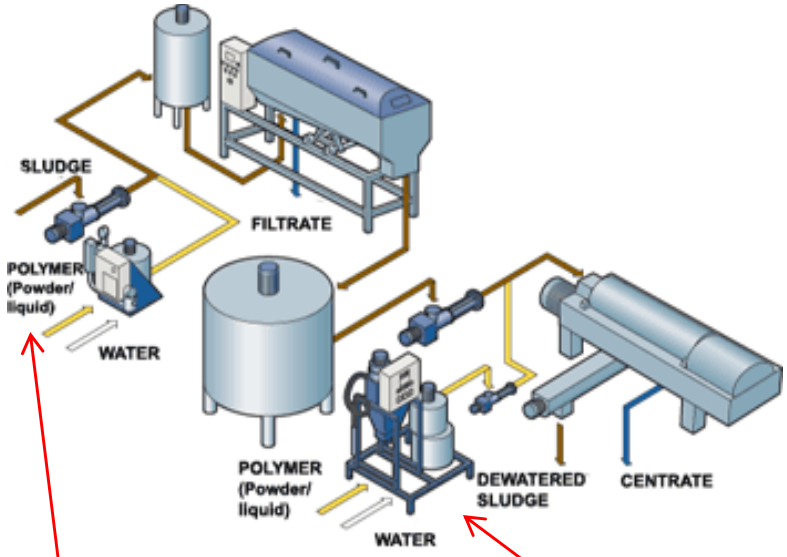
Precision+Reliability



PolyRex within Sludge dewatering

Polymer is needed to obtain a good result in the sludge dewatering process.

The polymer consists of elongated and charged hydrocarbon molecules that make the sludge lumps and becomes more water repellent. In this way the dry content of the ready-treated sludge is raised, which facilitates further handling. Polymer solution is prepared with powder or liquid polymers.



Tomal wide range of different polymer make-up units

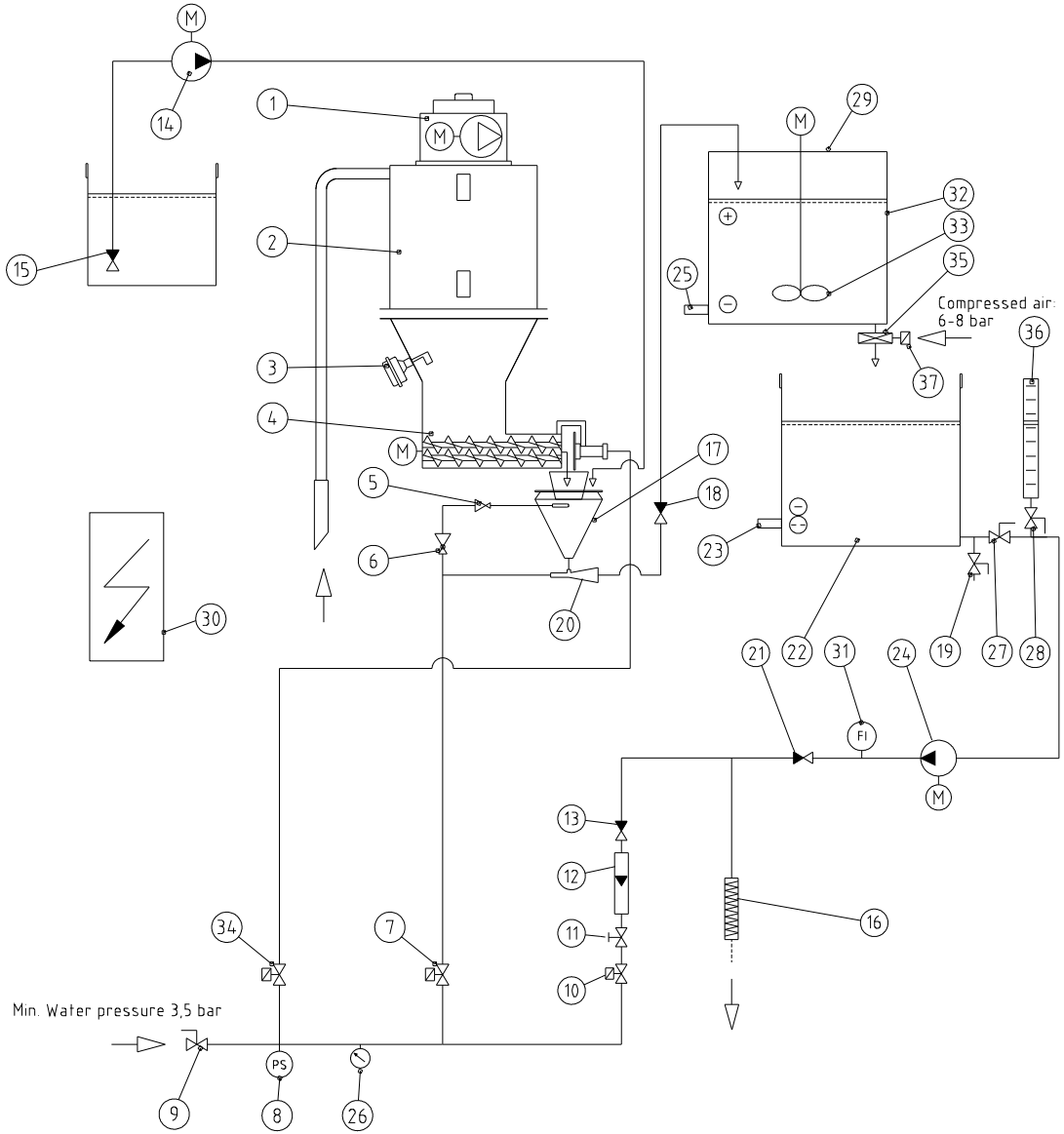
- PolyRex-Batchwise make-up of POWDER and LIQUID polymers
- PolyRex Liquid -Batchwise production of LIQUID polymers
- PolyRex in Customer Adapted Design – e.g. continuous preparation unit, ATEX units (Ex-proof)

Polymer make-up unit PolyRex

Universal system for batchwise preparation of polymer solutions.

- Turn-key automatic machine
- User friendly PLC-control with touch panel
- Multiscrew feeder - High accuracy
- High effective step-by-step mixing system
- Tanks in stainless steel AISI 304
- Vacuum conveyor - friendly environment
- Wide range of options
- Over 2000 units in 60 countries

PolyRex Flow diagram vacuum conveyor unit



PolyRex Capacity range

Machine capacity:

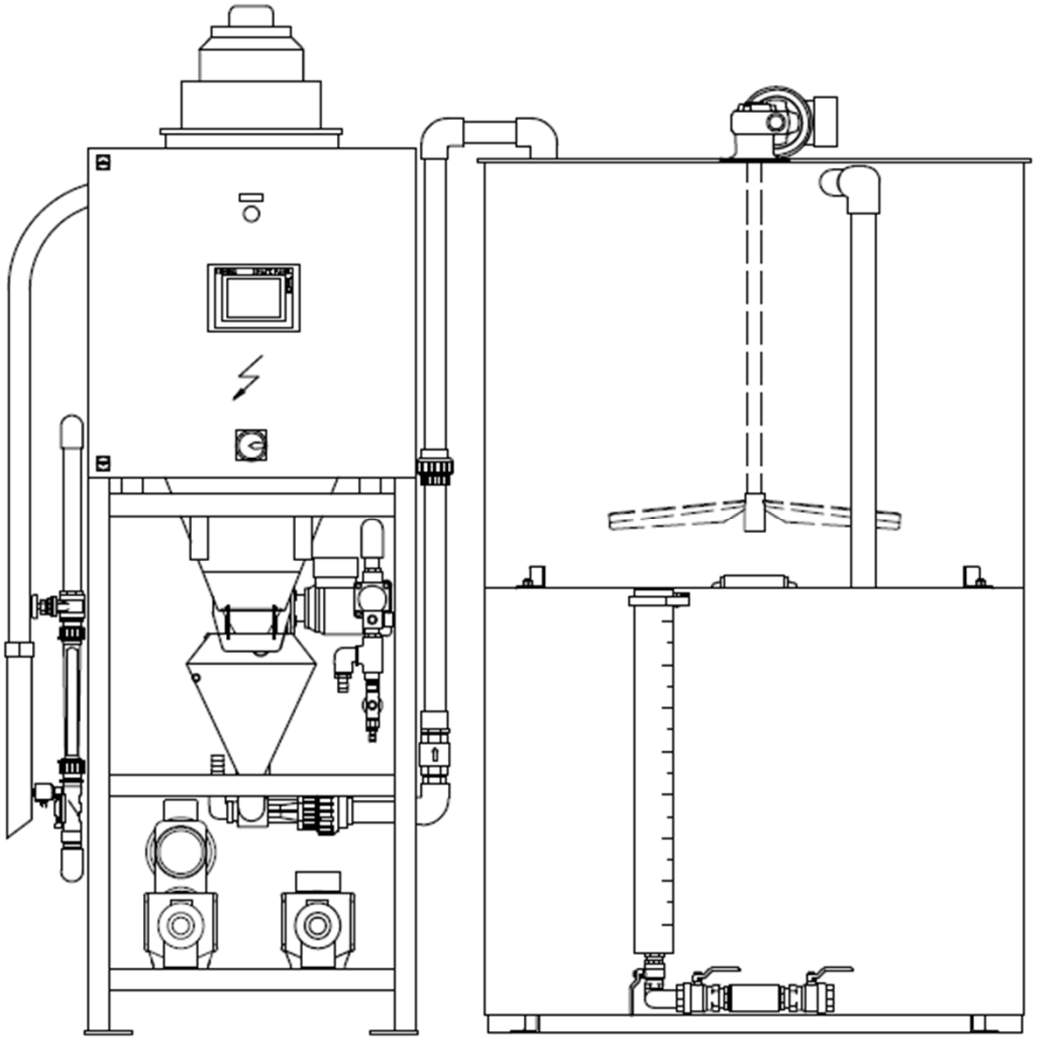
- Max. preparation capacity at 0,5 % or 0,25% stock solution concentration and 60-45 min. maturing time.

		0,5% solution	0,25% solution
PolyRex 0.6	(2 x 0,3 m³)	1,0 - 1,2 kg /h	0,5 - 0,6 kg /h
PolyRex 1.0	(2 x 0,5 m³)	1,8 - 2,3 kg h	0,9 - 1,1 kg /h
PolyRex 2.0	(2 x 1,0 m³)	3,8 - 4,7 kg /h	1,9 - 2,3 kg /h
PolyRex 3.0	(2 x 1,5 m³)	5,1 - 6,4 kg /h	2,5 - 3,2 kg /h
PolyRex 4.0	(2 x 2,0 m³)	7,7 - 9,5 kg /h	3,8 - 4,7 kg /h
PolyRex 5.4	(2 x 2,7 m³)	9,8 - 12,0 kg /h	4,9 - 6,0 kg /h
PolyRex 6.6	(2 x 3,3 m³)	12,9 - 16,0 kg /h	6,8 - 8,6 kg /h
PolyRex 8.4	(2 x 4,2 m³)	15,6 - 19,1 kg /h	8,3 - 10,4 kg /h
PolyRex Maxi 11	(2 x 5,5 m³)	20,7 - 25,5 kg /h	11,1 - 14,0 kg /h
PolyRex Maxi 16	(2 x 8,0 m³)	27,4 - 33,0 kg /h	15,1 - 18,6 kg /h
PolyRex Maxi 23	(2 x 11,5 m³)	34,8 - 41,0 kg /h	19,7 - 23,8 kg /h

PolyRex Small bag handling system

Support with vacuum conveyor

A powder hopper is filled up from a vacuum conveyor.



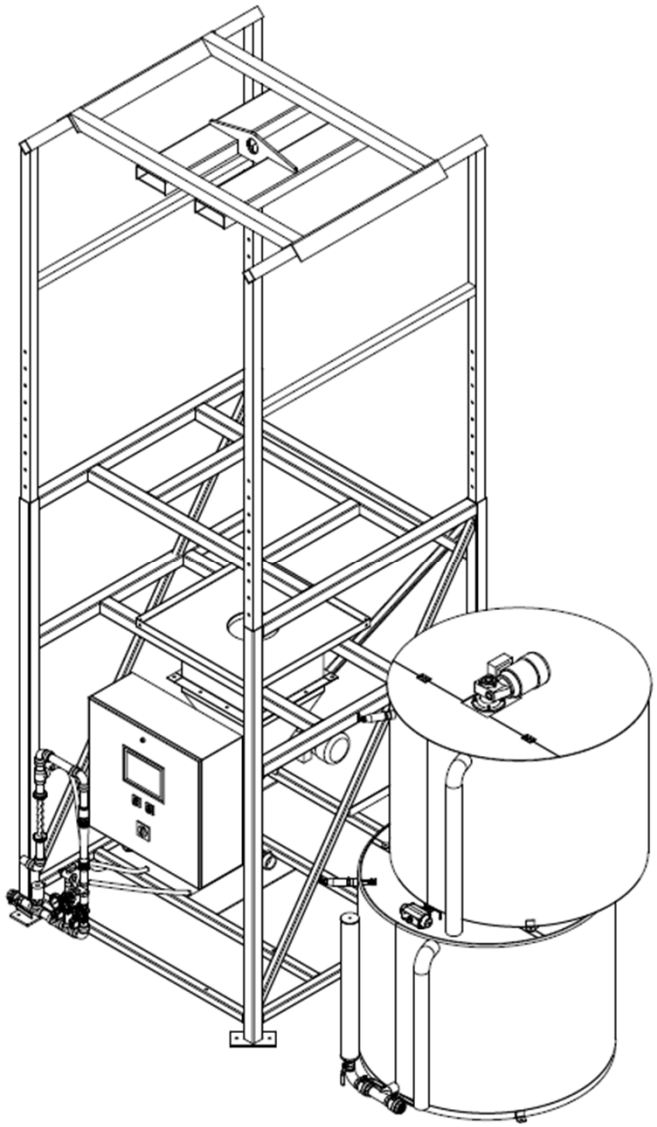
PolyRex Big bag handling system

Big-bag table

Lifting device
required at site.

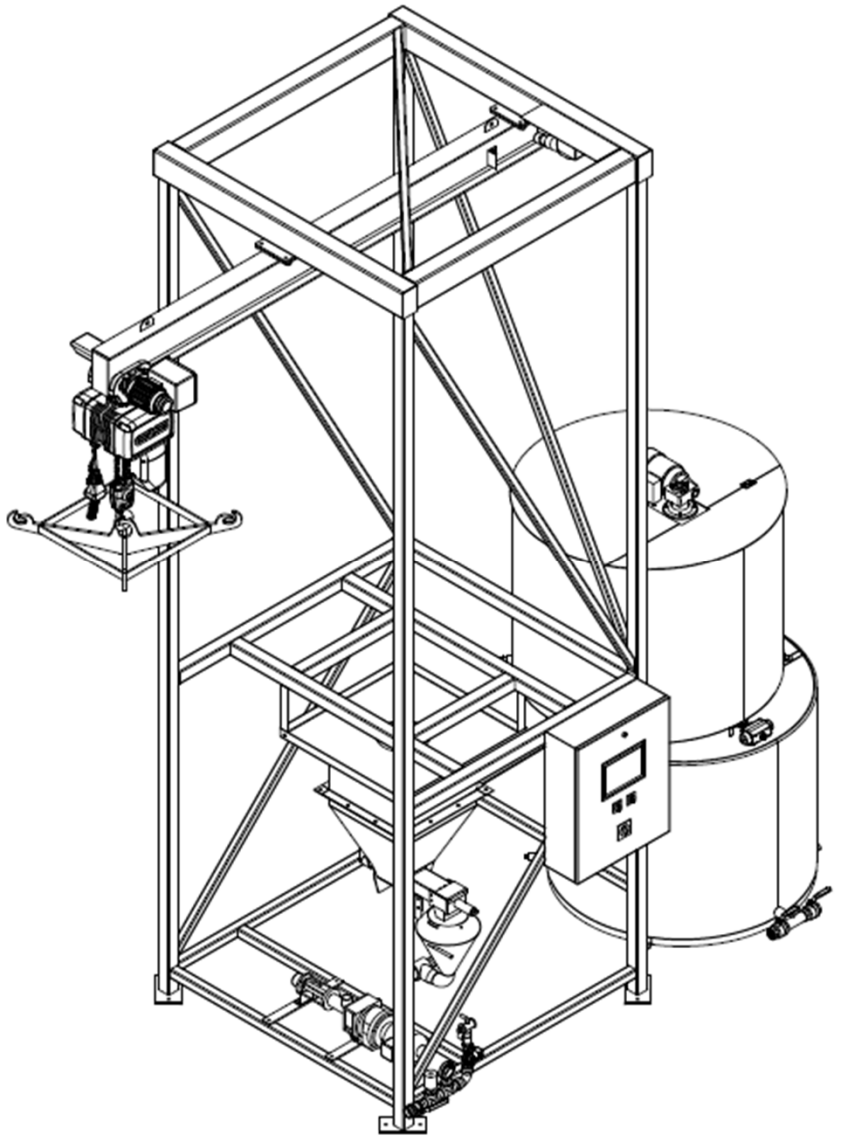
Adjustable big-bag support

Fork-lift or lifting device
required at site.



PolyRex Big bag handling system

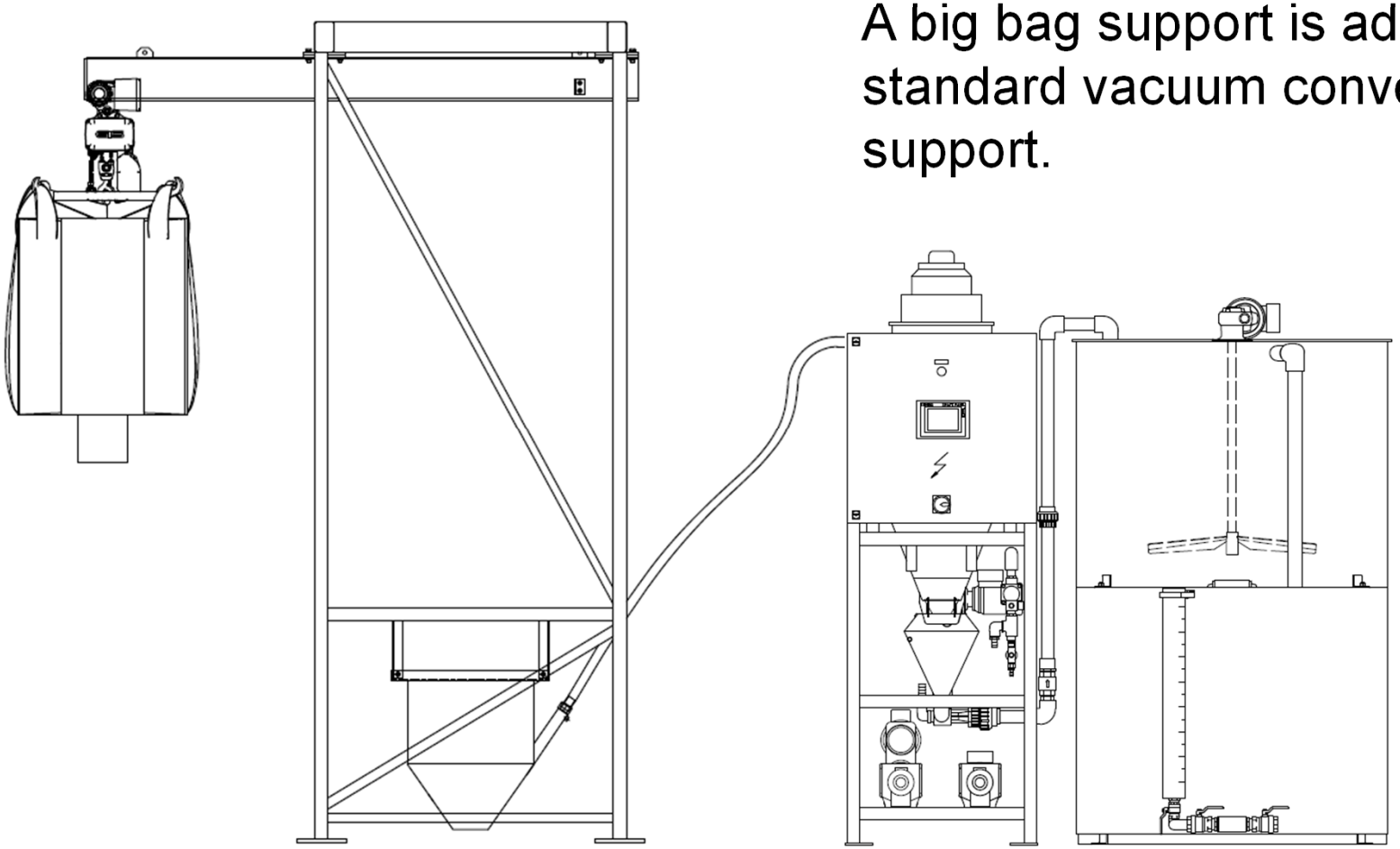
Hoist stand with integrated electrical chain hoist.



PolyRex Big bag handling system

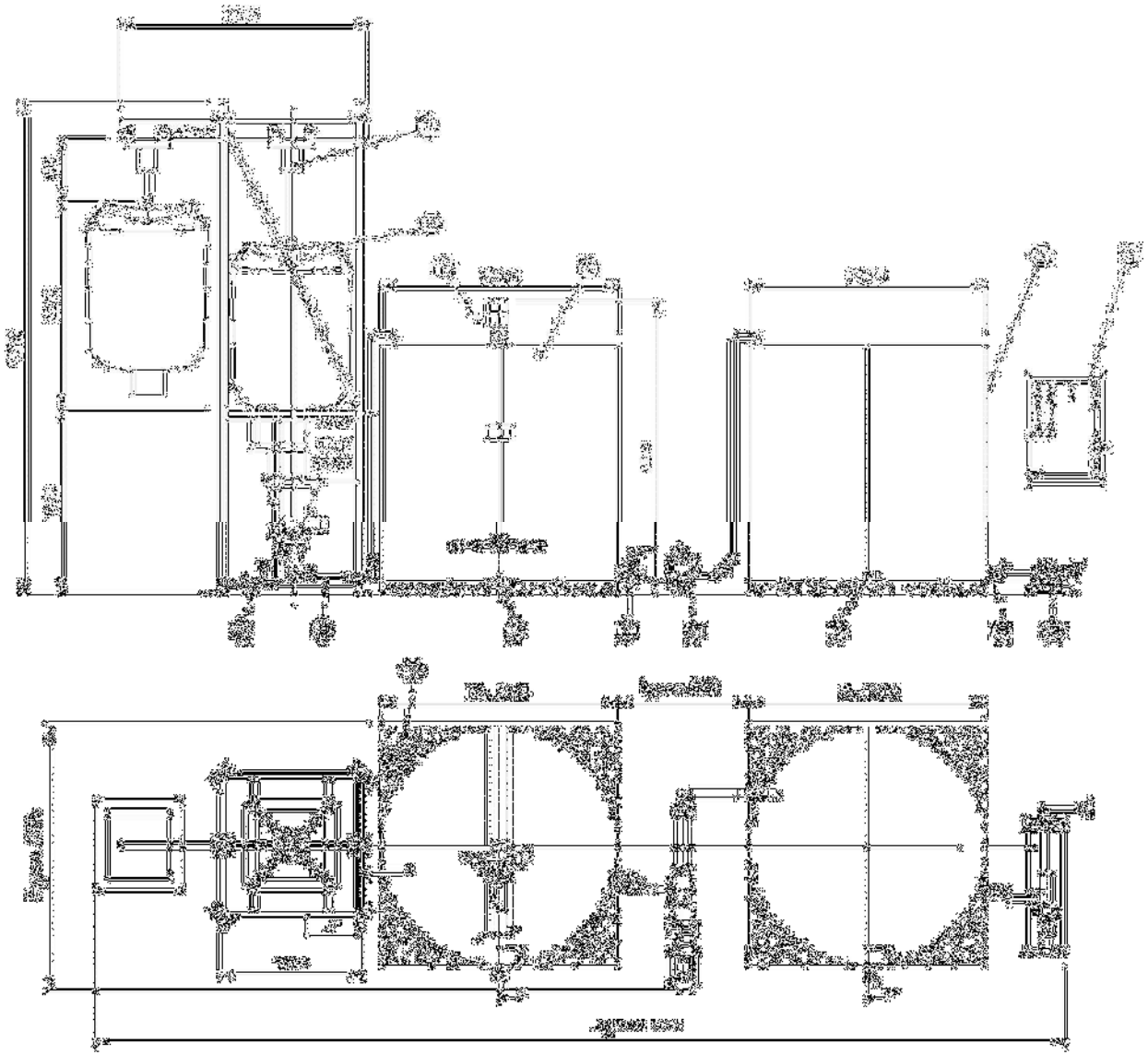
Support stand for vacuum transport

A big bag support is added to a standard vacuum conveyor support.



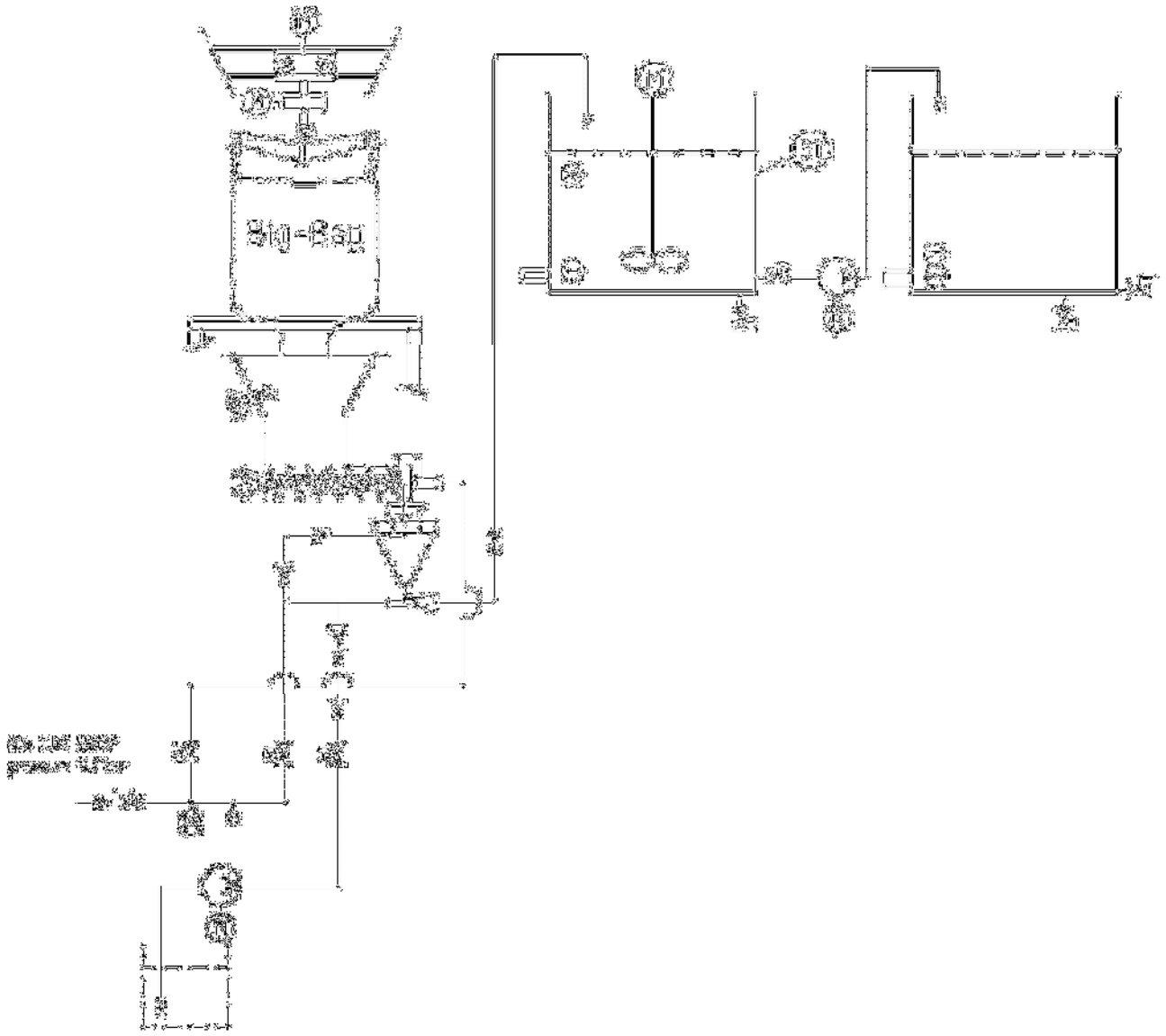
PolyRex Big bag handling system

PolyRex Maxi 16 with integrated lifting hoist.



PolyRex Big bag handling system

PolyRex Maxi 16
with integrated
lifting hoist.



PolyRex Classic Wetting cone system

Wetting cone with teflon coated inlet.

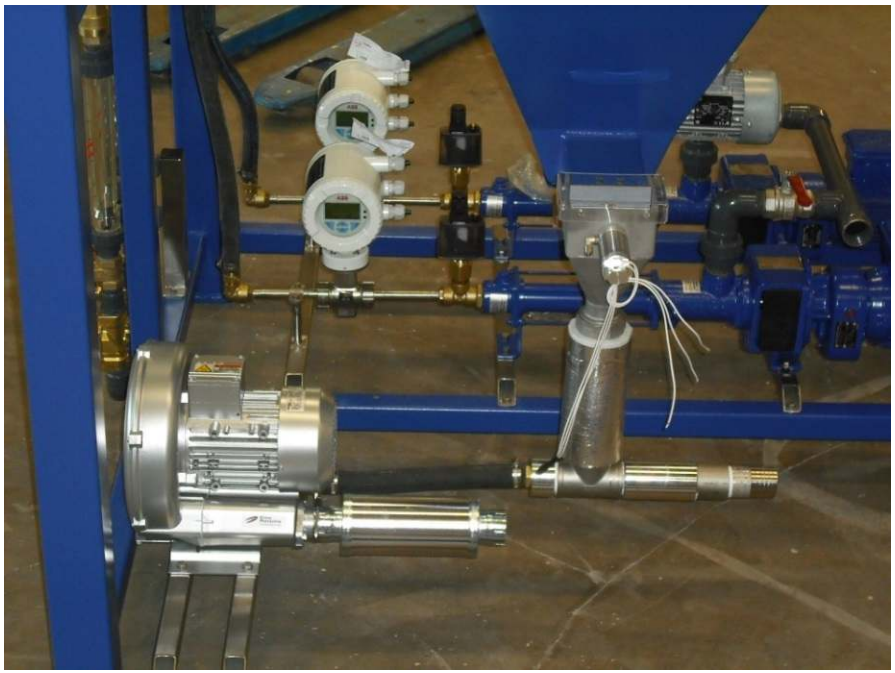
PolyRex Optimo Wetting system

Optimo is suitable for very high efficiencies of polymer mixing. This results in very low polymer consumption.

The unique construction has been developed especially for customers with high demands.

PolyRex AeroMix Wetting cone system

Pneumatic conveying system including a mixing pipe mounted on top of the mixing tank.



PolyRex Dust Free big bag handling system

Suitable for Big-bags with outlet spout. The outlet spout of the bag is sealed before opening.

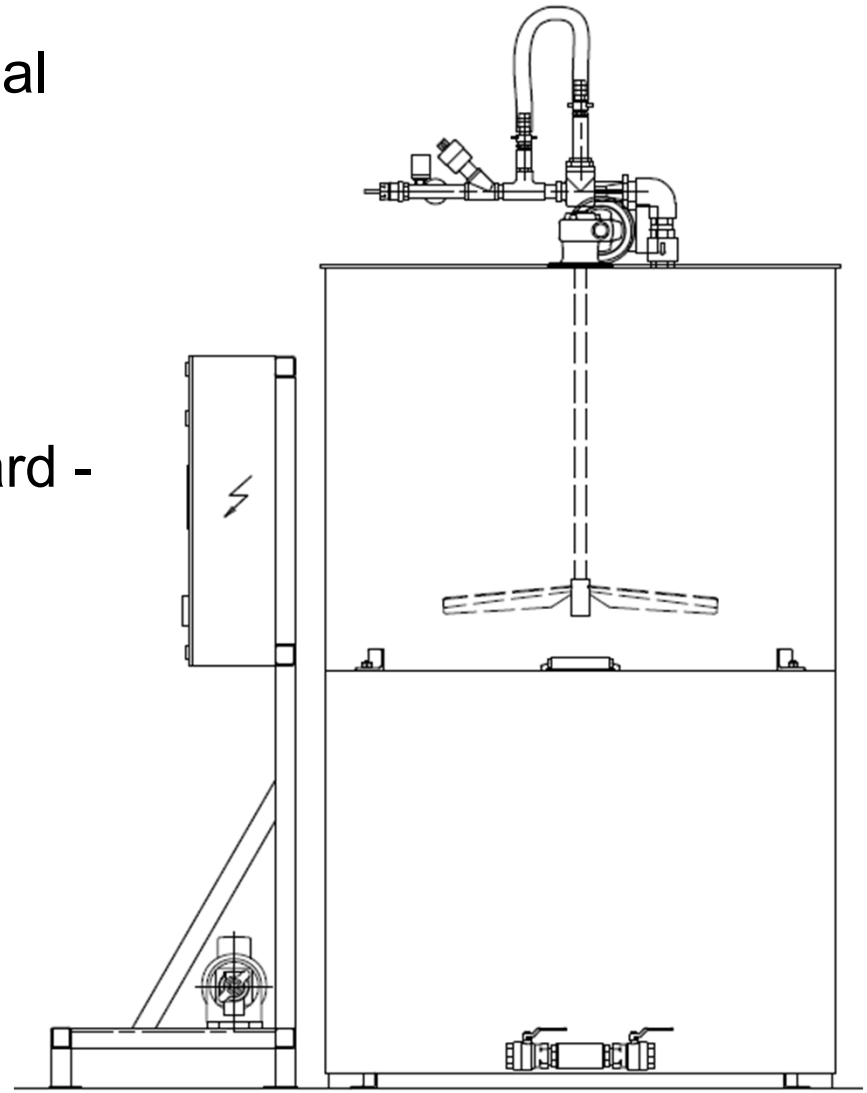
PolyRex Dust Free big bag handling system

Dustfilter with exhaust fan and Big-Bag cone with vibrator

Polymer make-up unit PolyRex Liquid

Batchwise peparation of commercial liquid polymer

- Ensures a fully activated polymer solution!
- Stainless steel execution standard - Long lifetime!

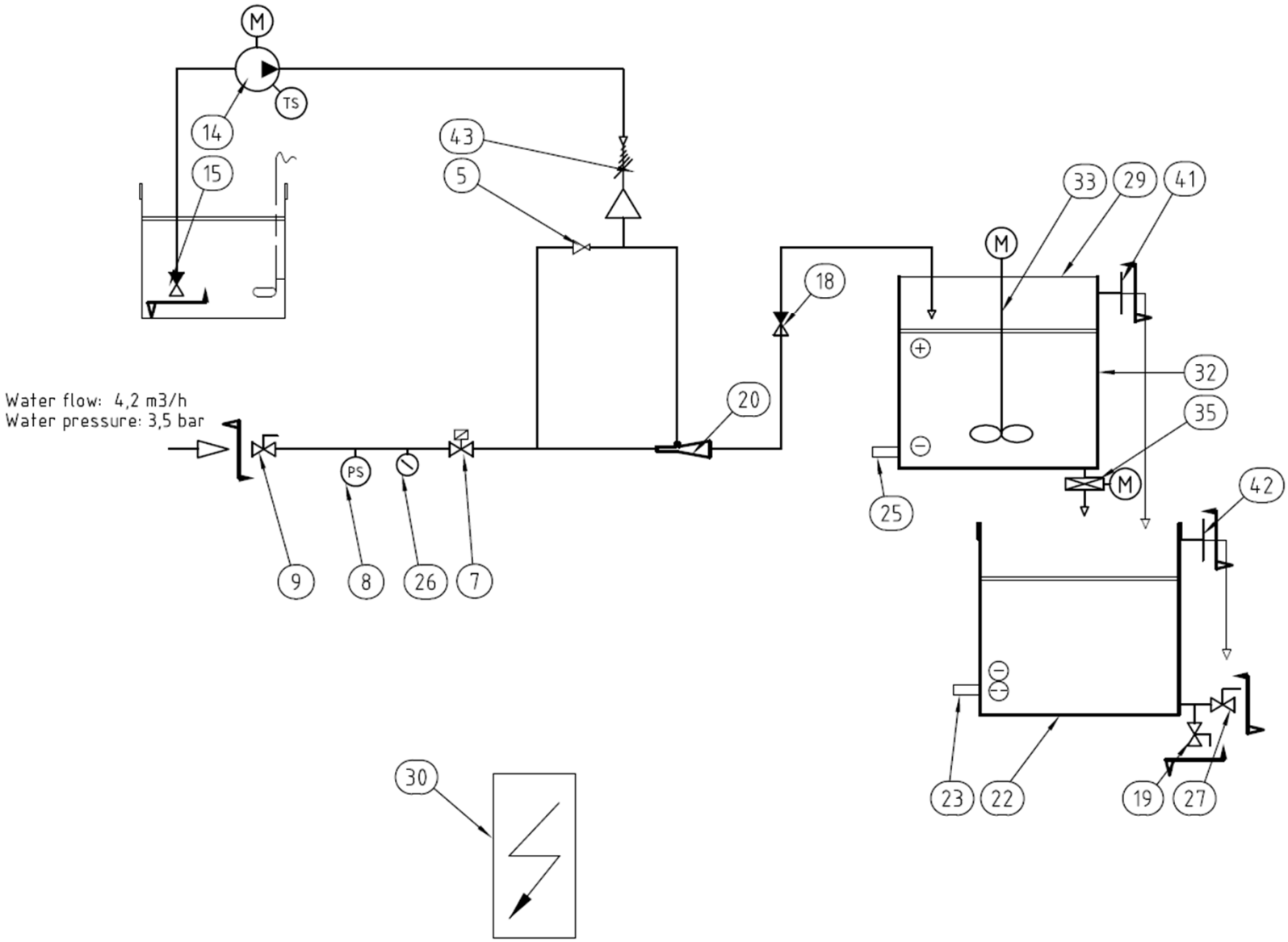


Polymer make-up unit PolyRex Liquid

- Injection nozzle for commercial liquid polymer!
- High energy mix-in via water injector

Polymer make-up unit PolyRex Liquid

Precision+Reliability



Polymer make-up unit PolyRex Liquid

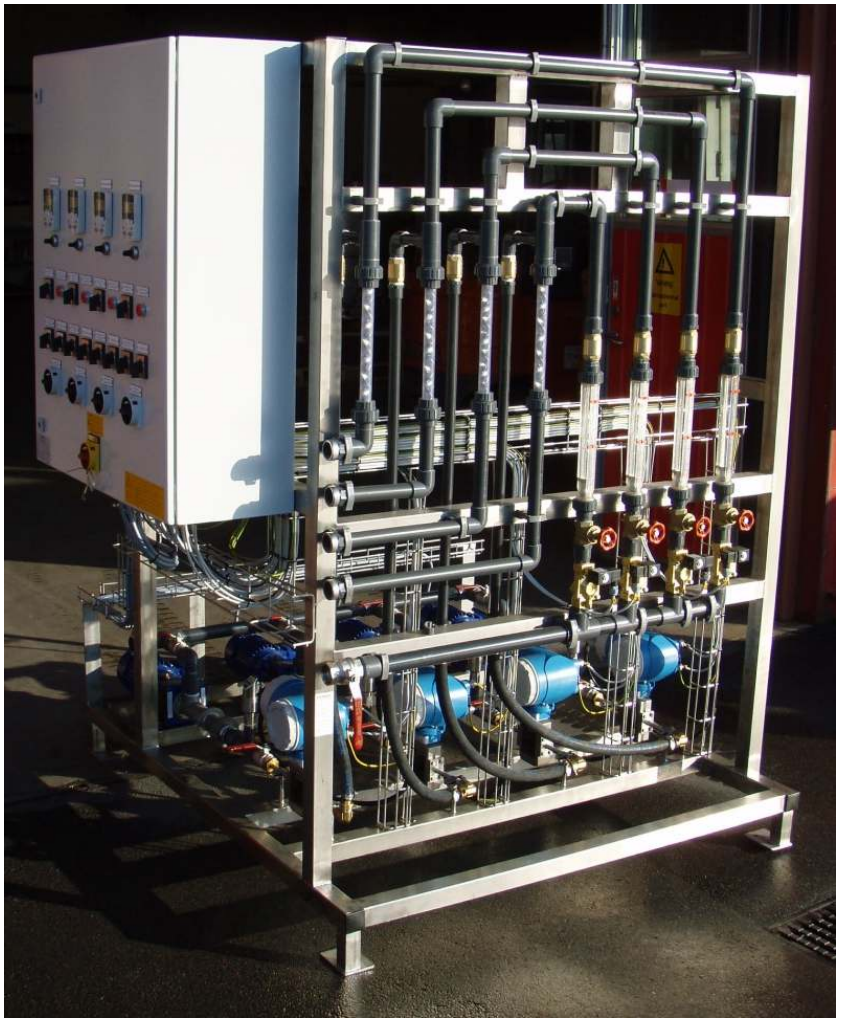
Machine capacity:

- Max. preparation capacity at 0,5 % or 0,25% stock solution concentration calculated from 100% active polymer.

Concentration:	0,5% solution				0,25% solution		
Maturing time:	15	30	60	min	15	30	60
PolyRex Liquid 1.0 (2x0,5 m³)	5,3	3,2	1,8	kg/h	2,9	1,7	0,9
PolyRex Liquid 2.0 (2x1,0 m³)	9,5	6,4	3,8	kg/h	5,7	3,5	2
PolyRex Liquid 3.0 (2x1,5 m³)	12,4	8,2	4,9	kg/h	7,5	4,6	2,6
PolyRex Liquid 4.0 (2x2,0 m³)	15,9	11,4	7,2	kg/h	10,2	6,7	4

Polymer pump skid

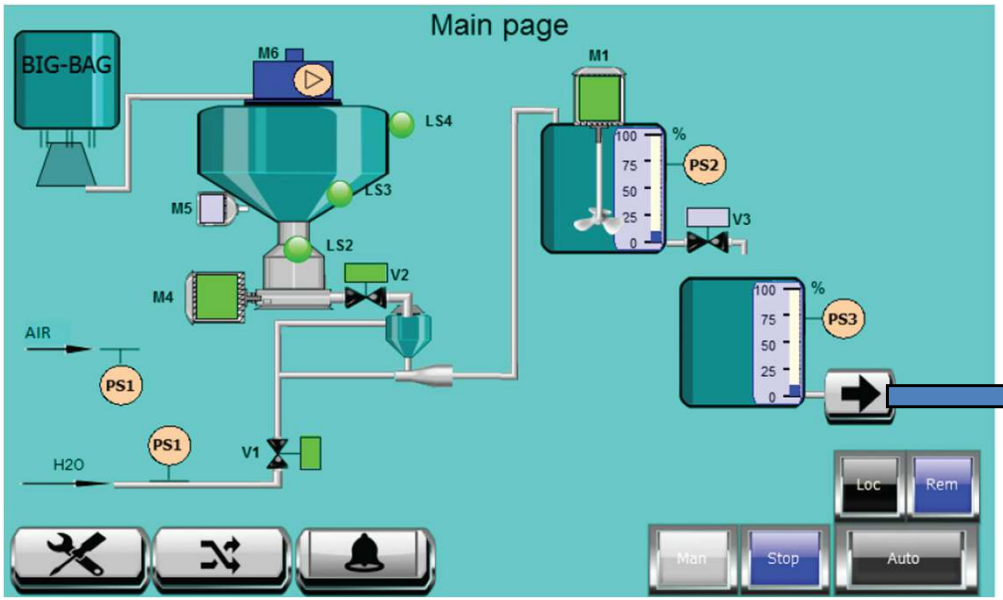
Separate pump skid including post dilution equipment.

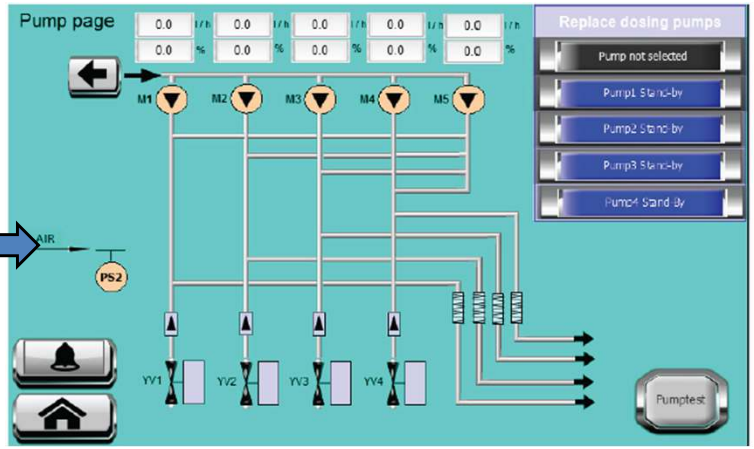


PolyRex User friendly controls

Standard control:
ABB PLC type AC500 PM554-T-ETH
with touch panel CP635

Example from a project specific panel layout:





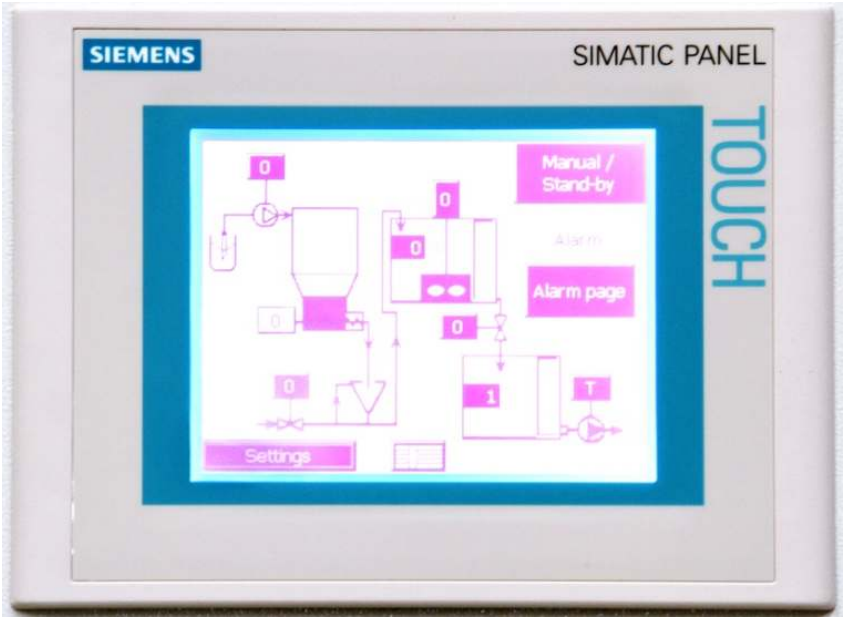
PolyRex User friendly controls

Optional controls:

Siemens PLC S-224 and touch display TP 177 Micro.

Allen Bradley MicroLogix 1400 and touch panel C600

Communication interfaces: Profibus DP, Ethernet or Modbus



PolyRex ATEX Gas design

Oil&Gas application in Kollsnes / Norway

PolyRex ATEX Gas design

ATEX Zone 1, gas group IIB, T3.
A complete preparation unit for liquid polymer emulsion inlcuding 2 feeding lines with pumps, electromag flow meters and emulsion tanks with radar level indicator. All material in AISI316 with pipe work type Parker.

Statoil that runs Kollsnes asked AkerSolution to rebuild the gas plant during process.
Krüger Kaldnes is responsible for the water treatment of the process water that contains methanole and glycole (MEG). In this process Tomal polymer unit is included.

PolyRex ATEX Gas design

Oil&Gas application in Rosneft / Russia

PolyRex ATEX Gas design

In the beginning of 2011 Tomal got their first order for preparation of polymer powder in an Ex-classified zone. The delivery consist of a PolyRex 2,0 with “liquid option” for ATEX Zone 2, GAS group IIB, Temp class T3. A complete preparation unit for both polymer powder and polymer emulsion including dosing pump and a separate vacuum conveyor (Ruwac). Tanks and pipe work are made in AISI 316. The support is made in AISI 304.

Rosneft’s refinery in Tuapse is the company’s oldest and was commissioned in 1929. The refinery is located on the east side of the Black sea coast and it is specialized in the production of motor fuel. “Slop oil” is a low quality waste oils that are generated in the refining crude oil process. The “slop oil” can’t be used without cleaning. Tomal’s equipment is included in the “slop oil” cleaning process.

PolyRex Standard and Norms

- Tomal AB is certified acc. to SS-EN ISO 9001
- Control panel and wiring according to SS-EN 60204-1
- Quality requirements of welding SS-EN 729-3
- Approval testing of welders SS-EN 287-1
- Guidance on quality levels for imperfections SS-EN 5817-C

Note!! Tomal has a special quality presentation.

Visit our website www.tomal.se

TOMAL®
METERING SYSTEMS

ProMinent® Group

HOME | COMPANY | QUALITY & ENVIRONMENT | APPLICATIONS | PRODUCTS | CONTACT

Metering systems for solids

Tomal AB is an engineering company with mechanical production that produce and sell custom made metering equipment. At present Tomal have 63 employees.
We are one of the leading companies in our branch, with deliveries to communities and industries on the international market, where 80% of our deliveries are export. Our work is carried out in Vessigebro, just outside of Falkenberg at the lovely west coast of Sweden.
We are certified according to ISO 9001:2008.

Tomal's business idea

- Development, manufacturing and sales of custom made metering equipment for solids.
- Reliable discharge and high accuracy.
- Delivery, mounting and service to industries and municipalities at the international market.

News

2013-06-05
Updated homepage for use of smartphones

2012-02-23
New EU-directives

2012-02-23
ISO 9001:2008 renewed 3-years certification

News Archive »

Interesting deliveries

New solenoid driven metering pump **gamma/ X**

Experts in Chem-Feed and Water Treatment

ProMinent®

X-tremely clever!

Neev FLUIDEX PVT. LTD.

gamma/ X X-tremely clever!

ProMinent®

1. **New technology**
   - Controlled solenoid drive

2. **New solenoid drive benefits**
   - Highest process safety
   - Highest dosing quality
   - Highest economy

3. **New metering pump series gamma/ X**
   - Technical characteristics

Neev FLUIDEX PVT. LTD.

gamma/ X Controlled solenoid drive

ProMinent®

X-tremely reliable

Linear solenoid, consisting mainly of

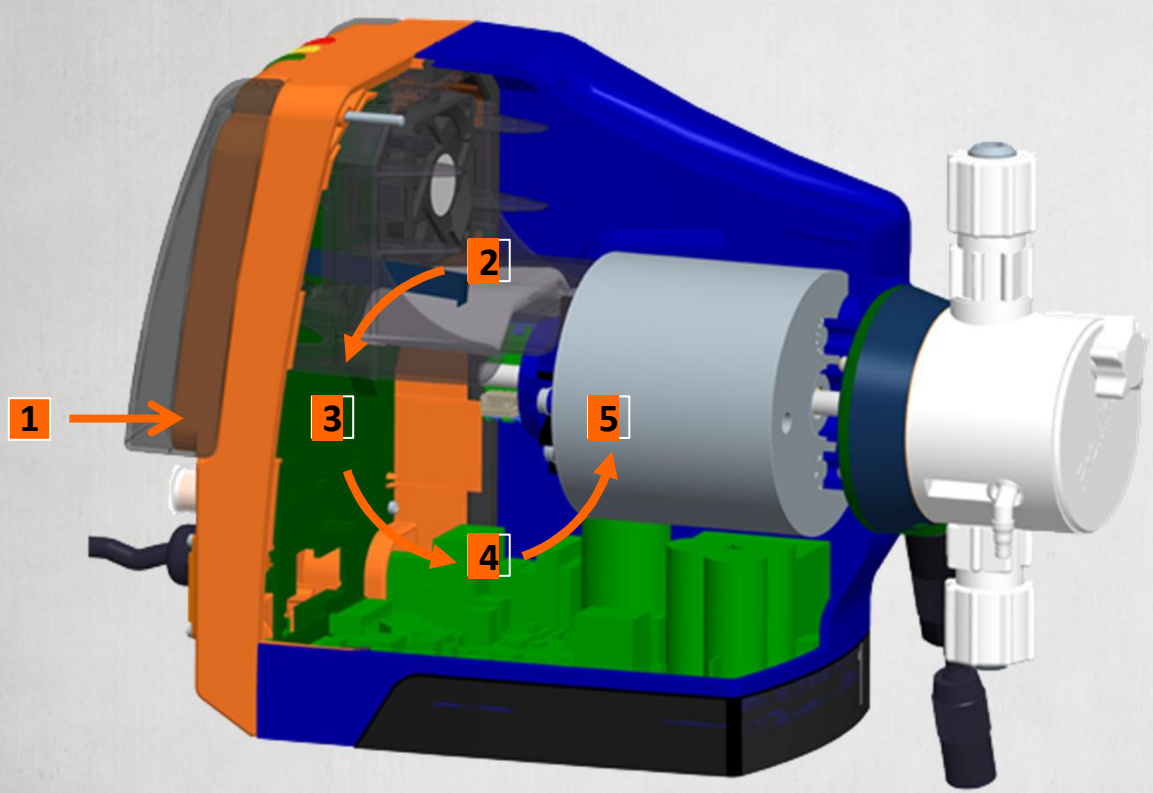
- Pressure piece with solenoid axle
- PTFE filled bearings
- Position sensor
- Solenoid coil

Neev FLUIDEX PVT. LTD.

gamma/ X Controlled solenoid drive

Experts in Chem-Feed and Water Treatment

ProMinent®



1. Set dosing parameters
2. Stroke position sensor
3. Controller
4. Booster
5. Solenoid

Neev FLUIDEX PVT. LTD.

New features for highest process safety

ProMinent®

X-tremely clever: reduction of down-time

- Integrated pressure measurement and indication without any sensor in the dosing head

- Detection of hydraulic problems as
  - Overpressure
  - No pressure (broken discharge line)
  - Gas in the dosing head
- Alarm on display or via relay or fieldbus to the PLC

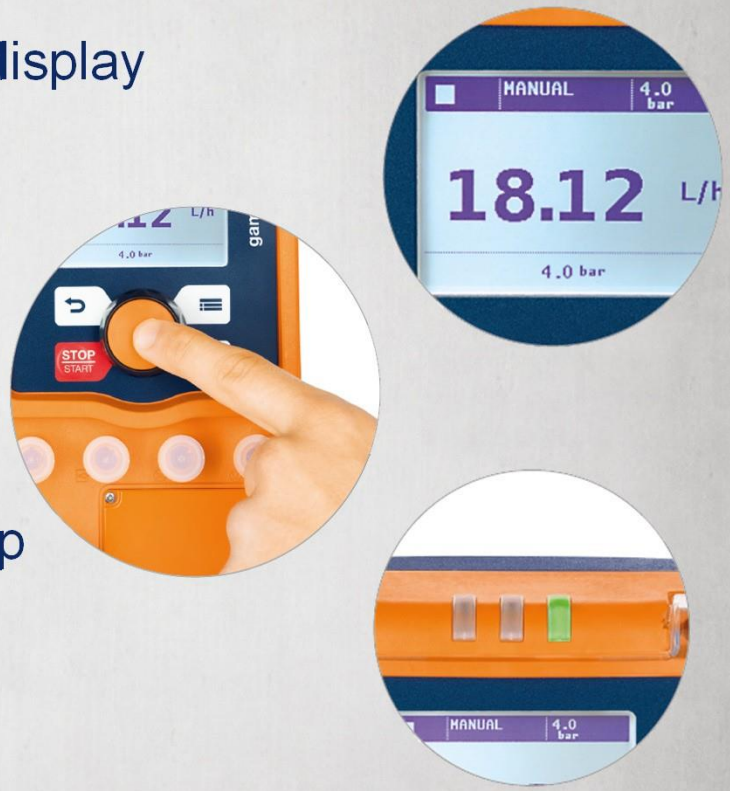
Neev FLUIDEX PVT. LTD.

New features for highest process safety

ProMinent®

X-pert for simplicity through

- Large illuminated high resolution LC display
- Easy self explaining programming by
  - Click wheel
  - Buttons: STOP/START, Return, Priming, Menu
- 3 LED status indication, visible from front, aside and back of the pump
- Service modul with logfile



Neev FLUIDEX PVT. LTD.

New features for highest dosing quality

ProMinent®

Controlled solenoid drive allows

- Setting of different dosing profiles
  - Suction and/or discharge stroke can be performed fast or slow
  - Optimal adaption on high viscous or outgassing liquids

- Electronic setting of stroke length resp. stroke volume
  - Total remote control of pump parameters from PLC
  - Pump can be used in filling processes where a certain volume must be dosed in a short time, e.g. filling of ink cartridges

Neev FLUIDEX PVT. LTD.

New features for highest dosing quality

ProMinent®

Controlled solenoid drive allows

- **Standard mode**
  Capacity setting in l/h or via stroke length and – frequency

- **Automatic mode**
  Capacity setting in l/h, pump selects stroke length and frequency, gain is no cavitation and overload with lowest possible energy consumption

Neev FLUIDEX PVT. LTD.

New features for highest economy

ProMinent®

- Solenoid drive has only one moving part, no gear etc.
- Load on the bearings is independent from back pressure
- Solenoid drive is safe against overload
- Energy saving operation
- Relief valves can be spared thanks to overpressure detection
- Wide capacity range spares different pump types

Neev FLUIDEX PVT. LTD.

Technical characteristics

ProMinent®

- Capacity range 2 – 45 l/h, 25 – 2 bar with 6 dosing head sizes
- Dosing head/valve/seal materials
  - PP PVDF PTFE
  - PVDF PVDF PTFE
  - PMMA PVDF PTFE
  - PTFE PTFE PTFE
  - SS SS PTFE

  Suitable for all liquids in water treatment, chemical industry, …

- Easy to install thanks to click in foot console

Neev FLUIDEX PVT. LTD.

Technical characteristics

ProMinent®

Control possibilities

- Capacity setting manually (internal control)
- Internal 7 day timer for dosing programs, e.g. in cooling water treatment
- External control by
  - Contact signal e.g. from a water meter
  - Analog signal 0/4 – 20 mA or
  - Fieldbus signal e.g. from PLC

Neev FLUIDEX PVT. LTD.

Technical characteristics

ProMinent®

Inputs

- Contact
- Analog
- Pause
- Auxiliar frequency
- 2 stage level switch

Outputs

- Relay
- Analog 0/4-20 mA for capacity settings

Communication

- Fieldbus as Profibus, Profinet, CANbus, Modbus etc.
- Bluetooth for programming with smartphone etc.

Neev FLUIDEX PVT. LTD.

Thank You

510, Shreeya Amalga,
Opp Avalon Hotel,Off sindhu Bhavan Road,
Ahmedabad - 380059

ProMinent®

Neev FLUIDEX PVT. LTD.

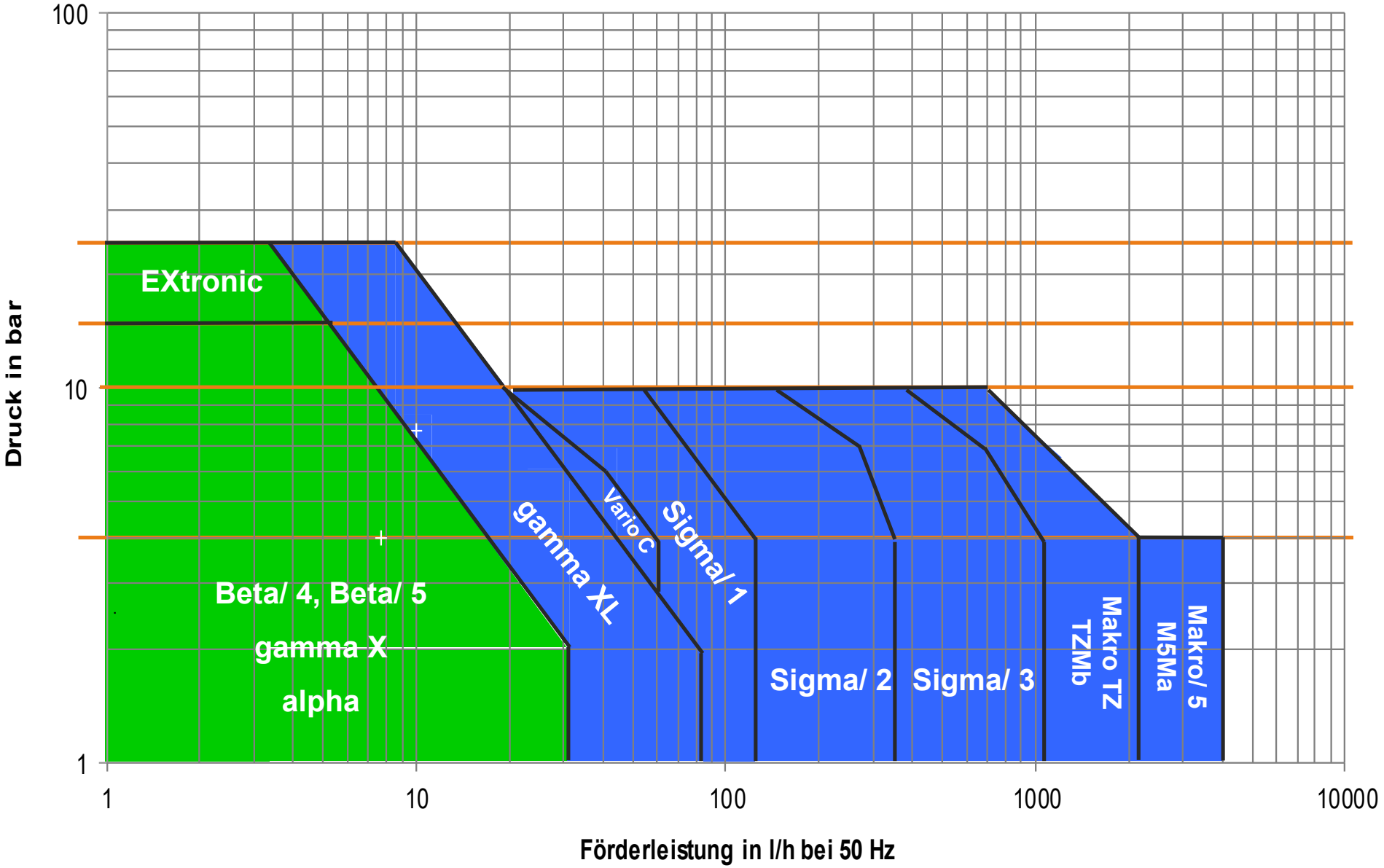
Sigma X – Product Family

Sigma X Family – S1Cb, S2Cb, S3Cb

1. **New uniform operating concept**
   combined with reliable Sigma drive technology

2. **Benefit of the new Sigma X family**
   Uniform operating unit
   - Intuitive operation and excellent dosing quality
   - Same handling gamma and Sigma
   - Highest process safety and reliability
   - Communication over fieldbus
   - Extended Connectivity DULCOnneX

Product overview low pressure metering pumps



ProMinent®

Sigma X Family
Uniform operating concept

Sigma X Family: New Functions - Overview

- Uniform operating concept with Click-Wheel and 4 operating keys analog gamma/ X
- Extended range of operating languages
- Info about wear parts inside service menu
- Integrated timer as standard
- Integrated log book
- HMI can be retrofitted

Uniform operating concept

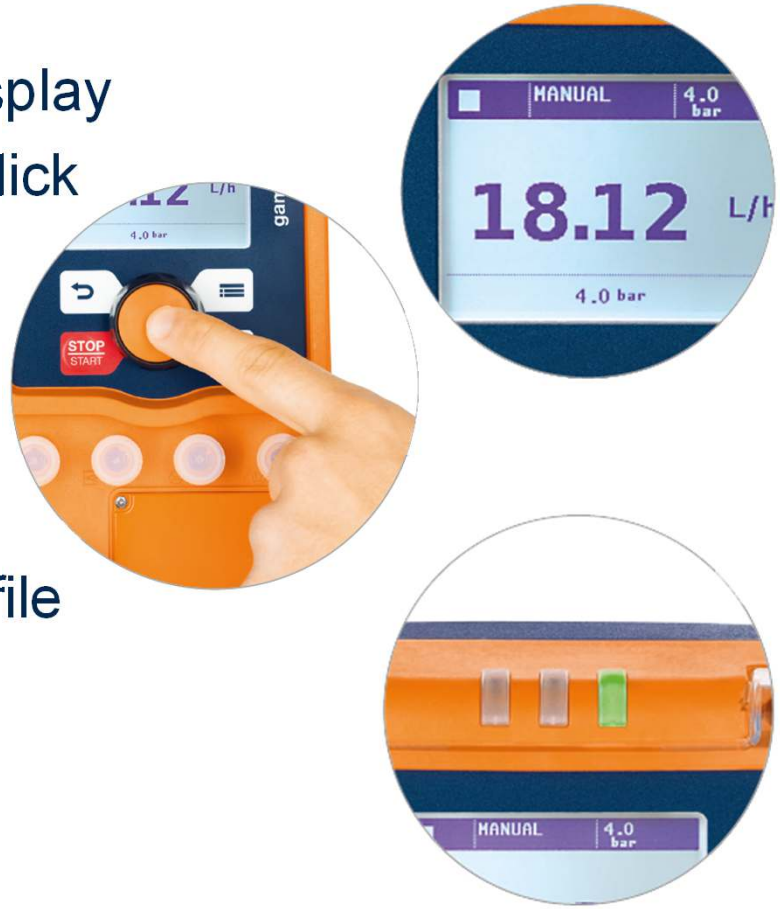
Uniform and easy operation for all intelligent ProMinent metering pumps gamma/ X und Sigma X

from 1 ml/h up to 1 m³/h dosing capacity

New features for highest process safety

Intuitive operation through

- Large illuminated high resolution LC display
- Easy self explaining programming by Click Wheel and butons:
  - STOP/START
  - Return
  - Priming
  - Menu
- Service modul with spare parts and logfile
- 3 LED status indication, visible from front, aside and back of the pump



Advantage

- Einfache Inbetriebnahme, Montage und Wartung

Extended range of operating languages

Larger memory

- Simple integration of languages
  - Russian
  - Czech
  - Schwedish
  - Finnish
- Asian languages possible

  e.g. CN, Thai

Advantages

- For installer/technician: Commissioning of the pump in local language
- For operators: Error messages in separate national language
- Better international service possibilities

Wear parts inside service menu

Display of material number according to specific identcode:

- Part no.: Spare part set and Multi layer safety diaphragm

Advantages

- On-site display of wearing parts
- Faster ordering of spare parts on site possible

Integrated log book

Log book structure
(1) Line number
(2) Date and time
(3) Type of entry (warning, error …)
(4) Number
(5) Description

Last 300 incidents with date and time
Diagnosis of pump events:

- Level / flow monitoring
- Diaphragm rupture, manual start / stop
- Stroke length change > 5%
- Warnings and errors:

Advantages

- Timely traceability of events, warnings and errors
- Simple and fast fault diagnosis, simpler service
- Minimization of downtime
- Verification possibility

Timer: standard HMI function

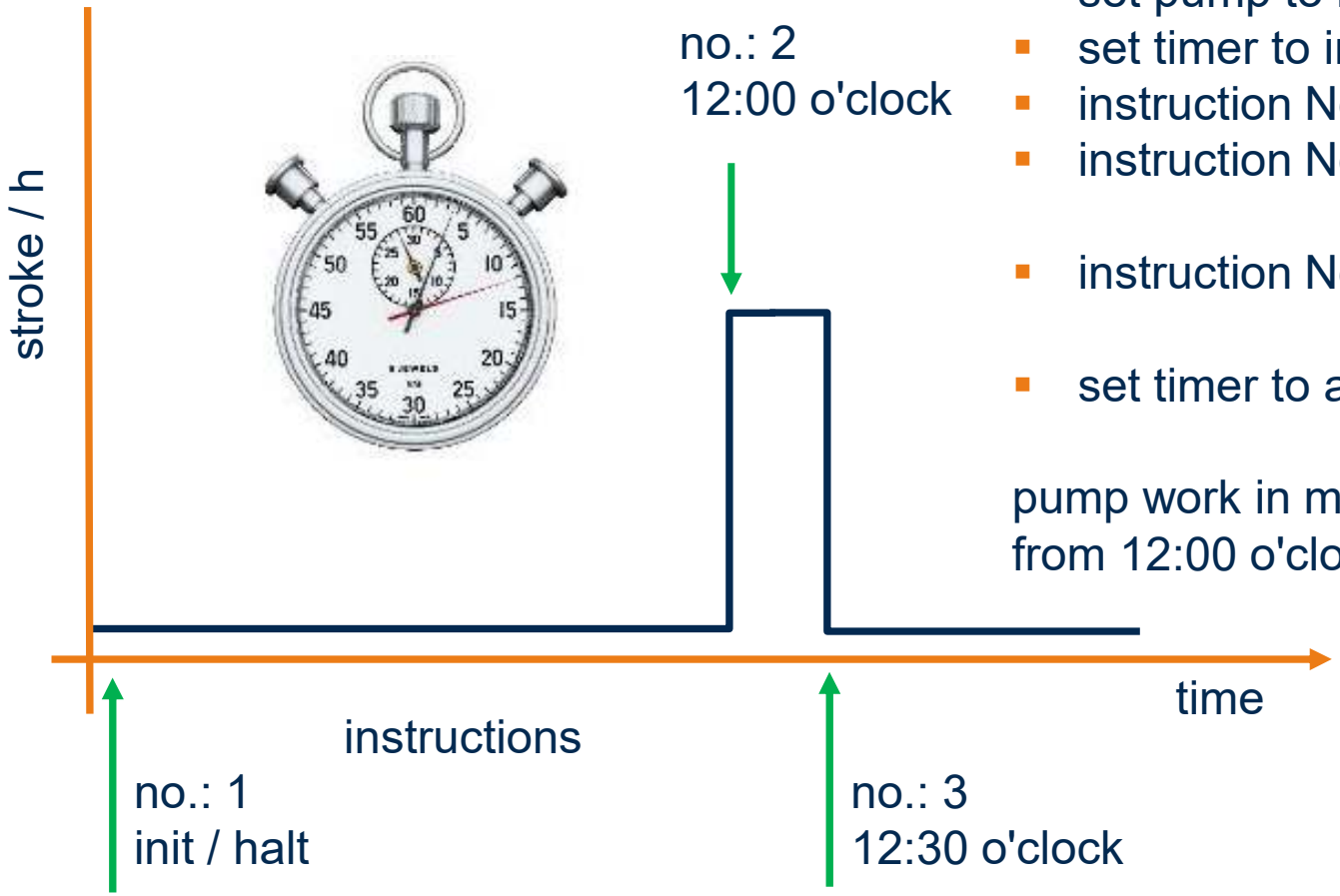
Time-dependent control of the dosing quantity
e.g. of biocide dosing on cooling towers and air washers

- Integrated timer (every hour …. month)
- Similar to gamma / X
- Action:
  - Pump start / stop
  - Change of operating mode
  - Relay open / close (step 2)
- 32 different activities can be stored

Advantages

- Simple operation
- Replacement of the old Sigma SXCa timer version

Timer: How to program the HMI?



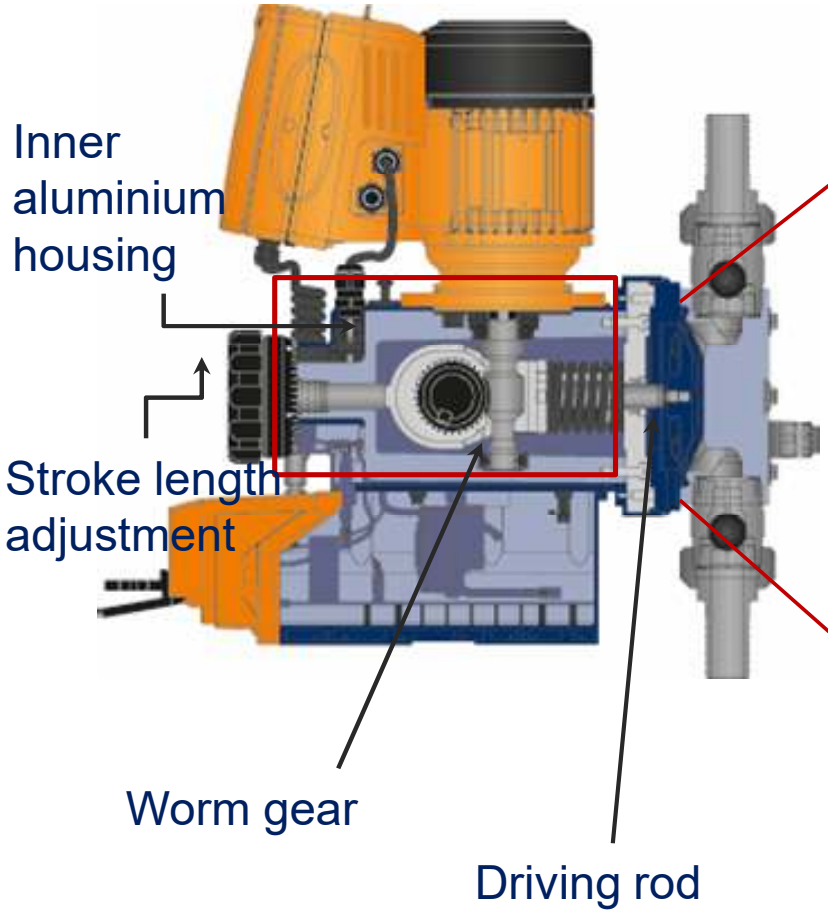
Example:

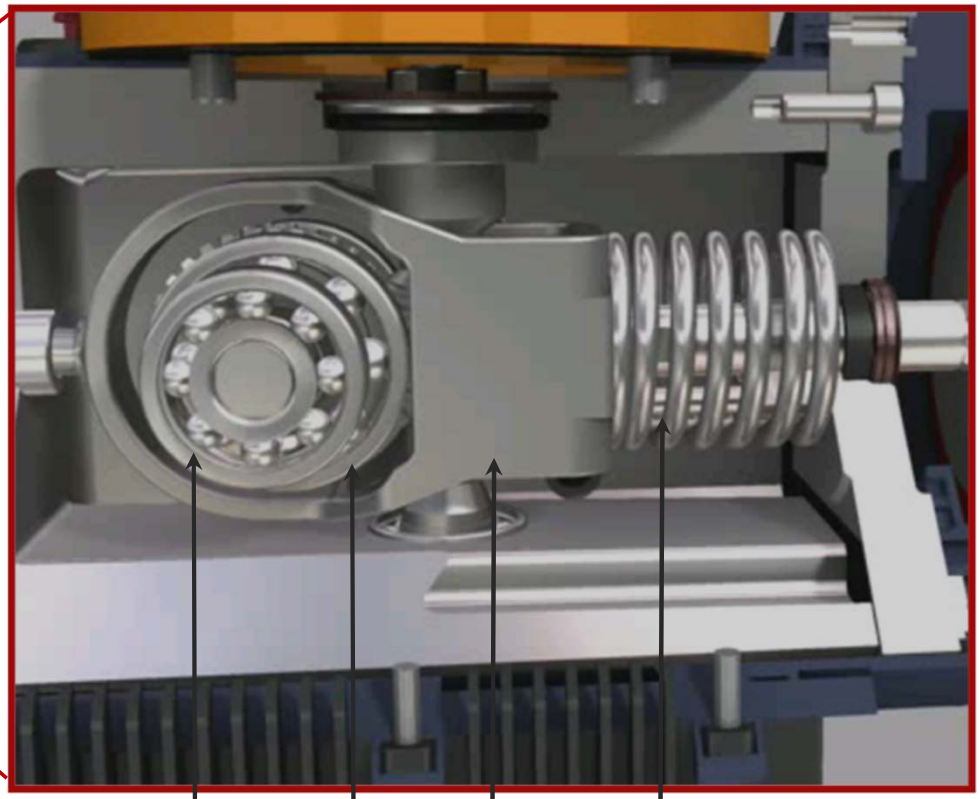
- set pump to manual mode
- set timer to inactive mode
- instruction No. 1 = init (halt)
- instruction No. 2 = workday 1 (Mo-Fr) (12:00 / 3600 str./ h)
- instruction No. 3 = workday 1 (Mo-Fr) (12:30 / halt)
- set timer to active mode

pump work in manual mode
from 12:00 o'clock to 12:30 o'clock

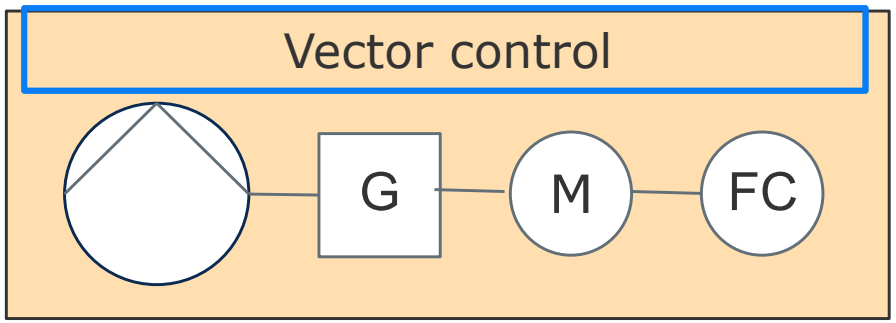
Sigma X
Drive unit & liquid end

Sigma: Structure & Function: Drive-unit





Sigma Control Type



1 Information and control unit

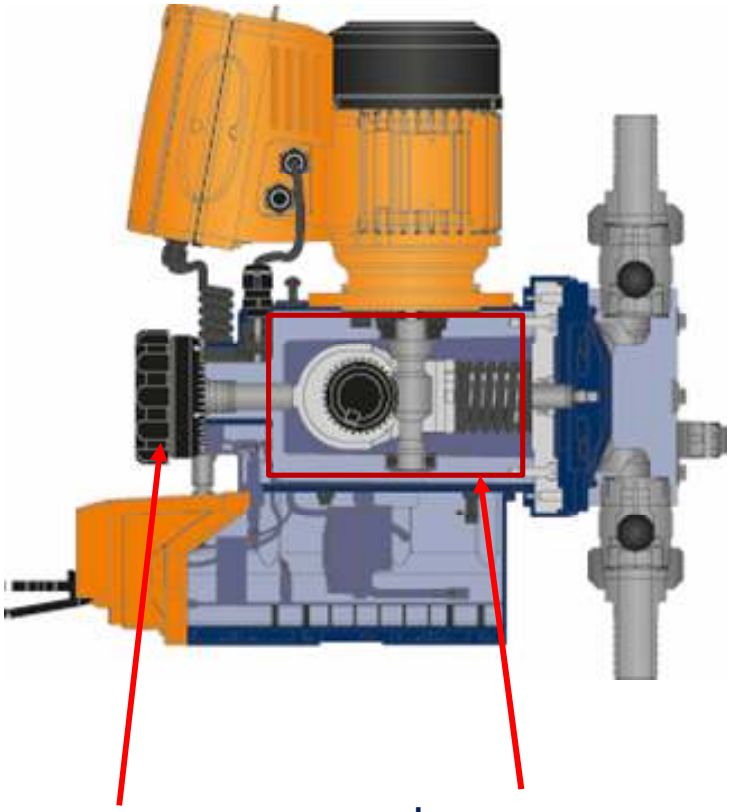
2 Frequency converter + vector control

3 Motor – energy demand

4 Mechanical drive-unit

5 Stroke adjustment,
Control possibilities input / output
Flexible customization options
Power supply:
wide range voltage input
1ph - 100...240V 50/60Hz

Sigma: Reliability



Features

- Aluminium housing with glass fibre reinforced plastic housing
- Large adjustment range by combination of frequency and stroke length adjustment
- Efficient protection by built-in frequency converter with microprocessor control
- Automatic hardware recognition

Advantage

- High resistance to chemicals
- Universal use in industry
- No country-specific models
- Reduced storage costs

Sigma: Reliability

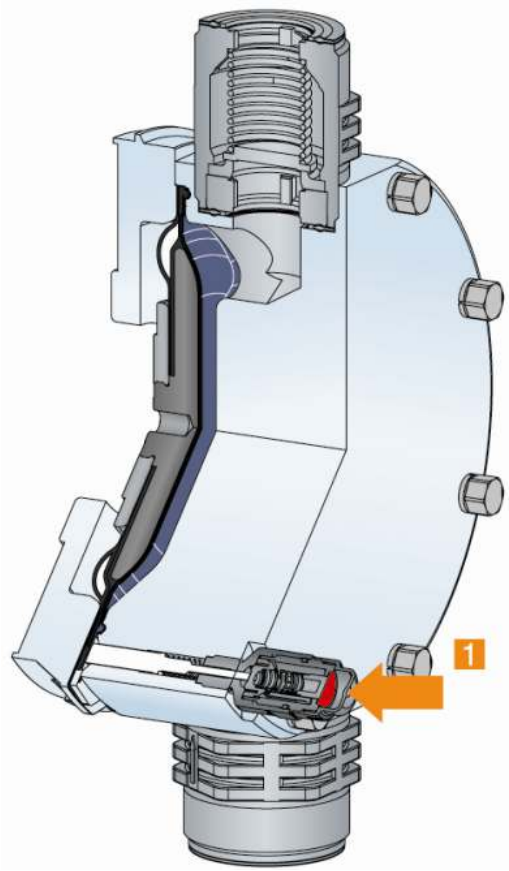
High temperature tolerance, stability

- Ambient temp.: -10 ... +45 °C
- Medium temp.: PVT: -10 ... +60 °C
  Medium temp.: SST: -10 ... +90 °C
- Protection class IP 65

Advantage:

- Low maintenance costs
- Reliable use in industrial applications
- Pump can be easily used in diverse locations, ambient and media temperatures

Sigma: Process safety and Reliability



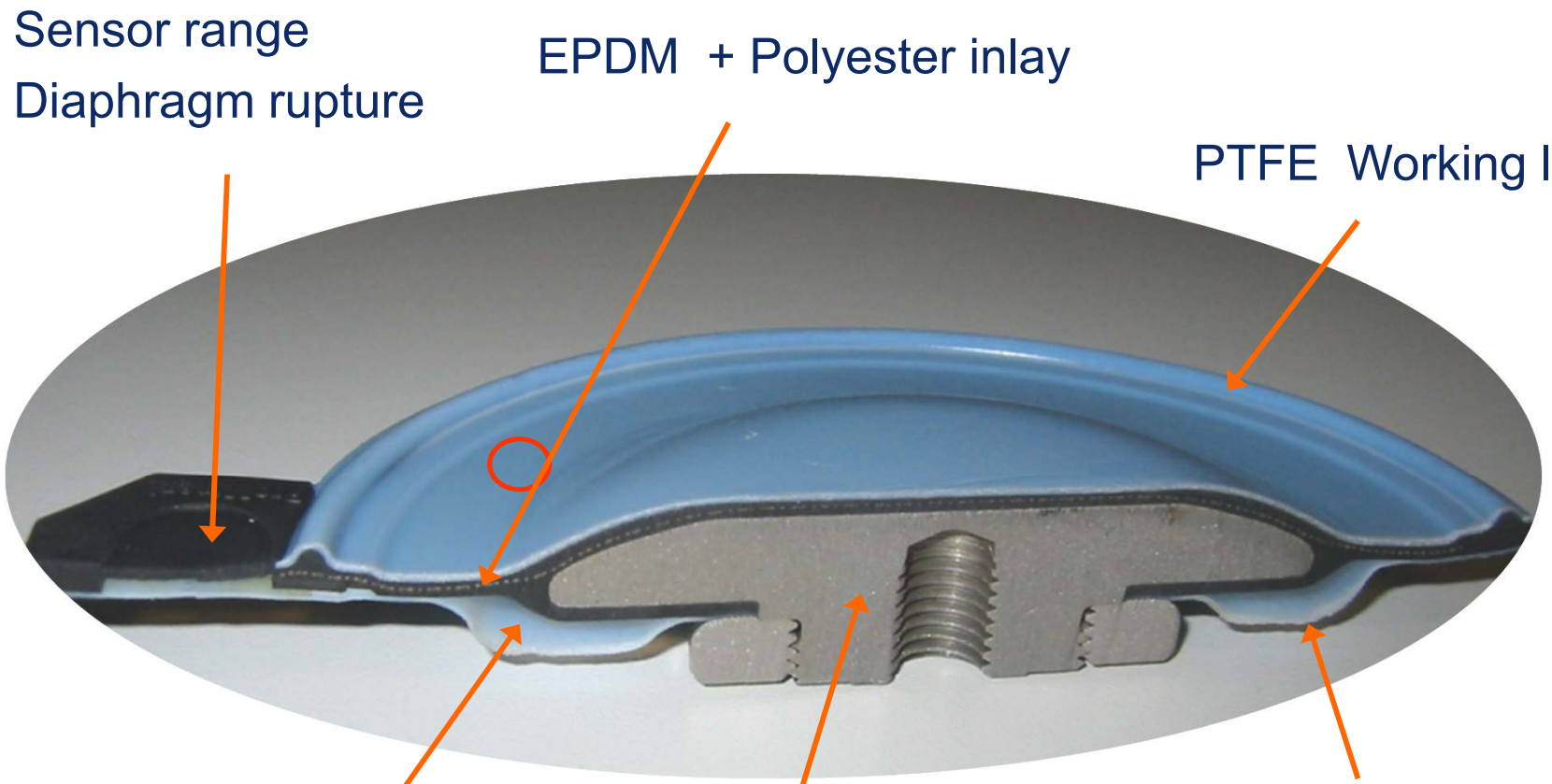
- Only two variants: PVDF (PVT) or stainless steel (SST)
- Patent registered multi-layer safety diaphragm
- Process safety thanks to multi-layer diaphragm with diaphragm rupture warning system. Prevents medium from leaking in the event of a diaphragm rupture
- Emergency mode possible
- Optical display as standard **(1)**
  Electrical diaphragm sensor as option for signal analysing
- Simpler technology than the double diaphragm system

Advantage

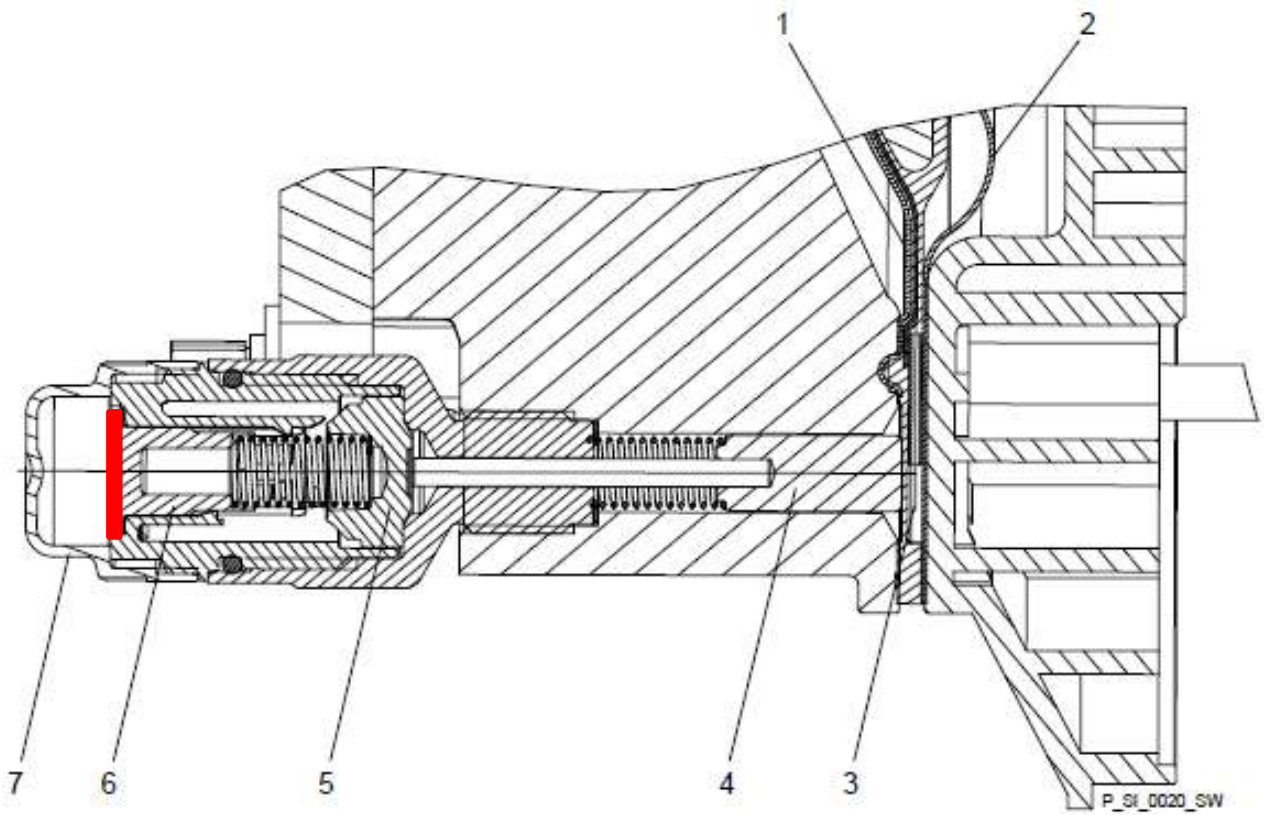
- Reduced downtimes
- Reduced maintenance and service costs
- High process and operator safety as standard

Sigma: Process safety and Reliability

Structure: Multy-layer safety diaphragm



Sectional view of diaphragm rupture



1 Working layer

(≙ Working diaphragm)

2 Safety layer

(≙ Safety diaphragm)

3 Strap

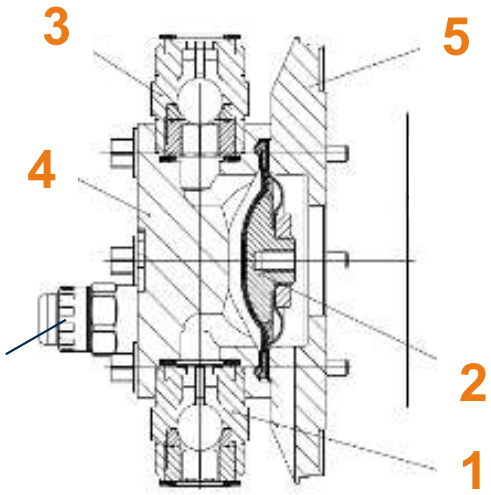
4 Piston

5 Diaphragm sensor

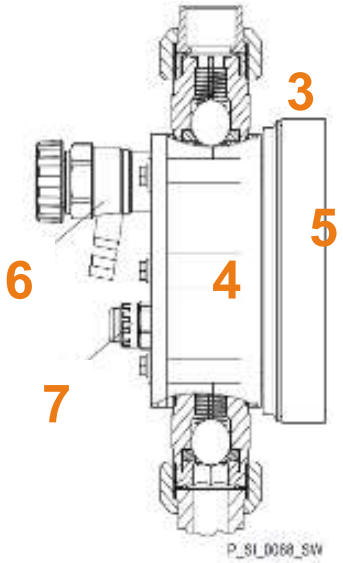
6 Cylinder, red

7 Lid, transparent

Sigma: Liquid ends



(1) / (3) Suction valve / Discharge valve
(2) Multil-layer safety diaphragm
(4) / (5) Dosing head / Back plate
(6) Integrated bleed valve or pressure relief
(depending on identcode)
Materials: PVDF or stainless steel
(7) Diaphragm sensor (optical)



Liquid ends with integrated relief or bleed valve

- Integrated relief valve protects the pump against overloading
- Integrated bleed valve ensures reliable operation by means of a bleed option during the metering process.
- Not recommended for crystallizing media

Sigma X – Communication

Sigma: Communication Interfaces

Standard

- External contact mode via potential free contacts; factor 99:1 – 1:99
- Batch mode via potential free contact with max. 99,999 strokes / start pulses
- Pause-function
- 2-step level measurement

Auxiliar-frequency

- Switch-on a pre-selected frequency
- i.e. shock dosage

Analogue 0/4-20 mA

- Compatible to 3rd party products
- Easy integration into process automation system
- Worldwide accepted standard

Sigma: Fault-indication relay

Selectable relay modules:

- Relay module with 1 x switchover contact

  230 V – 8 A
- Relay module with 2 x On

  24 V – 100 mA
- Output / relay module:
  Relay module with 1 x On 24 V – 100 mA
  plus 0/4- 20 mA analogue output for remote transmission of the stroke rate

Sigma: Fault-indication output signal
Extended relay settings

	Warning indication	Error message	Stopp manual	Pause	Stopp via Bus	Stroke	Signal from option
Warning	X						
Error		X					
Warning + Error	X	X					
Warning + Error + Stopp	X	X	X	X	X		
Stop		X	X	X	X		
Pacing*						X	
Pump inactive		X	X				
Option** (e.g. Profibus)							X

* Only as semi-conductor relay at fault-indicating / pacing relay
** Access to relay for chosen option e.g. Profibus

Sigma: Communication PROFIBUS

- Profibus DPV1
  Compared to DPV0 (old SXCa) transmission only of requested data
- Signal lamps green/red to different Profibus operating states
- Additional data:
  - Device identification / Identcode
  - Serial No. / Device name / Location

Advantages

- Faster due to low data volume
- Exact error description
- Values can be changed individually:
  - Stroke and quantity counter
  - Batch
  - Contact

Sigma: Communication PROFINet via DULCOnvert

ProfiNet is increasingly used in new networked systems

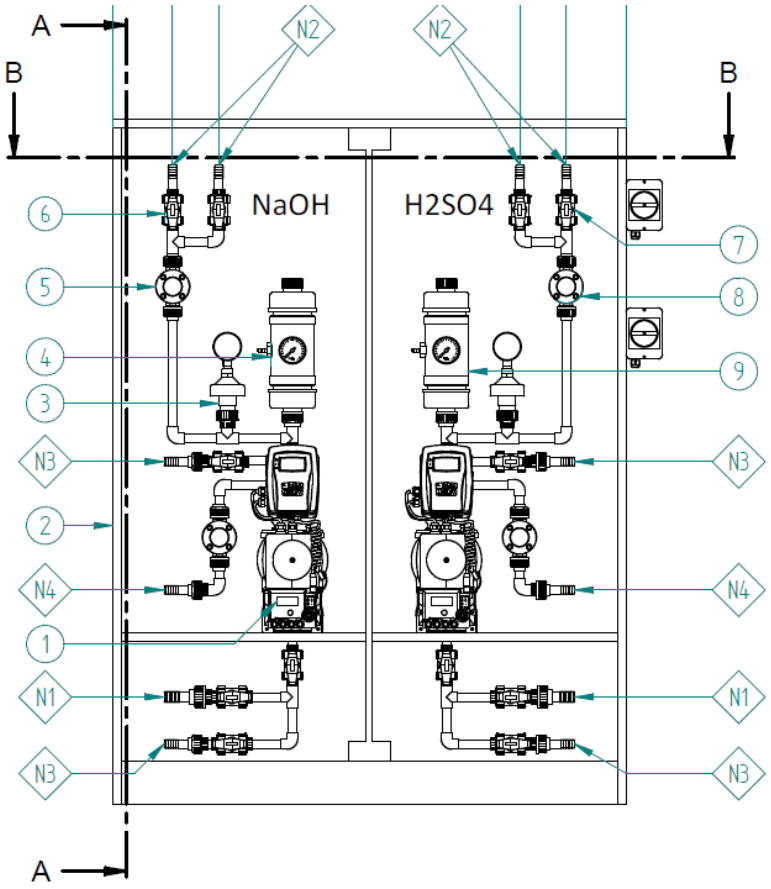
- External converter-box No.: 1080422
- Profibus cable 2m incl. (M12) plug connection
- Mounting holes for installation
- Sigma - ProfiBUS module is required
- External power supply 24Volt
- DULCOnvert is not meant to generate big profits, it serves as sales support for Sigma

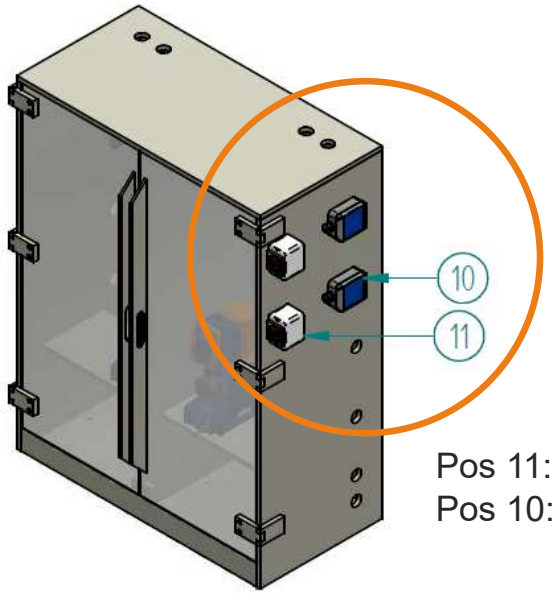
Advantages

- Connection of Sigma in ProfiNet networks possible

Sigma: Communication PROFINet via DULCOnvert

Example: Water treatment (pH – Control)





Pos 11: 2 Main switch 1044573
Pos 10: 2 DULCOnvert adapter

Advantage

- No terminal box required
- No control cabinet required
- 2m Profibus cable included

Sigma: Communication CANopen

- Control version „7“
- Communication protocol device profile CiA 402
- Via HMI socket (M12)
- Pump without operation unit (HMI)
- Emergency operation in case of failure of CAN bus via AUX function
- Manual commissioning without CAN bus via registration of an HMI and manual operation

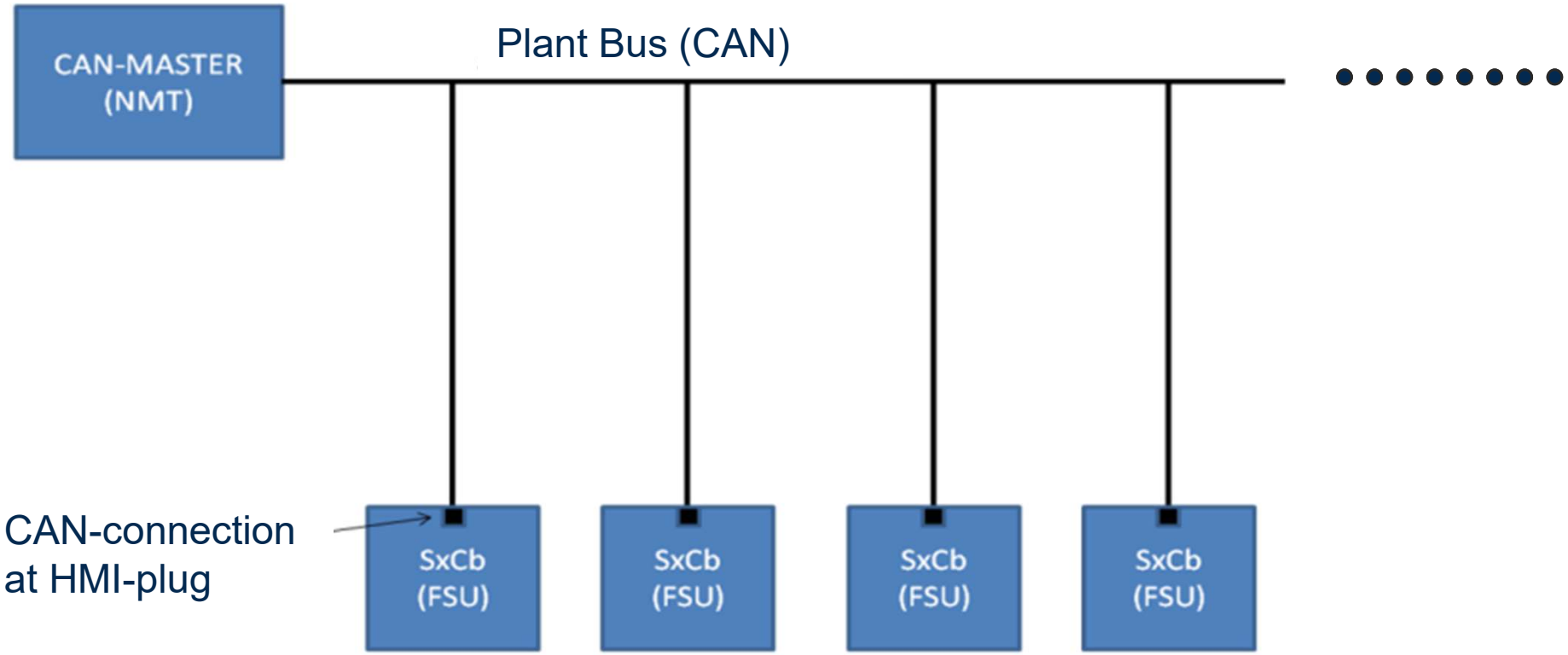
Advantage

- Ideal for small data volumes and fast synchronization

Sigma: Communication CANopen

Communication protocol device profile CiA 402 (M12 plug),
Pump without operation unit (HMI)

Schematic sketch:

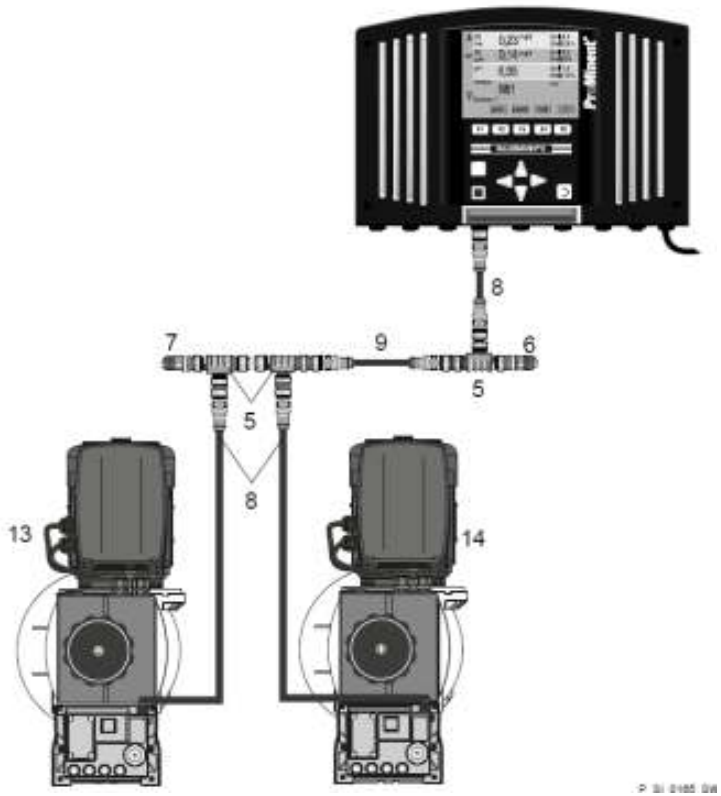


NMT – Network Management
FSU – Fieldbus Slave Unit

Sigma: Communication CANopen

Example:

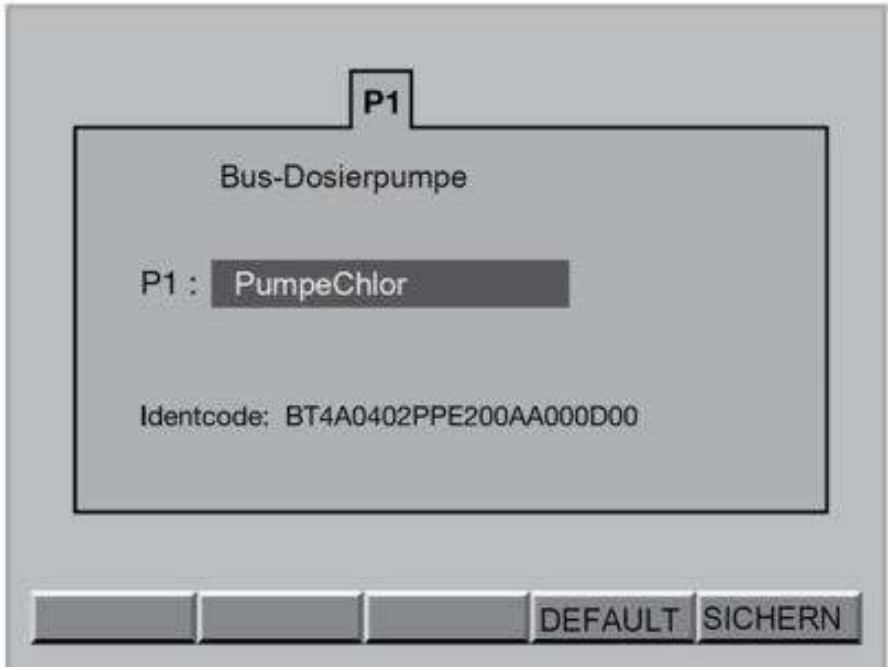
- CAN-connection from Dulcomarin II as control device to dosing pump
- Sigma b without HMI („X“) – configuration / control of pump via Dulcomarin II



5 T-Distributor, M 12, 5-Pol. CAN
6 Terminator M 12-Coupling
7 Terminator M 12-Plug
8 CAN connection cable
9 CAN-connection cable
13 CAN-Sigma, e.g. for acid
14 CAN-Sigma , e.g.for lyes

Sigma: Communication CANopen

Display Text in the bus menu of ProMinent controllers:
P1-Module (Dosing pump module configurate)



Sigma: Communication – HMI with Bluetooth

- Simple on-site configuration via ProMinent App (Android)
- Backup of pump data for documentation
- Easy copy & paste of settings
- Analogue to Gamma X

not with current sales release

Sigma: Extended Connectivity DULCOnneX

- Connection over CANopen version
  - Control version „7“
  - „CANopen DSP 402 (M12)“
  - Plus DULCOnnect modul
- DULCOnneX plus 1 Sigma pump
  pump with operation unit (HMI)
- DULCOnneX plus 2 and more Sigma pumps only for project solutions without HMI
- One DULCOnnect device per pump

Identcode Overview – Operating unit with Click-Wheel

S1Cb….. / S2Cb …… / S3Cb …….

					Operating unit
0				0	HMI with Click Wheel (0,5 m cable)
4				4	HMI with Click Wheel + 2 m cable
5				5	HMI with Click Wheel + 5 m cable
6				6	HMI with Click Wheel + 10 m cable
X				X	without operating unit
S				S	HMI with foil key board (0,5m cable)
1				1	HMI with foil key board + 2m cable
2				2	HMI with foil key board + 5m cable
3				3	HMI with foil key board + 10m cable
					Access code / Communication
	0			0	without access control
	1			1	with access control
	B			B	with access control + Bluetooth (operating unit)
	W			W	with access control + WLAN (operating unit)

0 = standard

		Language
DE	DE	German
EN	EN	English
ES	ES	Spanish
FR	FR	French
PT	PT	Portuguese
IT	IT	Italian
NL	NL	Dutch
PL	PL	Polish
RU	RU	Russian
CS	CS	Czech
SV	SV	Swedish
FI	FI	Finnish
DA	DA	Danish
ZH	ZH	Chinese
KO	KO	Korean

Extension of operating languages

not with current sales release

Overview main functions – Sigma X / gamma/ X

Uniform operating concept versus two drive concepts

Features	Sigma X	gamma/ X
Multy layer safety diaphragm	✓	✗
Diaphragm rupture indication	✓	✓
Integrated bleed valve	✓	✓
Integrated relief valve	✓	✗
Dosing profils	✓	✓
Detachable operating unit	✓	✗
Automatic mode (stroke length adjustment)	✗	✓

Overview main functions – Sigma X / gamma/ X

Uniform operating concept versus two drive concepts

Features	Sigma X	gamma/ X
Output signals: fault indication relay, pacing relay or mA-analogue output relay	✓	✓
Input signals: level switch, flow control	✓	✓
Additional configurable IO's	✗	gamma/ XL
ProfiBUS; ProfiNET, CANopen, IoT	✓	✓
Operation mode: manual, contact, batch, analog	✓	✓
Display of wear, timer, log book	✓	✓
Automatische Entlüftung	✗	✓
Display of pressure	✗	✓

Sigma B – Overview
Sales Benefit & Advantages

Sigma – Easy Handling

Large illuminated display

- Operating data in plain text and icons
- LEDs are visible from any angle
- Integrated timer and lock book
- Info about wear parts inside service menu

Advantage:

- Easy programming, handling, even in difficult installation conditions
- Fast detection, as it is visible from all sides of the pump

Benefit :

- Simple start-up, installation and maintenance enable time and cost saving

Sigma – Easy Handling

Detachable Operation Unit

- Detachable over helix cable approx. 0,5 m
- Extension cable 2 m, 5 m, 10 m available

Advantage:

- Display can be pulled up to oneself for reading or adjusting pump parameters, even in difficult installation conditions
- Wall bracket is part of standard package

Benefit :

- Smaller range of models
- Simple start-up, installation and maintenance enable time and cost saving

Sigma – Safety

Multi-layer safety diaphragm

- Process safety due to multi-layer diaphragm with diaphragm rupture signalling as standard. This prevents media from leaking in case of diahragm rupture

Advantage:

- Simpler technology than double diaphragm system
- Advantage at maintenance / service, emergency operation is possible
- Reliable pump protection for process and operatore with ProMinent

Benefit :

- Reduced downtimes
- Reduced costs for maintenance and service due to simpler technology

Sigma - Reliability

High temperature tolerance, stability

- Ambient temperature -10 ... +45 °C
- medium temperature PVT: -10 ... +60 °C
- medium temperature SST: -10 ... +90 °C
- protection class IP 65

Advantage:

- The pump can be easily used in diverse locations, ambient and media temperatures

Benefit :

- Reliable use in industrial applications
- low maintenance costs

Sigma - Reliability

Drive Unit

- Combined metal / plastic housing combines advantages of both materials
- Metal – Stable, robust
- Plastic – High chemical resistance

Advantage:

- Incrased performance reserves
- Longer life time

Benefit :

- Low maintenance costs

Sigma - Flexibility

Low number of variants

- 2 standard materials (PVDF, stainless steel)
  3 series cover a wide range of applications by different approvals (CE, EAC, FDA)

Advantage:

- Universal use in industry due to high chemical, temperature resistance and different approvals

Benefit :

- Short response time, quick availability
- Low stock
- Reduction of installation and shipping costs

Sigma - Flexibility

Wide range voltage input

- Nominal voltage 1ph, 100 … 230 V, 50/60 Hz

Advantage:

- Pump can be used almost world-wide at every a.c. mains
- Universal power supply

Benefit :

- Reduction of costs
- No county-specific versions
- Low stock

Sigma – Flexibility

Project- OEM Applications

- Pump use without operation unit in OEM-applications
  Example: Dosing station with 5 pumps and 1 changing operation unit for commissioning / maintenance or pumps without operation device and 1 unit for service

Advantage:

- Use of all operation modes the operate the pump after commissioning without operation unit

Benefit :

- Protection against prohibited / non-requested operation
- Reduction of costs 1 operation unit = 5 pumps
- No administration of pump passwords

CHLORINSITU IIa XL 5 - 45 kg/h

The CHLORINSITU IIa XL is specifically designed to produce sodium hypochlorite (NaOCl) for water treatment. Efficient electrolysis cells produce a highly pure sodium hypochlorite disinfectant with very little by-products. All specifications given at 20 °C ambient temperature and 15-22 °C soft water temperature.

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Production capacity	24 h/d							
Salt conversion	3.2 kg/kg							
Energy consumption (DC/AC)	4.2 (DC) / 4.9 (AC) kWh/kg chlorine							
Product concentration	8 g/l (0.8 % ± 0.05) chlorine							
pH product (approx.)	pH 9.5							
Number of cells	1	1	2	2	3	3	4	6
Product (NaOCl) volume	625 l/h 15 m^3/d	935 l/h 22.5 m^3/d	1,250 l/h 30 m^3/d	1,875 l/h 45 m^3/d	2,500 l/h 60 m^3/d	2,810 l/h 67.5 m^3/d	3,750 l/h 90 m^3/d	5,625 l/h 135 m^3/d
Salt consumption	16 kg/h 384 kg/d	24 kg/h 576 kg/d	32 kg/h 768 kg/d	48 kg/h 1,152 kg/d	64 kg/h 1,536 kg/d	72 kg/h 1,728 kg/d	96 g/h 2,304 kg/d	144 g/h 3,456 kg/d
Salt requirements	CHLORINSITU Salt or salt tablets meeting the following specifications: Min. 99.4 % NaCl, max. 0.05 % insoluble substances, max. 10 mg/kg iron, max. 10 mg/kg manganese and max. 100 mg/kg calcium + magnesium.							
Max. ambient conditions	Temperature 10 ... 40 °C ; humidity 85 %*1							
Feed water temperature	8 ... 25 °C							
Water supply (drinking water quality)	• Non-Return valve or break tank is required in water supply in case of direct water connection (regarding local regulations). • 3 bar < Pressure < 6 bar (behind the non-return valve) and >100 l/min*2; Softened water, hardness < 0.05 °d H.							
Ambient conditions	Ambient air non condensation, non-corrosive and dust free air within the installation room							
External brine tank	Customer specific							

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Footprint Production unit (cm) L x W x H	120x100x200	160x100x200	120x100x200	160x100x200	160x100x200	160x100x200	200x120x200	200x120x200
Weight Production cabinet (net)	200 kg	250 kg	280 kg	320 kg	400 kg	400 kg	450 kg	650 kg
Space requirements	• Due to operation and maintenance there is 100 cm around the production unit required. • The height of the production unit is as it will be delivered, there is a min of 50 cm space above the unit required for NaOCl discharge. • There must be one or more air openings in the room, cross sectional area ≥ 500 cm^2.							

*1 Excluding the rectifier, see further data in this sheet

*2 Max. volume (l/min) of water supply will depend on the selected capacity of the CHLORINSITU IIa XL. The water volume corresponds to the product volume.

RECTIFIER

Together with the CHLORINSITU IIa XL there is are separate rectifiers within the scope. It is advised to place the rectifier(s) in a separate conditioned room.
The rectifiers are equipped with a safety control cabinet (SCC), at the 5Kg, 7.5Kg and the 10Kg this is built inside one cabinet. From 15 kg and higher the rectifier(s) are placed in a separate cabinet (see table below). From 15kg and higher water cooling on the rectifier is possible on request.

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Total Power consumption incl. Control box and Blower for degassing	28 kW	43 kW	54 kW	83 kW	107 kW	125 kW	166 kW	247 kW
Total nominal current per phase AC	41 A	63 A	79 A	123 A	158 A	186 A	2x123 =246 A	3x123 =369 A
Advised fuse per phase Rectifier	63 A	80 A	100 A	160 A	200 A	220 A	300 A	425 A
Footprint rectifier (cm) L x W x H	80x60x220	80x60x220	80x60x220	60x60x220 (1x)	60X80X220 (1x)	60X80X220 (1x)	60x60x220 (2x)	60x60x220 (3x)
Weight Rectifier (net)	170 kg	170 kg	170 kg	350 kg	500 kg	500 kg	350 kg (2x)	350 kg (3x)
Footprint SCC	No extra footprint				60x60x220 All height dimensions are Including 20 cm base/plinth			
Weight SCC (net)	No extra Weight				120 kg			
Power connection Control box	1.5 kW	1.5 kW	2 kW	2 kW	3.2 kW	3.2 kW	5 kW	5 kW
Advised fuse per phase Control box	8 A	8 A	10 A	10 A	16 A	16 A	20 A	20 A

Rectifier cabinet	• Enclosure class IP 20. • For each rectifier a separate power connection to the safety Cabinet.
Max. ambient conditions	• Max relative non condensing humanity 70%. • Temperature 10 ... 30 °C.
Space requirements	• Due to operation and maintenance there is 120 cm free space needed in front of the cabinet. • The rectifier(s) and safety Cabinet must be placed with at least 20 cm space from the back side to any obstacles. • The height of the Rectifier is as it will be delivered, there is a min of 50 cm space above the unit required for cable connections.

DEGASSING TANK

For each CHLORINSITU IIa XL a degassing tank is mandatory, and must be supplied by Prominent/VDH Watertechnology. The min. volume is depending on the capacity of the CHLORINSITU IIa XL production unit. The degassing tank can also be used for NaOCl storage and can be provided in any other volume bigger as the minimum required. In case of a separate storage tank it is possible to transfer the NaOCl from the degassing tank into the separate storage tank. Separate storage tanks and transfer units are available on request. Each degassing tank is mandatory provided with one blower (redundant blower on request is possible). Blower capacity meets 25% LEL as a standard. The blower will be powered and controlled from the control box of the CHLORINSITU IIa XL.

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Degassing tank volume	1 m^3	1.5 m^3	2 m^3	3 m^3	4 m^3	4 m^3	6 m^3	9 m^3
Blower capacity 25% LEL (standard)	300 m^3/h	450 m^3/h	600 m^3/h	900 m^3/h	1200 m^3/h	1350 m^3/h	1800 m^3/h	2700 m^3/h
Motor power (kW)	0.37	0.37	0.55	0.55	0.75	0.75	1.5	2.2
Footprint degassing tank (cm) Dia. x H	100x150	100x200	130x150	160x150	180x160	180x160	200x190	220x230
Space requirements	• Due to operation and maintenance there is 100 cm around the blower required. • The height of the Degassing tank is as it will be delivered, there is a min of 100 cm space above the degassing tank required for connections and maintenance.							

BRINE DOSING UNIT

For each CHLORINSITU IIa XL a brine dosing is mandatory, the capacity of the brine dosing is depends on the type of CHLORINSITU IIa XL (see table). The brine dosing will be controlled by the control box of the CHLORINSITU IIa XL. The brine dosing unit is provided with one dosing pump, second dosing pump for redundancies on request possible. The brine units supplied by PM/VDH watertechnology are provided in PP cabinet covered with transparent safety plates placed on a coated stainless steel pedestal with levelling feet's.

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Brine dosing pump capacity At brine concentration 280 gr/L*1	57 L/h	86 L/h	114 L/h	172 L/h	228 L/h	257 L/h	343 L/h	514 L/h
Footprint Brine dosing unit (cm) L x W x H single dosing pump	120x65x170	120x65x170	120x65x170	120x65x200	120x65x200	120x65x200	120x65x200	120x65x200
With redundant pump	160x65x170	160x65x170	160x65x170	160x65x200	160x65x200	160x65x200	160x65x200	160x65x200
Space requirements	• Due to operation and maintenance there is 100 cm before the unit required.							
Control requirements	• The control 0-100% = 4-20 mA. • Flow readback 0-100% = 4-20 mA.							

*1 Advised overcapacity brine dosing pump: do not exceed 30% of the brine dosing capacity mentioned in the table.

SOFTENER UNIT

For each CHLORINSITU IIa XL a softener unit could be necessary depending on the available water quality. The capacity of the softener unit is depending on the Capacity of the CHLORINSITU IIa XL and the local water hardness. The incoming process water must be free of hardness < 0.05˚dH (1 ppm $CaCO_3$). The Softener unit is completely stand alone. The softener units supplied by PM/VDH watertechnology are provided in PP cabinet covered with transparent safety plates placed on a coated stainless steel pedestal with levelling feet's.

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Softener type at 30˚dH (534 ppm $CaCO_3$)	2x125	2x125	2x150	2x250	2x300	2x350	2x500	2x500
Footprint softener unit (cm) L x W x H	120x50x200	120x50x200	120x50x200	140x80x200	140x80x215	140x80x215	140x80x215	140x100x230
Space requirements	• Due to operation and maintenance there is 100 cm space required in front of the softener unit.							

In case of other local specifications please contact Prominent or VDH Watertechnology for further cooperation in engineering.

BRINE TANK

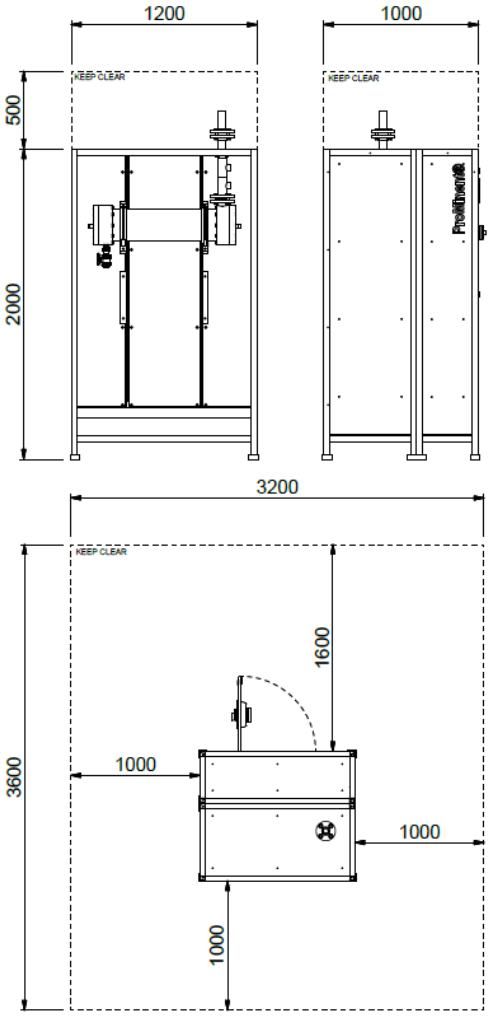
For each CHLORINSITU IIa XL a brine tank is mandatory. The capacity of the brine tank is depending on the capacity of the CHLORINSITU IIa XL and the customer requirements on stock volume. The brine storage tanks supplied by PM/VDH Watertechnology are designed on limited storage and footprint.
Filling units are on request.

Installation capacity (as Cl_2 equivalent)	5 kg/h 120 kg/d	7.5 kg/h 180 kg/d	10 kg/h 240 kg/d	15 kg/h 360 kg/d	20 kg/h 480 kg/d	22.5 kg/h 540 kg/d	30 kg/h 720 kg/d	45 kg/h 1,080 kg/d
Brine storage tank volume (m^3)	3	4.5	7.5	7.5	9.7	9.7	9.7	9.7
Footprint brine (cm) Dia. x H	138x236	167x245	210x289	210x289	210x360	210x360	210x360	210x360
Salt requirements	See page 1							
Feed water temperature	12 ... 25 °C							
Water supply (drinking water quality)	• Softened water, hardness < 0.05 °d H.							
Max. ambient conditions	• Temperature min. 12°C.							
Space requirements	• Due to operation and maintenance there is enough space around the brine storage tank required (100 cm recommended). • In case of automatic salt filling unit take notice of extra space.							

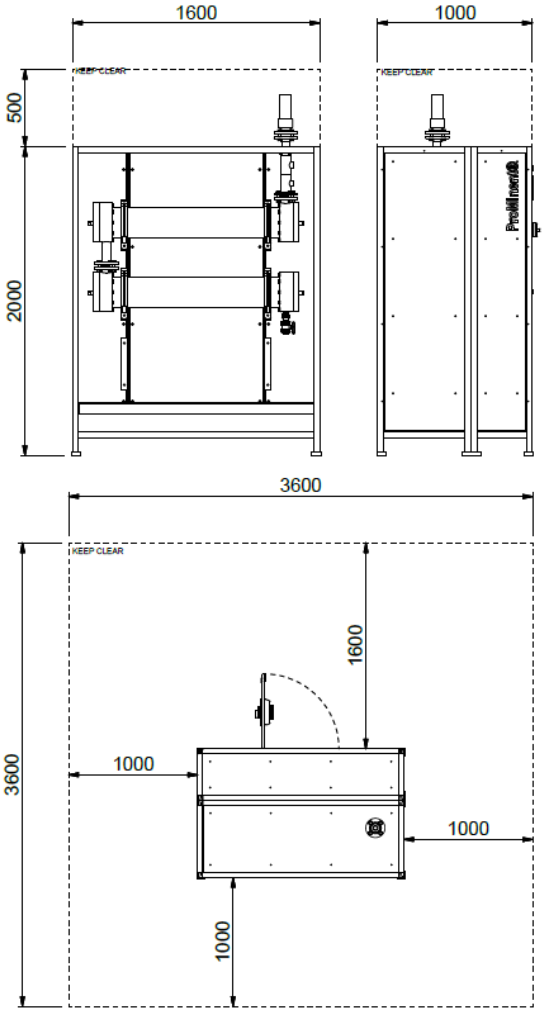
In case of other local specifications please contact Prominent or VDH Watertechnology for further cooperation in engineering.

DIMENSIONS PRODUCTION UNIT

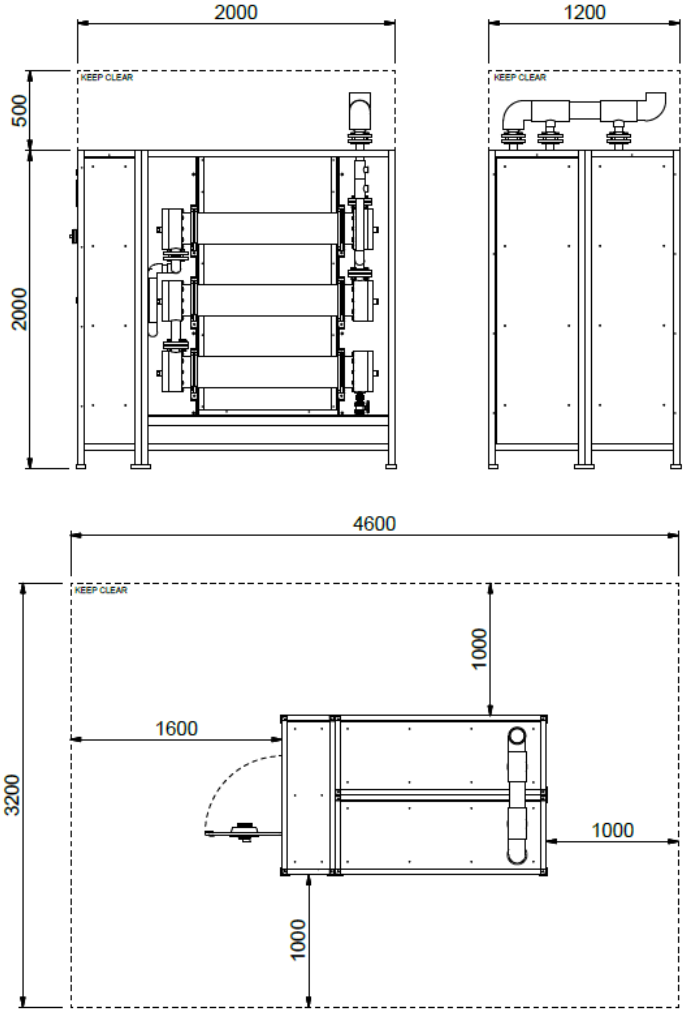
5 kg/h and 10 kg/h



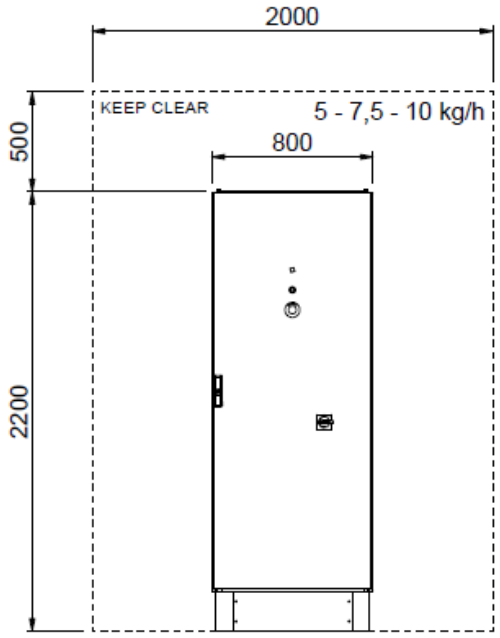
7.5 kg/h, 15 kg/h, 20 kg/h and 22.5 kg/h

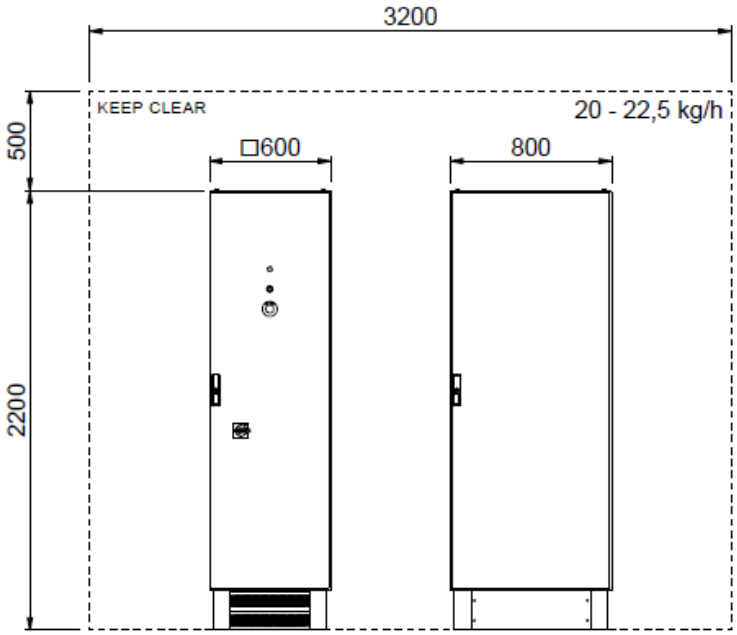


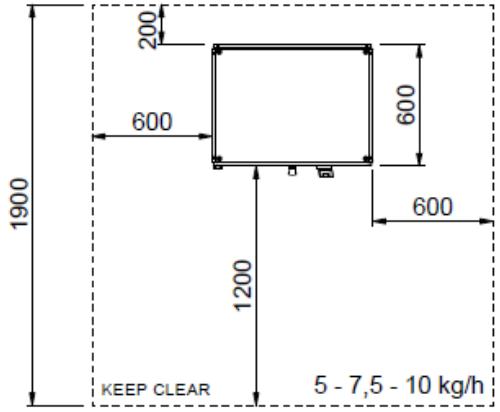
30 kg/h and 45 kg/h

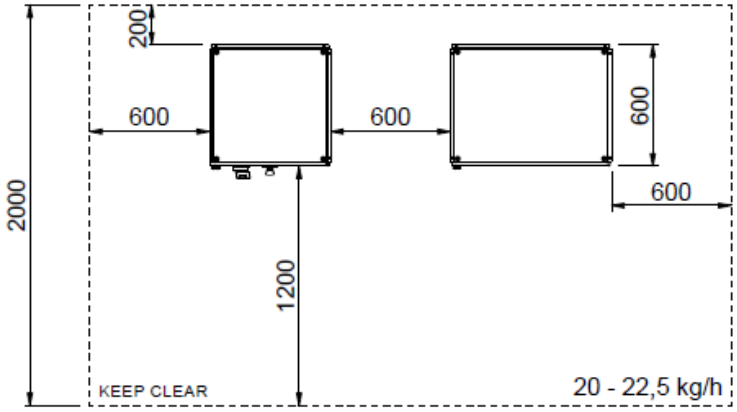


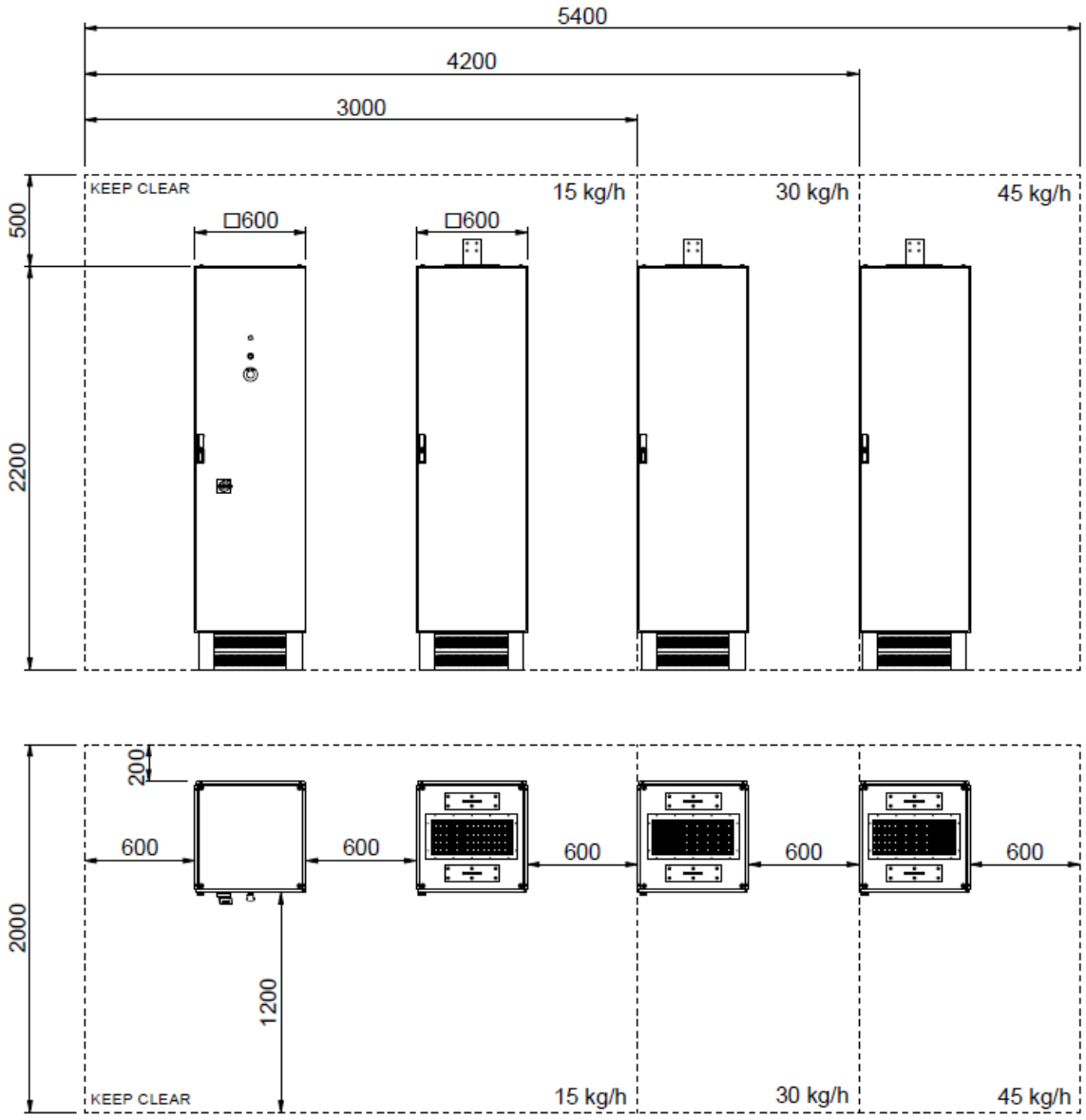
DIMENSIONS SCC AND RECTIFIER UNIT









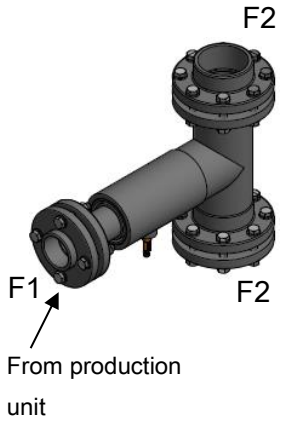

5400
4200
3000
KEEP CLEAR
15 kg/h
30 kg/h
45 kg/h
□600
□600
500
2200
200
600
600
600
600
600
2000
1200
KEEP CLEAR
15 kg/h
30 kg/h
45 kg/h

CONNECTION TABLE CHLORINSITU-IIa XL

	A.		B.		C.		D.		E.	
CHLORINSITU	Water inlet - Softened		Brine inlet - Saturated		Acid in/out let - Acid cleaning Cell drain		NaOCl outlet - 0,8% pH 9,5		Drain outlet	
Type IIa XL	Connection	Advised material	Connection	Advised material	Connection	Advised material	Connection	Advised material	Connection	Advised material
CIIa XL-5 kg	DN 25	PVC - U	DN 20	PVC - U	DN 15	Hose	DN	PVC - U	DN 40	PVC - U
CIIa XL-7.5	DN 25	PVC - U	DN 20	PVC - U	DN 15	Hose	DN 40	PVC - U	DN 40	PVC - U
CIIa XL-10	DN 25	PVC - U	DN 20	PVC - U	DN 15	Hose	DN 40	PVC - U	DN 40	PVC - U
CIIa XL-15	DN 25	PVC - U	DN 20	PVC - U	DN 15	Hose	DN 40	PVC - U	DN 40	PVC - U
CIIa XL-20	DN 40	PVC - U	DN 25	PVC - U	DN 15	Hose	DN 100	PVC - U	DN 40	PVC - U
CIIa XL-22.5 kg	DN 40	PVC - U	DN 25	PVC - U	DN 15	Hose	DN 100	PVC - U	DN 40	PVC - U
CIIa XL-30 kg	DN 40	PVC - U	DN 25	PVC - U	DN 15	Hose	DN 100	PVC - U	DN 40	PVC - U
CIIa XL-45 kg	DN 40	PVC - U	DN 25	PVC - U	DN 15	Hose	DN 100	PVC - U	DN 40	PVC - U

CONNECTION TABLE DEGASSINGTANK, a mandatory component of the CHLORINSITU-IIa XL

	F.		G.		H.		I.	
CHLORINSITU	NaOCl inlet - 0,8% pH 9,5 T-Piece		Air inlet		Exhaust air outlet		NaOCl - 0,8% pH 9,5 Transport/dosing outlet	
Type IIa XL	Connection F1/F2	Advised material	Connection	Advised material	Connection	Advised material	Connection*	Advised material
CIIa XL-5 kg	DN 65/DN 100	PVC - U	DN 150	PVC - U	DN 150	PVC - U	DN 40	PVC - U
CIIa XL-7.5	DN 65/DN 100	PVC - U	DN 150	PVC - U	DN 150	PVC - U	DN 40	PVC - U
CIIa XL-10	DN 65/DN 100	PVC - U	DN 150	PVC - U	DN 150	PVC - U	DN 50	PVC - U
CIIa XL-15	DN 65/DN 100	PVC - U	DN 200	PVC - U	DN 200	PVC - U	DN 65	PVC - U
CIIa XL-20	DN 100/DN 150	PVC - U	DN 200	PVC - U	DN 250	PVC - U	DN 100	PVC - U
CIIa XL-22.5 kg	DN 100/DN 150	PVC - U	DN 200	PVC - U	DN 250	PVC - U	DN 100	PVC - U
CIIa XL-30 kg	DN 100/DN 150	PVC - U	DN 200	PVC - U	DN 300	PVC - U	DN 100	PVC - U
CIIa XL-45 kg	DN 100/DN 150	PVC - U	DN 300	PVC - U	DN 300	PVC - U	DN 100	PVC - U



* = by local production of the degassing tank this dimension is advised. All other connections are mandatory.

Ozone system DULCOZON OZLa

High-output ozone generator with a very compact design.

Ozone capacity 380 - 6,080 g ozone/h

The ozone systems DULCOZON OZLa are low-maintenance generators. The systems have a modular design and can therefore be flexibly adapted to the process requirements. The simple way in which individual modules are activated and deactivated ensures efficient, in-built redundancy and increases system availability. The ozone generators can be easily integrated into a superordinate system.

Your benefits

- Minimum consumption of energy through unique efficiency
- Maximum space saving of up to 70 % compared with conventional systems
- High operating safety through use of modules that can be redundantly activated and deactivated
- Minimum demand for oxygen due to high concentration of up to 20 % wt
- Reliable and robust thanks to low load of electrical components
- Simple operation and process visualisation thanks to large and colour 10" touch screen panel

Field of application

- **Drinking water supply:** Oxidation of iron, manganese and arsenic, refinement and taste enhancement and disinfection
- **Waste water treatment:** Degradation / reduction of COD and microcontaminants, reduction of sewage sludge and disinfection
- **Aquaculture:** Oxidation and disinfection during the treatment of water for fish farming
- **Textile industry:** Oxidation of waste water and treatment of textile fibres
- **Industry:** Cooling water disinfection and legionella prevention
- **Food and beverage industry:** Oxidation of iron and manganese, disinfection of table water and rinser water

Printed in Germany, 20-5-2021.

Ozone system DULCOZON OZLa

High-output ozone generator with a very compact design.

Technical Data

DULCOZON ozone generation systems OZLa01 – 16 O (using ozone as the operating gas)

Ambient parameters

Max. 85% air humidity of the ambient air, non-condensing, non-corrosive, dust-free, max. ambient temperature: 40 °C

		OZLa01O	OZLa02O	OZLa03O	OZLa04O	OZLa06O	OZLa08O	OZLa12O	OZLa16O
Number of generator modules		1	2	3	4	6	8	12	16
Nominal ozone capacity at 148 g/Nm³	g/h	380	760	1,040	1,520	2,280	3,040	4,560	6,080
Specific energy requirement at nominal capacity	Wh/g	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Ozone connection EN10226	Rp	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	1/2"

Electrical Connection

		OZLa01O	OZLa02O	OZLa03O	OZLa04O	OZLa06O	OZLa08O	OZLa12O	OZLa16O
Mains connected load	V/Hz/kW	400-3ph/50; 60/3	400-3ph/50; 60/6	400-3ph/50; 60/9	400-3ph/50; 60/12	400-3ph/50; 60/18	400-3ph/50; 60/24	400-3ph/50; 60/36	400-3ph/50; 60/48
Enclosure rating		IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

Overall Dimensions

		OZLa01O	OZLa02O	OZLa03O	OZLa04O	OZLa06O	OZLa08O	OZLa12O	OZLa16O
Width	mm	1,000	1,000	1,200	1,200	1,600	1,600	2,800	2,800
Height	mm	1,400	1,400	1,900	1,900	1,900	1,900	1,900	1,900
Depth	mm	400	400	600	600	600	600	600	600
Weight	kg	145	210	295	410	540	770	1,060	1,340

Specification of Oxygen and Cooling Water

		OZLa01O	OZLa02O	OZLa03O	OZLa04O	OZLa06O	OZLa08O	OZLa12O	OZLa16O
Gas volume at nominal power 148 g/Nm³	Nm³/h	2,66	5,32	7,98	10,64	15,96	21,28	31,92	42,456
Cooling water consumption (15 °C)	l/h	380	760	1,040	1,520	2,280	3,040	4,560	6,080
Cooling water inlet EN10226	Rp	1/2"	1/2"	1/2"	1"	1"	1"	1"	1"

Oxygen quality

Requirements of ISO 8573-1, class 1, particle content 1…5 µm max. 10 mg/m³, max. dewpoint – 70 °C and max. hydrocarbons 0.01 mg/m³.

Min. concentration 90 vol %, max. pressure 5 bar, max. temperature 30 °C.

Cooling Water Quality

No tendency to form lime scale, no corrosive components, removable substances: < 0.1 ml/l , iron: < 0.2 mg/l, manganese:

< 0.05 mg/l, conductivity: > 100 µS/cm, chloride: < 250 mg/l

Printed in Germany, 20-5-2021.

ProMinent Group
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2.1.1 Polyelectrolytes in Water Treatment

The use of polyelectrolytes as flocculation aids is characterised by an extensive field of applications. They can be used in all applications where colloidal solids need to be economically separated from liquids.

Our preparation and metering systems have been designed specifically for the production of ordinary or standard solutions of synthetic polyelectrolytes in powdered or liquid form and have proved themselves many times over.

The experts in wastewater treatment at ProMinent understand how to provide the efficient technology to implement this specialist application. They have developed systems for the most stringent requirements, which are also very easy to assemble and operate.

ProMinent also provides all the advice needed for the efficient operation of a polymer batching and metering system:

- Evaluation of the situation on-site by trained, expert field sales staff.
- Project planning of the system.
- Commissioning and system maintenance by our trained service technicians.

2.1.2 Performance Overview of Polymer Preparation and Metering Systems ULTROMAT, DULCODOS and PolyRex

ProMinent offers a wide range of systems for the most diverse preparation and metering applications. The following overview shows the capacity ranges of our type series:

	Extraction rate l/h concentration max. 0.5 %	Application	Characteristic
Continuous flow system			
ULFa • Powder • Liquid	400 – 8,000 (maturation time 60 min., starts with batching mode)	• Potable water treatment • Wastewater treatment (industry and local authorities) • Sludge dewatering	• Simple screw feeder with good dosing precision proportional to the water supply • Functionally simple mixing system with/without wetting cone • PP tank, 3-chamber design
Batch preparation stations			
	Extraction rate l/h concentration max. 0.5 %	**Application**	**Characteristic**
ULDa • Powder • Liquid	400 – 2,000 (maturation time 60 min., starts with batching mode)	• Potable water treatment • Wastewater treatment (industry and local authorities) • Sludge dewatering • Paper production	• Simple screw feeder with good dosing precision proportional to the water supply • Functionally simple mixing system with/without wetting cone • PP tank, double-decker design
PolyRex • Powder • Liquid	240 – 8,200 (maturation time 45 min., starts after metering)	• Potable water treatment • Wastewater treatment (industry and local authorities) • Sludge dewatering • Paper production	• Multi-screw feeder with high dosing precision • Special flushing system with water ejector for effective powder hydration • Stainless steel tanks, double-decker design • Integrated Big Bag emptying system
PolyRex Liquid • Liquid	1,060 – 3,180 (maturation time 15 min., starts after metering)	• Wastewater treatment (industry and local authorities) • Sludge dewatering	• High-energy mixing • Stainless steel tanks
MT • Powder	140 – 4,000	• Potable water treatment • Wastewater treatment (industry and local authorities) • Sludge dewatering	• For manual batching operation • Ultra-simple mixing system • PP tank
In-line preparation station			
	Extraction rate l/h Concentration max. 1.0 %	**Application**	**Characteristic**
ULIa • Liquid	55 – 400 (maturation time 15 min, starts with preparation mode)	• Sludge dewatering and thickening • Drinking water treatment • Wastewater treatment (industry and local authorities)	• Integrated mixing and maturing chamber for fully activated liquid polymer solutions • Peristaltic pump and/or metering pumps for the metering of emulsions/dispersions • Operator-managed input of the concentration with proportional metering • Optional specification of the polymer preparation output
Pendulum system			
	Extraction rate l/h concentration max. 0.5 %	**Application**	**Characteristic**
ULPa • Powder • Liquid	400 – 4,000 (maturation time 60 min., starts with batching mode)	• Potable water treatment • Paper production	• Simple screw feeder with good dosing precision proportional to the water supply • Functionally simple mixing system with wetting cone • Preparation system using 2 PP tanks

2.1.3 Questionnaire for the Design of Polymer Preparation and Metering Systems ULTROMAT, DULCODOS and PolyRex

For the treatment of

- ☐ Potable water
- ☐ Wastewater
- ☐ Sludge
- ☐ Paper
- ☐ _____

Polymer available as

- ☐ Powdered polymer
- ☐ Liquid polymer
- ☐ Active substance:_____

Required quantities

- ☐ Concentration of the batched solution:_____
- ☐ Max. metering quantity (volume of polymer):_____
- ☐ Required maturing time:_____

Quality of dilution water

- ☐ Potable water
- ☐ Industrial water

Mains voltage supply

- ☐ 400 V AC/50/60 Hz
- ☐ 440 – 480 VAC/60 Hz
- ☐ Other:_____

Other requirements

_____

_____

_____

2.1.4 Preparation Stations and Metering of Powdered and Liquid Polymer Solutions ULTROMAT and DULCODOS

Preferred fields of application include:

- Drinking water treatment
- Wastewater treatment (industry and local authorities)
- Sludge dewatering
- Paper production

4 different system concepts are available:

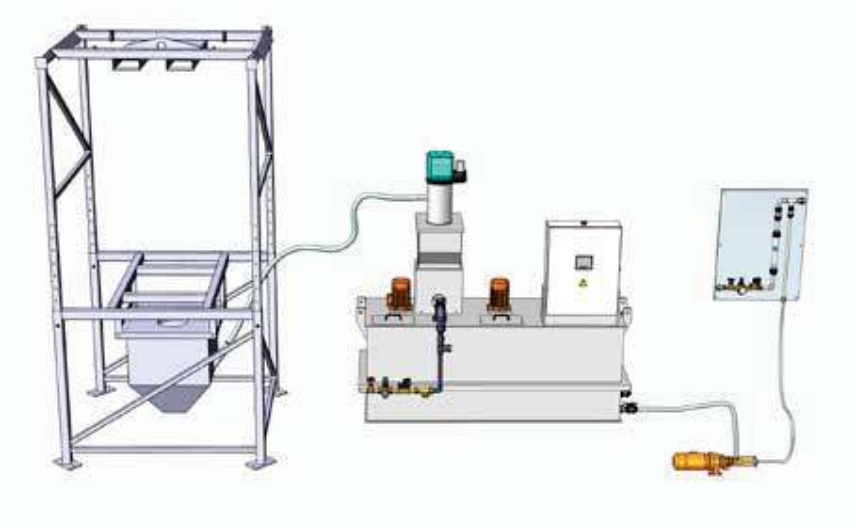
- Continuous flow system (identity code ULFa)
- Pendulum system (identity code ULPa)
- Double-decker system (identity code ULDa)
- Inline preparation station (identity code ULIa)

The systems differ primarily in terms of the construction of the tank. The tank in the continuous flow system is subdivided into 3 chambers, largely preventing the mixing of fresh and matured polymer. Pendulum and double-deck systems are designed with two completely separate tanks. This prohibits the mixing of fresh and matured polymer. An integrated mixing and maturing chamber is used with the inline preparation station.

Powder feeder units and liquid concentrate pumps can be freely selected by means of the identity code. Powdered or liquid polymers can therefore be prepared depending on the application.

ULTROMAT and DULCODOS device types ULFa, ULPa, ULDa and ULIa are equipped with a PLC compact controller and touch panel. As an option, the PLC compact controller can be fitted with a PROFIBUS®, Modbus or PROFINET module. The user manages input of the solution concentration as well as calibration of the powder feeder unit and liquid concentrate pump. Alarm messages and warnings are shown on the display. The feed of dilution water is continuously recorded by a flow meter and displayed on the touch panel. The control calculates the polymer requirement based on the set solution concentration and proportionately controls the powder feeder unit or concentrate pump so that the concentration of polymer solution is always kept constant even if there are fluctuations in the water supply.

Application example for a ULFa polymer preparation system



Big Bag handling
Powder conveyor
Powder storage vessel
ULTROMAT ULFa
Chemical transfer pump
Post-dilution

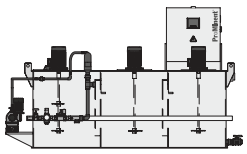
2.1.5 Metering System ULTROMAT ULFa

Efficient production of a polymer solution with a high throughput capacity.

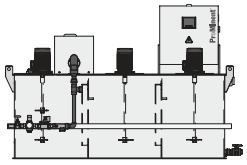
Extraction rates of up to 8,000 l/h

Polymer preparation station ULTROMAT ULFa (continuous flow system): This metering system can be used to batch flocculation aids for the preparation of a ready-to-use polymer solution. The system was designed for the fully automatic batching of polymer solutions.

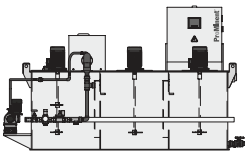
These systems can be used to handle both liquid and powdered polymers. The tank, which is sub-divided into three chambers, largely prevents the entrainment of the freshly prepared polymer.



ULTROMAT ULFa for liquid polymers



ULTROMAT ULFa for powder polymers



ULTROMAT ULFa for powder and liquid polymers

Your Benefits

- Processing of powdered polymers (0.05 – 0.5 %) and liquid polymers (0.05 – 1.0 %)
- Minimal carry-over of product and thus high-quality results
- Operator-controlled input of solvent concentration and calibration of powder feeder unit and liquid concentrate pump
- Gentle mixing of the polymer solution using electric stirrers, running as standard at approx. 700/840 rpm, available as an option with gearbox stirrer in the first preparation chamber running at approx. 70/84 rpm (relative to 50/60 Hz mains supplies)
- New: information about consumption of the liquid polymer via 4-20 mA signal of liquid concentrate pump DFXa
- Pressure sensor for measuring the liquid level
- Version with terminal box available on request

Technical Details

Siemens S7 – 1200 compact control system and KTP 400 touch panel

- Optionally fitted with PROFIBUS® and DP/DP coupler
- Optionally fitted with PROFINET and PN/PN coupler
- Optionally fitted with Modbus TCP
- Optional post dilution units for usage solutions of 1,000 - 50,000 l/h, inductive flow meter (opt.)

Field of Application

- Potable water treatment
- Wastewater treatment (industry and local authorities)
- Sludge de-watering

The following types of polymer can be processed:

- Powdered polymers (0.05 - 0.5%)
- Liquid polymers (0.05 - 1.0 %) with a 50 % active ingredient

Selectable components:

- Tank size/extraction rate
- Construction (normal or mirror image)
- Wide-range power connection for 50 Hz or 60 Hz mains supplies
- Control S7 – 1200 (with and without PROFIBUS®/PROFINET/Modbus TCP)
- Powder feeder unit and various types of add-on hoppers for powder storage
- Vibrator for powder feeder unit and various types of add-on hoppers for powder storage (promotes the movement of polymer)
- Powder conveyor FG205 (for automatically filling the powder feeder unit)
- Liquid concentrate pumps of types sigma, SPECTRA, DULCOFLEX and DULCOFLEX DFXa
- Monitor for liquid concentrate pump (float switch/flow monitor)
- Flush valve (Y-flush inlet or wetting cone)
- Gearbox driven stirrer in preparation chamber 1
- Stirrer for 3rd chamber
- Language (pre-set language for the touch panel)
- Gearbox driven stirrer in preparation chamber 1

The standard scope of delivery includes among other things:

- Pause function/operating message/running dry function
- Preparation operation active message
- Monitoring of an optional post dilution unit
- Lifting lugs for transport

Technical Data

Discharge volume	l/h	400	1,000	2,000	4,000	6,000	8,000
Useful tank volume (with reserve of approx.10%)	l	400	1,000	2,000	4,000	6,000	8,000
Raw water feed	l/h	600	1,500	3,000	6,000	9,000	12,000
Water pressure	bar	3…5	3…5	3…5	3…5	3…5	3…5
Max. dosing rate of powdered polymer	kg/h	11	11	18	55	55	110
Max. dosing rate of liquid polymer (with 50% active ingredient)	l/h	12	30	60	120	180	240
Length	mm	1,999	2,643	3,292	3,301	4,120	4,605
Width	mm	918	1,002	1,186	1,456	1,651	1,910
Height	mm	1,390	1,740	1,890	2,182	2,182	2,290
Water connection for raw water	Inch	1	1	1	1 1/2	1 1/2	2
Discharge nozzle DN	mm	25	25	32	40	40	50
Concentrate feed DN	mm	15	15	15	20	20	20
Nominal voltage/frequency	V AC/Hz	400/50 460/60	400/50 460/60	400/50 460/60	400/50 460/60	400/50 460/60	400/50 460/60
Power uptake	kW	1.5	2.6	3.2	5.0	5.0	9.5
Enclosure rating		IP 55 *	IP 55 *	IP 55 *	IP 55 *	IP 55 *	IP 55 *

* IP54 at 460 V AC

Identity Code Ordering System for ULTROMAT ULFa (Continuous Flow Systems)

ULFa	Type / Tank size / Discharge volume
	0400 Continuous flow system / 400 l / 400 l/h
	1000 Continuous flow system / 1000 l / 1000 l/h
	2000 Continuous flow system / 2000 l / 2000 l/h
	4000 Continuous flow system / 4000 l / 4000 l/h
	6000 Continuous flow system / 6000 l / 6000 l/h
	8000 Continuous flow system / 8000 l / 8000 l/h
	Design
	N Normal/propeller in stainless steel/PP
	P Normal/propeller in stainless steel
	S Mirror image/propeller in stainless steel/PP
	Q mirror-inverted/propeller in stainless steel
	G Gear box driven stirrer in preparation chamber 1
	H Mirror image/gear box driven stirrer in preparation chamber 1
	Electrical Connection
	A 380-420 VAC, 50 Hz (3-phase, N, PE)
	B 440-480 VAC, 60 Hz (3-phase, N, PE)
	Control
	0 PLC S7-1200
	1 PLC S7-1200 with PROFIBUS® (DP/DP coupler)
	2 PLC Programmable Logic Controller S7-1200 with PROFINET (PN/PN coupler)
	3 PLC Programmable Logic Controller S7 – 1200 with MODBUS TCP
	4 With terminal box (without control cabinet)
	Options
	0 None
	1 Discharge pipework, PVC (400, 1000)
	2 Discharge pipework, PVC (2000)
	3 Discharge pipework, PVC (4000, 6000)
	4 Discharge pipework, PVC (8000)
	Powder feeder
	P0 None
	P1 Powder feeder (0400, 1000)
	P2 Powder feeder (2000)
	P3 Powder feeder (4000, 6000)
	P4 Powder feeder (8000)
	Vibrator for powder feeder
	0 None
	1 With vibrator for powder feeder
	Powder conveyor FG 205, add-on hopper
	0 None
	1 With add-on hopper 50 l (0400, 1000, 2000)
	2 With add-on hopper 75 l (4000, 6000)
	3 With add-on hopper 100 l (8000)
	4 With add-on hopper 50 l + powder conveyor unit FG205 (0400, 1000, 2000)
	5 With add-on hopper 75 l + powder conveyor unit FG205 (4000, 6000)
	6 With add-on hopper 100 l + powder conveyor unit FG205 (8000)
	7 With adapter cover + powder conveyor unit FG205
	A With add-on hopper 50 l + visual level indicator (0400, 1000, 2000)
	B With add-on hopper 75 l + visual level indicator (4000/6000)
	C With add-on hopper 100 l + visual level indicator (8000)
	Liquid concentrate pump
	L0 None
	L1 With DFXa (0400-2000) or Sigma (4000-8000) fitted
	L2 With SPECTRA fitted (0400-8000)
	L3 Prepared for DFXa/sigma 4-20 mA control
	L4 Prepared for SPECTRA FC control
	L5 Prepared for DFXa/sigma 4-20 mA control, no bracket
	L6 Prepared for SPECTRA FC control, no bracket
	L7 Prepared for DFBa peristaltic pump FC control (4000-8000)
	L8 With DFBa peristaltic pump fitted (4000-8000)
	Monitoring for liquid concentrate pump
	0 None
	1 With capacitive sensor for concentrate tank
	2 With flow monitor, only SPECTRA
	3 With capacitive sensor and flow monitor, only SPECTRA
	Water pipework with wetting fitting
	1 Y-wetting fitting, PVC (0400, 1000, 2000)
	2 Y-wetting fitting, PVC (4000, 6000)
	3 Y-wetting fitting, PVC (8000)
	4 Wetting cone, PVC (0400, 1000, 2000)
	5 Wetting cone, PVC (4000, 6000)
	6 Wetting cone, PVC (8000)
	7 Wetting cone, PP (0400, 1000, 2000)
	8 Wetting cone, PP (4000, 6000)
	9 Wetting cone, PP (8000)

	Stirrer for 3<superscript>rd</superscript> chamber
0	None
1	Stirrer for storage tank 400, 0.18/0.25 kW, 50/60 Hz
2	Stirrer for storage tank 1000, 0.55/0.68 kW, 50/60 Hz
3	Stirrer for storage tank 2000, 0.75/0.86 kW, 50/60 Hz
4	Stirrer for storage tank 4000/6000, 1.1/1.3 kW, 50/60 Hz
5	Stirrer for storage tank 8000, 2.2/2.55 kW, 50/60 Hz

	Language
BG	Bulgarian
CN	Chinese
CZ	Czech
DA	Danish
DE	German
EL	Greek
EN	English
ES	Spanish
ET	Estonian
FI	Finnish
FR	French
HR	Croatian
HU	Hungarian
IT	Italian
LT	Lithuanian
LV	Latvian
MS	Malay
NL	Dutch
NO	Norwegian
PL	Polish
PT	Portuguese
RO	Romanian
RU	Russian
SK	Slovakian
SL	Slovenian
SV	Swedish
TR	Turkish

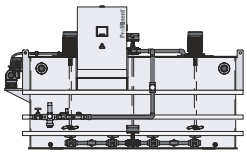
2.1.6 Metering System ULTROMAT ULPa

A good solution when preparing polymer solutions as flocculation aids.

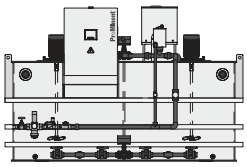
Extraction rates from 400 to 4,000 l/h

The metering system ULTROMAT ULPa (oscillating system) is ideal for batching flocculation aids for the preparation of a ready-to-use polymer solution.

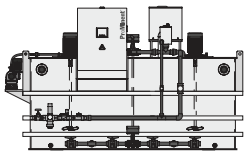
ULTROMAT ULPa consists of two separate chambers which are successively filled with polymer solution, thereby ruling out the risk of product carry-over. Both liquid and powdered polymers can be processed depending on the product range.



ULTROMAT ULPa for liquid polymers



ULTROMAT ULPa for powder polymers



ULTROMAT ULPa for powder and liquid polymers

Your Benefits

- Processing of liquid polymers (0.05 - 1.0 %) and powdered polymers (0.05 - 0.5 %)
- No mixing of fresh and matured polymer
- Operator-controlled input of solvent concentration and calibration of powder feeder and liquid concentrate pump
- Gentle mixing of the polymer solution (electric stirrer)
- Pressure sensor for the measurement of the liquid level
- Version with terminal box available on request

Technical Details

Siemens S7 – 1200 compact control system and KTP 400 touch panel

- Optionally fitted with PROFIBUS® and DP/DP coupler
- Optionally fitted with PROFINET and PN/PN coupler
- Optionally fitted with Modbus TCP

Field of Application

- Potable water treatment
- Paper production

The following types of polymer can be processed:

- Liquid polymers (0.05 – 1.0 %)
- Powdered polymers (0.05 – 0.5%)

Selectable components:

- Tank size / extraction rate
- Construction (normal or mirror image)
- Electrical connection
- Control S7 – 1200 (with and without PROFIBUS®/PROFINET/Modbus TCP)
- Powder feeder unit
- Vibrator for powder feeder unit (promotes the movement of polymer)
- Powder conveyor FG205/add-on hopper (for filling and feeding the powder feeder unit)
- Liquid concentrate pumps of types sigma, SPECTRA, DULCOFLEX DFXa
- Monitor for liquid concentrate pump (float switch/flow monitor)
- Flush valve
- Language (pre-set language for the control panel)

The standard scope of delivery includes among other things:

- Pause function/operating message/running dry function
- Monitoring of the post dilution unit
- Lifting lugs for transport

Technical Data

Discharge volume	l/h	400	1,000	2,000	4,000
Tank contents	l	2 x 400	2 x 1,000	2 x 2,000	2 x 4,000
Raw water feed	l/h	1,600	4,000	8,000	16,000
Water pressure	bar	3…5	3…5	3…5	3…5
Powdered polymer	kg/h	0.5…11	0.8…18	3.6…55	4.8…110
Length	mm	2,040	2,840	3,340	4,540
Width	mm	1,253	1,733	1,918	2,583
Height	mm	1,635	1,739	2,178	2,384
Water connection for raw water	Inch	1	1 1/4	1 1/2	2
Discharge nozzle DN	mm	25	32	40	50
Concentrate feed DN	mm	15	15	20	20
Voltage/frequency	V AC / Hz	400/50	400/50	400/50	400/50
Power uptake	kW	2.5	3.2	5.5	7.0

Identity Code Ordering System for Oscillating Systems ULTROMAT ULPa

ULPa	Type / Tank size / Discharge volume
	0400 Oscillating system / 2x400 l / 400 l/h
	1000 Oscillating system / 2x1,000 l / 1,000 l/h
	2000 Oscillating system / 2x2,000 l / 2,000 l/h
	4000 Oscillating system / 2x4,000 l / 4,000 l/h
	Design
	N Standard
	S Mirror-imaged
	Electrical Connection
	A 400 V AC, 50/60 Hz (3ph, N, PE)
	Control
	0 PLC S7-1200
	1 PLC S7-1200 with PROFIBUS® (DP/DP coupler)
	2 PLC Programmable Logic Controller S7-1200 with PROFINET (PN/PN coupler)
	3 PLC Programmable Logic Controller S7 – 1200 with MODBUS TCP
	Options
	0 None
	Powder feeder
	P0 None
	P1 Powder feeder (0400)
	P2 Powder feeder (1000)
	P3 Powder feeder (2000)
	P4 Powder feeder (4000)
	Vibrator for powder feeder
	0 None
	1 With vibrator for powder feeder
	Powder conveyor FG205, add-on hopper
	0 None
	1 With add-on hopper 50 l (0400, 1000)
	2 With add-on hopper 75 l (2000)
	3 With add-on hopper 100 l (4000)
	4 With add-on hopper 50 l + powder conveyor unit FG205 (0400, 1000)
	5 With add-on hopper 75 l + powder conveyor unit (2000)
	6 With add-on hopper 100 l + powder conveyor unit (4000)
	7 With adapter cover + powder conveyor unit
	Liquid concentrate pump
	L0 None
	L1 With sigma
	L2 With SPECTRA
	L3 Prepared for sigma
	L4 Prepared for SPECTRA
	L5 Prepared for sigma, no bracket
	L6 Prepared for SPECTRA, no bracket
	L7 Prepared for peristaltic pump
	L8 With peristaltic pump
	Monitoring for liquid concentrate pump
	0 None
	1 With capacitive sensor for concentrate tank
	2 With flow monitor, only SPECTRA
	3 With capacitive sensor and flow monitor, only SPECTRA
	Water pipework with wetting fitting
	0 Without wetting cone (liquid version)
	1 Wetting cone, PVC (0400)
	2 Wetting cone, PVC (1000, 2000)
	3 Wetting cone, PVC (4000)
	4 Wetting cone, PP (0400)
	5 Wetting cone, PP (1000, 2000)
	6 Wetting cone, PP (4000)
	Language
	BG Bulgarian
	CN Chinese
	CZ Czech
	DA Danish
	DE German
	EL Greek
	EN English
	ES Spanish
	ET Estonian
	FI Finnish
	FR French
	HR Croatian
	HU Hungarian
	IT Italian
	LT Lithuanian
	LV Latvian

MS	Malay
NL	Dutch
NO	Norwegian
PL	Polish
PT	Portuguese
RO	Romanian
RU	Russian
SK	Slovakian
SL	Slovenian
SV	Swedish
TR	Turkish

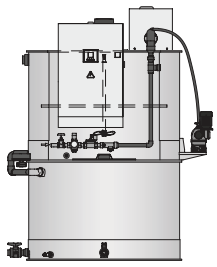
2.1.7 Metering System ULTROMAT ULDa

A good solution when preparing polymer solutions as flocculation aids.

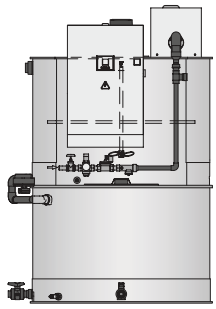
Extraction rates of up to 2,000 l/h

The ProMinent metering system ULTROMAT ULDa is an automatic polyelectrolyte preparation system. It is useful wherever polymers need to be automatically prepared as polymer solutions to act as flocculation aids.

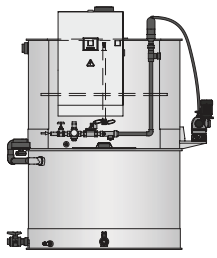
ULTROMAT ULDa double-decker systems are used to process liquid and powdered polymers. The system is comprised of two separate PP tanks, one stacked on top of the other. Product carry-over is thereby avoided. The polymer solution is batched in the upper storage tank and can be transferred to the lower storage tank once the maturing time has elapsed.



ULTROMAT ULDa for powder and liquid polymers



ULTROMAT ULDa for powder polymers



ULTROMAT ULDa for liquid polymers

Your Benefits

- Processing of liquid polymer (0.05 – 1.0 %) and powdered polymers (0.05 – 0.5 %)
- No mixing of fresh and matured polymer
- Wide range of versions for specific applications
- Operator-controlled input of solvent concentration and calibration of powder feeder and liquid concentrate pump
- Water apparatus with flow meter and fitting set for the dilution water
- Gentle mixing of the polymer solution (electric stirrer)
- Pressure sensor for the measurement of the liquid level
- Version with terminal box available on request

Technical Details

Siemens S7 – 1200 compact control system and KTP 400 touch panel

- PLC optionally fitted with PROFIBUS® and DP/DP coupler
- Optionally fitted with Profinet and PN/PN coupler
- Optionally fitted with Modbus TCP

Field of Application

- Potable water treatment
- Wastewater treatment (industry and local authorities)
- Sludge de-watering
- Paper production

The following types of polymer can be processed:

- Liquid polymers (0.05 – 1.0 %)
- Powdered polymers (0.05 – 0.5%)

Selectable components:

- Tank size/extraction rate
- Construction (normal or mirror image)
- Electrical connection
- Control S7 – 1200 (with and without PROFIBUS®/PROFINET/Modbus TCP)
- Powder feeder unit
- Vibrator for powder feeder unit (promotes the movement of polymer)
- Powder conveyor FG205/add-on hopper (for filling and feeding the powder feeder unit)
- Liquid concentrate pumps of types sigma, SPECTRA, DULCOFLEX DFXa
- Monitor for liquid concentrate pump (float switch/flow monitor)
- Flush valve (Y-flush inlet or wetting cone)
- Language (pre-set language for the control panel)

The standard scope of delivery includes among other things:

- Pause function/operating message/running dry function
- Monitoring of the post dilution unit
- Lifting lugs

Technical Data

		400	1,000	2,000
Tank contents	l	2 x 400	2 x 1,000	2 x 2,000
Raw water feed	l/h	1,600	4,000	8,000
Water pressure	bar	3…5	3…5	3…5
Powdered polymer	kg/h	0.5…11	0.8…18	3.6…55
Length	mm	1,638	1,902	2,288
Width	mm	1,351	1,615	2,005
Height	mm	2,030	2,514	3,149
Water connection for raw water	Inch	1	1	1 1/2
Discharge nozzle DN	mm	25	32	40
Concentrate feed DN	mm	15	15	20
Voltage/frequency	V AC / Hz	400/50	400/50	400/50
Power uptake	kW	1.5	2.6	3.2

Identity Code Ordering System for Double-deck System ULTROMAT ULDa

ULDa	Type / Tank size / Discharge volume
	0400 Double-deck system / 2x400 l / 400 l/h
	1000 Double-deck system / 2x1,000 l / 1,000 l/h
	2000 Double-deck system / 2x2,000 l / 2,000 l/h
	Design
	N Standard
	S Mirror-imaged
	Electrical Connection
	A 400 V AC, 50/60 Hz (3ph, N, PE)
	Control
	0 PLC S7-1200
	1 PLC S7-1200 with PROFIBUS® (DP/DP coupler)
	2 PLC Programmable Logic Controller S7-1200 with PROFINET (PN/PN coupler)
	3 PLC Programmable Logic Controller S7 – 1200 with MODBUS TCP
	Options
	0 None
	Powder feeder
	P0 None
	P1 Powder feeder (0400)
	P2 Powder feeder (1000)
	P3 Powder feeder (2000)
	Vibrator for powder feeder
	0 None
	1 With vibrator for powder feeder
	Powder conveyor FG205, add-on hopper
	0 None
	1 With add-on hopper 50 l
	2 With add-on hopper 75 l
	3 With add-on hopper 100 l
	4 With add-on hopper 50 l + powder conveyor unit
	5 With add-on hopper 75 l + powder conveyor unit
	6 With add-on hopper 100 l + powder conveyor unit
	7 With adapter cover + powder conveyor unit
	Liquid concentrate pump
	L0 None
	L1 With Sigma
	L2 With SPECTRA
	L3 Prepared for sigma
	L4 Prepared for SPECTRA
	L5 Prepared for sigma, no bracket
	L6 Prepared for SPECTRA, no bracket
	L7 Prepared for peristaltic pump
	L8 With peristaltic pump
	Monitoring for liquid concentrate pump
	0 None
	1 With capacitive sensor for concentrate tank
	2 With flow monitor, only SPECTRA
	3 With capacitive sensor and flow monitor, only SPECTRA
	Water pipework with wetting fitting
	1 Y-wetting fitting, PVC (0400)
	2 Y-wetting fitting, PVC (1000)
	3 Y-wetting fitting, PVC (2000)
	4 Wetting cone, PVC (0400)
	5 Wetting cone, PVC (1000)
	6 Wetting cone, PVC (2000)
	7 Wetting cone, PP (0400)
	8 Wetting cone, PP (1000)
	9 Wetting cone, PP (2000)
	Language
	BG Bulgarian
	CN Chinese
	CZ Czech
	DA Danish
	DE German
	EL Greek
	EN English
	ES Spanish
	ET Estonian
	FI Finnish
	FR French
	HR Croatian
	HU Hungarian
	IT Italian
	LT Lithuanian
	LV Latvian

MS	Malay
NL	Dutch
NO	Norwegian
PL	Polish
PT	Portuguese
RO	Romanian
RU	Russian
SK	Slovakian
SL	Slovenian
SV	Swedish
TR	Turkish

2.1.8 Metering System DULCODOS ULIa (Inline System Liquid)

Metering system specifically designed for the batching of a fully activated liquid polymer solution

Extraction volume 100 – 400 l/h against 4.5 bar

The polymer preparation system DULCODOS ULIa is an inline system and processes liquid polymers to produce a fully activated solution. It is ideally equipped for your application with integrated mixing and maturing chamber and novel peristaltic metering pump.

The compact inline preparation station DULCODOS ULIa features a special mixing chamber in which liquid polymer is added by peristaltic or metering pumps. Optimum mixing with water produces a fully activated polymer solution with a maturing time of approx. 15 min in the maturing chamber.

The concentration of the polymer solution can be simply adjusted on the touch panel.

Continuous polymer preparation output in l/h can be specified as an option. The polymer preparation system works reliably and conserves resources thanks to its optimum process control.

Your Benefits

- Precise processing of liquid polymers (0.05 - 1.0 %) with a 50 % active ingredient
- Highly efficient mixing and maturing chamber for emulsions / dispersions and water
- Operator-managed input of the concentration with proportional metering
- Compact design with various installation options
- Optional operator-managed specification of the polymer preparation output in l/h
- System runs directly against a 4.5 bar back pressure, there is no need for a chemical transfer pump

Technical Details

- Proportional metering as standard
- 3 system types with different equipment can be selected:
  - basic - manual flow adjustment, manual flushing
  - medium - automatic flow control, manual flushing
  - comfort - automatic flow control, automatic flushing
- Integrated post dilution unit available as an option
- Choice of peristaltic or metering pumps:
  - Peristaltic pumps DFXa 0530 and 0565 for back pressures of up to max. 4.5 bar
  - Metering pumps gamma/ X with HV head up to 4.5 bar
  - Metering pumps Sigma up to 4.5 bar
- Compact controller Schneider Electric TM241 and touch panel STO735 4.3”
  - Optionally fitted with Ethernet/Modbus TCP
  - Optionally fitted with PROFIBUS®

Field of Application

- Sludge dewatering and sludge thickening
- Wastewater treatment (industry and local authorities)
- Drinking water treatment

The following types of polymer can be processed:

- Liquid polymers (0.05 – 1.0 %)
- As emulsions or dispersions

Selectable components:

- Freely selectable preparation capacity
- Configuration versions
- Electrical connection
- Control versions with or without data communication
- Operating versions
- Liquid polymer metering pumps
  - Peristaltic pump DFXa
  - Metering pump gamma/ X
  - Metering pump sigma/ X S1Cb
- Monitoring of low liquid polymers
- Raw water booster pump
- Post dilution unit
- Language

Technical Data

Type		100	200	400
Max. extraction rate	l/h	100	200	400
Max. extraction rate/Inline with post-dilution	l/h	450	900	1,800
Maturation time	min	15	15	15
Max. water pressure	bar	8	8	8
Min. water pressure*	bar	4	4	4
Back pressure, max.	bar	4.5	4.5	4.5
Length	mm	1,200	1,200	1,200
Width	mm	800	800	800
Height	mm	1,900	1,900	1,900
Water connection DN	mm	25	25	25
Discharge nozzle DN	mm	25	25	25
Protection class		IP 55	IP 55	IP 55
Power supply V/Hz		220-240/50-60	220-240/50-60	220-240/50-60

* if the water pressure is lower, use the pressure boost option

! **Note:** Batch preparation stations are still at the development stage.

Identity code ordering system for DULCODOS ULIa inline systems liquid

ULIa	Type												
	100	Inline batching station 50 - 100 l/h, K= 1.0 %											
	200	Inline batching station 94 - 200 l/h, K= 1.0 %											
	400	Inline batching station 188 - 400 l/h, K= 1.0 %											
		Design											
		NP	Standard/wall-mounted										
		NV	Standard/vertical to the wall										
		SP	Mirror-inverted/wall-mounted										
		SV	Mirror-inverted/vertical to the wall										
			Electrical Connection										
			EU	220-240 VAC 50 Hz									
			WL	220-240 V AC 60 Hz									
			US	100-120 VAC 60 Hz									
				Control and data communication									
				0	With PLC Schneider PLC TM241 series								
				1	With PLC Schneider PLC TM241 series + Ethernet switch box / Modbus TCP								
				2	With PLC Schneider PLC TM241 series + Profibus								
				3	With PLC Schneider PLC TM241 series + Profinet								
					Operating version								
					B	Basic - manual flow adjustment, proportional metering, manual flushing							
					M	Medium - automatic flow control, proportional metering, manual flushing							
					C	Comfort - automatic flow control, proportional metering, automatic flushing							
						Metering pump for liquid polymer							
						L1	Peristaltic pump DFXa 0530 for ULIa 100, 200, 400 (up to 3 (5) bar back pressure)						
							Liquid polymer tank liquid level monitor						
							0	None					
							1	Capacitive sensor					
								Raw water booster pump					
								B0	None				
								BP	Prepared/with control signal				
								B1	Installed				
									Post-dilution unit				
									D0	None			
									D1	Fitted for basic version			
									D2	Fitted for medium+comfort version			
										additional maturing/storage tank with equipment			
										A0	None		
											Stirrer for maturing/storage tank		
											0	None	
												Feed pump for maturing/storage tank	
												F0	None
													Language
													CZ Czech
													DE German
													EN English
													ES Spanish
													FI Finnish
													FR French
													IT Italian
													PT Portuguese
													SV Swedish
													ZH Chinese

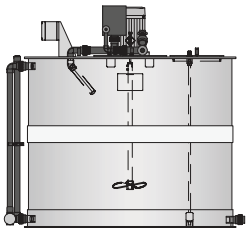
2.1.9 Metering System ULTROMAT MT for Batch Operation

This manual polymer batching station is worthwhile if you only work with small quantities.

Capacity range 120 – 3,800 l/h

✓ Manual polymer batching station ULTROMAT MT: Perfect metering system for the processing of small quantities of liquid and powdered polymers: extremely robust and cost-effective.

The ULTROMAT MT is ideal for individually batching polymer solutions where there is no need for automatic operation. The powdered polymer is added manually through the wetting cone to the maturing tank and mixed by the stirrer. After the maturing time, the flocculant solution can then be metered into the application.



Your Benefits

- Ideal for use where there is no need for continuous operation
- Manual addition of flocculants
- Robust and cost-effective
- Round polypropylene batching tank
- Flushing system with wetting cone and injector
- Gentle mixing of the polymer solution

Technical Details

- Slowly-running stirrer
- Flushing system
- Level switch (Low flow, Min, Max contact)
- Terminal box

Field of Application

- Potable water treatment
- Wastewater treatment (industry and local authorities)
- Sludge de-watering

The systems consist of:

- 1 PP preparation tank
- 1 flushing system for flushing and wetting the powder with wetting cone, injector and fitting set for the dilution water
- 1 slow-rotating electric stirrer
- 1 level switch with three switching points
- 1 terminal box

ULTROMAT MT

	Order no.
MT 140, stirrer 0.18 kW	1037073
MT 250, stirrer 0.55 kW	1037094
MT 500, stirrer 0.75 kW	1037095
MT 1000, stirrer 1.1 kW	1037096
MT 2000, stirrer 2.2 kW	1037097
MT 3000, stirrer 2.2 kW	1037098
MT 4000, stirrer 3 kW	1037099

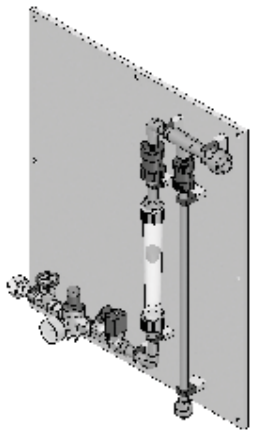
Technical Data

Type		MT 140	MT 250	MT 500	MT 1000	MT 2000	MT 3000	MT 4000
Discharge volume	l/h	120	210	440	920	1,890	2,850	3,800
Useful tank volume (with reserve of approx.10%)	l	120	210	440	920	1,890	2,850	3,800
Diameter of tank	mm	640	650	850	1,260	1,460	1,770	1,650
Height of tank	mm	714	1,116	1,018	1,016	1,518	1,620	2,072
Height	mm	1,003	1,405	1,309	1,320	1,875	1,998	2,496
Water connection DN	mm	20	20	20	25	32	40	40
Discharge nozzle DN	mm	20	20	20	25	32	40	40
Voltage/frequency	V AC / Hz	400/50	400/50	400/50	400/50	400/50	400/50	400/50
Power uptake	kW	0.18	0.55	0.75	1.10	2.20	2.20	3.00

The systems are also available with flushing water fitting, level indicator and switchgear.

2.1.10 ULTROMAT and DULCODOS Accessories Including Big Bag Systems

ULTROMAT post-dilution unit VS

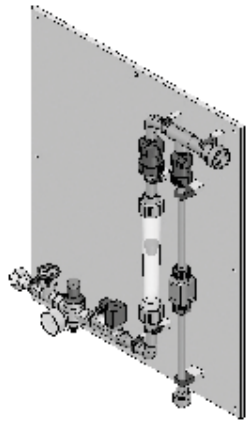


The ULTROMAT post-dilution units are fully assembled units for the post-dilution of polymer solutions, essentially consisting of:

- 1 water apparatus for the dilution water with manual shut-off valve, pressure reducer, 24 V DC solenoid valve and float flow meter including minimum contact
- 1 pipework for the polymer solution to be diluted including check valve
- 1 static mixer integrated into the output pipework for mixing the stock solution with the dilution water

	Process solution	Order no.
VS 1000	1,000 l/h	1096130
VS 2000	2,000 l/h	1096131
VS 5000	5,000 l/h	1096132
VS 10000	10,000 l/h	1096133
VS 20000	20,000 l/h	1096134
VS 30000	30,000 l/h	1096135
VS 50000	50,000 l/h	1096136

ULTROMAT post-dilution unit VS-IP with flow measurement

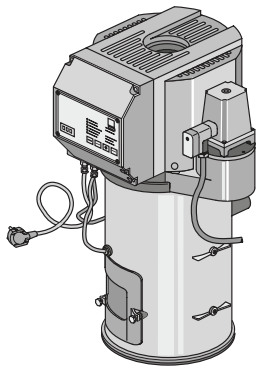


The ULTROMAT post-dilution units are fully assembled units for the post-dilution of polymer solutions, essentially consisting of:

- 1 water apparatus for the dilution water with manual shut-off valve, pressure reducer, 24 V DC solenoid valve and float flow meter including minimum contact
- 1 pipework for the polymer solution to be diluted including check valve and inductive flow meter
- 1 static mixer integrated into the output pipework for mixing the stock solution with the dilution water

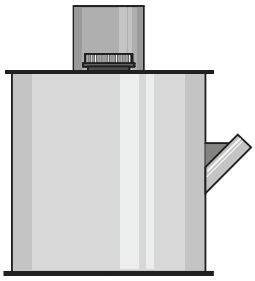
	Process solution	Order no.
VS 1000 IP	1,000 l/h	1096137
VS 2000 IP	2,000 l/h	1096138
VS 5000 IP	5,000 l/h	1096139
VS 10000 IP	10,000 l/h	1096140
VS 20000 IP	20,000 l/h	1096142
VS 30000 IP	30,000 l/h	1096143
VS 50000 IP	50,000 l/h	1096144

ULTROMAT powder conveyor FG 205



The ULTROMAT powder conveyor FG 205 is used to top up the dry material feeder of the DULCODOS systems with commercially available powdered polymers. A suction hose and a suction lance are used to draw the powder from the storage container (Big Bag, powder storage tank) into the powder conveyor and to transport it through a flap into the dry material feeder of the polymer dissolving station. The powder conveyor is self-controlled and simply needs a 230 V single-phase connection. External switch contacts are not needed. Approx. 40 kg powdered polymer can be transported per hour depending on the properties of the powder. The 4-metre-long metering hose and extraction nozzle are included in the scope of delivery.

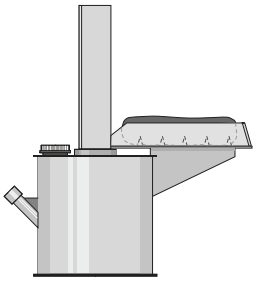
	Minimum pump capacity	Order no.
Powder conveyor FG 205 230 VAC/50 Hz	40 kg/h	1000664
Powder conveyor FG 205 230 VAC/60 Hz	40 kg/h	1061422



Powder pre-storage tank

The powder pre-storage tank is used for interim storage of powdered polymers that are delivered in Big-Bags. The Big-Bag is suspended over the tank on a frame and emptied into the powder pre-storage tank.

	Order no.
Powder pre-storage tank	1005573



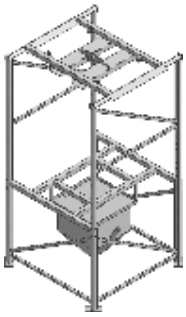
Powder pre-storage tank with bag tipper

The powder pre-storage tank with bag tipper is used for interim storage of powdered polymers delivered in 25 kg sacks.

	Order no.
Powder pre-storage tank with bag tipper	1025137

Big Bag emptying units

These emptying units are used to hold and empty Big Bags weighing up to 1,000 kg. A powder hopper is used to transfer the powder into a special feed unit, such as powder feeder FG 205, thereby ensuring the supply of powder to the dry feeder of the polymer preparation station.

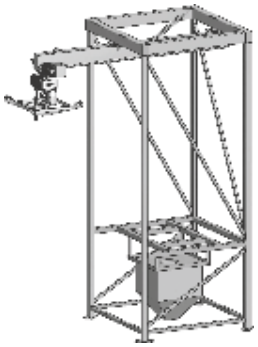


Big Bag emptying unit, standard

- Standard design in painted steel
- Integrated travelling crane
- Electrical lifting equipment with suspension cross for the Big Bags
- Powder storage tank with approx. 200-litre content

	Order no.
Big Bag emptying unit, standard	1083075

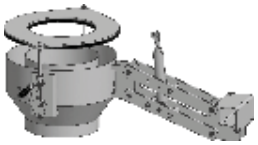
Big Bag emptying unit with electrical lifting equipment



- Height-adjustable frame
- Standard design in painted steel
- Integrated suspension cross for the Big Bags
- Suitable for loading with crane or fork-lift
- Powder storage tank with approx. 200-litre content

	Order no.
Big Bag emptying unit with electrical lifting equipment	1083076

Big Bag emptying unit with dust-free emptying option



- Additional unit under the Big Bag including dust filter

	Order no.
Big Bag emptying unit with dust-free emptying option	1083077

2.1.11 Batching Stations and Metering of Powdered and Liquid Polymer Solutions PolyRex

Preferred fields of application include:

- Potable water treatment
- Wastewater treatment (industry and local authorities)
- Sludge dewatering
- Paper production

3 different system concepts are available:

- Preparation system with vacuum conveyor (PolyRex)
- Preparation system with Big Bag emptying unit (PolyRex Big Bag)
- Preparation system for common liquid polymers (PolyRex Liquid)

PolyRex is a turnkey system for batch-wise treatment of powder and liquid polymers. Common to all PolyRex systems is the use of 2 stainless steel tanks; one batching maturity tank and one supply tank, either with a double-decker design or side by side.

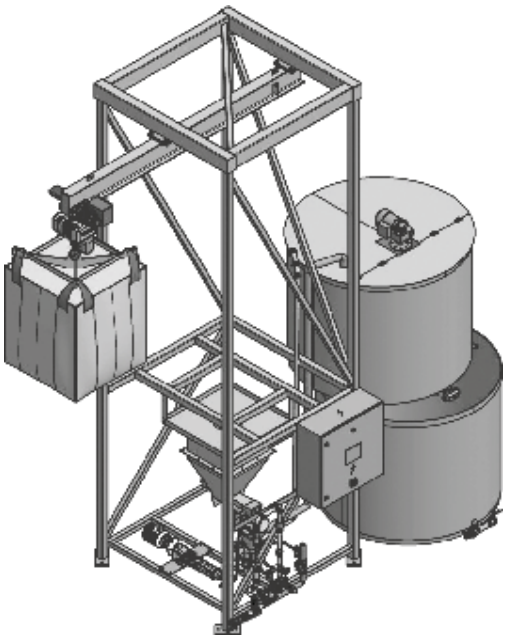
PolyRex uses a highly effective, three-stage process for flushing, water acceleration and gentle but efficient mixing in the mixing tank to produce a homogeneous, activated polymer solution.

The batch preparation system provides exceptional properties compared to a continuous system. This is because there is no short-circuiting effect. The polymer particles cannot run through the process without being activated.

The proven multi-screw feeder guarantees reliable emptying without pulsation with extremely precise metering. This ensures precise batch composition. If conventional liquid polymers are used, a reliable eccentric screw pump is used, which guarantees reliable and ultra-precise metering.

PolyRex systems are equipped with a compact PLC and touch panel. As an option, the compact PLC can be fitted with a PROFIBUS® or Ethernet module. Commissioning could not be simpler. Input of the solvent concentration as well as calibration of the powder feeder unit and liquid concentrate pump is user-managed. Alarm messages and warnings are shown on the display.

Application example for a PolyRex polymer preparation system

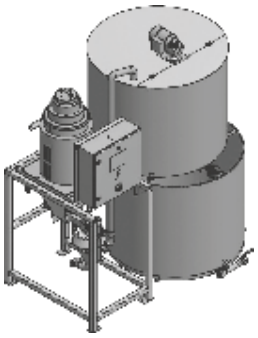


2.1.12 Metering System PolyRex

PolyRex can do more: Processes liquid and powdered polymers.

Capacity range of up to 8200 l/h

The metering system PolyRex is a double-decker batching station for the processing of liquid and powdered polymers. It consists of the feed and mixer unit and the two stainless steel double-decker tanks. The polymers used are ideally utilised.



The upper storage tank represents the batching/ maturing tank. The lower tank is the storage tank for the prepared polymer solution.

The powdered polymer is transported to the powder feeder by a vacuum conveyor using 2 conveyor screws and mixed into 3 layers with water in the underlying mixer unit; wetting cone, water injector and stirrer in batching tank. The solution is then transferred to the upper storage tank using the water pressure of the diluting water. The polymer solution matures completely in this, a short circuit effect is avoided. After maturing, the solution can be transferred to the lower storage tank via the motorised valve.

Your Benefits

Compact controller ABB AC500 PM573-ETH and touch panel CP635

- Dust-free filling of the powder storage tank thanks to use of a vacuum conveyor
- Double screw metering unit with 2 counter-rotating conveyor screws enables low-pulsation metering with a high level of dosing precision.
- Pressure reducer for a constant water supply
- Effective 3-phase mixing of the polymer solution
- No short-circuiting effect: polymer particles cannot pass through the process without activation

Technical Details

- Vacuum conveyor for filling from small powder bags
- Powder top hopper with inspection glass
- Powder level probe for detecting an empty top hopper
- Shut-off damper on feeder to prevent moisture infiltration
- Wetting cone in stainless steel for dissolving of the powder
- Water apparatus with wetting cone and injector to produce an effective and homogeneous polymer solution from powdered polymers
- Stainless steel tank for maturing and feeding the polymer solution in slightly offset double-deck arrangement for PolyRex 0.6 - 8.4, with adjacent tanks for PolyRex Maxi 11 - 23
- Motorised valve to dispense the solution into the storage tank
- Slow-running stirrer in the upper storage tank for gentle mixing of the polymer solution

Field of Application

- Potable water treatment
- Wastewater treatment (industry and local authorities)
- Sludge de-watering
- Paper production

Options

- Batching commercially-available liquid polymers using a progressive cavity pump
- Heating elements at wetting cone entrance and at feeder output (recommended for environment with high air humidity)
- PROFIBUS® or Ethernet communication
- Compact controllers from Siemens or Allen Bradley on request
- Water apparatus and piping in stainless steel design

Accessories

- Re-dilution with highly effective static mixer
- Progressive cavity pump with speed control
- Electromagnetic flow meter for precise control of the metering pump

Technical Data

	Tank contents m^3	Discharge volume l/h	Polymer dosing capacity kg/h
PolyRex 0.6	2 x 0.3	240	1.2
PolyRex 1.0	2 x 0.6	460	2.3
PolyRex 2.0	2 x 1.0	940	4.7
PolyRex 3.0	2 x 1.5	1,280	6.4
PolyRex 4.0	2 x 2.0	1,900	9.5
PolyRex 5.4	2 x 2.7	2,400	12.0
PolyRex 6.6	2 x 3.3	3,200	16.0
PolyRex 8.4	2 x 4.2	3,820	19.2
PolyRex Maxi 11	2 x 5.5	5,100	25.5
PolyRex Maxi 16	2 x 8.0	6,600	33.0
PolyRex Maxi 23	2 x 11.5	8,200	41.0

2.1.13 Metering System PolyRex Big Bag

PolyRex can do more: Processes liquid and powdered polymers.

Capacity range of up to 8200 l/h

The metering system PolyRex is a double-decker batching station for the processing of liquid and powdered polymers. It consists of the feed and mixer unit and the two stainless steel double-decker tanks. The polymers used are ideally utilised.

The upper storage tank represents the batching/ maturing tank. The lower tank is the storage tank for the prepared polymer solution.

The powdered polymer is transported to the powder feeder by a vacuum conveyor using 2 conveyor screws and mixed into 3 layers with water in the underlying mixer unit; wetting cone, water injector and stirrer in batching tank. The solution is then transferred to the upper storage tank using the water pressure of the diluting water. The polymer solution matures completely in this, a short circuit effect is avoided. After maturing, the solution can be transferred to the lower storage tank via the motorised valve.

Your Benefits

Compact controller ABB AC500 PM573-ETH and touch panel CP635

- Flexible and height-adjustable Big Bag emptying unit with integrated lifting cross for charging by crane or fork-lift
- Double-screw feeder with 2 reverse conveyor screws enables low-pulsation metering with a high level of dosing precision
- Pressure reducer for a constant water supply
- Effective 3-phase mixing of the polymer solution
- No short-circuiting effect: polymer particles cannot pass through the process without activation

Technical Details

- Powder top hopper with inspection glass
- Powder level probe for detecting an empty top hopper
- Shut-off damper on feeder to prevent moisture infiltration
- Wetting cone in stainless steel for dissolving of the powder
- Water apparatus with wetting cone and injector to produce an effective and homogeneous polymer solution from powdered polymers
- Stainless steel tank for maturing and feeding the polymer solution in slightly offset double-deck arrangement for PolyRex 0.6 - 8.4, with adjacent tanks for PolyRex Maxi 11 - 23
- Motorised valve to dispense the solution into the storage tank
- Slow-running stirrer in the upper storage tank for gentle mixing of the polymer solution

Field of Application

- Potable water treatment
- Wastewater treatment (industry and local authorities)
- Sludge de-watering
- Paper production

Options

- Big Bag emptying unit with travelling crane and electrical lifting equipment
- Dust-free emptying, thanks to additional unit under the Big Bag including dust filter
- Batching of commercially available liquid polymers by the use of an eccentric screw pump
- Heating element at the inlet of the wetting cone and/or at the outlet of the metering unit (recommended for environments with high air humidity)
- PROFIBUS® or Ethernet communication
- Compact Siemens or Allen Bradley controller on request
- Water apparatus and piping in stainless steel design

Accessories

- Re-dilution with highly effective static mixer
- Eccentric screw pump with speed control
- Electromagnetic flow meter for the precise control of the metering pump

Technical Data

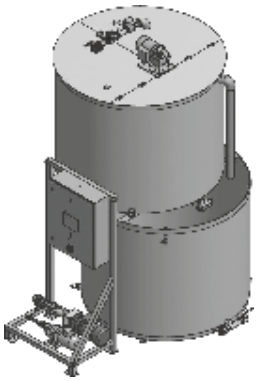
	Tank contents m^3	Discharge volume l/h	Polymer dosing capacity kg/h
PolyRex 0.6	2 x 0.3	240	1.2
PolyRex 1.0	2 x 0.6	460	2.3
PolyRex 2.0	2 x 1.0	940	4.7
PolyRex 3.0	2 x 1.5	1,280	6.4
PolyRex 4.0	2 x 2.0	1,900	9.5
PolyRex 5.4	2 x 2.7	2,400	12.0
PolyRex 6.6	2 x 3.3	3,200	16.0
PolyRex 8.4	2 x 4.2	3,820	19.2
PolyRex Maxi 11	2 x 5.5	5,100	25.5
PolyRex Maxi 16	2 x 8.0	6,600	33.0
PolyRex Maxi 23	2 x 11.5	8,200	41.0

2.1.14 Metering System PolyRex Liquid

The PolyRex can do more: it processes common liquid polymers.

Capacity range of up to 3180 l/h

The metering system PolyRex is a double-decker batching station for the processing of liquid polymers. It consists of the feed and mixer unit and the two stainless steel double-decker tanks. The polymers used are ideally utilised.



The upper storage tank represents the batching/maturing tank. The lower tank is the storage tank for the prepared polymer solution.

The liquid polymer is fed in by an eccentric screw pump and an injection nozzle and mixed with water in 2 stages by means of a water injector and a stirrer in the batching/maturing tank. The solution is transferred to the upper storage tank using the water pressure of the diluting water. The polymer solution can fully mature in this, avoiding a short-circuiting effect. After maturing, the solution can be transferred to the bottom storage tank via the motorised valve.

Your Benefits

Compact controller ABB AC500 PM573-ETH and touch panel CP635

- Reliable eccentric screw pump for metering commercially available polymers
- High energy mixing process
- Unique injection nozzle prevents clogging of the liquid polymer
- Pressure reducer for a constant water supply
- Effective 2-phase mixing of the polymer solution
- No short-circuiting effect: polymer particles cannot pass through the process without activation

Technical Details

- Water apparatus with wetting cone and injector to produce an effective and homogeneous polymer solution
- Double-decker storage tank made of stainless steel for maturing and storing the polymer solution
- Motorised valve to dispense the solution into the storage tank
- Slow-rotating stirrer in the upper storage tank for the gentle mixing of the polymer solution

Field of Application

- Wastewater treatment (industry and local authorities)
- Sludge de-watering

Options

- PROFIBUS® or Ethernet communication
- Compact controllers from Siemens or Allen Bradley on request
- Water apparatus and piping in stainless steel design

Accessories

- Re-dilution with highly effective static mixer
- Eccentric screw pump with speed control
- Electromagnetic flow meter for precise control of the metering pump

Technical Data

	Tank contents	Discharge volume	Polymer dosing capacity
	m^3	l/h	kg/h
PolyRex Liquid 1.0	0.5	1,060	5.3
PolyRex Liquid 2.0	1.0	1,900	9.5
PolyRex Liquid 3.0	1.5	2,480	12.4
PolyRex Liquid 4.0	2.0	3,180	15.9

Note: The metering rate of liquid polymer in kg/h denotes a 100 % active ingredient content. Naturally, the concentration of the active ingredient in the systems can be adjusted to the commercially available liquid polymers with a 30 - 60 % active ingredient percentage.

2.1.15 PolyRex Accessories – Mixing Systems

The PolyRex and PolyRex Big Bag systems are fitted with special mixing systems for powdered polymer.

Efficient mixing systems for polymers

	Use	Polymer	Mixing unit	Application/benefits
PolyRex Classic	Standard	• Powder • Liquid	Cyclonic wetting cone	• Reliable and effective hydration

	Use	Polymer	Mixing unit	Application/benefits
PolyRex Optimo	Option	• Powder • Liquid	Sealed system with heated conical wetting area and integrated mixing pump	• Highly efficient polymer mixing • Reliable and dust-free • Very low powder consumption

	Use	Polymer	Mixing unit	Application/benefits
PolyRex Aero Mix	Option	• Powder	Closed system with pneumatic powder conveyance, fans, water nozzles, mixing tank	• High air humidity • High ambient temperature

2.1.16 TOMAL® Multi-Screw Feeder

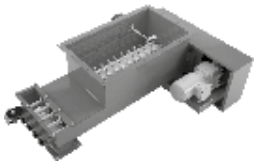
Reduce costs with precision and reliability when metering dry products.

Capacity range 0.4 – 215 m³/h

✓ Its unique construction makes the multi-screw feeder ideally suited for metering powders and granulates.

TOMAL® metering units are volumetric multi-screw feeders and can be integrated into almost every process, whether continuously or intermittently, into many applications in which solids need to be metered safely and precisely.

The metering unit is ideally designed and selected to your customer-specific requirements.



Your Benefits

- Safe silo emptying
- Excellent dosing precision better than ± 1% with constant bulk weight/density
- Linear discharge curve

Technical Details

- Robust construction for low wear
- Number of intermeshed and counter-rotating feeder screws, which form a blocking zone and thus prevent blind 'co-rotation' of the solid
- Material extraction along the entire active inlet surface of the metering unit
- Self-cleaning construction

Field of Application

- Wastewater treatment
- Paper industry
- Flue gas cleaning
- Chemical industry
- Glass and ceramic industry

Options

- Weighing technology can be added to the volumetric TOMAL® metering unit to form a gravimetric metering system. This is ideal with large fluctuations in bulk weight.
- Level sensors to detect bridge formation

Examples of typical metered products

- Active carbon
- Aluminium sulfate
- Bentonite
- Calcium hydroxide
- Cement
- Flue ash
- Fluoride
- Iron oxide
- Iron sulfate
- Lignite coke HOK®
- Limestone meal
- Magnesium sulfate
- Magnesium oxide
- Plaster
- Polymers
- Potassium permanganate
- Soap pellets
- Sodium bicarbonate
- Sodium carbonate
- Sodium hydrosulfite
- Starch
- Talcum
- Urea
- Wood powder
- Zinc oxide

2.2 Metering and Emptying Station DULCODOS SAFE-IBC

2.2.1 Metering and Emptying Station DULCODOS SAFE-IBC

Safety as a priority with the reliable metering of liquid chemicals.

Storage and drainage of IBCs up to 1,000 l – metering of chemicals up to 1,000 l/h

✓ The metering and emptying station DULCODOS SAFE-IBC provides your process with chemicals interruption-free. It conforms to the modified legislature for liquids harmful to water in accordance with the German Ordinance for Systems Handling Substances Harmful to Water AwSV.

DULCODOS SAFE-IBC is a special metering and emptying station for Intermediate Bulk Containers (IBC) with almost complete residual drainage.

The customer positions and fixes the IBC on the respective installation surface of the retaining tank, which is slightly inclined forwards. Using leak-proof safety couplings and hoses, the IBC is connected to an intermediate tank of approximately 200 litres fitted to the left side of the retaining tank. Alternatively, the station can be ordered with a standpipe and tank volume of approx. 60 litres.

This buffer volume ensures an uninterrupted process when changing the IBC. The visual level indicator and a level measurement function with alarm messages also allow IBC changes to be planned more efficiently. The station is equipped with an inspection opening for maintenance purposes.

To ensure reliable metering, a compact metering station can be integrated in the front of the intermediate tank depending on process requirements. This is equipped either with one or two solenoid metering pumps or with one motor-driven metering pump.

Larger metering stations can be configured as required and designed for side mounting on the wall or installation on the floor.

Liquid level measurement in intermediate tank with the new radar liquid level sensor DULCOLEVEL:

NEW

- Indication of the exact liquid level in litres on a mobile phone. This requires the free DULCONNEX Blue app.
- With a 4-20 mA output signal to connect to a PLC or connection via Bluetooth to a gamma/ X metering pump

Your Benefits

- Maximum operating safety
- Excellent process reliability due to interruption-free metering in the process
- Secure installation of an IBC on a special roll-under retaining tank construction. Any drops are reliably collected and cannot escape at the installation-site
- Almost complete residual drainage of the IBC
- Intermediate tank with a volume of approx. 200 litres combined with an integrated metering station
- Retaining tank and intermediate tank both have DIBt approval Z-40.21-585
- Special designs for installation in earthquake zones 1 to 3 in accordance with DIN 4149

Neev FLUIDEX PVT. LTD.

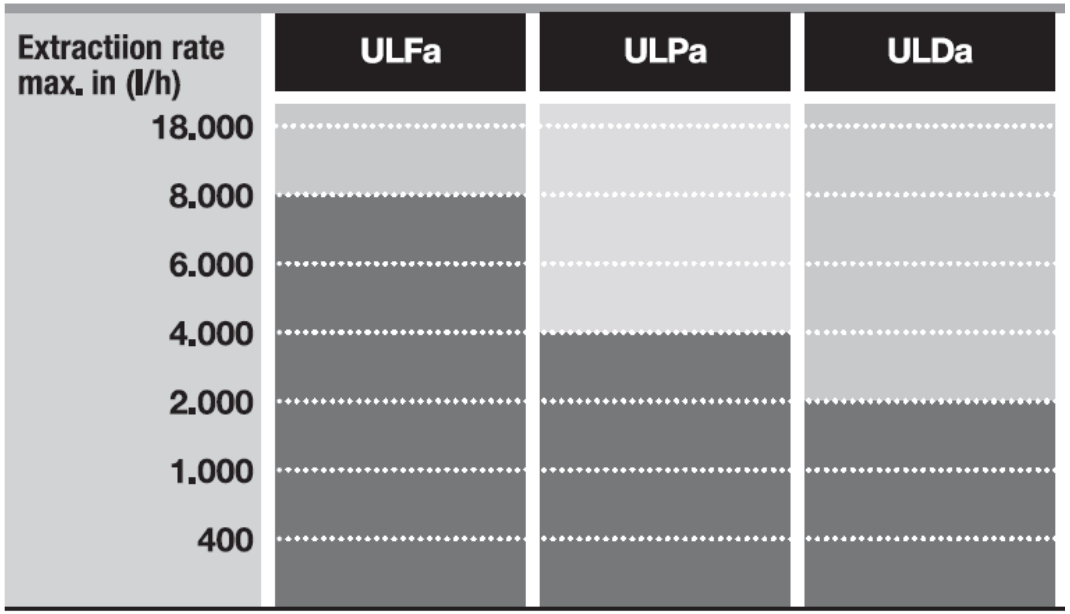
ProMinent®

Experts in Chem-Feed and Water Treatment

Polymer preparation systems
Ultromat series

Performance overview of polymer systems

Experts in Chem-Feed and Water Treatment

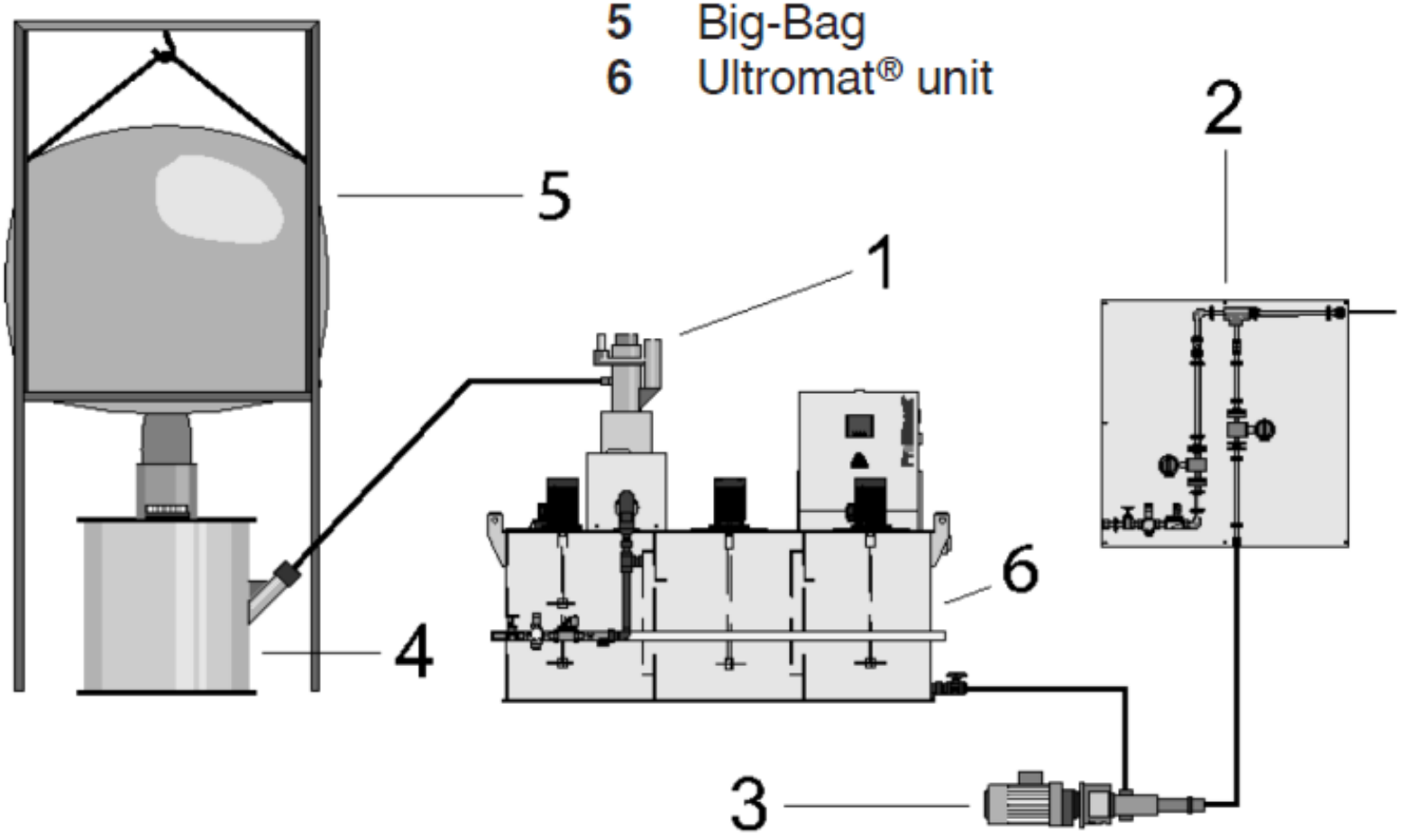


Extractiion rate max. in (l/h)	ULFa	ULPa	ULDa
18.000			
8.000			
6.000			
4.000			
2.000			
1.000			
400			
Type of polymer			
	Powder Liquid	Powder Liquid	Powder Liquid
Applications			
Potable water	■	■	■
Waste water	■		■
Sludge	■		■
Paper		■	■
Cooling water	■		

ProMinent range of products for complete polymer preparation systems

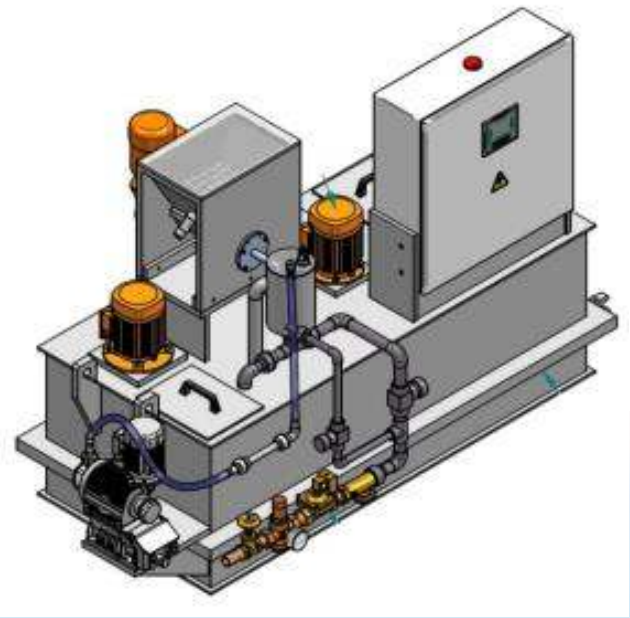
Experts in Chem-Feed and Water Treatment

1 Powder conveyor unit
2 Re-dilution
3 Transfer pump
4 Powder storage tank
5 Big-Bag
6 Ultromat® unit

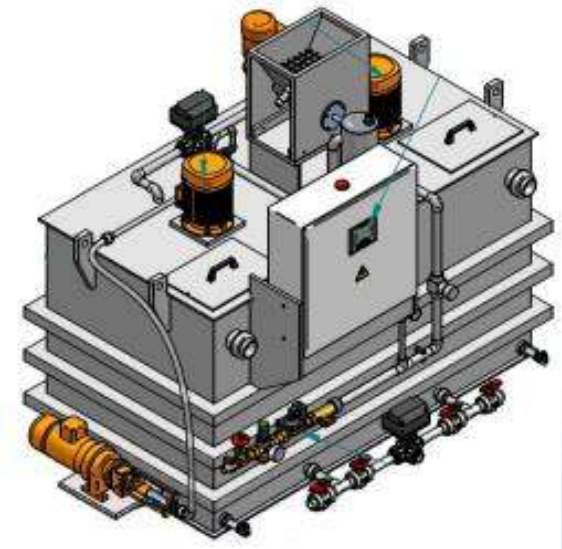


Ultromat series in 2016

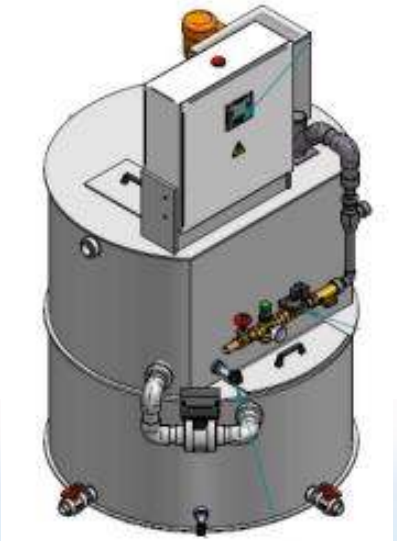
ULFa
Durchlauf
Continous **F**low Through



ULPa
Pendel
Pendulum

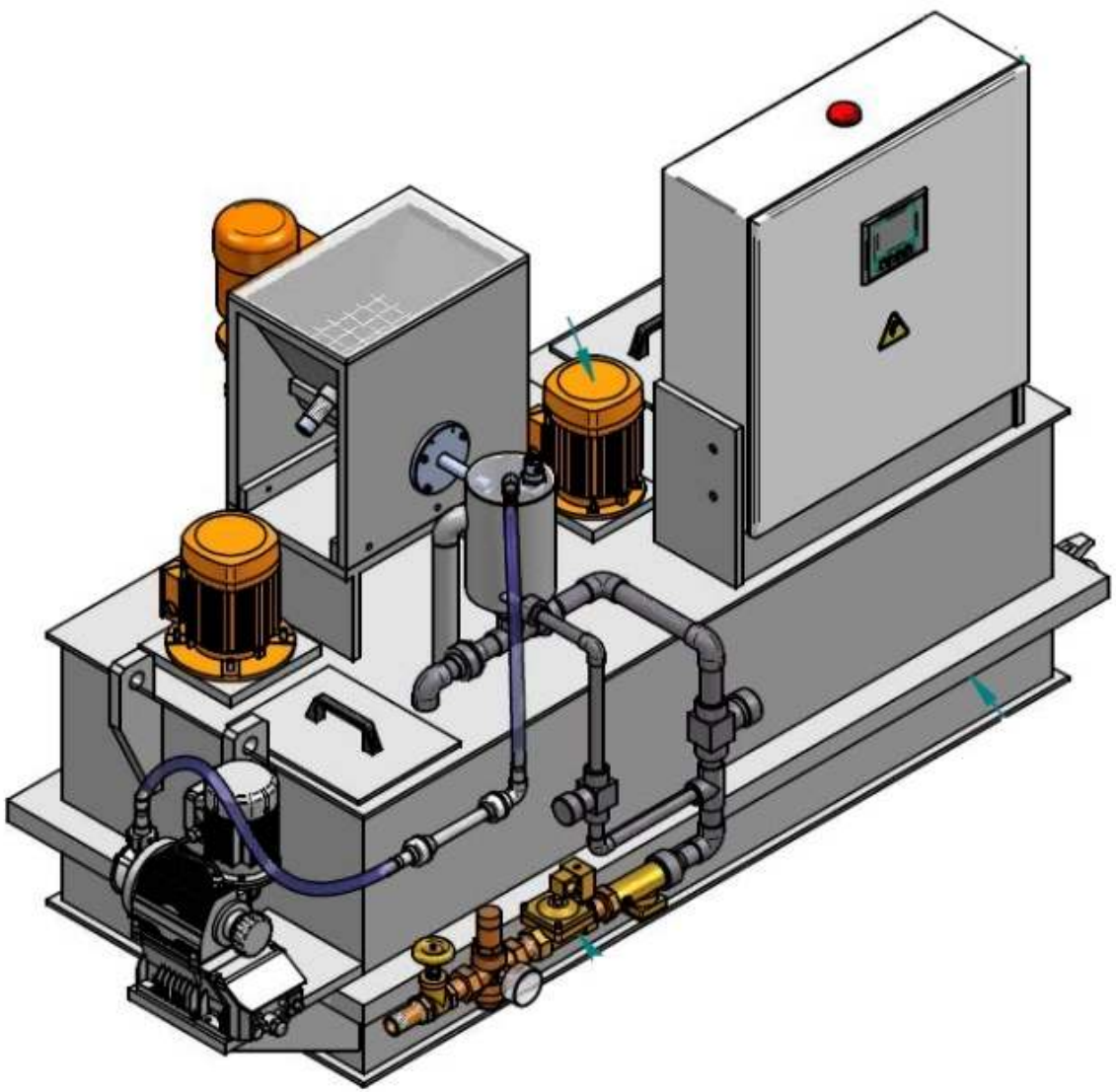


ULDa
Doppelstock
Double-Decker



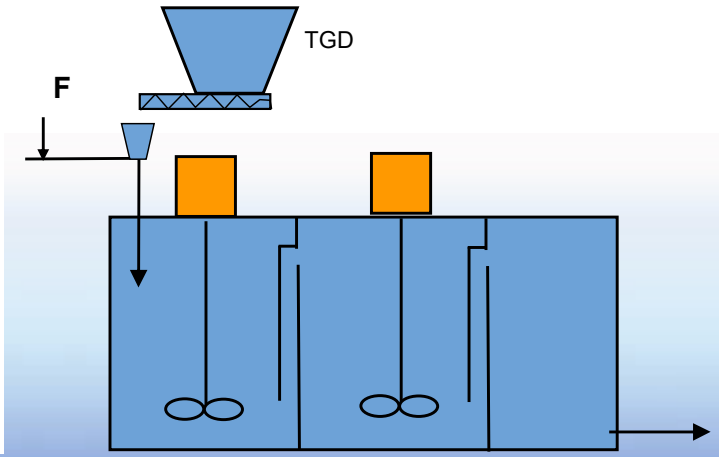
Ultromat ULFa Continous Flow Through units

Experts in Chem-Feed and Water Treatment

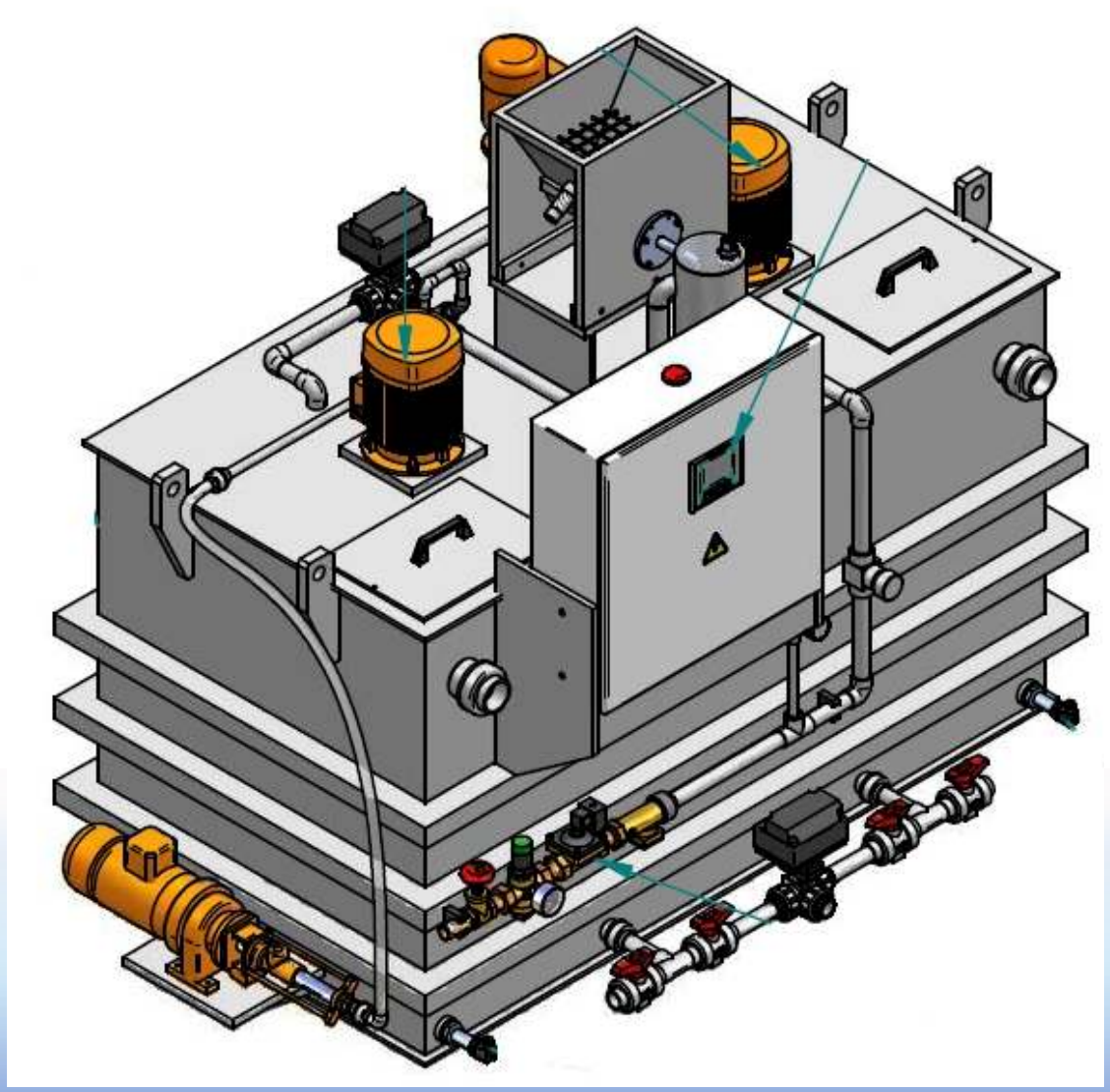


- Continuous flow system
- Capacity range:

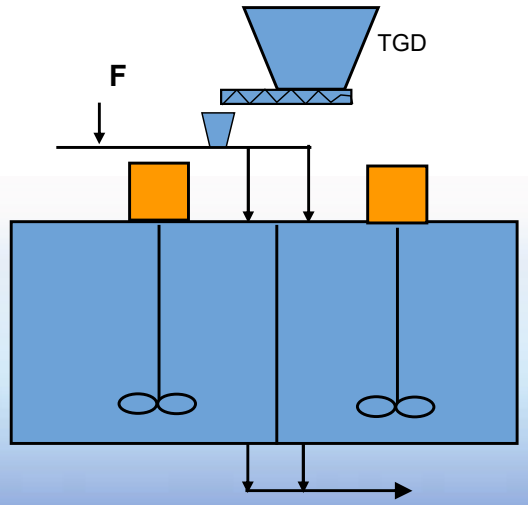
  400, 1000, 2000, 4000, 6000 and 8000 l/h
- For powder and liquid polymers
- Control system S7-1200
- Level measurement: pressure sensor
- Identity code ordering system



Ultromat ULPa Oscillating units

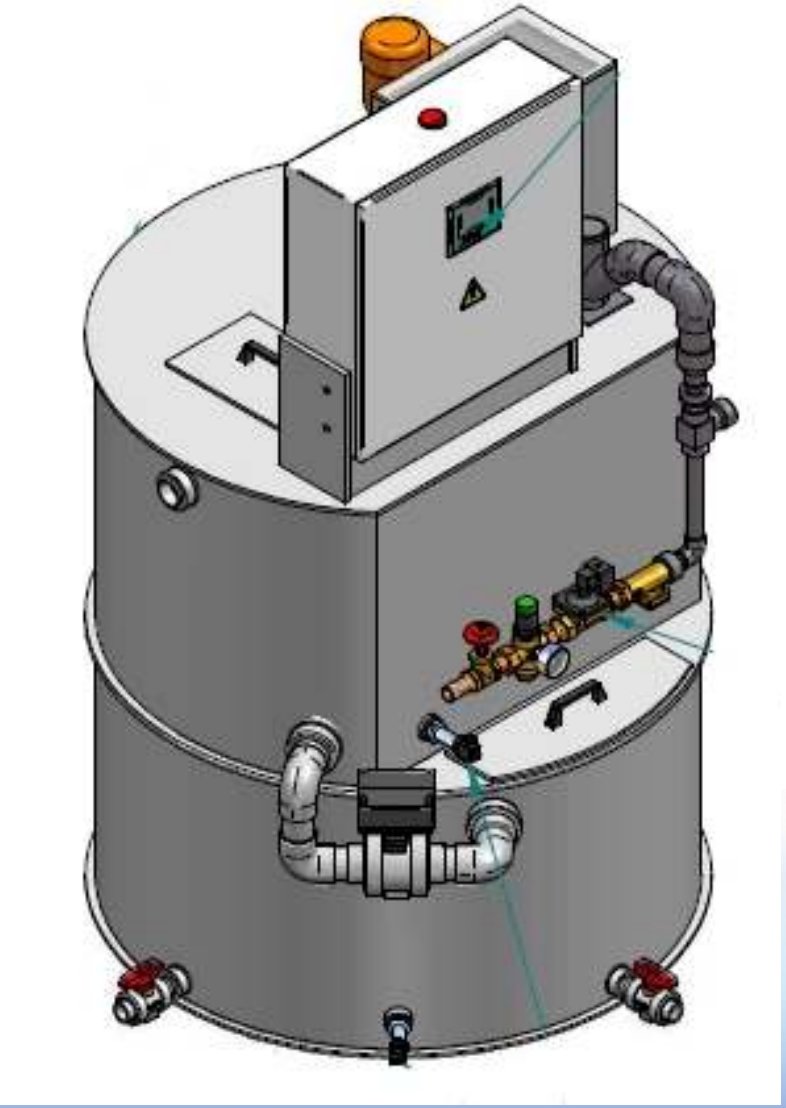


- Oscillating (pendulum) system
- Capacity range:
  400, 1000, 2000, 4000 l/h
- For powder and liquid polymers
- Control system S7-1200
- Level measurement: pressure sensor
- Identity code ordering system

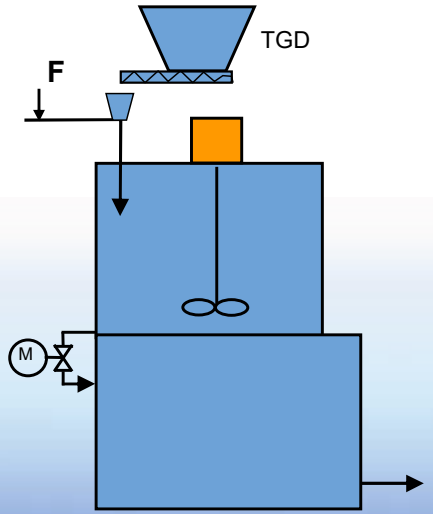


Ultromat ULDa Double-deck units

Experts in Chem-Feed and Water Treatment



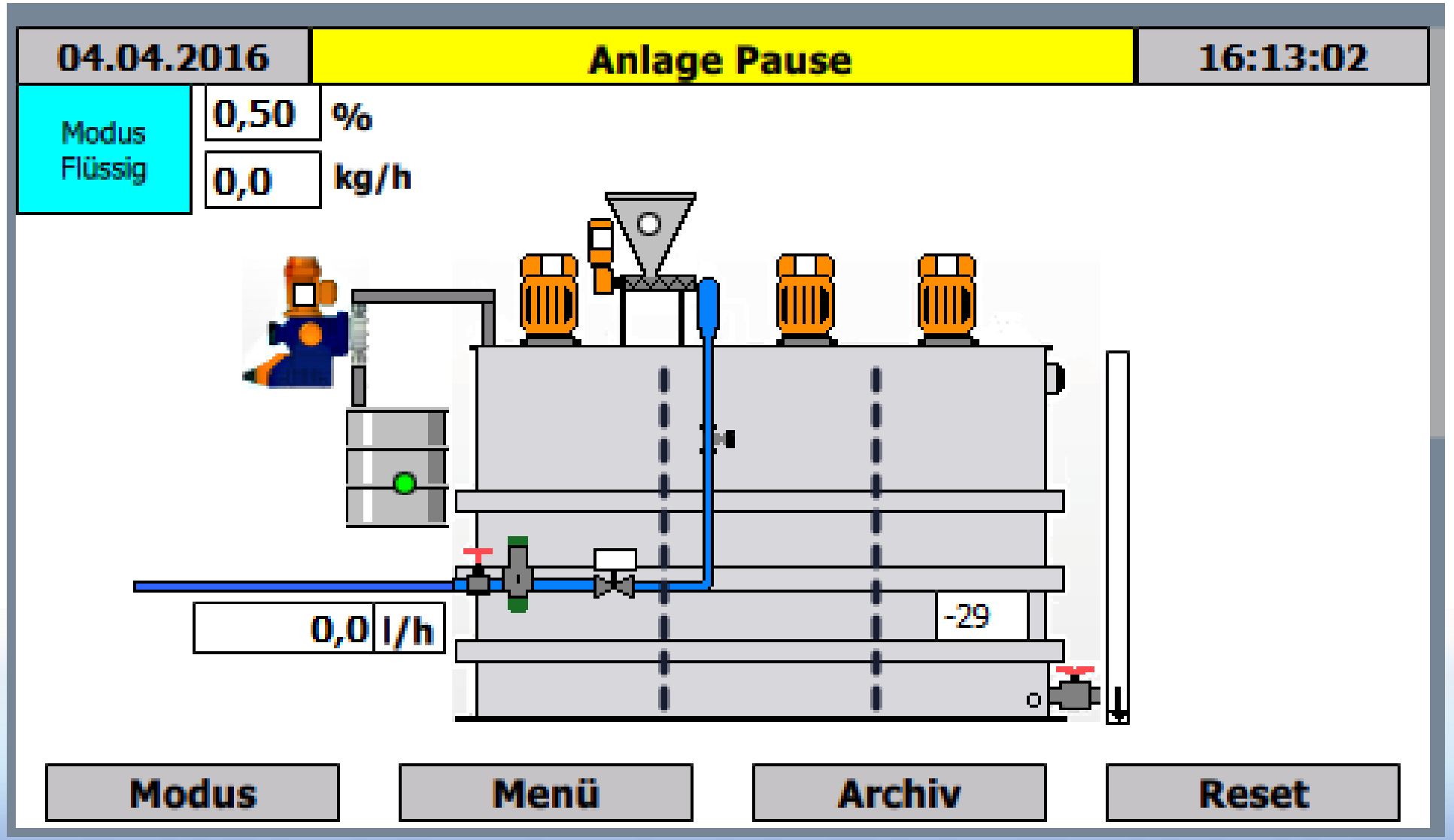
- Double-deck system
- Capacity range:
  400, 1000, 2000 l/h
- For powder and liquid polymers
- Control system S7-1200
- Level measurement: pressure sensor
- Identity code ordering system



View on control cabinet of Ultromat ULFa unit

Experts in Chem-Feed and Water Treatment

View on new touch panel of Ultromat ULFa unit



Picture of an Ultromat ULFa unit

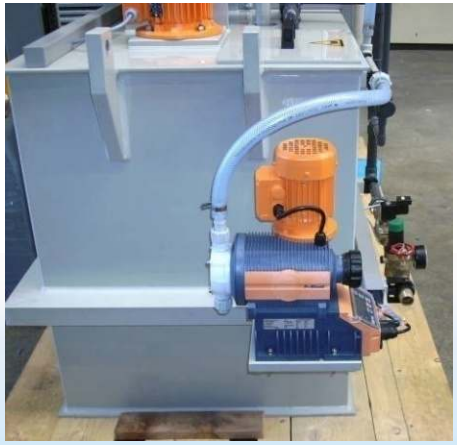
Detailed view on main components

Experts in Chem-Feed and Water Treatment

pressure sensor

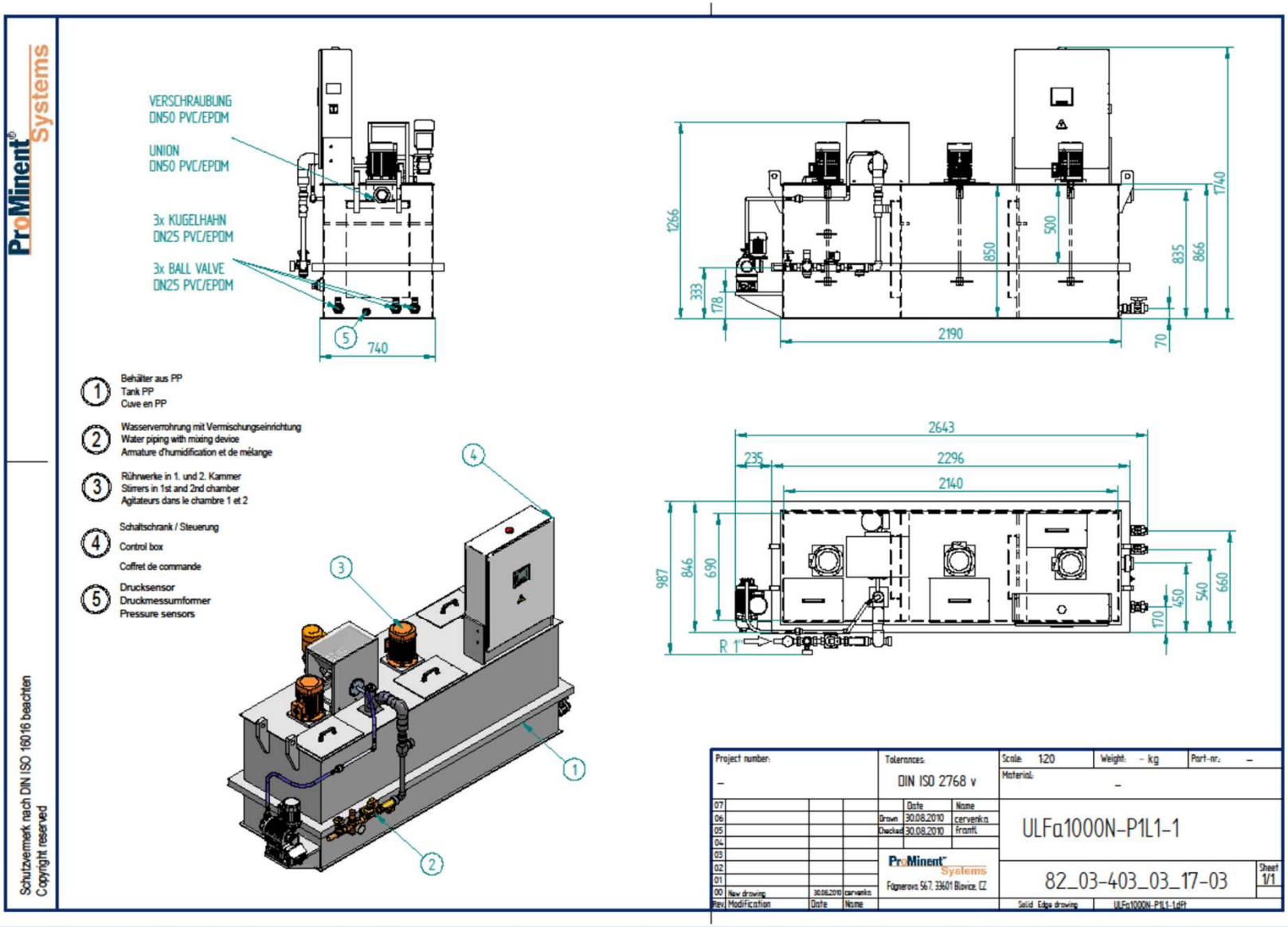
powder feeder

wetting cone

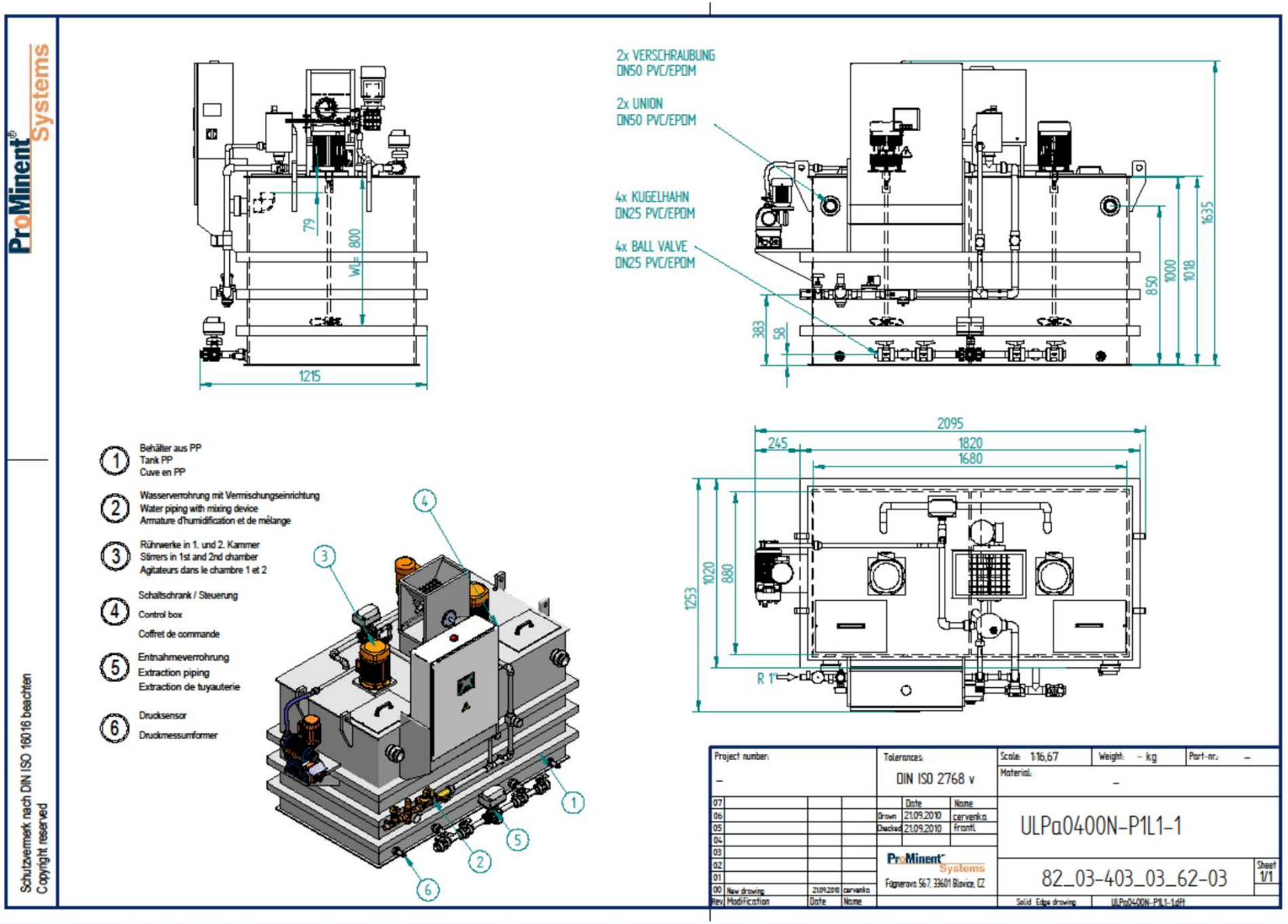


Sigma

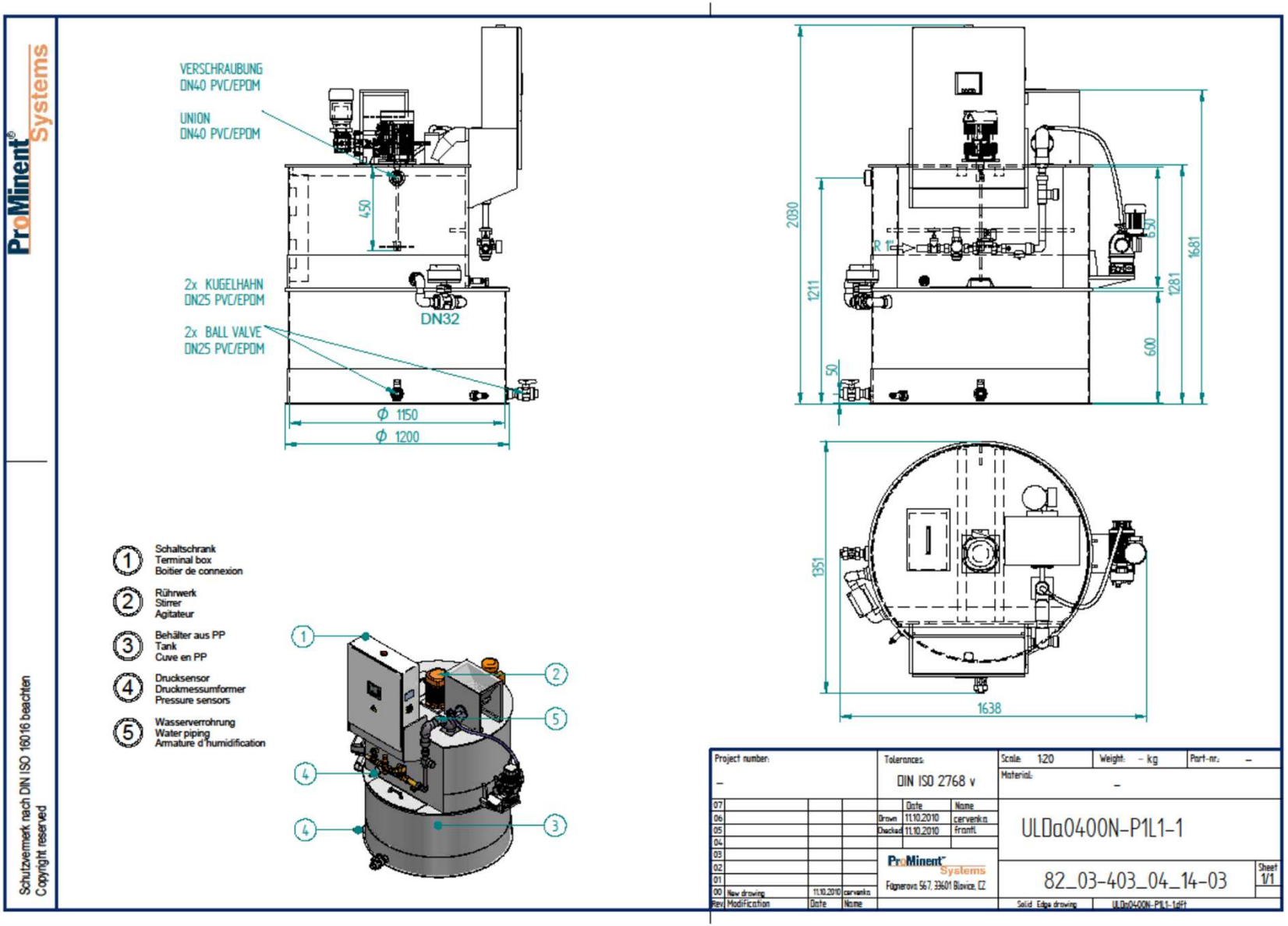
CAD Drawing: ULFa 1000…



CAD Drawing: ULPa 0400…

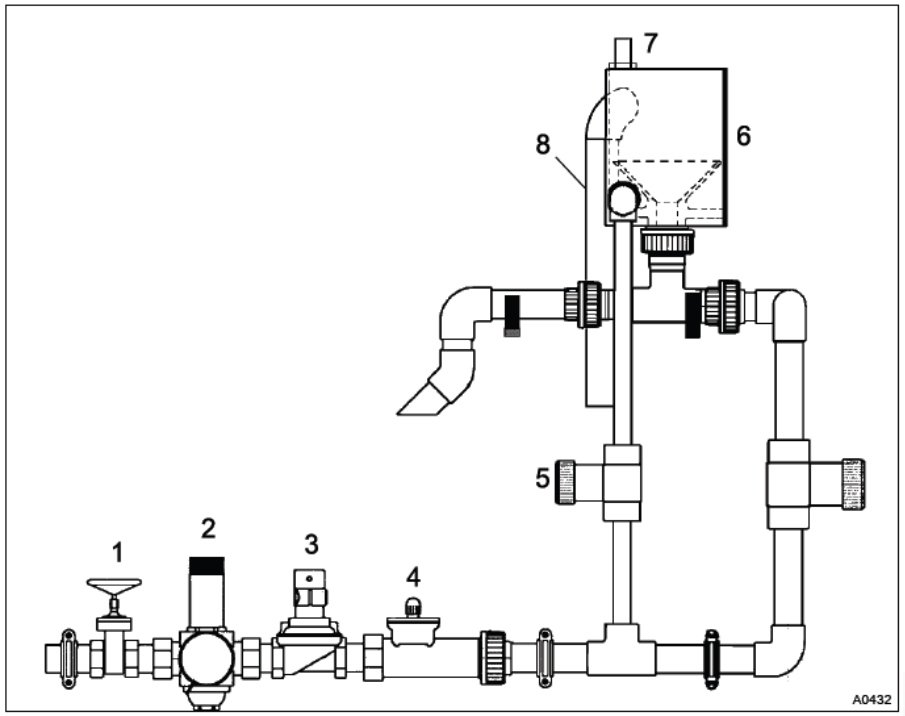


CAD Drawing: ULDa 0400…

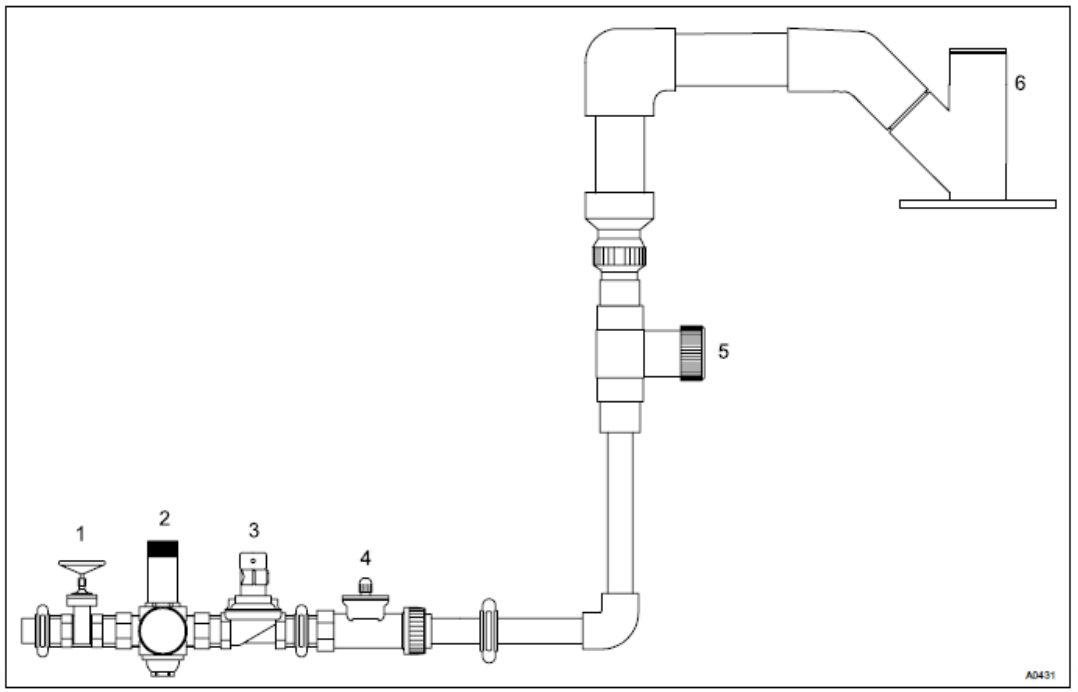


Wetting systems

Wetting cone:

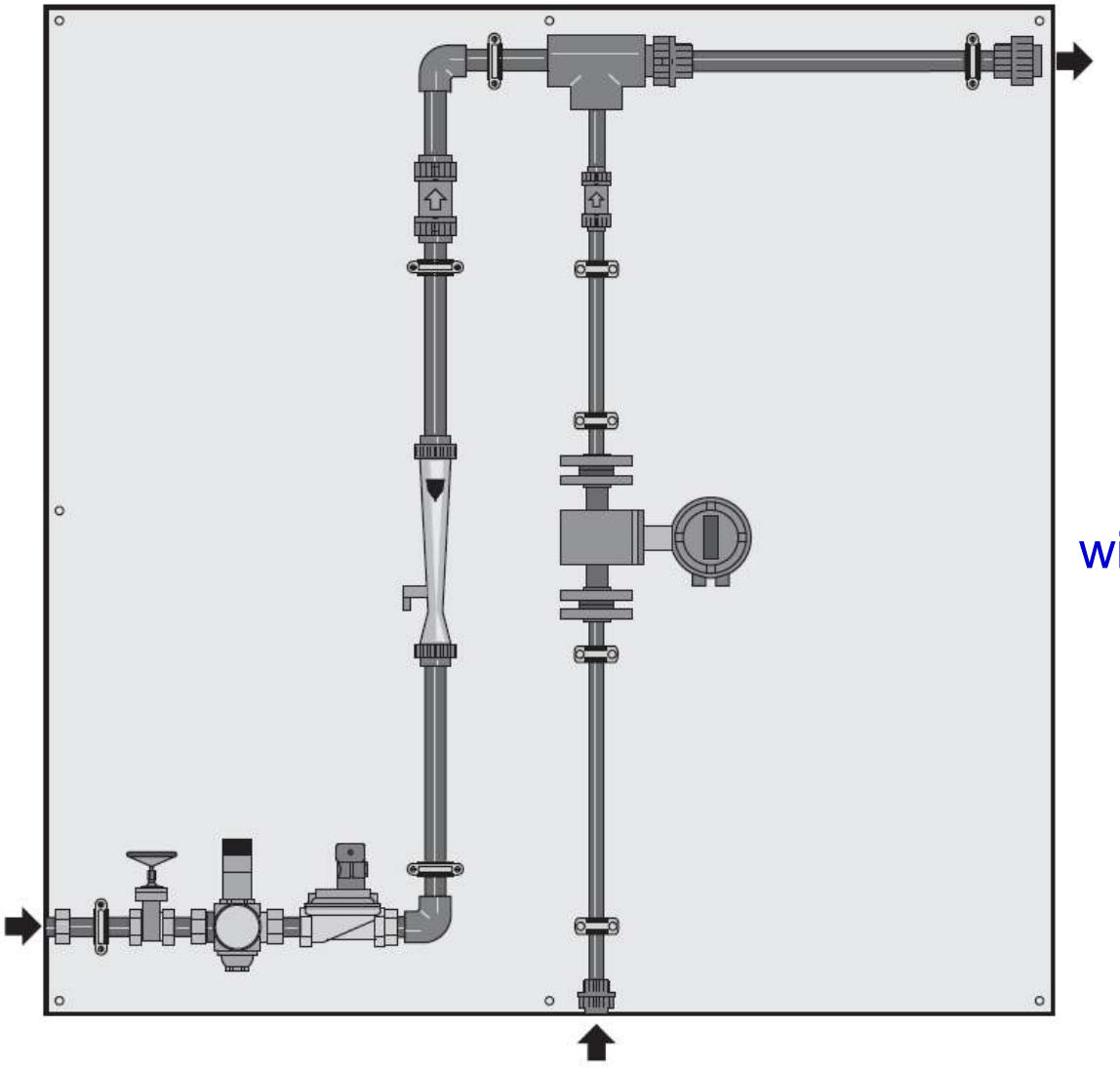


Y-wetting system



Re-dilution / post dilution units

Experts in Chem-Feed and Water Treatment

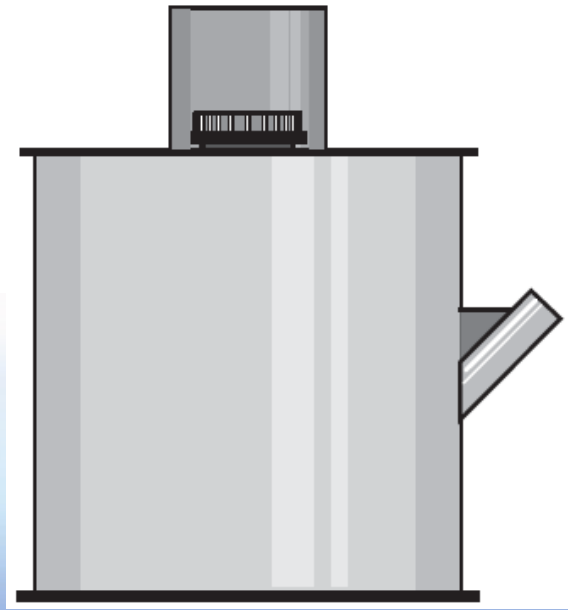


water pipework with static mixer

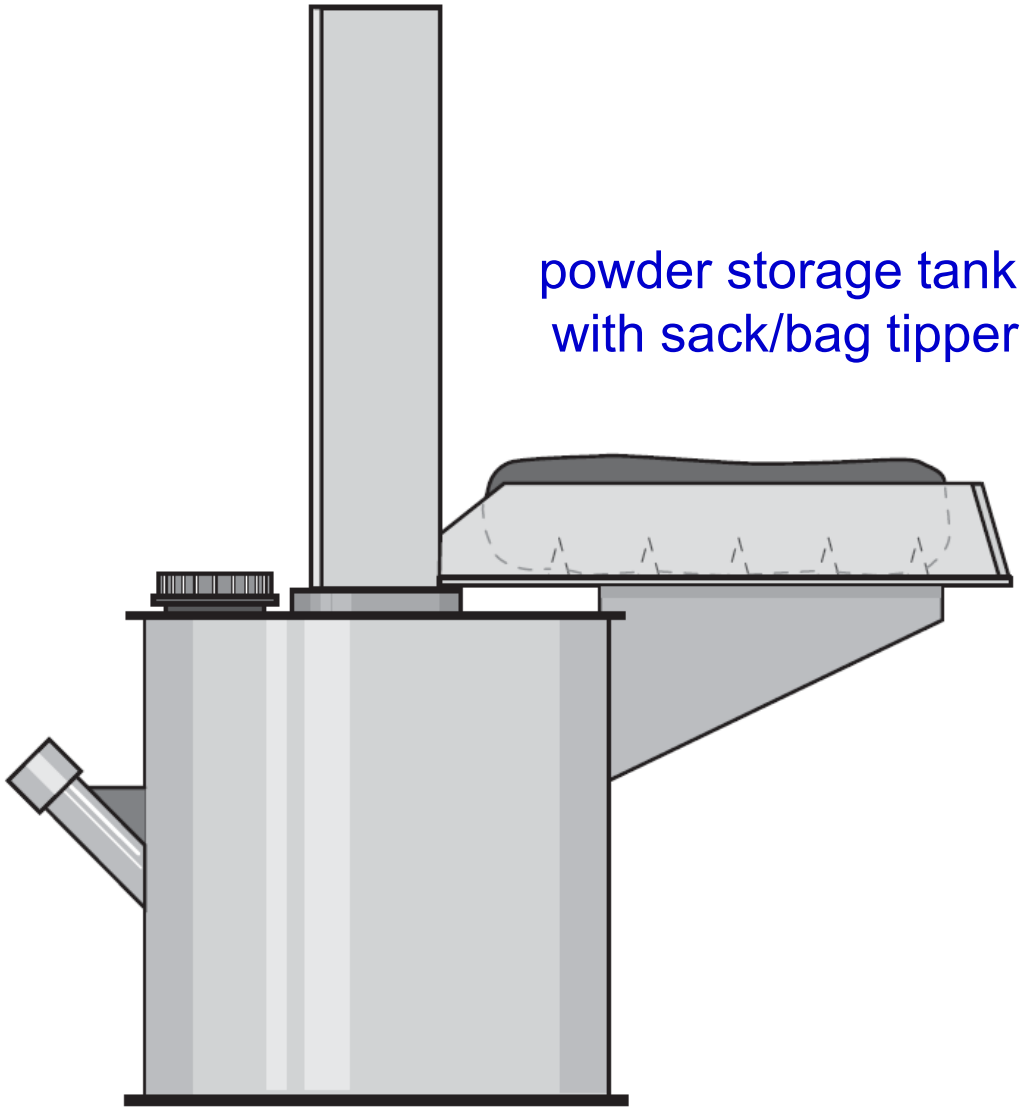
with selectable inductive flow meter

Accessories to Ultromat series – part 1

powder storage tank

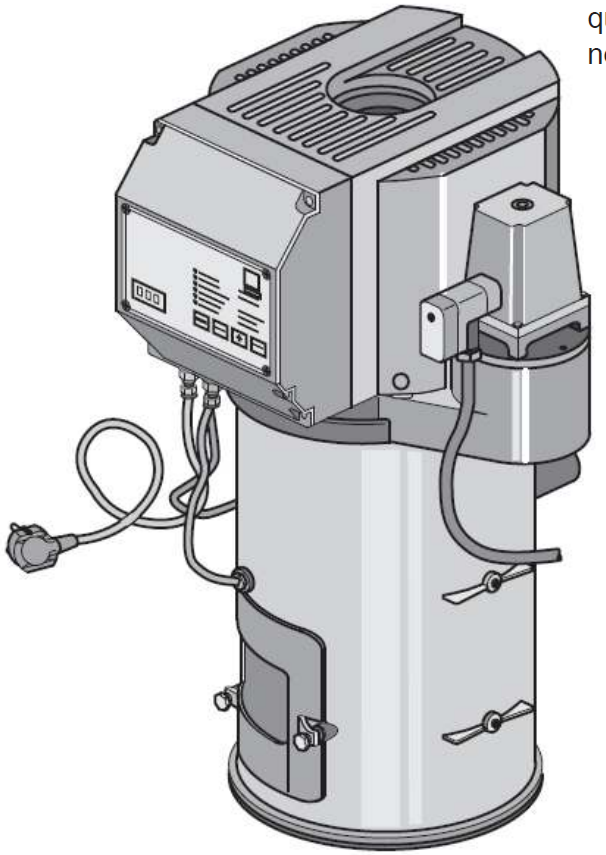


powder storage tank
with sack/bag tipper



Accessories to Ultromat series – part 2

Experts in Chem-Feed and Water Treatment



Ultromat® hopper loader FG 205

The Ultromat® hopper loader 205 is used to refill the dry feeder in Ultromat® systems with commercially available powdered polymers. With the aid of a suction hose and suction lance, the powder is sucked out of the storage container (Big-Bag, powder storage tank) into the powder conveyor and via a flap into the powder feed screw of the polymer diluting station. The powder conveyor is self-operating and simply requires a 230 V DC terminal. External control contacts are not necessary. Depending upon the powder quality, approx. 75-90 kg of powder polymer can be conveyed per hour. The 4 m feed tube and suction nozzle are included as standard.

New solenoid driven metering pump **gamma/ X**

Experts in Chem-Feed and Water Treatment

ProMinent®

X-tremely clever!

Neev FLUIDEX PVT. LTD.

gamma/ X X-tremely clever!

ProMinent®

1. **New technology**
   - Controlled solenoid drive

2. **New solenoid drive benefits**
   - Highest process safety
   - Highest dosing quality
   - Highest economy

3. **New metering pump series gamma/ X**
   - Technical characteristics

Neev FLUIDEX PVT. LTD.

gamma/ X Controlled solenoid drive

ProMinent®

X-tremely reliable

Linear solenoid, consisting mainly of

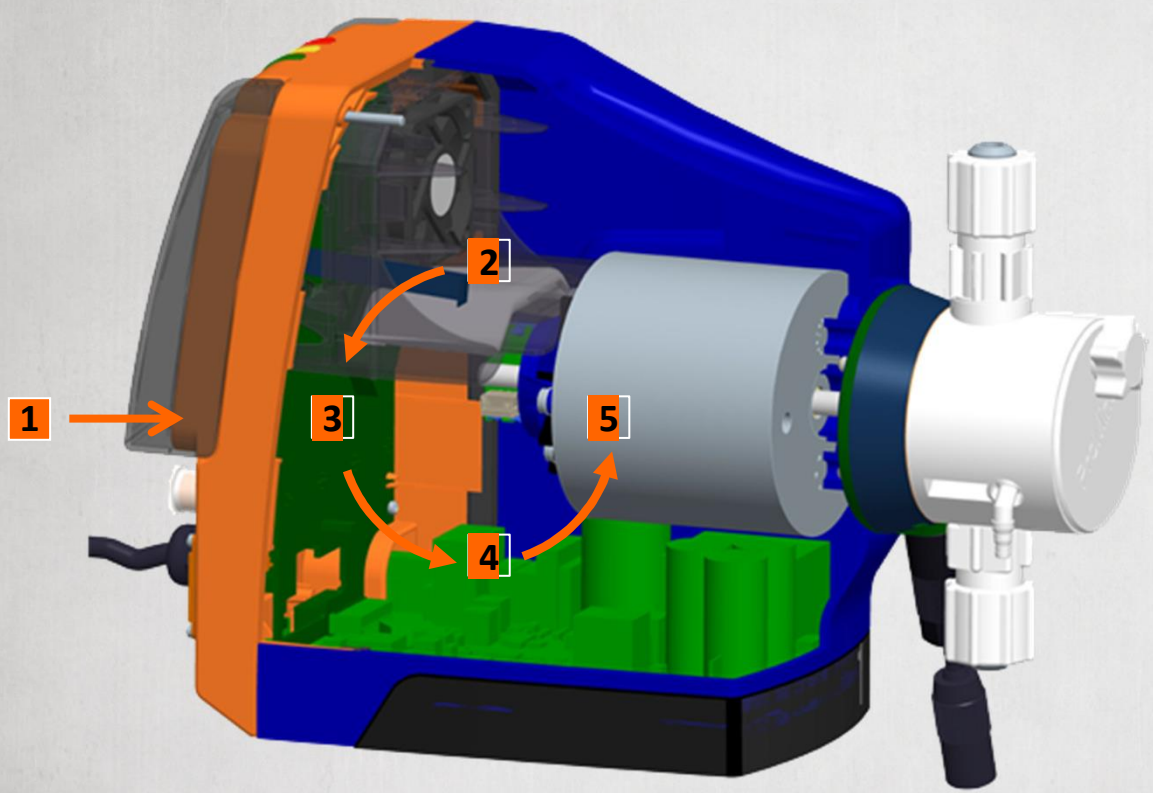
- Pressure piece with solenoid axle
- PTFE filled bearings
- Position sensor
- Solenoid coil

Neev FLUIDEX PVT. LTD.

gamma/ X Controlled solenoid drive

Experts in Chem-Feed and Water Treatment

ProMinent®



1. Set dosing parameters
2. Stroke position sensor
3. Controller
4. Booster
5. Solenoid

Neev FLUIDEX PVT. LTD.

New features for highest process safety

ProMinent®

X-tremely clever: reduction of down-time

- Integrated pressure measurement and indication without any sensor in the dosing head

- Detection of hydraulic problems as
  - Overpressure
  - No pressure (broken discharge line)
  - Gas in the dosing head
- Alarm on display or via relay or fieldbus to the PLC

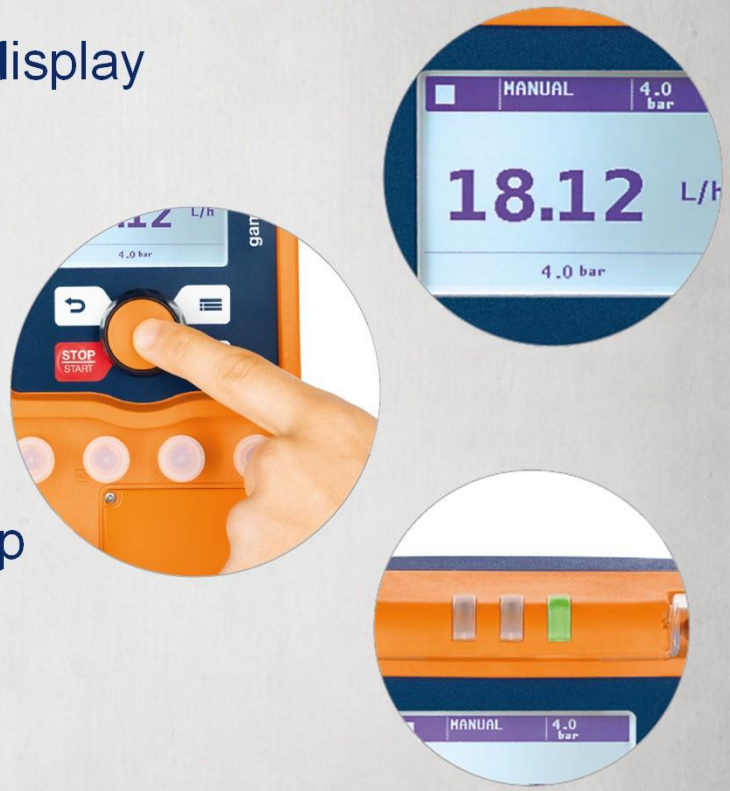
Neev FLUIDEX PVT. LTD.

New features for highest process safety

ProMinent®

X-pert for simplicity through

- Large illuminated high resolution LC display
- Easy self explaining programming by
  - Click wheel
  - Buttons: STOP/START, Return, Priming, Menu
- 3 LED status indication, visible from front, aside and back of the pump
- Service modul with logfile



Neev FLUIDEX PVT. LTD.

New features for highest dosing quality

ProMinent®

Controlled solenoid drive allows

- Setting of different dosing profiles
  - Suction and/or discharge stroke can be performed fast or slow
  - Optimal adaption on high viscous or outgassing liquids

- Electronic setting of stroke length resp. stroke volume
  - Total remote control of pump parameters from PLC
  - Pump can be used in filling processes where a certain volume must be dosed in a short time, e.g. filling of ink cartridges

Neev FLUIDEX PVT. LTD.

New features for highest dosing quality

ProMinent®

Controlled solenoid drive allows

- **Standard mode**
  Capacity setting in l/h or via stroke length and – frequency

- **Automatic mode**
  Capacity setting in l/h, pump selects stroke length and frequency, gain is no cavitation and overload with lowest possible energy consumption

Neev FLUIDEX PVT. LTD.

New features for highest economy

ProMinent®

- Solenoid drive has only one moving part, no gear etc.
- Load on the bearings is independent from back pressure
- Solenoid drive is safe against overload
- Energy saving operation
- Relief valves can be spared thanks to overpressure detection
- Wide capacity range spares different pump types

Neev FLUIDEX PVT. LTD.

Technical characteristics

ProMinent®

- Capacity range 2 – 45 l/h, 25 – 2 bar with 6 dosing head sizes
- Dosing head/valve/seal materials
  - PP PVDF PTFE
  - PVDF PVDF PTFE
  - PMMA PVDF PTFE
  - PTFE PTFE PTFE
  - SS SS PTFE

  Suitable for all liquids in water treatment, chemical industry, …

- Easy to install thanks to click in foot console

Neev FLUIDEX PVT. LTD.

Technical characteristics

ProMinent®

Control possibilities

- Capacity setting manually (internal control)
- Internal 7 day timer for dosing programs, e.g. in cooling water treatment
- External control by
  - Contact signal e.g. from a water meter
  - Analog signal 0/4 – 20 mA or
  - Fieldbus signal e.g. from PLC

Neev FLUIDEX PVT. LTD.

Technical characteristics

ProMinent®

Inputs

- Contact
- Analog
- Pause
- Auxiliar frequency
- 2 stage level switch

Outputs

- Relay
- Analog 0/4-20 mA for capacity settings

Communication

- Fieldbus as Profibus, Profinet, CANbus, Modbus etc.
- Bluetooth for programming with smartphone etc.

Neev FLUIDEX PVT. LTD.

Thank You

510, Shreeya Amalga,
Opp Avalon Hotel,Off sindhu Bhavan Road,
Ahmedabad - 380059

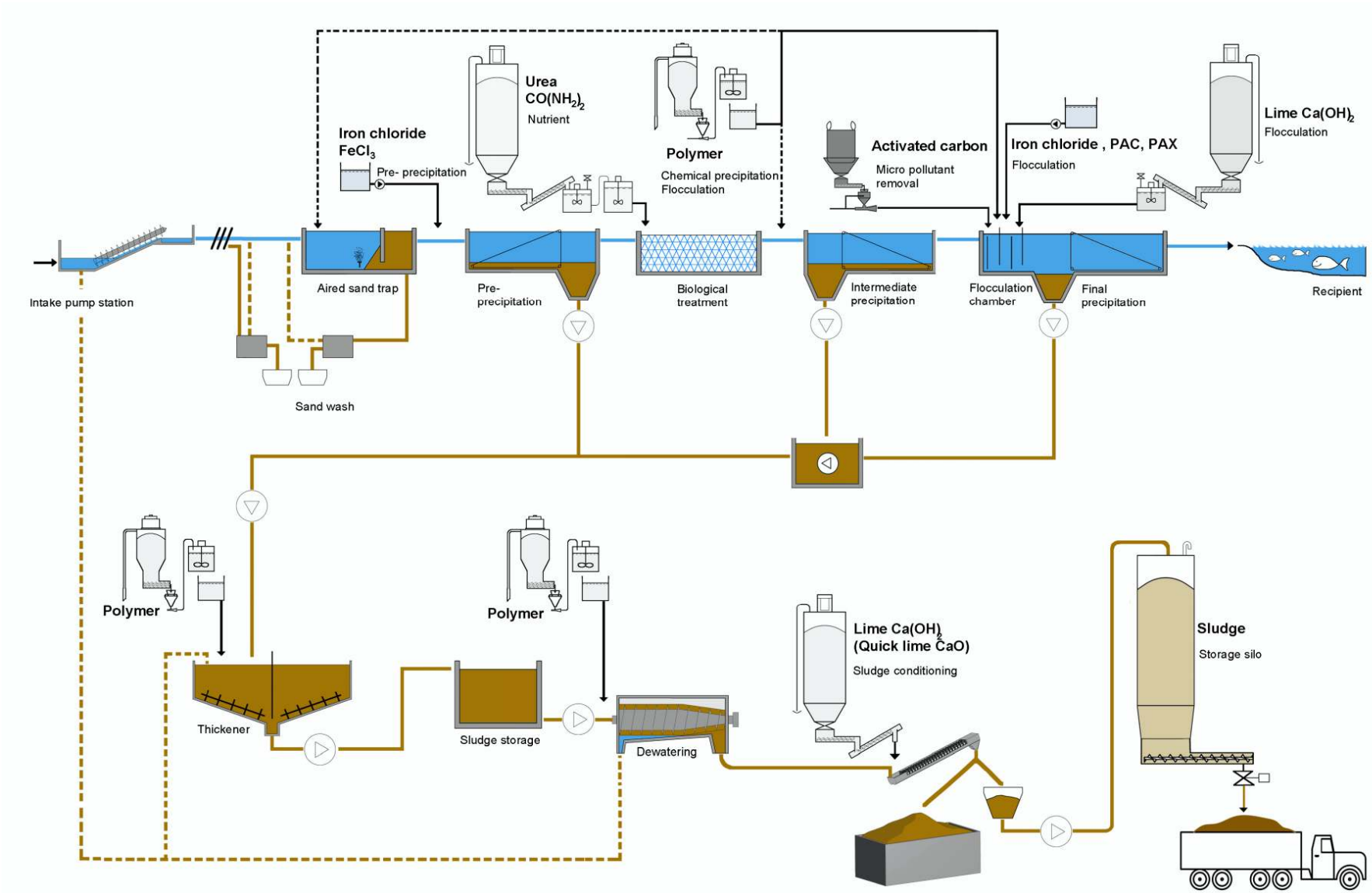
PolyRex – Polymer make-up unit

Precision+Reliability

Tomal AB
Bol 110
311 65 Vessigebro, Tel +46 (0)346 - 71 31 00

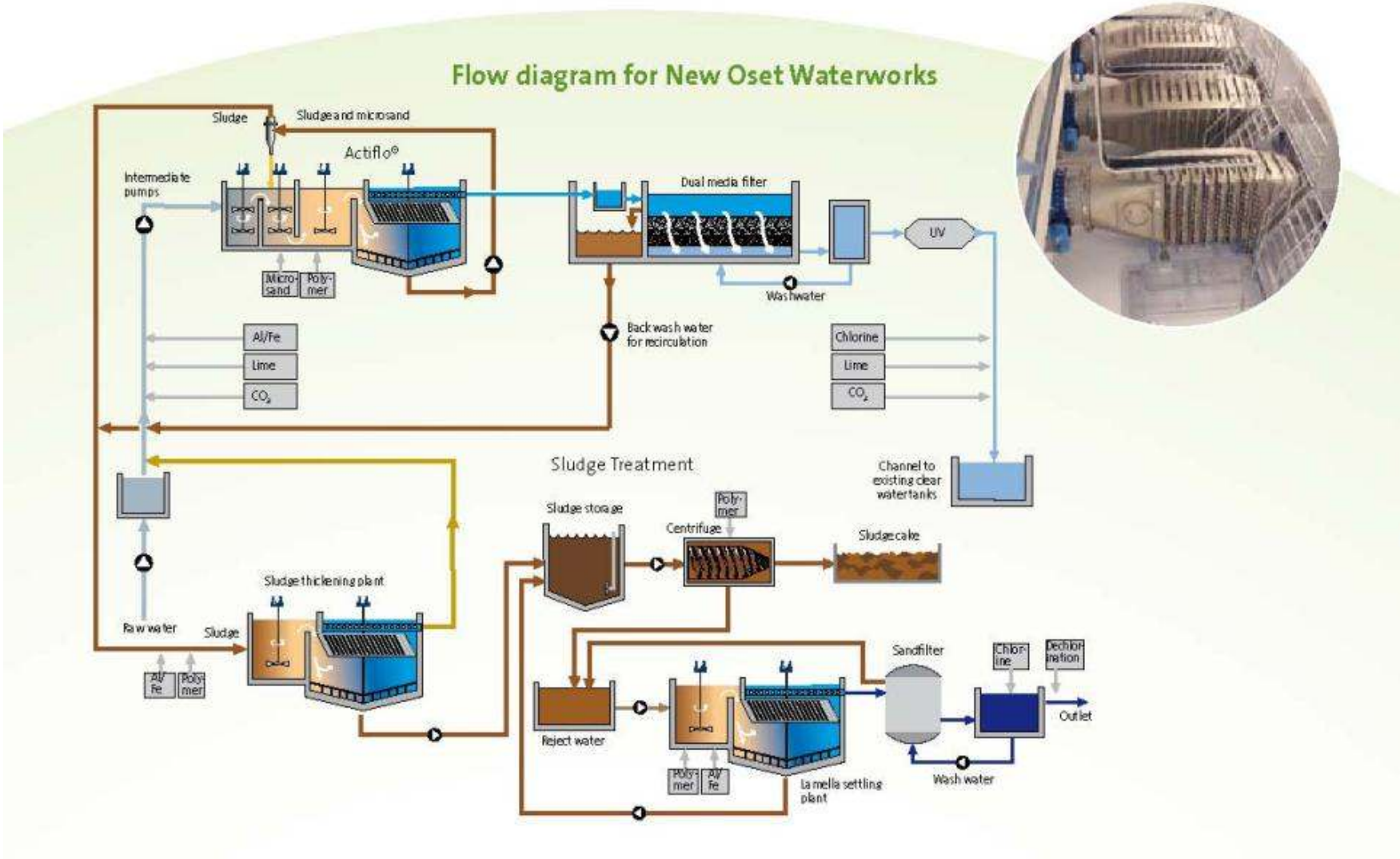
Tomal metering system in Waste water treatment

Precision+Reliability



Tomal metering system in Water treatment

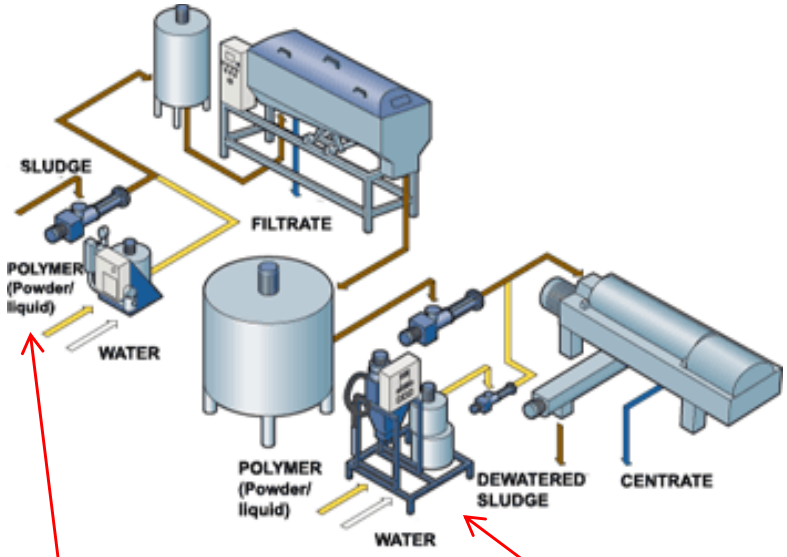
Precision+Reliability



PolyRex within Sludge dewatering

Polymer is needed to obtain a good result in the sludge dewatering process.

The polymer consists of elongated and charged hydrocarbon molecules that make the sludge lumps and becomes more water repellent. In this way the dry content of the ready-treated sludge is raised, which facilitates further handling. Polymer solution is prepared with powder or liquid polymers.



Tomal wide range of different polymer make-up units

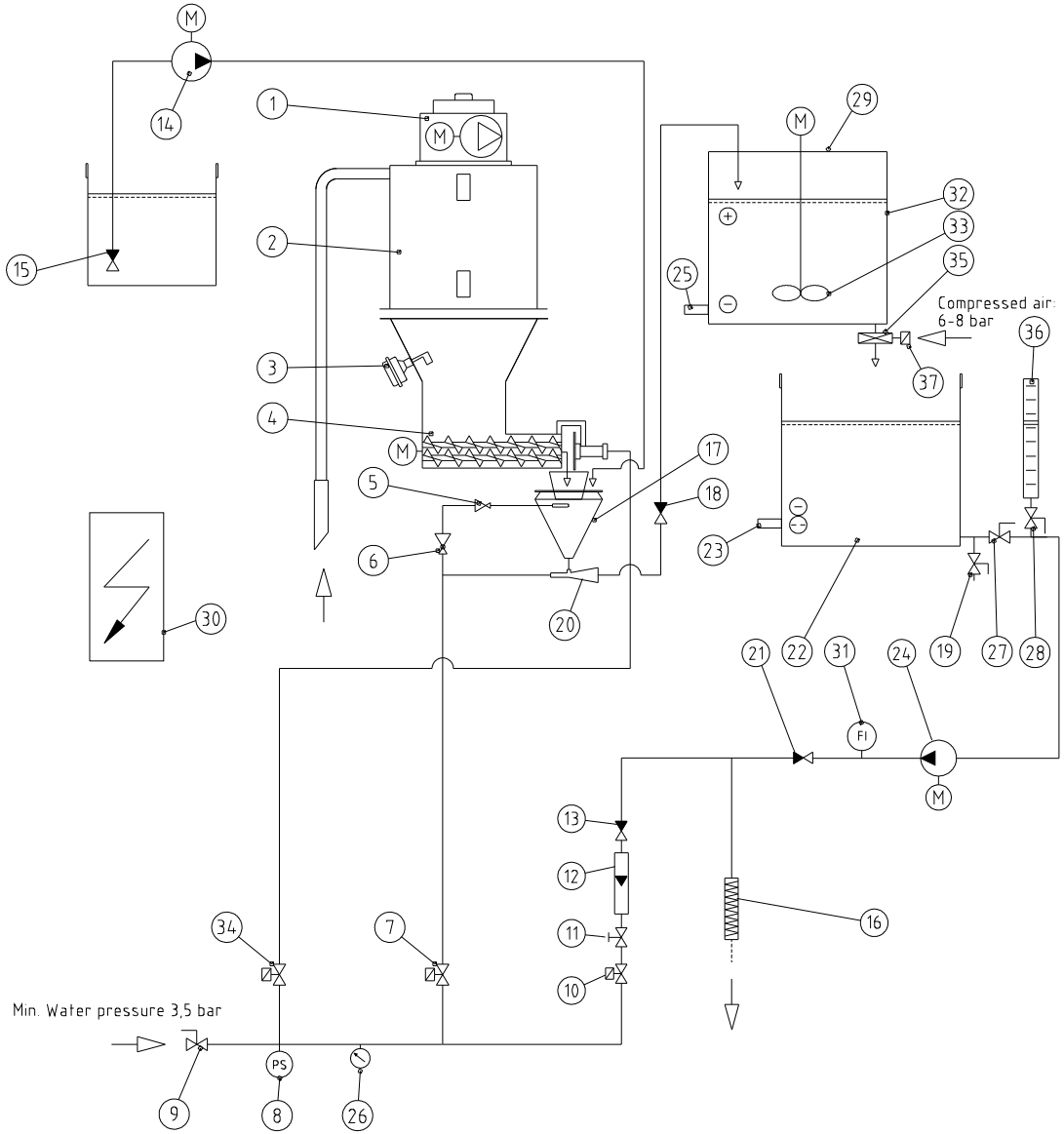
- PolyRex-Batchwise make-up of POWDER and LIQUID polymers
- PolyRex Liquid -Batchwise production of LIQUID polymers
- PolyRex in Customer Adapted Design – e.g. continuous preparation unit, ATEX units (Ex-proof)

Polymer make-up unit PolyRex

Universal system for batchwise preparation of polymer solutions.

- Turn-key automatic machine
- User friendly PLC-control with touch panel
- Multiscrew feeder - High accuracy
- High effective step-by-step mixing system
- Tanks in stainless steel AISI 304
- Vacuum conveyor - friendly environment
- Wide range of options
- Over 2000 units in 60 countries

PolyRex Flow diagram vacuum conveyor unit



PolyRex Capacity range

Machine capacity:

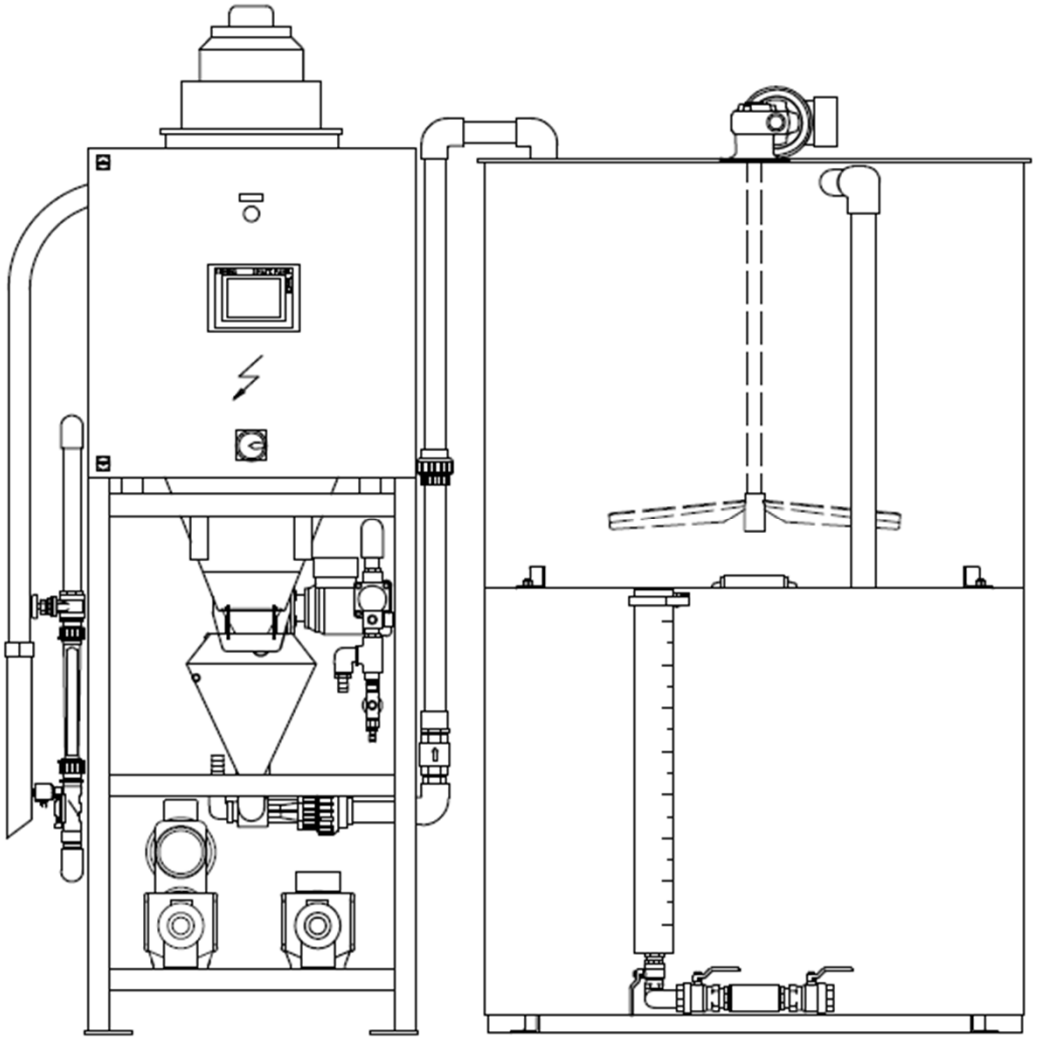
- Max. preparation capacity at 0,5 % or 0,25% stock solution concentration and 60-45 min. maturing time.

		0,5% solution	0,25% solution
PolyRex 0.6	(2 x 0,3 m³)	1,0 - 1,2 kg /h	0,5 - 0,6 kg /h
PolyRex 1.0	(2 x 0,5 m³)	1,8 - 2,3 kg h	0,9 - 1,1 kg /h
PolyRex 2.0	(2 x 1,0 m³)	3,8 - 4,7 kg /h	1,9 - 2,3 kg /h
PolyRex 3.0	(2 x 1,5 m³)	5,1 - 6,4 kg /h	2,5 - 3,2 kg /h
PolyRex 4.0	(2 x 2,0 m³)	7,7 - 9,5 kg /h	3,8 - 4,7 kg /h
PolyRex 5.4	(2 x 2,7 m³)	9,8 - 12,0 kg /h	4,9 - 6,0 kg /h
PolyRex 6.6	(2 x 3,3 m³)	12,9 - 16,0 kg /h	6,8 - 8,6 kg /h
PolyRex 8.4	(2 x 4,2 m³)	15,6 - 19,1 kg /h	8,3 - 10,4 kg /h
PolyRex Maxi 11	(2 x 5,5 m³)	20,7 - 25,5 kg /h	11,1 - 14,0 kg /h
PolyRex Maxi 16	(2 x 8,0 m³)	27,4 - 33,0 kg /h	15,1 - 18,6 kg /h
PolyRex Maxi 23	(2 x 11,5 m³)	34,8 - 41,0 kg /h	19,7 - 23,8 kg /h

PolyRex Small bag handling system

Support with vacuum conveyor

A powder hopper is filled up from a vacuum conveyor.



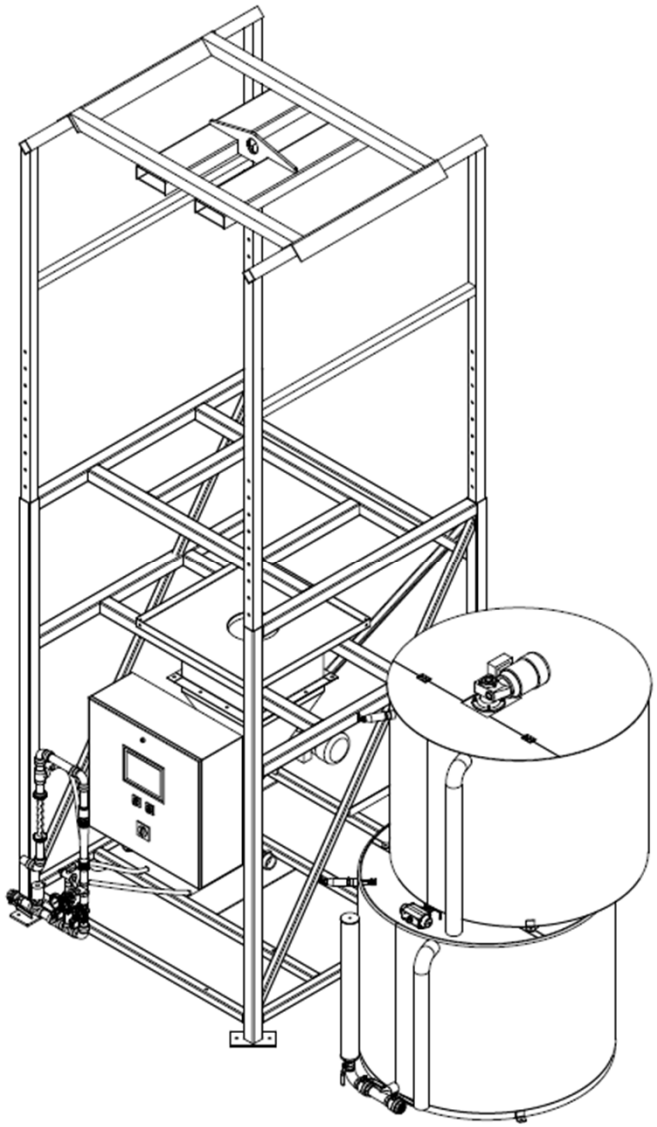
PolyRex Big bag handling system

Big-bag table

Lifting device
required at site.

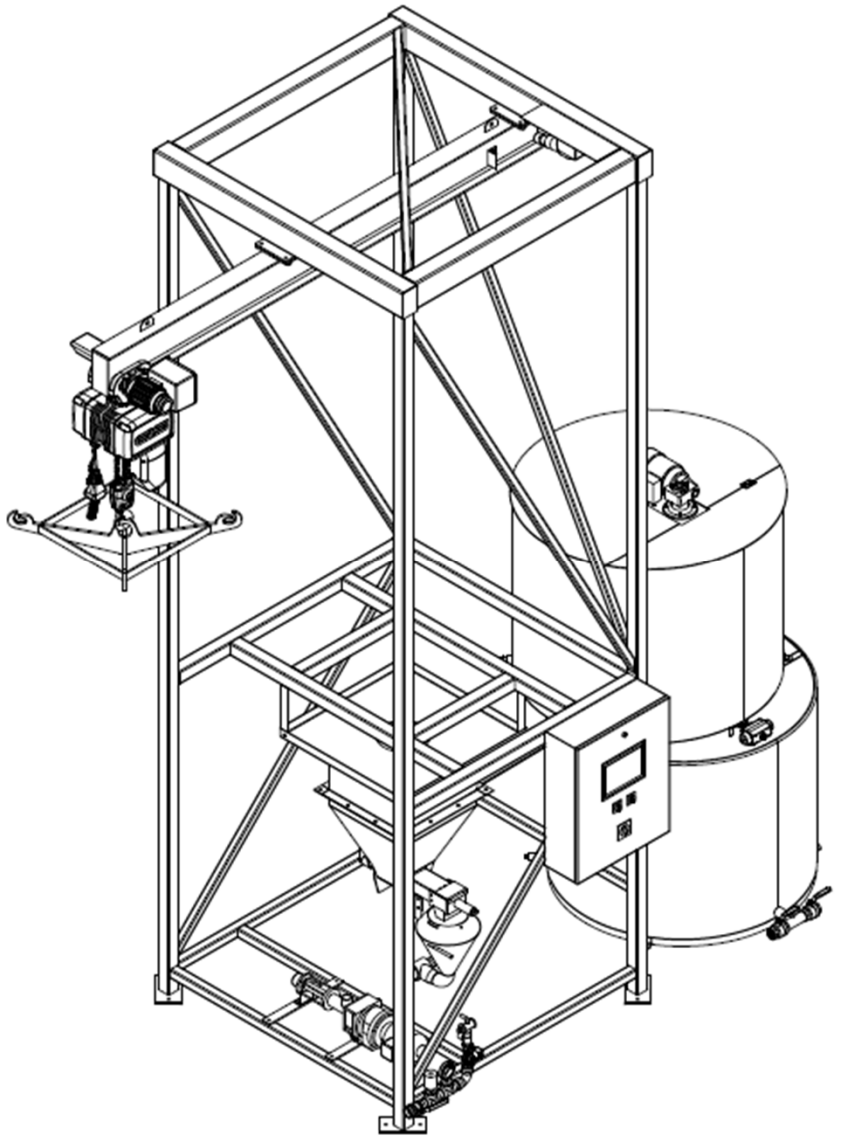
Adjustable big-bag support

Fork-lift or lifting device
required at site.



PolyRex Big bag handling system

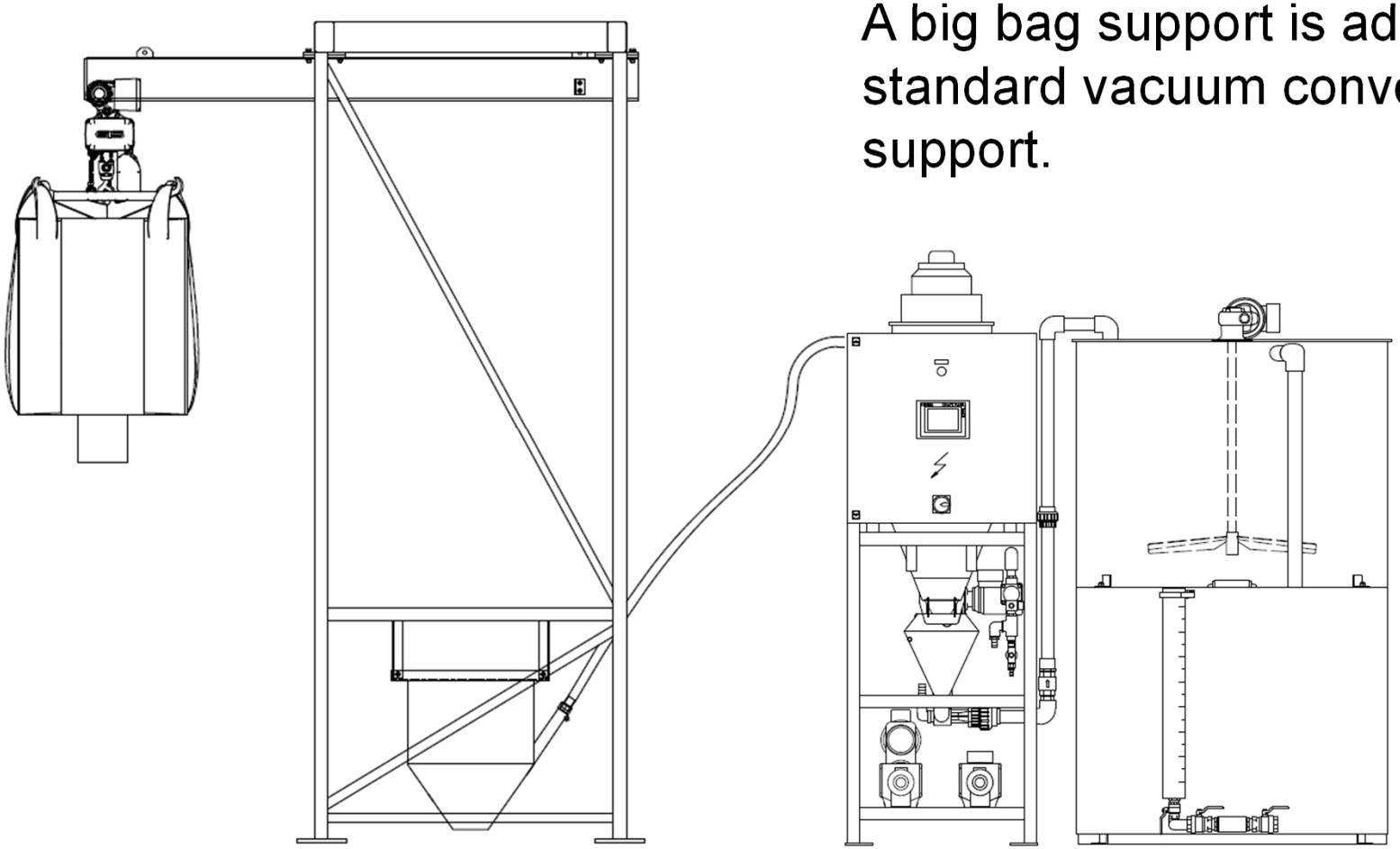
Hoist stand with integrated electrical chain hoist.



PolyRex Big bag handling system

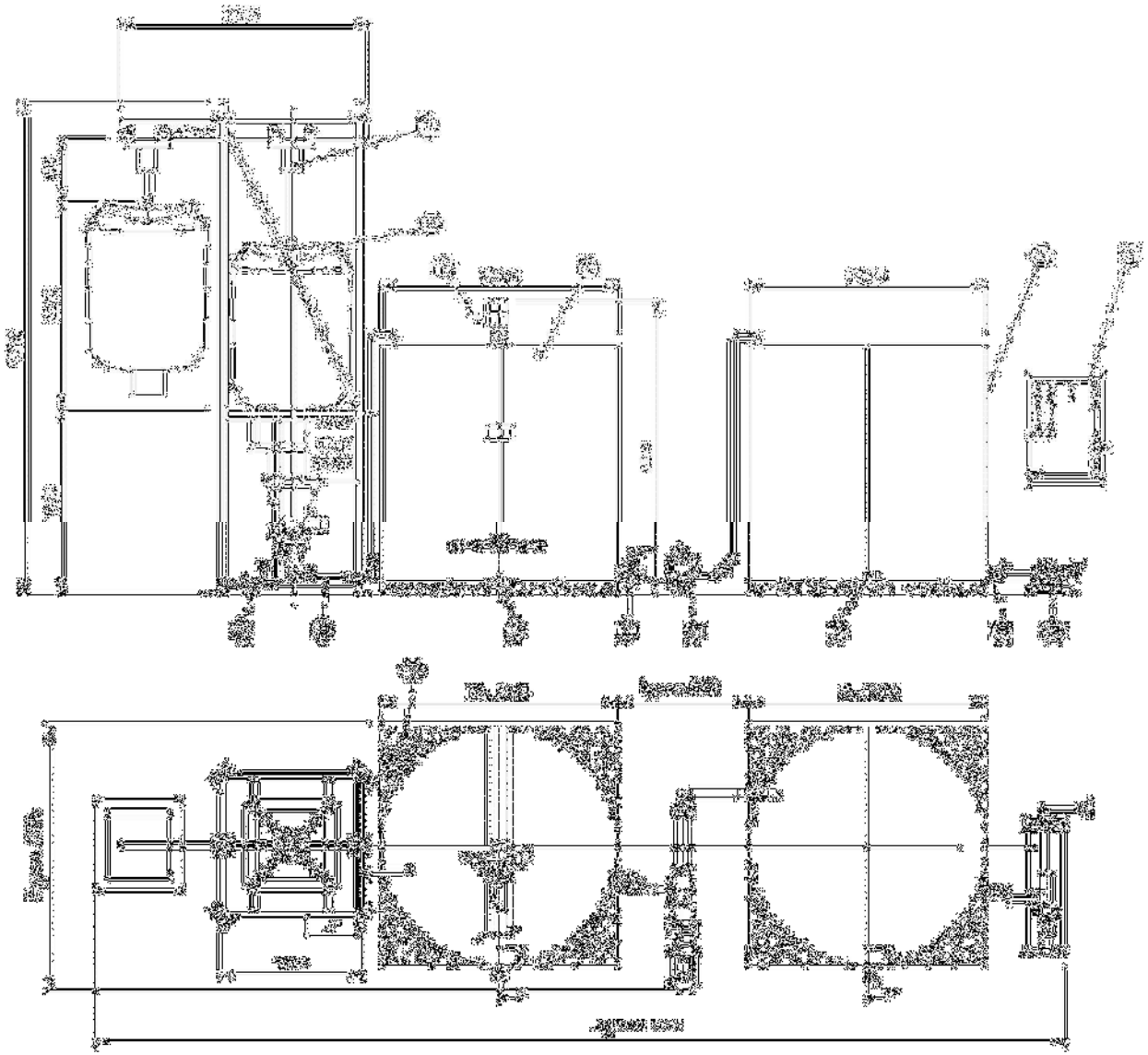
Support stand for vacuum transport

A big bag support is added to a standard vacuum conveyor support.



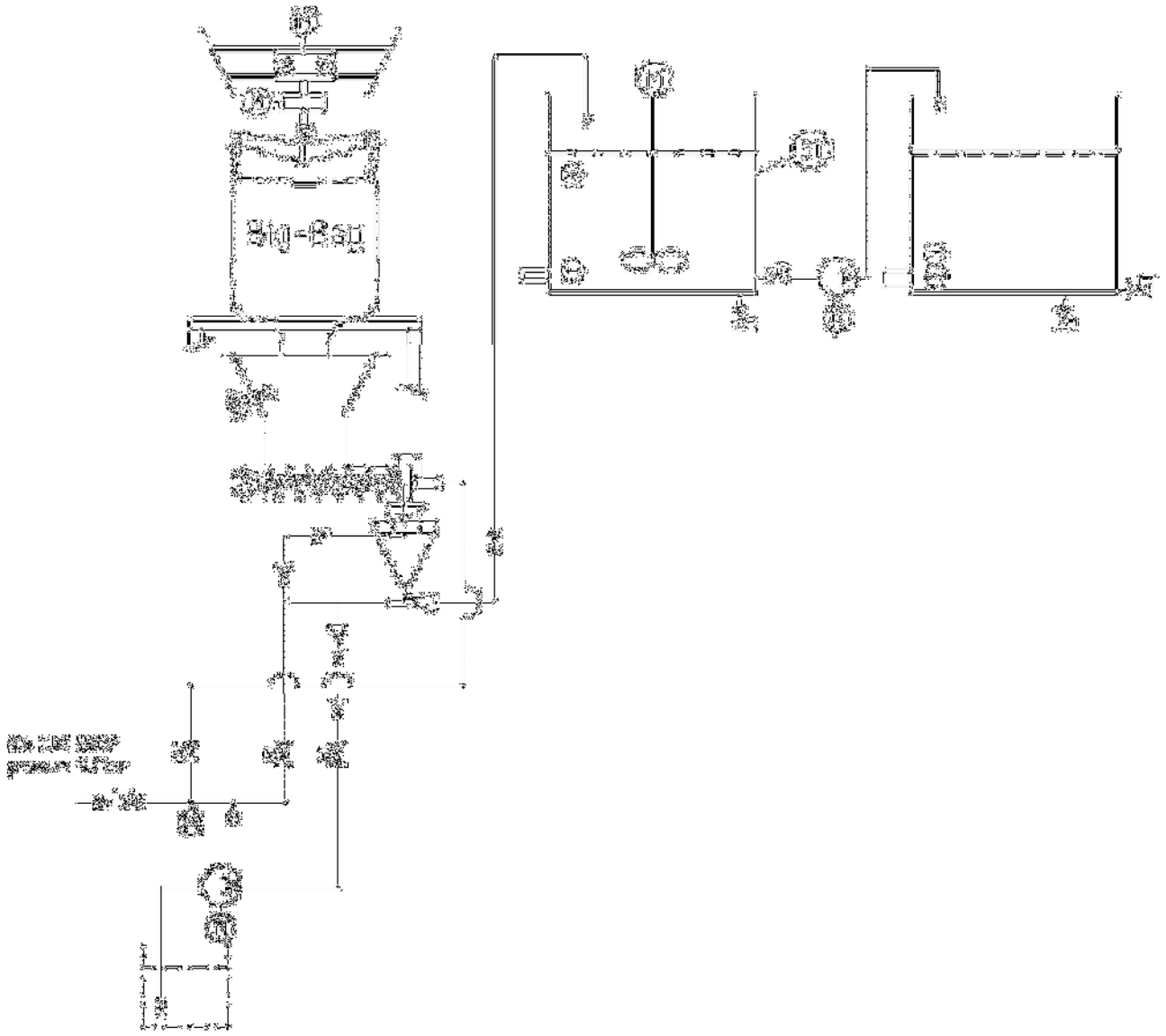
PolyRex Big bag handling system

PolyRex Maxi 16 with integrated lifting hoist.



PolyRex Big bag handling system

PolyRex Maxi 16
with integrated
lifting hoist.



PolyRex Classic Wetting cone system

Wetting cone with teflon coated inlet.

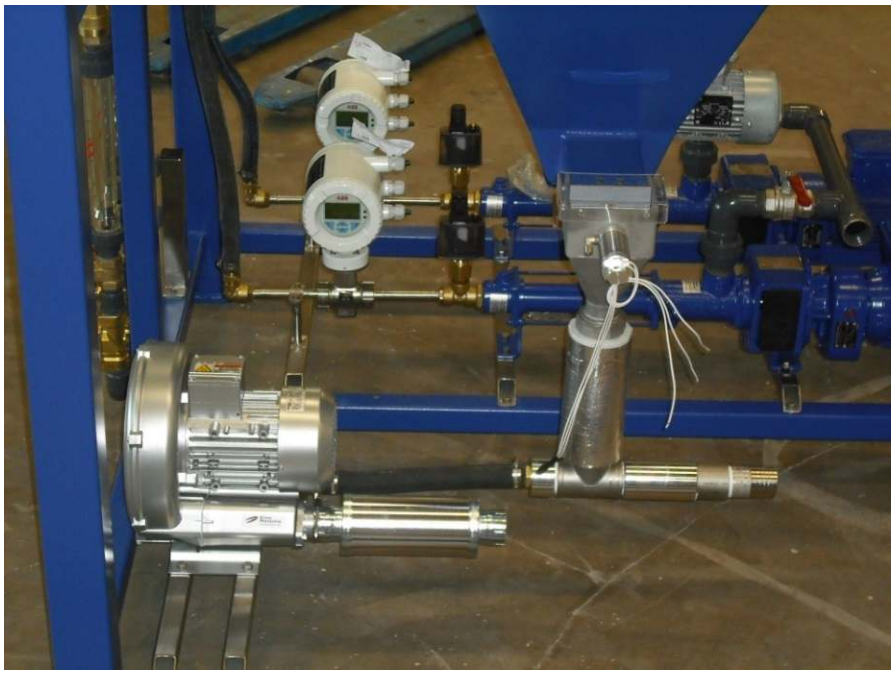
PolyRex Optimo Wetting system

Optimo is suitable for very high efficiencies of polymer mixing. This results in very low polymer consumption.

The unique construction has been developed especially for customers with high demands.

PolyRex AeroMix Wetting cone system

Pneumatic conveying system including a mixing pipe mounted on top of the mixing tank.



PolyRex Dust Free big bag handling system

Suitable for Big-bags with outlet spout. The outlet spout of the bag is sealed before opening.

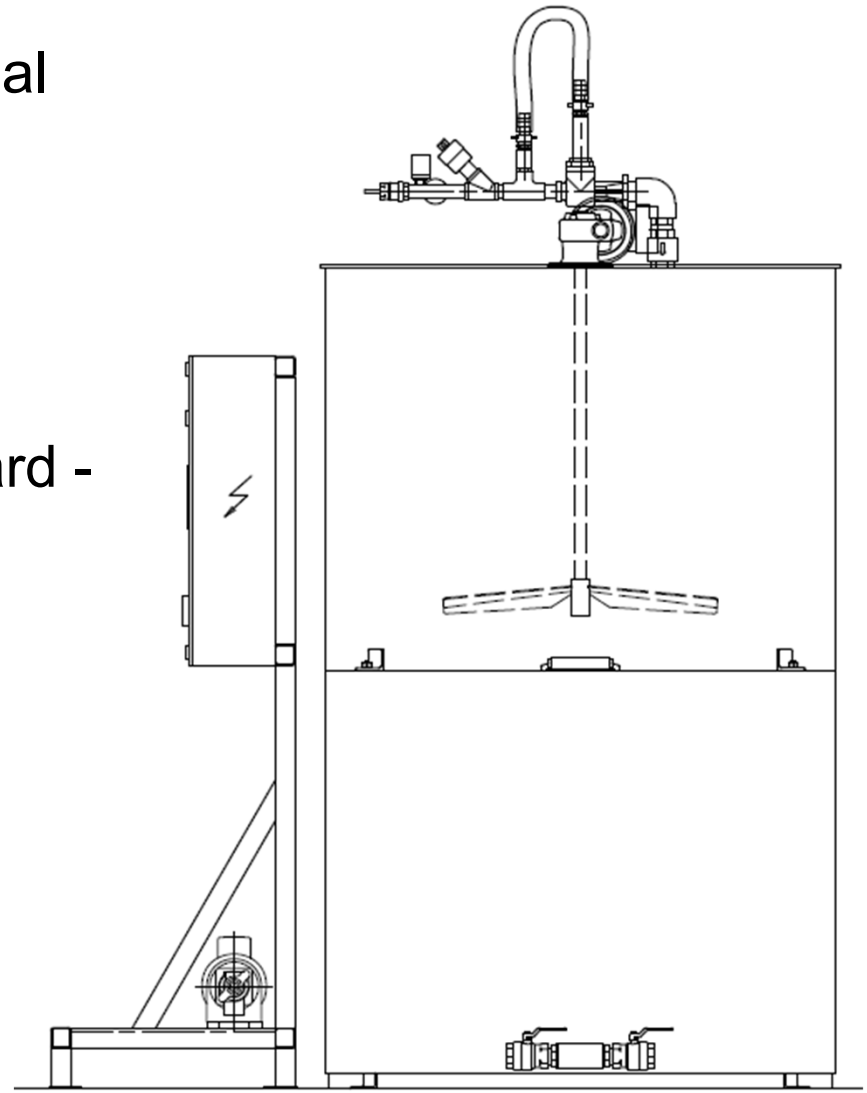
PolyRex Dust Free big bag handling system

Dustfilter with exhaust fan and Big-Bag cone with vibrator

Polymer make-up unit PolyRex Liquid

Batchwise peparation of commercial liquid polymer

- Ensures a fully activated polymer solution!
- Stainless steel execution standard - Long lifetime!

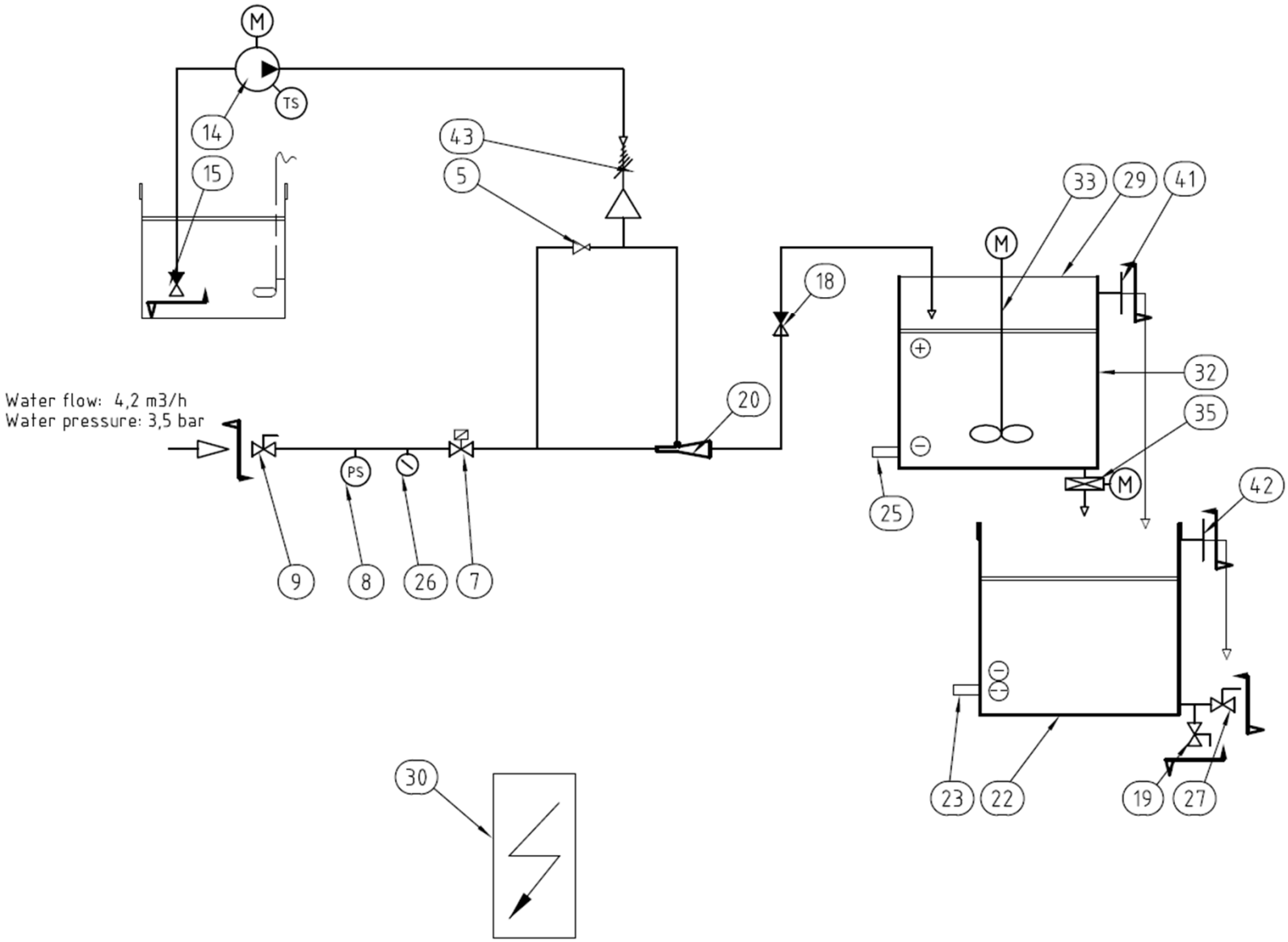


Polymer make-up unit PolyRex Liquid

- Injection nozzle for commercial liquid polymer!
- High energy mix-in via water injector

Polymer make-up unit PolyRex Liquid

Precision+Reliability



Polymer make-up unit PolyRex Liquid

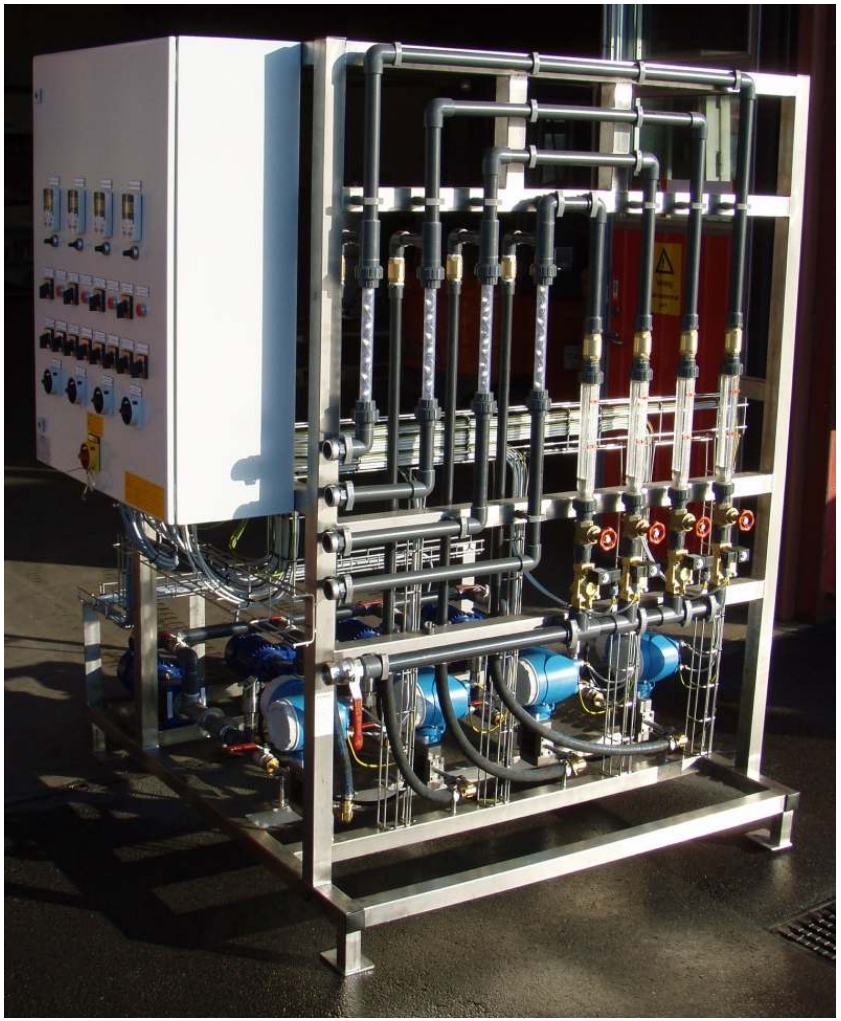
Machine capacity:

- Max. preparation capacity at 0,5 % or 0,25% stock solution concentration calculated from 100% active polymer.

Concentration:	0,5% solution				0,25% solution		
Maturing time:	15	30	60	min	15	30	60
PolyRex Liquid 1.0 (2x0,5 m³)	5,3	3,2	1,8	kg/h	2,9	1,7	0,9
PolyRex Liquid 2.0 (2x1,0 m³)	9,5	6,4	3,8	kg/h	5,7	3,5	2
PolyRex Liquid 3.0 (2x1,5 m³)	12,4	8,2	4,9	kg/h	7,5	4,6	2,6
PolyRex Liquid 4.0 (2x2,0 m³)	15,9	11,4	7,2	kg/h	10,2	6,7	4

Polymer pump skid

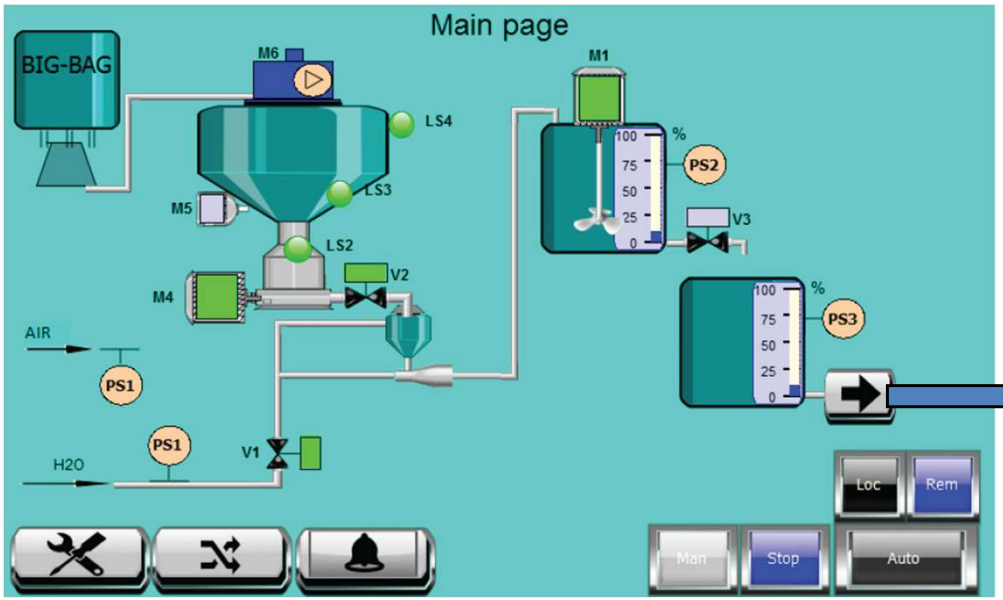
Separate pump skid including post dilution equipment.

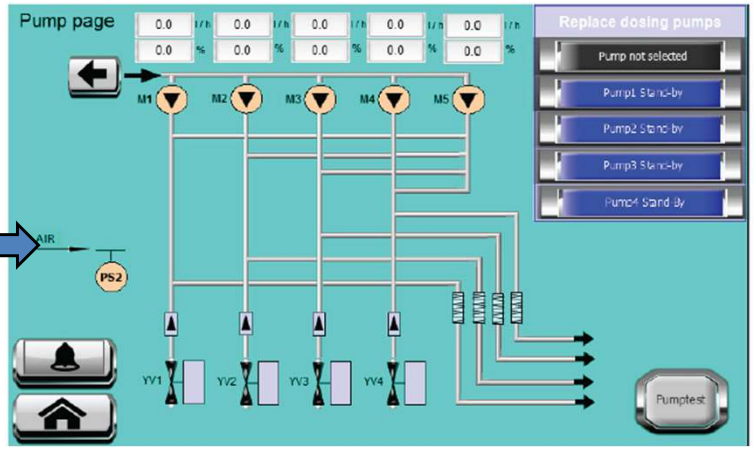


PolyRex User friendly controls

Standard control:
ABB PLC type AC500 PM554-T-ETH
with touch panel CP635

Example from a project specific panel layout:





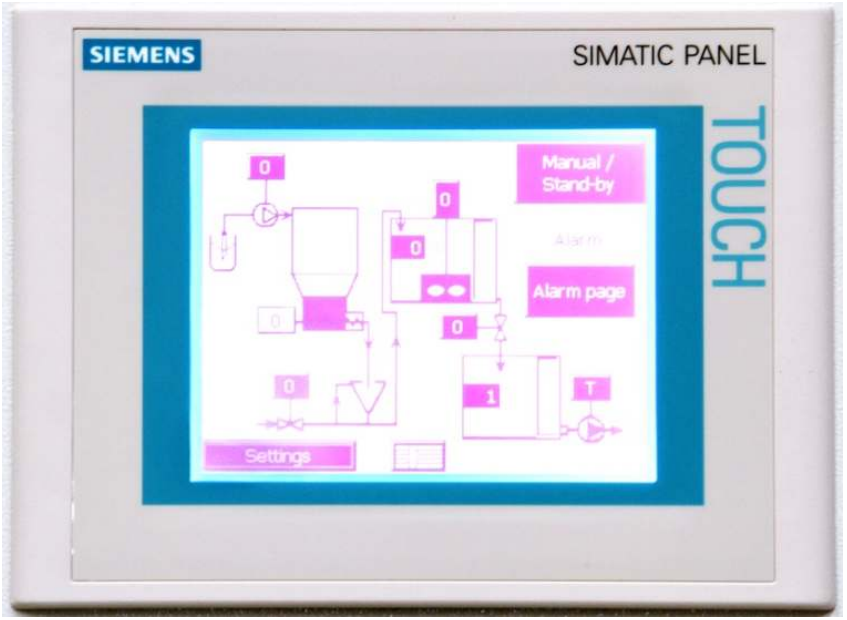
PolyRex User friendly controls

Optional controls:

Siemens PLC S-224 and touch display TP 177 Micro.

Allen Bradley MicroLogix 1400 and touch panel C600

Communication interfaces: Profibus DP, Ethernet or Modbus



PolyRex ATEX Gas design

Oil&Gas application in Kollsnes / Norway

PolyRex ATEX Gas design

ATEX Zone 1, gas group IIB, T3.
A complete preparation unit for liquid polymer emulsion inlcuding 2 feeding lines with pumps, electromag flow meters and emulsion tanks with radar level indicator. All material in AISI316 with pipe work type Parker.

Statoil that runs Kollsnes asked AkerSolution to rebuild the gas plant during process.
Krüger Kaldnes is responsible for the water treatment of the process water that contains methanole and glycole (MEG). In this process Tomal polymer unit is included.

PolyRex ATEX Gas design

Oil&Gas application in Rosneft / Russia

PolyRex ATEX Gas design

In the beginning of 2011 Tomal got their first order for preparation of polymer powder in an Ex-classified zone. The delivery consist of a PolyRex 2,0 with “liquid option” for ATEX Zone 2, GAS group IIB, Temp class T3. A complete preparation unit for both polymer powder and polymer emulsion including dosing pump and a separate vacuum conveyor (Ruwac). Tanks and pipe work are made in AISI 316. The support is made in AISI 304.

Rosneft’s refinery in Tuapse is the company’s oldest and was commissioned in 1929. The refinery is located on the east side of the Black sea coast and it is specialized in the production of motor fuel. “Slop oil” is a low quality waste oils that are generated in the refining crude oil process. The “slop oil” can’t be used without cleaning. Tomal’s equipment is included in the “slop oil” cleaning process.

PolyRex Standard and Norms

- Tomal AB is certified acc. to SS-EN ISO 9001
- Control panel and wiring according to SS-EN 60204-1
- Quality requirements of welding SS-EN 729-3
- Approval testing of welders SS-EN 287-1
- Guidance on quality levels for imperfections SS-EN 5817-C

Note!! Tomal has a special quality presentation.

Visit our website www.tomal.se

TOMAL®
METERING SYSTEMS

ProMinent® Group

HOME | COMPANY | QUALITY & ENVIRONMENT | APPLICATIONS | PRODUCTS | CONTACT

Metering systems for solids

Tomal AB is an engineering company with mechanical production that produce and sell custom made metering equipment. At present Tomal have 63 employees.
We are one of the leading companies in our branch, with deliveries to communities and industries on the international market, where 80% of our deliveries are export. Our work is carried out in Vessigebro, just outside of Falkenberg at the lovely west coast of Sweden.
We are certified according to ISO 9001:2008.

Tomal's business idea

- Development, manufacturing and sales of custom made metering equipment for solids.
- Reliable discharge and high accuracy.
- Delivery, mounting and service to industries and municipalities at the international market.

News

2013-06-05
Updated homepage for use of smartphones

2012-02-23
New EU-directives

2012-02-23
ISO 9001:2008 renewed 3-years certification

News Archive »

Interesting deliveries