

TABLE OF CONTENTS

1. Technical Specifications

- 1.1 Module Description
- 1.2 – 1.18 Description of Hardware and Software

2. Delivery terms

- 2.1 Service and Scope of delivery
- 2.2 Pricing
- 2.3 Offer validity
- 2.4 Installation and Commissioning
- 2.5 Packaging

3. Contractual agreements

- 3.1 Warranty
- 3.2 Terms of Payment
- 3.3 Delivery time
- 3.4 General Information
- 3.5 Service Contract

2. TECHNICAL SPECIFICATIONS

2.1 Module Descriptions

Pos.	Quantity	Description
1		Etching- and Copper recovery system for 2.5kg copper hour
1.1		Electrolysis cell consisting of:

- 1 - 1 Master electrolysis cell made of PVC
 - with one set of anode and one cathode sheet,
 - with contact rails and 15 bipolar plates made of V2A,
 - Glass lid with lid lock,
 - One button for electrolysis cell,
 - Exhaust air connection, PVC, d = 63,
 - Terminal box with intermediate cable
 - 4 adjustable feet
 - 2 double thermostats
 - for monitoring the anode and cathode temperature
 - 1 thermostat for regulating the cell temperature
 - 1 safety thermostat
 - 1 level probe, min. Level cell
 - 1 filter pump, 0.75 kW, with filter and PP pleated filter cartridge
 - 20 "10 µ, with piping to the electrolysis cell
 - 1 solenoid valve, PVC, d = 20
 - 1 solenoid valve, PVC, d = 20
 - 1 dosing pump, PP / EPDM, 0.37 kW
 - adjustable from 0 - 180 l / h
 - 1 level probe, TG, max. Operating level
 - 2 cooling systems, V2A
 - 1 solenoid valve, PVC, d = 20

1.2 **buffer tank (80 g Cu / l) consisting of:**

- 1 - 1 buffer tank 1 made of PP (80 g Cu / l)
 - Dimensions: diameter = 2,000 mm, H = 1,600 mm,
 - with an additional 1 chambers for electrolysis cells
 - and each with a manhole,
 - Side walls, bottom and lid completely insulated,
 - prepared to accommodate max. 2 electrolytic cells,
 - Tank volume approx. 5500 l,
 - Working volume approx. 5000 l,
 - Terminal box with intermediate cable
 - 1 heaters, Teflon, 2.0 kW
 - 1 temperature sensor
 - 1 safety thermostat
 - 1 level probe (TG)
 - 1 pH measurement
 - 1 dosing pump for accelerator with control 4 - 20 mA
 - for stepless regulation
 - 1 pump console

1.3 **buffer tank (30 g Cu / l) consisting of:**

- 1 - 1 buffer tank made of PP (30 g Cu / l)
 - Dimensions: diameter = 2,000 mm, height = 1700 mm,
 - with a manhole,
 - Side walls, bottom and lid completely insulated,

 - 1 connecting tube, d = 32, to the electrolysis cells,
 - Tank volume approx. 5,500 l,

Working volume approx. 5,000 l,
Terminal box with intermediate cable and cable route
1 heater, Teflon 2.0 kW
1 temperature sensor
1 safety thermostat
1 level probe (TG)
1 dosing pump controlled by density control

1.4 **Control cabinets**

- 1 - with control, transformer, and rectifier

1.5 **Switch cabinet**

- 1 - to control the buffer system and the pH value

Liquids and accessories

- 1.6 - Additional display for all functions of the cells and the buffer system on the Etching machine
- 1.7 - 3000 liter batch solution for first filling
- 1.8 - 25 liter accelerator 40 starters
- 1.9 - Complete piping to the etching machine is supplied and installed (pipe and cable route Provided by the customer)
50 end ventilation line for the buffer tanks up to the building roof
- 1.10 - Gas supply Complete with pressure reducer and connecting hoses and gas cabinet TÜV Checked.
- 1.11 - Floor pan made of PP 8.00X3.00X0.25 m
- 1.12 - 2 Additional set of anode cathode sheets
- 1.13 - 3 solenoid valves
- 1.14 - 1 SERA dosing pump
- 1.15 - 1 Set of Ph electrodes (glass and reference electrode) 1 filter insert
- 1.16 - Cooling unit 22 KW cooling capacity
- 1.17 - Electricity meter with terminal box
- 1.18 - Price 1 liter accelerator 40
- Price 1 liter accelerator 40 starters

2.2 Description of the hardware and software

PLC Siemens Simatic S7 to control the process machine.

Visualization for operating the system and visualization of the process flow.

Operation and display in German or English Russian

- Graphic representation of the plant.
- Visualization of messages, warnings and faults.
- Logging warnings and faults.
- Plausibility check of input values.

4.1 Warranty and Options

24 months, from start-up

GGP has the option to retrofit a second E-cell with a capacity of 2.5kg / hour, which can be operated in parallel or separately.

Complete including installation and commissioning:

This option has a term of 3 years from the commissioning of the system from this offer.

4.2 Terms of payment

40% upon receipt of order

20% upon delivery

30% after commissioning and acceptance

10% after 2 weeks of trouble-free running

4.3 Delivery time

Approx. 3 months, each after receipt of order and technical clarification.

4.4 General information

Capacity data and process times refer to the system specified here.

If there are no requirements regarding process times, we will provide generally average process times for the capacity calculation.

A responsibility for loss of capacity due to unknown

We have to reject the properties of process chemistry.

4.5 Service contract on the following conditions

- Flat rate for arrival and departure
- Hourly rate for work on site
- Flat rate for planned maintenance appointments
- Possibly, accruing accommodation costs are borne by GGP
- Response time for on-site use: Max 24 hours
- Replacement pump delivery: within 24 hours