Technical specification of the subject of the public contract

The instruments must include all components listed below and must fulfil the following minimal requirements set by the Contracting Authority:

A. Magnetic Hotplate Stirrer (15 units)

The heating plate must be round and made from aluminium alloy.
The plate must have a minimum diameter of 130 mm.
The device must achieve a stirring capacity in the minimal range of 0,25l to 20 liters for H_2O
The speed range must be between 50 and 1500 rpm or better.
The maximum dimensions of the device must not exceed 200 mm (width) x 100 mm (depth) x 300 mm (height).
The temperature control accuracy must be ±0.5°C or better with an external sensor.
The temperature setting range must be at least between ambient +15°C to 310°C.
The heat control accuracy of heating plate (at 100°C) must be ±5°K or better.
The heat output must be at least 600 W.
The device weight must not exceed 2.5 kg.
The device must feature to visualise the realtime temperature and stirring speed.

B. Rotary Evaporator (5 units)

The rotary vacuum evaporator must have an adjustable rotation speed ranging at least from 20 rpm to 280 rpm.
The rotary vacuum evaporator must feature manual lifting of the evaporating flask from the bath.
The rotary vacuum evaporator must include an integrated heating bath with a minimum temperature range of at least 20°C to 95°C.
The heating bath must have a minimum volume of 4 liters.
The rotary vacuum evaporator must be equipped with a vertical condenser.
The vertical condenser must have a standard joint (SJ) 29/32 that is plastic-coated (to enhance durability and chemical resistance).

C. Diaphragm Vacuum pump for rotary evaporator (5 units)

The diaphragm vacuum pump must be made from PTFE (Polytetrafluoroethylene) and must be chemically resistant.
The vacuum pump must have a minimum pumping capacity of at least 1.5 m^3/h
The vacuum pump must achieve a vacuum level of at least 10 mbar.
The vacuum pump must be equipped with a Woulf flask to collect condensate and protect the pump.
The vacuum pump has to work automatically to maintain vacuum level on all the time
The vacuum controller must have a measuring range of at least 1400 – 1 mbar.
The vacuum pump must be compatible with a rotary evaporator described in point B.

D. Chiller (1 units)

The compact recirculating cooler must be designed to support the rotary vacuum evaporator (described in point C).
The cooler must have an adjustable cooling temperature.
The cooler must deliver a cooling power of at least 530 W at 15 °C.
The cooler must provide a minimum cooling power of 390 W at 10 °C.

The cooler must offer a cooling power of at least 120 W at 0 °C.
The adjustable temperature range must be between at least of -10 °C and +25 °C.
The cooler must have the capability of being regulated using the Buchi I-100 interface (the lab is already equiped with Buchi I-100).

E. Combined refrigerator/freezer (3 units)

The unit must have a refrigerator providing at least 200 liters and the freezer offering a minimum of 50 liters.
The refrigerator must have a temperature range adjustable between at least of +3 °C and +15 °C.
The freezer must have a temperature range adjustable between at least-10 °C and -30 °C.
The unit must have feature to display realtime tempratures.
The unit must have an automatic defrost function.
The unit must include a minimum of 5 compartments, consisting of at least 4 shelves.
The unit must be equipped with a mechanical door lock.
The unit must have a network outage alarm.
The unit must operate at a sound level not exceeding 49 dB.
The unit must not have a weight more than 90 kg.

F. Refrigerator (4 units)

The unit must have at least capacity of 180 liters.
The refrigerator must have a temperature range adjustable between at least of +3 °C and +10 °C.
The unit must feature a digital display for monitoring of the temperature.
The unit must have an automatic defrost function.
The unit must include a minimum of 3 plastic-coated grid shelves.
The unit must be equipped with a mechanical door lock.
The unit must have a network outage alarm.
The unit must operate at a sound level not exceeding 45 dB.
The unit must not have a weight more than 40 kg.

G. Oven (2 units)

The oven unit must have a minimum capacity of 60 liters.
The oven unit must utilize natural convection, distribution without the use of a fan.
The oven unit must have a temperature range adjustable between at least of 50 °C and 250 °C.
The oven unit must have a temperature fluctuation of ±0.4 °C at 150 °C or better.
The oven unit must have a stainless steel chamber.
The oven unit must feature to display real-time temperatures.
The oven unit must have an automatic over-temperature alarm system.
The oven unit must be supplied with a minimum of 2 shelves.
The oven unit must have an data interface.
The oven unit must include an exhaust vent that can also serve as an access port for an external temperature sensor.
The internal dimensions must be less than 350×420×500 mm (W×D×H).
The external dimensions must not exceed 550×580×750 mm (W×D×H).

H. Analytical Balance (1 units)

The balance must have a weighing capacity of at least 220 g.
The balance must have a readability of 0.1 mg accuracy or better in measurements.
The balance must have a repeatability of ±0.1 mg or better.

The balance must have a linearity of ±0.2 mg or better.
The balance must feature a round stainless steel weighing pan with a minimum diameter of 90 mm.
The balance must include internal calibration.
The balance must have overload protection.
The balance must be equipped with a glass draft shield.
The balance must support data transfer in PC spreadsheet, PC text, and ASCII protocols.
The balance must include built-in applications with GLP/GMP compliant data output for at least the following functions: weighing and dosing, counting, percentage weighing, density determination, and mass unit conversion.
(GMP and GLP are quality standards applied to the manufacturing of pharmaceuticals and other healthcare products).

I. Balance (1 units)

The balance must have a weighing capacity of at least 2000 g.
The balance must have a readability of 10 mg or better.
The balance must have a repeatability of ±10 mg or better.
The balance must have a linearity of ±20 mg or better.
The balance must feature a round stainless steel weighing pan with a minimum diameter of 180 mm.
The balance must have overload protection.
The balance must support data transfer in PC spreadsheet, PC text, and ASCII protocols.
The balance must include built-in applications with GLP/GMP compliant data output for at least the following functions: weighing and dosing, counting, percentage weighing, density determination, and mass unit conversion.
(GMP and GLP are quality standards applied to the manufacturing of pharmaceuticals and other healthcare products).

J. UV lamp with UV Cabine (1 units)

The UV lamp must have a plastic housing.
The unit must include an observation port with a built-in UV filter in the viewing window.
The interior must be accessible via an established roller shutter on the front.
The UV lamp must support dual wavelengths of 254 nm and 366 nm, with each wavelength powered by 2 x 8 W lamps.
The base dimensions must be a minimum of 400 x 260 mm.
The external dimensions must not exceed 500 x 400 x 300 mm.

K. Ultrasonic bath (2 units)

The equipment must feature power-controlled ultrasound.
It must maintain a temperature range between at least 30 to 80 °C, adjustable in increments of 5 °C or lower.
The minimum capacity of the device must be at least 2 liters.
The ultrasound frequency must be selectable between at least 37 kHz and 80 kHz.
It must provide a minimum heating power of 200 watts.
The tank dimensions must be at least 240 mm wide, 100 mm deep, and 135 mm high.
The external dimensions must not more than 350×250×200 mm (W×D×H).

L. Shaker, Vortex Mixer (2 units)

The equipment must be suitable for tubes up to 30 mm in diameter.
It must be operate with an orbital shaking motion.

The minimum speed of the orbital motion must be 2800 revolutions per minute (min^{-1}).
The maximum mixing capacity must be at least 50 ml.
The dimensions of the equipment must not exceed 100 mm in width, 100 mm in depth, and 80 mm in height.
The maximum weight of the equipment must be less than 1 kg.

M. Mechanical overhead stirrer (2 units)

The unit must have a maximum stirring capacity of at least 25 liters for H_2O.
The unit must support a maximum viscosity of at least 30000 mPas.
The speed range must be adjustable from at least 0/30 to 2000 min^{-1}.
The unit must have a maximum torque at the chuck of at least 40 Ncm.
The chuck range must be from at least 0.5 to 10 mm.
The output power of the motor must be minimum 87 W.
The unit dimensions must be less than 100×210×250 mm (W×D×H).
The unit must weigh less than 5 kg.

N. Vacuum PUMP (2 units)

The unit must achieve a final vacuum of at least 2×10^{-3} mbar.
The unit must achieve a final vacuum of at least 1×10^{-2} mbar with gas ballast.
The unit must have a protection class of IP 40 or better.
The outlet connection must be a hose nozzle with a diameter of DN 8 - 10 mm.
The inlet connection must be a small flange KF DN 16.
The unit dimensions must be maximaly 350×550×250 mm (W×D×H).
The unit must not weigh more than 30 kg.

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A. Magnetic Hotplate Stirrer (15 units)

The RCT basic magnetic stirrer provides reliability, an exceptionally long product lifetime and the highest safety standards. RCT basic is suitable for stirring tasks up to 20 L (H_2O) and reaches temperatures up to 310 °C. With the connection option for an external temperature sensor (PT1000.60), the temperature can be measured and controlled directly in the reaction medium. Thanks to insulation of the aluminium heating plate, maintenance-free EC motor and electronic switching power supply, RCT basic features excellent energy efficiency as well as reduced self-heating of the heating plate during stirring operation, contributing to a more sustainable laboratory.

Tempered shatter-proof glass surface for optimal chemical resistance and easy cleaning
Large display with easy to read LED display
Illuminated symbols for displaying important status information (set and actual temperature, heating status), temperature sensor
USB and RS232 interface for control or documentation of the test parameters via a PC
Compatible with labworldsoft® laboratory software
QR code for quick access to device information, accessories, downloads and extended warranty
Easily accessible main switch on the front of the device

Technical Data

Number of stirring positions	1
Stirring quantity max. per stirring position (H2O)	20 l
Maximun load	25 kg
Motor rating output	9 W
Direction of rotation	right
Speed display set-value	LED
Speed display actual-value	LED
Speed adjustment	Turning knob
Speed range	50 - 1500 rpm
Setting accuracy speed	10 rpm
Stirring bar length	20 - 80 mm
Self-heating of the set-up plate by max. stirring (RT:22°C/duration:1h)	+17 K
Heat output	600 W
Temperature display set-value	LED
Temperature display actual-value	LED
Temperature unit	°C
Heating temperature range	Room temp. + device self heating - 310 °C
Heat control	Turning knob
Temperature setting range	0 - 310 °C
Temperature setting resolution of heating plate	1 K
Connection for ext. temperature sensor	PT1000, ETS-D5, ETS-D6
Temperature setting resolution of medium	1 K
Adjustable safety circuit	50 - 360 °C
Set-up plate material	Aluminium alloy
Set-up plate dimensions	Ø 135 mm
Sensor in medium detection (Error 5)	yes
Temperature measure range PT1000	-20 - 310 °C
Speed deviation (no load,nominal voltage, at 1500rpm + 25 °C)	±2 %
Heating rate (1l H2O in H1500)	6.5 K/min
Heat control accuracy of heating plate (at 100°C)	±5 K
Heat control accuracy with ext. PT1000 (500ml H2O in 600ml beaker,40mm stirring bar,600rpm,50°C)	±1 K
Heat control accuracy with ETS-D5 (500ml H2O in 600ml beaker,40mm stirring bar,600rpm,50°C)	±0.5 K
Heat control accuracy with ETS-D6 (500ml H2O in 600ml beaker,40mm stirring bar,600rpm,50°C)	±0.2 K
Dimensions (W x H x D)	160 x 85 x 270 mm
Weight	2.4 kg
Permissible ambient temperature	5 - 40 °C
Permissible relative humidity	80 %

Protection class according to DIN EN 60529	IP 42
RS 232 interface	yes
USB interface	yes
Voltage	220 - 230 V
Frequency	50/60 Hz
Power input	650 W
Power input standby	1.6 W

H Analytical Balance (1 units)

VWR Analytical balance PBA224I-1S

The balance have a weighing capacity of 220 g.
The balance have a readability of 0.1 mg accuracy
The balance have a repeatability of ±0.1 mg
The balance have a linearity of ±0.2 mg
The balance feature a round stainless steel weighing pan with a diameter of 90 mm.
The balance include internal calibration.
The balance have overload protection.
The balance is equipped with a glass draft shield.
The balance support data transfer in PC spreadsheet, PC text, and ASCII protocols.
The balance include built-in applications with GLP/GMP compliant data output for the following functions: weighing and dosing, counting, percentage weighing, density determination, and mass unit conversion.
(GMP and GLP are quality standards applied to the manufacturing of pharmaceuticals and other healthcare products).

I Balance (1 units)

VWR precision balance PBP2202-1S

The balance have a weighing capacity of 2200 g.
The balance have a readability of 10 mg
The balance have a repeatability of ±10 mg
The balance have a linearity of ±20 mg
The balance feature a round stainless steel weighing pan with a diameter of 180 mm.
The balance have overload protection.
The balance support data transfer in PC spreadsheet, PC text, and ASCII protocols.
The balance include built-in applications with GLP/GMP compliant data output for the following functions: weighing and dosing, counting, percentage weighing, density determination, and mass unit conversion.
(GMP and GLP are quality standards applied to the manufacturing of pharmaceuticals and other healthcare products).

UV lamp with UV cabinet

CAMA040.2000

CHARACTERISTICS

Applications	laboratory, for research laboratories, for the pharmaceutical industry
Configuration	compact
Other characteristics	UV

DESCRIPTION

The UV Cabinet 4 is designed for inspecting thin-layer chromatograms or other objects under UV light in absence of ambient light.

The UV Cabinet 4 consists of a UV Lamp 4 and the Viewing Box 4. The front of the Viewing Box 4 is closed with a roller shutter. Eyes are protected by the UV filter in the viewing window. The distance between UV lamp and object is optimally selected for homogeneous illumination and observation of the entire TLC plate through the viewing window.

Key Features
Two UV tubes for illumination (UV 254 nm & UV 366 nm, each 8W)
Minimum space requirements through small footprint
Eyes protected through UV filter in the viewing window
Almost no influence of ambient light
For any plate format up to 20 x 20 cm

L. Shaker, Vortex Mixer (2 units)

Vortex mixer suitable for single, small containers up to 30 mm in diameter, for example, test tubes, centrifuge tubes and microtubes. The upper casing is PP and the test tube surface is made from inert TPU-plastic; the bottom section is a coated, zinc die-casting.

- Small, compact and reliable
- Excellent mixing action

Certifications: IP protection class according to DIN EN 60529: IP 40

Delivery information: Supplied with 12 V power pack set.

Model	lab dancer
Shaking motion	Orbital
Orbit	4,5 mm

Speed range	2800 min^{-1} fixed
Max. capacity	50 ml
Motor input/output	1,2/0,8 W
Ø×H	100×70 mm
Weight	0,55 kg

M. Mechanical overhead stirrer (2 units)

Laboratory stirrers that are ideal for simple stirring tasks, suitable for quantities up to 25 L (VOS 40 digital). Due to microprocessor-controlled technology, the stirrers automatically adjust the speed within the speed range of 0/30 to 2000 min^{-1}.

- Digital speed display
- Infinitely adjustable speed
- Push-through agitator shafts
- Overload protection - units can be operated for short periods in overload conditions
- Error code display

Safety circuits ensure automatic cut-off in anti-stall or overload conditions. The actual shaft and pre-set speed are constantly monitored, and variations adjusted automatically. This guarantees a constant speed even with changes in sample viscosities. Stirrers have a slim casing and provide quiet operation.

SPECIFICATIONS	
Model	VOS 40 digital
Max. stirring capacity H_2O	25 L
Max. viscosity	30000 mPas
Speed range	0/30 - 2000 min^{-1}
Max. torque at chuck	40 Ncm
Chuck range	0,5 - 10 mm
Power - motor input/output	112/87 W
W×D×H	86×208×248 mm
Weight	4,4 kg

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N. Vacuum PUMP (2 units)

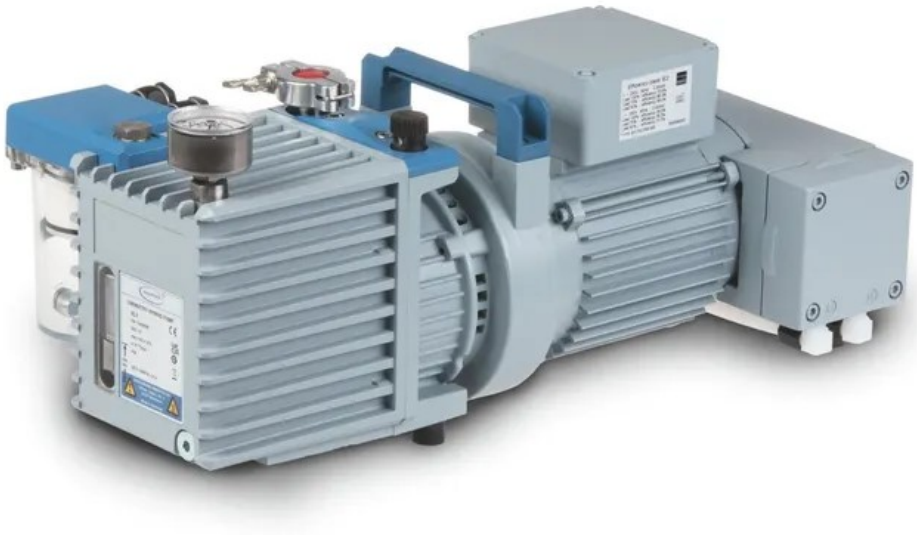
The RC 6 chemistry-HYBRID pump combines a two-stage rotary vane pump and a two-stage chemistry diaphragm pump for optimized corrosion resistance.

Reduced internal corrosion, even when working with corrosive vapours
Oil changes typically reduced 90% or more compared with rotary vane pumps alone
Most economical solution: In practical operation a cold trap is often no longer necessary
Ease of maintenance due to telescopic design

The RC 6 chemistry-HYBRID pump is a combination of a two-stage rotary vane pump and a two-stage chemistry diaphragm pump for optimized corrosion resistance. The diaphragm pump maintains the oil reservoir under vacuum in order to keep the partial pressures of solvent vapours at levels below their condensation points and to reduce largely the concentration of oxygen and corrosive gases. Therefore, the RC 6 chemistry-HYBRID pump has a much higher solvent vapour pumping capability and resistance to aggressive gases than conventional rotary vane pumps.

Water vapor tolerance with gas ballast >40 mbar.

Informace o dodávce: Pump completely mounted, ready for use after oil filling (bottle 0,5 L enclosed), with manual.



SPECIFICATIONS

Model	RC 6
Ultimate vacuum	2×10^{-3} mbar; 1×10^{-2} mbar (with gas ballast)
Protection class	IP 40
Connection on pressure side	Hose nozzle DN 8 - 10 mm (outlet connection)
Connection on suction side	Small flange KF DN 16 (inlet connection)
W×D×H	302×526×226 mm
Weight	25 kg
Max. pump capacity	5,9 m^3/h (max. pumping speed)