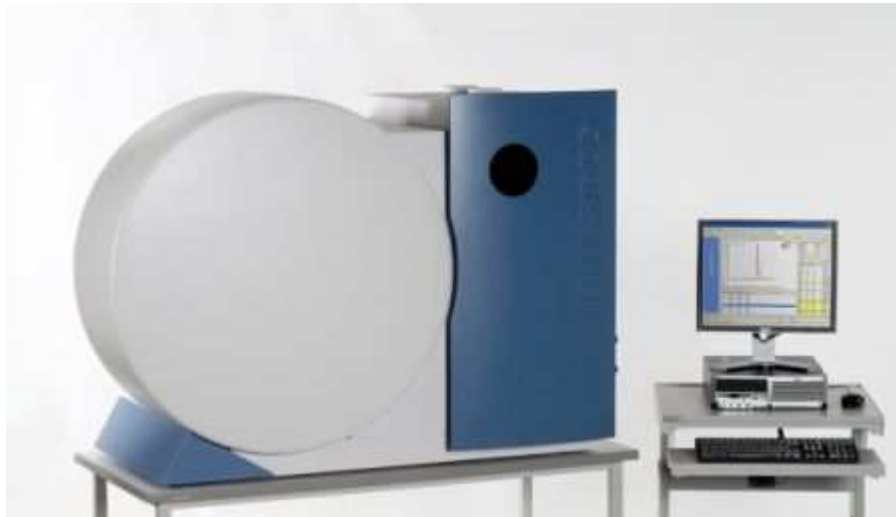


SPECTRO ARCOS



Installation Information SOP/EOP

1 Technical Data

Description	Value
Electrical connection	230 V AC \pm 5 %, 50/60 Hz Phase + neutral + PE, The instrument is equipped with a CEE 32A plug (5-pol).
Instrument power consumption	4.5 kVA
Instrument required line protection	30 - 32 A (slow-blow)
Storage conditions	2 – 40°C (36 – 104°F)
Operation conditions (ambient temperature limits)	15 – 35°C (59 – 95°F)
Recommended temperature range to achieve the specified performance	18 – 25°C (64 – 77°F)
Relative humidity	< 80% (non-condensing)
Air quality	Free of corrosive vapors and excessive dust
Operation	Max. 3000 m above mean sea level
Argon gas supply	
Inlet pressure during operation	7.5 bar; 109 psi; A maximum Ar inlet pressure of 10.0 bar (145 psi) must not be exceeded under any circumstances
Quality	\geq 4.6 (99,996 %)
Consumption	\leq 25 l/min
Oxygen supply for the Auxiliary gas (optional, for organic applications only)	
Pressure	4 bar (58 psi);
Quality	\geq 4.5 (99.995 %)
Gas flow	The gas flow depends on the application.
Exhaust requirements	
Plasma chamber	110 – 180 m ³ /h ; 65 – 106 ft ³ /min
Generator	250 – 300 m ³ /h; 150 – 175 ft ³ /min
Recommendation for the installation of an exhaust system	2 separate exhausts, each \geq 250 m ³ (\geq 150 ft ³ /min), separately adjustable between zero and maximum
Protection class	IP 20 (DIN 40050)

Description	Value
Cooling (EOP) Optional an external water-air cooling system is available for the SPECTRO ARCOS (EOP).	
Electrical connection (230 V equipment)	230 V AC \pm 5 %, 50 or 60 Hz Required line protection: 16 A
Electrical connection (110 V equipment)	110 V AC \pm 5 %, 60 Hz Required line protection: 15 A
Medium	Water
Heat dissipation	approx. 1 kW
Inlet temperature	5 – 25°C (41 – 77°F)
Free from impurities	> 1 mm (> 0.04")
Flow rate	1.5 – 2.5 l/min (5.2 – 8.7 Imp/s)
Pressure	1 – 5 bar; 14.5 – 72.5 psi
Water connection	2.5 m (8.2 ft) long Hose with $\frac{3}{4}$ " connections incl. filter

Technical data for accessories

Description	Value
Electrical connection (230 V equipment)	230 V AC \pm 5 %, 50 or 60 Hz Required line protection: 16 A
Electrical connection (110V equipment)	115 V AC \pm 10 %, 60 Hz Required line protection: 15 A

2 Transport/Setup



Caution! Damage to unit!

Never transport the unit without the wooden plate supplied for this purpose,



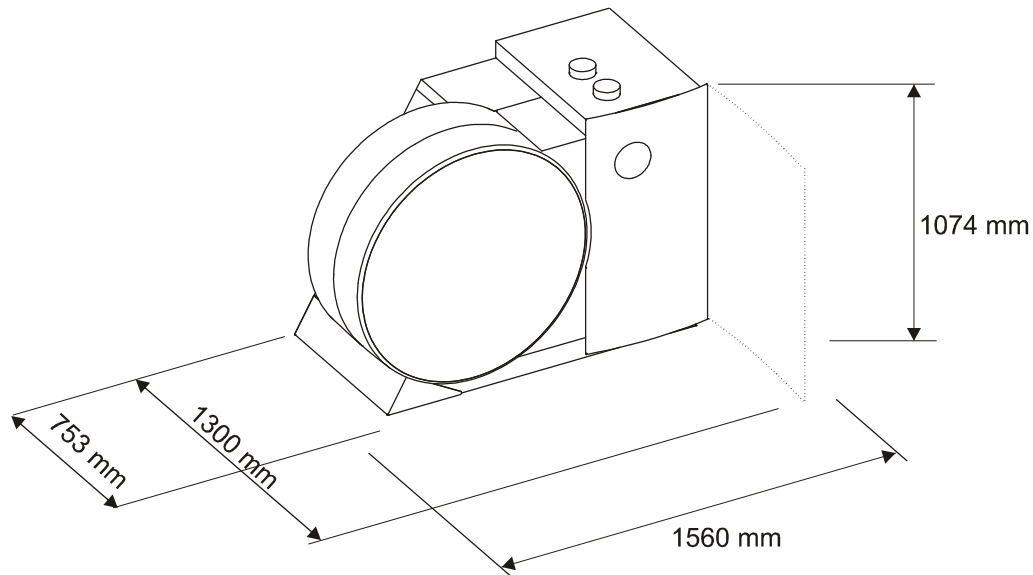
Warning! Heavy object!

The unit weighs approx. 250 kg (~ 550 lbs) and the weight is not evenly distributed.

Always use appropriate gear to lift the unit. Avoid tilting the instrument more than 10 degrees from the vertical.

2.1 Dimensions and Weight

Description	Value
Unit height	1074 mm; 42,3"
Unit width	1610 mm; 63,4"
Unit depth	753 mm; 29.7"
Unit weight	ca. 250 kg; ~ 550 lbs
Footprint	1367 * 692 mm; 53.8" * 27.3"



Transportation of the instrument to the installation location is the customer's responsibility.

To move the instrument from the loading dock to the place of installation, a lifting platform or forklift and personnel are required.

We strongly recommend arranging internal delivery to your installation location through a licensed and bonded local forwarding agent. SPECTRO will not accept any responsibility for transport within the company.

Please check the maximum load and dimensions of lifts as well as the widths of corridors and doorways.

The service department is ready to assist you with any questions regarding the transport of the instrument.

2.2 Transportation



Caution! Damage to unit!

If the unit is relocated after installation, it may be damaged.

Secure the unit for transportation. Never transport the unit without the wooden plate supplied for this purpose, Contact the SPECTRO Service Department in this matter.



Warning! Heavy object!

The unit weighs approx. 250 kg (~ 550 lbs) and the weight is not evenly distributed.

Always use appropriate gear to lift the unit. Avoid tilting the instrument more than 10 degrees from the vertical.

2.2.1 Remove from pallet

The unit is fixed to a wooden plate. This wooden plate is fixed with 4 Phillips screws to the bottom part of the crate (pallet). In the case the pallet cannot be moved to the place of installation, the unit can also be transported on the wooden plate, only. Remove the Phillips screws if this should be necessary.

See picture 1 and 2.



Picture 1



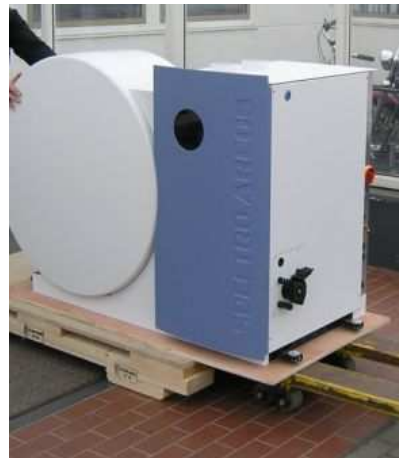
Picture 2

Now the wooden plate including the unit can be pushed from the pallet onto a hand pallet truck or forklift.

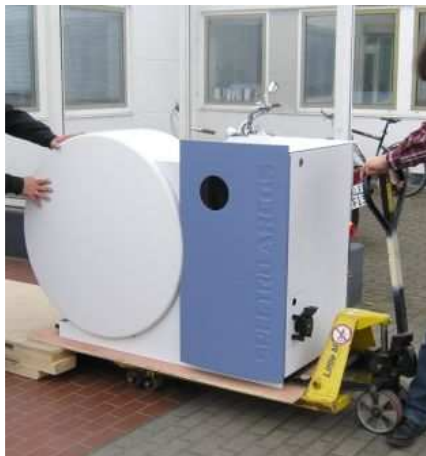
The pictures 3 to 8 show how to remove the unit from the pallet.



Picture 3



Picture 4



Picture 5



Picture 6



Picture 7



Picture 8



Picture 9

Picture 9 shows how to use a fork lift to lift the unit onto a bench. Please note that the unit bottom does not support any lifting devices. Never lift the unit without the wooden plate,

2.2.2 Instrument transport device

For lifting the unit from the plate onto the bench the transport device (square bars) included in the shipment can be used. First, unscrew the retaining screws.

See picture 10 and 11.



Picture 10



Picture 11

To mount the bars, pull the 4 sliding bars out and tighten the lifting bars to it.



Picture 12



Picture 13

The instrument can now be lifted onto a bench or table. Make sure the bench/table has corresponding dimensions and load-carrying capacity.



Picture 14

2.2.3 Mounting of the side panels

Finally mount the two small side panels, which are included in the scope of supply. Remove the lifting bars from the transport device.

Left side

Unscrew the screws on front of the sliding bars half way and mount the cover. See picture 15 to 19.



Picture 15



Picture 16



Picture 17



Picture 18

Tighten the screws and slide the panel back



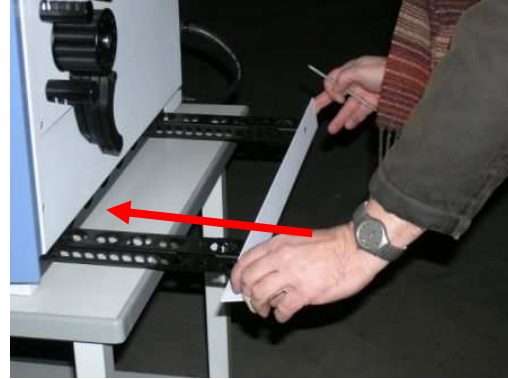
Picture 19

Right side

The right side works similar; see picture 20 to 22.



Picture 20



Picture 21

Tighten the screws and slide the panel back



Picture 22

2.3 Setup

- Extreme vibrations to the instrument during measurements result in measurement errors.
 - ⇒ For this reason, the instrument must be setup in a location that is free of extreme vibration.
- Large differences in temperature in the instrument result in measurement errors.
 - ⇒ The instrument must be setup so that one-sided heating is not possible.

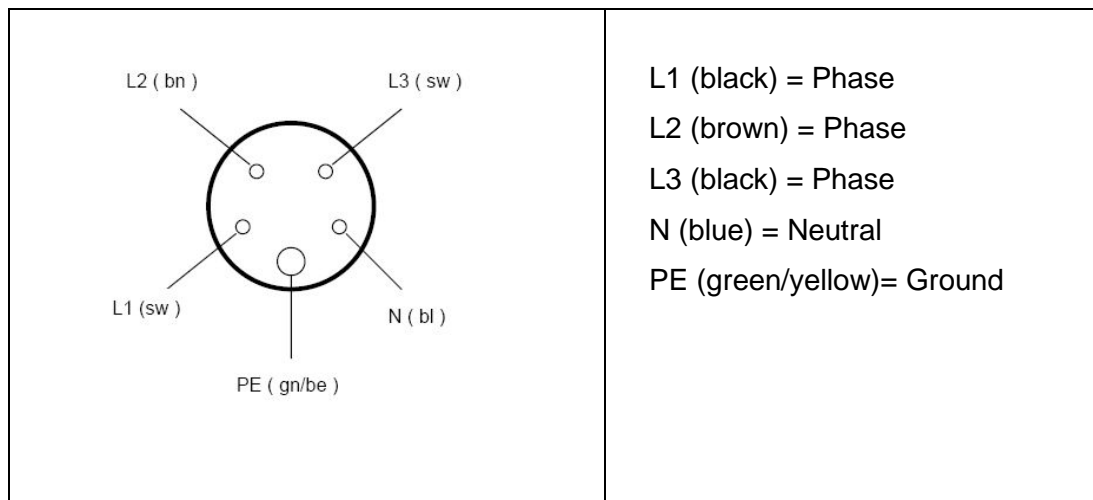
Please take the following into consideration during setup:

- Avoid mechanical shock to the instrument.
- All connections are found on the right hand side.
- The instrument must be accessible from the front and both sides for maintenance. It must be placed so that this is possible.
- A table with the corresponding dimensions and load bearing capabilities must be available (see section 2.1).
- If there is no direct gas line, there must be sufficient space for the argon supply available in addition to the space required for the SPECTRO ARCOS.
- The SPECTRO ARCOS is operated only from the front and the right hand side. There must be enough room available for the computer work place (keyboard, monitor, printer and sample changer (option)) and operating personnel.

3 Installation Requirements

3.1 Electrical Requirements

The instrument is equipped with a CEE 32A plug (5-pol). To comply with local regulations, the plug will be changed during the installation of the instrument, if required. Please contact our local office if you have questions regarding the electrical connection to be provided.



3.2 Ambient Temperature

Air-conditioning of the room is only required under exceptional conditions as the construction of the instrument compensates for small temperature fluctuations. One-sided heating of the instrument must, however, be avoided!

The specified performance is only valid within the recommended temperature range (18° – 25°C, 64° – 77° F). Operation of the instrument outside the recommended ambient temperature range may lead to worsening of the analytical results.

3.3 Dust

A relatively dust-free environment is required to avoid contamination during the analysis.

The maximum dust load should not exceed 36 million particles (0.5 µm (0.00002”) or larger) per cubic meter of air. Operating the unit in an environment with a higher dust load shortens maintenance intervals and may damage the unit. Example for comparison: a typical, clean office environment contains 18 to 36 million particles per cubic meter of indoor air.

To avoid damage to the instrument, it must be installed in an environment free from corrosive vapors.

3.4 Storage

At an ambient temperature below 2°C (36 °F), the cooling water will freeze and damage the instrument (EOP only).

Avoid storing the instrument at such low temperatures. If this cannot be avoided, ensure that there is no cooling water left inside the instrument (blow it out at the connection on the right side) (EOP only).

Storage conditions: Room temperature 2 – 40°C (36 - 104 °F).

3.5 Gas Supply

It is important to be especially careful during installation of the argon supply; the tubes and valves must be completely free of oil, grease and other contamination.

An argon supply must be available for the instrument.

A suitable pressure reducer/regulator must be available for the argon supply (cylinder or liquid gas tank).

- Outlet pressure: regulated, 0 - 10 bar

The argon is introduced to the instrument with tubing (5 m (approx. 16 ft) long, OD/ID = 8/6 mm). The tubing is connected on the right hand side of the instrument. Tubing and fittings for the connection to the instrument are included in the scope of supply. Fittings required for the connection to the supply line need to be provided.

The following flow rates are used during normal operation:

Coolant gas:	12 – 20 l/min
Auxiliary gas:	0.6 – 3 l/min
Nebulizer gas:	0.4 – 1.5 l/min

3.6 Cooling

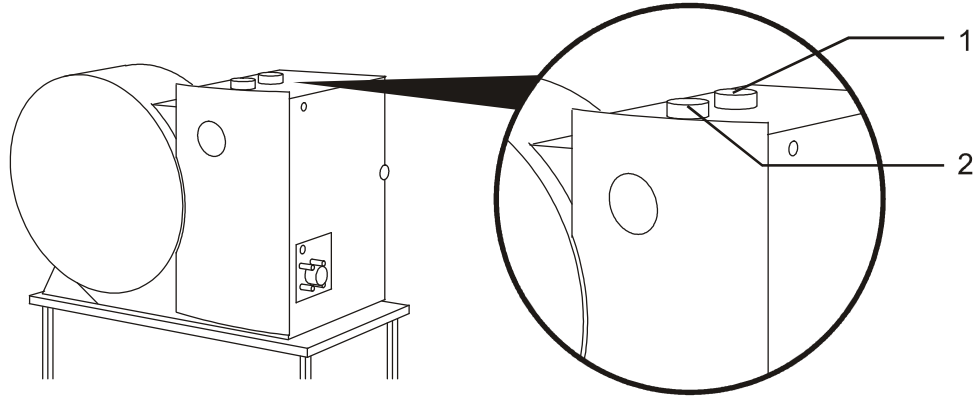
For the SPECTRO ARCOS EOP an external air/water cooling system is required (unless included in the order not part of the standard scope of supply). For the connection to the instrument a 2.5 m (approx. 8 ft) long water hose is included in the scope of delivery. It requires a $\frac{3}{4}$ " connector.

3.7 Exhaust (to outside)

Connections for the exhaust are found on the top of the instrument.

The corrosion-resistant exhaust connections must be connected to the laboratory exhaust system with non-flammable, corrosion-resistant flexible hoses (inner diameter 100 mm (3.94")). The exhaust fan must be resistant to chemicals and designed to operate at temperatures up to 80° C (approx. 180° F). See the following figure for the exact positions of the exhaust connections.

In case the exhaust requirements of the plasma chamber and the generator are different, it would be optimal to have two exhaust pipes from the laboratory system (each $\geq 250 \text{ m}^3 (\geq 150 \text{ ft}^3/\text{min})$), which can be adjusted separately. In case there is only one main exhaust line, adjustable "Two-in-one" adapters have to be used.



Exhaust capacity	
1 (rear) Generator	2 (front) Torch box
250 – 300 m³/h; 150 – 175 ft³/min	110 – 180 m³/h ; 65 – 106 ft³/min

All installations must be carried out in a professional manner and in accordance with valid technical regulations in order to exclude hazards to life and limb and to material property.

4 Miscellaneous

4.1 Connection of the Autosampler

To enable automation an optional autosampler can be connected to the SPECTRO ARCOS. The autosampler should be positioned directly next to the peristaltic pump. The unit is connected to the via a USB interface with the instrument control PC.

4.2 ICALization

To normalize the instrument during operation an ICALization should be performed on a regular basis and whenever the instrument request for an ICALization to be performed. A solution with the following composition is required:

Aqueous solutions:

Element	Concentration mg/L
Ca	1
Be	2
Li	2
Sr	2
Mn	5
Mo	5
Na	5
Sc	5
Ce	10
Cu	10
Fe	10

Element	Concentration mg/L
Eu	10
In	10
K	10
Ni	10
P	10
Si	10
Ti	10
V	10
Y	10
Zr	10
S	50

In addition, the solution must contain:

- 20 ml/l HCl
- 20 ml/l HNO₃

Please Note!

The deviation from the given element concentrations must not exceed 0.5%. Larger deviations may negatively influence the analytical performance or even make the ICALization impossible.

Organic applications:

For organic application an ICALization with the aqueous solution has to be made once. Afterwards the respective reference spectra have to be taken. A detailed description can be found in the online help of the instrument.

The ICAL solution as well as the optimization and instrument check solutions is available through your local service organization.

4.3 Sample Preparation

Sample preparation procedures are specific to the application and are the user's responsibility. We are available, upon request, for assistance with the development of sample preparation instructions and analytical programs.