

Producer declaration for OXIGEN GENERATORS

Model	Drawing number	Model	Drawing number
OGP 2	9829 5002 60	OGP 3	9829 5002 61
OGP 4	9829 5002 62	OGP 5	9829 5002 63
OGP 6	9829 5002 64	OGP 8	9829 5002 65
OGP 10	9829 5002 66	OGP 14	9829 5002 67
OGP 18	9829 5002 68	OGP 20	9829 5002 69
OGP 23	9829 5002 70	OGP 29	9829 5002 71
OGP 35	9829 5002 72	OGP 45	9829 5002 73
OGP 55	9829 5002 74	OGP 65	9829 5002 75
OGP 84	9829 5002 76	OGP 105	9829 5002 77
OGP 160	9829 5002 78	OGP 200	9829 5002 79

Text on drawing	Translation or Explanation
INLET	Inlet of the generator
OUTLET	Outlet of the generator
Exhaust pipe	Exhaust pipe


Dimension drawings are subject to change. Please consult your supplier to get the latest versions of the dimension drawings.

Installation

Outdoor operation

- If the generator is installed outdoors or if the ambient or air inlet temperature can be below 5 °C (41 °F), precautions must be taken. In this case, consult Atlas Copco.
- Humidity and dust: to avoid risk of damage to the electronic components, install the generator in an environment subject to limited relative humidity and low concentration of dust. The generator must also be protected against water droplets, rain and wind. According to the Low Voltage requirements (EN61010), indoor use is recommended for this unit.

Installation area requirements

	Oxygen is an oxidizing agent. Take extra care for cleanliness when assembling the oxygen piping. Keep the installation away of flammables and heat sources.
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- Temperature: the ambient temperature in the generator installation area must be between 5 °C (41 °F) and 45 °C (113 °F). Install the generator away from heat sources. Therefore, also avoid direct exposure to sunlight.
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- Positioning: when selecting the installation area for the generator, take into account minimum clearances required for operation and maintenance. Consult the Installation proposal drawings further in this chapter. Install the generator on a level floor, suitable for taking its weight.


Handling and positioning of the oxygen generator

The generator must be handled using suitable equipment such as a pallet mover or a forklift truck.

Remove all packaging, taking care not to damage the generator.

	<p>Keep the generator in vertical position at all times. It is not designed to be laid on its side (even not during transport !).</p>
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Inlet air quality

	<p>The properties of the compressed air at the inlet of the oxygen generator, as well as the minimum pressure and flow rate requirements, play an important role with regard to its performance and lifetime.</p> <p>The compressed air used should be of a quality that meets ISO 8573-1; class 1-4-1. <u>Using a lower quality of compressed air will cause irreversible damage to the generator.</u> In such case, the manufacturer denies all liability for damages and any costs for repairs will be charged to the client.</p> <p>The purity of the oxygen produced is reduced when the air pressure at the inlet decreases. Therefore the installation of an accordingly sized compressed air tank is recommended. In case of any doubt with regard to the above, contact your supplier for advice on the most suitable compressed air system (compressor, dryer, filters, tank) for the specific application.</p>
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The inlet dew point should be kept at 3 °C and not exceed 5 °C (at reference conditions). This dew point can be established by a correctly sized refrigerant dryer. In case of high ambient temperatures, an oversized external refrigerant dryer should be selected.

The oxygen generators can be used with oil injected compressors as well as with oil free compressors.

Please note however that it is of utmost importance to prevent any dust, water or oil from entering the oxygen generator, because this will damage the molecular sieve material. Contact Atlas Copco for advice in case of doubt.

- If an oil injected compressor is used, a complete filtration package (DD, PD, QDT,- see installation proposal drawings) is to be installed upstream the compressed air tank, just after the compressor outlet.**


On DD and PD inlet filters, a drain tube must be installed. The drain pipes to the drain collector must not dip into the water. For draining of pure water when oil injected compressors are used, install an oil/water separator (consult Atlas Copco).

- If an oil free compressor is used, principally no filter is required at the generator inlet, but specific applications may require an *oxygen approved* filter downstream the oxygen tank, e.g. to protect the application from eventual dust contamination.
- If the compressor is not equipped with an automatic water separator, install an automatic water separator upstream the inlet filters.

Piping connections

The illustration shows the components used in a typical oxygen generator system.

Avoid distances exceeding 2 m (6.5 ft) between the various elements.

	<p>Oxygen is a very corrosive medium.</p> <p>When installing an oxygen net, make sure that all pipes, tubes, hoses, fittings and eventual instrumentation are cleaned and suited for oxygen service. High velocities of oxygen in combination with inappropriate materials and oil, dust or other debris might cause ignition in the oxygen net. Suited materials for an oxygen net are copper pipes, stainless steel pipes or nylon tubes. For more detailed information on oxygen pipe systems refer to instruction 9828 0757 00. Aluminium pipes are to be avoided.</p> <p>All piping is to be connected stress-free.</p>
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- **Connection of the inlet:**

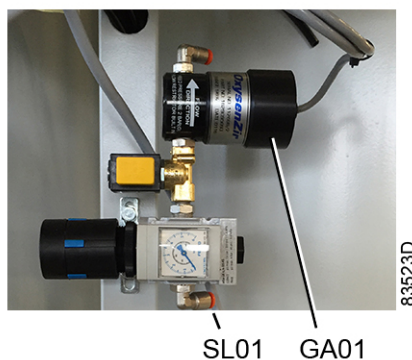
- Locate the air coupling, on the inlet pressure regulator (RV01), at the front side of the generator.
- Connect the hose or the flanged pipe.
- Connect the other end of the hose to the compressed air tank (upper coupling).

- **Connection of the oxygen tank**

Connect the oxygen outlet of the generator to the oxygen tank (TK04).

- **Connection of the oxygen sensor**

Connect the oxygen feedback line (SL01) from the oxygen tank (TK04) to the oxygen sensor (GA01).




- **Oxygen outlet**

The generator produces oxygen at a preset purity level (between 90 % and 95 %) according to the user's requirements and required oxygen flow and pressure.

The oxygen flow rate depends on the model and on the required purity.

The oxygen pressure depends on the pressure of the compressed air at the inlet.

	<p>If the application involves metal cutting, welding, brazing, etc. it is highly recommended to use flash guard check valves as close to the torch head as possible.</p>
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- **Connection of safety valves to outside**

The safety valves on the adsorber tanks (TK02 and TK03) have a threaded connection that can be piped outside, which ensures that in case of overpressure the oxygen will not be released in the room, but will be guided to outside.

- **Exhaust**

In case there is no sufficient ventilation in the room, it is recommended to lead the exhaust of the generator out of the room, since the exhausted air has an increased nitrogen concentration.

To keep the back pressure as low as possible and to safeguard the performance of the generator, the piping to the exhaust has to be as follows:

- Length < 3 m (10 ft): connect the exhaust pipe to the muffler.
- Length between 3 m (10 ft) and 10 m (33 ft): the diameter of the regeneration pipe has to be at least 1.5 x larger than the connection of the muffler.
- Length > 10 m (33 ft): consult your supplier.

The pressure drop over the exhaust pipe can be calculated from:

$$\Delta p = (7.57 \times q^{1.85} \times L \times 10^4) / (d^5 \times P),$$

where q is calculated as:

$$q = [(V_{\text{adsorber}} / 1000) \times (P_{\text{eq}} + 1)] / (t_{\text{bo}} \times 60)$$

with

- Δp = pressure drop over the exhaust pipe in bar
- q = exhaust air flow in m³/min
- L = length of the exhaust pipe in m
- d = inner pipe diameter in mm
- P = initial absolute pressure (= equalisation pressure) in bar(a)
- V_{adsorber} = volume of 1 adsorber vessel in l (liter)
- P_{eq} = equalisation pressure (as relative pressure) in bar(e)
- t_{bo} = blow-off time in seconds (fixed, 4 s)

The back pressure during regeneration (after exhaust) must be kept as low as possible. It should not exceed 100 mbar.




- Provide sufficient ventilation. An increased nitrogen level resulting from the exhaust flow may increase the risk for suffocation.
- Divert the safety valves from the oxygen generator and the oxygen buffer tank to the outside.
- Keep the exhaust open at all times. Do not block or decrease the exhaust pipe opening. This might cause decreased performance of the generator or even cause the muffler to explode.
- If no room ventilation is present, and the exhaust is guided outside, also guide the simulated oxygen consumption from the ball valve (BA10) outside.

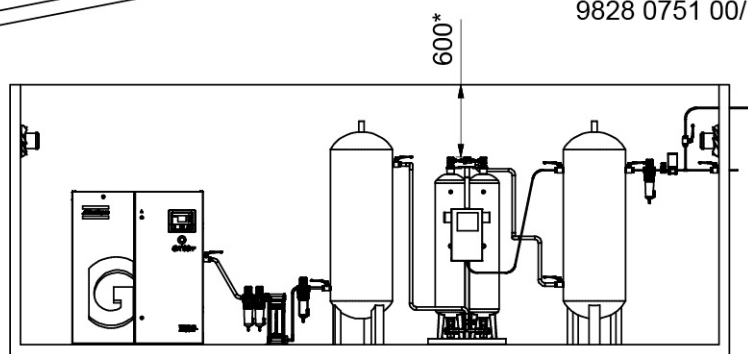
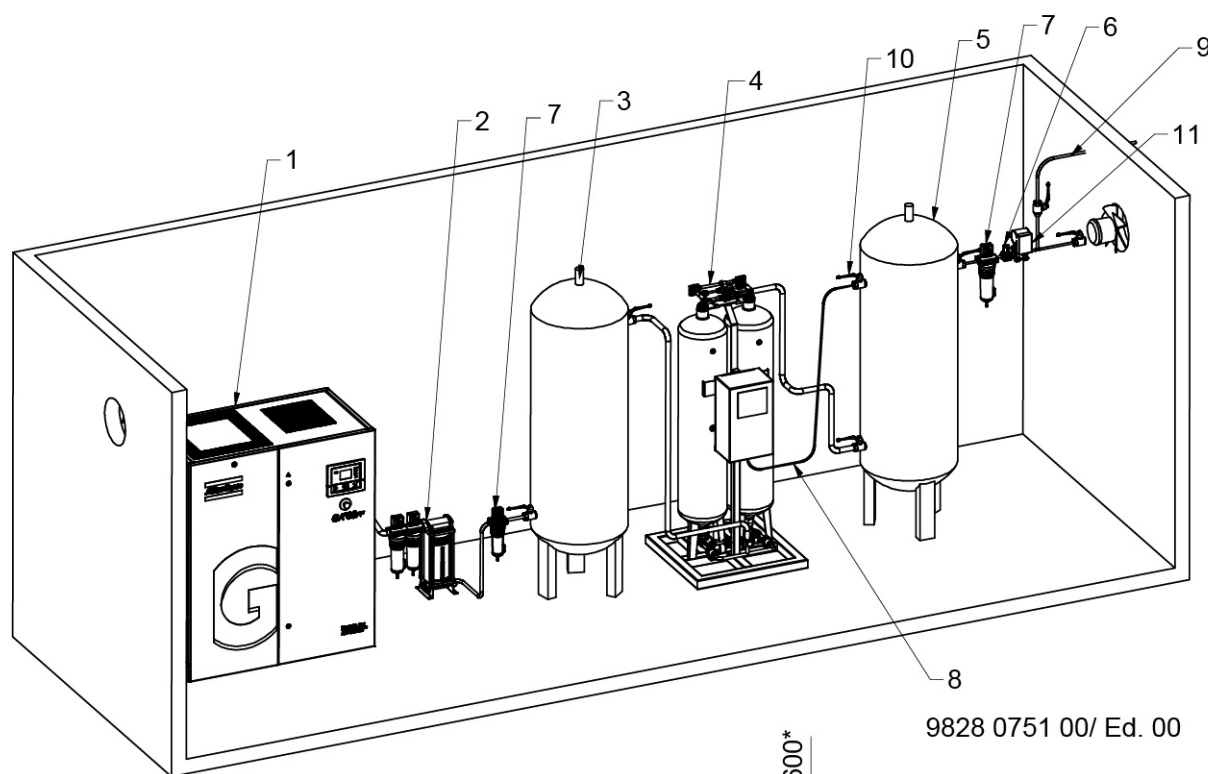
Installation guidelines

-	It is recommended that the connection of the compressor air outlet pipe is made on top of the main air net pipe in order to minimize carry-over of possible condensate residue. Make sure that no dirt particles (e.g. coming from corrosion in the compressed air network) can enter the generator. These particles may be harmful to the generator components.
-	<p>Ventilation: depending on how the exhaust air will be vented, appropriate measures have to be taken to make sure that the oxygen concentration in the room never exceeds 23.5 % or drops below 19 %.</p> <ul style="list-style-type: none"> In many cases, natural ventilation can be sufficient, for example rooms or halls provided with ventilation openings. General guideline is that ventilation openings should at least have a flow area of 1/100 of the floor area. The openings should be diagonally opposite to each other and shall ensure a free air circulation without obstacles. When natural ventilation is not possible, a ventilation unit should be foreseen with a capacity of approximately 6 air changes per hour. There shall be a safety warning in case ventilation fails. Note that each installation can require specific measures to ensure that the oxygen concentration in the room never exceeds the mentioned limits. It is the responsibility of the installer to make sure that adequate measures are taken. Special consideration to the ventilation of underground rooms, pits, trenches, etc. is to be given: since oxygen is heavier than air, oxygen gas tends to accumulate in low lying areas.
-	Room oxygen level detection system: When operators are working in the vicinity of oxygen generating equipment and the oxygen content can rise to a dangerous level, a continuous measurement system is necessary. A system with a visual/audible alarm is advisable. The oxygen level detection systems needs to be put in the working area and near the operator.
-	Filter drain connections should be connected to a drain collector but must not dip into the water of the drain collector.
-	Use the main cable entry to connect the power supply cable to the unit.
-	Make sure that hose length is as short as possible if it is required to measure oxygen at a customer defined sample point in the network (for example the oxygen tank in front of the application).
-	Only use oxygen approved safety valves in the oxygen net an on the buffer vessel.

Warnings

	<ul style="list-style-type: none"> If a failure in gas supply (e.g. due to a power failure, the activation of an electrical safety device, or a generator fault) is - even temporarily - not admissible, it can be advisable to foresee a backup oxygen source to enable provisional supply of gas (totally or partially automatic). To ensure compliance with the standards imposed by the Machinery Directive, the restart of the generator after the electrical power supply is restored cannot be automatic. It must be activated manually by the operator.
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Single generator set-up



*: Minimum free area to be reserved for the generator installation.

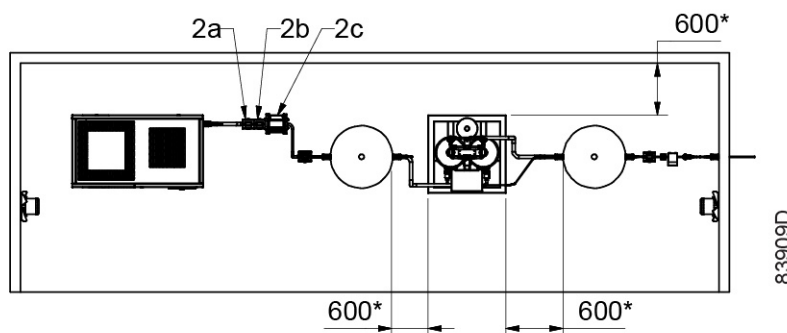


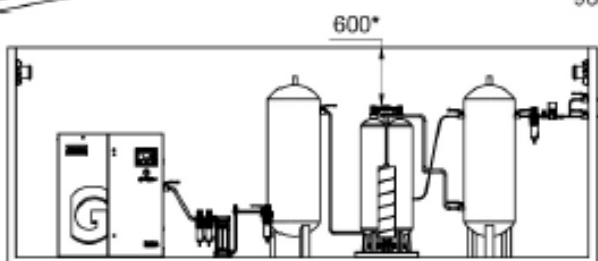
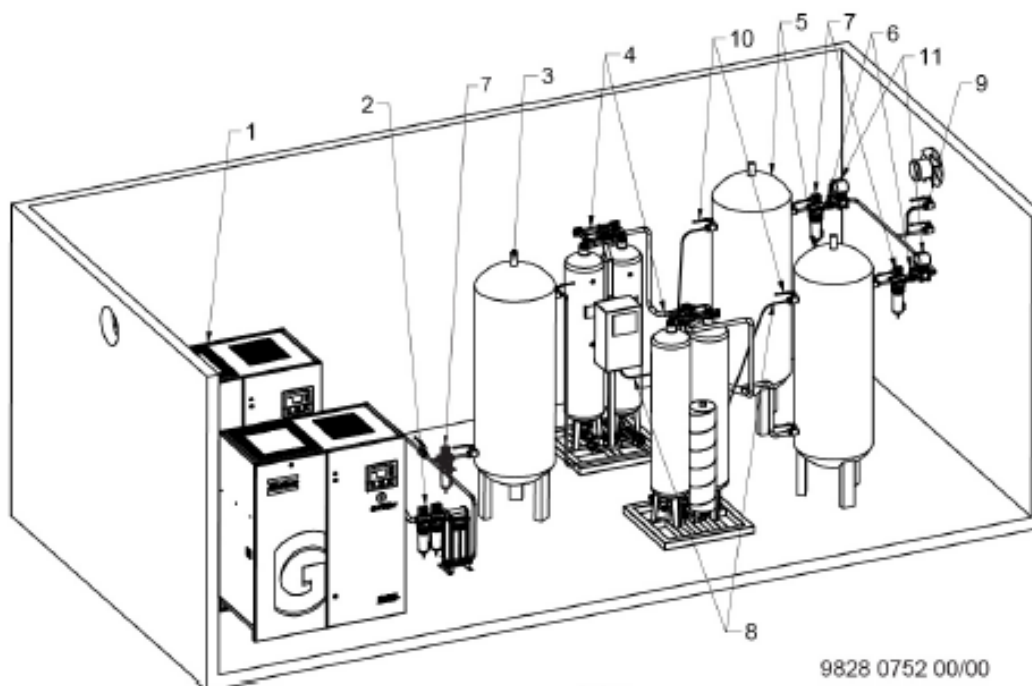
Figure 6: Installation proposal (typical installation with GA compressor)

1	Compressor with integrated refrigerant dryer	7	Dust filter (oxygen approved) (if required by the application)
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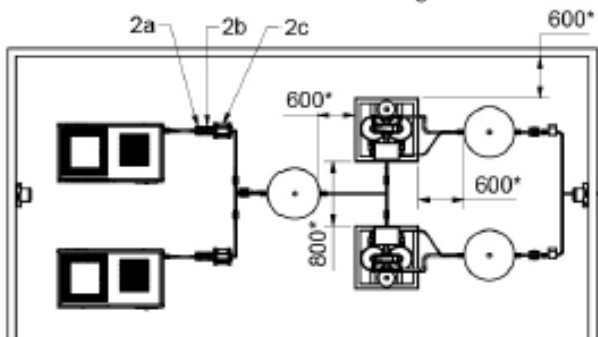
2	DD, PD and QDT filters	8	Purity measurement line
3	Air tank	9	T-coupling with ball valve and pipe/hose for load simulation on startup
4	Oxygen generator	10	Ball valve on feedback (purity measurement) line
5	Oxygen tank (oxygen approved)	11	Flow meter
6	Pressure regulator (oxygen approved)		

Generators in parallel

When installing more oxygen generators in parallel, it is recommended to install a separate oxygen tank for each generator.



*: Minimum free area to be reserved for the generator installation.



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4	Oxygen generator	10	Ball valve on feedback (purity measurement) line
5	Oxygen tank (oxygen approved)	11	Flow meter
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