

Atacama SERIES

Operating Manual

Machine detail

Model	ATACAMA_____
Order Number.	
Project Number.	
Unit Serial Number.	
Year of manufacture	
Power Supply to Dryer	_____V _____Hz
Issue date of Operating Manual	
Year of manufacture	

It is the responsibility of the owner,

- to enter for the first time the above appliance data.
- to keep these appliance data up to date.

The above-stated appliance data provide for a clear identification of the dryer and its components, and significantly facilitate any service measures.

Further important data on the dryer such as the details on the permissible operating pressure and the electrical connection are found on the type plate (for position of the type plate see page 8).

Table of contents

General information.....	5
Manufacturer's details.....	5
Details on the dryer.....	6
About these operating instructions.....	7
For your own safety.....	8
Signs, instruction plates and danger zones at the dryer.....	8
Intended use of the dryer.....	10
General safety notes.....	10
Safety notes on specific operating phases.....	
Technical product description	
Summary drawing.....	
Function description.....	
Available options.....	
Transportation, installation and storage.....	
Information on transportation packaging.....	
What to do in the case of transport damage occurring?	
Transporting and installing the dryer.....	
Installing and anchoring.....	
Storing the dryer.....	
Installation.....	
Preconditions for installation.....	
Connect piping.....	
Installing the electrical connection.....	
Start-up	
Requirements for initial start-up.....	
Setting times of the operating phases.....	
Emergency shutdown.....	
Start up dryer.....	
Changing cycle mode (optional).....	
Monitoring dryer operation.....	
With dewpoint-sensing control (optional).....	
Shutdown and restart dryer.....	
Emergency shutdown`.....	
Depressurising and shutting down the dryer.....	

If work is to be carried out on the electrical system.....
Restart

Maintenance and repair of the dryer.....

Notes on maintenance.....
Regular maintenance intervals
Daily maintenance tasks.....
Weekly maintenance tasks.....
Monthly maintenance tasks
Maintenance work to be completed every 12 months
Maintenance work to be completed every 48 months

Identify and eliminate faults

Summary of faults

Index

Annex with technical documentation

Logic control diagram
Flow diagram.....

Replacement and consumables list.....

General information

Suppliers details

Name and address

Hi-Line Industries Ltd
5 Crown Industrial Estate
Oxford St
Burton-Upon-Trent
Staffordshire
DE14 3PG

Tel 01283 533377
Fax 01283 533367

Details on the dryer

Standard equipment

Dryer, comprising

- 2 vessel columns filled with desiccant
- 1 upstream filter
- 1 downstream filter
- Silencer
- Control system

Associated documents

- Operating Manual (present)
- Technical documentation (see annex)

Warranty notes

In the following cases, the warranty shall be void:

- If aggressive media in the compressed air and in the environment cause corrosion damage and functional faults on the dryer.
- If the dryer is used without prior approval and confirmation in writing by the manufacturer for purposes other than those specified in these operating instructions or contractually agreed.
- If preset parameters (e. g. on the control system etc.) are changed without prior approval and confirmation in writing by the manufacturer.
- If the dryer is transported or stored incorrectly.
- If the dryer is sited and installed incorrectly.
- If the dryer is repaired or maintained incorrectly.
- If the dryer is operated by personnel that does not have the requisite qualifications.
- If modifications are carried out on the dryer, the manufacturer did not approve that.

In the event of non-compliance the manufacturer will not accept any liability for any consequential damage whatsoever.

About these operating instructions

These operating instructions contain basic information on the safe use of the dryer.

It is recommended for the owner to complete reading this Manual before handling the ATACAMA dryers.

Characters and symbols used

- Work steps that you have to carry out in the sequence stated are marked by black triangles.
- Lists are marked by a small box.

Note

These notes provide you with hints and information on the s and efficient handling of machines and devices.



Warning

These safety notes warn against damage to property and help you to avoid such damage.



Danger

These danger notes with a grey background warn against personal injury and/or danger to life and limb; danger notes help you to avoid serious or life-threatening situations for yourself and/or third parties.

Target group of these operating instructions

These operating instructions are intended for all persons working on and using the dryer. We assume that all such persons are specialist personnel, e.g. fitters or electricians.

Operating instructions: handling

These operating instructions must be continuously available at the site where the dryer is used. We recommend to prepare a copy and to keep the same in a safe and freely accessible place next to the dryer. Keep the original document in a safe place.

For your own safety

The dryer has been built in accordance with the state of the art and the recognized technical safety regulations. Nevertheless, there is a risk of personal injury and damage to property when the dryer is used, if

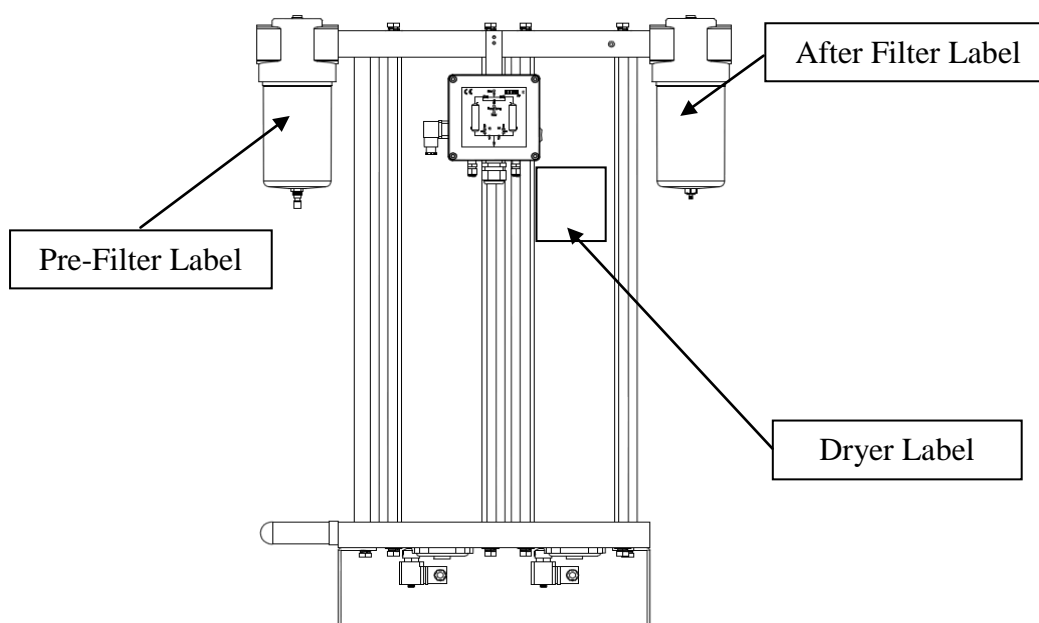
- it is operated by non-qualified personnel,
- not used within its intended design specifications,
- is repaired or maintained incorrectly.

Note:

For your own safety and to prevent machine damage, please note the information and safety notes in these operating instructions when working with the dryer.

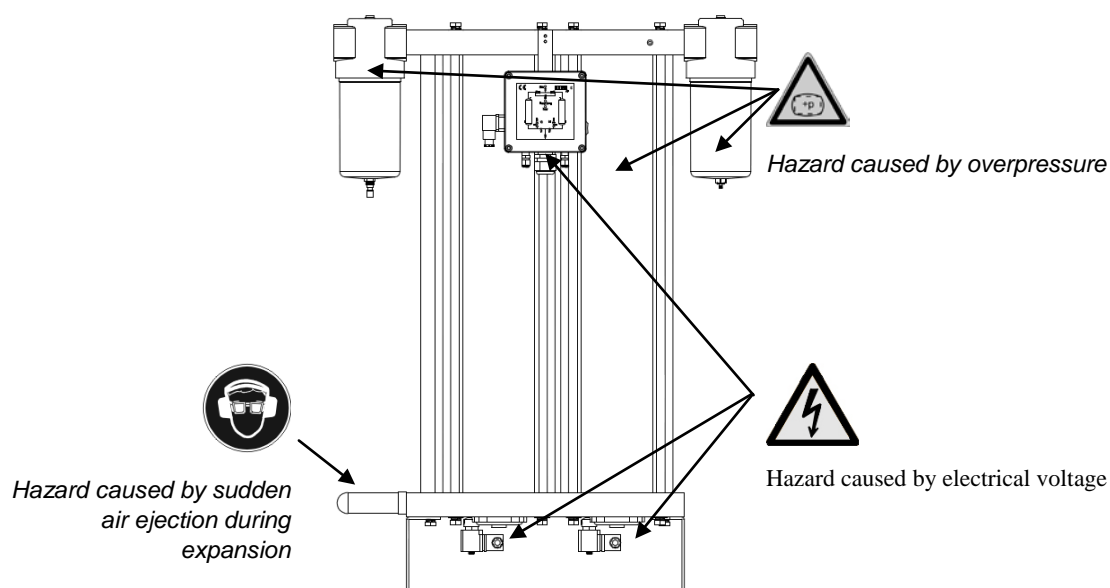
Signs, instruction plates and danger zones at the dryer





Signs and instructions



Please note the above plates and instructions attached to the dryer. Ensure that they are not removed and are always readable.

Hazard areas on the dryer



Hazard area	Symbol in operating instructions
<p>Warning against hazardous electrical voltage</p> <p>Different parts of the dryer carry electrical current. These parts may be connected, opened, and maintained by authorized specialist personnel only.</p>	
<p>Warning against overpressure</p> <p>The entire dryer is under pressure. Before commencing any work, the plant must be depressurised.</p>	
<p>Warning against sudden air ejection</p> <p>When the vessels are depressurised, air flows suddenly out of the sound absorber:</p> <ul style="list-style-type: none"> ■ This causes a sudden loud cracking noise. ■ Due to particles carried in the air flow, there is a very considerable risk of eye injury. <p>When working on the dryer, always wear eye and ear protection equipment.</p>	
<p>Skid risk</p> <p>When emptying and filling the vessels with drying agent, there is a risk of skidding caused by spilt drying agent.</p>	

Intended use of the dryer

The dryer is exclusively intended for drying compressed air. Depending on defined input conditions, it dries compressed air for industrial use.

The dryer is designed for compressed air, which is free from aggressive water, oil, and solid matter constituents.

As standard, the dryer is intended to be sited within a building and protected against the weather. When it is sited in the open air (option), the instructions on page 17 must be complied with.

The dryer may be operated only in accordance with the data on the type plate and in accordance with the contractual conditions.

Suspected misuse

The dryer must not be misused as a climbing aid! It is not designed for such loads. Unforeseen mechanical failures are imminent.

General safety notes



For your own safety, when carrying out any work on the dryer comply with all applicable national safety regulations!

Personnel qualification

Only authorized and qualified specialist personnel may be tasked with the work on the dryer described in these operating instructions.

Conversions and modifications

Without prior approval by the manufacturer, no conversions and modifications must be made to the dryer! Any non-approved modifications may restrict the operational safety of the dryer and cause damage to property or personal injury.

Handling drying agents

The drying agents are perfectly safe when in an unused condition. However, when filling and emptying the vessels with drying agents, increased dust generation may occur. Please comply with the following instructions:

- When filling drying agents into the vessels, wear a dust mask and eye protection!
- If a spillage occurs, any spilt drying agent must be taken up immediately. There is a risk of skidding!

Safety notes on specific operating phases

Transportation and siting

- Only use suitable and technically perfect lifting gear with a sufficient carrying capacity.
- Carefully secure the dryer during transportation.

Start-up



Warning against sudden air ejection!

During expansion the pressure is released suddenly through the silencer:

- A loud expansion noise is caused which may damage your hearing.
- Particles carried in the air can injure your eyes or skin.

Always wear eye and ear protection, therefore, when you are in the vicinity of the dryer!



Hazard due to a sudden release of pressure!

Never remove any parts of the dryer, or manipulate the same in any way, for as long as the plant is still pressurised! A sudden escape of pressure may cause serious injuries.

Before carrying out any work on the dryer, first depressurise the plant.

- Carry out all prescribed tests and checks.
- The factory settings on the control board in the switchbox must not be changed on any account without prior approval by the manufacturer.
- Before start-up, ensure that no tools or other foreign parts have been left lying in a part of the dryer where they might pose a hazard to the dryer being started up.

Emergency shutdown

- In any emergency, proceed as described in the section on page 35.

Monitor operation



Warning against sudden air ejection!

During expansion the pressure is released suddenly through the silencer:

- A loud cracking noise occurs which can injure your hearing.
- Particles carried in the air flow act like bullets and can injure your eyes or skin.

Always wear eye and ear protection, therefore, when you are in the vicinity of the dryer!

- Only operate the dryer within the permissible limits (see dryer label). By operating the dryer in conditions that go beyond the defined values, the dryer is subjected to loads for which it has not been designed. This may cause functional defects.
- The more powerful the dryer is, the more noise may be generated during operation. Therefore, the operator must provide suitable protective equipment (e. g. ear protection).
- Check the dryer regularly for externally visible damage and defects. Any changes, even in its operating behaviour, must be reported immediately to the competent office or person.
- In the event of an emergency or if a safety-relevant disruption occurs (e.g. escaping compressed air, defective component), the dryer must be shut down immediately as described in the section on page 35). The unit may only be restarted after all defects have been eliminated.

Maintenance of the dryer and fault removal



Hazard due to a sudden release of pressure!

Never remove any parts of the dryer, or manipulate the same in any way, for as long as the plant is still pressurised! A sudden escape of pressure may cause serious injuries.

Before carrying out any work on the dryer, first depressurise the plant.

- Carry out maintenance work only when the plant has been shut down and depressurised!
- The factory settings on the control board in the switchbox must not be changed on any account without prior approval by the manufacturer.
- Bolt connections must be undone with care! Note ram pressure values! Otherwise emerging media may cause personal injury.
- Never carry out any welding on and or change the same in any other way!
- Never use pipes and fittings as steps or holding points! The components might fracture, or the distortions which occur may cause internal damage on the dryer. There is a risk of injury by slipping off the components, components breaking off, and expanding compressed air!
- Never leave tools, loose parts or cloths in, at or on the dryer.
- Following maintenance work always test all bolt connections for leak tightness and secure seating.
- Only use replacement that are suitable for the relevant function and meet the technical requirements stipulated by the manufacturer. This is always the case, if you use original replacement parts only.

Disassembly and disposal



Hazard due to a sudden release of pressure!

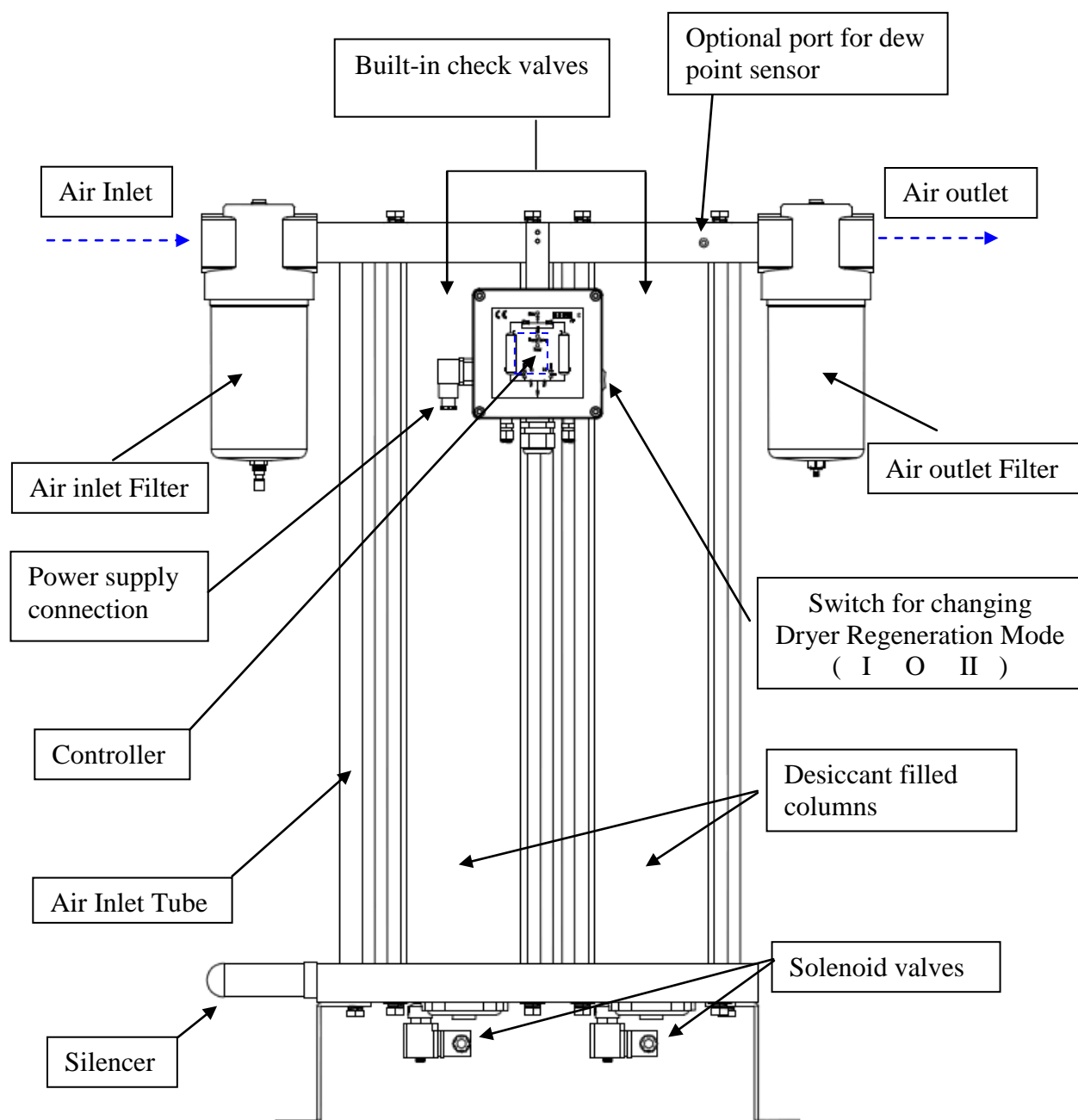
Never remove any parts of the dryer, or manipulate the same in any way, for as long as the plant is still pressurised! A sudden escape of pressure may cause serious injuries.

Before carrying out any work on the dryer, first depressurise the plant.

- Dispose all parts of the dryer, the drying agent, and all other operating materials in an environmentally safe way and in accordance with all current statutory regulations. The waste code of the drying agents can be obtained from the manufacturer (for the manufacturer's address see page 5).

Technical product description

Drawing overview



Function description

The dryer dries the compressed air supplied by the compressor and makes it available for industrial use.

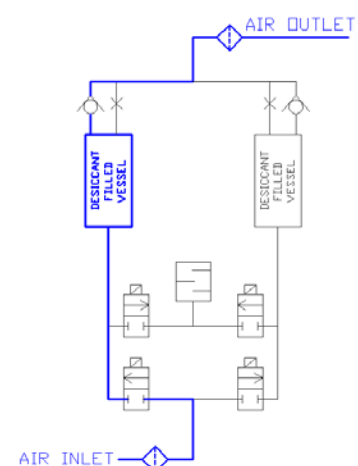
Upstream filters clean the compressed air and remove dust, dirt, oil, and water droplets, before the compressed air reaches the dryer. Thus, an upstream filter is also used for extending the service life of the drying agent.

Downstream filters clean the compressed air from drying agent abrasions, before it is fed into the compressed air system.

The two vessels contain an extremely porous drying agent by means of which humidity is removed from the compressed air and stored just as in a sponge. The stored humidity is then removed again from the drying agent and re-introduced into the ambient environment.

To this end, the two vessels alternate between different operating modes. Whilst in one vessel, compressed air is de-humidified (adsorption), in the other vessel the humid drying agent is being prepared for another charge (regeneration). These two states, which run in parallel during compressed air preparation, are described below.

Via a compressor, humid compressed air is supplied to the upstream filter. From here, the compressed flows upwards through the adsorption vessel, which is pressurised. In so doing, the drying agent dehumidifies the air. The dry compressed air is supplied to the pipe network via the downstream filter.



Here, adsorption is shown in the left vessel.

Regeneration (running in parallel to the adsorption)

At the same time the other vessel is prepared for a renewed take-up of humidity. This process is called regeneration.

The regeneration is subdivided into three phases: expansion, dehumidification, and pressure build-up.

Please do take note that **standard** ATACAMA series are operating with regeneration by means of **Fixed Cycle Regeneration (Timer Control)**.

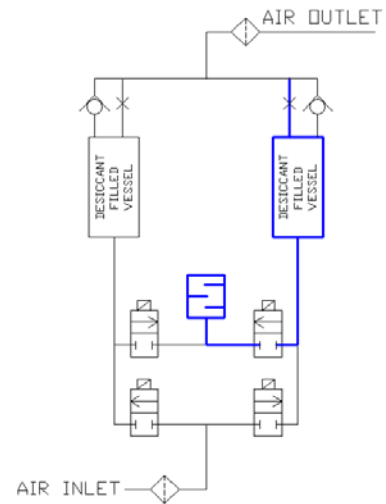
For ATACAMA to run with **Variable Cycle Regeneration (Dew Point Dependant Control)**, please refer page32 for details

Expansion

During the expansion phase, the pressure in the alternate vessel is released via the silencer down to ambient pressure within just a few seconds. The outflow of the compressed air becomes noticeable due to a sudden powerful flow noise at the silencer.

Dehumidification

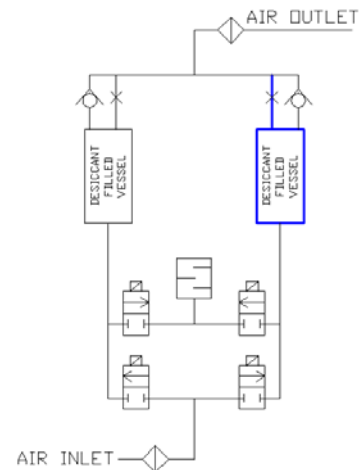
Prior to being released into the pipe network, dried compressed air is bled by means of an orifice. This separate regeneration air flow is fed through the depressurised vessel. The humidity stored in the drying agent is taken up by the air flow and expelled into atmosphere via the silencer.



Here, regeneration is shown in the right vessel.

Pressure build-up

After dehumidification, the pressure in the regenerated hollow section vessel is built up to operating pressure, so that the switchover from regeneration to adsorption can take place at operating pressure level.



Pressure build-up

Standby phase (Only with the *DewPoint-Sensing control option*)

When in standby phase, the fully regenerated vessel is ready for adsorption operation. The system is switched to this vessel, as soon as the measured dewpoint at the compressed air outlet has reached the set dewpoint value for switchover.

Switchover

When the drying agent in the adsorbing vessel has taken up a sufficient level of humidity, then the switchover between the vessels will commence between the vessels. Following switchover, the above-described process is repeated, with the adsorption and regeneration now taking place in the respective different vessel.

Available options

The following options are available for the dryer:

- Start-up device
- Outside installation

- Signalling contacts of control system
- Dewpoint-sensing control
- Paint compatible design

Start-up device

A start-up device basically consists of a pressure holding device, which is located downstream of the dryer. The pressure holding device ensures that pressure can build up in the dryer and adsorption take place.

It is always required when an empty compressed air reservoir or an empty compressed air system must be filled downstream of the dryer (e.g. following weekend shutdowns and when the pressure in the compressed air system can frequently drop below the stated operating pressure).

Outside installation

As standard, the dryer is not suitable for outside installation, as its function and service life is influenced by the following factors:

- Environmental humidity due to rain (or other deposit)
- Corrosion caused by environmental humidity or a salt-containing environment
- Freezing of valves, cocks, flaps, and other components at low temperatures

Therefore, a planned outside installation must always be discussed in advance with the manufacturer to allow specific technical design measures to be provided for the installation location.

Bypass line

The bypass line is a "detour line", which allows the compressed air system to continue operating even whilst maintenance of the dryer is in progress. However, during this time the air is not dried but flows through the bypass line past the dryer and through to the actual loads.

Filters in the bypass line are meaningful so that the actual loads are largely protected against dirt, water, and oil droplets even whilst maintenance is in progress.

Dewpoint-sensing control

With a dewpoint-sensing control system, you can operate the dryer in fixed or variable cycles. In the fixed cycle, switchover commences after a fixed time period (usually after 5 minutes). In the variable cycle, the switchover commences in relation to the dew point reached and the charging of the drying agent. The adsorption time in the variable cycle amounts to 30 minutes maximum.

Paint compatible design

Paint shop plants impose particularly stringent requirements with regard to the cleanliness of the compressed air, as already the contaminations can reduce the quality of the paint finish. Even minute quantities of oil and grease containing foreign materials or solvents — above all silicones — are sufficient to cause pits, discolorations, swellings, and other contaminations in the paint finish.

Dryers in a paint compatible design comprise seals and filters that are absolutely free of grease and silicon and thus ensure a high quality of the compressed air used for painting.

Transportation, installation and storage



Danger due to incorrect transportation!

The dryer must be transported by authorized and qualified specialist personnel only. During transportation all applicable national regulations for accident prevention must be complied with. Otherwise there is a risk of personal injury.

- Only use suitable and technically perfect lifting gear with a sufficient carrying capacity.
- During transportation the dryer must be carefully secured against falling over.

The manufacturer will not be liable for any damage caused by incorrect storage or incorrect transportation. Please note therefore the following instructions as well as the storage instructions on page 21.

Information on transportation packaging

Depending on the type of transportation, the dryer is delivered in different types of packaging:

- All transportation types: the apertures of the dryer are closed off by means of plugs.
- In addition, when transportation is effected by air: the dryer is packaged in a wooden box.
- In addition, when transportation is effected by ship: the dryer is packaged in a film material and in a wooden box.

If the packaging is undamaged

- ▶ The undamaged packaging should be removed only at the final installation site, as it offers protection against any weather influences.

What to do in the case of transport damage occurring?

- ▶ Check whether only the packaging or the dryer itself were damaged.
- ▶ Inform the haulier immediately in writing of any damages.
- ▶ Contact the manufacturer urgently in order to report the damage. You will find the telephone number on page 5.



Warning!

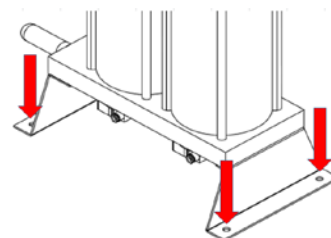
A damaged dryer must not be taken into operation! Damaged components may lead to functional faults and possibly cause further damage.

Transporting and installing the dryer

Requirements for the installation site

The conditions at the installation site have a large influence on the functional capability of the dryer and the service life of the drying agent. In order to ensure a mode of operation, which is as continuous as possible, and low maintenance, the installation site must meet the following requirements:

- The installation site must be located within a building. Protect the dryer against moisture. For outside installation (option) the instructions on page 17 must be complied with.
- The ambient temperature must not drop below +1 °C (33,8 °F).
- Heed the dryer's noise emission when selecting the installation location.
- The installation area must be level and firm. It must have the necessary carrying capacity for the weight of the dryer. The weight of the dryer is specified in the technical data section of the annex.
- The dryer should be installed with sufficient spacing at the top, sides, and rear, in order to be able to carry out maintenance work and change the drying agent without any hindrances (see figure).



Necessary spacing at the top and sides = min. 1 m

If in doubt, the installation site must be inspected by specialists. If you have any queries in this regard, please contact the manufacturer (for details see page 5).

Transportation using lifting or forklift trucks



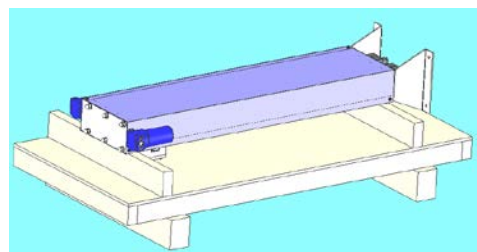
Warning against damage to property!

The dryer is delivered lying on its side on a transportation pallet. At the top it is protected by a carton. Top and sides have not been designed for mechanical loads.

Therefore do not place any load onto the top face. Do not stack.

Therefore, always transport the dryer on a lifting or forklift truck.

- ▶ Secure the dryer on the lifting or forklift truck against sliding movements.
- ▶ Transport the dryer to its installation site.



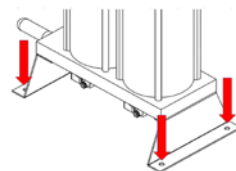
Dryer on transportation pallet

Installing and anchoring

Anchoring the dryer

The upright stand profiles of the dryer are provided with four pre-drilled anchorage bores.

- ▶ Use suitable attachment material to anchor the dryer to the floor (see figure).
- ▶ *In the case of vibrating floors:* place the dryer on suitable vibration dampers.



Bores at the foot of the dryer

Storing the dryer

If the dryer is to be stored for an extended period of time, the storage location must meet the following conditions:

- The dryer must not be stored in the open air.
- The storage room must be dry.
- The storage room must be free from dust or the dryer must be covered by a protective sheet.
- The storage room must have an ambient temperature of at least +1 °C (33,8 °F).

In order to store the dryer proceed as follows:

- ▶ Take dryer out of operation as described on page 35.
- ▶ Ensure that the compressed air inlet valve installed by the owner, and the installed compressed air outlet valve installed by the owner, are both closed, and that the dryer is depressurised.
- ▶ Disconnect dryer from the compressed air system.
- ▶ Disconnect the dryer from the electrical power supply and all external lines.
- ▶ Use film material or similar to close the compressed air inlet apertures and compressed air outlet apertures on the dryer in order to protect them against contamination.
- ▶ If possible cover dryer with a protective sheet.

The dryer can now be stored for long periods.

Note:

If you wish to take the dryer back into service after an extended period of storage, please proceed as described for its first commissioning and start-up (see page 27).

Store drying agents

- ▶ Do not store drying agents in the open air.
- ▶ Protect drying agents against humidity.

Installation



Only authorized and qualified specialist personnel may carry out work on pipes and electrical systems.

As soon as the dryer has been set up at its installation location, you can install the compressed air infeed and outlet lines to make the electrical connections.

Preconditions for installation

For a correct installation the following preconditions must be met on the part of the owner.

- Connections and lines for the infeed and outfeed of compressed air must be provided.
- A compressed air inlet valve as well as a compressed air outlet valve must be installed by the owner, so that the dryer can be installed and maintained in a depressurised condition (see also the installation example on page 23).
- All pipes, couplings, and connections must have the correct diameter and match the operating pressure.



Hazard caused by exceeding the limit values!

A safety device must be provided in order to protect against the maximum permissible operating pressure from being exceeded.

The safety device must be installed so that the dryer is reliably protected from exceeding the maximum permitted operating pressure even when the temperature of the compressed gas increases.

The data required to meet these preconditions are contained in the technical documentation attached in the annex.



Warning!

If the above preconditions are not complied with, a safe operation of the dryer cannot be assured. Also, the functionality of the dryer may be detrimentally affected.

Connect piping

In order to ensure that the dryer operates optimally, the dryer must be assembled into the compressed air system free of all stresses.

- ▶ Ensure before connection that all infeed and outfeed compressed air lines and valves are clean and undamaged.
- ▶ Check the bolt connections and retighten if necessary, as they could have worked loose during transportation.
- ▶ Remove plugs on the pressure inlet and outlet.

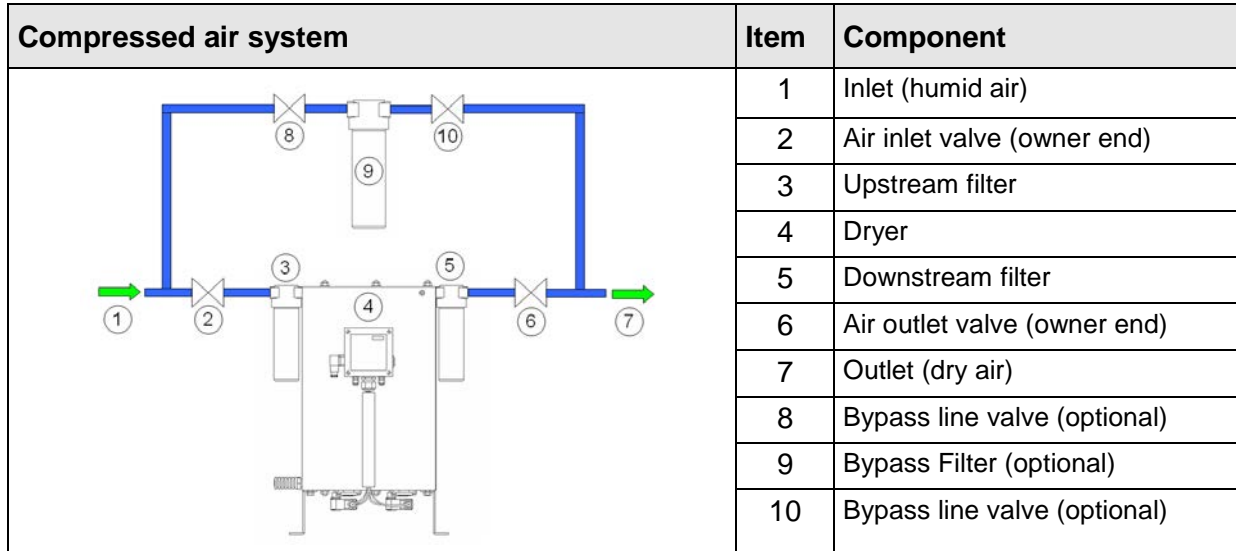


All piping must be free from any stress and tension whatever!

Pipes subject to stress may burst due to the load placed on them during operation. This may cause damage to property and personal injury.

- Use steel pipes to connect the dryer to the compressed air system.

The following figure shows an installation example.



Example of an installation with bypass line

- The connection lines for the upstream filter (3) are to be installed at a slight incline in the direction of the upstream filter.
- One shutdown valve each (2, 6) is to be installed at the compressed air inlet and outlet ends of the dryer.
- *If you fit a bypass line with additional shutdown valve:*
Fit the line such that, when carrying out maintenance work on the dryer, the line system can continue to be supplied with compressed air.

Installing the electrical connection



Warning against electrical voltage

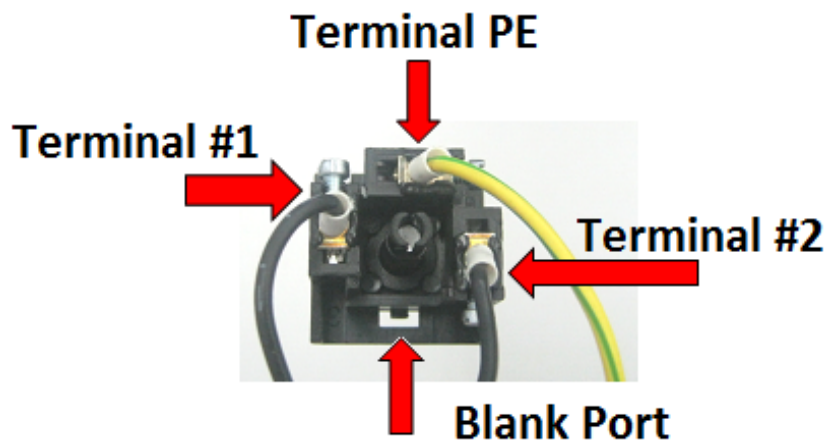
Only qualified specialist personnel may carry out work on the electrical system!

Installing the supply cable

The components of the dryer have been connected to the control cabinet at the factory. You only need to connect the control cabinet to the electrical supply cable.

The controller is provided with a connector where electrical power must be connected.

- ▶ Ensure that the cross-section of the electrical supply cable corresponds to the power rating of the dryer and the electrical voltage provided by the customer.
- ▶ Connect the electrical supply cable to the dryer voltage-free.
- ▶ Secure the electrical supply cable to the dryer against switch-on.
- ▶ Now make the cable connection as follows:
 - Earth to terminal PE
 - L1 to terminal 1
 - N to terminal 2



- ▶ **In all phases the dryer must be protected against short circuits by means of fuses.**
- ▶ In order to relief cable strain, re-tighten the PG union.

To install the external line, proceed as follows:

- ▶ Connect the signalling line to the potential-free busbar connection of the compressor to terminals 1 and 2 on the control board (see circuit diagram).

Check bolt connections

Before the initial start-up:

- ▶ Check all fastener connections as well as the terminals in the controller for secure seating; re-tighten if necessary.

Start-up



Warning!

The dryer must be taken into operation by trained personnel only! Untrained personnel does not have the required knowledge. Such personnel might cause serious faults.

Note:

You can order the initial commissioning and start-up from the manufacturer and have your personnel trained by the manufacturer. For telephone number, see page 5.

- Carry out all prescribed tests and checks.
- Before start-up, ensure that no tools or other foreign parts have been left lying in a part of the dryer where they might pose a hazard to the dryer being started up.

Requirements for initial start-up

For the first start-up the following preconditions must have been met:

- The pipe system is free from
 - scales
 - thread abrasions
 - welding beads and
 - other contaminations.
- All shutdown valves
 - of the compressed air inlet and outlet valves installed by the owner
 - in the bypass line (if available)are closed.
- The dryer is correctly sited and installed.

Checks before start-up

Ensure that

- all pipe, cable and fastener connections on the dryer have been retightened,
- no pipes chafe against body edges,
- all mountings are perfectly secure,
- the electrical connections are in safe contact and in good condition,
- owner-end and pressurised parts such as safety valves or other devices are not blocked up by dirt or paint,
- all compressed air system parts which are pressurised (valves, hoses etc.) are free from wear symptoms and defects.

Setting times of the operating phases

In its standard version, the dryer is delivered with a time-dependent control system. The phase sequence occurs in a fixed cycle.

With the optional dewpoint-sensing control, the dryer can also be operated at variable cycles (depending on the dewpoint).

The following table provides information on the duration of the individual phases.

Phase duration	Fixed cycle	Variable cycle
Adsorption	5 min	30 min, maximum
Regeneration, total	5 min	5 min
– of which: expansion time	~ 0.2 min	~ 0.2 min
– of which: dehumidification time	~ 4 min	~ 4 min
– of which: pressure build-up	~ 1 min	~ 1 min
Standby	—	~ 25 min, maximum

Emergency shutdown

In the event of an emergency, shut down the dryer as described on page 35.

Start up dryer



Warning against sudden air ejection!

During expansion the pressure is released suddenly through the silencer:

- A loud cracking noise occurs which can injure your hearing.
- Particles carried in the air flow act like bullets and can injure your eyes or skin.

Always wear eye and ear protection, therefore, when you are in the vicinity of the dryer!



Hazard due to a sudden release of pressure!

Never remove any parts of the dryer, or manipulate the same in any way, for as long as the plant is still pressurised! A sudden escape of pressure may cause serious injuries.

Before carrying out any work on the dryer, first depressurise the plant.

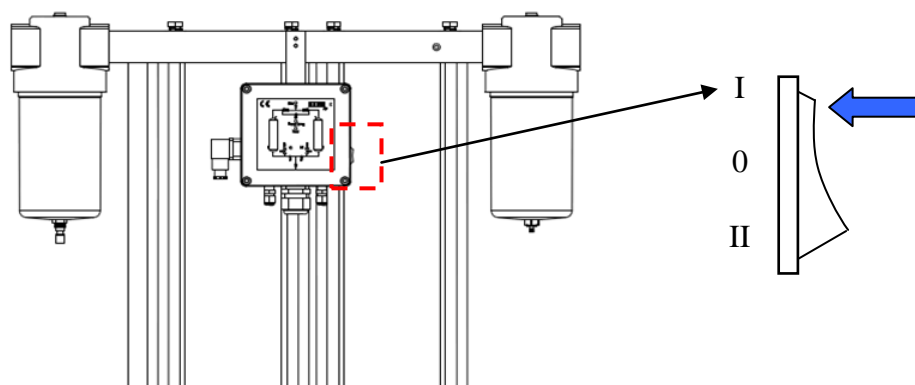
- The more powerful the dryer is, the more noise may be generated during operation. Therefore, the operator must provide suitable protective equipment (e. g. ear protection).
- Only operate the dryer within the permissible limits. By operating the dryer in conditions for which it has not been designed, functional faults may be caused.
- Depending on the size of the dryer and the compressed air network and the respective legal requirements in your country, it may be necessary to perform initialisation according to the directive for pressure equipment 97/23/EC.

- Check the dryer regularly for externally visible damage and defects. Any changes, even in its operating behaviour, must be reported immediately to the competent office or person.
- In the event of an emergency or if a safety-relevant disruption occurs (e.g. escaping compressed air, defective component), the dryer must be shut down immediately as described in the section on page 35). The unit may only be restarted after all defects have been eliminated.

Open compressed air supply and switch on dryer

For start-up, please proceed in the sequence shown here.

- Ensure that the compressed air inlet and outlet valves installed by the owner are closed (see installation example on page 23).
- Ensure that the compressed air system upstream of the dryer is pressurised.
- Switch on dryer by setting the ON/OFF switch to I. This will initiate the ATACAMA control valve to be in such position that ONE vessel is pressurised, and THE OTHER vessel is at atmospheric pressure. (Note: By using the “ I ” mode, it means that the ATACAMA is running at a Fixed Regeneration Cycle)



Slowly open compressed air inlet valve!

Avoid sudden pressure build-up in any circumstance! If pressure builds up too fast, this may cause damage to the dryer. Therefore, the compressed air inlet valve must always be opened quite slowly!

- Slowly open the compressed air inlet valve, installed by the owner, upstream of the dryer.
- If the dryer is taken into operation for the first time, or after a change of drying agent, the following intermediate step is recommended. In the case of a restart situation, the following intermediate step can be skipped.

Operating the dryer for the first time (or after a change of drying agent) separately
Depending on the transportation and storage conditions, the drying agent in the vessels can already be loaded with humidity from the environment. At each first start-up it makes sense therefore to operate the dryer from some time separately from the compressed air system. This causes the drying agent in each vessel to be regenerated repeatedly and thus to be prepared optimally for the take-up of humidity.

Note:

Depending on the pressure dew point to be achieved, we recommend to operate the dryer at first start-up without compressed air consumption:

- for at least 4 hours at a pressure dew point of -25 to -40 °C or
- for approx. 3 to 5 days at a pressure dew point of -70 °C.

If you wish to take the dryer into operation in accordance with our recommendation, proceed as follows:

- ▶ Ensure that the compressed air outlet valve installed by the owner is closed.
- ▶ Keep the compressed air outlet valve closed for the time period recommended above.
- ▶ Then the dryer can be taken into service in the compressed air system as described in the following section:

Operate dryer immediately in the compressed air system

- ▶ Ensure that the compressed air system downstream of the dryer is pressurised or that a start-up device (option, see page 17) was installed into the compressed air system directly downstream of the dryer.
The importance of this increases with the size of the compressed air system downstream of the dryer. Smaller compressed air systems can be pressurised also by means of compressed air fed through the dryer.



Slowly open compressed air outlet valve!

Avoid a sudden drop in pressure in any circumstance! If pressure drops too fast, this may cause damage to the dryer. Therefore, the compressed air outlet valve must always be opened quite slowly!

- ▶ Slowly open the compressed air outlet valve installed by the owner. Observe the vessel pressure gauge of the pressurised vessel. The pressure should not drop below the operating pressure (if possible.). If necessary, keep the compressed air outlet valve in a slightly open position until the compressed air system downstream of the dryer has filled up completely; only then should the valve be opened fully.

The dryer can then be taken into operation within the compressed air system.

In the event of a fault

In the event of an emergency or if a safety-relevant disruption occurs (e.g. escaping compressed air, defective component), the dryer must be shut down immediately as described in the section on page 35).

Then proceed as follows:

Remedy fault

- ▶ Look up possible cause of the fault, and how to remedy the same, in the table on page 47.
- ▶ Remedy fault.
- ▶ Repeat the start-up procedure.

Changing Cycle Mode (Optional)

When *can* I change cycle mode?

If the dryer has been successfully commissioned and is equipped with one of the following options:

- *compressor synchronisation* or
- *dewpoint-sensing control*

it can be set to *Economy Cycle* mode.

When and how *should* I change cycle mode?

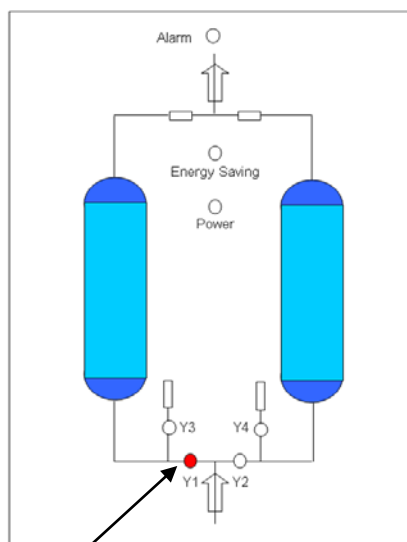
Cycle changes should be made:

During the pressure build-up phase

And prior to vessel switchover

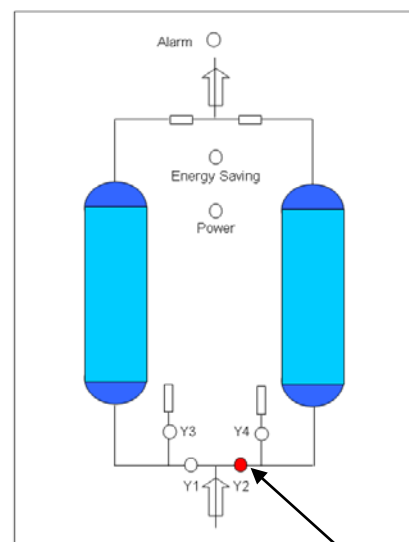
During this phase, the pressure in both vessels is just below operating pressure so that a fast pressure build-up is prevented when the vessels are switched.

During this period, **ONLY** the adsorption LED is lit on the controller.



Only this LED is lit during pressure build up stage

OR



Only this LED is lit during pressure build up stage

and the digital display shows step 4 or step 9 for the duration of 1 minute (see logic control diagram; not displayed with dewpoint sensing).

Which cycle modes can I choose?

If the dryer is connected to a *Compressor Synchronisation System* and is equipped with the *Dewpoint-Sensing Control* option, these two optional devices can only be started together. The compressor synchronisation has thereby precedence over the dewpoint-sensing control.

With Compressor Synchronisation (Optional)

If compressor synchronisation is enabled, the dryer can only be operated in conjunction with the compressor. As soon as the compressor is switched off, the dryer is automatically set to standby mode.

In standby mode, the control system remains running, and the dryer prepare itself ready for the next switchover, which is made as soon as the compressor is switched on.

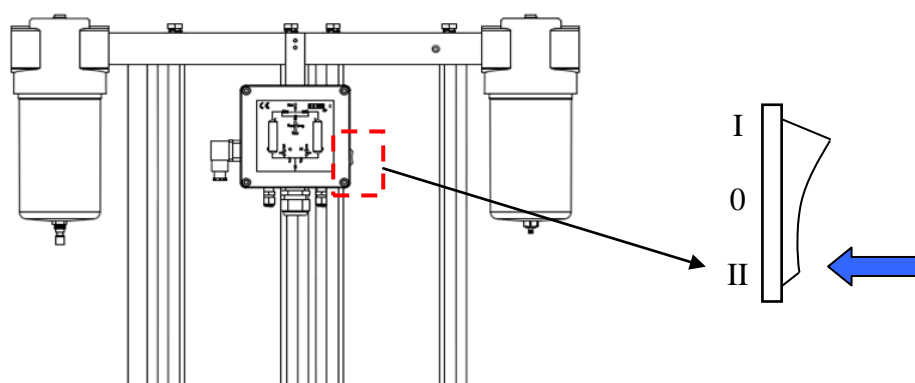
With Dewpoint-Sensing Control (Optional)

Dryers equipped with dewpoint-sensing control operated in variable cycle mode, based on the measured dewpoint of the dried air at the compressed air outlet. As soon as a certain dewpoint is reached, as the drying agent in the absorbing vessel is saturated, the vessels are switched.

The dewpoint at which a switchover is made is preset at the factory.

How do I change cycle mode?

- Wait until the dryer has reached the pressure build-up phase (phase prior to switchover).
One LED for *Adsorption B1/B2* is on in the flow diagram.
- Set the ON/OFF switch to position **II**.

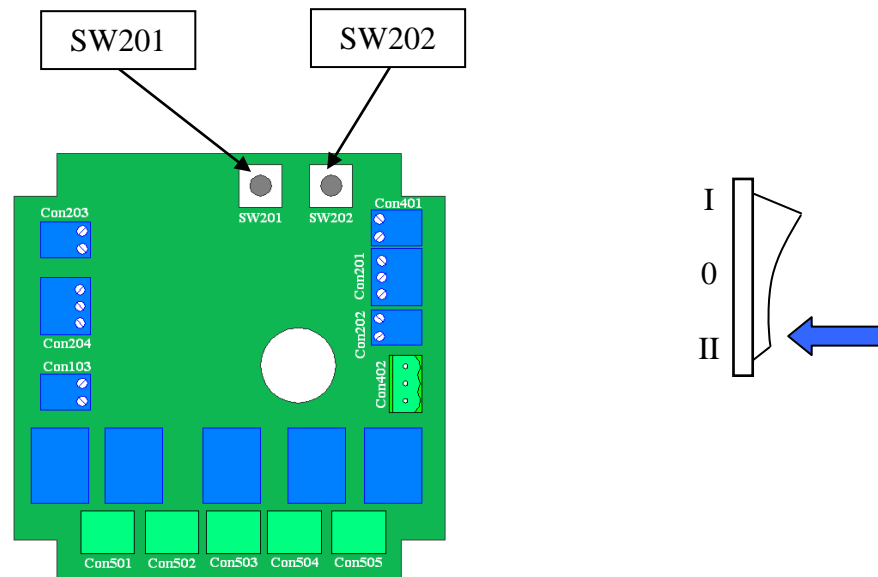


How do I change the dew point value for vessel switch over?

For ATACAMA which are operating with *Dewpoint-Sensing Control*, the factory setting will be at -30°C.

To change the pre-set value, open up the control panel enclosure.

- Ensure mode is at position **II**.



- On the PLC board, look for the switch “SW201” and “SW202”.
- To enter dew point switching mode, press “SW202”
- Then press “SW201” or “SW202” to increase or decrease the desired dew point switching value.
- Once the desired dew point setting is reached, wait for 5 seconds for PLC to save the setting.
- The dryer will now run with the new dew point setting.

Monitoring dryer operation

The dryer operates fully automatically. However, you should carry out the regular checks described in the Chapter *Maintenance and repair of the dryer*.



Warning against sudden air ejection!

During expansion the pressure is released suddenly through the silencer:

- **A loud expansion noise is caused which may damage your hearing.**
- **Particles carried in the air flow act like bullets and can injure your eyes or skin.**

Always wear eye and ear protection, therefore, when you are in the vicinity of the dryer!

With Dewpoint-Sensing Control (Optional)

Display of dewpoint

If the dryer is equipped with a dewpoint-sensing control system, the digital display at the front of the switchbox shows the currently measured dewpoint. The range of display is $-100\text{ }^{\circ}\text{C}$ ($-148\text{ }^{\circ}\text{F}$) to $+20\text{ }^{\circ}\text{C}$ ($68\text{ }^{\circ}\text{F}$).

If the set dewpoint is exceeded, the system automatically completes a switchover between the vessels. The dewpoint at which a switchover is made is preset at the factory.


- After commissioning or extensive maintenance work, check the dewpoint display at the dryer.

Under certain circumstances, the desired dewpoint is only reached after prolonged operation.

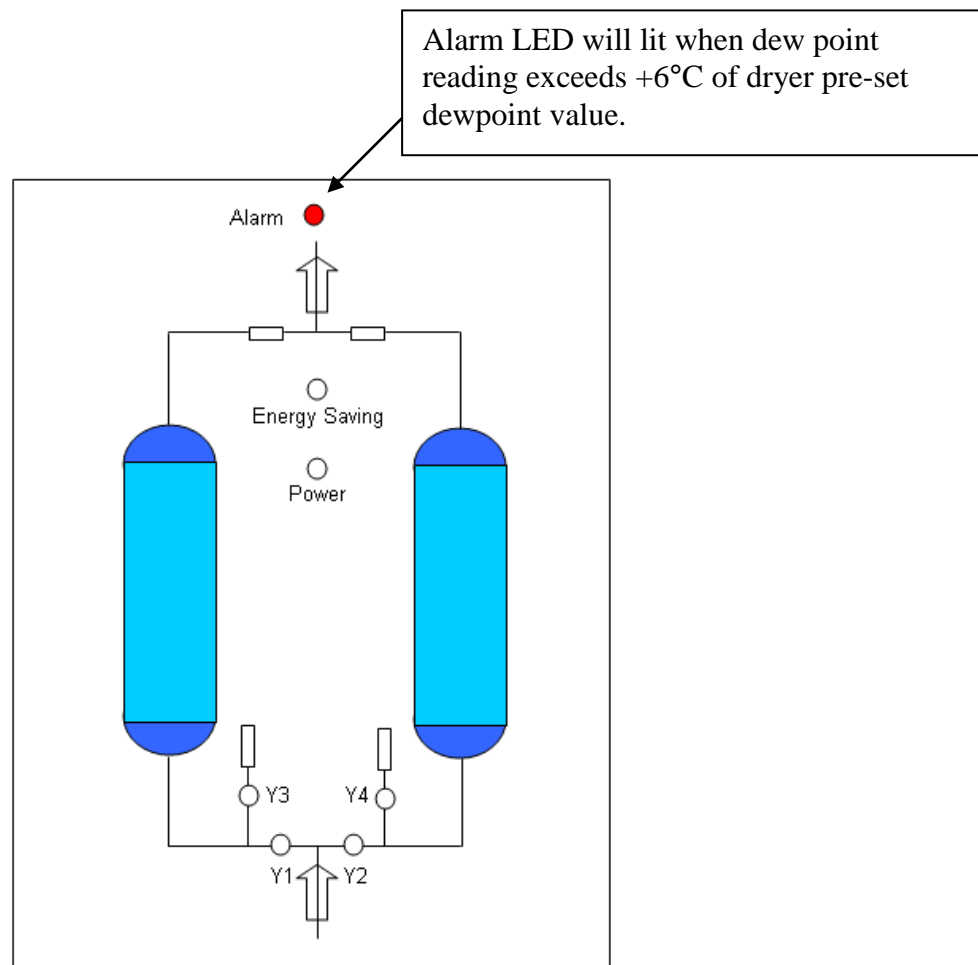
Error messages

If the measured dewpoint exceeds the preset alarm limit $+6\text{ }^{\circ}\text{C}$ ($42.8\text{ }^{\circ}\text{F}$) above the switchover value, the displayed dewpoint value will be in flashing condition. In addition, an error message can be issued through the potential-free busbar.

Error codes and their causes:

Display	Cause
Blinking with current dew point reading	<ul style="list-style-type: none"> ■ Upper measuring range limit exceeded
	<ul style="list-style-type: none"> ■ Dewpoint sensor defective ■ Dewpoint sensor not powered ■ Cable defective ■ Sensor defective

For instructions on how to eliminate faults, see chapter *Identify and eliminate faults*



Shutdown and restart dryer

In the following cases, the dryer must be fully shut down and depressurised:

- In the event of an emergency or malfunction
- For maintenance work
- For dismantling



Risk of injury from escaping compressed air!

Never remove any parts of the dryer, or manipulate the same in any way, as long as the unit is pressurised! Suddenly escaping compressed air might cause serious injuries.

Prior to any work, release all pressure from the unit.

Note:

If the unit is equipped with a compressor synchronisation system, first switch off the compressor and then wait until the dryer has reached the standby phase before switching it off with the ON/OFF switch.

This ensures that the regeneration cycle is completed, and that the pressure in both vessels is at the same level.

Note:

As soon as the dryer is switched on again, the programme continues the cycle from the point at which it has been stopped.

Emergency shutdown

In any emergency proceed as described in the next section.

Depressurising and shutting down the dryer

In order to make the dryer safe, follow the instructions in the next three sections:

Disconnect dryer from compressed air system

- ▶ Close the compressed air outlet valve (provided by owner).
- ▶ Close the compressed air inlet valve (provided by owner).
- ▶ If installed: Open bypass line.

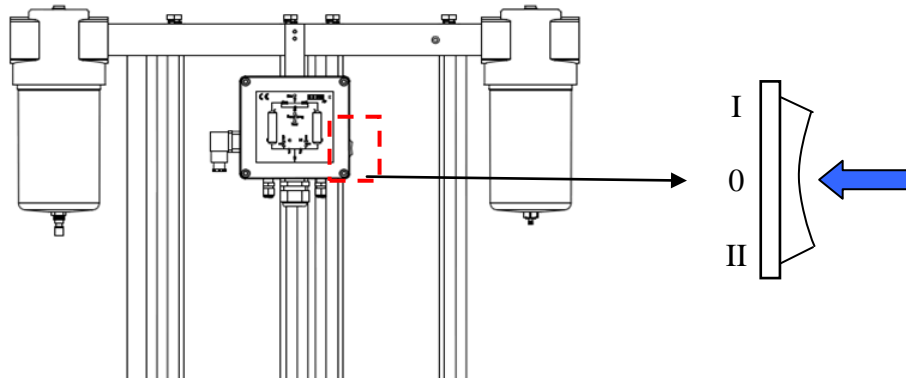
Depressurise dryer

- ▶ Leave the dryer on until the expansion phase in both vessels has been completed.

During the expansion phase, the vessels are completely depressurised.

Disconnect voltage supply

- ▶ Switch off the dryer by setting the ON/OFF switch to position 0.



If work is to be carried out on the electrical system

- ▶ Depressurise and shut down the dryer, following the instructions in the above chapter.



Risk of injury due to voltage-carrying parts!

The electrical supply cable and external power lines are live even after the dryer is switched off and, in the event of body contact, may cause serious injury! Before carrying out any work on the electrical system, the electrical supply cable and all external power lines must be made voltage-free!

- ▶ Make the electrical supply cable to the dryer voltage-free.
- ▶ Secure the electrical supply cable to the dryer against switch-on.

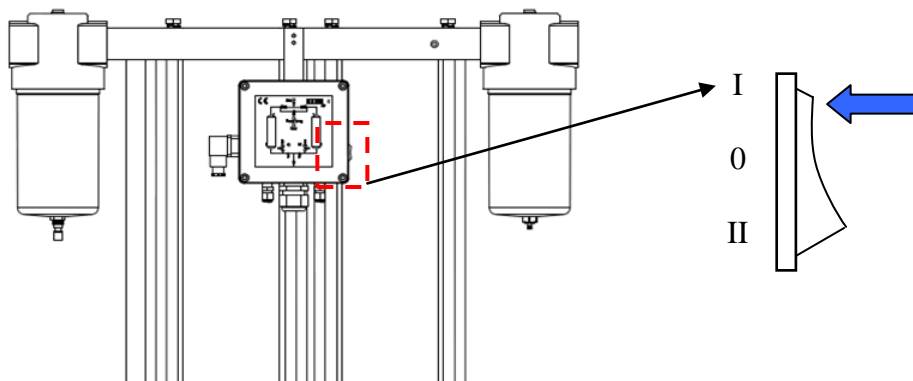
Restart

Depending on the fittings installed by the operator and the actual pressure conditions, the unit might have to be restarted at operating pressure. The following general rules apply:

- When switched off, the dryer is blocked in the main flow direction.
- The pressure in the vessel drops (provided that the compressed air outlet valve provided by the operator is opened), if
 - compressed air can escape to the compressed air system,
 - the dewpoint-sensing control is implemented.

If compressed air system and dryer have remained at operating pressure

- Ensure that the compressed air inlet valve (provided by the owner) is open.
- Set ON/OFF switch to **I**. The programme continues the cycle from the point at which it was interrupted.



Slowly open compressed air outlet valve!

Avoid a sudden drop in pressure in any circumstance! If pressure drops too fast, this may cause damage to the dryer. Therefore, the compressed air outlet valve must always be opened quite slowly!

- **Slowly** open the compressed air outlet valve installed by the owner. If necessary, keep the compressed air outlet valve in a slightly open position until the compressed air system downstream of the dryer has filled up completely; only then should the valve be opened fully.
- If available, block off bypass line.

The dryer is now in operation again and operates fully automatically.

If compressed air system and dryer have not remained at operating pressure

- If disconnected, reconnect the voltage supply of the dryer.
- Pressurise and switch on the dryer as described in the section *Open compressed air supply and switch on dryer* on page 27.

The dryer is now in operation again and operates fully automatically.

Maintenance and repair of the dryer

In order to allow maintenance work on the dryer to be carried out efficiently and without danger for maintenance personnel, you should comply with the following instructions.

Notes on maintenance



Warning!

Maintenance tasks may be carried out only by authorized and qualified specialist personnel, and only with the plant in a switched off and depressurised condition.

Note:

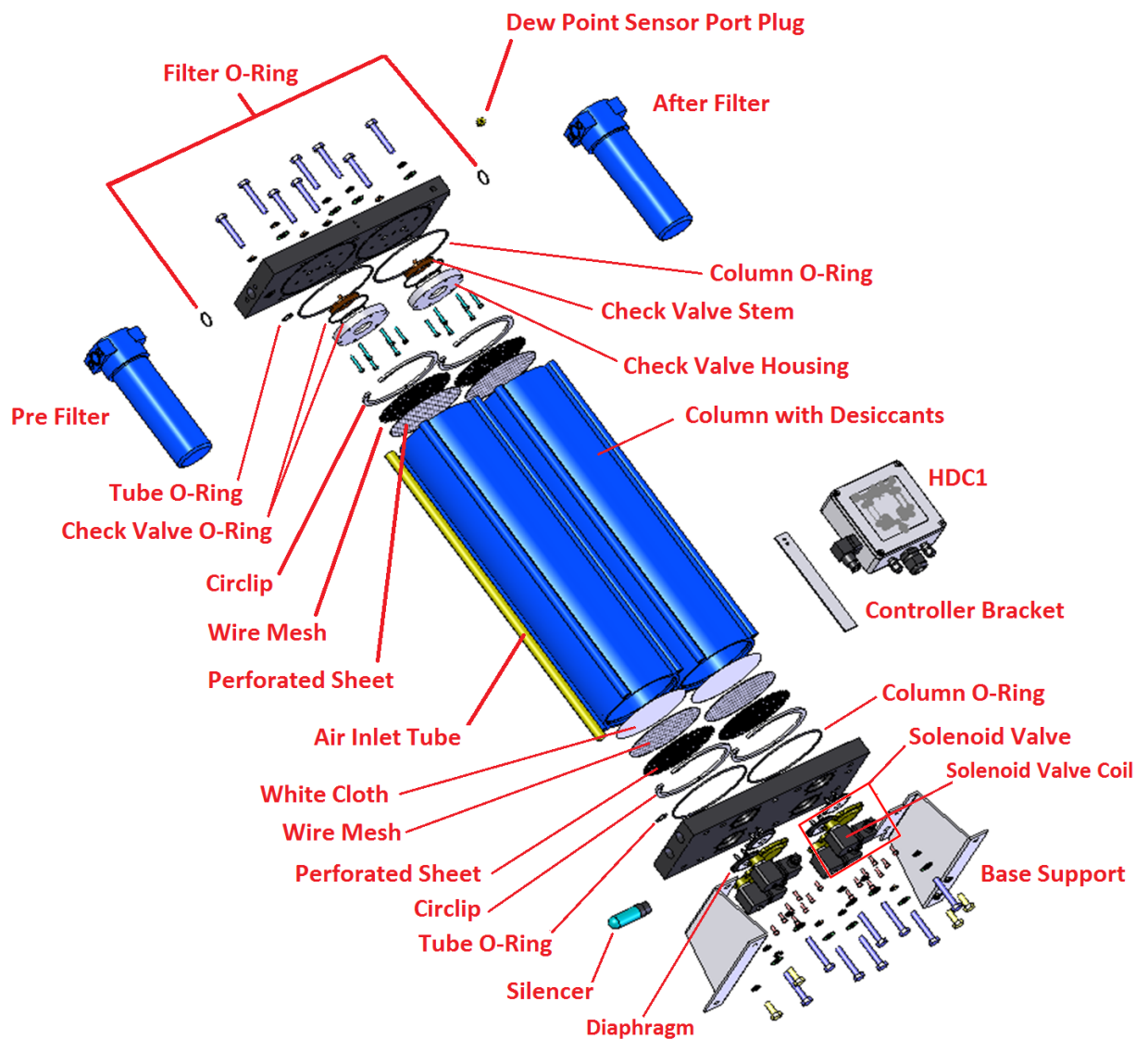
In order to ensure perfect maintenance and reliable operation we recommend that you conclude a maintenance contract (For telephone number, see page 5).

When exchange or replacement parts are ordered, always state the dryer type and the build no. of the dryer. These data are found on the type plate attached to the front casing of ATACAMA, near the controller.

- Carry out all maintenance work only when the plant has been shut down and depressurised!
- Bolt connections must be undone with care! Note ram pressure values! Otherwise emerging media may cause personal injury.
- Do not modify the factory settings of the control system in any way without prior consultation with the manufacturer.
- Never carry out welding work on a vessel or modify the same in any way!
- Following maintenance work, always check all fittings and bolt connections for leakage and secure seating.
- Never leave tools, loose parts or cloths in, at or on the dryer.

Dryer Assembly Mechanism

- Refer below exploded drawing view for better understanding of ATACAMA assembly mechanism



Tools and items required for maintenance works

- Allen key for DIN 912 Cap Screws size M4, M5, M8, M10, M12
- Circlip Pliers for DIN472 Circlip size B-85, B-140 and B-185
- Vacuum for removal of desiccants
- Grease

Regular maintenance intervals

Note:

If a vessel has been depressurised, e.g. after completion of the expansion phase, and the pressure remains above 0 bar, the vessel is pressurised by what is known as ram pressure. This might be due to

- blockage at the silencer(s),
- contamination of the dust sieves,
- spent drying agent.

To prevent such malfunctions, regularly service the dryer as described below.

The table provides an overview of the maintenance work to be carried out. The individual tasks are described in the following pages.

Component	Maintenance task to be carried	Maintenance interval						see page
		daily	weekly	monthly	12 months	24 months	48 months	
Complete dryer	Carry out visual and function checks.	▲						41
Upstream and downstream filters	Check function of condensate trap on pre filter. Clean if necessary.			▲				Error! Bookmark not defined.
	Replace all filter elements after 1 year of operation.				●			42
Silencer	Replace silencer after 1 year of operation and after renewing the dessicant.				●			42
Dew point sensor (with optional dew point sensing-control)	Must be calibrated.				●			
Check valves	Renew.				●			
Solenoid valves	Replace valve bodies.				●			
	Replace solenoid coils.					●		
Dust sieves, drying agent	Renew.						●	43

Codes:

▲ Check.

● Renew.

When carrying out any maintenance work, comply with the following safety instructions:



Danger!

There is a very considerable risk of personal injury, when carrying out work on the activated and pressurised dryer.



Before commencing any maintenance tasks always shut down the dryer as described on page 35 !



Warning against electrical voltage!

Only qualified specialist personnel may carry out work on the electrical system!

Daily maintenance tasks

Carry out visual and function check on the complete dryer

- ▶ Check dryer for external damage or unusual noise generation.
- ▶ Duly eliminate any defects found.

Clean dryer

- ▶ Remove any loose dust by means of a dry cloth, and, if required, also by means of a moist and well wrung cloth.
- ▶ Clean the surfaces with a moist well wrung cloth.

If no compressed air or an unusually large amount of condensate, or no water condensate at all, emerge, you have to remove the condensate trap, clean and if necessary, replace the same. To this end, proceed as follows:

- ▶ Depressurise the dryer and shut it down (see page 35).
- ▶ Unscrew the bottom section of the filter housing; remove the condensate trap, clean or fit new condensate trap.
- ▶ Refit bottom section of the filter housing: first screw on very tightly then unscrew by a quarter turn.
- ▶ Restart dryer (see page 37).
- ▶ Recheck function of the condensate trap.

Monthly maintenance tasks

Check the function of the condensate trap on the upstream filter

A level-controlled condensate trap is installed at the upstream filter. The condensate trap drains the condensate automatically whenever a predefined fill level is reached. This trap prevents that the humidity separated from the filter ingresses into the dryer and has a detrimental effect on the drying agent.

Check the condensate trap as follows:

If no compressed air or an unusually large amount of condensate, or no water condensate at all, emerge, you have to remove the condensate trap, clean and if necessary, replace the same. To this end, proceed as follows:

- ▶ Depressurise the dryer and shut it down (see page 35).
- ▶ Unscrew the bottom section of the filter housing; remove the condensate trap, clean or fit new condensate trap.
- ▶ Refit bottom section of the filter housing: first screw on very tightly then unscrew by a quarter turn.
- ▶ Restart dryer (see page 37).
- ▶ Recheck function of the condensate trap.

Maintenance work to be completed every 12 months

Renew filter elements on the filters

The filter elements must be replaced every 12 months.

- ▶ Depressurise dryer and take out of service (see page 35).
- ▶ Remove the bottom section of the filter housing
- ▶ Replace filter element.
- ▶ Refit bottom section of the filter housing: first screw on very tightly, and then unscrew by a quarter turn.
- ▶ Dispose off used filter element in accordance with the applicable regulations.
- ▶ Restart dryer (see page 37). Check the filters for leaks.

Renew silencers

The dryer is equipped with a silencer. If the silencer becomes blocked, a dam pressure is generated which in extreme cases may cause the silencer to burst.



Hazard caused by blocked silencer!

Blocked silencers can cause a dangerous overpressure to build up which may cause the silencers to burst. Flying fragments may cause personal injury and damage to property.

Therefore, the silencers must be replaced every 12 months and after each change of desiccant.



Warning against sudden air ejection!

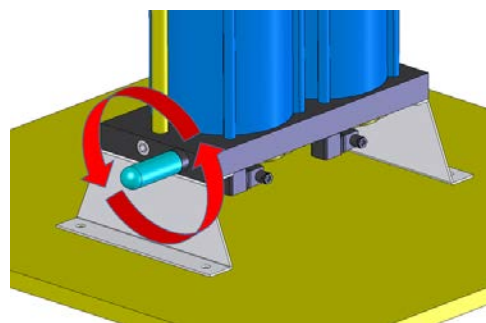
During expansion the pressure is released suddenly through the silencer:

- **A loud cracking noise occurs which can injure your hearing.**
- **Particles carried in the air flow act like bullets and can injure your eyes or skin.**

Always wear eye and ear protection, therefore, when you are in the vicinity of the dryer!

Renew silencer

- ▶ Depressurise the dryer and shut it down (see page 35).
- ▶ Unscrew silencer as shown in the illustration.
- ▶ Replace silencer and secure it.



Undo silencer

- ▶ Restart dryer (see page 37).

Maintenance work to be completed every 48 months

To complete the following maintenance tasks, you must dismantle ATACAMA's top plate and the columns. We therefore recommend that you carry out these tasks together.

Note:

In accordance with national regulations, a pressure vessel inspection may be prescribed to be carried out at regular intervals by an independent supervisory office.

For an inspection of the pressure vessels, the drying agent must be removed as described as follows.

When inspecting the pressure vessels, it is recommended to check the condition of all fittings such as e.g. sieve bottoms and dust sieves, including gaskets. If necessary, these fittings must be cleaned or renewed.

In the event of comprehensive maintenance or repair tasks, contact the manufacturer (see page 5).

Replace Desiccant and Dust Sieves

The service life of the drying agent is usually approx. 3 to 5 years. However, in favourable installation conditions, the change of drying agent may be carried out at a substantially later date (for notes on the installation site, see also page 20). The change interval depends very significantly from the degree of contamination in the compressed air (or the quality of the compressed air upstream filters). Oil, dust, and dirt particles cover the drying agent surface and reduce its effective surface, in part quite irreversibly.

If in doubt, have a sample of your drying agent assessed by specialists. Send a sample of approx. 200 g to the manufacturer (for address, see page 5).

Comply with the following safety notes when changing the drying agent:

Desiccants are contained in the columns and are secured by dust sieves on both ends of the column. If these dust sieves become blocked, a dam pressure is generated which can cause compressed air fluctuations in the compressed air system.

To remove the dust sieves, the Top Plate Block must be dismounted.



Hazard due to a sudden release of pressure!

Always check and confirm that the dryer has been depressurised before dismantling. A sudden escape of pressure may cause serious injuries.



Wear eye protection and dust mask due to increased dust generation.

When emptying the drying agent, increased dust generation may occur.

In order to avoid any eye irritations, wear protective goggles!



In order to avoid any dust inhalation, wear dust mask!



Risk of skidding!

If drying agent has been spilt on the floor, there is a risk of skidding caused by the drying agent beads. Therefore, spilt drying agent must always be taken up immediately.

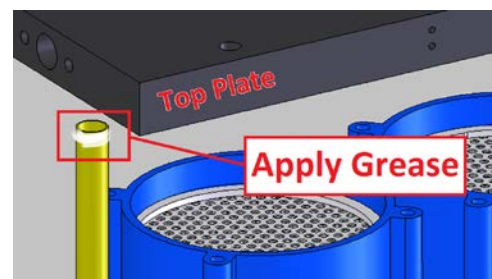
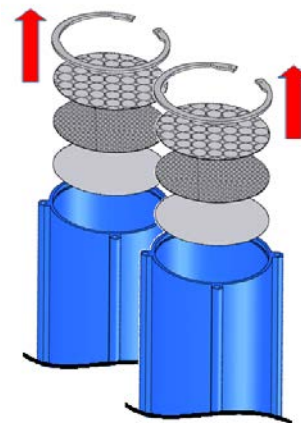
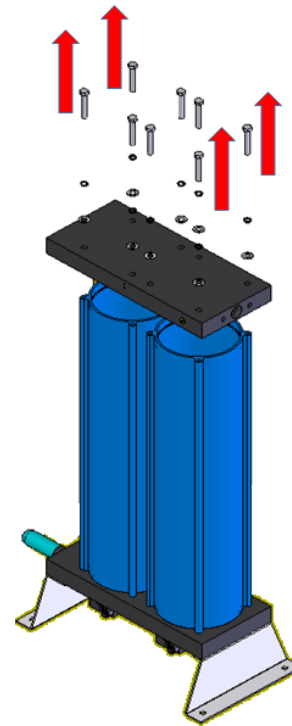


Warning!

If the dryer is not used within specifications, the drying agent can be contaminated with pollutants. Always take this into account for the environmentally safe disposal of the drying agent. The waste code numbers of the drying agent can be obtained from the manufacturer (see page 5).

- Dispose of the used drying agent in accordance with all applicable regulations.

- ▶ Depressurise dryer and take out of service (see page 35).
- ▶ Unscrew eight cap screws on the Top Plate for detachment.
- ▶ Using a circlip plier, remove the circlip which is held inside the column's groove.
(NOTE: Circlip by itself exerts a hard force. Becareful when removing from column)
- ▶ Remove the perforated sheet and wire mesh under the circlip.
- ▶ Drain out the desiccants with a vacuum.
- ▶ When desiccants are completely removed, you will see a piece of white cloth, wire mesh and perforated sheet at the bottom on the column. **(Note: Make sure no desiccants falls into the bottom plate. This will cause the valves to be blocked. If desiccants fall into the bottom plate, remove the valves, and clean it)**
- ▶ Use compressed air or wire brush to clean dust sieves. Replace if necessary.
- ▶ Place the dust sieve layers and circlip back into the column accordingly. **(NOTE: Circlip by itself exerts a hard force. Becareful when placing it into the column)**
- ▶ Check and clean the o-rings between vessel column and Top/Bottom Plate, for sealing assurance. Replace if necessary.
- ▶ Ensure o-rings did not fall off the groove when mounting the top plate back on the columns. Applying grease on the o-ring will provide a mild adhesion effect to ensure o-ring will not fall off during assembly.
- ▶ **Apply grease** on the tip of the tube so that it can slide nicely back into the Top Plate. High chance o-rings will be torn if no grease is applied.
- ▶ Fasten the eight cap screws.
- ▶ Restart dryer (see page 37). Check that the connection is leak tight.



Identify and eliminate faults

The following table provides information on what designatory abbreviations are to be used for the various components. These designations are also found in the technical documentation.

Abbreviation	Component
PDI	Differential pressure gauge
V1–V2 (Y1–Y2)	Main valves (solenoid valves)
V3–V4 (Y3–Y4)	Expansion valves (solenoid valves)

Summary of faults

There are different fault types. In the case of most electrical faults (e. g. short circuit, defective fuse etc.) the main valves close. In the case of some process faults, the dryer will continue to operate for some time. Faults on the dryer become noticeable e.g. due to unusual noises and dam pressures.

The following table shows who is allowed to remedy a fault: the owner's specialist personnel or the manufacturer's service engineer.

Table of possible faults

Fault	Possible cause	Remedy	Spec. personnel	Service engineer
Excessive dam pressure during regeneration	Silencer or filter element of the silencer is contaminated.	Check silencers or filter elements for contamination, clean if necessary, and possible. renew.	●	●
	Expansion valve V3/V4 does not open correctly.	Check expansion valve for contamination, if necessary, clean/renew.	●	●
	Dust sieves are contaminated.	Clean or renew dust sieves.	●	●
Vessel pressure is too low	Excessive differential pressure on the upstream filter.	Check differential pressure on the upstream filter, if necessary, renew filter element.	●	
No pressure build up	The compressed air system upstream of the dryer is not pressurised.	Check whether the compressed air system upstream of the dryer is pressurised. Remove any faults.	●	
	Solenoid valve Y1/Y2 does not open correctly.	Check supply voltage, cable, contacts and solenoid; replace, if necessary.	●	●
Excessive compressed air consumption	Leakage.	Check condensate trap at the upstream filter; clean, if necessary.	●	●
Dryer does not switch over	Solenoid valve Y1/Y2 does not open correctly.	Check supply voltage, cable, contacts and solenoid; replace, if necessary.	●	●
	Solenoid valve Y1/Y2 cannot be opened properly (audible humming sound or valve flapping).	Check supply voltage. Check pilot valves; replace, if necessary.	●	●
	Control board defective.	Check fuse in supply line and in the switchbox; replace, if necessary.	●	●
	Power supply interrupted, cable broken.	Reconnect the unit to the power supply.	●	
	Compressor might be off.	Check compressor synchronisation circuit.		
	Error in control programme.	Restart programme.		●
No expansion	Solenoid valve Y3/Y4 cannot be opened.	Check supply voltage, cable, contacts and solenoid; replace, if necessary.	●	●
	Solenoid valve Y3/Y4 cannot be opened properly (audible humming sound or valve flapping).	Check supply voltage. Check pilot valves; replace, if necessary. Check valve bodies for contamination; clean or replace, if necessary.	●	●
Dryer is continuously bled	Solenoid valve Y3/Y4 cannot be closed properly (audible humming sound or valve flapping).	Check supply voltage. Check solenoid and diaphragm; replace, if necessary.	●	●
	Main valve Y1/Y2 does not open.	Check main valve, replace if nec.	●	●
Dryer is excessively bled	Solenoid valve Y1/Y2 cannot be closed.	Check solenoid and diaphragm; replace, if necessary.	●	●

Fault	Possible cause	Remedy	Spec. personnel	Service engineer
Pressure dew point is not reached	Operating pressure is too low.	Increase operating pressure.	●	
	Compressed air volume flow is too high.	Reduce compressed air volume flow	●	
	Compressed air inlet temperature is too high.	Reduce compressed air inlet temperature or pre-connect a compressed air cooler.	●	●
	Control board is defective.	Check control board, renew if necessary.		●
	Differential pressure on the upstream filter is too high.	Check differential pressure on the upstream filter, renew filter element if necessary.	●	
	Condensate trap on the upstream filter does not work.	Check function of the condensate trap, clean or renew if necessary.	●	●
	Drying agent is contaminated or too old.	Check upstream filter for contamination, renew element if necessary.	●	
		Check drying agent for contamination, renew drying agent if necessary.	●	●
	Regeneration gas too low.	Check function of expansion valve V3/V4 and silencer, renew silencer or filter element if necessary.	●	●

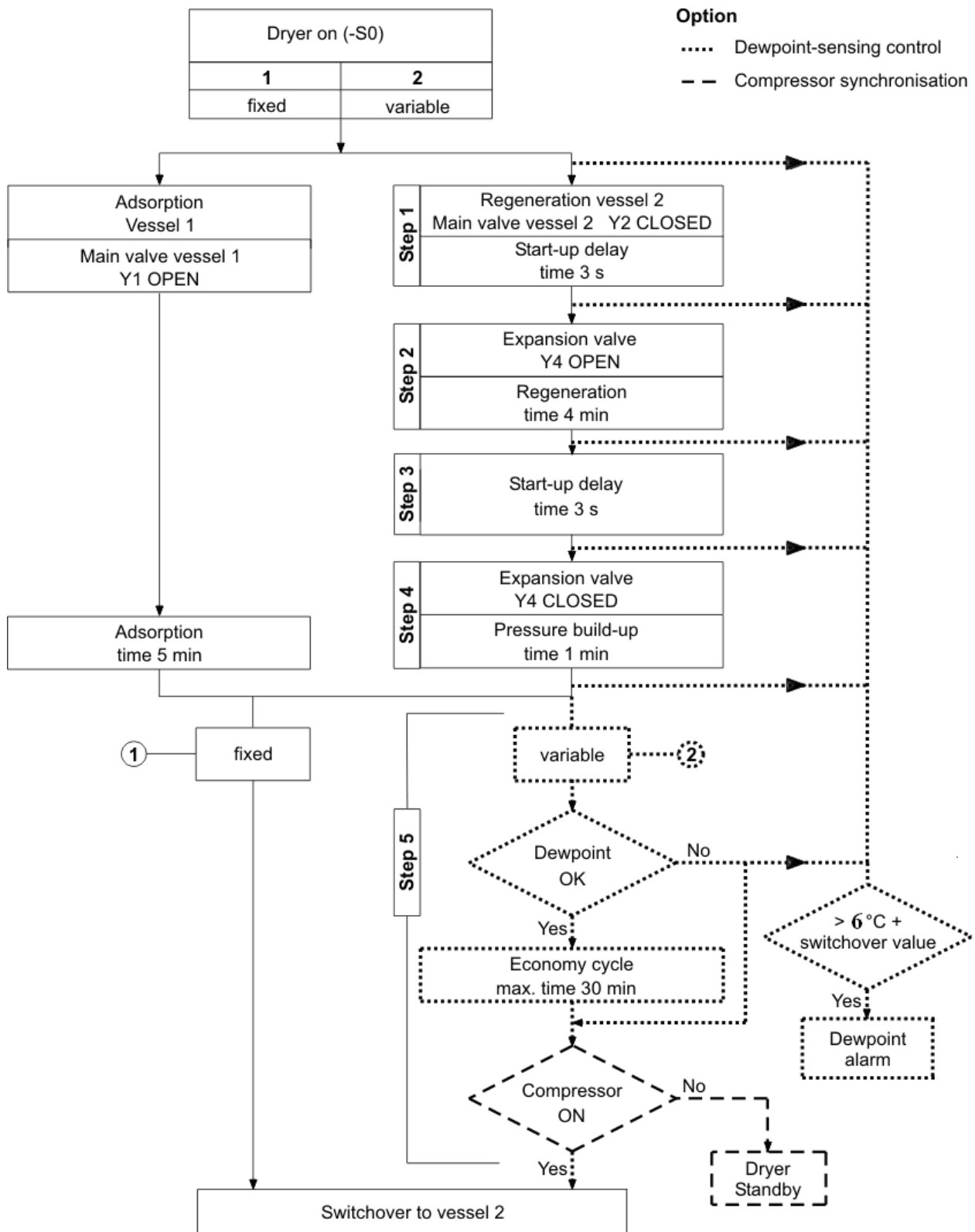
Annex with technical documentation

This annex comprises the following information and technical documentation:

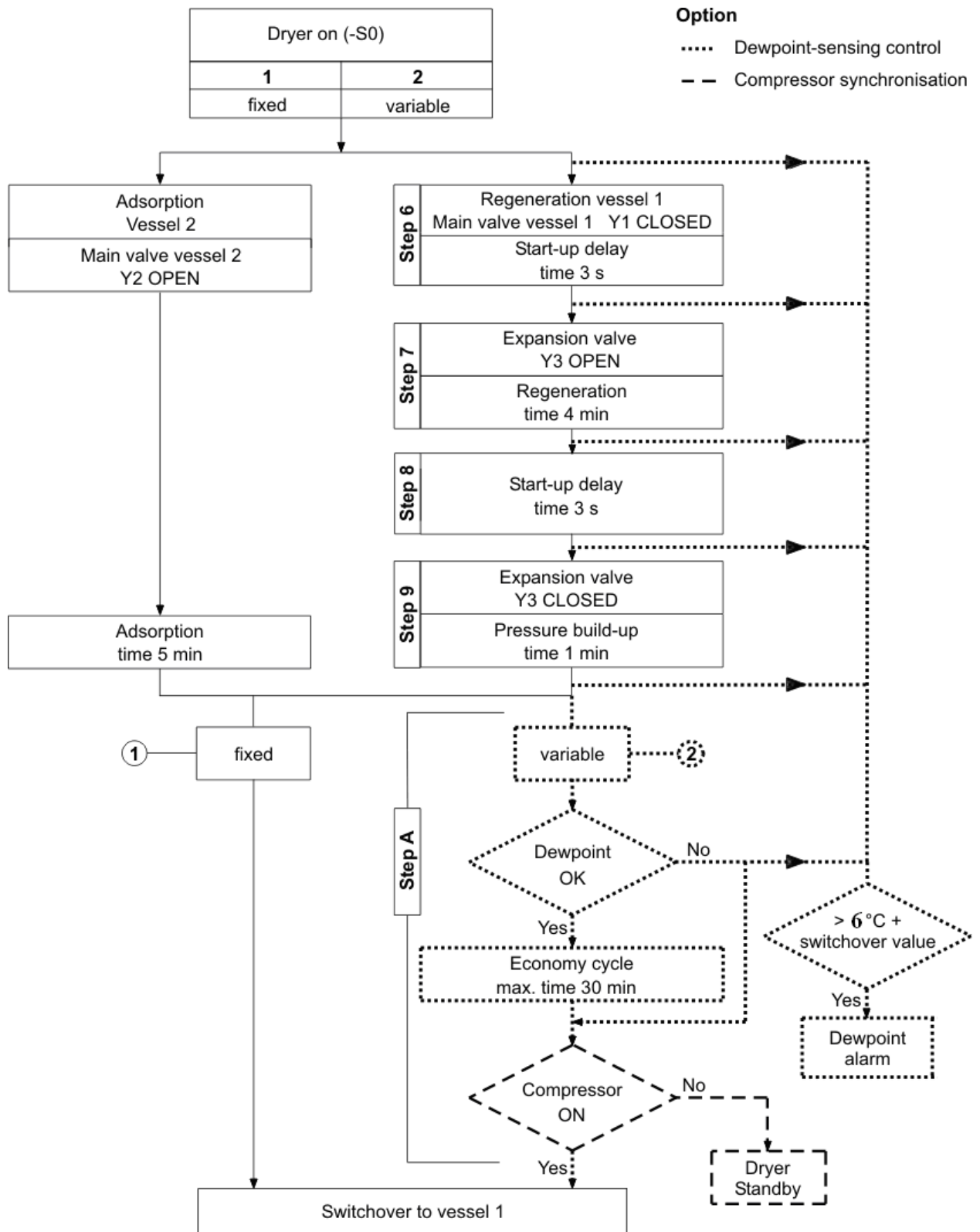
- Logic control diagram
- P&ID
- Dimensional drawing
- Replacement and consumables list

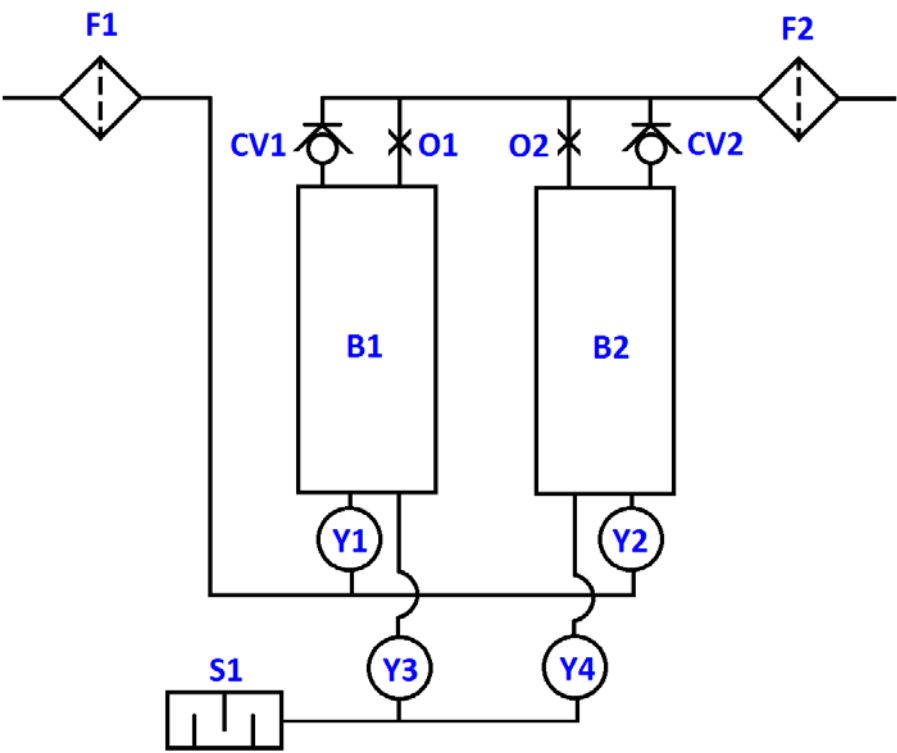
Logic control diagram

Adsorption in B1 and regeneration in B2



Regeneration in B1 and adsorption in B2



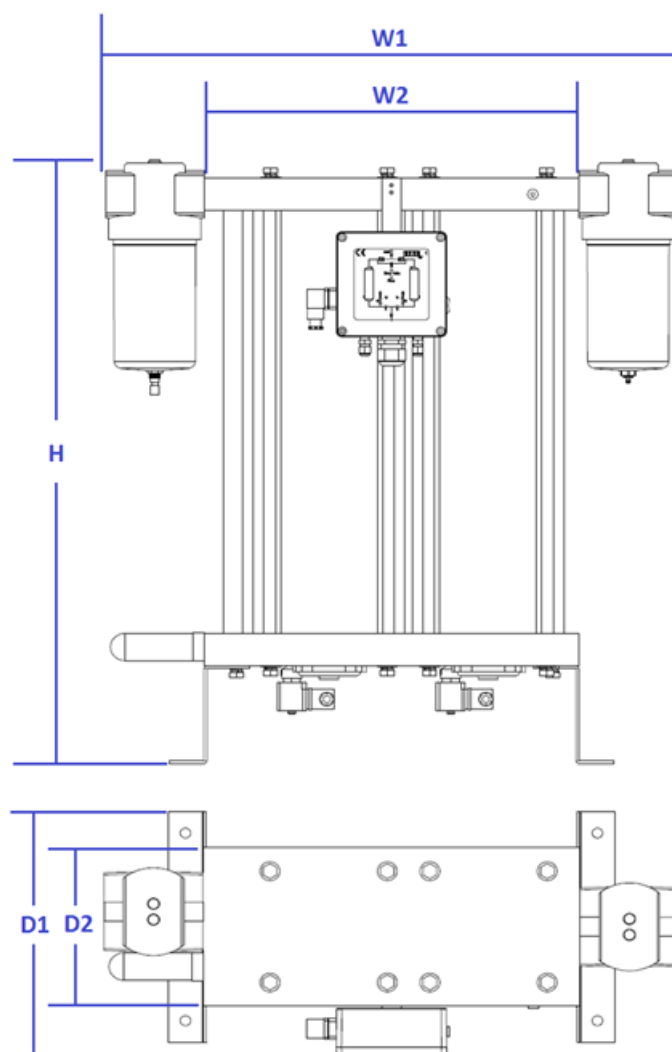


Pos.	Designation
F1	Pre-Filter
F2	After-Filter
CV1	Built-in Check Valve for B1
CV2	Built-in Check Valve for B2
O1	Built-in Orifice for B1
O2	Built-in Orifice for B2
S1	Silencer

Pos.	Designation
B1	Desiccant Filled Vessel
B2	Desiccant Filled Vessel
Y1	Control Valve for B1
Y2	Control Valve for B2
Y3	Exhaust Valve for B1
Y4	Exhaust Valve for B2

Dimensional drawings

Model	H (mm)	W1 (mm)	W2 (mm)	D1 (mm)	D2 (mm)	Weight (kg)	Connection
Atacama5	420	366	245	226	106		1/4"
Atacama10	670	366	245	226	106		1/4"
Atacama15	920	366	245	226	106		1/4"
Atacama20	1120	366	245	226	106		1/4"
Atacama35	992	550	375	273	160		1/2"
Atacama50	1242	550	375	273	160		1/2"
Atacama75	1036	755	495	338	220		1"
Atacama100	1386	755	495	338	220		1"



No.	Component Description								
		5	10	15	20	35	50	75	100
1	Desiccant MS4A	1.6kg	3.6kg	5.6kg	7.2kg	16.3kg	21.7kg	29.6kg	43.3kg
2	Pre Filter Element	✓	✓	✓	✓				
						✓	✓		
								✓	✓
3	After Filter Element	✓	✓	✓	✓				
						✓	✓		
								✓	✓
4	Pre Filter Drain	✓	✓	✓	✓	✓	✓	✓	✓
5	After Filter Drain	✓	✓	✓	✓	✓	✓	✓	✓
7	Solenoid Valve Coil (230VAC)	✓	✓	✓	✓	✓	✓	✓	✓
8	Solenoid Valve Coil (110VAC)	✓	✓	✓	✓	✓	✓	✓	✓
9	Solenoid Valve Coil (24VDC)	✓	✓	✓	✓	✓	✓	✓	✓
10	Solenoid Valve 1/2" Diaphragm Set	✓	✓	✓	✓				
11	Solenoid Valve 1" Diaphragm Set					✓	✓		
12	Solenoid Valve 1.1/2" Diaphragm Set							✓	✓
13	Silencer	✓	✓	✓	✓				
						✓	✓		
								✓	✓
14	O-Ring Set	✓	✓	✓	✓				
						✓	✓		
								✓	✓
15	Dust Sieve Set	✓	✓	✓	✓				
						✓	✓		
								✓	✓

Remarks:

- 1.) Bulk density of desiccants from supplier may vary from different batches.
Amount calculated in table above are rounded up to the bigger qty

Replacements and Consumables List

Remarks:

- It is recommended to replace filter elements at least once a year for preserving good performance to the dryer and downstream system of the dryer.
- Use only genuine parts for best performance.