Quincy

Desiccant dryers

QCMD 4, QCMD 7, QCMD 11

Instruction book

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Original instructions

This instruction book is valid for CE, non-CE as well as UKCA labelled machines. It meets the requirements for instructions specified by the applicable European directives or UK statutory instruments as identified in the Declaration of Conformity.

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1 Safety precautions

1.1 Safety icons

Danger: Indicates a hazard with a high level of risk, which, if not avoided, will result in death or serious injury and / or property damage.

Warning: Indicates a hazard with a medium level of risk, which, if not avoided, could result in death or serious injury.

Caution: Indicates a hazard with a low level of risk, which, if not avoided, could result in minor or moderate injury.

Notice: Indicates that a mandatory action shall be taken to avoid a hazard.

1.2 Statement of use

This dryer is designed for indoor use only in temperatures above 1°C (33.8 °F). The inlet pressure should not exceed 14 bar (203 Psi). The dryer is capable of producing industrial grade instrument air. The dryer is not capable of producing breathable quality air.

Only qualified personnel should install, operate, diagnose and service the dryer. For any technical assistance, please contact your supplier.

1.3 General safety precautions

Danger: Do not touch any electrical connections, valves, or sensors for troubleshooting purposes as this could result in death or serious injury, and/or property damage. Only qualified personnel should perform diagnostic work on the dryer. Contact your representative for assistance.

Danger: Piping and pressure vessels operate with dangerous, highly pressurized compressed air, which, if intentionally or accidentally released, could result in death, serious injury, and/or property damage. Only use or operate the dryer as described and instructed in this Instruction Book. Only use or operate the dryer within the specified temperature and pressure limits described in this Instruction Book.

Danger: Follow all Lock Out/Tag Out (LOTO) procedures before any maintenance or repairs are performed on the dryer. Failure to follow all LOTO methods could result in death or serious injury, and/or property damage.

Warning: Do not modify or alter the dryer piping or vessels by welding, drilling, or any other method. Only qualified personnel should perform modifications, alterations, or repairs on the dryer, its piping, or pressure vessels. Any modifications or alterations could result in death or serious injury. Provide written notification to your manufacturer's representative about any modifications or alterations to the dryer and its vessels.

Warning: The air produced by the compressors and the dryer is not of breathable quality and is therefore not safe for human breathing.

Caution: On units with automatic start/stop system or if the automatic restart funtion after voltage failure is activated (ARAVF - Automatic Restart After Voltage Failure), a sign stating "This machine may start without warning." must be affixed near the instrument panel.

Notice: This dryer should only be operated by using the DC1 controller and only in accordance with the instructions provided in this Instruction Book.

- The operator must employ safe working practices and observe all requirements and regulations related to work safety.
- Installation, operation, maintenance, and repair work must only be performed by authorized, trained, specialized personnel.
- The personnel must apply safe working practices using personal protection equipment, appropriate tools, and defined procedures.
- Do not walk or stand on the dryer components.
- The owner is responsible for maintaining the unit in safe operating condition. Parts and accessories shall be replaced if unsuitable for safe operation.

Personal safety

Danger: Stay alert and watch what your are doing when operating the dryer. Do not operate the dryer while you are tired, under influence of drugs, alcohol, or medication. A moment of inattention while operating the dryer could result in serious personal injury.

Danger: Never direct the compressed air at your face, skin, or another person.

Danger: Never use the compressed air to clean dirt from your clothes.

Warning: Always wear ear, eye, and hand protections while operating the dryer and/or working around compressed air. Observe all federal, state, local, and site-specific government regulations and company guidelines regarding PPE (Personal Protective Equipment).

Warning: Wear a safety helmet when working in an area where work is being performed overhead or with lifting equipment. Observe all federal, state, local, and site-specific government regulations and company guidelines regarding PPE (Personal Protective Equipment).

Warning: Always wear protective clothing and use PPE (Personal Protective Equipment) in accordance with instruction of all federal, state, and site-specific regulations, and company guidelines. Observe all federal, state, local, and site-specific government regulations and company guidelines regarding PPE (Personal Protective Equipment).

1.4 Safety precautions during installation

Precautions during installation

All responsibility for any damage or injury resulting from neglecting these precautions, or non-observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

Danger: Install the dryer with floor level and fix it firmly. If the ground is not level or can be subject to variable inclination, consult the manufacturer.

Danger: If remote control is installed, the unit must bear a clear sign stating: "DANGER: This machine is remotely controlled and may start without warning."

Danger: If the dryer is to be operated by remote control then the end user needs to attach a label/sign to the control panel box stating: "DANGER: This machine is remotely controlled and may start without warning."

Danger: Keep the inlet and ambient air free from hazardous gases, fumes, vapors, and particles that can lead to an internal fire or explosion, which could result in personal injury and/or death or equipment damage.

Danger: When lifting the dryer, follow all applicable safety regulations.

- Use the lifting lugs located in the top manifold. To access them, remove the canopy.
- Secure loose or pivoting parts before lifting.

Failure to follow this warning could result in personal injury and/or death or equipment damage.

Danger: Do not remove or tamper with the safety devices or guards fitted on the unit. Every pressure vessel or auxiliary that is installed outside the unit to contain air above atmospheric pressure, must be protected by a pressure relieving device or devices as required. Failure to follow the warning could result in personal injury and/or death or equipment damage.

Danger: If no safety valve is present in the air net close to the desiccant dryer (e.g., safety valve of compressor), full flow safety valves must be installed on the dryer vessels.

Danger: If the maximum pressure of the compressor is higher than the design pressure of the dryer, a full flow safety valve must be installed between the compressor and the dryer to blow off the excessive pressure. This is done in case the safety valve of the dryer is out of order or blocked.

Warning: All piping to and from the dryer, including regeneration air outlet piping, must be of sufficient size, strength, and quality to withstand normal operating pressures and temperatures. Additionally, the piping must be securely mounted and supported in accordance with all federal, state, local, and site-specific government regulations, company guidelines, and good engineering practices. Consult a local engineer familiar with the applicable site, equipment, guidelines, and regulations. Failure to comply with any applicable federal, state, local, and/or company guideline or regulation could result in bodily injury or death.

Caution: Be careful when working around the regeneration air outlet pipe and other high temperature piping or parts. Contact with high temperature piping or parts will result in bodily injury.

Notice: Do not obstruct the air inlet, air outlet, and regeneration outlet. Do not allow water, oil, and other contaminants into the inlet air, which could result in damage to the equipment.

Notice: Remove all flange covers, plugs, caps, and desiccant bags before connecting any piping to the dryer to ensure proper performance.

Notice: Ensure the dryers are grounded and protected against short circuits by fuses in all phases.

Notice: Place the unit where the ambient air is as cool and clean as possible. If necessary, install a suction duct.

Notice: Ensure all piping connections (inlet, outlet, and regeneration) are properly installed and mounted. They need stress-free support that can withstand any unexpected release of

compressed air. The piping and its installation need to comply with good engineering practices, all federal, state, local, and site-specific government regulations, and company guidelines.

Notice: The electrical connections must correspond to the applicable codes.

- In the USA: NFPA 70® (National Electrical Code®)
- In the European countries: IEC 60364

Follow all federal, state, local, and site-specific government regulations, and company guidelines. A lockable power-isolating switch must be installed near the dryer.

- Installation should be done by qualified personnel only.
- All piping connections should be reviewed and approved by qualified personnel. Keep the unit in safe operating conditions as per all federal, state, local, and site-specific government regulations, and company guidelines.
- Also consult the following safety precautions, see section *Safety precautions during operation* and *Safety precautions during maintenance or repair*.
- The precautions apply to all machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application, which are not included herein.
- Same precautions are general and cover several unit types and equipment; hence some statements may not apply to your unit.

1.5 Safety precautions during operation

Precautions during operation

Danger: Do not remove any components of the unit during operation (piping, vessels, valves, etc.). Sudden release of highly dangerous, pressurized compressed air could result in bodily injury or death.

Warning: Do not touch any piping or components of the unit during operation.

Warning: Do not operate the dryer when flammable or toxic fumes, vapors or particles are present in the vicinity of the dryer.

Warning: Do not switch on or remotely control the dryer without ensuring no one is working on the dryer. Affix a suitable notice to the remote start equipment.

Warning: Do not peform maintenance or repair when the dryer is in remote control.

Warning: Do not perform maintenance or repair when the dryer has the ARAVF (Automatic Restart After Voltage Failure) activated.

Notice: Do not operate the dryer above or below its temperature, flow or pressure ratings. The dryer needs a minimum inlet flow and pressure to operate correctly, and high flow will result in damage to the desiccant beads and loss of performance. High pressure can result in damage to the dryer, pipework and other components in the system.

Notice: Only use DC1 controller to operate the dryer.

1.6 Dismantling and disposal

The device must be disposed according to local regulations. The product is not designed for refurbishing after finished lifecycle.

Dismantling

Once the end of life of the machine is reached, please follow next steps:

1. Stop the machine.
2. Check all safety precautions mentioned in the previous chapters to secure safe handling (e.g. LOTO, cool-down, depressurize, discharge, etc.).
3. Have trained personnel dismantle the installation.
4. Separate the harmful from the safe components (e.g. drain oil from parts containing oil).
5. Refer to the disposal topic below.

Disposal of electrical and electronic appliances (WEEE)

This equipment falls under the provisions of the European Directive 2012/19/EU on waste electrical and electronic appliances (WEEE) as well as under the UKCA Waste Electrical and Electronic Equipment regulations 2013 and may not be disposed as unsorted waste.

The equipment is labelled in accordance with the European Directive 2012/19/EU and the UKCA Waste Electrical and Electronic Equipment regulations 2013 with the crossed-out wheelie bin symbol.

At the end of life-time of the electric and electronic equipment (EEE) it must be taken to separate collection.

For more information check with your local waste authority, customer center or distributor.

Disposal of other used material

Used filters or any other used material (e.g. filter bags, filter media, desiccant, lubricants, cleaning rags, machine parts, etc.) must be disposed of in an environmentally friendly and safe manner, and in line with the local recommendations and environmental legislation.

2 General description

2.1 General description

Introduction

The air dryers described in this book are heatless adsorption dryers, designed to remove humidity from compressed air for industrial applications.

There are different variants of the dryers, all are equipped with a DC1 electronic controller. Depending on the variant, the dryer can reach a pressure dew point of -40 °C (-40 °F) or -70 °C (-100 °F). Optionally, a pressure dew point (PDP) sensor can be added.

The dryers are designed for indoor use and at altitudes up to 2000 m (6560 ft).

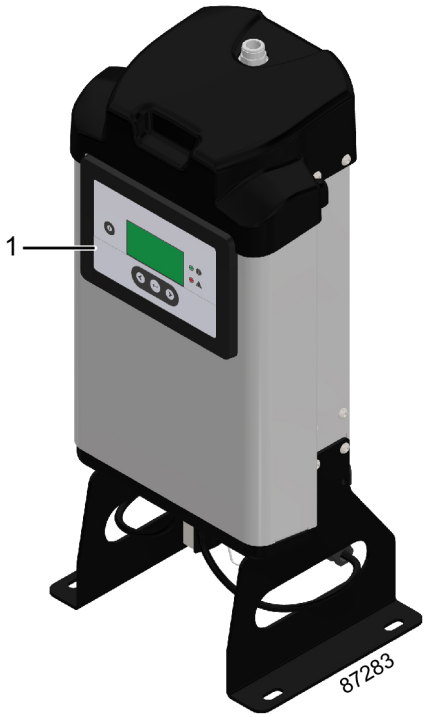


Figure 1: Front view

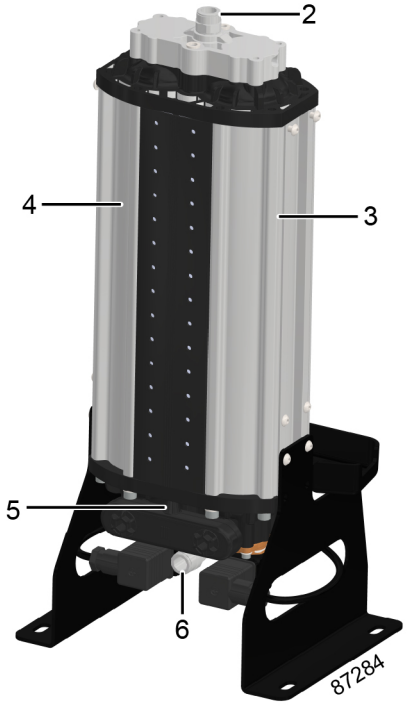


Figure 2: Rear view

Reference	Description
1	DC1 controller
2	Air outlet
3	Left tower
4	Right tower
5	Silencer inlet
6	Air inlet

A dust filter and a coalescing inlet filter are supplied loose.

2.2 Operation

Notice: Images are for reference only. Contact your local representative for applicable general arrangement drawing for the correct model.

General

With its simple construction, the air dryer is both reliable and easy to service. A dryer module basically consists of two towers, containing the adsorption material or desiccant. The desiccant cartridge is able to adsorb large amounts of water vapor.

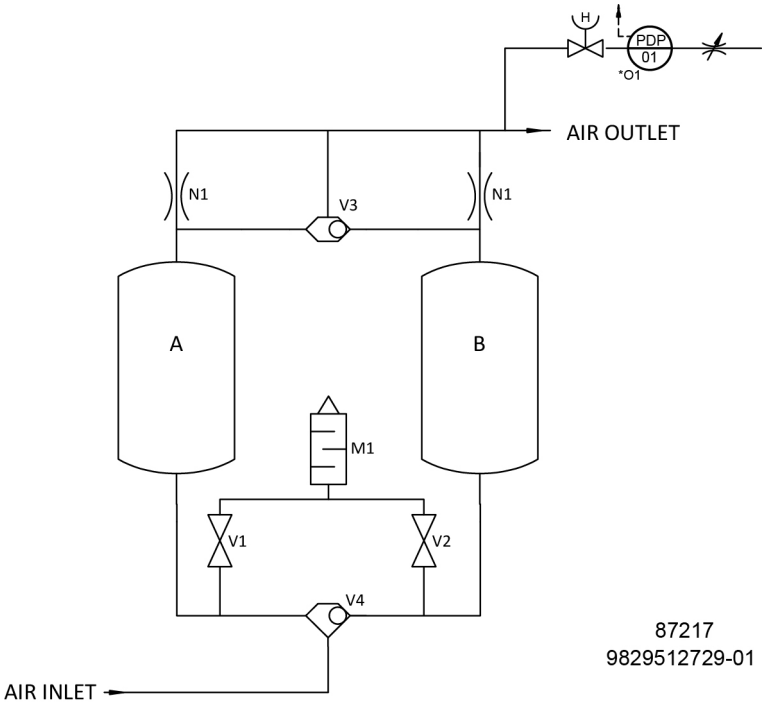


Figure 3: Flow diagram

Reference	Description
AIR INLET	Air inlet
AIR OUTLET	Air outlet
A	Left desiccant tower
B	Right desiccant tower
V1	Left valve (with solenoid valve)
V2	Right valve (with solenoid valve)
V3	Top Shuttle valve
V4	Bottom Shuttle valve
M1	Blow off silencer
N1	Nozzle (left and right)

Operation principle

The operation cycle of the dryer is repetitive and is controlled by a factory set timer in the controller or by the pressure dew point (PDP) sensor, which is optionally available. While the desiccant in one tower dries the compressed air, the desiccant in the second tower is being regenerated. Regeneration of the desiccant is achieved by means of purge air from the drying tower.

The compressed air entering the dryer is led to one of the towers by means of valve V4. The position of V4 is controlled by valves V1 and V2. As the air flows upwards through the tower, the desiccant adsorbs the water vapor and the compressed air is dried. The dried air leaves the dryer via the outlet valve (V3).

A small portion of the dried air passes a nozzle (N1), expands to atmospheric pressure and flows downwards through the other tower, regenerating (drying) the desiccant. The nozzles are regulated for operation of the dryer at 7 bar. Contact your supplier or service documentation to regulate the nozzle for other pressures.

The regeneration air is released via the solenoid valves (V1 and V2) and the silencer (M1). These solenoid valves are controlled by the timers.

After a preset period (or when triggered by the PDP sensor) the function of the towers is reversed. The fully regenerated tower will now dry the air, while the desiccant in the other tower will be regenerated.

By default, the regeneration timer will restart from the beginning of the cycle in case of a power failure during operation or in case the dryer was switched off.

The working sequence of the controller is as follows:

X11, X12 and X13 are the relay numbers on the back of the controller.

Status	Left tower	Right tower	X11	X12	X13
0	Stopped	Stopped	0	0	0
1	Adsorbing	Adsorbing	0	0	0
2	Shifting	Adsorbing	1	0	0
3	Regenerating	Adsorbing	1	0	1
4	Equalizing	Adsorbing	1	0	0
5	Freeze (compressor synchronization)	Adsorbing	1	0	0
6	Standby	Adsorbing	1	0	0
7	Adsorbing	Adsorbing	0	0	0
8	Adsorbing	Shifting	0	1	0
9	Adsorbing	Regenerating	0	1	1
10	Adsorbing	Equalizing	0	1	0
11	Adsorbing	Freeze (compressor synchronization)	0	1	0
12	Adsorbing	Standby	0	1	0

When the ON/OFF push-button is pressed during operation, the controller jumps automatically to status 6 or 12 (equalization phase). After that, the stop status (0) will be reached. The following start command will restart the sequence from the state 2 or 9. The same happens when the power is switched off.

3 Controller

3.1 Control panel

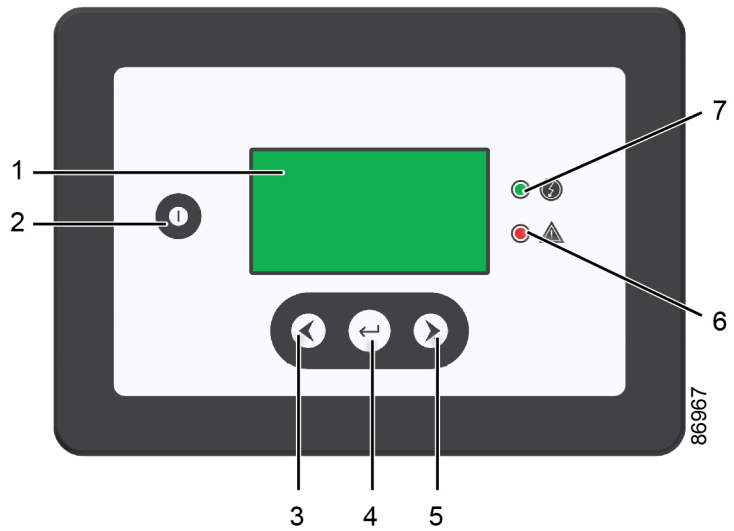
General description

The controller automatically controls and protects the dryer, i.e.:

- Keeping the pressure dew-point stable.
- Monitoring switches to ensure safe operation and stopping the dryer whenever necessary.
- Restarting the dryer when required.

In order to control the dryer and to read and modify programmable parameters, there is a control panel provided with:

- LEDs indicating the status of the dryer.
- A display indicating the operating conditions or a fault.
- Keys to control the dryer and to access the data collected.
- Buttons to manually start and stop the dryer.



Reference	Description
1	Display
2	On/off button
3	Left button
4	Enter button
5	Right button
6	Alarm LED
7	Power on LED

Button functions

Press any button to light up the display.

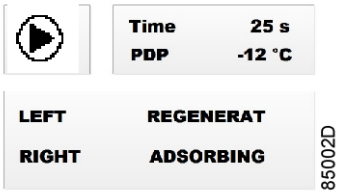
Button	Normal operation	Alarm status	Selection menu	Alarms browser	Parameters editing	Counters and service menu
On/off	Starts/stops the dryer					
Left	No action	No action	Moves the cursor upwards cyclically	Displays the previous alarm cyclically	• Selects the parameter • Decrements the data value	No action
	With the PDP option available, you can press the left or right button to show a graph of the PDP.					
Right	No action	No action	Moves the cursor downwards cyclically	Displays the next alarm cyclically	• Selects the parameter • Increments the data value	No action
	With the PDP option available, you can press the left or right button to show a graph of the PDP.					
Enter	Displays the selection menu	Cancels the displayed alarm for one minute (alarm acknowledgment)	Selects the pointed menu and activates it	• Returns to the selection menu • Cancels the service alarm when pressed for 5 seconds	• Starts the parameter editing • Selects the numerical data digits • Confirms the modified value • Returns to the selection menu when pressed for 2 seconds	Returns to the selection menu

LED functions

LED	Color	Description
Power on	Green	The controller is turned on.
Alarm	Blinking red	The controller is in alarm condition.
	Fixed red	The controller needs technical assistance.

3.2 Main screen

During normal operation, the following image is displayed:



- In the upper right area, the current working phase countdown and the measured dew point are displayed.

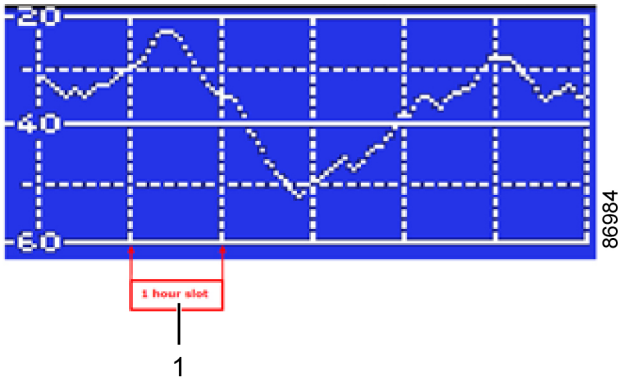
  When the pressure dew point (PDP) sensor is not enabled, the dew point is not displayed. When the PDP sensor is enabled but either not connected or defective, no dew point value is displayed (four dashes substitute the measure).
- In the lower area, the current working phase of each vessel is displayed.
- In the upper left area of the screen, an animated icon is present:

Icon	Description
	Rotating arrow Displayed when the dryer is in its working phases.
	Stationary vertical bars Displayed when the dryer is in the FREEZE status.
	Stationary square Displayed when the dryer is stopped.

The various working phases are:

Phase	Text displayed on screen	Translation
Stop	STOPPED	STOPPED
Shifting	SHIFTING	SHIFTING
Adsorbing	ADSORBING	ADSORBING
Pressure relief	DEPRESS	DEPRESS
Regeneration	REGENERAT	REGENERAT
Pressure equalize	EQUALIZE	EQUALIZE
Freeze	FREEZE	FREEZE
Standby	STANDBY	STANDBY
Blowing off	BLOW OFF	BLOW OFF

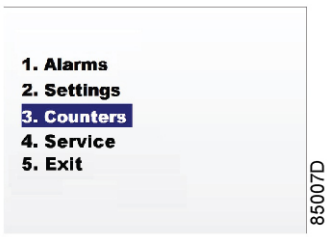
When a PDP meter is connected, pressing left or right arrow will show a graph of the measured values from the last hours.



Reference	Description
1	1 hour slot

3.3 Selection Menu

When you press Enter in the normal operation main screen (not during alarm!), you will see the following selection menu:



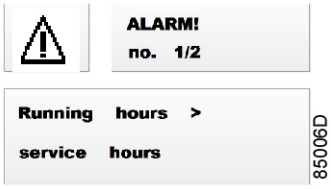
Press Left or Right to navigate to the required menu item and press Enter to select.

	Selection	Translation	Description
1	Alarms	Alarms	Alarms browser
2	Settings	Settings	Parameters list
3	Counters	Counters	Counters status
4	Service	Service	Service status
5	Exit	Exit	Back to the main display

Select item 5 (Exit) to return to the main screen or wait approximately 30 seconds.

3.4 Alarm screen

When there is an alarm, you will see the following image on your screen:



When one or more alarms are active, the alarm screen overrides the main screen.

In the upper right area, the current alarm number and the total active alarms number are displayed.

In the lower area, the current alarm description is displayed.

If more than one alarm is active, the fault messages are shown every 2 seconds.

Pressing Enter acknowledges the alarm currently being displayed.

If all the alarms have been cleared, you will return automatically to the main screen.

After one minute, if the acknowledged alarm is still active, the alarm display is shown again.

The icon in the upper left area blinks.

Module involved	Cause	Message on the display	How to clear the alarm	Alarm LED status
Pressure Dew Point (PDP) sensor	PDP above or equal to the minimum value of the PDP range	PDP is not connected	Verify if the PDP sensor is correctly connected and if it is not damaged.	Blinking
	PDP lower than or equal to the minimum value of the PDP range	PDP measure is wrong	Verify if the PDP sensor is correctly connected and if it is not damaged.	Blinking
	PDP sensor supply voltage < 20 V	PDP supply is in fault	Verify if the sensor supply voltage is correct.	Blinking
	PDP more than 10 °C (18 °F) above the desired setpoint	PDP meas > the setpoint	The alarm is automatically cleared when the desired dew point is reached.	Blinking
Service	Running hours > programmed service hours A, B or C	Running hours > service hours X (X = A, B or C)	Perform the requested maintenance (A, B or C). Next, enter the Alarm menu, select Service Alarm, press the Enter button and keep it pressed during minimum 5 seconds.	Blinking
24 V supply	Supply voltage < 18 V	24 V supply is in fault	Contact your supplier	Blinking

Module involved	Cause	Message on the display	How to clear the alarm	Alarm LED status
Controller	Controller hardware fault	Internal error	Reset all settings to the default value. Switch off the controller and switch it on again. Contact your supplier if the fault persists.	Lit continuously

Table 1: Possible alarm causes

When an alarm is active, relay K01 and contacts 9 and 10 of relay X15 are closed. When all the alarms are cleared, K01 is open.

Acknowledgement of the alarms does not affect the status of K01 or the status of the red LED.

See section *Electric diagram*.

3.5 Editing parameters

During parameters editing (see section *Selection menu*), you will see a similar image on your screen:

In the upper right area, the current parameter number and the total modifiable parameters number are visualized.

In the lower area, the current parameter description and value are displayed.

Only the unprotected parameters can be displayed and modified. Examples of settings that are accessible to the end user are: Automatic restart after voltage failure (ARAVF), language and the display time-out.

Pressing Enter for at least 2 seconds ends the editing procedure. The display will return to the selection menu.

Editor button functions

Button	Function
Left	• Selects the previous parameter • Decrements the value
Right	• Selects the next parameter • Increments the value

Button	Function
Enter	• Starts the parameter editing • Selects the numerical data digits • Confirms the modified value • Pressing the Enter button for at least 2 seconds ends the editing procedure. The display will return to the selection menu.

How to modify a parameter

Step	Button involved	Action
1	Right or left	To select the parameter to be modified
2	Enter	Starts the modification procedure • If the parameters is a selection value (e.g. a language) or a boolean value (On or Off), go to the following step. • If the parameters is a numerical value, press the Enter button repeatedly as required.
3	Right or left	Modifies the selected parameter • If the parameter is a selection value (e.g. a language), pressing Right increments and pressing Left decrements the selection within the allowed range. • If the parameter is a boolean value (On or Off), Right forces the data to ON, Left to OFF. • If the parameters is a numerical value, Right increments and Left decrements the selected digit.
4	Enter	• For numerical data, Enter moves the cursor to the upper digit (see step 2). If the digit is the last one, Enter closes the editing phase. • For selection or boolean values, Enter closes the editing phase.

Modifiable parameters

Following parameters can be modified without password:

Parameter number	Parameter name	Description	Default value	Allowed range
1	Automatic restart after voltage failure (ARAVF)	Selects if the controller will restart automatically or not in case of power failure.	Off	On or Off
2	Language	Selects the language of the displayed messages.	English	English, French, Spanish, Italian, Portuguese, German, Russian
3	Display timeout		5 min	1 — 999 min

Parameter number	Parameter name	Description	Default value	Allowed range
4	PDP control	On: The dryer tries to follow the set point. Off: only display the PDP. The dryer will run at the lowest possible dewpoint.	Off	On or Off
5	Dewpoint setpoint	Fixes the target for the PDP.	Based on the model of dryer: • -40 °C (-40 °F) • -70 °C (-100 °F)	Maximum value: -10 °C (+14 °F) Minimum value: • -40 °C (-40 °F) • -70 °C (-100 °F) based on the model of dryer.
6	PDP temp in °F	Selects the temperature.	Off	On or Off

All other parameters are protected by a password and need no modification.

PDP Sensor retrofit

For the PDP sensor retrofit kit number, refer to part list.

To access the PDP settings:

1. Go to main screen and press Enter to access the menu.
2. Select **Settings**
3. Go to **Password** and enter password: **4321**

The password is recorded from right to left.

To edit the PDP parameters:

1. In **Settings**, go to **PDP enable**

   Set parameter: ‘ON’
2. Go to parameter **PDP control**

   Choose preferred behavior.
3. Go to parameter **Dewpoint setpnt**

   Modify and confirm preferred PDP sensor setpoint.
4. To go back to the main screen, press Enter for 2 seconds. The main menu will appear. Press Exit and the main screen will display.

4 Installation

4.1 Dimension drawings

Refer to section *Statement of use* for more details about safety instructions.

Notice: Images are for reference only. Contact your local representative for applicable general arrangement drawing for the correct model and vintage.

The dimension drawings can be found in your technical documentation.

Drawing number	Model
9829 5299 09	QCMD 4
9829 5299 10	QCMD 7
9829 5299 11	QCMD 11

4.2 Installation proposal

Danger: If the piping is not properly supported, any release of compressed air (working pressure 4.5 bar (65 psi) - 14 bar (203 psi)) through the piping could result in personal injury, death and/or property damage.

Danger: The vessel and its piping surface temperature may rise to 60 °C (140 °F), which can cause serious burns to the skin. Adequate protection and personal protective equipment (PPE) should be provided to protect personnel from touching the hot surfaces of the dryer and its piping.

Notice: When installing the piping, make sure that all pipes are clean.

Notice: All connections to the dryer must be mounted stress-free and properly supported to comply with all applicable engineering codes, regulations, and standards. Consult a knowledgeable and experienced engineer familiar with your equipment and site.

Notice: Before connection on the main power supply, check the voltage requirements in the technical specifications or on the dryer data plate.

Consult trained personnel with knowledge of local state and federal government regulations and company guidelines.

General

The dryer is intended for indoor use and should at least be placed under a roof (protected against sun, wind and rain). The minimum ambient temperature mentioned on the data plate must be respected. See section *Limitations for operation*.

Install the dryer on a solid, level floor, suitable for taking its weight.

Make sure to leave enough space (minimum 800 mm (2.6 ft)) around and above the dryer for servicing purposes. See section *Dimension drawings*.

Provide enough space under the filter elements so that the filter cartridges can be replaced without having to disassemble the piping.

Make sure that all pipes, filters, valves, etc. are clean and that they are installed correctly with or without bypass system.

Make sure that the piping is installed stress free.

For more information concerning air nets, cooling systems, etc. refer to the compressor installation manual.

Instructions

Refer to the images below for the references used.

To ensure correct operation, the dryer must be fitted properly into the compressed air circuit, consisting of the compressor, the dryer and the application.

- The dryer (5) is an indicative representation of a general dryer.
- The water separator (3) is a high-efficiency water separator that removes 90 % of the free water in the compressed air. If not mounted in the compressor, a water separator needs to be installed between the compressor and the air receiver or the dryer inlet filter (whichever comes first).
- It is recommended to install a general purpose inlet filter upstream of the dryer to remove liquid oil.
- A high-efficiency filter (4) (delivered with the dryer (5)) removes particles from the compressed air down to 0.01 micron and removes the remaining oil (maximum oil carry-over of 0.01 ppm). On the inlet filter a drain tube must be installed. The drain tubes (8) to the drain collector must not dip into the water. Install an oil/water separator to drain pure condensate water. Consult your supplier.
- Outlet filter: the outlet filter is integrated into the desiccant cartridge. Depending on the desired air quality an optional outlet filter can be installed downstream of the dryer.
- A drain tube must be installed on the water separator and inlet filters. The drain pipes (8) to the drain collector must not dip into the water. For draining of pure condensate water, install an oil/water separator. Consult the manufacturer.
- Oil vapor and odors must be removed. A carbon filter can be installed downstream the outlet dust filter.
- It is advisable to install bypass pipes with ball valves over the filters in order to isolate the filters during service operations without disturbing the compressed air delivery.
- It is recommended to install a ball valve (7) after the dryer. This valve should be closed at startup to ensure pressure is built up. The valve can be left open when the pressure remains in the dryer.
- If the maximum pressure of the compressor is higher than the design pressure of the dryer, a full flow safety valve must be installed between the compressor and the dryer in order to blow off the excessive pressure.

Notice: Never overload the dryer as a too high air speed may damage the desiccant. It is recommended to install the dryer upstream of the air receiver to prevent overload. Consult the manufacturer.

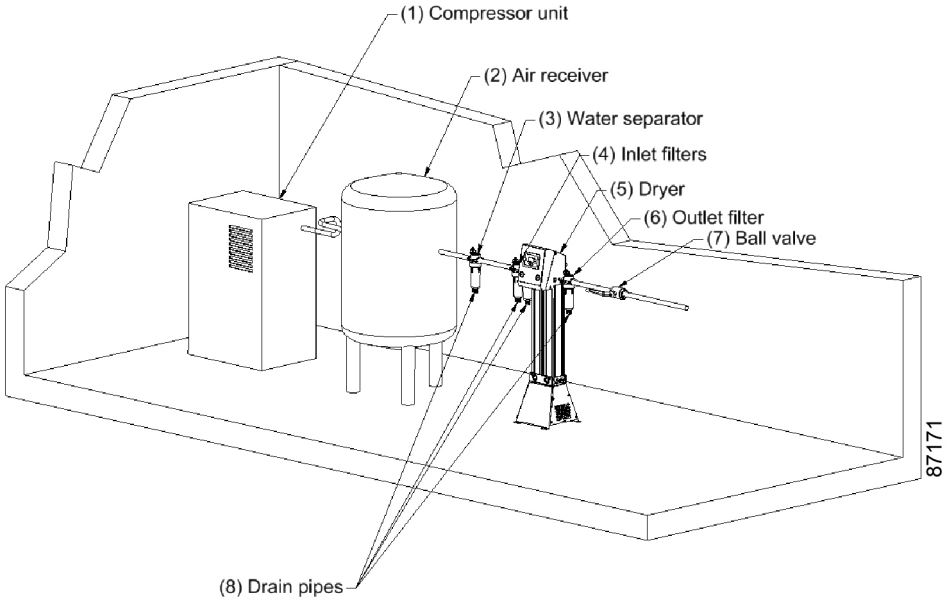
Depending on whether the compressor synchronization contact (connector X2 on the controller) is used (see also section *Operation*), there are two possible installation methods:

Installation in case the freeze contact (X2) is not connected

If the installation sequence is compressor-air receiver-dryer, do not connect the load/unload contact of the compressor to the freeze contact (X2 on the control board of the dryer).

Notice: When the air receiver is installed upstream of the dryer, the load/unload contact of the compressor must not be connected to X2. The dryer could get overloaded by the air receiver's air volume when it is in freeze mode.

An external contact can only be connected to the X2 contact of the dryer when the air receiver is placed downstream of the dryer.

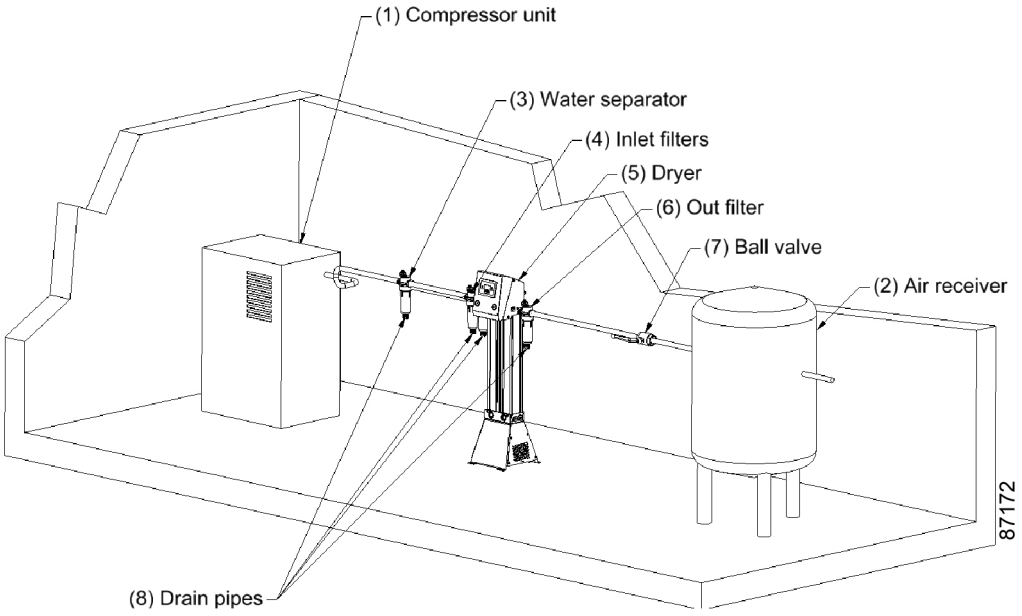


Installation in case the freeze contact (X2) is connected

The entire flow from the compressor passes the dryer. The dry air is stored in the air receiver downstream of the dryer.

With X2 connected, the dryer will stop the purge air flow at the end of the cycle (for less than 2 minutes) and it will restart when the air compressor resumes to deliver compressed air.

Notice: When the air receiver is installed upstream of the dryer, the load/unload contact of the compressor must not be connected to X2. The dryer could get overloaded by the air receiver's air volume when it is in freeze mode.



4.3 Wall mounting

All dryers can be configured so they may be wall mounted.

Locate and remove the leg mounting screws using the allen key provided.

Remove the legs and rotate 90°.

Align the legs and insert the leg mounting screws and tighten.

Note: QCMD 4, QCMD 7 and QCMD 11 dryers can use the standard legs supplied with the product. These can be configured to allow for wall mounting. Ensure that the surface is suitable for wall mounting and can support the weight of the dryer.

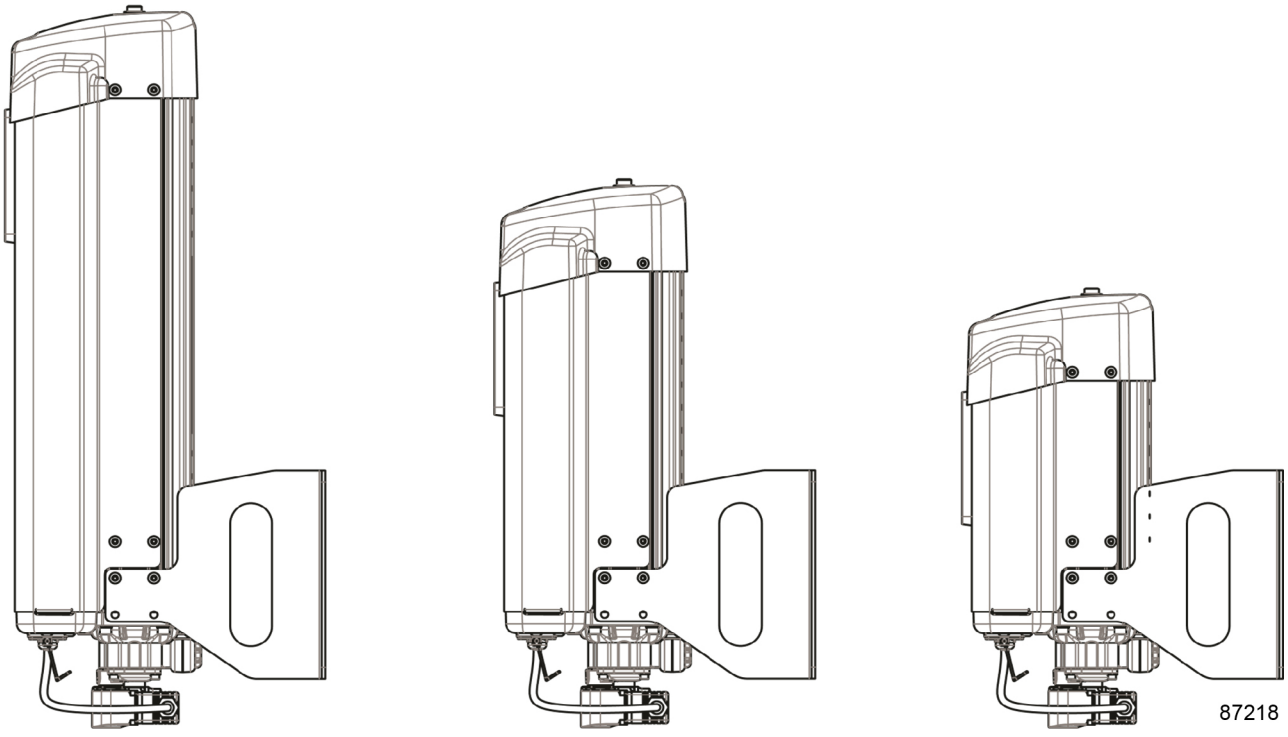


Figure 4: Wall mounting

4.4 Nozzle regulation

- Purge is factory set for good performance at 6-7 bar(g).
- Consult the service personnel to adjust the settings (factory pre-set). Consult a service technician to adjust as per site condition.

4.5 Electrical connections

Check that the electrical installation corresponds to the local codes. The dryer must be earthed and protected against short circuit by fuses of the inert type in all phases.

Notice: Local regulations remain applicable if they are stricter than the values proposed below.

Electric diagram

The complete electric diagram can be found in your technical documentation.

Drawing number	Controller type
9829 5298 59	DC1 controller

Notice: The electrical images are for reference only. Contact your representative for applicable drawings.

5 Operating instructions

Danger: Check the connections of the dryer for air leaks. Air leaks could result in serious or potentially fatal conditions, such as hearing damage due to noise, harm to the skin due to pressurized air, and air embolism.

Warning: The operator must read and understand all relevant safety precautions. Refer to *Safety precautions*.

Initial start-up

To start up the dryer for the first time or after a long period of standstill, proceed as follows:

1. If installed, open the bypass valves of the dryer.
2. Close the air supply towards the pressure dew point (PDP) sensor.
3. Close off the air supply from the compressor towards the dryer by closing the external inlet valve (if installed).
4. If installed, close the outlet valve.
5. Start the compressor and wait until the minimum pressure is reached.
6. Slowly open the inlet valve.
7. Check the connections of the dryer for air leaks and remedy if necessary.
8. Switch on the dryer by pushing the start button on the controller.
9. Let the dryer operate for several hours with the external outlet valve closed.
10. Gradually open the external outlet valve.
11. If applicable, close the bypass valves of the dryer.
12. Open the air supply towards the pressure dew point (PDP) sensor.

If the application allows air that is not completely dry, the valve towards the dry air consumer may be opened even before the optimal pressure dew point (PDP) is reached. In this case, however, it will take more time for the desiccant to dry the air completely.

At initial start-up, and especially when the dryer is loaded from the beginning, it can take a long time before the dew point is reached.

It is therefore recommended to operate the dryer for a number of days with the outlet valve closed.

Normal start

Warning: Operating the dryer below the acceptable working pressure or starting the dryer against an empty air net can result in broken or shattered desiccant beads. These will enter in the customer's air net and spread out, possibly resulting in considerable damage to the dryers or production processes connected to the air net.

If the dryer has not been used for more than 3 months, refer to section *Initial startup*. In all other cases, proceed as follows:

1. Cut off the air supply from the compressor towards the dryer by closing the external inlet valve.
2. Close the air supply towards the pressure dew point (PDP) sensor.
3. If installed, close the external outlet valve between the dryer and the dry air consumer.
4. Start the compressor and slowly open the external inlet valve.
5. Switch on the dryer.
6. Gradually open the air outlet valve.
7. If applicable, close the bypass valves of the dryer.

8. Open the air supply towards the pressure dew point (PDP) sensor.

Notice: Close the external inlet valve in case the compressor needs to be restarted. The high air speed in the startup phase of the compressor may damage the desiccant.

During operation

The LEDs for pressure dew point (PDP) warning and pressure dew point (PDP) alarm are only functional if the dryer is equipped with a pressure dew point (PDP) sensor.

Stopping

To stop the dryer, proceed as follows:

1. If installed and if necessary, open the bypass valves of the dryer so that the application will still receive compressed air.
2. Close the external inlet valve between the compressor and the dryer and the external outlet valve between the dryer and the dry air consumer.
3. Let the dryer operate for a period without consumption, to depressurize the vessels.
4. Switch off the dryer.

Notice: If the dryer is stopped for a longer period, keep the external inlet and outlet valve closed to avoid moisture from entering the dryer.

Notice: Under no circumstances shall compressed air be allowed to flow through the dryer when the electrical power is switched off. This will result in terminal failure of the desiccant material and regeneration will no longer be possible.

6 Maintenance

General recommendations and precautions

Before carrying out any maintenance or corrective activity, read the following recommendations and safety precautions and proceed accordingly.

- Stop the dryer by pushing the Stop button on the controller.
- Disconnect all pressure sources and vent the internal pressure of the system before dismantling any pressurized component.
- Use genuine spare parts only. Consult the Spare Parts List for part numbers. For preventive maintenance, dedicated service kits are available.
- Check for correct operation after maintenance.

Danger: Do not touch any electrical connections, valves, or sensors for troubleshooting purposes as this could result in death or serious injury, and/or property damage. Only qualified personnel should perform diagnostic work on the dryer. Contact your representative for assistance.

Danger: Piping and pressure vessels operate with dangerous, highly pressurized compressed air, which, if intentionally or accidentally released, could result in death, serious injury, and/or property damage. Only use or operate the dryer as described and instructed in this Instruction Book. Only use or operate the dryer within the specified temperature and pressure limits described in this Instruction Book.

Danger: Follow all Lock Out/Tag Out (LOTO) procedures before any maintenance or repairs are performed on the dryer. Failure to follow all LOTO methods could result in death or serious injury, and/or property damage.

Warning: Before starting any maintenance or repair, consult the *General safety precautions*.

Warning: Safeguard against unintentional switch-on. Apply all relevant safety precautions, including those mentioned in this book. Filters and valves between the compressor, dryer and air consumers may require other maintenance than stated below. Refer to the appropriate manual for more information.

Warranty - Product Liability

Use only authorized parts at the correct intervals (check with your local Customer Center). Any damage or malfunction caused by the use of unauthorized parts or unqualified personnel is not covered by Warranty or Product Liability. In the event of any extended warranty, the end user must ensure that all required maintenance actions are performed when indicated on the controller display (see table below) or, alternatively, use a service agreement.

Preventive maintenance schedule

A number of service operations are grouped by means of service plans. If the programmed service interval is reached, an alarm will appear on the display of the controller to carry out these service actions. The following checks should be carried out regularly to ensure safe operation and long service life. Depending on the environmental and working conditions of the unit, the local Customer Center may overrule the standard maintenance schedule; always check if in doubt.

Warning: This section is only intended for authorized, trained, specialized personnel.

Frequency	Service plan	Activity
Daily		Check the display panel for information and service messages.
Every 6 months or every 4000 hours of operation(1)	I	• Check for damaged wiring or loose connections. • Check for air leaks. • Check the regeneration cycle.
Every year or every 8000 hours of operation(1)	A	• Replace the inlet filter cartridge. • Optional outlet filter: replace filter cartridge. • Replace the silencer.
Every 2 years or every 16000 hours of operation(1)	B	• Replace the pressure dewpoint (PDP) sensor (optional). • Replace desiccant cartridges. • Replace top manifold gasket seals. • Replace inlet and outlet ball and seals.
Every 4 years or every 32000 hours of operation(1)	C	• Service plan B. • Replace solenoid valves.

Table 2: Dryers filled with beads desiccant

(1)whichever comes first

It is recommended to have the desiccant replaced by a qualified service technician. Consult your supplier.

Reset the service timer after a maintenance intervention.

All spare parts required for scheduled maintenance can be found in the Spare Parts List. Consult this list for part number information.

7 Problem solving

Warning: In the case of any fault or problem with the dryer that cannot be resolved by the user via the control panel, the user should contact a local representative. Under no circumstances should the user attempt to troubleshoot, diagnose or repair the dryer. Any attempt to troubleshoot, diagnose or repair the dryer by a person not specifically trained to service the dryer could result in death or personal injury.

Overview

Fault	Cause	Remedy
Pressure dew point too high. PDP alarm is lit.	The dryer has not had the time to regenerate completely.	Close the valve installed between the dryer and the application (if permitted) and have the desiccant regenerated.
	The drain is not working correctly.	Check the drain valve of the filter.
	The air flow through the dryer is too high.	Check for correct application.
	The outlet pressure is too low.	Check whether the compressor provides enough air for the application.
	The inlet temperature is too high.	Check the compressor aftercooler.
	Free water in the dryer.	Check the water separator and the drain valve of the filters upstream of the dryer.
	Insufficient purge air.	Purge incorrectly adjusted, consult the service personnel to adjust the settings (factory pre-set). Consult Service Technician to adjust as per site condition.
	Exhaust silencer blocked.	Replace exhaust silencer/muffler element.
The dryer produces a lot of noise.	Check the silencer and its fixation to the unit.	Replace the silencer if necessary or correct its fixation.
Insufficient air leaves the dryer.	Too much purge air escapes.	Check the condition of the solenoid valve and replace it if necessary. Check if the purge is correctly set.

Fault	Cause	Remedy
Failure dryer to cycle.	Controller not functioning correctly.	Ensure the controller is powered up, check the on screen column status to ensure it is powering the solenoid valves during operation.
	Insufficient inlet pressure.	A minimum inlet pressure of 4 barg (58 psig) is required to operate. If not, check and restore the system pressure.
	Controller not illuminated.	Check power supply to the dryer. Check the fuse and replace. The display of controller times out to save screen. At normal operation the power light remains lit.
	Failure to depressurize when cycling.	Check condition of solenoid valves and associated power connections.
	Failure to initialize dryer.	Switch off and restart dryer. Ensure the dryer is pressurized before powering up to allow the dryer to initialize before operation.

8 Technical data

8.1 Reference conditions

Condition	Unit	Value
Compressed air effective inlet pressure	barg	7
Compressed air effective inlet pressure	psig	101.5
Compressed air inlet temperature	˚C	35
Compressed air inlet temperature	˚F	95
Relative humidity of the air at inlet	%	100
Pressure dew point (PDP)	˚C	-40
Pressure dew point (PDP)	˚F	-40
Pressure dew point (PDP)	˚C	-70
Pressure dew point (PDP)	˚F	-100

8.2 Limitations for operation

Limitation	Unit	Value
Maximum compressed air effective inlet pressure	barg	14
Maximum compressed air effective inlet pressure	psig	203
Minimum compressed air effective inlet pressure	barg	4
Minimum compressed air effective inlet pressure	psig	58
Maximum ambient air temperature	˚C	45
Maximum ambient air temperature	˚F	113
Minimum ambient air temperature	˚C	1.5
Minimum ambient air temperature	˚F	34.7
Maximum compressed air inlet temperature	˚C	50
Maximum compressed air inlet temperature	˚F	122
Minimum compressed air inlet temperature	˚C	1.5
Minimum compressed air inlet temperature	˚F	34.7
Minimum volume flow at inlet	See *Dryer data*.	

8.3 Dryer data

PDP -40 °C

Characteristic	Unit	QCMD 4	QCMD 7	QCMD 11
Volume flow at dryer inlet	l/s	1.5	3	5
Volume flow at dryer inlet	cfm	3.2	6.4	10.6
Pressure drop at maximum flow	bar	0.16	0.18	0.2

Characteristic	Unit	QCMD 4	QCMD 7	QCMD 11
Pressure drop at maximum flow	psi	2.32	2.61	2.90
Time to half a cycle	s	108	108	108
Regeneration time	s	90	90	90
Pressurization time	s	18	18	18
Average regeneration air consumption	%	18	18	18
Desiccant type		Cartridge 50% Activated Alumina 50% Molecular Sieve	Cartridge 50% Activated Alumina 50% Molecular Sieve	Cartridge 50% Activated Alumina 50% Molecular Sieve
Inlet filter 1		C	C	C
Outlet filter 1		Integrated	Integrated	Integrated
Maximum air outlet temperature	°C	55	55	55
Maximum air outlet temperature	°F	122	122	122
Minimum volume flow at inlet	l/s	0.33	0.65	1.08
Minimum volume flow at inlet	cfm	0.7	1.4	2.3

PDP -70 °C

Characteristic	Unit	QCMD 4	QCMD 7	QCMD 11
Volume flow at dryer inlet	l/s	1.4	2.8	4.7
Volume flow at dryer inlet	cfm	3.0	5.9	10.0
Pressure drop at maximum flow	bar	0.16	0.18	0.2
Pressure drop at maximum flow	psi	2.32	2.61	2.90
Time to half a cycle	s	108	108	108
Regeneration time	s	90	90	90
Pressurization time	s	18	18	18
Average regeneration air consumption	%	25	25	25
Desiccant type		Cartridge 50% Activated Alumina 50% Molecular Sieve	Cartridge 50% Activated Alumina 50% Molecular Sieve	Cartridge 50% Activated Alumina 50% Molecular Sieve
Inlet filter 1		C	C	C
Outlet filter 1		Integrated	Integrated	Integrated

Characteristic	Unit	QCMD 4	QCMD 7	QCMD 11
Maximum air outlet temperature	°C	55	55	55
Maximum air outlet temperature	°F	140	140	140
Minimum volume flow at inlet	l/s	0.42	0.84	1.41
Minimum volume flow at inlet	cfm	0.9	1.8	3.0

9 Instructions for use

Instructions

- The dryers can contain pressurized air. This can be potentially dangerous if the equipment is misused.
- The towers of the dryer consist of an extruded profile, which must only be used as a vessel and must be operated within the limits specified. See section *Pressure Equipment Directives*.
- No alterations shall be made to the vessels by welding, drilling or other mechanical methods without the written permission of the manufacturer.
- The design pressure and temperature of this pressure bearing part must be clearly indicated on the data label.
- If installed, the safety valve must correspond with pressure surges of 1.1 times the maximum allowable operating pressure. This should guarantee that the pressure will not permanently exceed the maximum allowable operating pressure of the vessel.
- Original bolts have to be used after opening for inspection. The maximum torque has to be taken into consideration (see the table below).

Maximum bolt torque

Thread size	Tightening torque (Nm)	Allowed deviation (Nm)
M3	1	0.3
M4	2.4	0.6
M5	5	1.2
M6	8	2.1
M8	20	5
M10	41	10
M12	73	18
M14	115	29
M16	185	46
M18	238	60
M20	335	84

Recommendation of the manufacturer for inspection intervals

Following actions are to be executed by authorized service personnel only, unless stated otherwise in the applicable legislation. The stated time interval takes the start-up day of the unit as reference.

- Every 6 months: inspect the vessel material on the outside (exposed) for traces of strong corrosion. Consult the service department of your supplier if necessary.
- When replacing the desiccant, following inspections are to be carried out:
  - Inspection of outside and inside of the material for excessive and local corrosion.
  - Inspection of outside and inside of the material for cracks, leaks, damage.
  - Consult the service department of your supplier if necessary.
- Additional visual inspection is necessary when number of cycles is exceeded: 3 million cycles.

10 Guidelines for inspection

Guidelines

On the Declaration of Conformity / Declaration by the Manufacturer, the harmonised and/or other standards that have been used for the design are shown and/or referred to.

The Declaration of Conformity / Declaration by the Manufacturer is part of the documentation that is supplied with this dryer.

Local legal requirements and/or use outside the limits and/or conditions as specified by the manufacturer may require other inspection periods as mentioned below.

11 Pressure equipment directives

Components Subject to Pressure Equipment Directive (PED) 2014/68/EU

Parts of category I according to 2014/68/EU and 2016 - S.I. 2016/1105 are integrated into the machine and fall under the exclusion of article I, section 2-(f)-(i).

The table below contains the necessary information for the inspection of all category I pressure equipment according to Pressure Equipment Directive (PED) 2014/68/EU and all pressure equipment according to the Simple Pressure Vessel Directive 2014/29/EU as well as according to the Pressure Equipment (Safety) Regulations 2016 - S.I. 2016/1105.

Part number	Tube drawing p.n.	Media	Design temperature (°C)	Max pressure (Bar(e))	Tube diameter (mm)	Tube length (mm)	Tube internal volume (l)	Tube wall thickness (mm)	PED category
QCMD 4	Extrusion	Air	-10 to 50	16	65	215	0.7	6	I
QCMD 7	Extrusion	Air	-10 to 50	16	65	310	1.0	6	I
QCMD 11	Extrusion	Air	-10 to 50	16	65	460	1.5	6	I

12 Declaration of conformity

Insert logo here

EU DECLARATION OF CONFORMITY

We, (1) declare under our sole responsibility, that the product
Machine name :
Machine type :
Serial number :

Which falls under the provisions of article 12.2 of the EC Directive 2006/42/EC on the approximation of the laws of the Member States relating to machinery, is in conformity with the relevant Essential Health and Safety Requirements of this directive.

The machinery complies also with the requirements of the following directives and their amendments as indicated.

Directive on the approximation of laws of the Member States relating to		Harmonized and/or Technical Standards used		Att' mnt
(2)		(3)		
				X
				X
				X

The harmonized and the technical standards used are identified in the attachments hereafter

<1> is authorized to compile the technical file.

	Conformity of the specification to the directives	Conformity of the product to the specification and by implication to the directives
Issued by	Engineering	Manufacturing
Name		
Signature		
Date		
Place		

8435DD

Figure 5: Typical example of a Declaration of Conformity document

(1)	Contact address: C. Aria C. S.R.L. Via Selva Maiolo, 5/7 Montecchio, Maggiore, Vicenza Italy
(2)	Applicable directives
(3)	Standards used

On the Declaration of Conformity / Declaration by the Manufacturer, the harmonized and/or other standards that have been used for the design are shown and/or referred to.

The Declaration of Conformity / Declaration by the Manufacturer is part of the documentation that is supplied with this device.

Performance You Demand. Reliability You Trust.

No. 2920 7218 80 / July 2023 Nano-Purification Solutions Ltd

Quincy COMPRESSOR

www.quincycompressor.com