Quincy







Instruction book

Quincy

QAF 25-1500, QCF 25-1500, QMF 25-1500, QPF 25-1500

Instruction book

Original instructions

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

2015 - 05 **No. 2920 7150 20**



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1 Safety precautions

1.1 Safety icons

Explanation

\triangle	Danger for life
	Warning
Ø	Important note

1.2 Safety precautions during installation

- 1. Place the device where the ambient air is cool and as clean as possible. Consult section Reference conditions and limitations.
- 2. During installation or any other intervention on one of the connected machines, the machines must be stopped, de-energized and the isolating switch opened and locked before any maintenance or repair. As a further safeguard, persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.
- 3. Install the equipment in an area free of flammable fumes, vapours and particles, e.g. paint solvents, that can lead to internal fire or explosion.
- 4. The electrical connections must correspond to the applicable codes. The device must be earthed and protected against short circuits by fuses in all phases. A lockable power isolating switch must be installed near the device.
- 5. For machines controlled by a central control system, a sign stating "This machine may start without warning" must be affixed near the instrument panel.
- 6. In multiple compressor systems, manual valves must be installed to isolate each compressor. Nonreturn valves (check valves) must not be relied upon for isolating pressure systems.
- 7. Never remove or tamper with the safety devices.

1	Also consult following safety precautions: Safety precautions during operation and
1	Safety precautions during maintenance or repair.
•	These precautions apply to electrical devices.
	For precautions applying to the connected equipment consult the relevant instruction
	book.
	Some precautions are general and cover several machine types and equipment; hence
	some statements may not apply to your device.

1.3 Safety precautions during operation

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.

- 1. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
- 2. Never operate the device in the presence of flammable or toxic fumes, vapours or particles.
- 3. Never operate the device below or in excess of its limit ratings.
- 4. Do not operate the device when there are flammable or toxic fumes, vapors or particles.
- 5. Keep all bodywork doors and panels closed during operation. The doors may be opened for short periods only, e.g. to carry out routine checks.
- 6. People staying in environments or rooms where the sound pressure level reaches or exceeds 90 dB(A) shall wear ear protectors.
- 7. Periodically check that:
 - All guards and fasteners are in place and tight
 - All hoses and/or pipes are in good condition, secure and not rubbing
 - There are no leaks
 - All electrical leads are secure and in good order
- 8. Never remove or tamper with the safety devices.

10	Also consult following safety precautions: Safety precautions during installation and
	Safety precautions during maintenance or repair.
•	These precautions apply to electrical devices.
	For precautions applying to the connected equipment consult the relevant instruction
	book.
	Some precautions are general and cover several machine types and equipment; hence
	some statements may not apply to your machine.

1.4 Safety precautions during maintenance or repair



- 1. Use only the correct tools for maintenance and repair work.
- 2. Use only genuine spare parts.
- 3. A warning sign bearing a legend such as "Work in progress do not start" shall be attached to the starting equipment, including all remote start equipment.
- 4. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
- 5. Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapours of cleaning liquids.
- 6. Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.

- 7. Never use a light source with open flame for inspecting the interior of the device.
- 8. All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.
- 9. Before clearing the device for use after maintenance or repair, check that operating pressures, temperatures and time settings are correct. Check that all control and shut-down devices are fitted and that they function correctly.
- 10. Make sure that no tools, loose parts or rags are left in or on the device.
- 11. Never use caustic solvents which can damage materials of the device.

Ø	Also consult following safety precautions: Safety precautions during installation and Safety precautions during operation. These precautions apply to electrical devices. For precautions applying to the connected equipment consult the relevant instruction book. Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.



Units and/or used parts should be disposed of in an environmentally friendly and safe manner and in line with the local recommendations and legislation.

2 Description

2.1 General description



Filters are available in a number of grades (QMF, QPF, QCF and QAF) and sizes (25, 50, 75, 100, 175, 300, 400, 550, 750, 1000, 1500).

Naming of the filters: FILTER (grade)(flow)

Example: FILTER QMF 25 is a filter of the QMF grade with size 25.

Grade	Description	Maximum air inlet pressure	Air flow	Drain	Differential pressure indicator (1)	Differential pressure gauge (2)
QMF	 Coalescing filters for general purpose protection, removing solid particles, liquid water and oil aerosol Total mass efficiency: 99.0 % 	16 bar	From inside to outside	Automatic float drain	size 25 up to 75	size 100 up to 1500
QCF	 High efficiency coalescing filters, removing solid particles, liquid water and oil aerosol Total mass efficiency: 99.9 % 	16 bar	From inside to outside	Automatic float drain	size 25 up to 75	size 100 up to 1500
QPF	 Particulate filters for dust protection Count efficiency: 99.81 % at most penetrating particle size 	16 bar	From outside to inside	Manual drain	size 25 up to 75	size 100 up to 1500
QAF	 Oil vapour and odour removal filter Air flows through the activated carbon, which absorbs oil vapours and odours 	16 bar	From outside to inside or inside to outside	Manual drain	size 25 up to 75	size 100 up to 1500

The QAF filter does not remove methane, carbon monoxide, carbon dioxide or other toxic gases and fumes!

(1) At start up and during normal operation, the differential pressure indicator will be yellow; it turns red when the pressure drop of the filter increases.



(2) The differential pressure gauge indicates the pressure drop by a color scale which gradually changes from yellow to orange to red which corresponds to an absolute scale of 0 to 750 mbar.



Scale indicates actual differential pressure reading

Drains

The automatic mechanical float drain valve will discharge liquid from the filter bowl when it reaches a fixed level in the bowl.



1	Float

The manual drain can be used to manually discharge dust or liquid from the filter bowl.



2.2 Options

Filter connection kit

This kit allows to interconnect the filter heads if two or more filters are installed in series.



Always observe the correct air flow direction. Install a QMF filter upstream of a QPF grade filter. An arrow indicating the air flow direction is shown on the filter head.



Wall mounting kit

For wall mounting, a special set is available as option. Fit the mounting brackets with bolts, washers and nuts to a solid frame within easy reach, leaving sufficient space for maintenance and service.



Voltage-free contact

A voltage-free switch, mounted in the differential pressure gauge, closes at a pressure drop of 0.35 bar (5 psi) and can be used for remote control or alarm purposes.



Drain connection

Quick couplings are available to make easy connection of the automatic drain valve possible.



Electronic water drain



A set of couplings is available to connect an electronic water drain to the filter. The manual drain or automatic mechanical float drain valve should be removed before installing the kit.



Always remove the manual drain or the automatic drain of the filter before installing the electronic drain.

3 Installation

3.1 General remarks

When installing the filter, keep in mind the following:

- Be sure that the piping is internally clean, especially downstream of the filter.
- When selecting the filter size, take care that the maximum flow capacity is not exceeded to make sure that filtration performance and filter lifetime are guaranteed.
- Take into account the flow direction:



• The filters must be mounted vertically:



- If the unit is integrated in a multiple line system, provide isolating valves and (if required) a bypass.
- The automatic drain has a special connection allowing easy installation of a hose or a quick coupling to pipe away the drained liquid. This drained liquid should be fed into a non-pressurized vessel or drain pipe. In case two filters are installed next to each other, the drain pipe length per filter should be at least 2 meters before connecting them together. The pipe diameter of the collector should be at least twice the diameter of the pipes connected to the filter drain.



• Open and close isolating valves slowly, as a sudden pressure rise or pressure drop can cause irreversible damage to the filter element.

3.2 Specific remarks

QMF filter

The filter should be preceded by a water separator if no water separator is integrated in the after cooler of the compressor. In case a dryer is preceding the filter, a water separator is no longer required.

QPF filter

It is recommended to install a grade QMF filter upstream the QPF filter. If not, the load on the QPF filter element may become too high and will reduce its lifetime.



QCF filter

When the QCF filter is used with an adsorption type air dryer, install the filter downstream of the dryer.

QAF filter

To protect the active carbon element, a QAF filter must always be preceded by a QMF and QPF filter.

The filter should be mounted as close as possible to the point of use of the air.

3.3 ISO 8573-1:2010

General

For new installations as well as for installations that have to be made up-to-date, the ISO 8573-1:2010 standard can be used. Some proposals are given fulfilling this standard.

This part specifies purity classes of compressed air with respect to particles, water and oil, independent of the location in the compressed air system at which the air is specified or measured, for ISO 8573-1:2010 standard.

A	The ISO 8573-1:2010 standard only concerns compressed air for general use and does
Z	not deal with, or is not applicable to, e.g. breathing air.

ISO class	Dust			Water		Oil	
	Maximum number of particles per m ³ as function of particle size <i>d</i>			Pressure dew point		Total oil concentration (aerosol, liquid and	
	0.1< <i>d</i> ≤0.5 μm	0.5< <i>d</i> ≤1.0 μm	1.0< <i>d</i> ≤5.0 μm	°C	°F	vapour) mg/m ³	
0	As specified by the equipment user or supplier and more stringent than class 1						
1	≤ 20000	≤ 400	≤ 10	≤ -70	≤ -94	≤0.01	
2	≤ 400000	≤ 6000	≤ 100	≤ -40	≤ -40	≤0.1	
3	not specified	≤ 90000	≤ 1000	≤ -20	≤ -4	≤1	
4	not specified	not specified	≤ 10000	≤ +3	≤ +37.4	≤5	
5	not specified	not specified	≤ 100000	≤ +7	≤ +44.6	-	
6	mass concentration: 1 - 5 mg/m ³			≤ +10	≤ +50	-	

Terms and definitions

Particle: small discrete mass of solid or liquid matter

Particle size d: length of the greatest distance between two external boundaries

Dew point: temperature at which water vapour begins to condense

Pressure dew point: dew point of the air at the specified pressure

A desiccant dryer will be needed to reduce the dew point down to -40 °C (-40°F).

The air purity according to ISO 8573-1:2010 is expressed as follows: class [X.Y.Z], where X, Y and Z are respectively the purity classes with regard to dust, water and oil.

A few examples are given in the image below.



84120D

A	General purpose protection Air purity class ISO 8573-1:2010 [2:-:3]
В	High purity air with reduced dew point Air purity class ISO 8573-1:2010 [1:4:1]
С	General purpose protection and reduced oil concentration Air purity class ISO 8573-1:2010 [1:-:2]
D	High purity air with extremely low dew point Air purity class ISO 8573-1:2010 [2:2:1]

Components shown in above image

ltem	Description	Item	Description
1	Compressor with after cooler	5	QCF filter
2	QMF filter	6	Refrigerant dryer
3	QPF filter	7	Desiccant dryer
4	QAF filter (for critical applications)	8	Compressor with integrated dryer

Compressed air may come into direct or indirect contact with food. When this happens, for example during production or processing, this requires a much higher level of contaminant control. Particular attention needs to be given to contaminants added during the compression and the distribution process, such as bread packaging, fluidized bed in the transfer of flour from a tanker etc.

Recommendations:

- No contact: Air purity class ISO 8573-1:2010 [1:4:1]
- Contact: Air purity class ISO 8573-1:2010 [1:2:1]

The filters comply with the bacteriological filtration grade and the British Compressed Air Society (BCAS) Food Grade Compressed Air Code of Practice.

3.4 ISO 12500

ISO 12500

ISO 12500 has been introduced specifically to test purification equipment for compressed air and complements ISO 8573.

ISO 12500 currently consists of:

- Part 1: Oil aerosol filters
- Part 2: Oil vapor filters
- Part 3: Particulate filters
- Part 4: Water removal

ISO 12500-1:2007 - Testing of Coalescing filters

ISO 12500-1:2007 provides a set of standardized conditions with which coalescing filters should be tested in order to show their filtration performance in accordance with ISO 8573-1:2010. The testing will provide the user with an oil aerosol carry-over figure in mg/m³ and saturated (or wet) pressure drop in mbar. This is the filter performance at the reference conditions and can be used for benchmarking purposes.

ISO 12500-3:2009 - Testing of Dust removal filters

ISO 12500-3:2009 provides a guide for choosing an appropriate method of determining the solid particulate removal efficiency rating by particle size. Measurement methods are recommended based on the size range of the particulates that the filter being tested has been designed to remove. The test is performed as a type-test on filters as being representative of a range.

4 Maintenance

4.1 Maintenance

When maintaining the filter, keep in mind the following:

- On filters with manual drain valve, open the latter at regular intervals to evacuate collected dust or liquid.
- In case an automatic drain valve or a solenoid timer drain is installed, manual draining can be carried out by turning the connection nipple of the automatic drain valve counterclockwise.



When the filter has to process air with a temperature higher than the specified maximum temperature, the filter's lifetime will be reduced considerably!

4.2 Filter element change



The hand-tool icon on the figure indicates the items provided in a dedicated filter kit.

- 1. Before filter element change, check for any leakages at the bottom of the filter bowl (connection of manual and automatic drain) during normal filter operation. If no leakage is observed, point 6 up to 9 can be discarded.
- 2. Isolate the filter from the air net.
- 3. Depressurize the filter by turning the connection nipple of the automatic drain valve counterclockwise or by opening the manual drain valve.
- 4. Unscrew the bowl. A whistling noise will warn you if the bowl is not fully depressurized. If this occurs, the bowl should be screwed back and the venting should be repeated.
- 5. Discard the filter element.



- 6. Remove the drain valve by unscrewing the retaining nut underneath the bowl.
- 7. Remove the O-ring from the bowl and clean the bowl. Position a new O-ring on the bowl.
- 8. Remove the O-ring from the drain valve and position a new O-ring on the drain valve. The latter is supplied with each new filter kit.
- 9. Reinstall the drain valve in the bowl using the retaining nut (tightening torque 3 Nm).
- 10. Reposition the new filter element with the 2 new O-rings.
- 11. Screw the bowl completely on the head.

A small amount of acid-free vaseline may be applied to screw threads and O-rings to facilitate the assembly.

4.3 Service intervals

QMF, QPF, QCF filters

The filter elements of oil mist filters (QMF, QCF) should be replaced after 4000 hours. The gauge or pop-up is not a measure, as a typical oil mist filter operates in the steady state mode during its life and this mode is e.g. 200-220 mbar.

Note that the indicator or gauge will not move into the red area but will stay yellow or orange during operation.

The filter elements of dus filters (QPF) should be replaced after 4000 hours or when the pressure drop reaches 350 mbar (whatever comes first).

The pressure drop is reached when the indicator or gauge turns red.

Summarizing the following service intervals should be observed (whatever comes first):

- 4000 operating hours
- 12 months in use
- pressure drop: 350 mbar

QAF filters

For QAF filters, the change interval of the adsorption element is approximately 1000 operating hours or yearly. Its pressure drop will not increase during its useful life. Nevertheless, the adsorption element must be changed earlier at the first signs of oil vapor and odor.

4.4 Filter disposal

Used filters must be disposed of in an environmentally friendly and safe manner, and in line with the local recommendations and environmental legislation.

5 Technical data

5.1 Reference conditions

Air inlet pressure	7 bar(e)	102 psig
Air inlet temperature	20°C	68 °F
Ambient temperature	20°C	68 °F

5.2 Principal data

Maximum compressed air inlet pressure	16 bar(e)	232 psig
Minimum compressed air inlet pressure	1 bar(e)	15 psig
Minimum compressed air inlet temperature	1°C	34°F
Maximum compressed air inlet temperature for QAF filters	35°C	95 °F
Minimum ambient temperature	1°C	34 °F
Maximum ambient temperature for QAF filters	35°C	95 °F
Maximum ambient temperature for other types	65°C	149 °F
Maximum recommended pressure drop (not for QAF filters)	0.35 bar(e)	5 psig

5.3 Specific data

Performance data at nominal volume flow and at reference conditions, unless otherwise stated.

		QMF	QCF	QPF	QAF
Maximum oil carry-over at reference conditions	mg/m ³	< 0.1	< 0.01	0.003	-
Filtration efficiency for particle	MPPS ^a	-	-	-	99.81 %
SIZE	0.01 µm	-	-	-	99.87 %
	1 µm	-	-	-	99.97 %
	Total mass efficiency	99.0 %	99.90 %	-	-
Initial pressure drop over filter when dry	mbar	120	140	160	120
Initial pressure drop over filter when saturated	mbar	205	240	-	-

a) MPPS: Most Penetrating Particle Size

5.4 Rated flow at reference conditions

Size	25	50	75	100	175	300	400	550	750	1000	1500
l/min	720	1500	2100	3000	4800	8400	11400	15600	21600	31500	40500
m³/h	43	90	126	180	288	504	684	936	1296	1890	2430
cfm	25	50	75	100	175	300	400	550	750	1000	1500

5.5 Correction factors

 \triangleleft

When the actual working pressure differs from the reference pressure, multiply the nominal
capacity of the filter with the corresponding correction factor to obtain the correct capacity.

Working pressure bar(e)	1	2	3	4	5	6	7	8	10	12	14	16
Working pressure psig	15	29	44	58	73	87	102	116	145	174	203	232
correction factor	0.38	0.53	0.65	0.75	0.83	0.92	1	1.06	1.20	1.31	1.41	1.5

5.6 Dimensions and weight

Туре	Α	В		С		D	D		E		G		Н		
	"	mm	"	mm	"	mm		mm		mm	"	mm	"	mm	
25	3/8	158	6.2	136	5.4	90	3.5	8	0.3	303	11.9	228	9	21	0.8
50	1/2	158	6.2	136	5.4	90	3.5	8	0.3	303	11.9	228	9	21	0.8
75	1/2	158	6.2	136	5.4	90	3.5	8	0.3	358	14.1	283	11.1	21	0.8
100	3/4	190	7.5	168	6.6	110	4.3	5	0.2	378	14.9	303	11.9	27.5	1.1
100	1	190	7.5	168	6.6	110	4.3	5	0.2	378	14.9	303	11.9	27.5	1.1
175	1	190	7.5	168	6.6	110	4.3	5	0.2	418	16.5	343	13.5	27.5	1.1
300	1 1/2	240	9.5	218	8.6	140	5.5	5	0.2	549	21.6	449	17.7	34	1.3
400	1 1/2	240	9.5	218	8.6	140	5.5	5	0.2	632	24.9	532	20.9	34	1.3
550	1 1/2	240	9.5	218	8.6	140	5.5	5	0.2	632	24.9	532	20.9	34	1.3
750	2	279	11	251	9.9	179	7	8	0.3	768	30.2	618	24.3	50	2
750	2 1/2	279	11	251	9.9	179	7	8	0.3	768	30.2	618	24.3	50	2
1000	3	320	12.6	288	11.3	210	8.3	9	0.35	920	36.2	720	28.3	57	2.2
1500	3	320	12.6	288	11.3	210	8.3	9	0.35	1090	42.9	890	35	57	2.2

Туре	J		К		L		Μ		N		Р		Q		Net mass
	mm		mm	"	mm	"	mm		mm		mm		mm	"	kg
25	7	0.28	20	0.78	92	3.62	80	3.15	2	0.08	52	2.05	6.6	0.26	1
50	7	0.28	20	0.78	92	3.62	80	3.15	2	0.08	52	2.05	6.6	0.26	1.1
75	7	0.28	20	0.78	92	3.62	80	3.15	2	0.08	52	2.05	6.6	0.26	1.3
100	10	0.4	30	1.18	118	4.65	100	3.94	2	0.08	68	2.68	9	0.35	1.9
100	10	0.4	30	1.18	118	4.65	100	3.94	2	0.08	68	2.68	9	0.35	1.9
175	10	0.4	30	1.18	118	4.65	100	3.94	2	0.08	68	2.68	9	0.35	2.1
300	10	0.4	42	1.65	157.5	6.2	131	5.16	2.5	0.1	92	3.62	9	0.35	4.2
400	10	0.4	42	1.65	157.5	6.2	131	5.16	2.5	0.1	92	3.62	9	0.35	4.5
550	10	0.4	42	1.65	157.5	6.2	131	5.16	2.5	0.1	92	3.62	9	0.35	4.6
750	12	0.47	42	1.65	183	7.2	166	6.54	2.5	0.1	100	3.94	11	0.43	6.9
750	12	0.47	42	1.65	183	7.2	166	6.54	2.5	0.1	100	3.94	11	0.43	6.9
1000	15	0.59	50	1.97	230.5	9.08	191	7.52	4	0.16	135	5.32	11	0.43	11
1500	15	0.59	50	1.97	230.5	9.08	191	7.52	4	0.16	135	5.32	11	0.43	12.6

Dimension A is G (ISO 228/1) or NPT (ANSI B1.20.1) - thread.

Dimension F indicates the space needed for dismantling.





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