PU-65

Accommodation HVAC system

AA

Apolon Climate Engineering Ltd

1/14/2019

Contents

1. Technical specification

1.1. General data

Power supply		400V/50Hz or 440V/60Hz
Refrigerant type		R134A
Refrigerant q'ty		15kG
Unit protection class		IP44
Length		1600mm
Width		900mm
Height		1980mm
Weight		1346kg

1.2. Performance

50Hz

Power supply		400V/60Hz/3Ph
Power Input		25kW
Current		42A
Cooling capacity		71kW
Nominal air flow		4400m3/h
Rejected heat		92kW
Water flow		14m3/h
Refrigerant type		R134A

60Hz

Power supply		440V/60Hz/3Ph
Power Input		29.5kW
Current		45A
Cooling capacity		85kW
Nominal air flow		5000m3/h
Rejected heat		110kW
Water flow		14m3/h

1.3. Electrical data

Unit max. rated power		53kW
Unit max current		73A
Compressor LRA		233A
Power cable terminals		35m2
Unit protection class		IP44
Control panel protection class		IP55
Compressor protection class		IP54

1.4. Compressor data

Compressor type		Semi-hermetic reciprocating
Brand		Bitzer AG
Compressor model		6GE-34Y-40P
Compressor oil type		BSE-32
Compressor oil q'ty		4.8lt
Displacement @60Hz		153.03m3/h
Max rated current		65.5A
Power input		48.3kW
Locked rotor current		233A
Compressor protection class		IP54

1.5. Evaporator fan

Type		Plug-in centrifugal fan
Model		K3G450-AZ30-01
Brand		Ebm-Papst AG
Voltage range		380..480VAC
Power consumption		5370W
Max rated current		8.3A

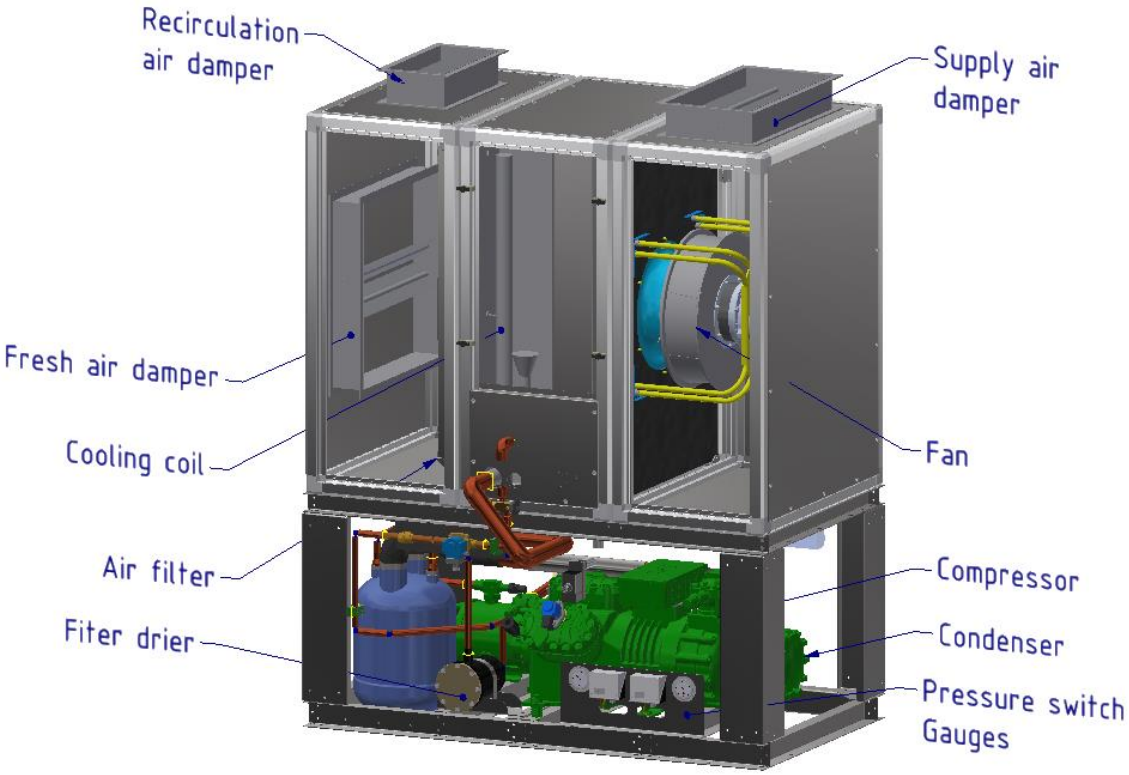
1.6. Shell and tube condenser

Type		Shell and tube condenser
Model		K813H
Relief valve		21.7bar
Media		Ethylene glycol 20%
Flow		14m3/h
Pressure drop		0.15bar
Inlet port		2"
Outlet port		2"
Operating condition calculation		
Inlet temperature		40°C
Outlet temperature		46.4°C
Flow		14m3/h
Condenser capacity		99kW

1.7. Refrigerant equipment

Expansion Valve		Sporlan OJE-16
Solenoid valve		Danfoss, EVR-22 + Coil 220V
Filter drier		Danfoss, DCL 0487
High pressure switch		KP5, AUTO
Low pressure switch		KP1, AUTO
High pressure gauge		LR, Dia 60, Max 18barg, R134A
Low pressure gauge		LR, Dia 60, Max 35barg, R134A

2. Main components location



3. Air conditioning unit operation

Always warm compressor before each start.

Compressor is equipped with crankcase heater which heat compressor during stand-by.

Keep unit always powered to prevent cold start of compressor.

When system is powered, switch off unit from operation switch on control panel. Compressor requires minimum 4 hours for heating.

3.1. Power supply

Unit is supplied by 440V/60Hz from ship ECR circuit breaker „Air conditioner AC3“. Unit control panel is equiped with circuit breakers for consumers and diferent curent circuits.

3.2. Wired control of the unit from ship automatiosation system

Unit can be stoped/started by external relay connected to terminals.

General alarm of unit ca be read on terminals.

3.3. Controller

Unit is equipped with controller XC460d of company Dixell Italy.

By NTC temperature probe located below filter, controller measure room temperature and regulate compressor capacity. User can set requested temperature by controller buttons.

3.4. Icons of the display and keys

4.1 DISPLAYING

	UPPER DISPLAY	LOWER DISPLAY	ICONS
1 probe enabled	Temperature	Pressure	- Working loads - Measurement unit - Alarm or status Icons
2 probes enabled	Probe 1	Probe 2	- Working loads - Measurement unit - Alarm or status Icons

4.2 KEYBOARD

SET To see or modify the set point. in programming mode it selects a parameter or confirm an operation.
Alarm menu: By holding it pressed for **3s,** the current alarm is erased.

▲ (UP) **To enter the Alarm menu.**
In programming mode: it browses the parameter codes or increases the displayed value.
With Hot key inserted: it starts the Hot key programming procedure.

▼ (DOWN) **In programming mode:** it browses the parameter codes or decreases the displayed value.
Manual restart of loads: By holding it pressed for **3s,** it switches on again loads previous locked by a safety digital input alarm.

CLOCK To display the loads running hours.
By holding it pressed for 3s the **Maintaining menu** is entered.

KEY COMBINATIONS
▲ + ▼ To lock and unlock the keyboard.
SET + ▼ To enter the programming mode.
SET + ▲ To exit the programming mode.

4.3 ICONS

LED	FUNCTION	MEANING
°C	ON	Celsius degrees
°F	ON	Fahrenheit degrees
bar	ON	bar displaying
PSI	ON	PSI displaying
1	ON	Load 1 on
1	Flashing	Load 1 is waiting to start (1HZ). or digital input alarm for Load 1 (2Hz). o Load 1 in maintenance status (2Hz).
2	ON	Load 2 on
2	Flashing	Load 2 is waiting to start (1HZ). or digital input alarm for Load 2 (2Hz). o Load 2 in maintenance status (2Hz).
3	ON	Load 3 on
3	Flashing	Load 3 is waiting to start (1HZ). or digital input alarm for Load 3 (2Hz). o Load 3 in maintenance status (2Hz).
4	ON	Load 4 on
4	Flashing	Load 4 is waiting to start (1HZ). or digital input alarm for Load 4 (2Hz). o Load 4 in maintenance status (2Hz).
5	ON	Load 5 on
5	Flashing	Load 5 is waiting to start (1HZ). or digital input alarm for Load 5 (2Hz). o Load 5 in maintenance status (2Hz).
6	ON	Load 6 on
6	Flashing	Load 6 is waiting to start (1HZ). or digital input alarm for Load 6 (2Hz). o Load 6 in maintenance status (2Hz).
	ON	The Maintenance menu has been entered
	Flashing	One or more loads have been placed in maintenance status
	ON	Alarm is happening
	ON	All the stored alarms have been seen.
	Flashing	A new alarm has happened

3.5. Unit switch On/Off

From switch on front panel unit can be switched On or Off. When unit is switch on test procedure of all internal protection occurs, it takes about 2mins.

After that is system is ok and cooling needed compressor start

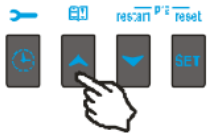
3.6. Changing set-point value

1. **Set the kind of freon by means of the FtyP parameter (see 3.1** HOW TO SET THE KIND OF GAS**)**
2. **Set the measurement unit (dEU par.).**
3. **Check and if necessary modify the set point limits (LSE and HSE par.).**

1. Push the **SET** key for more than 2 seconds;
2. The Lower display will show the **"SEtC"** label, will the Upper display will show its value flashing.
3. To change the Set value push the ▲ or ▼ within 30s.
4. To memorise the new value and pass to the fan set point push the **SET** key.
5. The Lower display will show the **"SEtF"** label, will the Upper display will show the fan set point flashing.
6. To change its value push the ▲ or ▼ within 30s.

To exit: push the **SET key** or wait for 30 without pressing any keys.

3.7. Display alarm



1. Push the ▲ key.
2. The last alarm happened is showed on the Upper display, while the lower display shows its number.
3. Push again the ▲ key and the other alarm are displayed starting from the most recent.
4. To see the alarm **duration** and push the **SET** key.
5. By pushing again the ▲ **or SET** key the next alarm is displayed.

Alarms erasing.

1. Enter the Alarm Menu.
2. To erase the displayed alarm push the "**SET**" key till the "rSt" label will be displayed in the Lower Display,
3. **NOTE** the running alarms cannot be erased..
4. To erase the whole Alarm Menu, hold pressed the "**SET**" key for 10s.

3.8. Alarm codes

Usually alarm conditions are signalled by means of:

1. Activation of alarm output 0-12V
2. Buzzer activation
3. Message on proper display
4. Log of alarm: code and duration.

Mess.	Errata	Corrige
nLod	Number of loads higher than loads available in the controller	• Check number of oAi set as load, this number has to be lower of equal to the number of relay of the controller.
cStP	Load (step) configuration error	• A relay oA(i) has been set as compressor without a previous relay oA(i-1) has been set as compressor. EI oA1 = StP
AOP2	P2 probe not available for the 4÷20mA output	• P2 probe not available P2P =no. Enable the probe setting: P2P =yES • The second probe P2 is used to control the temperature of the engine of screw compressors. Check CtyP and set it different from Scr.
dSP2	P2 probe not available for the dynamic set point function	• P2 probe not available P2P =no. Enable the probe setting: P2P =yES • The second probe P2 is used to control the temperature of the engine of screw compressors. Check CtyP and set it different from Scr.
FAP2	P2 probe not available for fan regulation	• P2 probe not available P2P =no. Enable the probe setting: P2P =yES • The second probe P2 is used to control the temperature of the engine of screw compressors. Check CtyP and set it different from Scr.
CSP2	P2 probe not available for screw compressor	• Check CtyP and set it different from Scr.
P2CF	Wrong second probe configuration (EI.: If Cty= Scr P2 ha to be PTC)	• Set P2P = yES and PbC2 = PTC

Code	Description	Cause	Action	Reset
P1	**P1 probe failure alarm**	Probe failure or out of range	The compressors are activated according to the SPr or PoPr parameters.	**Automatically** as soon as the probe restarts working.
P2	**P2 probe failure alarm**	Probe failure or out of range	The fans are activated according to the FPr parameters.	**Automatically** as soon as the probe restarts working.
EA1 **EA2** **EA3** **EA4** **EA5** **EA6**	**Load safeties alarm**	Safeties compressor/fan input activation. NOTE: with step compressors 1 input for each compressor has to be used.	the corresponding load is turned off. (with step compressors all relays referred to the input are disabled).	Recovery depends on **ALMr** parameter: With **ALMr** = **no** The instrument restart the standard operating mode when the input is disabled. With **ALMr** = **yES** manual recover for the alarms of compressors and fans. Push the **DOWN** key for 3s.
LA	**Minimum pressure (temperature) alarm compressors section**	Suction pressure or temperature lower than SET_C-LAL value	signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set_C-LAL+ differential) value. (differential = 0.3bar or 1°C)
LA2	**Minimum pressure (temperature) alarm fans section**	Condensing pressure or temperature lower than SET_F-LAL value	signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set_F-LAL+ differential) value. (differential = 0.3bar or 1°C)
HA	**Maximum pressure (temperature) alarm compressors section**	Suction pressure or temperature higher than SET_C+HAL value	signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set_C + HAL - differential) value. (differential = 0.3bar or 1°C)
HA2	**Maximum pressure (temperature) alarm fans section**	Condensing pressure or temperature higher than SET_F+HAL value	signalling only	**Automatically:** as soon as the pressure or temperature reaches the (Set_F + HAL - differential) value. (differential = 0.3bar or 1°C)
A14	**Load maintenance alarm**	A load has worked for the hour set in the SEr parameter	signalling only	**Manually:** reset the running hour of the compressor (see par.**8 RUNNING HOURS OF LOADS**)