



INSTALLATION, OPERATION AND MAINTENANCE MANUAL FOR AIR DEHUMIDIFIER DESICCANT ROTOR TYPE DFRC-E SERIES

MUSC-0651E-EN-17-01

In fulfilment of the Regulations of the European Union on Machine Safety,
it is indispensable to read this manual in detail prior to installing the equipment.

Contents

1.	Introduction.....	4
1.1	Operating instructions.....	4
2.	Safety notes.....	5
2.1	General.....	5
2.2	Operational safety notes.....	5
3.	Transport.....	7
3.1	General.....	7
3.2	Packing.....	7
3.3	Interim storage.....	7
3.4	Check for complete and correct delivery of goods.....	7
4.	General description.....	8
4.1	Background.....	8
4.2	The desiccant wheel. Operating principle.....	9
4.3	Dehumidifier main components identification.....	10
4.4	Options and ancillary components.....	11
4.5	Regulation and control.....	11
5.	Installation.....	12
5.1	Locating the unit.....	12
5.2	Service areas.....	12
5.3	Air duct connections.....	13
5.4	Electric mains connections.....	14
6.	Start up.....	14
6.1	Unit start up.....	14
6.2	Stopping the unit.....	15
6.3	Security and control components.....	15
7.	Maintenance.....	16
7.1	Preventative maintenance.....	16
7.2	Corrective maintenance.....	16
7.3	Desiccant wheel service.....	16
7.4	Washing procedure desiccant rotor.....	17
8.	Fault finding.....	18
9.	General technical data sheet.....	18

9.1	Nominal performances.....	18
9.2	Pressure drop to adjust nominal flow	20
9.3	Operational limits and conditions	22

Addenda

- A) EC conformity declaration**
- B) Warranty**

1. Introduction

Dear customer,

The FISAIR dehumidifier is our answer to today's technical requirements. It satisfies them by means of its operational safety, its operational comfort and its economic efficiency.

To be sure of operating your FISAIR Dehumidifier efficiently please read these Operation and Maintenance Instructions.

Use the steam humidifier only in proper and safe conditions, paying attention to all notes in these instructions.

If you have any questions...please contact us:

Fisair S.L.

Tel.: (34) 91-6921514 Fax: (34) 91-6916456

E-mail address: info@fisair.com

Or your local dealer

1.1 Operating instructions

The correct use of the dehumidifier also includes adherence to our installation, dismantling, refitting, commissioning, operation and maintenance instruction as well as taking correct disposal steps.

Only qualified and authorised personnel may operate the unit. Persons transporting or working on the unit, must have read and understood the corresponding parts of the Operation and Maintenance Instruction and especially the chapter "Safety Notes". Additionally, operating personnel must be informed of any possible dangers. You should place a copy of the Operation and Maintenance Instruction at the unit's operational location (or near the unit).

2. Safety notes

2.1 General

These safety notes are required by law. They are for your protection and to prevent accidents.

Warning notes and safety symbols:

The following safety symbols shown in the text will warn about dangers and danger sources. Get familiar with these symbols.



Attention: Not observing this warning can lead to injury or danger to your life and/or damage to the unit.



Attention, Voltage: Dangerous electrical current. Not observing this warning can lead to injury or danger to your life.



Note: Further explanation or cross-references to other sections of the text in the Operation and Maintenance Instructions

2.2 Operational safety notes

In general

Observe all safety and warning notices.

If there should be malfunctions, shut down the unit immediately and secure against being restarted. Faults should be rectified immediately.

During repair work, guarantee operational safety of the unit by using qualified personnel.

Only use original FISAIR spare-parts.

For the effective operation of this unit refer to any national regulations restricting or governing its use.

Accident preventions regulations

Observe the accident prevention regulations:

"Electrical Installation and Electrical Equipment" or equivalent national codes. In this way you can prevent injury to yourself or others.

Operation of the unit

Do not impair the safety of the unit.

Periodically check all protection and warning devices for proper functioning.

Safety equipment is not to be removed or put out of operation.

Installation, dismantling, maintenance and repair of the Unit

Turn off power, when doing maintenance work or repairs to the unit.

Extensions to the unit or installation of additional equipment is only allowed after obtaining written approval from the manufacturer.

Electrical parts

Work on electrical parts must be carried out by qualified electricians.

Turn off the power and secure against restart when working on electrical parts.

Immediately turn the unit off when faults occur in the electrical energy supply.

Only use original type fuses of correct rating.

Make periodical checks of the electrical equipment.

Defects, like loose connections or burned cables must be repaired immediately.

Test all installed protective devices after installation or repairs (e.g. grounding).

3. Transport

3.1 General



Attention: Transport the air dehumidifier carefully. Prevent damage from careless loading and unloading and avoid the use of unnecessary force.



Attention: When lifting the air dehumidifier, always use a pallet truck or forklift.



3.2 Packing



Note: Observe the pictograms displayed on the carton.

3.3 Interim storage

During storage, keep the unit dry and protected from frost.

3.4 Check for complete and correct delivery of goods

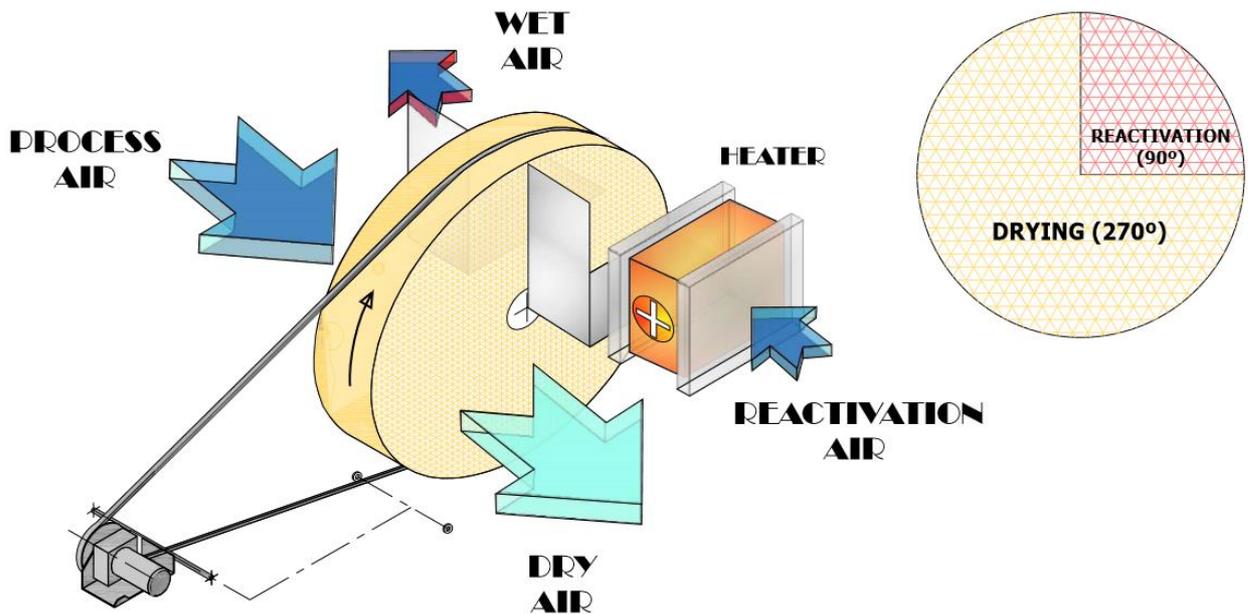
Upon receipt of the unit, make sure that:

- Type and serial number on the name plate correspond to the order and supply information.
- Equipment is complete and in perfect condition.



Note: Immediately file a written claim with your shipping agent in case of transport damage or missing parts.

4. General description



4.1 Background

Modern standards concerning human comfort and the environmental requirements for manufacturing, storage & preservation of products and materials, make increasing demands on the control of moisture content in the working environment.

Where the natural or treated environment have an ambient condition holding more water vapor than the specified or desirable conditions, it is necessary to integrate equipment which can reduce humidity to the desired level.

FISAIR ROTARY DESICCANT DEHUMIDIFIER provide the solution.

The FISAIR dehumidifier is simple to install, reliable in operation and will provide long lasting humidity control at a reasonable running cost.

4.2 The desiccant wheel. Operating principle

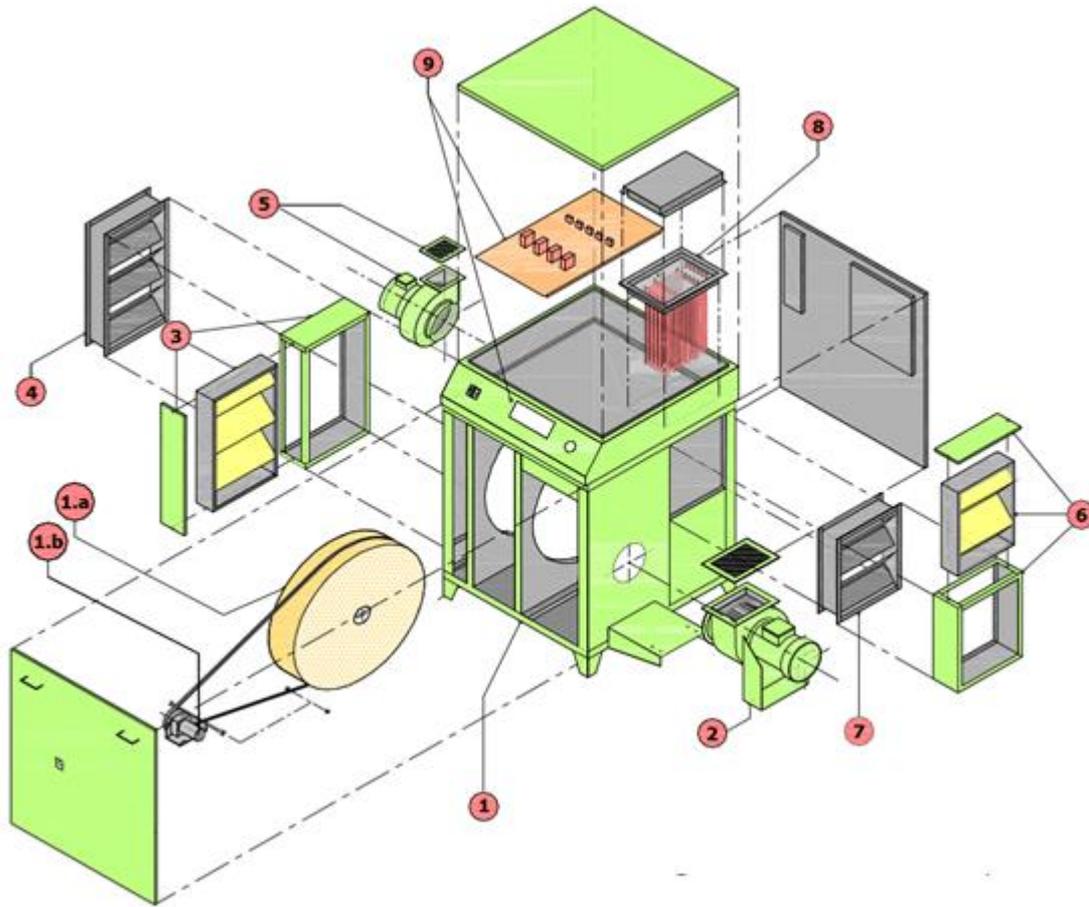
FISAIR series DFRC dehumidifiers operate on the adsorption property of a desiccant synthesized activated silica gel manufactured into a cylindrical wheel shape with multiple axial channels.

The face of the cylinder is divided in two zones, one is for the process air and the other for a heated auxiliary air stream to reactivate the desiccant. Thus a large surface area is presented to the air streams ensuring that a rapid drying process takes place.

The process air section occupies 75% or 270 degrees of the face. In this section the desiccant removes moisture from the process air passing through the rotating desiccant cylinder. The reactivation air, using a pre-heater, passes counter flow through the remaining 90 degrees section of the rotating cylinder, removing moisture from the desiccant to prepare it for the drying cycle once again.

A gear motor via a pulley and driving belt rotates the cylinder at low speed to provide a continuous and uniform operation. Air seals separate the two sections and prevent air loss at the perimeter of the rotor to ensure maximum performance.

4.3 Dehumidifier main components identification



The FISAIR series DFRC dehumidifiers consist of the following main components.

(1) Housing module, manufactured in galvanised steel sheet with a phosphate primer coat and an enamel finish. Internally the casing is arranged to provide two separate air streams for process/dry air and regeneration/wet air with tight seals. The module is easily accessed to ensure simple inspections and maintenance of the unit. Inside is:

(1.a) A desiccant rotor on a horizontal axis, the shaft is fixed and the wheel rotates on its hub.

(1.b) The driving geared motor with a pulley and a peripheral belt driving the rotor.

(2) Dry/Process air fan, centrifugal single entry with forward curved blades. Direct motor driven.

(3) Process air filter G4 standard.

(4) Aluminium process air flow control damper located at the air intake.

(5) Wet air/regeneration fan, centrifugal, single entry with forward curved blades, direct motor driven.

(6) Regeneration air filter G4 standard.

(7) Aluminium regeneration air flow control damper located at the air intake.

(8) Reactivation air heater (inside of main module for electrically regenerated models up to 63 kW. power).

(9) Electric control and protection box with simple function switches.

4.4 Options and ancillary components

On demand, DFRC series of FISAIR Dehumidifiers can be provided with:

- Stainless steel casings.
- High pressure Fans (up to 600 mm WC available).
- Backwards curved blades fans.
- Fans with stainless steel impellers/casings.
- Pulley/Belt driven fans.
- More efficient air filters (up to F9).

4.5 Regulation and control

Desiccant rotor dehumidifier drying capacity can be regulated by acting on:

- Reactivation heater power (lower power = lower drying capacity).
- Reactivation air flow (lower air flow = lower drying capacity).

When you select the unit you have to define regulation, so that it is not a matter of this manual to extend in this aspect, but only to give an idea about possible alternatives.



Note: As standard, FISAIR dehumidifiers are supplied with a hygrostat connection for On/Off operation.

For electrically regenerated models, control of heater and the total unit is supplied (bridges H1, H2 or H3 of wiring diagram).

5. Installation

5.1 Locating the unit

Before installing FISAIR dehumidifiers the following points should be considered.

- If the dehumidifier has to be stored for a significant period prior to installation it should be protected from external damage and dust and construction material. In the case of outdoor storage, weatherproof covers should be employed.
- Once final location is defined ensure that there is enough space for servicing to be carried out. Take care to ensure that ducting connections are made without stressing the unit.



Attention: The maximum temperature and humidity conditions in the area where you will install the machine, must not exceed 40°C and 50% R.H.



Attention: The standard FISAIR DFRC dehumidifier is designed for indoor and outdoor installation.

5.2 Service areas

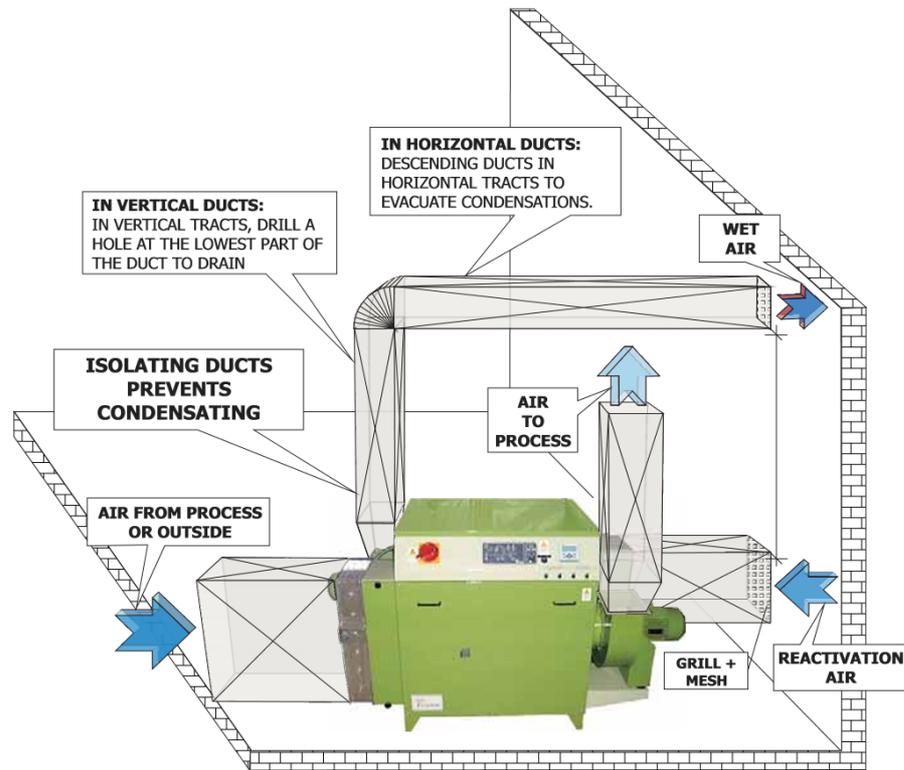
Dado que los deshumidificadores serie DFRC, están diseñados para trabajar en una ubicación temporal, deberá situarse de forma que no queden bloqueados los accesos al panel de mando, filtros y a la tapa del rotor desecante, durante su utilización.

- Air filters must be cleaned or changed.
- The desiccant wheel faces should be inspected and cleaned and the air seals adjusted as necessary.
- Driving belt should be checked for fatigue and its tightness checked.



Note: In the case of the motor or belt failure they should be replaced. To do this dismantle the front door which will provide space for dismantling the desiccant wheel driving device.

5.3 Air duct connections



- Check the operation of fans and motors and the reactivation heater. In case of failure, repair or replace.
- Check the components in the control box, service or change as necessary.

Duct connections should be made using normal industry standards for air transmission systems. However, the following particular items should be considered:

- Make sure that available external pressures stated in the unit data-sheet have been considered when designing the ducts sizes and layout, allowing that the dehumidifier will operate with the nominal air flows.
- The FISAIR dehumidifier is normally delivered with air dampers in both air streams, in order to adjust the flows to the nominal values.
- The outdoor air intakes must be designed with grilles/wire meshes to avoid the involuntary carryover of raindrops, leaves, insects, etc. that could affect the correct unit operation.
- The wet air outlet (normally saturated air) must be placed as far as possible from the air intakes, to avoid losses of performance.
- Also, the wet air duct must facilitate the draining of the condensing water produced when this air becomes cooler due to heat transmission. To achieve this the duct must slope downstream and, if possible, be insulated. When this duct runs vertically upwards, a small hole drilled (5 mm. approx.) should be arranged at the lowest part of the duct to drain the condensate that could go back to the unit or block the air duct.

5.4 Electric mains connections



Attention, Voltage: The dehumidifier works with medium electrical power and voltage and its connection to the mains must be done by qualified personnel and according to the applicable local electrical regulations.

The unit must be connected to the electrical network of the installation through a short circuiting and ground leakage protection line, with wires section/sensitivity as corresponds to the dehumidifier power. The unit has a terminal block into the electric box sized according to the electrical standards, to connect the supply wires.

6. Start up

Once the ductwork has been completed. You have to connect to the electrical mains as show in the wiring diagram included into the electrical cabinet.

6.1 Unit start up



Attention, Voltage: Before using the control panel, verify that all mechanical elements can work freely and the unit has no installation debris inside.

- Check that hygrostat set point is demanding the equipment operation (this figure should be at least 10% - 15% lower than environmental humidity), or its terminals have a bridge.
- Check that the air flow regulation dampers are at least 50% opened.
- Make sure that all screwed electrical terminals into the electric control box are rightly tightened to avoid faulty connections. Then, turn on the isolator switch and check that the power lamp is on. (REMARK: Do not use the isolator switch to operate the unit).
- Check that the phases are connected in the correct order = fan motors and gear-motor are rotating in the right direction. To do it, switch on the equipment for a few seconds by the control switch.
- If fans/gear-motor do not rotate in the correct direction, change the phases order at the equipment supply. **Note:** It is not necessary from model DFRC 1100 due to -I3- selector, which is a turning inverter.
- Start the unit again.



Note: It is advisable to check the electric consumption of the main elements and to verify that they correspond to the nominal values.

- Adjust the air flows if necessary.



Note: The nominal reactivation air flow with standard heater will heat this air stream 100°C (approx.) above the inlet temperature. So, you can use the thermometer reading to roughly adjust the reactivation air flow.

- After working for enough time to reach its standard operation (at least 30 minutes), make suitable thermo-hygrometric measurements.

6.2 Stopping the unit

To stop the dehumidifier after a period of operation for any length of time, use the selector I2 to set it to -0-.



Attention: You must not use the selector -I1- in any case to stop the operation, it is necessary that the power supply is present for at least 5 minutes after the stop order by I2, in this way, the fans continue to operate in order to dissipate the heat produced by the thermal inertia of the reactivation resistances.

6.3 Security and control components

Apart from the usual electrical components protections (against shortcuts and overload at the motors, with manual reset) the electrical panel of the dehumidifier is counting with the following security and control components:

- A temperature sensor in the reactivation side to read in the thermometer located in the control panel and thus to regulate the functional temperature within the operative limits.
- A safety switch to cut the power of the electric heater in case of over temperature due to the lack of reactivation air flow.

7. Maintenance

7.1 Preventative maintenance

The following service schedule can be used.

OPERATION	FREQUENCY
Filters cleaning	Weekly
Rotor driving check	Weekly
Fan impellers inspection	Monthly
Inner inspection (desiccant rotor surfaces) driving belt tension and absence of unexpected materials	Every second month
Electrical consumption and terminals tightening	Every second month
General cleaning	Yearly

7.2 Corrective maintenance

The (desiccant rotor type) FISAIR dehumidifiers' series DFRC have a very simple design and their components should have very few problems.

The fans/motors are of standard manufacture and in case of electrical or mechanical damages any skilled serviceman may do the repairing. The heaters can be easily changed or serviced when necessary (normally after a very long working period) like any other conventional air heater element.

Also, minor components like filters, dampers, driving belt and electric box components could be replaced after their useful life and the user will have to define the necessity of storing these parts, depending on their availability through local dealers.

7.3 Desiccant wheel service

This is the only dehumidifier component that needs any special attention.

Concerning the mechanical operation, the rotor should not require attention for a very long time. Its rotation speed is so low (20 - 24 r.p.h) that the bearings and desiccant material housing cannot suffer any mechanical damage normally. However, it is very important to verify periodically the correct operation of the driving device because it directly affects the drying process.

Regarding the water vapor adsorption process, the main rotor component, activated silica gel, works by fixing the water vapor molecules in its micro pores in the process air stream. Passes through the rotor channels.

This process is not affected by the normal environmental air conditions, nor by accidents of the installation that can be expected (for example, water direct action on the rotor does not affect the material, which is also fireproof).

Usual dust deposits on rotor surfaces can be removed by vacuum or blowing as well as by washing (please contact your dealer for written method when needed).

7.4 Washing procedure desiccant rotor

The desiccant rotor that include FISAIR air dehumidifiers has the advantage over the desiccant rotor type that it can be washed with water.

Normally, ordinary dust particles are removed with a vacuum cleaner as necessary. The cleaning frequency depends on the type of installation and the working cycles.

In the cases that vacuum cleaning is not enough to remove dirt and dust, it is possible to clean the rotor with water, using the following steps:

- 1) Remove the rotor from the dehumidifier. Remove the shaft and bearings, to be incorporated again after washing.
- 2) Prepare water in a container large enough to immerse the rotor, and to place the rotor so that it can be submerged in vertical position.
- 3) Immerse / remove the rotor from the tank of water two or three times, wait till the water drains from the rotor and the dissolved products in it are removed.
- 4) Once the process is complete, blow the rotor channels with compressed air to drag the remaining water.
- 5) Replace the rotor in the dehumidifier setting its axis and sealing gaskets.
- 6) Turn the rotor and the wet air fan on for about 30 minutes.
- 7) Connect the reactivation heater to finish the drying process.

Estimated time for washing procedure by model			
From 075 to 0300	From 0400 to 0900	From 1100 to 2100	From 2900 to 3500
6 hours	8 hours	12 hours	16 hours

8. Fault finding

If any fault happens, shut off immediately the unit through the I2 selector switch. Faults must be solved for qualified people only, following the security rules.

9. General technical data sheet

9.1 Nominal performances

Data for:

Process and reactivation air inlet at [T = 20°C and R.H = 60%]

Reactivation air flow = 0,3 x Process air flow (Vp).

(For other conditions, please ask to FISAIR S.L)

DFRC-E MODEL	Vp (m3/h)	Pr (kW)	Δx (g/kg)	Δt (°C)	W (kg/h)
0175	1200	13,5	6,3	23,5	9,1
0200	1400	15,8	6,2	22,5	10,4
0230	1600	18,0	6,1	22,0	11,7
0300	2100	22,5	5,7	20,0	14,3
0400	2700	27,0	5,8	21,0	18,8
0500	3600	36,0	5,7	19,5	24,6
0650	4500	45,0	5,5	18,0	29,7
0900	6000	63,0	5,7	20,0	41,0
1100	7500	81,0	5,8	19,0	52,2
1300	9000	99,0	6,0	21,0	64,8
1700	12000	126,0	5,9	22,0	85,0
2100	15000	162,0	5,9	21,0	106,2
2900	20000	200,0	5,7	21,0	136,8
3500	24000	240,0	5,6	20,0	161,2

Vp = Process air flow

Δt = Dry air temperature rise

Pr = Reactivation heater power

W = Drying capacity

Δx = Specific capacity

For quick estimation see next table.

Adsorption capacity change with different air inlet conditions (*)

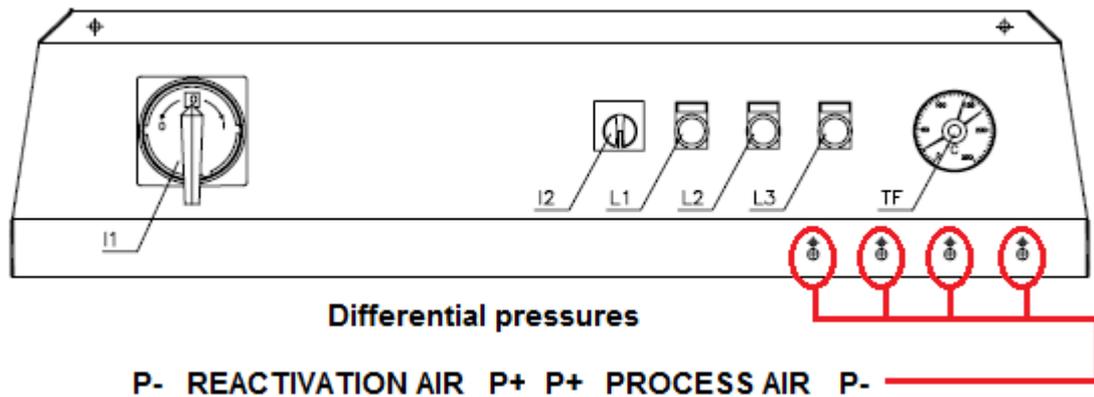
Correction coefficient percentage (%) to be applied to the drying capacity (*)

T (°C) R.H (%)	5	10	15	20	25	30	35
40	25	38	57	73	90	105	110
50	35	46	70	87	105	120	125
60	40	60	78	100	120	125	135
70	50	68	90	110	130	135	145
80	56	75	95	120	135	140	-
95	62	80	105	130	140	145	-

* Approximate data used for quick capacity estimates; to be confirmed in each case.

Practical example: Starting with a DFRC-0300-E with 14,3 kg/h (at 20°C and 60% R.H), we want to know the capacity if the air being handled is at 30°C and 70% R.H. The table show us that a Correction Coefficient of 135% must be applied, which gives a new capacity of $14,3 \times 1,35 = 19,3$ kg/h (at 30°C and 70% R.H).

9.2 Pressure drop to adjust nominal flow



(*) To adjust the process air flow and the reactivation air flow, it's necessary to measure the differential pressure loss in the desiccant rotor with a manometer. Set the pressure drop on air process and on air reactivation with the parameters of the next table by opening and closing the respective dampers.

Example: (*) For a DFRC-0300-E you'll have to measure with the manometer 292 Pa in the process air to have 2100 m³/h. You'll have to measure 372 Pa in the reactivation air to have 630 m³/h.

DFRC-E MODEL	Process air flow (m ³ /h)	Pressure drop of process air (Pa)	Reactivation air flow (m ³ /h)	Pressure drop of reactivation air (Pa)
0175	1200	141	360	192
0200	1400	167	420	225
0230	1600	200	480	261
0300	2100	292	630	372
0400	2700	158	810	213
0500	3600	228	1080	296
0650	4500	167	1350	223
0900	6000	243	1800	314
1100	7500	177	2250	236
1300	9000	225	2700	293
1700	12000	179	3600	238
2100	15000	242	4500	313
2900	20000	184	6000	244
3500	24000	235	7200	305

(*) Process and Reactivation air inlet: T = 20°C and R.H = 60%.

9.3 Operational limits and conditions

9.4 Chemical resistance for silica gel rotor wheel



Attention: The following chemical compounds will cause the damage to SILICAGEL ROTOR WHEEL or decrease the dehumidification performance.



Note: If you operate the FISAIR DFRC dehumidifier under this chemical compounds, the warranty will become void.

INORGANIC COMPOUNDS

	COMPOUND	FORMULA	PHENOMENON
1	Lithium Chloride	LiCl	Clog silica gel pore by absorption
2	Sodium Hydroxide	NaOH	Dissolve silica gel
3	Potassium Hydroxide	KOH	Dissolve silica gel
4	Sodium Chloride	NaCl	Decrease of silica gel performance
5	Potassium Chloride	KCl	Decrease of silica gel performance
6	Calcium Chloride	CaCl ₂	Decrease of silica gel performance
7	Magnesium Chloride	MgCl ₂	Decrease of silica gel performance
8	Ammonia	NH ₃	Basic gas
9	Hydrogen Fluoride	HF	Fluoride
10	Aluminium Chloride	AlCl ₃	Decrease of silica gel performance
11	Sea Water	--	Decrease of silica gel performance
12	Steam at high temp.	--	Dissolve silica gel
13	Plasticizer	--	Clog silica gel pore
14	Strong Acid	pH= 2-3 and less	Decrease of ceramic mechanical property

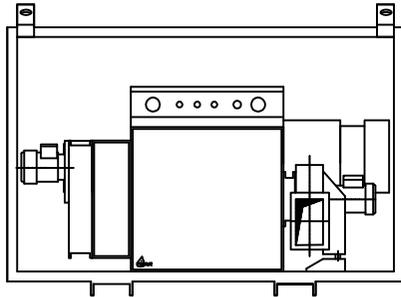
ORGANIC COMPOUNDS

Please note that you have to be careful of the following volatile organic compounds which have high boiling temperature and low vapour pressure. Once silica gel adsorbed those volatile compounds, it does not release them. That means silica gel does not work for moisture removal.

	COMPOUND	FORMULA	PHENOMENON
1	Oil Mist	--	Clog silica gel pore
2	Cyclohexanone	C ₆ H ₁₀ O	Decrease of silica gel performance
3	Isopropyl Alcohol	(CH ₃) ₂ CHOH	Decrease of silica gel performance
4	o-Xylene	--	Decrease of silica gel performance
5	m-Xylene	C ₆ H ₄ (CH ₂) ₂	Decrease of silica gel performance
6	p-Xylene		Decrease of silica gel performance
7	Phenol	C ₆ H ₅ OH	Decrease of silica gel performance
8	o-Dichlorobenzene	C ₆ H ₄ CL ₂	Decrease of silica gel performance
9	Methyl Bromide	CH ₃ Br	Decrease of silica gel performance

AIR DEHUMIDIFIERS SERIES DFRC

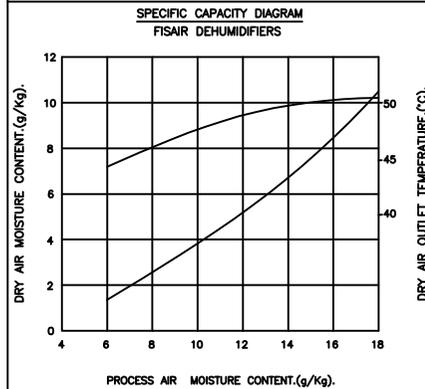
Compact and self-supporting air dehumidifiers with protective frame and roof for movable or temporary applications.



TECHNICAL DATA

MODEL	DRY AIR FLOW m ³ /h	ELECTRIC POWER kW	NOMINAL DRYING CAPACITY (Kg water/h) (*)
DFRC-0175	1200	15	7.2
DFRC-0300	2100	25.5	12.6
DFRC-0400	2700	30	16.2
DFRC-0500	3600	39.4	21.6
DFRC-0650	4500	51	27
DFRC-0651	5000	60	30
DFRC-0900	6000	73	36
DFRC-1100	7500	89	45
DFRC-1300	9000	100	54
DFRC-1700	12000	141	72
DFRC-2100	15000	183	90

CAPACITY DIAGRAM.(*)



SETTLED PARAMETERS.

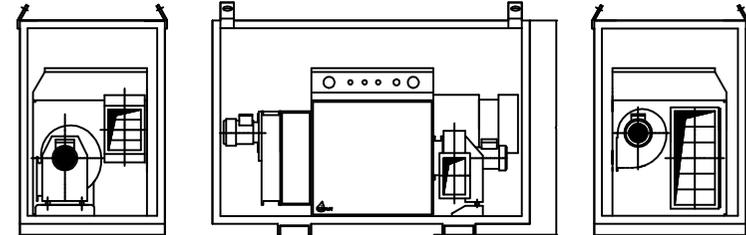
- PROCESS AIR TEMPERATURE : 25°C
- REACTIVATION AIR TEMPERATURE : 140°C
- EQUAL PROCESS/REACTIVATION AIR MOISTURE CONTENT.

(*)Capacity diagram for DFRC-1100 model,with the specified settled parameters.Other models capacities to be furnished under demand.

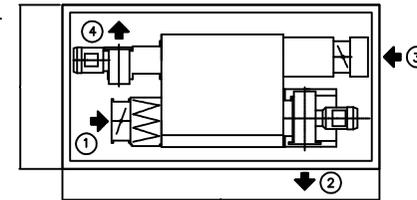
FISAIR AIR DEHUMIDIFIERS.

SPECIFICATION :

Air dehumidifier by silicagel desiccant rotor,brand FISAIR,model DFRC-0000-E Manufactured in a self - supporting and compact unit with protective frame and roof made of steel tube/plate. Complete with fans,air filters,dampers for airflows regulation,reactivation air heater and electric control box for outdoors application. Performances and power requirements as stated into front table.



- 1 PROCESS AIR INLET
- 2 DRY AIR OUTLET
- 3 REACTIVATION AIR INLET
- 4 WET AIR OUTLET

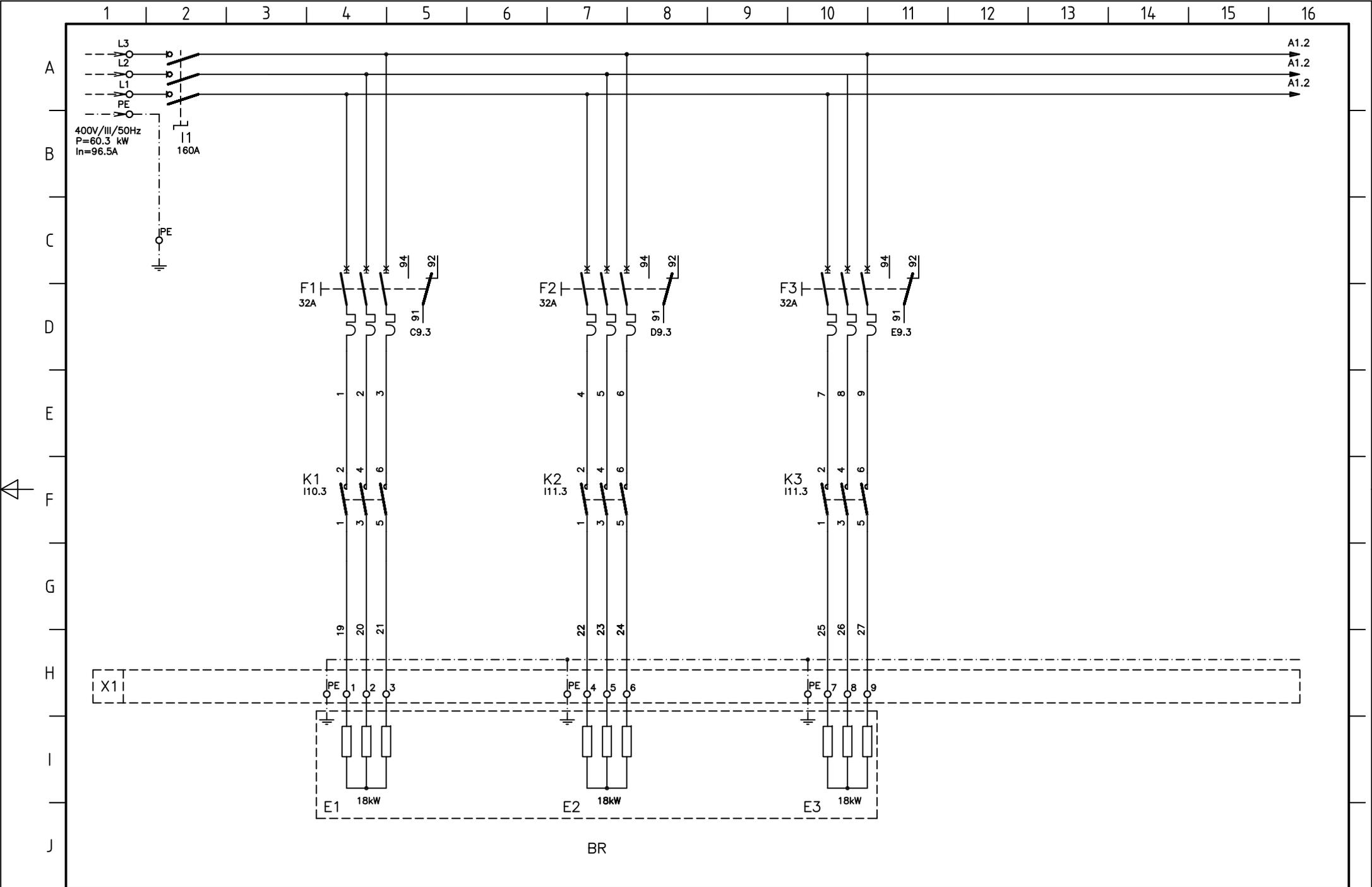


Main dimensions,mm.

POS.	MODEL DFRC	CODE	A	B	C	AIR INLET FLANGES (L X H)		AIR OUTLET FLANGES (L X H)		APROXIMATIVE WEIGHT (Kg)
						1	3	2	4	
01	0175	70200020	2000	950	1215	250X614	250X314	115X140	103X125	285
02	0300	70200012	2000	950	1215	250X614	250X314	140X216	130X160	300
03	0400	70200021	2000	1100	1415	350X614	350X414	140X216	115X146	350
04	0500	70200022	2000	1100	1415	350X614	350X414	200X320	130X160	400
05	0650	70200023	2350	1300	1710	450X1014	450X514	228X280	140x216	515
06	0651	70200024	2350	1300	1710	450X1014	450X514	228X280	140x216	525
07	0900	70200025	2350	1300	1710	450X1014	450X514	250X320	140X216	570
08	1100	70200026	2800	1600	2035	575X1214	575X514	250X320	140X216	930
09	1300	70200027	2800	1600	2035	575X1214	575X514	250X320	140X216	990
10	1700	70200028	3300	2000	2220	600X1514	600X714	315x450	228x280	1750
11	2100	70200029	3300	2000	2220	600X1514	600X714	410X600	228x280	1820

DISTRIBUTOR :

URANIO N° 20
P.I. AIMAYR
28330-SAN MARTIN DE LA VEGA. MADRID. (SPAIN)



N° PLANO: F-5190-001
 Dwg Nr:
 REVISION: -
 Review:

TIPO: DFRC-0651
 Type:
 CONEXIÓN: 400V/III/50Hz
 Supply:

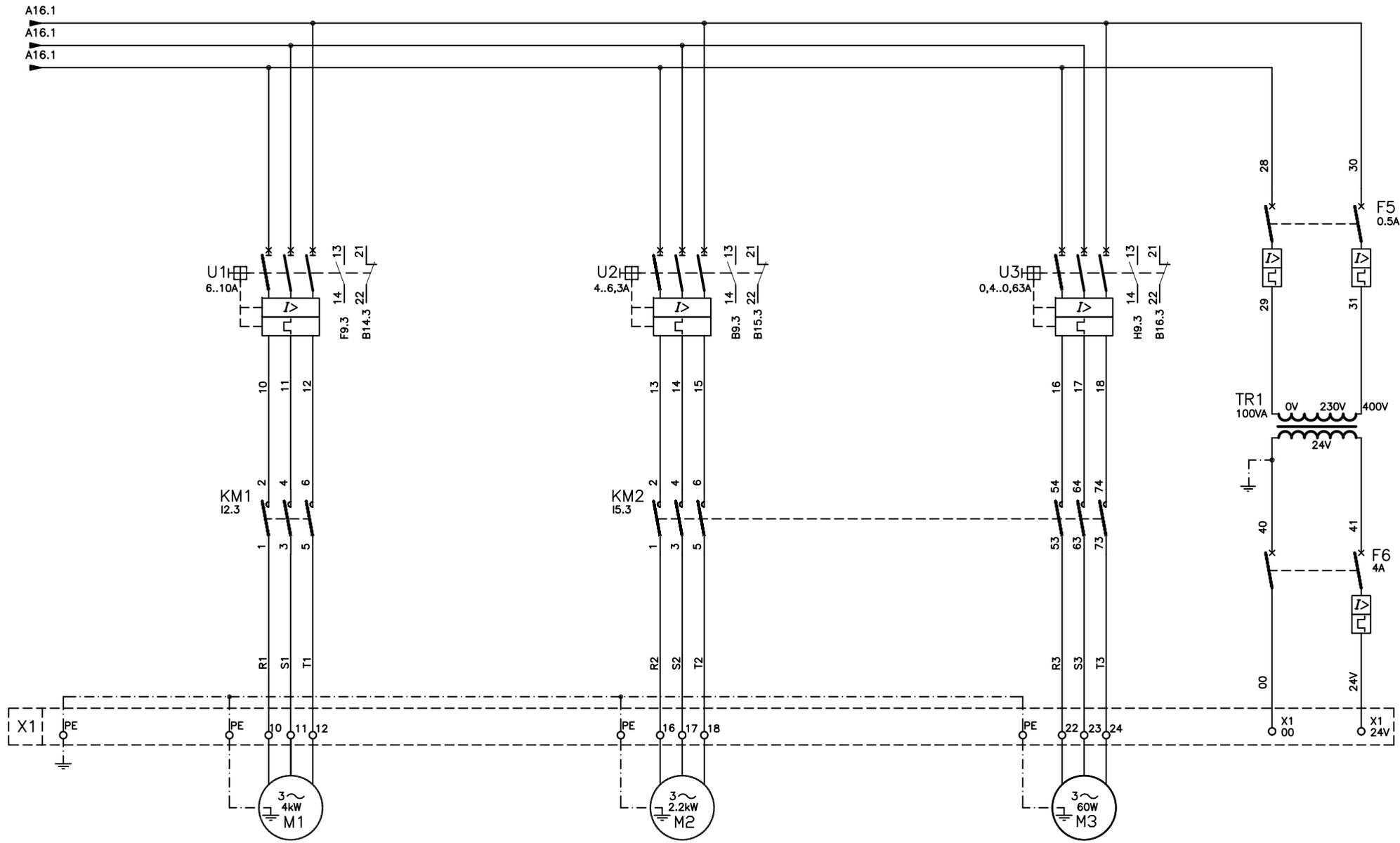
DENOMINACIÓN: ESQUEMA ELÉCTRICO
 Denomination: Wiring diagram

DIBUJADO: B.R.G.
 Drawn:
 COMPROBADO: J.M.B.
 Checked:

APROBADO: H.L.A.
 Approved:
 HOJA N°: 1 DE: 5
 Sheet Nr: Of:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

A
B
C
D
E
F
G
H
I
J



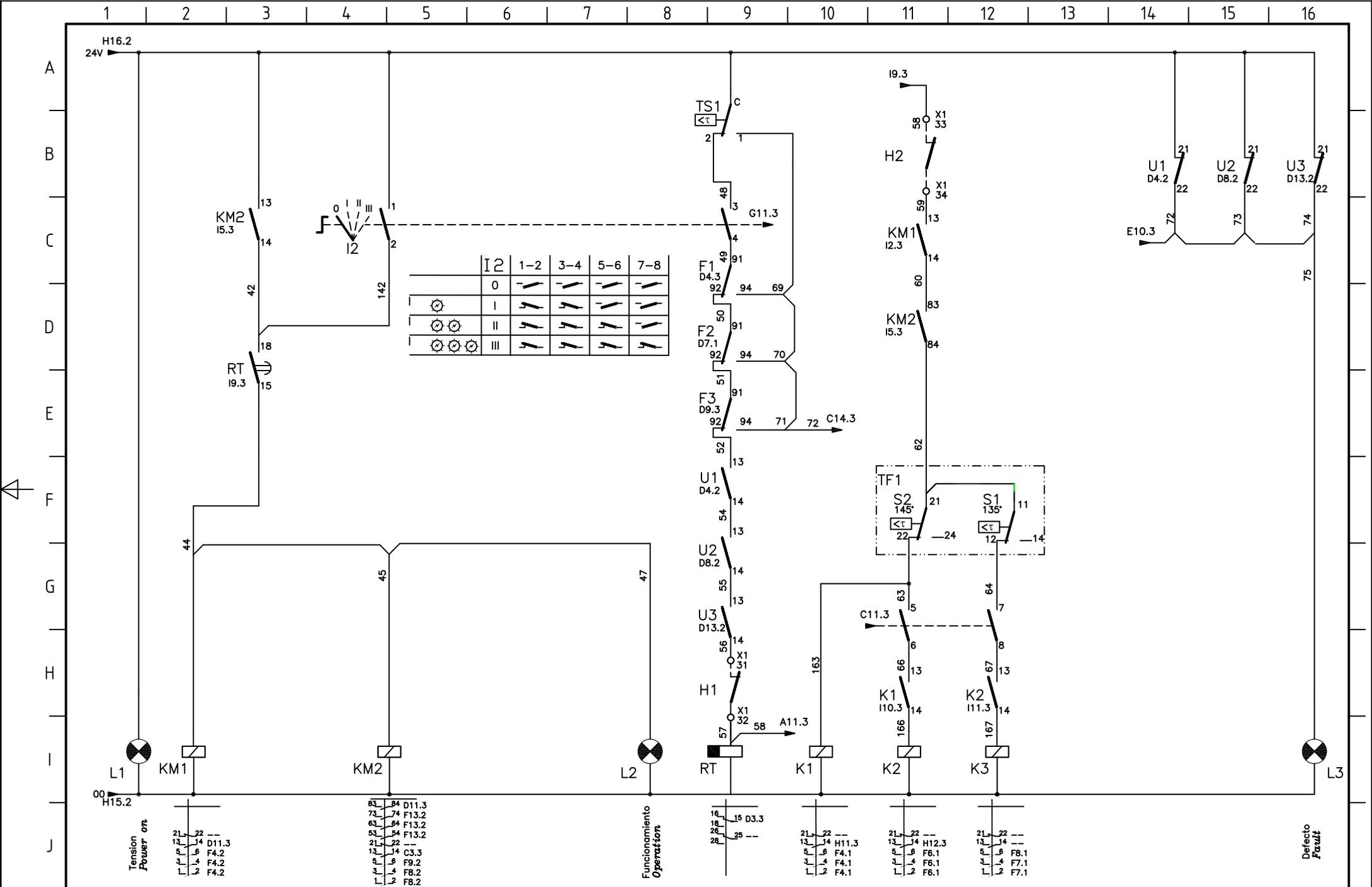
N° PLANO: F-5190-001
 Dwg Nr:
 REVISION: -
 Review:

TIPO: DFRC-0651
 Type:
 CONEXIÓN: 400V/III/50Hz
 Supply:

DENOMINACIÓN: ESQUEMA ELÉCTRICO
 Denomination: Wiring diagram

DIBUJADO: B.R.G.
 Drawn:
 COMPROBADO: J.M.B.
 Checked:

APROBADO: H.L.A.
 Approved:
 HOJA N°: 2 DE: 5
 Sheet Nr: Of:



I2	1-2	3-4	5-6	7-8
0	—	—	—	—
I	—	—	—	—
II	—	—	—	—
III	—	—	—	—



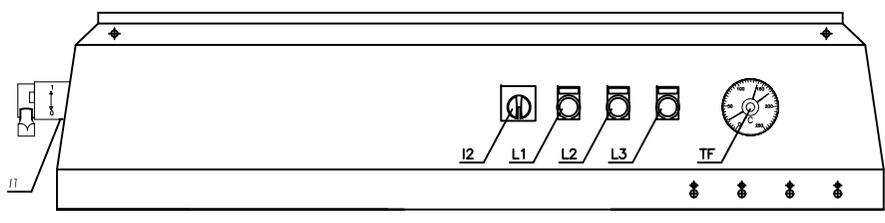
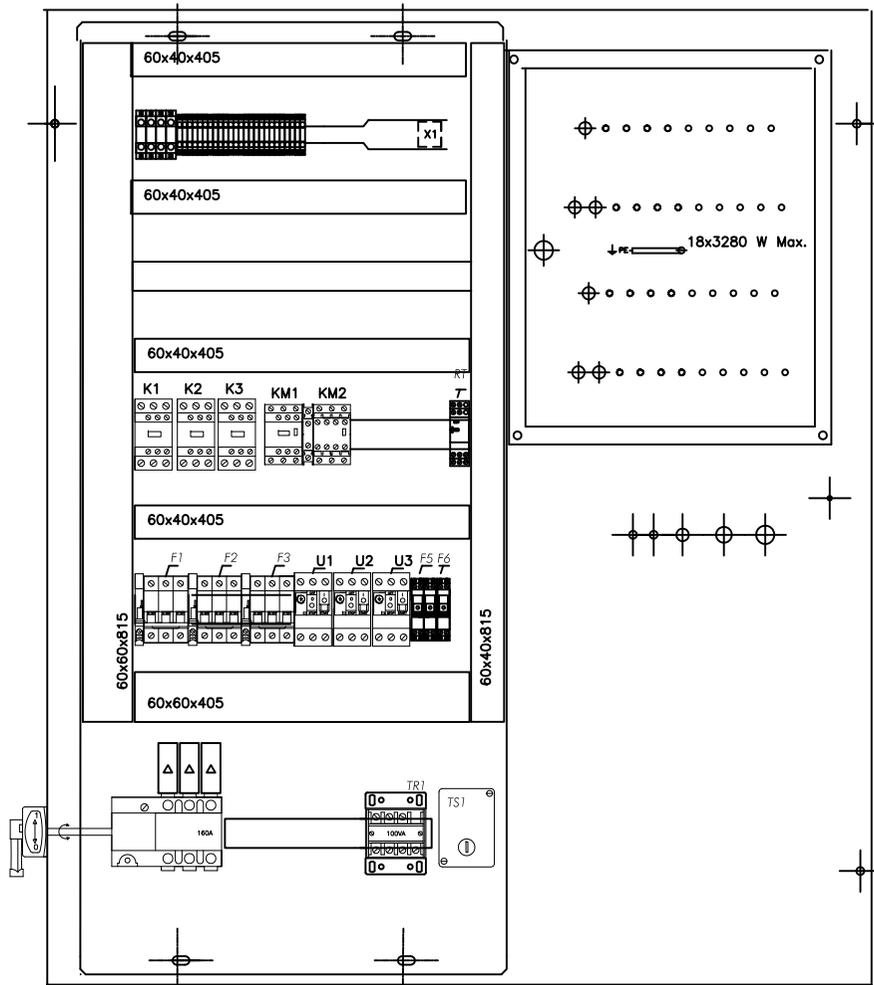
N° PLANO: F-5190-001
 Dwg Nr:
 REVISION: A
 Review:

TIPO: DFRC-0651
 Type:
 CONEXIÓN: 400V/III/50Hz
 Supply:

DENOMINACIÓN: ESQUEMA ELÉCTRICO
 Denomination: Wiring diagram

DIBUJADO: B.R.G.
 Drawn:
 COMPROBADO: J.M.B.
 Checked:

APROBADO: H.L.A.
 Approved:
 HOJA N°: 3 DE: 5
 Sheet Nr: Of:



N° PLANO: F-5190-001
 Dwg Nr:
 REVISION: A
 Review:

TIPO: DFRC-0651
 Type:
 CONEXIÓN: 400V/III/50Hz
 Supply:

DENOMINACIÓN: ESQUEMA ELÉCTRICO
 Denomination: Wiring diagram

DIBUJADO: B.R.G.
 Drawn:
 COMPROBADO: J.M.B.
 Checked:

APROBADO: H.L.A.
 Approved:
 HOJA N°: 4 DE: 5
 Sheet Nr: Of:

	Nombre <i>Name</i>	Descripción <i>Description</i>	Posición <i>Position</i>	Nombre <i>Name</i>	Descripción <i>Description</i>	Posición <i>Position</i>
A	I1	Interrupitor seccionador <i>Isolator switch</i>	A2.1	I2	Interrupitor selector de funcionamiento <i>Selector switch</i>	C5.3
B	F1		D4.3	RT	Relé temporizador a la desconexión <i>Delayed motor disconn relay</i>	I9.3
	F2	Protección magnetotérmica de E2. <i>(E2) circuit breaker</i>	D7.1	TS1	Termostato de seguridad de batería de reactivación <i>Heater safety thermostat</i>	A9.3
C	F3	Protección magnetotérmica de E3. <i>(E3) circuit breaker</i>	D9.3			
	U1	Protección magnetotérmica de motor-ventilador M1 <i>Circuit breaker for (M1)</i>	D4.2	TF1	Termostato de funcionamiento dos etapas S1/S2 <i>(Two stages S1/S2) operation thermostat</i>	F11.3
	U2	Protección magnetotérmica de motor-ventilador M2 <i>Circuit breaker for (M2)</i>	D8.2	H1	Conexión primera etapa higróstico <i>Higrostat conection 1(Whole unit OFF)</i>	H9.3
D	U3	Protección magnetotérmica de motor-ventilador M3 <i>Circuit breaker for (M3)</i>	D13.2	H2	Conexión segunda etapa higróstico <i>Higrostat conection 2(Heater OFF)</i>	B11.3
	K1		I10.3	L1	Indicación puesta en tensión <i>Power ON LED</i>	I1.3
E	K2	Contactador de E2 <i>E2 contactor</i>	I11.3	L2	Indicación puesta en funcionamiento <i>Operation LED</i>	I8.3
	K3	Contactador de E3 <i>E3 contactor</i>	I12.3	L3	Indicación defecto <i>Fault LED</i>	I16.3
F	KM1	Contactador del motor ventilador M1 <i>M1 contactor</i>	I2.3			
	KM2	Contactador motor de M2/M3 <i>Fan motor M2 and drive motor M3 contactor</i>	I5.3			
G						--
	BR	Batería de resistencias (Tres etapas: E1, E2, E3) <i>3-Stages air heater</i>	J7.1			--
H	M1	Motor ventilador de proceso. <i>Process fan motor</i>	I4.2			--
	M2	Motor ventilador de reactivación. <i>Reactivation fan motor</i>	I8.2			--
	M3	Motor reductor. <i>Rotor drive motor</i>	I13.2			--
I	F5	Protección magnetotérmica de TR. <i>Circuit breaker for transformer</i>	C16.2			--
	TR1	Transformador del circuito de maniobra <i>Transformer for control wiring</i>	E16.2			--
J	F6	Protección magnetotérmica del circuito de maniobra <i>Circuit breaker for control wiring</i>	G16.2			--



N° PLANO: F-5190-001
Dwg Nr:
 REVISION: A
Review:

TIPO: DFCR-0651
Type:
 CONEXIÓN: 400V/III/50Hz
Supply:

DENOMINACIÓN: ESQUEMA ELÉCTRICO
Denomination: Wiring diagram

DIBUJADO: B.R.G.
Drawn:
 COMPROBADO: J.M.B.
Checked:

APROBADO: H.L.A.
Approved:
 HOJA N°: 5 DE: 5
Sheet Nr: Of:



DECLARACIÓN CE DE CONFORMIDAD
EC CONFORMITY DECLARATION
EG KONFORMITÄTSERLÄRUNG
DECLARATION CE DE CONFORMITÉ



Departamento de Dirección Técnica
Technical Direction Department

Abteilung von der technischen Leitung
Département de Direction Technique



FISAIR S.L.
C/ Uranio, 20 (Pol. Ind. Aimayr)
28330 San Martín de la Vega (Madrid) ESPAÑA
☎ Tfº (34) 916921514
☎ Fax (34) 916916456

DECLARAMOS Bajo nuestra única responsabilidad que el deshumidificador de aire:
WE DECLARE, under our own responsibility that the air dehumidifier:
Unter unserer ausschließlicher Verantwortung ERKLÄREN WIR, daß der Luftentfeuchter:
NOUS DECLARONS, sous notre unique responsabilité que le deshydrateur d'air:

MARCA/BRAND/MARKE/MARQUE:

SERIE/SERIES/REIHE/SÉRIE:

FISAIR

DFRC

Se adapta a las normas:
Meets the regulations:
Den Normen entspricht:
S'adapte aux normes:

* EN 12100: 2012
* EN 60204-1: 2007
* EN 61000-6-1: 2007
* EN 61000-6-3: 2007
* EN 13857: 2008

Es conforme a los requisitos esenciales de las Directivas:
Conforms to the essential requirements of the Directives:
Und den von den Richtlinien aufgestellten Grundvoraussetzungen Rechnung trägt:
Et est conforme aux conditions essentielles des Directives:

* 2006/42/CE
* 2004/108/CE
* 2006/95/CE

Con exclusión de responsabilidades sobre las partes o componentes adicionales o montados por el cliente.

With no liability for the parts or components added or assembled by the customer.

Unter Ausschluß der Verantwortung über die vom Kunden bereitgestellten und/oder angebauten Teile.

Avec exclusion des responsabilités concernant les parties ou les composants ajoutés ou assemblés par le client.

Departamento Dirección Técnica/Technical Direction Department/Département de Direction Technique/Abteilung von der technischen Leitung:

Hugo J. López Álvarez
San Martín de la Vega, marzo 2014



FISAIR S.L. WARRANTY POLICY



Technical Direction Department
Departamento de Dirección Técnica



FISAIR S.L.

C/ Uranio, 20 (Pol. Ind. Aimayr)
28330 San Martín de la Vega (Madrid) SPAIN
☎ Tfº (34) 916921514
☎ Fax (34) 916916456

Two-year Limited Warranty

FISAIR warrants to the original purchaser that its products will be free from defects in materials and parts for a period of two (2) years after installation or twenty-seven (27) months from the date FISAIR ships such product, whichever date is the earlier.

If any FISAIR product is found to be defective in material or assembly during the applicable warranty period, FISAIR's entire liability, and the purchaser's sole and exclusive remedy, shall be the repair or replacement of the defective product or part.

Warranty disclaimer

FISAIR shall not be liable for any costs or expenses, whether direct or indirect, associated with the installation, removal or reinstallation of any defective product.

The Limited Warranty does not include any consumer part such as joints, pulleys, filters or media.

FISAIR's Limited Warranty shall not be effective or actionable if:

- a) All related product invoices have been paid in time and terms.
- b) Unless there is compliance with all installation and operating instructions furnished by FISAIR, or if the products have been modified or altered without the written consent of FISAIR, or if such products have been subject to accident, misuse, mishandling, tampering, negligence or improper maintenance. Such situations could be an incorrect power supply connection, crashed with inappropriate objects, security protection devices unblocked and so.

Any warranty claim must be submitted to FISAIR in writing within the stated warranty period.

Parts Warranty

Defective parts may be required to be returned to FISAIR. In case any part is claimed as a faulty one, FISAIR will ask the customer to send the part back to the factory in order to analyze if the part is failing due to any of above referred actions (see warranty disclaimer) or due to effective part failing.

If the part must be replaced immediately, FISAIR will ship the part to the customer immediately and invoice the part with a 30 days delay payment for the faulty part to be returned. If the part is returned in this period, the part fail analysis would be made to emit a technical report for the warranty coverage based in this Warranty Statement document.

In case that the part is failing due to a lack of quality, FISAIR will credit this invoice in order to stop the payment. In case FISAIR does not receive the part in this period, or if the failure is due to the reasons covered in the Warranty disclaimer paragraph, the invoice will be effective.

In case any part from the product / shipment is missing, the customer should notify FISAIR before 3 days from the shipment date of arrival.



FISAIR S.L. WARRANTY POLICY



Technical Direction Department
Departamento de Dirección Técnica

Service Covered by Warranty

In case that there is any FISAIR product that should be serviced in order to recover its proper used designed, FISAIR will select the person (s) in charge of this operation. These qualified technicians should have the enough knowledge to service FISAIR units.

No company should practice a warranty service without the writing FISAIR notice giving the authorization to do it and if any cost should be cover by FISAIR should be advised in advance to the service job. In case that FISAIR should send FISAIR staff to solve the solution, trip expenses are not covered by the warranty.

FISAIR's Limited Warranty is made in lieu of, and FISAIR disclaims all other warranties, whether express or implied, including but not limited to any implied warranty of merchantability, any implied warranty of fitness for a particular purpose, any implied warranty arising out of a course of dealing or of performance, custom or usage of trade.

FISAIR shall not, under any circumstances be liable for any direct, indirect, incidental, special or consequential damages (including, but not limited to, loss of profits, revenue or business) or damage or injury to persons or property in any way related to the manufacture or the use of its products. The exclusion applies regardless of whether such damages are sought based on breach of warranty, breach of contract, negligence, strict liability in tort, or any other legal theory, even if FISAIR has notice of the possibility of such damages.

By purchasing FISAIR's products, the purchaser agrees to the terms and conditions of this Limited Warranty.

Extended Warranty

The original user may extend the term of the FISAIR Limited Warranty for a limited number of months past the initial applicable warranty period and term provided in the first paragraph of this Limited Warranty. All the terms and conditions of the Limited Warranty during the initial applicable warranty period and term shall apply during any extended term.

Each case should be valued in terms of type of product, equipment application, use and location of the product operation site.

Any extension of the Limited Warranty under this program must be in writing, signed by FISAIR, and paid for in full by the purchaser.

Technical Direction Department:

Hugo J. López Álvarez
San Martin de la Vega, junio 2013