ROOF-TOP Air Conditioners
D4IC-090/120/150/180/240/300 (Cool only)
B4IH-090/120/180/240/300 (Heat pump)
D4IG-090/120/150/180/240/300 (Cool only + gas heating)

Ref.: Y-R70123 0105M

Technical Information

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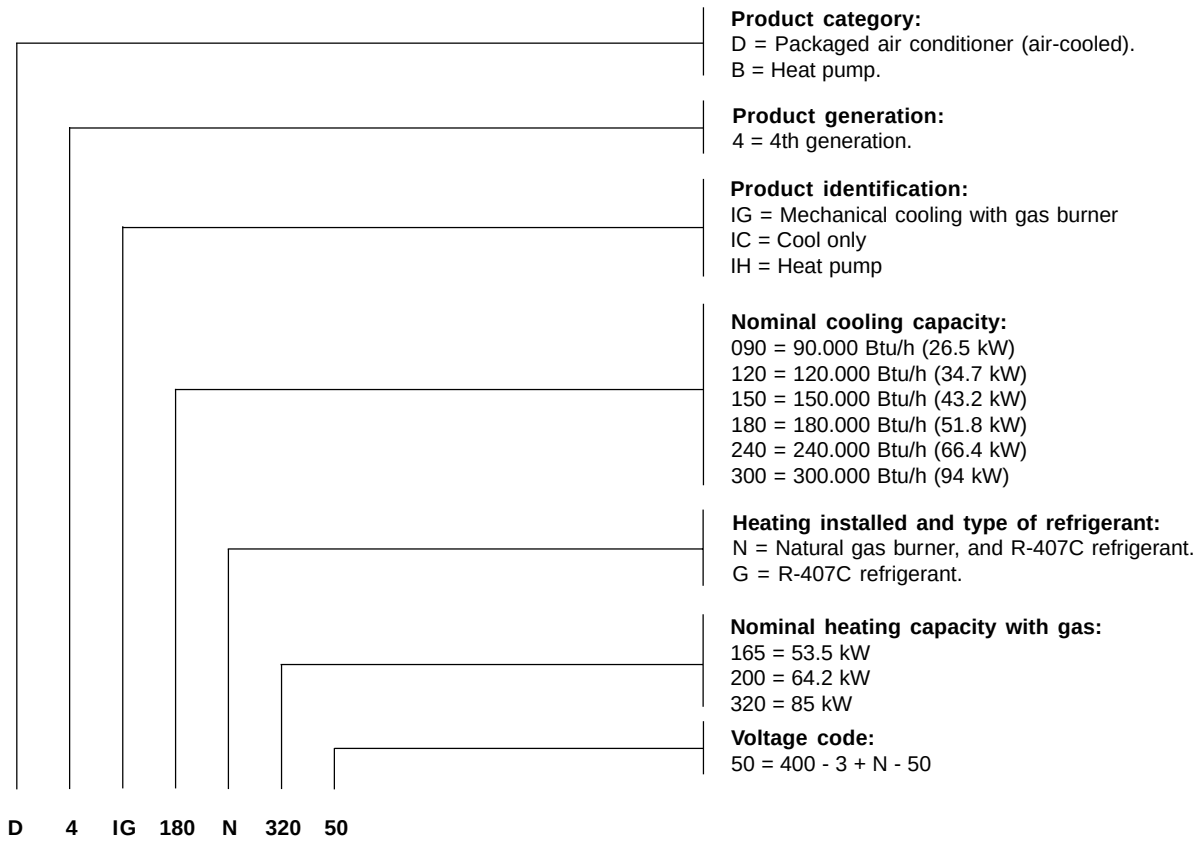
1 - Description

The Sunline 2000 units are adequate for installing outdoors, either on the roof or on ground level.
The D4IG units are high performance packaged air conditioners and gas heating units.
The D4IC series are cool only versions, but accept electric heaters for heating.
The B4IH models are reversible heat pump versions with optional electric heaters as backup.
Factory supplied completely mounted, with all necessary tubing, connected and loaded, in one sole assembly for shipping and handling, making installation easier and faster.

2 - Product nomenclature



3 - Characteristics

3.1.- Design of convertible flow

For maximum flexibility, all models can be adapted to downward or horizontal air flows by simply removing two panels (either at the bottom or the sides) when installing.

3.2.- Wide range of flows

All units have belt-drive fans, with adjustable pitch pulleys, to cover needed flows with precision.

3.3.- Base beams

The base beams are fixed and provide a foundation for the entire unit.
The beams have suspension holes on the front surface that allow using a crane to locate the unit.
They also have holes on the bottom surface for locating the unit on shock absorbers, when required.

3.4.- Service connections

There are holes for the entry of power supply cables both in the base as well as on the sides of the units that allow connection at the installation site with minimum labour.

3.5.- Control circuit

There is a 24 V control circuit that can operate with the optional DPC-1 thermostat (communication), or a 24 V thermostat with control signals (Y1, Y2, G, O/B, W).
The use of a system analyser (Yktool) is also allowed for the purpose of simplifying commissioning, trouble shooting and resolving failures.
The access cover can be removed for repairs or maintenance operations without affecting the normal operating pressures of the system.

3.6.- Multiple cooling circuits

A double circuit in all models guarantees better control of the temperature and comfort level of the room, as well as better performance with minimum operating costs.

3.7.- Durable construction

All metal parts of this equipment are made of commercial quality galvanised steel sheeting (G90).
After manufacture, all parts are cleaned, then coated with a layer of zinc phosphate, and finished with oven-baked enamel so as to guarantee a quality finish for many years of service.

RAL9002, an exceptionally durable coating method guaranteed by the 800-hour fog spray protection process, in compliance with standard DIN 50021.

3.8.- Low noise level

All packaged air conditioners operate at extremely low noise levels.
The compressors are mounted on antivibratory supports.
The vertical discharge condenser fans direct the noise upwards and far away from the surrounding structures.

3.9.- Compressors

Hermetic compressors with motors cooled by suction gas and acoustic insulation of the suction and discharge lines, as well as an exterior sump heater.

3.10.- System protection

All cooling circuits are equipped, in series, with the following protection features:
- High and low pressure switches.
- Discharge and suction probe.
- Liquid line filter-dryer.
- Suction accumulator (on heat pumps).

3.11.- Gas burner (D4IG equipment)

All gas models are equipped with two equal capacity control stages. The burner assembly is equipped with a heat exchanger with aluminium-coated steel tubing, an adjustable gas valve, electronic ignition control, mechanical ventilation, as well as all safety controls needed to cover the latest EC standards.
The gas supply pipe is channelled to the heating compartment through a hole located in the front panel of the unit.
This equipment is supplied complete and ready for connection to a natural gas connection at 20 mbar (2ND-H, G20).

3.12.- Air filters

Equipped with disposable 50 mm. filters, with 85% gravimetric efficiency, EU-3 and F1 class fire resistance (DIN 53438).

3.13.- Electrical panel

- Complies with the EN60204-1 and 60439-1 standards.
- Main switch with a yellow-red handle and a latched door, supplied as standard.
- Motors protected by magneto thermal switches and motor guards.

3.14.- Defrost sequence (B4IH equipment)

The heat pumps are equipped with a defrost adjustable timer controlled by microswitches (30, 60, 90 minutes) that acts upon the liquid probe temperature and does not allow the simultaneous defrost of two cooling circuits.

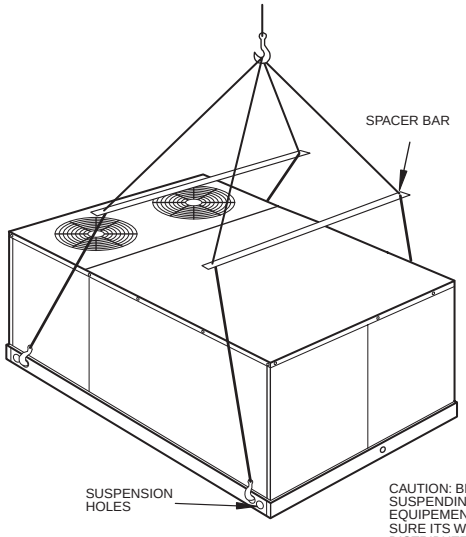
3.15.- Location

Use the following guidelines to select an adequate location for these units.
1. This equipment is designed for outdoor installation only.
2. The condenser requires an unlimited air supply. Whenever possible to choose a location, locate the equipment on the north or east side of the building.
3. For ground level installations, use a level concrete slab of at least 100 mm. thick. The length and width should be at least 150 mm. more than the base beams of the units. Do not fasten the bedframe to the foundation of the building.
4. For roof-top installation, the roof structure should be able to support the weight of the equipment, its options and/or accessories. The equipment should be installed on a mounting base or on an adequate frame of steel angles (the optional accessory «mounting base» or «Roof-Curb» is available).
5. Maintain a maximum 13 mm. level tolerance along the entire length and width of the equipment.

3.16.- Transportation and handling

Suspend the unit using chain or cable slings (Fig. 1) and spacers longer than the width of the equipment. Do not use forklift trucks.

Typical elevation



- Fig. 1 -

4 - Technical specifications

4.1.- D4IC/D4IG

Models			D4IC/D4IG					
			90	**120**	**150**	**180**	**240**	**300**
Capacities	Cooling (1)	kW	26.8	34.2	44.2	50.6	67	92.5
	Total heating (D4IG)	kW	53.5	64.2	64.2	85	85	85
	Net heating (D4IG)	kW	47.5	57	57	76	76	76
Compressor	(Alternative)	cant.	2	2	1+1 dual	1+1 dual	2 dual	3 dual
Circuits	Refrigerant (R-407C)	sys.1	3.1	4.2	5	7.9	8.2	7.7
		sys.2	3.1	4.3	4.8	3.5	8.2	7.3
		sys.3	-	-	-	-	-	8.2
Power supply		V / ph / Hz	400 / 3 + N / 50					
Absorbed power (2)		kW	8.9	10.6	13.1	15.2	21.3	28
Intensity	Nominal/start	A	19.9 / 76	24.3 / 83	34.8 / 151	40.9 / 175	51 / 187	67.3 / 204
Evaporator fan Maximum flow (1 x unit)	Nominal air flow	m^3/h	5 100	6 800	8 640	10 000	13 700	17 000
	Static pressure (standard)	Pa	170	275	210	340	320	120
	Static pressure (with high speed accessory)	Pa	-	-	-	450	390	450
	Maximum flow	m^3/h	6 400	8 500	10 800	12 200	15 900	18 700
	Minimum flow	m^3/h	3 800	5 100	6 500	7 200	10 000	13 600
	Motor	kW	1.5	2.2	4	4	5.5	7.5 (Standard) 11.5 (Acce.)
Evaporating coil	Tubing depth		3	3	3	3	3	4
	Fins x inch		13	13	13	13.5	13.5	13
	Front area	m^2	0.73	1.02	1.25	1.45	1.92	2.14
Condensing unit fan (2 x unit)	Diameter	mm	610	610	610	762	762	762
	Nominal flow	m^3/h	4 930	6 120	7 500	10 200	13 600	13 600
	Motor	kW	0.4	0.4	0.4	1.5	1.5	1.5
Condensing coil	Tubing depth		2	2	2	2	2	3
	Fins x inch		13	13	16	13	20	15
	Front area	m^2	1.55	2.23	2.73	3.35	4.02	4.02
Dimensions	Height	mm	855	1 007	1 210	1 235	1 337	1 337
	Length	mm	2 552	2 552	2 552	3 180	3 460	3 460
	Width	mm	1 800	1 800	1 800	2 337	2 337	2 337
Nett weight (basic unit without acces.)	D4IC	kg	437	472	590	860	957	1 238
	D4IG	kg	472	537	642	970	1 066	1 353
The nominal cooling capacity corresponds to: Indoor air temp. 27° C DB / 19°C WB - Outdoor air temp. 35°CDB.								

(1) These capacities are total values. To obtain nett values, correct by means of the impulse air fan motor heat. See Fan Performance Table.
(2) Without indoor fan.

4.2.- B4IH

Models			B4IH				
			90	**120**	**180**	**240**	**300**
Capacities	Cooling (1)	kW	24.7	33.2	47.8	60.7	92.4
	Heating	kW	24.3	32.3	47.3	63.9	79
Compressor	(Alternative)	cant.	2	2	2 dual	2 dual	2 scroll
Circuits	Refrigerant (R-407C)	sys.1	4.1	7	9.5	12.7	15
		sys.2	4.1	7	9.5	12.7	15
Power supply		V / ph / Hz	400 / 3 + N / 50				
Absorbed power (2) Cool / Heat		kW	8.3 / 6.7	10.5 / 8.2	14.7 / 13	19.3 / 16.7	24.6 / 23.8
Intensity	Nominal/start	A	19.9 / 76	24.3 / 83	39.5 / 161	51 / 187	78.3 / 189
Evaporator fan Maximum flow (1 x unit)	Nominal air flow	m^3/h	5 100	6 800	10 000	13 700	17 000
	Static pressure (standard)	Pa	110	125	325	300	325
	Static pressure (with high speed accessory)	Pa	-	-	435	370	450
	Maximum flow	m^3/h	6 400	8 500	12 200	15 900	18 700
	Minimum flow	m^3/h	3 800	5 100	7 200	10 000	13 600
	Motor	kW	1.5	2.2	4	5.5	9.2
Evaporating coil	Tubing depth		4	4	4	4	4
	Fins x inch		15	15	13.5	13.5	15
	Front area	m^2	0.73	1.25	1.45	1.92	2.14
Condensing unit fan (2 x unit)	Diameter	mm	610	610	762	762	710
	Nominal flow	m^3/h	4 930	7 490	10 200	13 600	14 500
	Motor	kW	0.4	0.4	1.5	1.5	1.72
Condensing coil (2 x unit)	Tubing depth		3	3	3	3	4
	Fins x inch		13	13	15	13	15
	Front area	m^2	1.55	2.73	3.35	4.02	3.94
Dimensions	Height	mm	855	1 210	1 235	1 337	1 337
	Length	mm	2 552	2 552	3 180	3 460	3 460
	Width	mm	1 800	1 800	2 337	2 337	2 337
Nett weight (basic unit without accessories)		kg	477	637	953	1 043	1 279

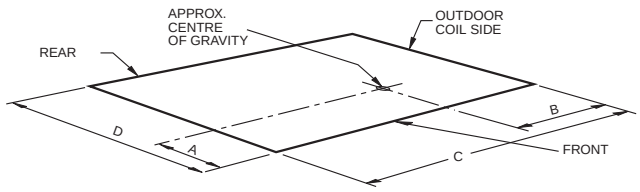
The nominal cooling capacity corresponds to: Indoor air temp. 27°C DB / 19°C WB - Outdoor air temp. 35°CDB.
The nominal heating capacity corresponds to: Indoor air temp. 20°C DB - Outdoor air temp. 7°C DB/6°C WB.

(1) These capacities are total values. To obtain nett values, correct by means of the impulse air fan motor heat. (See Fan Performance Table.)
(2) Without indoor fan.

4.3.- Weights, accessories

Models	090 - 120 - 150	180	240 - 300
Economiser	35	73	73
Barometric damper/fixed outdoor air intake	4.5	-	-
Extraction fan	30	55	55
Mounting base (Fixed/adjustable)	70/130	81/157	85/165
Electric heater	15	20	20
Hot water coil	36	60	60
Fixed outdoor air intake	-	9	9
Barometric damper	-	20	20

4.4.- Centre of gravity



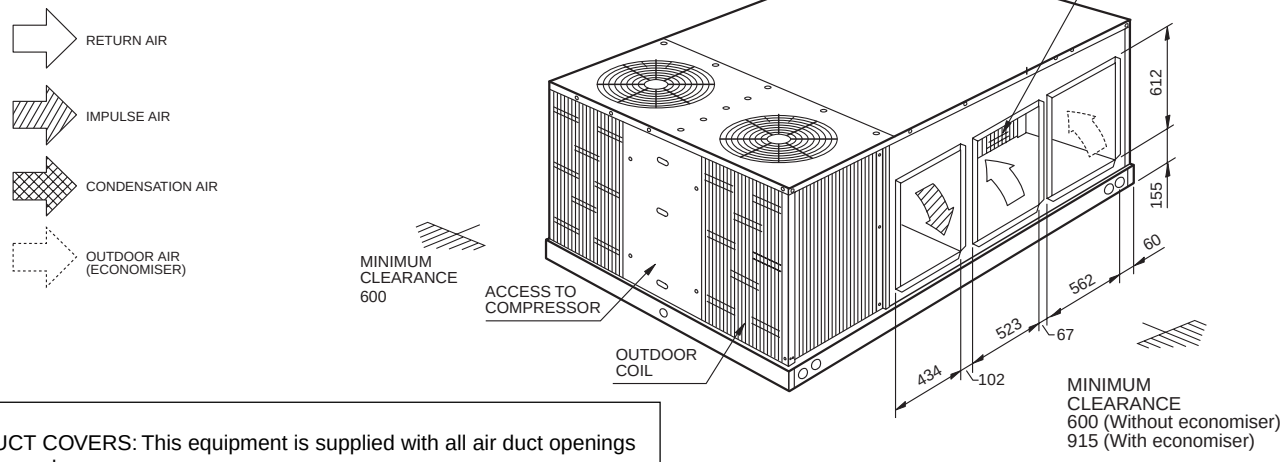
Unit model	Dimensions (mm)			
	A	B	C	D
090	845	1 207	2 552	1 800
120	826	1 187	2 552	1 800
150	826	1 143	2 552	1 800
180	1 143	1 524	3 180	2 337
240	1 143	1 524	3 460	2 337
300	1 143	1 524	3 460	2 337

- Fig. 2 -

5 - Dimensions, clearances and accesses

5.1.- Models 090 - 120 - 150

Detail «X» - Clearances.
Impulse and return air side openings, models 090, 120 and 150



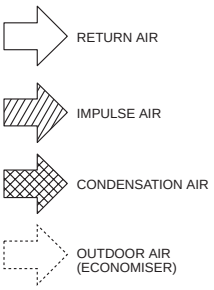
DUCT COVERS: This equipment is supplied with all air duct openings covered.
For applications with **side** ducts:
1.- Remove and discard the impulse and return air duct covers.
2.- Connect the duct network to the corresponding flanges at the rear of the units.
For applications with **bottom** ducts:
1.- Remove the side impulse and return air side duct covers so as to have access to the bottom impulse and return air duct covers.
2.- Remove and discard the duct covers.
3.- Replace the side duct covers, making sure they are hermetic.

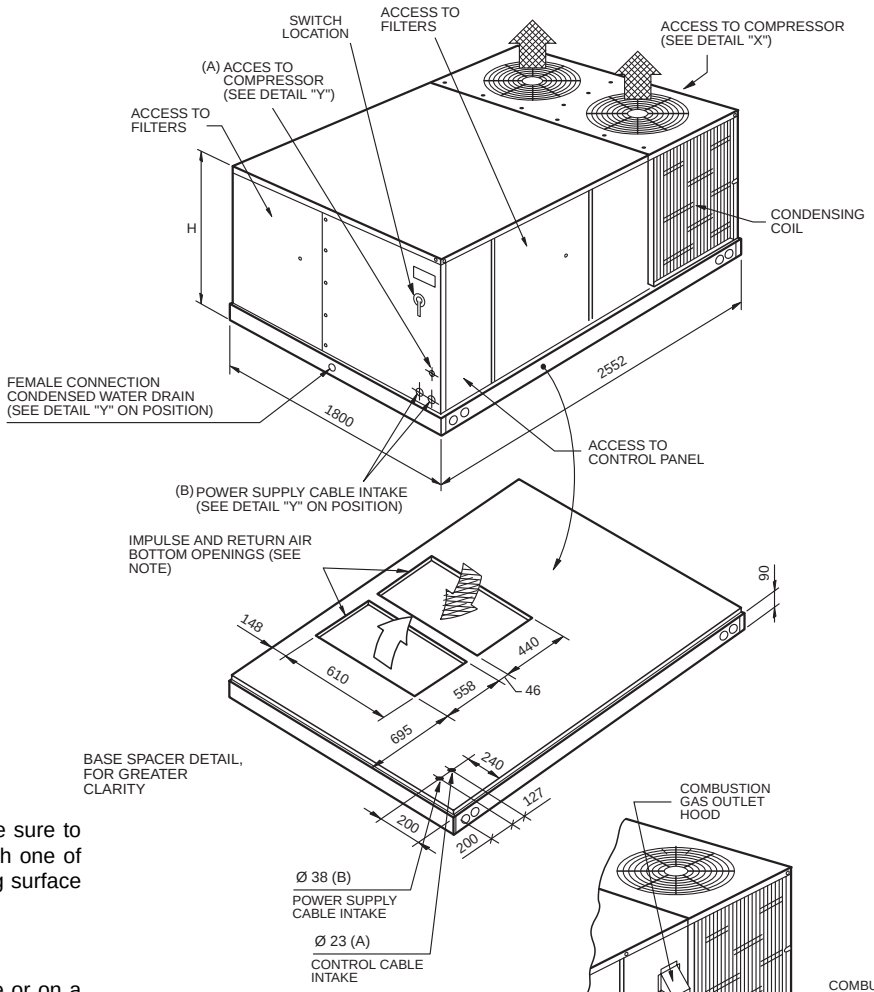
MINIMUM CLEARANCE AT THE TOP OF THE UNIT:
This equipment is designed to be installed outdoors only. On ground level installations, the building eaves should not be at less than 1830 mm. vertically from the top of the equipment, as long as they do not protrude over 915 mm. horizontally over the equipment.
If the eaves are over 3000 mm. above the equipment, there are no restrictions regarding the horizontal measurement.

- Fig. 3 -

Models 090 - 120 - 150

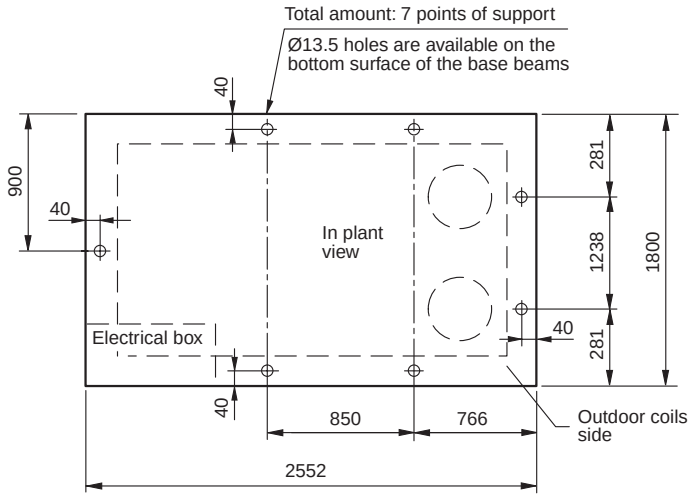
Models	H
090	855
D4IC and D4IG - 120	1 007
B4IH - 120	1 210
150	1 210





CAUTION:
To keep the panels closed hermetically, make sure to replace all screws, with their O-rings, on each one of them (located between the internal supporting surface of the panel and the base of the unit).

CAUTION:
If a unit is to be installed on a mounting base or on a special angle frame other than a standard mounting base, gaskets should be placed on all surfaces that are in contact with the lower part of the unit.
If it is preferable to place the unit on shock absorbers, this should be done in accordance with the following figure:

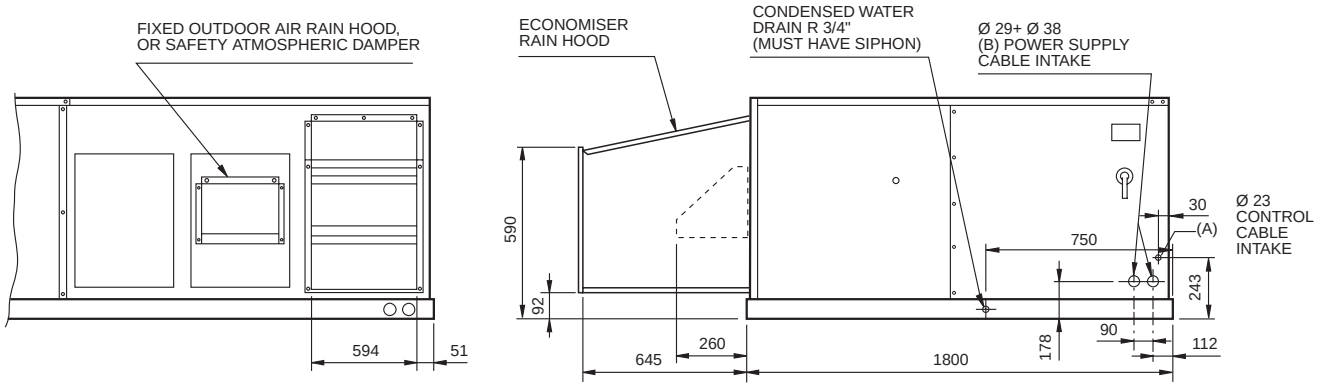


Approx. load on each point of support (kg)					
Unit model and size	Basic unit without acces.	Increment per accessory			
		Motor-driven damper or economiser	Electric heater	Extraction fan	Water coil
D4IC-090	63	5	2	4	5
D4IC-120	68				
D4IC-150	84				
B4IH-090	68	5	2	4	5
B4IH-120	91				
D4IG-090	68	5	-	4	-
D4IG-120	77				
D4IG-150	92				

- Fig. 3 -

Models 090 - 120 - 150

Detail «Y» - Equipment with economiser and outdoor air fixed hoods (accessories)

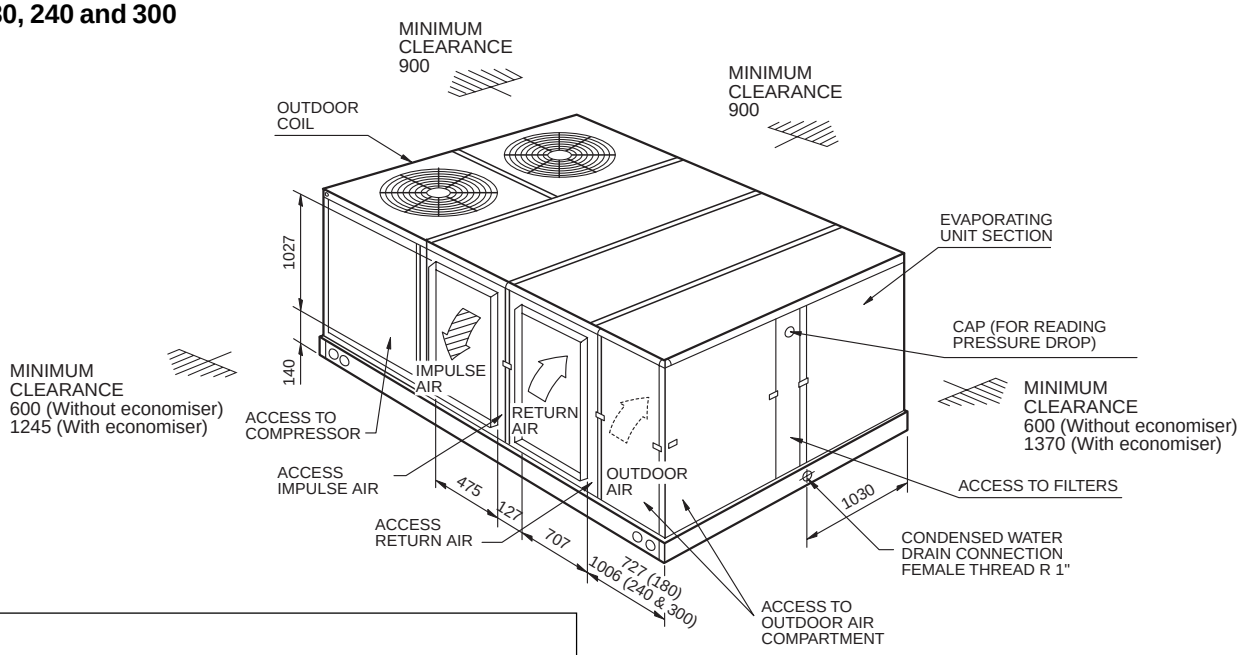


REAR VIEW **LEFT SIDE VIEW**

- Fig. 3 -

5.2.- Models 180 - 240 - 300

Detail «X» - Clearances.
Impulse and return air side openings, models 180, 240 and 300



DUCT COVERS: This equipment is supplied with all air duct openings covered. An accessory kit with flanges for connecting the side ducts is available.

For applications of ducts with **downward discharge:**

1.- Remove the impulse and return air side duct covers so as to have access to the bottom impulse and return air duct covers, making sure they are hermetic.
2.- Remove and discard the bottom duct covers.
3.- Replace the impulse and return air compartment side duct covers.

For applications of ducts with side discharge:

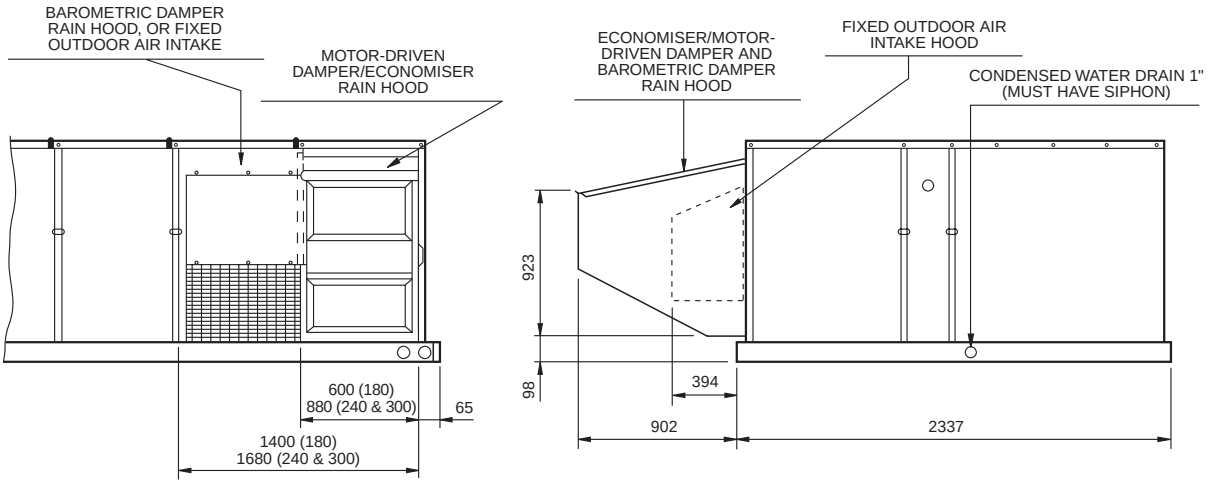
1.- Substitute the side panels of the impulse and return air compartments with the accessory panel assembly, making sure they are hermetic.
2.- Connect the duct network to the flanges of these panels.

MINIMUM CLEARANCE AT THE TOP OF THE UNIT:
This equipment is designed to be installed outdoors only. On ground level installations, the building eaves should not be at less than 1830 mm. vertically from the top of the equipment, as long as they do not protrude over 915 mm. horizontally over the equipment.
If the eaves are over 3000 mm. above the equipment, there are no restrictions regarding the horizontal measurement.

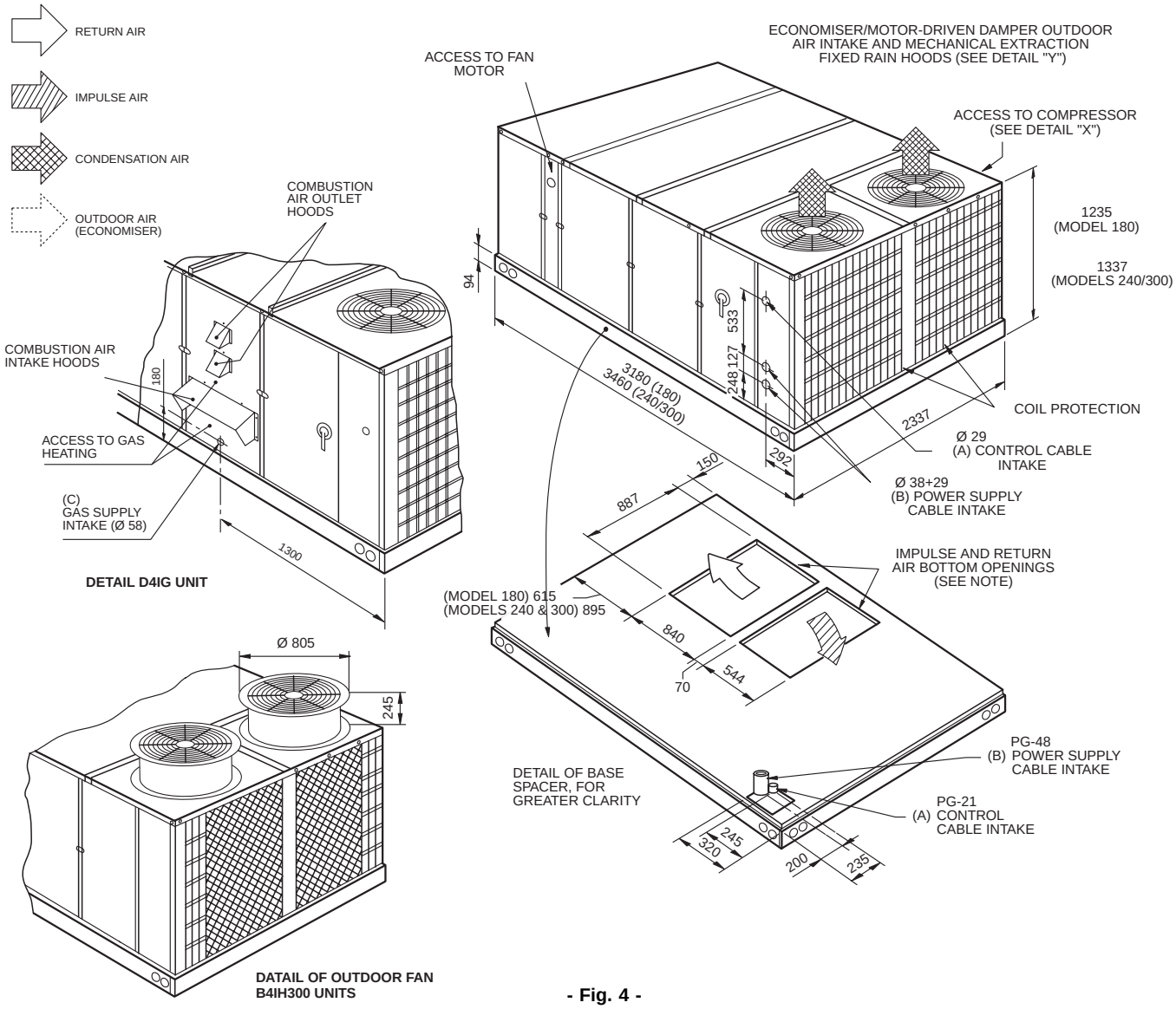
- Fig. 4 -

Models 180 - 240 - 300

Detail «Y» - Equipment with rain hoods (accessories)



REAR VIEW **LEFT SIDE VIEW**

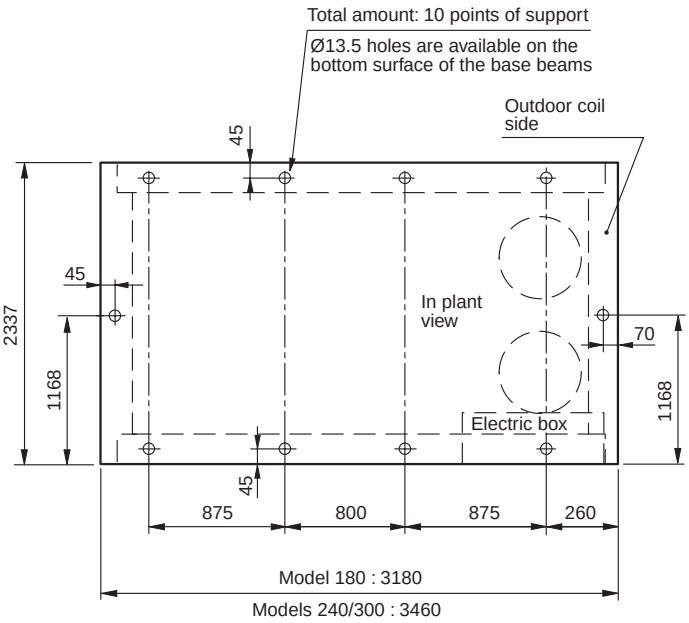


- Fig. 4 -

CAUTION:
To keep the panels closed hermetically, make sure to replace all screws, with their O-rings, on each one of them (located between the internal supporting surface of the panel and the base of the unit).

Models 180 - 240 - 300

CAUTION:
If a unit is to be installed on a mounting base or on a special angle frame other than a standard mounting base, gaskets should be placed on all surfaces that are in contact with the lower part of the unit.
If it is preferable to place the unit on shock absorbers, this should be done in accordance with the following figure:



Approx. load on each point of support (kg)

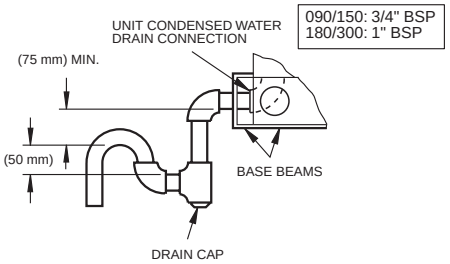
Unit model and size	Basic unit without accessories	Increment per accessory				
		Motor-driven damper or economiser	Electric heater	Extraction fan	Water coil	Barometric damper
D4IC-180	86	7	2	6	6	2
D4IC-240	96					
D4IC-300	124					
B4IH-180	96	7	2	6	6	2
B4IH-240	105					
B4IH-300	128					
D4IG-180	97	7	-	6	-	2
D4IG-240	107					
D4IG-300	136					

- Fig. 4 -

5.3.- Indoor coil condensed water drain

The piping installation should comply with local regulations. Use sealing putty on male threads. Install a condensed water drain pipe from the female connection on the unit, to an open drain.

Note:
The condensed water drain pipe should have a siphon so as to facilitate correct evacuation. See Fig. 5.
The drain pipe should be tilted a minimum of 2 cms. per meter of length.



- Fig. 5 -

6 - Electrical characteristics and connections

6.1.- Basic units

- D4IC/D4IG

Model	Power supply	Compressor		Outdoor fan motor (2 x unit)		Indoor fan motor		Total intensity (unit) amps	Max. automatic switch (K curve)[1]	Min. cable section[2] (mm²)
		Operating intensity	Start intensity each	kW each	Nominal amps each	kW	Nominal amps			
090	400/3+N/50	2 x 6.1	62	0.4	2.1	1.5	3.5	19.9	32	4
120	400/3+N/50	2 x 7.5	63	0.4	2.1	2.2	5.1	24.3	32	6
150	400/3+N/50	9.2/12.4	79/128	0.4	2.1	4	8.9	34.8	50	10
180	400/3+N/50	16.6/9.6	146/66	1.5	2.9	4	8.9	40.9	50	10
240	400/3+N/50	2 x 16.6	146	1.5	2.9	5.5	12	51	63	16
300	400/3+N/50	3 x15.4	146	1.5	2.9	7.5	15.3	67.3	80	25

- B4IH

Model	Power supply	Compressor		Outdoor fan motor (2 x unit)		Indoor fan motor		Total intensity (unit) amps	Max. automatic switch (K curve)[1]	Min. cable section[2] (mm²)
		Total intensity (unit) amps	Start intensity each	kW each	Nominal amps each	kW	Nominal amps			
090	400/3+N/50	2 x 6.1	62	0.4	2.1	1.5	3.5	19.9	32	4
120	400/3+N/50	2 x 7.5	63	0.4	2.1	2.2	5.1	24.3	32	6
180	400/3+N/50	2 x 12.4	128	1.5	2.9	4	8.9	39.5	50	10
240	400/3+N/50	2 x 16.6	146	1.5	2.9	5.5	12	51	63	16
300	400/3+N/50	2 x 26.2	189	1.3	4.7	9.2	16.5	78.3	100	35

Important: Automatic switch sizing and power supply and control cable sections are orientative and should be corrected in accordance with the job site conditions, length between units and legislation in force.
Notes: 1.- K curve (DIN, VDE 0660-104) 2.- Based on copper conductors.

6.2.- Units with backup heaters

- D4IC

Model D4IC	Power supply V. Ph. Hz.	Electric heater				Total maximum unit intensity (A)	Maximum automatic switch (K curve) (1)	Minimum cable section (mm²)
		Type	Capacity (kW)	Stages	Intensity (A)			
90	400.3.50	2EH04512446	16	2	24	31	40	6
		2EH04513646	25	2	36	43	50	10
120	400.3.50	2EH04512446	16	2	24	31	40	6
		2EH04513646	25	2	36	43	50	10
		2EH04515446	37	2	54	62	80	16
150	400.3.50	2EH04512446	16	2	24	43	50	10
		2EH04513646	25	2	36	47	63	10
		2EH04515446	37	2	54	65	80	16
180	400.3.50	2RE04501850	12	1	18	41	50	10
		2RE04503650	25	2	36	45	63	10
		2RE04505450	37	2	54	63	80	16
		2RE04507250	50	2	72	79	100	25
240	400.3.50	2RE04501850	12	1	18	51	63	16
		2RE04503650	25	2	36	51	63	16
		2RE04505450	37	2	65	66	80	25
		2RE04507250	50	2	72	84	100	25
300	400.3.50	2RE04501850	12	1	18	67	80	25
		2RE04503650	25	2	36	67	80	25
		2RE04505450	37	2	54	69	80	25
		2RE04507250	50	2	72	87	100	35

Notes: 1.- K curve (DIN, VDE 0660-104) 2.- Based on copper conductors, 105° C.

- B4IH

Model D4IC	Power supply V. Ph. Hz.	Electric heater				Total maximum unit intensity (A)	Maximum automatic switch (K curve) (1)	Minimum cable section (mm²)
		Type	Capacity (kW)	Stages	Intensity (A)			
90	400.3.50	2EH04512446	16	2	24	44	50	10
		2EH04513646	25	2	36	56	63	16
120	400.3.50	2EH04512446	16	2	24	48	63	10
		2EH04513646	25	2	36	60	80	16
		2EH04515446	37	2	54	78	100	25
180	400.3.50	2RE04501850	12	1	18	58	80	16
		2RE04503650	25	2	36	76	100	25
		2RE04505450	37	2	54	94	125	35
		2RE04507250	50	2	72	112	125	35
240	400.3.50	2RE04501850	12	1	18	69	100	25
		2RE04503650	25	2	36	87	100	25
		2RE04505450	37	2	54	105	125	35
		2RE04507250	50	2	72	123	160	50
300	400.3.50	2RE04501850	12	1	18	96	125	35
		2RE04503650	25	2	36	114	125	50
		2RE04505450	37	2	54	132	160	50
		2RE04507250	50	2	72	150	200	70

Notes: 1.- K curve (DIN, VDE 0660-104) 2.- Based on copper conductors, 105°C.

6.3.- Power and control wiring

Job site wiring and grounding of the unit should be carried out in compliance with national, local and city regulations. The voltage tolerances to be maintained at the compressor terminals during start up and operation appear on the Identification Plate and in the Table of section 6.1.

The inner wiring hose supplied with the unit is an integral part of same. No variation at job site should be necessary for compliance with electrical regulations.

An automatic switch and a differential should be installed on job site for the unit. This switch should be independent of all other circuits. Should any of the cables supplied with the unit need replacement, the replacement cable should be of the type shown on the wiring diagram. See Wiring Specifications Table.

The power supply line should be adequately sized for the load. Use only copper wires. Each one of the units should be connected to an independent circuit with an automatic switch and a differential, supplied directly from the main panel.

CAUTION:
When connecting the power supply and control wiring to the unit, waterproof type wires **should be used** so as to avoid water or humidity getting into the unit during normal operation. These waterproof conditions also apply when a switch is installed at the job site.

See Fig. 6 for typical wiring on job site.

NOTES:

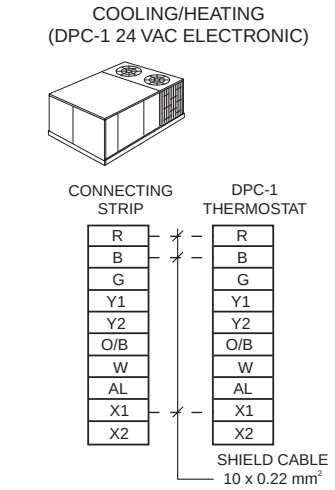
1. All job site wiring should be carried out in compliance with all city and local standards and/or regulations in force at the time of installing the unit.
2. Should it be necessary to remove any cables supplied with the unit, these should be replaced by cables of the HO5V-K, HO7V-K or equivalent type, and be numbered clearly for identification purposes.
3. Motors are intrinsically protected, except for the indoor fan motor, that has external protection.
4. This unit is wired for operation with a 415 V power supply.
5. See the Identification Plate for the maximum size of the automatic switch and minimum power supply cable section.
6. To invert the rotation of the indoor fan, interchange two wires of the «KM 3» contactor.

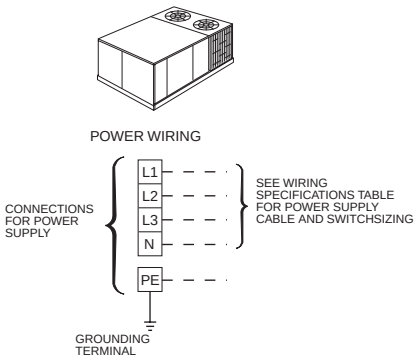
Thermostat

The ambient thermostat should be located on an inner wall, at about 1.5 mm. above floor level, where it will not be exposed to air flows, direct sunlight or heat from other electric devices. For general installation, follow the instructions supplied by the manufacturer. To connect the thermostat to the unit, shielded colour-coded 10 x 0.22 mm² wires should be used.

Typical job site wiring

CONTROL WIRING





- Fig. 6 -

7 - Performances D4IC / D4IG

7.1.- D4IC / D4IG 090

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
		Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW			
m³/h	WB °C			Intake temp. DB						Intake temp. DB						Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
3 800	23	29.7	8.1	19.6	14.9	10.3	8	28.2	8.8	19.1	14.4	9.7	7.4	25.4	9.8	18.1	13.5	8.8	6.5
	19	26.9	7.8	24.9	20.2	15.6	13.2	25.4	8.5	24.3	19.6	14.9	12.6	22.9	9.2	22.9	18.7	14.3	11.7
	17	25.4	7.7	25.4	22.8	18.1	15.8	23.4	8.4	23.4	20.8	16.2	13.8	20.8	9.1	20.8	20.8	16.1	13.8
	15	22.9	7.6	22.9	22.9	20	17.7	21.8	8.3	21.8	21.8	18.1	15.8	19.6	9	19.6	19.6	18.5	16.2
5 100	23	31.3	8.4	22.9	16.8	10.8	7.8	29.7	9.2	22.3	16.3	9.8	7.2	26.8	10.2	21.4	15.4	9.3	6.3
	19	28.4	8.2	28.4	23.6	17.6	14.5	26.8	8.9	26.8	22.9	16.9	13.9	24.1	9.6	24.1	22	15.9	12.9
	17	26.8	8.1	26.8	26.8	20.8	17.8	24.6	8.8	24.6	24.5	18.4	15.4	21.9	9.5	21.9	21.9	18.8	15.8
	15	24.1	8	24.1	24.1	23.4	20.4	23.8	8.6	23.8	23.8	21	18.1	20.6	9.4	20.6	20.6	20.6	18.9
6 400	23	32.5	8.8	26.1	18.6	11.3	7.6	30.9	9.6	25.5	25.1	10.7	7.1	27.8	10.6	24.6	17.2	9.8	6.1
	19	29.5	8.5	29.5	26.8	19.4	15.7	27.8	9.2	27.8	18.1	18.8	15.1	25.1	10	25.1	25.1	17.8	14.1
	17	27.8	8.3	27.8	27.8	23.4	19.7	25.6	9.1	25.6	26.1	20.7	17	22.8	9.9	22.8	22.8	21.3	17.7
	15	25.1	8.2	25.1	25.1	25.1	23	23.9	9	23.9	25.6	23.9	20.2	21.4	9.8	21.4	21.4	21.4	21.4

7.2.- D4IC / D4IG 120

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
		Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW			
m³/h	WB °C			Intake temp. DB						Intake temp. DB						Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
5 100	23	38.7	8.7	26	19.7	13.4	10.2	36.8	9.5	25.2	19	12.7	9.5	33.1	10.6	24.1	17.8	11.5	8.4
	19	35.1	8.4	33.1	26.8	20.6	17.4	33.1	9.2	32.3	26	19.7	16.5	29.8	9.9	29.8	24.7	18.5	15.3
	17	33.2	8.2	33.2	30.2	24	20.8	30.5	9.1	30.5	27.7	21.4	18.3	27.1	9.8	27.1	27.1	21.4	18.2
	15	29.8	8.1	29.8	29.8	26.5	23.4	28.5	8.9	28.5	28.5	24.1	20.9	25.5	9.7	25.5	25.5	24.6	21.4
6 800	23	41	9.1	30	22.1	14.1	10.2	37.9	10	28.9	21	13.1	9.1	34.2	11.1	27.8	19.9	11.9	8
	19	36.9	8.9	36.9	30.8	22.9	18.9	34.2	9.6	34.2	29.7	21.8	17.8	30.7	10.4	30	28.5	20.6	16.6
	17	34.2	8.7	34.2	34.2	26.9	22.9	31.4	9.5	31.4	31.4	23.7	19.7	28	10.3	28	28	24.3	20.4
	15	34.2	8.6	34.2	34.2	31.9	27.9	31.4	9.3	31.4	31.4	28.4	24.5	28	10.2	28	28	28	25.2
8 500	23	42.4	9.5	34.4	24.6	14.7	9.8	40.2	10.4	33.7	23.9	14	9.1	36.2	11.5	32.5	22.7	12.8	7.9
	19	38.4	9.2	38.4	35.4	25.6	20.6	36.2	10	36.2	34.6	24.7	19.8	32.6	10.8	32.6	32.6	23.5	18.5
	17	36.2	9	36.2	36.2	30.9	25.9	33.3	9.9	33.3	33.3	27.4	22.5	29.7	10.7	29.7	29.7	28.2	23.3
	15	32.6	8.9	32.6	32.6	32.6	30.3	31.1	9.7	31.1	31.1	31.1	26.8	27.9	10.6	27.9	27.9	27.9	27.9

7.3.- D4IC / D4IG 150

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
6 480	23	49.1	11	32.9	24.9	17	13	46.6	12.1	32	24	16.1	12.1	41.9	13.3	30.5	22.5	14.6	10.6
	19	44.5	10.7	41.9	33.9	26	22	41.9	11.6	40.8	32.9	24.9	21	37.7	12.5	37.7	31.3	23.4	19.4
	17	41.9	10.4	41.9	38.3	30.3	26.4	38.6	11.5	38.6	35	27.1	23.1	34.4	12.4	34.4	34.4	27	23.1
	15	37.7	10.3	37.7	37.7	33.6	29.6	36.1	11.2	36.1	36.1	30.4	26.4	32.3	12.3	32.3	32.3	31.1	27.1
8 640	23	51.7	11.6	38.3	28.1	17.8	12.7	49	12.7	37.4	27.2	16.9	11.8	44.2	14	35.9	25.7	15.4	10.3
	19	46.8	11.2	46.8	39.5	29.2	24.1	44.2	12.1	44.2	38.4	28.2	23.1	39.7	13.2	39.7	36.9	26.6	21.5
	17	44.2	11	44.2	44.2	34.8	29.7	40.6	12.0	40.6	40.6	30.9	25.8	36.2	13.1	36.2	36.2	31.5	26.4
	15	39.7	10.9	39.7	39.7	39.2	34.1	38	11.8	38	38	35.3	30.2	34	13	34	34	34	31.6
10 800	23	53.7	12	41.4	30	18.5	12.8	50.9	13.1	40.5	29.1	17.6	11.9	45.9	14.5	39	27.6	16.1	10.4
	19	48.6	11.6	48.6	42.7	31.2	25.5	45.9	12.6	45.9	41.6	30.2	24.4	41.3	13.6	41.3	40	28.5	22.8
	17	45.9	11.4	45.9	45.9	37.4	31.7	42.2	12.5	42.2	42.2	33.1	27.4	37.6	13.5	37.6	37.6	34	28.3
	15	41.3	11.2	41.3	41.3	41.3	36.7	39.4	12.3	39.4	39.4	38.1	32.4	35.3	13.4	35.3	35.3	35.3	34.1

7.4.- D4IC / D4IG 180

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
7 200	23	56.2	10.3	37.2	28.3	19.4	15	53.3	11.3	36.2	27.3	18.4	14	48	12.5	34.4	25.6	16.7	12.2
	19	50.9	10	47.3	38.4	29.5	25.1	48	10.9	46.1	37.2	28.3	23.9	43.2	11.7	43.2	35.4	26.5	22.1
	17	48.1	9.8	48.1	43.3	34.4	30	44.2	10.8	44.2	39.6	30.8	26.3	39.4	11.6	39.4	39.4	30.6	26.2
	15	43.2	9.7	43.2	43.2	38	33.6	41.3	10.5	41.3	41.3	34.5	30	37	11.5	37	37	35.1	30.7
10 000	23	59.2	10.8	44.1	32.3	20.4	14.5	56.1	11.8	43.1	31.2	19.4	13.5	50.6	13	41.4	29.5	17.7	11.8
	19	53.6	10.4	53.6	45.5	33.6	27.7	50.6	11.3	50.6	44.3	32.4	26.5	45.5	12.3	45.5	42.5	30.6	24.7
	17	50.6	10.2	50.6	50.6	40	34.1	46.5	11.2	46.5	46.5	35.6	29.7	41.4	12.1	41.4	41.4	36.3	30.3
	15	45.5	10.1	45.5	45.5	45.2	39.3	43.5	11	43.5	43.5	40.7	34.8	38.9	12	38.9	38.9	38.9	36.4
11 200	23	61.5	11.2	47.5	34.9	21.2	14.7	58.3	12.2	46.4	33.3	20.2	13.6	52.2	13.5	44.7	31.6	18.5	11.9
	19	55.7	10.8	55.7	48.9	35.8	29.2	52.5	11.7	52.5	47.6	34.5	28	47.3	12.7	47.3	45.8	32.7	26.1
	17	52.5	10.6	52.5	52.5	42.8	36.3	48.3	11.6	48.3	48.3	38	31.4	43.1	12.6	43.1	43.1	39	32.4
	15	47.3	10.5	47.3	47.3	47.3	42.1	45.2	11.4	45.2	45.2	43.7	37.1	40.4	12.4	40.4	40.4	40.4	39.1

7.5.- D4IC / D4IG 240

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
10 000	23	74.4	18.2	50.3	38	25.7	19.6	70.6	20	48.9	36.6	24.4	18.2	63.6	22	46.6	34.4	22.1	16
	19	67.4	17.7	64.1	51.9	39.6	33.5	63.6	19.2	62.6	50.3	38.1	31.9	57.2	20.7	57.2	47.9	35.7	29.5
	17	63.6	17.3	63.6	58.6	46.3	40.2	58.5	19	58.5	53.7	41.4	35.3	52.1	20.5	52.1	52.1	41.4	35.2
	15	57.2	17.1	57.2	57.2	51.4	45.2	54.7	18.6	54.7	54.7	46.5	40.4	49	20.3	49	49	47.6	41.5
13 700	23	78.3	19.2	59.4	43.2	27.1	19	74.3	21.1	58.1	41.9	25.7	17.6	67	23.2	55.8	39.7	23.5	15.4
	19	71	18.6	71	61.2	45	36.9	67	20.2	67	59.7	43.5	35.4	60.3	21.8	60.3	57.3	41.1	33
	17	67	18.2	67	67	53.8	45.7	61.6	20	61.6	61.6	47.8	39.7	54.9	21.6	54.9	54.9	48.8	40.7
	15	60.3	18	60.3	60.3	60.3	52.8	57.6	19.6	57.6	57.6	54.8	46.7	51.5	21.4	51.5	51.5	51.5	49
15 900	23	81.4	19.9	65.1	46.7	28.2	19	77.2	21.7	63.8	45.3	26.9	17.6	69.6	24	61.5	43	24.6	13.2
	19	73.7	19.2	73.7	67.1	48.6	39.3	69.6	20.9	69.6	65.4	47	37.7	62.6	22.6	62.6	62.6	44.5	30.4
	17	69.6	18.8	69.6	69.6	58.5	49.3	64	20.7	64	64	51.9	42.7	57	22.4	57	57	53.4	38
	15	62.6	18.6	62.6	62.6	62.6	57.5	59.8	20.3	59.8	59.8	59.8	50.7	53.6	22.1	53.6	53.6	53.6	46.1

7.6.- D4IC / D4IG 300

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
13 600	23	112.4	24.2	85.4	62.1	38.8	27.2	106.6	26.4	83.5	60.2	36.9	25.3	96.1	29.2	80.2	57	33.7	22.1
	19	101.8	23.4	101.8	87.9	64.7	53.1	96.1	25.4	96.1	85.7	62.4	50.8	86.4	27.5	86.4	82.3	59	47.4
	17	96.5	22.9	96.5	96.1	77.3	65.6	88.4	25.2	88.4	88.4	70.6	59	78.8	27.2	78.8	78.8	70.1	58.5
	15	86.4	22.6	86.4	86.4	86.4	75.8	82.6	24.7	82.6	82.6	80.5	68.9	74	27	74	74	74	70.4
17 000	23	108.2	23.3	80	58.6	37.3	26.7	102.6	25.5	78.1	56.8	35.5	24.8	92.5	28.2	75	53.6	32.3	21.7
	19	98	22.6	98	82.4	61.1	50.4	92.5	24.6	92.5	80.2	58.9	48.3	83.2	26.5	83.2	76.9	55.6	45
	17	92.5	22.1	92.5	92.5	72.7	62	85.1	24.3	85.1	85.1	66.5	55.8	75.8	26.3	75.8	75.8	65.7	55.1
	15	83.2	21.9	83.2	83.2	81.9	71.2	79.5	23.8	79.5	79.5	75.5	64.8	71.2	26.1	71.2	71.2	71.2	65.9
18 700	23	102.8	22.2	70.2	52.8	35.5	26.8	97.5	24.3	68.3	51	33.6	25	87.8	26.8	65.2	47.9	30.5	21.9
	19	93.1	21.5	89.8	72.4	55.1	46.4	87.8	23.3	87.6	70.3	52.9	44.3	79.1	25.2	79.1	67	49.7	41
	17	87.8	21	87.8	81.9	64.6	55.9	80.8	23.1	80.8	76.5	59.1	50.5	72	25	72	72	57.8	49.1
	15	79	20.8	79	79	71.8	63.1	75.5	22.6	75.5	75.5	66.3	57.7	67.6	24.7	67.6	67.6	66.6	57.9

8 - Performances B4IH

8.1.- Cooling capacities B4IH 090

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
3 800	23	27.4	6.8	19.4	14.4	9.4	7	26	7.4	18.9	13.9	8.9	6.5	23.4	8.2	18.1	13.1	8.1	5.7
	19	24.8	6.6	24.8	20	15	12.5	23.4	7.2	23.4	19.4	14.4	12	21.1	7.7	21.1	18.5	13.6	11.1
	17	23.4	6.4	23.4	22.7	17.7	15.2	21.5	7.1	21.5	21.5	16.5	14	19.2	7.6	19.2	19.2	15.9	13.4
	15	21.1	6.4	21.1	21.1	19.8	17.3	20.1	7	20.1	20.1	18.5	16.1	18	7.6	18	18	18	16
5 100	23	28.9	7.1	23.1	16.5	10.3	6.7	27.4	7.8	22.6	16	9.5	6.2	24.7	8.6	21.8	15.2	8.7	5.4
	19	26.1	6.9	26.1	23.7	17.2	13.9	24.7	7.5	24.7	23.2	16.6	13.4	22.2	8.1	22.2	22.2	15.8	12.5
	17	24.7	6.7	24.7	24.7	20.7	17.4	22.7	7.4	22.7	22.7	19.3	16.1	20.2	8	20.2	20.2	18.9	15.6
	15	22.2	6.6	22.2	22.2	22.2	20.4	21.2	7.2	21.2	21.2	21.2	18.8	19	7.9	19	19	19	19
6 400	23	30	7.3	26.7	18.6	10.5	6.5	28.4	8	26.2	18.1	10.1	6	25.6	8.9	25.4	17.3	9.2	5.2
	19	27.2	7.1	27.2	27.2	19.3	15.3	25.6	7.7	25.6	25.6	18.7	14.7	23.1	8.3	23.1	23.1	17.9	13.8
	17	25.6	7	25.6	25.6	23.6	19.6	23.6	7.6	23.6	23.6	22.1	18	21	8.3	21	21	21	17.8
	15	23.1	6.9	23.1	23.1	23.1	23.1	22	7.5	22	22	22	21.5	19.7	8.2	19.7	19.7	19.7	19.7

8.2.- Cooling capacities B4IH 120

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
5 100	23	39	8.5	26.9	20.2	13.4	10.1	37	9.3	26.2	19.5	12.7	9.4	33.3	10.2	25.1	18.3	11.6	8.2
	19	35.3	8.2	34.5	27.8	21	17.7	33.3	8.9	33.3	26.9	20.2	16.8	30	9.6	30	25.7	19	15.6
	17	33.3	8	33.3	31.4	24.7	21.3	30.6	8.8	30.6	30	23.1	19.8	27.3	9.5	27.3	27.3	22.1	18.8
	15	30	7.9	30	30	27.5	24.1	28.6	8.6	28.6	28.6	25.9	22.5	25.6	9.4	25.6	25.6	25.6	22.2
6 800	23	39.8	8.9	31.5	22.6	13.8	9.3	36.8	9.7	30.5	21.6	12.8	8.4	33.2	10.7	29.4	20.6	11.7	7.3
	19	35.8	8.6	35.8	32.3	23.4	19	33.2	9.8	33.2	31.3	22.4	18	29.8	10.1	29.8	29.8	21.3	16.8
	17	33.2	8.4	33.2	33.2	28	23.5	30.5	9.2	30.5	30.5	26.3	21.9	27.2	10	27.2	27.2	25.5	21.1
	15	33.2	8.3	33.2	33.2	33.2	28.9	30.5	9.1	30.5	30.5	30.5	27.1	27.2	9.9	27.2	27.2	27.2	26.3
8 500	23	42.6	9.2	36.7	25.8	14.9	9.4	40.4	10	36	25.1	14.2	8.7	36.4	11.1	34.8	23.9	13	7.6
	19	38.6	8.9	38.6	37.7	26.8	21.4	36.4	9.7	36.4	36.4	26	20.5	32.8	10.5	32.8	32.8	24.7	19.3
	17	36.4	8.7	36.4	36.4	32.7	27.2	33.5	9.6	33.5	33.5	30	25.2	30	10.4	30	30	30	24.6
	15	32.8	8.6	32.8	32.8	32.8	32.2	31.3	9.4	31.3	31.3	31.3	29.8	28.1	10.3	28.1	28.1	28.1	28.1

8.3.- Cooling capacities B4IH 180

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
		Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW			
m³/h	WB °C			Intake temp. DB						Intake temp. DB						Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
7 200	23	53.1	12.1	37	27.7	18.3	13.6	50.4	13.2	36	26.7	17.4	12.7	45.4	14.6	34.5	25.1	15.8	11.1
	19	48.1	11.7	47.5	38.2	28.8	24.1	45.4	12.7	45.4	37.5	27.7	23.1	40.8	13.7	40.8	35.4	26.1	21.4
	17	45.4	11.4	45.4	43.3	33.9	29.2	41.7	12.6	41.7	40.8	31.5	26.8	37.2	13.6	37.2	37.2	30.4	25.8
	15	40.8	11.3	40.8	40.8	37.8	33.2	39	12.3	39	39	35.3	30.6	34.9	13.5	34.9	34.9	34.9	30.5
10 000	23	60.7	12.7	46.6	33.8	21	14.5	56.1	13.9	45.1	32.3	19.5	13	50.6	15.3	43.4	30.6	17.8	11.4
	19	54.6	12.3	54.6	47.9	35	28.6	50.6	13.4	50.6	46.3	33.5	27.1	45.5	14.4	45.5	44.5	31.7	25.3
	17	50.6	12	50.6	50.6	41.6	35.2	46.5	13.2	46.5	46.5	38.7	32.3	41.4	14.3	41.4	41.4	37.9	31.4
	15	50.6	11.9	50.6	50.6	49.5	43.1	46.5	13	46.5	46.5	46.4	40	41.4	14.2	41.4	41.4	41.4	39.1
11 200	23	58.1	13.1	48.4	34.3	20.2	13.2	55.1	14.4	47.4	33.3	19.2	12.2	49.6	15.9	45.8	31.7	17.6	10.6
	19	52.6	12.7	52.6	49.7	35.7	28.6	49.6	13.8	49.6	48.6	34.5	27.5	44.6	14.9	44.6	44.6	32.8	25.8
	17	49.6	12.4	49.6	49.6	43.2	36.2	45.6	13.7	45.6	45.6	40	33	40.7	14.8	40.7	40.7	39.6	32.6
	15	44.7	12.3	44.7	44.7	44.7	42.5	42.7	13.4	42.7	42.7	42.7	39	38.2	15.7	38.2	38.2	38.2	38.2

8.4.- Cooling capacities B4IH 240

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
		Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW				Total power kW	Abs. power kW	Sensible power kW			
m³/h	WB °C			Intake temp. DB						Intake temp. DB						Intake temp. DB			
				32	28	24	22			32	28	24	22			32	28	24	22
10 000	23	73	16.2	50.5	37.9	25.2	18.8	69.2	17.8	49.2	36.6	23.9	17.5	62.4	19.7	47.1	34.4	21.7	15.4
	19	66.1	15.7	64.8	52.1	39.5	33.1	62.4	17.1	62.4	50.6	38	31.6	56.1	18.5	56.1	48.3	35.7	29.3
	17	62.4	15.4	62.4	59.1	46.4	40.1	57.4	16.9	57.4	55.1	42.4	36.1	51.1	18.3	51.1	51.1	41.6	35.2
	15	56.1	15.2	56.1	56.1	51.7	45.4	53.6	16.6	53.6	53.6	47.7	41.4	48	18.1	48	48	48	41.7
13 700	23	72.8	17.1	60.4	42.9	25.3	16.6	67.3	18.7	58.7	41.1	23.6	14.8	60.7	20.7	56.7	39.2	21.6	12.8
	19	65.5	16.6	65.5	62	44.4	35.6	60.7	18	60.7	60.1	42.6	33.8	59.6	19.4	54.6	54.6	40.5	31.7
	17	60.7	16.1	60.7	60.7	53.4	44.6	55.8	17.8	55.8	55.8	49.9	41.2	49.7	19.3	49.7	49.7	49	40.2
	15	60.7	16	60.7	60.7	60.7	55.2	55.8	17.5	55.8	55.8	49.7	51.5	49.7	19.1	49.7	49.7	49.7	49.7
15 900	23	79.8	17.7	67.6	47.7	27.8	17.9	75.7	19.4	66.3	46.4	26.5	16.6	68.2	21.4	64.1	44.2	24.3	14.4
	19	72.3	17.1	72.3	69.5	49.6	39.7	68.2	18.6	68.2	68	48.1	38.1	61.4	20.1	61.4	61.4	45.7	35.8
	17	68.2	16.8	68.2	68.2	60.3	50.3	62.8	18.4	62.8	62.8	55.8	45.8	55.9	19.9	55.9	55.9	55.4	45.4
	15	61.4	16.6	61.4	61.4	61.4	59.3	58.7	18.1	58.7	58.7	58.7	54.7	52.5	19.8	52.5	52.5	52.5	52.5

8.5.- Cooling capacities B4IH300

Return air		Air temperature in outdoor coil (DB)																	
		27°C						35°C						46°C					
				Sensible power kW						Sensible power kW						Sensible power kW			
m³/h	WB °C	Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB				Total power kW	Abs. power kW	Intake temp. DB			
				22	25	27	31			22	25	27	31			22	25	27	31
13 600	23	94.0	32.4	24	37	45	63	87.0	36.7	21	34	43	61	78.2	42.4	18	32	40	58
	19	84.4	34.0	43	56	65	82	78.2	39.0	40	54	62	78	70.4	44.4	38	51	60	70
	17	78.2	35.5	52	65	74	78	72.0	40.5	47	61	69	72	64.1	46.3	46	59	64	64
	14	70.4	36.1	65	70	70	70	62.6	41.5	60	62	62	62	59.0	48.2	59	59	59	59
17 000	23	100.0	35.0	24	40	51	72	92.3	39.3	21	37	48	70	83.2	45.5	18	35	45	67
	19	90.0	36.4	47	64	74	90	83.2	41.4	45	61	72	83	75.0	48.0	42	58	69	75
	17	83.2	38.1	58	75	83	83	76.5	43.5	53	70	76	76	68.0	49.7	52	68	68	68
	14	75.0	39.0	74	75	75	75	66.5	44.5	66	66	66	66	62.4	52.0	62	62	62	62
19 500	23	104.0	36.2	24	42	54	79	96.0	41.0	21	40	52	76	86.5	47.4	18	37	49	74
	19	93.4	38.0	50	69	81	93	86.5	43.1	48	66	79	86	78.0	49.6	45	63	76	78
	17	86.5	40.0	63	81	86	86	79.6	45.2	58	76	79	79	71.0	52.0	57	71	71	71
	14	78.0	40.3	78	78	78	78	69.2	46.3	69	69	69	69	65.0	54.0	65	65	65	65

8.6.- Heating capacities B4IH 090

m³/h	Return air °C DB	Capacity kW	Outdoor air temperature °C (72% RH)							
			-23	-18	-12	-7	-1	4	10	16
3 800	13	Total	2	6	9	14	18	23	26	30
		Absorbed	4.5	4.8	5.2	5.6	6.0	6.6	6.9	7.2
	20	Total	1	5	8	12	16	20	23	27
		Absorbed	4.7	5.0	5.5	5.9	6.3	6.9	7.2	7.6
	27	Total	1	5	9	13	16	21	24	28
		Absorbed	5.0	5.4	5.9	6.3	6.8	7.3	7.7	8.1
5 100	13	Total	4	7	11	15	18	23	28	33
		Absorbed	4.6	4.9	5.2	5.5	5.9	6.3	6.7	7.0
	20	Total	4	6	10	13	17	21	25	29
		Absorbed	4.8	5.1	5.5	5.8	6.2	6.6	7.0	7.4
	27	Total	4	7	10	14	17	21	25	30
		Absorbed	5.2	5.5	5.8	6.2	6.6	7.1	7.5	7.9
6 400	13	Total	3	7	12	16	21	26	29	32
		Absorbed	4.6	4.8	5.2	5.6	5.9	6.4	6.5	6.6
	20	Total	3	6	10	15	19	23	26	29
		Absorbed	4.8	5.1	5.5	5.8	6.2	6.7	6.8	6.9
	27	Total	3	7	11	15	19	24	27	30
		Absorbed	5.1	5.4	5.8	6.3	6.7	7.2	7.3	7.4

8.7.- Heating capacities B4IH 120

m³/h	Return air °C DB	Capacity kW	Outdoor air temperature °C (72% RH)							
			-23	-18	-12	-7	-1	4	10	16
5 100	13	Total	9.4	12.3	14.9	18.2	21.7	25.2	29.9	34.6
		Absorbed	4.5	4.9	5.3	5.7	6.1	6.5	7.2	7.8
	20	Total	9.7	12.6	15.5	18.8	22.3	26.1	30.8	35.8
		Absorbed	6.1	6.7	7.2	7.7	8.3	8.8	9.7	10.7
	27	Total	9.7	12.6	15.5	18.8	22.3	26.1	30.8	36.0
		Absorbed	6.5	7.1	7.7	8.2	8.8	9.4	10.3	11.3
6 800	13	Total	9.7	13.2	16.4	19.9	24.0	27.8	31.9	36.3
		Absorbed	4.4	4.8	5.2	5.6	6.0	6.4	6.9	7.4
	20	Total	10.3	13.5	17.0	20.8	24.6	29.0	33.1	37.5
		Absorbed	6.1	6.6	7.1	7.7	8.2	8.8	9.4	10.1
	27	Total	10.3	13.5	17.0	20.8	24.9	29.0	33.1	37.5
		Absorbed	6.5	7.0	7.6	8.2	8.7	9.3	10.0	10.7
8 500	13	Total	10.3	13.5	16.7	19.9	23.7	27.8	31.9	36.3
		Absorbed	3.0	3.6	4.3	4.9	5.6	6.2	6.7	7.1
	20	Total	10.8	14.1	17.3	20.8	24.6	28.7	33.1	37.8
		Absorbed	4.1	5.0	5.8	6.7	7.6	8.5	9.1	9.7
	27	Total	10.8	14.1	17.3	20.8	24.6	28.7	33.1	37.8
		Absorbed	4.3	5.3	6.2	7.1	8.1	9.0	9.7	10.3

8.8.- Heating capacities B4IH 180

m³/h	Return air °C DB	Capacity kW	Outdoor air temperature °C (72% RH)								
			-20	-15	-10	-5	0	5	10	15	20
7 200	13	Total	13.3	17.1	21.8	27.4	33.8	41.0	49.2	58.2	68.1
		Absorbed	8.8	9.4	10.1	10.8	11.5	12.3	13.2	14.1	15.1
	20	Total	12.7	16.2	20.5	25.5	31.4	38.6	46.0	54.2	63.0
		Absorbed	9.0	9.7	10.6	11.4	12.2	13.0	13.9	14.9	15.9
	27	Total	12.1	15.3	19.1	23.8	29.1	35.1	41.8	49.2	57.1
		Absorbed	9.2	9.9	10.7	11.5	12.3	13.2	14.1	15.1	16.1
10 000	13	Total	13.7	17.6	22.4	28.1	34.6	42.1	50.4	59.7	69.8
		Absorbed	8.3	8.8	9.4	10.1	10.8	11.6	12.4	13.2	14.2
	20	Total	13.2	16.9	21.5	26.9	33.3	41.1	49.3	58.3	68.2
		Absorbed	8.9	9.6	10.3	11.0	11.8	12.7	13.6	14.6	15.6
	27	Total	12.8	16.3	20.6	25.8	31.9	38.9	46.8	55.6	65.3
		Absorbed	9.1	9.9	10.6	11.5	12.4	13.4	14.4	15.4	16.5
12 200	13	Total	14.0	18.0	22.9	28.8	35.5	43.2	51.8	61.2	71.6
		Absorbed	7.8	8.3	8.9	9.5	10.1	10.9	11.6	12.4	13.3
	20	Total	13.8	17.7	22.6	28.4	35.3	43.8	52.7	62.7	73.7
		Absorbed	8.6	9.2	9.9	10.7	11.5	12.4	13.3	14.3	15.3
	27	Total	13.5	17.3	22.1	28.0	35.0	43.1	52.4	62.9	74.6
		Absorbed	9.0	9.8	10.6	11.5	12.5	13.5	14.6	15.8	17.0

These capacities are total values. To obtain nett values, correct by means of the impulse air fan motor heat. See Fan Performance Table on the kW of the impulse air fan.

8.9.- Heating capacities B4IH 240

m³/h	Return air °C	CAP (kW) Power Abs.	Outdoor air temperature °C (72% RH)									
			-20	-15	-10	-5	0	5	7	10	15	20
10 000	13	CAP	19.17	23.64	31.31	39.62	48.56	58.79	63.26	70.93	83.71	97.77
		Power Abs.	11.36	12.02	12.86	13.69	14.70	15.70	16.20	16.87	18.04	19.37
	20	CAP	18.53	23.00	29.39	36.42	45.37	55.59	60.07	66.46	77.96	90.74
		Power Abs.	11.19	12.36	13.53	14.53	15.53	16.53	17.03	17.70	19.04	20.37
	27	CAP	17.25	21.73	27.48	33.87	42.17	50.48	54.32	60.07	70.93	81.79
		Power Abs.	11.86	12.69	13.69	14.70	15.70	16.87	17.37	18.04	19.21	20.54
13 700	13	CAP	19.81	24.92	31.95	40.26	49.84	60.71	65.18	72.85	85.63	100.32
		Power Abs.	10.52	11.36	12.02	12.86	13.69	14.70	15.20	15.87	16.87	18.20
	20	CAP	19.17	24.28	30.67	38.98	47.93	59.43	63.90	70.93	83.71	97.77
		Power Abs.	11.36	12.19	13.03	14.03	15.20	16.20	16.70	17.37	18.70	19.87
	27	CAP	18.53	23.64	29.39	37.06	46.01	56.23	60.71	67.10	79.88	93.93
		Power Abs.	11.52	12.53	13.53	14.70	15.87	17.03	17.54	18.20	19.71	21.04
15 900	13	CAP	19.81	26.20	33.23	41.54	51.12	61.98	67.10	74.76	88.18	102.88
		Power Abs.	9.85	10.52	11.36	12.02	13.03	13.86	14.20	14.86	15.87	17.03
	20	CAP	19.17	25.56	32.59	40.90	50.48	63.26	68.37	76.04	90.10	106.07
		Power Abs.	11.02	11.86	12.69	13.69	14.70	15.70	16.20	17.03	18.20	19.54
	27	CAP	18.53	24.92	31.95	40.26	50.48	61.98	67.10	75.40	90.74	107.35
		Power Abs.	11.52	12.53	13.53	14.70	16.03	17.20	17.87	18.70	20.21	21.71

8.10.- Heating capacities B4IH 300

m³/h	Return air °C	CAP (kW) Power Abs.	Outdoor air temperature °C (87% RH)									
			-20	-15	-10	-5	0	5	7	10	15	20
13 050	13	CAP	23.70	29.23	38.71	48.98	60.04	72.68	78.21	87.69	103.49	120.87
		Power Abs.	26.66	28.22	30.18	32.14	34.50	36.85	38.02	39.59	42.34	45.47
	20	CAP	22.91	28.44	36.34	45.03	56.09	68.73	74.26	82.16	96.38	112.18
		Power Abs.	26.26	29.01	31.75	34.10	36.46	38.81	39.98	41.55	44.69	47.82
	27	CAP	21.33	26.86	33.97	41.87	52.14	62.41	67.15	74.26	87.69	101.12
		Power Abs.	27.83	29.79	32.14	34.50	36.85	39.59	40.77	42.34	45.08	48.22
17 400	13	CAP	24.49	30.81	39.50	49.77	61.62	75.05	80.58	90.06	105.86	124.03
		Power Abs.	24.70	26.66	28.22	30.18	32.14	34.50	35.67	37.24	39.59	42.73
	20	CAP	23.70	30.02	37.92	48.19	59.25	73.47	79.00	87.69	103.49	120.87
		Power Abs.	26.66	28.62	30.58	32.93	35.67	38.02	39.20	40.77	43.90	46.65
	27	CAP	22.91	29.23	36.34	45.82	56.88	69.52	75.05	82.95	98.75	116.13
		Power Abs.	27.05	29.40	31.75	34.50	37.24	39.98	41.16	42.73	46.26	49.39
20 460	13	CAP	24.49	32.39	41.08	51.35	63.20	76.63	82.95	92.43	109.02	127.19
		Power Abs.	23.13	24.70	26.66	28.22	30.58	32.54	33.32	34.89	37.24	39.98
	20	CAP	23.70	31.60	40.29	50.56	62.41	78.21	84.53	94.01	111.39	131.14
		Power Abs.	25.87	27.83	29.79	32.14	34.50	36.85	38.02	39.98	42.73	45.86
	27	CAP	22.91	30.81	39.50	49.77	62.41	76.63	82.95	93.22	112.18	132.72
		Power Abs.	27.05	29.40	31.75	34.50	37.63	40.38	41.94	43.90	47.43	50.96

These capacities are total values. To obtain nett values, correct by means of the impulse air fan motor heat. See Fan Performance Table on the kW of the impulse air fan.

9 - Rated power

9.1.- Application data with gas heating

Model	Heating capacity		Gas consumption* m^3/h	Temperature increase in °C at full power**	
	Total (L.H.C.)*** kW	Nett kW		Minimum	Maximum
90	53.5	47.5	5.4	17	33
120	64.2	57	6.5	17	33
150	64.2	57	6.5	11	28
180	85	76	8.6	17	33
240	85	76	8.6	17	33
300	85	76	8.6	17	33

Note: These gas units are supplied for natural gas, but can be transformed into propane gas (LPG) by means of a conversion kit.
*Based on gas type 2ND-H, G20.
**Air flow should be regulated to obtain a temperature increase within indicated limits.
***L.H.C.: Lower heating capacity.

10 - Performances of impulse fan

- For equipment with fixed outdoor air intake, dry indoor coil and standard air filters (see section 13 for pressure drop values of the accessories)

10.1.- Applications with horizontal ducts, models 090

Fan speed (r.p.m.)	Air flow m^3/h									
	3 800		4 500		5 100		5 700		6 400	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
950	191	1.0	138	1.1	78	1.2	-	-	-	-
1 005	228	1.1	176	1.2	116	1.3	43	1.5	-	-
1 060	271	1.1	218	1.3	159	1.4	86	1.6	-	-
1 120	322	1.2	270	1.4	210	1.6	138	1.8	60	2.0
1 175	375	1.4	323	1.5	263	1.7	190	1.9	-	-
1 230	432	1.5	380	1.7	320	1.9	-	-	-	-

P.E.D. = Available static pressure.

10.2.- Applications with vertical ducts, models 090

Fan speed (r.p.m.)	Air flow m^3/h									
	3 800		4 500		5 100		5 700		6 400	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
950	173	1.0	116	1.1	46	1.2	-	-	-	-
1 005	211	1.1	154	1.2	84	1.3	-	-	-	-
1 060	253	1.1	193	1.3	126	1.4	43	1.6	-	-
1 120	305	1.2	248	1.4	178	1.6	95	1.8	-	-
1 175	357	1.4	300	1.5	230	1.7	148	1.9	-	-
1 230	415	1.5	358	1.7	288	1.9	-	-	-	-

P.E.D. = Available static pressure.

10.3.- Applications with horizontal ducts, models 120

Fan speed (r.p.m.)	Air flow m³/h									
	5 100		6 000		6 800		7 600		8 500	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
880	283	1.3	231	1.5	176	1.7	102	2.0	20	2.2
930	332	1.5	282	1.7	156	1.9	156	2.1	76	2.4
975	377	1.6	329	1.8	206	2.1	206	2.3	127	2.6
1 025	429	1.8	381	2.0	261	2.2	261	2.5	184	2.8
1 070	475	1.9	429	2.1	312	2.4	312	2.7	236	3.0
1 120	528	2.0	484	2.3	370	2.6	370	2.9	-	-

P.E.D. = Available static pressure.

10.4.- Applications with vertical ducts, models 120

Fan speed (r.p.m.)	Air flow m³/h									
	5 100		6 000		6 800		7 600		8 500	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
880	250	1.3	186	1.5	118	1.7	27	2.0	-	-
930	300	1.5	237	1.7	171	1.9	82	2.1	-	-
975	345	1.6	284	1.8	219	2.1	131	2.3	37	2.6
1 025	396	1.8	336	2.0	273	2.2	187	2.5	94	2.8
1 070	443	1.9	385	2.1	323	2.4	238	2.7	147	3.0
1 120	496	2.0	439	2.3	379	2.6	295	2.9	-	-

P.E.D. = Available static pressure.

10.5.- Applications with horizontal ducts, models 150

Fan speed (r.p.m.)	Air flow m³/h									
	6 480		7 560		8 640		9 720		10 800	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
960	270	1.8	179	2.1	91	2.5	22	3.1	-	-
1 000	321	2.0	229	2.3	140	2.7	70	3.3	-	-
1 040	372	2.2	280	2.5	190	3.0	119	3.6	44	4.4
1 080	424	2.4	331	2.8	240	3.3	169	3.9	93	4.7
1 120	476	2.7	382	3.0	291	3.6	219	4.2	142	5.0
1 160	529	3.0	434	3.3	342	3.9	269	4.5	-	-

P.E.D. = Available static pressure.

10.6.- Applications with vertical ducts, models 150

Fan speed (r.p.m.)	Air flow m³/h									
	6 480		7 560		8 640		9 720		10 800	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
960	213	1.8	104	2.1	-	-	-	-	-	-
1 000	264	2.0	154	2.3	51	2.7	-	-	-	-
1 040	315	2.2	205	2.5	100	3.0	30	3.6	-	-
1 080	367	2.4	256	2.8	151	3.3	79	3.9	-	-
1 120	419	2.7	307	3.0	201	3.6	129	4.2	42	5.0
1 160	472	3.0	360	3.3	253	3.9	179	4.5	-	-

P.E.D. = Available static pressure.

10.7.- Applications with vertical ducts, models 180 - standard activation

Fan speed (r.p.m.)	m³/h									
	7 200		8 800		10 000		11 200		12 200	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
845	173	2.2	138	2.6	83	3.1	18	3.5	-	-
885	208	2.3	172	2.8	115	3.3	49	3.7	-	-
925	245	2.4	208	2.9	149	3.4	82	3.9	-	-
960	281	2.6	242	3.1	182	3.6	114	4.1	30	4.6
1 000	323	2.7	283	3.2	222	3.8	152	4.3	67	4.8
1 040	369	2.9	327	3.4	264	4	193	4.5	107	5.1

P.E.D. = Available static pressure.

10.8.- Applications with vertical ducts, models 180 - high speed activation kit

Fan speed (r.p.m.)	m³/h									
	7 200		8 800		10 000		11 200		12 200	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
1 030	357	2.8	316	3.4	253	3.9	183	4.5	97	5
1 070	405	3	362	3.6	298	4.2	226	4.7	-	-
1 115	461	3.2	416	3.8	351	4.4	278	5	-	-
1 115	514	3.4	468	4	401	4.7	-	-	-	-
1 200	577	3.7	529	4.3	461	5	-	-	-	-
1 240	636	3.9	587	4.5	-	-	-	-	-	-

P.E.D. = Available static pressure.

10.9.- Applications with vertical ducts, models 240 - standard activation

Fan speed (r.p.m.)	m³/h									
	10 000		11 900		13 700		14 800		15 900	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
765	137	3.3	93	3.3	23	3.7	-	-	-	5
795	176	3.4	132	3.5	62	3.9	-	-	-	-
820	209	3.6	165	3.7	95	4.1	40	4.5	-	-
850	250	3.8	206	3.9	236	4.4	81	4.8	16	5.3
875	284	3.9	240	4.1	170	4.6	115	5	51	5.6
905	327	4.1	283	4.3	212	4.9	157	5.3	93	5.9

P.E.D. = Available static pressure.

10.10.- Applications with vertical ducts, models 240 - high speed activation kit

Fan speed (r.p.m.)	m³/h									
	10 000		11 900		13 700		14 800		15 900	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
895	312	4	268	4.3	198	4.8	143	5.2	79	5.8
930	362	4.3	318	4.5	248	5.1	193	5.6	129	6.2
970	421	4.5	377	4.9	306	5.5	252	6	187	6.6
1 005	473	4.8	429	5.1	359	5.8	304	6.4	240	7
1 045	535	5	491	5.5	420	6.2	365	6.8	-	-
1 080	590	5.3	546	5.8	475	6.5	420	7.1	-	-

P.E.D. = Available static pressure.

10.11.- Applications with vertical ducts, models DIC/G 300 - standard activation

Fan speed (r.p.m.)	m³/h									
	13 600		15 300		17 000		18 700		20 400	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
1 010	399	6.4	249	7.5	125	8.7	-	-	-	-
1 064	473	6.9	349	8.0	224	9.3	75	10.6	-	-
1 118	573	7.4	448	8.6	324	10.0	249	11.4	50	12.9
1 172	673	7.9	548	9.2	424	10.6	274	12.2	125	13.7

P.E.D. = Available static pressure.

10.12.- Applications with vertical ducts, models DIC/G 300 - high speed activation kit

Fan speed (r.p.m.)	Flow m³/h									
	13 600		15 300		17 000		18 700		20 400	
	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW	P.E.D. Pa	kW
1 080	483	6.9	356	9	229	9.3	76	10.6	-	-
1 130	610	7.9	505	9.2	400	10.6	230	12.2	100	13.7
1 180	737	8.1	610	9.6	483	11.1	330	12.6	178	14.2
1 235	787	8.4	660	9.9	533	11.4	381	13	-	-
1 270	-	-	762	10.8	635	12.2	508	13.9	-	-

P.E.D. = Available static pressure.

10.13.- Applications with vertical ducts, models BIH 300 - standard activation

Fan speed (r.p.m.)	Flow m³/h									
	13 600		15 300		17 000		18 700		20 400	
	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW
1 010	300	6.5	200	7.3	75	8	-	-	-	-
1 064	400	7.0	275	7.8	175	8.6	-	-	-	-
1 118	440	7.4	350	8.4	230	9.4	90	10.6	50	12.2
1 172	550	7.8	430	9.6	310	10.3	190	11.7	100	12.7

P.E.D. = Available static pressure.

10.14.- Applications with vertical ducts, models BIH 300 - high speed activation kit

Fan speed (r.p.m.)	Flow m³/h									
	13 600		15 300		17 000		18 700		20 400	
	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW	P.E.D. Pa	P.Abs. kW
1 080	430	6.9	310	7.9	180	9.3	68	10.7	-	-
1 130	500	7.7	385	8.8	245	10.0	155	11.5	75	12.5
1 180	583	8.1	455	9.6	330	11.0	200	12.3	120	13.8
1 235	655	8.4	550	10.2	430	11.8	259	13.4	160	14.7
1 270	-	-	-	-	500	12.0	343	14.2	274	15.2

P.E.D. = Available static pressure.

11 - Limits of use

		Model		90	120	150	180	240	300
		Voltage limits	Min./Max.	342 / 457					
Cool		Indoor coil air intake temp.	WB°C Min./Max.	14 / 22	14 / 22	14 / 22	14 / 22	14 / 22	14 / 22
		Outdoor temp.	DB°C Min./Max.	7 / 49	7 / 49	7 / 49	-4 / 52	-4 /52	-4 / 49
Heat pump	Summer cycle	Indoor coil air intake temp.	WB°C Min./Max.	14 / 22	14 / 22	-	14 / 22	14 / 22	7 / 49
		Outdoor temp.	DB°C Min./Max.	7 / 49	7 / 49	-	7 / 52	7 / 52	7 / 49
	Winter cycle	Indoor coil air intake temp.	DB°C Min./Max.	10 / 27	10 / 27	-	10 / 27	10 / 27	7 / 49
		Outdoor temp.	DB°C Min./Max.	-20 / 16	-20 / 16	-	-23 / 20	-23 / 20	7 / 49
Gas heating*		Indoor temp.	DB°C Max.	30	30	30	30	30	30
		Outdoor temp.	DB°C Min./Max.	-15 / 25	-15 / 25	-15 / 25	-15 / 25	-15 / 25	-15 / 25

*The gas heating units (D4IG) are adequate for gas only. On installations with GLP (propane), make sure that, in no case, the fuel in liquid form can reach the gas group.

12 - Indoor fan characteristics

Model		Speed range (r.p.m.)	Motor[1]		Motor pulley (adjustable)		Fan pulley (fixed)		Belt		
			kW	Casing type	Ø pulley (mm)	Ø shaft (mm)	Ø pulley (mm)	Ø shaft (mm)	Length (mm)	Ref.	Amount
090		950-1230	1.5	090L	86-112	24	132	25	1 240	BX47	1
120		880-1120	2.2	090LB	86-112	24	132	25	1 360	BX52	1
150		960-1160	4	100LC	124-150	28	188	25	1 540	BX59	1
Standard	**180**	845-1040	4	100LC	109-135	28	188	25	1 790	BX69	1
	240	765-905	5.5	112MB	124-150	28	236	25	2 040	BX79	1
High speed	**180**	1030-1240	4	100LC	147-178	28	188	25	1 840	BX71	1
	240	895-1080	5.5	112MB	147-178	28	236	25	2 123	BX82	1
Standard Cool	**300**	1010-1172	7.5	132M	152-190	38	235	35	2 123	BX82	2
Standard Pump	**300**	1010-1172	9.2	132MBA	139-173	38	212	35	2 040	BX79	2
High speed	**300**	1080-1270	11	132MB	152-190	38	212	35	2 123	BX82	2

1) All motors are of the totally enclosed type, fan-cooled, operate at 1.450 r.p.m., with a solid base and a 1.15 service factor.

13 - Pressure drop of accessories

13.1.- Models 090 - 120 - 150

Accessory		Pressure drop (Pa)				
	m^3/h	3 800	5 100	6 800	8 500	10 200
Economiser/motor-driven damper		5	5	7.5	12.5	17.4
Electric heater (kW 400 V)	16	15	27	50	77	111
	25	15	30	52	82	120
	37	-	35	57	87	129
Water coil		42	52	80	120	145

13.2.- Models 180 - 240 -300

Accessory			Pressure drop (Pa)							
			180			240-300				
		m^3/h	7 600	10 000	12 250	10 000	12 000	13 700	14 700	15 800
Economiser/motor-driven damper			6	10	15	10	14	18	21	24
Electric heater (kW 400 V)		12	27	49	72	49	68	90	105	121
		25	27	49	72	49	68	90	105	121
		37	34	60	88	60	83	110	129	148
		50	54	96	142	96	134	177	206	238
Water coil			37	63	90	63	88	115	125	140
Horizontal discharge ducts*	Impulse duct		150	106	81	106	84	70	66	64
	Return duct		12	12	12	12	12	12	12	12

*P.E. values to be added to those shown in the tables of sections 10.7 to 10.12, in the case of horizontal impulse and/or return air ducts.

14 - Accessories

14.1.- Electronic economisers

Comprises a damper assembly with a motor actuator having a totally modulating spring capable of introducing up to 100% outdoor air with 1% nominal pressure drop type dampers.

14.2.- Atmospheric/fixed outdoor air intake damper assembly (models 090 - 120 - 150) Fig. 7

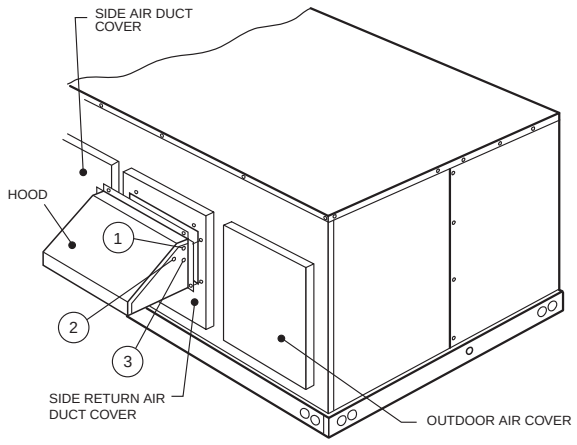
Acts as a safety atmospheric damper in units equipped with an economiser, or as a fixed outdoor air intake damper on models without an economiser.

On equipment without an economiser, it regulates the damper in accordance with the desired air flow, by setting to one of the 3 possible positions.

Position 1 allows an air flow of approximately 25%, position 2 approximately 15% and position 3 approximately 10%. There is a screw on either side of the hood for setting this support to the correct position.

In the case of a horizontal return air duct, it should be mounted on the front surface of said duct, as close as possible to the unit.

090 - 120 - 150



- Fig. 7 -

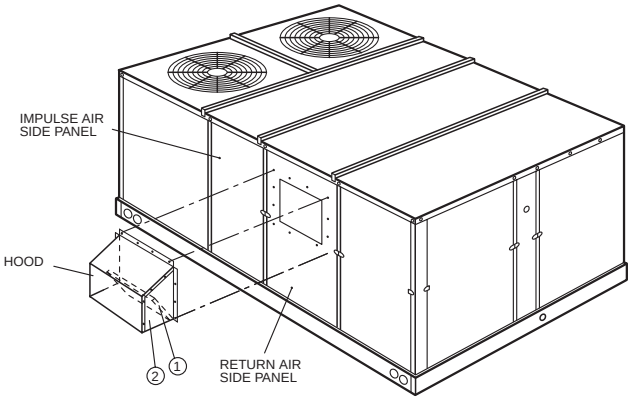
14.3.- Fixed outdoor air intake damper (models 180 - 240 - 300) Fig. 8

This assembly comprises a rain hood with a damper that can be adjusted to admit 10, 15 or 25% of outdoor air. In the case of bottom ducts, this air intake damper should be mounted on the opening of the return air panel. With horizontal discharge ducts, it should be mounted on the return air duct.

The damper deflector set to position 1 will allow a recirculating air flow of approximately 10%, in position 2 approximately 15% and to allow approximately 25%, remove the damper deflector.

In the case of a horizontal return air duct, it should be mounted on the front surface of said duct, as close as possible to the unit.

180 - 240 - 300



- Fig. 8 -

14.4.- Safety atmospheric damper (models 180 - 240 - 300)

This accessory can be used to relieve the indoor air pressure in units equipped with an economiser, but without mechanical extraction.

This accessory comprises a rain hood, an anti-bird grid and a totally assembled damper. In the case of bottom ducts, this damper should be mounted on the opening of the return air panel.

In the case of a horizontal return air duct, it should be mounted on the front surface of said duct, as close as possible to the unit.

14.5.- Accessory (operation) at low temperatures

The packaged air conditioning units are designed to operate at only ambient temperatures of up to 7 or -4° C (depending upon the model). With this accessory, the unit operates correctly at ambient temperatures of up to -18° C.

14.6.- High speed activation

A smaller pulley on the fan or a larger pulley on the motor increase the impulse air fan speed for applications with greater flow and/or static pressure.

This accessory is manufactured for models 180, 240 and 300 only.

14.7.- Propane gas conversion kit (D4IG)

The burner and pilot flame jets, as well as the gas valve regulation necessary for converting the natural gas burner to propane gas are supplied. The service pressure of the propane gas should be 37 mbar.

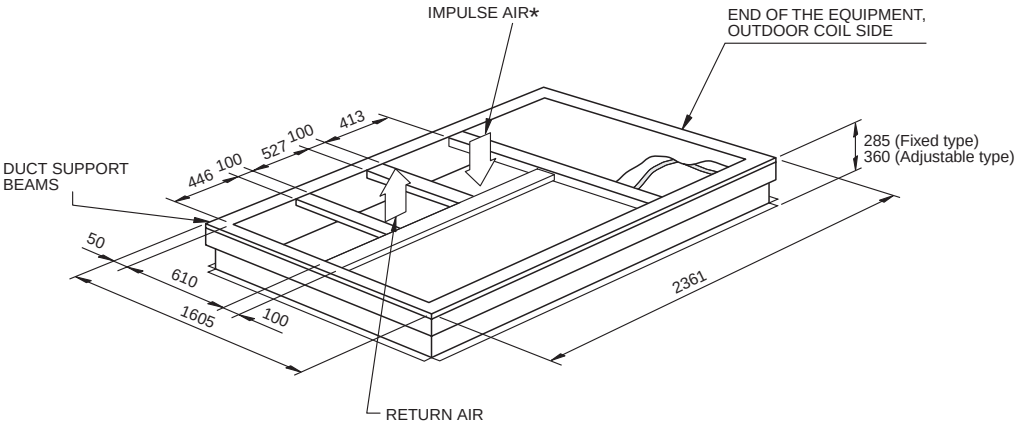
14.8.- Obstructed filter pressure switch

Allows viewing a filter icon on the DPC-1 thermostat when the filters are obstructed. The adjustment range is: 70 - 60 Pa. With an IP54 splash protection level.

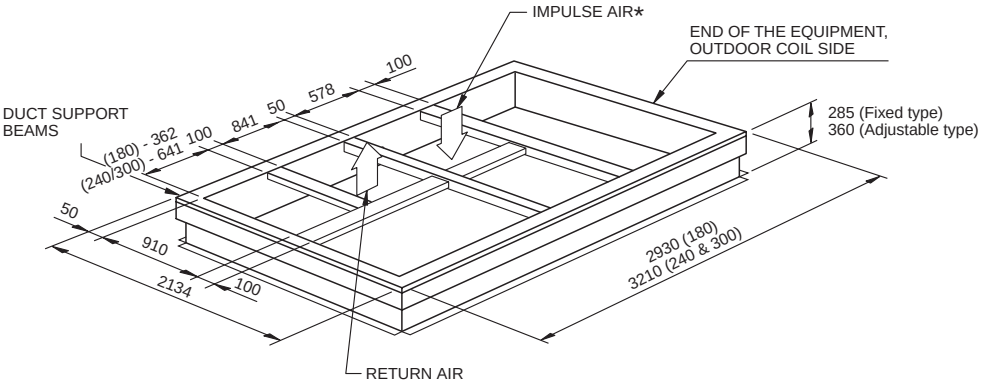
14.9.- Mounting base (Roof-Curb) Fig. 10

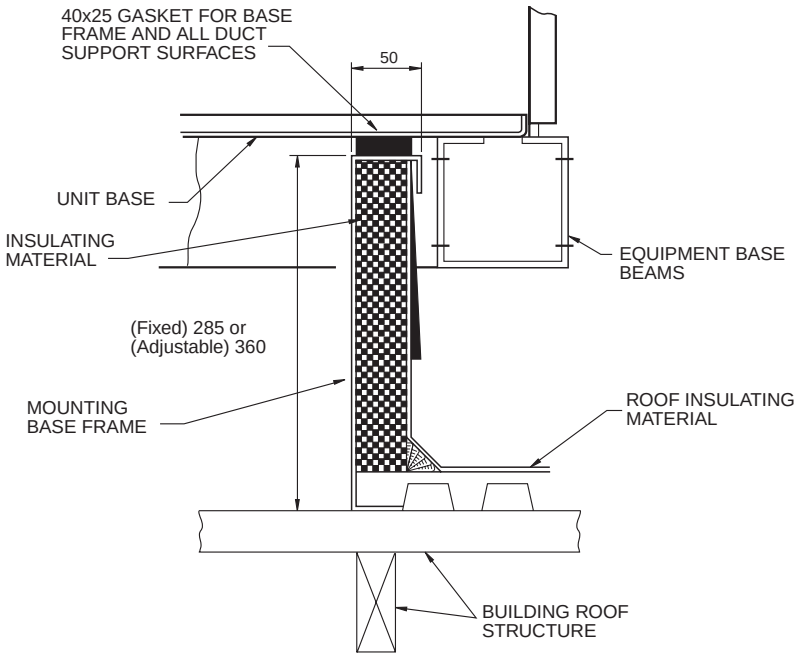
The mounting bases provide a leak-tight joint between the unit and the finished roof. These mounting bases are shipped unassembled and are to be mounted at the job site.

090 - 120 - 150



180 - 240 - 300





DETAIL OF TYPICAL ASSEMBLY

Fig. 10
Dimensions of mounting base (Roof-Curb)

They are designed to fit into the base beams of the equipment.
The ducts can be installed in the mounting base from the roof.
All electrical connections can be carried out inside the mounting base.
Two types of mounting bases are available:
1.- Fixed: for non-sloping roof tops.
2.- Adjustable: for roof tops with a slope of up to 7°.

14.10.- Smoke detection

This option comprises two main components:
1.- An ionic detector in compliance with standard 950-11-85.
2.- An electronic board in compliance with standard 961-09-89.

They are located in the return air compartment, behind the air filters, and when smoke is detected, the outdoor air damper closes and the equipment turns off. If economiser board jumper J20 is connected, the outdoor air damper opens and the equipment turns off. The equipment can be restarted by means of the internal manual reset device.

14.11.- Return extraction fan

To relieve the air pressure generated inside the building when an economiser or motor-driven damper is used.
Supplied preassembled, ready for job site installation on the return air side panel of the unit.
In the case of a horizontal return air duct, it should be mounted on the front surface of said duct, as close as possible to the unit.

14.12.- Side duct connecting panels (models 180-240-300)

Needed to connect the horizontal impulse and/or return ducts on the side of the unit.

14.13.- Backup electric heaters

Supplied factory-installed, or for job site installation.
Located in the impulse air area of the unit.
Available in 12 to 50 kW capacities, depending upon the unit model.
They are all 2-stage (except for the 12 kW type, which is 1-stage), with automatic switch included.

14.14.- How water coil

Supplied factory-installed, available in heating capacities of from 35 to 105 kW, depending upon the unit. This assembly includes: Coil, 3-way regulating valve, proportional electric actuator and antifreeze probe. The coil is located in the impulse air region of the unit, and the ducts can be connected to either the side or bottom part of the unit indistinctly.

14.15.- Washable air filters

Filters with a 48 mm. metal frame and washable filtering material. Gravimetric efficiency 85%, and class F1 fire resistance.

14.16.- Low noise level kit

Comprises a set of low noise level outdoor fans and insulation linings for the compressors.

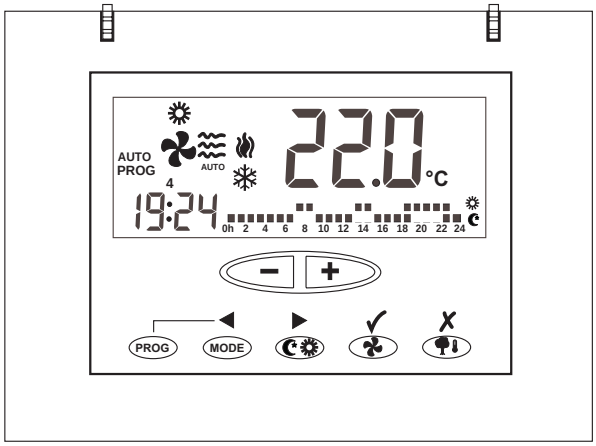
14.17.- High temperature thermostat

Located in the impulse air compartment and, when a high temperature (80°C) is detected, the outdoor air damper closes and the unit turns off. If economiser board jumper J20 is connected, the outdoor air damper opens and the equipment turns off. It can be turned back on by means of the manual reset.

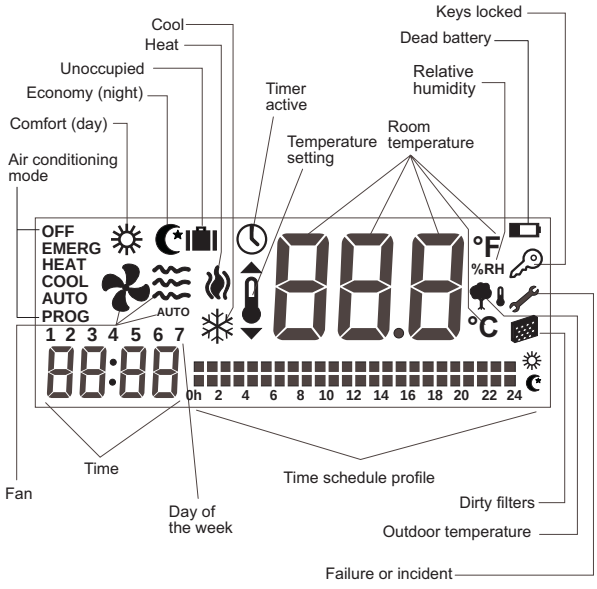
15 - DPC-1 Programmable digital thermostat with communication

Internal view of the thermostat

With the front cover up, showing the front panel. The cover is lifted only to access the controls.Descripción de la pantalla



Description of the display



15.1.- Air conditioning modes

By pressing the MODE, key repeatedly, the different air conditioning modes can be selected.

Off

In this mode the air conditioning system is off. **OFF** is displayed on screen.

Cool

COOL is displayed with the ❄ icon (flashing if under demand, and static if not).

Heat

COOL is displayed with the icon (with the sides flashing if under demand, and without sides if not).

Auto

Both the system heating as well as cooling functions are activated. The word icon ❄, icon (flashing if there is a demand) are displayed.

Programmed

The programmed mode implies the previously described **AUTO** mode, but also includes the time schedule profile, and the AUTO PROG mode is displayed.

If pin 2 of the micro-switch is set to OFF, this option is not displayed (see Configuration Micro-switches).

Emergency heat

This mode avoids compressor operation in extreme outdoor conditions, and the icon (flashing if the unit is on, and static without sides if off) and the words EMERG HEAT are displayed.

Fan only

The fan only mode is accessed in the OFF mode by pressing the key, which selects the fan speed. In this way the air conditioning system is off and only the fan is operative.

15.2.- Key functions

Programming key PROG

In the Normal Mode and by pressing this key, the Programming Mode is accessed, allowing the selection of one of the following options:

- Clock setting (day of the week, hours and minutes).
- Fan programming.
- 0h 2 4 6 8 10 12 14 16 18 20 22 24 Time schedule profile programming. A time schedule profile accepts *Comfort and Economy (Day and Night)* modes only.
- Programming of set point temperatures for heat and cool in *Occupied, Comfort or Day Modes.*
- Programming of set point temperatures for heat and cool in *Stand-by, Economy or Night Modes.*
- Programming of set point temperatures for heat and cool in *Unoccupied Mode.*

Plus and minus keys, − and +.

Pressing one of these two keys in *Normal Mode* accesses the *Adjust Mode*, displaying present temperature set point, with the icon flashing.

If pressed and held for over 1 second, or released and pressed again while still in the *Adjust Mode*, said set point will be increased or decreased in steps of 0.5° C or 1° F.

If both the − and +, keys are pressed simultaneously, the temperature reading goes from °C to °F and vice versa.

Air conditioning mode key MODE

Pressing this key in *Normal Mode* changes the present air conditioning mode (OFF, COOL, HEAT, AUTO PROG, EMERG HEAT).

Occupation mode key

In Normal Mode it will change the present occupation or com-

fort mode *(Day/Night)*, displaying the set point temperature next to the flashing thermometer. If pressed once again while still in the *Adjust Mode*, each occupation mode will be accessed one by one in a sequential and cyclic manner.
If the key is pressed and held for over 1 second, the unoccupied mode will be accessed. If no other change is made in this mode, the unoccupied status will remain indefinitely. If the PROG key is pressed, the set point disappears and No. 0 is displayed in its place, indicating the number of days the unoccupied status should last. Keys − and + increase and decrease this number of days (with a maximum of 99), and the is displayed.

Fan mode key
Pressing this key accesses the *Adjust Mode*, which lasts 5 seconds. In this mode the fan flashes and the programmed speed is displayed, and whether in auto or permanent mode.

Outdoor temperature key
Pressing this key in *Normal Mode* displays the outdoor temperature for 5 seconds.

16 - Operation

16.1.- Cooling system

The cooling system is a complete factory-mounted assembly that uses an air-cooled condenser. The system is delivered charged with refrigerant. The compressors are sealed airtight and have internal shock absorbency.
The compressors also have intrinsic (internal) protection. Should there be an unusual temperature increase in the compressor, the safety device will open, turning the compressor off.

16.2.- Preliminary cooling operation

Once installation is completed, connect the sump heaters during at least four hours prior to starting the unit up. After this initial heating operation, the compressors should undergo three false connections (sufficient for a few rotations), with a 5-7-minute delay between starts, prior to full operation.

NOTE:
Before each cooling season, the sump heaters should be connected at least 10 hours prior to starting the system.

16.3.- Thermostat operation

VENTILATION MODE: If the fan switch is set to «FAN», the indoor fan is in continuous operation. If not, the fan is activated by means of the thermostat only during cool or heat operation.
AUTO MODE: If the thermostat selector is set to «AUTO», the unit operates both in the cooling as well as heating modes, as required by the thermostat. There is a differential of 1° C between the cool and heat set points (this value can be increased with the DPC-1 thermostat).
COOL/HEAT: If the thermostat is set to «COOL», the unit operates in the cooling mode when the thermostat requires cool, but does not operate in the heating mode. If set to «HEAT», the unit operates in the heating mode when required, but not in the cooling mode.
This demand for cool or heat varies in accordance with the type of thermostat in use: DPC-1 (communication) or a relay thermostat.

16.4.- Cooling operation sequence

Without economiser: If the unit is not equipped with an Economiser, the first demand of the thermostat starts the compressor with the lesser number of operating hours, or available.
If the thermostat generates a second demand, the compressor with the second lesser number of operating hours, or available, is started.
Models D4IC and D4IG-300 can generate a third demand since they have three circuits.
If relay thermostats are used, the third demand is generated by the control board by timing. This is deactivated once the second demand disappears.
With economiser: If the unit is equipped with an Economiser, the request for Cooling will depend upon whether conditions are favourable. In this case, the damper is modulated to achieve the lowest possible impulse temperature without going below 12°C. In the temperature mode, favourable conditions are understood as an outdoor temperature below 20° C, while remaining below the return temperature.
In enthalpy mode, favourable conditions are understood as an outdoor enthalpy below the return enthalpy by at least 5%, and an outdoor temperature below 20°C. Operation in enthalpy mode requires a jumper at S2 of the economiser board. Should the enthalpy probes fail, the unit operates on the conventional probes.
REQUEST FOR COOLING, 1: If conditions are favourable, the damper is modulated to achieve an impulse air temperature of 12° C.
If not favourable, one compressor is enabled.
REQUEST FOR COOLING, 2: If the thermostat is not satisfied by the operation of the economiser, the thermostat generates a second demand, starting a compressor.

Occupation detector
The occupation detector intake is pin 1 of connector J1 on the second compressor board. Open means un occupied. In this case, there is an incidence of the green LED on the control board.
If thermostat DPC-1 is used, the night set points will be applied. In the case of a relay thermostat, the economizer will operate in cool mode only.

16.5.- Low temperature operation

(Models D4IC/D4IG-180-240-300)
If the outdoor temperature is above 21° C, the 2 outdoor fans are operative.
If the outdoor temperature is below 16° C, operation of outdoor fan of circuit 1 is discontinued.

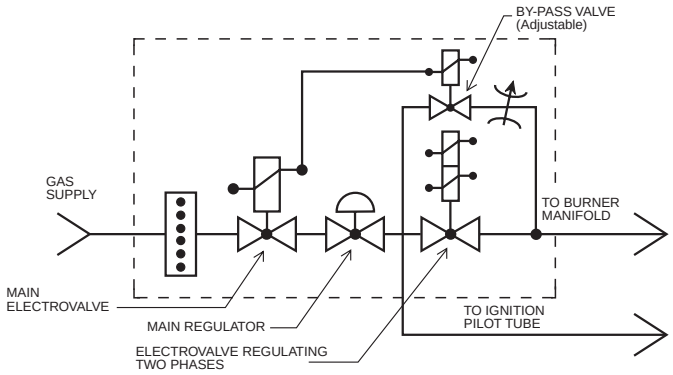
In this way, the limited air flow in condensing coils allows cooling operation up to -4° C.

16.6.- Gas heating operation sequence (models D4IG)

REQUEST FOR HEATING, 1: If the thermostat generates a demand for heat, the YKlon board activated the indoor fan and the gas control board generates a W1 (terminal 41) output.

If thermostat LS1 (manual reset) is off and the gas supply pressure is above the gas pressure switch (GS) set point, ignition control (IC1) is activated and the ignition sequence is initiated. See Fig. 12, a typical diagram of the gas valves.

Gas valve diagram



- Fig. 12 -

IGNITION SEQUENCE: The Ignition Control makes sure the Air Pressure Switch (AS) contact is open. In this case, the burner fan motor is activated and a 30-second prepurge sequence is begun.

As long as the AS contact has closed, thermostats RS and LS2 (automatic reset) are off and the prepurge is completed, the Ignition Transformer is activated, which gives a high frequency arc at the ignition electrode. The main gas valve is activated at a low flow rate. The burner ignites and the ignition tube assembly ensures that all burners ignite correctly. If the flame detector (of the ionisation electrode type) supplies an adequate intensity within a 5-second interval, the gas valve is activated. If not, ignition control is locked out and generates an alarm detected by the gas board which, in turn, resets IC1. The gas board can carry out a maximum of 5 resets, while the thermostat the same demand for heat. Then the gas control will be locked out and thermostat DPC-1 will display the failure.

If ignition sequence is correct but the flame goes out afterwards, the ignition control tries to start again. If no flame presence is detected at the end of the cycle, the IC1 control is locked out and an alarm is generated. If heat switch LS2 or the burner heat switch RS open due to excessive temperature in the gas control compartment, or if the air pressure switch (AS) opens due to a lack of combustion air (for example, lock-out or failure of the fan), the unit is locked out and an alarm is generated.

REQUEST FOR HEAT, 2: If the thermostat generates a second demand, the gas control board generates W2 output (terminals 42, 43), allowing the gas assembly to operate at 100% capacity.

Models D4IG90, 120 and 150 have one single gas control, a 2-stage gas valve and a burner.

Models D4IG180, 240 and 300 have two gas controls, two single-stage gas valves and two independent burners.

16.7.- Electric heater heating operation sequence (models D4IC)

REQUEST FOR HEAT, 1: If the thermostat generates a demand for heat, the YKlon board activates the indoor fan and the output of auxiliary heaters 1 or 2, depending upon the number of operating hours in use.

REQUEST FOR HEAT, 2: If the thermostat generates a second demand, the output of auxiliary heaters 1 or 2 is activated, depending upon the number of operating hours in use.

16.8.- Heat pump heating operation sequence (models B4IH)

REQUEST FOR HEAT, 1: If the thermostat generates a demand for heat, the YKlon board activates the indoor fan and the compressor with less operating hours, or available.

REQUEST FOR HEAT, 2: If the thermostat generates a second demand, the second compressor becomes operative.

REQUEST FOR HEAT, 3: If the thermostat generates a third demand, the output of auxiliary heaters 1 or 2 is activated, depending upon the number of operating hours in use.

REQUEST FOR HEAT, 4: If the thermostat generates a fourth demand, the output of auxiliary heaters 1 or 2 is activated, depending upon the number of operating hours in use.

EMERGENCY HEAT: If the Emergency Heat mode is selected

on the thermostat, the compressors are turned off. The first demand for heat starts one stage of the heater, and the second another stage.

16.9.- Defrost sequence (models B4IH)

The heat pumps are equipped with a defrost adjustable timer controlled by microswitches (30, 60, 90 minutes). Factory-set at 30 minutes.
Defrost can be carried out only when the unit is in heat pump operation.

Start:
The following conditions should exist:
- The compressor is in operation.
- The liquid probe temperature is below -3° C for 3 minutes, or for 5 minutes if the outdoor temperature is below -5° C.
- That the time period from the last defrost, 30 minutes, has expired.

Operating procedure:
When starting defrost, the following operating procedure should be carried out:
- Set the 4-way valve to cool mode.
- Turn the outdoor fan off.
- The YKlon board call manager will decide whether another heat stage can be started.
- During defrost, do not turn off the compressor that is defrosting, even if called for by the thermostat.
- The indoor fan will turn off if there is any stage that can produce heat, and microswitch No. 8 is set to OFF. If set to ON, the indoor fan turns off. (Set to ON by default.)

End:
The operating procedure will last until one of the following conditions is present.
- Liquid temperature above 13° C for 2 seconds.
- Liquid temperature above 5° C for 30 seconds.
- Liquid temperature above 2° C for 2 minutes.
- Time expired sin the start of the defrost over 10 minutes.
- A high pressure switch failure signal is generated.
- If liquid temperature drops below -25° C.

Operating procedure:
When the defrost is finished:
- Turn outdoor fan on and wait 10 seconds.
- Set the four-way valve to heat.
- The call manager will decide whether or not the compressor is to remain in operation.

To eliminate the drops of water from the coil, the outdoor fan will remain in operation for one minute, even if there is no call.
Simultaneous defrost of two stages is not allowed, and one of these remains in standby until the operating procedure of the other is over.

17 - Safety features and controls

17.1.- Cooling lock-out:
The cooling circuit is protected against high pressure (HP), low pressure (LP), discharge temperature and repeated starts in cool by means of a suction probe in the summer cycle.
If a failure is detected, thermostat DPC-1 indicates the cooling circuit affected (two numbers) and type of failure.
Furthermore, the YKlon board alarm relay is activated, with 24 VAC phase R at terminal AL.
If the cause of the failure has disappeared, the failure can be reset from the thermostat by setting the thermostat to OFF and then back to ON. Only three resets can be carried out in 24 hours.

17.2.- Gas heating lock-out (models D4IG):
Should Ignition Control (IC1) be locked out due to the activation of any of the LS2 devices (Automatic Reset Heat Switch), RS (Burner Heat Switch) or AS (Air Pressure Switch), this control will not resume operation until the activated device is re-established and reset.
In the case of a lock-out due to failure in detecting the flame, control IC1 generates an alarm signal and the gas board can carry out a maximum of 5 resets. Then the gas control will be locked out and thermostat DPC-1 will display the failure.
If manual reset heat switch LS1 opens, the ignition control will not be operative until reset manually. LS1 can be accessed through the impulse air access panel (for bottom duct installations), or through the cover on the dividing wall of the condensing unit compartment (for installations with side ducts).

17.3.- Low gas pressure (models D4IG):
If the gas supply pressure drops below the set point of the gas pressure switch (GS), the electric power supply to the ignition control circuit is interrupted, and the unit becomes inoperative. The gas equipment will reset automatically once the gas supply pressure surpasses the pressure switch set point, and the ignition sequence will begin once again. See Table 18.4 on the adjustment of the gas valve and the heat switch.

17.4.- Heating lock-out (electric heaters):
Should any of the electric heater phases not operate, check heat protection devices F12 and F15 (manual reset heat switch, 105° C). If F13 or F16 (automatic reset, 77° C) fail three times, the control board will detect this, turn off the corresponding heater and display the failure on thermostat DPC-1.
Also check short circuit and overload protection automatic switches F21 and F22 (1st and 2nd phases). The heat switches and automatic switches can be accessed through the external access panel of the electric heater.

17.5.- Motor overload protection:
All motors of the hermetic compressors and fan motors are protected against overloads by means of an internal heat line cut-off switch. This protection will reset automatically once the motor has cooled off sufficiently. Externally, they are protected against short circuits and overloads by means of automatic switches, curve K (DIN, VDE 0660-104).
The indoor fan motor is protected by a motor-guard, adjusted to the maximum amperage of the fan motor. In the case of excessive power consumption in the three phases, the motor-guard opens, interrupting the electric power supply to In-

door Fan Contactor.
The motor-guard auxiliary contact opens and the control board detects this, turns the entire unit off and displays the failure on thermostat DPC-1.

18 - Start-up, models D4IG

18.1.- Check list prior to start-up

Check the following before starting the unit.

1. Check the type of gas to be used. Make sure it is the same as shown on the unit identification plate.
2. Make sure the gas outlet and combustion air hoods have been installed correctly.

18.2.- Operating instructions

CAUTION:
This burner is equipped with automatic ignition systems.
Do not attempt to ignite it manually.

18.3.- Check list after start-up

After having activated the entire control circuit and the heating section is in operation, check the following:

1. Make sure there are no leaks in the unit and supply tubing.
2. Make sure the gas pressures in the manifold are correct. See 18.4.
3. Check gas supply pressure. It should be within the limits that appear on the identification plate. Supply pressure should be checked with all gas apparatus in the building at full performance. The auxiliary gas line pressure should not, at any time, surpass 25 mbar, nor should the working pressure drop below 12.5 mbar on natural gas equipment. If the gas pressure is not within these limits, contact your local gas company for the corresponding corrective measures.

To ignite the main burners:

1. Disconnect the power supply to the unit.
2. Set the ambient thermostat to its lowest setting.
3. Connect the power supply to the unit.
4. Set the ambient thermostat to the desired temperature. (If the temperature «set» on the thermostat is higher than the ambient temperature, the burner will ignite.)

On models D4IG-180/240/300, ignition control IC2 is locked out if the second stage flame fails. Lock-out of IC2 does not imply IC1 lock-out.

18.5.- Gas pressure adjustment in the manifold

This equipment is dispatched from the factory prepared for natural gas of the 2ND-H (G-20) type.
When adjustment is needed, and depending upon the type of gas used, this can be done by means of the adjusting screws of the gas valve (Fig. 15), in accordance with the following sequence. Set to the values given in Table 18.4.

Note
For equipment converted to propane gas (LPG), the gas valve should be adjusted in accordance with the technical information included in the conversion kit.

1. Set the interior pilot (A) to maximum value (+).
2. Turn the Quick Partial Opening Regulation flywheel (B) one complete turn backwards.
3. With the second stage in operation, loosen the Flow Regulating Flywheel of the second flame (C) slightly, and set said flywheel to its maximum opening. Adjust the main regulator (D) in accordance with the tabulated value. Reduce the Flow Regulation of the second flame (C) until the specified pressure is reached.
4. With only the first stage in operation, set the Flow Regu-

18.4.- Gas valve/heat switch adjustment

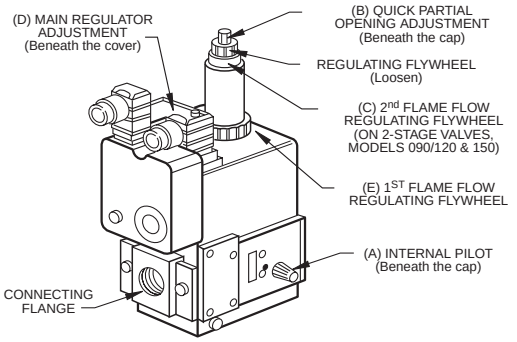
D4IG Model	Burner model	Heating capacity (kW)		Gas type	Gas valve adjustments (mbar)			Heat switch limits (°C)	
		Total (P.C.I)	Nett		Main regulator	2nd stage regulator	1st stage regulator	Automatic reset	Manual reset
090	N165	53.5	47.5	2ND-H/E (G20) 2ND-L (G25)	10.5 15.2	9.9 14.6	4.9 7.3	82	93
120 / 150	N200	64.2	57	2ND-HE (G20) 2ND-L (G25)	10.5 15.2	9.9 14.6	4.9 7.3	82	93
180/240/300	N320	85	76	2ND-H/E (G20) 2ND-L (G25)	10.5 15.2	- -	9.9* 14.6*	82	93

- 180/240/300: The same adjustment on both valves.
- (P.C.I.) Lower heating capacity.

lating Flywheel of the first flame (E) to the specified pressure. Tighten the Regulating Flywheel to fix the settings permanently.
Close the small cover on the main regulator.

5. Using an extraction gas analyser, check the CO, CO2 and Nox content, if possible, in the combustion gases leaving the smoke duct. The carbon monoxide (CO) content should be less than 0.1% (1000 ppm). Make sure the CO/CO2 ratio is below 0.2.

Typical gas valve



- Fig. 15 -

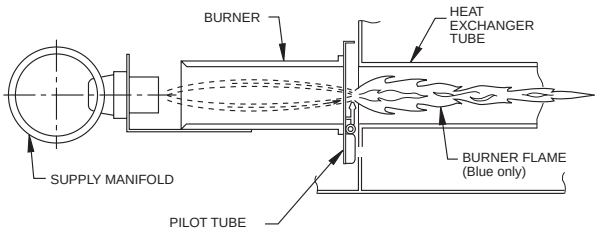
18.6.- Burner instructions

To check the burners, pilots or jets, **close the main manual shut-off valve and turn off all power supply to the unit.**

1. Remove the screws that fasten the burner to its supports on both sides.
2. Disconnect the gas supply line by loosening the connecting flange at the gas valve intake.
3. Disconnect the gas valve and ignition electrode cables. Remove the manifold-gas valve assembly from the burner by pulling up and towards the rear.

The burners can now be accessed. See Fig. 16 for a view of a typical burner and flame.
To reassemble this assembly, invert the previous procedure. Make sure the burners are level and rest on the guides at the rear of the heat exchanger.

View of typical flame



- Fig. 16 -

19 - Checking air flow

The RPMs of the impulse air fan depend upon the air flow required, the accessories of the unit and the static resistances of the impulse and return air systems. With this information, the RPMs of the impulse air fan can be determined by means of the performance data of the fan shown in the Tables of section 10.
Knowing the fan RPMs required, the adjustment (turns open) of the impulse air motor pulley can be determined by means of the Table «Adjustment, motor pulley, indoor fan».
Turn on the impulse air fan motor.
Adjust resistances both in the impulse as well as return air duct systems so as to balance distribution throughout the air conditioned space. Due to the specifications of the site, it may be necessary to have this balancing carried out by someone other than the unit installer.

To check the impulse air flow after initial balancing:

1. There are two 9.5 mm. ports for reading pressure before and after the evaporating coil.
   They are located on the filter side and fan side access panels, and are fitted with caps. Fig. 18.

Adjustment, motor pulley, indoor fan

Turns open*	Fan speed range (r.p.m), depending upon model								
	090	120	150	180		240		300	
				Standard	High speed	Standard	High speed	Standard	High speed
6	-	880	960	845	1 030	765	895	1 010	1 080
5	950	930	1 000	885	1 070	795	925	1 065	1 130
4	1 000	975	1 040	925	1 115	820	955	1 120	1 180
3	1 060	1 025	1 080	960	1 155	850	990	1 170	1 235
2	1 120	1 070	1 120	1 000	1 200	875	1 020	-	1 270
1	1 175	1 120	1 160	1 040	1 240	905	1 050	-	-
0	1 230	-	-	-	-	-	1 080	-	-

* Pulleys can be adjusted in increments of half a turn.

Remove both caps.

2. Insert at least 200 mm. of tubing (with a diameter of about 6 mm.) through each one of the ports in such a way that there is sufficient penetration in the air flow on both sides of the indoor coil.

NOTE:
The tubing should be inserted and kept in perpendicular to the air flow in such a way that the speed pressure does not affect the static pressure reading.

3. Using an inclined pressure gauge, determine the pressure drop in a dry indoor coil. Since humidity can vary considerably in an indoor coil, to measure a pressure drop in a wet coil under site conditions would not be precise.

To make sure the coil is dry, the compressors should be disconnected during this test.

4. Knowing the value of the pressure drop in a dry coil, the real air flow through the unit can be determined by means of the curve appearing in Fig. 19.

Once these readings are made, remove the tubing and replace the caps on both ports.

WARNING
Not being able to adjust the total amount of air in the system can cause serious damage to the fan.

20 - Temperature increase adjustment (models D4IG)

Temperature increase (or temperature difference between the return air and the hot impulse air) should be within the limits shown in the Table of section 9.

Once the temperature increase is determined, the flow can be calculated as follows:

$$m^3/s = \frac{0.8 \times kW\ Gas\ intake^*}{1.2072 \times °C\ Temp.\ increase}$$

* Based on an 80% nominal performance and the higher heating value of the gas. Alternatively, use gas intake 0.9 x gas intake, based on 90% nominal performance and the lower heating value of the gas.

After about 20 minutes of operation, determine the temperature increase. Take a reading of both the return and hot air in the ducts (at about 1.8 m. from the boiler) where this reading is not affected by radiant heat.

Increase the fan air flow so as to **decrease** the temperature; **decrease** the fan air flow so as to **increase** the temperature.

21 - Belt-drive fan

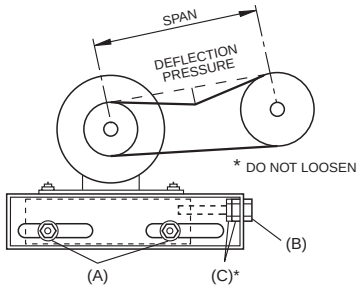
All units are equipped with single-speed motors and belt drive for fans. The variable fan motor pulley can be adjusted so as to obtain the desired impulse air flow. Belt tensing should be carried out as shown in Fig. 17.

22 - Tensing belts

CAUTION
Procedure for tensing belts:

1. Loosen the four nuts (upper and lower) (A).
2. Turn to adjust (B).
3. Do not loosen nuts (C).
4. With a belt tensing tester, apply perpendicular pressure on the intermediate point of a belt, as shown below. This deflecting pressure should be applied until a correct 4 mm. deflection distance is achieved.

To determine the deflection distance from the normal position, use a straight edge, from pulley to pulley, as a line of reference. The advisable deflection pressure is as shown below:

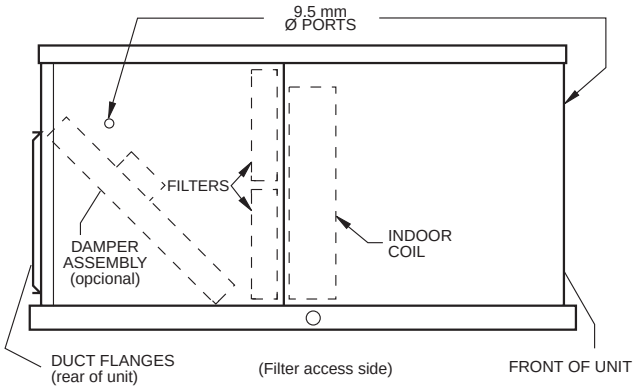


Tense all new belts to the maximum deflection recommended. Check belt tension at least twice during the first 24 hours of operation. Whenever the belts are retensed, the deflection pressure values should be within maximum and minimum.

5. After this tensing operation, retighten nuts (A).

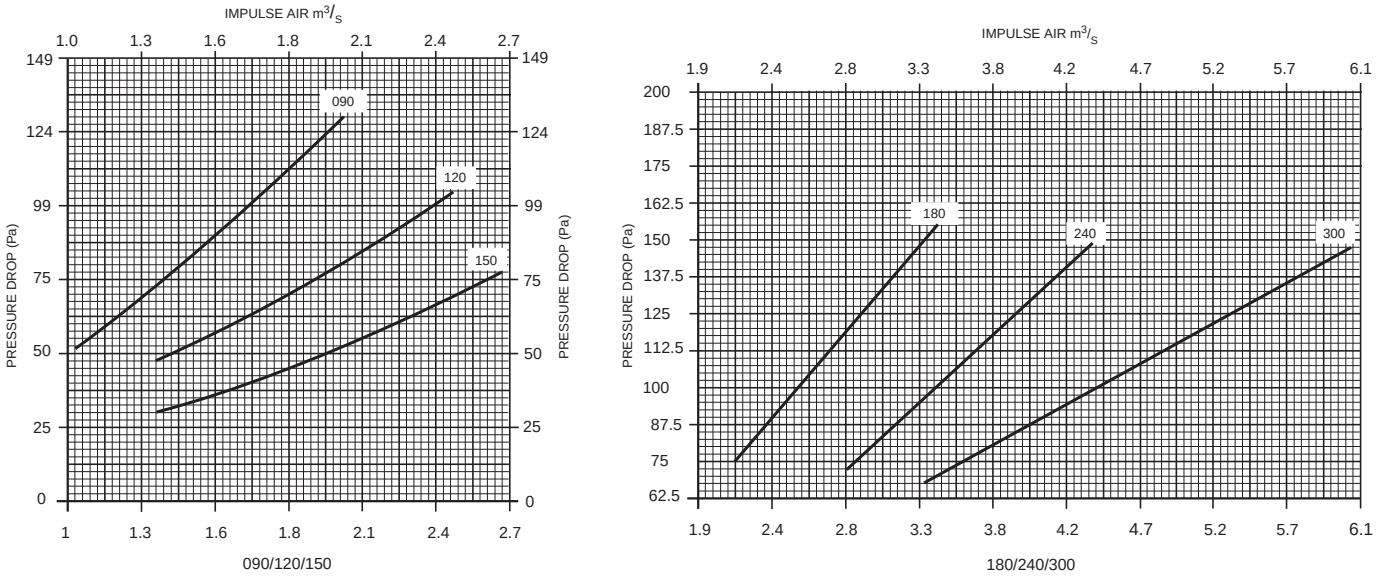
- Fig. 17 -

Port location (pressure drop readings)



- Fig. 18 -

Pressure drop in dry indoor coil vs. impulse air flow



- Fig. 19 -

23 - Maintenance

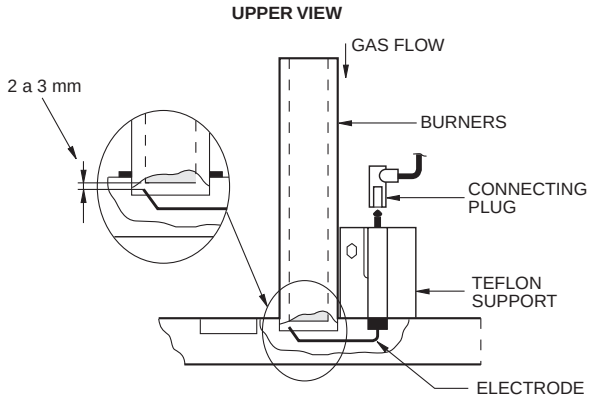
23.1.- Normal maintenance

CAUTION:
Before carrying out any of the following operations, disconnect all electric power supply to the unit so as to avoid personal injuries.

Normally, periodical maintenance comprises changing or cleaning filters and (on models D4IG) cleaning the burners.
FILTERS: Check them once a month. Replace the non-reusable or clean the permanent filters, as required. DO NOT replace the permanent type with non-reusable types. The dimensions of the replaced filter should be the same as the original.
MOTORS: The indoor and outdoor fan motors have permanent lubrication and do not require maintenance.
OUTDOOR COIL: Dirt should not accumulate on the surface of the outdoor coils, or on other parts of the air circuit. They should be cleaned as frequently as required. Make sure the electrical power supply to the unit is disconnected before carrying out this cleaning operation.

NOTE:
When cleaning the coils, be sure not to damage the fins of same.
Do not allow any structure or overhanging element to obstruct outdoor air discharge.

BURNER: Regularly (at least once a year, at the beginning of each heating season), visually check the flame of the main burner. If necessary, adjust the main burner.



- Fig. 20 -

TO CLEAN THE BURNERS: Remove them from the boiler as described in «Burner Instructions». Clean the burners with hot water along the top of same. When reassembling a burner, make sure the electrode is at 2 - 3 mm. See Fig. 20.
COMBUSTION AIR DISCHARGE: Regularly, visually check the discharge outlet to make sure there is no excessive accumulation of soot and dirt. If necessary, clean to keep the combustion air discharge in adequate condition.

23.2.- Cleaning of smoke stacks and heat exchanger

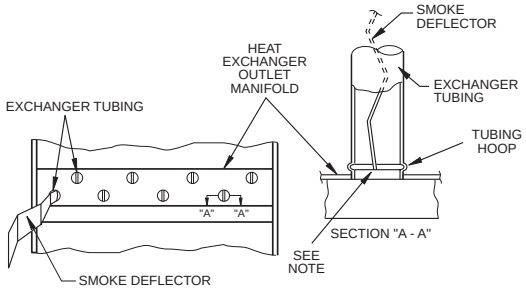
With adequate combustion adjustment, the heat exchanger hardly ever needs cleaning. If the element has deposits of soot on it, it can be cleaned as follows:

1. Remove the burner assembly as described in «Burner Instructions».
3. On the top, remove the screws from the casing and from

the top turbine of the combustion gas extraction fan.

3. Remove the screws that fasten the top to the smoke stack, without tearing the insulation next to it. Then remove the central dividing plate that separates the upper and lower smoke stacks.
4. Inside the smoke stack, remove the smoke deflectors inside the tubes. Make sure the last curve of the deflector fits tightly with the pipe, holding the end of the deflector tightly in the pipe hoop. This hoop is formed when the pipe is expanded at an end plate. To remove, move the end of the deflector towards the centre of the pipe, thus releasing the deflector end from the pipe hoop, and then pull straight out. See Fig. 21.
5. With a metal brush on a flexible rod, sweep the inside of the heat exchangers from the entrance of the burner, and the ends of the smoke discharges.
6. Sweep the inside of the smoke stacks and the smoke deflectors.
7. Pass the metal brush through the ventilation hoods downwards, from the side of the smoke stack.
8. If the accumulation of soot is considerable, remove the fan motor and clean the turbine and casing.
9. Once brushing is concluded, clean out with air or nitrogen. If necessary, use a vacuum cleaner.
10. Reassemble all parts in the same order as disassembly.
11. When replacing the centre and top of the smoke stack, be sure not to tear the insulation next to them.
12. Make sure all gaskets on the ventilation side of the combustion system are airtight. Apply high-temperature sealing putty (260° C).

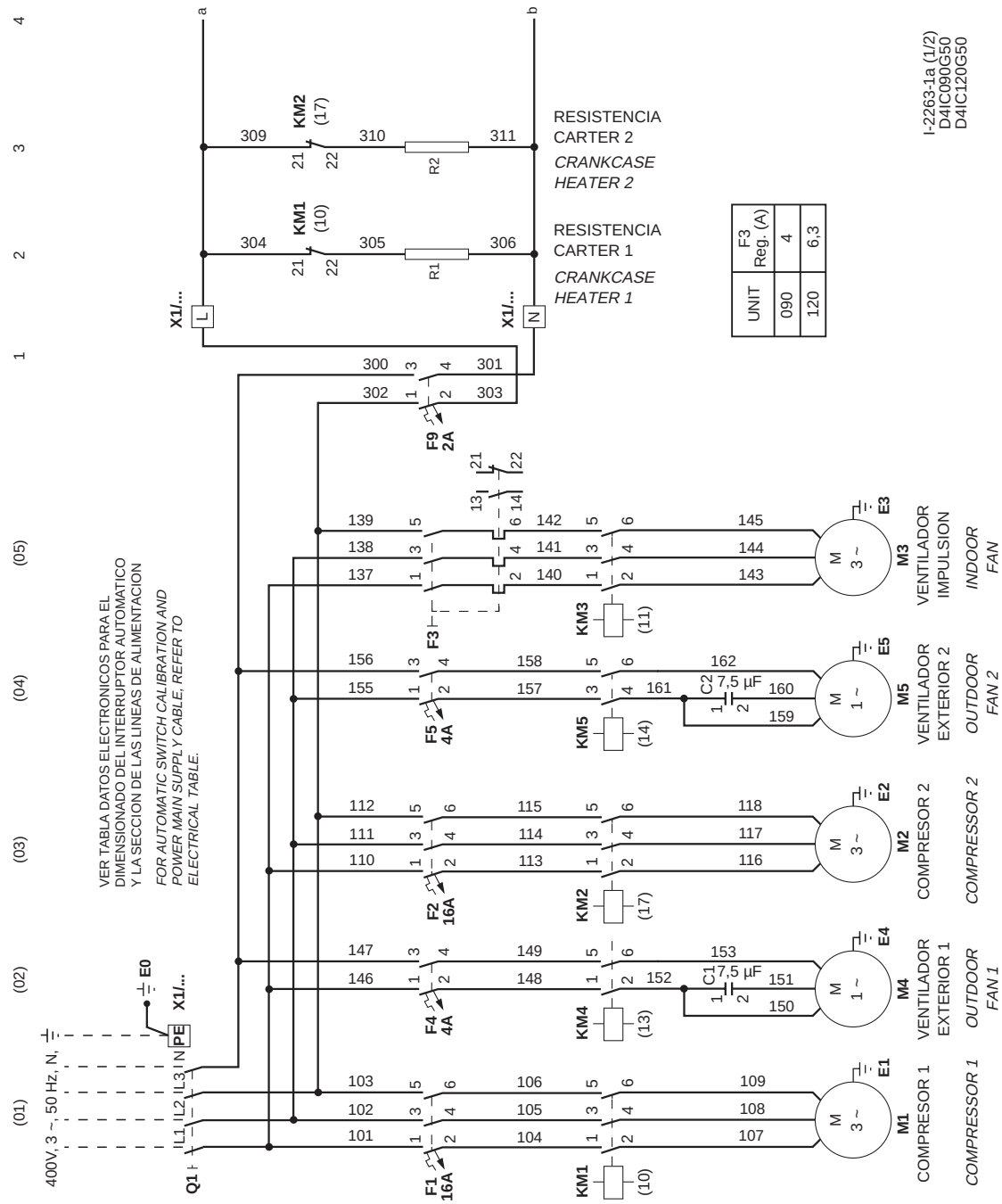
Typical installation of a smoke deflector



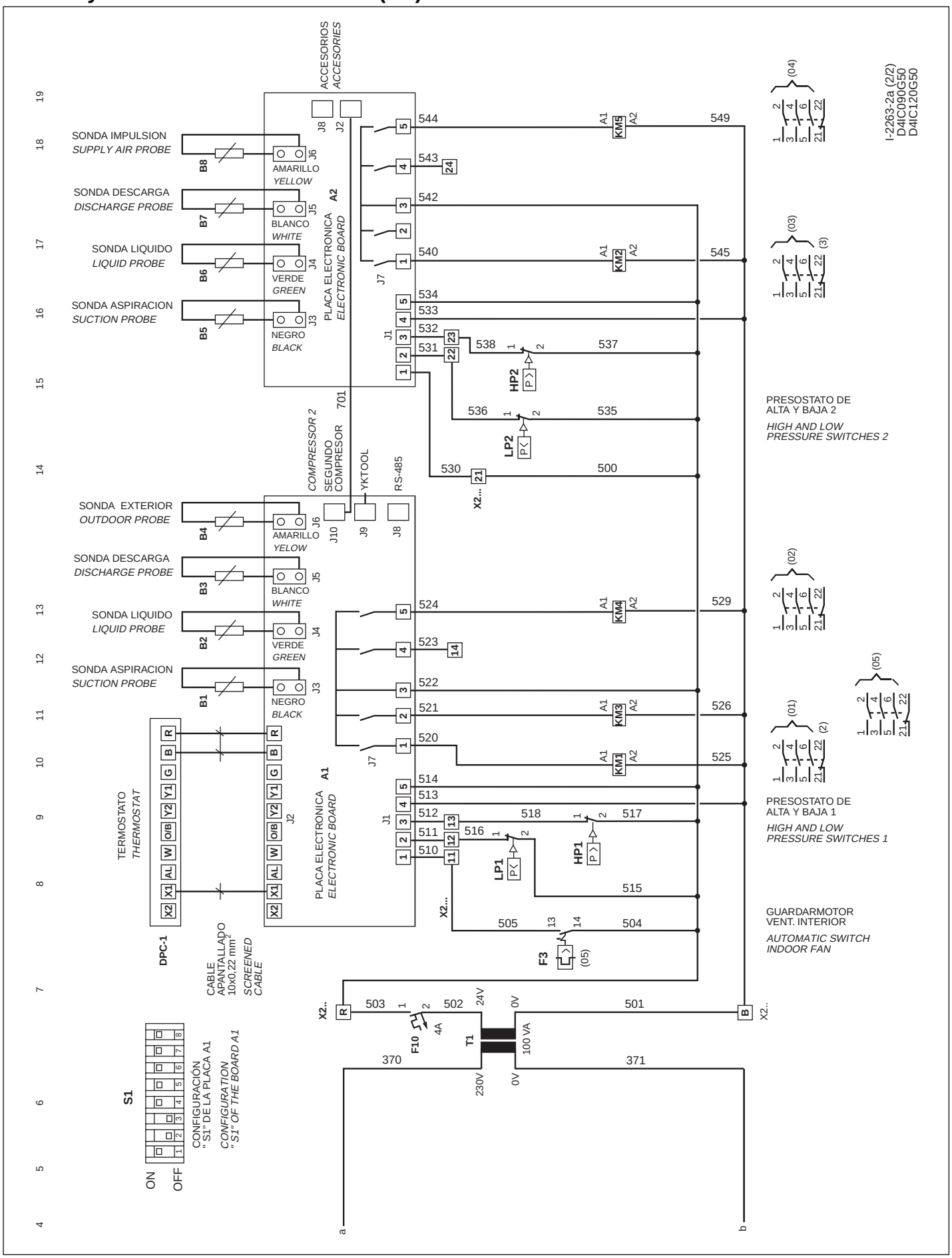
- Fig. 21 -

24 - Wiring diagrams

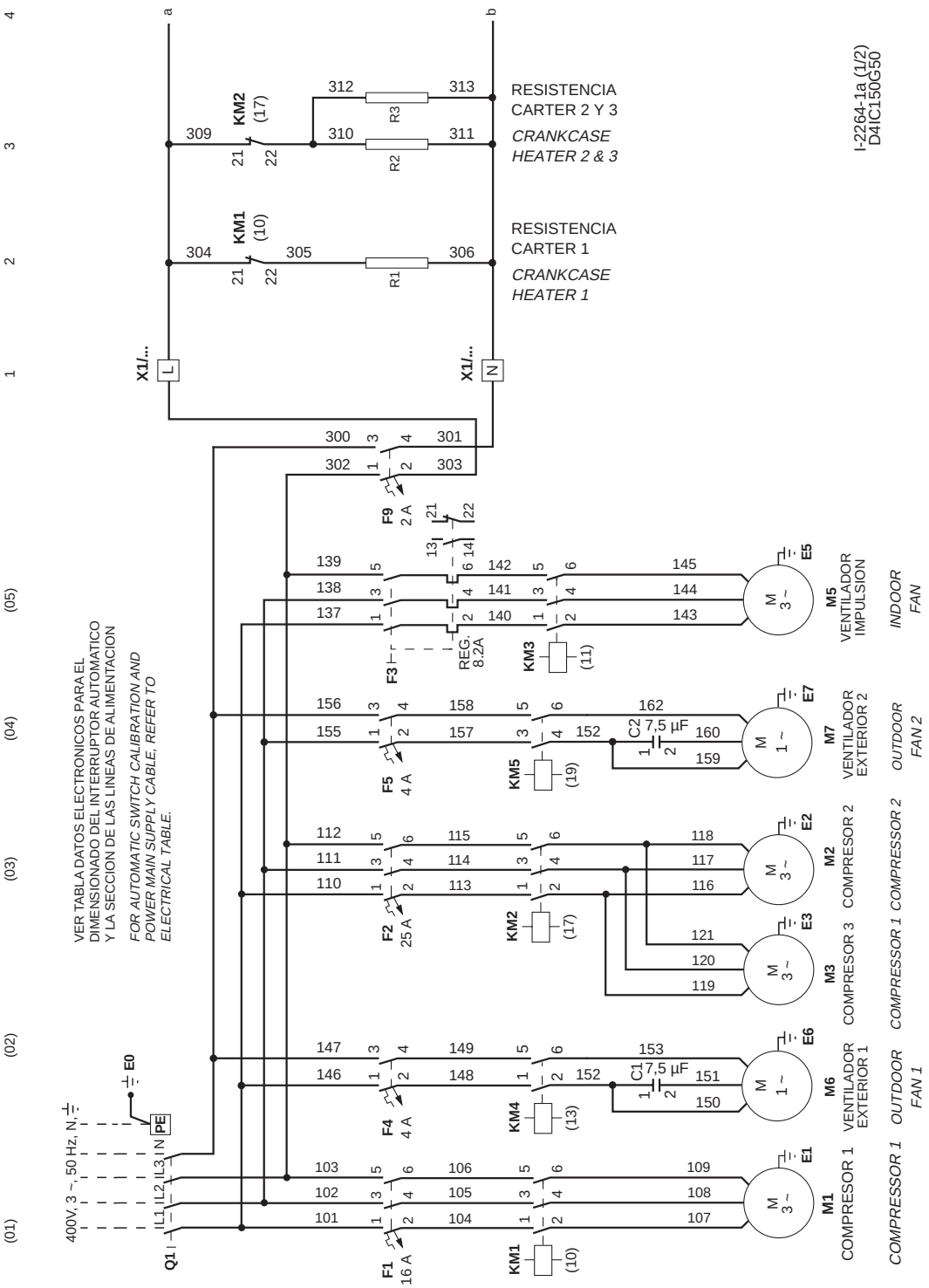
Cool only units D4IC-090G50/120G50 (1/2)



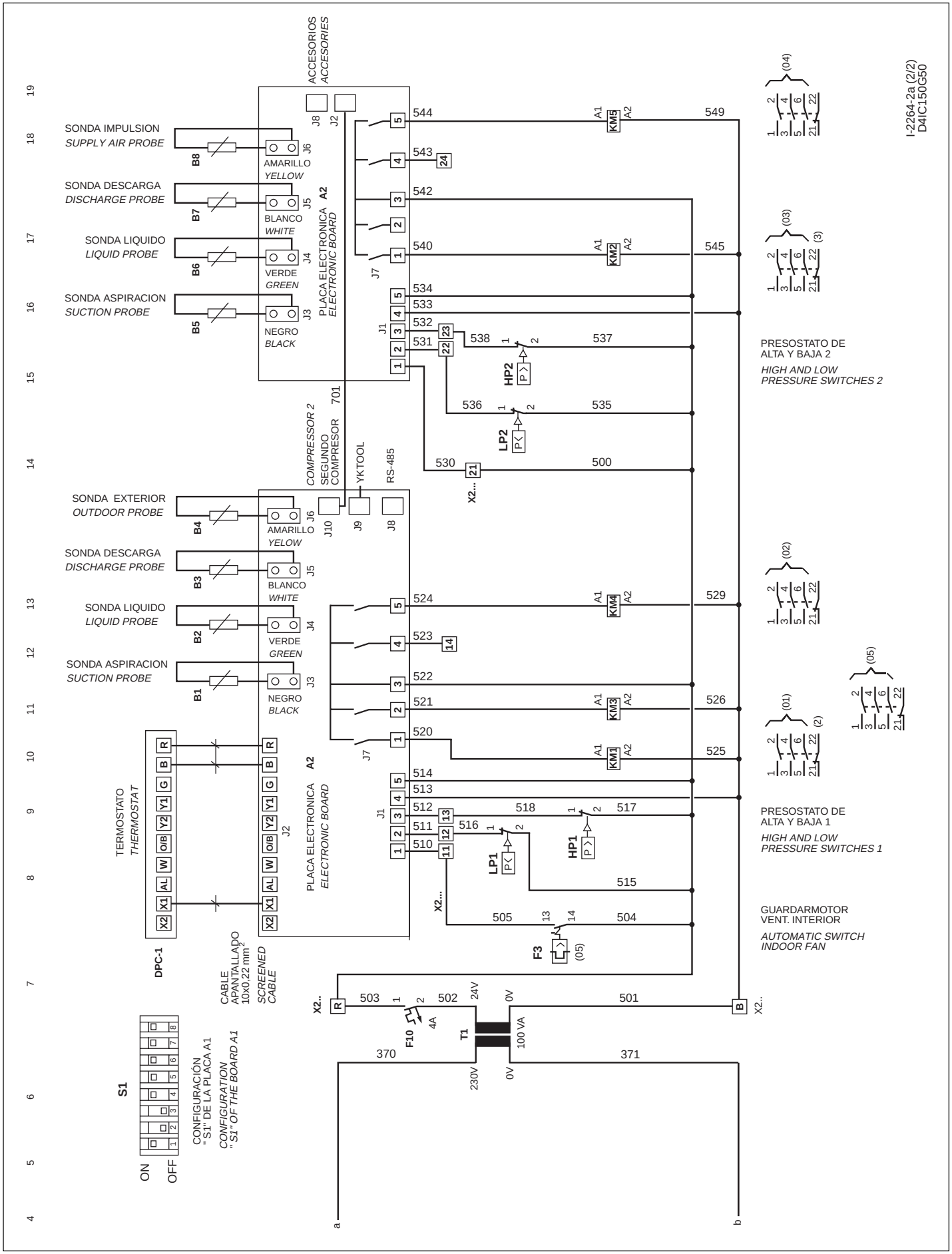
Cool only units D4IC-090G50/120G50 (2/2)



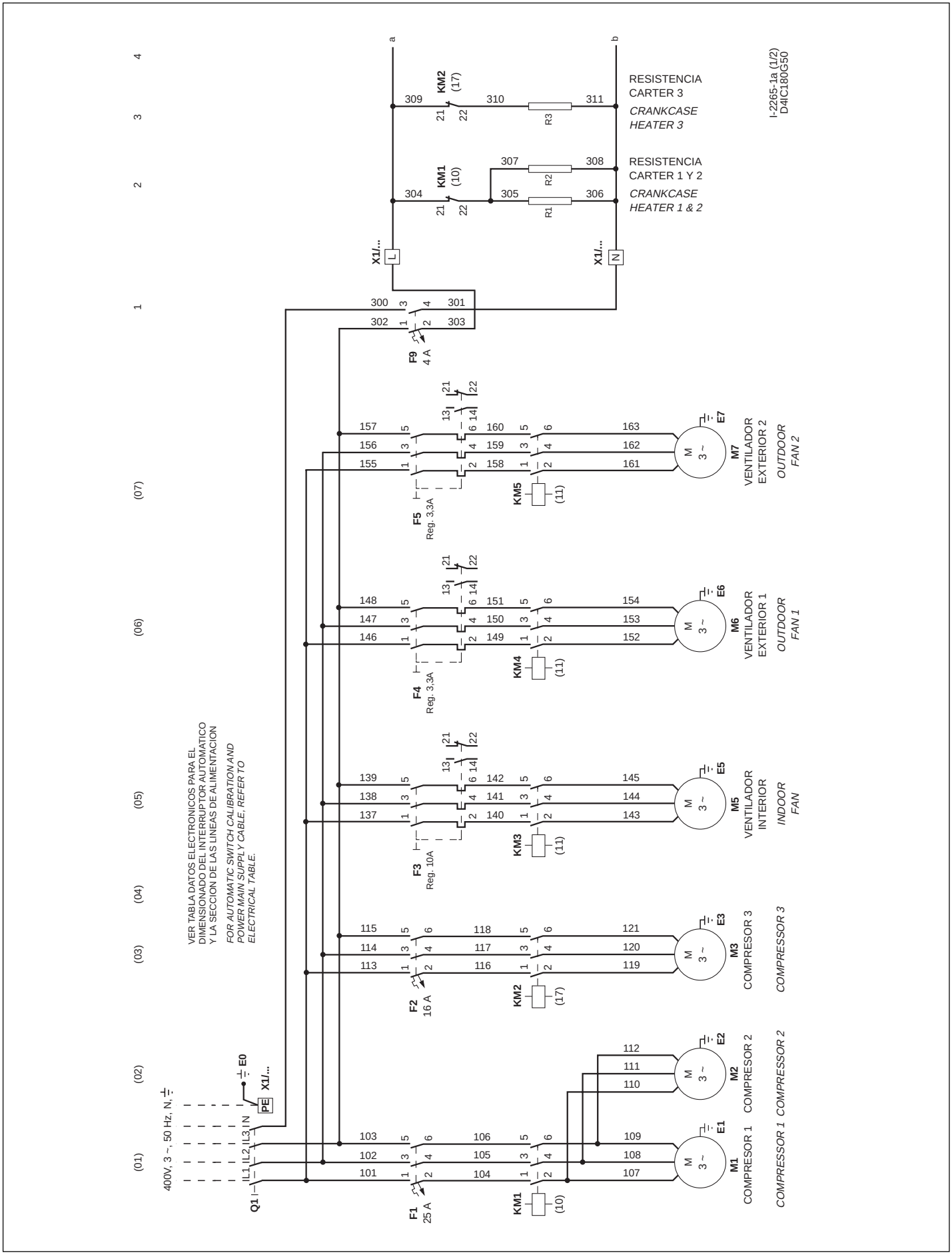
Cool only units D4IC-150G50 (1/2)



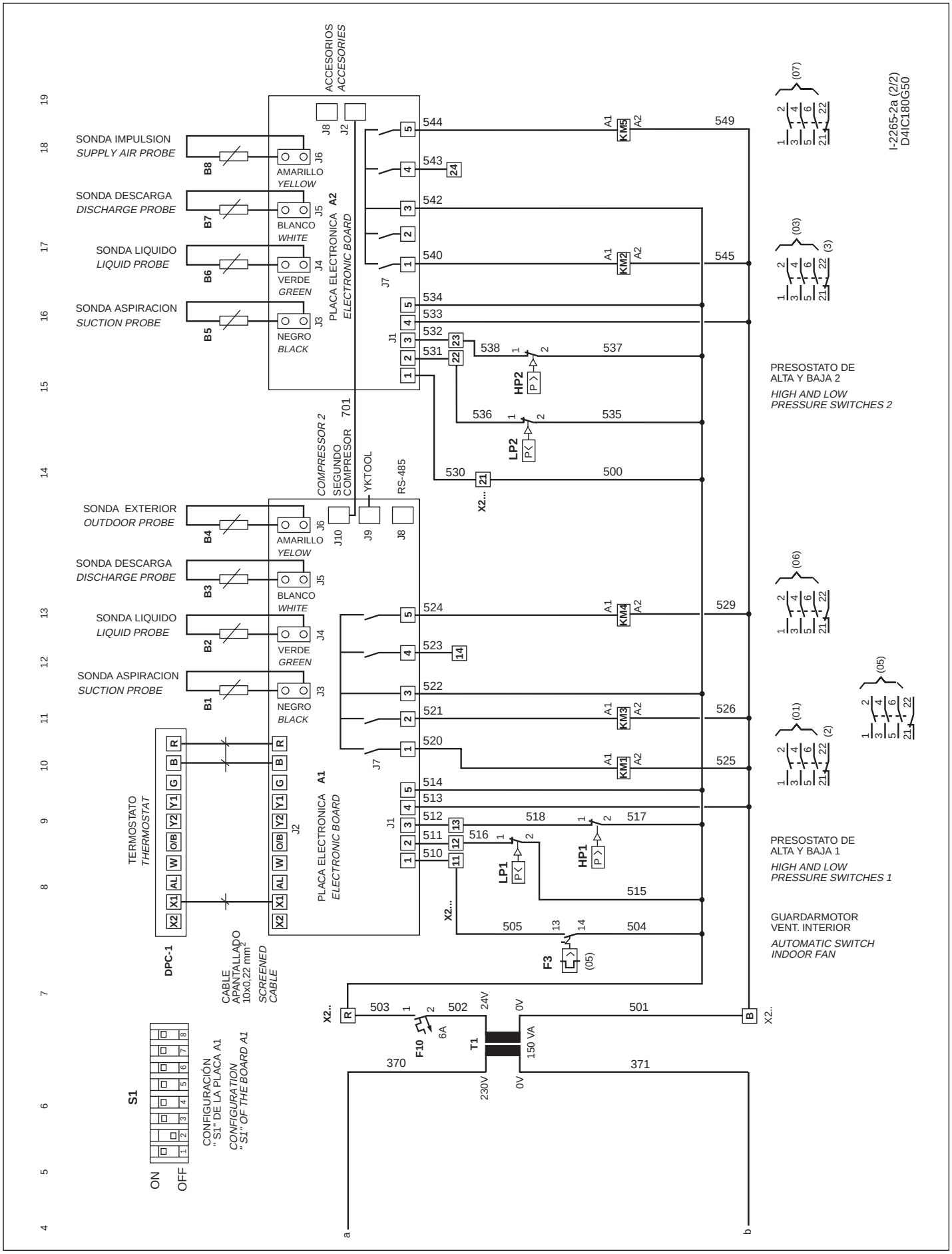
Cool only units D4IC-150G50 (2/2)



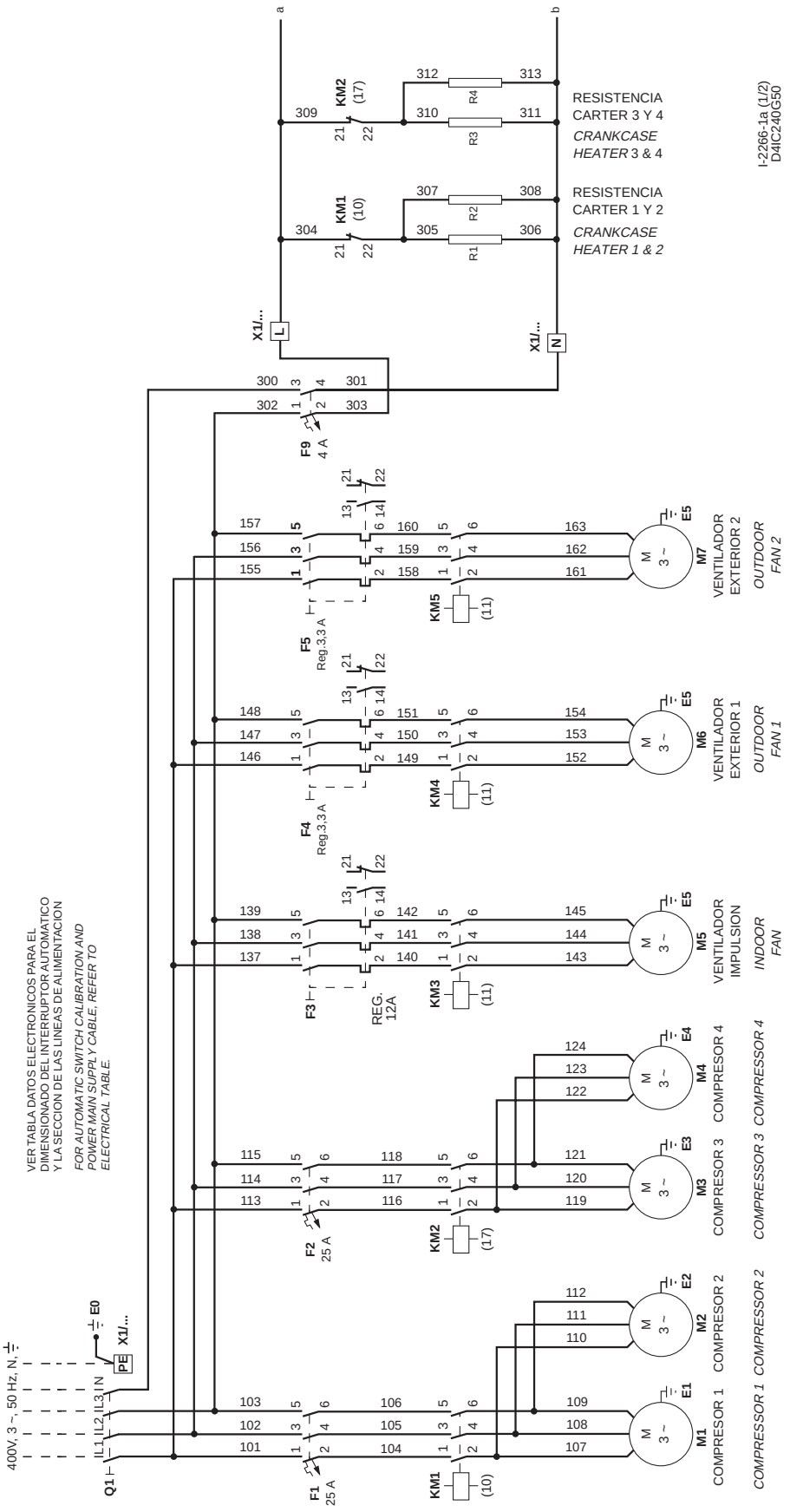
Cool only units D4IC-180G50 (1/2)



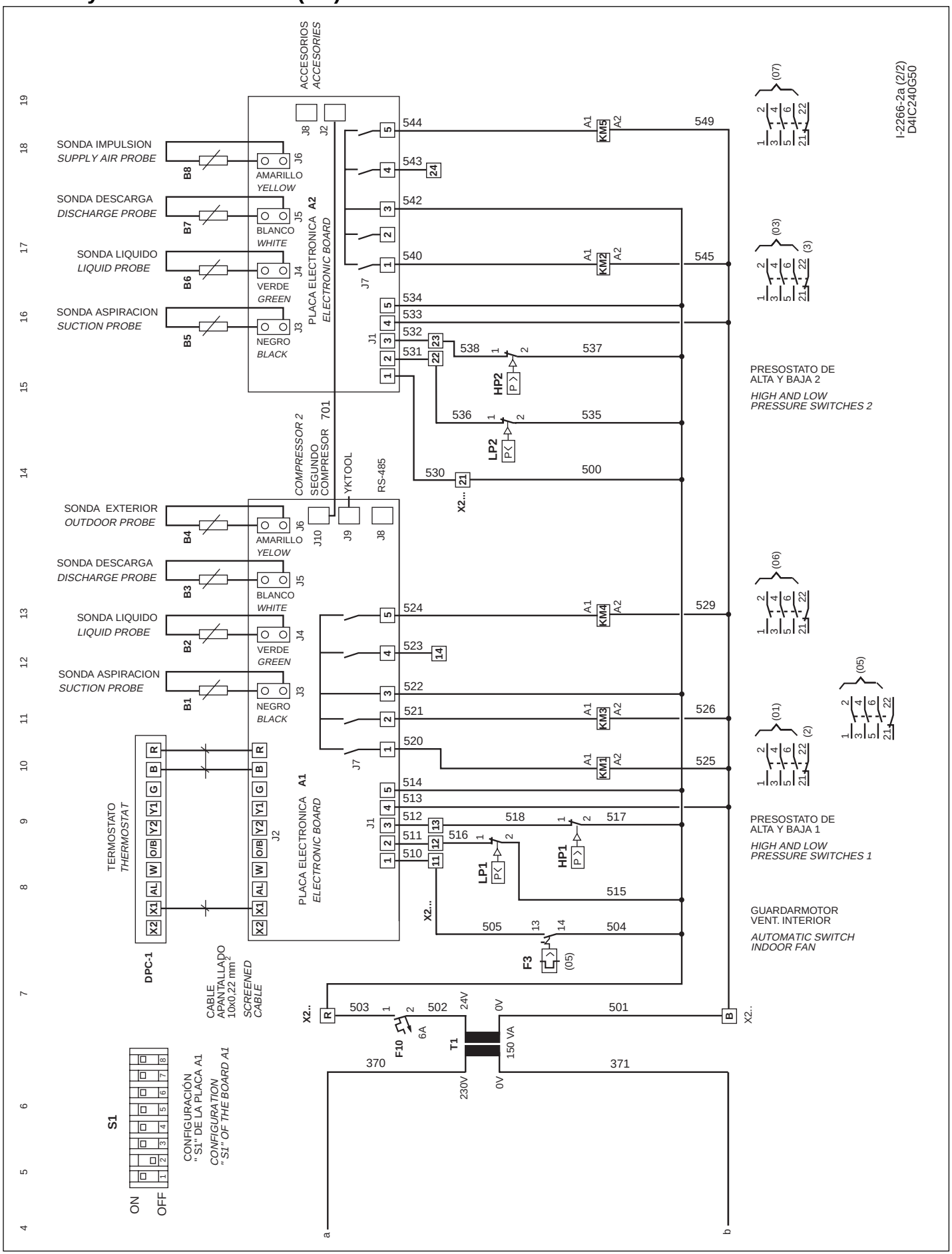
Cool only units D4IC-180G50 (2/2)



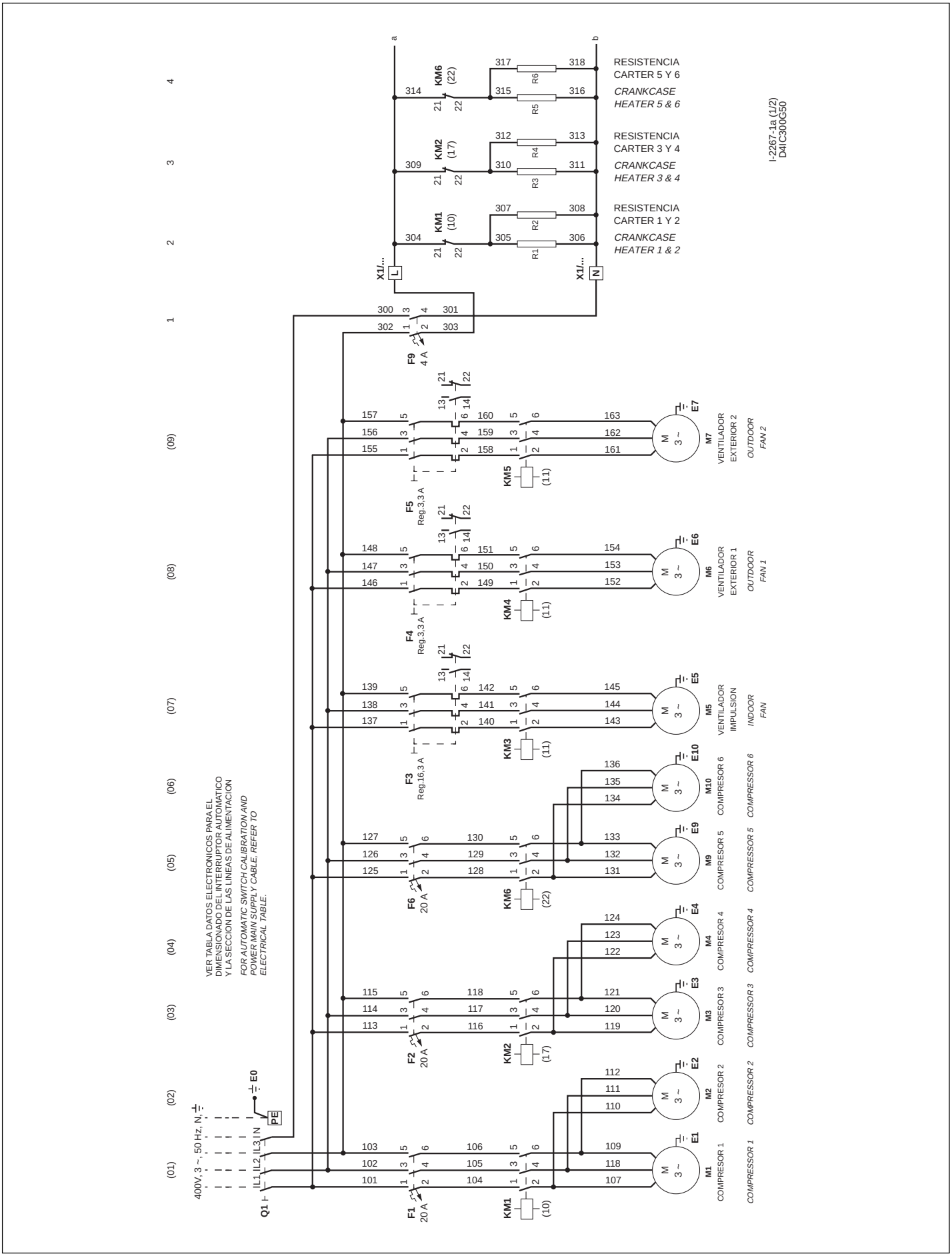
Cool only units D4IC-240G50 (1/2)



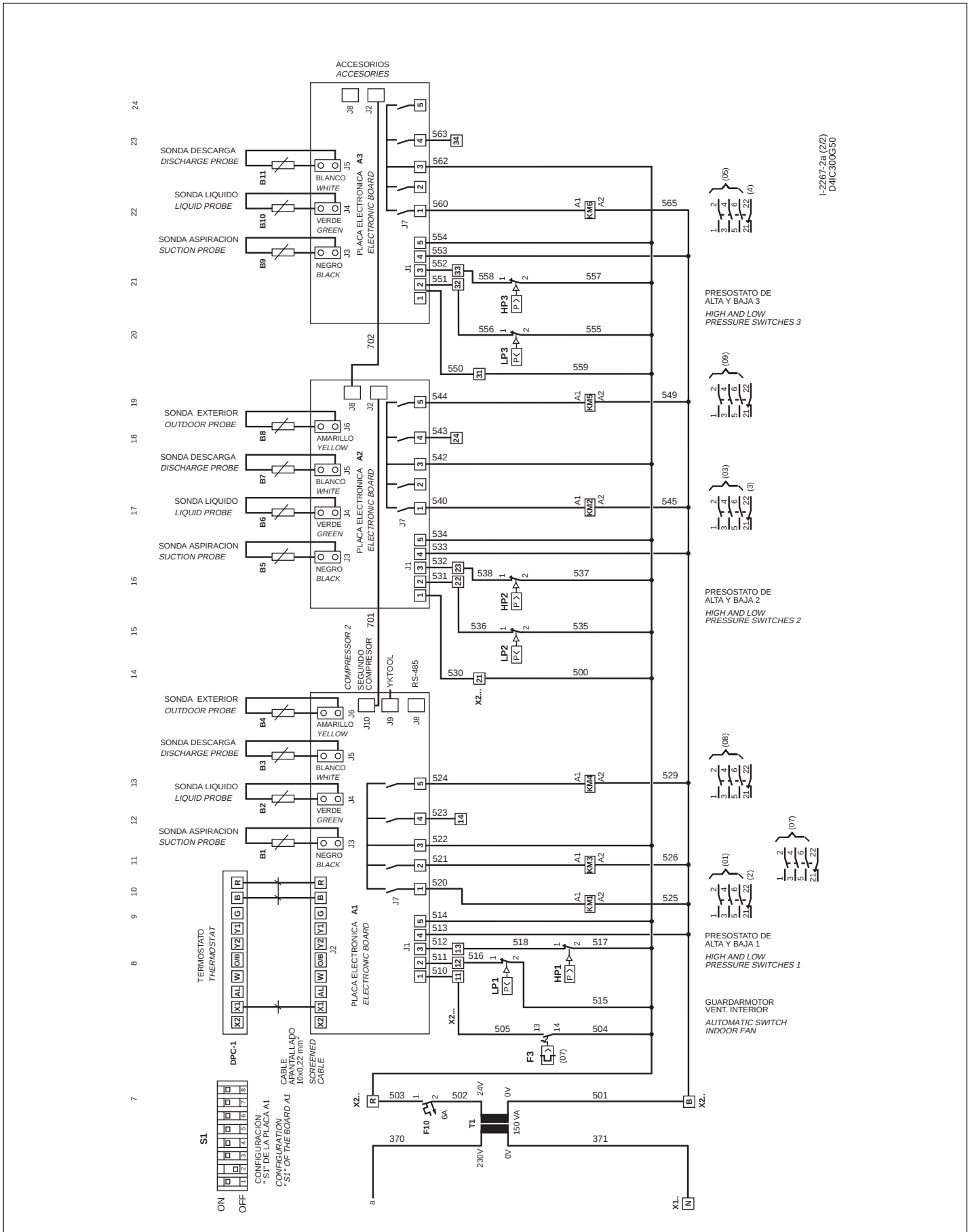
Cool only units D4IC-240G50 (2/2)



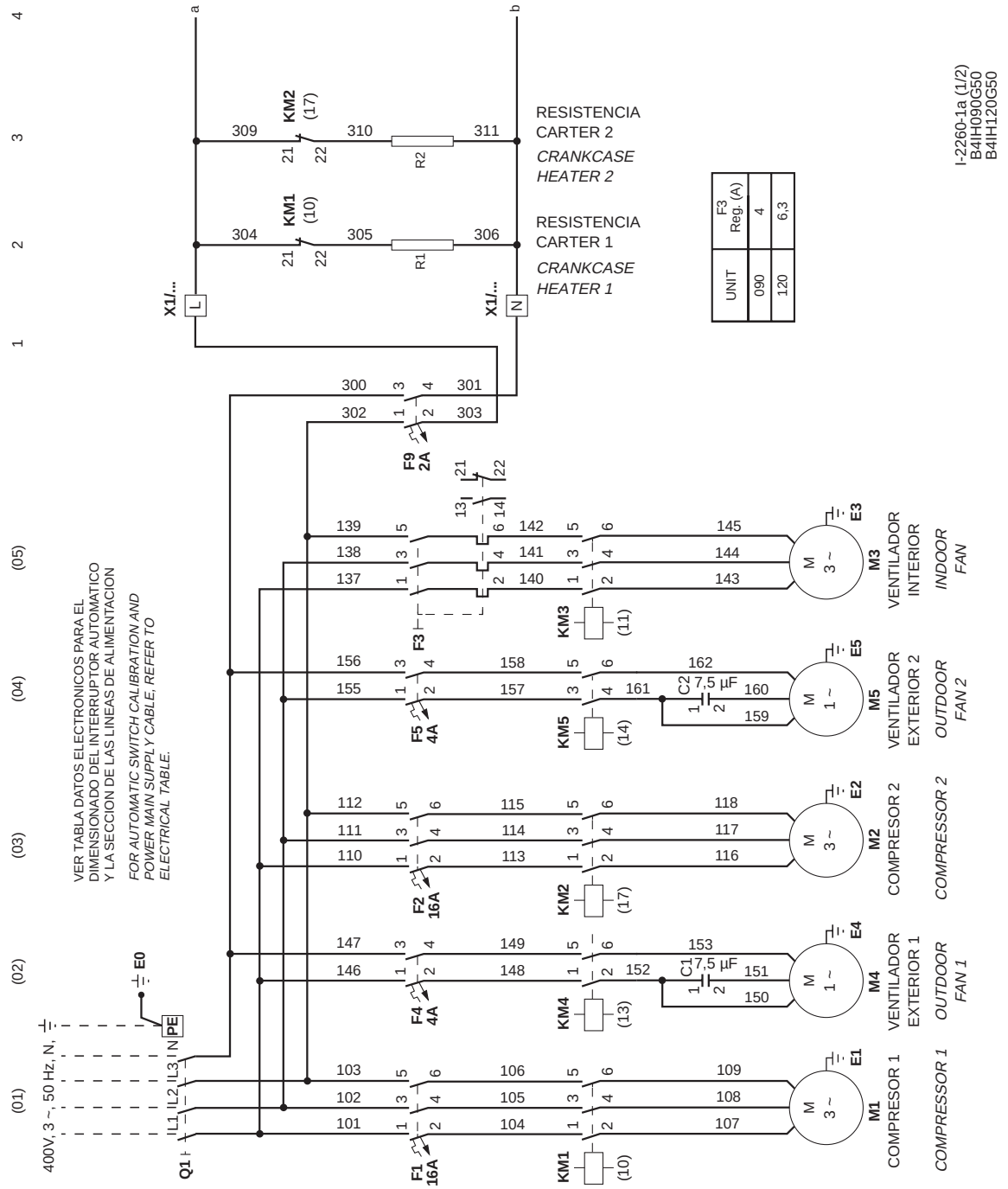
Cool only units D4IC-300G50 (1/2)



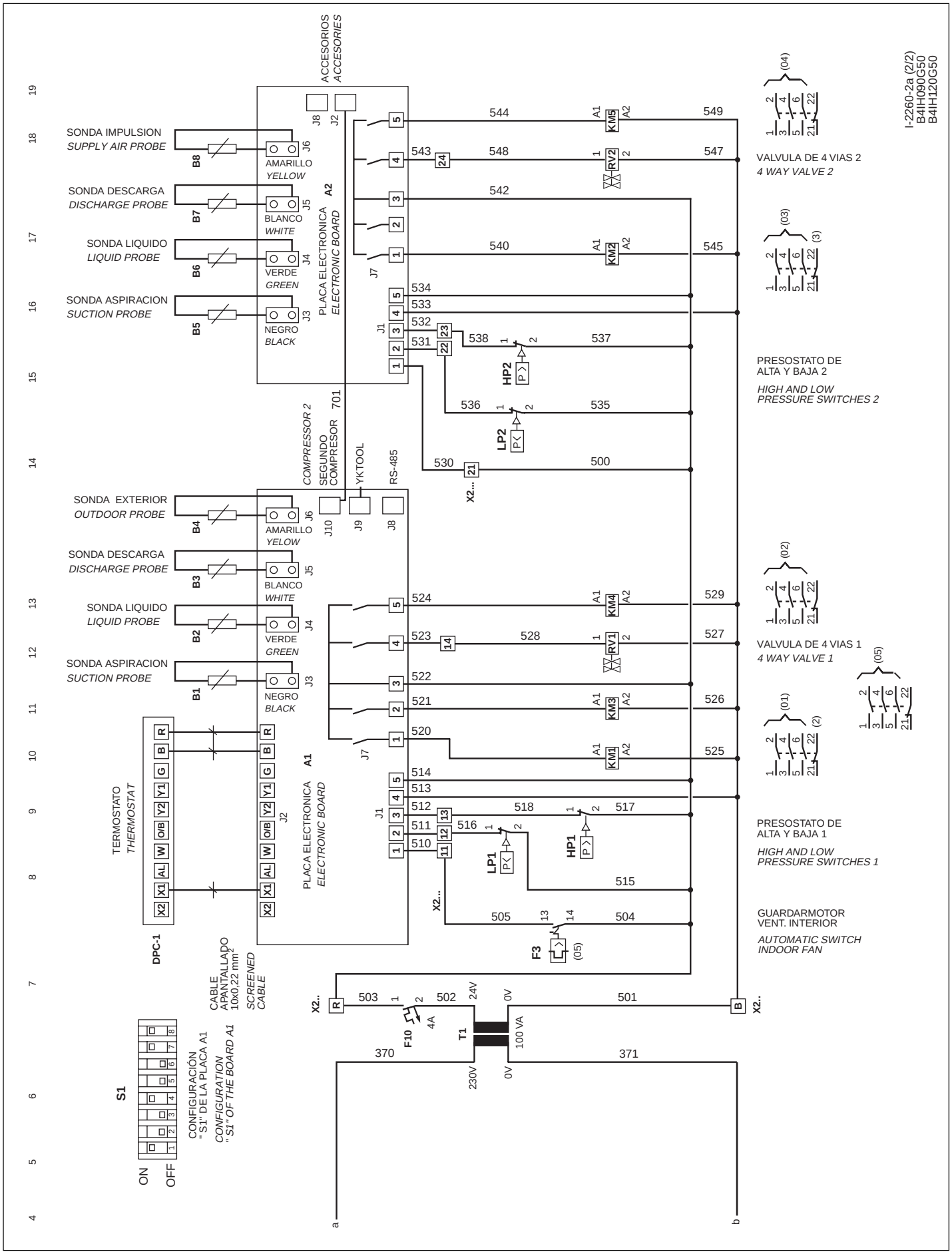
Cool only units D4IC-300G50 (2/2)



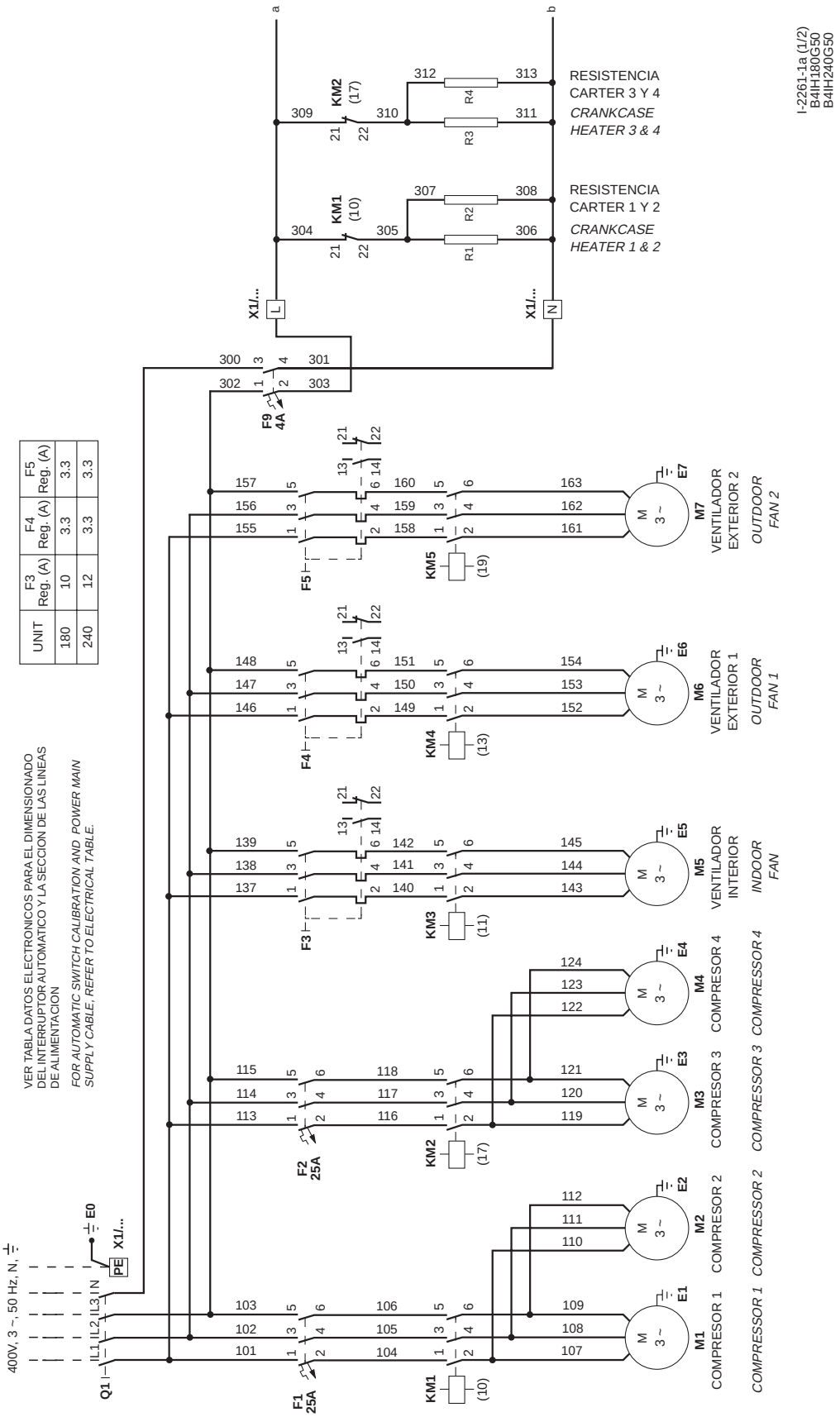
Heat pump units B4IH-090G50/B4IH-120G50 (1/2)



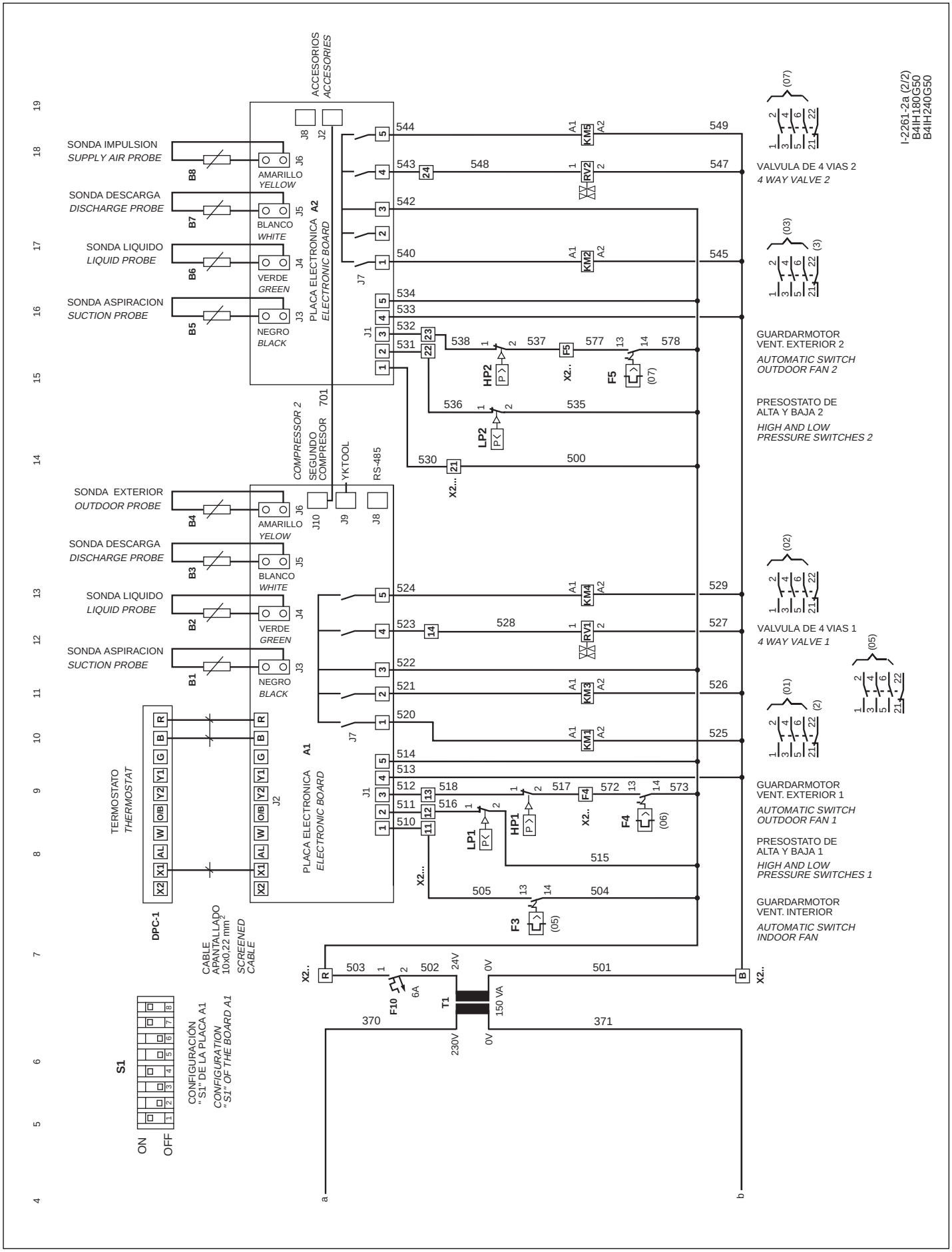
Heat pump units B4IH-090G50/B4IH-120G50 (2/2)



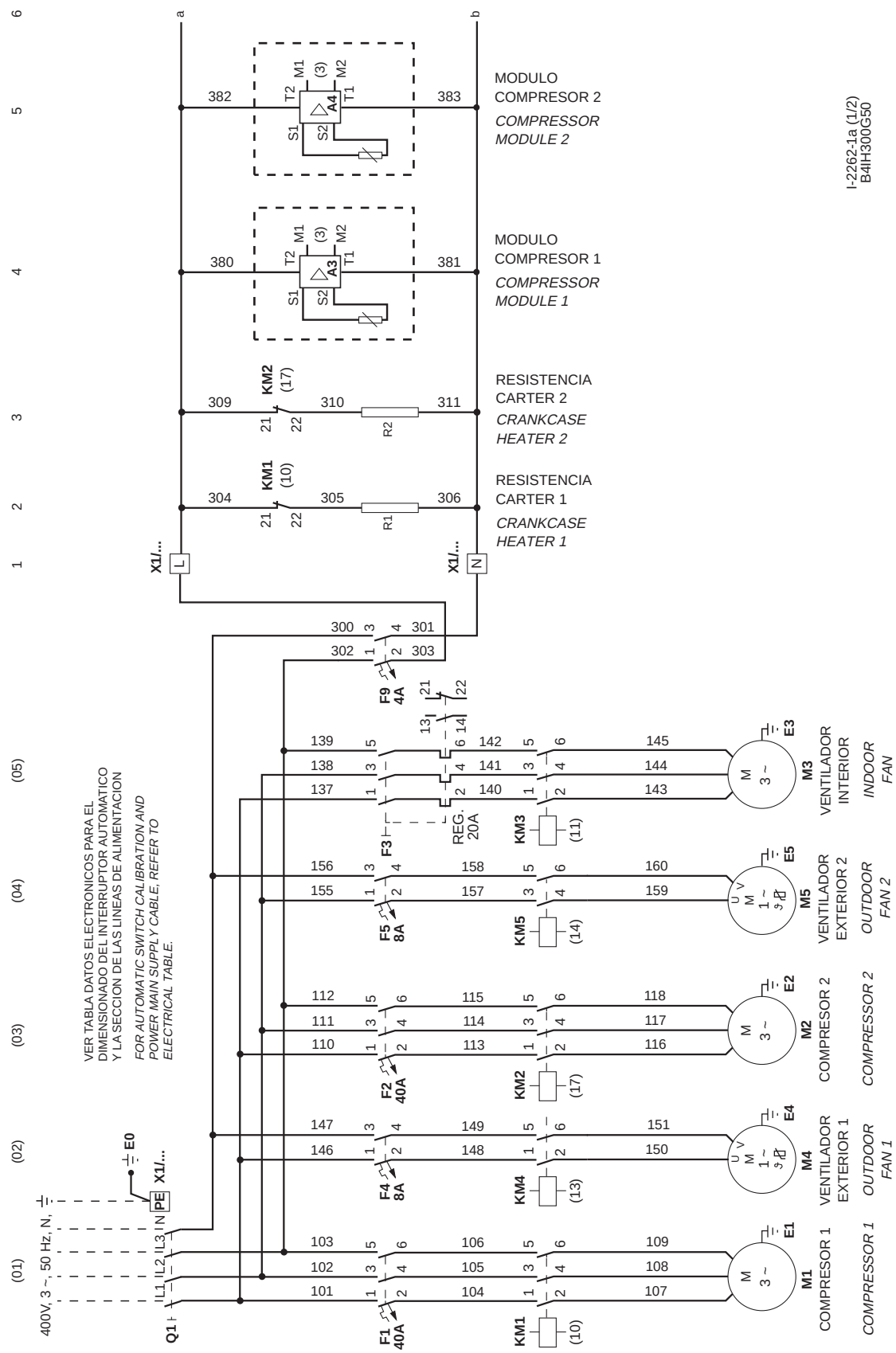
Heat pump units B4IH-180G50/B4IH-240G50 (1/2)



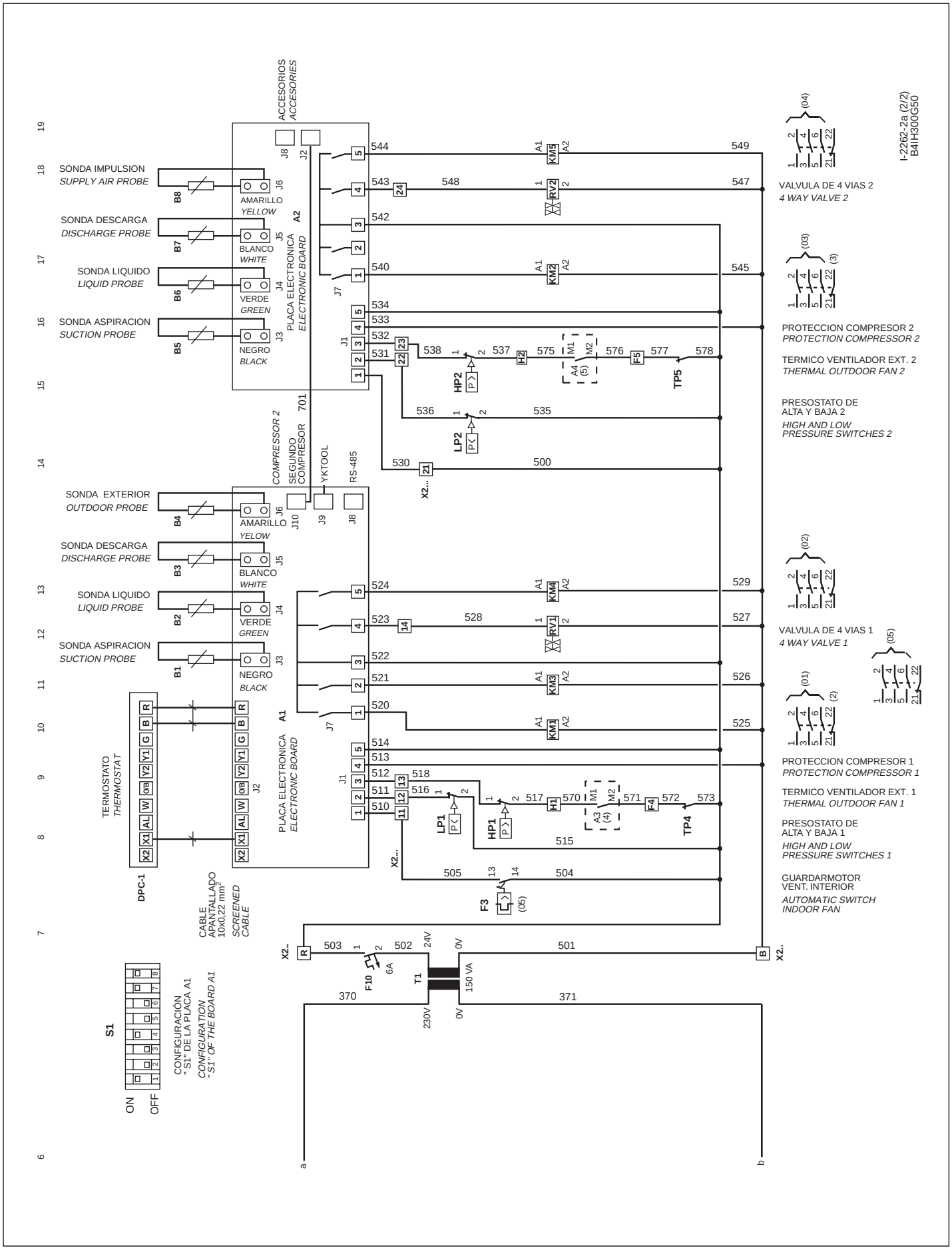
Heat pump units B4IH-180G50/B4IH-240G50 (2/2)



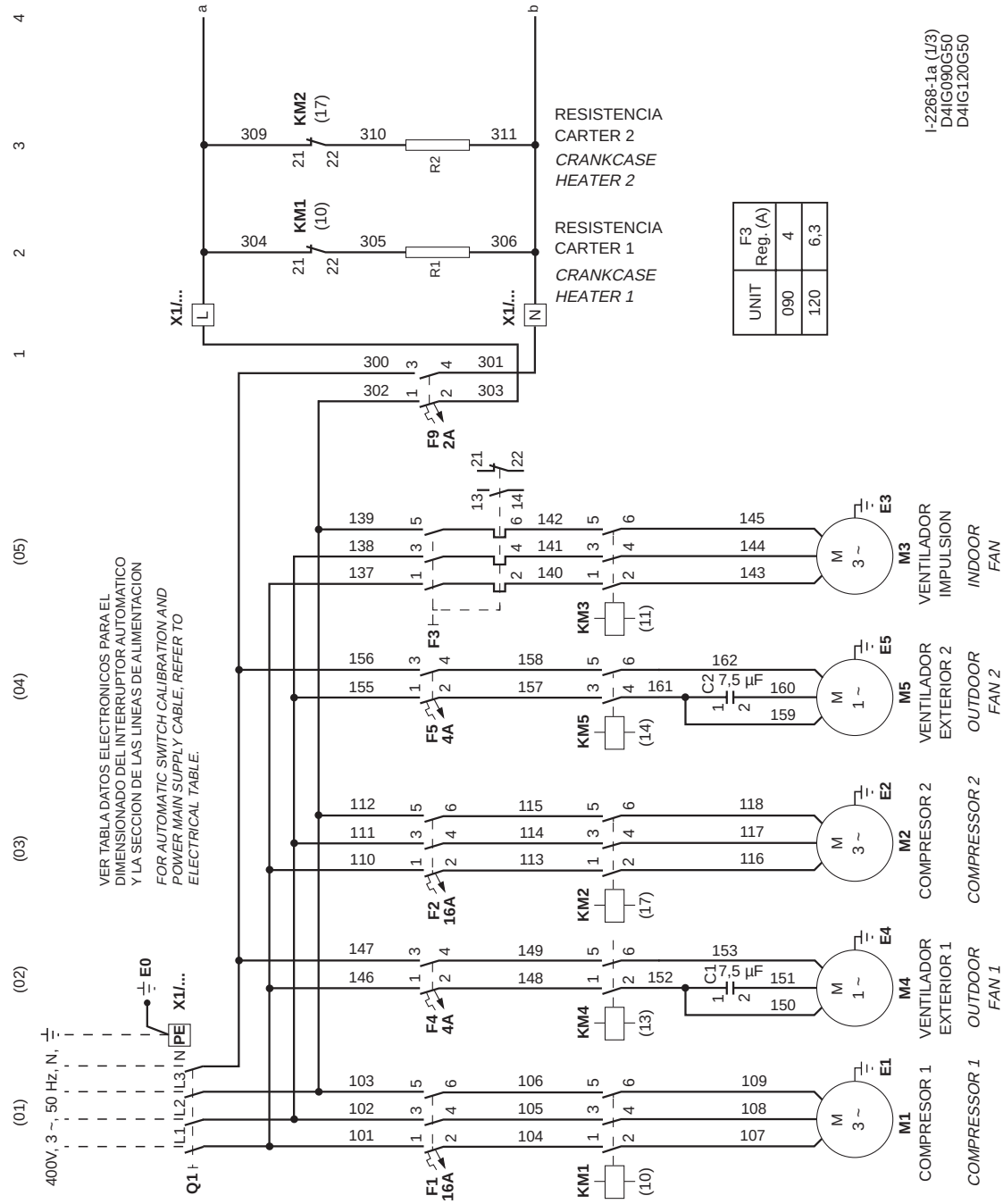
Heat pump units B4IH-300G50 (1/2)



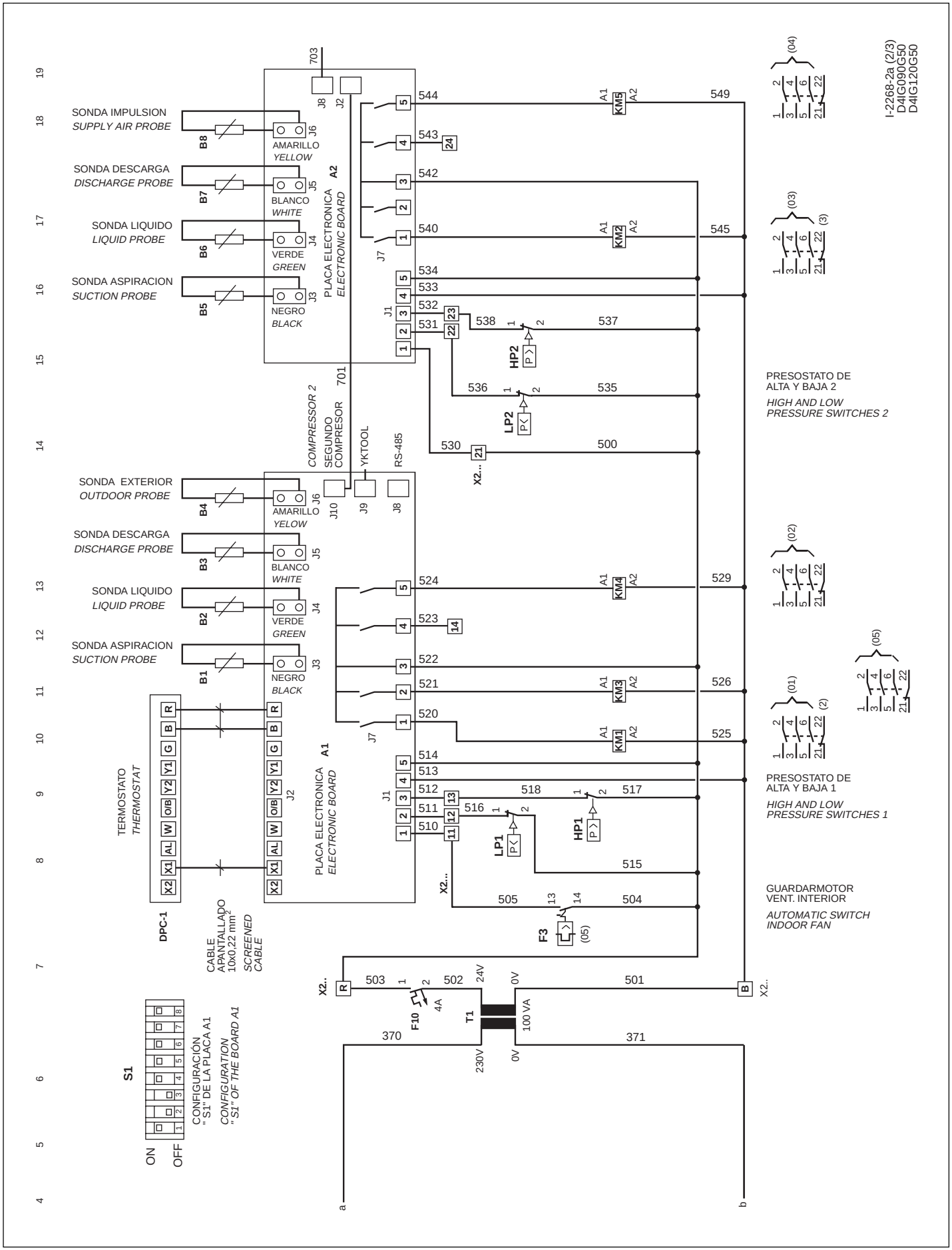
Heat pump units B4IH-300G50 (2/2)



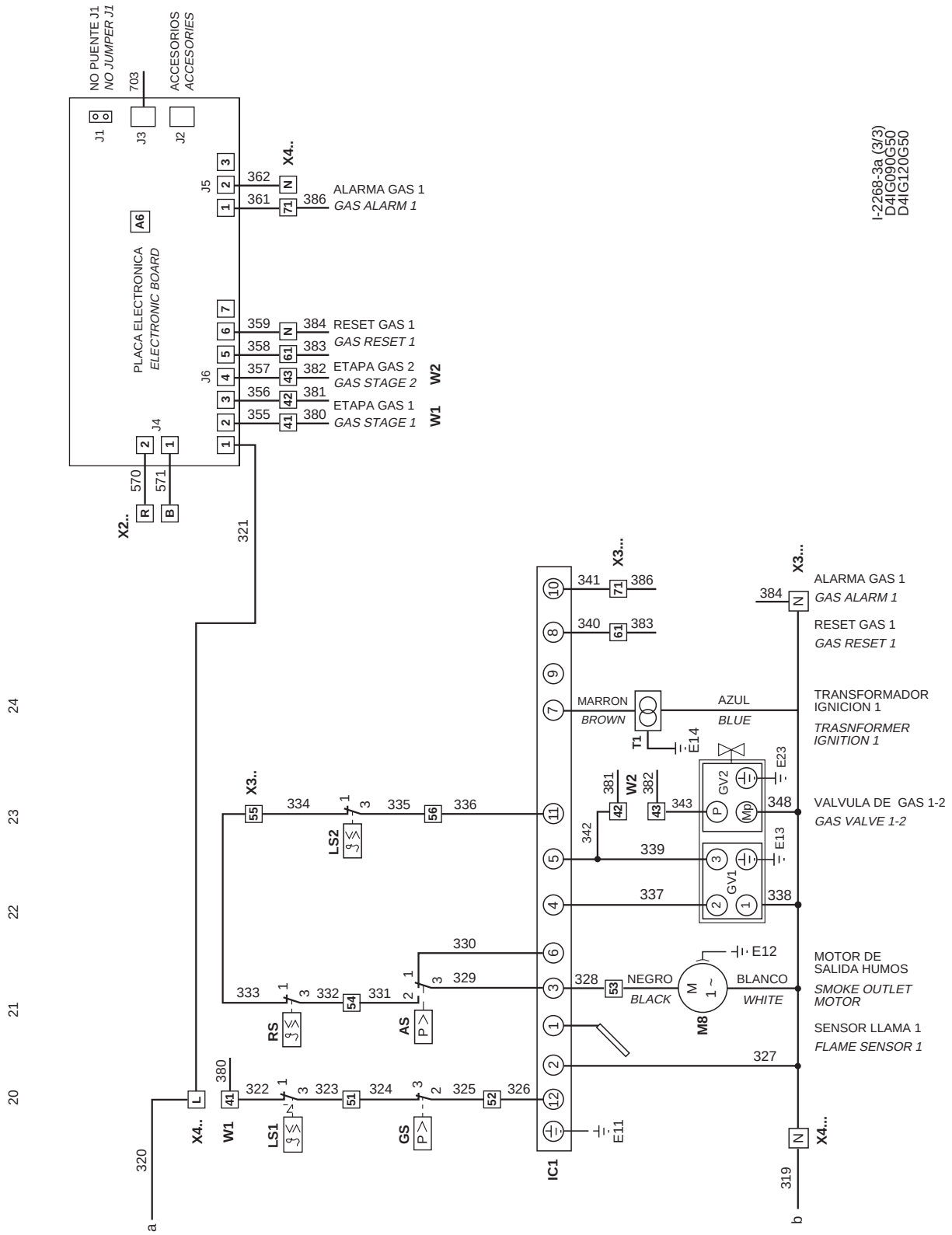
Cool only and gas heating units D4IG-090G50/D4IG-120G50 (1/3)



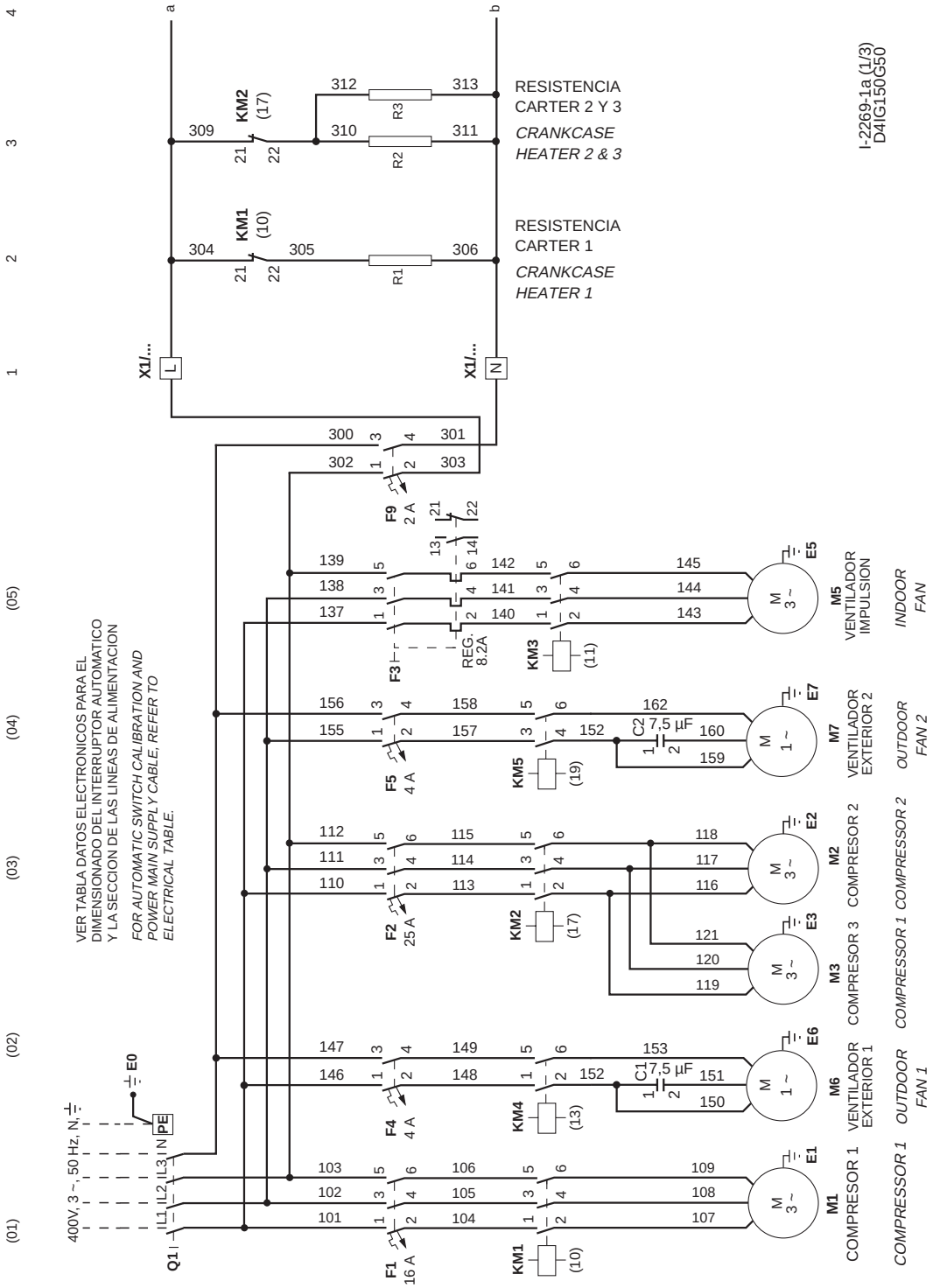
Cool only and gas heating units D4IG-090G50/D4IG-120G50 (2/3)



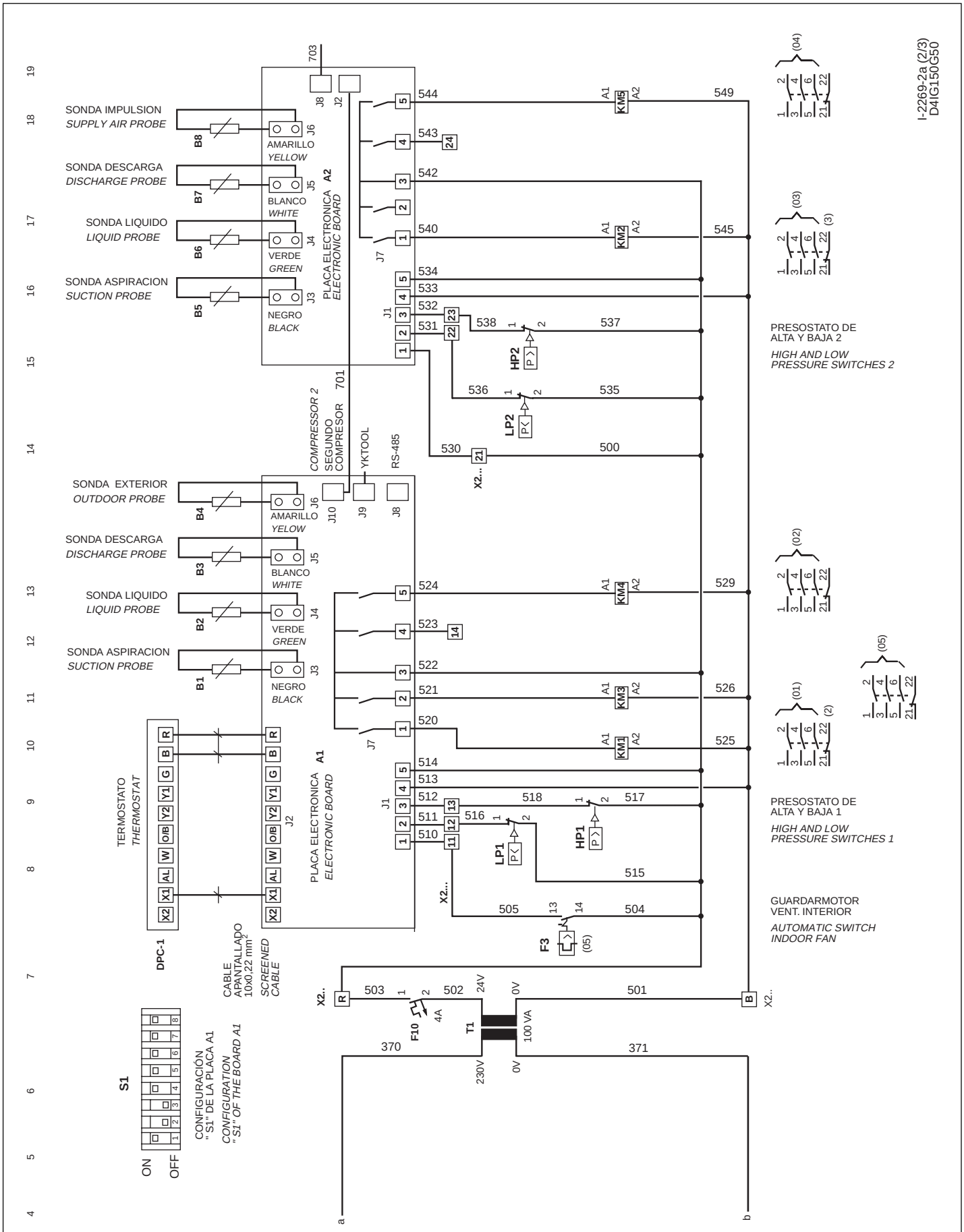
Cool only and gas heating units D4IG-090G50/D4IG-120G50 (3/3)



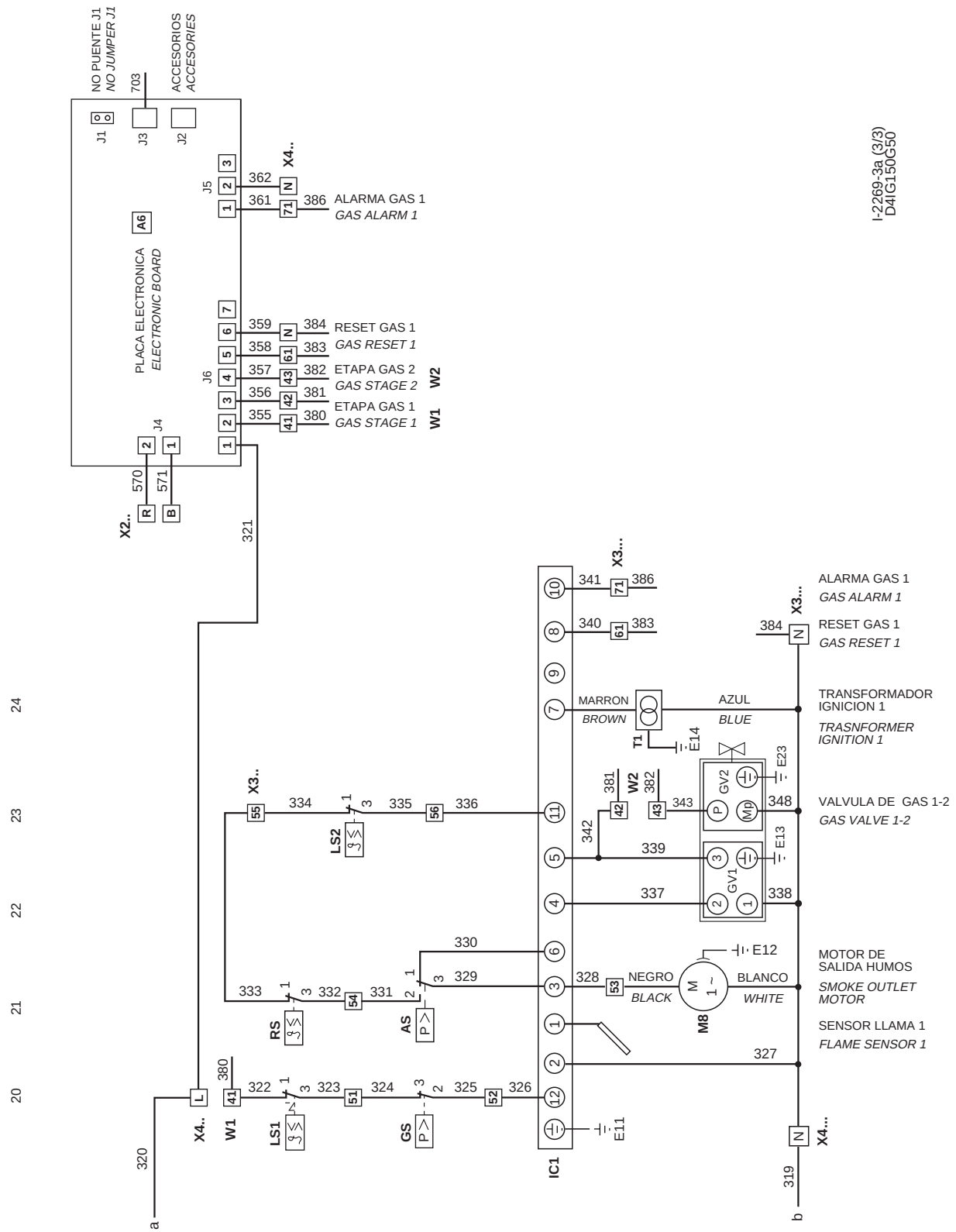
Cool only and gas heating units D4IG-150G50 (1/3)



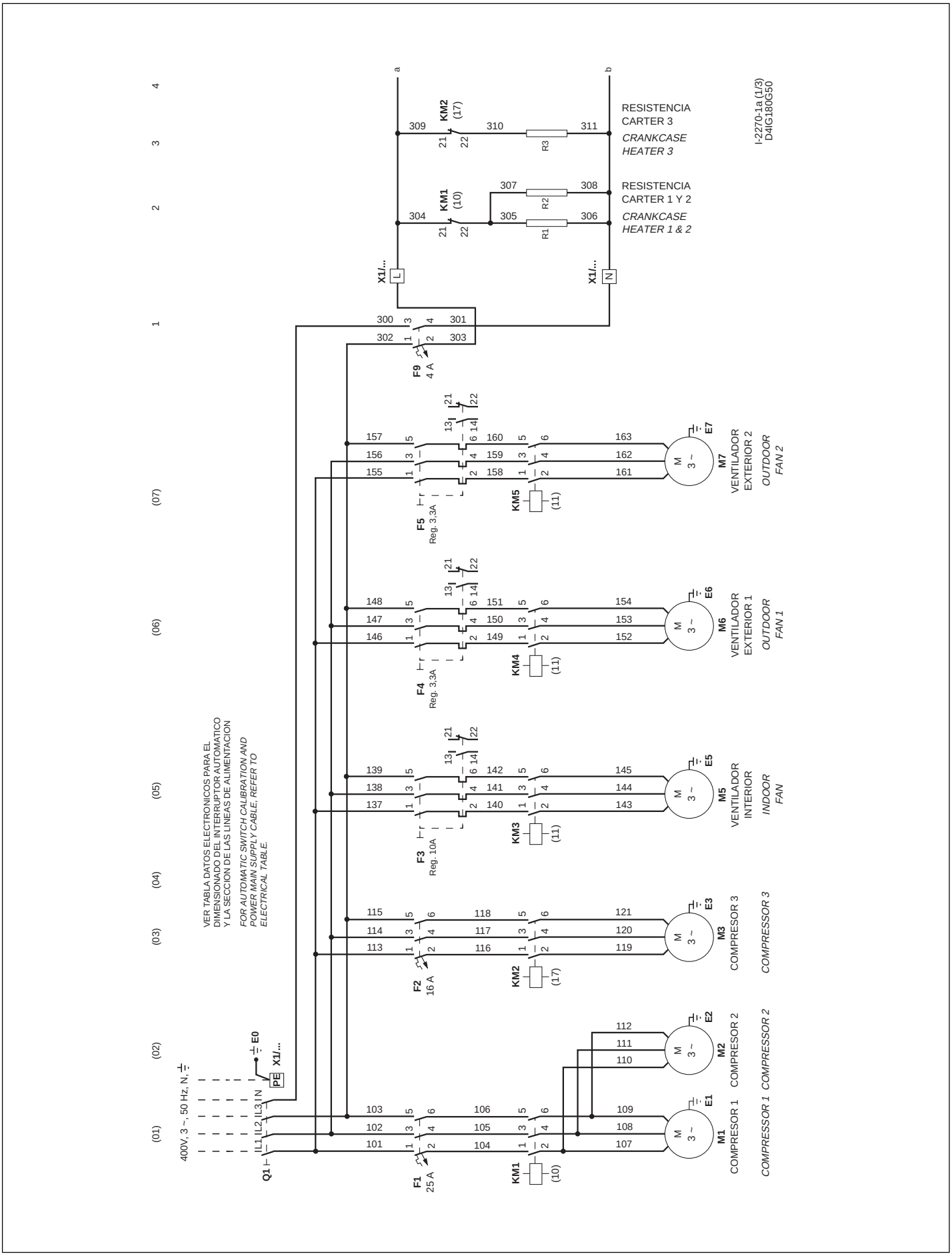
Cool only and gas heating units D4IG-150G50 (2/3)



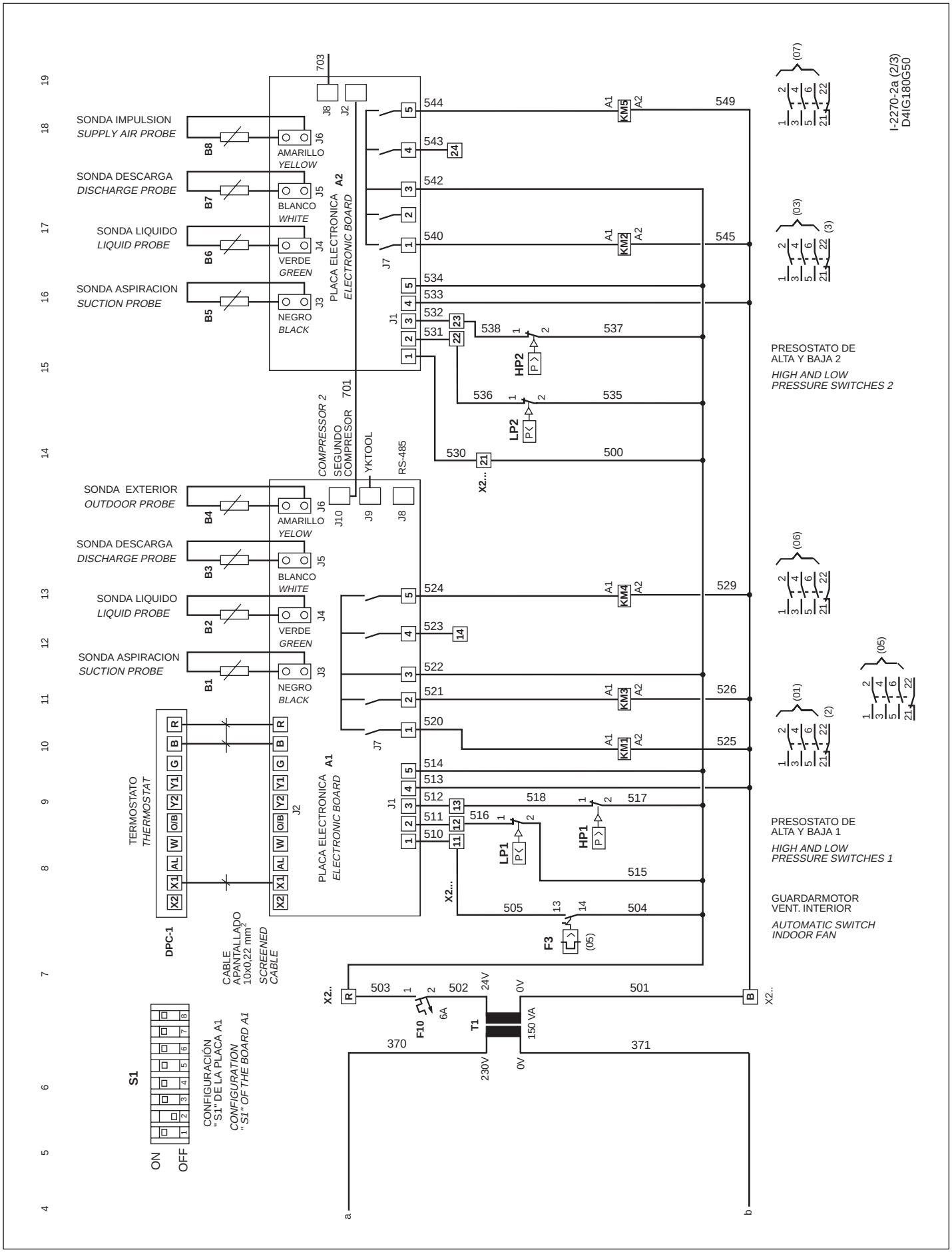
Cool only and gas heating units D4IG-150G50 (3/3)



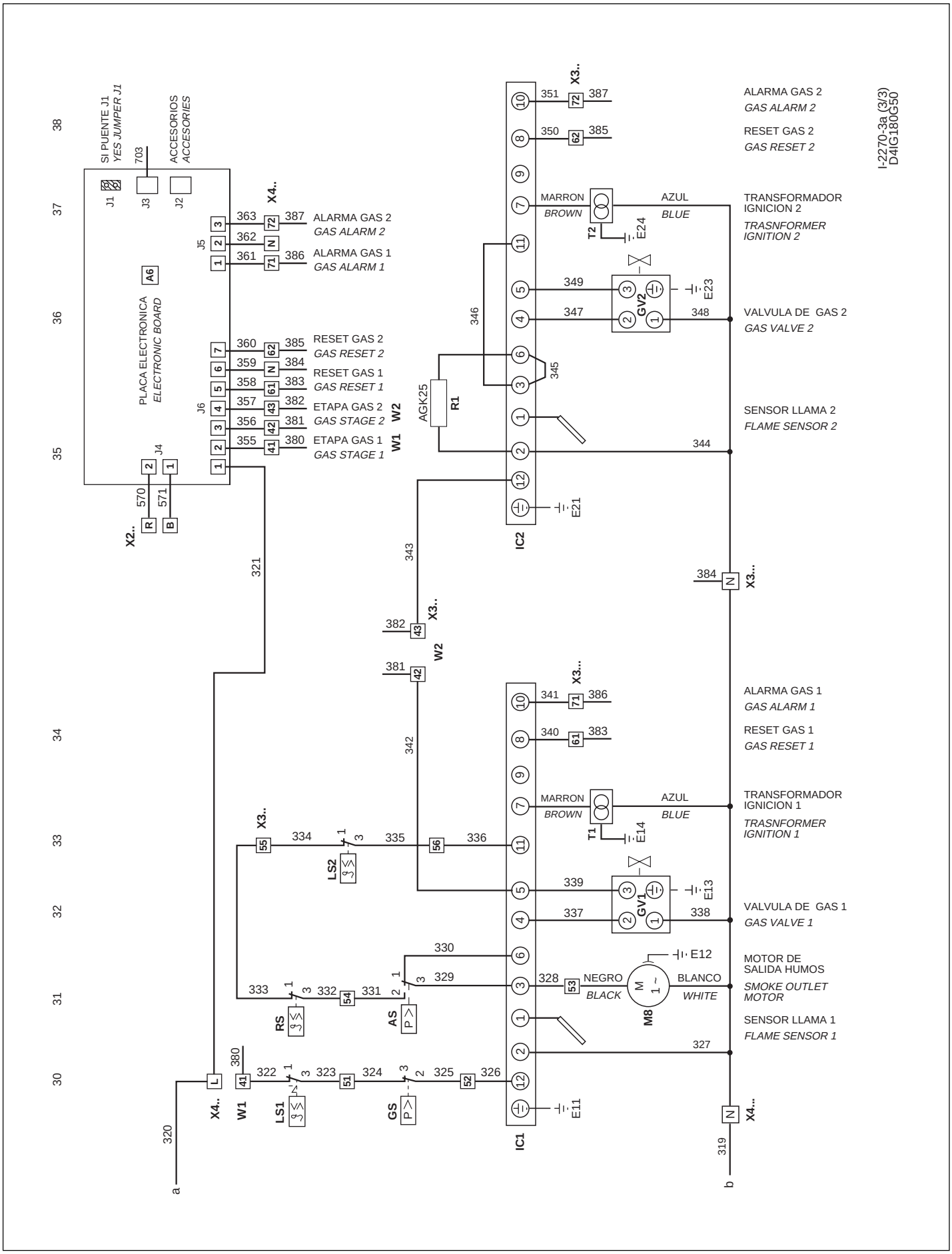
Cool only and gas heating units D4IG-180G50 (1/3)



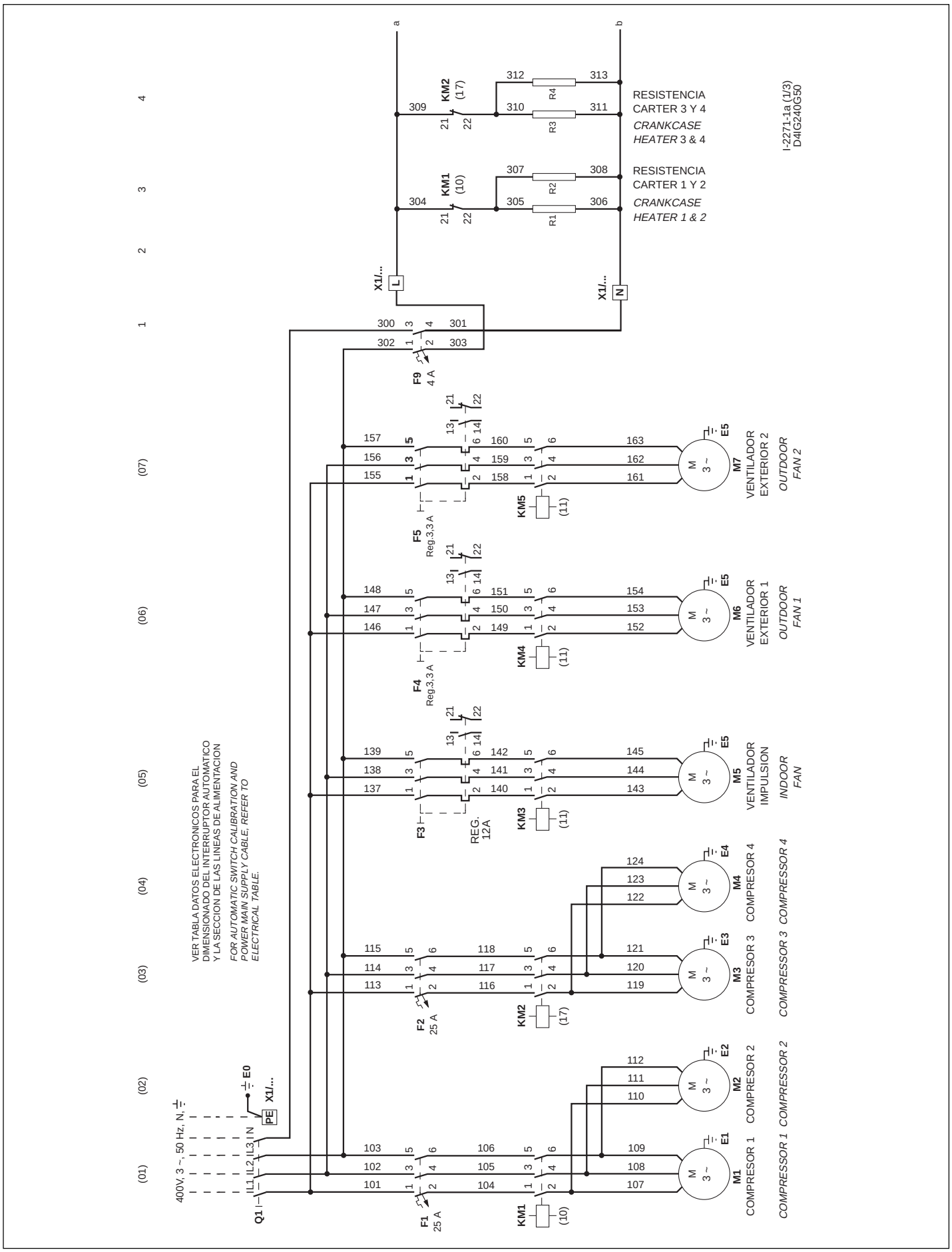
Cool only and gas heating units D4IG-180G50 (2/3)



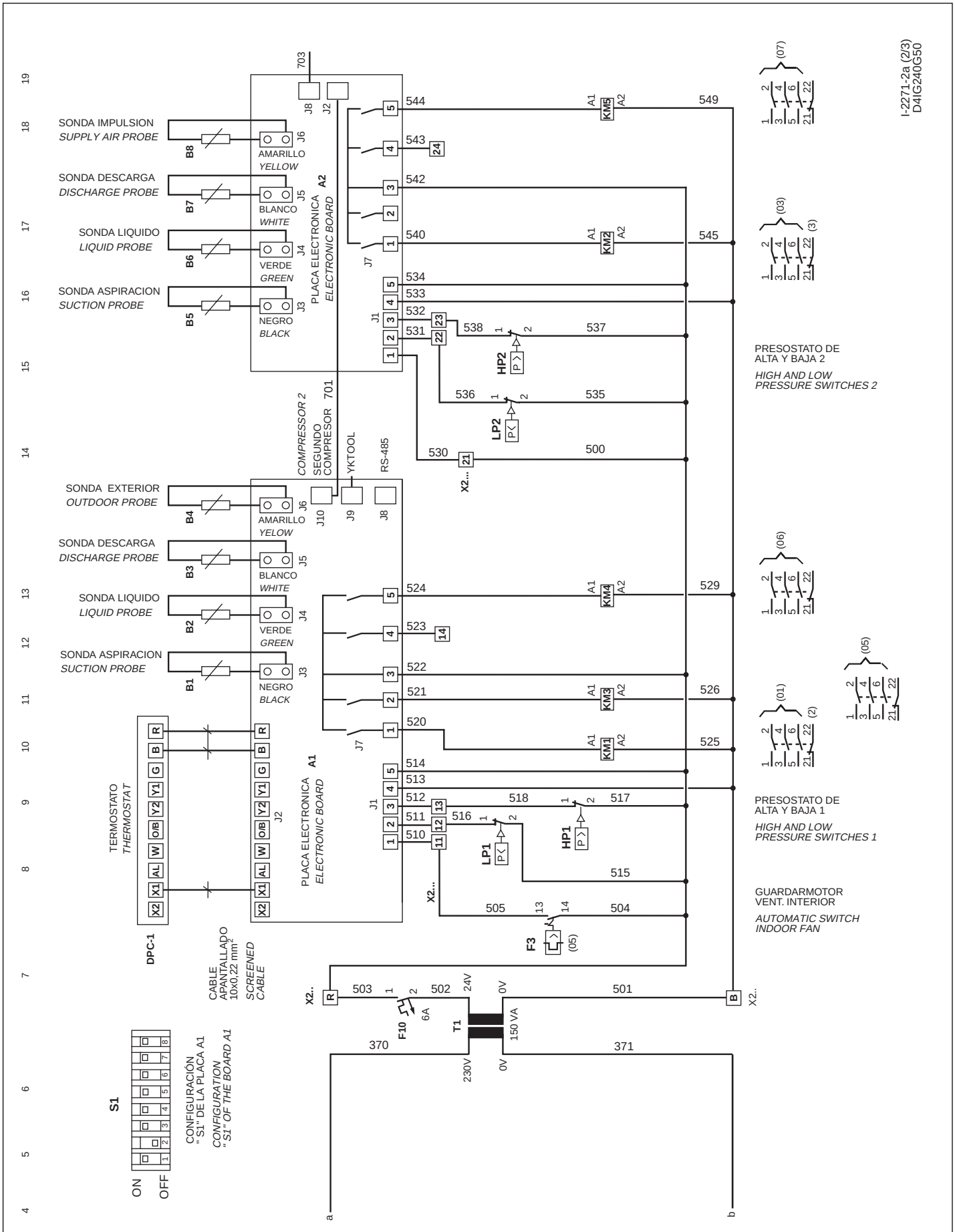
Cool only and gas heating units D4IG-180G50 (3/3)



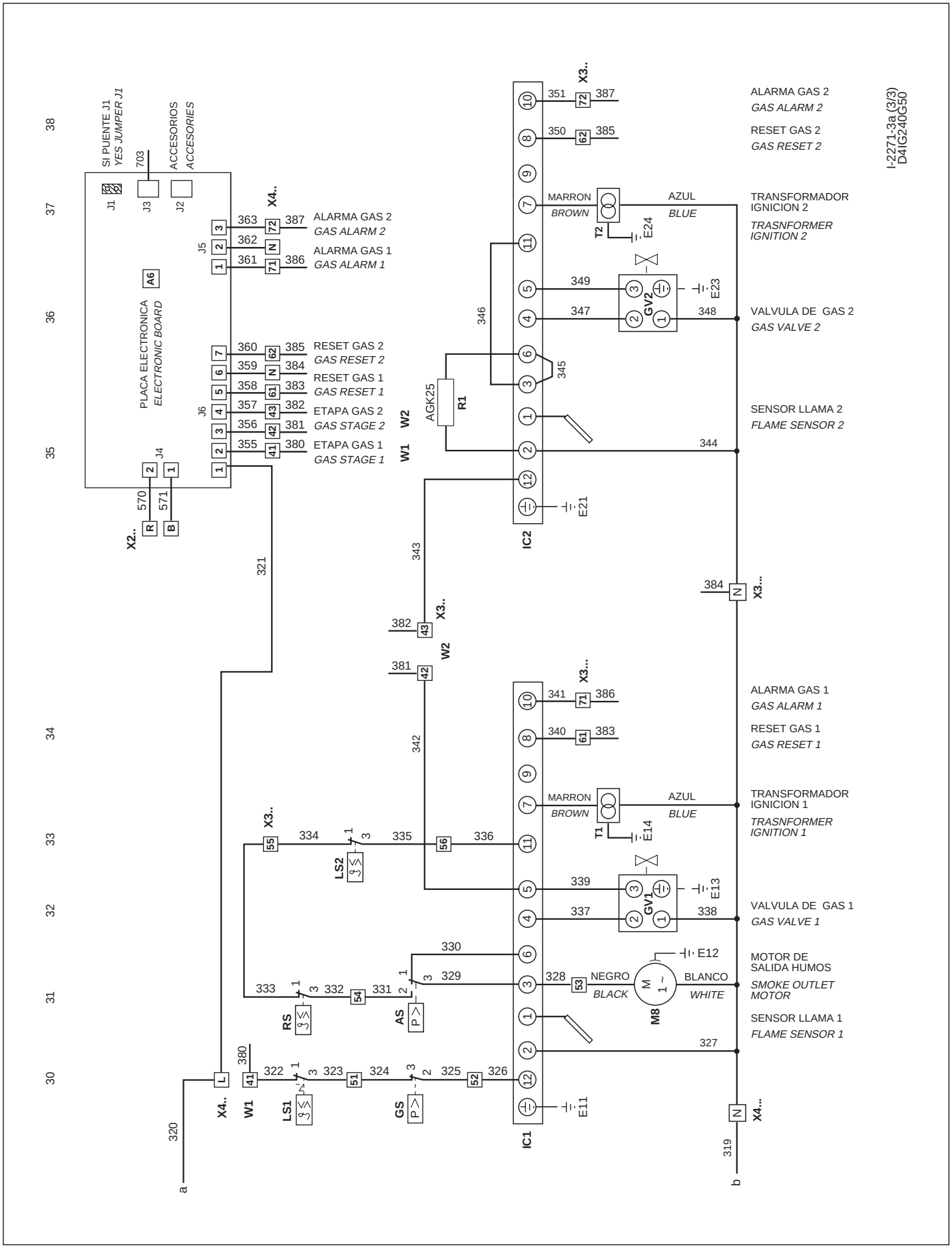
Cool only and gas heating units D4IG-240G50 (1/3)



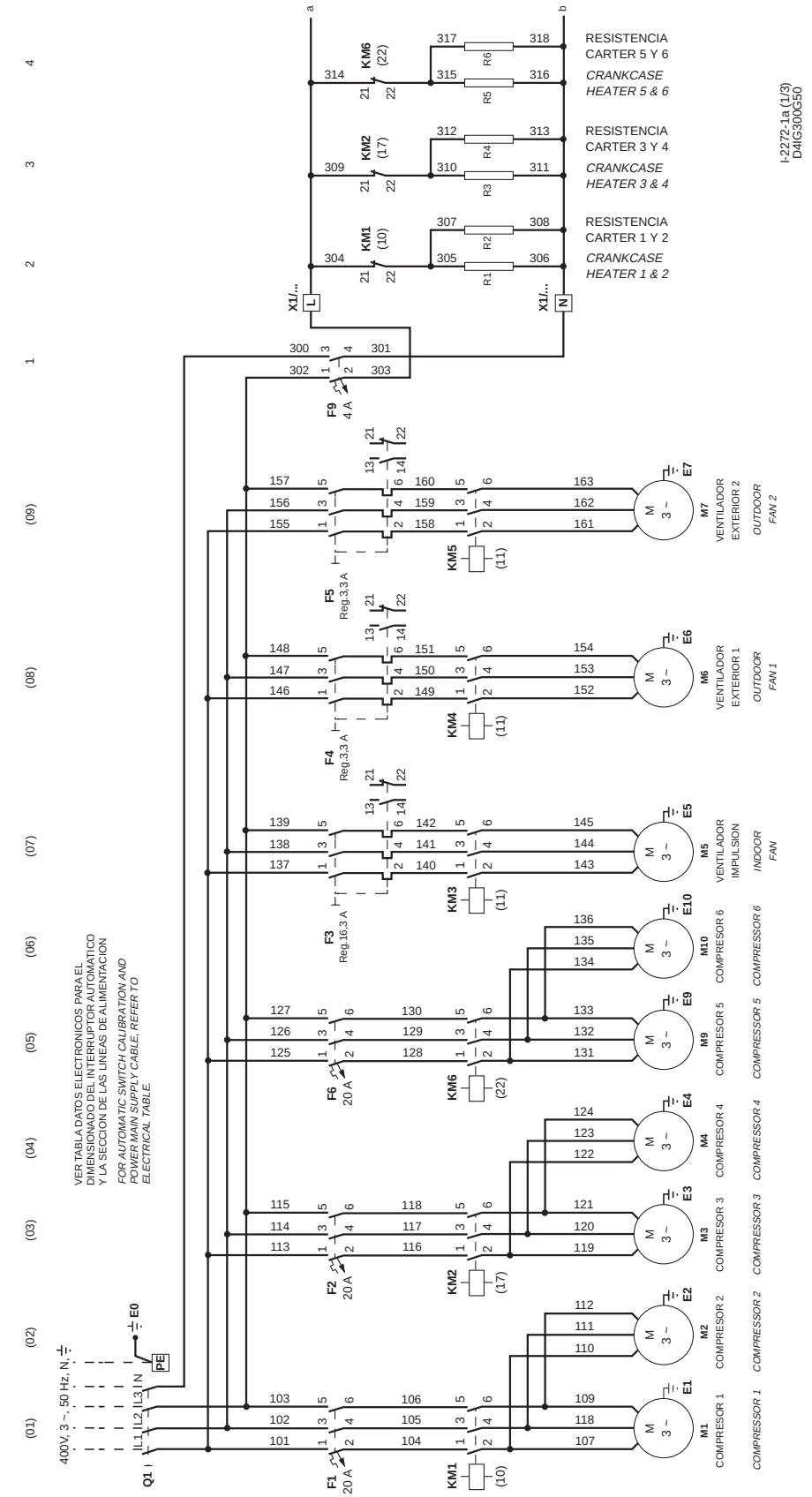
Cool only and gas heating units D4IG-240G50 (2/3)



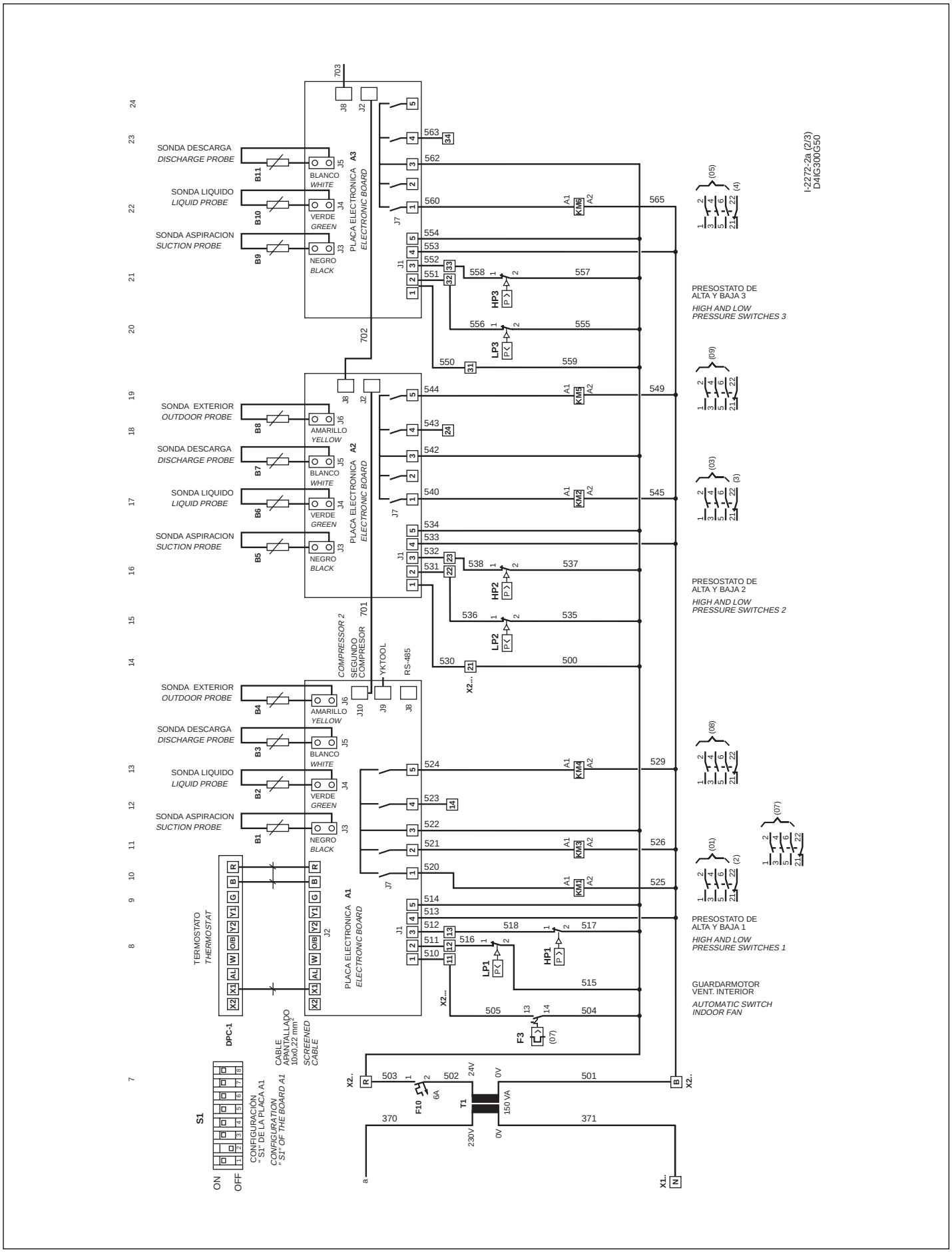
Cool only and gas heating units D4IG-240G50 (3/3)



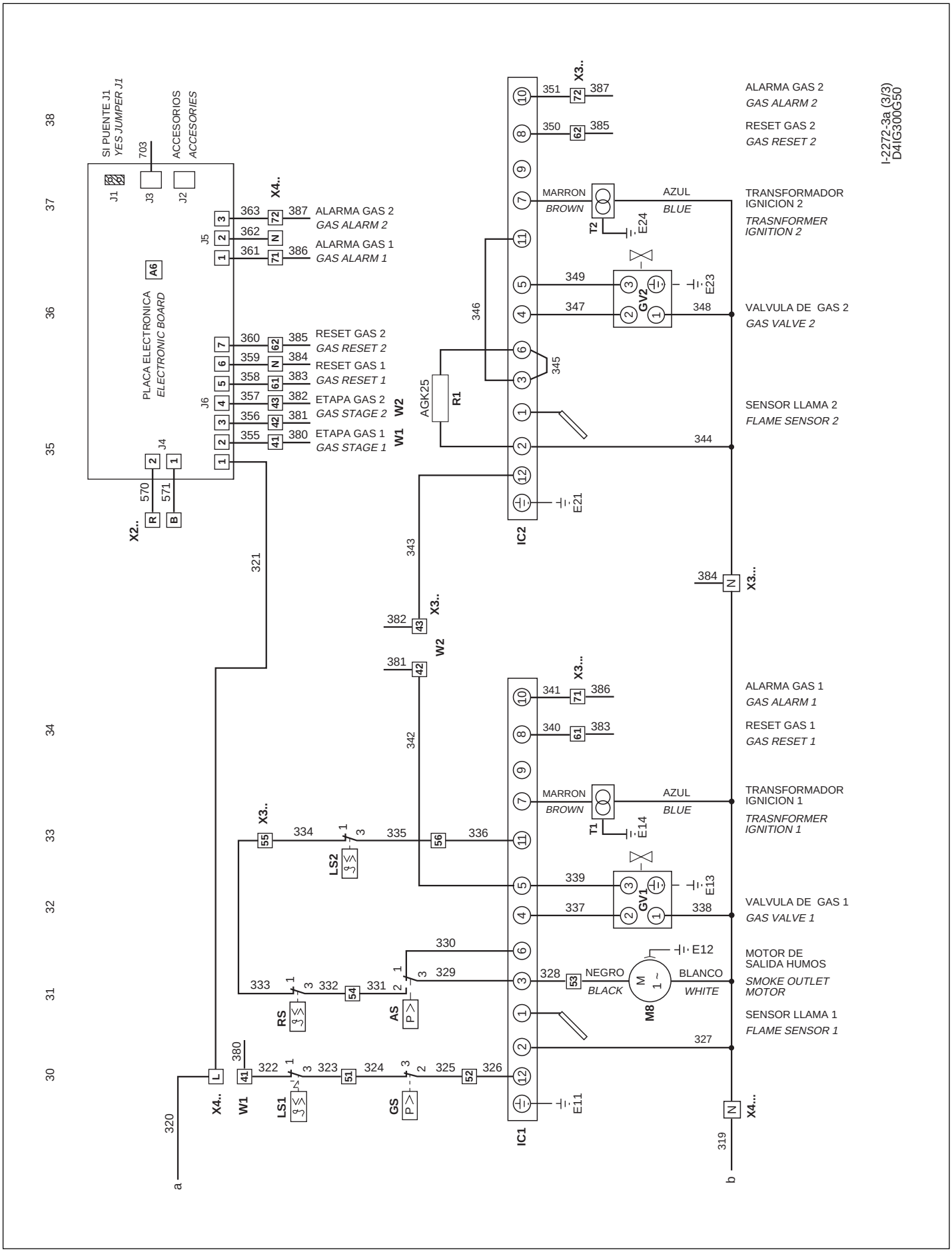
Cool only and gas heating units D4IG-300G50 (1/4)



Cool only and gas heating units D4IG-300G50 (2/4)



Cool only and gas heating units D4IG-300G50 (3/4)



Microswitches configuration:

These stablish the following setups:

Number	State	Meaning
1 / 2	OFF/OFF	Ignore SW, programmed by communications
	ON/OFF	Defrost time 30'
	OFF/ON	Defrost time 60'
	ON/ON	Defrost time 90'
3	ON	Crossed coils
	OFF	Independent coils
4	ON	Compressor time delay at start -up 2'
	OFF	Compressor time delay at start -up 5'
5	ON	Cooling only selection
	OFF	Heat pump selection
6	ON	4-way valve ON in heat pump mode
	OFF	4-way valve ON in cooling only mode
7	ON	Thermostat with signal B (ON in heat pump mode)
	OFF	Thermostat with signal O (ON in cooling only mode)
8	ON	Indoor Fan ON in defrost mode
	OFF	Indoor Fan OFF in defrost mode

Failures

These are indicated by the red LED on the YKlon board. If no failure is present, this LED remains OFF permanently. When a failure occurs, this LED flashes in two sequences. The first indicates the compressor affected: One flash for compressor 1, two flashes for compressor 2, three flashes for compressor 3 and four flashes for accesories, followed by a short pause. The second indicates the cause of the failure.

Failures table (Red LED)

Flashes		Meaning
1 2 or 3	1	Discharge temperature exceeded
	2	High pressure switch
	3	Low pressure switch
	4	Indoor fan thermal switch
	5	Repeated start ups in cool or suction temperature <-25°C
4	1	Failure of gas control 1 or heater 1
	2	Failure of gas control 2 or heater 2
	3	Stage failure of heater 3
	4	Stage failure of heater 4
	5	Failure of economizer or HW coil (impulse, outdoor, return, water probe)
	6	Detection of smoke or high temperature

Incidents

Incidents are indicated by the green LED on the YKlon board. If no incidents is present, this LED flashes at a constant frequency. When an incident occurs, the LED flashes in three sequences. The first indicates the compressor affected: one flash for compressor 1, two flashes for compressor 2, three flashes for compressor 3 and four flashes for others, followed by a short pause. The second and third indicates the cause of the incident.

Table of incidents (Green LED)

Flashes			Type	Incident
1 2 or 3	1	1	Probes	Discharge probe open or short circuited
		2		Liquid probe open or short circuited
		3		Suction probe open or short circuited
	2	1	Temperature	Repeated defrost cycles
		2		Discharge temperature doesn´t recuperate
4	1	1	Probes	Impulsion probe open or short circuited
		2		Return probe open or short circuited
		3		Outdoor probe open or short circuited
		4		Water probe open or short circuited
		5		Error in enthalpy probes
	2	1	Thermostat	Signal Y1 or Y2 without signal G
		2		Signal W without signal B
		3		Signal W without signal G
		4		Signal Y2 or Y2 without Y1
	3	1	Aux. heat	Thermal switch of heater 1
		2		Thermal switch of heater 2
		3		Thermal switch of heater 3
		4		Thermal switch of heater 4
	4	1	Temperature	Water coil temperature not recuperating
		2		Outdoor temperature too low
		3		Water coil in defrost cycle
		4		Impulse temperature above 80°C
	5	1	Others	ID transceiver unknown
		2		At least one accesory not found
		3		Call for air quality
		4		Dirty filters
		5		Presence sensor set to unoccupied

Test push-button

- Also shortens certain timings and resets any failure detected if pressed until the green LED goes ON.
- Also identifies optional accesories and probes connected to the board when pressed an held until the red LED goes ON.
- Operates as a LonWorks pin service button. When pressed it sends the Neuron ID through the LonWorks network.
- If the module is powered with this push-button pressed and held for over 3 seconds, the setup of the node is cancelled (only used by authorized staff).

Thermostat DPC-1

When occurs a failure, and there is communication, the thermostat indicates time and failure (according to the failures table). Also indicates others indicents of the thermostat.

Type	Thermostats numbers		Incident
Thermostat	9	1	Ambient probe open or short circuited
	9	2	Internal probe not calibrated
	9	3	Error in communication
	9	4	Outdoor failure

I-2367a


YORK