ROOF-TOP Air Conditioners
D5IC-090/120/150/180/240/300
(Cool only)
B5IH-090/120/150/180/240/300
(Heat pump)
D5IG-090/120/150/180/240/300
(Cool only + gas heating)

Ref.: N-27521 1107

Technical Information

YORK BY JOHNSON CONTROLS

Johnson Controls

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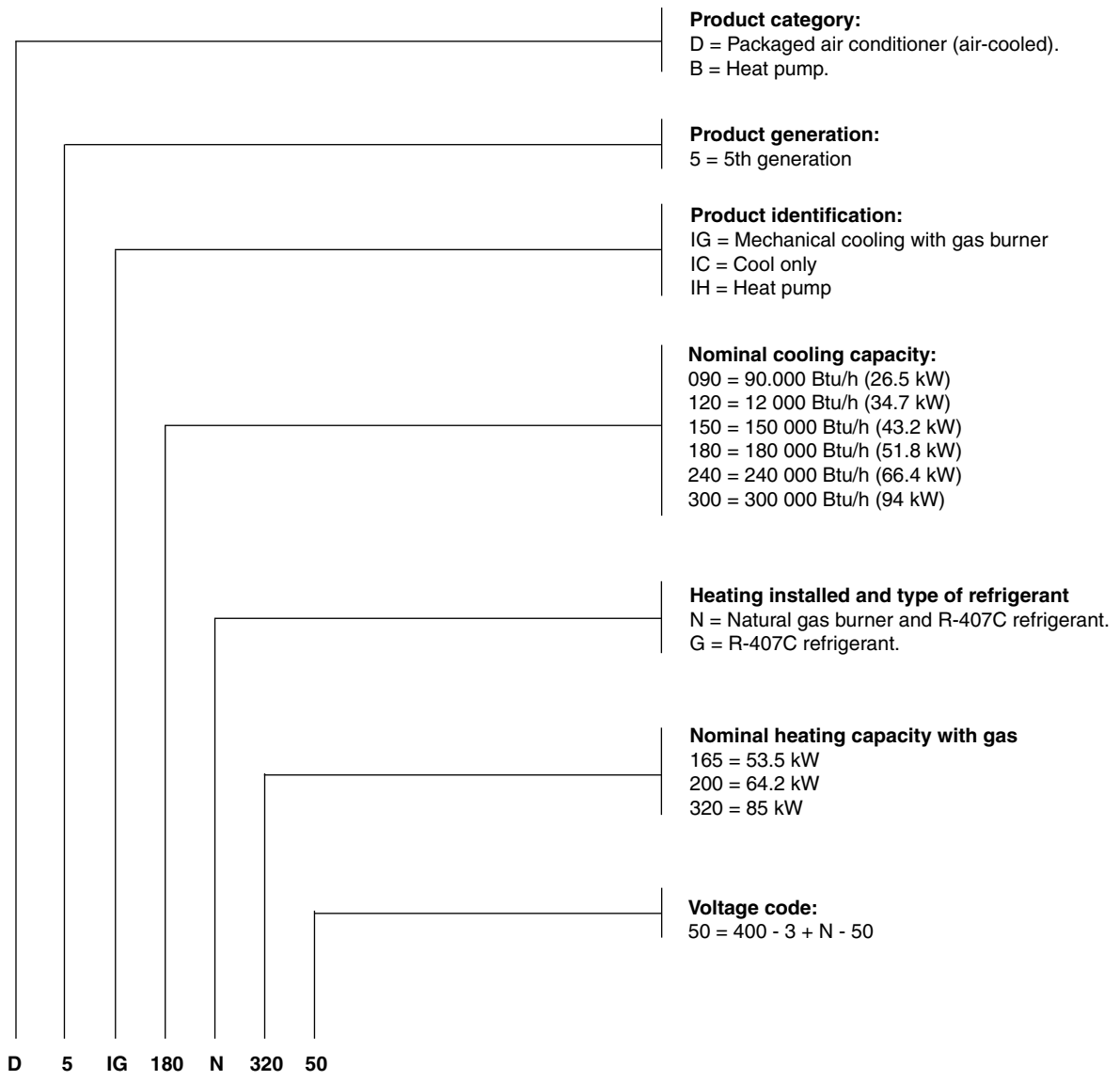
1 - Description

The Sunline 2000 units are adequate for installing outdoors, either on the roof or on ground level. The D5IG units are high-performance packaged air conditioners and gas heaters.
The D5IC series are the cool only versions, but accept electric heaters for heating.
The B5IH series are the reversible heat pump versions with optional electric heaters as backup.
Factory supplied completely assembled, with all necessary tubing, connected and charged, in one single assembly for shipping and handling, making installation easier and faster.

2 - Product nomenclature



3 - Characteristics

3.1.- Structure

Designed to evacuate rainwater and condensed water easily from the unit.
The roofing surface of the evaporating section has a an embossed section to avoid pools of water. It also has a weathering surface over the entire perimeter to avoid water dripping along the sides.

3.2.- Durable construction

All metal parts are made of zinc-aluminium coated steel sheeting.
The outer surface is treated with oven-baked polymerised paint RAL9002, which guarantees a quality finish for many years of service (800 H.N.S. in compliance with DIN 50021).
Blue-Fin type coils, as well as copper fin coils are also avail-

able as an option.

3.3.- Thermal/acoustic insulation
The return and discharge air sections are fully insulated.
The outer surface of this 10 mm. thick insulation is protected by reinforced aluminium sheeting, with a M1 fireproof classification in compliance with UNE 23727.
This aluminium surface causes minimum friction with the air, and is easy to clean.

3.4.- Base beams
The base beams are fixed and provide a foundation for the entire unit.
The beams have suspension openings on the front surface that allow using a crane to locate the unit. See Fig. 1.
Also equipped with openings on the bottom surface for placing the unit on shock absorber equipment, when needed.

3.5.- Duct connections
All models are equipped for connecting downward or side return and impulse air ducts.
Simply remove the covers that correspond to each case (see Figs. 3 and 4).

3.6.- Wide range of flows / fan start-ups
All units have belt-drive impulse fans, with adjustable pitch pulleys on the motor, to accurately cover air flow and static pressure conditions required by each installation.
The impulse fan model 300 is equipped with a smooth starter.

3.7.- Access for maintenance and servicing
This equipment is provided with access panels having ¼-turn locks.
They offer excellent access to all components that may require maintenance or servicing.
Access to the control circuit is independent of the cooling operation of the unit.

3.8.- Service connections
There are openings for the entry of power supply and control cables on the side of the units and at the base, to allow connection at the installation site with minimum labour.

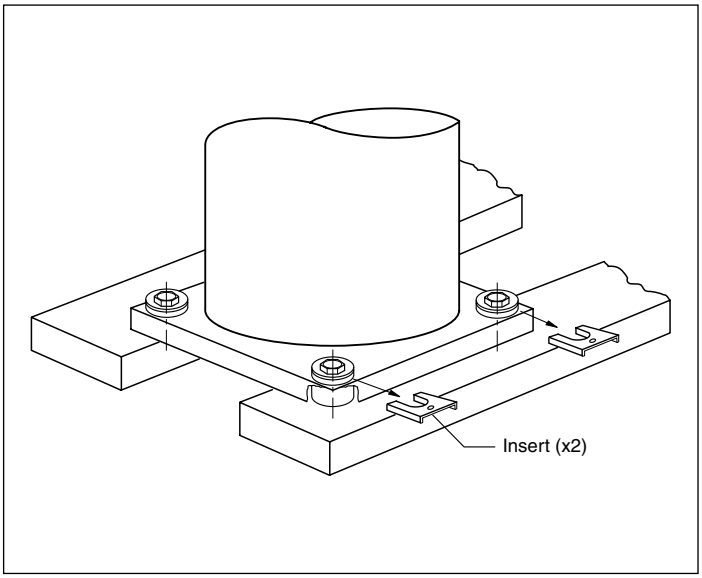
3.9.- Electrical panel
- In compliance with the EN60204-1 and 60439-1 standards.
- Main switch with lever, as standard equipment.
- Motors protected by magneto thermal switches and motor guards.
- Sequence and phase failure detector. In the case of detecting a phase sequence other than R-S-T, or a phase fails once the unit is in operation, this detector, by means of an internal volt-free contact, disconnects power supply to the main board of the unit, leaving it inoperative.

3.10.- Control circuit
A 24 V control circuit that can operate with the optional DPC-1 (communication) thermostat, or a 24 V thermostat with control signals (Y1, Y2, G, O/B, W).
Also allows the use of a system analyser (YKtool) for the purpose of simplifying commissioning, trouble shooting and resolving failures.
The electrical box panel can be removed to carry out repair or maintenance operations without affecting normal system operating pressures.

3.11.- Low noise level
All packaged air conditioning units operate at extremely low noise levels.
The compressors are mounted on antivibratory supports.
The vertical discharge condensing unit fans direct the noise upwards and away from the surrounding structures.

3.12.- Multiple cooling circuits
All models are equipped with 2 independent circuits that ensure better temperature control and comfort level of the room, as well as improved performance with minimum operating costs.
The operating sequence of the circuits depends upon the control unit, and is alternated in accordance with the accumulation of operating hours of each circuit.

3.13.- Compressors
Reciprocating type with suction gas cooled motor on models 090 and 120, and hermetic Scroll type vertical compressors, with internal motor protection on models 150, 180, 240 and 300.
With external sump heater included on all models.
On the 180, 240 and 300 units, the compressors are equipped with a special fastening system that avoids their movement during transportation (see Fig.).
This system is comprised of an insert, located on the two fastening bolts of each compressor, near the access panel. For easy location, they are painted yellow.
Once the equipment is in place, and before commissioning, it is indispensable to eliminate these inserts, as per the following procedure:
- Loosen the fastening bolt, without removing it, until the insert is free.
- Remove the insert.
- Tighten the bolt to a maximum.
- Once both inserts are removed from each compressor, make sure the latter rests correctly on the antivibratory supports.



3.14.- System protection

All cooling circuits are equipped, in series, with the following protection features:

- High and low pressure switches.
- Suction line antifreeze thermostat.
- Liquid line filter-dryer.
- Discharge temperature cut-off switch.
- Suction accumulator (on heat pumps).
- Liquid sight glasses.

3.15.- Gas burner (D5IG units)

All models operating on gas include two equal capacity control stages. The burner assembly is comprised of a heat exchanger, aluminium coated pipes, adjustable gas valve, electronic ignition control, mechanical ventilation, as well as the safety controls to cover the latest CE regulations.

The gas supply pipe is channelled to the heating compartment through an opening located on the front panel of the unit.

The unit is supplied complete and ready for connecting to a natural gas supply of 20 mbar (2ND-H, G20).

3.16.- Air filters

As standard equipment, these include metal frame filters and 48 mm. nonreusable filtering media, with a gravimetric efficiency of 82% (EU 3), and F1 fire resistance (DIN 53438).

The filtering media is easily interchangeable without the need of tools.

Washable filtering media with a gravimetric efficiency of 90% (EU 4) are also available as an option.

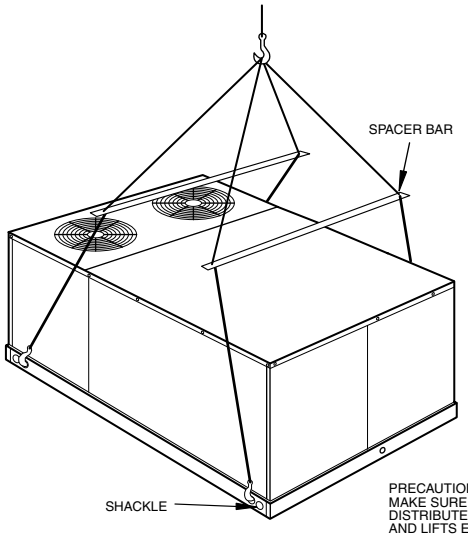
3.17.- Defrost sequence (B5IH units)

Defrost is carried out only in heat pump operation. The start and of the defrost cycle depends upon the value of the liquid probe installed in the outdoor coil. On units with several compressors, two circuits cannot defrost at the same time.

3.18.- Transportation and handling

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

Typical elevation



Note: See physical data table for unit weight - basic unit plus accessories installed

- Fig. 1 -

3.19.- 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 bed frame to the foundation of the building.
4. For roof-top installation, the roof structure should be able to support the weight of the equipment plus its options and/or accessories. The unit should be installed on a mounting base or 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 unit.

3.20.- Sound level

Roof Top	OUTDOOR Specturm per octave band dB(A)							Global sound power level dB (A)	Sound pressure level dB (A) at 5 m
	125 Hz	250 Hz	500 Hz	1 000 Hz	2 000 Hz	4 000 Hz	8 000 Hz		
D5IC090G	70	76	80	83	79	74	66	87	65
D5IC120G	71	77	80	83	79	74	66	87	65
D5IC150G	72	78	81	83	80	74	66	88	66
D5IC180G	76	83	84	84	84	77	73	90	68
D5IC240G	76	83	85	85	84	77	73	90	68
D5IC300G	77	83	85	85	85	78	73	91	69

3.20.- Sound level

Roof Top	INDOOR Spectrum per octave band in DUCT dB(A)							Global sound power level dB (A)
	125 Hz	250 Hz	500 Hz	1 000 Hz	2 000 Hz	4 000 Hz	8 000 Hz	
D5IC090G	62	69	74	77	74	67	60	81
D5IC120G	63	70	76	78	77	72	62	83
D5IC150G	68	71	77	79	78	72	65	84
D5IC180G	70	75	76	76	74	72	72	82
D5IC240G	72	76	77	78	78	76	72	85
D5IC300G	73	78	81	81	80	76	72	87

4 - Technical specifications and physical data

4.1.- D5IC/D5IG

Models			D5IC/D5IG					
			90	**120**	**150**	**180**	**240**	**300**
Heating and cooling capacities	Nett cooling capacity (1)	kW	25.3	32	40.2	46.6	61.5	88
	Nominal absorbed power in cool	kW	10.4	12.8	17.1	18.1	23.5	38.0
	Heating capacity D5IG (Total/Net) (2)	kW	53.5/47.5	64.4/57	64.4/57	85/76	85/76	85/76
	Optional electric heater heating capacity (only D5IC)(2)(400V)	kW	16/25	16/25/37	16/25/37	12/25/37/50	12/25/37/50	12/25/37/50
Compressors	Nominal/start current	A	19.9/76	24.3/83	32/99	36/127	46/127	73/198
	Type		BRISTOL (alternative)		COPELAND (scroll)			
	No. of circuits		2	2	2	2	2	2
Refrigerant (R-407C) circuit (1/2)		kg	3.1/3.1	4.2/4.3	4.8/5.5	8.48/4.45	9.16/9.16	14.28/14.28
Power supply		V / ph / Hz	400V / 3 + N / 50 Hz					
Gas valve (DIG)	Amount		1	1	1	2	2	2
	Stages (per valve)		2	2	2	1	1	1
	Type of gas		Natural (G20 or G25)					
Indoor fan (3)	Nominal air flow	m^3/h	5 100	6 800	8 640	10 000	13 700	17 000
	Maximum static pressure with nominal flow	Standard Pa	330	413	183	405	315	116
		HPD Pa	-	>450	>450	>450	>450	>392
	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
	Standard motor	kW	2.2	3	4	4	5.5	9.2
Indoor coil	No. of elements		3	3	3	3	3	4
	Distance between fins	mm	1.95	1.95	1.95	1.88	1.88	1.58
	Front surface	m^2	0.73	1.02	1.25	1.44	1.91	2.1
Air filters	Amount per unit		4	4	5	5	8	9
	Dimensions mm		48 x 289 x 594 (x2)	48 x 390 x 594 (x2)	48 x 390 x 594 (x3)	48 x 442 x 594 (x5)	48 x 404 x 632 (x4)	48 x 404 x 632 (x2)
								48 x 404 x 498 (x4)
			48 x 390 x 594 (x2)	48 x 442 x 594 (x2)	48 x 442 x 594 (x2)		48 x 404 x 498 (x4)	48 x 350 x 498 (x3)
Outdoor fan	Diameter / number	mm	610/2	610/2	610/2	710/2	710/2	710/2
	Nominal flow	m^3/h	9 860	12 240	16 000	26 000	26 400	24 200
	Motor	kW	0.4	0.4	0.4	0.8	0.8	0.8
Outdoor coil	No. of elements		2	2	2	2	2	4
	Distance between fins	mm	1.95	1.95	1.58	1.95	1.27	1.58
	Front surface	m^2	1.55	2.23	2.64	3.31	3.97	3.9
Nett 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
Net weight (basic unit without accessories) (4)	D5IC	kg	437	472	590	860	957	1 238
	D5IG	kg	472	537	642	970	1 066	1 353

(1) Data in compliance with Eurovent. Summer: indoor DB 27° C / WB 19° C. - Outdoor DB 35° C. (DB = dry bulb, WB = wet bulb) (2) Add indoor motor consumption.(3) See INDOOR FAN PERFORMANCES table for different pressure flows. (4) See dimensions and weights of the accessories.
HPD: High pressure drive, optional.

4.2.- B5IH

Models			B5IH					
			90	**120**	**150**	**180**	**240**	**300**
Cooling capacity (1)	Nett cooling capacity	kW	23.2	31	37	46.5	58.3	86.6
	Nominal absorbed power in cool	kW	9.8	12.8	15	17.2	23.7	38.7
Heating capacity	Heating capacity B5IH	kW	24.3	32.3	37.7	50.6	70	80
	Nominal absorbed power in heat	kW	8.2	10.4	14.7	18.2	24.1	33.3
	Optional electric heater heating capacity (400V) (2)	kW	16/25	16/25/37	16/25/37	12/25/37/50	12/25/37/50	12/25/37/50
Compresores	Nominal/start current	A	19.9/76	24.3/83	32/101	38/99	46/127	73/198
	Type		BRISTOL (alternative)		COPELAND (scroll)			
	No. of circuits		2	2	2	2	2	2
Refrigerant (R-407C) circuit (1/2)		kg	4.1/4.1	7/7	7.5/7.5	10.16/10.16	11.66/11.66	16.78/16.78
Power supply		V / ph / Hz	400V / 3 + N / 50 Hz					
Indoor fan (3)	Nominal air flow	m^3/h	5 100	6 800	8 640	10 000	13 700	17 000
	Maximum static pressure with nominal flow	Standard Pa	275	300	135	382	295	116
		HPD Pa	-	>450	>410	>450	>429	>392
	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
	Standard motor	kW	2.2	3	4	4	5.5	9.2
Evaporating unit	No. of elements		4	4	4	4	4	4
	Distance between fins	mm	1.69	1.69	1.69	1.95	1.95	1.58
	Front surface	m^2	0.73	1.25	1.25	1.44	1.91	2.1
Air filters	Amount per unit		4	5	5	5	8	9
	Dimensions mm		48 x 404 x 632 (x2)	48 x 404 x 632 (x2)	48 x 404 x 632 (x2)	48 x 404 x 632 (x2)	48 x 404 x 632 (x2)	48 x 404 x 632 (x2)
			48 x 404 x 632 (x2)	48 x 404 x 632 (x2)	48 x 404 x 632 (x2)		48 x 404 x 632 (x2)	48 x 404 x 632 (x2)
								48 x 404 x 632 (x2)
Outdoor fan	Diameter / number	mm	610/2	610/2	610/2	710/2	710/2	710/2
	Nominal flow	m^3/h	9 900	12 250	15 000	24 700	25 600	24 200
	Motor	kW	0.4	0.4	0.4	0.8	0.8	0.8
Condensing unit	No. of elements		3	3	3	3	3	4
	Distance between fins	mm	1.95	1.95	1.95	1.95	1.69	1.58
	Front surface	m^2	1.86	2.7	2.61	3.61	3.94	3.9
Nett dimensions	Height	mm	855	1 210	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
Net weight (basic unit without accessories) (4)	B5IH	kg	477	637	743	953	1 043	1 279

(1) Data in compliance with Eurovent. Summer: Indoor DB 27° C / WB 19° C. Outdoor DB 35° C. (DB = dry bulb, WB = wet bulb). Winter: indoor DB 20°C, outdoor DB 7°C/ WB 6°C

(2) Add indoor motor consumption.

(3) See INDOOR FAN PERFORMANCES table for different pressure flows.

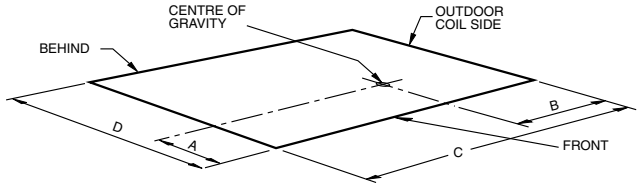
(4) See dimensions and weights of the accessories.

HPD: High pressure drive, optional.

4.3.- Weights of accessories

Models				090	120	150	180	240	300
Economiser			kg	35	35	35	73	73	73
Barometric damper / fixed outdoor air intake			kg	4.5	4.5	4.5	-	-	-
Extraction fan			kg	30	30	30	55	55	55
Mounting base (fixed/adjustable)			kg	70/130	70/130	70/130	81/157	85/165	85/165
Electric heater			kg	15	15	15	20	20	20
Hot water coil			kg	36	36	36	60	60	60
Fixed outdoor air intake			kg	-	-	-	9	9	9
Barometric damper			kg	-	-	-	20	20	20
Cu coil	D5IC / D5IG	indoor		15	21	26	31	41	78
		outdoor		21	36	45	46	85	135
	B5IH	indoor		23	40	40	40	52	78
		outdoor		37	55	55	75	95	135

4.4.- Centre of gravity



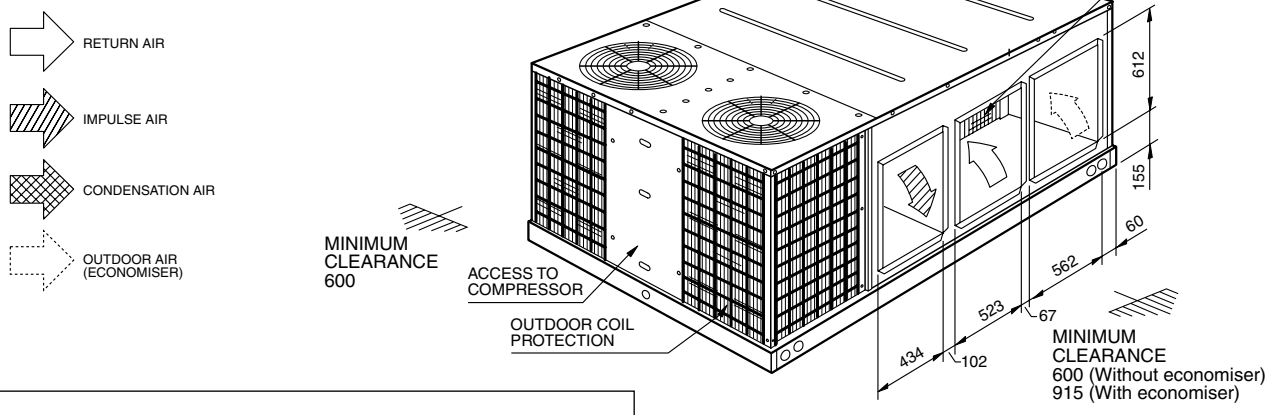
Unit model	Dimensions (mm)			
	A	B	C	D
090	845	1 207	2 552	1 800
120	826	1 187	2 552	1 800
150	826	1 143	2 552	1 800
180	1 143	1 524	3 180	2 337
240	1 143	1 524	3 460	2 337
300	1 143	1 524	3 460	2 337

- 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 - 150



DUCT COVERS: Units are shipped with all air duct openings covered.
In applications of **side** ducts:
1. Remove and discard the impulse and return air duct covers.
2. Connect the ducts to the duct flanges located at the back of the unit.

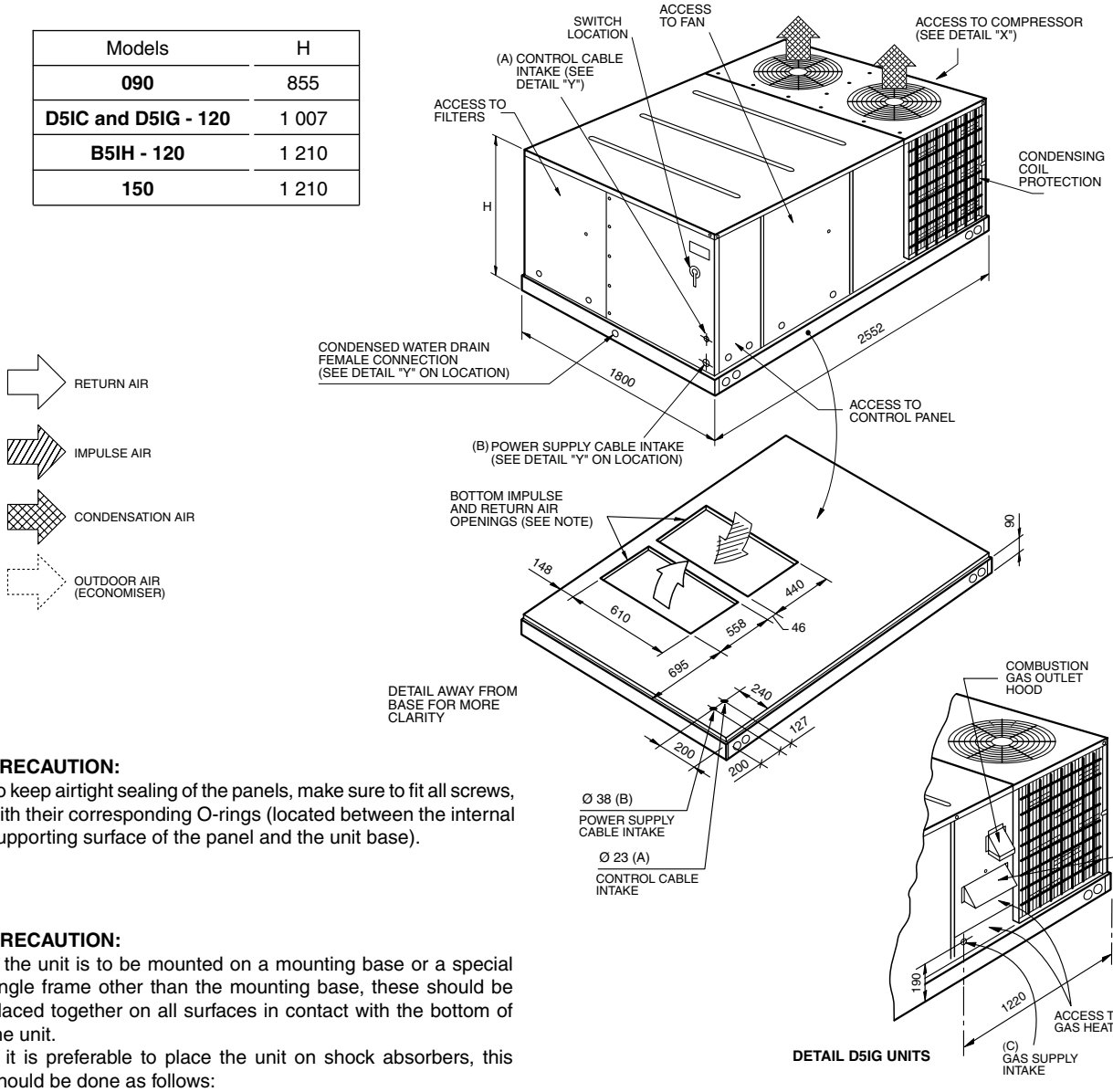
In applications with **bottom** ducts:
1. Remove the impulse and return air ducts side covers to access the impulse and return air bottom covers.
2. Remove and discard the duct covers.
3. Fit the side duct covers, making sure of airtightness.

MINIMUM CLEARANCE AT THE TOP OF THE UNIT:
These units are designed for installing outdoors only.
In ground level installations, the eaves of the building should not be at less than 1830 mm. in vertical position from the top of the unit, as long as they do not overhang more than 915 mm. in horizontal position over the unit. If the eaves are over 3000 mm. over the unit, there are no restrictions on the horizontal measurements.

- Fig. 3 -

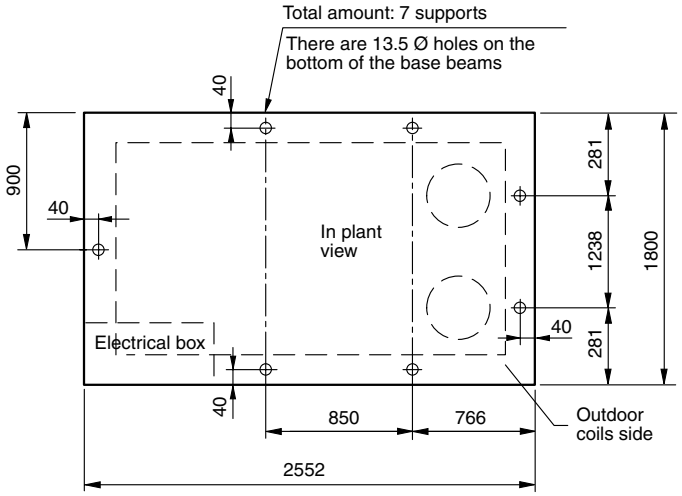
Models 090 - 120 - 150

Models	H
090	855
D5IC and D5IG - 120	1 007
B5IH - 120	1 210
150	1 210



PRECAUTION:
To keep airtight sealing of the panels, make sure to fit all screws, with their corresponding O-rings (located between the internal supporting surface of the panel and the unit base).

PRECAUTION:
If the unit is to be mounted on a mounting base or a special angle frame other than the mounting base, these should be placed together on all surfaces in contact with the bottom of the unit.
If it is preferable to place the unit on shock absorbers, this should be done as follows:

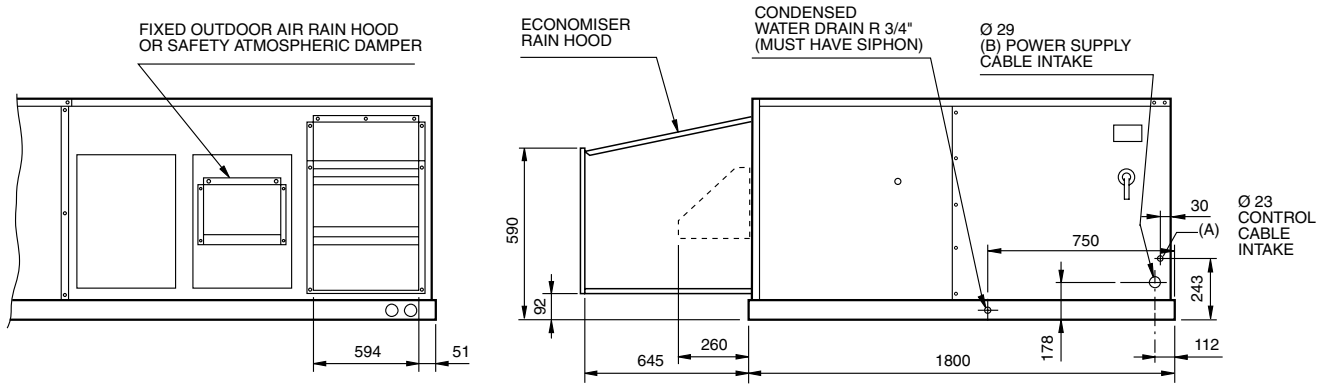


Approx. load on each point of support (kg)					
Unit model and capacity	Basic unit without acc.	Increment per accessory			
		Motor-driven damper or economiser	Electric heater	Extraction fan	Water coil
D5IC-090	63	5	2	4	5
D5IC-120	68				
D5IC-150	84				
B5IH-090	68	5	2	4	5
B5IH-120	91				
B5IH-150	92				
D5IG-090	68	5	-	4	-
D5IG-120	77				
D5IG-150	92				

- Fig. 3 -

Models 090 - 120 - 150

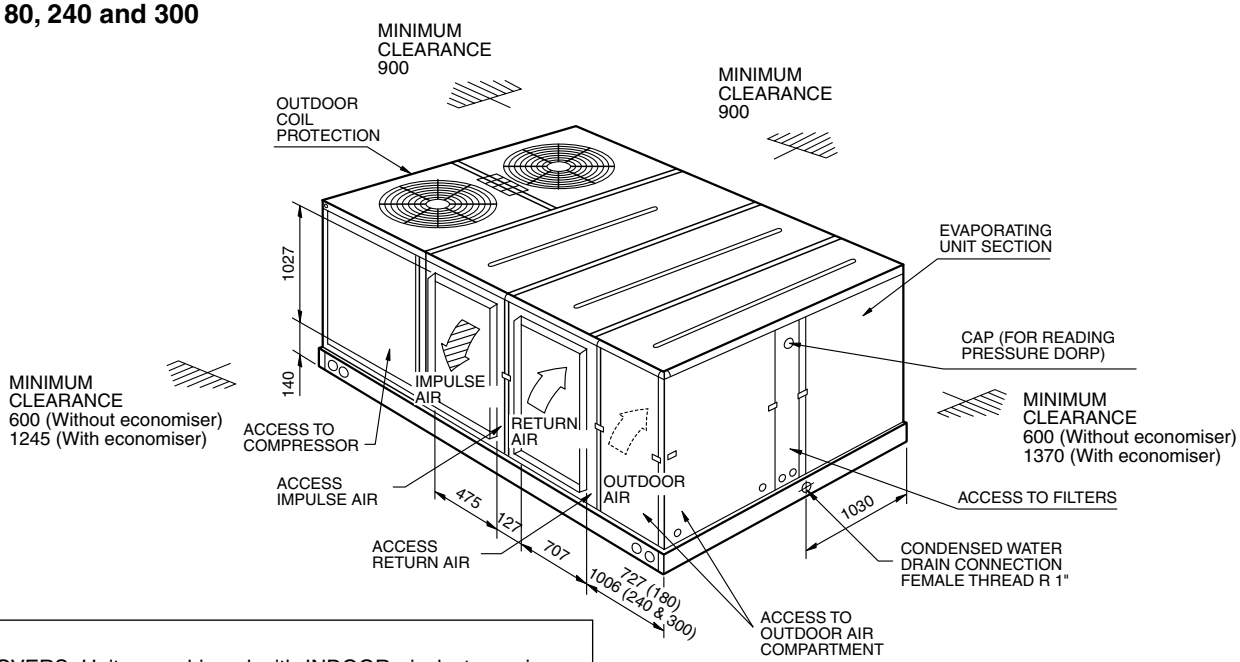
Detail "Y" - Unit with economiser rain hood and fixed outdoor air (accessories)



- Fig. 3 -

5.2.- Models 180 - 240 - 300

Detail "X" - Clearances.
Side impulse and return air openings, models 180, 240 and 300



DUCT COVERS: Units are shipped with INDOOR air duct openings covered. An accessory kit is available with flanges for connecting side ducts.
In applications of **downward discharge**:
1. Remove the impulse and return air compartment side panels to access the bottom covers of the impulse and return air ducts, making sure of airtightness.
2. Remove and discard the bottom duct covers.
3. Replace the side panels of the side impulse and return air compartments.

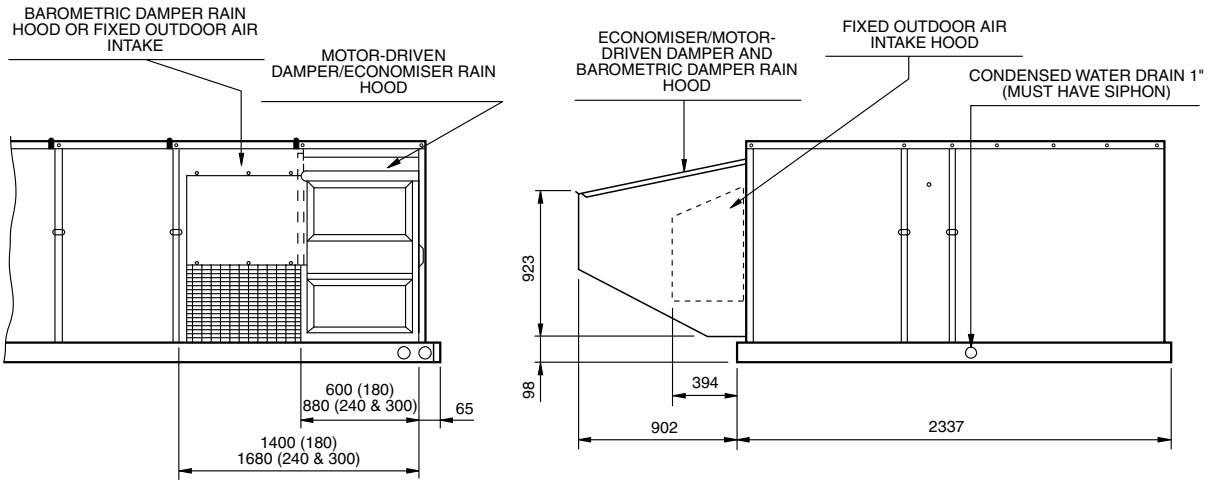
In applications with **side discharge**:
1. Replace the impulse and return air compartment side panels with the accessory panels, making sure of airtightness.
2. Connect the ducts to the flanges of these panels.

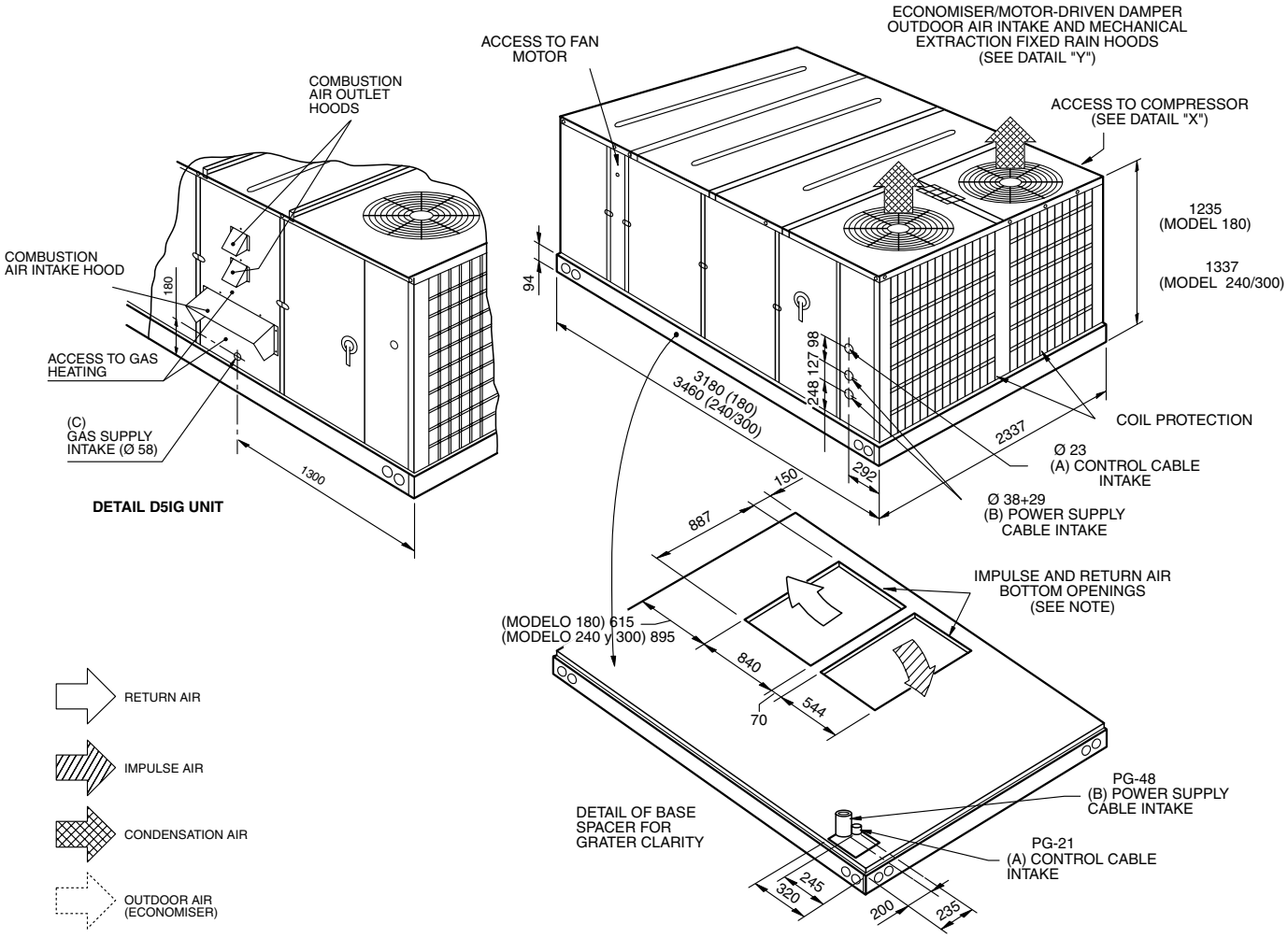
MINIMUM CLEARANCE AT THE TOP OF THE UNIT:
These units are designed for installing outdoors.
In ground level installations, the eaves of the building should not be at less than 1830 mm. in vertical position from the top of the unit, as long as they do not overhang more than 915 mm. in horizontal position over the unit.
If the eaves are over 3000 mm. over the unit, there are no restrictions on the horizontal measurements.

- Fig. 4 -

Models 180 - 240 - 300

Detail "Y" - Unit with rain hoods (accessories)



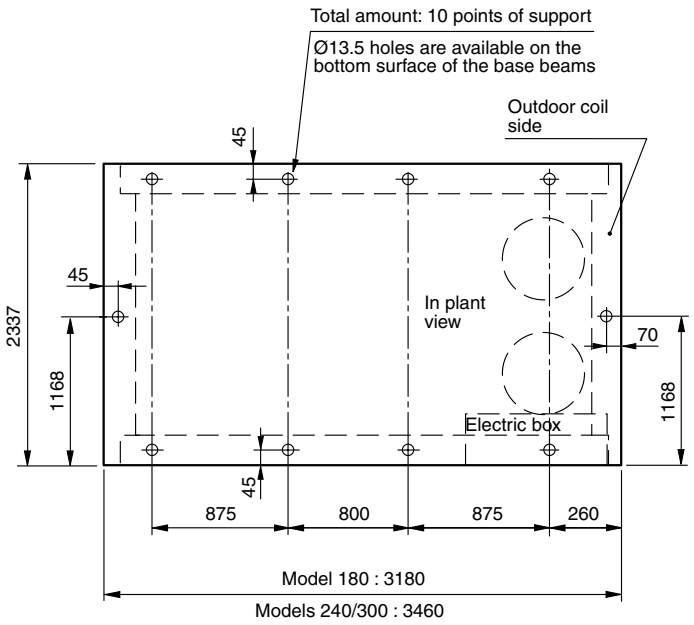


- Fig. 4 -

PRECAUTION:
To keep airtight sealing of the panels, make sure to fit all screws, with their corresponding O-rings (located between the internal supporting surface of the panel and the unit base).

Models 180 - 240 - 300

PRECAUTION:
If the unit is to be mounted on a mounting base or a special angle frame other than the mounting base, these should be placed together on all surfaces in contact with the bottom of the unit.
If it is preferable to place the unit on shock absorbers, this should be done as follows:



Approx. load on each supporting point (kg)

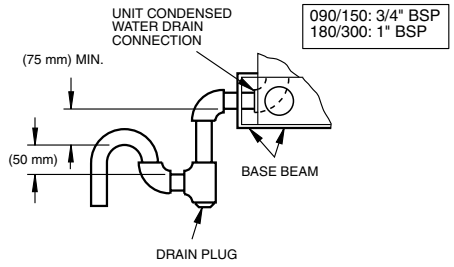
Unit model and capacity	Basic unit without accessories		Increment per accessory				
	max.	min.	Motor-driven damper or economiser	Electric heater	Extraction fan	Water coil	Barometric damper
D5IC-180	91	80	7	2	6	6	2
D5IC-240	101	90					
D5IC-300	130	118					
B5IH-180	101	90	7	2	6	6	2
B5IH-240	111	99					
B5IH-300	134	122					
D5IG-180	101	90	7	-	6	-	2
D5IG-240	113	101					
D5IG-300	142	130					

- Fig. 4 -

5.3.- Indoor coil condensed water drain

Piping installation should be in compliance with local regulations. Use sealing putty on male threads. Install a condensed water line from the female connection on the unit to an open drain.

Note:
The condensed water drain line **must** have a siphon for correct evacuation. See Fig. 5.
The drain line should have a pitch of at least 2 cm. per each metre in length.



- Fig. 5 -

6 - Electrical characteristics and connections

6.1.- Basic units

- D5IC/D5IG/B5IH

Model	Compressor			Outdoor fan motor		Indoor fan motor		Nominal total	Max. total intensity (unit) amps	Max. total intensity (unit) amps	Automatic switch (K curve) amps	Min. cable section mm²
	Power supply	Operating intensity each	Start intensity each	kW each	Nominal amps each	kW	Nominal amps	kW				
090	400.3.50	7.4	76	0.4	1.9	2.2	4.8	12	23	25	32	6
120	400.3.50	8.1	83	0.4	1.9	3	6.5	13.6	26	29	40	10
150	400.3.50	10.2/13.7	74/99	0.4	1.9	4	7	17	35	41	50	16
BIH-150	400.3.50	10.9	101	0.4	1.9	4	7	17	35	44	50	16
180	400.3.50	15.9/8.5	127/66	0.8	2.3	4	7	18	36	48	63	16
BIH-180	400.3.50	13.9	99	0.8	2.3	4	7	18	38	50	63	16
240	400.3.50	15.7	127	0.8	2.3	5.5	10.4	24	46	61	80	25
300	400.3.50	26	198	0.8	2.3	9.2	15.9	39	73	85	100	35

Important: Automatic switch sizing and power supply and control cable sections are orientative and should be corrected in accordance with 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

- D5IC

Model D5IC	Power supply V. Ph. Hz	Electric heater			Maximum total intensity of unit (A)	Maximum automatic switch (K curve)[1]	Minimum cable section[2] (mm²)
		Capacity (kW)	Stages	Intensity (A)			
90	400.3.50	16	2	24	31	40	6
		25	2	36	43	50	10
120	400.3.50	16	2	24	31	40	6
		25	2	36	43	50	10
		37	2	54	62	80	16
150	400.3.50	16	2	24	43	50	10
		25	2	36	47	63	10
		37	2	54	65	80	16
180	400.3.50	12	1	18	41	50	10
		25	2	36	45	63	10
		37	2	54	63	80	16
		50	2	72	79	100	25
240	400.3.50	12	1	18	51	63	16
		25	2	36	51	63	16
		37	2	65	66	80	25
		50	2	72	84	100	25
300	400.3.50	12	1	18	67	80	25
		25	2	36	67	80	25
		37	2	54	69	80	25
		50	2	72	87	100	35

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

- B5IH

Model B5IH	Power supply V. Ph. Hz	Electric heater			Maximum running current of unit (A)	Maximum automatic MCB (K curve)[1]	Minimum cable section[2] (mm^2)
		Capacity (kW)	Stages	Intensity (A)			
90	400.3.50	16	2	24	44	50	10
		25	2	36	56	63	16
120	400.3.50	16	2	24	48	63	10
		25	2	36	60	80	16
		37	2	54	78	100	25
150	400.3.50	16	2	24	56	63	10
		25	2	36	68	80	16
		37	2	54	86	100	25
180	400.3.50	12	1	18	58	80	16
		25	2	36	76	100	25
		37	2	54	94	125	35
		50	2	72	112	125	35
240	400.3.50	12	1	18	69	100	25
		25	2	36	87	100	25
		37	2	54	105	125	35
		50	2	72	123	160	50
300	400.3.50	12	1	18	96	125	35
		25	2	36	114	125	50
		37	2	54	132	160	50
		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 and 7.

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 and differential switch 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 copper wires only.** Each one of the units should be connected to an independent circuit with an automatic and differential switch, supplied directly from the main panel.

CAUTION:
When connecting the power supply and control wiring to the unit, waterproof type wires **must be used** to avoid water or humidity getting into the unit during normal operation. These waterproof conditions also apply when a switch is installed at 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, which has external protection.

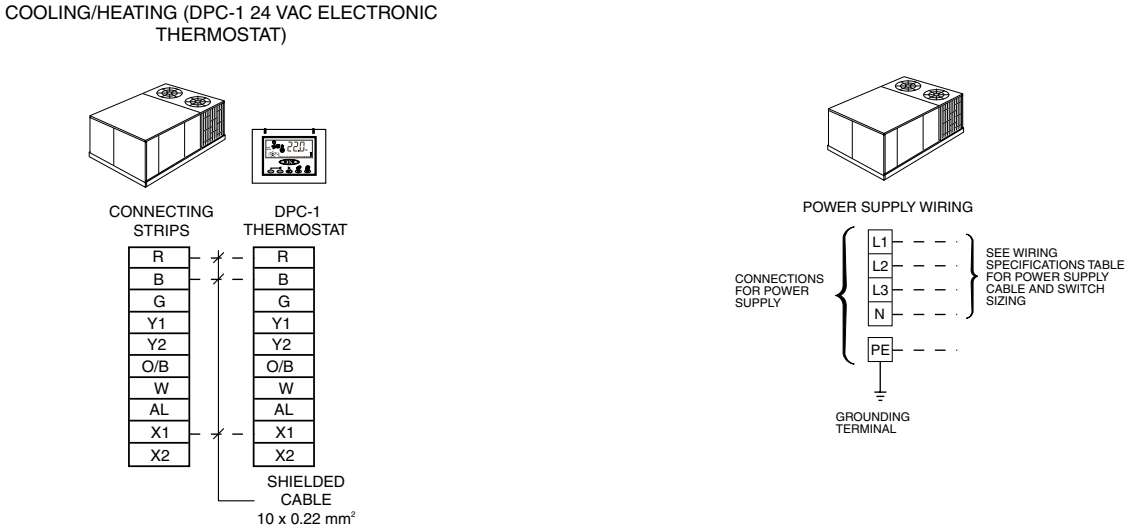
4. This unit is wired for operation with a 400 V power supply.
5. See the Identification Plate for the maximum size of the automatic switch and minimum power supply cable section.
6. All motors are factory wired to rotate in the correct direction.

Thermostat

The ambient thermostat should be located on an inner wall, at about 1.5 m. 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 - Operating limits

Model				90	120	150	180	240	300
Voltage limits			Min./Max.	342 / 457					
D5IC/D5IG Cool	Indoor coil entering air temp.		WB°C Min./Max.	15 /23	15 /23	15 /23	15 /23	15 /23	15 /23
			DB°C Min./Max.	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32
	Outdoor temp.		DB°C Min./Max.	7 / 50	7 / 50	7 / 46	7 / 50	7 / 50	7 / 47
B5IH Heat pump	Summer cycle	Indoor coil entering air temp.	WB°C Min./Max.	15 / 23	15 / 23	15 / 23	14 / 23	14 / 23	14 / 23
			DB°C Min./Max.	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32
		Outdoor temp.	DB°C Min./Max.	7 / 50	7 / 50	7 / 48	7 / 50	7 / 50	7 / 47
	Winter cycle	Indoor coil entering air temp.	DB°C Min./Max.	10 / 27	10 / 27	10 / 27	10 / 27	10 / 27	10 / 27
		Outdoor temp.	DB°C Min./Max.	-20 / 16	-20 / 16	-20 / 16	-20 / 20	-20 / 20	-20 / 20
D5IG 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 (D5IG) are adequate for gas only. On installations with GLP (propane), make sure no gas in liquid form reaches the gas assembly under any circumstance.

8 - Performances D5IC/D5IG

8.1.- D5IC/D5IG - 090

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 3 800	23	29	17	13.5	10	-	27.5	16.5	13	9.5	-	24.8	15.6	12.1	8.6	-
	19	26.3	22.3	18.8	15.3	13	24.8	21.7	18.2	14.7	12.4	22.3	20.8	17.3	13.8	11.5
	17	24.8	24.8	21.4	17.9	15.6	22.8	22.8	19.5	15.9	13.6	20.3	20.3	19.4	15.9	13.6
	15	22.3	22.3	22.3	19.8	17.5	21.3	21.3	21.3	17.9	15.6	19.1	19.1	19.1	18.3	16
Nominal flow 5 100	23	29.6	19.3	14.8	10.2	-	28.1	18.8	14.3	9.7	-	25.3	17.9	13.4	8.9	-
	19	26.8	26	21.5	16.9	13.9	25.3	25.3	20.9	16.3	13.3	22.8	22.8	20	15.5	12.4
	17	25.3	25.3	24.7	20.2	17.2	23.3	23.3	22.5	18	15	20.7	20.7	20.7	18.3	15.3
	15	22.8	22.8	22.8	22.8	19.8	21.8	21.8	21.8	20.6	17.6	19.5	19.5	19.5	19.5	18.4
Maximum flow 6 400	23	30	21.5	16	10.4	-	28.4	21	15.5	9.9	-	25.6	20.2	14.7	9.1	-
	19	27.1	27.1	24.1	18.5	14.8	25.6	25.6	23.5	18	14.3	23	23	22.6	17.1	13.4
	17	25.6	25.6	25.6	22.5	18.8	23.5	23.5	23.5	20	16.3	21	21	21	20.6	17
	15	23	23	23	23	22.1	22	22	22	22	19.6	19.7	19.7	19.7	19.7	19.7

8.2.- D5IC/D5IG - 120

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 5 100	23	36.7	22.1	17.4	12.7	-	34.8	21.5	16.7	12	-	31.4	20.4	15.6	10.9	-
	19	33.3	29.2	24.5	19.8	16.6	31.4	28.5	23.7	19	15.9	28.3	27.3	22.6	17.9	14.7
	17	31.4	31.4	27.9	23.2	20.1	28.9	28.9	25.6	20.9	17.7	25.7	25.7	25.5	20.8	17.6
	15	28.3	28.3	28.3	25.8	22.7	27	27	27	23.5	20.4	24.2	24.2	24.2	24	20.8
Nominal flow 6 800	23	37.4	25.1	19	13	-	35.5	24.5	18.4	12.3	-	32	23.4	17.3	11.3	-
	19	33.9	33.9	28	21.9	17.9	32	32	27.3	21.2	17.1	28.8	28.8	26.1	20.1	16
	17	32	32	32	26.3	22.3	29.4	29.4	29.4	23.6	19.5	26.2	26.2	26.2	24	20
	15	28.8	28.8	28.8	28.8	25.8	27.5	27.5	27.5	27.1	23	24.6	24.6	24.6	24.6	24
Maximum flow 8 500	23	38	28.1	20.7	13.3	-	36	27.5	20.1	12.7	-	32.5	26.5	19.1	11.7	-
	19	34.4	34.4	31.5	24.1	19.2	32.5	32.5	30.7	23.4	18.4	29.2	29.2	29.2	22.2	17.3
	17	32.5	32.5	32.5	29.4	24.4	30	30	30	26.3	21.4	26.6	26.6	26.6	26.6	22.1
	15	29.2	29.2	29.2	29.2	28.9	27.9	27.9	27.9	27.9	25.7	25	25	25	25	25

Data in compliance with EUROVENT conditions.

8.3.- D5IC/D5IG - 150

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 6 500	23	46.1	27.9	21.9	15.9	-	43.7	27.1	21.1	15.1	-	39.4	25.7	19.7	13.7	-
	19	41.8	36.9	30.9	24.9	20.9	39.4	35.9	30	24	20	35.5	34.5	28.5	22.5	18.5
	17	39.4	39.4	35.3	29.3	25.3	36.2	36.2	32.2	26.3	22.3	32.3	32.3	32.2	26.2	22.2
	15	35.5	35.5	35.5	32.6	28.6	33.9	33.9	33.9	29.6	25.6	30.3	30.3	30.3	30.3	26.3
Nominal flow 8 640	23	47	31.7	24	16.3	-	44.6	30.9	23.2	15.5	-	40.2	29.5	21.8	14.2	-
	19	42.6	42.6	35.3	27.6	22.5	40.2	40.2	34.4	26.7	21.6	36.2	36.2	33	25.3	20.2
	17	40.2	40.2	40.2	33.2	28	37	37	37	29.7	24.5	33	33	33	30.2	25.1
	15	36.2	36.2	36.2	36.2	32.6	34.6	34.6	34.6	34.1	29	30.9	30.9	30.9	30.9	30.3
Maximum flow 10 800	23	47.7	35.5	26.1	16.7	-	45.3	34.7	25.3	16	-	40.8	33.4	24	14.7	-
	19	43.2	43.2	39.7	30.3	24.1	40.8	40.8	38.8	29.4	23.2	36.7	36.7	36.7	28	21.8
	17	40.8	40.8	40.8	37	30.8	37.5	37.5	37.5	33.1	26.9	33.5	33.5	33.5	33.4	27.9
	15	36.7	36.7	36.7	36.7	36.5	35.1	35.1	35.1	35.1	32.3	31.4	31.4	31.4	31.4	31.4

8.4.- D5IC/D5IG - 180

Return air		Temperatura del aire en la batería exterior (TS)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 7 200	23	53.5	31.9	25.2	14.5	-	50.7	30.9	24.2	17.5	-	45.7	29.3	22.6	15.9	-
	19	48.4	42	35.3	28.6	24.1	45.7	40.9	34.2	27.5	23	41.1	39.2	32.5	25.8	21.3
	17	45.7	45.7	40.2	33.5	29	42	42	36.9	30.2	25.7	37.5	37.5	36.7	30	25.5
	15	41.1	41.1	41.1	37.2	32.7	39.3	39.3	39.3	33.9	29.5	35.2	35.2	35.2	34.5	30
Nominal flow 10 000	23	54.5	36.9	27.9	18.9	-	51.7	35.9	27	18	-	46.6	34.4	25.4	16.4	-
	19	49.4	49.4	41.1	32.1	26.1	46.6	46.6	40	31.1	25.1	41.9	41.9	38.4	29.4	23.4
	17	46.6	46.6	46.6	38.6	32.6	42.9	42.9	42.9	34.7	28.7	38.2	38.2	38.2	35.2	29.2
	15	41.9	41.9	41.9	41.9	37.9	40.1	40.1	40.1	39.9	33.9	35.9	35.9	35.9	35.9	35.3
Maximum flow 12 200	23	55.3	40.8	30.1	13.4	-	52.5	39.9	29.2	18.5	-	47.3	38.4	27.7	17	-
	19	50.1	50.1	45.7	35	27.8	47.3	47.3	44.6	33.9	26.8	42.6	42.6	42.6	32.3	25.2
	17	47.3	47.3	47.3	42.6	35.5	43.5	43.5	43.5	38.3	31.2	38.8	38.8	38.8	38.8	32.1
	15	42.6	42.6	42.6	42.6	42	40.7	40.7	40.7	40.7	37.4	36.4	36.4	36.4	36.4	36.4

Data in compliance with EUROVENT conditions.

8.5.- D5IC/D5IG - 240

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 10 000	23	70.5	42.9	33.6	24.4	-	66.9	44.6	32.4	23.1	-	60.3	39.6	30.3	21	-
	19	63.9	56.8	47.6	38.3	32.1	60.3	55.4	46.1	36.8	30.6	54.3	53.2	43.9	34.6	28.4
	17	60.3	60.3	54.3	45	38.9	55.5	55.5	49.9	40.6	34.4	49.5	49.5	49.4	40.4	34.2
	15	54.3	54.3	54.3	50.2	44	51.8	51.8	51.8	45.8	39.6	46.4	46.4	46.4	46.4	40.5
Nominal flow 13 700	23	71.6	49.5	37.2	25	-	68.3	48.3	36	23.8	-	61.5	46.3	34	21.8	-
	19	65.2	65.2	55.3	43	34.8	61.5	61.5	53.8	41.6	33.4	55.3	55.3	51.7	39.4	31.3
	17	61.5	61.5	61.5	51.8	43.6	56.6	56.6	56.6	46.6	38.4	50.4	50.4	50.4	47.3	39.1
	15	55.3	55.3	55.3	55.3	50.9	52.9	52.9	52.9	52.9	45.5	47.3	47.3	47.3	47.3	47.3
Maximum flow 15 900	23	73	53.5	59.5	25.5	-	69.3	52.3	38.3	24.4	-	62.4	50.3	36.3	22.4	-
	19	66.1	66.1	59.9	45.9	36.6	62.4	62.4	58.5	44.5	35.2	56.2	56.2	56.2	42.4	33.1
	17	62.4	62.4	62.4	55.9	46.6	57.4	57.4	57.4	50.3	41	51.2	51.2	51.2	51.2	42.1
	15	56.2	56.2	56.2	56.2	55.1	53.7	53.7	53.7	53.7	49.1	48	48	48	48	48

8.6.- D5IC/D5IG - 300

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 13 600	23	100.8	61.5	48.2	34.8	-	95.3	59.7	46.4	33	-	86.2	56.7	43.4	30	-
	19	91.4	81.6	68.2	54.8	46	86.2	79.5	66.1	52.8	43.9	77.6	76.3	63	49.6	40.7
	17	86.2	86.2	77.9	64.6	55.7	79.3	79.3	73.6	60.2	51.3	70.7	70.7	70.7	57.9	49
	15	77.6	77.6	77.6	72	63.1	74.1	74.1	74.1	67.5	58.6	66.4	66.4	66.4	66.4	58.1
Nominal flow 17 000	23	103	68.7	52.1	35.6	-	97.7	66.9	50.4	33.9	-	88	64	47.5	31	-
	19	93.3	93	76.5	60	49	88	88	74.5	58	47	79.2	79.2	71.4	54.9	43.9
	17	88	88	88	71.9	60.9	81	81	81	67.2	56.2	72.2	72.2	72.2	65.4	54.4
	15	79.2	79.2	79.2	79.2	70.6	75.7	75.7	75.7	75.7	65.4	67.8	67.8	67.8	67.8	65.6
Maximum flow 18 700	23	104.5	72.4	54.4	36.3	-	99.1	70.7	52.6	34.6	-	89.3	67.8	49.7	31.6	-
	19	94.6	94.6	80.9	62.8	50.8	89.3	89.3	78.8	60.8	48.7	80.4	80.4	75.7	57.7	45.6
	17	89.3	89.3	89.3	75.8	63.7	82.1	82.1	82.1	70.9	58.9	73.2	73.2	73.2	69.3	57.2
	15	80.4	80.4	80.4	80.4	74.5	76.8	76.8	76.8	76.8	69	68.8	68.8	68.8	68.8	68.8

Data in compliance with EUROVENT conditions.

9 - Performances B5IH

9.1.- Cooling capacities B5IH - 090

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 3 800	23	26.5	16.6	12.9	9.2	-	25.2	16.2	12.4	8.7	-	22.7	15.4	11.7	7.9	-
	19	24	22.2	18.5	14.7	12.3	22.7	21.7	18	14.2	11.7	20.4	20.4	17.1	13.4	10.9
	17	22.7	22.7	21.2	17.5	15	20.9	20.9	20.1	16.4	13.9	18.6	18.6	18.6	15.7	13.3
	15	20.4	20.4	20.4	19.6	17.1	19.5	19.5	19.5	18.4	15.9	17.5	17.5	17.5	17.5	15.8
Nominal flow 5 100	23	27.1	19.4	14.4	9.5	-	25.7	18.9	13.9	9	-	23.2	18.1	13.2	8.3	-
	19	24.6	24.6	21.6	16.7	13.4	23.2	23.2	21.1	16.2	12.9	20.9	20.9	20.3	15.4	12
	17	23.2	23.2	23.2	20.2	16.9	21.3	21.3	21.3	19	15.7	19	19	19	18.6	15.3
	15	20.9	20.9	20.9	20.9	19.9	19.9	19.9	19.9	19.9	18.5	17.9	17.9	17.9	17.9	17.9
Maximum flow 6 400	23	27.6	22.1	15.9	9.8	-	26.2	21.6	15.5	9.4	-	23.6	20.9	14.8	8.6	-
	19	25	25	24.8	18.7	14.6	23.6	23.6	23.6	18.1	14.1	21.2	21.2	21.2	17.4	13.3
	17	23.6	23.6	23.6	23	18.9	21.7	21.7	21.7	21.7	17.6	19.3	19.3	19.3	19.4	17.3
	15	21.2	21.2	21.2	21.2	21.2	20.3	20.3	20.3	20.3	20.3	18.2	18.2	18.2	18.2	18.2

9.2.- Cooling capacities B5IH - 120

Aire de Retorno		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 5 100	23	35.6	22.4	17.3	12.3	-	33.7	21.8	16.7	11.7	-	30.4	20.8	15.7	10.6	-
	19	32.2	30	24.9	19.8	16.4	30.4	29.3	24.2	19.1	15.7	27.4	27.4	23.1	18	14.6
	17	30.4	30.4	28.6	23.5	21.1	27.9	27.9	27.3	22.2	18.8	24.9	24.9	24.9	21.2	17.8
	15	27.4	27.4	27.4	26.4	23	26.1	26.1	26.1	25	21.6	23.4	23.4	23.4	23.4	21.3
Nominal flow 6 800	23	36.3	26	19.3	12.7	-	34.4	25.4	18.7	12	-	31	24.4	17.7	11	-
	19	32.9	32.8	29.1	22.4	17.9	31	31	28.4	21.7	16.3	27.9	27.9	27.3	20.7	16.2
	17	31	31	31	27.2	22.8	28.5	28.5	28.5	25.8	21.3	25.4	25.4	25.4	25	20.5
	15	27.9	27.9	27.9	27.9	26.9	26.7	26.7	26.7	26.7	25	23.9	23.9	23.9	23.9	23.9
Maximum flow 8 500	23	36.8	29.6	21.4	13.1	-	34.9	29	20.8	12.5	-	31.5	28	19.8	11.5	-
	19	33.4	33.4	33.3	25	19.5	31.5	31.5	31.5	24.3	18.8	28.3	28.3	28.3	23.3	17.8
	17	31.5	31.5	31.5	30.9	25.4	28.9	28.9	28.9	28.9	23.8	25.8	25.8	25.8	25.8	23.2
	15	28.3	28.3	28.3	28.3	28.3	27.1	27.1	27.1	27.1	27.1	24.2	24.2	24.2	24.2	24.2

Data in compliance with EUROVENT conditions.

9.3.- Cooling capacities B5IH - 150

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 6 500	23	42.5	27.5	21	14.7	-	40.3	26.7	20.3	13.9	-	36.3	25.5	19.1	12.7	-
	19	38.5	37	30.6	24.2	19.9	36.3	36.1	29.7	23.3	19	32.7	32.7	28.4	22	17.8
	17	36.3	36.3	35.2	28.8	24.5	33.4	33.4	33.4	27.1	22.8	29.8	29.8	29.8	26.1	21.8
	15	32.7	32.7	32.7	32.5	28.2	31.2	31.2	31.2	30.6	26.3	27.9	27.9	27.9	27.9	26.2
Nominal flow 8 640	23	43.3	31.9	23.5	15.2	-	41.1	31.2	22.8	14.5	-	37	30	21.7	13.3	-
	19	39.2	39.2	35.8	27.4	21.8	37	37	34.9	26.6	20.9	33.3	33.3	33.3	25.3	19.7
	17	37	37	37	33.4	27.8	34	34	34	31.5	25.9	30.3	30.3	30.3	30.3	25.1
	15	33.3	33.3	33.3	33.3	32.9	31.8	31.8	31.8	31.8	30.6	28.5	28.5	28.5	28.5	28.5
Maximum flow 10 800	23	44	36.5	26.1	15.7	-	41.7	35.7	25.4	15	-	37.6	34.6	24.2	13.9	-
	19	39.8	39.8	39.8	30.6	23.7	37.6	37.6	37.6	29.8	22.9	33.8	33.8	33.8	28.6	21.7
	17	37.6	37.6	37.6	37.6	31.1	34.6	34.6	34.6	34.6	28.9	30.8	30.8	30.8	30.8	28.6
	15	33.8	33.8	33.8	33.8	33.8	32.3	32.3	32.3	32.3	32.3	28.9	28.9	28.9	28.9	28.9

9.4.- Heating capacities B5IH - 180

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 7 200	23	53.3	32.4	25.4	18.4	-	50.6	31.5	24.5	17.5	-	45.6	29.9	22.9	15.9	-
	19	48.3	42.9	35.9	28.9	24.3	45.6	41.8	34.8	27.8	23.2	41	40.2	33.2	26.2	21.5
	17	45.6	45.6	41	34	29.4	41.9	41.9	38.6	31.6	26.9	37.4	37.4	37.4	30.5	25.9
	15	41	41	41	37.9	33.3	39.2	39.2	39.2	35.4	30.8	35.1	35.1	35.1	35.1	30.6
Nominal flow 10 000	23	54.4	37.9	28.4	18.9	-	51.6	37	27.5	18	-	46.5	35.5	26	16.5	-
	19	49.3	49.3	42.4	32.9	26.5	46.5	46.5	41.3	31.8	25.5	41.8	41.8	39.7	30.2	23.8
	17	46.5	46.5	46.5	39.7	33.3	42.8	42.8	42.8	36.8	30.5	38.1	38.1	38.1	36.3	29.9
	15	41.8	41.8	41.8	41.8	39	40	40	40	40	35.9	35.8	35.8	35.8	35.8	35.8
Maximum flow 12 200	23	55.2	42.3	30.9	19.5	-	53.4	41.4	30	18.6	-	47.2	39.9	28.5	17.1	-
	19	50	50	47.5	36	28.4	47.2	47.2	46.4	35	27.4	42.5	42.5	42.5	33.4	25.8
	17	47.2	47.2	47.2	44.2	36.5	43.4	43.4	43.4	41	33.4	38.7	38.7	38.7	38.7	33.2
	15	42.5	42.5	42.5	42.5	42.5	40.6	40.6	40.6	40.6	39.9	36.3	36.3	36.3	36.3	36.3

Data in compliance with EUROVENT conditions.

9.5.- Cooling capacities B5IH - 240

Return air		Air temperature in outdoor coil (DB)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	TH °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 10 000	23	66.8	42.5	32.8	23.1	-	63.4	41.3	31.6	21.9	-	57.1	39.4	29.7	20	-
	19	60.5	56.9	47.2	37.5	31	57.1	55.6	45.9	36.2	29.7	51.4	51.4	43.8	34.1	27.6
	17	57.1	57.1	54.2	44.5	38.1	52.5	52.5	51.1	41.4	35	46.8	46.8	46.8	40.2	33.8
	15	51.4	51.4	51.4	50.1	43.6	49.1	49.1	49.1	46.8	40.3	43.9	43.9	43.9	43.9	40.4
Nominal flow 13 700	23	68.2	49.9	32.8	23.9	-	64.7	48.7	35.7	22.7	-	58.3	46.9	33.9	20.9	-
	19	61.8	61.8	55.8	42.8	34.1	58.3	58.3	54.5	41.5	32.8	52.5	52.5	52.5	39.5	30.8
	17	58.3	58.3	58.3	52.1	43.4	53.6	53.6	53.6	48.5	39.8	47.8	47.8	47.8	47.8	39.2
	15	52.5	52.5	52.5	52.5	51.3	50.1	50.1	50.1	50.1	47.2	44.9	44.9	44.9	44.9	44.9
Maximum flow 15 900	23	69.1	54.3	39.4	24.5	-	65.6	53.2	38.3	23.4	-	59.1	51.3	36.4	21.5	-
	19	62.6	62.6	60.9	46	36.1	59.1	59.1	59.1	44.7	34.8	53.2	53.2	53.2	42.8	32.8
	17	59.1	59.1	59.1	56.7	46.7	54.4	54.4	54.4	52.8	42.8	48.5	48.5	48.5	48.5	42.5
	15	53.2	53.2	53.2	53.2	53.2	50.8	50.8	50.8	50.8	50.8	45.5	45.5	45.5	45.5	45.5

9.6.- Cooling capacities B5IH - 300

Return air		Temperatura del aire en la batería exterior (TS)														
		27°C					35°C					46°C				
		Total power kW	Sensible power kW				Total power kW	Sensible power kW				Total power kW	Sensible power kW			
m³/h	WB °C		Intake temp. DB					Intake temp. DB					Intake temp. DB			
			30	27	24	22		30	27	24	22		30	27	24	22
Minimum flow 13 600	23	99.3	61	47.6	34.3	-	94.2	59.2	45.9	32.5	-	84.9	56.3	42.9	29.6	-
	19	90	81	67.6	54.3	45.4	84.9	78.9	65.6	52.2	43.3	76.4	75.8	62.5	49.1	40.3
	17	84.9	84.9	77.3	64	55.1	78.1	78.1	73.1	59.7	50.8	69.6	69.6	69.6	57.5	48.6
	15	76.4	76.4	76.4	71.5	62.6	73	73	73	67.1	58.2	65.4	65.4	65.4	65.4	57.7
Nominal flow 17 000	23	101.3	68.1	51.6	35.1	-	96.1	66.4	49.9	33.4	-	86.6	63.5	47	30.5	-
	19	91.8	91.8	75.9	59.4	48.4	86.6	86.6	73.9	57.4	46.4	77.9	77.9	70.9	54.4	43.4
	17	86.6	86.6	86.6	71.3	60.3	79.7	79.7	79.7	66.7	55.7	71	71	71	64.9	53.9
	15	77.9	77.9	77.9	77.9	70	74.5	74.5	74.5	74.5	64.9	66.7	66.7	66.7	66.7	65.2
Maximum flow 18 700	23	102.8	71.9	53.8	35.8	-	97.6	70.2	52	34	-	87.9	67.3	49.3	31.2	-
	19	93.2	93.2	80.3	62.2	50.2	87.9	87.9	78.3	60.2	48.2	79.1	79.1	75.3	57.2	45.2
	17	87.9	87.9	87.9	75.2	63.2	80.9	80.9	80.9	70.4	58.4	72.1	72.1	72.1	68.8	56.8
	15	79.1	79.1	79.1	79.1	73.9	75.6	75.6	75.6	75.6	68.5	67.7	67.7	67.7	67.7	67.7

Data in compliance with EUROVENT conditions.

9.7.- Heating capacities B5IH - 090

m^3/h	Return air DB °C	Outdoor air temperature DB °C								
		-15	-10	-5	0	5	7	10	15	20
Minimum flow 3 800	14	9.9	12.6	15.8	19.6	24	26.1	28.7	33.8	39.5
	17	9.5	12.1	15.3	18.9	23.1	25	27.4	32.3	37.8
	20	9.2	11.6	14.6	18.2	22.3	24.1	26.5	31.3	36.6
	23	8.8	11.1	13.4	17.4	21.4	23.2	25.5	30.1	35.2
	25	8.4	10.4	13.6	17	20.9	22.7	24.8	29.3	34.3
Nominal flow 5 100	14	10	12.7	15.9	19.7	24.1	26.3	28.8	34	39.8
	17	9.5	12.2	15.4	19	23.3	25.1	27.6	32.6	38.1
	20	9.2	11.7	14.7	18.3	22.5	24.3	26.7	31.6	36.9
	23	8.9	11.1	14	17.5	21.6	23.4	25.7	30.3	35.5
	25	8.4	10.5	13.7	17.1	21	22.8	25	29.6	34.6
Maximum flow 6 400	14	10	12.7	16	19.8	24.2	26.4	29	34.3	40.1
	17	9.6	12.3	15.4	19.1	23.4	25.2	27.6	32.6	38.2
	20	9.2	11.7	14.8	18.4	22.6	24.4	26.7	31.7	37.1
	23	8.9	11.2	14.1	17.6	21.7	23.5	25.8	30.5	35.7
	25	8.5	10.5	13.7	17.1	21.1	22.9	25.2	29.7	34.8

9.8.- Heating capacities B5IH - 120

m^3/h	Return air DB °C	Outdoor air temperature DB °C								
		-15	-10	-5	0	5	7	10	15	20
Minimum flow 5 100	14	13.2	16.8	21	26	21.8	34.7	38.2	44.9	52.6
	17	12.6	16.1	20.3	25.1	30.8	33.1	36.4	43	50.2
	20	12.2	15.4	19.4	24.2	29.7	32.1	35.2	41.6	48.7
	23	11.7	14.7	18.6	23.2	28.5	30.9	33.8	40	46.8
	25	11.1	13.8	18.1	22.5	27.8	30.1	33	39	45.6
Nominal flow 6 800	14	13.3	16.9	21.2	26.2	32	35	38.3	45.3	53
	17	12.7	16.2	20.4	25.3	31	33.4	36.7	43.3	50.6
	20	12.2	15.5	19.6	24.3	29.9	32.3	35.5	42	49.1
	23	11.8	14.8	18.7	23.3	28.7	31.1	34.1	40.3	47.2
	25	11.2	13.9	18.2	22.7	28	30.3	33.2	39.3	46
Maximum flow 8 500	14	13.3	16.9	21.3	26.3	32.2	35.1	38.6	45.6	53.3
	17	12.7	16.3	20.5	25.4	31.1	33.5	36.7	43.4	50.8
	20	12.3	15.6	19.6	24.4	30	32.4	35.5	42.1	49.3
	23	11.9	14.9	18.8	23.4	28.8	31.2	34.3	40.6	47.4
	25	11.2	14	18.2	22.8	28.1	30.5	33.5	39.5	46.3

Data in compliance with EUROVENT conditions.

Conditions not within compressor range.

9.9.- Heating capacities B5IH - 150

m^3/h	Return air DB °C	Outdoor air temperature DB °C								
		-15	-10	-5	0	5	7	10	15	20
Minimum flow 3 800	14	15.8	20.1	25.2	31.2	38.1	41.6	47.8	53.8	63
	17	15.1	19.3	24.3	30	36.9	39.7	43.7	51.5	60.2
	20	14.6	18.5	23.3	29	35.6	38.4	42.2	48.9	58.4
	23	14	17.6	22.3	27.8	34.1	37	40.5	47.9	56
	25	13.3	16.6	21.6	27	33.3	36.1	39.5	46.7	54.6
Nominal flow 5 100	14	15.9	20.2	25.4	31.4	38.4	41.9	45.9	54.2	63.4
	17	15.2	19.4	24.5	30.3	37.1	40	43.9	51.8	60.7
	20	14.7	18.6	23.5	29.1	35.8	38.7	42.6	50.3	58.8
	23	14.2	17.8	22.4	27.9	34.4	37.3	40.9	48.3	56.5
	25	13.4	16.7	21.8	27.2	33.5	36.3	39.8	47.1	55.1
Maximum flow 6 400	14	16	20.3	25.5	31.5	38.5	42.1	46.2	54.6	63.9
	17	15.2	19.5	24.5	30.4	37.3	40.1	43.9	52	60.8
	20	14.7	18.7	23.5	29.3	36	38.8	42.5	50.4	59
	23	14.2	17.8	22.5	28.1	34.5	37.4	41.1	48.6	56.8
	25	13.5	16.8	21.8	27.3	33.6	36.5	40.1	47.3	55.4

9.10.- Heating capacities B5IH - 150

m^3/h	Return air DB °C	Outdoor air temperature DB °C								
		-15	-10	-5	0	5	7	10	15	20
Minimum flow 7 200	14	20.7	26.3	32.9	40.8	49.8	54.4	59.8	70.3	82.3
	17	19.7	25.3	31.8	39.3	48.2	51.9	57.1	67.4	78.7
	20	19	24.1	30.4	37.9	46.5	50.2	55.2	65.2	76.3
	23	18.3	23	29.1	36.3	44.6	48.4	53	62.6	73.3
	25	17.4	21.7	28.3	35.3	43.5	47.2	51.7	61.1	71.5
Nominal flow 10 000	14	20.8	26.4	33.1	41.1	50.2	54.8	60	70.9	83
	17	19.9	25.4	32	39.6	48.5	52.3	57.4	67.8	79.3
	20	19.2	24.4	30.7	38.1	46.9	50.6	55.6	65.7	76.9
	23	18.5	23.2	29.3	36.5	44.9	48.7	53.4	63.1	73.9
	25	17.5	21.8	28.5	35.5	43.8	47.5	52.1	61.6	72.1
Maximum flow 12 200	14	20.9	26.5	33.3	41.2	50.4	55	60.4	71.4	83.5
	17	19.9	25.6	32.1	39.7	48.7	52.5	57.4	68	79.5
	20	19.3	24.4	30.8	38.3	47	50.8	55.6	66	77.2
	23	18.6	23.3	29.4	36.7	45.1	48.9	53.8	63.6	74.2
	25	17.6	21.9	28.6	35.7	44	47.7	52.5	61.8	72.5

Data in compliance with EUROVENT conditions.

Conditions not within compressor range.

9.11.- Heating capacities B5IH - 240

m^3/h	Return air DB °C	Outdoor air temperature DB °C								
		-15	-10	-5	0	5	7	10	15	20
Minimum flow 10 000	14	28.6	36.4	45.6	56.4	69	75.3	82.8	97.3	113.9
	17	27.3	35	43.9	54.4	66.7	71.8	79	93.2	108.9
	20	26.4	33.4	42.1	52.4	64.3	69.5	76.3	90.2	105.6
	23	25.4	31.9	40.3	50.2	61.7	66.9	73.3	86.6	101.4
	25	24.1	30	39.1	48.8	60.2	65.3	71.5	84.5	98.8
Nominal flow 13 700	14	28.7	36.6	45.9	56.8	69.4	75.8	83	98.1	114.8
	17	27.5	35.2	44.3	54.8	67.1	72.3	79.5	93.8	109.8
	20	26.5	33.7	42.5	52.7	64.8	70	77	90.9	106.4
	23	25.6	32.2	40.5	50.5	62.2	67.4	73.9	87.3	102.2
	25	24.3	30.2	39.4	49.2	60.6	65.8	72	85.2	99.7
Maximum flow 15 900	14	28.9	36.7	46.1	57.1	69.7	76.1	83.6	98.8	115.5
	17	27.6	35.4	44.4	54.9	67.4	72.6	79.5	94.1	110
	20	26.7	33.8	42.6	52.9	65.1	70.3	76.9	91.2	106.8
	23	25.7	32.3	40.7	50.8	62.4	67.7	74.4	87.9	102.7
	25	24.4	30.3	39.5	49.3	60.8	66	72.6	85.5	100.3

9.12.- Heating capacities B5IH - 300

m^3/h	Return air DB °C	Outdoor air temperature DB °C								
		-15	-10	-5	0	5	7	10	15	20
Minimum flow 13 600	14	32.7	41.6	52.1	64.5	78.8	86	94.6	111.2	130.2
	17	31.2	40	50.2	62.2	76.2	82.1	90.3	106.5	124.4
	20	30.1	38.2	48.1	59.9	73.5	79.4	87.2	103.1	120.7
	23	29	36.4	46	57.4	70.5	76.5	83.8	99	115.9
	25	27.6	34.3	44.7	55.8	68.8	74.6	81.7	96.5	113
Nominal flow 17 000	14	32.9	41.8	52.4	64.9	79.4	86.6	94.8	112.1	131.2
	17	31.4	40.2	50.6	62.6	76.7	82.6	90.8	107.2	125.4
	20	30.3	38.5	48.5	60.2	74.1	80	88	103.9	121.6
	23	29.3	36.7	46.3	57.8	71.1	77	84.5	99.8	116.8
	25	27.7	34.5	45.1	56.2	69.3	75.1	82.3	97.4	114
Maximum flow 18 700	14	33	42	52.7	65.2	79.7	87	95.5	112.9	132
	17	31.5	40.4	50.7	62.8	77	82.9	90.8	107.5	127.7
	20	30.5	38.6	48.6	60.5	74.4	80.3	87.9	104.3	122
	23	29.4	36.9	46.5	58	71.4	77.3	85	100.5	117.4
	25	27.8	34.7	45.2	56.4	69.5	75.5	82.9	97.7	114.6

Data in compliance with EUROVENT conditions.

Conditions not within compressor range.

10 - Heating performance D5IG

10.1.- Application data with gas heating

Model	Heating Capacity		Gas consumption* m^3/h	Temperature increase in °C at full power**	
	Total (P.C.I)*** 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: The gas units are supplied ready for use with natural gas, but can be changed over to propane gas (LPG) by means of a conversion kit.
* Based on gas type 2ND-H, G20.
** Air flow should be adjusted to achieve a temperature increase within the indicated limits.
*** P.C.I.: Low heating power

11 - Characteristics of indoor fan

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	2.2	90LB	86-112	24	132	25	1 240	BX47	1
Standard	**120**	780-1015	3	100LB	86-112	28	160	25	1 412	BX54	1
High speed HPD	**120**	950-1230	4	100LC	-	-	132	25	1 360	BX52	1
Standard	**150**	955-1155	4	100LC	124-150	28	188	25	1 513	BX58	1
High speed HPD	**150**	1124-1360	5.5	112MB	-	-	160	25	1 490	BX57	1
Standard	**180**	840-1140	4	100LC	109-135	28	188	25	1 740	BX67	1
High speed HPD	**180**	1130-1370	5.5	112MB	147-178	28	-	-	1 790	BX69	1
Standard	**240**	765-920	5.5	112MB	124-150	28	236	25	2 040	BX79	1
High speed HPD	**240**	900-1090	7.5	132M	147-178	38	-	-	2 040	BX79	1
Standard	**300**	950-1080	9.2	132MBA	139-173	38	212	35	1 990	BX77	2
High speed HPD	**300**	1040-1300	11	132MB	152-190	38	-	-	2 040	BX79	2

[1]) All motors are of the fully enclosed type, fan-cooled at 1.450 r.p.m., with a solid base and a 1.15 service factor. See section No. 12 (Indoor fan performances) to determine motor pulley setting and the type of drive needed.

12 - Indoor fan performances

- For cool only units with 0% outdoor air and 100% return, dry indoor coil and standard EU3 air filters.
- Attention: Before going on to the tables, do not forget to add the pressure needed in the installation, the pressure drop due to whether the unit is gas or pump, the vertical impulse and return and the accessories on the unit, if applicable (see section No. 13).
- The motor pulley is factory set to 4 opening turns. See section No. 15 for belt adjustment and tensing procedure.
- **Attention:** When starting the installation up, and once air distribution is balanced in the conditioned space, impulse air flow should be checked.
  It is highly recommended not overpass -200 Pa depression at the indoor fan section section with clean filters.

Verification of indoor air flow

The indoor air flow depend upon the accessories on the unit and the static resistances of the supply and return air systems. With this information you can determine the opening of the motor pulley (Nº of turns) by means of the fan performance data indicated in the Tables of section 12.

Knowing the opening of the motor pulley needed, the speed range (r.p.m.) can be determined as indicated in the table of setion 15.

Turn on the indoor air fan motor. Adjust resistances both in the supply and return air ducts to balance distribution throughout the conditioned room. Depending upon site specifications, it might be necessary to have this balancing operation carried out by someone other that the unit installer.

To check impulse air flow after the initial balancing operation:

1. There are two 9.5 mm. holes for reading the pressure in front and behind the evaporating coil. These are located on the access panels filter side and fan side, and have a cap, Fig. 7. Remove both caps.
2. Insert at least 200 mm. of pipe (with a diameter of about 6 mm.) through each hole to penetrate in the air flow sufficiently on both sides of the indoor coil.

Note:
The pipes should be inserted and kept in perpendicular position to the air flow so the dynamic pressure will not affect static pressure readings.

3. Using an inclined pressure gauge, determine the pressure drop through the new air filter and the dry indoor coil. Since humidity can vary considerably in an indoor coil, measuring the pressure drop in a wet coil in site conditions would not be precise.

To make sure the coil is dry, disconnect the compressors while checking.

4. Knowing the pressure drop in the dry coil, you can determine real air flow through the unit by means of the curve in Fig. 8.

Once a reading has been taken, remove the pipes and replace the caps on both openings.

Warning:
Not being able to adjust the total amount of air in the system could cause serious damage to the fan.

Location of openings (pressure drop reading)

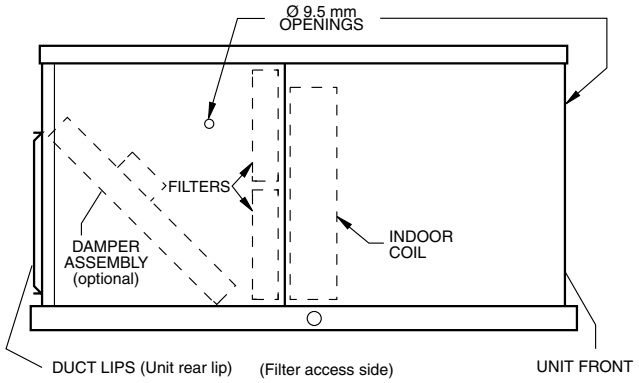
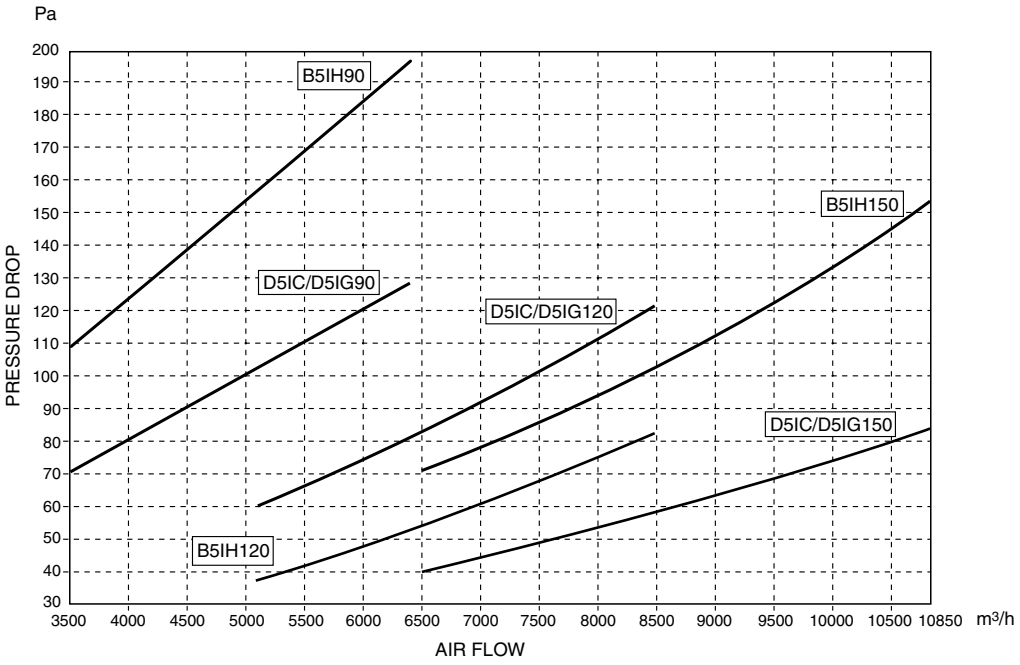


Fig. 7.

Pressure drop of new air filter and dry indoor coil vs. air flow



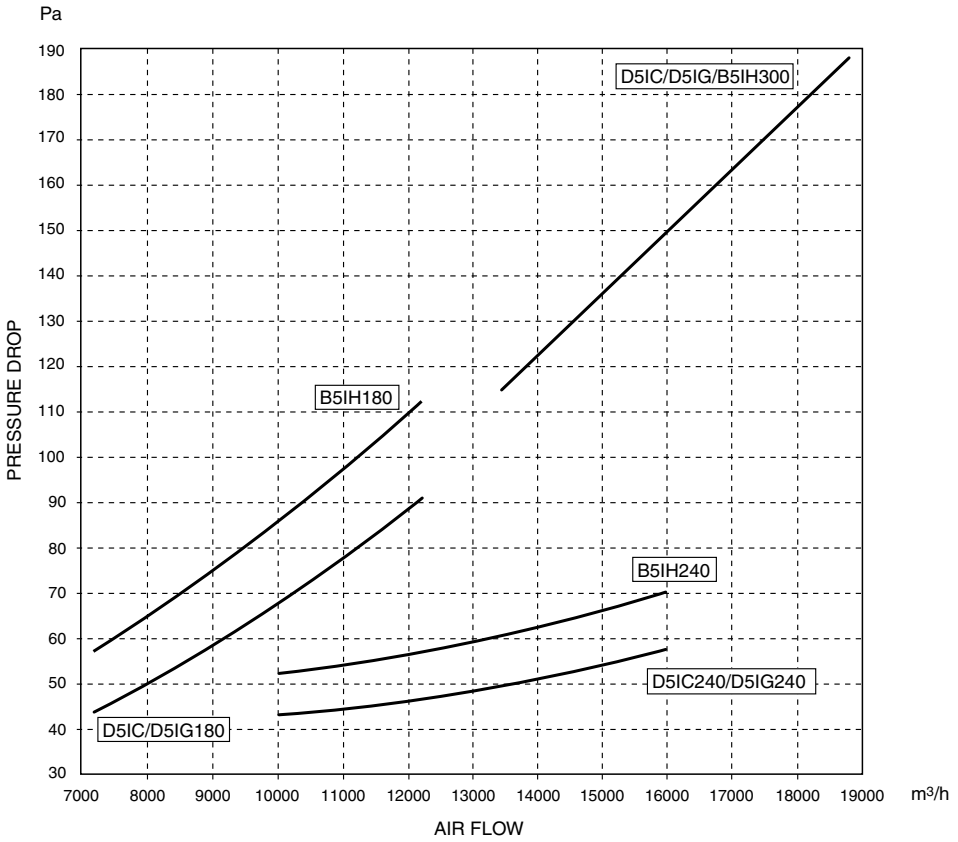


Fig. 8.

12.1.- Models 090, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)v	Air flow m³/h									
	3 800		4 500		5 100		5 700		6 400	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	480	1.7	401	1.9	330	2.2	256	2.4	165	2.7
1	438	1.6	360	1.85	288	2.1	217	2.3	125	2.55
2	394	1.5	318	1.8	249	2	176	2.2	88	2.4
3	355	1.4	277	1.65	210	1.85	136	2.05	50	2.25
4	316	1.3	237	1.5	156	1.7	97	1.9	-	-
5	280	1.2	202	1.4	132	1.55	60	1.75	-	-
6	246	1.1	167	1.3	98	1.4	-	-	-	-

ASP = Available static pressure Pa Standard drive (2.2 kW) Zone out of range

12.2.- Models 120 C/G, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	5 100		6 000		6 800		7 600		8 500	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	413	2.96	327	3.45	200	3.9
1	-	-	436	2.9	362	2.74	270	3.16	151	3.68
2	450	1.91	385	2.21	310	2.55	217	2.93	97	3.45
3	380	1.75	312	2.03	237	2.31	140	2.67		
4	307	1.57	243	1.84	165	2.11	62	2.42	-	-
5	262	1.45	196	1.68	115	1.93	-	-	-	-
6	218	1.3	150	1.5	65	1.74	-	-	-	-

ASP = Available static pressure Pa Standard drive (3 kW) Zone out of range

12.3.- Models 120 C/G, applications with horizontal ducts (side) (HPD drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	5 100		6 000		6 800		7 600		8 500	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	-	-	436	4.12	307	4.71
1	-	-	-	-	485	3.5	405	3.95	275	4.55
2	-	-	-	-	462	3.3	370	3.76	246	4.41
3	-	-	490	2.65	417	3.03	327	3.45	200	4.02
4	-	-	446	2.4	370	2.74	280	3.13	156	3.65
5	475	1.91	393	2.21	320	2.53	226	2.9	105	3.35
6	415	1.74	347	2	265	2.31	170	2.67	50	3.05

ASP = Available static pressure Pa Optional HPD drive (4 kW) Zone out of range

12.4.- Models 120 H, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	5 100		6 000		6 800		7 600		8 500	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	570	2.4	441	2.8	325	3.1	189	3.5	40	3.9
1	503	2.2	375	2.55	256	2.85	130	3.2	-	-
2	435	2	310	2.3	190	2.6	64	2.9	-	-
3	364	1.8	250	2.1	130	2.35	-	-	-	-
4	295	1.6	184	1.9	67	2.1	-	-	-	-
5	229	1.45	125	1.7	-	-	-	-	-	-
6	163	1.3	64	1.5	-	-	-	-	-	-

ASP = Available static pressure Pa Standard drive (3 kW) Zone out of range

12.5.- Models 120 H, applications with horizontal ducts (side) (HPD drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	5 100		6 000		6 800		7 600		8 500	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	497	3.95	370	4.4	210	4.8
1	-	-	-	-	436	3.7	310	4.1	150	4.55
2	-	-	495	3.1	375	3.4	253	3.8	97	4.3
3	-	-	434	2.8	316	3.15	190	3.5	36	3.9
4	500	2.25	380	2.55	260	2.9	130	3.25	-	-
5	480	2	315	2.3	193	2.7	65	2.95	-	-
6	360	1.8	250	2.1	127	2.35	-	-	-	-

ASP = Available static pressure Pa Optional HPD drive (4 kW) Zone out of range

12.6.- Models 150, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	6 500		7 600		8 640		9 700		10 800	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	428	2.9	325	3.5	208	4.1	80	4.2	-	-
1	378	2.8	272	3.35	158	3.9	-	-	-	-
2	330	2.7	227	3.2	106	3.7	-	-	-	-
3	286	2.5	183	2.95	67	3.5	-	-	-	-
4	245	2.3	145	2.75	-	-	-	-	-	-
5	206	2.15	103	2.6	-	-	-	-	-	-
6	165	2	60	2.4	-	-	-	-	-	-

ASP = Available static pressure Pa Standard drive (4 kW) Zone out of range

12.7.- Models 150, applications with horizontal ducts (side) (HPD drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	6 500		7 600		8 640		9 700		10 800	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	458	5	310	5.85	134	6.8
1	-	-	-	-	405	4.6	260	5.35	100	6.2
2	-	-	470	3.7	350	4.2	210	4.9	65	5.6
3	490	2.8	395	3.4	280	3.9	144	4.5	-	-
4	430	2.6	320	3.1	210	3.6	76	4.15	-	-
5	353	2.4	250	2.9	180	3.35	-	-	-	-
6	280	2.25	180	2.7	55	3.1	-	-	-	-

ASP = Available static pressure Pa Optional HPD drive (5.5 kW) Zone out of range

12.8.- Models 180, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	7 200		9 000		10 000		11 000		12 200	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	461	3.15	405	3.6	347	4.2	279	4.9
1	-	-	420	2.9	360	3.35	301	3.9	237	4.6
2	478	2.1	378	2.7	317	3.1	256	3.6	176	4.3
3	423	2	334	2.6	277	3	217	3.55	152	4.1
4	373	1.9	289	2.5	236	2.9	180	3.3	105	3.9
5	328	1.8	243	2.35	192	2.7	136	3.1	76	3.7
6	283	1.7	201	2.2	150	2.5	94	2.9	-	-

ASP = Available static pressure Pa Standard drive (4 kW) Zone out of range

12.9.- Models 180, applications with horizontal ducts (side) (HPD drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	7 200		9 000		10 000		11 000		12 200	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	530	4.15	463	4.8	382	5.6
1	-	-	-	-	467	3.9	408	4.45	328	5.2
2	-	-	455	3.3	406	3.6	350	4.1	275	4.8
3	-	-	392	2.95	347	3.3	291	3.8	217	4.45
4	410	1.95	334	2.6	286	3	232	3.45	160	4.1
5	356	1.8	280	2.9	231	2.8	180	3.2	106	3.8
6	300	1.7	223	2.3	177	2.6	120	3	50	3.5

ASP = Available static pressure Pa Optional HPD drive (5.5 kW) Zone out of range

12.10.- Models 240, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	10 000		11 900		13 700		14 800		15 900	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	503	3.8	415	4.6	315	5.45	252	6	180	6.5
1	435	3.5	355	4.3	263	5.1	200	5.6	137	6.1
2	379	3.2	300	4	210	4.7	150	5.2	90	5.7
3	330	2.95	250	3.6	157	4.3	93	4.8	37	5.3
4	283	2.7	200	3.2	104	3.9	40	4.4	-	-
5	227	2.5	145	2.95	47	3.65	-	-	-	-
6	170	2.3	90	2.7	-	-	-	-	-	-

ASP = Available static pressure Pa Standard drive (5.5 kW) Zone out of range

12.11.- Models 240, applications with horizontal ducts (side) (HPD drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	10 000		11 900		13 700		14 800		15 900	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	520	7.1	452	7.75	382	8.4
1	-	-	-	-	460	6.6	397	7.2	330	7.8
2	-	-	502	5.3	405	6.15	340	6.7	276	7.3
3	-	-	454	4.85	357	5.7	292	6.2	221	6.8
4	493	3.8	403	4.4	306	5.2	240	5.7	167	6.3
5	427	3.45	342	4.1	250	4.85	180	5.4	110	5.9
6	360	3.1	280	3.8	190	4.5	125	5	52	5.6

ASP = Available static pressure Pa Optional HPD drive (7.5 kW) Zone out of range

12.12.- Models 300, applications with horizontal ducts (side) (standard drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	13 600		15 300		17 000		18 700		20 400	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	472	7.6	350	8.55	208	10	56	11.4	-	-
1	422	7.2	292	8.2	150	9.5	-	-	-	-
2	360	6.75	230	7.8	93	9	-	-	-	-
3	287	6.4	164	7.1	-	-	-	-	-	-
4	215	6	90	6.4	-	-	-	-	-	-
5	160	5.6	-	-	-	-	-	-	-	-
6	100	5.1	-	-	-	-	-	-	-	-

ASP = Available static pressure Pa Standard drive (9.2 kW) Zone out of range

12.13.- Models 300, applications with horizontal ducts (side) (HPD drive)

Opening adjustment of motor pulley (No. of turns)	Air flow m³/h									
	13 600		15 300		17 000		18 700		20 400	
	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW	A.S.P.	kW
0	-	-	-	-	463	11.5	300	13.4	130	15.2
1	-	-	-	-	392	11	235	12.7	73	14.3
2	-	-	476	9.1	330	10.5	176	12	-	-
3	506	7.5	392	8.5	250	9.9	91	11.3	-	-
4	426	7.1	307	8	180	9.3	-	-	-	-
5	360	6.7	240	7.7	102	8.7	-	-	-	-
6	295	6.3	167	7.4	-	-	-	-	-	-

ASP = Available static pressure Pa Optional HPD drive (11 kW) Zone out of range

13 - Pressure drop depending upon models and accessories

13.1.- Models 090 - 120 - 150

Model			Pressure drop (Pa)				
		m³/h	3 800	5 100	6 800	8 500	10 800
Gas D5IG			7	15	31	53	90
Heat pump B5IH		090	41	55	-	-	-
		120	-	22	30	39	-
		150	-	-	34	46	71
Vertical discharge and return		090	18	34	-	-	-
		120	-	33	59	92	-
		BIH 120/150	-	44	61	81	113
Accessory	Economiser / motor-driven damper		3	5	8	12	20
	Electric heater kW	16	15	27	50	76	114
		25	16	30	52	82	134
		37	-	35	58	87	142
	Water coil		56	78	110	140	188

13.2.- Models 180 - 240 - 300

Model			Pressure drop (Pa)							
		m^3/h	7 200	8 500	10 000	12 200	13 700	15 900	17 000	18 700
Gas D5IG			19	24	32	47	60	80	91	108
Heat pump B5IH		180	13	16	22	33	-	-	-	-
		240	-	-	11	16	20	27	-	-
Vertical discharge		180	45	60	83	122	-	-	-	-
		240	-	-	48	73	91	124	-	-
		300	-	-	-	-	45	98	130	185
Vertical return			12	12	12	12	12	12	12	12
Accessory	Economiser / motor-driven damper		6	8	10	14	19	25	28	33
	Electric heater kW	16	22	32	46	71	90	125	144	175
		25	22	32	46	71	90	125	144	175
		37	29	41	56	87	110	149	172	208
		50	47	67	92	140	177	240	274	334
	Water coil		36	48	63	92	110	144	163	195

14 - Accessories

Definition: "OPTION" are factory fitted items supplied installed on the unit and ready for use; "ACCESSORY" are items that must be installed, fully or in part, at the job site.

Section	Description	Option / Accessory
14.1	Economiser or motorized air damper	Option
14.2	Atmospheric damper / fixe outdoor air intake assembly (mod.090/120/150)	Accessory
14.3	Fixed outdoor air intake damper (mod. 180/240/300)	Accessory
14.4	Barometric releif damper	Accessory
14.5	Low temperature control (Low ambient)	Option / Accessory
14.6	High pressure drive (HPD)	Option / Accessory
14.7	Propane gas conversion kit (D5IG)	Accessory
14.8	Dirty filter pressure switch	Option
14.9	Mounting base (Roofcurb), fixed and adjustable	Accesorio
14.10	Smoke detector	Option
14.11	Power exhaust fan	Accessory
14.12	Side duct connecting panels (mod. 180/240/300)	Accessory
14.13	Electric heater	Option
14.14	Hot water coil	Option
14.15	Air filters, washable, G4 (EU4)	Option
14.16	Low noise level kit	Option
14.17	Firestat	Option
14.18	Copper fin coil	Option
14.19	"Blue Fin" coil	Option
14.20	Enthalpy probes for economiser	Option
14.21	Indoor air quality probe	Option or Accessory

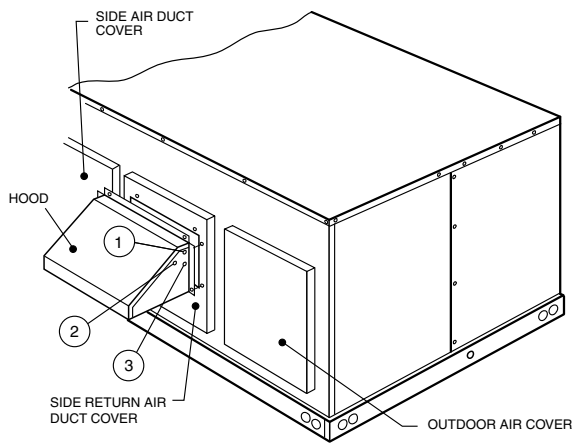
14.1.- Modulating economiser, temperature control

Comprised of a damper located at the return end of the unit, and another at the outdoor air intake.
This control compares the outdoor and return air values and adjusts the opening of both dampers proportionally by means of the 0-10v modulating actuator equipped with a return spring.
To ensure a good level of comfort, the impulse temperature is limited to 12° C.
The dampers are factory set for a minimum outdoor air volume of approximately 10%.
The outdoor air damper is equipped with a rain hood assembly, which includes aluminium mesh filters, to avoid drops of water seeping into the unit.
This rain hood is supplied fully unassembled for on site assembly.
If necessary, the economiser can include, as options, the enthalpy sensor control (see 14-02) as well as power exhaust fan system when required by the installation design (see 14-11).
The economiser can be adapted to operate as a motor-driven outdoor air damper, which makes it possible to adjust the minimum and maximum outdoor air volume values, depending upon installation requirements; always in accordance with the operating limits of the unit.

14.2.- Fixed outdoor air intake / barometric damper assembly (models 090-120-150) Fig. 9

Acts as a safety atmospheric damper on units equipped with an economiser or a fixed outdoor air intake damper in models without an economiser. On units without economiser, it adjusts the damper in accordance with the desired air flow, setting it to one of the three possible positions.
Position 1 allows an air flow of approximately 25%, position 2 about 15% and position 3 around 10% approximately. There is a screw on both sides of the hood for fastening this support in place.
In the case of a side return duct, it should be fitted on the front of said duct, as close to the unit as possible.

090 - 120 - 150

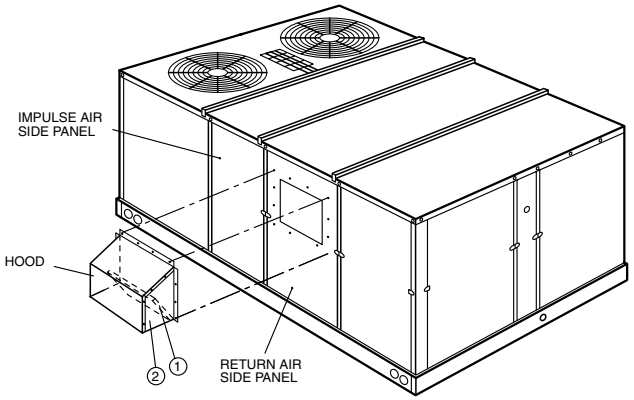


- Fig. 9 -

14.3.- Fixed outdoor air intake damper (models 180 - 240 - 300) Fig. 10

This assembly comprises a rain hood with a damper that can be adjusted to accept an outdoor air flow of 10, 15 or 25%. In the case of bottom ducts, the air intake damper should be fitted on the opening located on the return air panel. With horizontal discharge ducts, it should be fitted on the return air duct.
The damper deflector set to position 1 allows a recycled air flow of approximately 10%, in position 2 about 15% and to achieve 25% approximately, remove the deflector from the damper.
In the case of a side return duct, it should be fitted on the front of said duct, as close to the unit as possible.

180 - 240 - 300



- Fig. 10 -

14.4.- Barometric releif damper (model 180 - 240 - 300)

To relieve excess air pressure inside the building, which can be generated when an economizer or motor-driven damper is used. This is the most economical and appropriate extraction system for installations in which air return is without ducts, for an extraction of up to a maximum of 25% of total impulse air flow.
Comprises a surge pressure damper, to be fitted in the return area of the unit. Includes a rain hood and a protecting grid. In the case of bottom duct connections, the damper should be fitted on the side opening of the return air panel.
In the case of a side return duct, it should be fitted on the front of said duct, as close to the unit as possible.

14.5.- Low ambient temperature control

Packaged air conditioning units are designed to operate in cooling mode down to 7° C. With this accessory, the unit operates correctly in cool mode at ambient temperatures down to -18° C.

14.6.- High pressure drive (HPD)

Allows increasing indoor fan performance with regard to flow and/or static pressure. Comprises a larger motor than the standard model, and a larger diameter motor pulley, or smaller diameter fan pulley, depending upon the model.
This accessory is manufactured for models 120, 150, 180, 240 and 300 only.

14.7.- Conversion kit to propane gas (D5IG)

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

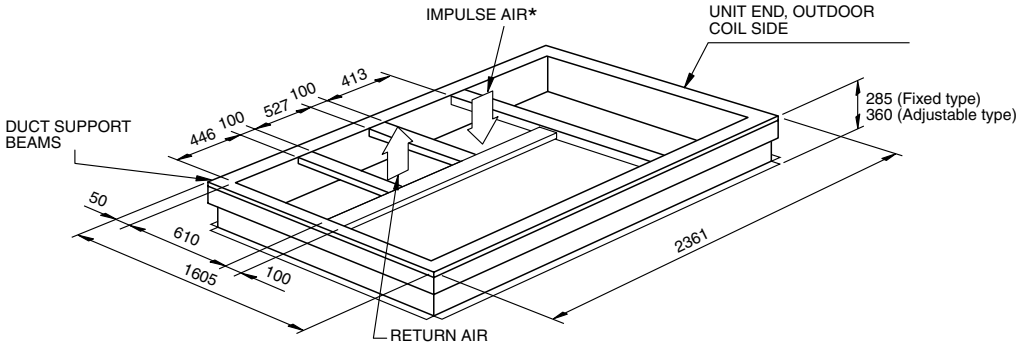
14.8.- Dirty filter pressure switch

Allows establishing a dry contact when the filters are obstructed, thus indicating filters need maintenance or replacement. Connected to the DPC-1 (with communication) thermostat, allows viewing the filter icon on the display.

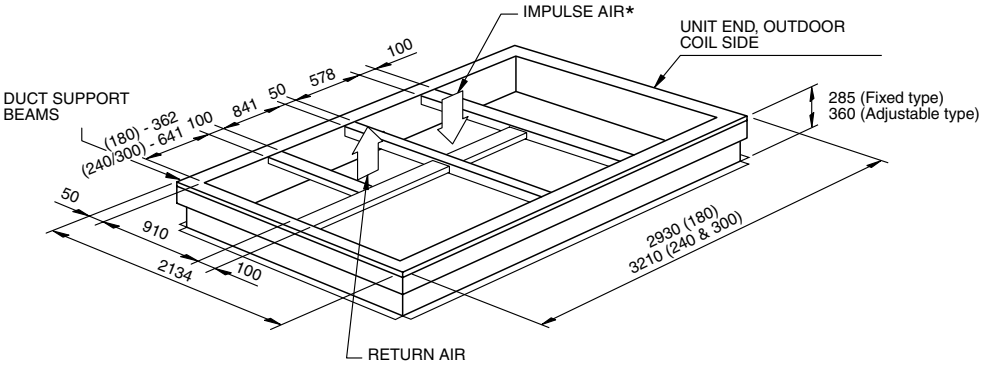
14.9.- Mounting bases (Roof-Curb)

The mounting bases provide an airtight seal between the unit and the finished roof. These bases are shipped unassembled for site assembly.
Designed to fit into the unit base beams.
The ducts can be installed on the mounting base from the

090 - 120 - 150



180 - 240 - 300



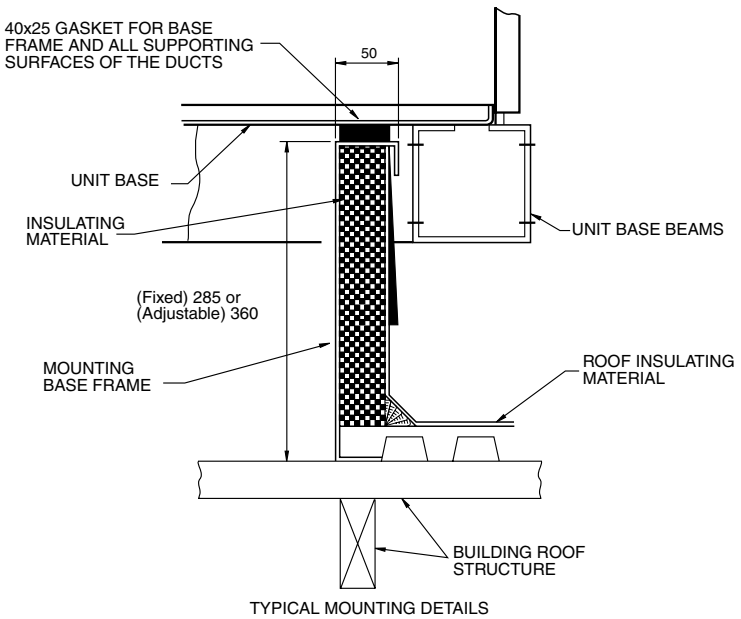


Fig.11
Dimensions of mounting base (Roof-Curb)

roof. All wiring can be done from the mounting base.
There are 2 types of mounting bases.
1.- Fixed: For roofs without a slope.
2.- Adjustable: For roofs with a slope of up to 7°.

14.10.- Smoke detector

The smoke detector is installed in the return air section of the unit.
If smoke particles are detected, the unit is locked out (off) and must be reset manually to resume operation.
The smoke detector is a protection device for the unit. It should not be used as protection system for the building or other installations. Use is subject to compliance with local regulations that affect the unit (with regard to ventilation systems, fire prevention, etc.). Depending upon these regulations, this option could require the use of an economiser or a motor-driven damper.

14.11.- Power exhaust fan (axial)

This is the adequate extraction system when using an economiser or motor-driven damper and an extraction of over 25% of total impulse air flow is required, and the return is ducted.
The system comprises one axial fan located inside a rain hood, which also includes a barometric releif damper.
Up to approximately 30% of outdoor air intake, it acts as a barometric damper.
When this intake degree is reached, the fans become operative with direct outdoor discharge.
Supplied pre-assembled, ready for on site installation on the of unit return air side panel.
In the case of a side return duct, it should be fitted on the front of said duct, as close to the unit as possible.

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

Necessary for connecting side impulse and/or return ducts on the side of the unit.

14.13.- Electric heater

Available for cool only and heat pump models.
Located in the impulse air zone of the unit.
Available in 12 to 50 kW capacities, depending upon the size of the unit.
All are 2-stage (except the 12 kW type, which is single-stage), with an automatic switch included.

14.14.- Hot water coil and control

Supplied factory installed, available in 35 to 105 kW heating capacities, depending upon the unit. The assembly includes: Coil,
3-way mixing valve, 0-10v proportional actuator and anti-freeze probe. The coil is located in the impulse air zone of the unit, and allows connecting the ducts on the side or the bottom, indistinctly.

Equipment		**090**	**120**	**150**	**180**	**240**	**300**
Air flow	m³/h	5 100	6 800	8 600	10 000	14 000	17 000
Heating capacity	kW	37	45	55	70	92	105
Water flow	m³/h	1.6	2.1	2.4	3.6	6.4	7
Entering water temperature	°C	80	80	80	80	80	80
Leaving water temperature	°C	60	60	60	65	65	65
Water circuit pressure drop	Kpa	1.4	1.9	2.5	13	37.8	44.4
Total water volume	l	7.7			10		

- Data with entering air temperature at 18°C
- For air pressure drop, please see tables Nos. 13.1 and 13.2

14.15.- Washable EU4 air filters

48 mm. metal frame filters with washable filtering media. Gravimetric efficiency 90% (EU4), and fire resistance class F1 (DIN 53438).

14.16.- Fire detection thermostat

As standard equipment, the unit includes an air impulse probe that locks the unit out at 80° C and must be reset manually to resume operation.
There is a manual adjust and reset temperature probe, as an accessory, to be located on the impulse plenum of the unit. Should this zone reach the set temperature, the unit is locked out and the probe and control unit must be reset manually to resume operation.
The fire detecting thermostat is a protection device for the unit. It should not be used as protection system for the build-

ing or other installations. Use is subject to compliance with local regulations that affect the unit (with regard to ventilation systems, fire prevention, etc.). Depending upon these regulations, this option could require the use of an economiser or a motor-driven damper.

14.17.- Copper fin coils

Coils with copper fins achieve the greatest anticorrosion protection for installations in seaside areas, ensuring 100% efficiency. Applied to both condensing (outdoor) as well as evaporating (indoor) units. See section No. 4.3. for weight increase on standard units.

14.18.- "Blue Fin" coils

Aluminium fins with a varnish type coating and a polyurethane base, offering anticorrosion resistance of up to 1000 H.N.S. (ASTM-B117).

14.19.- Enthalpy probes for economiser

When a more adaptable control of the economiser is required in zones in which humidity level is important.

14.20.- Indoor air quality probe

This option operates necessarily with the economiser. The probe determines the degree of air pollution due to different causes, such as, for example, occupation level of the room, cigarette smoke, kitchens, carbon monoxide, etc.
When the preset limits are exceeded, this control unit acts upon the economiser, adjusting the outdoor air damper, without hindering the cooling function of the unit. Three air quality levels can be selected by means of this probe. By default, normal level is selected.
The indoor air quality sensor is active only if the indoor air temperature is reach (The indoor temperature has priority)

15 - Pulley adjustment and belt tensing

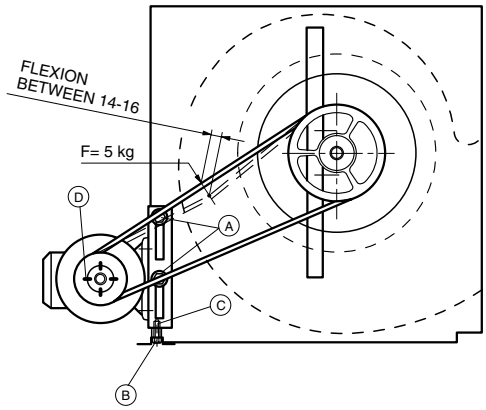
All units are equipped with single-speed motors and pulley drives on fans. The variable fan motor belt can be adjusted to obtain the desired impulse air flow. Belt tensing should be carried out as shown in Fig. 12.

1.- Adjusting pulley (1 channel mod. 090, 120, 150, 180 and 240), (2 channels mod. 300).
- Loosen the belts by loosening nuts "A" and turning tensing screw "B" (do not loosen nuts "C").
- Loosen studs "D" to release mobile rims "E".
- Turn rim "E" on the thread of the fixed core of the pulley, in the adequate direction to increase or decrease pulley aperture.
- Tighten studs to a maximum, coinciding with their lodging in the fixed core of the pulley.
  Attention: On model 300, with 2-channel pulley), both channels must have the same clearance (the same number of opening or closing turns).

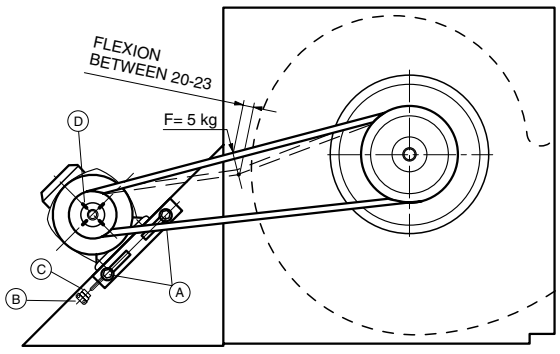
2.- Belt tensing
- Tense with tensing screw "B".
- If no belt strain gauge is available, use the following practical method:
- Apply a pressure of 5 kg on the midpoint of the belt, and perpendicular to same.
- With this pressure, the belt should move from 12 to 14 mm. for models 090, 120 and 150, and between 20 and 23 mm. for models 180, 240 and 300.

3.- After tensing, retighten nuts "A".

4.- It is recommendable to check belt tension twice during the first 24 operating hours.

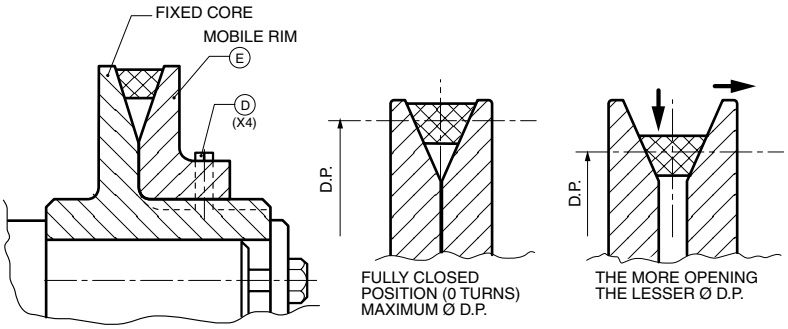


Mod. 090, 120, 150

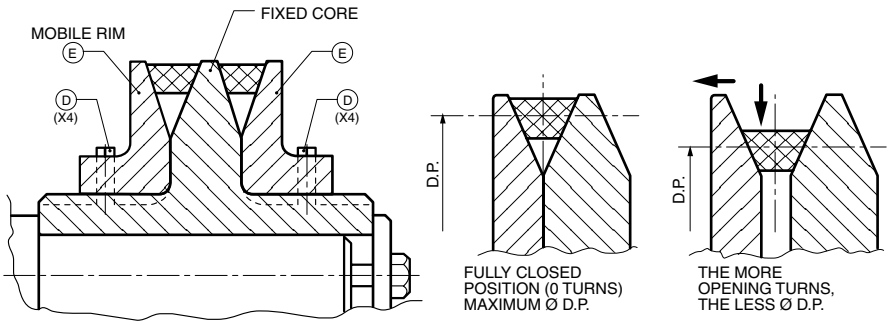


Mod. 180, 240, 300

Mod. 090, 120, 150, 180 and 240 (1-channel pulley)



Mod. 300 (2-channel pulley)



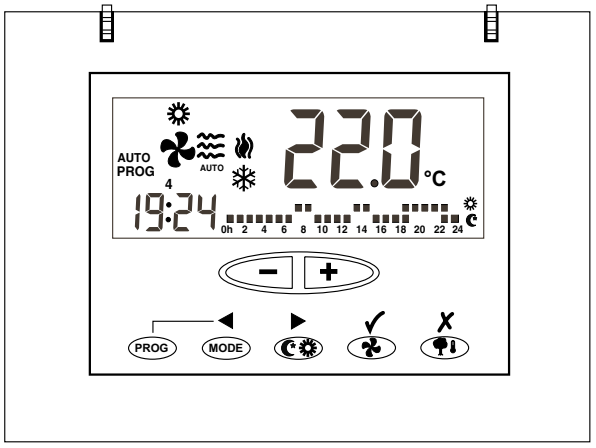
Caution: Disconnect all power supply to the unit before carrying out any of these operations.

- Fig. 12 -

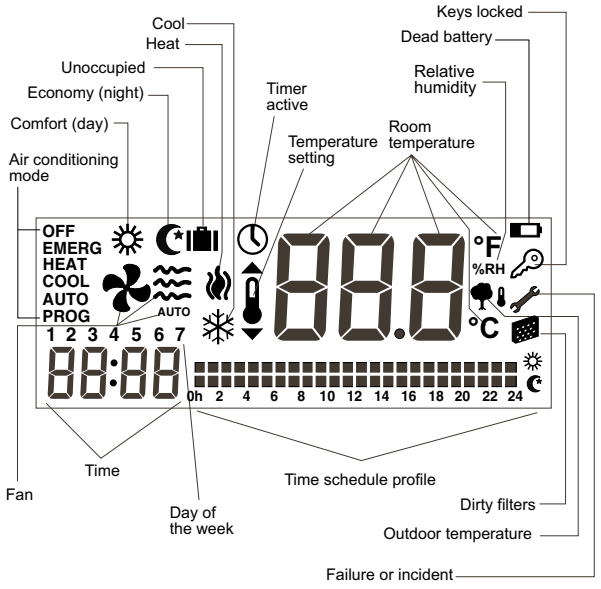
16 - DPC-1 programmable digital thermostat with communication

Internal view of the thermostat

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



Description of the display



16.1.- 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

HEAT 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 enabled. The word **AUTO** and the 🔥 icon and ❄ (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 the unit is 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.

16.2.- 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 − and + keys are pressed at the same time, reading goes from ° C to ° F, and vice versa.

Air Conditioning mode key MODE

Pressing this key in Normal Mode changes the current air

conditioning mode (OFF, COOL, HEAT, AUTO, AUTO PROG, EMERG HEAT).

Occupation mode key

In *Normal Mode* it will change the current occupation or comfort 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 for an indefinite period of time. 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 clock 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.

17 - Operation

17.1.- 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.

17.2.- 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 start-ups (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.

17.3.- 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 cool or heat management varies in accordance with the type of thermostat in use: DPC-1 (communication) or a relay thermostat.

17.4.- 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.
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 unoccupied. 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 economiser will operate in cool mode only.

17.5.- Low temperature operation

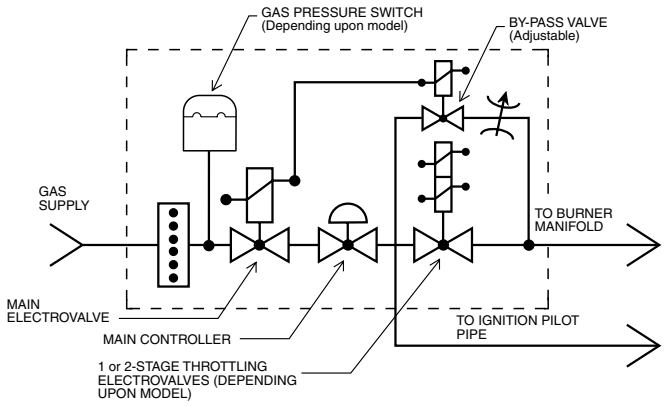
(Models D5IC/D5IG-180-240-300)
If outdoor temperature is above 21° C, the 2 outdoor fans

are operative.
If outdoor temperature is below 16° C, the outdoor fan of circuit 1 goes off.
In this way, the limited air flow in the condensing coils allows cooling operation up to -4° C.

17.6.- Heating operation sequence with gas (models D5IG)

REQUEST FOR HEAT, 1: If the thermostat generates a demand for heat, the YKIon board activates the indoor fan and the gas control board generates a W1 signal (terminal 41). If the LS1 thermostat (manual reset) is closed and gas supply pressure is above the gas pressure switch (GS) set point, the ignition control (IC1) is activated and the ignition sequence begins. See Fig. 13, Typical gas valve.

Typical gas valve



- Fig. 13 -

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.
If the AS contact has closed, thermostats RS and LS2 are off (automatic reset) and the prepurge is finished, 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 ignition pipe assembly assures that all burners ignite correctly. If the flame detector (of the ionisation electrode type) gives adequate intensity within a 5-second interval, the gas valve is activated.
If not, the ignition control is locked out and generates an alarm that is detected by the gas board and resets IC1. The gas board can carry out a maximum of 5 resets while the thermostat generates the same request for heat. Then the gas control is locked out and thermostat DPC-1 indicates the failure on the display.
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 generates an alarm. If heat switch LS1 or the heat switch (RS) of burner assembly 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 generates an alarm.
REQUEST FOR HEAT, 2: If the thermostat generates a second request for heat, the gas control board generates outlet W2 (terminals 42, 43), allowing the gas assembly to operate at 100% capacity.
Models D5IG 090, 120 and 150 have one single gas control, a 2-stage gas valve and a burner.
Models D5IG 180, 240 and 300 have two gas controls, two 1-stage gas valves and two independent burners.

17.7.- Heat operation sequence with electric heaters (models D5IC)

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

17.8.- Heat operation sequence heat pump (models B5IH) with electric heater (optional)

REQUEST FOR HEAT, 1: If the thermostat generates a demand for heat, the YKIon 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 heater 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 heater 1 or 2 is activated, depending upon the number of operating hours in use.
EMERGENCY HEAT: If the Emergency Heat mode is se-

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

17.9.- Defrost sequence (models B5IH)

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.
- 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 no stage that can produce heat, and microswitch No. 8 is set to OFF. If set to ON, the indoor fan keep running. (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 since 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 defrost is over:
- 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.

18 - Safety features and controls

18.1.- 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 (with two numbers) and type of failure.
Furthermore, the YKlon board alarm relay is activated, with 24 VAC phase R at AL terminal.
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.

18.2.- Gas heating lock-out (models D5IG):
Should the Ignition Control (IC1) be locked out due to the activation of any of the LS2 (Automatic Reset Heat Switch), RS (Burner Heat Switch) or AS (Air Pressure Switch) features, the control does not unlock until the feature activated is re-established and a reset is carried out. In the case of a lock-out due to a lack of flame detection, the IC1 control 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 indicate the failure on the display.
Should the Manual Reset Heat Switch (LS1) open, the Ignition Control will not operate until LS1 is reset manually. LS1 can be accessed through the impulse air access panel (for installations of bottom ducts), or through the cover located on the dividing wall of the condenser compartment (for installations with side ducts).

18.3.- Low gas pressure (models D5IG):
If the gas supply pressure drops below the set point of the gas pressure switch (GS), the electric power supply to the Ignition Control is interrupted, and this unit becomes inoperative. The gas unit will reset automatically once the gas supply pressure surpasses the pressure switch set point, and the ignition sequence will begin once again. See Table 19.4 for gas valve and heat switch adjustments.

18.4.- 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 stages). The heat and automatic switches can be accessed through the external access panel of the electric heater.

18.5.- Motor overload protection: All motors of the hermetic compressors and outdoor 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 Indoor 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.

19 - Start-up of models D5IG

19.1.- 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 of the same type shown on the Identification Plate of the unit.
2. Make sure the gas and combustion air outlet hoods are installed correctly.

19.2.- Operating instructions

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

19.3.- 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 gas leaks at the unit or supply pipes.
2. Make sure that the gas pressures in the manifold are correct. See 19.4.
3. Check the gas supply pressure. It should be within the limits that appear on the Identification Plate. The supply pressure should be checked with all gas equipment in the building operating at full power. In no case should the pressure of the auxiliary gas line surpass 25 mbar, nor should the operating pressure drop below 12.5 mbar (5" each) on natural gas equipment. If the gas pressure is not within these limits, contact the local gas company so that the corresponding corrective measures may be taken.

To ignite the main burners:

1. Disconnect power supply to the unit.
2. Set ambient thermostat to lowest setting.
3. Connect power supply to the unit.
4. Set ambient thermostat to the desired temperature. (If the setting temperature on the thermostat is above the ambient temperature, the burner will turn on.)

On models D5IG-180/240/300, the IC2 ignition control is locked out in the case of a second stage request failure. IC2 lockout does not imply locking IC1 out as well.

19.5.- Gas pressure adjustment in the manifold

This equipment is dispatched from the factory prepared for natural gas of the 2ND-H type (G-20).
When adjustment is needed, depending upon the type of gas used, this can be done by means of the adjusting screws of the gas valve (Fig. 14), in accordance with the following sequence. Set to the values given in Table 19.4.

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.

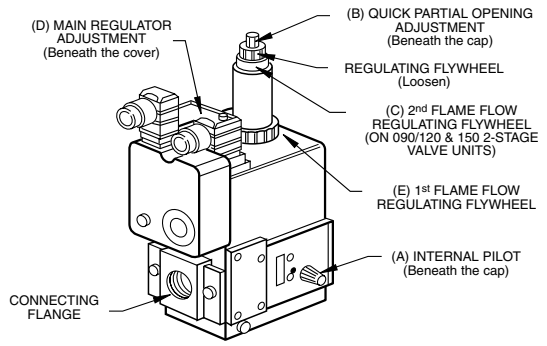
1. Set the interior pilot (A) to maximum value (+).
2. Turn the Quick Partial Opening Regulation flywheel (B) one complete turn backwards.
3. With the second phase in operation, loosen the Flow Regulating Flywheel of the second flame (C) slightly, and set said flywheel to its maximum opening. Adjust the main regulator (D) in accordance with the tabulated value. Reduce the Flow Regulation of the second flame (C) until that specific pressure is reached.
4. With only the second phase in operation, set the Flow Regulating flywheel of the first flame (E) at the specific pressure. Tighten the Regulating Flywheel to fix the settings permanently. Close the little cover located on the main regulator.
5. Using an extraction gas analyser, check the CO1, CO_2 and Nox content, if possible, in the combustion gasses at the outlet of the smoke duct. The carbon monoxide (CO) content should be less than 0.1% (1000 ppm), CO/CO_2 ratio is less than 0.02 and smoke temperature <140°C.

19.4.- Gas valve/heat switch adjustment

D5IG unit capacity	Burner model	Heating capacity (kW)		Type of gas	Gas valve adjustments (mbar)			Heat switch limits (°C)	
		Total (P.C.I)	Nett		Main controller	2nd stage controller	1st stage controller	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

- Mod. 180/240/300: Same adjustment on the 2 valves.
- (P.C.I.) Lower heating capacity.

Typical gas valve



- Fig. 14 -

19.6.- Burner instructions

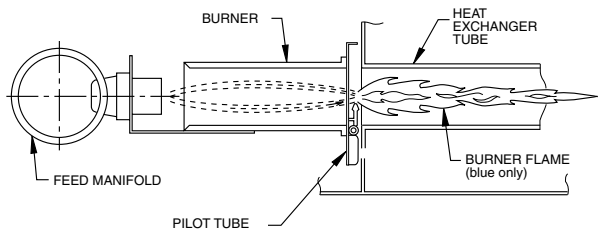
To check the burners, pilots or jets, **close the main manual valve and shut off all power supply to the unit.**

1. Remove the screws that hold 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 from the burner by pulling up and towards the rear.

The burners can now be accessed. See Fig. 15 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 bottom of the heat exchanger.

View of typical flame



- Fig. 15 -

20 - Temperature increase adjustment (model D5IG)

Temperature increase (or temperature difference between the return air and the hot impulse air) should be within the limits shown in Table 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 greater heating capacity value of the gas. Alternatively, use gas intake 0.9 x 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 increase; **decrease** the fan air flow so as to **increase** the temperature increase.

21 - Maintenance

21.1.- Normal maintenance

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

Normally, periodical maintenance comprises replacing or cleaning filters and (in models D5IG) cleaning the burners.

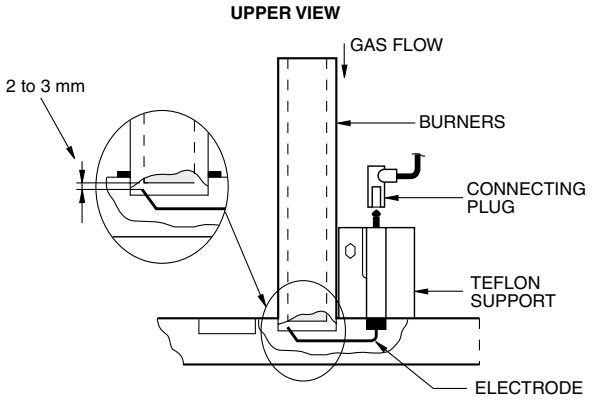
FILTERS: Check them once a month. Replace the non-reusable or clean the permanent filters, as required. DO NOT replace the permanent type with non-reusable types. The dimensions of the replaced filter should be the same as the original.

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 coil, or on other parts of the air circuit. It should be cleaned as frequently as required. Make sure power supply to the unit is disconnected before cleaning.

NOTE:
When cleaning the coil, 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.
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 or 3 mm. See Fig. 16.
COMBUSTION AIR DISCHARGE: Regularly, visually check the discharge outlet to make sure there is no accumulation of soot and dirt. If necessary, clean to keep the combustion air discharge in adequate condition.



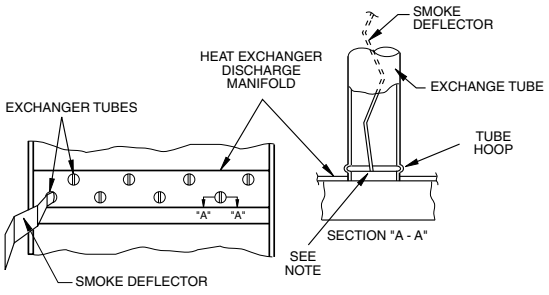
- Fig. 16 -

21.2.- 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".
2. At the top, remove the casing screws and the screws from the combustion gas extraction fan upper turbine.
3. Remove the screws that fasten the top to the smoke stack, without tearing the insulation next to it. Then remove the central deflector plate between the upper and bottom smoke stacks.
4. Inside the smoke stack, remove the deflector inside the tubes. Note that the last curve of the deflector fits tightly into the tube, making the end of the deflector tight inside the hoop of the tube. This hoop is produced when the tube is expanded in an end plate. To remove it, slide the end of the deflector towards the centre of the tube, thus freeing the end of the deflector from the hoop of the tube, and then pull straight out. See Fig. 17.
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 pipe downwards, from the end 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 inverse order.
11. When replacing the centre and top parts of the smoke stack, be sure not to tear the insulation next to it.
12. Make sure all gaskets on the ventilation side of the combustion system are airtight. Apply high-temperature sealing putty (260°C).

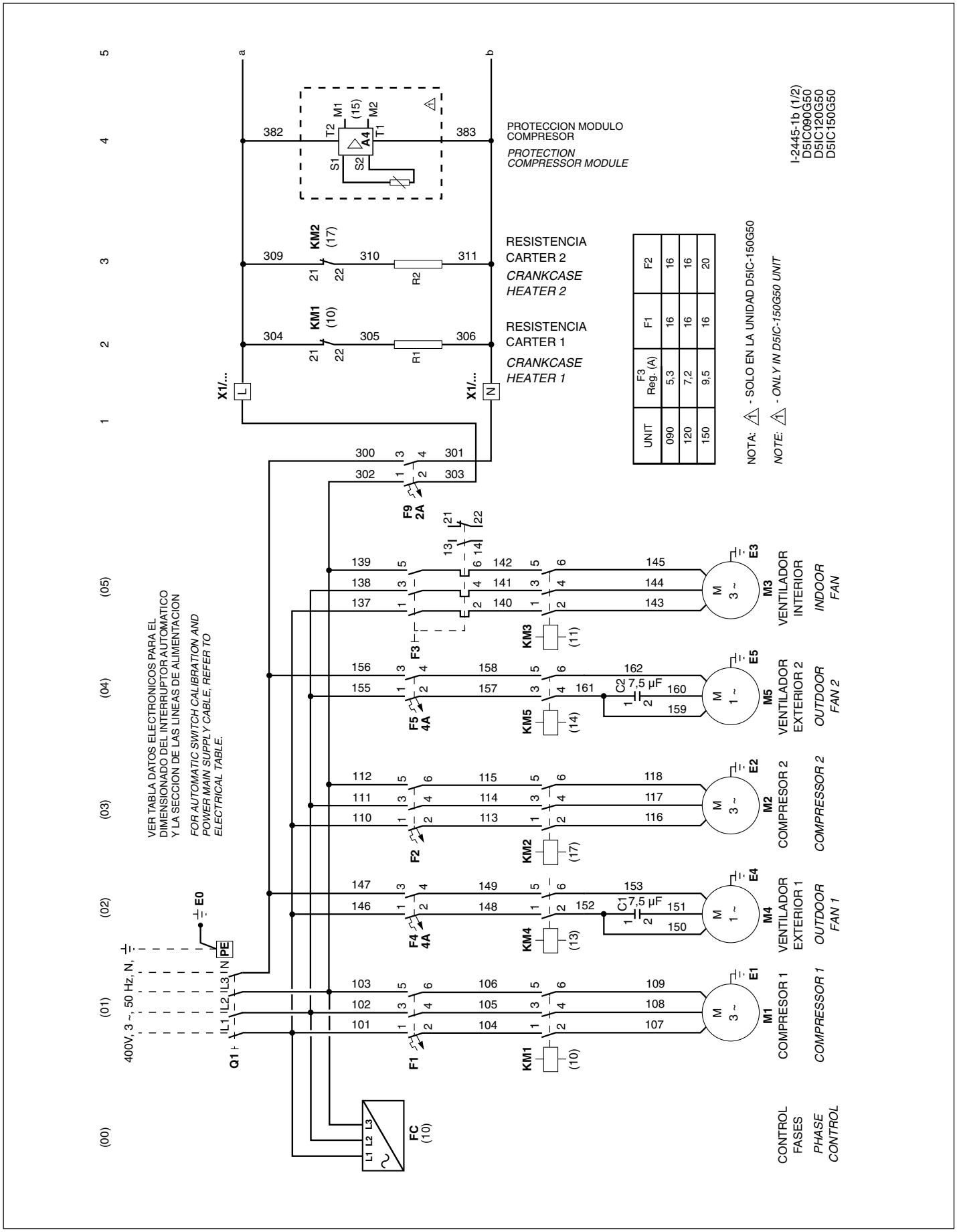
Typical installation of the smoke deflector



- Fig. 17 -

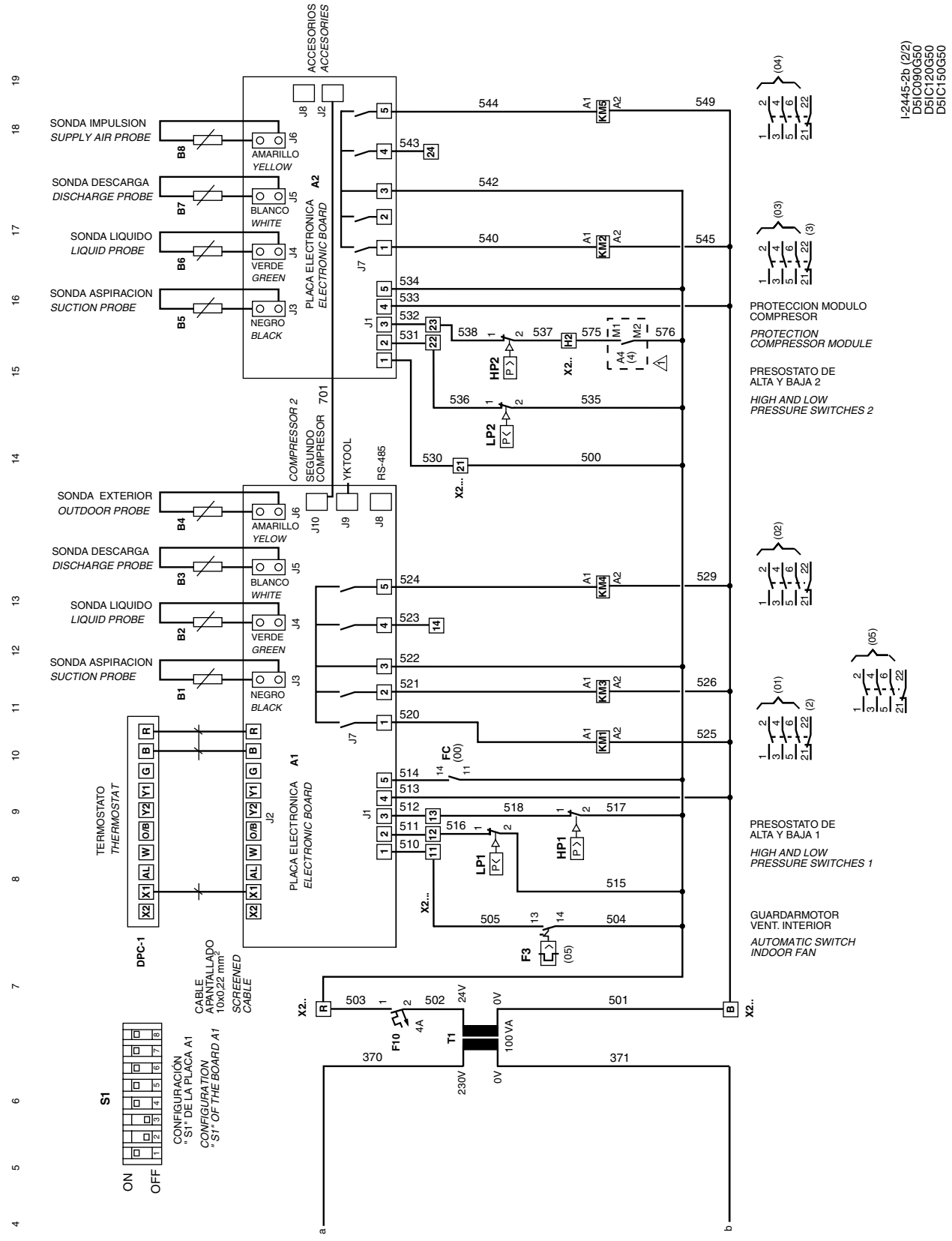
22 - Wiring diagrams

Cool only units D5IC-090G50/120G50/150G50 (1/2)

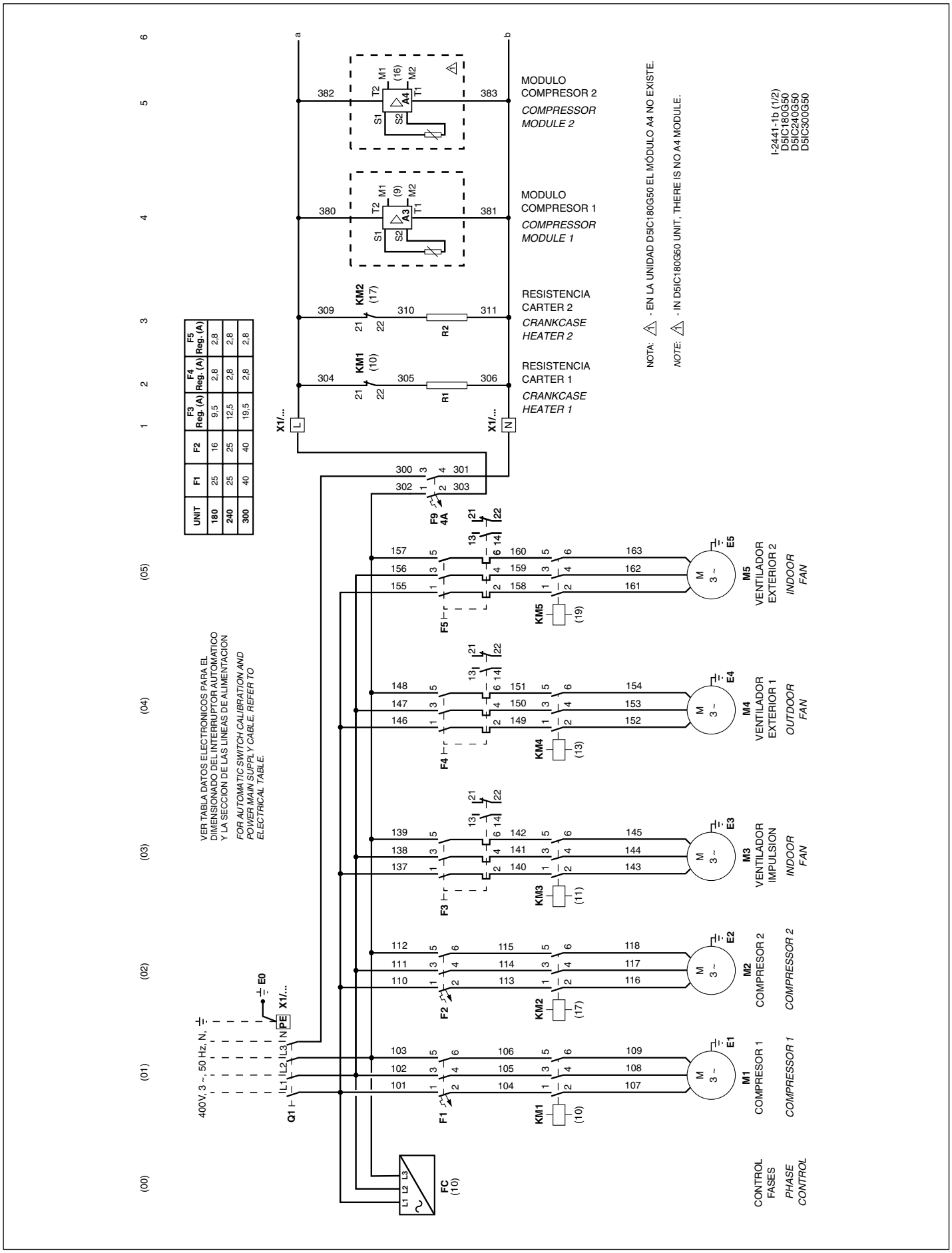


UNIT	F3 Reg. (A)	F1	F2
090	5,3	16	16
120	7,2	16	16
150	9,5	16	20

Cool only units D5IC-090G50/120G50/150G50 (2/2)

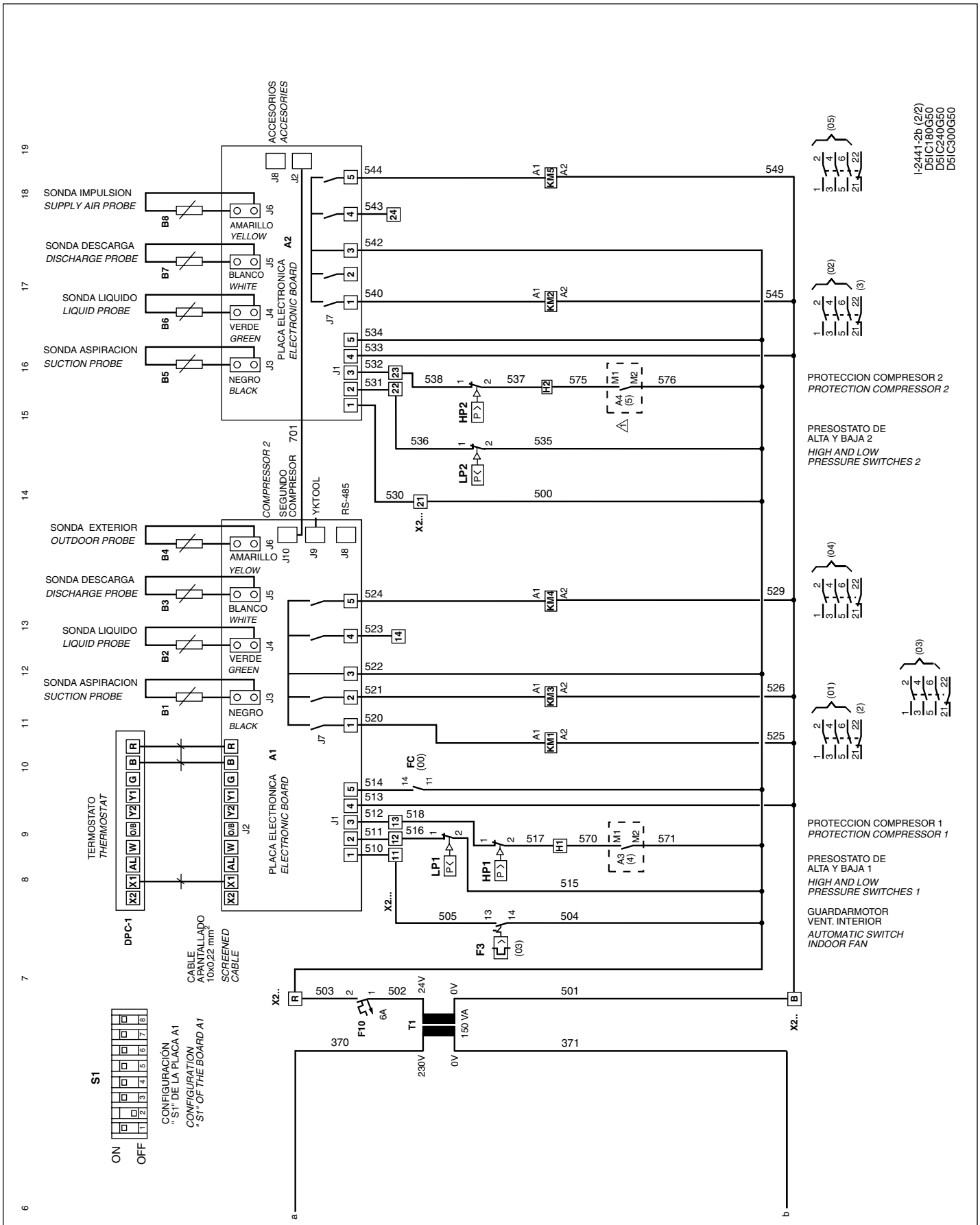


Cool only units D5IC-180G50/240G50/300G50 (1/2)

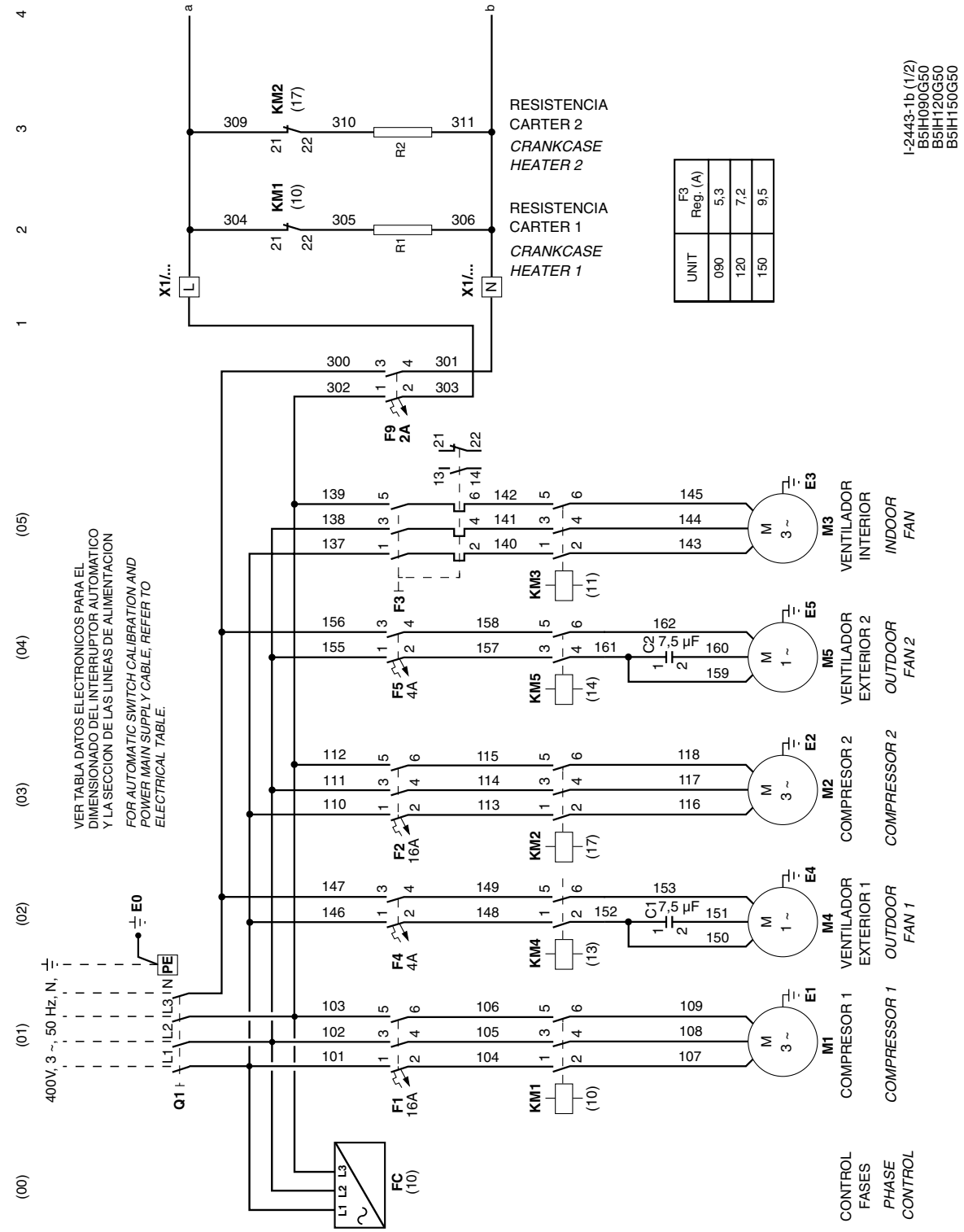


UNIT	F1	F2	F3 Reg. (A)	F4 Reg. (A)	F5 Reg. (A)
180	25	16	9,5	2,8	2,8
240	25	25	12,5	2,8	2,8
300	40	40	19,5	2,8	2,8

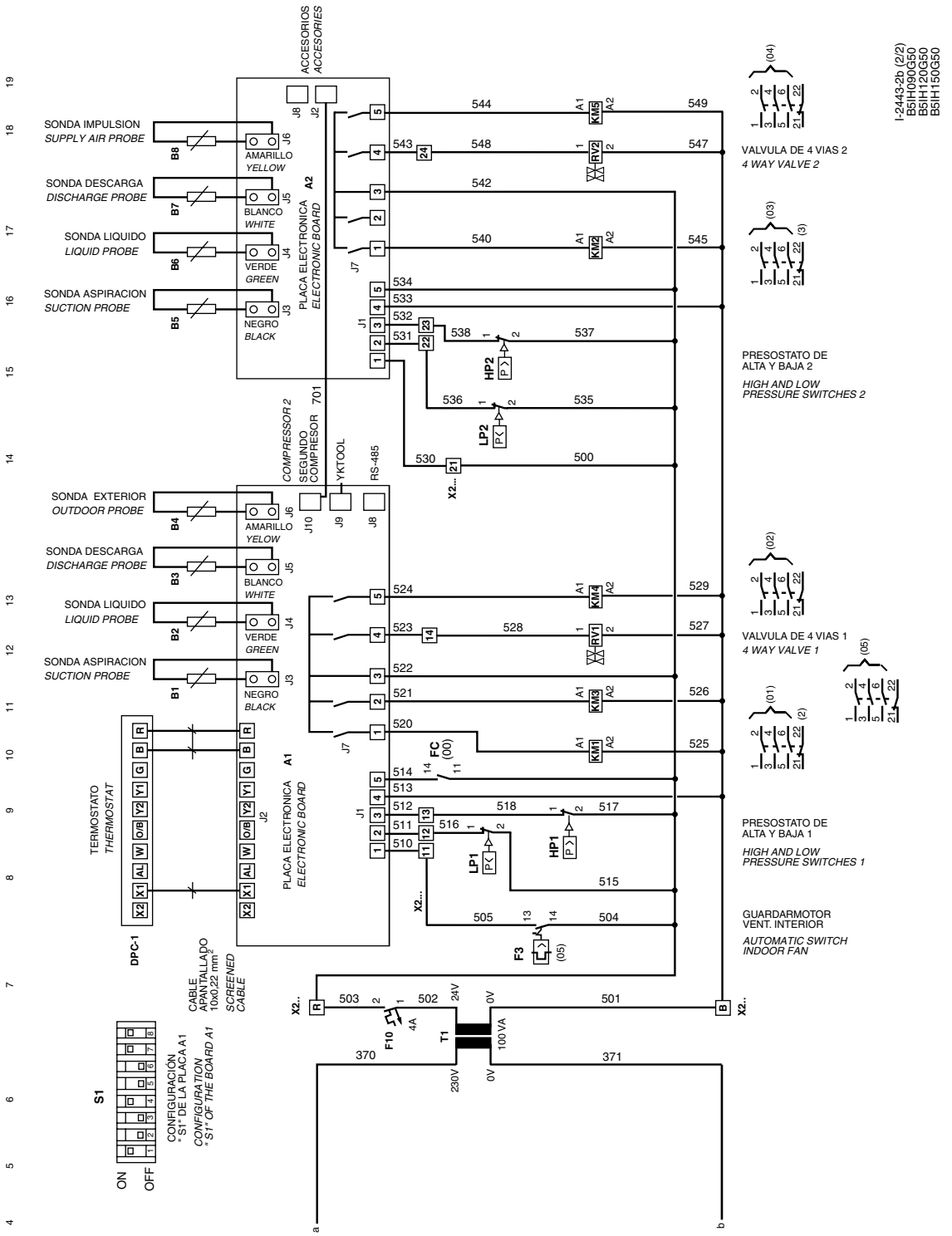
Cool only units D5IC-180G50/240G50/300G50 (2/2)



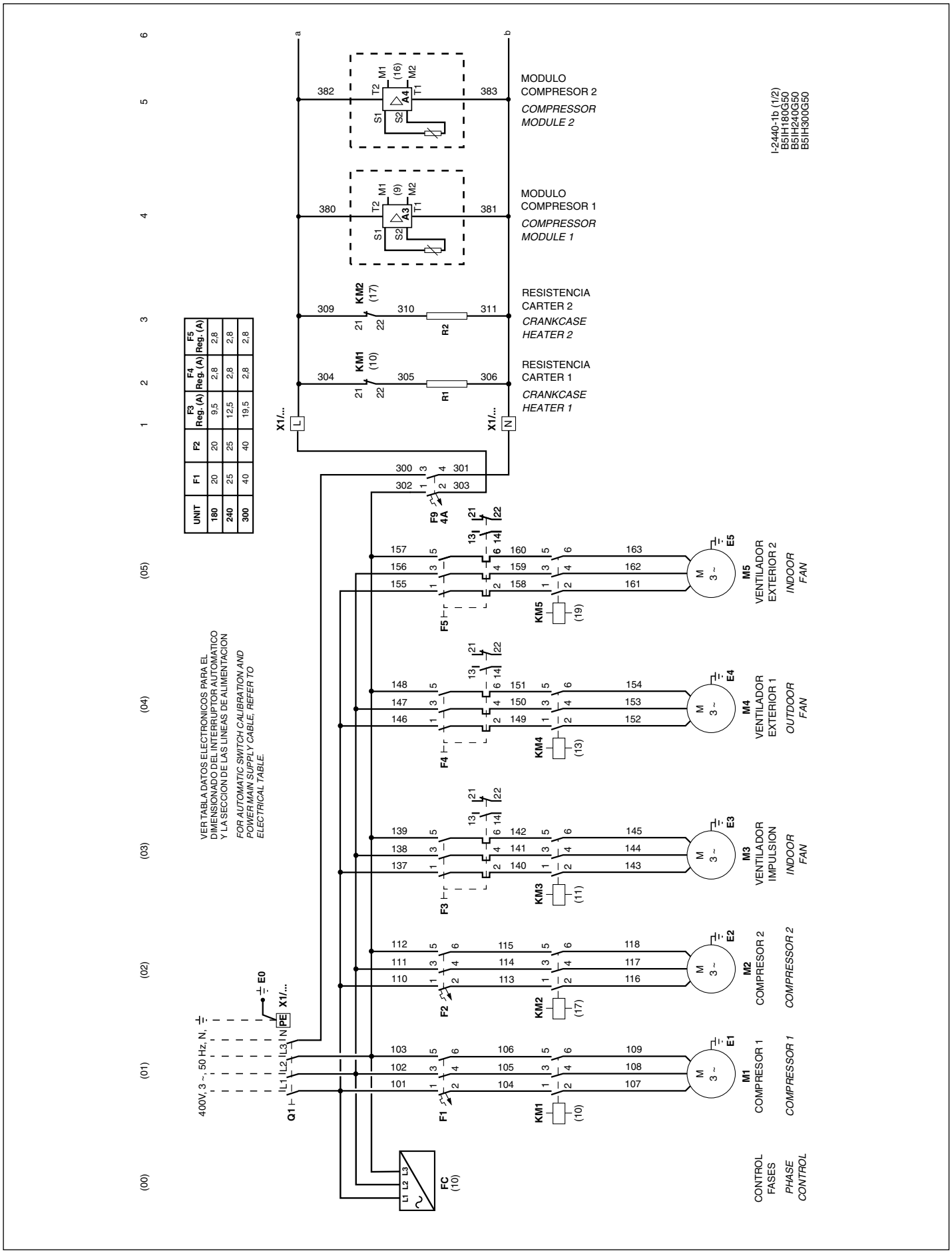
Heat pump units B5IH-090G50/B5IH-120G50/B5IH-150G50 (1/2)



Heat pump units B5IH-090G50/B5IH-120G50/B5IH-150G50 (2/2)

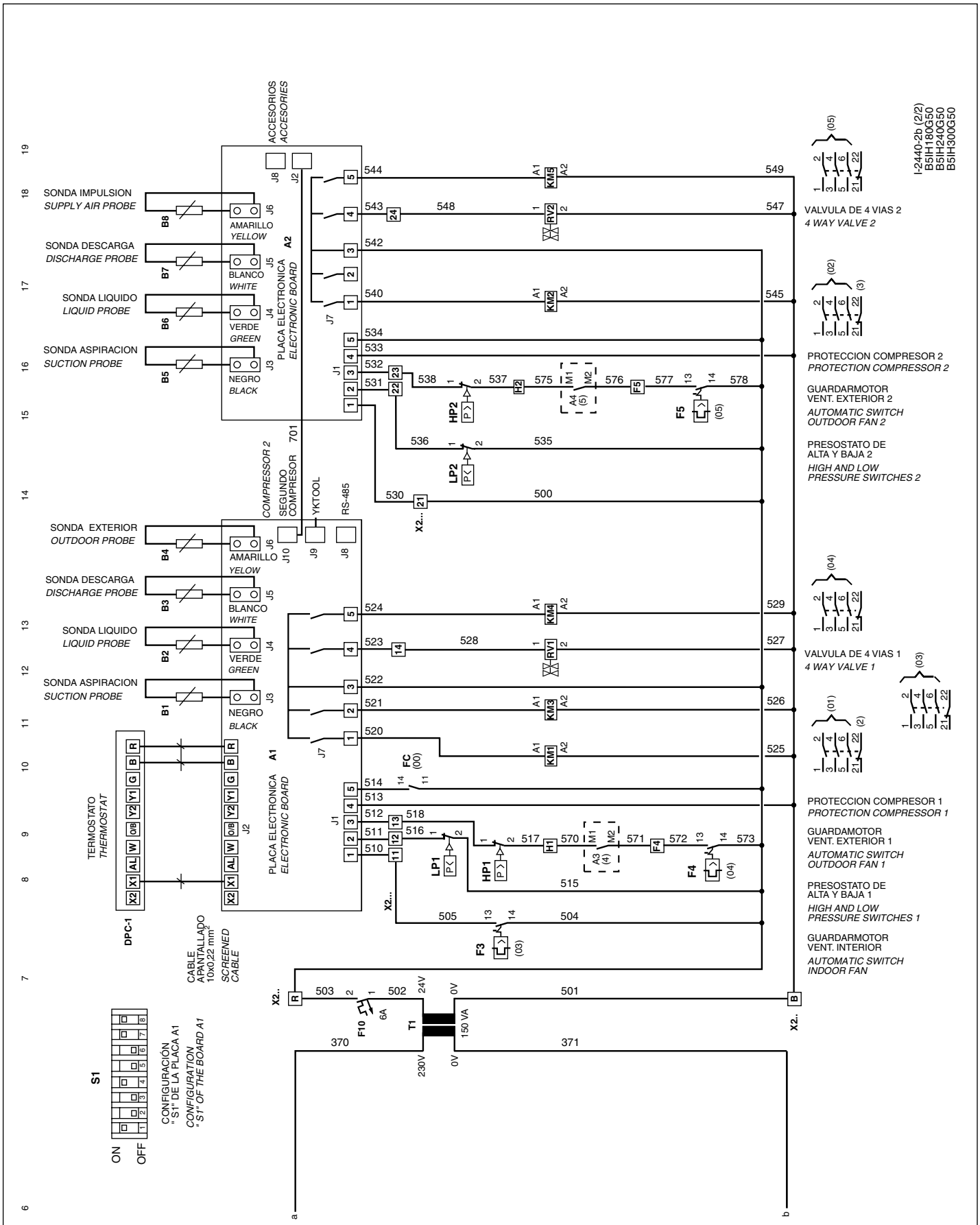


Heat pump units B5IH-180G50/B5IH-240G50/B5IH-300G50 (1/2)

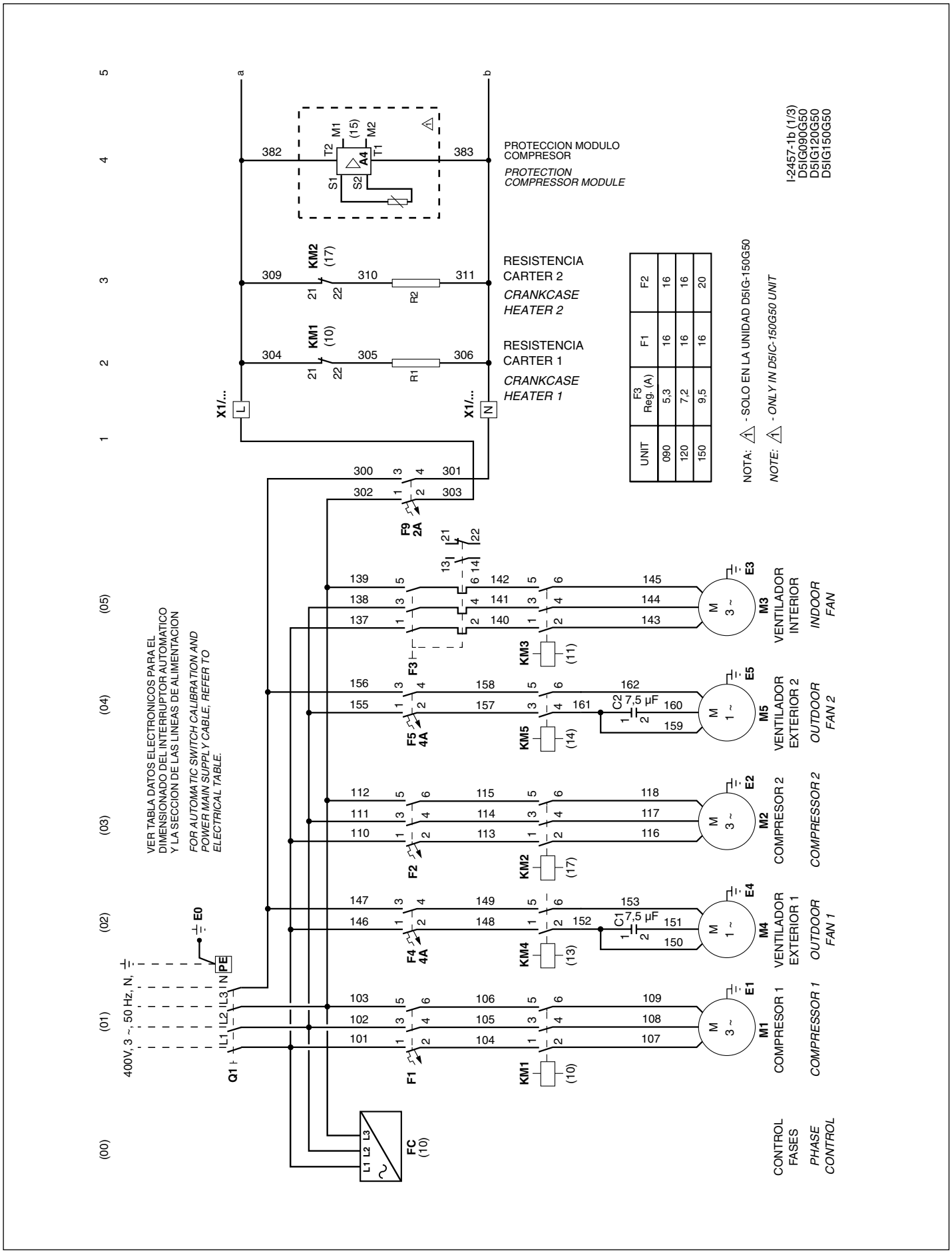


UNIT	F1	F2	F3 Reg. (A)	F4 Reg. (A)	F5 Reg. (A)
180	20	20	9,5	2,8	2,8
240	25	25	12,5	2,8	2,8
300	40	40	19,5	2,8	2,8

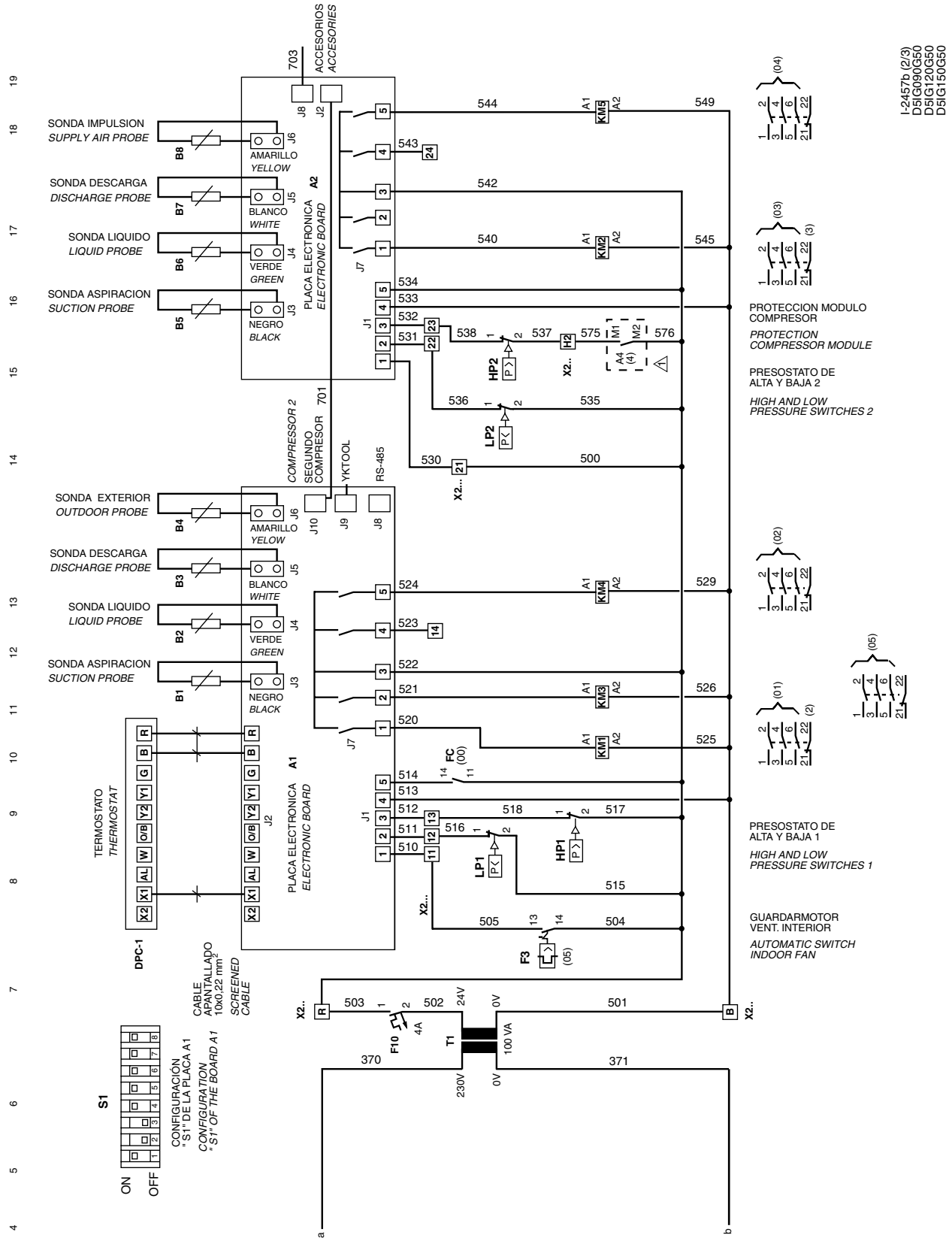
Heat pump units B5IH-180G50/B5IH-240G50/B5IH-300G50 (2/2)



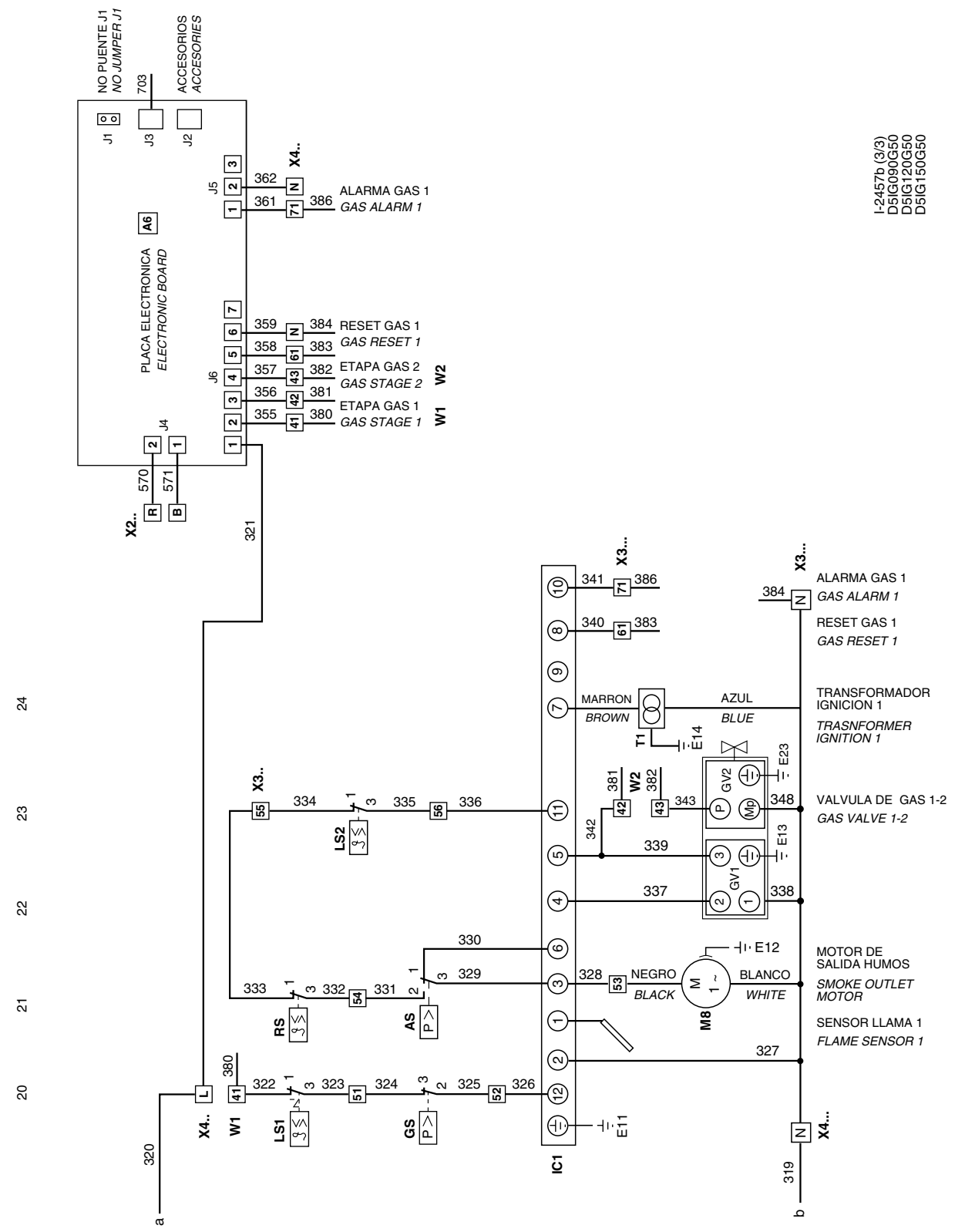
Cool only and gas heating units D5IG-090G50/D5IG-120G50/D5IG-150 (1/3)



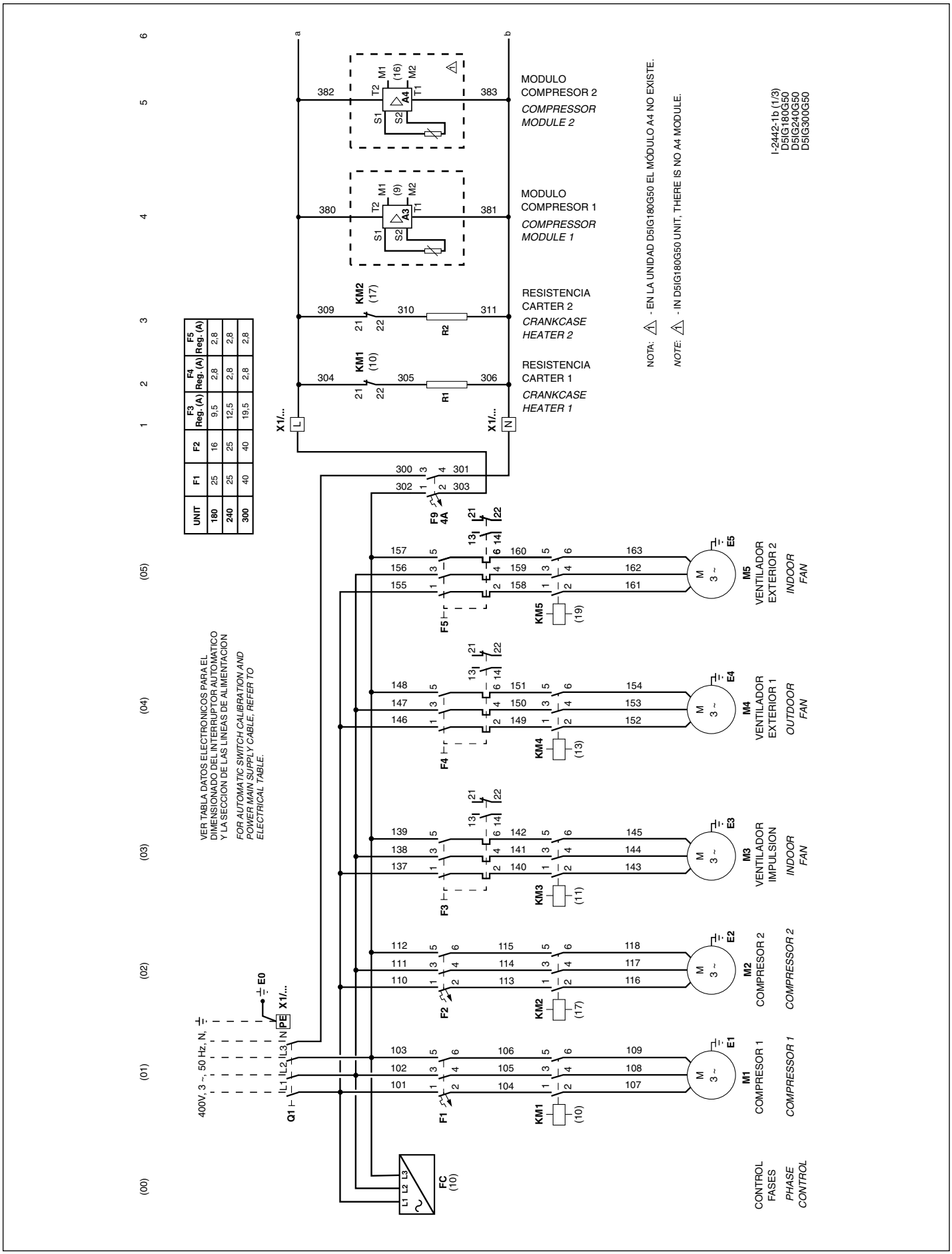
Cool only and gas heating units D5IG-090G50/D5IG-120G50/D5IG-150 (2/3)



Cool only and gas heating units D5IG-090G50/D5IG-120G50/D5IG-150 (3/3)

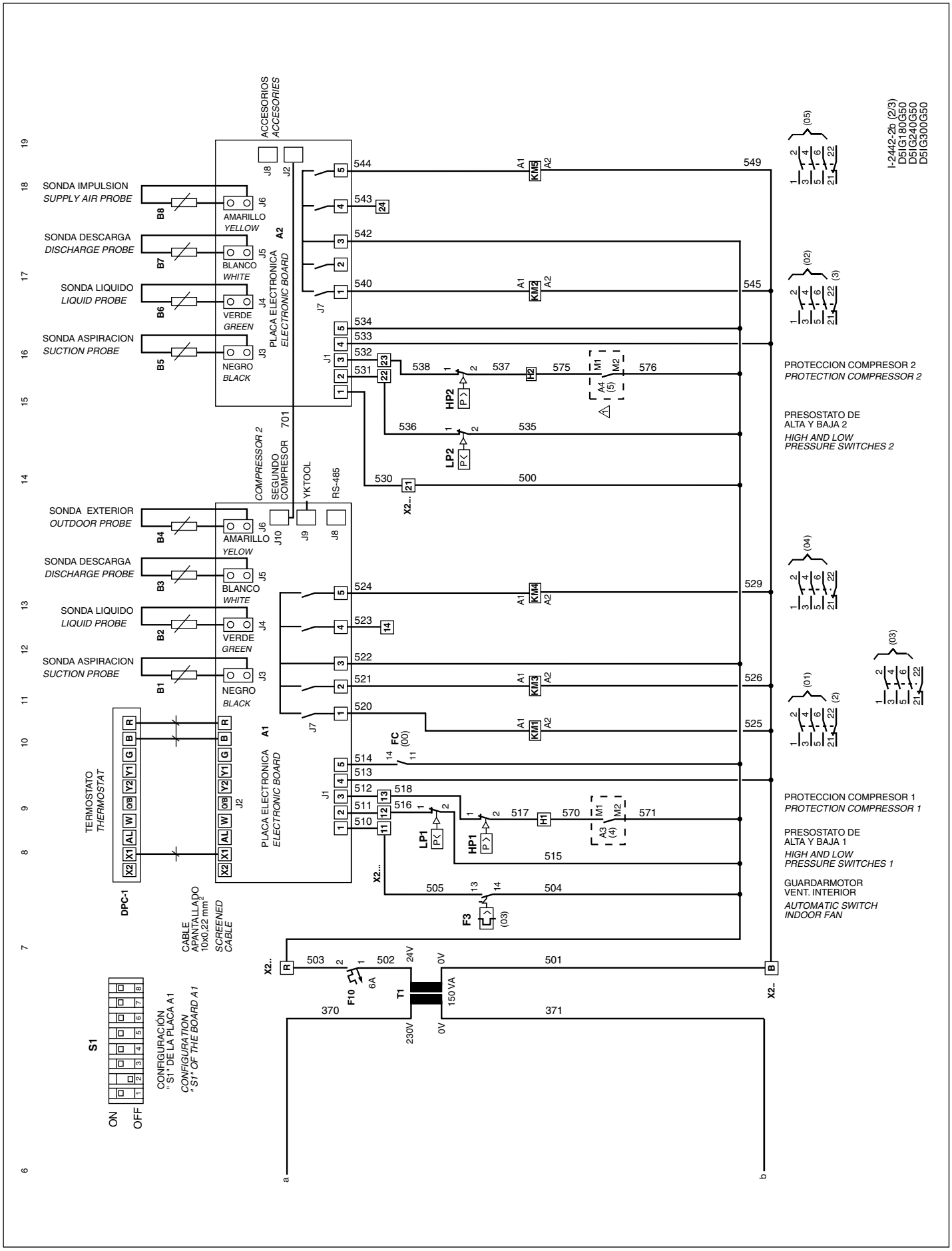


Cool only and gas heating units D5IG-180G50/D5IG-240G50/D5IG-300 (1/3)

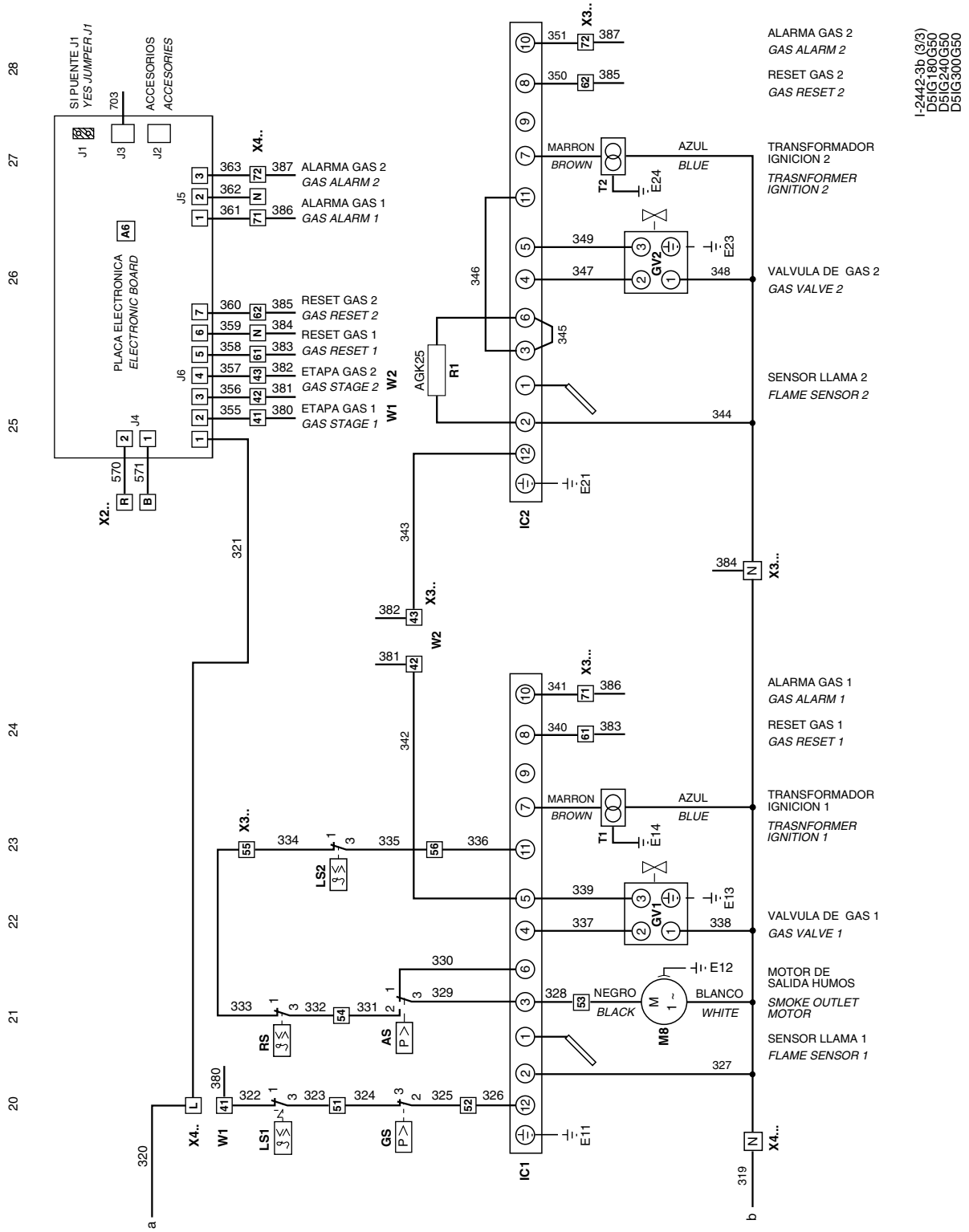


UNIT	F1	F2	F3 Reg. (A)	F4 Reg. (A)	F5 Reg. (A)
180	25	16	9,5	2,8	2,8
240	25	25	12,5	2,8	2,8
300	40	40	19,5	2,8	2,8

Cool only and gas heating units D5IG-180G50/D5IG-240G50/D5IG-300 (2/3)



Cool only and gas heating units D5IG-180G50/D5IG-240G50/D5IG-300 (3/3)



Configuration of switches

The microswitches establish the following configurations:

Number	Status	Meaning
1 / 2	OFF/OFF	Ignore SW, programs communication route
	ON/OFF	Defrost period 30'
	OFF/ON	Defrost period 60'
	ON/ON	Defrost period 90'
3	ON	Crossed coils
	OFF	Independent coils
4	ON	Compressor delay 2'
	OFF	Compressor delay 5'
5	ON	Cool mode
	OFF	Heat pump mode
6	ON	4-way valve active in heat
	OFF	4-way valve active in cool
7	ON	Receives signal B from thermostat (active in heat)
	OFF	Receives signal O from thermostat (active in cool)
8	ON	Fan on during defrost
	OFF	Fan off during defrost

It is necessary to disconnect power supply to the board to read the new configuration.

Failures (lockouts)

Failures or lockouts are indicated by the red led on the YKLON board. If no failure is present, this led remains permanently off. When a failure takes place, this led flashes in two constant sequences. The first indicates the circuit involved: one flash for compressor one two for compressor two, three for compressor three and four for accessories, followed by a short pause. The second series indicates the element or situation causing the lockout.

Table of lockouts (red led)

Flashes		Meaning
1 2 or 3	1	Discharge temperature exceeded
	2	High pressure switch, outdoor fan thermal switch or compressor module thermal 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	Failure heater 3 phase
	4	Failure heater 4 phase
	5	Failure in economiser or hot water coil (outdoor impulse probe, water return)
	6	Detection of smke or high temperature

Incidents

Incidents are indicated by the green led on the YKLON board. If there is no failure present, this led flashes at a constant frequency. When an incident occurs, the led flashes in three constant sequences. The first series indicates the circuit involved: one flsh for compressor one, two for compressor two, three for compressor three and four for incidences, followed by a short pause.
The second and third series indicate direct cause of the incicent.

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 defrosts
		2		Discharge temperature not recovered
4	1	1	Probes	Impulse 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 on 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 without signal Y1
	3	1	Auxiliary heat	Electric heater thermal switch 1
		2		Electric heater thermal switch 2
		3		Electric heater thermal switch 3
		4		Electric heater thermal switch 4
	4	1	Temperature	Water coil temperature not recovered
		2		Outdoor temperature too low
		3		Water coil in antifreeze operation
		4		Impulse temperature over 80°C
	5	1	Others	ID of transceiver unknown
		2		At least one accessory not found
		3		Call forair quality
		4		Dirty filters
		5		Presence sensor in unoccupied

Test button

- Pressing until the green led goes on shortens certain timings and resets any lockout detected.
- Pressing until the red led goes on identifies the optional accessories and probes connected to the board.
- If there is communication between units, pressing this button sends the Neuron ID by means of the LonWorks network.

DPC-1 thermostat

When a failure is detected and there is communication, the thermostat indicates, in al alternative way, the time and failure in accordance with the failure table of the unit.
Also indicated other thermostat incidents.

Type	No. thermostats		Incidents
Thermostat	9	1	Ambient probe open or short circuited
	9	2	Internal probe not calibrated
	9	3	Communication error
	9	4	Failure with terminal **AL** connected
	9	5	Digital probe S5 not detected
	9	6	Digital probe S6 not detected
	9	7	Digital probe S7 not detected
	9	8	Digital probe S8 not detected
	9	9	Outdoor digital probe not detected

I-2367b

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