Compact Horizontal
Air-Air Heat Pump
Model RTH 07L to 30L

Ref.: Y-R70171 0707

Technical information

ISO 9001 AENOR Empresa Registrada ER-0028/1991

ISO 14001 AENOR Gestión Ambiental CGM-97/013

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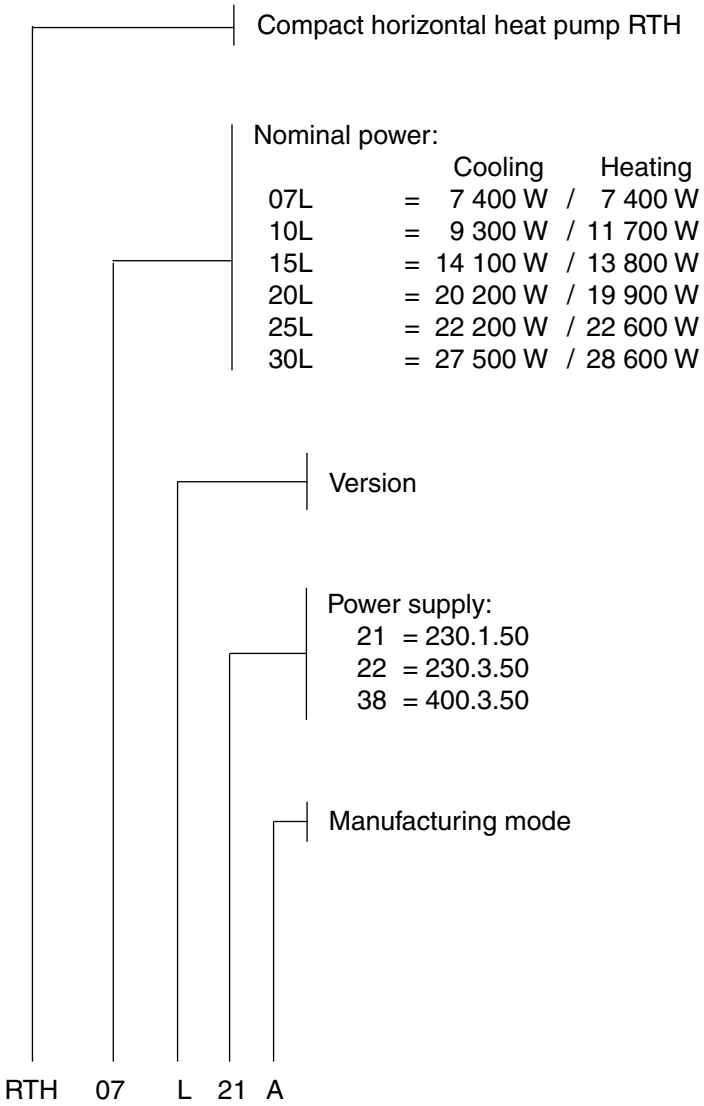
General information

General description

The RTH model heat pumps are compact horizontal units, condensed by air, that allow air conditioning, both in winter as well as in summer, by inverting their operating cycle.
They can be installed either indoors or outdoors, and the fans are of the centrifugal type, and thus accept air ducts.

Nomenclature



Technical specifications

Mechanical specifications

Compressor

Of the vertical hermetic alternative "Scroll" type, mounted on shock absorbers and with internal motor protection. Includes an electric heater for heating the oil sump, which makes start-ups easier and avoids oil leaking from the compressor.

Coils

With a large surface, made of grooved copper tubing and notched aluminium fins.

Fans

Centrifugal with directly fitted motor or belt and pulley drive, depending upon the model. Have sufficient pressure for the installation of optional ducts and accessories.

Casing

Made of galvanised aluminium steel sheeting and finished with oven-polymerised powdered paint, for outdoor installation. The interior is lined with an insulation coating so as to avoid condensation and reduce noise levels. These units include galvanised sheeting trays with their corresponding drains for collecting condensates from the coils.

Cooling circuit

Made of welded copper tubing. The units are supplied with their optimum refrigerant loads and having gone through maximum pressure and air tightness tests. Both in the interior as well as exterior sections, the expansion of the refrigerant is carried out by means of a calibrated hole in 07L, 10L and 15L sizes, and with expansion valve and distributor in 20L, 25L and 30L. The circuit includes: four-way valve, suction accumulator, high and low pressure switches and suction and discharge pressure collectors.

Refrigerant

These units are manufactured with R-410A.

Electric panel

Accessible directly from the exterior. Includes: connecting strip, protectors, electronic board and probes, power supply contactors, operating relay, phases control relay and transformer. In compliance with European standards in force.

Phase control relay

The electric panel of models RTH20L, 25L and 30L features a 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.

Electric heater (optional)

Of the uncovered wire tipe for quick heat dispersion, avoiding temperature intertia that could affect components, equipped with thermal contacts and protectors, automatic switch and manual reste.

Thermostat

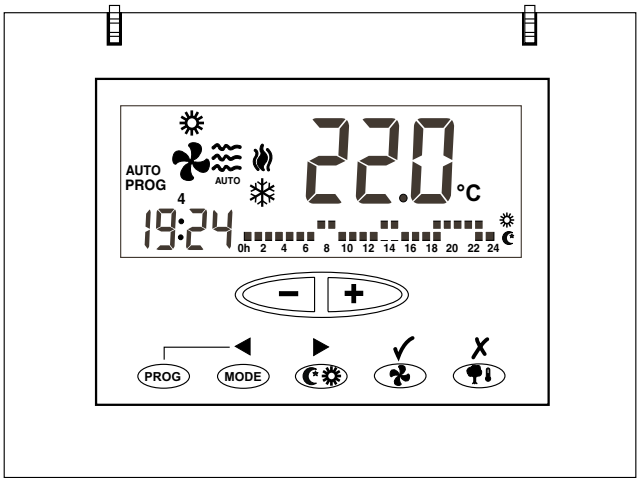
The RTH07L to RTH30L units include, as standard equipment, the electronic DPC-1 thermostat.
To connect the thermostat to the board, 10x0.22mm^2 screened communication cable should be used.

Ambient thermostat DPC-1

Programmable digital thermostat with communication

This thermostat was designed to give close control of the ambient temperature and graphic information regarding the mode it is currently operating in. This control unit, in accordance with the differential between the programmed temperature and the ambient temperature, responds varying the on/off cycles.
The liquid crystal display (LCD) normally indicates the ambient temperature, operating mode and whether the system is in heat or cool.
It allows selecting different set point temperatures for cool and heat, besides choosing between °C and °F on the display.

Fan operation can be in continuous or automatic mode, off or in operation along with the compressor.



Physical data

Model			RTH07L	RTH10L	RTH15L	RTH20L	RTH25L	RTH30L
Compressor	Amount		1					
	Type		Scroll					
	Nominal power	kW	2.7	3.2	4.7	5.2	7.9	9.2
	Power supply	V.ph.Hz.	230.1.50	400.3.50	400.3.50	400.3.50	400.3.50	400.3.50
Outdoor coil	Amount		1					
	Tubing depth x height		5 x 18	5 x 21	5 x 21	5 x 21	5 x 24	5 x 24
	Front area	m^2	0.32	0.41	0.51	0.65	0.71	0.87
	Tubing diameter	mm (Inches)	9.52 (3/8")					
Indoor coil	Amount		1					
	Tubing depth x height		3 x 18	4 x 21	4 x 21	4 x 21	4 x 24	4 x 24
	Front area	m^2	0.22	0.25	0.37	0.47	0.61	0.73
	Tubing diameter	mm (Inches)	9.52 (3/8")					
Outdoor fan motor	Amount		1					(1)
	Turbine diameter	mm	270	320	320	320	320	320
	Turbine width	mm	270	240	240	320	320	320
	Nominal power	kW	0.58	0.99	0.99	1.1	1.1	1.5
	Motor nominal r.p.m.		900	900	900	900	900	1 420
	Power supply	V.ph.Hz.	230.1.50	230.1.50	230.1.50	400.3.50	400.3.50	400.3.50
Indoor fan motor	Amount		1				(1)	(1)
	Turbine diameter	mm	240	270	320	320	320	320
	Turbine width	mm	240	200	240	240	240	320
	Nominal power	kW	0.38	0.54	0.95	0.99	1.1	1.1
	motor nominal r.p.m.		900	900	900	900	1 410	1 410
	Power supply	V.ph.Hz.	230.1.50	230.1.50	230.1.50	230.1.50	230.1.50	230.1.50
Refrigerant load R-410A		kg	2.3	2.9	4.3	5.4	6.7	7
Dimensions with packing		cm	122x124x64	119x125x71.5	135x141x71.5	167x161x74.5	176x180x80	181x216x80
Weight	Nett	kg	178	190	224	285	350	412
	Gross	kg	189	205	240	305	370	452

(1) Pulley drive (adjustable on the motor).

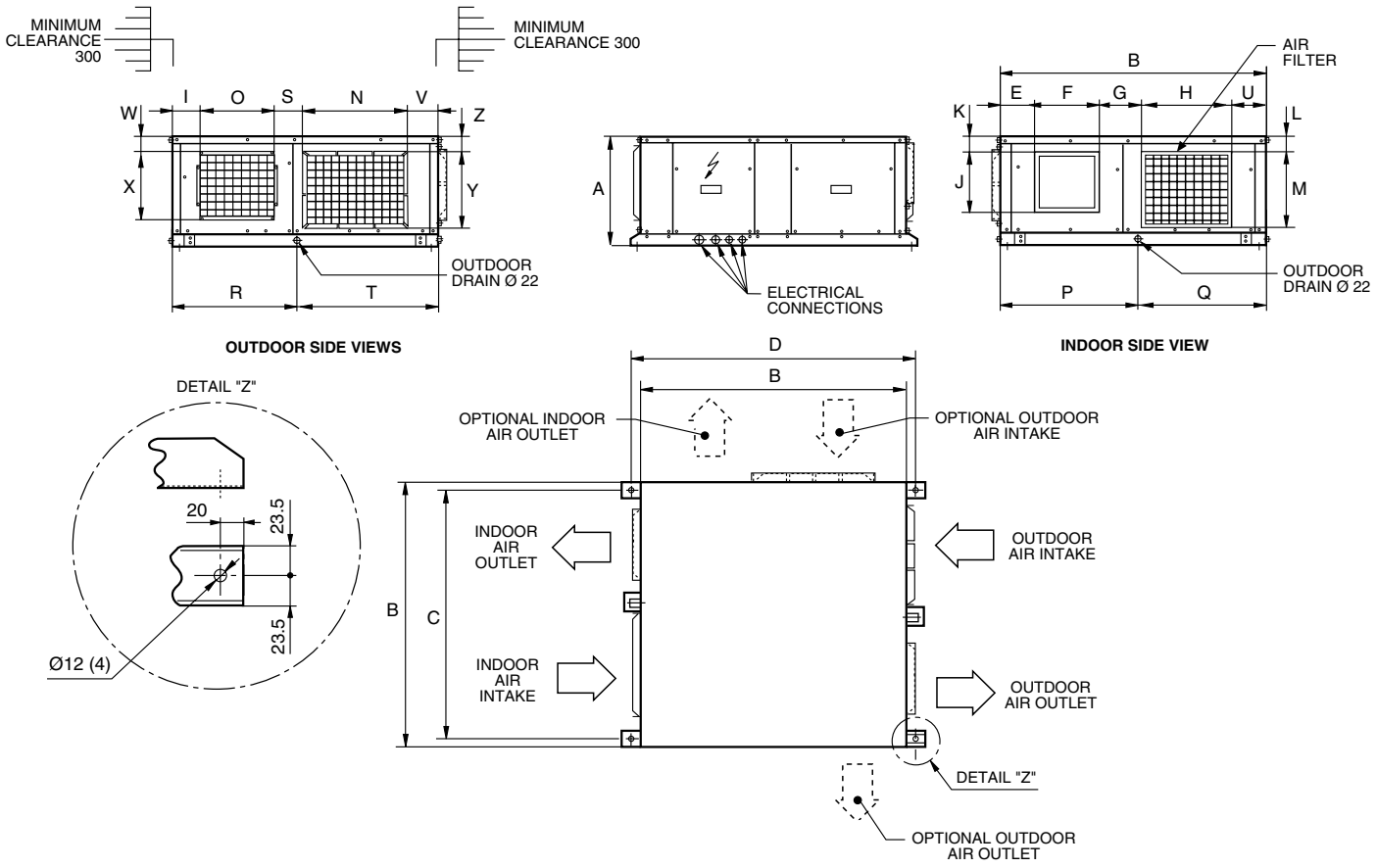
Limits of Use

Voltage limits				Air intake temperature to outdoor coil DB				Air intake temperature to indoor coil			
Nominal a 230 V		Nominal a 400 V		Operating cycle				Operating cycle			
				Minimum °C		Maximum °C		Minimum °C		Maximum °C	
Minimum	Maximum	Minimum	Maximum	Cool	Heat	Cool	Heat	Cool WB	Heat DB	Cool WB	Heat DB
198	254	342	436	19	-10 (1)	46	24	14 (min. 20BS without LAK)	10 (2)	22 (max. 32BS)	25

Notes: WB = Wet bulb. DB = Dry bulb. (1) At below -10°C, only the emergency electric heater (optional) remains operative. (2) This equipment can operate for a short period of time at a temperature below 10°C so as to increase the air temperature within the conditioned space to 10°C.

General dimensions mm

RTH07L, 10L, 15L & 20L



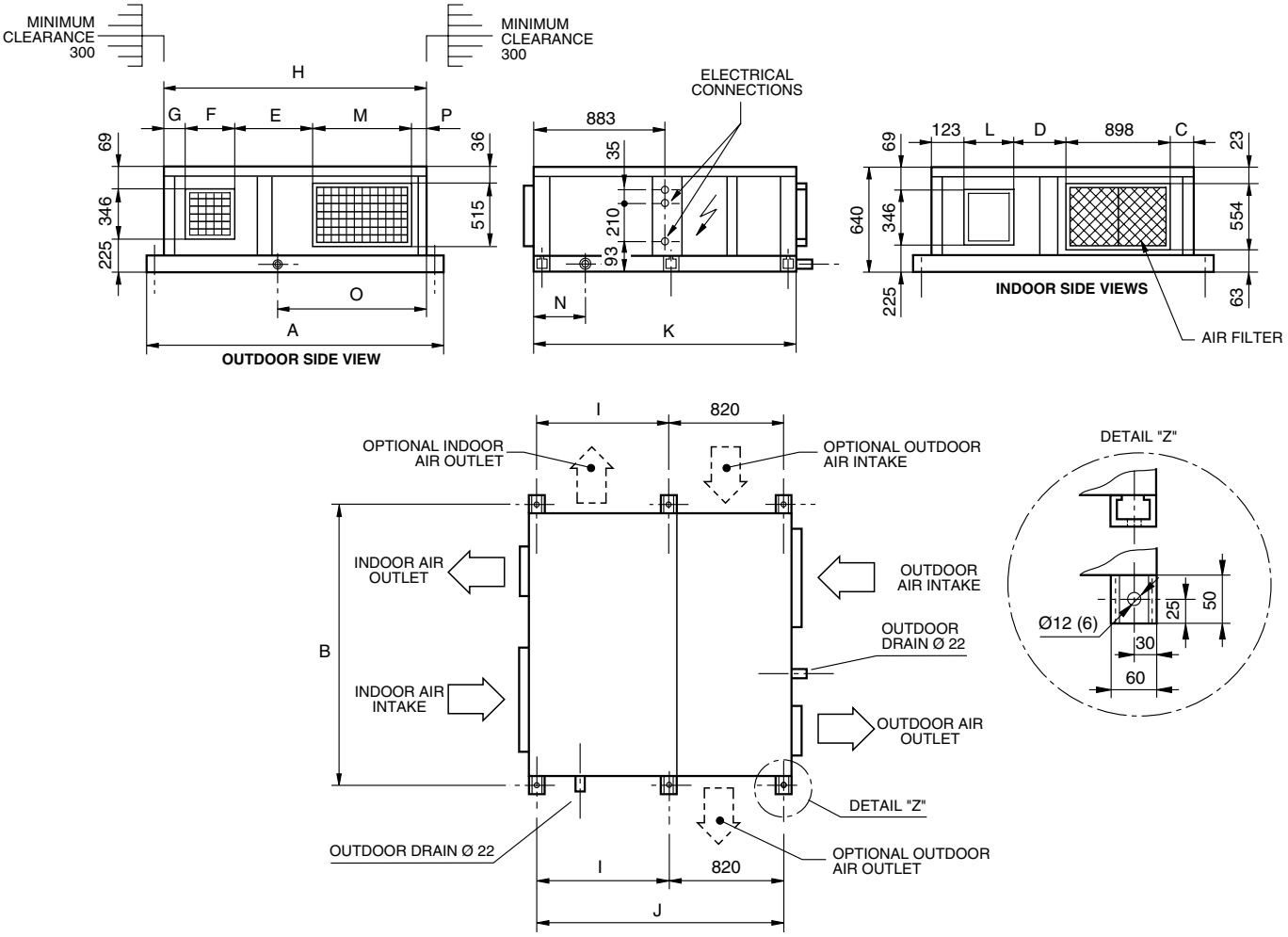
Note:

1- The solid arrows indicate the standard air intakes and outlets. The dotted arrows are the intakes and outlets that can be obtained at job site.

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
RTH07L	478	1100	1055	1150	117	302	136	425	82	262	72.5	60	300	425	347	600	500	602	165	500	120	82	18	305	342	40
RTH10L	555	1150	1105	1200	130	270	210	375	82	294	101	50	420	404	323	600	550	615	220	537	165	117	20	353	430	40
RTH15L	555	1310	1265	1360	140	316	154	600	87	346	24	45	425	554	323	600	710	590	225	720	100	121	20	353	430	40
RTH20L	585	1570	1525	1620	140	316	210	750	85	346	54	80	420	770	407	622	950	697	206	875	154	102	50	353	430	70

General dimensions mm

RTH25L & 30L



Note:

1- The solid arrows indicate the standard air intakes and outlets. The dotted arrows are the intakes and outlets that can be obtained at job site.

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RTH25L	1 750	1 700	81	233	442	405	133	1 650	870	1 690	1 750	315	667	348	1 145	93
RTH30L	2 150	2 100	130	499	648	405	138	2 050	890	1 710	1 770	400	732	368	1 495	132

Nominal capacities

Unit	Summer		Winter	
	Cooling capacity W	Consumption W	Heating capacity W	Consumption W
RTH07L	7 400	3 200	7 400	2 900
RTH10L	9 300	4 100	11 700	3 800
RTH15L	14 100	5 700	13 800	5 200
RTH20L	20 200	9 200	19 900	8 300
RTH25L	22 200	10 100	22 600	9 400
RTH30L	27 500	12 500	28 600	11 900

Test conditions

Voltage	Summer				Winter			
	Outdoor temp. °C		Indoor temp. °C		Outdoor temp. °C		Indoor temp. °C	
	DB	WB	DB	WB	DB	WB	DB	WB
230 or 400	35	24	27	19	7	6	20	12

Correcting factors

Correcting factors for cooling capacities

Correcting factors for cooling capacities in accordance with indoor and outdoor temperatures.

Indoor air intake temperature. °C WB	Outdoor intake air temperature.°C DB					
	19	25	30	35	40	46
23	-	1.20	1.15	1.11	1.06	1
19	1.10	1.08	1.04	1	0.96	0.90
14	0.88	0.86	0.84	0.82	0.79	0.74

Note: For indoor unit intake temperatures DB between 21 and 32°C. WB - wet bulb. DB - dry bulb.

Cooling capacity correcting factors for flows that differ from the nominal flows of the indoor coil.

Flow %	80	90	100	110	120	130
Total capacity	0.960	0.980	1	1.016	1.032	1.046
Sensible capacity	0.945	0.973	1	1.038	1.075	1.118
Comp. absorbed power	0.980	0.990	1	1.009	1.017	1.025

Correction of the real temperature of air intake of the outdoor coil for flows that differ from the nominal values.

Flow %	70	80	90	100	110	120	130
Correction in °C on real temperature of air intake of outdoor coil	5	3	1.5	0	-1	-2	-2.5

Correcting factors for the heating capacities

Indoor air intake temperature, °C DB	Outdoor air intake temperature, °C WB				
	14	10	6	0	-8
23	1.20	1.04	0.96	0.77	0.58
20	1.25	1.10	1.00	0.80	0.69
17	1.30	1.13	1.04	0.83	0.63

Correction of the real temperature of intake air to the outdoor unit coil for flows that differ from the nominal values.

Flow %	70	80	90	100	110	120	130
Correction in °C on real temperature of air intake of outdoor coil	-2	-1.5	-0.5	0	0.5	1	1.2

Nominal flows

The cooling and heating capacities that appear in the corresponding tables are valid for the following nominal flows:

Model	Nominal flow indoor fan m^3/h	Nominal pressure available Pa	Nominal flow outdoor fan m^3/h	Nominal pressure available Pa
RTH07L	1 490	25	2 420	50
RTH10L	2 015	37	3 520	50
RTH15L	3 580	50	3 890	50
RTH20L	4 100	50	4 810	50
RTH25L	5 060	62	5 640	50
RTH30L	5 300	62	7 450	50

For other flows, apply the correcting factors of the corresponding table.

Sensible cooling capacities

Model	Dry temperature, outdoor air °C (DB)	Humid temperature, air intake, °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power kW
				Dry intake air temperature to coil, °C (DB)				
				22	24	27	29	
			W	W	W	W	W	
RTH07L	25	22	8 880	2 765	3 632	4 932	5 800	2.54
		19	7 992	4 113	4 980	6 280	7 148	2.66
		17	7 400	4 995	5 862	7 162	7 400	2.78
	35	22	8 214	2 530	3 397	4 697	5 564	2.87
		19	7 400	3 881	4 748	6 048	6 915	3.02
		17	6 808	4 291	5 158	6 458	6 808	3.17
	45	22	7 400	2 269	3 136	4 436	5 303	3.32
		19	6 660	3 617	4 484	5 784	6 651	3.47
		17	6 068	4 442	5 308	6 068	6 068	3.62
RTH10L	25	22	11 160	3 398	4 683	6 610	7 897	2.44
		19	10 044	5 397	6 682	8 609	9 896	2.55
		17	9 300	6 709	7 994	9 300	9 300	2.67
	35	22	10 323	3 113	4 398	6 326	7 611	2.76
		19	9 300	5 115	6 400	8 327	9 300	2.90
		17	8 556	6 165	7 450	8 556	8 556	3.05
	45	22	9 300	2 796	4 081	6 009	7 294	3.19
		19	8 370	4 793	6 078	8 006	8 370	3.34
		17	7 626	6 033	7 318	7 626	7 626	3.48
RTH15L	25	22	16 920	5 084	7 257	10 518	12 695	3.39
		19	15 228	8 463	10 637	13 898	15 228	3.56
		17	14 100	10 686	12 860	14 100	14 100	3.72
	35	22	15 651	4 661	6 835	10 096	12 269	3.84
		19	14 100	8 044	10 218	13 478	14 100	4.04
		17	12 972	9 597	11 771	12 972	12 972	4.24
	45	22	14 100	4 190	6 364	9 625	11 798	4.44
		19	12 690	7 565	9 738	12 690	12 690	4.65
		17	11 562	9 679	11 562	11 562	11 562	4.85

Sensible cooling capacities

Model	Dry temperature, outdoor air °C (DB)	Humid temperature, air intake, °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power kW
				Dry intake air temperature to coil, °C (DB)				
				22	24	27	29	
			W	W	W	W	W	
RTH20L	25	22	24 240	7 484	9 996	13 764	16 280	5.05
		19	21 816	10 599	13 111	16 879	19 396	5.29
		17	20 200	13 952	16 464	20 200	20 200	5.53
	35	22	22 422	6 851	9 363	13 131	15 643	5.71
		19	20 200	9 986	12 499	16 267	18 779	6.01
		17	18 584	12 435	14 947	18 584	18 584	6.31
	45	22	20 200	6 148	8 660	12 428	14 940	6.61
		19	18 180	9 289	11 801	15 569	18 081	6.91
		17	16 564	12 458	14 970	16 564	16 564	7.21
RTH25L	25	22	26 640	8 096	11 210	15 881	18 999	6.72
		19	23 976	11 981	15 094	19 765	22 884	7.04
		17	22 200	16 120	19 234	22 200	22 200	7.36
	35	22	24 642	7 418	10 532	15 203	18 317	7.60
		19	22 200	11 323	14 437	19 107	22 200	8
		17	20 424	14 509	17 623	20 424	20 424	8.40
	45	22	22 200	6 664	9 778	14 449	17 563	8.80
		19	19 980	10 572	13 686	18 357	19 980	9.20
		17	18 204	14 511	17 625	18 204	18 204	9.60
RTH30L	25	22	33 000	10 240	13 540	18 490	21 794	7.58
		19	29 700	14 323	17 623	22 572	25 878	7.94
		17	27 500	18 733	22 032	26 982	27 500	8.30
	35	22	30 525	9 371	12 671	17 620	20 920	8.57
		19	27 500	13 483	16 772	21 732	25 031	9.02
		17	25 300	16 830	20 130	25 079	25 300	9.47
	45	22	27 500	8 407	11 706	16 656	19 955	9.92
		19	24 750	12 526	15 826	20 775	24 075	10.37
		17	22 550	16 685	19 984	22 550	22 550	10.82

Indoor fan services

Model	Available static pressure		Air flow		Absorbed power W
	mm WG	Pa	m³/h	m³/s	
RTH07L	8	78.4	1 053	0.29	342
	6	58.8	1 204	0.33	346
	4	39.2	1 355	0.37	351
	2.5	24.5	1 490	0.41	368
	2	19.6	1 517	0.42	369
	0	0	1 630	0.45	374
RTH10L	12	117.7	1 491	0.41	375
	10	98	1 657	0.46	390
	8	78.4	1 789	0.49	400
	6	58.8	1 913	0.53	415
	4	39.2	2 006	0.55	428
	3.8	37.3	2 015	0.56	428
	2	19.6	2 108	0.58	435
	0	0	2 199	0.61	450
RTH15L	18	176.5	2 690	0.75	786
	16	156.8	2 842	0.79	808
	14	137.2	2 993	0.83	828
	12	117.6	3 144	0.87	847
	10	98	3 271	0.91	873
	8	78.4	3 399	0.94	898
	6	58.8	3 518	0.97	907
	5.1	50	3 580	0.99	915
	4	39.2	3 637	1.01	950
	2	19.6	3 784	1.05	964
	0	0	3 859	1.07	978
RTH20L	20	196	2 900	0.90	824
	18	176.5	3 045	0.96	872
	16	156.8	3 260	0.99	922
	14	137.2	3 400	1.01	960
	12	117.6	3 580	1.07	1 000
	10	98.0	3 740	1.11	1 036
	8	78.4	3 890	1.14	1 075
	6	58.8	4 030	1.17	1 125
	5.1	50	4 100	1.19	1 150
	4	39.2	4 240	1.2	1 162
	2	19.6	4 300	1.24	1 187
	0	0	4 420	1.27	1 212
RTH25L	16	156.8	4 050	1.12	1 015
	12	117.6	4 535	1.25	1 160
	10	98	4 699	1.3	1 210
	8	78.4	4 916	1.36	1 275
	6.3	61.7	5 060	1.4	1 330
	4	39.2	5 243	1.46	1 392
	2	19.6	5 401	1.5	1 446
	0	0	5 560	1.54	1 500
RTH30L	16	156.8	4 098	1.14	830
	12	117.6	4 602	1.28	973
	10	98	4 854	1.35	1 044
	6.3	61.7	5 300	1.47	1 213
	4	39.2	5 541	1.54	1 239
	2	19.6	5 734	1.59	1 297
	0	0	5 928	1.64	1 356

Outdoor fan services

Model	Available static pressure		Air flow		Absorbed power W
	mm WG	Pa	m³/h	m³/s	
RTH07L	12	117.7	1 891	0.52	402
	10	98	2 055	0.57	414
	8	78.4	2 219	0.62	427
	6	58.8	2 360	0.65	442
	5.1	50	2 420	0.67	450
	4	39.2	2 501	0.69	458
	2	19.6	2 642	0.73	473
	0	0	2 772	0.77	490
RTH10L	16	156.8	2 859	0.79	794
	14	137.2	2 985	0.83	814
	12	117.6	3 112	0.86	844
	10	98	3 241	0.90	866
	8	78.4	3 369	0.93	887
	6	58.8	3 476	0.96	905
	5.1	50	3 520	0.98	919
	4	39.2	3 579	0.99	928
	2	19.6	3 665	1.02	953
	0	0	3 764	1.04	971
RTH15L	16	156.8	3 184	0.88	860
	14	137.2	3 326	0.92	882
	12	117.6	3 468	0.96	905
	10	98	3 599	1.00	935
	8	78.4	3 731	1.03	965
	6	58.8	3 810	1.06	980
	5.1	50	3 890	1.08	995
	4	39.2	3 954	1.09	1 010
	2	19.6	4 050	1.12	1 030
	0	0	4 145	1.15	1 050
RTH20L	16	156.8	3 705	1.03	933
	14	137.2	3 944	1.09	937
	12	117.6	4 183	1.16	941
	10	98.0	4 369	1.21	957
	8	78.2	4 556	1.26	1 075
	6	58.7	4 723	1.31	1 091
	5.1	50	4 810	1.33	1 104
	4	39.1	4 900	1.36	1 131
	2	19.6	5 090	1.41	1 184
	0	0.0	5 227	1.45	1 230
RTH25L	14	137.2	4 500	1.25	1 080
	10	98	5 030	1.39	1 223
	8	78.4	5 295	1.47	1 295
	6	58.8	5 532	1.53	1 367
	5.1	50	5 640	1.56	1 400
	4	39.2	5 790	1.61	1 440
	2	19.6	6 005	1.67	1 515
	0	0	6 240	1.73	1 595
RTH30L	14	137.2	6 449	1.79	1 655
	10	98	6 931	1.92	1 874
	8	78.4	7 158	1.99	1 983
	5.1	50	7 450	2.07	2 065
	4	39.2	7 553	2.10	2 145
	2	19.6	7 742	2.15	2 219
	0	0	7 932	2.20	2 293

Characteristics of the indoor/outdoor fan on pulley models

Model	Speed range (r.p.m)	Motor		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
25L (indoor)	876 - 1 057	1.1	090S	87 - 105	24	140	25	1 112	XPZ	1
30L (indoor)	876 - 1 057	1.1	090S	87 - 105	24	140	25	1 112	XPZ	1
30L (outdoor)	982 - 1 185	1.5	090L	87 - 105	24	125	25	1 112	XPZ	1

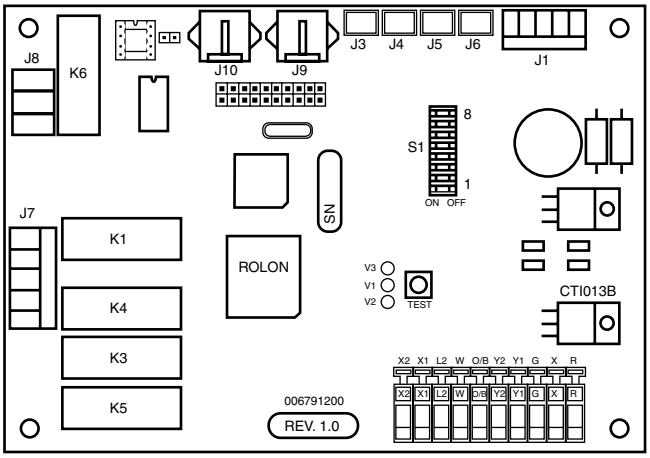
General characteristics

Model	Compressor			Fan Out. - Ind.	Outdoor fan motor		Indoor fan motor		Max. total power kW	Max. total intensity (unit) A	Max. total intensity (unit) A	Automatic switch (K curve) A	Min. cable section mm²
	Power supply V.ph.Hz	Nominal intensity A	Start intensity A	Power supply V.ph.Hz	kW	Nominal intensity A	kW	Nominal intensity A					
RTH07L	230.1.50	12	82	230.150	0.4	1.9	0.4	1.6	3.7	16	22	25	4
RTH10L	400.3.50	5.1	48	230.150	0.8	4.6	0.4	1.9	4.2	9.7	12.4	16	2.5
RTH15L	400.3.50	7	64	230.150	0.9	4.4	0.8	4.1	5.6	11.5	15	20	4
RTH20L	400.3.50	13.1	95	400.3.50	1.1	3.1	1	3.0	10	19	22	25	4
RTH25L	400.3.50	15	111	400.3.50	1.2	3	1.1	2.4	11	21	25	25	4
RTH30L	400.3.50	17	118	400.3.50	2	3.7	1.1	2.4	14	23	28	32	6

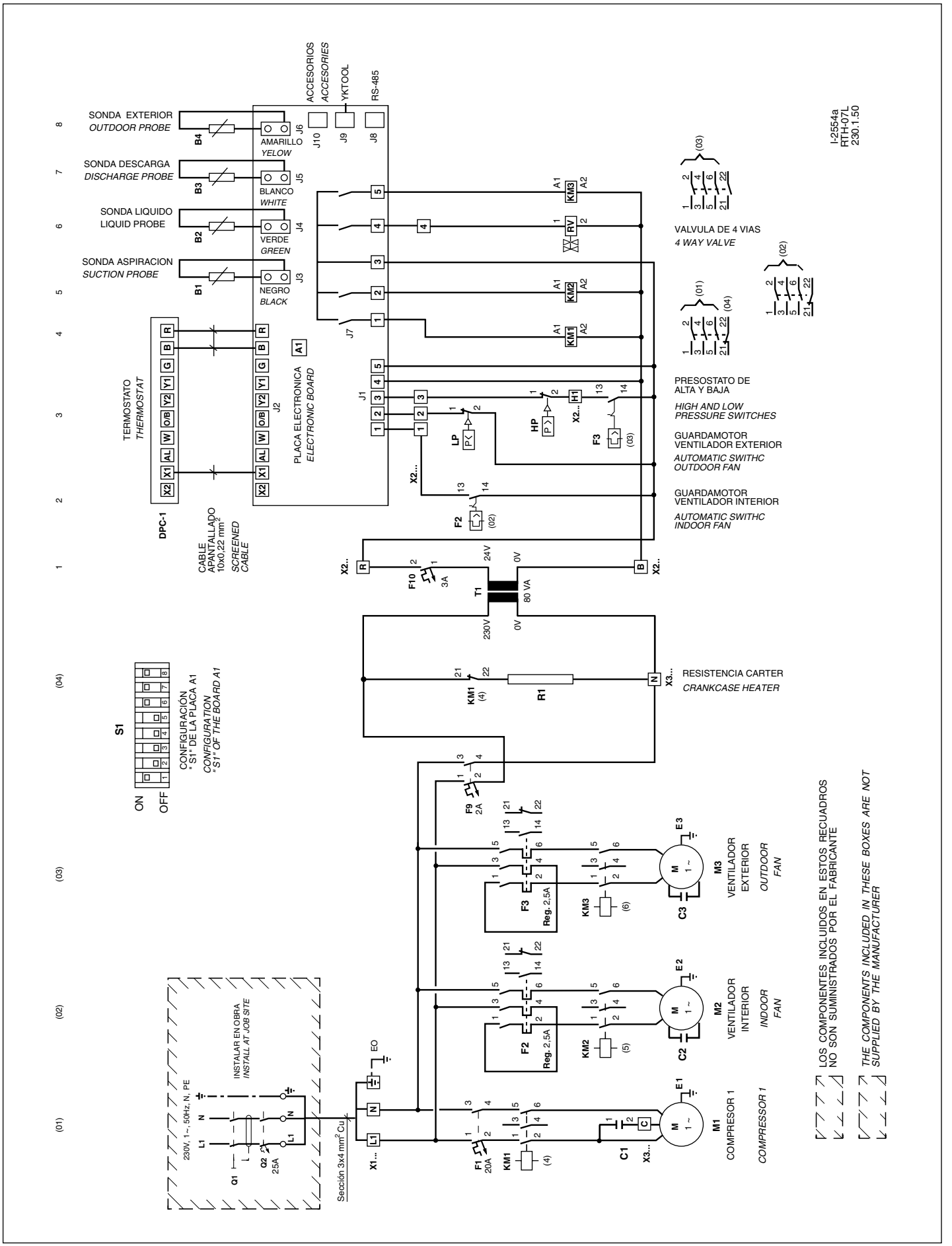
Important: Automatic switch dimensioning and power supply and operating line sections are orientative and should be corrected in accordance with conditions at job site. length between units and legislation in force.
Notes: 1.- K curve (DIN. VDE 0660-104). 2.- Based on copper conductors.

Control board

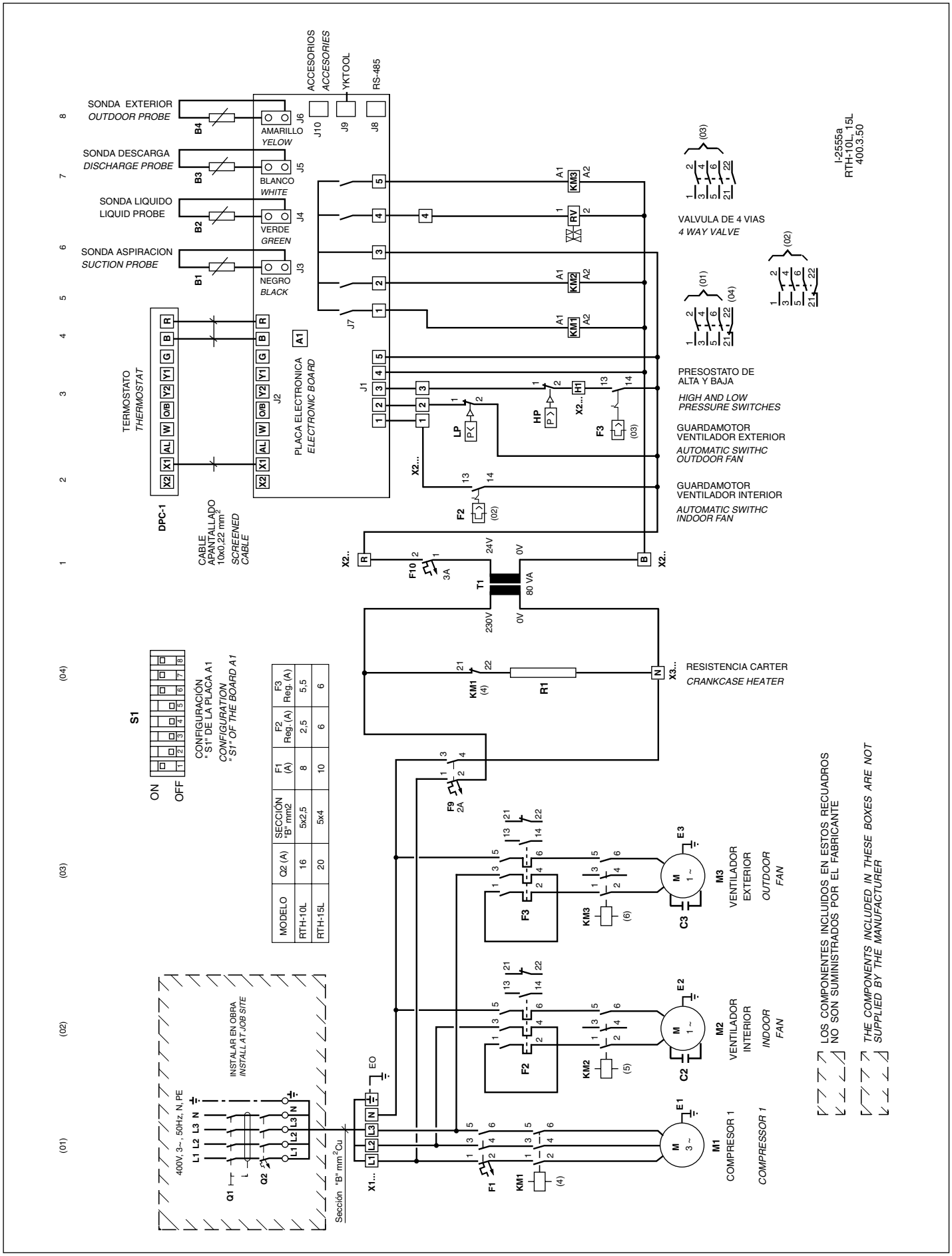
The control board of these units is common to both the cool only as well as the heat pump units. Equipment control is carried out by means of software that is resident in the board. The System operates in accordance with the position of the microswitches in the main board. There are also variations in the control algorithm, depending upon the accessories the board detects installed in the equipment.
For further details please see Technical Information of the control board.



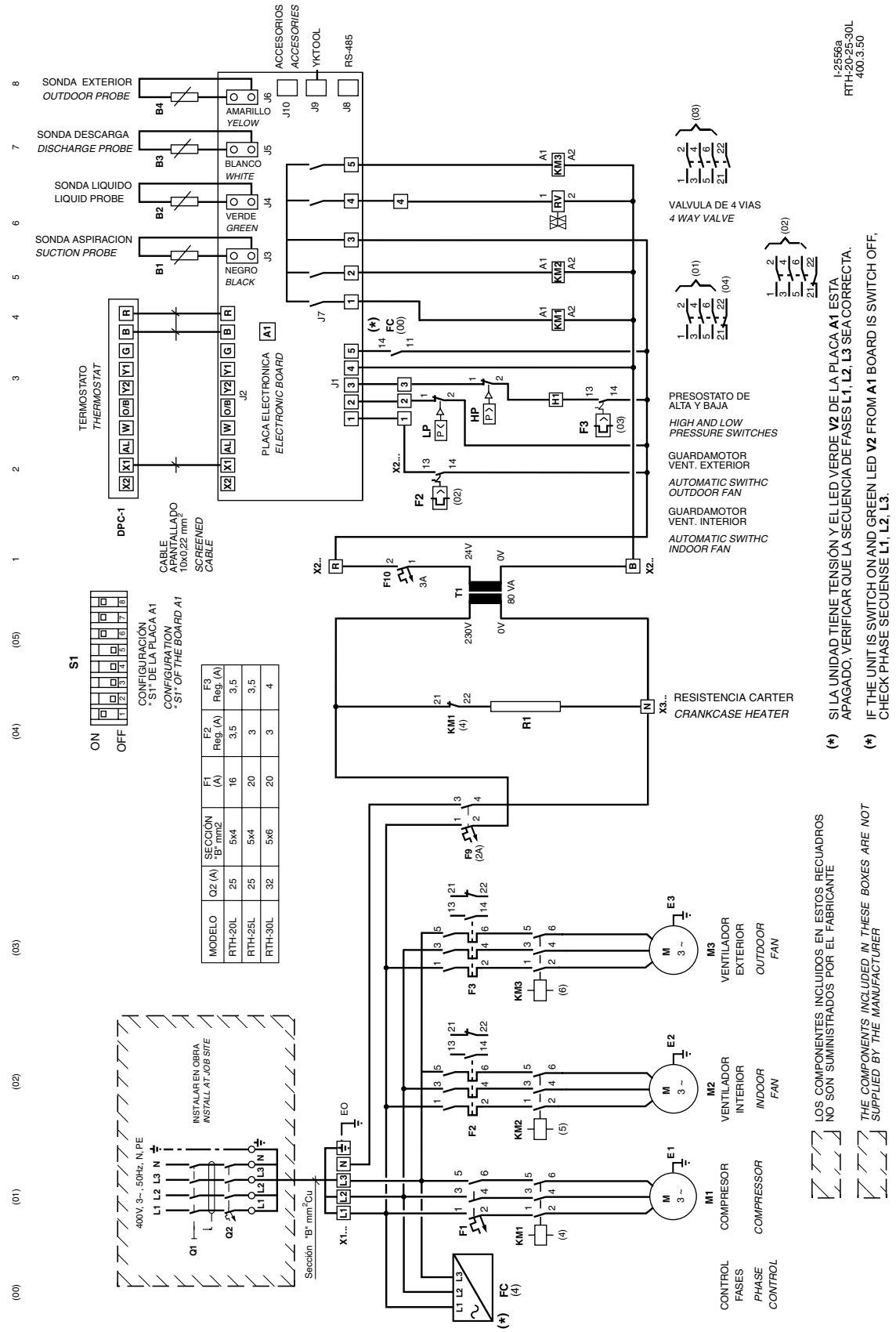
Wiring diagram, RTH07L, 230.1.50



Wiring diagram, RTH10L, 15L, 400.3.50



Wiring diagram, RTH20L, 25L, 30L, 400.3.50



Configuration of switches

The microswitches establish the following configurations:

Number	Status	Meaning
1 / 2	OFF/OFF	Ignore SW, programmed by communications
	ON/OFF	Time between defrosts 30'
	OFF/ON	Time between defrosts 60'
	ON/ON	Time between defrosts 90'
3	ON	Crossed coils
	OFF	Independent coils
4	ON	2' compressor delay
	OFF	5' compressor delay
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 operative during defrost
	OFF	Fan inoperative during defrost

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

Failures (Lockouts)

Lockouts are indicated by the red LED on the YKLON board. If no lockouts exist, the LED remains off.
When a lockout is generated, this LED produces two series of flashes with a constant sequence.
The first series indicates the affected circuit: one flash for the first compressor, two for the second, three for the third and four for the accessories. This is followed by a brief pause. The second series indicates the element or situation producing the lockout.

Lockout table (red LED)

Flashes		Failure
1 ó 3	1	Discharge temperature surpassed.
	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	Gas 1 control or heater 1 failure
	2	Gas 2 control or heater 2 failure
	3	Heater 3 stage failure
	4	Heater 4 stage failure
	5	Failure in economiser or hot water coil (outdoor impulse probe, water return)
	6	Smoke detection or high temperature (accessories) or impulse temperature > 80°C

Incidence

Incidences are indicated by the green LED on the YKLON board. If no lockouts exist, this LED flashes at a constant frequency.
When an incident is generated, this LED produces three series of flashes with a constant sequence.
The first series indicates the affected circuit: one flash for the first compressor, two for the second, three for the third and four for miscellaneous incidences. This is followed by a brief pause. The second and third series indicate the direct cause of the incidence.

Incidence table

Flashes			Type	Incidence
1 ó 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	Discharge temperature not recovered
		2		Return probe open or short circuited
		3		Outdoor probe open or short circuited
		4		Water probe open or short circuited
		5		Enthalpy probe error
	2	1	Thermostat	Signal Y1 or Y2 without G
		2		Signal W without B
		3		Signal W without G
		4		Signal Y2 without Y1
	3	1	Aux. heat	Thermal switch of heater 1
		2		Thermal switch of heater 2
		3		Thermal switch of heater 3
		4		Thermal switch of heater 4
	4	1	Temperature	Water coil temp. not recovered
		2		Outdoor temp. too low
		3		Water coil in antifreeze function
		4		Impulse temp. over 55° C
		5		Impulse temp. < 25° C with gas
	5	1	Others	Transceiver ID unknown
		2		At least one accessory not found
		3		Air quality demand
		4		Dirty filters
		5		Occupation sensor in unoccupied
		6		Suction temperature < 0°C, economiser

Test button

- If pressed until the green LED goes on, certain timings are shortened and any detected failure is reset.
- If pressed until the red LED goes on, two accessories and optional probes connected to the board are identified.
- If there is communication between units and this button is pressed, the Neuron ID is sent by the LonWorks network.

DPC-1 thermostat

When a lockout is generated, and there is communication, the thermostat indicates, alternatively, the time and failure produced, in accordance with the lockout table of the unit.
Also indicates other incidences of the thermostat.

Type	Thermostat numbers		Incidence
Thermostat	9	1	Ambient probe open or short circuited
	9	2	Internal probe not calibrated
	9	3	Communication error
	9	4	External entry of failure
	9	5	Digital probe S5 is not detected
	9	6	Digital probe S6 is not detected
	9	7	Digital probe S7 is not detected
	9	8	Digital probe S8 is not detected
	9	9	Digital probe S9 is not detected

I-2367c

Accessories

Duct electric heaters for RTC & RTH07L 30L

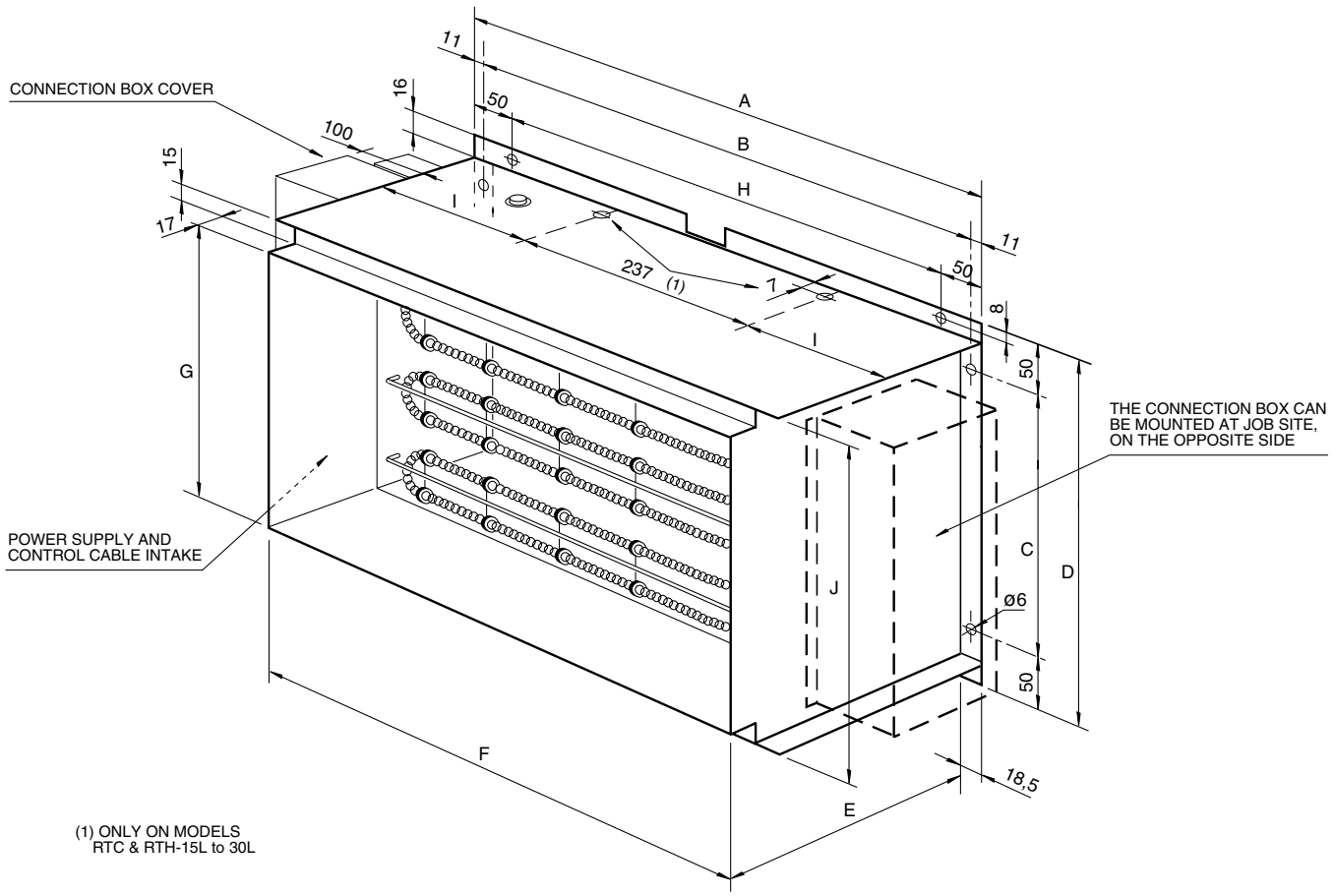
These duct electric heaters are designed to provide backup heat in the RTH units, and complementary heat in the RTC units. On and off cycles are governed by the air conditioning equipment control system. They should be fitted directly in the impulse outlet of the indoor section of the unit.

Technical specifications

These duct electric heaters include the following components:

- Galvanised sheet casing, covers and supports.
- Exposed nickel-chrome wire electric resistance mounted on steatite supports.
- Power supply contactor with a 24 VAC.
- Two thermal switches located at the top of the heater. The first, with automatic reset, disconnects the heater when a temperature of 77°C is reached. The second, accessible externally and with manual reset, disconnects the heater when a temperature of 138°C is reached.
- Interlock with the indoor fan thermal relay. The control system of the unit does not allow operation of the heater when the indoor fan thermal relay fails.
- Plug-in connector for interconnection between the control panel of the air conditioning unit and the heater.
- PVC gasket for heater-air conditioner joint and self-threading screws for fastening the accessory.

General dimensions mm



Model	A	B	C	D	E	F	G	H	I	J
RTC and RTH07L to 10L	400	378	285	385	275	362	320	300	-	353
RTC and RTH15L to 30L	527	505	325	425	350	490	380	427	145	412

General characteristics

Model	Power supply	Power	Consumption	Stages	Automatic switch (1) Q1	Power supply cable section (2)	Front furface	Pressure drop (3)
	V.ph.Hz	kW	A		A	mm^2	m^2	Pa
RTC and RTH07L	230.1.50	5	22	1	25	4	0,12	6
RTC and RTH07L to 10L	400.3.50	5	8	1	10	2,5	0,12	6
RTC and RTH07L to 10L	400.3.50	10	15	1	20	2,5	0,12	6
RTC and RTH15L to 30L	400.3.50	5	8	1	10	2,5	0,12	6
RTC and RTH15L to 30L	400.3.50	10	15	1	20	2,5	0,19	15
RTC and RTH15L to 30L	400.3.50	15	22	1	25	4	0,19	15
Notes: 1.- K curve (DIN, VDE 0660-104). 2.- Based on copper conductors. 3.- Considered the nominal air flow of the indoor section.								

Dimensions with packing and weights

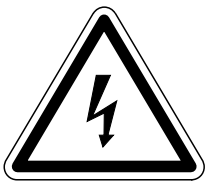
Heater model	Dimensions with packing mm			Weight kg
	Height	Width	Depth	
RTC and RTH07L & 10L	360	513	293	15
RTC and RTH15L to 30L	440	640	370	20

Installation

Install the electric heater in the RTC & RTH unit as follows:

1) In all cases, the **established national regulations** should be followed.
2) Disconnect the power supply to the air conditioning unit.
3) Install the magnetothermal and differential switches for the heater in accordance with the table of General Characteristics and the Wiring Diagrams.
4) Remove the access panels of the RTC & RTH unit control box.
5) Unpack the accessory, opening the top of the box. Make sure the heater assembly has not been damaged during transportation. Check the ceramic insulation and that the heater wires are not in contact with any metal parts.
6) Fit the electric heater in the mouth of the indoor fan panel housing and drill eight 3 diameter holes for fastening. Check to make sure that the reset push button of the F9 thermal switch is accessible and at the top. See Heater Location diagram.
7) Fasten the PVC gasket, supplied with the accessory, to the frame surface of the heater adjacent to the indoor fan panel.
8) Fasten the heater to the panel with the screws supplied.
9) Remove the electrical connections cover of the heater and connect the power supply cables to connecting strip X1. Connect the control cable supplied, between connector J1 of the A3 Auxiliary Resistance board, and connector J10 of the A1 control board of the air conditioning unit.
10) The installer should complete the electric circuit of the heater by fitting an air flow control F14 at the most convenient point of the ducts so as to make sure the heater operates only when there is sufficient air flow.
11) Connect power supply to the RTC & RTH unit and the heater.
12) To configure the accessory, press the test button of control board A1 for over 2 seconds, until the red led on the board goes on. Configuration will be complete when said led goes off.
13) Check operation of the heater by selecting the Emergency Heat mode at the ambient thermostat of the air conditioning unit.
14) Assemble the electrical box covers of the heater and the RTC & RTH unit.

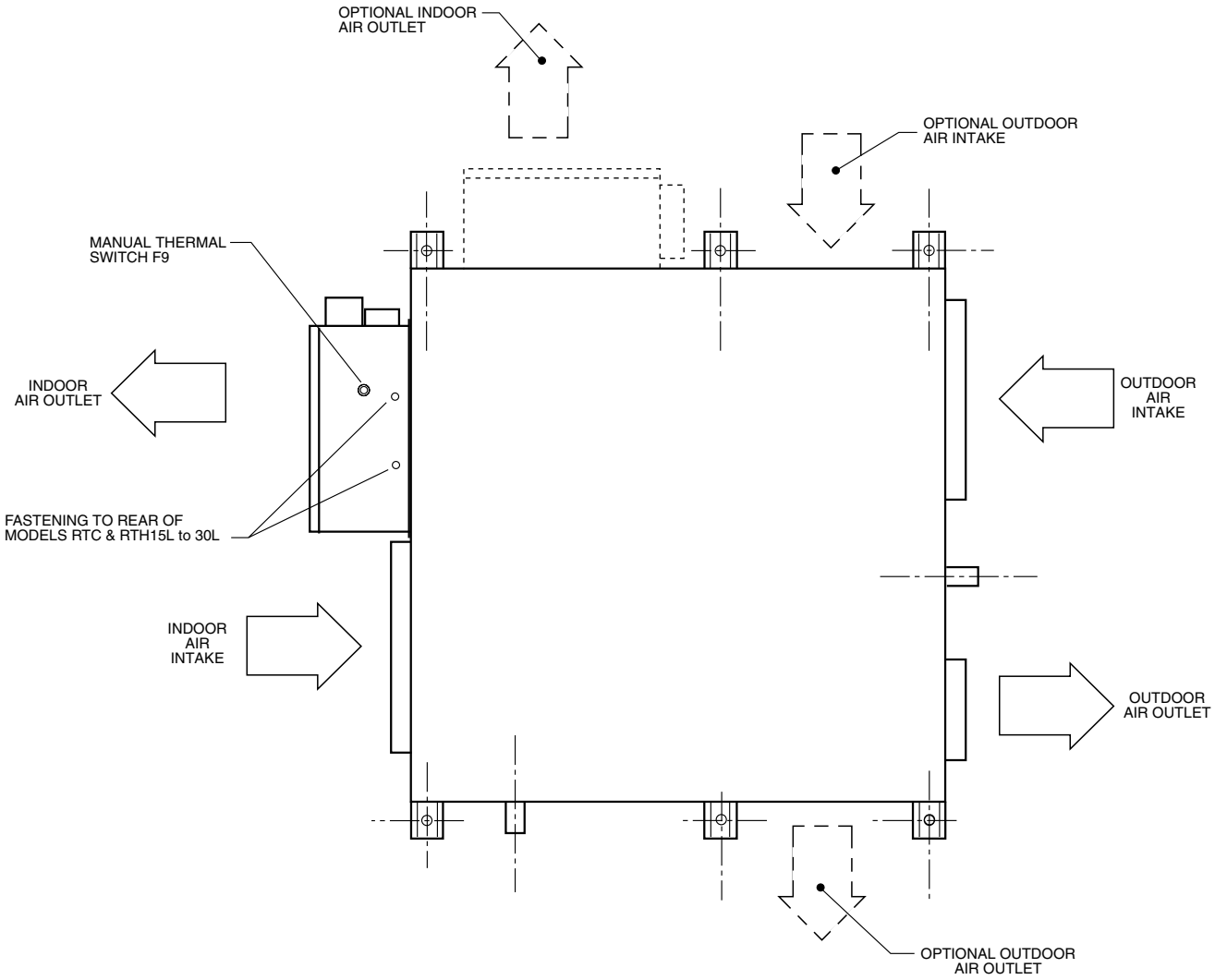
Note: Should an incorrect response of the system take place, see the Operation section of the RTC & RTH Installation Instructions. There you will find the control functions of the A1 electronic board on the heater, as well as its configuration, incidents identification, etc.

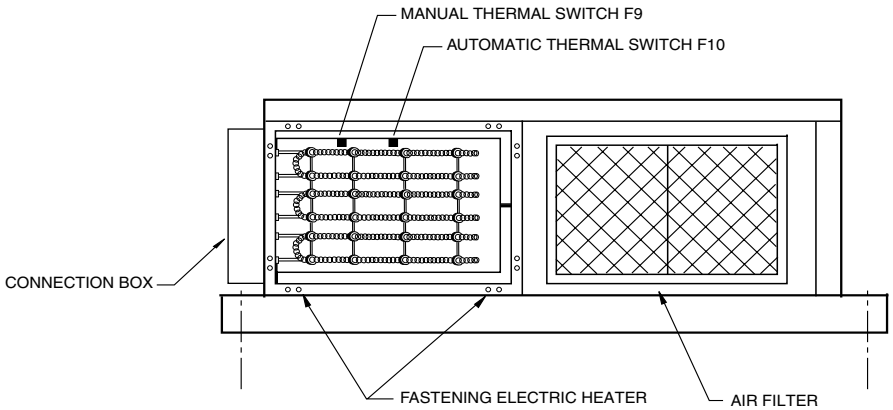


Loose cables can cause overheating of the terminals or incorrect operation of the unit. Fire hazards may also arise. Therefore, make sure all cables are connected tightly.

Heater location

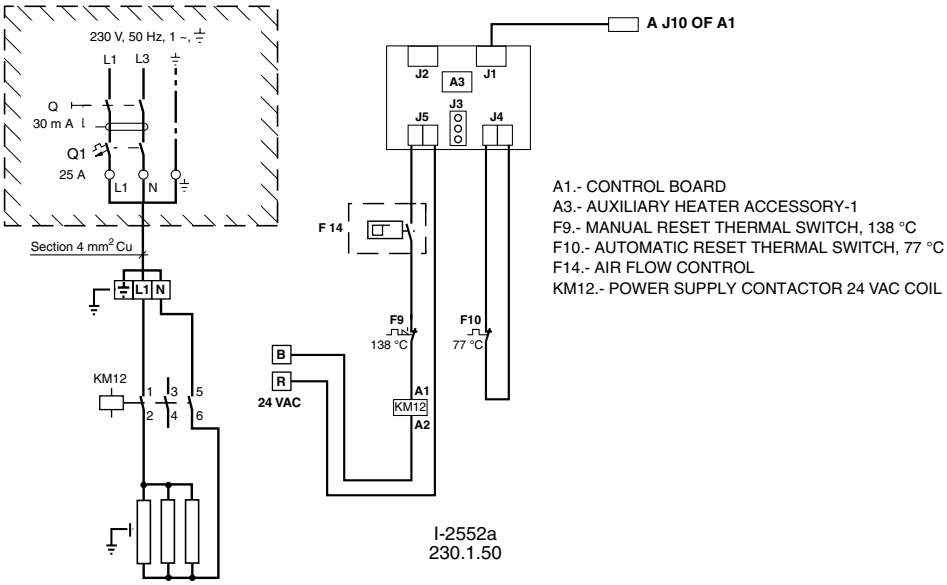
RTC & RTH07L to 30L





Wiring diagram

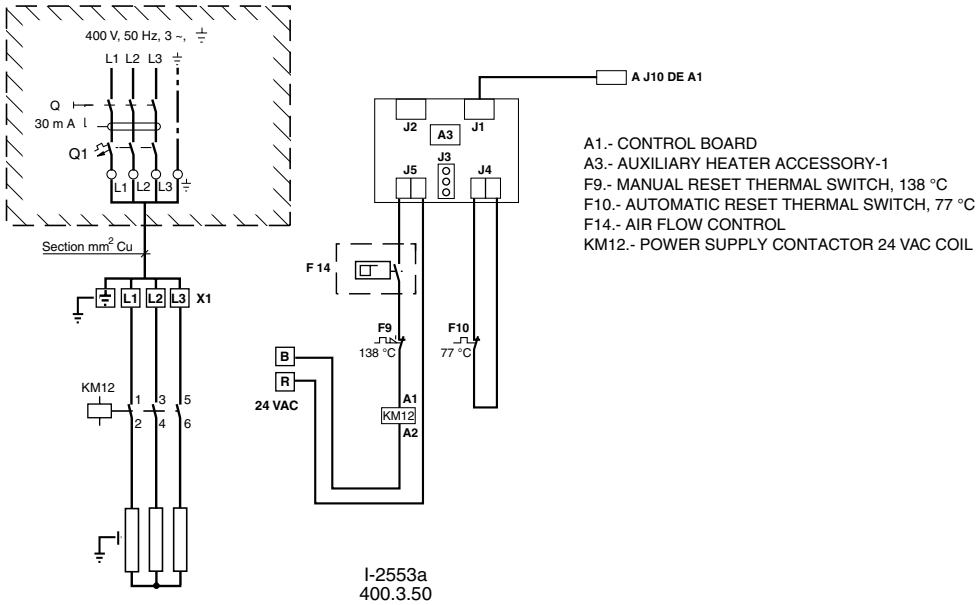
Heater 5kW, 230.1.50
RTC & RTH07L



Wiring diagram

Heater 5, 10, 15kW, 400.3.50
RTC & RTH07L to 30L

POWER kW	AUTOMATIC SWITCH Q1	MINIMUM CABLE SECTION mm²
5	10	2.5
10	20	2.5
15	25	4



A1.- CONTROL BOARD
A3.- AUXILIARY HEATER ACCESSORY-1
F9.- MANUAL RESET THERMAL SWITCH, 138 °C
F10.- AUTOMATIC RESET THERMAL SWITCH, 77 °C
F14.- AIR FLOW CONTROL
KM12.- POWER SUPPLY CONTACTOR 24 VAC COIL

I-2553a
400.3.50

THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

IMPORTANT: THE AUTOMATIC WITCH SIZING AND POWER SUPPLY LINE SECTION ARE ORIENTATIVE AND SHOULD BE CORRECTED IN ACCORDANCE WITH JOB SITE CONDITIONS AND LEGISLATION IN FORCE

Low Ambient Kit for RTH-7L, 10L and 15L

Location of components

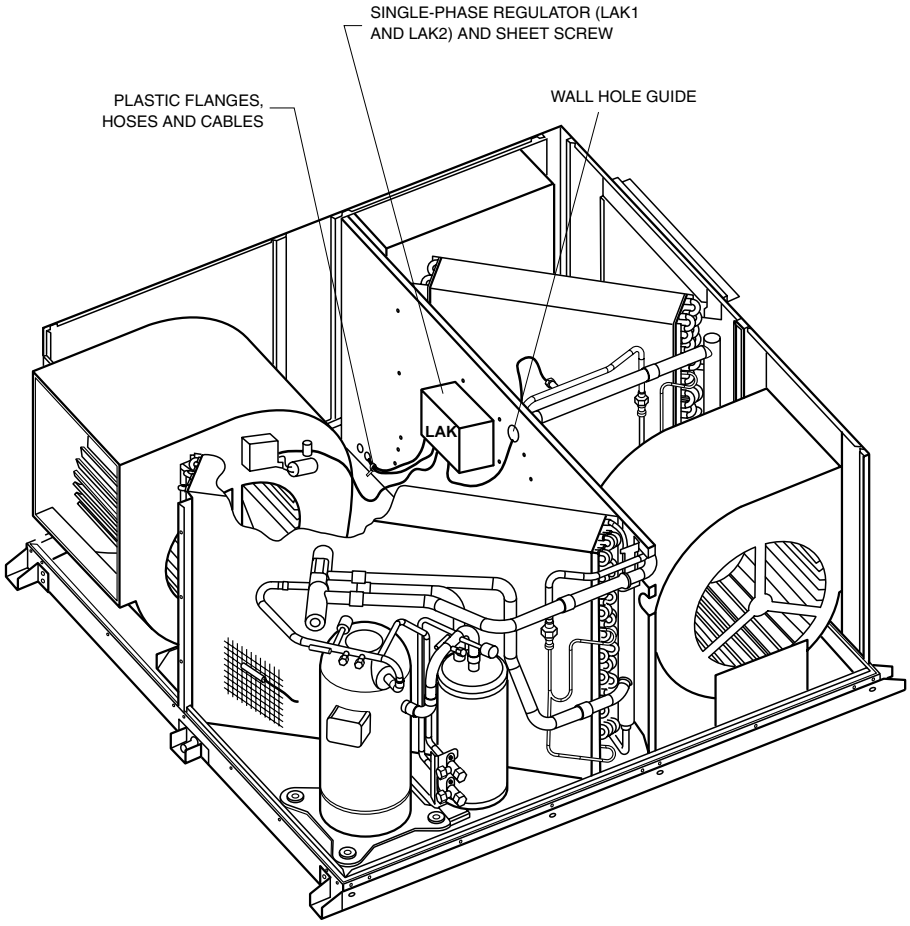


Fig. 1

Connection of hoses at electric box

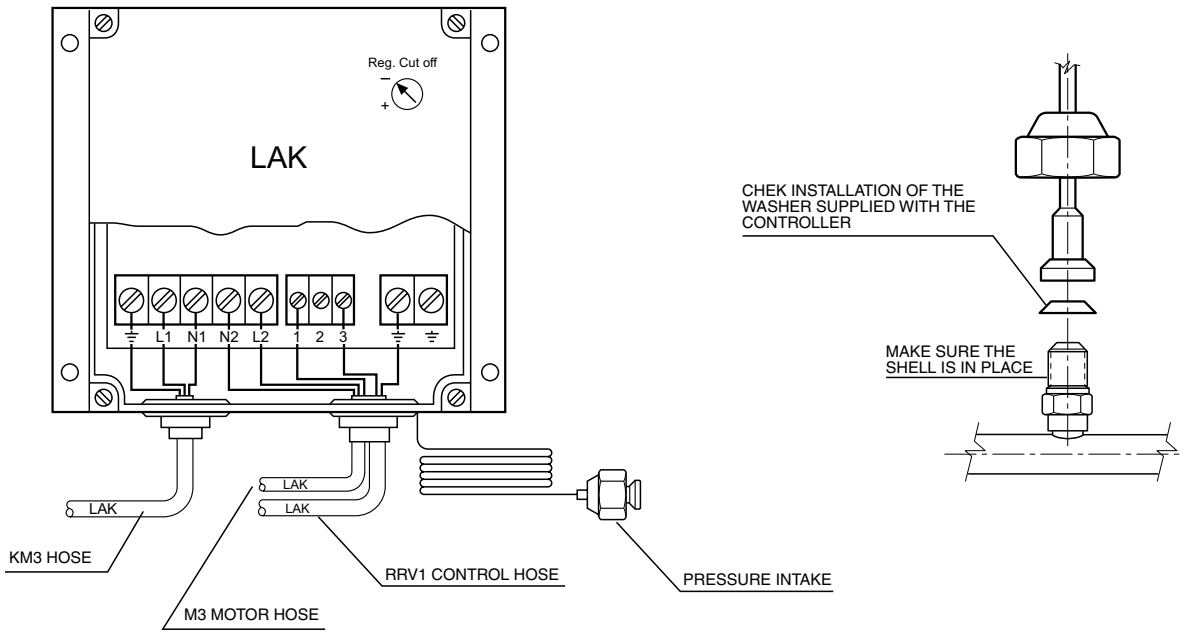


Fig. 2

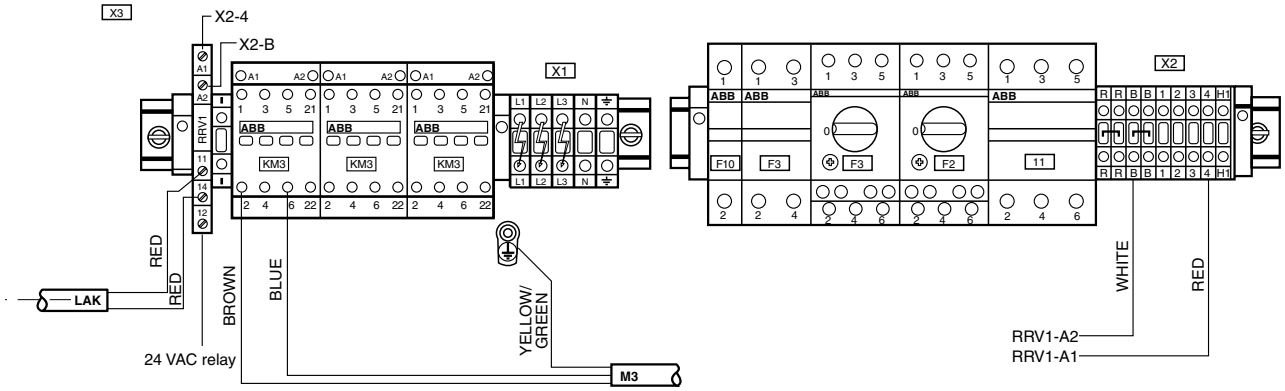


Fig. 3

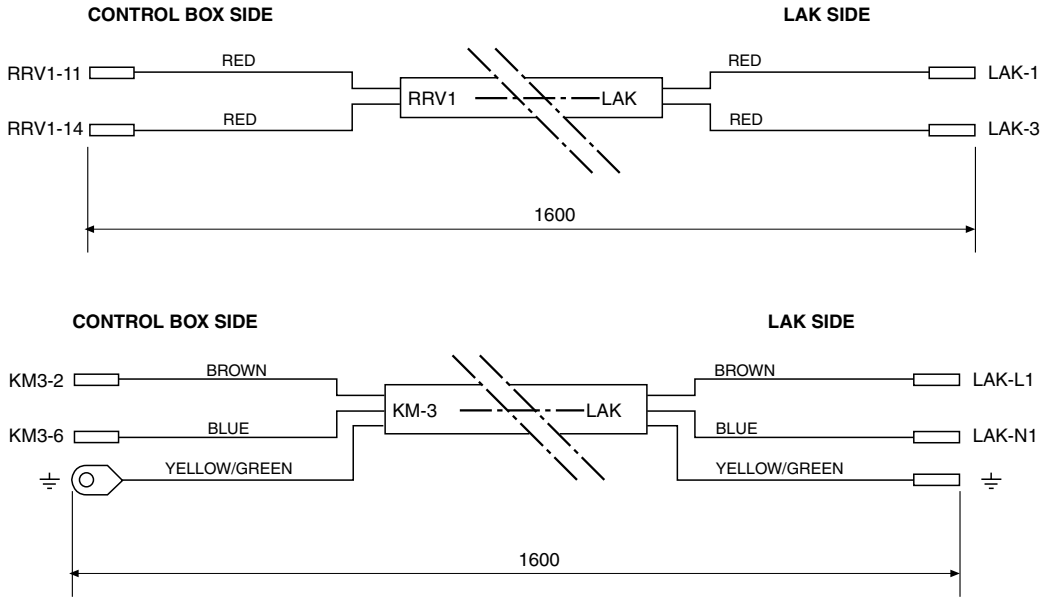


Fig. 4

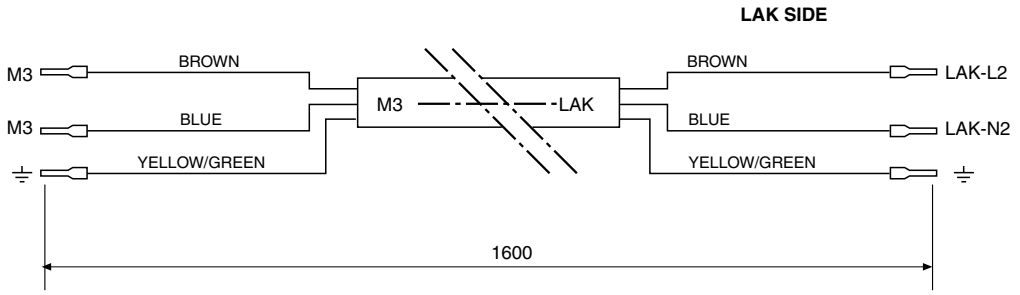


Fig. 5

Cable No.	Cable		Diagram			Cable length
	Color	Section	From		To	
1	White	1	X2-B		RRV1-A2	360
2	Red	1	X2-4		RRV1-A1	400

General information

The condensation control accessory (Low Ambient Kit) is factory-fitted as an option.

The electronic module controls the outdoor fan speed in cool cycle to keep the condensing pressure constant at low outdoor temperatures. This control is not carried out in the winter cycle, and fans operate at 100% capacity.

The regulator is located on the separator panel, on the outdoor fan side (M3).

Technical specifications

This accessory includes the following components:

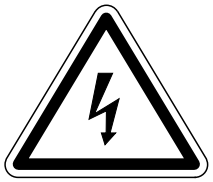
- Single-phase speed regulator, ref. P215DP (LAK). Cut-off regulation.
- Pressure switch set to 30 bar.
- 24 VAC terminal relay (RRV1) for RTH.
- Connecting hose and cables.
- Screws, wall hole guide and plastic flanges.

Installation

Disconnect main power supply to the unit with switch Q1. See Figs. 1, 2, 3, 4, 5 and wiring diagram for details on assembly and wiring connections.

Install the condensation control unit as follows:

1. Remove the top cover and access panels to the outdoor fan.
2. Install the speed regulators (LAK) on the separator panel, using the screws supplied. On heat pump models (RTH), connect the 24 VAC relay (RRV1) to terminal X3.
3. Connect cables inside the electric box in accordance with the wiring diagram.
4. Disconnect the outdoor fan (M3) hose from the KM3 contactor side, and connect same to the LAK side at terminals L2, N2 and ground. Connect the supplied outdoor fan hose to contactor KM3 on the electric box and connect terminals L1, N1 and ground to the LAK side.
5. Connect the control hoses of heat pump models (RTH) to terminals 11 and 14 of the RRV1 relay and on the LAK side of terminals 1 and 3.
6. Install the wall hole guide on the separator panel and insert the pressure switch pressure intake.
7. Connect the pressure intake of the pressure switch to the high pressure intake at the condenser outlet and make sure there are no leaks.
8. Check correct operation. Set maximum fan output regulation (LAK) and disconnect the magneto thermal switch of the compressor (F1). Connect power supply to the unit with switch Q1. Activate stage 1 of cool and make sure contactors KM1, KM2 and KM3 are enabled. The outdoor fan, M3, should rotate 100%. With a voltmeter, check the output voltage (230 VAC) at terminals L2 and N2 of the LAK1 regulator. Set output to a minimum (cut-off). Make sure the outdoor fan turns off.
9. If the unit is heat pump (RTH), activate stage 1 of heating and make sure the outdoor fan M3 rotates 100%. Deactivate this stage.
10. Connect the magneto thermal switch to the compressor (F1).
11. Replace the top cover and the access panel to the outdoor fan.



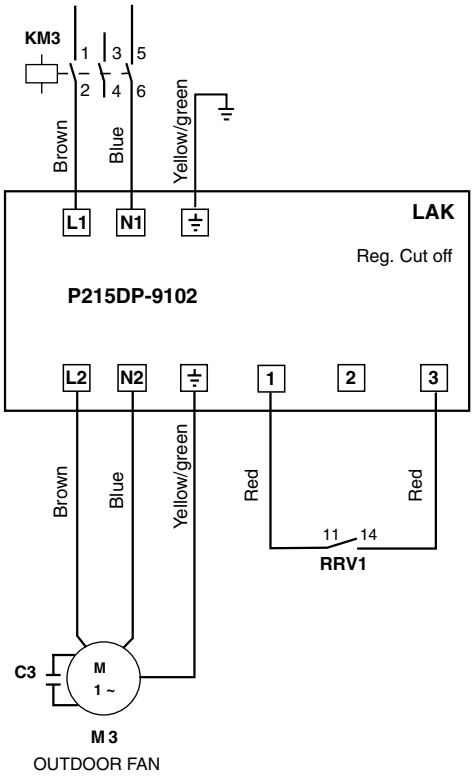
Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected tightly.

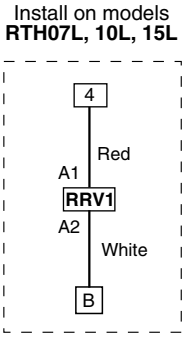
Operation

In summer cycle, allows adjusting outdoor fan speed to keep a constant condensing pressure at low outdoor temperatures. The pressure switch is factory-set to 30 bar. This setting can be modified with the adjusting screw on the pressure switch. Clockwise increases pressure and counter clockwise decreases pressure.

On heat pump models, the control has an intake that, in heat cycle, remains closed through the contact on the cycle changeover relay (RRV1). Fan speed at maximum (output voltage 230 VAC).

Wiring diagram for RTH 07L, 10L and 15L





RRV1- 4-way valve relay
LAK - Low ambient kit
M3 - Outdoor fan motor
KM3 - Outdoor fan contactor

I-2563a
LAK ACCESSORIES
RTC07L, 10L, 15L
RTH07L, 10L, 15L

LAK condensing pressure control for RTH-20L, 25L and 30L units

Location of components

RTC 20L ÷ 30L
RTH 20L ÷ 30L

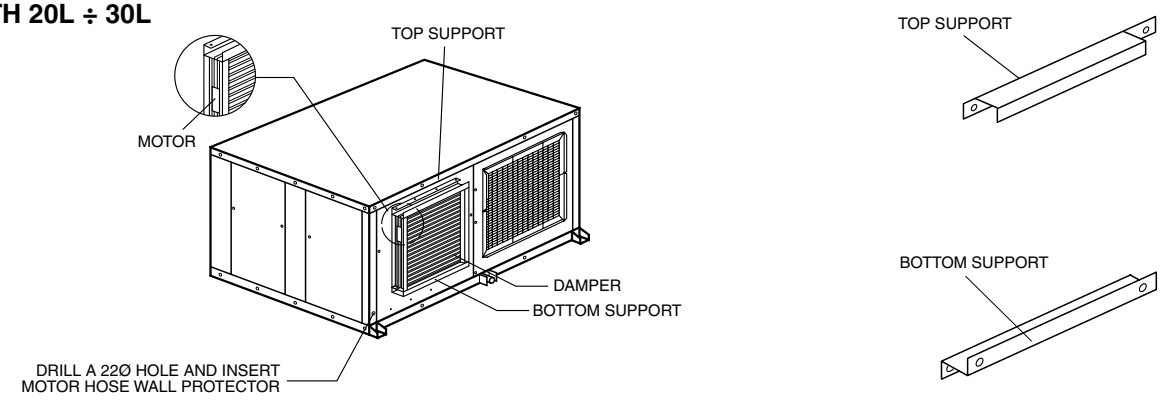


Fig. 6

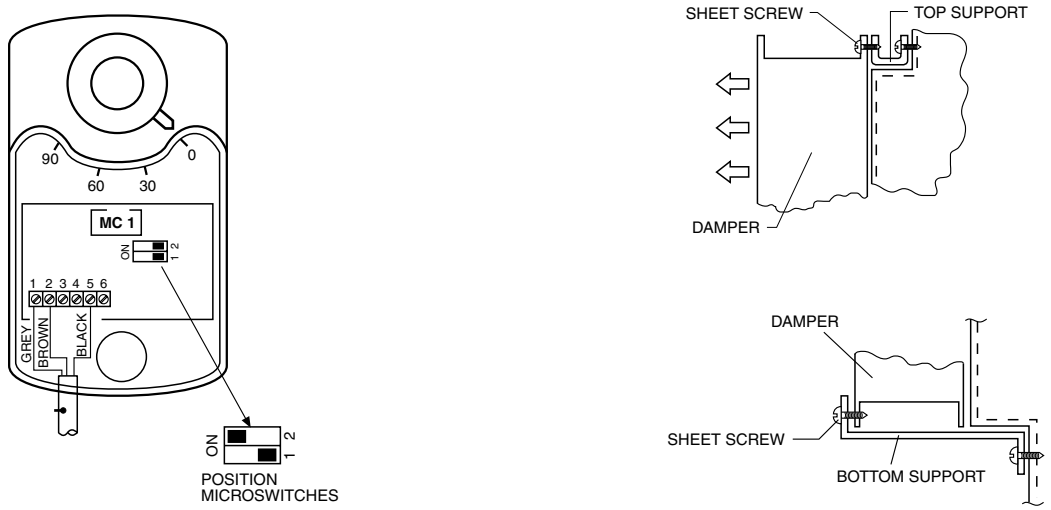


Fig. 7

Connection of hoses in electric box

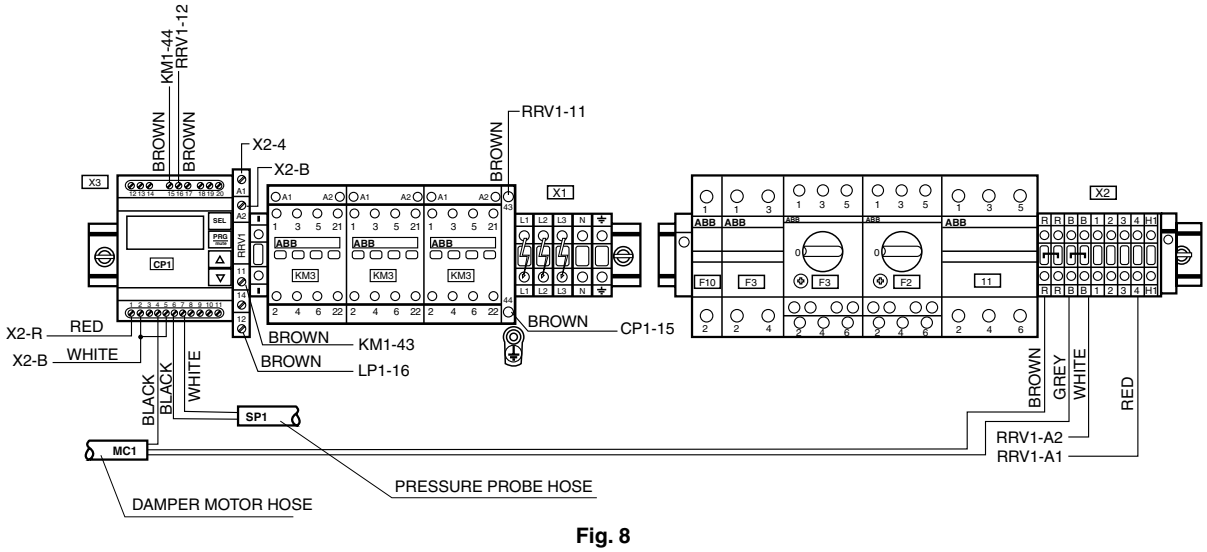


Fig. 8

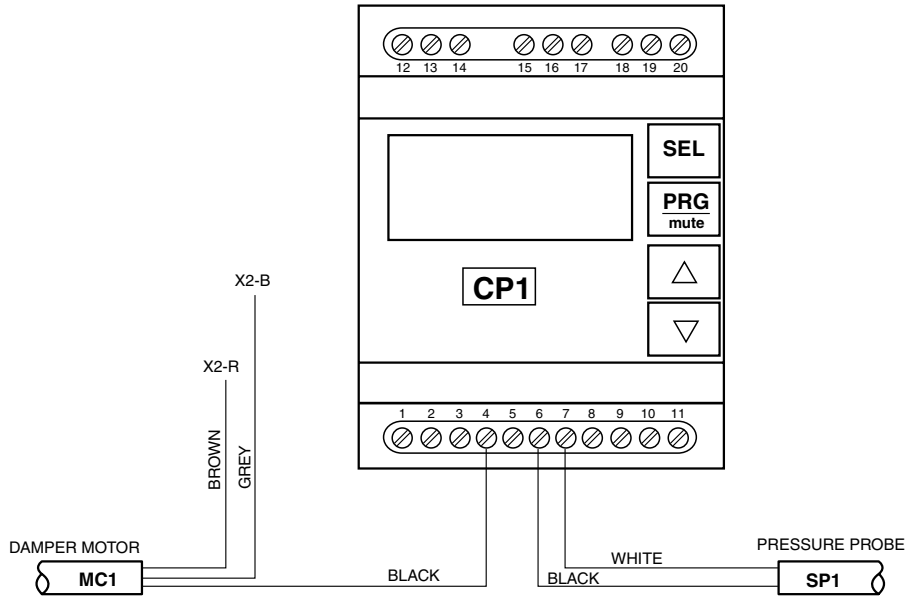


Fig. 9

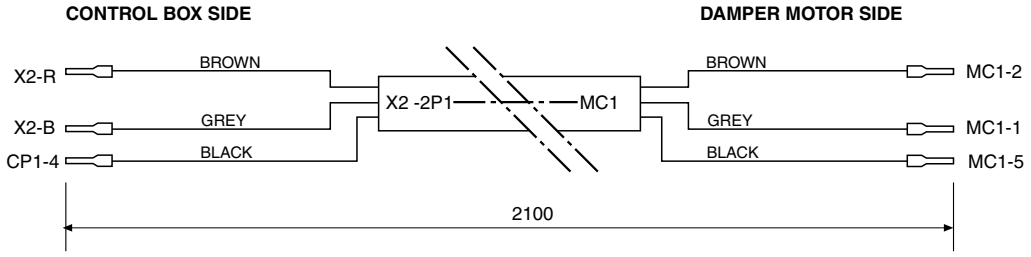


Fig. 10

Cable No.	Cable		Diagram			Cable length
	Colour	Section	From		To	
1	Red	1	X2-R		CP1-1	500
2	White	1	X2-B		CP1-2	490
3	White	1	CP1-5		-	160
4	Brown	1	CP1-15		KM1-44	570
5	Brown	1	KM1-43		RRV1-11	440
6	Brown	1	RRV1-12		CP1-16	590
7	Red	1	X2-4		RRV1-A1	500
8	White	1	RRV1-A2		X2-B	600

General information

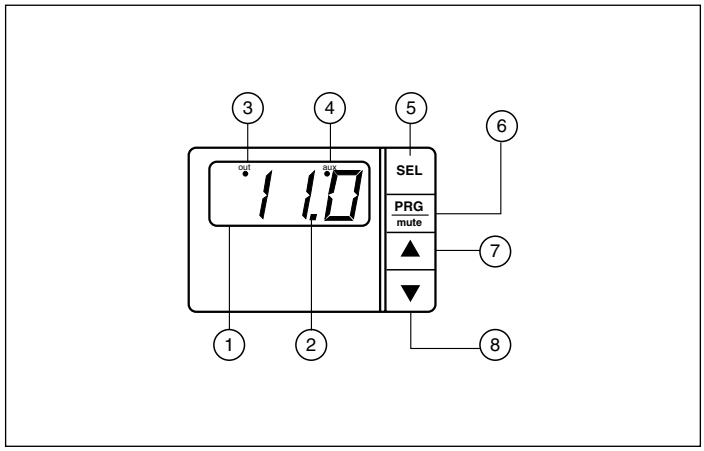
In the summer cycle, this accessory controls the condensing pressure by varying air flow in the outdoor coils. This air flow variation keeps the condensing pressure constant when outdoor temperatures are low.

Operation

By means of the pressure detected by the control unit through the analogical pressure switches installed in the cooling circuit, and carrying out the appropriate calculations in accordance with the settings, this control unit gives off an analogical signal that positions the opening of the dampers in such a way that the previously programmed set point condensing pressure is maintained.

Programming and adjustment

Keys and display (description of the control unit)



1) Display:
   - Displays the value of the pressure switches.
   - Displays the code of the alarms produced.
2) Decimal LED:
   - Is lit when the value has a decimal part.
3) OUT LED:
   - Is lit constantly when the 0V output is different.
   - Flashes when the output is at the maximum programmed value.
4) AUX LED:
   - Is lit or flashes, depending upon the operating mode selected.
5) (SEL) key:
   - Displays and/or selects the set point value.
   - If pressed along with the (Prg/Mute) key for 5 seconds, 00 appears on the display. Using the (▲) (▼) keys, select the access code to enter the main programming mode, parameters "Cxx".
6) (Prg/Mute) key:
   - If pressed for 5 seconds, the basic programming mode is accessed, parameters "Pxx".
   - If an alarm is produced, pressing once deactivates the acoustic signal. If pressed a second time, the alarm is reset.
7) (▲) key:
   - In standby mode, displays pressure switch 1 value.
   - In programming mode, it is used to move on to the next parameter and to increase the values of same.
8) (▼) key:
   - In standby mode, displays pressure switch 2 value.
   - In programming mode, it is used to move on to the previous parameter and to decrease the values of same.

Necessary settings

- Single compressor unit:

Parameter	Value
St1	26
C00	3
P01	2
C03	Ø
C04	Ø%
C05	1ØØ%
C10	Ø
C13	6
C14	Ø
C15	Ø.Ø
C16	44.8
C19	Ø
C30	4

Programming sequence

1.- Press (SEL) for 2 or more seconds, until "St1" appears on the display. After displaying "St1" for one second, the present "St1" value will appear.
2.- By means of the (▲) (▼) keys, change this value to the value indicated in the above tables.
3.- Press (SEL) to confirm the new value. "St2" will appear on the display, but it should not be programmed. Press (SEL) once again to exit the programming mode.
4.- To program C00, press (SEL) and (Prg/Mute) simultaneously for 5 seconds, until "00" appears on the display.
5.- By means of the (▲) (▼) keys, enter the password "77" to access the "Cxx" parameters. Press (SEL) to confirm.
6.- Use the (▲) (▼) keys to move through the different "Cxx" parameters, until reaching "C00".
7.- Press (SEL) to view current value.
8.- By means of the (▲) (▼) keys, set the values indicated in the above tables, as required.
9.- Press (SEL) to confirm the change.
10.- Press (Prg/Mute) to save the changes and exit the programming mode.
11.- To program "P01", press (Prg/Mute) for 5 seconds, until "P01" appears on the display.
12.- Press (SEL) to access the current value.
13.- Use the (▲) (▼) keys to modify the value in accordance with the above tables.
14.- Press (SEL) to confirm the change.
15.- Press (Prg/Mute) to save these values and exit the programming mode.
16.- To program the remaining "Cxx" parameters, press (SEL) and (Prg/Mute) simultaneously for 5 seconds, until "00" appears on the display. Enter the password "77" and press (SEL) to confirm.
17.- By means of the (▲) (▼) keys, move through the different "Cxx" parameters, and then use (SEL) to access and validate the values and the (▲) (▼) keys to modify these parameters in accordance with the above tables.

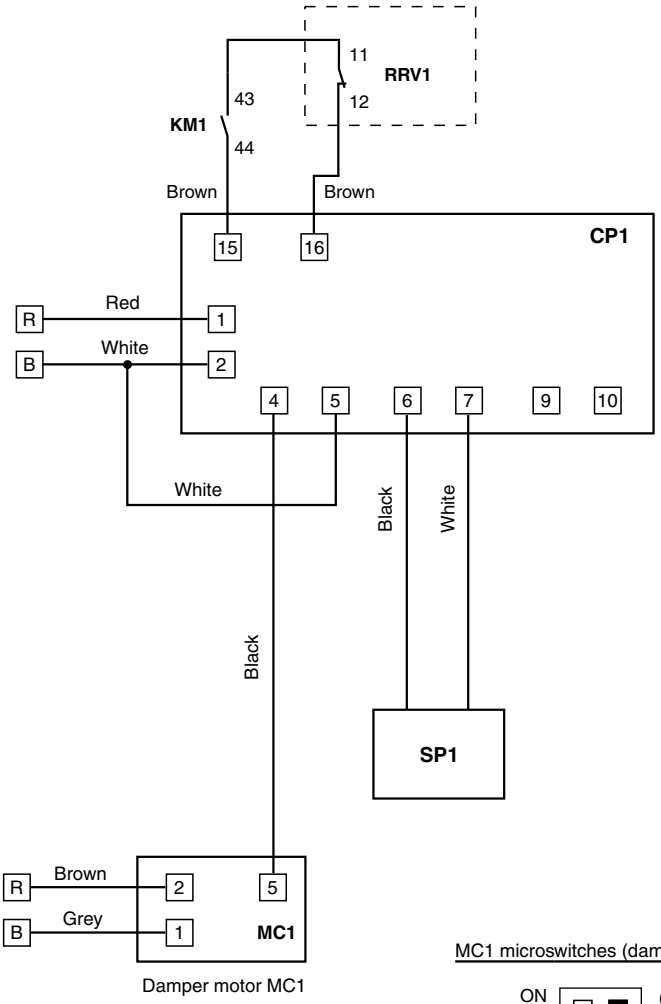
Horizontal air discharge assembly

0.- Check to see the packing is not damaged. Unblock the motor and make sure the slits open and close correctly by applying force.
1.- Disconnect power supply to the unit.
2.- Install the lower support supplied, as in figure 1. Fasten the support with the self-threading screws of the accessory.
3.- Lean the dampers on the previously fitted support, with the motor at the point nearest the control panel (Fig. 7).
4.- Install the top support and fasten it to the chassis of the unit by means of the drilled holes and self-threading screws supplied (Fig. 7).
5.- Fasten the dampers to the lower and top supports with the self-threading screws supplied (Fig. 7).
6.- Open the control panel and remove the roof cover.
7.- Fit the CP1 control unit in the DIN guide on the X3 connecting strip side. On models RTH, also install relay RRV1 (Fig. 8).
8.- Move contactors KM1 and KM2 to attach the side auxiliary contacts supplied.
9.- Screw the high pressure intake switch on to the condensing unit output and check for leaks. But first unscrew and remove the plugs that protect same.
10.- Connect the pressure switch hose and fasten it by means of the clamps supplied along with the existing wiring cables.
11.- Insert the pressure switch hose through the hole on the separator panel, and install the 28 ø wall hole guide supplied.
12.- Connect the pressure switch hoses to control unit CP1.
13.- Remove the damper motor cover, insert the damper hoses and connect as indicated on the corresponding diagram (Fig. 7).
14.- Drill a 22 Ø hole and insert the wall hole guide for the damper motor hose.
15.- Connect all cables supplied, in accordance with the corresponding wiring diagram.
16.- Turn main power supply on and program the control unit.
17.- Close all panels.

Checking

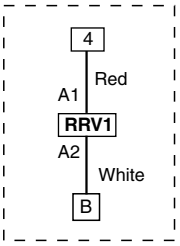
1.- Program the thermostat in the winter cycle (pumps only), start the compressors and make sure the dampers open completely.
2.- Turn the unit off and program the thermostat in the summer cycle.
3.- Start the compressors and check to be sure that when the pressure begins to rise above the programmed 26 bars, the dampers begin to close.
Once this pressure is reached, the dampers open to a specific position, depending upon the outdoor temperature. With a very low outdoor temperature, the dampers should be closed.

Wiring diagrams for RTH 20L, 25L y 30L



Damper motor MC1

ASSEMBLY MODELS RTH 20L, 25L, 30L

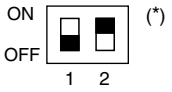


RRV1 - 4-way valve relay
CP1 - Proportional control
MC1 - Damper motor
SP1 - Circuit 1 pressure probe

Parameters CP1

St1 - 26
C00 - 3
P01 - 2
C03 - 0
C04 - 0%
C05 - 100%
C10 - 0
C13 - 6
C14 - 0
C15 - 0.0
C16 - 44,8
C19 - 0
C30 - 4

MC1 microswitches (damper motor)



I-2564a
RTC-20L, 25L and 30L
RTH-20L, 25L and 30L

(*) The position of the damper in standby (0V set point between 1 and 5 of MC1) should be open. With signal (0-10 Vdc), the damper shouls close. Set switch 2 to ON/OFF position to carry out this logic.

Data and dimensions subject to change without prior notice.

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