
Packaged air conditioning unit condensed by air model RTC 07L to 30L

Ref.: N-27656 0608

Technical information



Johnson Controls Manufacturing España, S.L. is participating in the EUROVENT Certification Program.

Products are as listed in the EUROVENT Directory of Certified Products, in the program AC1, AC2, AC3, LCP and FC.

The LCP program covers air condensed water chillers and heat pumps of up to 600 kW.

Index	Page	Page
General information	3	
- General description	3	
- Nomenclature	3	
Technical specifications	3	
- Mechanical specifications	3	
- Ambient thermostat DPC-1	3	
- Physical data	4	
- Limits of Use	5	
- Sound level	5	
- General dimensions	6 - 7	
- Nominal capacities	8	
- Test conditions	8	
- Correction factors	8	
- Nominal flows	8	
- Sensible cooling capacities	9 - 10	
- Indoor and Outdoor fan services	11	
- Characteristics of the indoor/outdoor fan on pulley models	11	
- General characteristics	12	
Control board	12	
Wiring diagram	13 - 15	
- Microswitches configuration	16	
Accessories	17 - 30	
		Duct electric heaters for RTC & RTH07L to 30L
		17
		- Technical specifications and general dimensions
		17
		- General characteristics
		18
		- Dimensions with packing and weights
		18
		- Installation
		18
		- Heater location
		19
		- Wiring diagram
		20 - 21
		Low Ambient Kit for RTC-7L, 10L and 15L
		22
		- General information
		22
		- Technical specifications
		22
		- Installation
		22
		- Operation
		22
		- Location of components
		23
		- Connection of hoses at electric box
		23 - 24
		- Wiring diagram for RTC-7L, 10L and 15L
		25
		LAK condensing pressure control RTC-20L, 25L and 30L units
		26
		- General information
		26
		- Operation
		26
		- Programming and adjustment
		26
		- Horizontal air discharge assembly
		27
		- Checking
		27
		- Location of components
		28
		- Connection of hoses in electric box
		28 - 29
		- Wiring diagrams for RTC-20L, 25L and 30L
		30

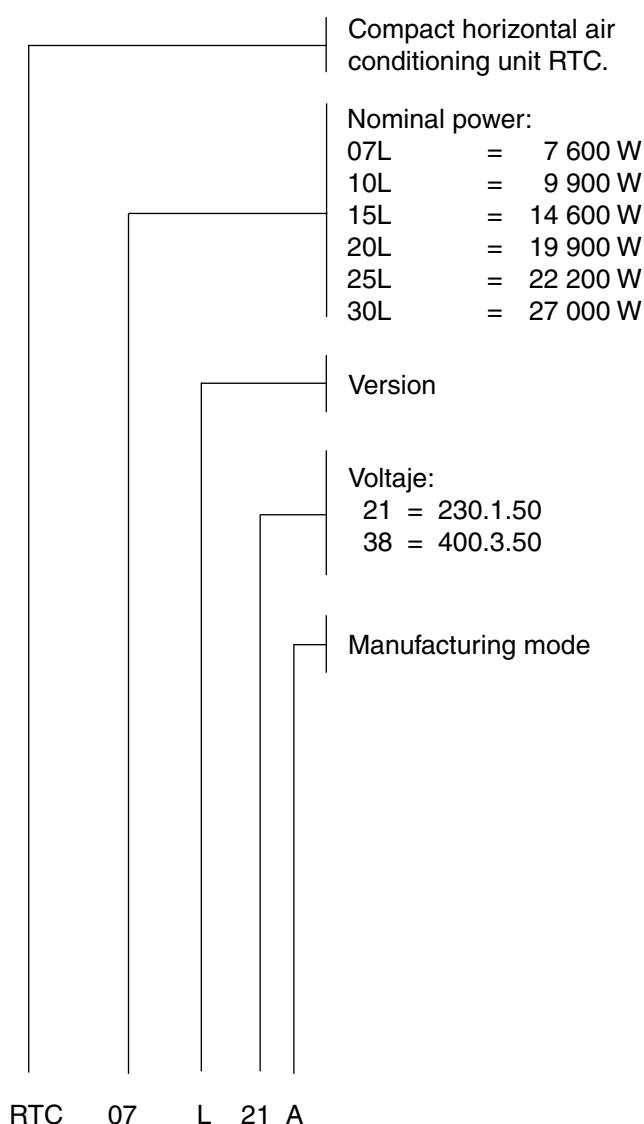
General information

General description

The RTC model air conditioners are packaged type compact horizontal units, condensed by air.

They can be installed either indoors or outdoors, and the fans are of the centrifugal type, and therefore accept ducts for channelling air.

Nomenclature



Technical specifications

Mechanical specifications

Compressor

Of the vertical hermetic type "Scroll", mounted on shock absorbers and with internal motor protection and an electric heater for heating the oil.

Coils

Made of copper tubing and aluminium fins. Located within the cabinet and completely protected against damage during transportation or installation.

Indoor and outdoor fans

Of the centrifugal type with directly fitted motor or belt drive.

These fans have sufficient available pressure for the installation of optional ducts and accessories.

Casing

Made of galvanized steel sheeting and finished with oven-polymerized powdered paint. This allows installing outdoors. Internally, in the evaporating unit area, it is coated with insulation to avoid condensation. These units include a galvanized sheeting tray with corresponding drain for collection of condensates from the evaporating coil.

Cooling circuit

Made of welded copper tubing. All units are supplied with a corresponding optimized refrigerant charge and having surpassed the maximum pressure and leak-tightness tests. Refrigerant expansion, which takes place in the internal section, is carried out by means of a calibrated and distributed hole in 07L, 10L and 15L sizes, and with expansion valve and distributor in 20L, 25L and 30L. The circuit includes: high and low pressure switches and suction and discharge pressure intakes.

Refrigerant

These units are manufactured with R-410A.

Electric panel

Accessible directly from the outside. Includes connecting strip, protectors, electronic board and probes, power supply contactors, operating relay, phase control relay and transformer. In compliance with European regulations currently in force.

Phase control relay

The electric panel of the unit RTC20L, 25L and 30L introduces 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 exposed wire type to allow fast heat dispersion, avoiding temperature inertia that could affect the components. Equipped with a contactor and thermal protectors: automatic and manual reset.

Thermostat

The RTC07L to 30L units include, as standard equipment, the electromechanical DPC-1 thermostat.

To connect the thermostat to the board, 10x0.22mm² screened communication cable should be used.

Ambient thermostat DPC-1

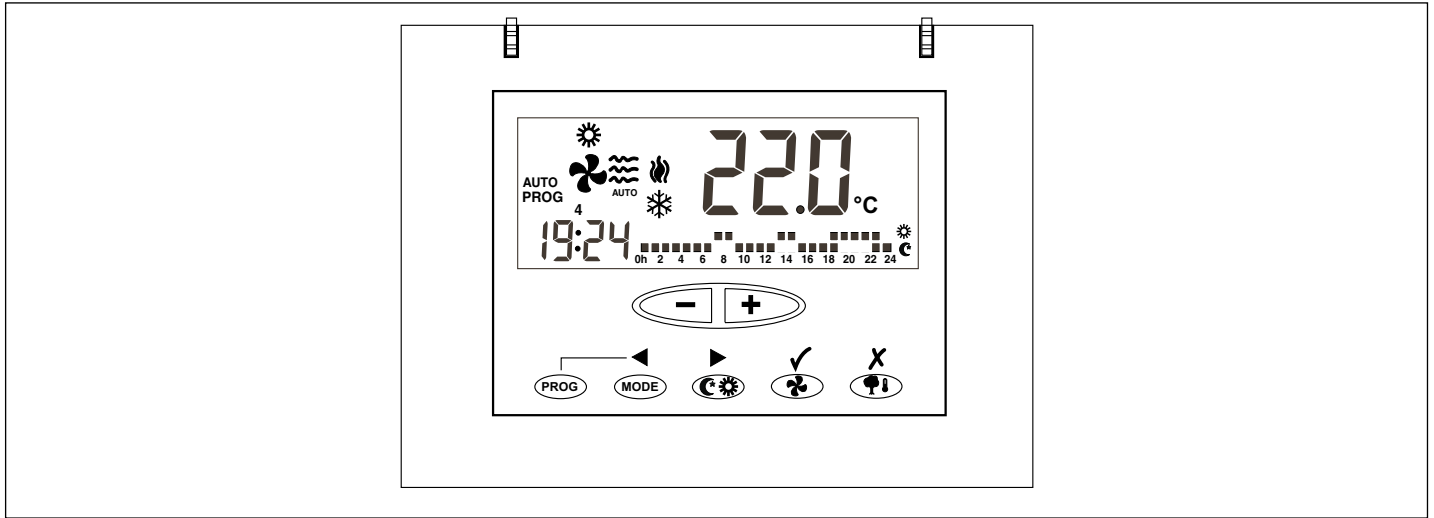
Programmable digital thermostat with communication

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



Physical data

Model		RTC07L	RTC10L	RTC15L	RTC20L	RTC25L	RTC30L
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
Indoor 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
	Fins per inch	12	12	12	12	14	14
	Front area m ²	0.32	0.41	0.51	0.65	0.71	0.87
	Tubing diameter mm (Inches)	9.52 (3/8")					
Outdoor 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
	Fins per inch	12					
	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	0.245	0.55	0.55	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	0.245	0.245	0.55	1.1	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	400.3.50	400.3.50	400.3.50
Refrigerant load R-410A	kg	2	2.7	4.5	5.1	6.4	7
Approximate nett weight	kg	172	180	235	305	358	455
Approximate gross weight	kg	183	195	254	325	384	483
Dimensions with standard packing	cm	122x124.5x64	127x129.5x71.5	143x145.5x71.5	171.5x169x74.5	180x188.6x81	190.6x220x81

(1) Belt drive

Limits of use

Voltage limits				Air intake temperature to the outdoor coil DB		Air intake temperature to the indoor coil	
Nominal at 230 V		Nominal at 400 V					
Maximum	Minimum	Maximum	Minimum	Maximum °C	Minimum °C	Maximum °C	Minimum °C
254	198	436	342	46	19 ₍₁₎	22	14

Notes: WB - wet bulb. DB - dry bulb. (1) With the LAK accessory the limit is -10°C.

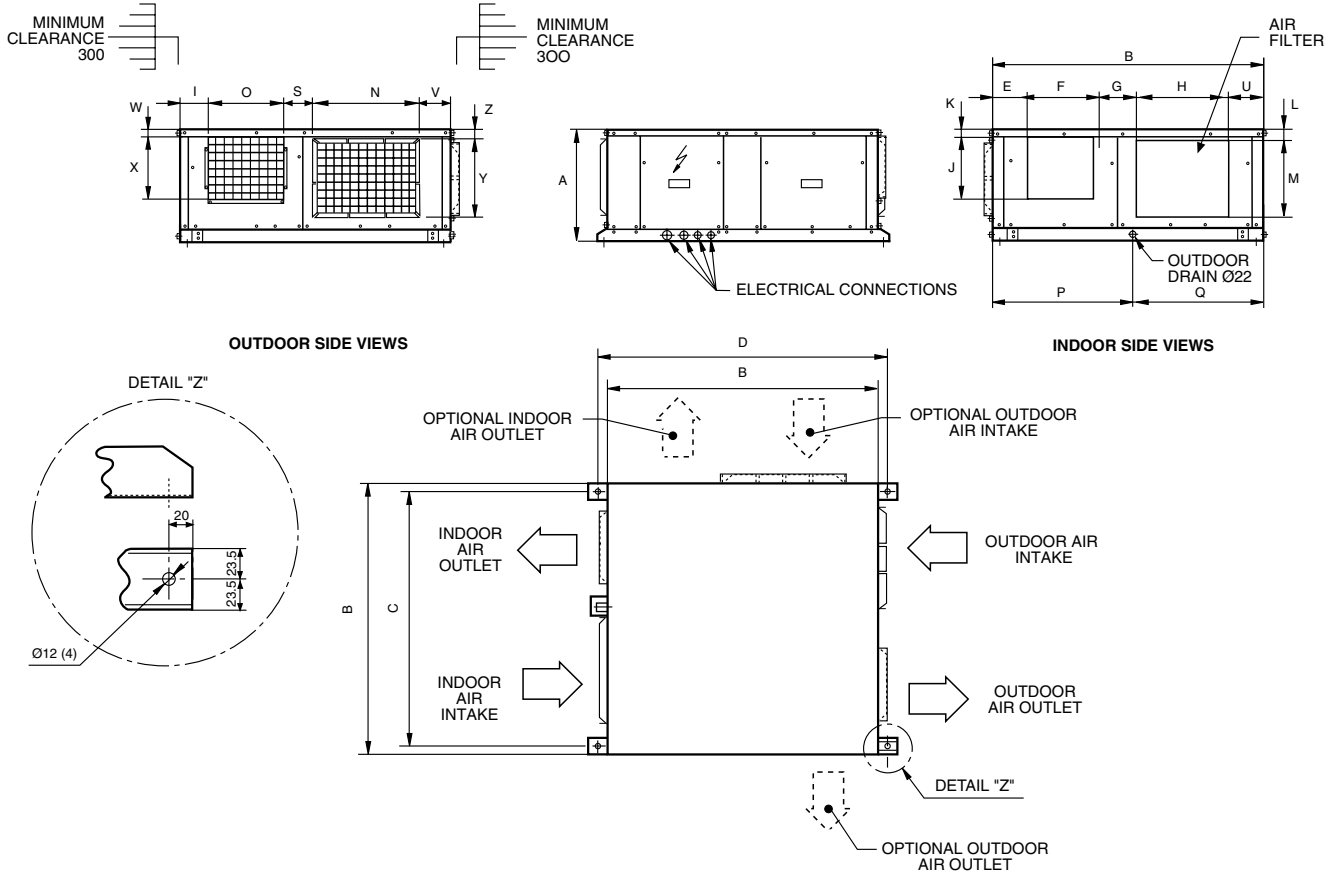
Sound level

Roomtop	OUTDOOR Spectrum 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	1000 Hz	2000 Hz	4000 Hz	8000 Hz		
RTC 07	58	59	64	65	65	60	54	71	49
RTC 10	58	59	64	65	65	60	54	71	49
RTC 15	59	60	65	66	66	63	57	72	50
RTC 20	59	60	66	68	68	66	60	74	52
RTC 25	60	63	70	72	70	67	65	77	55
RTC 30	61	66	76	76	73	68	66	81	59

Roomtop	INDOOR Spectrum per octave band in DUCT dB(A)							Global sound power level dB (A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
RTC 07	57	58	63	65	64	60	53	70
RTC 10	58	59	64	65	65	60	53	71
RTC 15	59	60	64	65	65	60	53	71
RTC 20	59	61	67	67	66	63	59	73
RTC 25	60	61	70	68	68	66	62	75
RTC 30	60	61	70	68	68	66	62	75

General dimensions mm

RTC07L, 10L, 15L and 20L



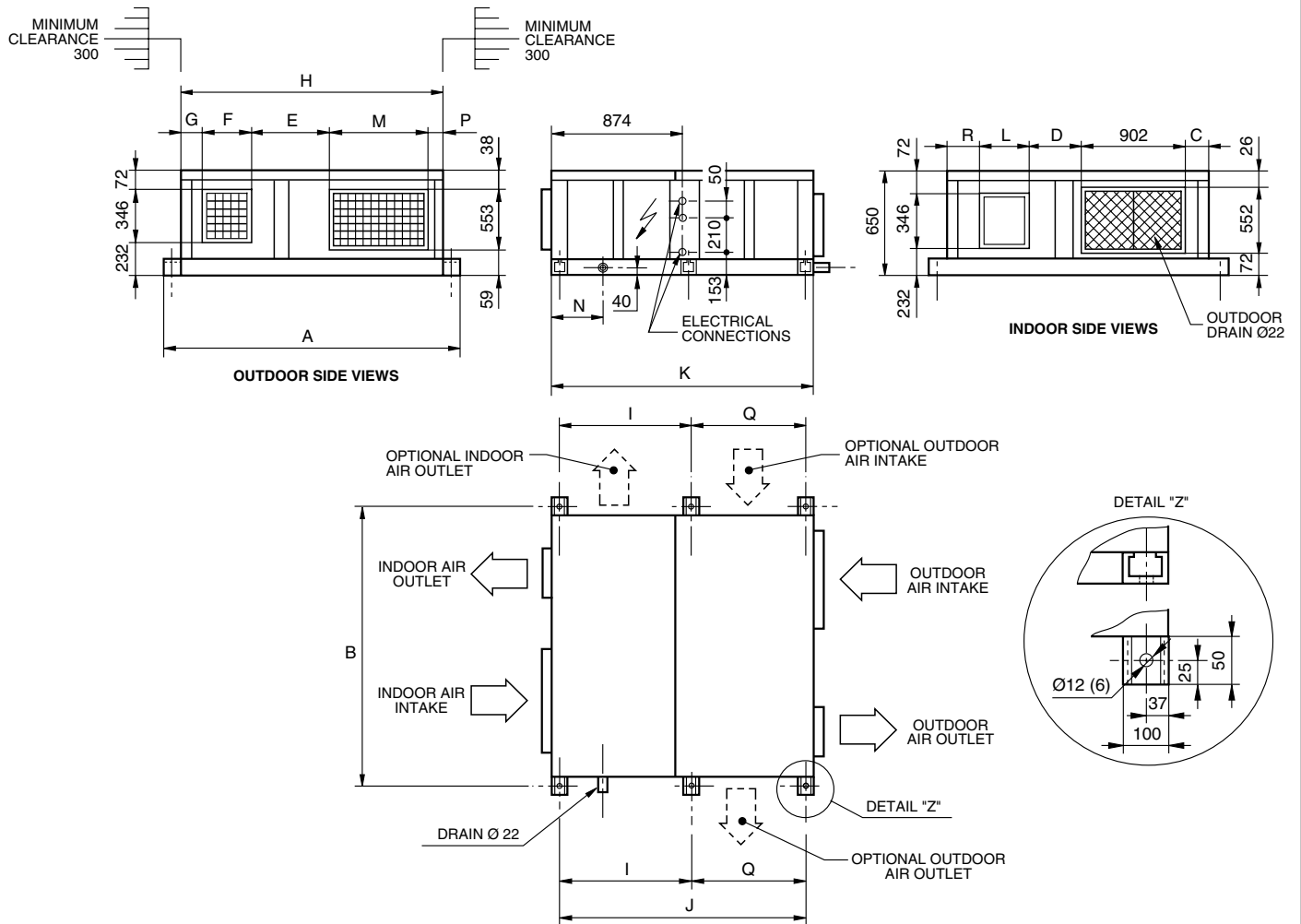
Note:

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	S	U	V	W	X	Y	Z
RTC07L	480	1102	1055	1150	117	302	126	447	82	262	72,5	60	306	425	347	597	505	166	110	82	18	305	342	40
RTC10L	557	1155	1105	1201	130	270	202	398	75	294	101	50	426	404	323	594	561	236	155	117	20	353	430	40
RTC15L	557	1312	1265	1361	140	316	136	640	73	346	24	45	425	554	323	616	696	241	80	121	20	353	430	40
RTC20L	585	1572	1525	1621	140	316	192	788	87	346	54	80	420	770	407	624	948	206	136	102	50	353	430	70

General dimensions mm

RTC25L and 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.
- 2- If a filter-holder with a filter is applied to air suction, see the dimensions of the duct in the information that corresponds to this accessory.

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R
RTC25L	1 750	1 700	87	200	338	405	135	1 651	870	1 675	1 750	315	673	354	100	806	147
RTC30L	2 150	2 100	115	512	704	405	135	2 056	880	1 696	1 770	400	717	369	95	816	127

Nominal capacities

Unit	Cooling capacity W	Consumption W
RTC07L	7 600	3 000
RTC10L	9 900	3 950
RTC15L	14 600	5 500
RTC20L	19 900	8 600
RTC25L	22 200	10 000
RTC30L	27 000	12 000

Test conditions

Voltage	Outdoor temp. °C		Indoor temp. °C	
	DB	WB	DB	WB
230 or 400	35	24	27	19

Correcting factors

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

Correction of the real temperature of air intake to the condensing coil in °C, for flows that differ from the nominal values.

Indoor intake air temp. °C WB	Outdoor air intake 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 intake temperatures DB to the indoor coil between 21 and 32°C. WB-wet bulb. DB-dry bulb.

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

Cooling capacity correcting factors for flows that differ from the nominal flows of the evaporating 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

Nominal flows

Model	Indoor fan m³/h	Nominal pressure available Pa	Outdoor fan m³/h	Nominal pressure available Pa
RTC07L	1 490	25	2 420	50
RTC10L	2 015	37	3 520	50
RTC15L	3 580	50	3 890	50
RTC20L	4 100	50	4 810	50
RTC25L	5 060	62	5 640	50
RTC30L	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 W	Sensible capacity (W)				Compressor absorbed power kW
				Dry intake air temperature to coil, °C (DB)				
				22	24	27	29	
RTC07L	25	22	9 120	2 851	3 718	5 018	5 886	2.00
		19.5	8 208	4 199	5 066	6 366	7 234	2.09
		17	7 600	5 080	5 947	7 247	7 600	2.19
	35	22	8 436	2 608	3 475	4 775	5 641	2.26
		19.5	7 600	3 959	4 826	6 126	6 993	2.38
		17	6 992	4 355	5 221	6 521	6 992	2.50
	45	22	7 600	2 338	3 205	4 505	5 372	2.62
		19.5	6 840	3 687	4 553	5 853	6 720	2.74
		17	6 232	4 509	5 375	6 232	6 232	2.86
RTC10L	25	22	11 880	3 663	4 906	6 771	8 016	2.44
		19.5	10 692	5 597	6 840	8 705	9 950	2.55
		17	9 900	6 864	8 107	9 900	9 900	2.67
	35	22	10 989	3 354	4 597	6 461	7 705	2.76
		19.5	9 900	5 291	6 534	8 399	9 642	2.90
		17	9 108	6 148	7 391	9 108	9 108	3.05
	45	22	9 900	3 010	4 253	6 118	7 361	3.19
		19.5	8 910	4 943	6 186	8 051	8 910	3.34
		17	8 118	6 133	7 376	8 118	8 118	3.48
RTC15L	25	22	17 520	5 286	7 459	10 720	12 897	3.39
		19.5	15 768	8 666	10 840	14 100	15 768	3.56
		17	14 600	10 888	13 062	14 600	14 600	3.72
	35	22	16 206	4 845	7 019	10 280	12 453	3.84
		19.5	14 600	8 229	10 403	13 663	14 600	4.04
		17	13 432	9 758	11 932	13 432	13 432	4.24
	45	22	14 600	4 355	6 528	9 789	11 963	4.44
		19.5	13 140	7 730	9 904	13 140	13 140	4.65
		17	11 972	9 839	11 972	11 972	11 972	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)				
			W	22	24	27	29	
RTC20L	25	22	23 880	7 359	9 869	13 635	16 150	5.72
		19.5	21 492	10 474	12 985	16 751	19 266	5.99
		17	19 900	13 824	16 334	19 900	19 900	6.27
	35	22	22 089	6 737	9 247	13 013	15 524	6.47
		19.5	19 900	9 872	12 383	16 149	18 660	6.81
		17	18 308	12 327	14 837	18 308	18 308	7.15
	45	22	19 900	6 046	8 557	12 323	14 834	7.49
		19.5	17 910	9 187	11 698	15 463	17 910	7.83
		17	16 318	12 355	14 866	16 318	16 318	8.17
RTC25L	25	22	26 640	8 096	11 210	15 881	18 999	6.75
		19.5	23 976	11 981	15 094	19 765	22 884	7.08
		17	22 200	16 120	19 234	22 200	22 200	7.40
	35	22	24 642	7 418	10 532	15 203	18 317	7.64
		19.5	22 200	11 323	14 437	19 107	22 200	8.04
		17	20 424	14 509	17 623	20 424	20 424	8.44
	45	22	22 200	6 664	9 778	14 449	17 563	8.84
		19.5	19 980	10 572	13 686	18 357	19 980	9.25
		17	18 204	14 511	17 625	18 204	18 204	9.65
RTC30L	25	22	32 400	10 028	13 328	18 277	21 582	7.56
		19.5	29 160	14 116	17 415	22 365	25 670	7.92
		17	27 000	18 522	21 822	26 771	27 000	8.28
	35	22	29 970	9 178	12 478	17 427	20 727	8.55
		19.5	27 000	13 293	16 593	21 543	24 842	9.00
		17	24 840	16 659	19 958	24 840	24 840	9.45
	45	22	27 000	8 235	11 535	16 484	19 784	9.90
		19.5	24 300	12 358	15 657	20 607	23 906	10.35
		17	22 140	16 518	19 818	22 140	22 140	10.80

Indoor fan services

Model	Available static pressure		Air flow		Absorbed power W
	mm WG	Pa	m ³ /h	m ³ /s	
RTC07L	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
RTC10L	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
RTC15L	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	
RTC20L	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
RTC25L	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
RTC30L	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	m ³ /h	m ³ /s		
RTC07L	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	
	RTC10L	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	
RTC15L		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	
	RTC20L	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	
RTC25L		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	
	RTC30L	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

Electrical characteristics

Model	Compressor			Fan Out. - Ind.	Outdoor fan motor		Indoor fan motor		Nominal total power (unit) kW	Max. total intensity (unit) A	Max. total power (unit) kW	Max. total intensity (unit) A	Automatic switch (K curve) A	Min. cable section mm ²
	Power supply V.ph.Hz	Nominal intensity A	Start intensity A	Power supply V.ph.Hz	kW	Nominal intensity A	kW	Nominal intensity A						
RTC07L	230.1.50	10.7	82	230.150	0.4	2	0.4	1.6	3.1	14.3	3.7	21	25	4
RTC10L	400.3.50	5.1	48	230.150	0.9	4.5	0.4	1.9	3.8	9.5	4.4	12.5	16	2.5
RTC15L	400.3.50	7	64	230.150	0.9	4.6	0.9	4.4	5	11.6	5.9	14	20	4
RTC20L	400.3.50	13.5	95	400.3.50	1	2.9	1.2	2.8	9	19	9.8	22	25	4
RTC25L	400.3.50	16	111	400.3.50	1.2	3.1	1.1	2.4	10	21	12	25	25	4
RTC30L	400.3.50	16	118	400.3.50	2	4	1.4	2.6	13	23	14	27	32	6

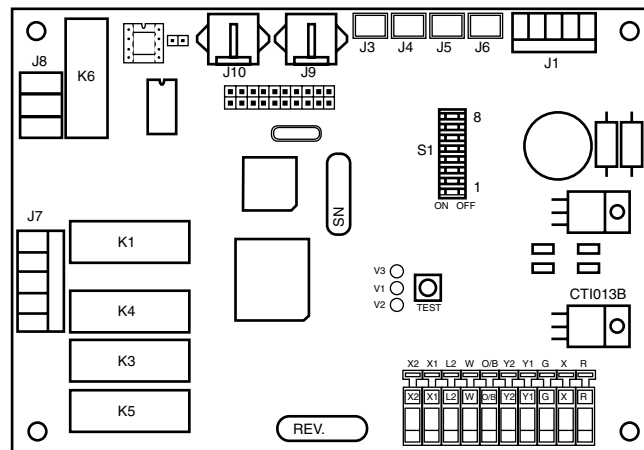
Important: Automatic switch dimensioning and power supply and operating line sections are orientative and should be corrected in accordance with conditions at job site. length between units and legislation in force.

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

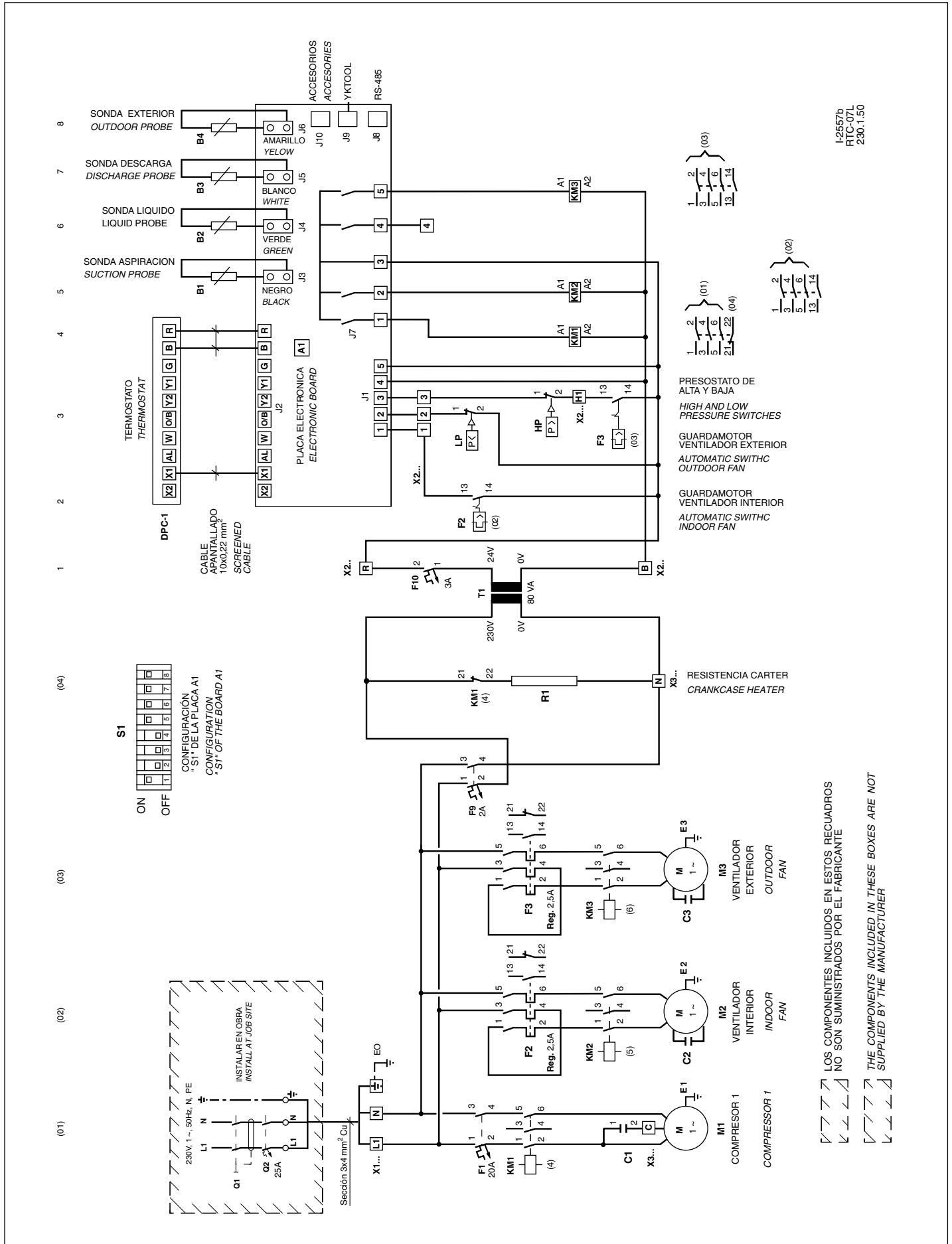
Control board

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. System operation is carried out in accordance with the posi-

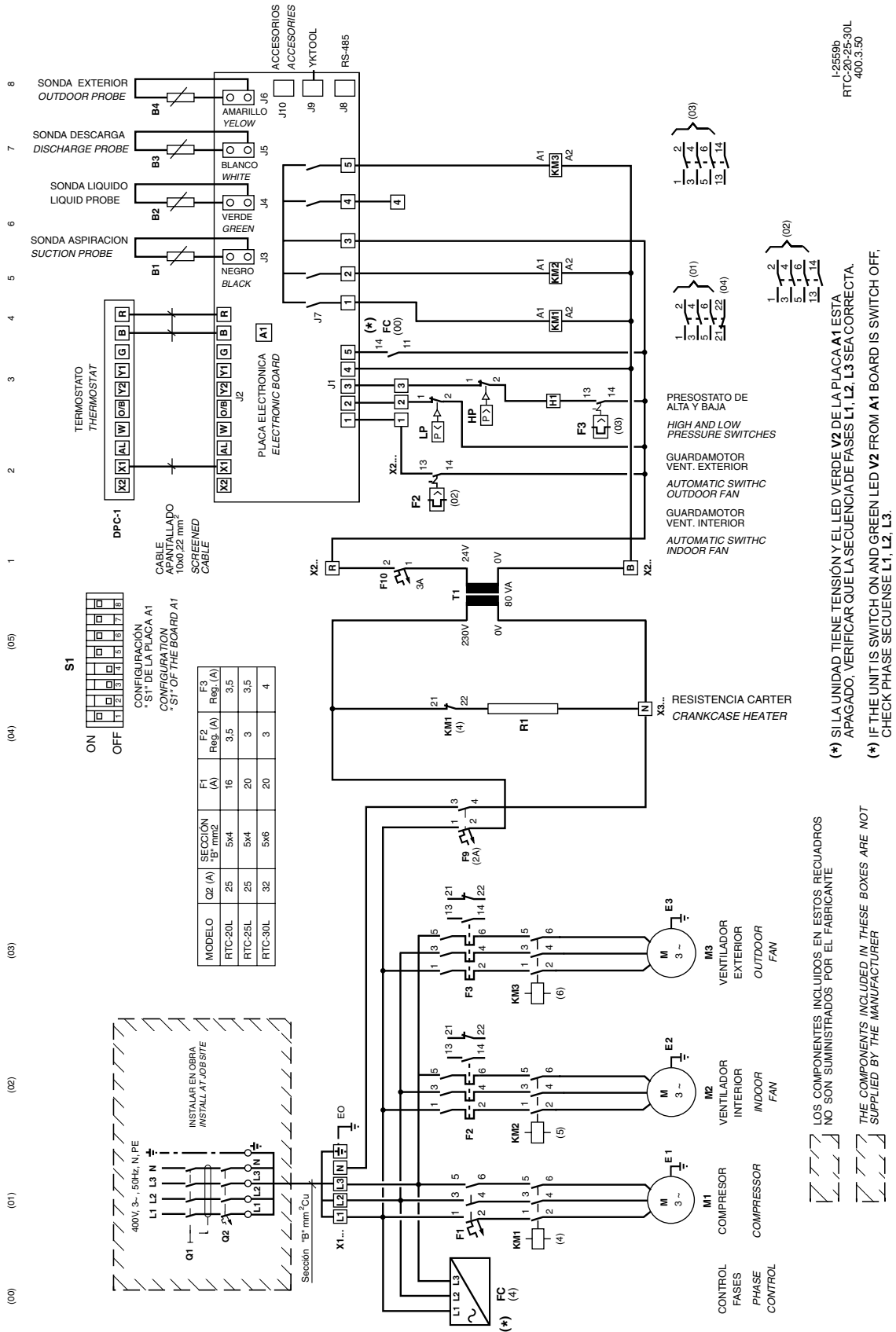
tion of the microswitches in the main board. There are also variations in the control algorithm, depending upon the accessories the board detects installed in the equipment. For further details please see Technical Information of the control board.



Wiring diagram, RTC07L, 230.1.50



Wiring diagram, RTC20L, 25L and 30L, 400.3.50



I-2559B
RTC-20-25-30L
400.3.50

(*) SI LA UNIDAD TIENE TENSION Y EL LED VERDE V2 DE LA PLACA A1 ESTA APAGADO, VERIFICAR QUE LA SECUENCIA DE FASES L1, L2, L3 SEA CORRECTA.
(*) IF THE UNIT IS SWITCH ON AND GREEN LED V2 FROM A1 BOARD IS SWITCH OFF, CHECK PHASE SEQUENCE L1, L2, L3.

LOS COMPONENTES INCLUIDOS EN ESTOS RECUADROS NO SON SUMINISTRADOS POR EL FABRICANTE
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

Microswitches configuration, failures and incidents

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'
3	ON/ON	Time between defrosts 90'
	ON	Crossed coils
4	OFF	Independent coils
	ON	2' compressor delay
5	OFF	5' compressor delay
	ON	Cool mode
6	OFF	Heat pump mode
	ON	4-way valve active in heat
7	OFF	4-way valve active in cool
	ON	Receives signal B from thermostat (active in heat)
8	OFF	Receives signal O from thermostat (active in cool)
	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	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.
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

Incidents 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	1	Discharge probe open or short circuited	
2	2	Liquid probe open or short circuited	
3	3	Suction probe open or short circuited	
6	2	Temperature	
3	1	Repeated defrosts	
2	2	Discharge temperature not recovered	
1	1	Discharge temperature not recovered	
2	2	Return probe open or short circuited	
3	3	Outdoor probe open or short circuited	
4	4	Water probe open or short circuited	
5	5	Enthalpy probe error	
2	1	Signal Y1 or Y2 without G	
2	2	Signal W without B	
3	3	Thermostat	
4	4	Signal W without G	
4	4	Signal Y2 without Y1	
4	3	1	Thermal switch of heater 1
	2	2	Thermal switch of heater 2
	3	3	Aux. heat
	4	4	Thermal switch of heater 3
	4	4	Thermal switch of heater 4
4	1	Water coil temp. not recovered	
2	2	Outdoor temp. too low	
3	3	Temperature	
4	4	Water coil in antifreeze function	
5	5	Impulse temp. over 55° C	
2	2	Impulse temp. < 25° C with gas	
5	5	Transceiver ID unknown	
2	2	At least one accessory not found	
3	3	Others	
4	4	Air quality demand	
5	5	Dirty filters	
6	6	Occupation sensor in unoccupied	
		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 and RTH07L to 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

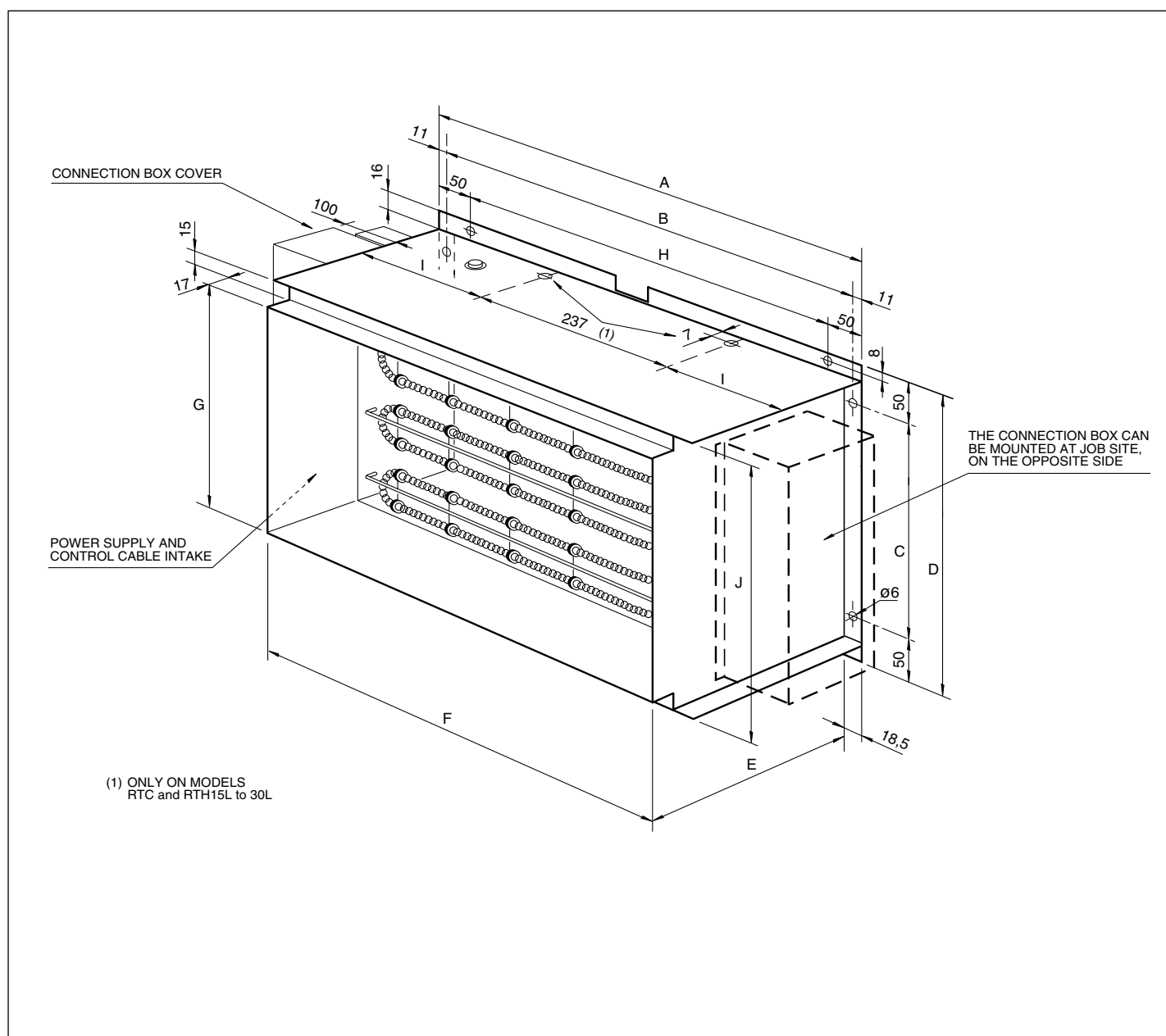
These duct electric heaters include the following components:

- 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 a 10L	400	378	285	385	275	362	320	300	-	353
RTC and RTH15L a 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 surface	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 and 10L	360	513	293	15
RTC and RTH15L to 30L	440	640	370	20

Installation

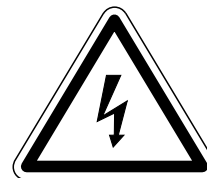
Install the electric heater in the RTC and RTH unit as follows:

- 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 and 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 and 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 and RTH unit.

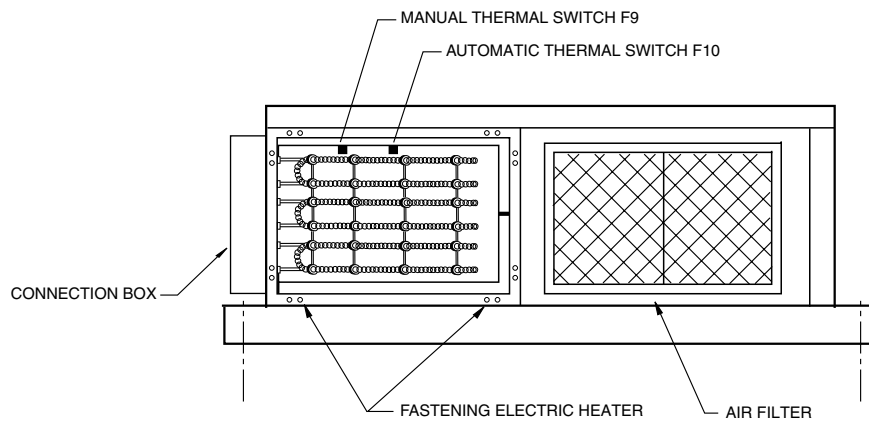
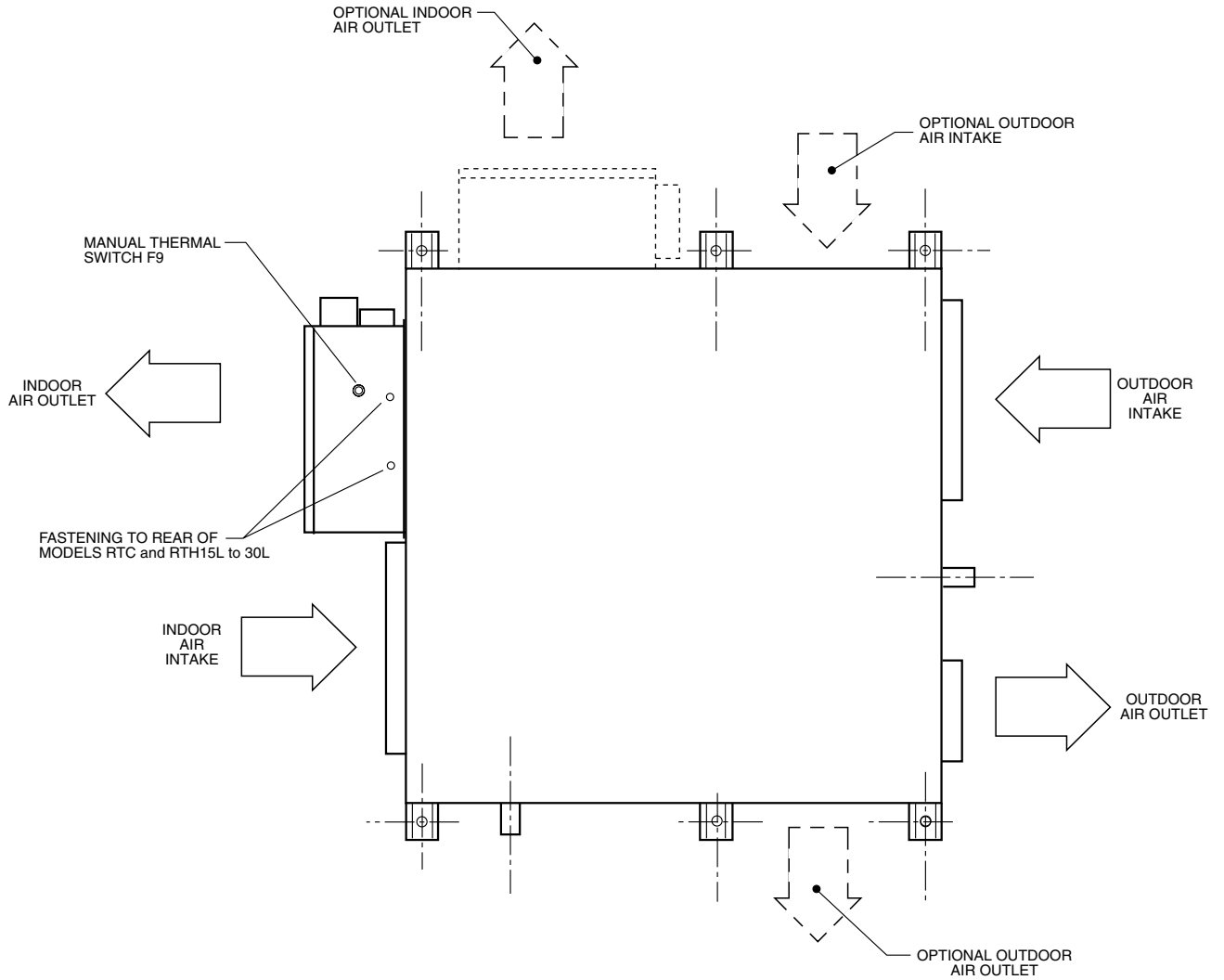
Note: Should an incorrect response of the system take place, see the Operation section of the RTC and RTH Installation Instructions. There you will find the control functions of the A1 electronic board on the heater, as well as its configuration, incidents identification, etc.



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.

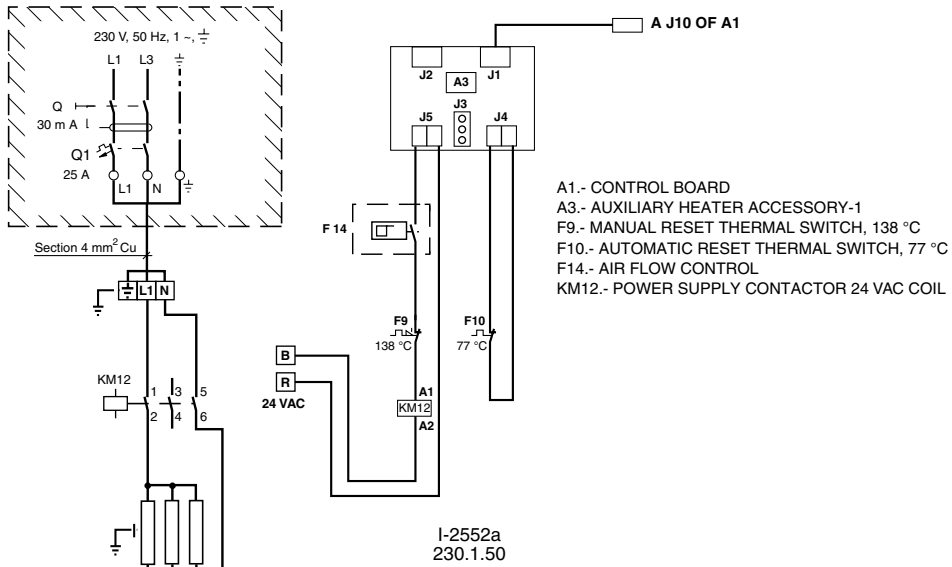
Heater location

RTC and RTH07L to 30L



Wiring diagram

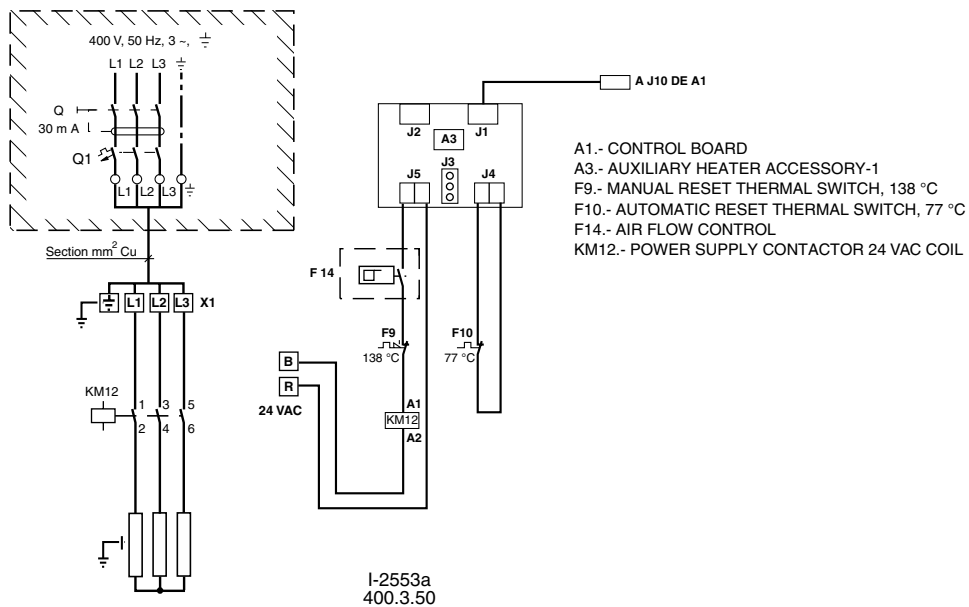
Heater 5kW, 230.1.50
RTC and RTH07L



Wiring diagram

Heater 5, 10, 15kW, 400.3.50
RTC and RTH07L to 30K

POWER kW	AUTOMATIC SWITCH Q1	MINIMUM CABLE SECTION mm ²
5	10	2.5
10	20	2.5
15	25	4



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

IMPORTANT: THE AUTOMATIC SWITCH 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 RTC-7L, 10L and 15L

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).

With this accessory the operating limit of the outdoor air is -10°C.

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).

Location of components

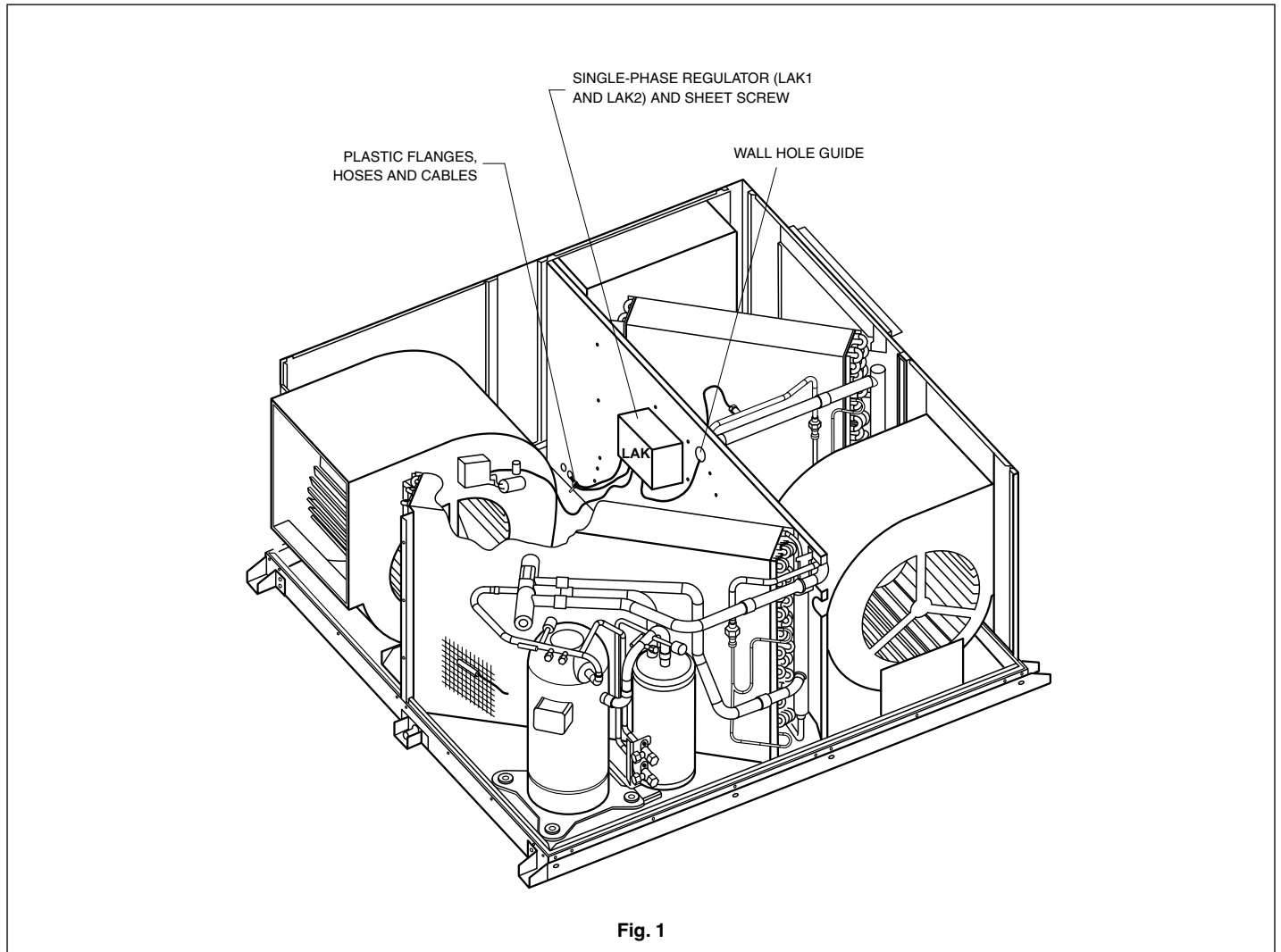


Fig. 1

Connection of hoses at electric box

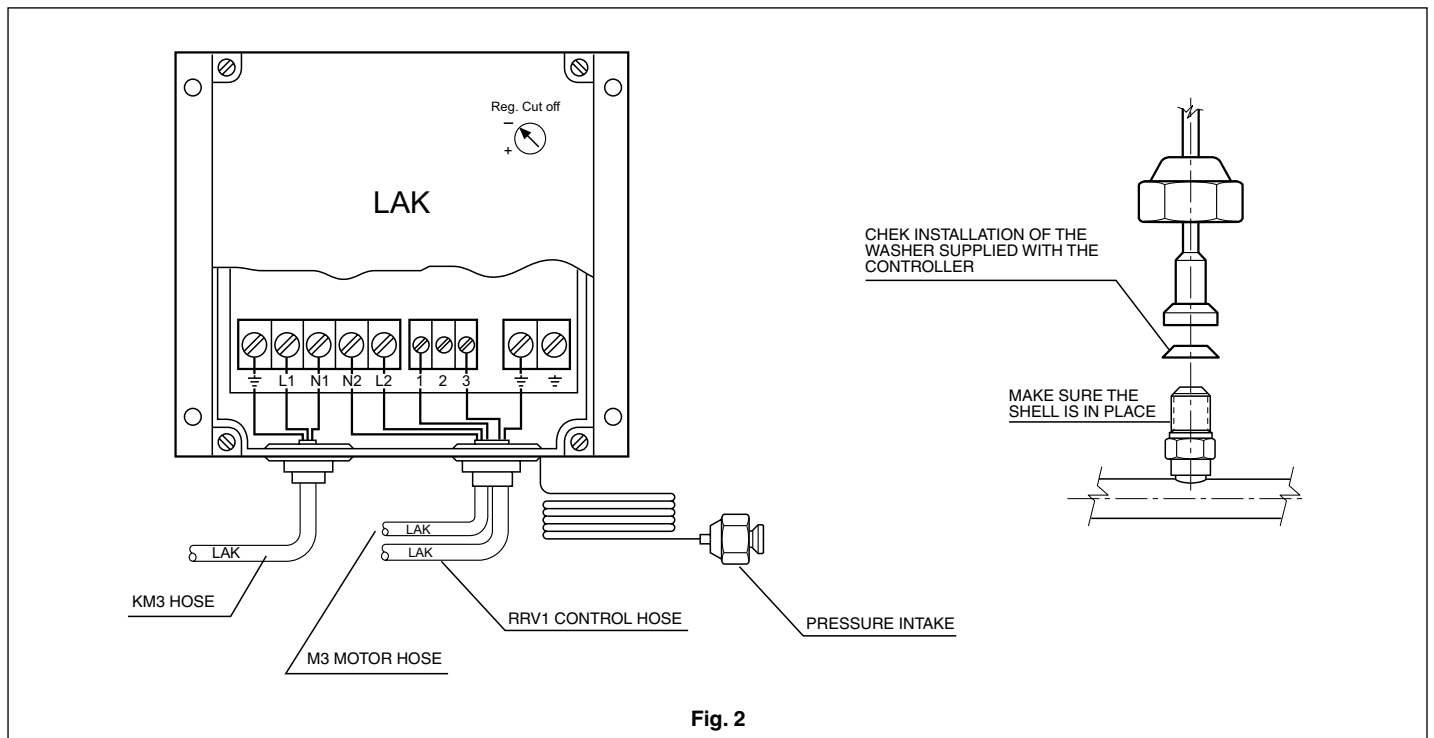


Fig. 2

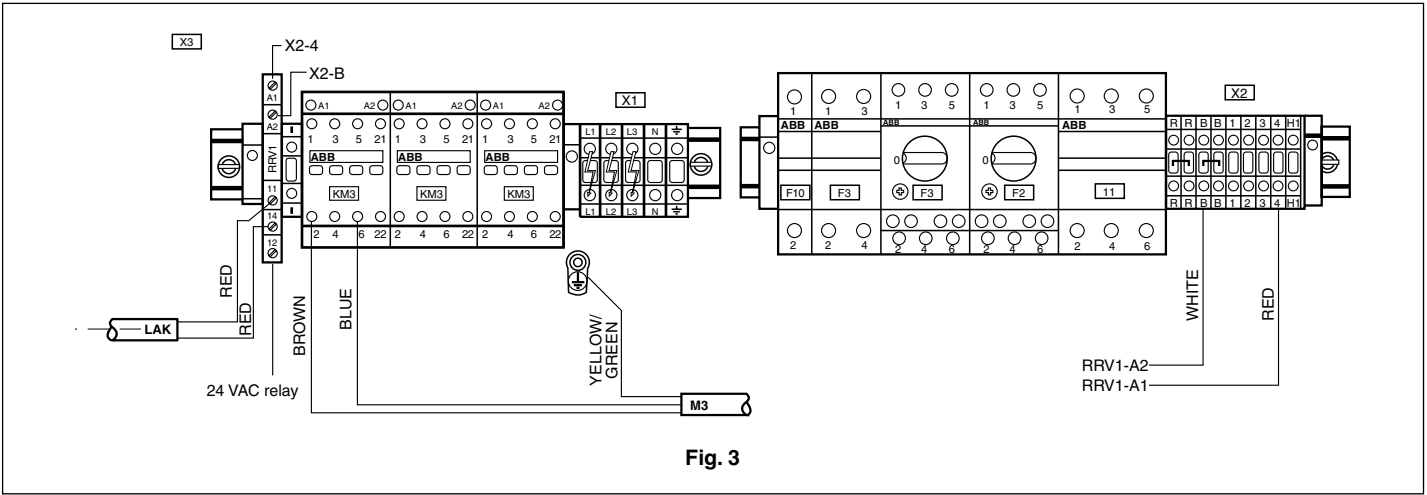


Fig. 3

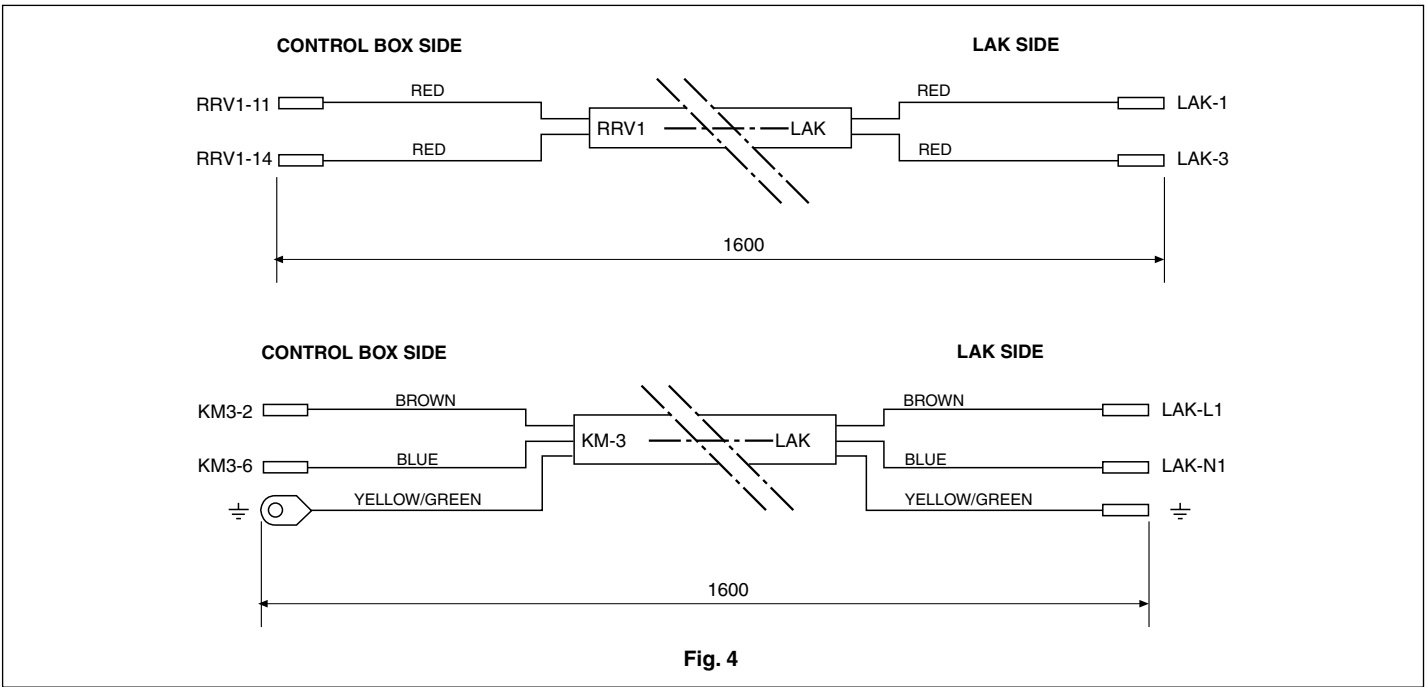


Fig. 4

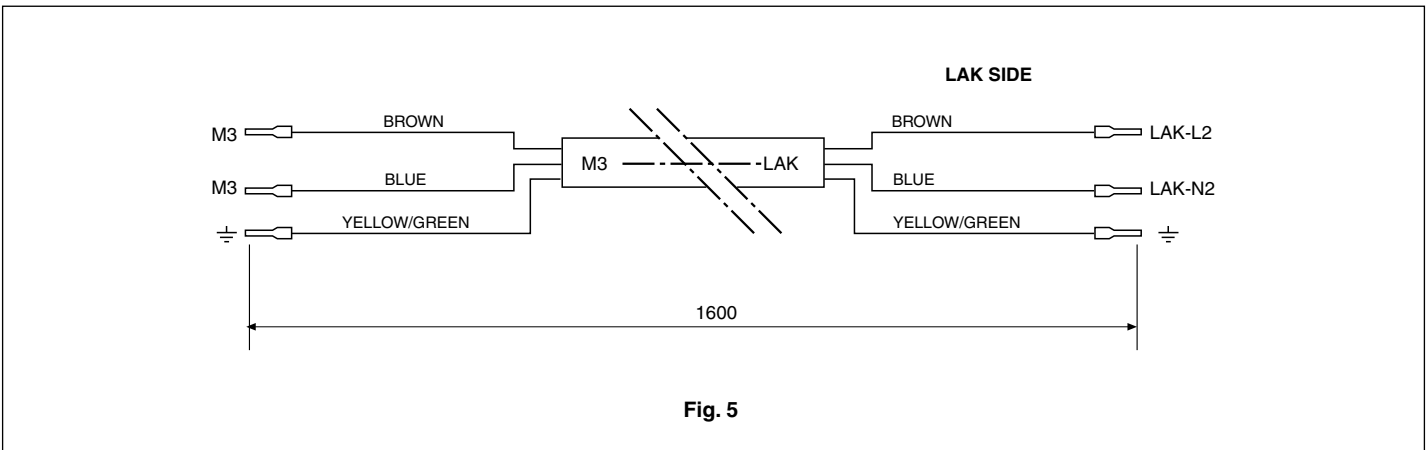
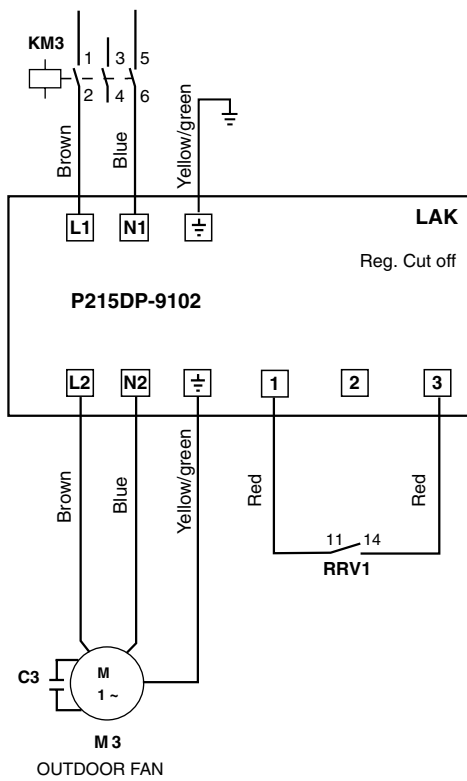


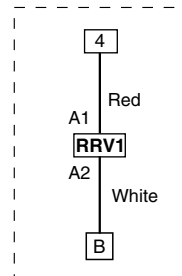
Fig. 5

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

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



Install on models
RTH07L, 10L, 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 RTC-20L, 25L and 30L units

General information

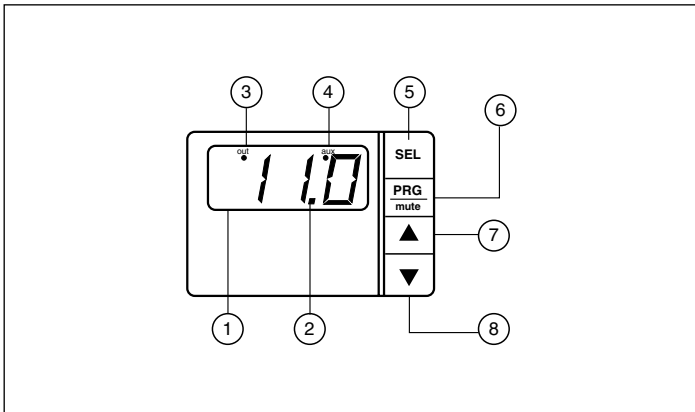
In the summer cycle, this accessory controls the condensing pressure by varying air flow in the outdoor coils. This air flow variation keeps the condensing pressure constant when outdoor temperatures are low. With this accessory the operating limit of the outdoor air is -10°C.

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	100%
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 differ-

ent "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.
Cut four 400 mm. long strips of the 24 x 24 mm. gasket. Place on both verticle sides of the damper and the panel to avoid air leaks.
- 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.

Location of components

RTC 20L ÷ 30L
RTH 20L ÷ 30L

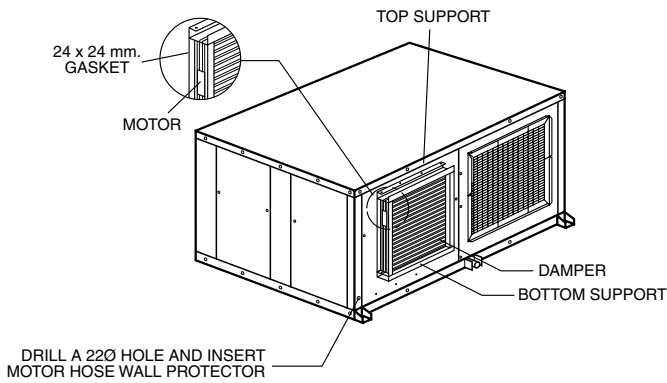


Fig. 6

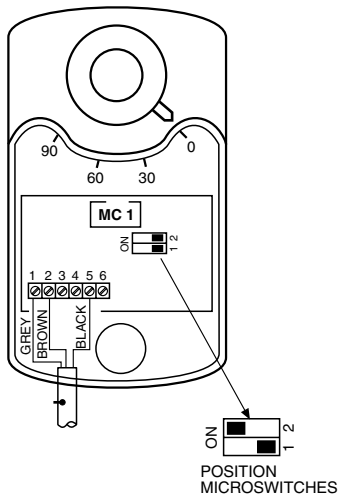
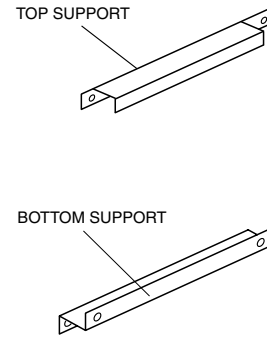
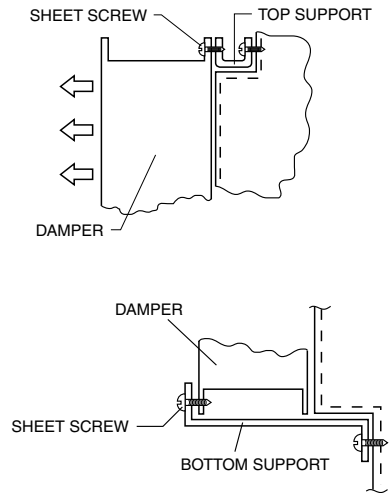


Fig. 7



Connection of hoses in electric box

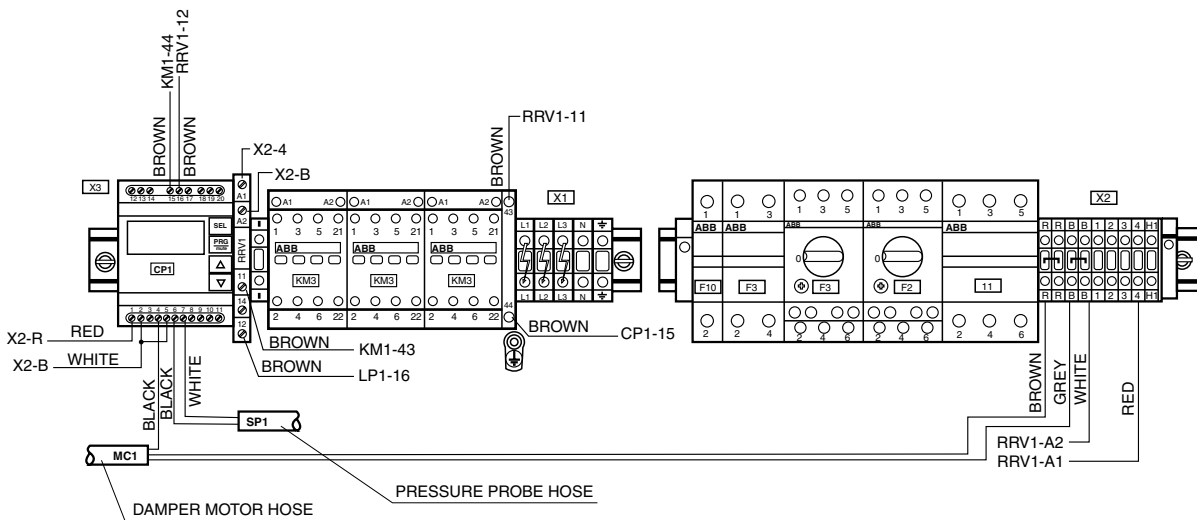
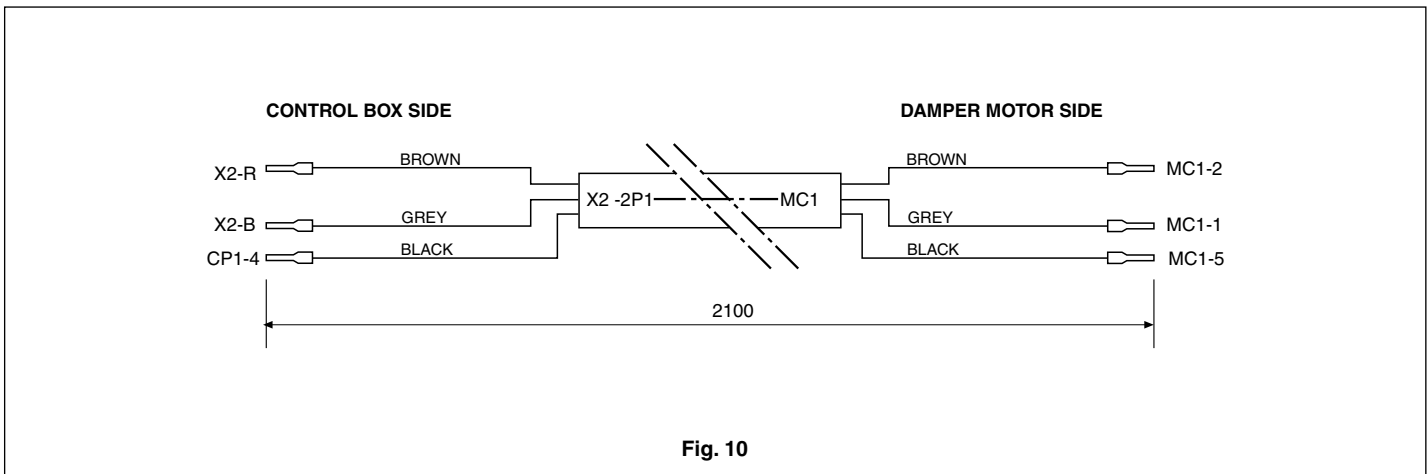
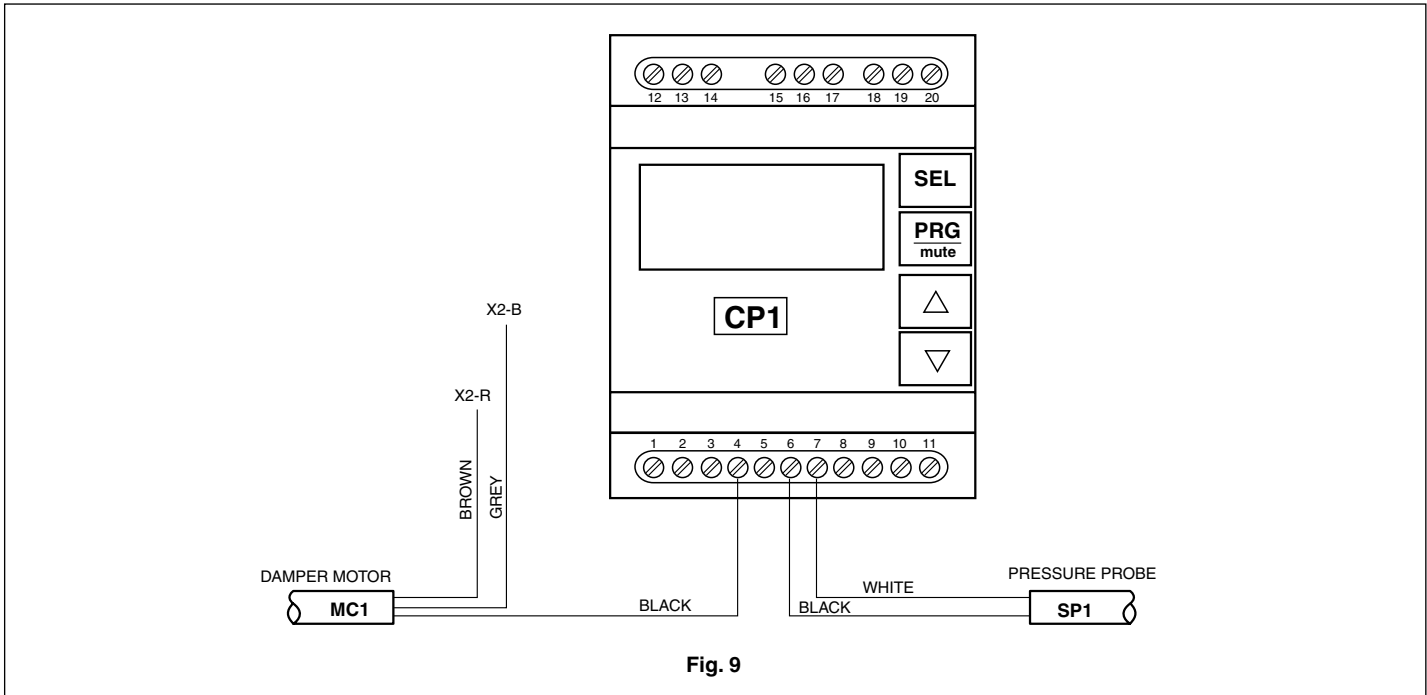
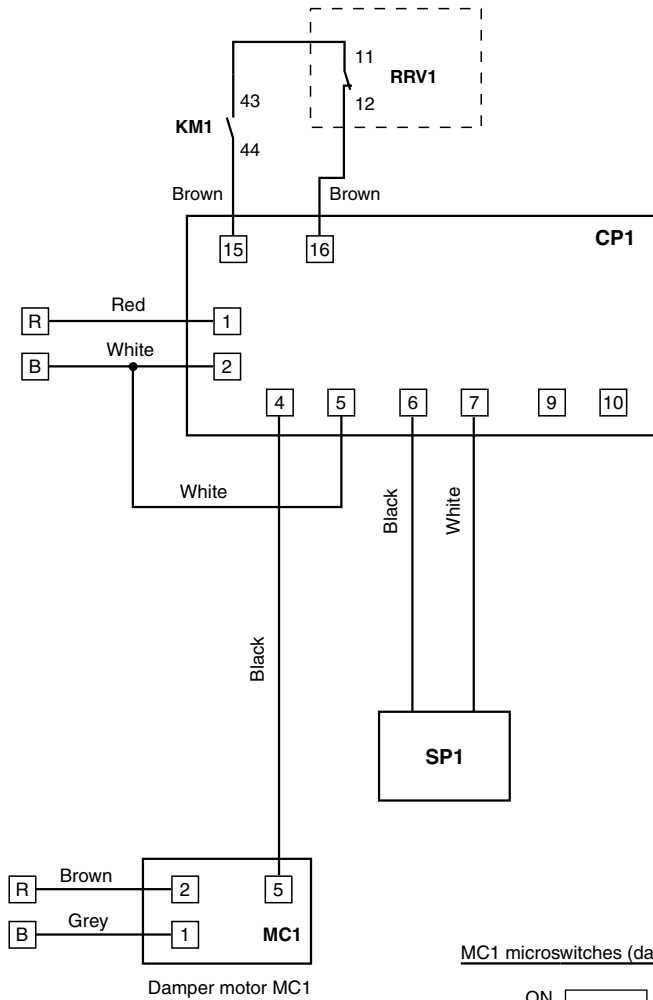


Fig. 8

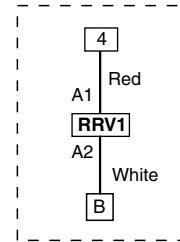


Cable No.	Cable		Diagram			Cable length
	Colour	Section	From	To		
1	Red	1	X2-R	CP1-1	500	
2	White	1	X2-B	CP1-2	490	
3	White	1	CP1-5	-	160	
4	Brown	1	CP1-15	KM1-44	570	
5	Brown	1	KM1-43	RRV1-11	440	
6	Brown	1	RRV1-12	CP1-16	590	
7	Red	1	X2-4	RRV1-A1	500	
8	White	1	RRV1-A2	X2-B	600	

Wiring diagrams for RTC 20L, 25L and 30L



ASSEMBLY MODELS RTH 20L, 25L, 30L

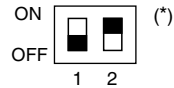


RRV1 - 4-way valve relay
CP1 - Proportional control
MC1 - Damper motor
SP1 - Circuit 1 pressure probe

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 should close. Set switch 2 to ON/OFF position to carry out this logic.



www.johnsoncontrols.com