

Air-Air Heat Pumps SCOH-070K to 300K/SICH-070 to SIH-300B



Ref.: Y-R70142 0705

Technical Information:



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Index

	Page		Page
General information	3	Internal electric heaters for SICH-070 to SIH-300B	29
- General description	3	- Technical specifications	29
- Nomenclature	3	- Assembly and general dimensions	29 - 30
Technical specifications	3	- General characteristics	30
- Mechanical specifications	3	- Dimensions with packing and weights	30
- Operating diagram	4	- Installation	31
- Thermostat	4	- Wiring diagram	32 - 33
- Ambient thermostat DPC-1	4	Duct electric heaters for SICH-070 to SIH-300B	34
- Physical data	5	- Technical specifications	34
- Limits of use	6	- General dimensions	34
- General dimensions	6 - 12	- General characteristics	35
- Process for transforming a horizontal discharge into a vertical discharge (SICH-070, 076, 090, 120, 150B units)	13	- Dimensions with packing and weights	35
- Variant chart	14	- Installation	35
- Nominal characteristics	15	- Location of the heater	36 - 37
- Correcting factors	15	- Wiring diagram	38 - 39
- Sensible cooling capacities	16 - 17	- Vertical air discharge conversion kit for: SCOH/SCOC-070 to 120K	40 - 41
- Test conditions	18	- Vertical air discharge conversion kit for: SCOH/SCOC-150 to 300K	42 - 43
- Nominal flows	18	- Vertical air discharge conversion kit for: SICH-180 to SIH-300B	44
- Indoor fan features	18 - 19		
- Outdoor fan features	20	Tray heaters	49
- Electrical characteristics	21	- General Information	45
- Control board	22	- Technical Specifications	45
Wiring diagram	23 - 26	- Assembly	45
Accessories	27	- Installation	45
- Standard accessories	27	- General dimensions	45
- Hot water coil for SICH-070-076, 090-120 and 150	28	- Wiring diagrams	46

General information

General description

The SCOH/SICH heat pump models are air-air units with centrifugal fans both in the indoor as well as the outdoor units.

The SCOH outdoor unit includes compressor, condensing unit, centrifugal fan and controls. The SICH indoor units include evaporating coil, filter and fan. If necessary, they can be easily modified on job site so as to have a compact unit.

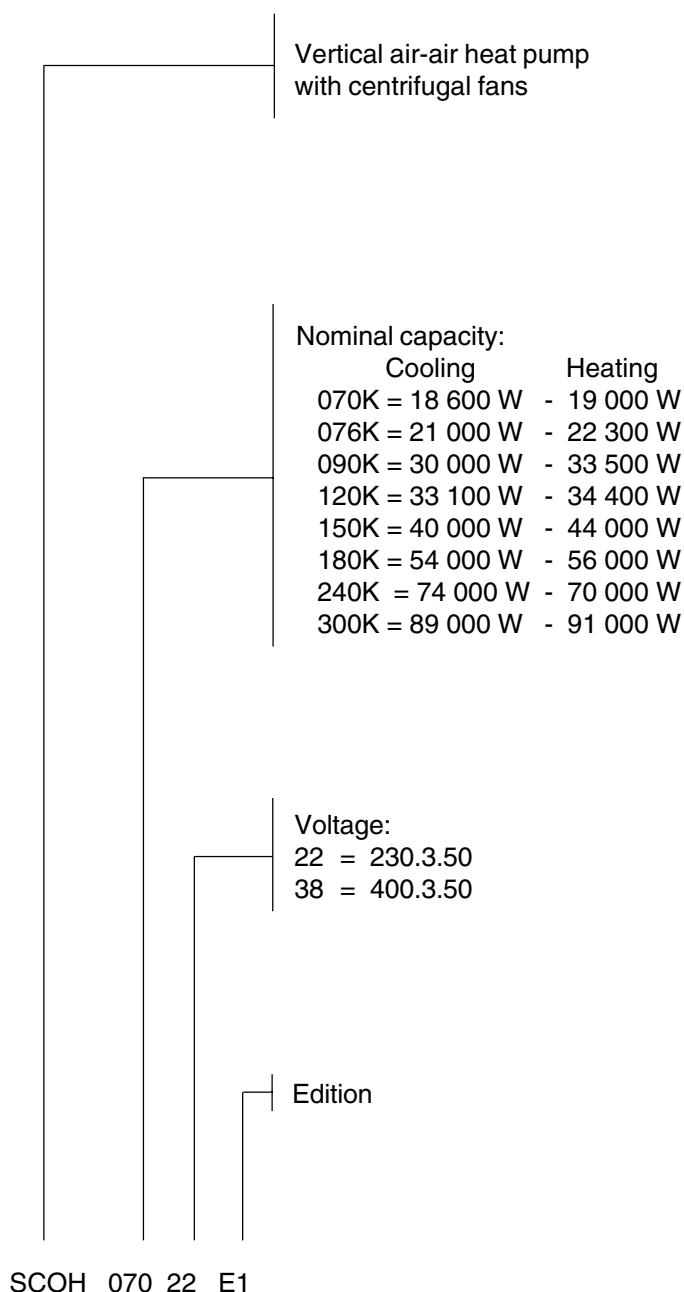
The outdoor unit can be installed either outdoors or indoors, as it is protected to withstand outdoor conditions, while the fans are of the centrifugal type and can accept ducts.

Supplied complete, factory tested and ready for installation of either interior or duct electric heaters accessories.

Designed to achieve considerable savings in energy and a long service life.

Start-up and automatic regulation of the temperature is carried out by means of a 24-volt ambient thermostat.

Nomenclature



Technical specifications

Mechanical specifications

Compressor

Vertical hermetic alternative type, mounted on antivibratory supports, specially designed for heat pump units with oversizing of mechanical components and low consumption motor.

The SCOH-070K, 076K, 090K and 120K units have one compressor, while the SCOH-150K, 180K, 240K and 300K units have two compressors.

Supplied with a charge of special oil so as to avoid foaming. With oil electric heater.

Compressor heater

Keeps the sump oil hot for easy start-up and avoiding oil being dragged out of the compressor.

Suction accumulator

Fitted in the suction tubing of the compressor, it protects same from slugging by avoiding oil leaving the compressor.

Coils

Of a large surface, made of grooved copper tubing and aluminium fins. Located inside the cabinet, and thus protected against damage during transportation or installation.

Indoor fan (SICH-070 and 076B)

A centrifugal fan driven by an independent motor and belt drive is installed.

Indoor fan (SICH-090, 120, 150, 180, 240 and 300B) and outdoor fan (SCOH-070, 076, 090 and 120K)

Two centrifugal fans with a common shaft and belt drive, driven by one single motor and coupled to the single plenum, are installed.

Outdoor fan (SCOH-150, 180, 240 and 300K)

Two independent centrifugal fans are installed. Each one of these is driven by an independent motor and coupled to the single plenum.

Transmission from the motor to the fan is by belt drive.

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

Cooling circuit

Made of welded copper tubing and equipped with access connections on the high and low pressure sides.

Refrigerant

The SCOH and SICH units are supplied with connections ready for welding. The refrigerant load should be carried out completely on job site. See refrigerant loads in physical data table. The refrigerant used is R-407C.

Electric panel

Accesible 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 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.

Should the phase sequence be correct and the centrifugal fan of the indoor unit (BCVI) rotates in the wrong direction, interchange two phases at the bottom of the fan contactor.

Dryer filter

Coupled to the cooling circuit to protect the refrigerant against humidity.

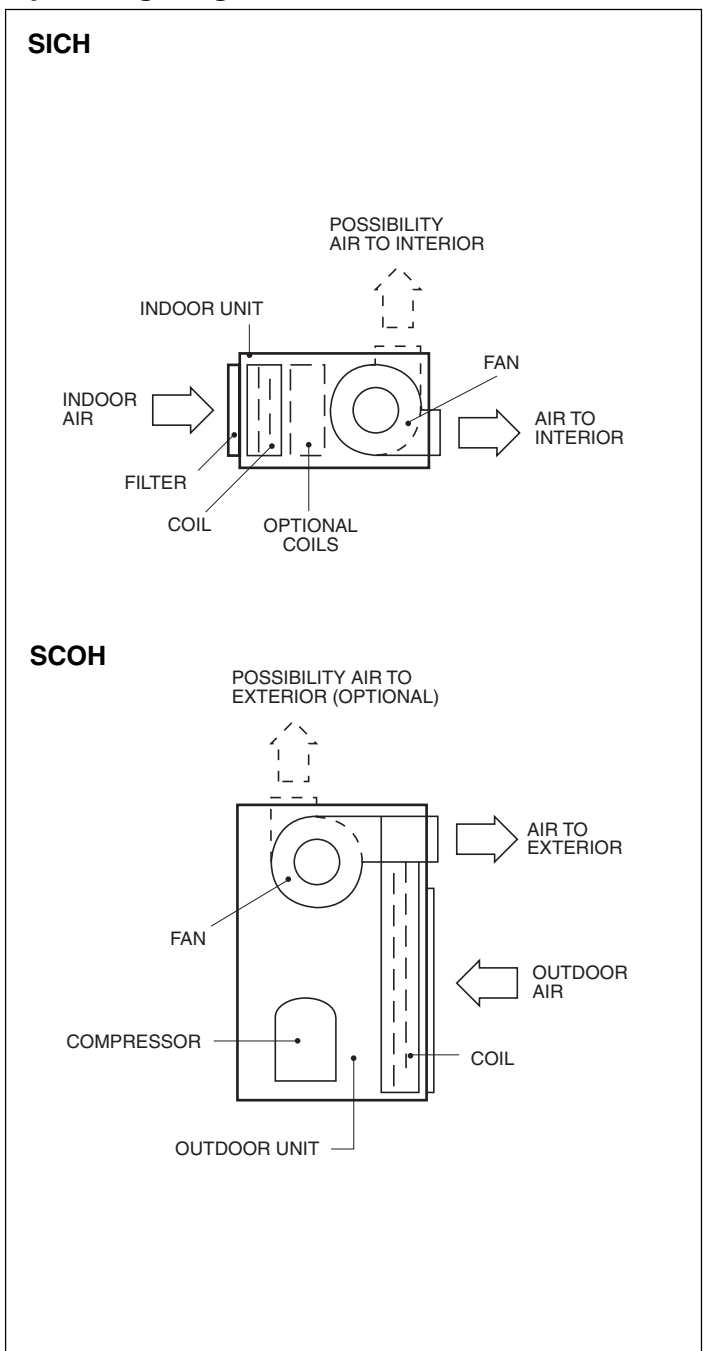
Casing

Made of zinc-aluminium plated steel sheeting, primed and enamelled in epoxy powder for outdoor installation.

Complementary heaters

Of the open-air wire type for fast heat dissipation, avoiding temperature inertia that could affect components.

Operating diagram



Thermostat

The SCOH/SICH-070 to 300 units include, as standard equipment, the electromechanical DPC-1 thermostat.

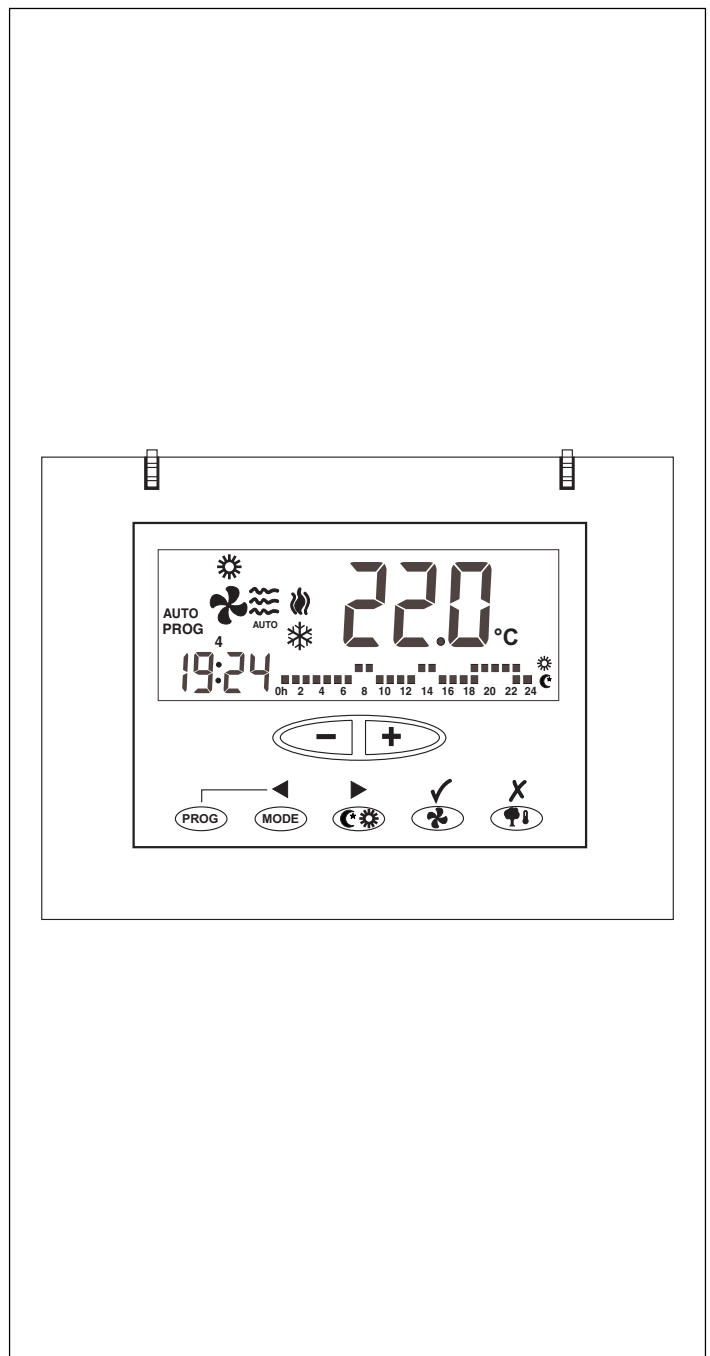
To connect the thermostat to the board, 10x0.22mm² screened communication cable should be used.

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.



Physical data

Outdoor units

Model		SCOH 070K	SCOH 076K	SCOH 090K	SCOH 120K	SCOH 150K	SCOH 180K	SCOH 240K	SCOH 300K	
Com-pressor	Amount	1	1	1	1	2	2	2	2	
	Power rating	kW	5.1	6.2	7.1	9	2 x 5.1	2 x 7.1	2 x 10.4	2 x 14.3
	Power supply	V.ph.Hz	230.3.50 or 400.3.50				400.3.50			
Outdoor fan	Power rating	kW	1.5	1.5	3	3	2 x 2.2	2 x 2.2	2 x 4	2 x 4
	Power supply	V.ph.Hz	230.3.50 or 400.3.50				400.3.50			
	Motor r.p.m.		1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400
	Diameter turbines	mm	270	270	320	320	320	380	380	380
	Width turbines	mm	270	270	320	320	320	380	380	380
Outdoor coil	Amount		1	1	1	1	2	2	2	2
	Tubing depth x height		5 x 37	5 x 37	5 x 40	5 x 40	5 x 40	5 x 42	5 x 48	5 x 48
	Diameter tubing		3/8"							
	Surface	m ²	1.01	1.01	1.47	1.47	2 x 0.84	2 x 1.02	2 x 1.44	2 x 1.44
Dimens. with packing	Height	mm	1 412	1 412	1 546	1 546	1 612	1 661	1 814	1 814
	Width	mm	1 360	1 360	1 738	1 738	2 040	2 240	2 640	2 640
	Depth	mm	883	883	883	883	883	883	973	973
Approx. Weight	Nett	kg	305	325	375	385	560	650	720	750
	Gross	kg	309	329	379	389	564	654	724	754
Refrige-rant load	Nominal load R-407C	kg	9	8.7	13.8	13	8 x 2	9 x 2	13 x 2	16 x 2

Indoor units

Model		SICH 070B	SICH 076B	SICH 090B	SICH 120B	SICH 150B	SICH 180B	SICH 240C	SIH 300B	
Indoor fan	Power rating	kW	0.75	0.75	1.5	1.5	1.5	3	3	5.5
	Power supply	V.ph.Hz	230.3.50 or 400.3.50				400.3.50			
	Motor r.p.m.		1 400							
	Diameter turbines	mm	320	320	320	320	320	320	380	380
	Width turbines	mm	320	320	240	240	320	320	380	380
Indoor coil	Amount		1	1	1	1	1	1	1	
	Tubing depth x height		4 x 21	4 x 21	4 x 25	4 x 25	4 x 25	4 x 29	5 x 32	5 x 32
	Diameter tubing		3/8"							
	Surface	m ²	0.57	0.57	0.84	0.84	1.11	1.40	1.76	1.76
Dimens. with packing	Height	mm	760	760	833	833	833	935	950	950
	Width	mm	1 444	1 444	1 825	1 825	2 125	2 390	2 800	2 800
	Depth	mm	930	930	930	930	930	955	1 030	1 030
Approx. Weight	Nett	kg	120	120	165	165	195	240	310	310
	Gross	kg	142	142	195	195	230	290	350	350

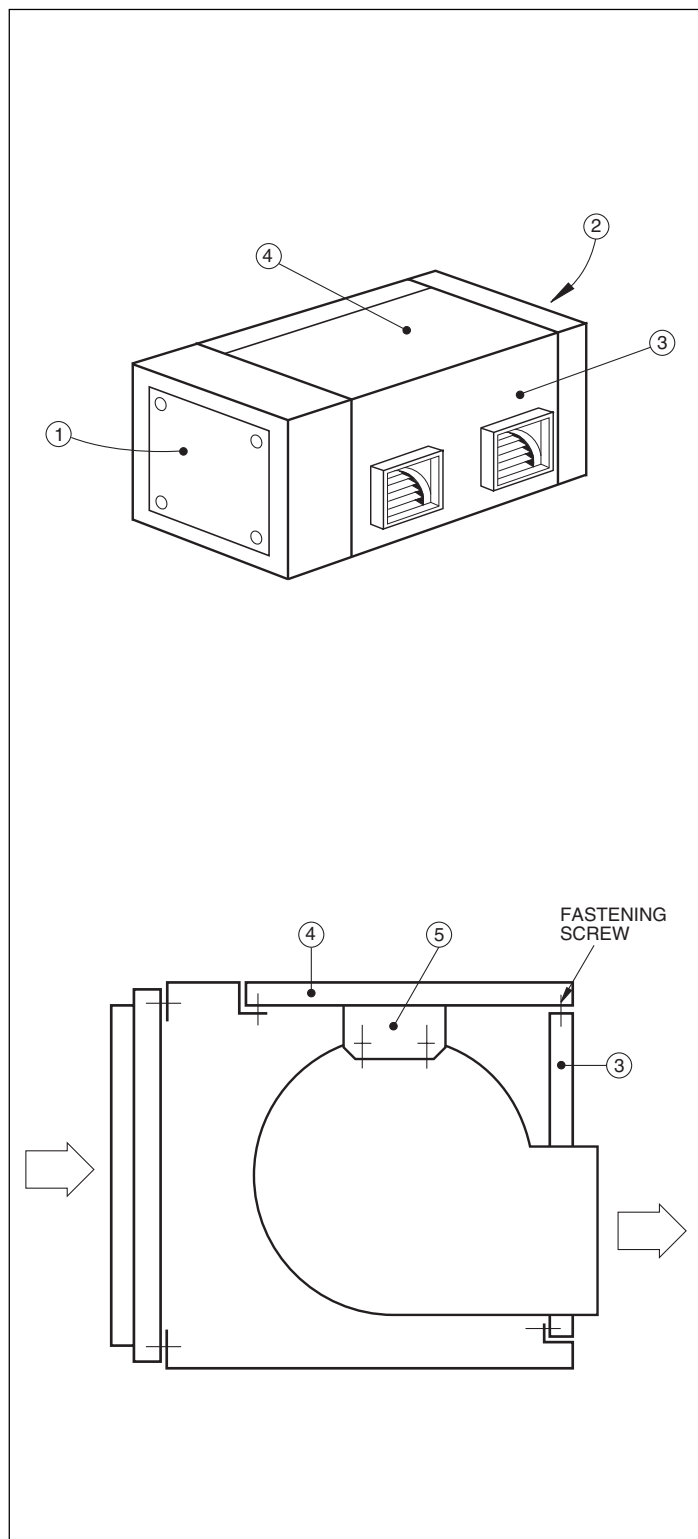
Process for transforming a horizontal discharge into a vertical discharge (SICH-070, 076, 090, 120, 150B units)

- 1- Remove the fastening screws from the side covers ref. 1 and 2 of the upper unit.
- 2- Remove the side covers ref. 1 and 2.
- 3- Loosen the screws that fasten the fan motor to its base, and remove the transmission belt.
- 4- Through the side accesses, unscrew panels ref. 3 and 4,

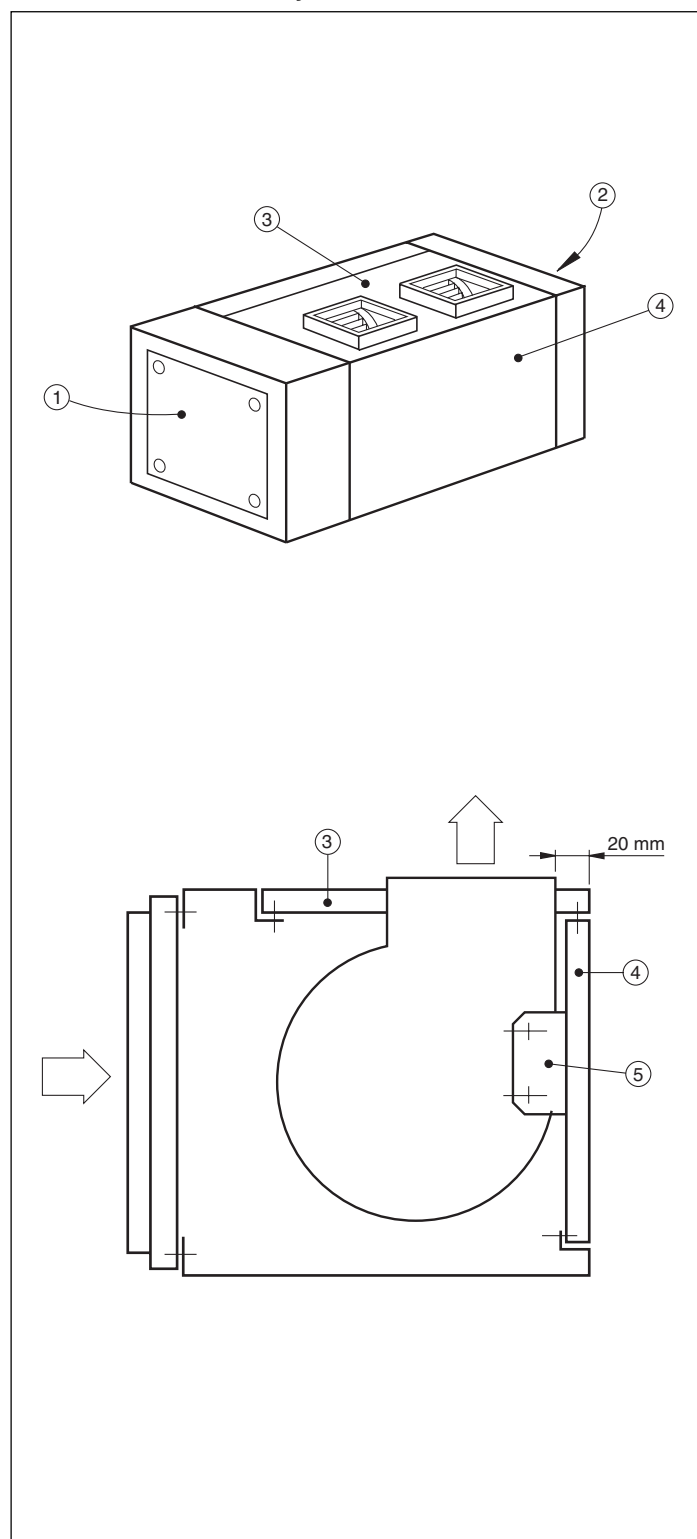
as indicated in the standard orientation figure.

- 5- Unscrew the fastener of the fan to its support ref. 5.
- 6- Place panel ref. 3 in the previous position of panel ref. 4, and place panel ref. 4 in the previous position of panel ref. 3.
- 7- Tighten the screws of these panels, and the fan on support ref. 5.
- 8- Replace the transmission belt and fasten the motor to its base.
- 9- Screw on side covers ref. 1 and 2.

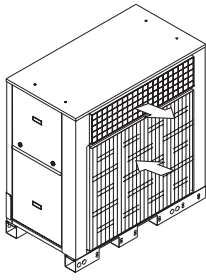
Standard orientation



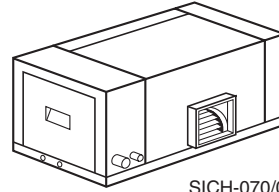
Orientation variable at job site



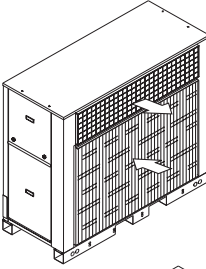
Variant chart



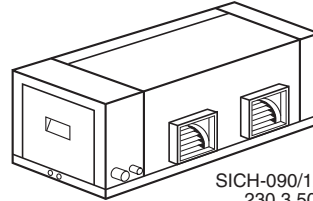
SCOH-070/076K
230.3.50
400.3.50



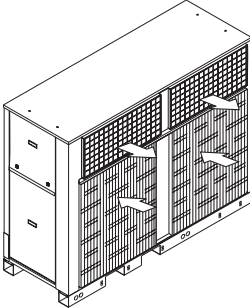
SICH-070/076B
230.3.50
400.3.50



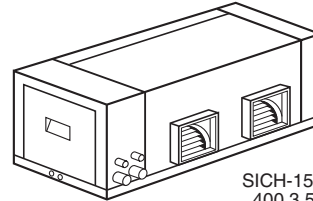
SCOH-090/120K
230.3.50
400.3.50



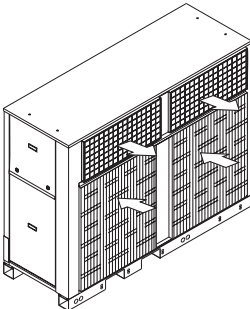
SICH-090/120B
230.3.50
400.3.50



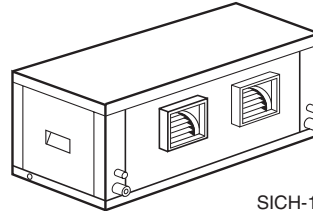
SCOH-150K
400.3.50



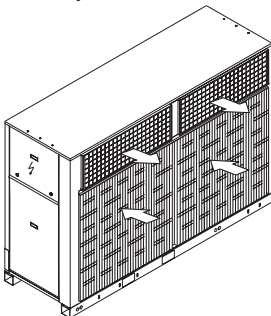
SICH-150B
400.3.50



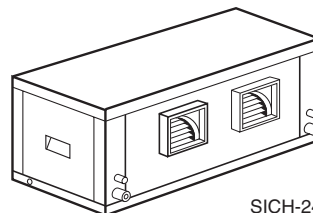
SCOH-180K
400.3.50



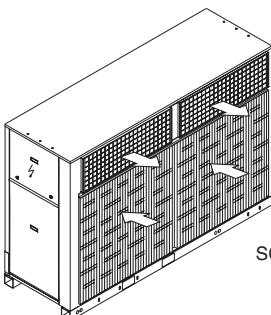
SICH-180B
400.3.50



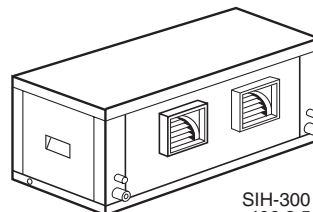
SCOH-240K
400.3.50



SICH-240C
400.3.50



SCOH-300K
400.3.50



SIH-300 B
400.3.50

Nominal characteristics

Outdoor unit	Indoor unit	Summer		Winter		Available pressure indoor fan Pa
		Cooling capacity W	Consumption W	Heating capacity W	Consumption W	
SCOH-070K	SICH-070/076B	18 600	8 000	19 000	7 300	62
SCOH-076K	SICH-070/076B	21 000	9 500	22 300	7 700	62
SCOH-090K	SICH-090/120B	30 000	11 000	33 500	12 700	75
SCOH-120K	SICH-090/120B	33 100	13 700	34 400	15 200	75
SCOH-150K	SICH-150B	40 000	16 500	44 000	16 200	75
SCOH-180K	SICH-180B	54 000	24 400	56 000	21 000	80
SCOH-240K	SICH-240C	74 000	30 800	70 000	26 000	80
SCOH-300K	SIH-300B	89 000	36 800	91 000	34 000	80

Correcting factors

Correcting factors for the cooling capacities

Cooling capacity correcting factors for flows that vary from the nominal flows in 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. absorb. power	0.980	0.990	1	1.009	1.017	1.025

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

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

Correcting factors for heating capacities

DB air intake temperature indoor unit °C	WB air temperature outdoor unit °C				
	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 the air intake to the outdoor coil for flows that vary from the nominal flows.

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

Sensible cooling capacities

Model	Dry outdoor air temperature °C (DB)	Humid air intake temperature °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power
				Dry air intake temperature to the coil °C (DB)				
				22	24	27	29	
			W	W	W	W	W	kW
SCOH-070K/ SICH-070B	25	22	22 560	6 806	9 605	13 802	16 604	5.54
		19.5	20 304	10 305	13 104	17 301	20 104	5.81
		17	18 800	14 018	16 816	18 800	18 800	6.07
	35	22	20 868	6 239	9 037	13 235	16 033	6.27
		19.5	18 800	9 754	12 552	16 750	18 800	6.60
		17	17 296	12 687	15 486	17 296	17 296	6.93
	45	22	18 800	5 608	8 406	12 603	15 401	7.26
		19.5	16 920	9 125	11 923	16 120	16 920	7.59
		17	15 416	12 668	15 416	15 416	15 416	7.92
SCOH-076K/ SICH-076B	25	22	25 440	7 792	10 590	14 787	17 590	6.59
		19.5	22 896	11 273	14 071	18 268	21 071	6.91
		17	21 200	15 000	17 798	21 200	21 200	7.22
	35	22	23 532	7 136	9 934	14 132	16 930	7.46
		19.5	21 200	10 637	13 436	17 633	20 431	7.85
		17	19 504	13 484	16 282	19 504	19 504	8.24
	45	22	21 200	6 408	9 206	13 403	16 201	8.64
		19.5	19 080	9 913	12 711	16 908	19 080	9.03
		17	17 384	13 448	16 246	17 384	17 384	9.42
SCOH-090K/ SICH-090B	25	22	36 360	10 866	15 763	23 109	28 013	6.89
		19.5	32 724	17 006	21 904	29 250	32 724	7.22
		17	30 300	23 487	28 384	30 300	30 300	7.54
	35	22	33 633	9 965	14 863	22 209	27 107	7.79
		19.5	30 300	16 130	21 028	28 374	30 300	8.20
		17	27 876	21 161	26 059	27 876	27 876	8.61
	45	22	30 300	8 961	13 859	21 205	26 103	9.02
		19.5	27 270	15 128	20 026	27 270	27 270	9.43
		17	24 846	21 337	24 846	24 846	24 846	9.84
SCOH-120K/ SICH-120B	25	22	40 080	12 147	16 937	24 121	28 917	9.24
		19.5	36 072	18 128	22 917	30 102	34 899	9.68
		17	33 400	24 490	29 280	33 400	33 400	10.12
	35	22	37 074	11 132	15 921	23 106	27 896	10.45
		19.5	33 400	17 142	21 931	29 116	33 400	11.00
		17	30 728	21 267	26 057	30 728	30 728	11.55
	45	22	33 400	10 002	14 792	21 976	26 766	12.10
		19.5	30 060	16 017	20 806	27 991	30 060	12.65
		17	27 388	22 077	26 867	27 388	27 388	13.20

Sensible cooling capacities

Model	Dry outdoor air temperature °C (DB)	Humid air intake temperature °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power
				Dry air intake temperature to the coil °C (DB)				
				22	24	27	29	
			W	W	W	W	W	kW
SCOH-150K/ SICH-150B	25	22	48 360	14 455	20 954	30 703	37 211	10.68
		19.5	43 524	22 604	29 103	38 852	43 524	11.19
		17	40 300	31 204	37 703	40 300	40 300	11.70
	35	22	44 733	13 257	19 756	29 505	36 004	12.08
		19.5	40 300	21 438	27 937	37 686	40 300	12.72
		17	37 076	28 104	34 603	37 076	37 076	13.36
	45	22	40 300	11 922	18 421	28 170	34 669	13.99
		19.5	36 270	20 105	26 604	36 270	36 270	14.63
		17	33 046	28 343	33 046	33 046	33 046	15.26
SCOH-180K/ SICH-180B	25	22	65 160	19 610	27 865	40 247	48 513	15.40
		19.5	58 644	29 940	38 195	50 578	58 644	16.13
		17	54 300	40 885	49 140	54 300	54 300	16.86
	35	22	60 273	17 978	26 233	38 616	46 871	17.41
		19.5	54 300	28 354	36 609	48 991	54 300	18.33
		17	49 956	36 680	44 936	49 956	49 956	19.25
	45	22	54 300	16 160	24 415	36 798	45 053	20.16
		19.5	48 870	26 542	34 797	47 179	48 870	21.08
		17	44 526	36 997	44 526	44 526	44 526	22.00
SCOH-240K/ SICH-240C	25	22	89 280	27 105	37 625	53 405	63 939	17.37
		19.5	80 352	40 233	50 753	66 533	77 070	18.20
		17	74 400	54 214	64 734	74 400	74 400	19.03
	35	22	82 584	24 837	35 357	51 137	61 657	19.65
		19.5	74 400	38 032	48 551	64 331	74 400	20.68
		17	68 448	49 864	60 383	68 448	68 448	21.71
	45	22	74 400	22 314	32 834	48 614	59 133	22.75
		19.5	66 960	35 520	46 040	61 819	66 960	23.78
		17	61 008	48 828	59 348	61 008	61 008	24.82
SCOH-300K/ SIH-300B	25	22	107 280	32 678	44 991	63 460	75 790	23.13
		19.5	96 552	48 026	60 339	78 808	91 142	24.24
		17	89 400	64 404	76 717	89 400	89 400	25.34
	35	22	99 234	29 938	42 251	60 270	73 033	26.16
		19.5	89 400	45 368	57 681	76 150	88 463	27.54
		17	82 248	58 814	71 127	82 248	82 248	28.92
	45	22	89 400	26 891	39 204	57 673	69 986	30.29
		19.5	80 460	42 336	54 649	73 118	80 460	31.67
		17	73 308	57 905	70 218	73 308	73 308	33.05

Test conditions

Voltage	Length interconnecting tubing	Summer				Winter			
		Outdoor temp. °C		Indoor temp. °C		Outdoor temp. °C		Indoor temp. °C	
		DB	WB	DB	WB	DB	WB	DB	WB
400	7.5 metros	35	24	27	19	7	6	20	12

Nominal flows

The cooling and heating capacities of the corresponding tables are valid for the following nominal flows.

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

Model	Nominal flow		Indoor fan available pressure Pa
	m ³ /h	m ³ /s	
SICH-070 & 076B	4 530	1.26	62
SICH-090 & 120B	8 500 / 8 300	2.36 / 2.31	62 / 75
SICH-150B	10 700	2.97	75
SICH-180B	13 600	3.77	80
SICH-240C	16 500	4.58	80
SIH-300B	19 500	5.42	80

Indoor fan features

Model	Static pressure available ⁽¹⁾		Air flow		Absorbed power W
	mm WG	Pa	m ³ /h	m ³ /s	
SICH-070-076B	14	137.2	3 200	0.89	605
	12	117.6	3 580	0.99	680
	10	98	3 930	1.09	735
	8	78.4	4 260	1.18	795
	6.3	61.7	4 530	1.26	860
	6	58.8	4 570	1.27	865
	4	39.2	4 860	1.35	935
	2	19.6	5 120	1.42	990
SICH-090-120B	0.0	0.0	5 360	1.49	1 035
	17	166.8	6 320	1.76	1 300
	16	157	6 590	1.83	1 340
	14	137	7 080	1.97	1 470
	12	118	7 500	2.08	1 570
	10	98	7 900	2.19	1 680
	7.6	75	8 300	2.31	1 770
	6.3	62	8 500	2.36	1 840
	4	39	8 800	2.44	1 935
	2	19.6	9 070	2.52	2 010
0.0	0.0	9 270	2.58	2 075	

Indoor fan features

Model	Static pressure available ⁽¹⁾		Air flow		Absorbed power
	mm WG	Pa	m ³ /h	m ³ /s	W
SICH-150B	17.9	175.4	7 000	1.94	896
	17.1	167.6	7 500	2.08	970
	16.0	156.8	8 000	2.22	1 045
	14.8	137.2	8 500	2.36	1 100
	13.3	130.3	9 000	2.50	1 175
	12.1	118.6	9 500	2.64	1 275
	10.0	98.0	10 000	2.78	1 375
	8.5	83.3	10 500	2.92	1 450
	6.5	63.7	11 000	3.05	1 600
	4.3	42.1	11 500	3.19	1 700
	2.0	19.6	12 000	3.33	1 802
	0.0	0.0	12 500	3.47	1 970
SICH-180B	15.9	155.8	11 500	3.19	2 004
	14.2	139.1	12 000	3.33	2 139
	12.6	123.4	12 500	3.47	2 240
	11.0	107.8	13 000	3.61	2 408
	8.6	84.2	13 500	3.75	2 535
	6.5	63.7	14 000	3.89	2 732
	3.9	38.2	14 500	4.02	2 843
	1.3	12.7	15 000	4.16	3 000
	0.0	0.0	15 200	4.22	3 150
SICH-240C	20	196	12 900	3.58	2 200
	16	157	14 000	3.89	2 800
	12	118	15 300	4.25	3 120
	8	78	16 500	4.58	3 500
	6	59	17 100	4.75	3 650
	4	39	17 700	4.92	3 800
	0.0	0.0	19 000	5.28	4 100
SIH-300B	30	294.3	12 800	3.56	3 105
	24	235.4	14 600	4.06	3 900
	20	196	16 000	4.44	4 300
	16	157	17 100	4.75	4 805
	12	118	18 350	5.10	5 110
	8	78	19 500	5.42	5 520
	6	59	20 000	5.56	5 800
	4	39	20 700	5.75	6 000
	0	0	22 300	6.19	6 300

(1) Values calculated with humid coil, including filters.

Outdoor fan features

Model	Static pressure available		Air flow		Absorbed power
	mm WG	Pa	m ³ /h	m ³ /s	
SCOH-070K SCOH-076K	18	177	3 380	0.94	730
	16	157	4 050	1.13	830
	12	118	5 050	1.40	970
	8	78	5 820	1.62	1 050
	5.1	50	6 300	1.75	1 130
	4	39	6 470	1.80	1 160
	0.0	0.0	7 010	1.95	1 270
SCOH-090K SCOH-120K	18	177	8 200	2.28	1 690
	14	137	9 750	2.71	1 900
	12	118	10 230	2.84	2 020
	10	98	10 700	2.97	2 130
	8	78	11 100	3.08	2 230
	6	59	11 500	3.19	2 330
	5.1	50	11 650	3.24	2 380
	4	39	11 800	3.28	2 430
	2	19.6	12 200	3.39	2 540
0.0	0.0	12 500	3.47	2 600	
SCOH-150K	20	196	9 200	2.56	2 430
	16	157	10 300	2.86	2 710
	12	118	11 200	3.11	2 920
	10	98	11 600	3.22	3 040
	8	78	12 000	3.33	3 180
	6	59	12 400	3.44	3 290
	5.1	50	12 600	3.50	3 360
	4	39	12 900	3.58	3 430
	2	19.6	13 300	3.69	3 550
0.0	0.0	13 700	3.81	3 630	
SCOH-180K	20	196	14 000	3.89	3 760
	16	157	15 100	4.19	4 100
	14	137	15 700	4.36	4 300
	10	98	16 800	4.67	4 630
	8	78	17 300	4.81	4 820
	5.1	50	18 100	5.03	5 070
	2	19.6	18 800	5.22	5 350
	0.0	0.0	19 300	5.36	5 500
SCOH-240K SCOH-300K	20	196	20 500	5.69	6 740
	16	157	21 600	6.00	72 00
	12	118	22 600	6.28	76 00
	8	78	23 400	6.50	8 000
	4	39	24 100	6.69	8 400
	0.0	0.0	24 800	6.89	8 800

Electrical characteristics

Outdoor units

Model	Power supply V.ph.Hz.		Consumption A				Power supply cable section (2) mm ²	Automatic switch (K curve)(1) A
	Compressor	Fan	Compressor		Fan			
			Start	Nominal	Start	Nominal		
SCOH-070K	230.3.50	230.3.50	166	24.1	23	4.9	6	32
	400.3.50	400.3.50	94	14.6	17	2.8	4	20
SCOH-076K	230.3.50	230.3.50	210	31.2	23	4.9	10	40
	400.3.50	400.3.50	116	17.9	10	2.8	4	25
SCOH-090K	230.3.50	230.3.50	224	31.5	53	8.5	16	63
	400.3.50	400.3.50	127	18.1	31	4.9	6	32
SCOH-120K	230.3.50	230.3.50	279	45.2	53	9.7	16	63
	400.3.50	400.3.50	158	25.6	31	5.6	10	40
SCOH-150K	400.3.50	400.3.50	2 x 94	2 x 14.6	2 x 17	2 x 3.9	10	50
SCOH-180K	400.3.50	400.3.50	2 x 127	2 x 16.9	2 x 30	2 x 4.3	16	63
SCOH-240K	400.3.50	400.3.50	2 x 158	2 x 18.8	2 x 38	2 x 7.4	25	80
SCOH-300K	400.3.50	400.3.50	2 x 189	2 x 25.8	2 x 38	2 x 7.4	35	100

Important: The dimensioning of the automatic switch and power supply line sections are orientative and should be corrected in accordance with job site conditions, length between units and legislation in force.

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

Indoor units

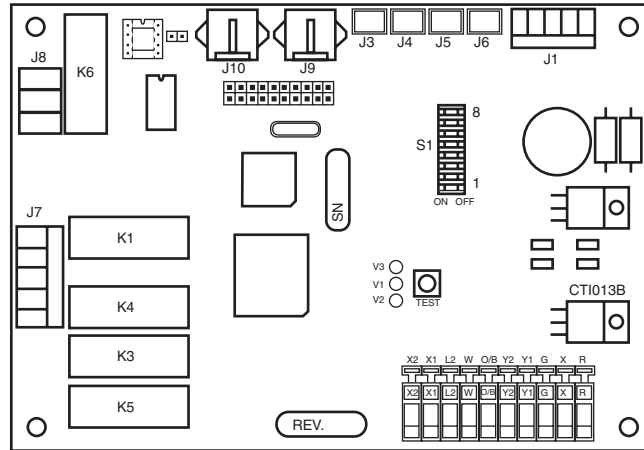
Model	Power supply V.ph.Hz.		Consumption A		Power supply cable section mm ²
	Fan	Fan	Fan		
			Start	Nominal	
SICH-070/076B	230.3.50		14	3.4	4 x 1.5
	400.3.50		8	2.2	4 x 1.5
SICH-090B	230.3.50		30	5.5	4 x 1.5
	400.3.50		17	3.2	4 x 1.5
SICH-120B	230.3.50		30	5.8	4 x 1.5
	400.3.50		17	3.4	4 x 1.5
SICH-150B	400.3.50		20	3.7	4 x 1.5
SICH-180B	400.3.50		34	6.1	4 x 1.5
SICH-240C	400.3.50		36	6.8	4 x 1.5
SIH-300B	400.3.50		68	9.8	4 X 2.5

Important: The dimensioning of the automatic switch and power supply line sections are orientative and should be corrected in accordance with job site conditions, length between units and legislation in force.

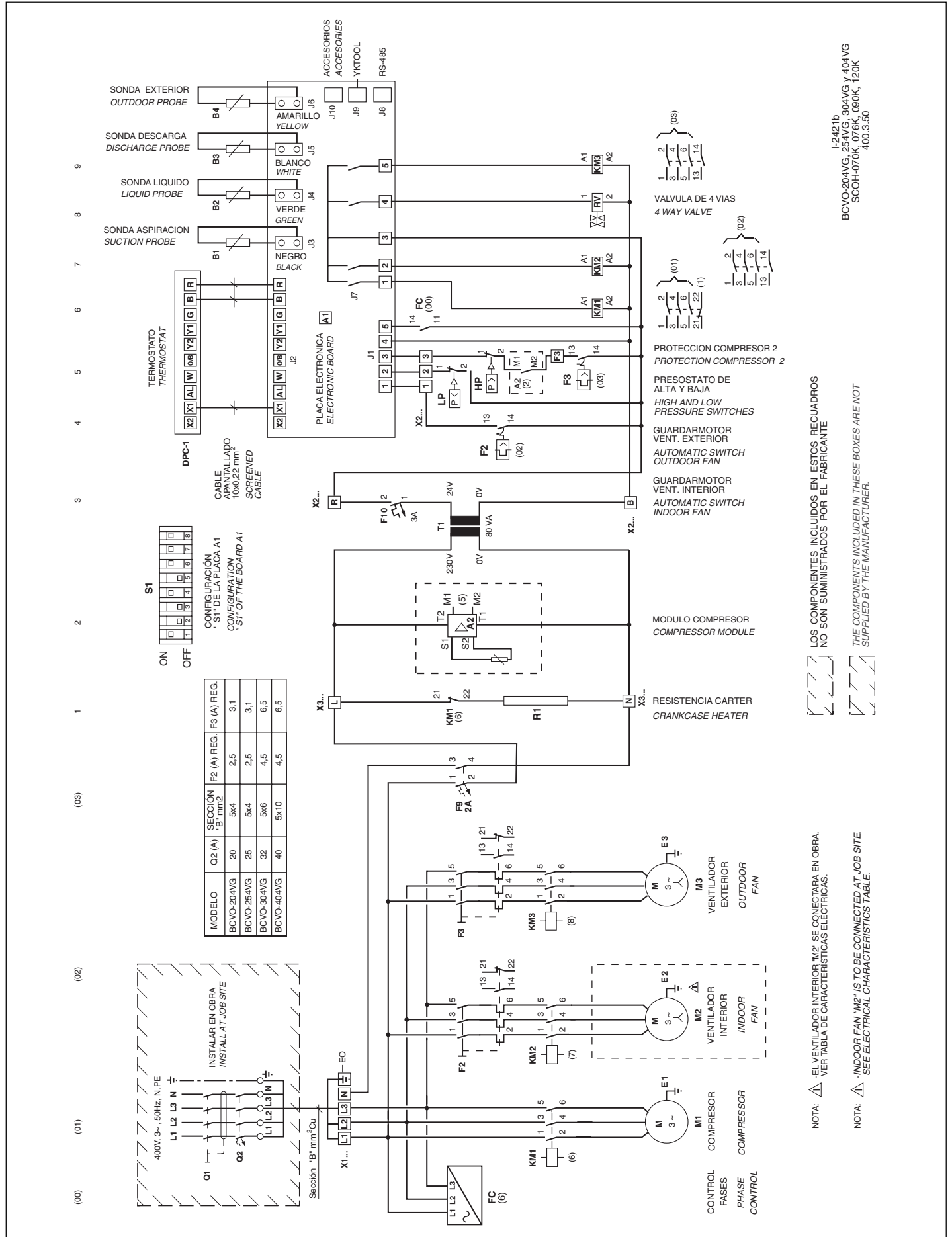
Control board

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-

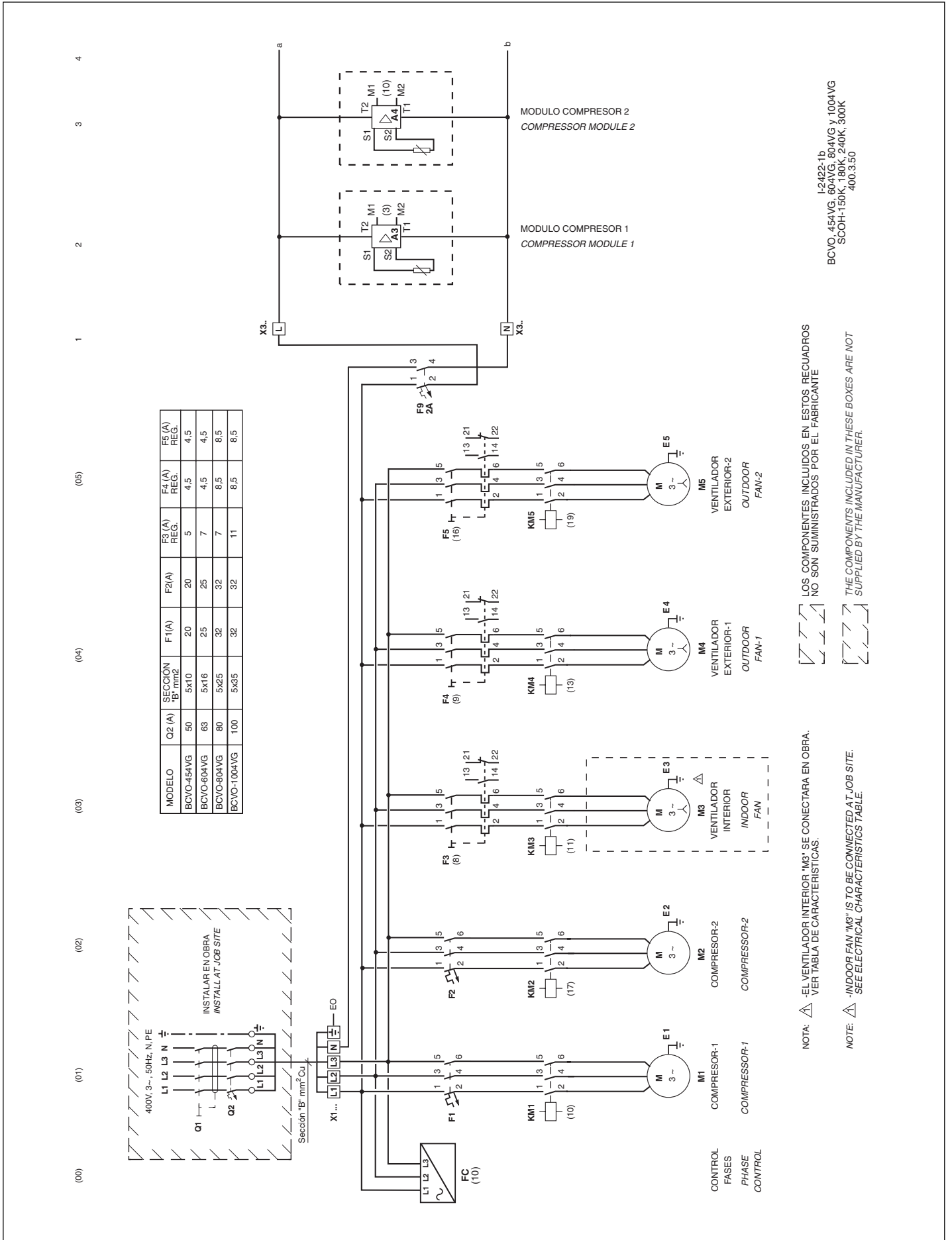
tion of the microswitches in the main board. There are also variations in the control algorithm, depending upon the accessories the board detects installed in the equipment. For further details please see Technical Information of the control board.



Wiring diagram, SCOH-070K, 076K, 090K and 120K, 400.3.50

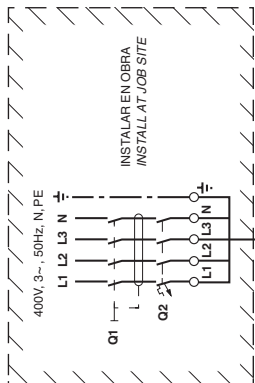


Wiring diagram, SCOH-150K, 180K, 240K and 300K, 400.3.50



(00) (01) (02) (03) (04) (05) 1 2 3 4

MODELO	Q2 (A)	SECCION "B" mm ²	F1 (A)	F2 (A)	F3 (A) REG.	F4 (A) REG.	F5 (A) REG.
BCVO-454VG	50	5x10	20	20	5	4.5	4.5
BCVO-604VG	63	5x16	25	25	7	4.5	4.5
BCVO-804VG	80	5x25	32	32	7	8.5	8.5
BCVO-1004VG	100	5x35	32	32	11	8.5	8.5



NOTA: -EL VENTILADOR INTERIOR "M3" SE CONECTARA EN OBRA. VER TABLA DE CARACTERISTICAS.
 NOTE: -INDOOR FAN "M3" IS TO BE CONNECTED AT JOB SITE. SEE ELECTRICAL CHARACTERISTICS TABLE.

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

1-2422-1b
 BCVO-454VG, 604VG, 804VG y 1004VG
 SCOH-150K, 180K, 240K, 300K
 400.3.50

Configuration of switches, failures (lock-outs) and incidents

Microswitches configuration:

These establish the following setups:

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

Failures

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

Failures table (Red LED)

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

Incidents

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

Table of incidents (Green LED)

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

Test push-button

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

Thermostat DPC-1

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

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

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Accessories

Standard accessories

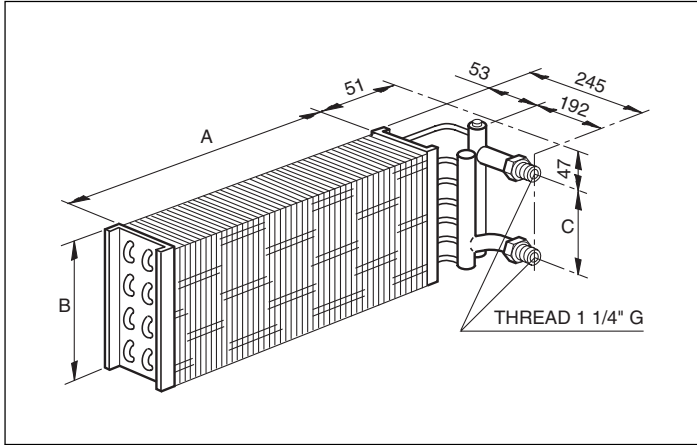
Accessory	Model SICH							
	070-076	090-120	150	180	240	300		
Internal electric heater	SICH-070-076B	10 kW	X					
Internal electric heater	SICH-070-076B	15 kW	X					
Internal electric heater	SICH-090-120B	10 kW		X				
Internal electric heater	SICH-090-120B	20 kW		X				
Internal electric heater	SICH-150B	15 kW		X				
Internal electric heater	SICH-150B	30 kW		X				
Internal electric heater	SICH-180B	15 kW			X			
Internal electric heater	SICH-180B	30 kW			X			
Internal electric heater	SICH-240C-SIH-300B	30 kW				X	X	
Internal electric heater	SICH-240C-SIH-300B	40 kW				X	X	
Duct electric heater	SICH-070-076B	10 kW	X					
Duct electric heater	SICH-070-076B	15 kW	X					
Duct electric heater	SICH-090-SIH-300B	20kW		X	X	X	X	X
Duct electric heater	SICH-090-SIH-300B	30kW		X	X	X	X	X
Water coil for model	SICH-070-076B		X					
Water coil for model	SICH-090-012B			X				
Water coil for model	SICH-150B			X				
Vertical transformation kit for model	SICH-180B					X		
Vertical transformation kit for model	SICH-240C						X	
Vertical transformation kit for model	SIH-300B							X

Accessory	Model SCOH							
	070K	076K	090K	120K	150K	180K	240K	300K
Vertical transformation kit SCOH	X	X	X	X	X	X	X	X
Tray heater-1	X	X	X	X				
Tray heater-2					X	X	X	X

Hot water coil for SICH-070, 076, 090, 120 and 150B

Made of copper tubes and aluminium fins.
Designed to be fitted inside the conditioner, on galvanised steel supports.
Equipped with an 1/8" air purger.

General dimensions mm



For model	A	B	C
SICH-070-076B	1 069	458	340
SICH-090-120B	1 312	534	416
SICH-150B	1 750	534	416

Physical data

For model	SICH-070-076B	SICH-090-120B	SICH-150B
Tube depth	2	2	2
Tube height	16	19	19
Fins/inch	12	12	12
Front area	m ² 0.49	0.70	0.93
Tubing diameter	3/8"	3/8"	3/8"
Inlet/outlet GAS male threaded connections	1 1/4"	1 1/4"	1 1/4"

Heating capacity

For model	Nominal flow-rate		Heating capacity (*)	Air circuit pressure drop	
	m ³ /h	m ³ /s	kW	mm WG	Pa
SICH-070-076B	4 615	1.28	40.7	3.9	38.2
SICH-090-120B	7 940	2.20	59.3	4.4	43.0
SICH-150B	10 000	2.97	79.1	4.4	43.0

* The heating capacities given in this table are valid for water intake temperatures of 90°C, outlet 80°C, and air intake at 13°C. For different conditions, apply the correction factor appearing in the corresponding table.

Correction factors for heating capacities of the hot water coil

These correction factors are for water intake and outlet and air intake temperatures other than nominal.

Air temperature	Water intake/outlet temperature ° C					
	75/65	85/75	90/80	85/70	90/75	90/70
-10	1.03	1.23	1.33	1.13	1.24	1.14
-5	0.97	1.16	1.28	1.07	1.17	1.08
0	0.91	1.09	1.19	1.00	1.10	1.01
5	0.85	1.02	1.12	0.94	1.03	0.95
10	0.79	0.95	1.04	0.88	0.96	0.89
13	0.75	0.91	1.00	0.84	0.92	0.85
15	0.73	0.88	0.97	0.82	0.90	0.83
20	0.68	0.82	0.90	0.76	0.83	0.77
25	0.60	0.74	0.83	0.68	0.75	0.69

Pressure drop in the water circuit of the hot water coil

		Hot water flow-rate												
		m ³ /h	1.00	1.30	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	6.00	7.00
For model SICH-070-076B	m WG		0.08	0.10	0.17	0.24	0.33	0.42	0.48					
	kPa		0.78	0.98	1.66	2.35	3.23	4.11	4.70					
For model SICH-090-120B	m WG				0.13	0.20	0.27	0.36	0.46	0.54	0.66			
	kPa				1.27	1.96	2.64	3.52	4.50	5.28	6.46			
For model SICH-150B	m WG					0.25	0.34	0.45	0.57	0.68	0.82	1.17	1.50	
	kPa					2.44	3.33	4.40	5.58	6.66	8.03	11.45	14.68	

Internal electric heaters for SICH-070 to SIH-300B

These internal electric heaters are designed to provide backup or complementary heat for the SICH units. On and off cycles are governed by the air conditioning equipment control system. They should be fitted to the internal supports of the indoor unit.

Technical specifications

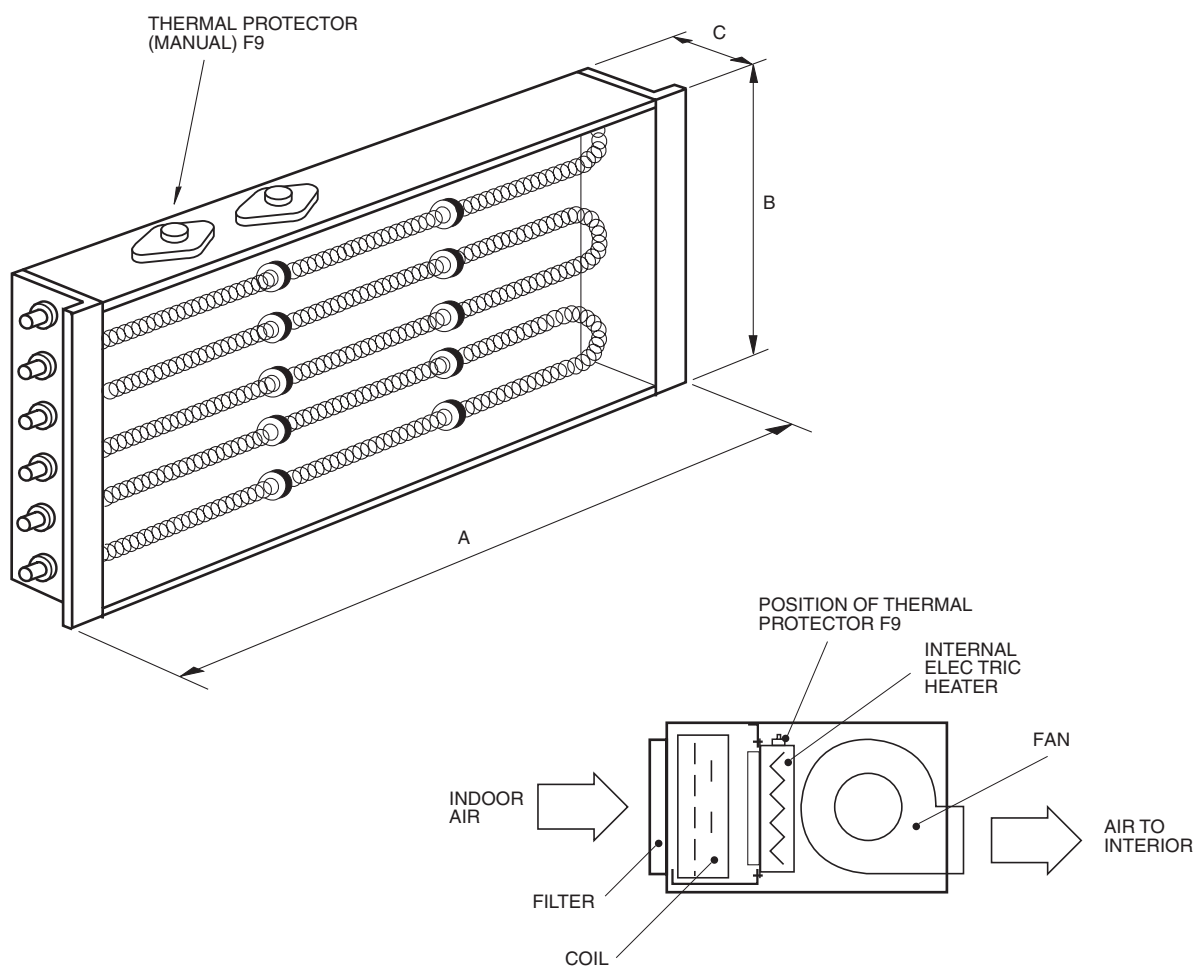
These internal electric heaters include the following components:

- Galvanised sheet casing and supports.
- Exposed nickel-chrome wire electric resistances mounted

on steatite supports.

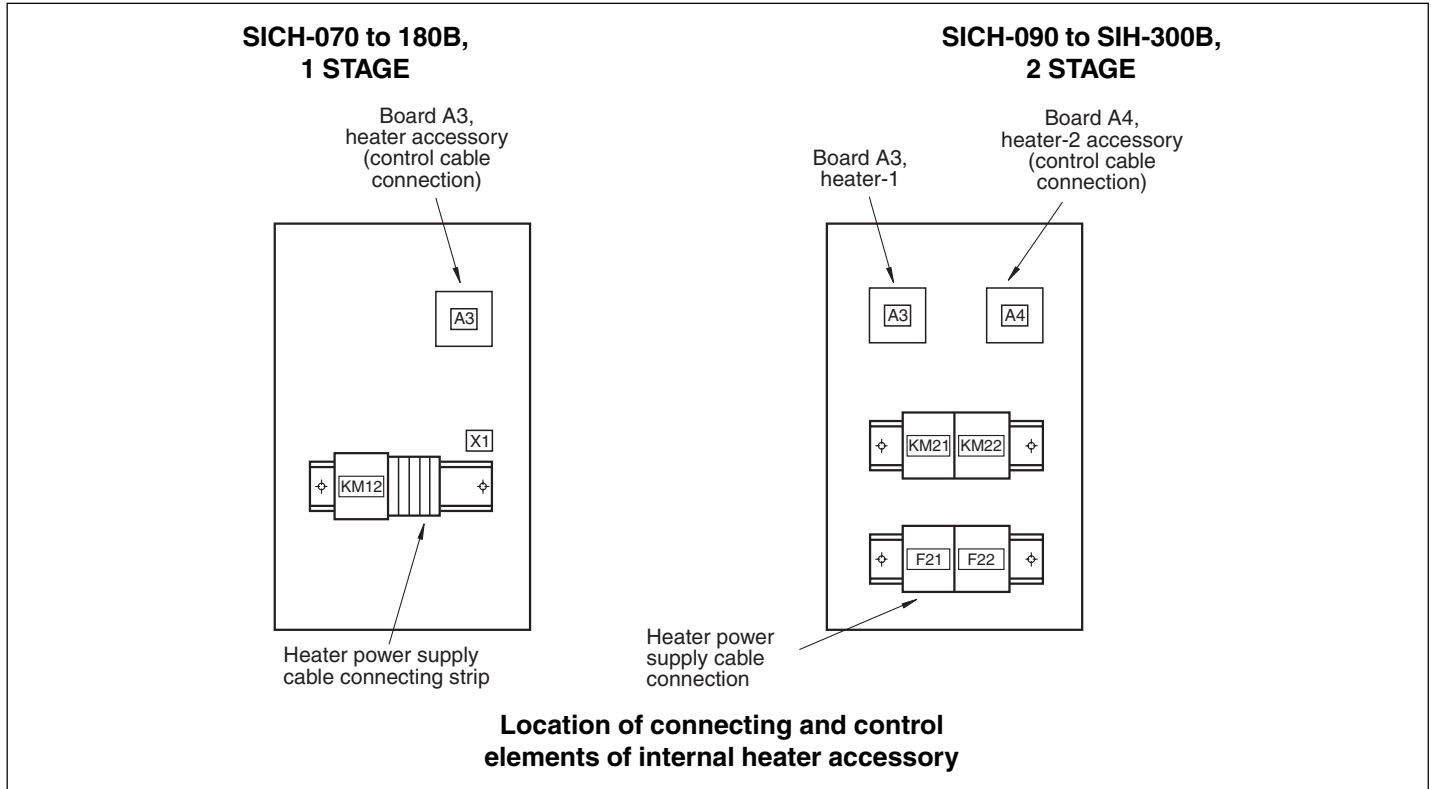
- Power supply contactor with a 400 V coil.
- Two thermal protectors located at the top of the heater. The first, with automatic reset, disconnects the heater when a temperature of 77°C is reached. The second, accessible internally and with manual reset, disconnects the heater when reaching a temperature of 138°C. Two-stage heaters contain four thermal protectors; two for each stage.
- Interlock with the heat relay of the indoor fan. The control system of the unit does not let the heater operate if the indoor fan heat relay has failed.
- Plug-in connector for interconnecting the control panel of the air conditioning unit and the heater.
- Self-threading screws for fastening this accessory.

Assembly and general dimensions mm



For mounting on	A	B	C
SICH-070 and 076B	1 103	480	48
SICH-090 and 120B	1 339	550	48
SICH-150B	1 740	550	48
SICH-150B	1 930	470	80

Assembly and general dimensions mm



General characteristics

Heater 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		
SICH-070 and 076B	400.3.50	10	15	1	20	2.5	0.53	2.9
SIH-070 and 076B	400.3.50	15	22	1	25	4	0.53	2.9
SICH-090 and 120B	400.3.50	10	15	1	20	2.5	0.74	4.9
SICH-090 and 120B	400.3.50	20	30	2	40	6	0.74	4.9
SICH-150B	400.3.50	15	22	1	25	4	0.98	7.1
SICH-150B	400.3.50	30	46	2	50	10	0.98	7.1
SICH-180B	400.3.50	15	22	1	25	4	0.98	7.1
SICH-180B	400.3.50	30	46	2	50	10	0.98	7.1
SICH-240C and SIH-300B	400.3.50	30	46	2	50	10	0.16	7.1
SICH-240C and SIH-300B	400.3.50	40	60	2	80	25	0.16	7.1

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 kgs.
	Height	Width	Depth	
SICH-070 and 076B	620	1 300	110	7
SIH-090 and 120B	620	1 520	110	8
SICH-150B	620	1 920	110	9
SICH-180B	510	2 405	165	10
SICH-240C and SIH-300B	630	480	480	15

Installation

Install the electric heater in the SICH 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 indications appearing in the table of General Characteristics and Wiring Diagrams.
- 4) Remove the access covers to the controls of the SCOC, SCOH, SOC or SOH/SICH units.
- 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) Remove the side covers of the SICH (070 to 180B) unit and place the electric heater on the two vertical supports of the coil, making the tab coincide with the drilled hole. Check to make sure that the reset push button of the F9 thermal switch (F9 and F11 in 2-stage units) is accessible and at the top.

For the SICH (240C and 300B) units, the electric heater is fitted through the front of the air outlet. Remove the central panel between the two fans and fasten the heater to the side supports with the self-threading screws supplied.

It is very important to manually check that the electric heater is not in contact with the fan shaft.

See Assembly and general dimensions.

- 7) Mount the control support on the side of the machine, or inside the electrical box, depending upon the SICH unit, and fasten with the screws supplied.
- 8) Connect the power supply cables to connecting strip X1 (or automatic switch F21 in 2-stage). Connect the control cable included between connector J1 of the A3 auxiliary heater board (A4 in 2-stage units) and connector J10 of the A1 control board of the air conditioning unit.

- 9) The installer should complete the electric circuit of the heater by fitting an air flow control F14 (F14 and F15 in 2-stage) at the most convenient point of the ducts so as to make sure the heater operates only when there is sufficient air flow.
- 10) Connect power supply to the SCOC or SCOH/SICH unit and to the heater.
- 11) 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 once said led goes off.
- 12) Check operation of the heater by selecting the Emergency Heat mode at the ambient thermostat of the air conditioning unit.
- 13) Replace the covers of the SCOC or SCOH/SICH units.

Note: Should an incorrect response of the system take place, see the Operation section of the SCOC or SCOH/SICH 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.

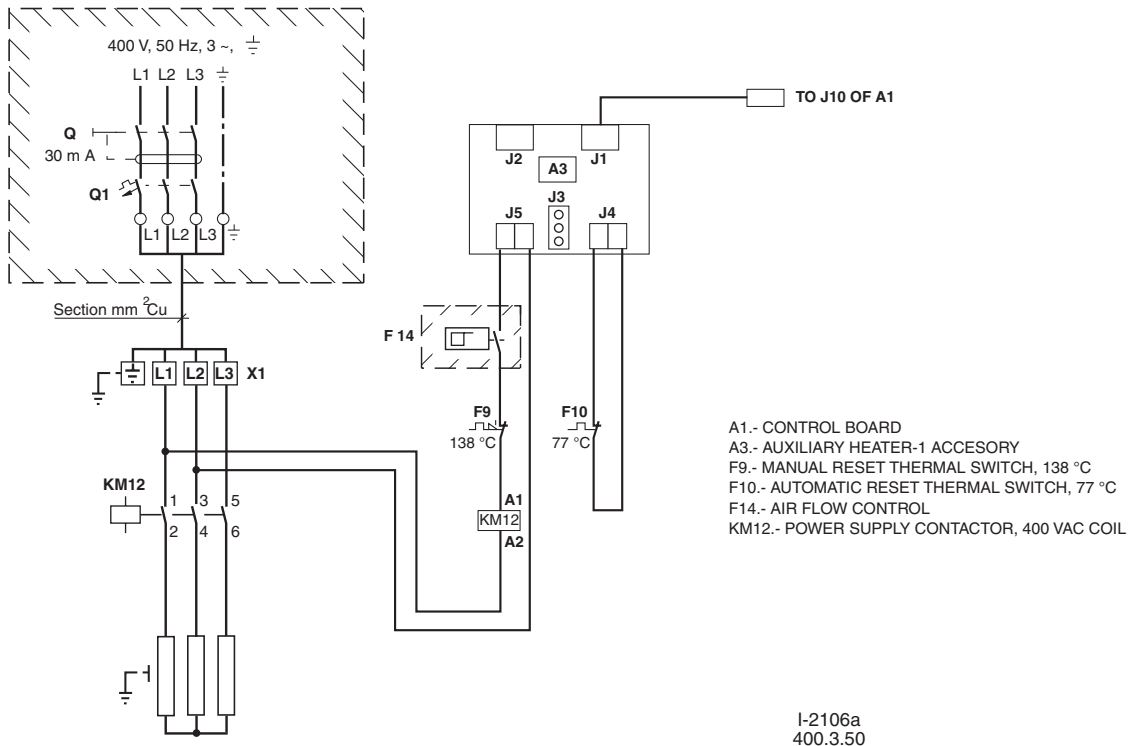


Loose cables can cause overheating of the terminals or incorrect operation of the unit. Fire hazards may also arise. Therefore, make sure all cables are connected tightly.

Wiring diagram

Heater 10, 15kW, 400.3.50
SICH-070 to 180B

POWER SUPPLY kW	AUTOMATIC SWITCH Q1	MINIMUM SECTION CABLES mm ²
10	20	2,5
15	25	4



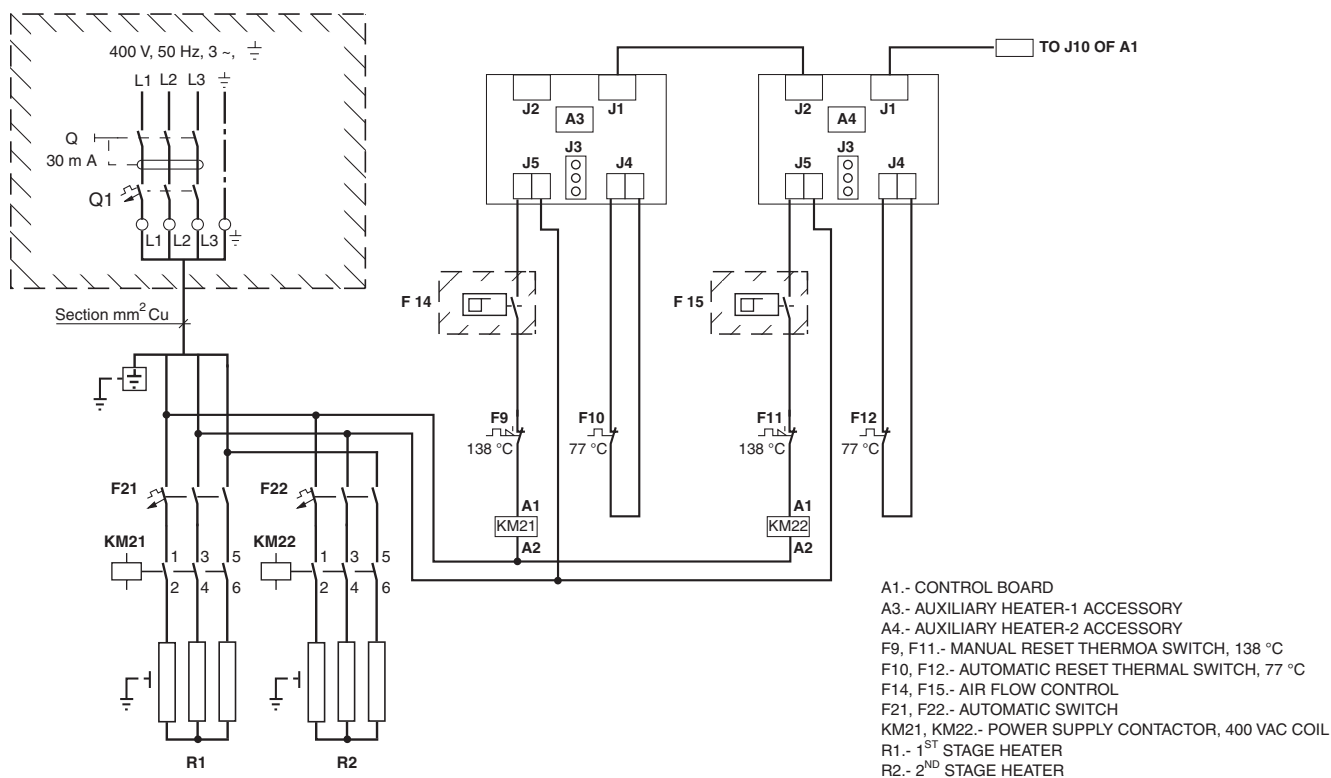
THE COMPONENTS INCLUDED IN THESE BOXES
 ARE NOT SUPPLIED BY THE MANUFACTURER.

IMPORTANT: THE SIZE OF THE CIRCUIT BREAKER AND THE CROSS-SECTION OF THE SUPPLY AND CONTROL LINES ARE ONLY AS A GUIDE AND SHOULD BE CORRECTED IN ACCORDANCE WITH THE CONDITIONS AT THE JOBSITE, DISTANCE BETWEEN UNITS, AND CURRENT LEGISLATION.

Wiring diagram

Heater 20, 30kW, 400.3.50
SIH-090 to SIH-300B

POWER SUPPLY kW	AUTOMATIC SWITCH Q1	AUTOMATIC SWITCH		MINIMUM SECTION CABLES mm ²
		F21	F22	
20	40	20	20	6
30	50	25	25	10
40	80	40	40	25



- A1.- CONTROL BOARD
- A3.- AUXILIARY HEATER-1 ACCESSORY
- A4.- AUXILIARY HEATER-2 ACCESSORY
- F9, F11.- MANUAL RESET THERMOA SWITCH, 138 °C
- F10, F12.- AUTOMATIC RESET THERMOA SWITCH, 77 °C
- F14, F15.- AIR FLOW CONTROL
- F21, F22.- AUTOMATIC SWITCH
- KM21, KM22.- POWER SUPPLY CONTACTOR, 400 VAC COIL
- R1.- 1ST STAGE HEATER
- R2.- 2ND STAGE HEATER

I-2107b
 400.3.50

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

IMPORTANT: THE SIZE OF THE CIRCUIT BREAKER AND THE CROSS-SECTION OF THE SUPPLY AND CONTROL LINES ARE ONLY AS A GUIDE AND SHOULD BE CORRECTED IN ACCORDANCE WITH THE CONDITIONS AT THE JOBSITE, DISTANCE BETWEEN UNITS, AND CURRENT LEGISLATION.

Duct electric heaters for SICH-070 to SIH-300B

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

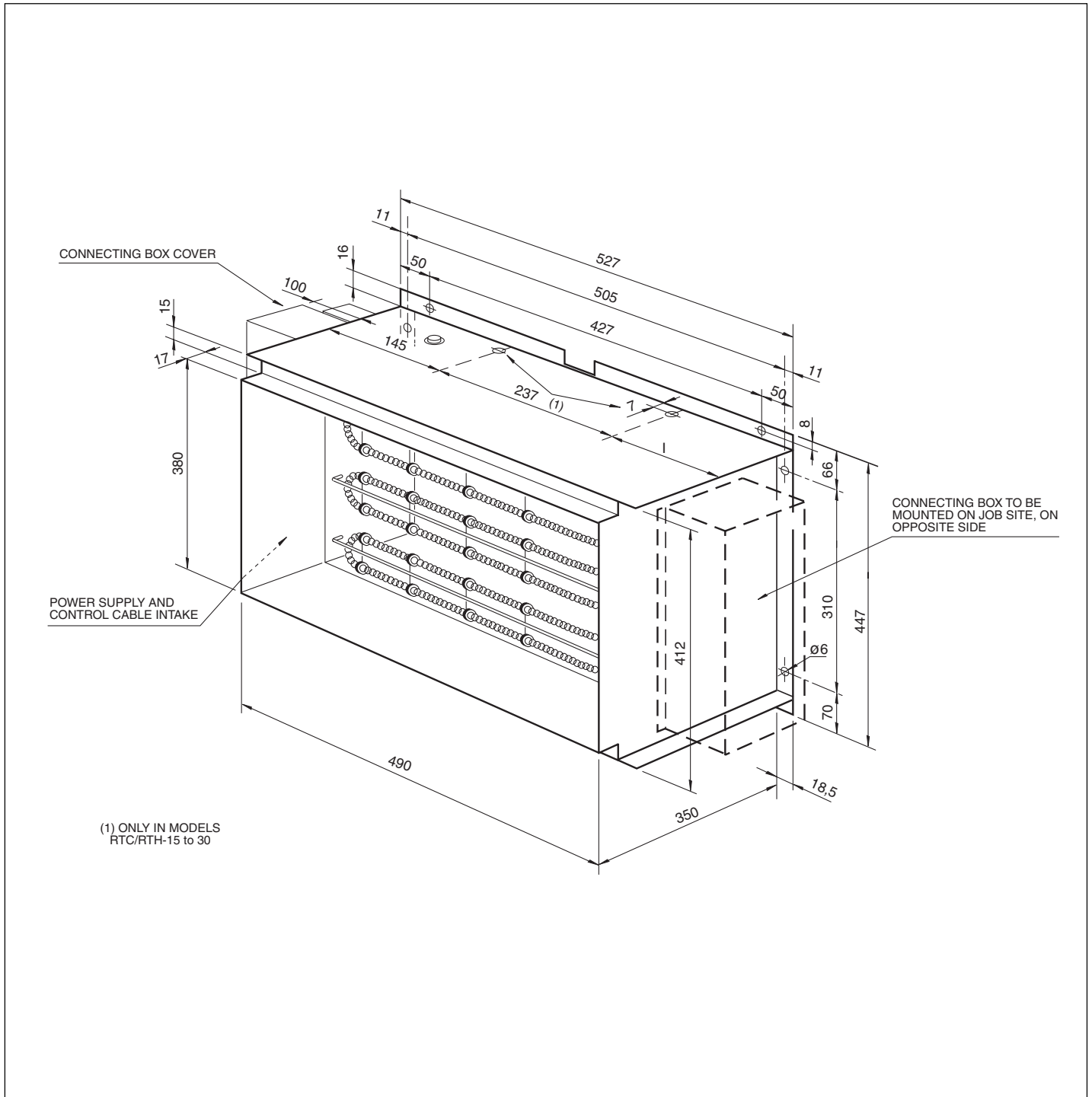
Technical specifications

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 400 V coil.

- 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. With 2-stage heaters, there are four thermal protectors, 2 for each stage.
- 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



General characteristics

Heater 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
SICH-070 & 076B	400.3.50	10	15	1	20	2.5	0.19	6
SICH-070 & 076B	400.3.50	15	22	1	25	4	0.19	6
SICH-090 to SIH-300B	400.3.50	20	30	2	40	6	0.19	15
SICH-090 to SIH-300B	400.3.50	30	46	2	50	10	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	
SICH-070 & 076B	440	640	370	20
SICH-090 to SIH-300B	880	640	370	40

Installation

Install the electric heater in the SICH 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 indications appearing in the table of General Characteristics and Wiring Diagrams.
- 4) Remove the access covers to the controls of the SCOC, SCOH, SOC or SOH/SICH units.
- 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 (F9 and F11 in 2 stages) 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 (or automatic switch F21 in 2 stages). Connect the control cable supplied, between connector J1 of the A3 Auxiliary Resistance board (A4 in 2 stages) 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 (F14 and F15 in 2 stages) 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 SCOC, SCOH, SOC or SOH/SICH 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 SCOC, SCOH, SOC or SOH/SICH unit.

Note: Should an incorrect response of the system take place, see the Operation section of the SCOC, SCOH, SOC or SOH/SICH 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.

Location of the heater

SICH - 070 and 076B

