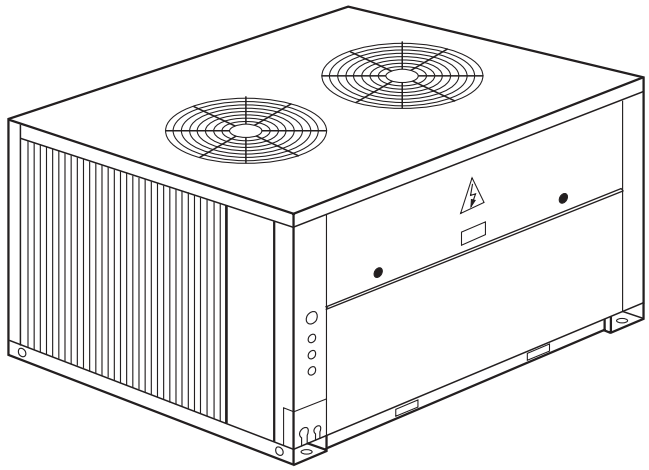
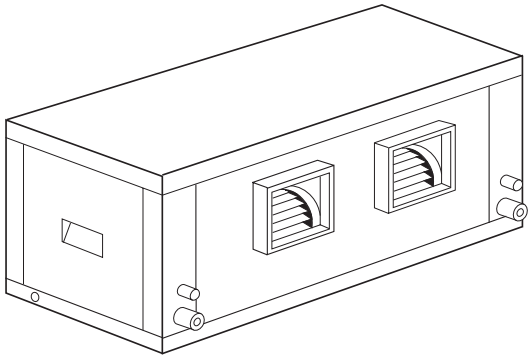
SPLIT SYSTEM

TECHNICAL GUIDE

Split system - Heat pump

Models SOH / SICH 076 to 240-B



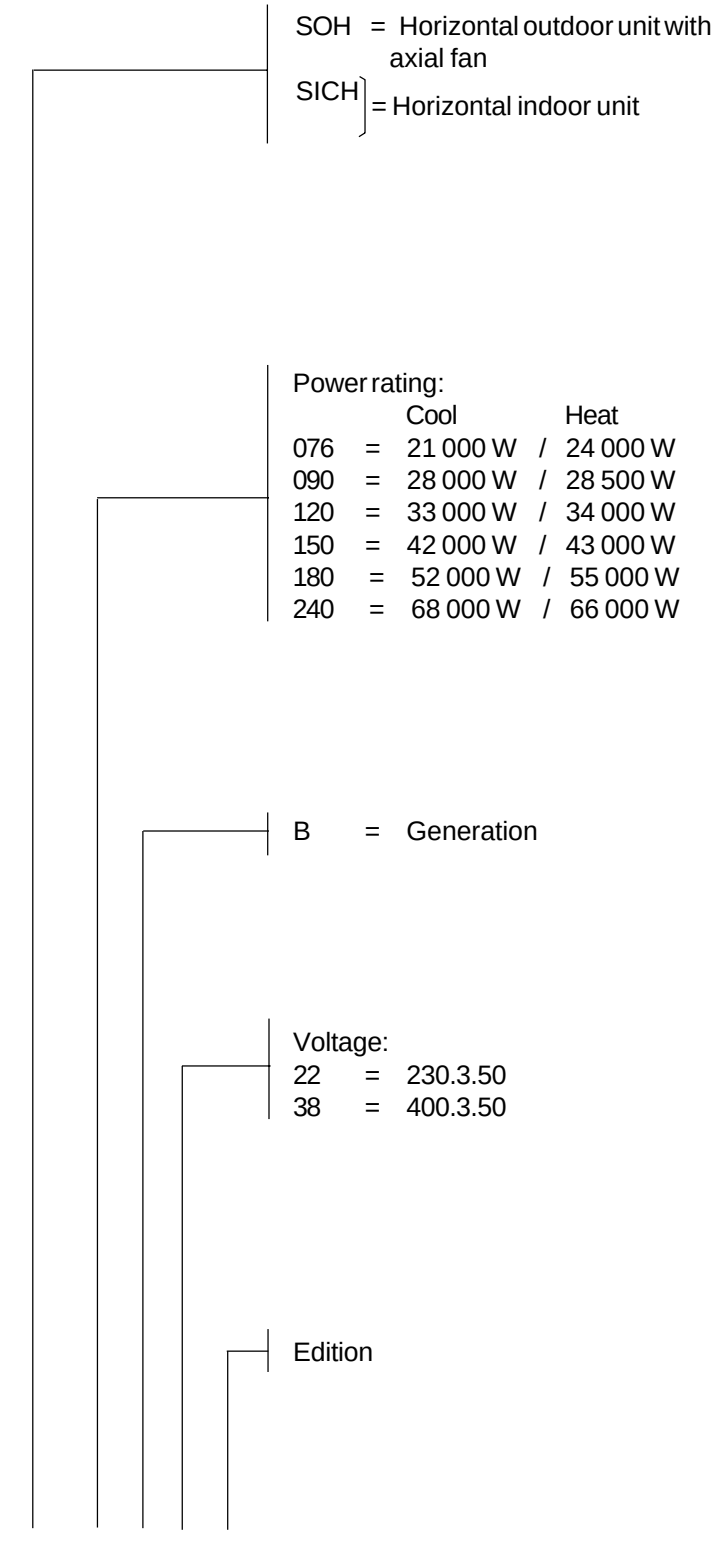


YORK®

Index

General information

Nomenclature



SOH 076 B 38 E1

General description

The SOH-B series units are the outdoor units a the split type heat pump, equipped with an axial fan, horizontal discharge and ready to be installed directly outdoors.

The SOH-076B to 180B units are compatible with indoor units SICH-076 to 240.

The SOH-240B outdoor units are compatible with the SICH-240 indoor unit.

For adequate operation, both the electrical as well as the cooling sections of these units need to be connected to the corresponding indoor unit.

The SICH indoor units can be equipped, as an optional accessory, with an electric heater or a hot water coil for auxiliary heat in the case of an emergency.

Technical specifications

Mechanical specifications

Compressor

Vertical hermetic alternative type. Mounted on antivibratory supports and internal motor protection. Include an electric heater for heating the oil in the sump to make start-up easier and avoid loss of oil in compressor.

Coils

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

Fans (outdoor units)

Axial with free air discharge, without ducts. The unit is equipped with a speed selector in summer cycle that is regulated by the high pressure of the cooling circuit.

Fans (indoor units)

Centrifugal, with dual scroll and one shaft in common, except in model SICH-076, that have a single scroll. Belt and pulley drive with a removable core. The motors are mounted on tensor bases.

Casing (outdoor units)

Made of galvanised steel sheeting, finished with oven-polymerised powdered paint, which allows installing outdoors.

Casing (indoor units)

Made of galvanised steel sheeting and finished with oven-polymerised powdered paint. Insulated internally so as to avoid condensation and reduce noise level.

Equipped with a tray and corresponding drain for collecting condensation from the coil. The structure of the SICH-076 to 150 indoor units allows either vertical or horizontal orientation of the fans.

Cooling circuit

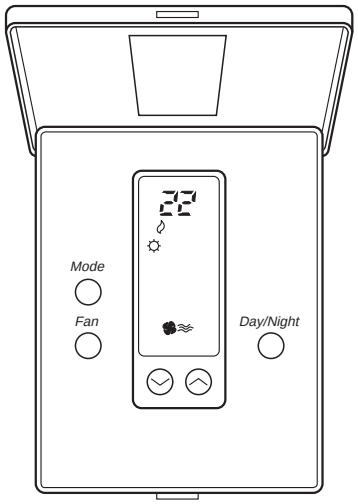
Made of solid copper tubing. The units are supplied dehydrated and factory tested with regard to maximum pressure and airtightness. In the indoor units, refrigerant expansion is carried out by means of calibrated and distributor holes. The outdoor units are equipped with thermostatic and distributor expansion valves. The outdoor units also include a suction accumulator, a discharge muffler, high and low pressure switches and suction and discharge pressure intakes.

Electrical panel

Accessible directly from the exterior. Includes connecting strip, control board and electronic probes, power supply contactors, operating relays, transformer, heat relays and automatic switches. In compliance with European standards in force.

Thermostat

Of the electronic digital type for heat pumps, and is available with one or two stages. Designed to give a precise control of the ambient temperature and graphic information of the mode in which the heat pump is operating. This is a Proportional-Differential-Integral response control and, in accordance with the difference between the programmed temperature and the ambient temperature, it varies the on-off cycles to between 3 and 7.5 cycles per hour.



Control

To achieve maximum energy savings and correct operation of the equipment, avoid failures and prolong the life of same, these units include the following features:

Compressor safety

A temperature sensor protects the compressor against very high discharge temperatures. It is also activated in the case of a refrigerant leak, or insufficient air flow through the coil acting as a condensing unit.

Another temperature sensor protects the compressor against very low suction temperatures in the cooling cycle.

A set of high and low pressure switches turns the compressor off when discharge pressure is too high, or the suction pressure is too low.

There is an optional temperature sensor (SOH-076 to 120B) that is mounted on the indoor coil so as to avoid freezing in the cooling mode. The heating mode does not allow operation of the indoor fan until the temperature of the coil reaches 35° C.

Defrost control

The defrost cycle is activated after a freely adjustable period of time of between 30, 60 and 90 minutes after start-up or the last defrost cycle, and the evaporating temperature is below -3° C.

Start-up timer

Avoids constant starts and stops. After a shutdown, the unit will not start again until after 2 or 5 minutes, which period of time is adjustable at will.

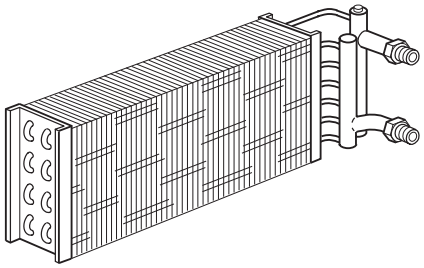
Operating at -20° C

When the outdoor temperature is below -20° C, operation of the compressor is not justified due to the small amount of heat generated.

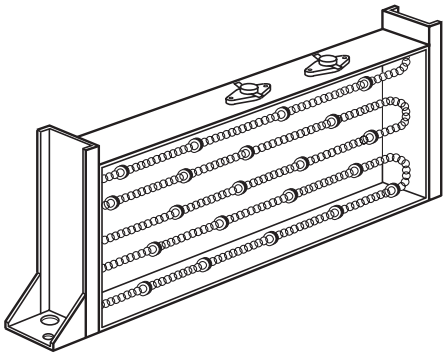
The electronic module of the unit detects this low temperature and activates automatically. It turns the compressor off and connects the auxiliary heater (if installed).

Accessories

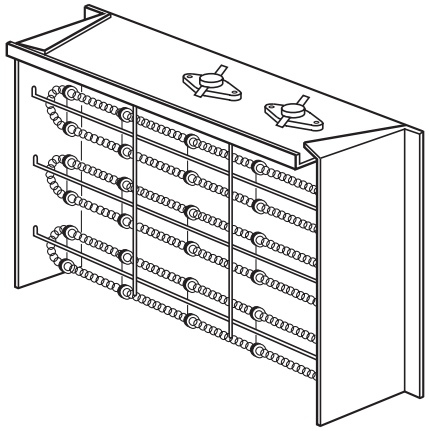
The SICH indoor units are equipped for the installation of water coils or electric heaters for supplying auxiliary heat,



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



Internal electric heater for SICH-180



Internal electric heater for SICH-070/076, 090/120 and 150

Physical data

Outdoor units

Model			SOH-076B	SOH-090B	SOH-120B	SOH-150B	SOH-180B	SOH-240B
Compressor	Amount		1	1	1	2	2	2
	Type		Recip/Scroll					
	Power rating	kW	8.32	11.2	13.8	2 x 8.32	2 x 11.2	2 x 13.8
	Power supply	V.ph.Hz	230.3.50 or 400.3.50					
Fan	Power rating	W	370					
	No. fans		1	1	2	2	2	4
	Power supply	V.ph.Hz.	230.1.50					
	Diameter propellers		610					
Coil	Amount		1	1	2	2	2	2
	Tubing depth x height		3 x 36	3 x 42	2 x 42	3 x 42	3 x 44	3 x 42
	Diameter tubing		3/8"					
	Surface	m²	1.86	2.17	1.57 x 2	1.57 x 2	1.82 x 2	2.17 x 2
Dimensions with standard packing	Height	mm	1 005	1 155	1 155	1 155	1 210	1 155
	Width	mm	1 240	1 240	1 240	1 240	1 240	1 975
	Depth	mm	880	880	1 630	1 630	1 630	1 630
Weight	Nett	kg	216	232	308	404	432	536
	Gross	kg	220	236	314	410	438	543

Indoor units

Model			SICH-070/076	SICH-090/120	SICH-150	SICH-180	SICH-240
Fan	Motor power rating	W	750	1 472	1 472	3 000	3 000
	Power supply	V.ph.Hz	230.3.50 or 400.3.50		400.3.50		
	Motor rpm		1 400				
	Number of turbines		1	2	2	2	2
	Turbine diameter	mm	320	320	320	320	380
	Turbine width	mm	320	240	320	320	380
Coil	Amount		1				
	Tubing depth x height		4 x 21	4 x 25	4 x 25	4 x 29	4 x 33
	Tubing diameter		3/8"				
	Surface	m²	0.57	0.83	1.11	1.42	1.72
Dimensions with packing	Heigut	mm	760	833	883	935	1 025
	Width	mm	1 444	1 825	2 125	2 390	2 450
	Depth	mm	930	930	930	955	973
Weight	Nett	kg	120	165	195	240	337
	Gross	kg	132	180	212	260	360

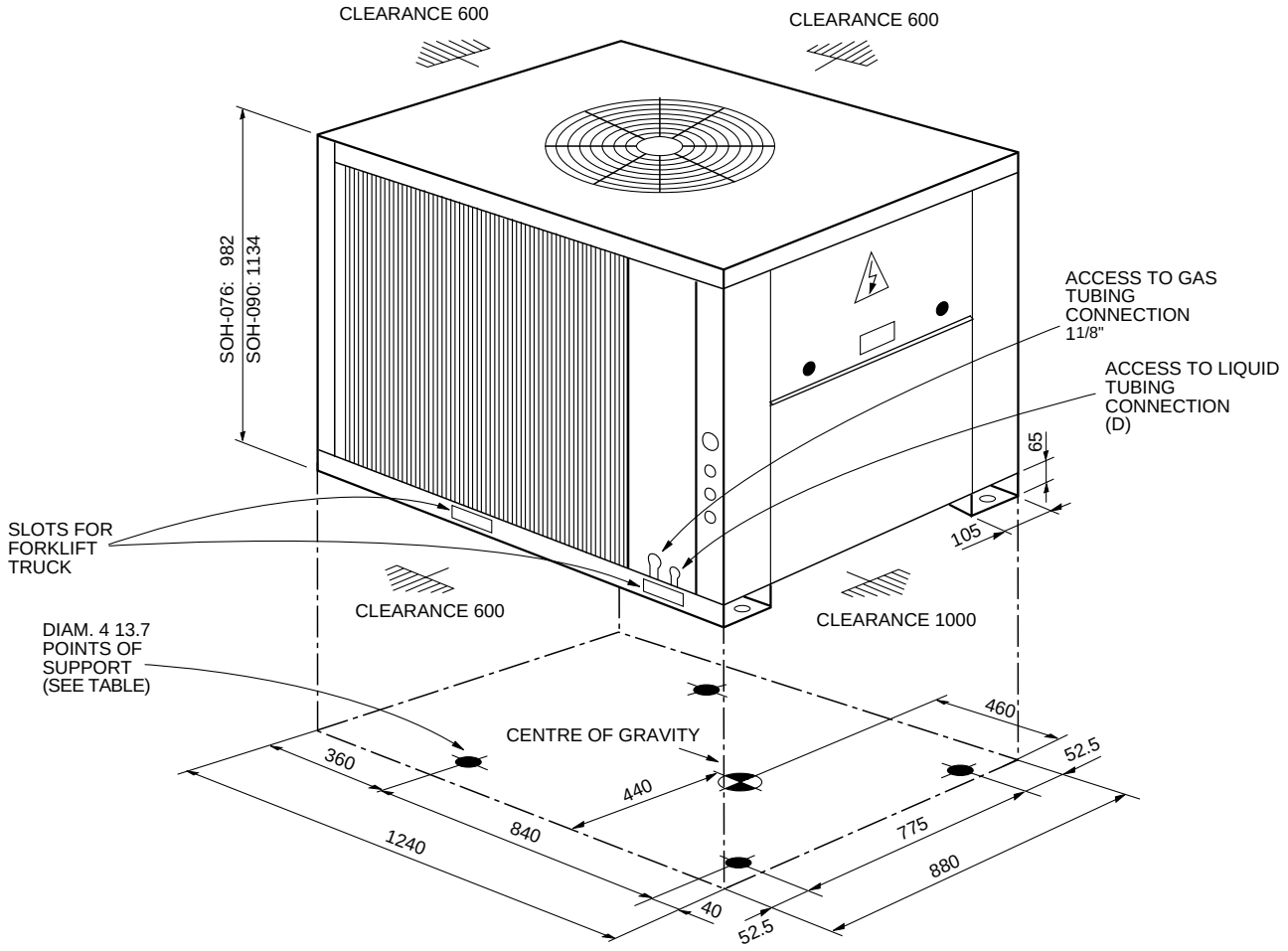
Limits of use

Voltage limits				Air intake temperature to the outdoor coil DB				Air intake temperature to the indoor coil			
Nom. 230 V		Nom. 400V		Operating cycle				Operating cycle			
				Minimum °C		Maximum °C		Minimum °C		Maximum °C	
Minimum	Maximum	Minimum	Maximum	Cool	Heat	Cool	Heat	Cool WB	Heat DB	Cool WB	Heat DB
198	254	342	436	2	-20 (1)	46	24	14	10 (2)	22	25

Notes: WB = wet bulb. DB = dry bulb.
(1) At below -20° C, only the emergency electric heater (optional) is operative.
(2) This equipment can operate for short periods of time at a temperature of below 10° C so as to increase the ambient temperature of the conditioned space to 10° C.

General dimensions mm

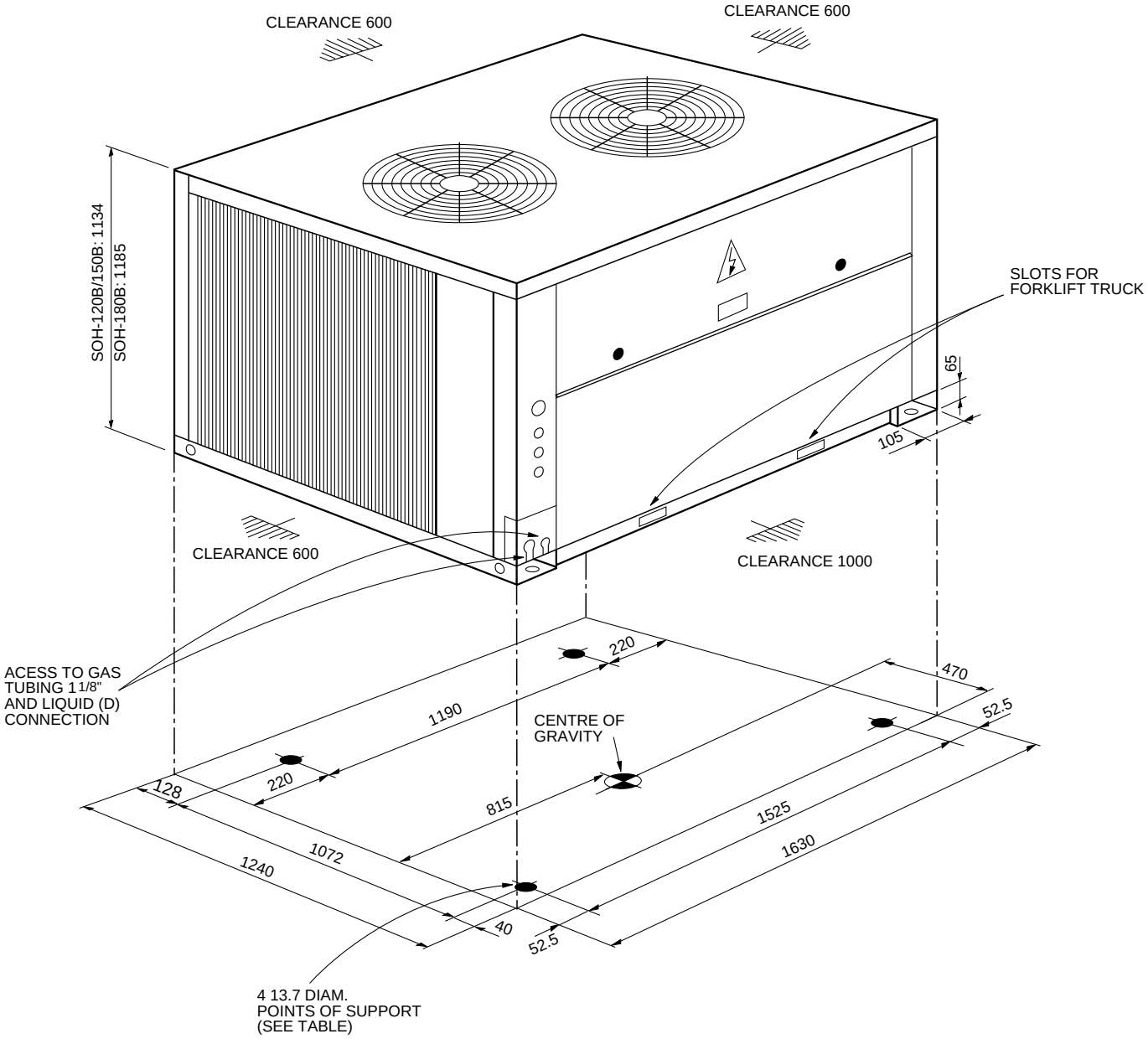
SOH-076 & 090B



Unit	(D) Liquid tubing diameter	Weight kgs. per point of support
076B	1/2"	54
090B	5/8"	58

General dimensions mm

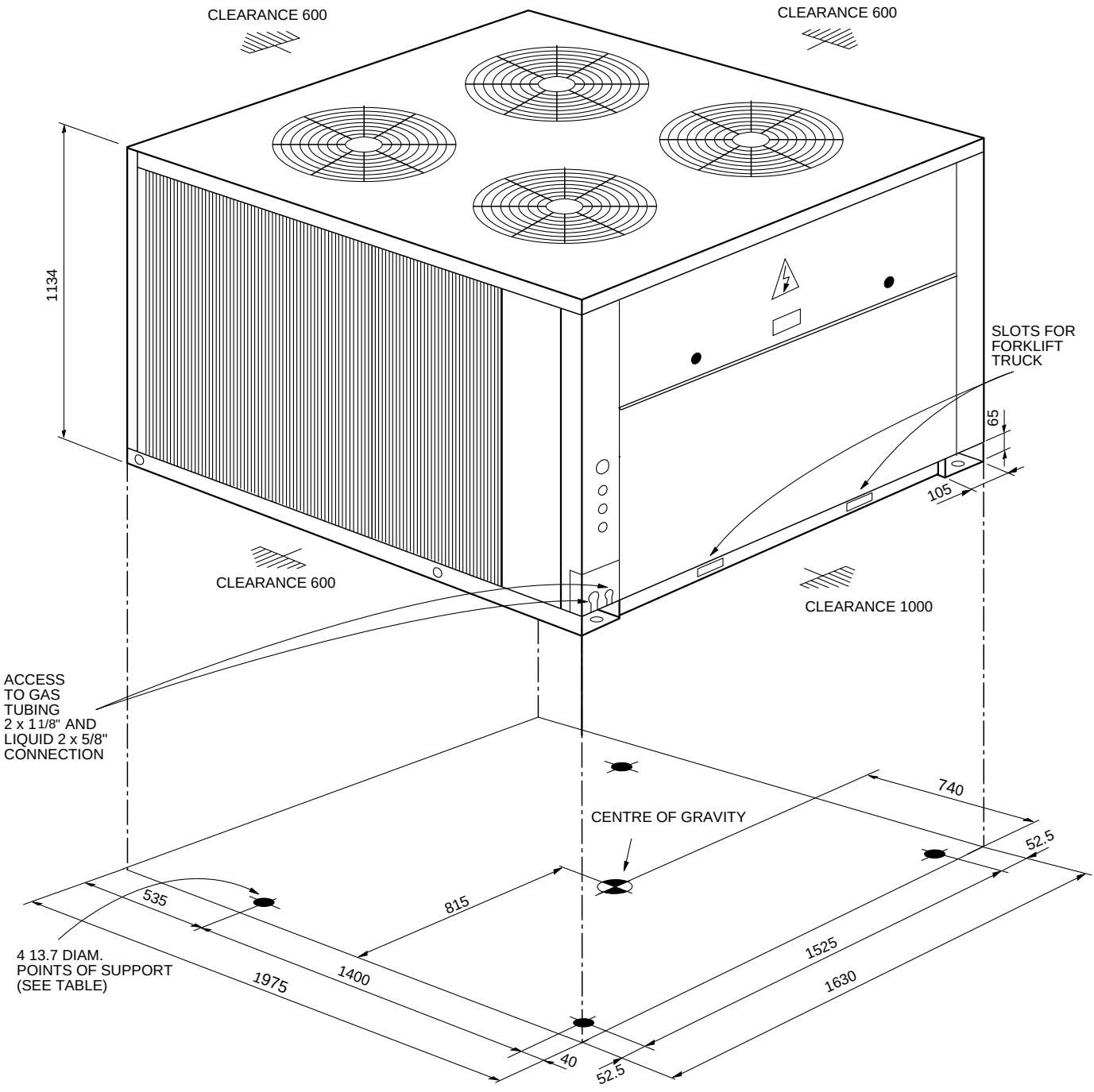
SOH-120B, 150B & 180B



Unit	(D) Liquid tubing diameter	Weight kgs. per point of support
120B	1 x 5/8"	77
150B	2 x 1/2"	101
180B	2 x 5/8"	108

General dimensions mm

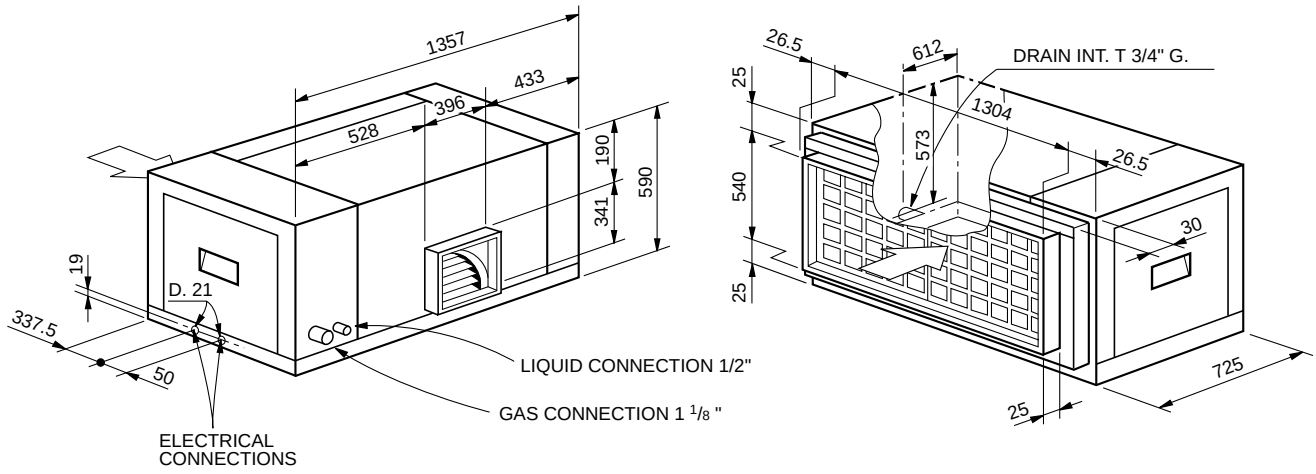
SOH-240B



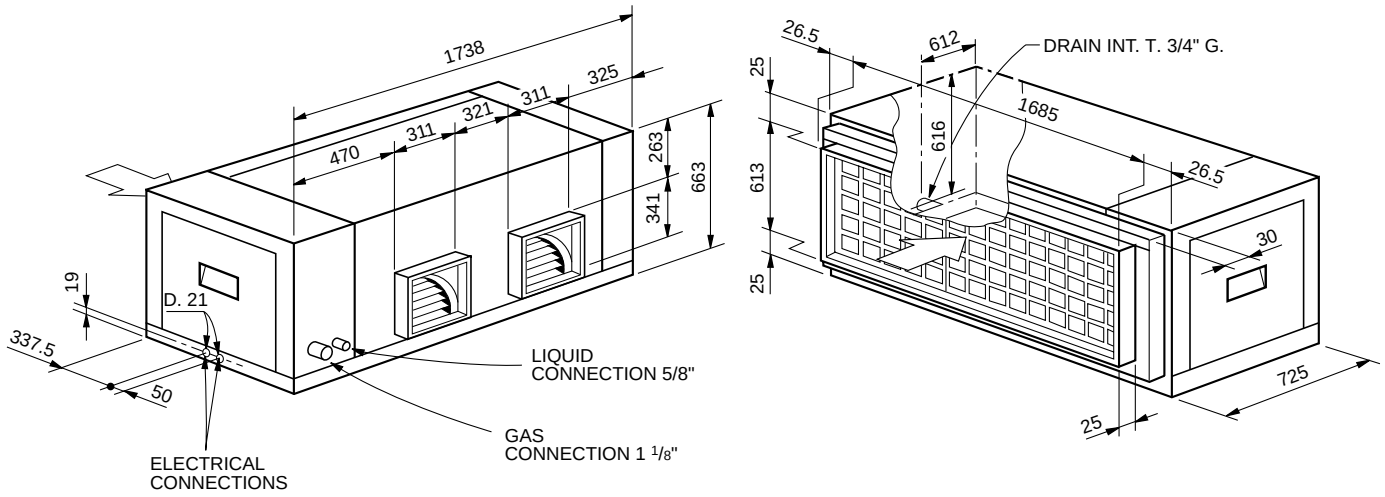
Unit	Weight kgs. per point of support
240B	134

General dimensions mm

SICH-070/076

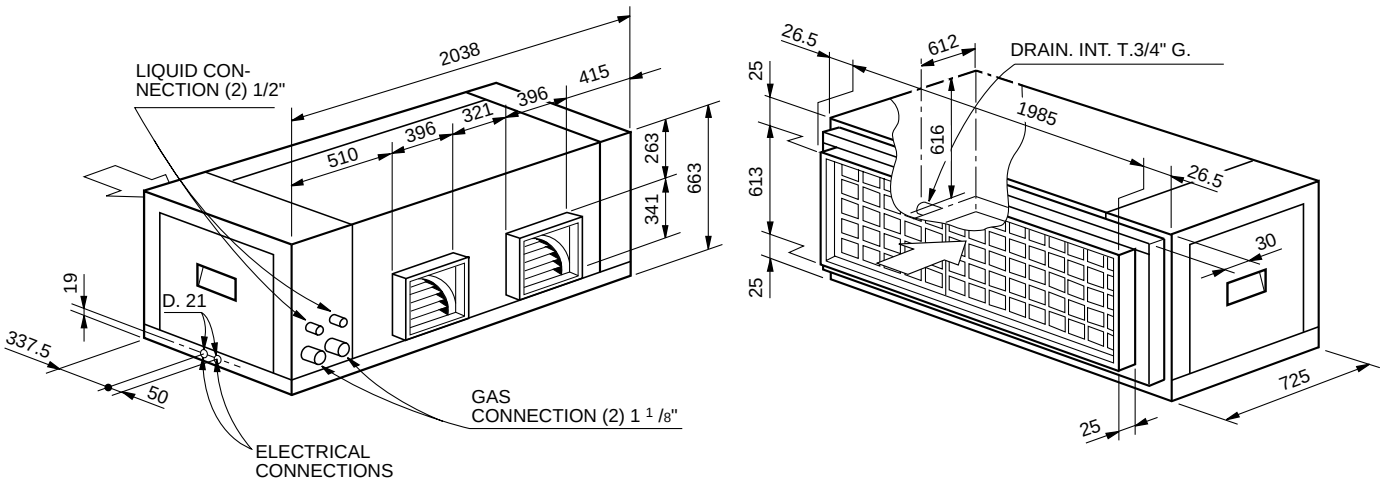


SICH-090/120

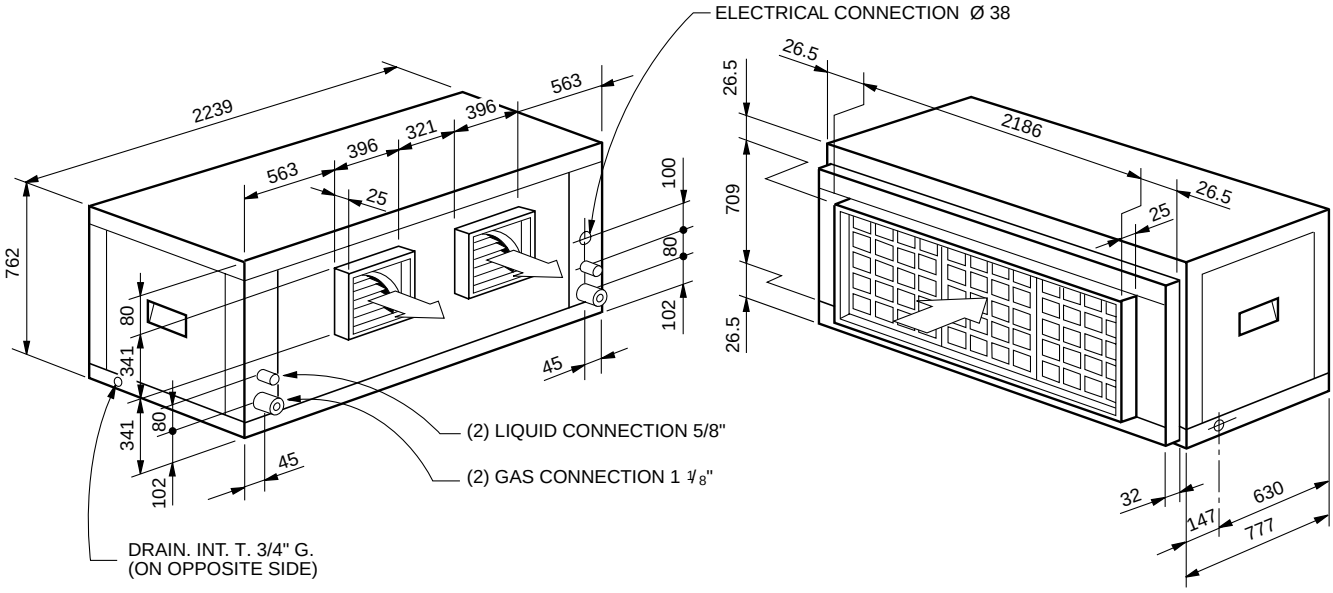


General dimensions mm

SICH-150

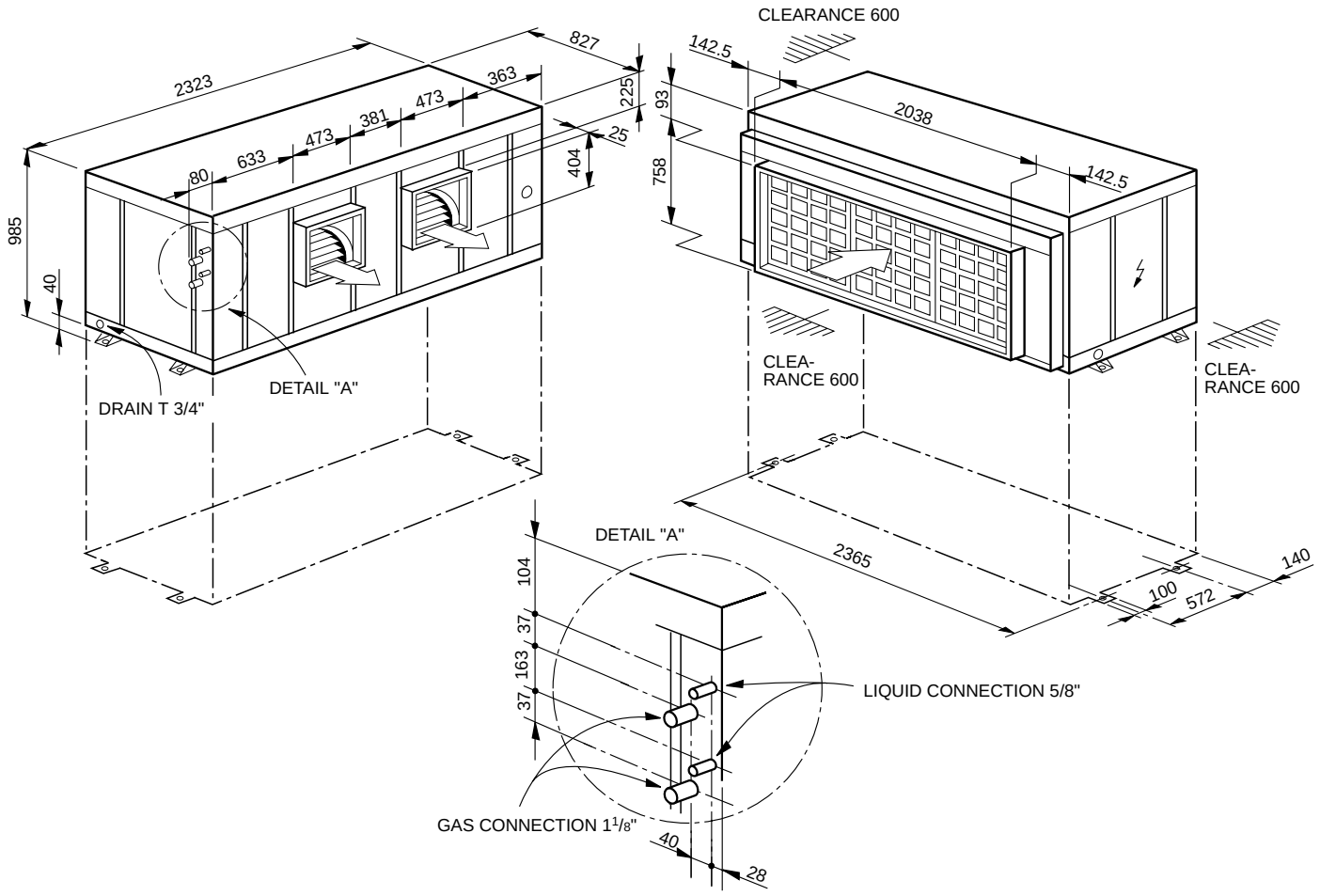


SICH-180

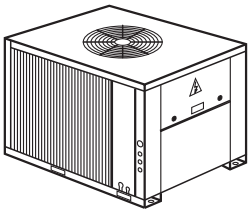


General dimensions mm

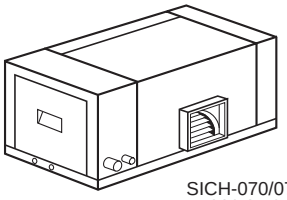
SICH-240



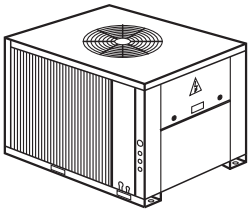
Variant chart



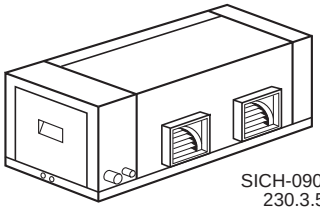
SOH-076B
230.3.50
400.3.50



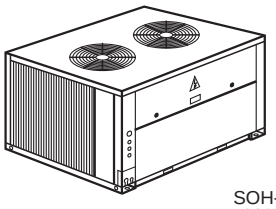
SICH-070/076
230.3.50
400.3.50



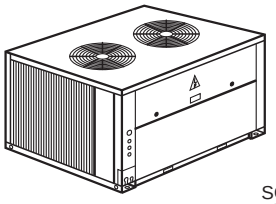
SOH-090B
230.3.50
400.3.50



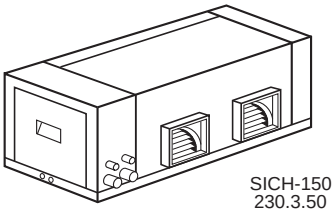
SICH-090/120
230.3.50
400.3.50



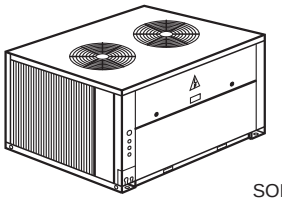
SOH-120B
230.3.50
400.3.50



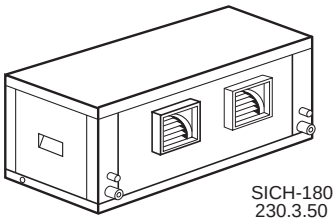
SOH-150B
230.3.50
400.3.50



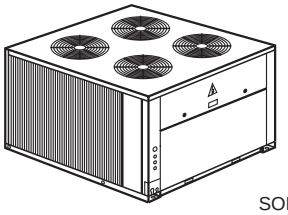
SICH-150
230.3.50
400.3.50



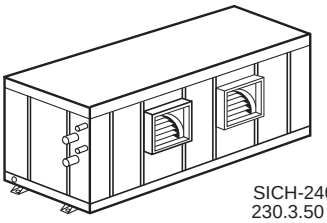
SOH-180B
230.3.50
400.3.50



SICH-180
230.3.50
400.3.50



SOH-240B
230.3.50
400.3.50



SICH-240
230.3.50
400.3.50

Nominal characteristics

Outdoor unit	Indoor unit	Summer		Winter	
		Cooling capacity W	Consumption W	Cooling capacity W	Consumption W
SOH-076B	**SICH-070/076**	21 000	9 590	24 000	8 570
SOH-090B	**SICH-090/120**	28 000	12 670	28 500	9 970
SOH-120B	**SICH-090/120**	33 000	15 640	34 000	14 240
SOH-150B	**SICH-150**	42 000	18 900	43 000	16 665
SOH-180B	**SICH-180**	52 000	25 690	55 000	21 650
SOH-240B	**SICH-240**	68 000	31 280	66 000	25 980

Correction factors

Correction factors of the cooling capacities

Correction 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

Correction factors for the heating capacities

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

Correction of the real temperature of the air intake to the coil of the outdoor unit 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	Sensinble capacity (W/h)				Compressor absorbed power
				Dry air intake temperature to the coil °C (DB)				
				22	24	27	29	
			W/h	W/h	W/h	W/h	W/h	kW
SOH-076B/ SICH070/076	25	22	25 200	7 671	10 579	14 942	17 855	6.99
		19.5	22 680	11 297	14 206	18 569	21 482	7.32
		17	21 000	15 165	18 074	21 000	21 000	7.65
	35	22	23 310	7 028	9 936	14 299	17 208	7.90
		19.5	21 000	10 673	13 582	17 945	20 853	8.32
		17	19 320	13 642	16 551	19 320	19 320	8.74
	45	22	21 000	6 313	9 221	13 584	16 493	9.15
		19.5	18 900	9 962	12 870	17 233	18 900	9.57
		17	17 220	13 640	16 548	17 220	17 220	9.98

Sensible cooling capacities

Model	Dry outdoor air temperature °C (DB)	Humid air intake temperature °C (WB)	Total capacity	Sensinble capacity (W/h)				Compressor absorbed power
				Dry air intake temperature to the coil °C (DB)				
				22	24	27	29	
			W/h	W/h	W/h	W/h	W/h	kW
SOH-090B/ SICH090/120	25	22	33 600	10 027	14 608	21 480	26 067	9.41
		19.5	30 240	15 773	20 354	27 226	30 240	9.86
		17	28 000	21 833	26 414	28 000	28 000	10.30
	35	22	31 080	9 197	13 778	20 650	25 231	10.64
		19.5	28 000	14 965	19 546	26 418	28 000	11.20
		17	25 760	19 741	24 322	25 760	25 760	11.76
	45	22	28 000	8 271	12 852	19 724	24 305	12.32
		19.5	25 200	14 041	18 622	25 200	25 200	12.88
		17	22 960	19 849	22 960	22 960	22 960	13.44
SOH-120B/ SICH090/120	25	22	39 600	11 988	16 764	23 928	28 710	10.10
		19,5	35 640	17 954	22 730	29 893	34 677	10.58
		17	33 000	24 296	29 072	33 000	33 000	11.06
	35	22	36 630	10 987	15 763	22 927	27 703	11.42
		19,5	33 000	16 981	21 757	28 921	33 000	12.02
		17	30 360	21 762	26 538	30 360	30 360	12.63
	45	22	33 000	9 872	14 648	21 812	26 588	13.23
		19,5	29 700	15 871	20 647	27 811	29 700	13.83
		17	27 060	21 916	26 692	27 060	27 060	14.43
SOH-150B/ SICH-150	25	22	50 400	15 136	21 635	31 384	37 892	6.33
		19,5	45 360	23 274	29 773	39 522	45 360	6.63
		17	42 000	31 886	38 385	42 000	42 000	6.93
	35	22	46 620	13 878	20 378	30 126	36 625	7.16
		19,5	42 000	22 051	28 550	38 299	42 000	7.53
		17	38 640	28 648	35 147	38 640	38 640	7.91
	45	22	42 000	12 477	18 976	28 725	35 224	8.29
		19,5	37 800	20 653	27 152	36 901	37 800	8.66
		17	34 440	28 887	34 440	34 440	34 440	9.04

Sensible cooling capacities

Model	Dry outdoor air temperature °C (DB)	Humid air intake temperature °C (WB)	Total capacity	Sensinble capacity (W/h)				Compressor absorbed power
				Dry air intake temperature to the coil °C (DB)				
				22	24	27	29	
			W/h	W/h	W/h	W/h	W/h	kW
SOH-180B/ SICH-180	25	22	62 400	18 683	26 948	39 346	47 622	7.83
		19,5	56 160	29 041	37 306	49 704	56 160	8.20
		17	52 000	39 983	48 248	52 000	52 000	8.57
	35	22	57 720	17 133	25 398	37 796	46 061	8.85
		19,5	52 000	27 533	35 798	48 196	52 000	9.32
		17	47 840	35 991	44 257	47 840	47 840	9.78
	45	22	52 000	15 405	23 671	36 068	44 334	10.25
		19,5	46 800	25 809	34 075	46 472	46 800	10.72
		17	42 640	36 284	42 640	42 640	42 640	11.18
SOH-240B/ SICH-240	25	22	81 600	24 781	34 373	48 762	58 368	19.65
		19.5	73 440	36 750	46 343	60 732	70 340	20.58
		17	68 000	49 500	59 092	68 000	68 000	21.52
	35	22	75 480	22 707	32 300	46 688	56 281	22.22
		19.5	68 000	34 737	44 330	58 718	68 000	23.39
		17	62 560	47 088	56 681	62 560	62 560	24.56
	45	22	68 000	20 400	29 992	44 381	53 973	25.73
		19.5	61 200	32 441	42 033	56 422	61 200	26.90
		17	55 760	44 575	54 168	55 760	55 760	28.07

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 meters	35	24	27	19	7	6	20	12

Nominal air 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
	m^3/h	m^3/s	Pa
SICH-070/076	4 615	1.28	62
SICH-090/120	8 060 / 7 850	2.24 / 2.18	62 / 75
SICH-150	10 700	2.97	75
SICH-180	13 600	3.77	80
SICH-240	14 780	4.1	80

Indoor fan performance

Model	Static pressure available		Air flow		Absorbed power
	mm WG (1)	Pa	m^3/h	m^3/s	W
SICH-070/076	14	137.2	3 577	0.99	680
	12	117.6	3 885	1.07	740
	10	98	4 130	1.14	785
	8	78.4	4 399	1.22	840
	6	58.8	4 653	1.29	900
	5	49	4 723	1.31	920
	4	39.2	4 860	1.35	955
	2	19.6	5 058	1.40	1 005
	0	0	5 281	1.46	1 070
SICH-090/120	17.1	167.6	5 250	1.46	650
	16.5	161.7	5 500	1.53	690
	15.2	149.0	6 000	1.66	770
	13.6	133.3	6 500	1.80	850
	11.5	112.7	7 000	1.94	950
	10.0	98.0	7 500	2.08	1 050
	6.7	65.7	8 000	2.22	1 100
	3.6	35.3	8 500	2.36	1 210
	1.0	9.8	9 000	2.50	1 320
	0.0	0.0	9 200	2.55	1 375
SICH-150	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-180	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-240	19.9	195	10 000	2.78	1 395
	18	176	11 000	3.05	1 550
	16.1	158	12 000	3.33	1 565
	13.4	131	13 000	3.61	1 905
	10.7	105	14 000	3.89	2 050
	7.4	73	15 000	4.16	2 240
	3.9	38	16 000	4.44	2 430
	0	0	17 000	4.72	2 675

(1) Performance calculated with wet coil including filtres.

Transportation

The outdoor units should always be transported in a vertical position so as to avoid oil leakage from the compressor. If this position has to be changed for any reason, it should be done only for as long as absolutely necessary.

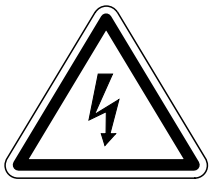
Location

Location should be carried out bearing in mind that a permanent access for maintenance servicing is required, either through the side or rear panels.

The outdoor units should be installed directly outdoors. When installed on the ground, they should rest on supports so as to avoid any snow obstructing the air intake.

Warning signs

The following signs indicate the existence of potentially dangerous conditions. Whenever found on the unit itself, their meaning should be taken into account.



This symbol indicates an electrical risk or danger.

Attention: The unit is equipped with remote control and can run automatically. Two minutes prior to having access to the interior, disconnect the power supply so as to avoid any contact with the fan turbine in motion.

Attention: It is obligatory to read the instructions prior to any handling.

Attention: Do not touch hot surfaces.

Attention: Belt and pulley drive.

Clearances

Clearances should be left in the installation of each unit for:

a) Air intake and discharge of the outdoor unit.
b) Maintenance servicing.
c) Power supply.

For proper operation, the minimum clearances indicated in the general dimension diagrams should always be respected with regard to possible obstruction that could avoid free air circulation or servicing.

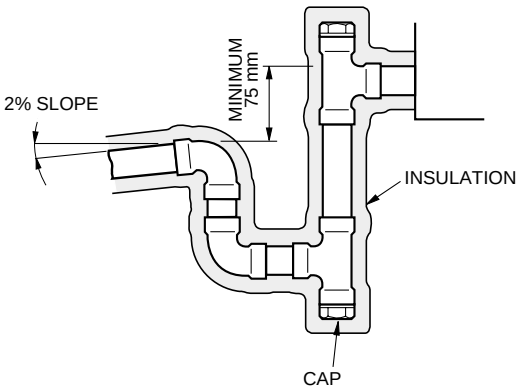
Ductwork (indoor unit)

1- Connect the ducts, isolating them from the unit by means of a flexible hose, preferably of non-combustible material, so as to avoid the transmission of vibrations of the unit. If the ducts are made of flexible material, they do not transfer vibrations.

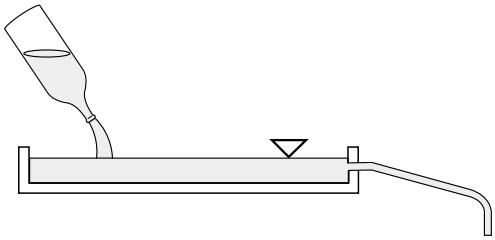
2 - It is advisable to fit a damper at each discharge ducting bypass so as to be able to carry out an appropriate balance of the system.

3 - Make sure to have easy access for cleaning and changing the air filters.

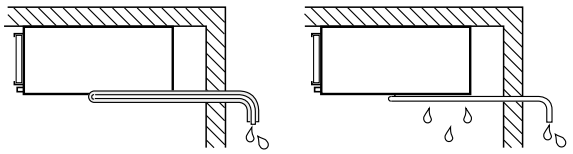
Drain: connection, checking and insulation



Insulate the condensate water drain pipe through the siphon, as indicated in this figure.



Make sure water evacuation is carried out correctly.



Insulate the siphon and drain pipe so as to avoid dripping.

Outdoor units

Condensation in the outdoor coil during the heat and defrost cycles will fall directly on the floor/roof. A bed of gravel is recommended to avoid puddles and splashing.

Take into account that this condensation will freeze whenever outdoor temperature is below 0° C.

Environmental protection

Packing

Packing is made of recyclable material. Its elimination should be carried out in accordance with the existing local regulations on selective collection of residual material.

Elimination of the unit

Upon disassembly after a long service life, the components of the unit should be recuperated ecologically. The cooling circuit contains refrigerant, which should be recuperated and then returned to the gas manufacturer for recycling.

Oil will remain in the hermetic compressor and, therefore, must be returned with its circuit sealed.

The air conditioning unit will be deposited in an area determined by the local authorities, for its selective recuperation.

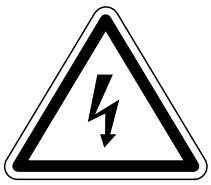
Wiring

Electrical connections

The **established national regulations** should be followed in all cases.

Each heat pump is supplied with a control box, to which the power supply will be connected by means of a fused main switch, or an automatic switch.

The electric heater, if applicable, should be installed with independent power supply and switches.



Tighten cables adequately. If loose, they can produce incorrect operation of the unit, overheating at the terminals as well as a fire.

Do not connect the power supply to the unit, nor start it up until installation is complete.

Make sure the power supply is connected correctly to the units, as shown in the wiring diagrams.

Electrical characteristics

Outdoor units

Model	Power supply V.ph.Hz.		Consumption A					Power supply cable section (2)	Automatic switch (K curve)(1)
	Compressor	Fan	Compressor			Fan			
			Start	Nominal	Maximum	Start	Nominal	mm²	A
SOH-076B	230.3.50	230.1.50	175	21.1	24	6	2.2	10	40
	400.3.50	230.1.50	86	12.1	13.9	6	2.2	4	25
SOH-090B	230.3.50	230.1.50	215	28.2	32.5	6	2.2	10	50
	400.3.50	230.1.50	108	14.7	18.7	6	2.2	6	32
SOH-120B	230.3.50	230.1.50	256	33.3	38.3	2 x 6	2 x 2.2	16	63
	400.3.50	230.1.50	129	19.1	22	2 x 6	2 x 2.2	10	40
SOH-150B	230.3.50	230.1.50	2 x 175	2 x 21.1	2 x 24	2 x 6	2 x 2.2	25	80
	400.3.50	230.1.50	2 x 86	12.1	2 x13.9	2 x 6	2 x 2.2	10	50
SOH-180B	230.3.50	230.1.50	2 x 215	2 x 28.2	2 x 32.5	2 x 6	2 x 2.2	35	100
	400.3.50	230.1.50	2 x 108	2 x 14.7	2 x 18.7	2 x 6	2 x 2.2	16	63
SOH-240B	230.3.50	230.1.50	2 x 256	2 x 33.3	2 x 38.3	4 x 6	4 x 2.2	50	125
	400.3.50	230.1.50	2 x 129	2 x 19.1	2 x 22	4 x 6	4 x 2.2	25	80

Important: Automatic switch dimensioning and power supply 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 conduction.

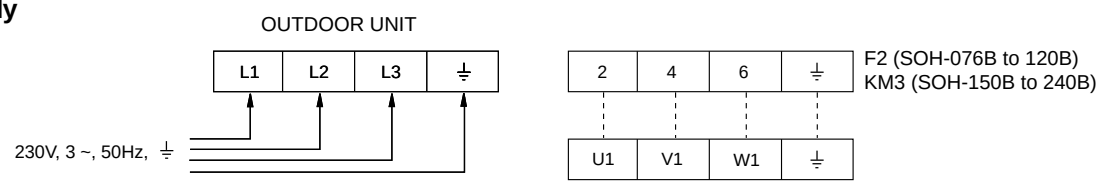
Indoor units

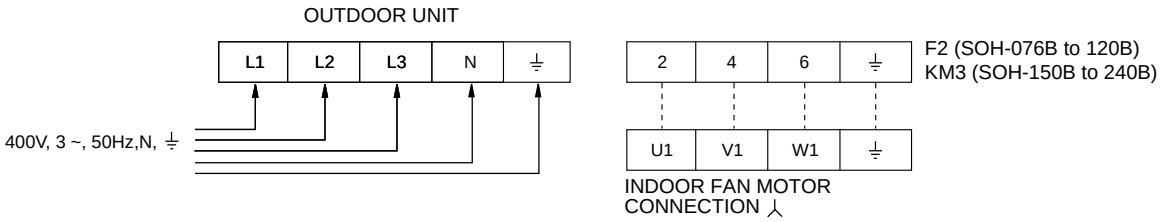
Model	Power supply V.ph.Hz.	Consumption A		Power supply cable section mm²
	Fan	Fan		
		Start	Nominal	
SICH-070/076	230.3.50	14	3.2	4 x 1.5
	400.3.50	8	1.8	4 x 1.5
SICH-090	230.3.50	30	5.5	4 x 1.5
	400.3.50	17.2	3.2	4 x 1.5
SICH-120	230.3.50	30	5.8	4 x 1.5
	400.3.50	17.2	3.4	4 x 1.5
SICH-150	230.3.50	30	5.8	4 x 1.5
	400.3.50	17.2	3.4	4 x 1.5
SICH-180	230.3.50	59	10.8	4 x 2.5
	400.3.50	34	6.3	4 x 1.5
SICH-240	230.3.50	59	10.8	4 x 2.5
	400.3.50	34	6.3	4 x 1.5

Important: Dimensioning of power supply sections is orientative and should be corrected in accordance with conditions at job site, length between units and legislation in force.

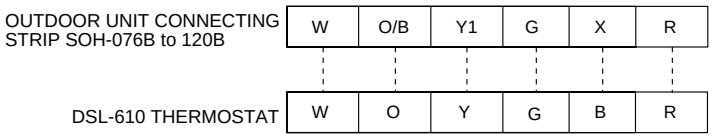
Power supply and thermostat connection diagrams

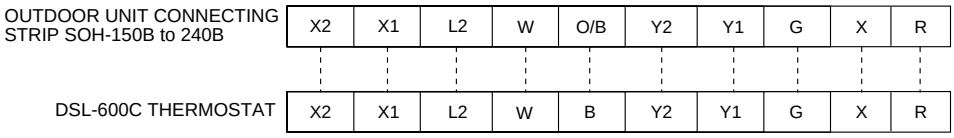
Power supply





Thermostat





Operating Instructions

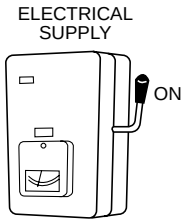
General Information

Automatic temperature start-up and regulation is carried out by means of an ambient thermostat.
Locate the thermostat at approximately 1.5 m. above floor level, where no obstacle can avoid measuring the real temperature of the room.

Important warning

The thermostat should be placed on a wall not exposed to direct sunlight; otherwise, temperatures would not be real and operation would be inadequate. Before starting up, turn the general switch on so as to supply power to the electrical heater of the compressor crankcase.
The compressor should not be started until a minimum of eight hours later.
This is done to evaporate any refrigerant in liquid form that may be been mixed with the oil in the compressor.

CAUTION



Connection:
To preheat the system, the electric heater should be turned on at least 8 hours prior to starting the air conditioning unit. Leave the power supply on, unless the air conditioner is not to be used during long periods of time.

Recommendations for best operation

- Turn the air conditioning on before the room gets warm. Any heat accumulated on furniture, walls, etc., makes the unit take longer to reach the desired temperature.
- It is advisable to inspect and service your equipment whenever necessary; this avoids damage and insures long service life of your air conditioner.

Control thermostats DSL-600C and DSL-610 (ARTTH003S & ARTTH001S)

These thermostats are designed to give precise ambient temperature control and graphic information with regard to heat pump operation. This control has a Proportional-Differential-Integral response and, depending upon the difference between the programmed temperature and the ambient temperature, reacts varying the on-off cycles, between 3 and 7.5 cycles per hour.
The liquid crystal (LCD) screen normally indicates the ambient temperature, operating mode and whether the cooling or heating system is operative.
It allows selecting different temperature set points for cooling and heating, as well as their indication in °C or °F.
The fan can be set to operate in a continuous or automatic mode, stopping and operating jointly with the compressor.
The controls are located beneath a cover that avoids handling by unauthorised personnel.

Operation and start up

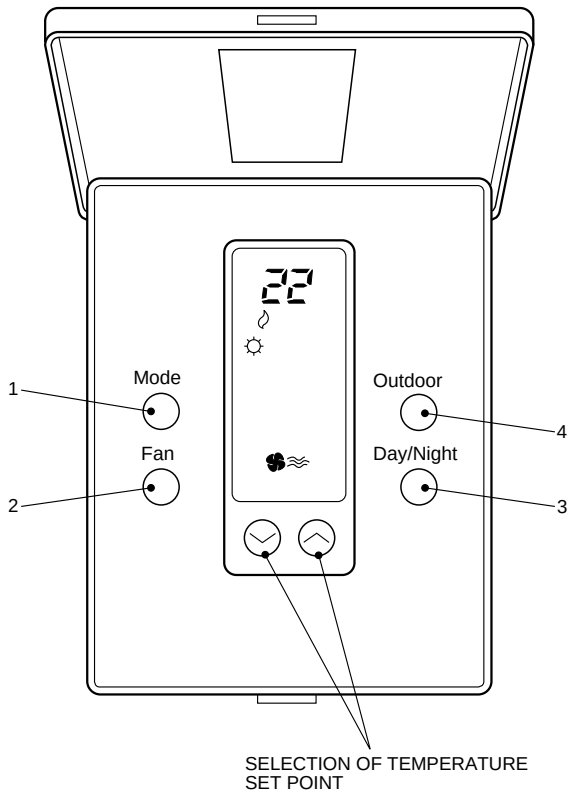
Start up is carried out by means of the thermostat controls.

1.- MODE
Pressing this button sets the heat pump operating mode. When pressed, alternatively, the LCD screen shows the following operating modes:

- COOL - Controls the system in the cooling mode. (The word COOL appears on screen for 5 seconds.)
- HEAt - Controls the system in the heating mode. (The word HEAt appears on screen for 5 seconds.)
- Auto - Controls the system in either the cooling or heating modes, as needed. (The word Auto appears on screen for 5 seconds.)
- E Ht - Controls the system in the emergency heating mode (operates only if an electric heater, optional accessory, is installed).
- OFF - Disconnects the system.

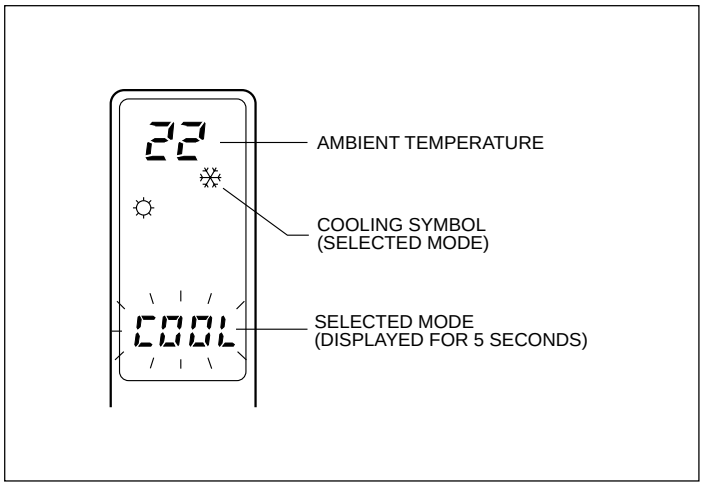
Controls and indicators

1.- Selection of operating mode.
2.- Selection of fan speed.
3.- Day/night selection.
4.- Option for displaying outdoor temperature (DSL-600C).

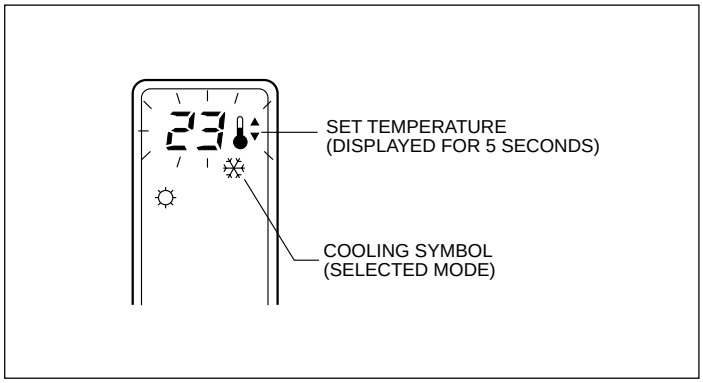


a) **Cooling**

Press the MODE button alternatively until the cooling symbol ❄ appears on screen (along with the word COOL for 5 seconds). The cooling symbol remains visible on screen.



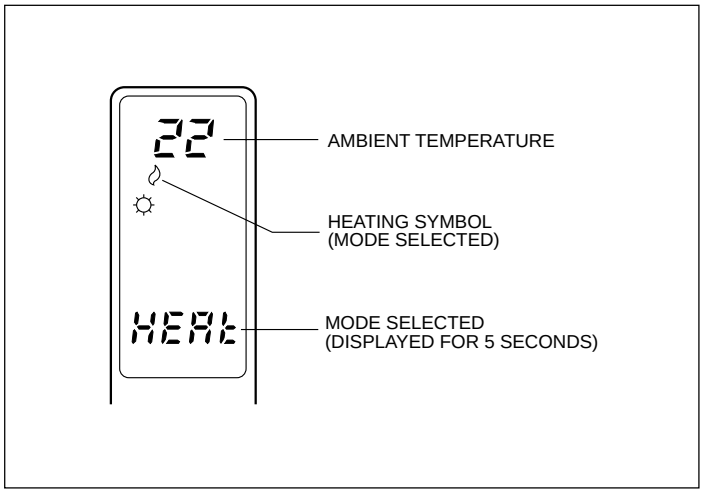
Once the operating mode is set, select the temperature setting by pressing button ⌃ or ⌄, so as to set a higher or lower temperature. The temperature setting appears along with a small symbol that represents a thermometer, and remains on screen for 5 seconds. When the temperature setting disappears, the ambient temperature appears once again.



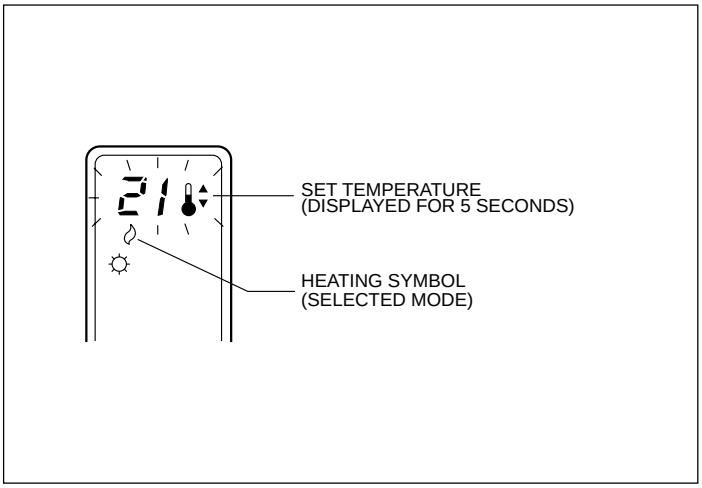
After a few minutes, the cooling system will begin to operate and the cooling symbol on screen will start to flash.

b) **Heating**

Press the MODE button alternatively until the heating symbol ♨ appears on screen (along with the word HEAt for 5 seconds). The heating symbol remains visible on screen.



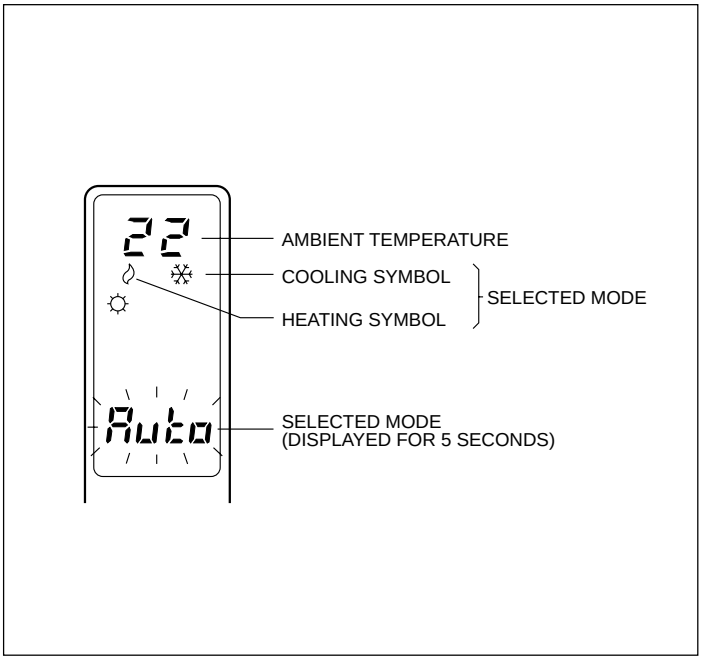
Once the operating mode is set, select the temperature setting by pressing button ⌃ or ⌄, so as to set a higher or lower temperature. The temperature setting appears along with a small symbol that represents a thermometer, and remains on screen for 5 seconds. When the temperature setting disappears, the ambient temperature appears once again.



After a few minutes, the heating system will begin to operate and the heating symbol on screen will start to flash.

c) **Automatic**

Select a temperature setting for the cooling mode and another for the heating mode, as described in paragraphs a) and b). In this operating mode, the COOL temperature setting should be at least 1°C above the HEAt temperature setting, which is the minimum differential allowed by the thermostat. Press the MODE button alternatively until the heating ♨ and cooling symbols ❄ appear on screen (along with the word Auto for 5 seconds). The heating and cooling symbols Auto remain visible on screen.



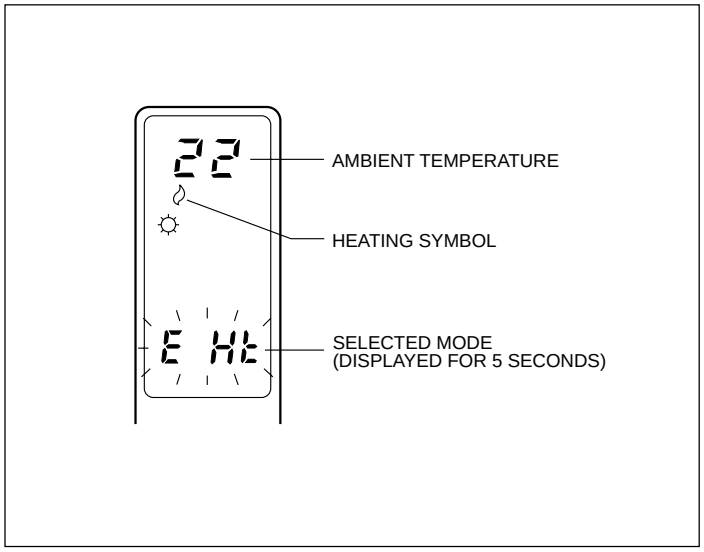
After a few minutes, the system will begin to operate, switching automatically between the heating and cooling modes so as to keep the ambient temperature between the two settings. When either the heating or cooling mode are in operation, the corresponding symbol starts to flash.

d) **Emergency heating**

Press the MODE button alternatively until the word E HE appears on screen (visible for 5 seconds), along with the heating symbol. After a few minutes, the emergency heating system will begin to operate, and the heating symbol on screen will start to flash.

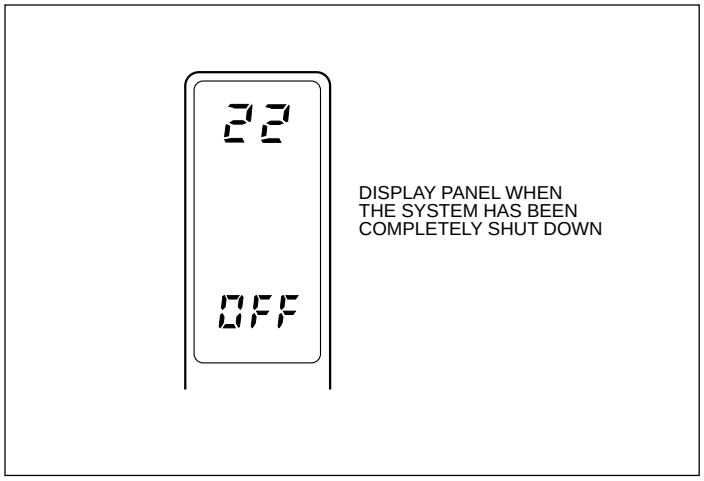
In this operating mode, the compressor is always inoperative and the auxiliary and emergency heaters (optional accessories), if installed, are used for heating.

This operating mode can be used for heating when there is any problem with the compressor.



e) **Off**

Press the MODE button alternatively until the word OFF appears on screen. The heat pump is turned off and the word OFF , along with the ambient temperature, remain permanently visible on screen.



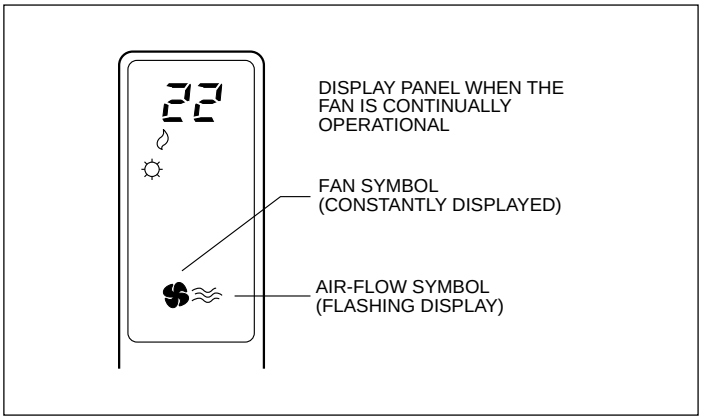
f) **°C/°F scale**

To change the temperature scale, press buttons and simultaneously.

2.- Fan

Pressing the FAN button puts the fan in continuous operation (independent of the operating mode of the unit), and the thermostat screen shows the fan and air flow symbols, the continuous fan and the flow symbols; fan always on and air flow flashing.

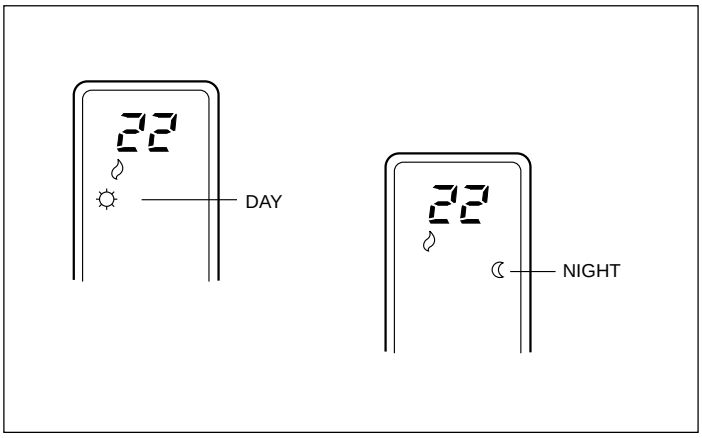
By pressing the FAN button once again, the symbol disappears and the fan operates automatically, in accordance with the compressor or the electric heater (if installed).



3.- Day/Night setting

By pressing the DAY/NIGHT button you can select different temperature settings, for the day or night periods (in each one of the operating modes). Upon installing the thermostat, the symbol appears on screen, indicating that the temperature setting is for the daytime. Upon pressing the DAY/NIGHT button, or closing the inner connecting strip contact of the thermostat CLK1 and CLK2 with an auxiliary external timer, the symbol appears on screen, indicating that the temperature setting is for the night-time.

Whenever this button is pressed alternatively, the established temperature settings, whether they be for day or night , will be altered.



4.- Option for displaying outdoor temperature (DSL-600C)

Optionally, the thermostat allows installing an outdoor temperature sensor. This temperature can be displayed by pressing the OUTDOOR button.

This outdoor sensor is to be connected to the inner connecting strip of the thermostat, terminals RS1-RS2-RS+V.

5.- Ambient temperature remote sensor option (DSL-600C)

The DSL thermostat is designed to accept a remote sensor for controlling the ambient temperature of a room other than the one the DSL thermostat is located in. This remote sensor is to be connected to the inner connecting strip of the thermostat, terminals RS1-RS2-RS+V.

6.- LED 1 option (DSL-600C)

The thermostat has a LED that, if actuated by 24 V (by means of an external timer or pressure switch signal), could indicate the need to clean the filter.

7.- LED 2 option (DSL-600C)

The thermostat has a second LED that, if actuated by 24 V through terminal Led2 (Rolon board) or a lock-out relay, can be used as a service demand.

8.- X1-X2 communication option (DSL-600C)
The thermostat has two terminals that allow communication with the Rolon control board. By means of this external communication with a PC, temperature set points can be modified and the unit operating mode can be selected.

9.- Keyboard locked
When the keyboard is locked (DIP switch in ON position), the user can change the temperature set point in ±3º C for 1 hour.

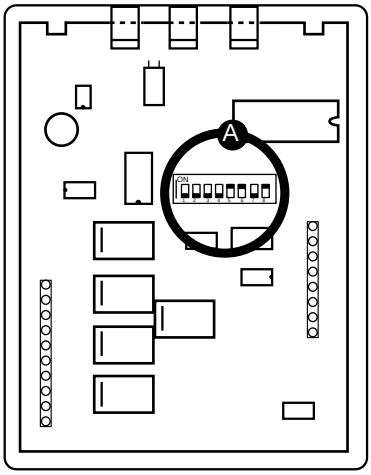
10.- Economy - comfort
The “comfort” mode allows immediate activation of the unit when the user changes the temperature set point.

11.- Graphic Information
The screen is continuously giving us information on: the ambient temperature, operating mode, day/night period and fan operation. To have access to information on the temperature set points press, just once, one of the temperature setting buttons. This will give us, on screen and for 5 seconds, the temperature set point established for the operating mode that is visible on screen at that moment.

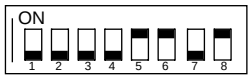
Internal configuration of thermostat (DSL-600C)

The thermostat has a configuration system (options) based on micro-switches located in the its base board.
The standard configuration of the thermostat should be as described in the following section.

Setting of micro-switches (DSL-600C for 2-circuit units)



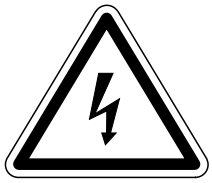
DETAIL A



DIP Switch in the OFF position	DIP Switch in the ON position
1. Normal	1. Add On
2. Do not use	2. Do not use
3. 4 minutos (Min. ON)	3. 2 minutes (Min. ON)
4. Keyboard unlocked	4. Keyboard locked
5. Economy	5. Comfort
6. 1 stage	6. 2 stages
7. LED 1+OFF icon	7. LED 1+filter icon
8. LED 2+OFF icon	8. LED 2+serivice icon

Maintenance

Clean the casings with a rag moistened in a mild liquid detergent.



Do not spill water on the unit for cleaning purposes. Water could damage internal components and cause electric discharges.
Never use neither solvents nor strong chemical products on the indoor units. Do not rub the casing with very hot water.

SICH indoor units ductwork

The discharge of the indoor units equipped for ducts are supplied
without a protecting grill. When carrying out maintenance servicing, keep this in mind.

CAUTION

In the case of installing an indoor unit with free discharge and equipped for ducts, the outlet opening should be protected with a grill. The lack of this protection could provoke damage caused by the fan turbine.

Cleaning the air filters

Keep the coil filters in good condition, checking them at least every month. If filters are dirty, they limit air flow and equipment performance.

Cleaning the outdoor coil

Dirt should not be allowed to accumulate on the outdoor coil. It should be cleaned as frequently as needed, with a brush, vacuum cleaner or detergent.

CAUTION

For safety reasons, make sure to turn the air conditioner off, and unplug the power supply, before cleaning.

CAUTION

Check the outdoor coil periodically to see if the air inlet or outlet are clogged by dirt or leaves, etc.
The coil and other components of the outdoor unit should also be cleaned periodically. Contact your dealer or maintenance service.

Priming the condensate drain trap

So as to avoid having problems with the condensed water, we recommend that, at start-up and before the beginning of each season, the drainage trap be filled with water so as to avoid air being sucked in through this tubing.

Checking vee-belt tension

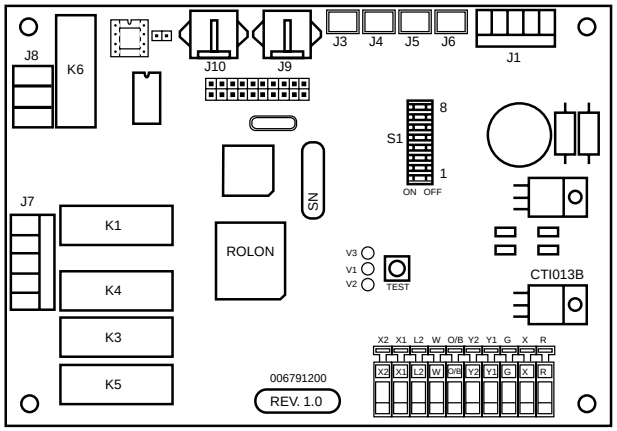
The tension and wear of the motor belts should be checked every year, and changed if necessary. Before carrying out this operation, turn the main power supply switch off.

CAUTION

For safety reasons, make sure to turn the air conditioner off, and unplug the power supply, before checking fan motor belt tension.

Operation

The control board of these units is common to both the cool only as well as the heat pump units. By connecting an additional module, two-compressor equipment can be controlled. System control is carried out in accordance with the position of the microswitches in the main board. There are also variations in the control algorithm, depending upon the accessories the board detects installed in the equipment.



Indoor fan

Operation can be continuous or automatic. For continuous operation, select said operation on the thermostat.
If the internal probe (optional accessory) is installed, and the operating mode is heat, the fan will not start until the indoor coil has reached 35° C, and will stop when this temperature drops to below 30° C. Whenever the electric heating starts, the indoor fan will also start.

Outdoor fan

The outdoor fan starts 5 seconds before the compressor. And stops after the compressor stops.

4-way valve

When SW6 of the control board is set to ON, the 4-way valve activates when the thermostat requests heat. When a defrost is carried out, this valve operates inversely; that is to say, in cool.

Compressor

When signal Y1 is present, the board commands the outdoor fan to become operative, and then the compressor. The compressor, along with the outdoor fan, does not start until after a minimum off time, so as to avoid consecutive start-ups. This period of time can be set by means of microswitches SW4; ON = 2' and OFF = 5'.
In two-stage equipment, the first compressor to start up will be the one that has been less hours in operation.
The second compressor will start if a Y2 signal is received from the thermostat.
Whenever one of the compressors is to turn off, it will be the one that has been most hours in operation.

Defrost

The defrost cycle is possible only in heat pump operation.
In two-stage units, simultaneous defrost of both stages is not allowed, one remaining in standby until the other one has finished.

Start-up

The following conditions should apply:
1) The compressor is on.
2) The liquid probe temperature is below -3° C for 3'.
3) If outdoor temperature is below 0° C, after compressor start-up 10' are timed before activating the defrost cycle.

When the defrost cycle is started, the board carries out the following operations:
1) Sets the 4-way valve to cool mode.
2) Turns the outdoor fan off.
3) Activates the following heat-generating phase, if the thermostat requires heat.
4) Turns the indoor fan off if there is no next heat stage.
5) Does not turn off the compressor that is defrosting, even if indicated by the thermostat.

End

This operation will last until one of the following conditions is completed:
a) Liquid temperature above 13° C during 2".
b) Liquid temperature above 5° C during 30".
c) Timing period after defrost start-up over 10'.
d) Failure signal from high pressure switch.

Once defrost is over:
1) Sets 4-way valve to heat.
2) Turns outdoor fan on.
3) Starts indoor fan if no next heat stage exists.
4) Turns off heat generating phase that started due to the defrost cycle.

Test button and LEDs

Pressing the Test button shortens certain timings, resets any failure detected and also acts as a LonWorks service pin.
There are three signalling led diodes:
a) The green led indicates correct operation of the equipment and incidents. If the equipment is operating correctly, this led flashes at a frequency of 1.6 Hz.
b) The red led indicates failures. If no failure is present, this led remains off.
c) The yellow led is the LonWorks service led, and also indicates, by flashing, that the operating compressor is timed.

System configuration

Each time the electronic board is powered, system configuration will be checked, with the exception of the accessories. Below we can see how the different options are configured.

DIP switches

They are read after power supply connection, and the board will act in accordance with their position. SW1 and SW2 set to OFF indicates that the configuration is carried out by remote control, and the parameters stored in the EEPROM memory are use.

Configuration of switches

The DIP switches establish the following configurations:

Number	State	Meaning
1 / 2	OFF/OFF	Ignore SW, programs communication routes
	ON/OFF	Defrost period 30'
	OFF/ON	Defrost period 60'
	ON/ON	Defrost period 90'
3	ON	Discharge temperature 115°C
	OFF	Discharge temperature 130°C
4	ON	Compressor delay 2'
	OFF	Compressor delay 5'
5	ON	Cool mode
	OFF	Heat pump mode
6	ON	4-way valve active in heat
	OFF	4-way valve active in cool
7	ON	Receives signal B from thermostat (active in heat)
	OFF	Receives signal O from thermostat (active in cool)
8	ON	NA
	OFF	NA

Configuration of accessories

To carry out an accessory search and configuration, the test button should be pressed for over two seconds, until the red led goes on. Once the search and configuration process begins, the red led on the board goes on, and stays on until the operation is concluded. Once off, the board uses the accessories found.

Said search will also determine which optional probes are connected to the board. A incident will be give if one of the optional probes detected in the configuration process does not give valid values. The following table shows the probe configuration.

Probe	Pump	
	Standard	Optional
Discharge	X	
Liquid	X	
Outdoor	X	
Suction	X	
Indoor coil		X

Installation of accessories

The accessories are used to support extended functions of the unit.

Said accessories can be either factory mounted or installed by the client. Power supply to the unit should always be disconnected. The accessory, along with the necessary elements, will then be assembled, and the power supply connected once again.

Once the search and configuration sequence is carried out, the new elements will be recognised and they will begin to operate.

The function of the different accessories is defined below.

Tray heater

It is used to power a cable heater mounted between the lower area of the outdoor coil and the tray, where the defrost water is collected. Its function is to avoid freezing of the water in the tray and ice in the lower area of the coil.

This heater should be activated in the winter cycle, while the compressor is operative, and when the liquid temperature is below -2° C; and deactivated when the temperature is above 2° C.

Electric heating

In the case of the heaters, the relay is used to switch the power contactor on and off, as well as the thermal switch with safety automatic reset.

In one-stage equipment, the response to a demand for first stage from the thermostat starts the compressor stage, and the second starts the electric heating.

In the case of a failure in the compressor stage, the electric heating would be activated as the first stage.

Whenever the electric heating is on, the indoor fan will also be operative.

Indoor coil probe (SOH-076B to 120B)

The probe in the indoor coil, depending upon the temperature, carries out the following operations:

1) If in heat operating mode, and the electric heater is not activated, the fan will not start until the indoor coil reaches 35° C. If the electric heating is not activated, the indoor fan will turn off if the temperature drops below 30° C. If once the compressor is operating in heat mode for 2' the indoor temperature does not reach over 35° C, an unrecoverable heat temperature incidence is indicated.
2) If in cool operating mode, and the probe temperature is below -25° C, or the compressor is in operation for over 5' and the temperature is below -4° C, the compressor and outdoor fan go off. After the timed period, the compressor starts again. If this is repeated three times in 35 minutes, a failure of repeated start-up in cool is indicated, and the compressor will not restart.

Malfunctions

There are two different types of malfunctions: incidents that do not turn the unit off, and failures or lockouts, that inactivate the unit.

Indoor fan thermal switch

Its activation turns the entire unit off, and an indoor fan thermal switch failure is indicated.

High and low pressure switch

Its activation turns the compressor and outdoor fan off. A high or low pressure failure of the switch is indicated.

Electric heating thermal switch (accessory)

Activation turns the electric heating off and indicates an incident. If this error occurs more than 3 times in an hour, an electric heater thermal switch incident is indicates, and the electric heater is turned off.

Thermostat errors

If signal Y is given without signal G, it acts as if signal G were active. An incident of signal Y1 without signal G is indicated.
If signal W is given without signal G, it acts as if signal G were active. An incident of signal W without signal G is given.
If signal W is given without signal B/O, it acts as if signal B/O were indicating heat mode. An incident of signal W without signal B/O is given.

Protection for defrost cycles

If 3 consecutive defrost cycles are carried out and ended in compliance with the 10' timer, an incident of repeated defrosts is indicated. This incident is deleted when a defrost cycle is ended in compliance with another condition that is not the maximum timer period.

Protection for temperature

a) If the outdoor temperature is below -20° C, the compressor turns off. An incident of low outdoor temperature (only in heat mode) is indicated.
b) If the discharge temperature is above SW3; ON = 115° C, OFF = 130° C, the compressor and outdoor fan turn off. An excessive discharge temperature failure is indicated.
c) If while the compressor is on for 5', the discharge temperature does not rise above 50° C, in cool mode, or 35° C in heat mode, a low discharge temperature incident is indicated.
d) If the suction temperature is very low, the compressor and outdoor fan turn off. If this is repeated 3 times in 35 minutes, a failure is indicated.
e) If, in heat mode, the liquid temperature is below -25° C, the compressor and outdoor fan turn off, and a failure is indicated.

Open or short circuit of the outdoor or indoor liquid probes

An incident of the corresponding probe is indicated if the value read is below -40° C, or above 100° C. If this incident takes place in heat mode in the liquid probe, repeated defrost cycles are carried out with a maximum duration of 1'.

Open or short circuit of discharge probe

An incident of the discharge probe is indicated if its value is below -20° C, or above 150° C. If the probe is short circuited, a failure is indicated.

Signalling

Malfunction signalling is carried out at two levels. One for incidents and another for failures.

Incidents

Incidents do not turn the unit off, and are indicated by the green led on the electronic board. If there is no failure present, this led flashes at a frequency of 1 Hz.
When an incident occurs, the led flashes in three sequences. The first indicates the compressor involved: one flash for stage 1, and two for stage 2, followed by a short pause. The second indicates the type of incident. Another short pause. The third indicates the incident detected, followed by a long pause, and the sequence is repeated again as long as the incident lasts. The incidents reset when the cause disappears. In the case of more than once incident at the same time, only the first one detected and not reset is indicated. As they reset, the other existing incidents will be indicated.
The following table shows the possible errors:

Type	Flashes 2nd	Flashes 3rd	Incident
Probes	1	1	Discharge probe open or >150ºC
	1	2	Liquid probe open or short circuited
	1	3	Outdoor probe open or short circuited
	1	4	Indoor probe open or short circuited
	1	5	Outdoor temperature too low
Thermostat	2	1	Signal Y1 or Y2 without signal G
	2	2	Signal W without signal B
	2	3	Signal W without signal G
	2	4	Signal Y2 without signal Y1
Electric heater	3	1	Electric heater thermal switch AUX1
	3	2	Electric heater thermal switch AUX2
	3	3	Electric heater thermal switch EM1
	3	4	Electric heater thermal switch EM2
Temperature	4	1	Repeated defrost cycles
	4	2	Discharge temperature does not recover
	4	4	Temperature in heat does not recover
Others	5	1	ID of transceiver unknown
	5	2	Accessory disappeared

Failures (lockouts)

Failures or lockouts turn the unit off.
They are indicated by the red LED on the board, and by means of the thermostat (depending upon the model). Relay K6 of the board is also activated with a 24 VAC signal between terminals LED2 and B of J2. If no failure is present, this led remains off. When a failure takes place, this LED flashes in two sequences. The first indicates the compressor involved: one flash for stage 1 and two for stage 2, followed by a short pause. Then the detected failure is indicated, followed by a long pause and the sequence is repeated.
Should more than one alarm take place, only the first one

detected and not reset is indicated.
The following table shows the possible errors:

Flashes	Meaning
1	Discharge temperature surpassed or probe short circuited
2	High pressure switch
3	Low pressure switch
4	Indoor or outdoor fan thermal switch
5	Repeated start-ups in cool
6	Low liquid temperature

Reset

The incidents, with a few exceptions, do not need to be reset. They reset automatically once the cause has disappeared.
The following incidents require resetting, and are reset in the same way as the alarms:

a) Accessory disappeared.
b) Repeated defrost cycles (also reset if a defrost cycle ends under normal conditions).
c) Electric heating thermal switch.

These alarms can be reset as follows:

1) Setting the thermostat to OFF, if communication with the thermostat has been implemented.
2) Pressing the reset button on the electronic board.
3) Disconnecting and reconnecting power supply to the electronic board.
4) By means of the communications trunk.

It is worth pointing out that, with a reset by means of setting the thermostat to OFF, the board cannot be reset more than 3 times a day.

Refrigerant circuit

The SOH-076B, SOH-090B and SOH-120B units have one single circuit. The SOH-150B, SOH-180B and SOH-240B units have 2 circuits. These units are supplied without valves, with connections ready for brazing. The refrigerant load should be fully charged at the job site. See the cooling interconnection process and refrigerant load in the following sections.

Cooling interconnections

When connecting the two units, take special care that the tubing to be used is kept clean and dry prior to installation. The following recommendations should be taken into account:

1- Use cooling quality copper tubing only.
2- Do not work outdoors when raining.
3- The ends of the tubing should remain closed during installation.
4- Do not leave dryer filters or the compressor out in the open for over one or two minutes.
5- For welding use low melting point rods containing at least 5% silver.
6- While welding, and as long as the tubing is hot, apply a current of dry nitrogen so as to avoid rust and scales inside the tubing that could produce contamination and obstruction.
7- Strippers should not be used on copper-copper joints.

Diameter of interconnecting tubing

Model	Gas line diameter (wide tubing)	Liquid line diameter (narrow tubing)
SOH-076B & 150B	$1^1/_8$" (28.5 mm)	1/2" (12.7 mm)
SOH-090B, 120B, 180B & 240B		5/8" (15.87 mm)

Emptying and dehydrating

Air does not act as a refrigerant as it cannot be liquefied by the compressor. Any air or humidity remaining in the cooling system has undesirable effects, as indicated in the following list. Consequently, it should be completely eliminated.

- Increase in high pressure.
- Increase in power consumption.
- Decrease in equipment performance.
- Water contained in the air can freeze and block the capillary tubes.
- Water can cause corrosion of certain parts of the circuit and deteriorate the compressor.

Emptying and dehydrating should be carried out with a vacuum pump.

The vacuum needed is 200 microns (0.2 mm. Hg).

The vacuum pump should be connected to the cooling circuit at the corresponding ¼" SAE connections. This will allow emptying and dehydrating the units and the interconnecting tubing.

Detecting leaks

Checking the single circuit of the two units for leaks will be carried out with refrigerant and an auxiliary detector.

Refrigerant load

The nominal refrigerant load is calculated for a tubing length of 7.5 m.

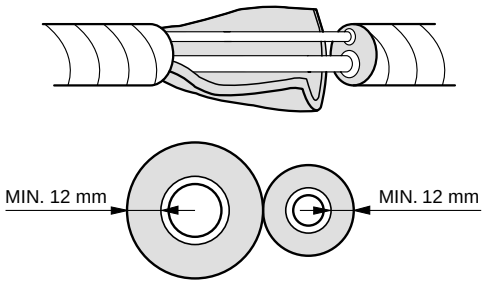
Model	Nominal load R-22 kg	Number of circuits	Liquid line diameter	Additional load grs. (per meter)
SOH-076B+SICH070/076	8.9	1	1/2" (12.7 mm)	104
SOH-090B+SICH090/120	11	1	5/8" (15.87 mm)	170
SOH-120B+SICH090/120	13.5	1	5/8" (15.87 mm)	170
SOH-150B + SICH150	9	2	1/2" (12.7 mm)	104
SOH-180B + SICH180	11	2	5/8" (15.87 mm)	170
SOH-240B + SICH240		2	5/8" (15.87 mm)	170

Adjusting refrigerant load

For tubing lengths longer or shorter than 7.5 m., the nominal refrigerant load should be increased or decreased by the number of grams indicated in the previous table, for each additional or missing meter of liquid tubing.

Insulating the tubing

To avoid losses of heat or dripping, both tubings should be insulated. Insulation should be at least 12 mm. thick.

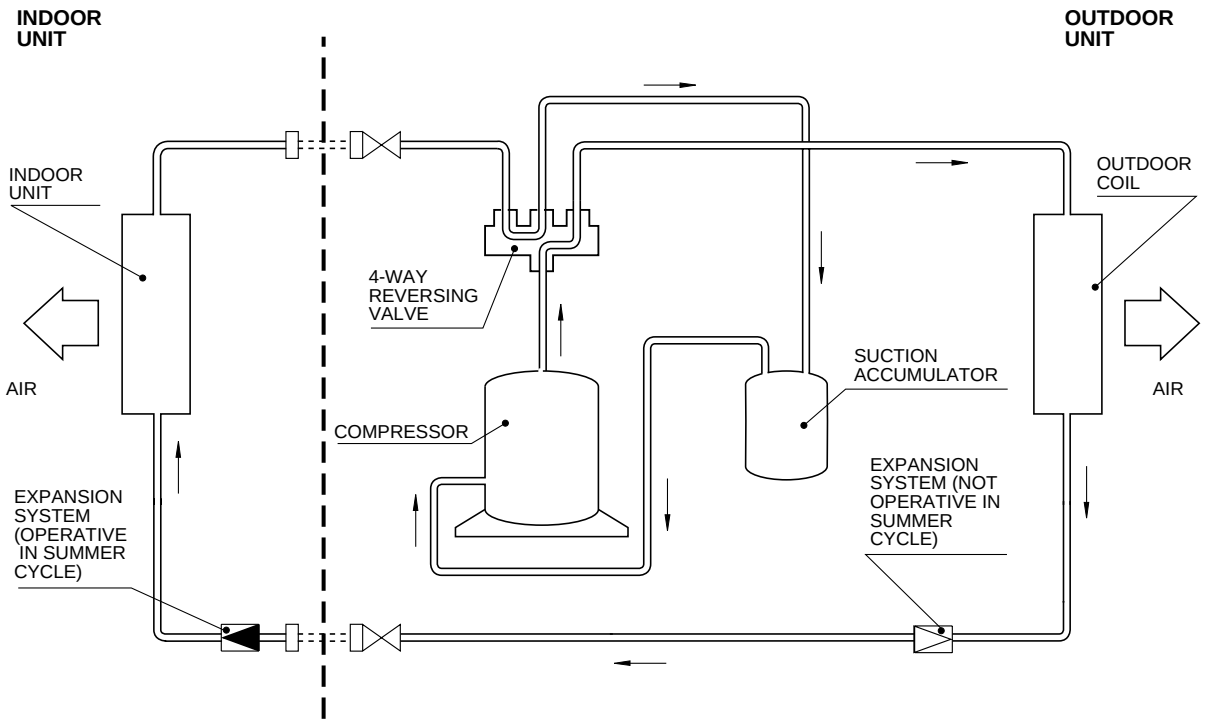


CAUTION

After insulating the tubing, never try to bend it excessively since it could crack or break.

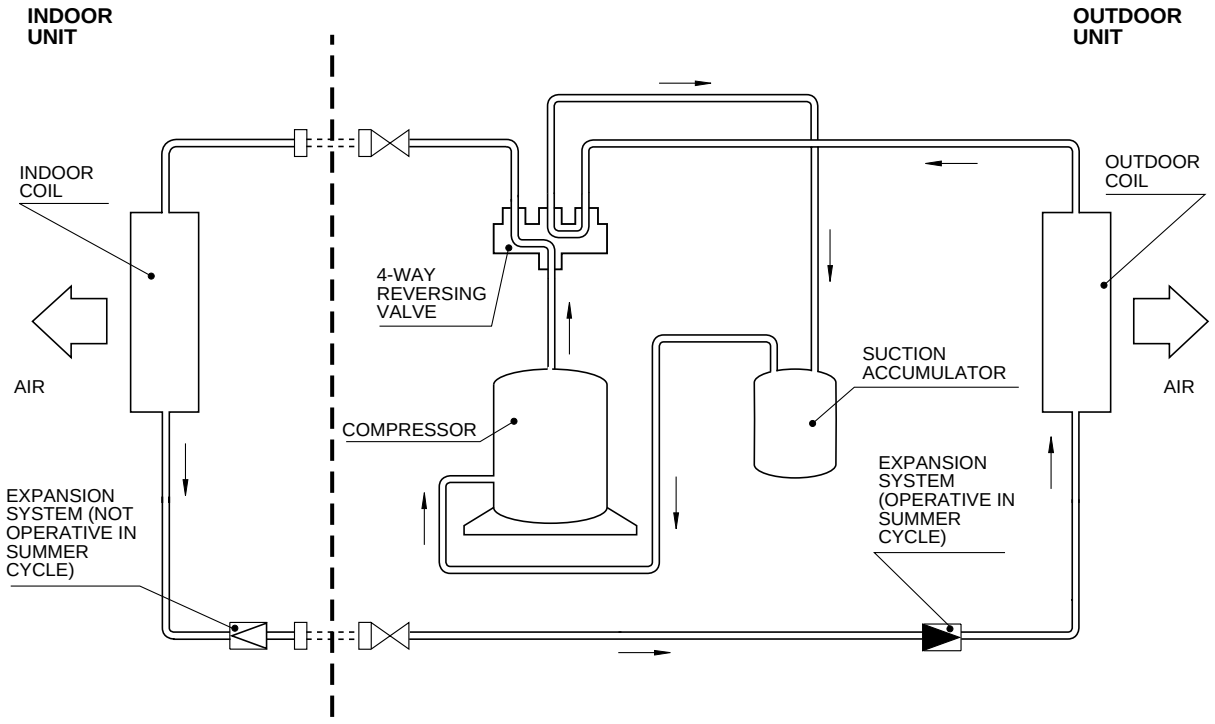
Cooling circuit diagram

Cool cycle



(⟶ DIRECTION OF REFRIGERANT)

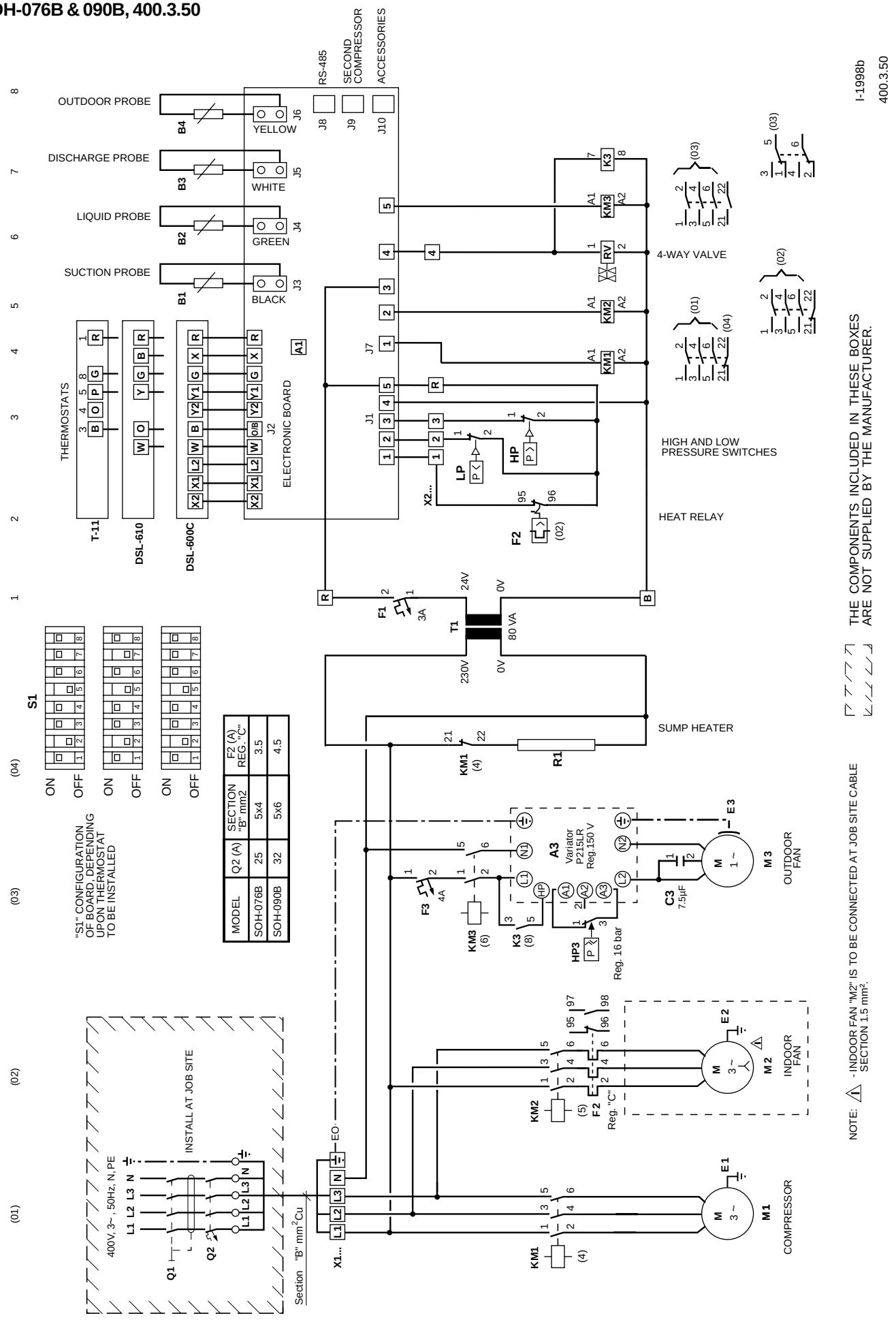
Heat cycle



(⟶ DIRECTION OF REFRIGERANT)

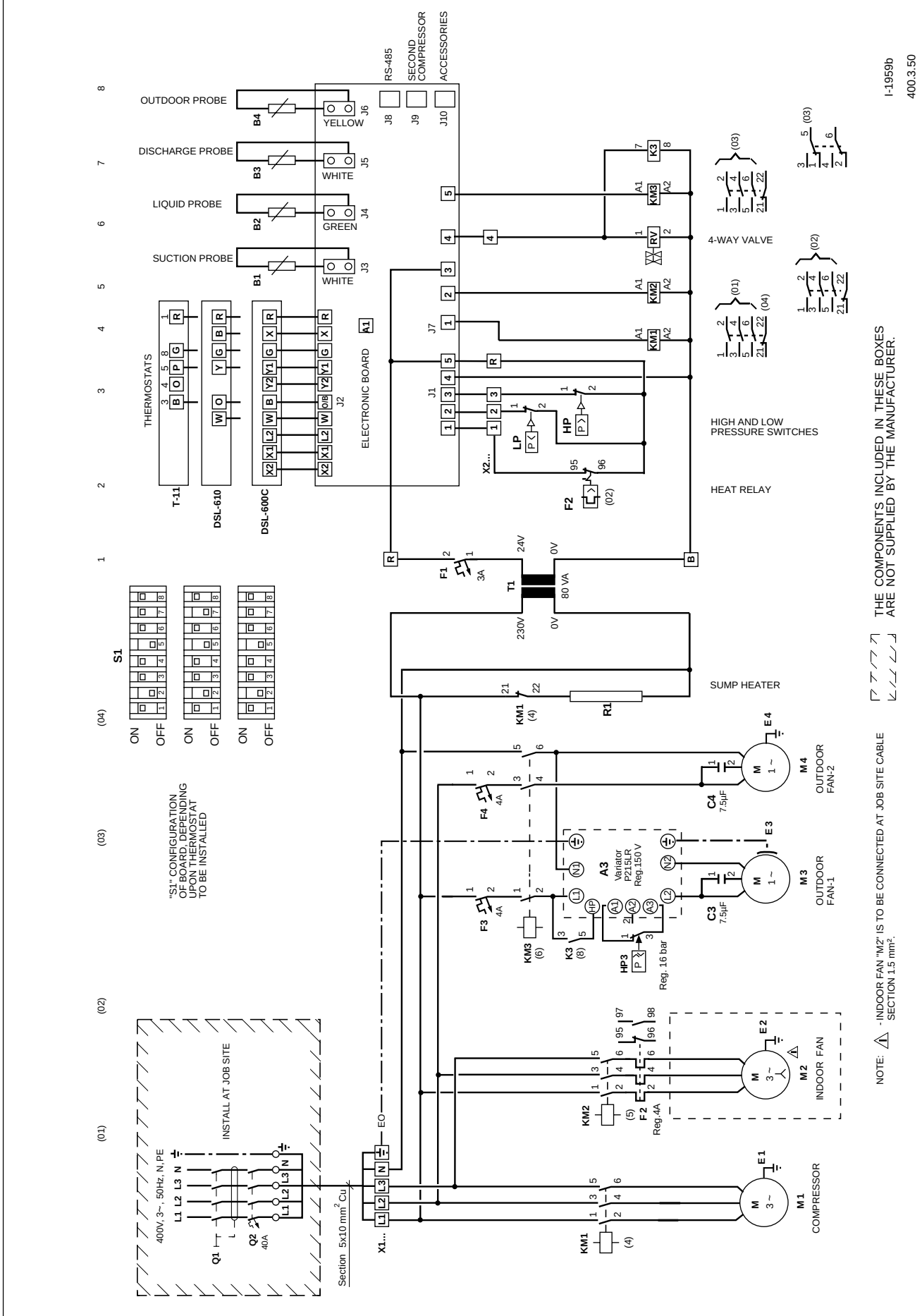
Wiring diagram

SOH-076B & 090B, 400.3.50



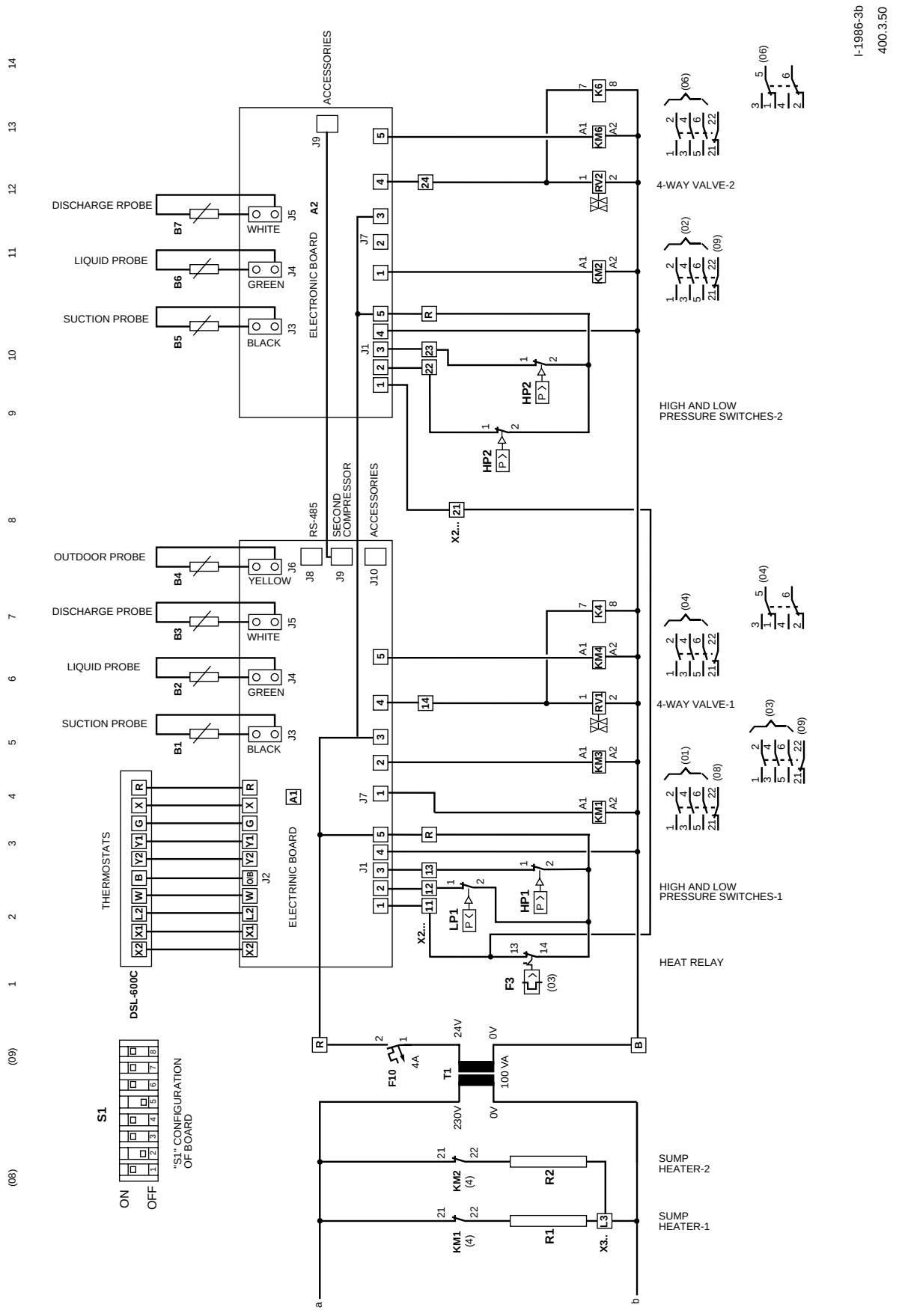
Wiring diagram

SOH-120B, 400.3.50



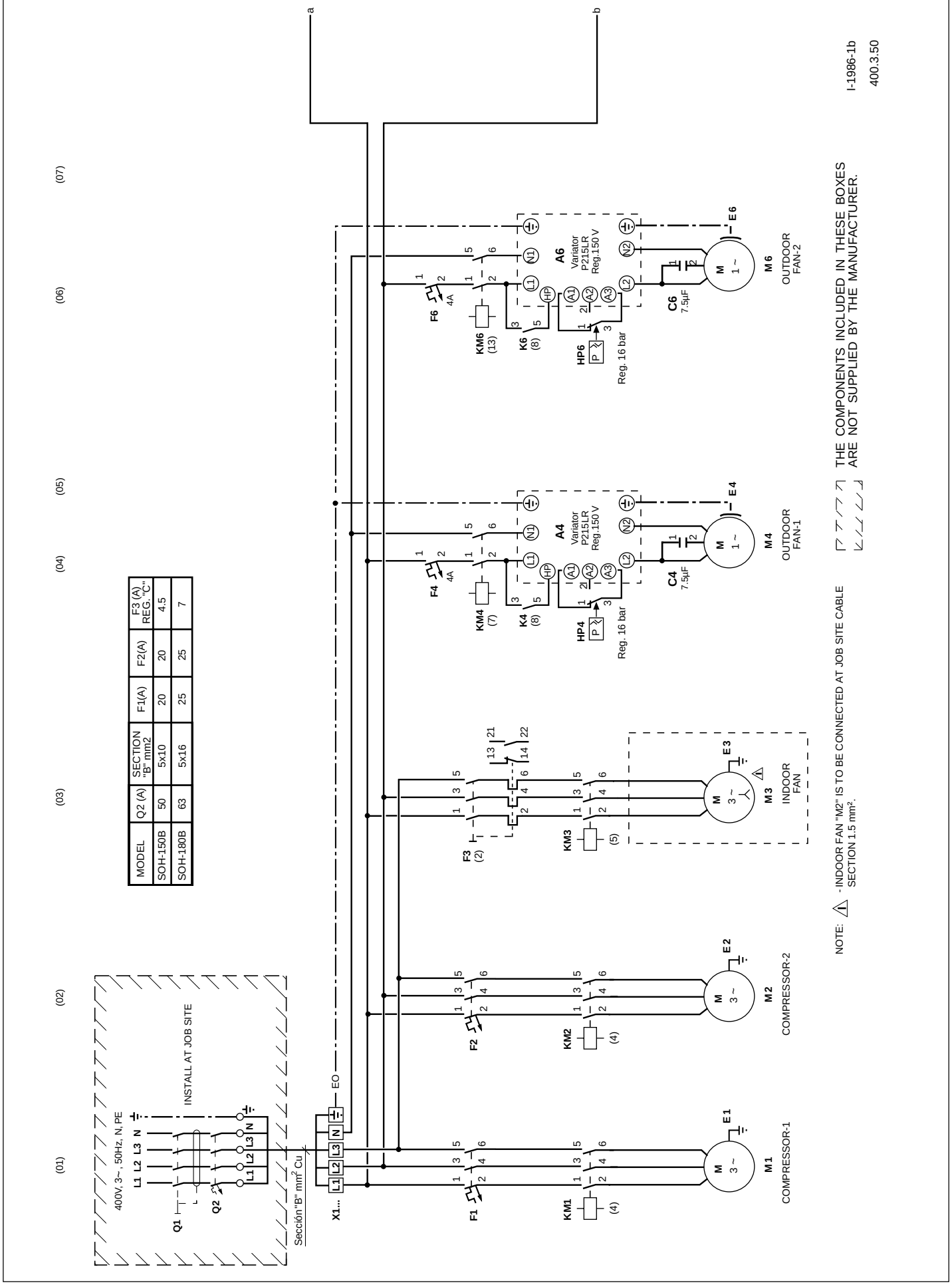
Wiring diagram

SOH-150B, 180B & 240B, 400.3.50



Wiring diagram

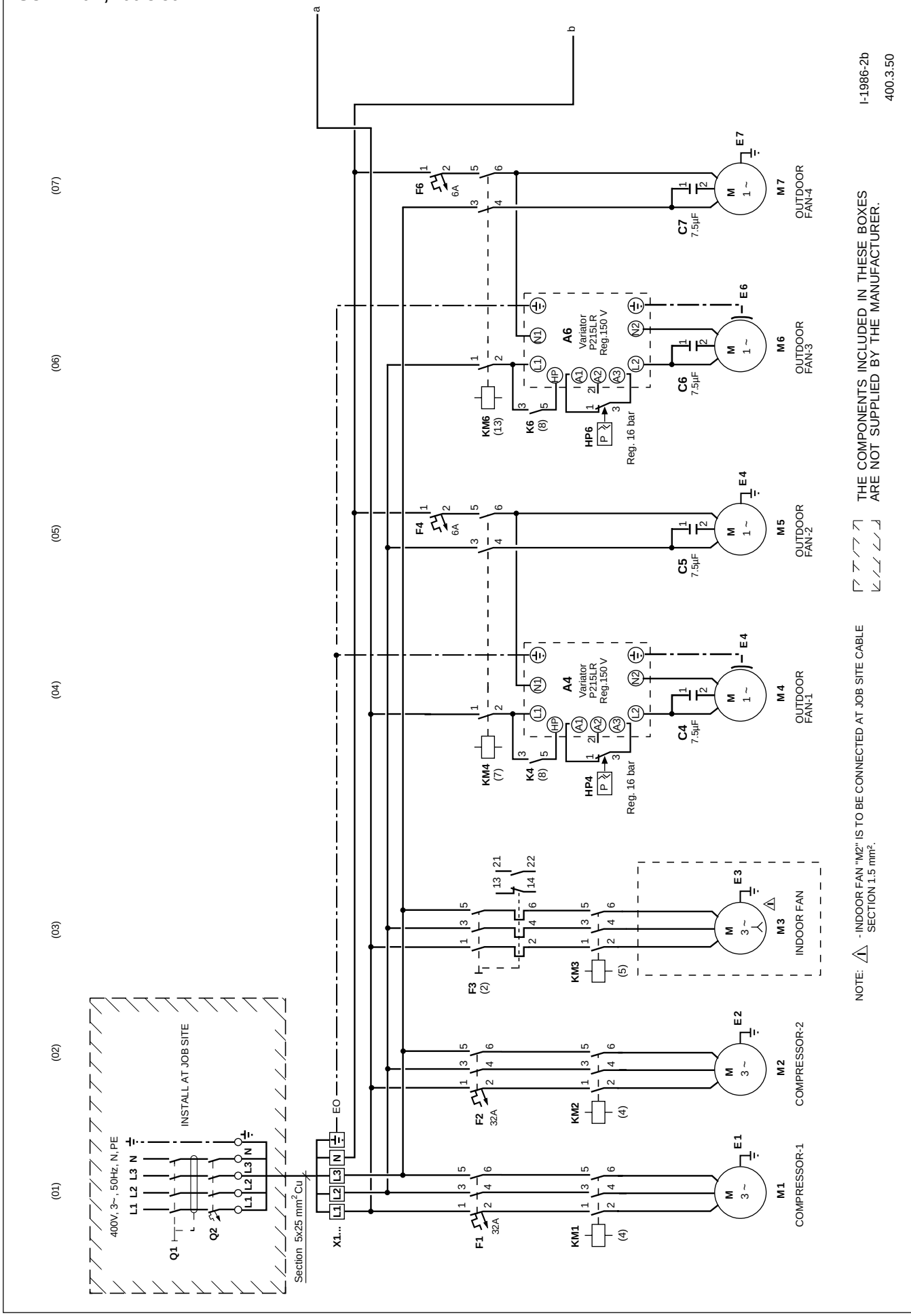
SOH-150B & 180B, 400.3.50



MODEL	Q2 (A)	SECTION "B" mm2	F1(A)	F2(A)	F3 (A) REG. "C"
SOH-150B	50	5x10	20	20	4.5
SOH-180B	63	5x16	25	25	7

Wiring diagram

SOH-240B, 400.3.50

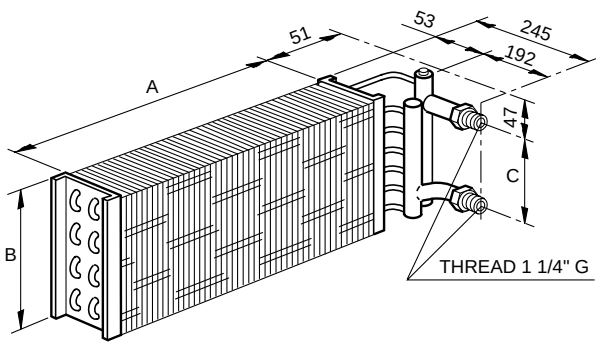


Accessories

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

Made of copper tubing and aluminium fins.
To be mounted inside the air conditioning unit, by means of galvanised steel supports.
Equipped with 1/8" air purger.

General dimensions mm



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

Physical data

For model		**SICH-070-076**	**SICH-090-120**	**SICH-150**
Tubing depth		2	2	2
Tubing heigth		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"
Intake/outlet connections, GAS male threar		$1^1/_4$"	$1^1/_4$"	$1^1/_4$"

Heating capacity

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

* The heating capacities shown in this table are valid for a water intake temperature of 90° C, outlet of 80° C, and air intake of 13° C. For other conditions, apply the correcting factors found in the corresponding table.

Correcting factors for heating capacities of the hot water heat coil

These correcting factors are for water intake and out as well as air intake temperatures other than nominal temperatures.

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

Water circuit pressure drop of heat hot water coil

	Hot water flow												
	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
	l/s	0.28	0.36	0.42	0.56	0.69	0.83	0.97	1.11	1.25	1.39	1.67	1.94
For model **SICH-070-076**	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-090-120**	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-150**	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

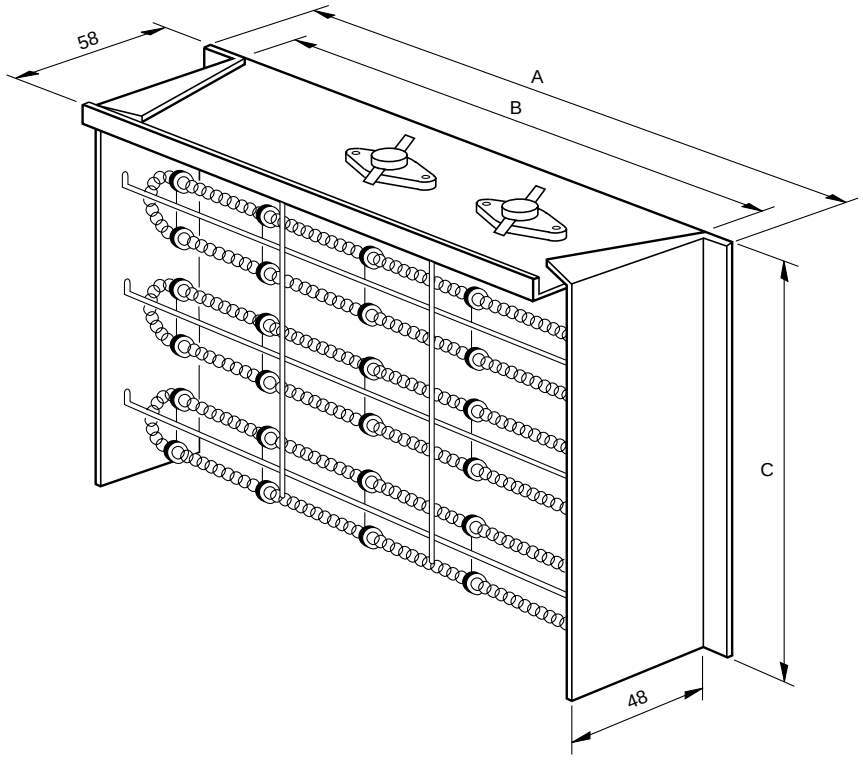
Internal electric heater for SICH-070-076, 090-120 and 150

Made up of nickel-chrome exposed wires, mounted on steatite supports and with a galvanised sheeting casing to be installed inside the unit. Contactors and connecting strip included.
Supplied with a thermal protector that disconnects the control circuit when an unusually high temperature is detected.
This heater should always operate with the air flow generated by the indoor unit, and the adequate relays should be fitted for this purpose. It is necessary to install an air flow control (see wiring diagrams).

Technical instructions for changing the voltage of the heaters

The electric heaters are supplied ready to be connected to a supply voltage of 400 V, 3-phase.

General dimensions mm



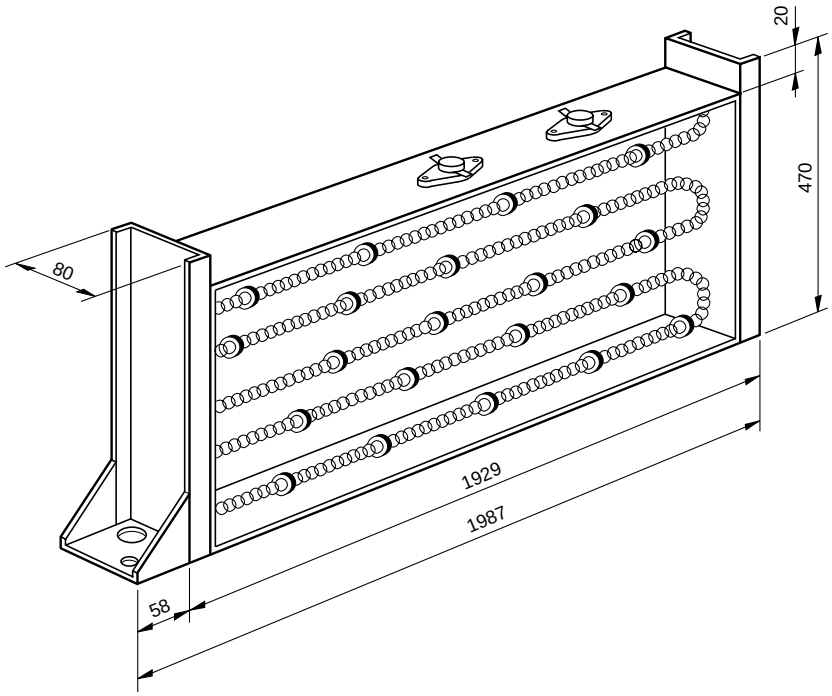
For model	A	B	C
SICH-070-076	1 103	1 069	480
SICH-090-120	1 339	1 305	552
SICH-150	1 777	1 743	552

For model	Nominal power kW	Power supply V.ph.Hz	Number of stages	Dimensions with packing mm
SICH-070-076	10	400.3.50	1	1 200 x 550 x 125
	15		1	
SICH-090-120	10		1	1 440 x 620 x 125
	20		2	
SICH-150	15		1	1 920 x 620 x 125
	30		2	

Internal electric heater for SICH-180

This electric heater includes contactors and connecting strip. Made up of nickel-chrome exposed wires, mounted on steatite supports and with a galvanised sheeting casing to be installed inside the unit.
Supplied with a thermal protector that disconnects the control circuit when an unusually high temperature is detected. This heater should always operate with the air flow generated by the indoor unit, and the adequate relays should be fitted for this purpose. It is necessary to install an air flow control (see wiring diagrams).

General dimensions mm



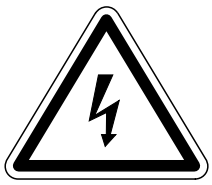
Characteristics

For model	Nominal power kW	Power supply V.ph.Hz	Number of stages	Dimensions with packing mm
SICH-180	15 30	400.3.50	1 2	510 x 2 405 x 165

Standard accessories

Accessory		Model SICH			
		070-076	090-120	150	180
Electric coil for model	**SICH-070-076** 10 kW	X			
Electric coil for model	**SICH-070-076** 15 kW	X			
Electric coil for model	**SICH-090-120** 10 kW		X		
Electric coil for model	**SICH-090-120** 20 kW		X		
Electric coil for model	**SICH-150** 15 kW			X	
Electric coil for model	**SICH-150** 30 kW			X	
Electric coil for model	**SICH-180** 15 kW				X
Electric coil for model	**SICH-180** 30 kW				X
Water coil for model	**SICH070-076**	X			
Water coil for model	**SICH-090-120**		X		
Water coil for model	**SICH-150**			X	
Vertical change over kit for model	**SICH-180**				X

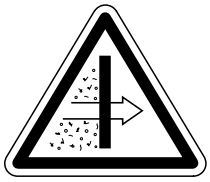
Prior to final approval of the installation



Make sure that:
- The voltage is always between 198-254 V, or 342-436 V.
- The power supply cable section is, at least, that recommended in the corresponding wiring diagrams.

- Condensed water drainage is carried out correctly, and there are no leaks in the water circuit.

- Operating instructions have been given to the user.



- Information has been given on the need to clean the air filter periodically.

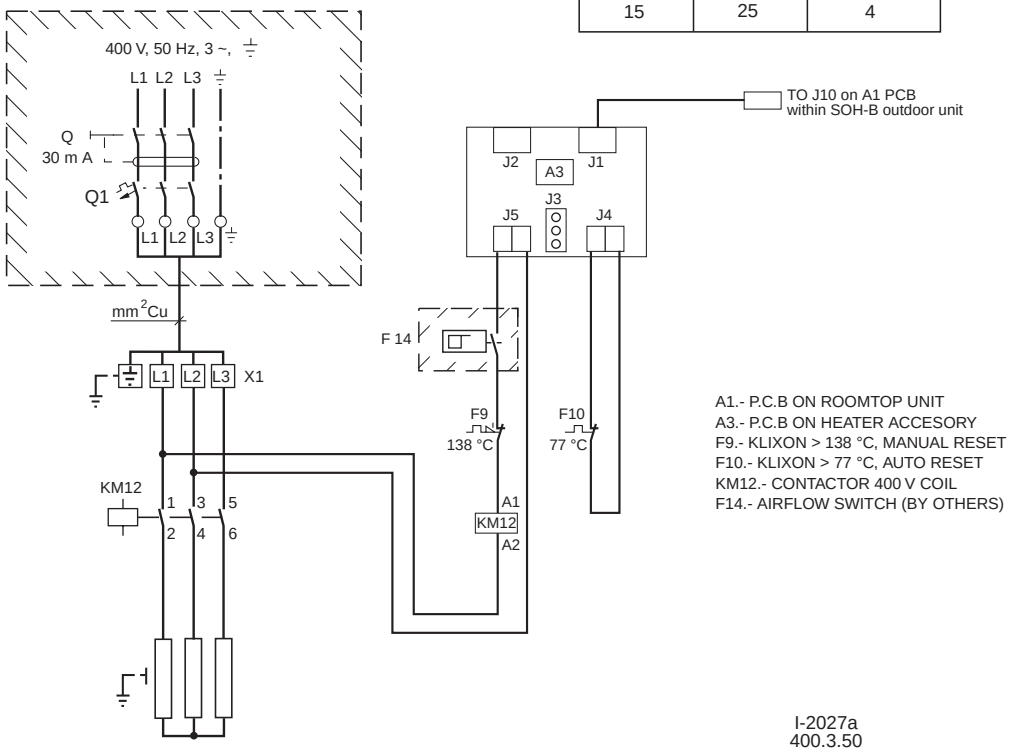
- The guarantee card has been filled out.
- Maintenance instructions have been given, or a contract has been made for periodical servicing.

All data subject to change without notice.

Wiring diagram

Electric heater - 10 & 15Kw, 400.3.50
SICH-070/076, 090/120, 150 & 180

POWER kW	MCB Q1	MIN SECTION CABLES mm²
10	20	2,5
15	25	4



A1.- P.C.B ON ROOMTOP UNIT
A3.- P.C.B ON HEATER ACCESORY
F9.- KLIXON > 138 °C, MANUAL RESET
F10.- KLIXON > 77 °C, AUTO RESET
KM12.- CONTACTOR 400 V COIL
F14.- AIRFLOW SWITCH (BY OTHERS)

I-2027a
400.3.50

IMPORTANT: Q1 MCB AND POWER CABLE SECTION SHOULD BE SIZED TO SUIT THE HEATER POWER COMSUMPTION AND THE SITE CONFIGURATION

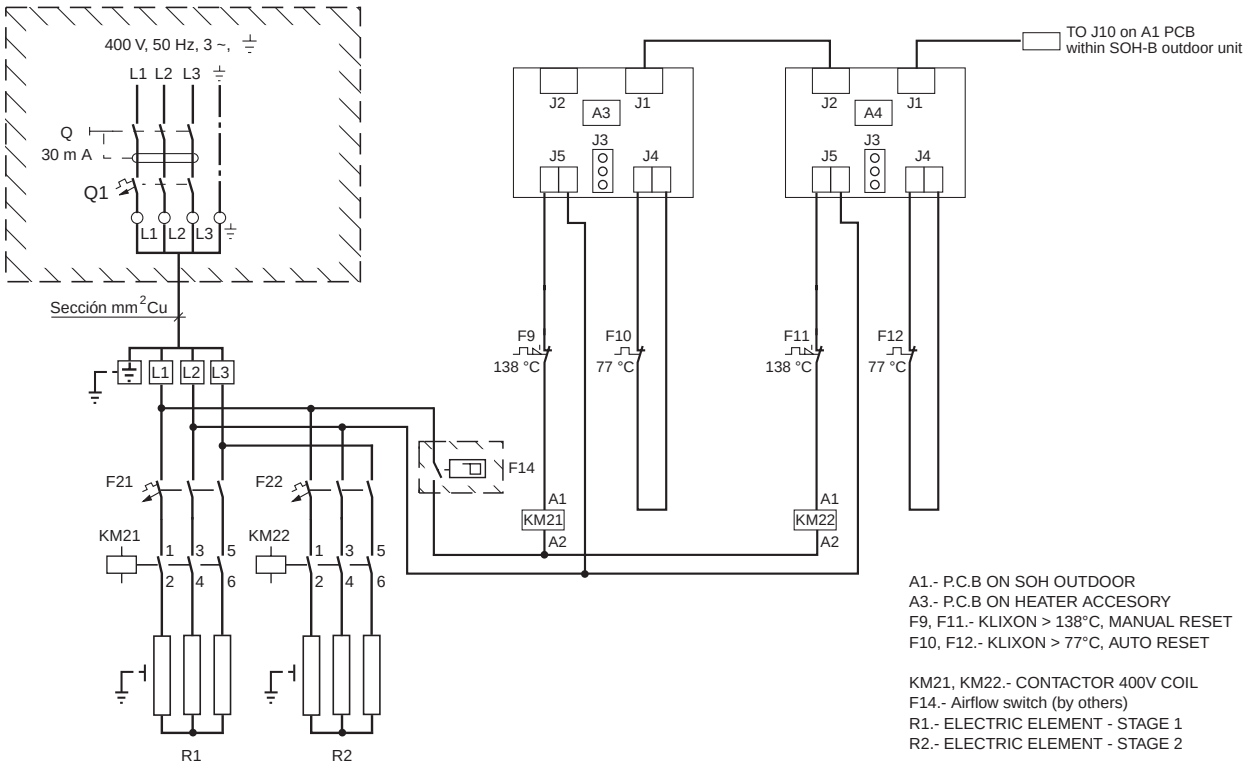
Installation of Accesory ALSH electric heater

- Isolate power to unit, connect the 25 mt cable supplied with telephone style plugs from socket J1 on A1PCB at electric heater to socket J10 an A3PCB in SOH outdoor unit.
- Switch on the unit.
- To configure the accessory, press the "Test" button on A1PCB for > 2 seconds until the red LED is lit.
- Once the red LED goes out, the A1PCB has configured the ALSH electric heater.
- Check operation of the electric heater using the thermostat in Emergency heat function.

Wiring diagram

Electric heater 20 & 30kw, SICH 090/120, 150 & 180

POWER kW	MCB Q1	MCB F21	MCB F22	CABLING MIN. SECTION mm²
20	40	20	20	6
30	50	25	25	10



A1.- P.C.B ON SOH OUTDOOR
A3.- P.C.B ON HEATER ACCESORY
F9, F11.- KLIXON > 138°C, MANUAL RESET
F10, F12.- KLIXON > 77°C, AUTO RESET

KM21, KM22.- CONTACTOR 400V COIL
F14.- Airflow switch (by others)
R1.- ELECTRIC ELEMENT - STAGE 1
R2.- ELECTRIC ELEMENT - STAGE 2

I-2107a
400.3.50

Installation of Accessory ALSH electric heater

- Isolate power to unit, connect the 25 mt cable supplied with telephone style plugs from socket J1 on A1PCB at electric heater to socket J10 an A3PCB in SOH outdoor unit.
- Switch on the unit.
- To configure the accessory, press the "Test" button on A1PCB for > 2 seconds until the red LED is lit.
- Once the red LED goes out, the A1PCB has configured the ALSH electric heater.
- Check operation of the electric heater using the thermostat in Emergency heat function.

DECLARATION OF COMPLIANCE ON MACHINERY

MANUFACTURER: **CLIMA ROCA YORK, S.L.**

ADDRESSE: Paseo Espronceda, 278, 08.204 SABADELL

This machine complies with the basic demands of the EP Standards on machinery (Standard "EC" 89/392/CEE), including any modification of same.

APPLICATION OF THE MACHINE: AIR CONDITIONER/COOLING

TYPE: **SOH-076 to 240B / SICH-076 to 240**

EC STANDARDS APPLIED: 89/392/EEC,89/336/EEC

MATCHING STANDARDS APPLIED: EN60204-1, EN292-1, EN292-2, EN563, EN294, EN953, EN55014, EN60555-2, EN50082-1

INTERNATIONAL STANDARDS AND TECHNICAL SPECIFICATIONS APPLIED : EN ISO 9001, (Pr EN378)

PLACE: Sabadell, (España)

SIGNATURES:

ROMÁN LARRODA

QUALITY CONTROL MANAGER

DEFINITIVE SHUTDOWN, DISASSEMBLY & DESTRUCTION

This product includes a refrigerant gas under pressure, moving parts and electric components which may be dangerous and cause injury!
All sevicing must be done by qualified personnel, wearing protective clothing, in compliance with applicable safety rules.

Rear the Manual

Risk of electrocution

Remote-controlled unit
May start up unexpectedly

CE

1. Cut off all electric power-supplies from the unit, as well as from the power supply of the control systems running it. Make sure that all elecric cut-off devices are blocked in open position and the town-gas supply valves are in closed position. The power-supply wires and gas pipes may then be disassembled and removed. Consult the technical documentation in order to ascertain the unit's connection points.
2. Transfer all refrigerant from each system component to an appropriate recipient, or use a specially-designed recovery unit. The refrigerant can then be re-used or returned to the manufacturer for destruction/recycling, depending on the case. **It is strictly forbidden to discharge the refrigerant into the atmosphere**. Depending on the case. drain the refrigerant oil from each system into an appropriate recipient and eliminate it in accordance with local applicable regulations relative to hydrocarbon waste products.
3. As a general rule, the solid-block units are to be disassembled and removed in a single piece. Remove all fastening bolts and then raise the items with handling equipment with appropriate lifting capacity. It is absolutely essential to consult the information in the technical documentation as regards the weight and recommended handling procedures. The residual refrigerant oil and spills are to be sponged up and eliminated according to instructions given above.
4. After disassembly, the system components are to be destroyed/drained/put in a recycling dump in accordance with local applicable regulations.

E - TEC - 000

York, Europe

Paseo Espronceda, 278
08204 Sabadell (Barcelona) - Spain
Telephone (34) 937 102 700
Telefax (34) 937 117 285

YORK®

E-TEC - S 0005 0300