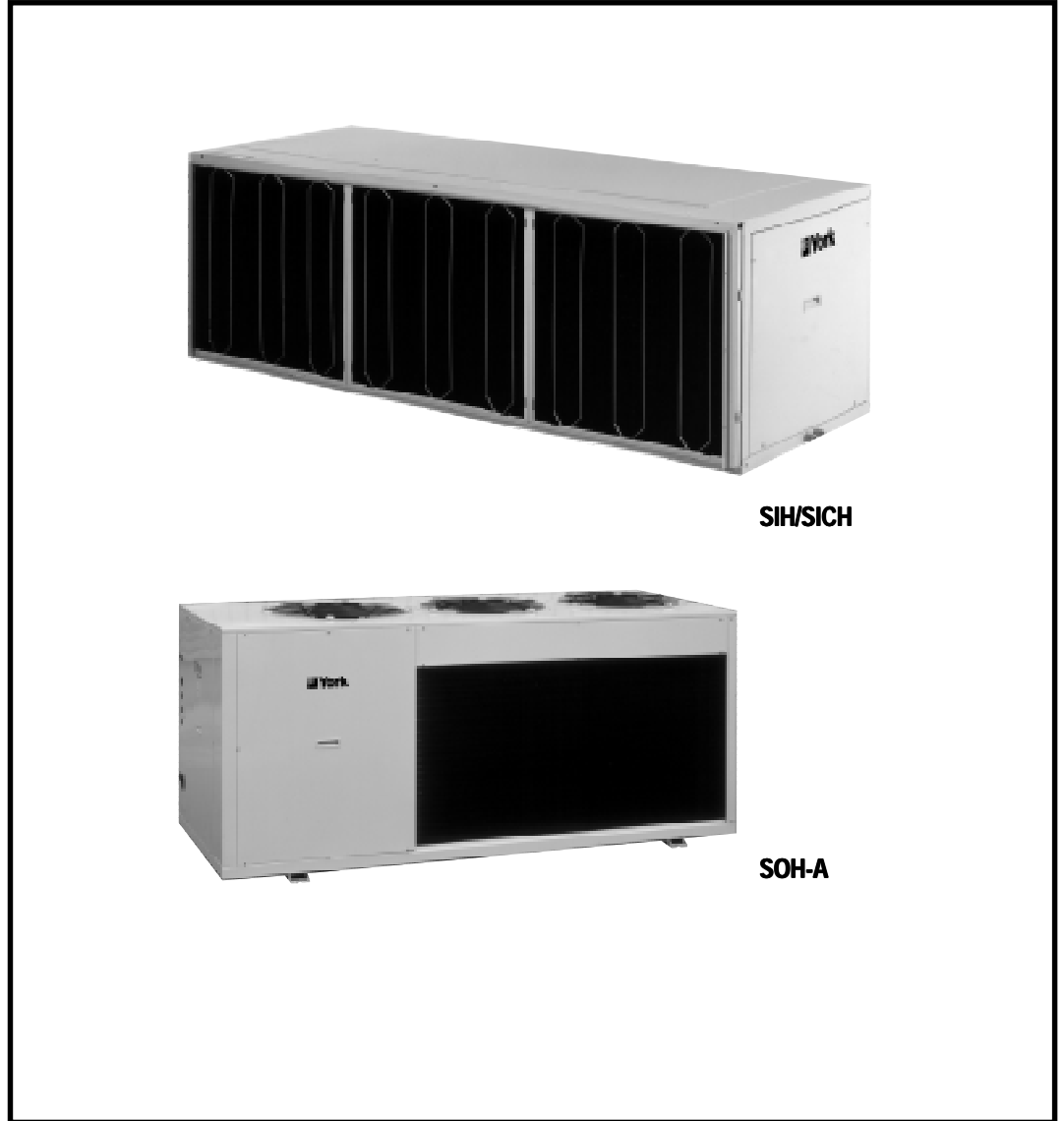

SPLIT SYSTEM

TECHNICAL GUIDE

Split system - Heat pump (R22 & R407C refrigerant)

Models SOH - SIH / SICH - 076 - 240 / A



 **YORK**[®]

CE



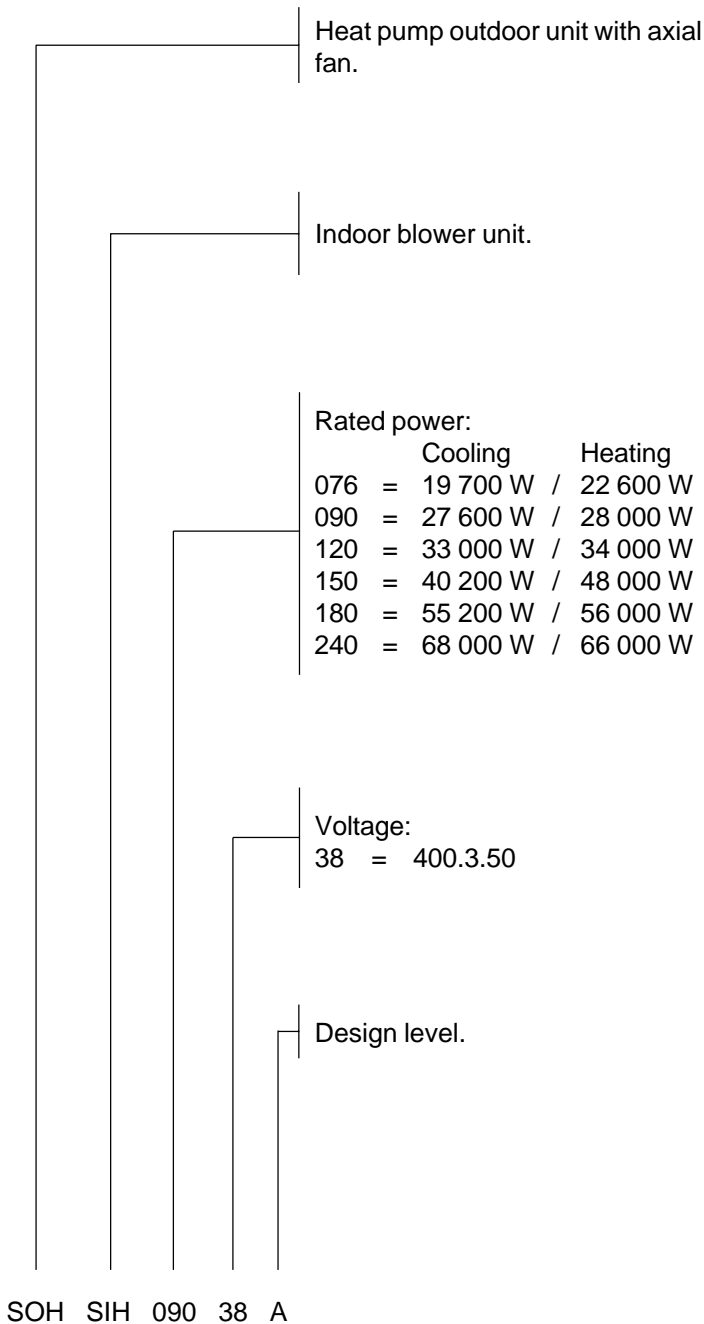
York Europe is participating in the EUROVENT Certification Programme. Products are as listed in the EUROVENT Directory of Certified Products, in the program AC1.

Index	Page	Page
General description	3	
- Nomenclature	3	
Technical specifications	3	
- Mechanical specifications of outdoor units	3	
- Mechanical specifications of indoor units	3	
- Operating diagram	3	
- Table of variations	4	
- Physical data	5	
- Rated performance data	5	
- Testing conditions	6	
- Correction factors	6	
- Cooling capacities	6 - 8	
- Indoor fan performance (standard drive)	9	
- Indoor fan performance (with High speed drive)	9	
Installation instructions	10	
- Protection of the environment	10	
- Warning signals	10	
- Transportation	10	
- Location	10	
- Service access	10	
- Outwork (indoor unit)	10	
- Drainage connections	11	
- Installation procedure	11	
Wiring installation	12	
- Electrical characteristics	13	
- Limits of use	13	
- Before final approval of the installation	13	
Instructions for use	14	
- General information	14	
- Control thermostat	14	
- Operation and start up	14	
- Internal configuration of the thermostat (2-circuit units)	17	
- Graphic information	17	
- Logic module		17
- "Outdoor" sensor		17
- "Discharge" sensor		17
- "Liquid" sensor		17
- Balance point		17
- Timer		18
- Miscellaneous		18
- Operation		18
- Operation sequence		19
- Indoor fan operation		19
- 25-pin connector		19
- Micro-switches SW1		19
- Indicating LEDS		19
- Defrost cycle		19
- Operation at -15°C (optionally -5, -10, -20)		19
- Operation of emergency heating		20
- Other electric circuit safety features		20
- Compressor sump heater		20
- Module model SOH 076-120		20
- Module model SOH 150-240		21
- Operation in accordance with the probes		21
- Operation of the jumpers (pins)		21
Maintenance		22
- Discharge of the indoor units with ducts		22
- Cleaning the filters		22
- Cleaning the outdoor unit		22
- Filling the drainage trap		22
- Checking the tension of the belts		22
General dimensions		23 - 25
Wiring diagrams		26 - 42
Optional accessories for heat pump models SOH / SIH		43
- Table of standard accessories		44
- Hot water coil for SIH-076, 090 & 150		45
- Indoor electric heater for SIH-076, 090 & 150		46
- Electric indoor heater for SIH-180		47

General description

The units in the SOH range are the outdoor units of a split-type air heat pump; they are fitted with a vertical discharge axial fan and have been designed for installation outdoors. The indoor SIH and SICH units include evaporator coil, filter and fan. These systems are supplied, factory tested, and designed to take electric heaters indoors or in the ducting. It is designed to achieve considerable energy savings and have a long working life.

Nomenclature



Technical specifications

Mechanical specifications of outdoor units

Compressor

Vertical hermetic type, mounted on vibration isolators, specially designed for heat pump equipment, with oversized mechanical components and a low-consumption motor. It is delivered with a charge of special oil which prevents the formation of foam, and with an oil heater element.

Models SOH-090 and SOH-180 incorporate Scroll rotary compressors. Remaining models incorporate reciprocating compressors.

Compressor heater

This is to keep the oil in the crankcase warm to facilitate start-ups and prevent the oil migrating out of the compressor.

Suction accumulator

Connected into the suction line of the compressor, it protects the compressor from liquid slugs which would damage the valvegear.

Coils

Large heat transfer area coils, made of copper tubes and 'slit' aluminium fins.

Fans

Axial fans with free air discharge, without ductwork. Quiet operation and three speeds available.

Casing

Made of aluminium-zinc galvanized steel sheet, finished with baked-on polymerized powder paint.

Refrigerant circuit

The SOH and SIH units are supplied with copper stubs ready for brazing. The refrigerant charging should be carried out completely at the jobsite. See, in the installation instructions, the section on refrigerant charge.

Refrigerant control

Refrigerant is introduced into the coils through calibrated orifices.

Electrical and control wiring system

Highly reliable integrated circuits. Their compact size permit easy and fast servicing. It complies with the European CE regulations currently in force.

Mechanical specifications of indoor units

Indoor fan (SIH-076)

A centrifugal fan is mounted with an independent motor and belt drive.

Indoor fan (SIH-090, 120, 150, 180 + SICH-240)

They feature two centrifugal fans on the same shaft, belt driven from the same motor, and connected to a single plenum.

Operating diagram

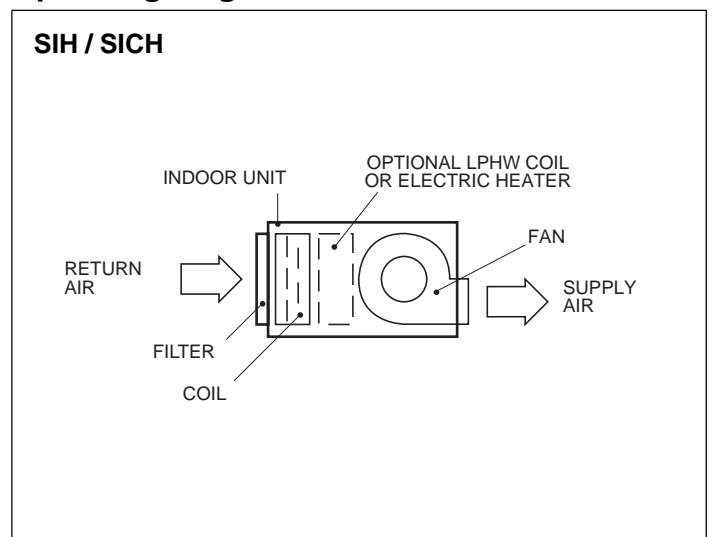
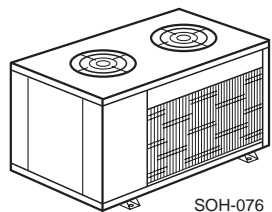
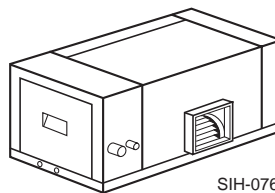


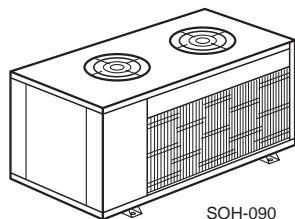
Table of variations



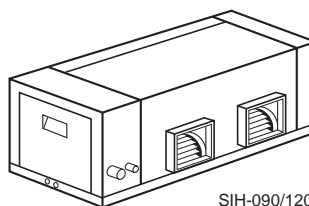
SOH-076



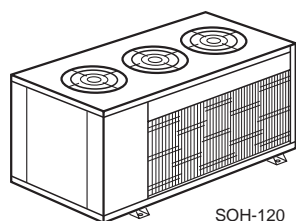
SIH-076



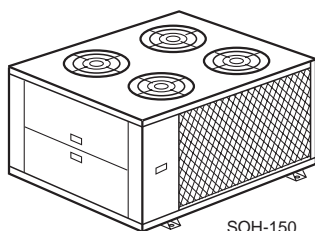
SOH-090



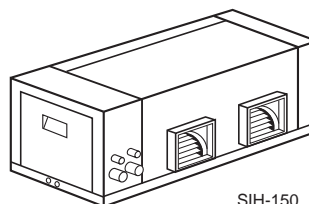
SIH-090/120



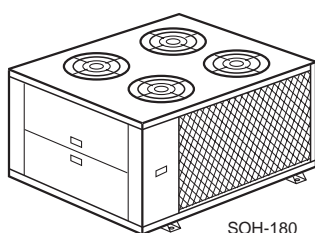
SOH-120



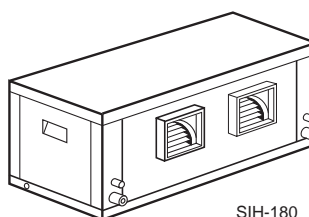
SOH-150



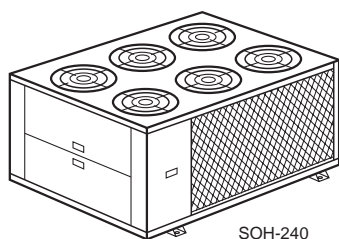
SIH-150



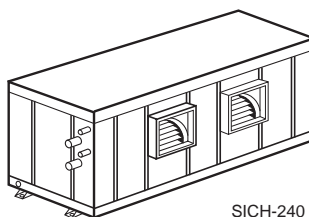
SOH-180



SIH-180



SOH-240



SIH-240

Physical data

Model			SOH-076	SOH-090	SOH-120	SOH-150	SOH-180	SOH-240	
Compressor	Quantity		1	1	1	2	2	2	
	Type		Reciprocating	Scroll	Reciprocating	Reciprocating	Scroll	Reciprocating	
	Nominal power	kW	8.4	10.2	12.2	2 x 8.4	2 x 10.2	2 x 12.2	
	Power supply	V.ph.Hz	400.3.50						
Outdoor unit fans	Nominal power	W	216	216	216	216	216	216	
	Number of fans		2	2	3	4	4	6	
	Power supply	V.ph.Hz	230.1.50						
	Propeller width		510	510	510	510	510	510	
Indoor unit fan	Motor power	kW	0.75	1.5	1.5	1.5	3	3	
	Electrical supply	V.ph.Hz	400.3.50						
	Motor rpm		1 400	1 400	1 400	1 400	1 400	1 400	
	Turbines diameter	mm	320	320	320	320	320	380	
	Turbines width	mm	320	240	240	320	320	380	
Approx. Weight	Nett	Outdoor unit	kg	265	314	347	622	748	782
		Indoor unit	kg	120	165	165	195	240	337
	Gross	Outdoor unit	kg	295	346	380	651	780	814
		Indoor unit	kg	142	195	195	230	330	427
Shippings dimensions of outdoor unit	Height	mm	1 030	1 030	1 030	1 495	1 495	1 495	
	Width	mm	1 580	1 860	2 230	1 690	1 975	2 150	
	Depth	mm	950	950	950	1 547	1 547	1 547	
Shippings dimensions of indoor unit	Height	mm	760	833	833	833	935	1 025	
	Width	mm	1 444	1 825	1 825	2 125	2 390	2 450	
	Depth	mm	930	930	930	930	955	973	

Rated performance data

Outdoor unit	Indoor unit	Summer		Winter		Available pressure indoor blower Pa
		Cooling capacity W	Consumption W	Cooling capacity W	Consumption W	
SOH-076	SIH-076	19 700	8 700	22 600	7 620	62
SOH-090	SIH-090/120	27 600	11 200	28 000	9 180	75
SOH-120	SIH-090/120	33 000	13 800	34 000	12 400	75
SOH-150	SIH-150	40 200	17 400	48 000	14 400	75
SOH-180	SIH-180	55 200	22 400	56 000	18 360	80
SOH-240	SICH-240	68 000	28 000	66 000	22 300	80

Testing conditions

Voltage	Length of interconnection pipework	Cooling				Heat pump			
		Outdoor temperature °C		Indoor temperature °C		Outdoor temperature °C		Indoor temperature °C	
		DB	WB	DB	WB	DB	WB	DB	WB
400	7.5 meters	35	24	27	19	7	6	20	12

Note: DB = Dry Bulb, WB = Wet Bulb.

Correction factors

Correction factors for cooling capacities

Cooling capacity correction factors according to indoor and outdoor temperatures.

% Flow rate	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. power input	0.980	0.990	1	1.009	1.017	1.025

Correction of the real entering outdoor coil air temperature for flow rates other than nominal.

% Flow rate	70	80	90	100	110	120	130
Correction in °C over the real entering outdoor coil air temperature	5	3	1.5	0	-1	-2	-2.5

Correction factors for heating capacities

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

Correction of the real entering outdoor coil air temperature for flow rates other than nominal.

% Flow rate	70	80	90	100	110	120	130
Correction in °C over the real entering outdoor coil air temperature	-2	-1.5	-0.5	0	0.5	1	1.2

Cooling capacities

Model	Temperature of air onto condenser coil °C (DB)	Temperature of air onto evaporator coil °C (WB)	Total capacity W	Sensible capacity (W)				Compressor absorbed power kW
				Temperature of air onto evaporator coil °C (DB)				
				22	24	27	29	
SOH-076/ SIH-076	25	22	23 640	7 077	10 212	14 915	18 054	5.72
		19.5	21 276	11 006	14 141	18 844	21 276	5.99
		17	19 700	15 157	18 292	19 700	19 700	6.27
	35	22	21 867	6 490	9 625	14 328	17 463	6.47
		19.5	19 700	10 435	13 570	18 273	19 700	6.81
		17	18 124	13 687	16 823	18 124	18 124	7.15
	45	22	19 700	5 835	8 971	13 674	16 809	7.49
		19.5	17 730	9 782	12 918	17 621	17 730	7.83
		17	16 154	13 756	16 154	16 154	16 154	8.17

Cooling capacities

Model	Temperature of air onto condenser coil °C (DB)	Temperature of air onto evaporator coil °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power
				Temperature of air onto evaporator coil °C (DB)				
				22	24	27	29	
			W	W	W	W	W	kW
SOH-090/ SIH-090/120	25	22	34 800	10 426	15 008	21 879	26 466	6.24
		19.5	31 320	16 167	20 748	27 619	31 320	6.54
		17	29 000	22 233	26 814	29 000	29 000	6.84
	35	22	32 190	9 561	14 142	21 014	25 595	7.06
		19.5	29 000	15 325	19 906	26 777	29 000	7.43
		17	26 680	20 062	24 643	26 680	26 680	7.80
	45	22	29 000	8 597	13 178	20 050	24 631	8.17
		19.5	26 100	14 363	18 944	25 816	26 100	8.54
		17	23 780	20 168	23 780	23 780	23 780	8.92
SOH-120/ SIH-090-120	25	22	39 600	12 050	16 631	23 503	28 091	9.63
		19.5	35 640	17 763	22 344	29 215	33 804	10.08
		17	33 000	23 855	28 436	33 000	33 000	10.54
	35	22	36 630	11 041	15 622	22 493	27 074	10.89
		19.5	33 000	16 783	21 364	28 236	32 817	11.46
		17	30 360	21 363	25 944	30 360	30 360	12.03
	45	22	33 000	9 917	14 499	21 370	25 951	12.61
		19.5	29 700	15 665	20 246	27 118	29 700	13.18
		17	27 060	21 459	26 040	27 060	27 060	13.75
SOH-150/ SIH-150	25	22	48 240	14 518	20 628	29 793	35 911	12.14
		19.5	43 416	22 164	28 274	37 438	43 416	12.72
		17	40 200	30 264	36 374	40 200	40 200	13.29
	35	22	44 622	13 310	19 420	28 584	34 694	13.73
		19.5	40 200	20 989	27 099	36 264	40 200	14.45
		17	36 984	27 253	33 363	36 984	36 984	15.17
	45	22	40 200	11 964	18 074	27 239	33 349	15.90
		19.5	36 180	19 648	25 758	34 922	36 180	16.62
		17	32 964	27 386	32 964	32 964	32 964	17.34

Cooling capacities

Model	Temperature of air onto condenser coil °C (DB)	Temperature of air onto evaporator coil °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power
				Temperature of air onto evaporator coil °C (DB)				
				22	24	27	29	
			W	W	W	W	W	kW
SOH-180/ SIH-180	25	22	64 800	19 662	27 333	38 841	46 524	12.60
		19.5	58 320	29 237	36 909	48 417	56 102	13.20
		17	54 000	39 432	47 104	54 000	54 000	13.80
	35	22	59 940	18 017	25 689	37 197	44 869	14.25
		19.5	54 000	27 641	35 313	46 820	54 000	15.00
		17	49 680	35 362	43 034	49 680	49 680	15.75
	45	22	54 000	16 187	23 859	35 367	43 039	16.50
		19.5	48 600	25 819	33 491	44 999	48 600	17.25
		17	44 280	35 525	43 197	44 280	44 280	18.00
SOH-240/ 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

Indoor fan performance (standard drive)

Model	Static pressure available		Air flow		Power absorbed W
	mm WG ⁽¹⁾	Pa	m³/h	m³/s	
SIH-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
SIH-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
SIH-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
SIH-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 filters.

Indoor fan performance (with High speed drive)

Model	Static pressure available in Pa		Air flow		
			m³/h	m³/s	
SIH-076	ALSHSD01				
	216		3 577	0.99	■ = Accessory 1.1 kW motor required.
	198		3 885	1.07	
	181		4 130	1.14	
	159		4 399	1.22	
	138		4 653	1.29	
	130		4 723	1.31	
	120		4 860	1.35	
	104		5 058	1.40	
	84		5 281	1.46	
SIH-090 /120	ALSHSD02 - ALSHSD03				
	204	253	5 250	1.46	■ = Accessory 2.2 kW motor required.
	196	247	5 500	1.53	
	182	237	6 000	1.66	
	164	217	6 500	1.80	
	151	206	7 000	1.94	
	129	194	7 500	2.08	
	110	172	8 000	2.22	
	86	148	8 500	2.36	
	53	120	9 000	2.50	
36	104	9 200	2.55		
SIH-150	ALSHSD02 - ALSHSD03				
	197	256	7 000	1.94	■ = Accessory 2.2 kW motor required.
	182	239	8 000	2.22	
	173	230	8 500	2.36	
	163	217	9 000	2.50	
	152	203	9 500	2.64	
	137	190	10 000	2.78	
	118	173	10 500	2.92	
	100	152	11 000	3.05	
	55	116	12 000	3.33	
29	94	12 500	3.47		
SIH-180	ALSHSD04				
	211		11 500	3.19	■ = Accessory 4.0 kW motor required.
	194		12 000	3.33	
	176		12 500	3.47	
	155		13 000	3.61	
	139		13 500	3.75	
	120		14 000	3.89	
	91		14 500	4.02	
	68		15 000	4.16	
SICH-240	ALSHSD05				
	234		10 000	2.78	■ = Accessory 4.0 kW motor required.
	221		11 000	3.05	
	204		12 000	3.33	
	183		13 000	3.61	
	146		14 240	3.95	
	120		15 000	4.16	
	85		16 000	4.44	
	47		17 000	4.72	

Note: ALSHSDXX = High speed drive part number.

Installation instructions

Protection of the environment



Packing

The packing material is recyclable. It should be disposed of in accordance with the residual collection regulations established.

Disposal of the unit

After a long service life, and upon disassembling the unit, its components should be recuperated ecologically. The cooling circuit is full of a refrigerant that should be salvaged and, finally, returned to the gas manufacturer for recycling.

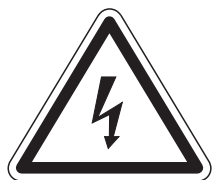
Oil will remain in the airtight compressor and, therefore, it will be returned along with the sealed circuit.

The air conditioning unit will be deposited wherever established by the local authorities for its selective disposal.

Warning signals

The following signs indicate the presence of potentially dangerous conditions for users or service personnel.

Whenever found on the unit itself, keep in mind the warning indicated by each one.



This sign indicates an electrical risk or danger.



Attention: The unit has a remote control system and can start automatically. Two minutes prior to having access to the interior, the power supply should be disconnected so as to avoid any contact with the fan turbine.



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



Attention: Fan in operation.



Attention: No to touch hot surfaces.



Attention: Possible gas leakage due to inadequate handling.



Attention: Transmission by belt and pulley.

Transportation

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

Location

The location chosen should allow permanent access for service maintenance, either through the side panels or the rear panel.

The outdoor unit should be installed directly outdoors. If placed on the floor, it should be on supports so as to avoid a possible accumulation of snow obstructing the air intake.

Service access

Empty space should be left in the installation of each unit for the following:

- Outdoor unit air intake and discharge.
- Connection of the drainage tubing and wiring.
- Air ducts.
- Maintenance service.
- Electrical supply.

For proper operation, the minimum distances indicated in the general dimensions drawings should always be respected with regard to obstacles that could obstruct the free circulation of air, or any service work.

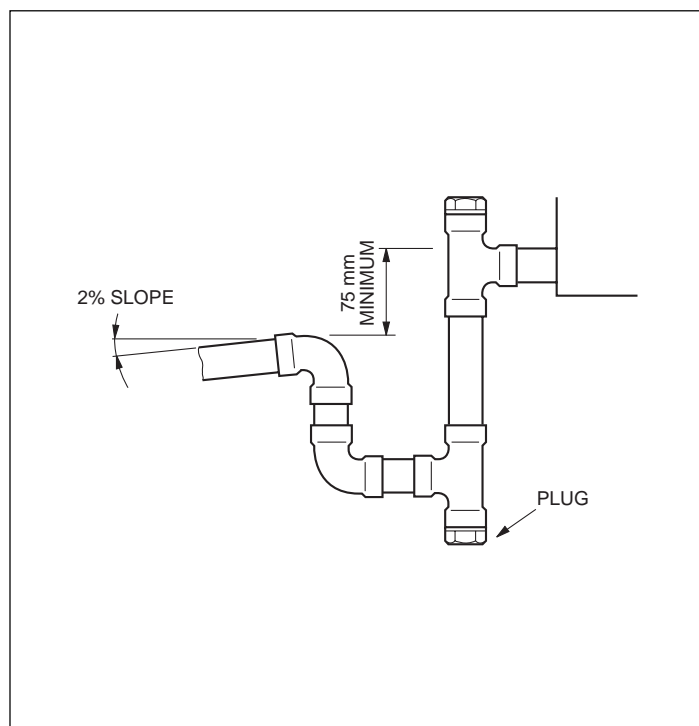
Ductwork (indoor unit)

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

- 2.- It is advisable to place a damper at each discharge duct derivation so as to be able to carry out a correct balance of the system.
- 3.- Make sure there is easy access for cleaning and changing the air filters.

Drainage connections

Install the drainage tubing of each tray through a trap. Leave a minimum height difference of 75 mm. between the height of the connection to the unit and the line after the trap (see figure). This is to avoid that the pressure drop produced by the fan may not interfere with the emptying of the tray. There should be an access so that, at the beginning of each season, the trap may be filled with water. The drainage line should have a minimum inclination of 2 cms. per meter of total length.



Installation procedure

The SOH-090 and SOH-120 units have only one circuit while the SOH-150, SOH-180 and SOH-240 units have two circuits. These units are supplied without valves, but with connections ready for welding. The refrigerant load must be carried out completely on site. See refrigerant load in the corresponding section, and follow the recommendations made in the Refrigerant Interconnections and Refrigerant Load Process sections.

Separation between the units

The length of interconnection tubing should be kept to a minimum.

Standard installation

The maximum admissible distances with the standard circuit and tube diameters are:

Total length of pipework m	Maximum height difference between units m
25	10

Special installation

For greater lengths, the installation must be made with a project previously approved by York technical service. Modifications to any of the following may be required for such a project:

- Tube dimensions.
- Refrigerant charge.
- Suction traps.
- Suction accumulator.
- Liquid solenoid valve.
- Oil separator.

In such cases, the maximum lengths which can be recommended are:

Type of installation		
Units at same level, maximum pipework length.	m	50
Outdoor unit higher than indoor, maximum pipework length and level difference.	m	50
Outdoor unit lower than indoor, maximum pipework length and level difference.	m	15

Refrigerant interconnections

When preparing the tubing to join the two units, special care should be taken to keep it clean and dry before the installation. The following recommendations serve as a guide which should be taken into consideration:

- 1.- Use only copper tubing of refrigeration quality.
- 2.- Do not carry out outdoor jobs in the rain.
- 3.- The ends of the tubes should be kept sealed during the installation.
- 4.- Do not leave the filter driers or the compressor open to the elements for more than one or two minutes.
- 5.- For soldering, use low melting-point rods with a minimum silver content of 5%.
- 6.- During soldering, and for as long as the tube stays hot, keep up a flow of dry nitrogen to avoid formation of oxides and crusting in the interior, which could cause contamination and blockage.

Interconnection tubing diameters

Model	Diameter gas line (wide tube)	Diameter liquid line (narrow tube)
SOH/SIH-076 & 150	1 1/8" (28.5 mm)	1/2" (12.7 mm)
SOH/SIH-090, 120, 180 & SOH/SICH-240	1 1/8" (28.5 mm)	5/8" (15.87 mm)

Refrigerant charge

The nominal charge shown in the table below is calculated for the functioning of a system with 7.5 mt of pipework. When the system is installed, the refrigerant charge must be increased or reduced in each circuit depending on the length of liquid tubing +/- 7.5 metres.

Oil charge

It is important to add oil into the circuit(s) for pipework lengths over 7.5 mt, or shown in the following table.

Model	Nominal charge kg	Number of circuits	Diameter liquid line	Additional charge gms. per metre	Additional oil charge gms. per metre
SOH-076/ /SIH-076	7.3	1	1/2" (12.7 mm)	104	10
SOH-090/ /SIH-090/120	9.95	1	5/8" (15.87 mm)	170	20
SOH-120/ /SIH-090/120	12.9	1	5/8" (15.87 mm)	170	20
SOH-150/ /SIH-150	8.5	2	1/2" (12.7 mm)	104	10
SOH-180/ /SIH-180	10.5	2	5/8" (15.87 mm)	170	20
SOH-240/ /SICH-240	11.1	2	5/8" (15.87 mm)	170	20

Charging procedure

- 1.- Ensure that any brazing is done, with a dry nitrogen flow inside the pipework.
- 2.- Use low melting-point rods with a minimum silver content of 5% for brazing.
- 3.- Pressure with dry nitrogen to detect leaks.
- 4.- Blow off the dry nitrogen.
- 5.- Pull a vacuum down to 200 microns.
- 6.- Charge the refrigerant, using scales or a calibrated cylinder. The charge accuracy should be +/- 30 grams.

The outdoor unit is fitted with pressure and temperature points on the connection outlets, for checking of super heat and sub-cooling. Check that both these values are around 5°C. Complete a log of refrigerant charge added, operating temperatures and pressures, superheat, subcooling and current drawn by compressor(s) and fans.

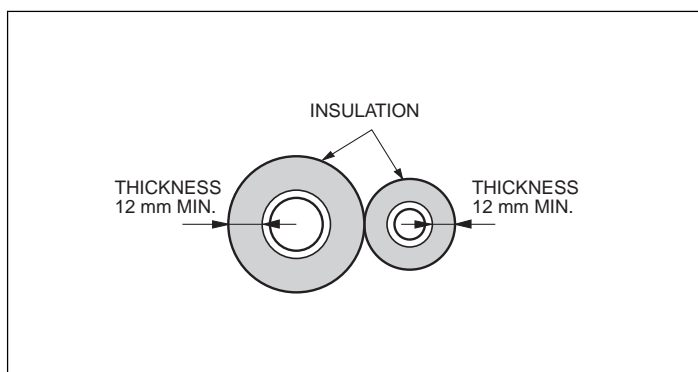
For R407C applications it is necessary to change only liquid refrigerant into the system.

In addition, it is advisable to check compressor oil level once the circuit has run continuously for 60 minutes minimum. Adjust oil charge on required. Some models have a sight glass in the compressor, others have a schrader access port at the point where oil level is correct.

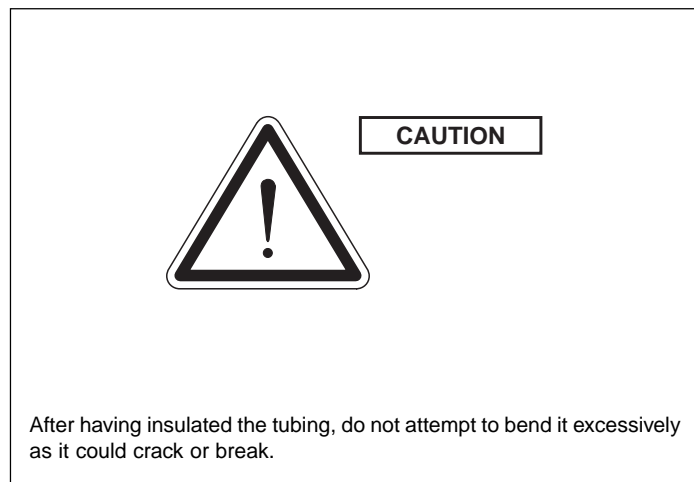
Insulation of pipework

The interconnection cooling tubing must be insulated.

The insulation requires specific characteristics: it must be easy to install, hard-wearing, water and fire-proof, and have a minimum thickness of 12 mm.



To avoid deterioration in sunlight, it is necessary to treat the insulation with suitable paint.

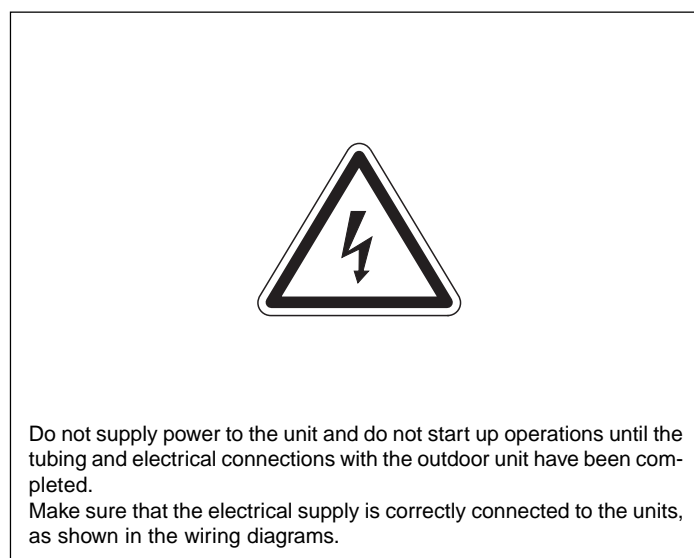
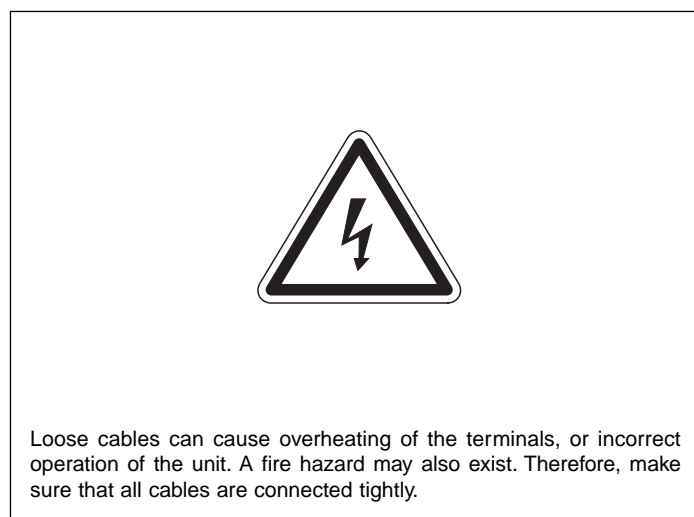


Wiring installation

Each heat pump is supplied with a control box to which the power supply is to be connected through a main switch with fuses, or an automatic switch.

The electric resistances, if any, should be connected to independent power supplies and switches, and not to the ones that feed the unit.

In all cases, the **national regulations should be complied with.**



Electrical characteristics

Outdoor units

Model	Power supply V.ph.Hz.		Consumption A					Power supply cable section mm ²	Automatic Switch A
	Compressor	Fan	Compressor			Fan			
			Start	Nominal	Maximum	Start	Nominal		
SOH-076	400.3.50	230.1.50	91	11.7	13.9	7	2.2	6	32
SOH-090	400.3.50	230.1.50	105	15.7	19.5	7	2.3	10	40
SOH-120	400.3.50	230.1.50	135	19.1	22	12	3.8	10	50
SOH-150	400.3.50	230.1.50	2 x 91	2 x 11.7	2 x 13.9	2 x 7	2 x 2.2	16	63
SOH-180	400.3.50	230.1.50	2 x 105	2 x 15.7	2 x 19.5	2 x 7	2 x 2.3	25	100
SOH-240	400.3.50	230.1.50	2 x 135	2 x 19.1	2 x 22	2 x 12	2 x 3.4	25	100

Indoor units

Model	Power supply V.ph.Hz.		Consumption A				Power supply cable section mm ²	Automatic switch A
	Fan	Fan	Fan		Fan			
			Start	Nominal				
SIH-076	400.3.50		7	2		4 x 2.5	-	
SIH-090/120	400.3.50		10	3.3		4 x 2.5	-	
SIH-150	400.3.50		10	3.5		4 x 2.5	-	
SIH-180	400.3.50		27	7.1		4 x 2.5	15	
SICH-240	400.3.50		30	6.4		4 x 2.5	15	

Limits of use

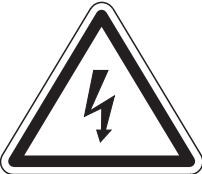




Voltage limits				Air intake temperature to the DB outdoor unit				Air intake temperature to the indoor unit			
Nom. 230 V		Nom. 400 V		Operating cycle				Operating cycle			
Minimum	Maximum	Minimum	Maximum	Minimum °C		Maximum °C		Minimum °C		Maximum °C	
				Cooling	Heating	Cooling	Heating	Cooling WB	Heating DB	Cooling WB	Heating DB
198	254	342	436	19	-20 ₍₁₎	46	24	14	10 ₍₂₎	22	25

Notes: WB - Wet bulb. DB - Dry bulb.

(1) Below 20°C, only the emergency electric heater (optional) remains operative.

(2) The unit can operate at short intervals at a temperature below 10°C so as to raise the temperature of the room being conditioned to 10°C.

Before final approval of the installation

	<p>Verify:</p> <ul style="list-style-type: none"> - Voltage is always between 198-254 V., or 342-436 V. - The section of the power supply cable is, at least, that recommended in the corresponding wiring diagrams. 		<ul style="list-style-type: none"> - The need to clean the air filter periodically has been notified.
	<ul style="list-style-type: none"> - Condensation drainage is carried out perfectly and there are no leaks in the water circuit. 		<ul style="list-style-type: none"> - The guarantee card has been filled out. - Maintenance instructions have been given, or a regular servicing contract has been signed.
	<ul style="list-style-type: none"> - Operating instructions have been given to the user. 		

Instructions for use

General information

The heat pump is a unit that allows air conditioning, both in Winter as well as in Summer, by reversal of its operating cycle.

The start up and automatic temperature setting is carried out by means of the ambient thermostat, at 24 volts, specially designed for these units.

Control thermostat

This thermostat is 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, it reacts varying the on-off cycles, between 3 and 7.5 cycles per hour.

The LCD screen normally indicates the ambient temperature, operating mode and whether the cooling or heating system is operative.

It allows selecting different temperature settings for cooling and heating, as well as their indication in °C or °F. The fan may operate in a continuous or automatic mode, turning off and operating jointly with the compressor.

The controls are located beneath a cover that avoids handling by unauthorized personnel.

Operation and start up

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

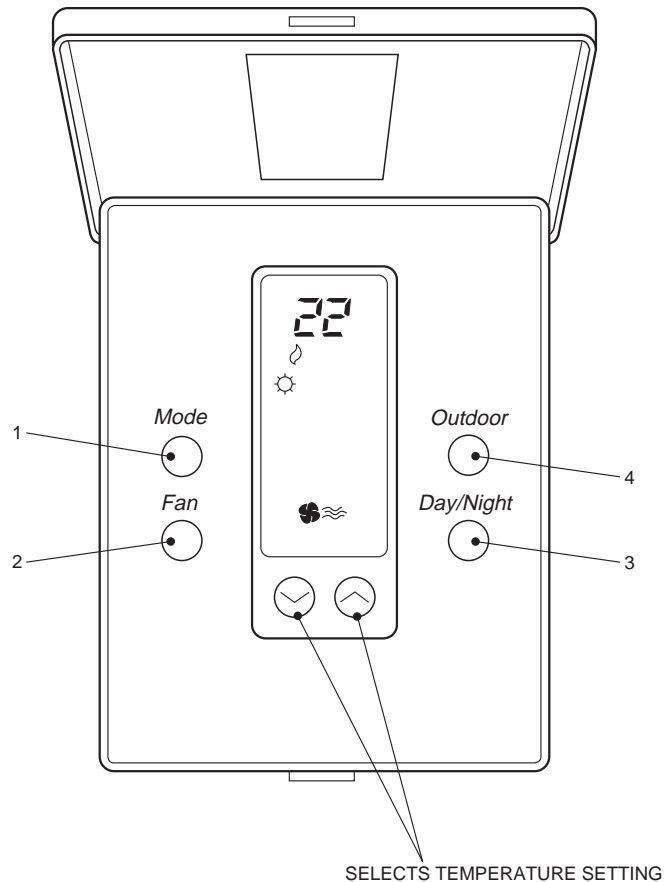
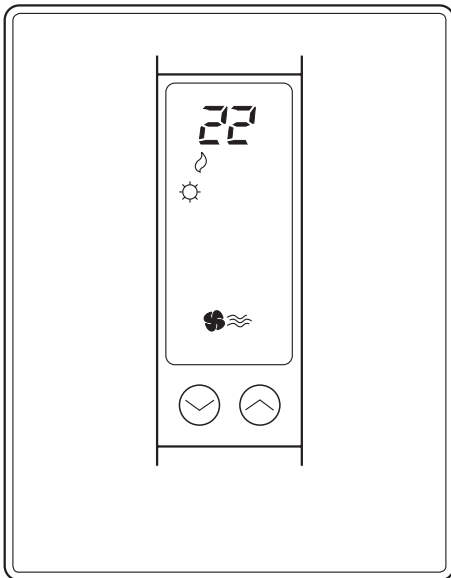
1.- MODE

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 during 5 seconds.)
- HEAT** 🔥 - Controls the system in the heating mode. (The word **HEAT** appears on screen during 5 seconds.)
- Auto** ❄️ 🔥 - Controls the system in either the cooling or heating modes, as needed. (The word **Auto** appears on screen during 5 seconds.)
- E HE** - Controls the system in the emergency heating mode (operates only if an electric heater, optional accessory, is installed).
- OFF** - Disconnects the system.

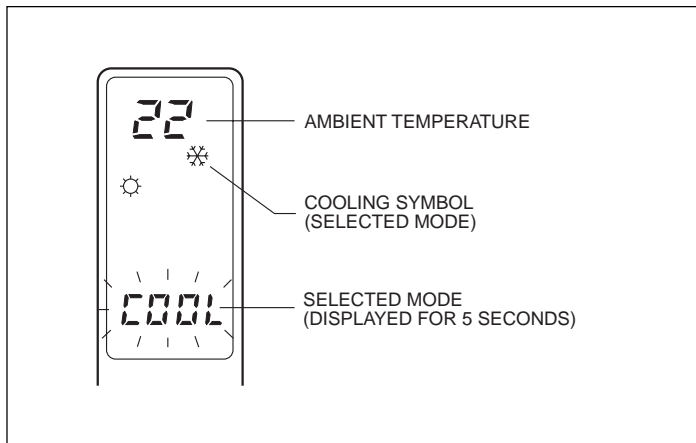
Controls and indicators

- 1.- Sets the operating mode.
- 2.- Starts the fan.
- 3.- Sets the day/night mode.
- 4.- Option of reading the outdoor temperature (2-circuit units).

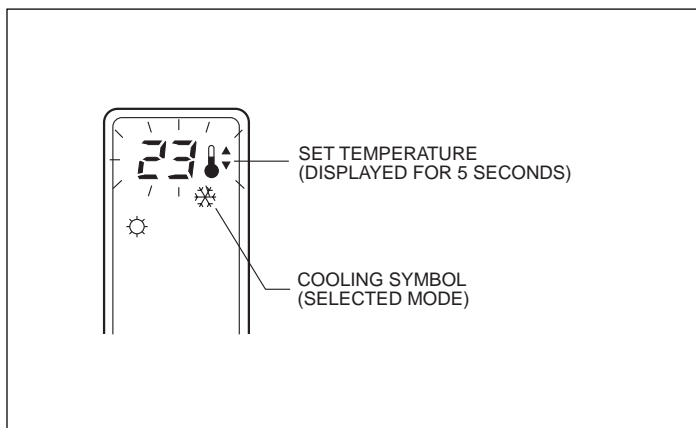


a) Cooling

Press the MODE button repeatedly until the cooling symbol ❄️ appears on screen (along with the word **COOL** during 5 seconds). This symbol remains visible on screen.



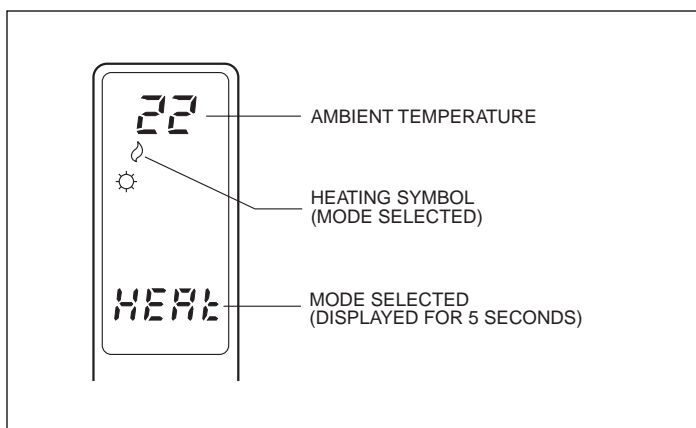
Once the operating mode is set, select the temperature setting by pressing button ⬆️ or ⬇️, so as to set a higher or lower temperature. The temperature setting appears along with a small symbol that represents a thermometer, and remains on screen during 5 seconds. As soon as the temperature setting disappears,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



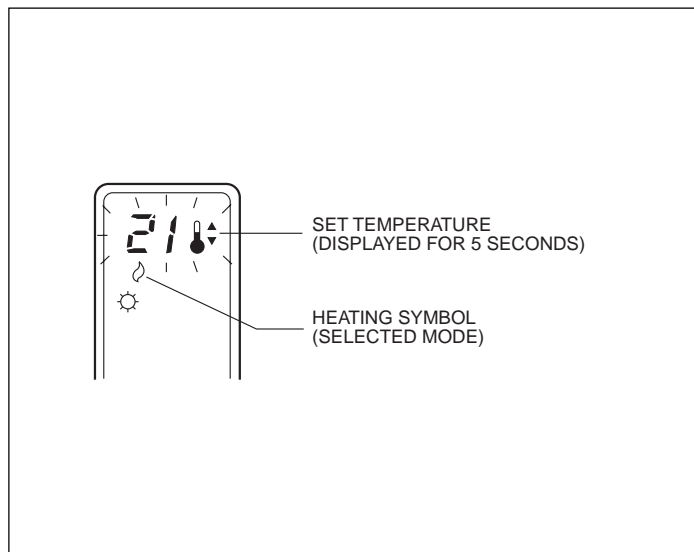
After a few minutes, the cooling system will begin to operate and the cooling symbol on screen will start to flash.

b) Heating

Press the MODE button repeatedly until the heating symbol 🔥 appears on screen (along with the word **HEAT** during 5 seconds). This symbol remains visible on screen.



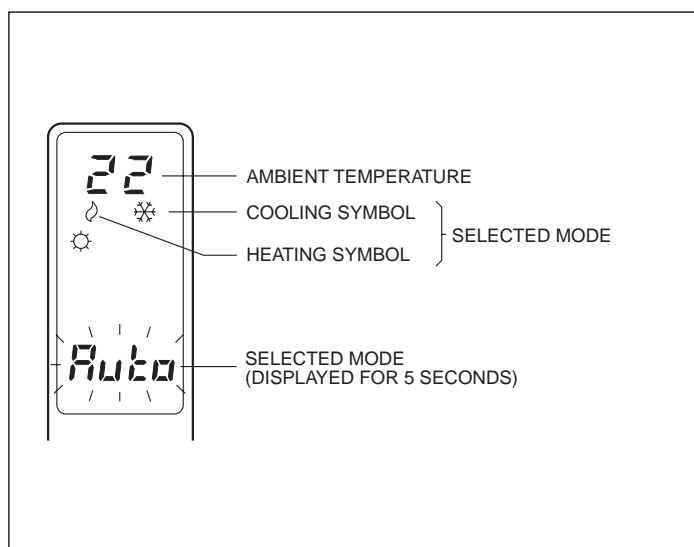
Once the operating mode is set, select the temperature setting by pressing button ⬆️ or ⬇️, so as to set a higher or lower temperature. The temperature setting appears along with a small symbol that represents a thermometer, and remains on screen during 5 seconds. As soon as the temperature setting disappears, 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 repeatedly until the heating 🔥 and cooling ❄️ symbols appear on screen (along with the word **Auto** during 5 seconds). These signals remain visible on screen.



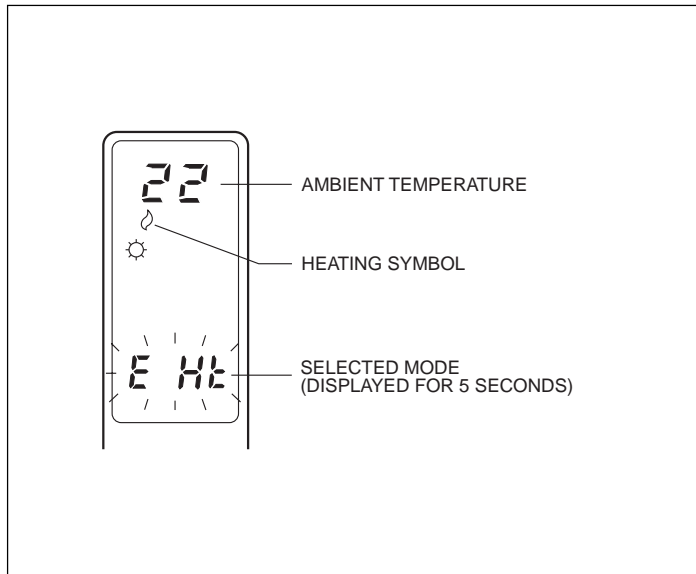
After a few minutes, the system will begin to operate, switching automatically between the heating and cooling modes so as to keep the ambient temperature between the two settings. When either the heating or cooling mode are in operation, the corresponding symbol starts to flash.

d) Emergency heating

Press the MODE button repeatedly until the word **E Ht** appears on screen (visible during 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.

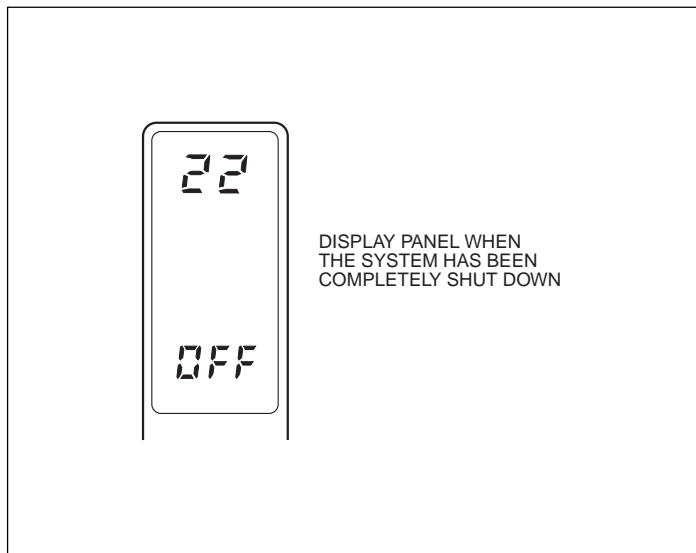
In this operating mode, the compressor is always inoperative and the auxiliary and emergency heaters, if any (optional accessories) are used for heating.

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





e) Off

Press the MODE button repeatedly 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.




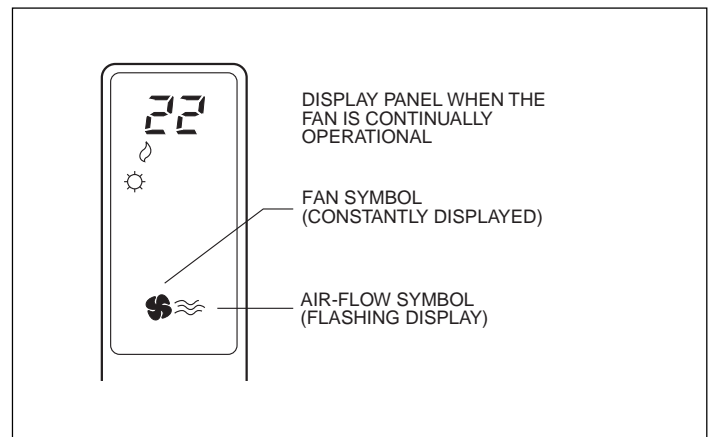
f) °C/°F scale

To change the temperature scale, press buttons  and  simultaneously.



2.- Fan



Pressing the FAN button puts the fan in continuous operation (independent of the unit's operating mode), and the thermostat screen shows the fan and air flow symbols, that of the continuous fan and the flow, intermittently.

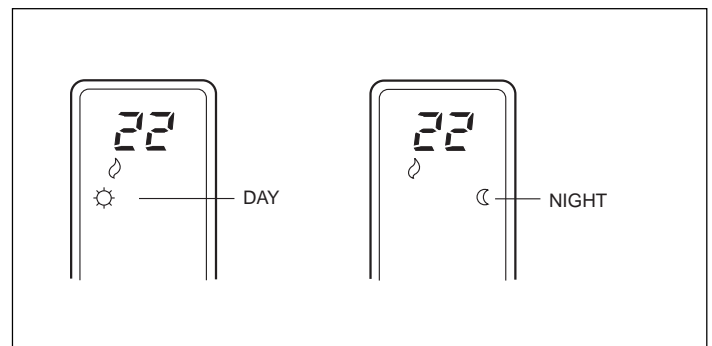
By pressing the FAN button once again, the  symbol disappears and the fan operates automatically in accordance with the compressor or the electric heater (if installed).



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 contact of the internal 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, the established temperature settings, whether they be for day  or night , will be altered.



4.- Option of outdoor temperature reading (2-circuit units)

Optionally, the thermostat allows installing a sensor that reads the outdoor temperature. This temperature may be read by pressing the OUTDOOR button.

Option of a remote ambient temperature sensor (2-circuit units)

The DSL thermostat is designed to accept a remote sensor that allows controlling the ambient temperature of the room apart from wherever the DSL thermostat is located. The remote sensor is connected to the inner connecting strip of the thermostat, at terminals RS1 - RS2 - RS + V.

LED option 1 (2-circuit units)

The thermostat is equipped with an LED that, if supplied with 24 V (by means of an external signal from the timer or pressure gauge) can notify the need to change the filters.

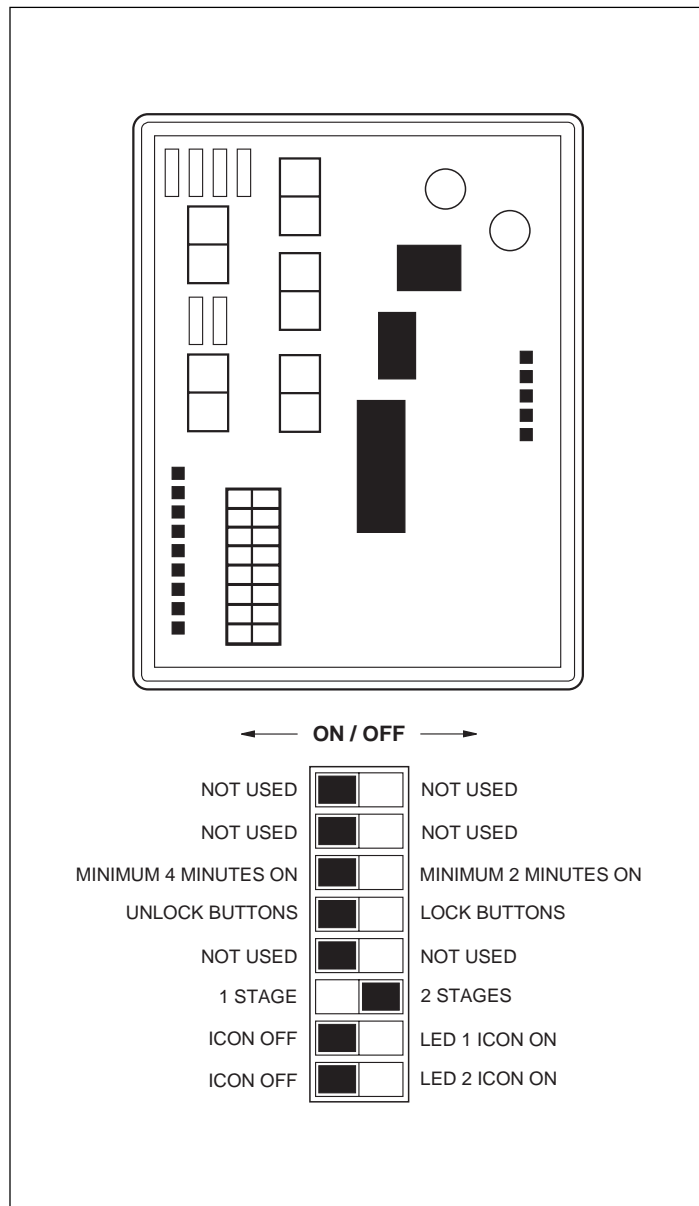
LED option 2 (2-circuit units)

The thermostat is equipped with a second LED that, if supplied with 24 V, can be used as a service call.

Internal configuration of the thermostat (2-circuit units)

The thermostat is equipped with a configuration system (options) by means of micro-switches located in the base plate. The standard configuration of the thermostat must be the configuration described in the following section.

Adjustment of the micro-switches (2-circuit units)



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 settings press, just once, one of the temperature setting buttons. This will give us, on screen and for 5 seconds, the temperature setting established for the operating mode that is visible on screen at that moment.

Logic module

This is the central protection and control point of the heat pump. It is equipped with operating and connecting elements that control the outdoor unit. The logic module responds to the signals of the thermostat, the high pressure gauge and the outdoor temperature and discharge and liquid sensors, determining the functions of the heat pump, electric heaters, defrosting cycles, timers, outdoor fan speed, etc.

"Outdoor" sensor

This is a thermistor placed at the air intake of the outdoor unit and registers the air temperature. It controls pump operation, turning same off when the outdoor temperature reaches approximately -15°C . This avoids the operation of the compressor when excessive fatigue can cause a high compression ratio. It allows activating the electric heater (optional) controlled by the 2nd phase of the ambient thermostat if the outdoor temperature is below -15°C .

By means of the "balance point", it allows setting the temperature to that which activates the optional electrical heater, if installed.

The signal given off by the outdoor probe is also used by the logic module to set the outdoor fan speed in accordance with the ambient temperature. In the Summer cycle, the plate sets high speed when the outdoor temperature is over 33°C while, in the Winter cycle, the high speed begins to operate at ambient temperatures of less than 9°C .

"Discharge" sensor

It is fitted to the compressor discharge tubing. It protects the compressor against high operational temperatures and pressures, turning the compressor off when the discharge temperature is excessive. Protects the compressor against loss of refrigerant and against air flow reduction in the indoor and outdoor batteries. Allows restarting the compressor circuit after a lockout.

"Liquid" sensor

Located at outdoor battery liquid line. Sets off the defrosting cycle after 30, 60 or 90 minutes (depending upon the setting) after the start up or the last defrosting cycle, if the temperature detected is equal to or lower than -5°C . Indicates the end of the defrosting cycle when the fluid temperature reaches 13°C , or is held at a minimum of 7°C during 5 minutes.

Avoids setting the defrosting cycle off in mild climates, as it does not detect a sufficiently low fluid temperature.

These defrosting time values of 30, 60 and 90 minutes constitute the real calculating basis used by the micro-processor of the electronic module, which compares said values with the reading of the ambient temperature detected by the outdoor sensor. In this way, the defrosting time the unit will actually be subject to will increase or decrease depending upon the ambient temperature. At low ambient temperatures, which normally have a low humidity value, the time period between defrosting will increase. On the other hand, if the ambient temperature is high, with a normally high humidity value, this time period is reduced. In very extreme cases, these values can be reduced to a third, or triplicated.

Balance point

As the heat pump functions by absorbing heat from the outside air, there may be times when the temperature of the latter is so low that it is not possible to extract sufficient heat from it to satisfy the heating demand. Therefore the control module incorporates six balance points (between -4°C and 14°C), one of which can be selected before start-up. On the outside air temperature reaching this point, the module automatically switches on the auxiliary electric heater, if necessary. The heat pump nevertheless continues functioning with a performance (COP) superior to that of the electric heaters, down to an outside temperature of -20°C .

Below this minimum temperature the heat pump switches off automatically, leaving the electric heaters to provide heating

on their own. This prevents the compressor from operating at excessively high compression ratios, which could shorten the life of the equipment.

Timer

Delays start up either 5 or 2 minutes, so as to avoid repeated start up cycles. This balances operational pressures before each start up of the compressor. If the thermostat, or manual operation, cause false contacts, the heat pump is not affected. It delays start up after an electric supply interruption, which allows line voltage to go back to normal values.

Miscellaneous

12-pin connector that allows the use of the service analyser. Push button or pin to eliminate the timer during testing.

Possibility of reducing the timer to 2 minutes. Forced defrosting button, for testing. LED for selfdiagnosis.

Operation

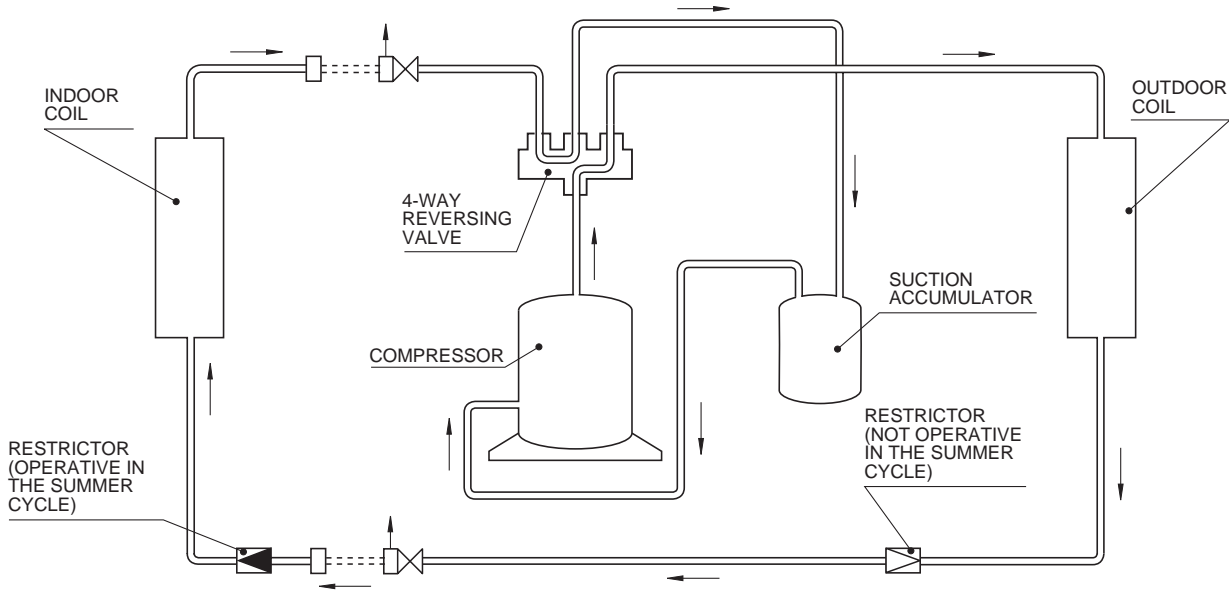
Summer cycle

Operation in Summer is similar to that of any conventional air conditioner. The 4-way valve is activated. The corresponding figure indicates the circuit followed by the refrigerant.

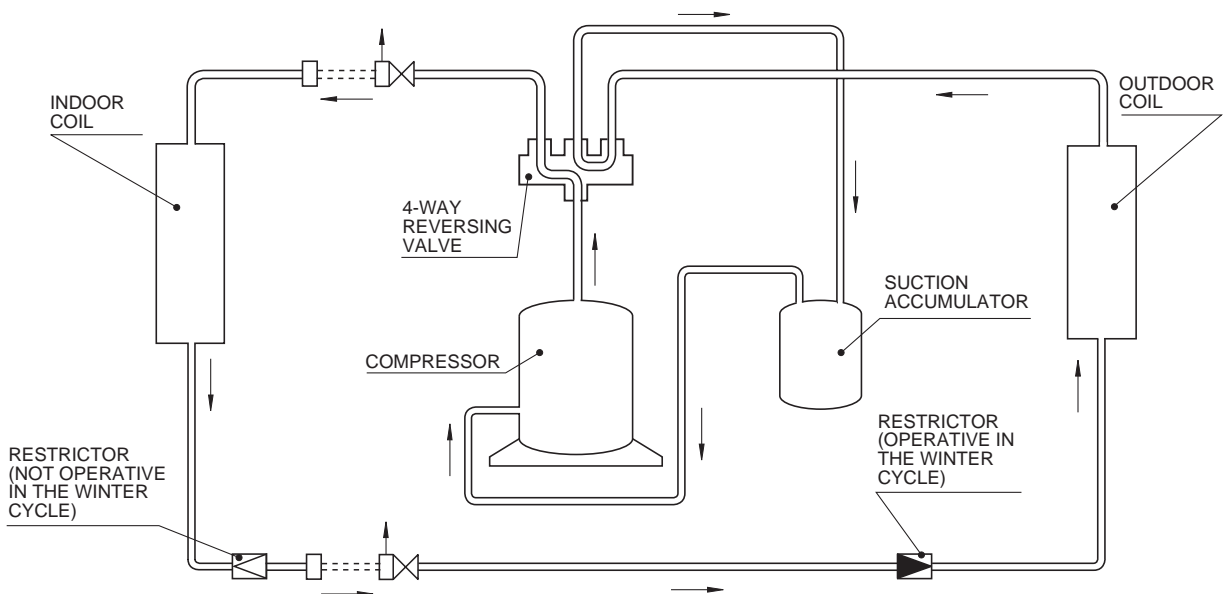
Winter cycle

In the Winter cycle the discharge gas goes to the indoor battery, which acts as a condenser. The 4-way valve is inoperative. The corresponding figure indicates the circuit followed by the refrigerant.

Summer cycle



Winter cycle



Note:

The SOH/SIH-150, 180 & SOH/SICH-240 units have 2 independent circuits with similar characteristics. The diagram shows the circuit followed by the refrigerant in one of them.

Operation sequence

See the corresponding electrical diagrams.

Summer cycle: Thermostat set to "AUTO".

- 1) The 4-way valve is fed through the thermostat, which allows the refrigerant to circulate through the summer cycle.
- 2) If the ambient temperature thermostat fan operating mode is set to "FAN", the contactor is fed and the fan operates continuously.
- 3) The logic mode times and, 5 minutes later, the unit may be turned on.
- 4) When the thermostat is connected, the contactor is connected and the compressor is turned on. If the operating mode of the fan is at its normal setting, the contactor is fed through the cooling circuit of the thermostat, and the fan begins to operate.
- 5) The unit will operate at intervals, in response to the corresponding signal from the ambient thermostat, so as to satisfy the required cooling level.
- 6) When the unit turns off, after an operational cycle or a supply voltage interruption, the logic module does not allow a new start up until after 5 minutes (this protects the compressor, allowing the operational pressures to be balanced).
- 7) If the discharge pressure is greater than 28 kg/cm², or the discharge temperature surpasses 130°C, the logic module turns the unit off, leaving the system in lockout.
- 8) To reset after a lockout, interrupt the power supply to the unit, or press the "RESET" button.
This resets the system and the unit turns on after 5 minutes.

Winter cycle: Thermostat set to "AUTO".

- 1) The 4-way valve does not receive voltage, allowing a setting for the heating circuit; that is to say, the indoor battery acts as a condenser, and the outdoor battery as an evaporator.
- 2) If the ambient temperature thermostat fan operating mode is set to "FAN", the contactor is fed and the fan operates continuously.
- 3) The logic mode times and, 5 minutes later, the unit may be turned on.
- 4) When the first phase of the thermostat is connected, the contactor is connected and the compressor is turned on. If the operating mode of the fan is at its normal setting, the contactor is fed through the heating circuit of the thermostat, and the fan begins to operate.
- 5) The unit will operate at intervals, in response to the corresponding signal from the ambient thermostat, so as to satisfy the required heating level.
- 6) When the unit turns off, after an operational cycle or a supply voltage interruption, the logic module does not allow a new start up until after 5 minutes (this protects the compressor, allowing the operational pressures to be balanced).
- 7) If the discharge pressure is greater than 28 kg/cm², or the discharge temperature surpasses 130°C, the logic module turns the unit off, leaving the system in lockout.
- 8) To reset after a lockout, interrupt the power supply to the unit, or press the "RESET" button.
This resets the system and the unit turns on after 5 minutes.

Indoor fan operation

The logic module is equipped with two jumpers, JP19 and JP20, that allow configuring the indoor fan operation:

- JP19 "closed" = The fan is turned off during the defrosting cycle.
JP19 "open" = The fan is operative during the defrosting cycle.
JP20 "closed" = The fan stops 1 minute after the compressor.
JP20 "open" = The fan stops simultaneously with the compressor.

25-pin connector

The plate is equipped with a 25-pin connector to:

- Connect the service analyser that corresponds to this plate.
- Connect a PC network for the control of various units.

Micro-switches SW1

The purpose of these micro-switches is to identify the plate with a number (from 1 to 32) within the above mentioned network.

Their position does not affect the operation of the plate.

Indicating LEDs

STANDBY: Activated when the plate is in its starting process during the initial timing operation.

INPUT O, G, Y, W: Activated when a signal is received from the thermostat.

Service push buttons:

TEST (Green): Upon being pressed, timing is reduced to 10 seconds. The defrosting interval is reduced to 1 minute.

RESET (Red): When pressed, the normal activation of the plate is allowed after any failure or system lockout.

Defrost cycle

The frost produced on the outdoor battery during the heating cycle should be eliminated when it starts to block the battery.

The defrosting cycle will begin after the 30, 60 or 90 minutes, depending upon the setting, of start up or the last defrosting, and the evaporating temperature is equal to or less than -5°C.

The logic module:

- Activates the 4-way valve so as to pass on to the cooling cycle.
- Turns the outdoor fan off.

The defrosting cycle is over when the liquid temperature, controlled by the thermistor, is sufficiently high (13°C) or, if not heated, it remains at a minimum of 7°C during 5 minutes, or after a maximum of 12 minutes after the beginning of the defrosting process.

Upon ending the defrosting cycle, the logic module reestablishes the normal operating conditions of the heating cycle.

Operation at -15°C (optionally -5, -10, -20)

When the outdoor temperature is below -15°C, operation of the compressor is not justified due to the low level of heating it generates. The logic module detects, through a thermistor located at the outdoor air intake, whether the temperature is below -15°C, and acts:

- Disconnecting the compressor.

- Connecting the electric heater (optional accessory), which is controlled by the first phase of the thermostat.
- Turns the indoor fan on, controlled by the first heating phase of the thermostat.

Operation of emergency heating

When the operating mode of the thermostat is set to emergency heating ("EHT" on screen):

- The compressor goes into lockout.
- The auxiliary and emergency heaters, if installed, are controlled by the first phase of the thermostat.

Other electric circuit safety features

- The compressor is protected against overloads and against failure of a phase by a solid state protector, with three sen-

sors embedded in the coils.

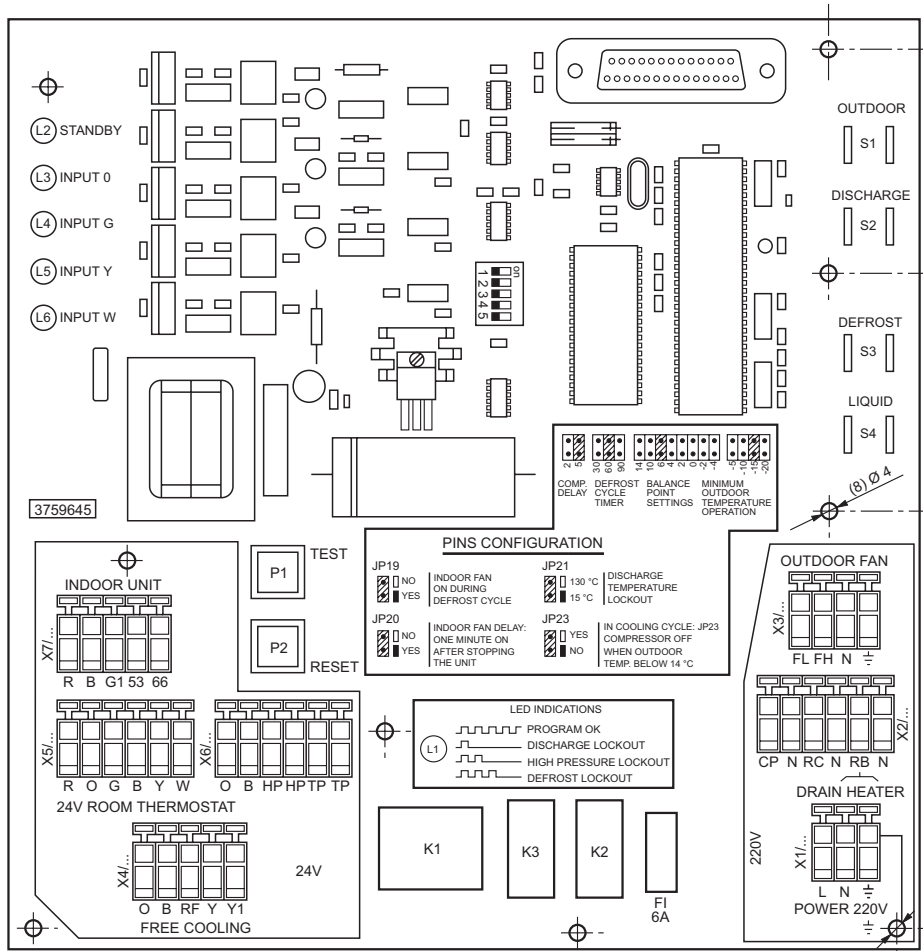
- The control circuit is protected by a fuse.
- In general, the entire unit and components are protected by a grounding circuit.

Compressor sump heater

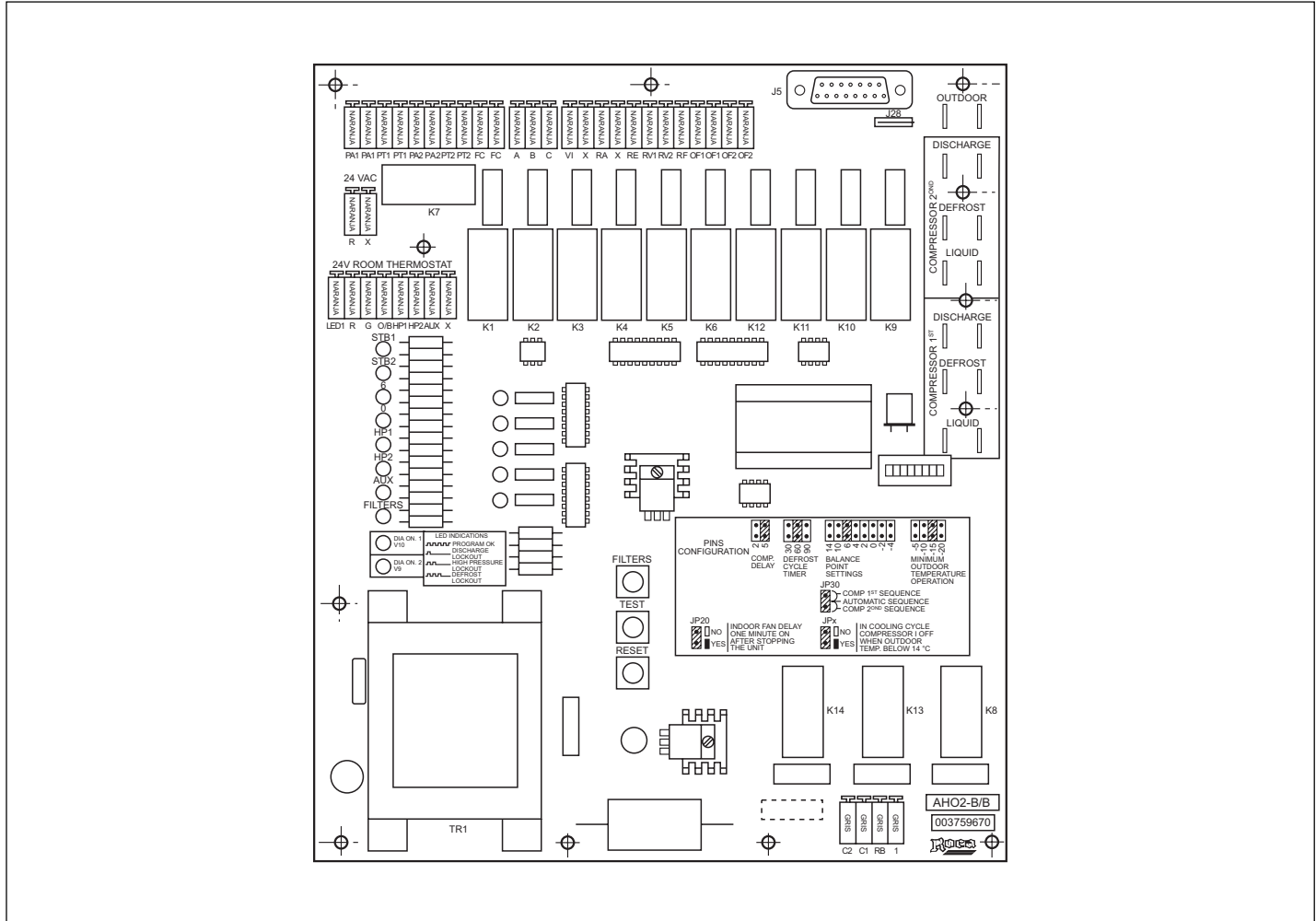
The compressor is equipped with a heater in its sump that heats the oil so as to avoid an excessive concentration of refrigerant in same while the compressor is turned off.

Should the main switch be turned off for a certain period of time, before starting the heat pump you should connect this switch at least 8 hours before, minimum. This is to remove the accumulated refrigerant from the compressor during that period of time.

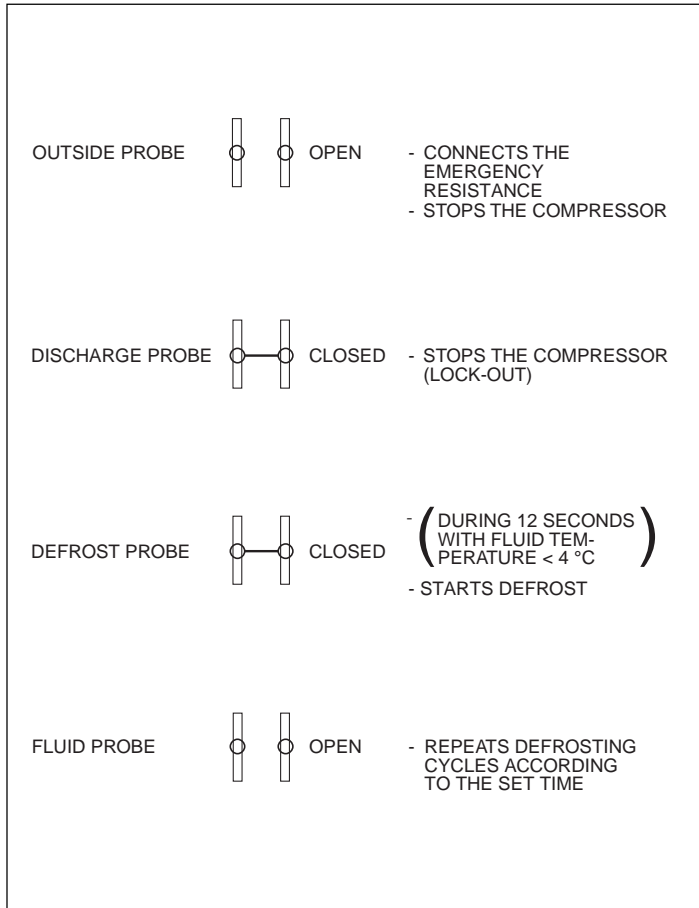
Module model SOH 076-120



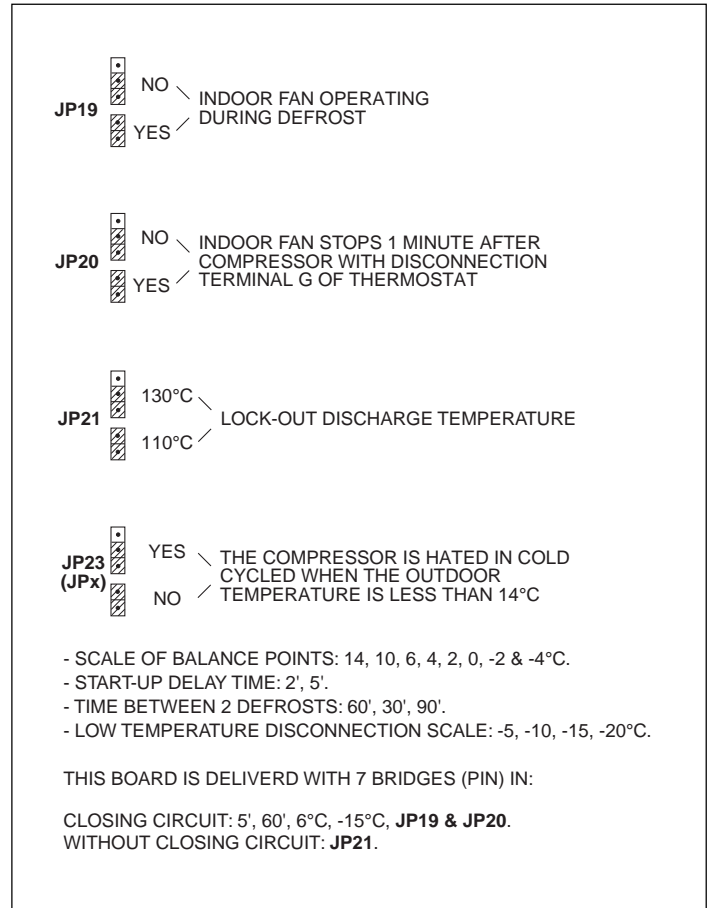
Module model SOH 150-240



Operation in accordance with the probes

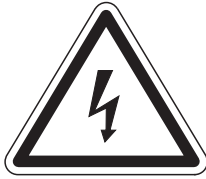


Operation of the jumpers (pins)



Maintenance

Clean the casing with a rag soaked in a soft liquid detergent.



Do not spill water on the unit for cleaning. Water could damage internal components and cause electrical discharges.
Never use solvents nor strong chemical products on the indoor units.
Do not rub the casing with very hot water.

Discharge of the indoor units with ducts

The discharge of the indoor units equipped for ducts are supplied without a protecting grill. When carrying out maintenance services, 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 filters

Keep the battery filters in good condition, checking them at least once a month. If the filters are dirty, air flow and equipment performance are reduced.

Cleaning the outdoor unit

Dirt should not be allowed to accumulate in the outdoor battery. 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, prior to cleaning.



CAUTION

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

Filling the drainage trap

So as to avoid having problems with the condensed water, we recommend that, prior to 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 the tension of the belts

The tension and wear of the belts of the motors should be checked yearly, and the belts changed if necessary. Before carrying this operation out, disconnect the main supply switch.

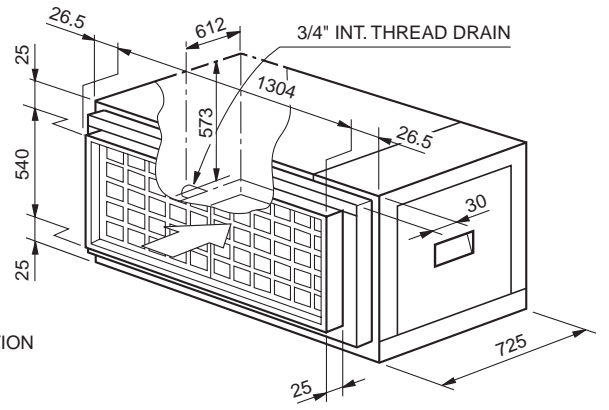
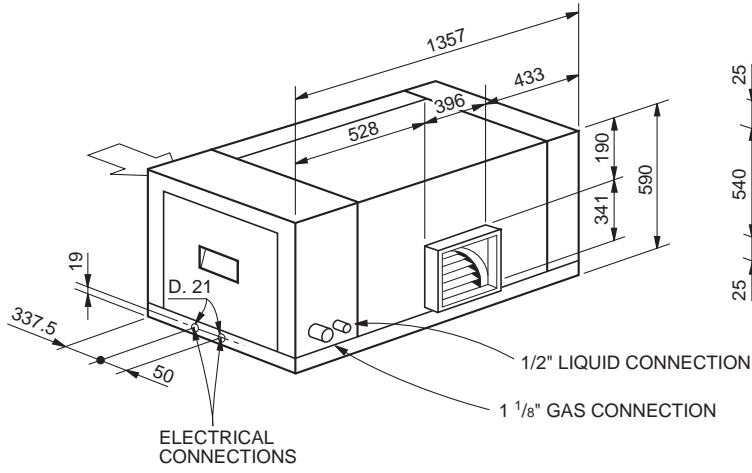


CAUTION

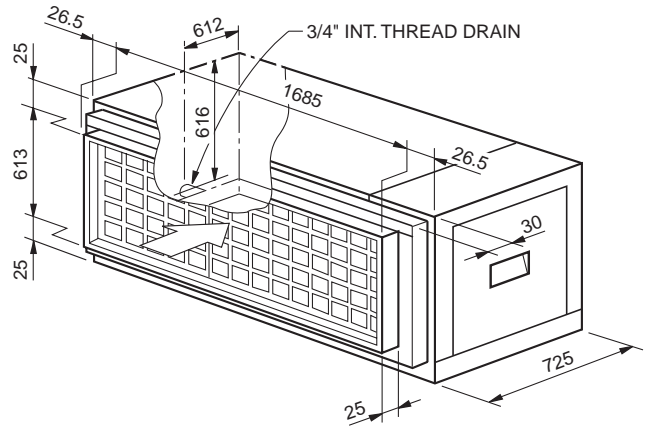
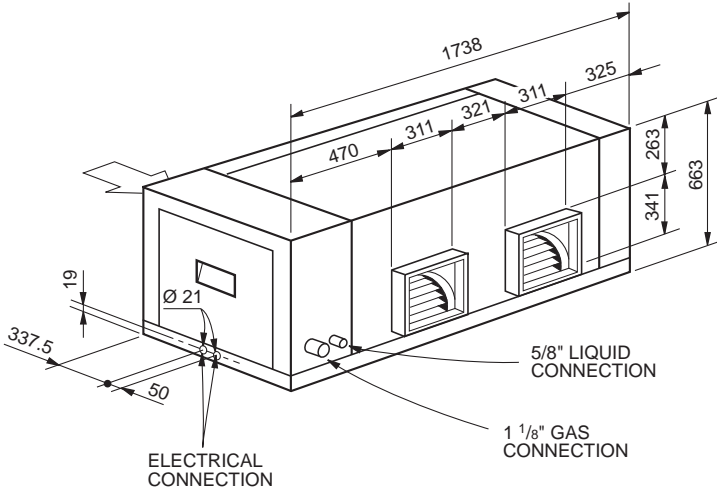
For safety reasons, make sure to turn the air conditioner off, and unplug the power supply, prior to checking the fan motor belts.

General dimensions mm

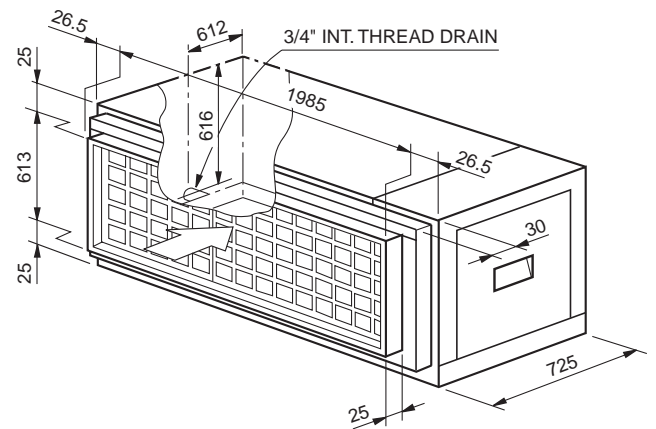
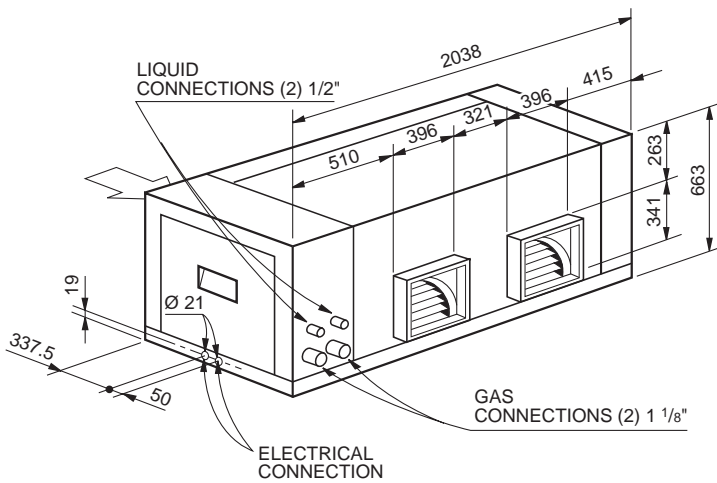
SIH-076



SIH-090/120

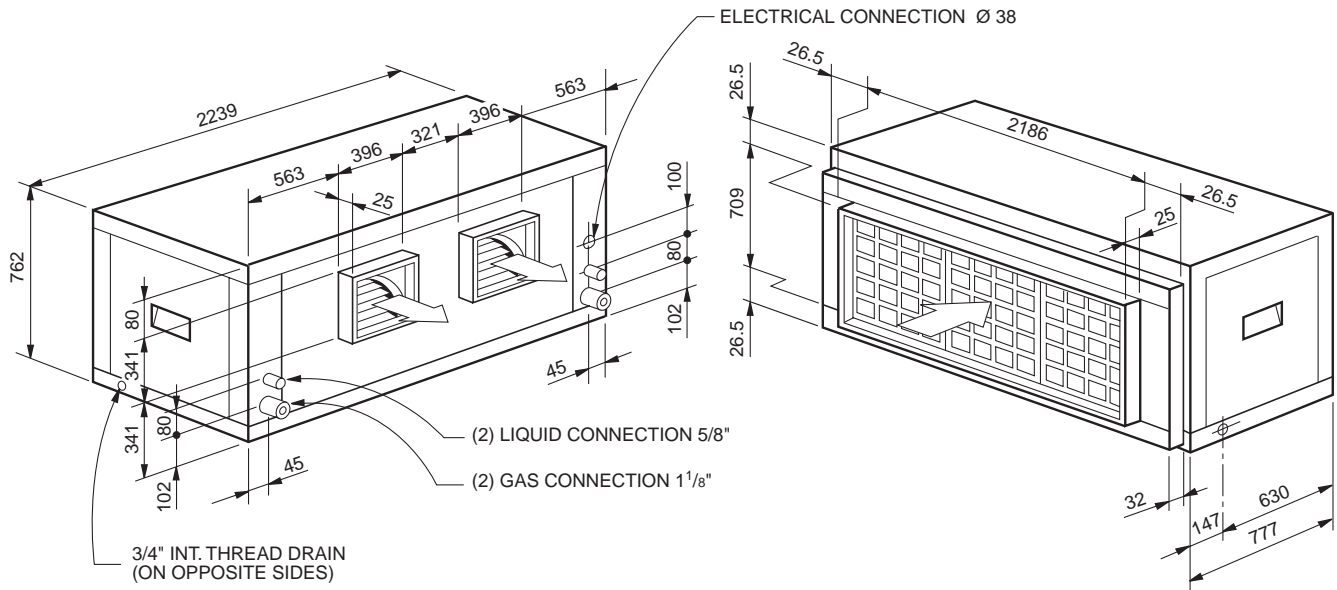


SIH-150

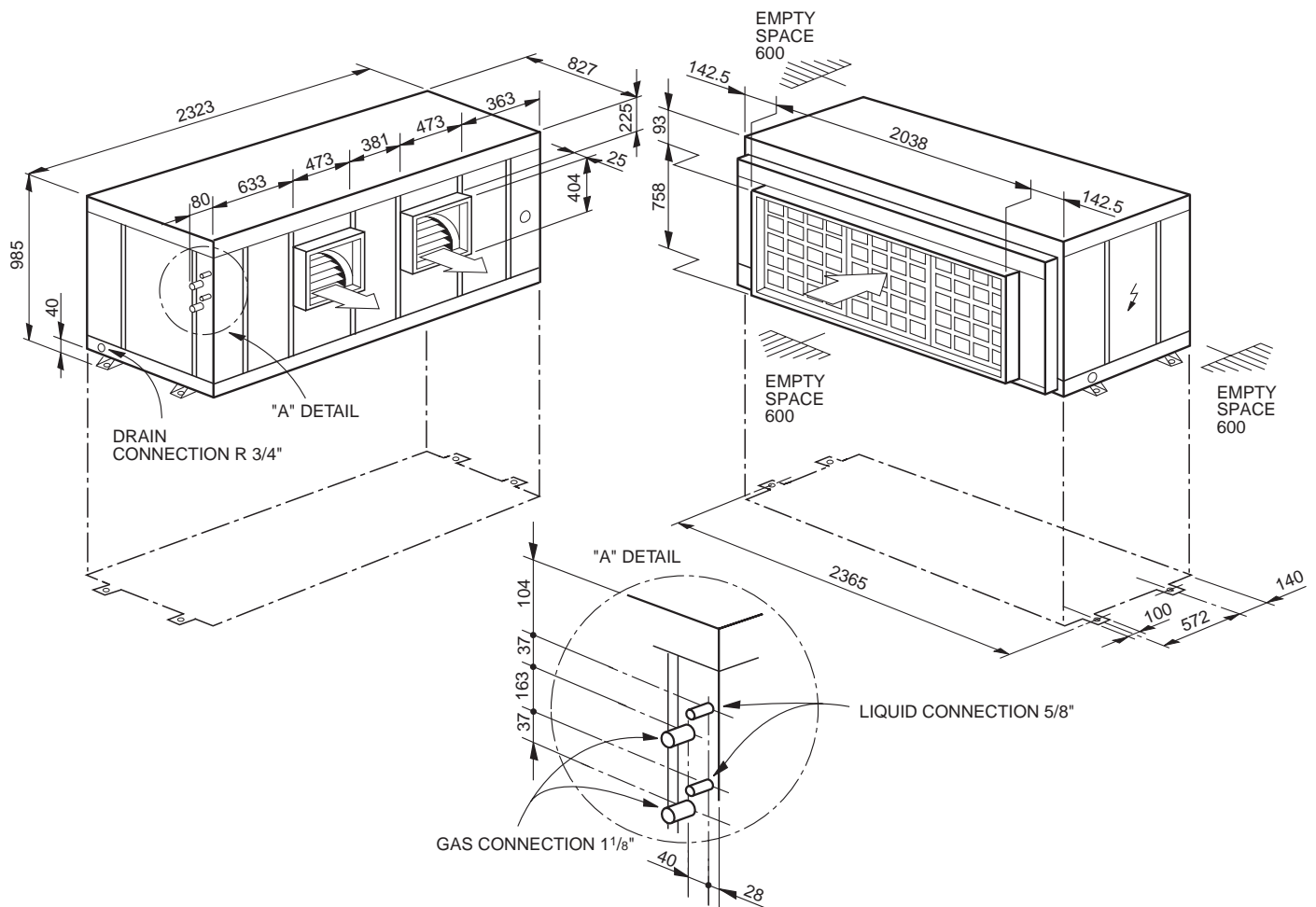


General dimensions mm

SIH-180

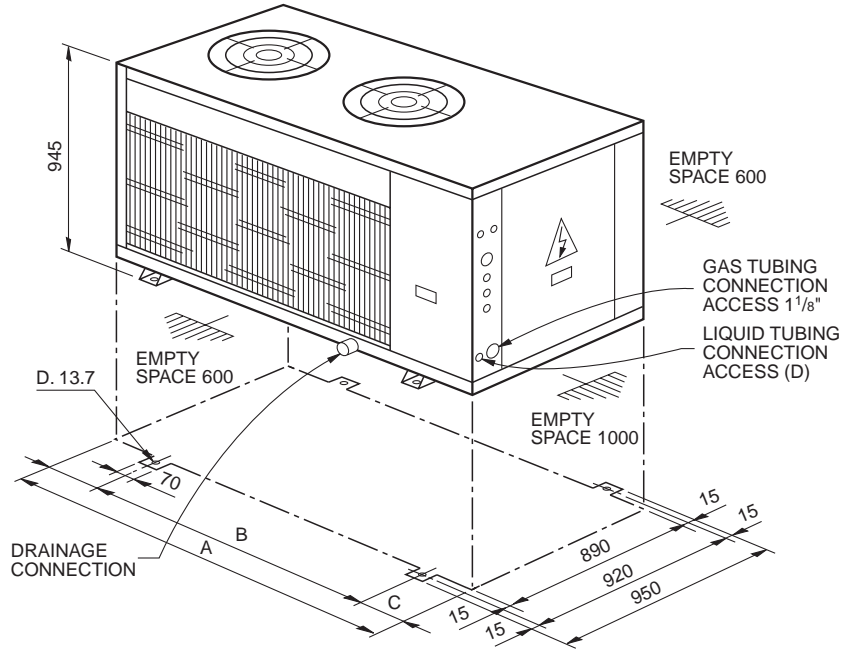


SICH-240



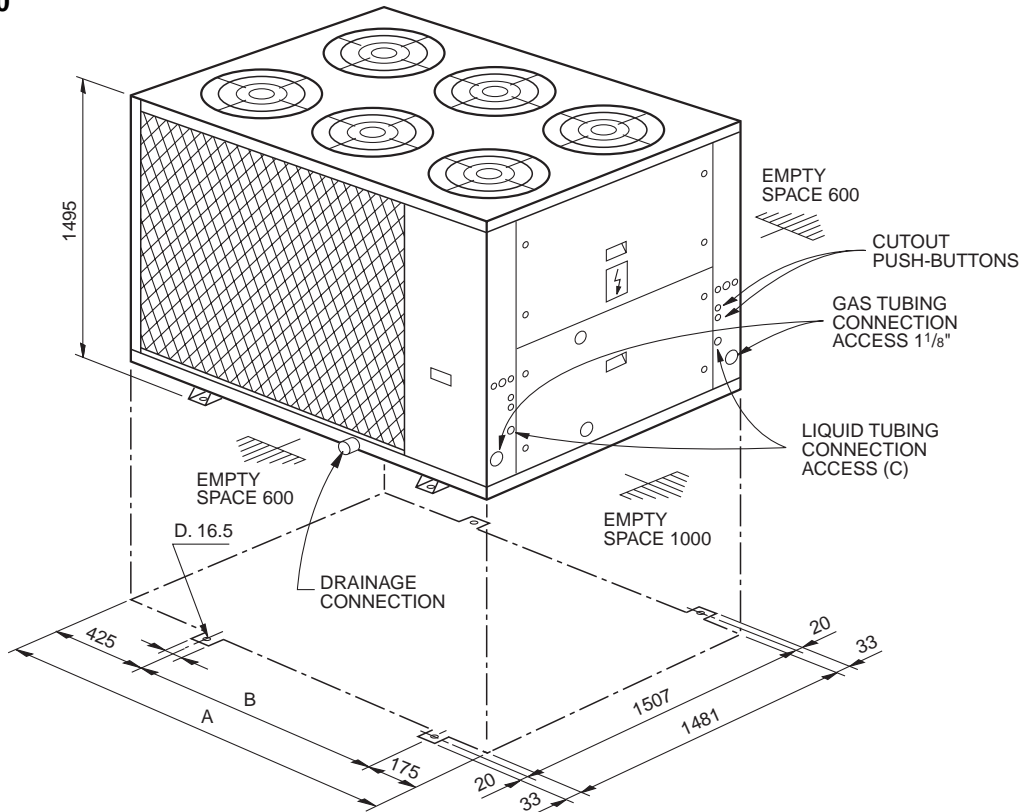
General dimensions mm

SOH-076, 090 & 120



Models	A	B	C	D
SOH-076	1 490	970	260	1/2"
SOH-090	1 775	1 255	260	5/8"
SOH-120	2 150	1 580	285	5/8"

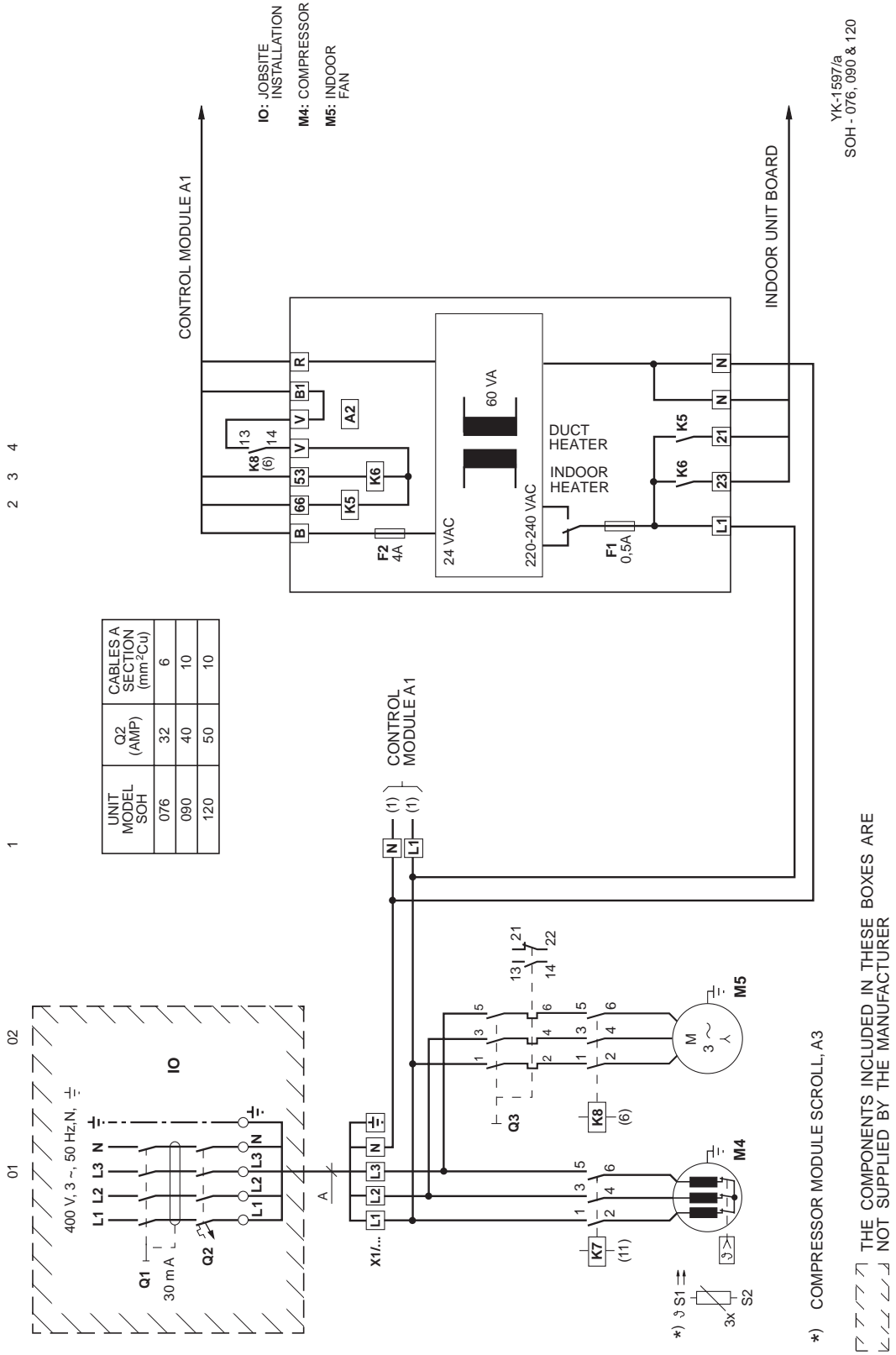
SOH-150, 180 & 240



Models	A	B	C
SOH-150	1 690	1 090	1/2"
SOH-180	1 975	1 375	5/8"
SOH-240	2 150	1 550	5/8"

Wiring diagram and control module A2

SOH - 076, 090 & 120



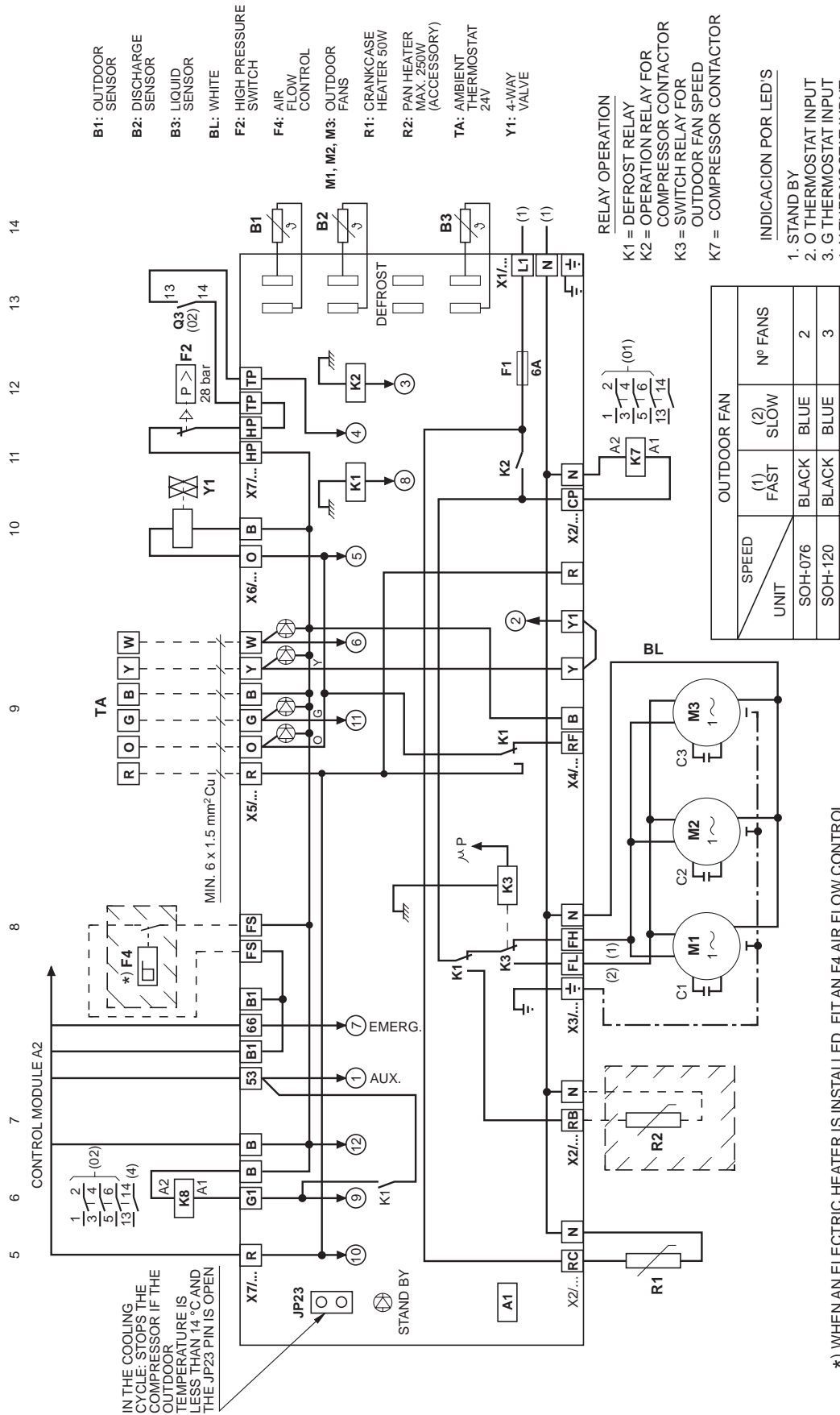
YK-1597/a
 SOH - 076, 090 & 120

*) COMPRESSOR MODULE SCROLL, A3

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

Wiring diagram (Control module A1)

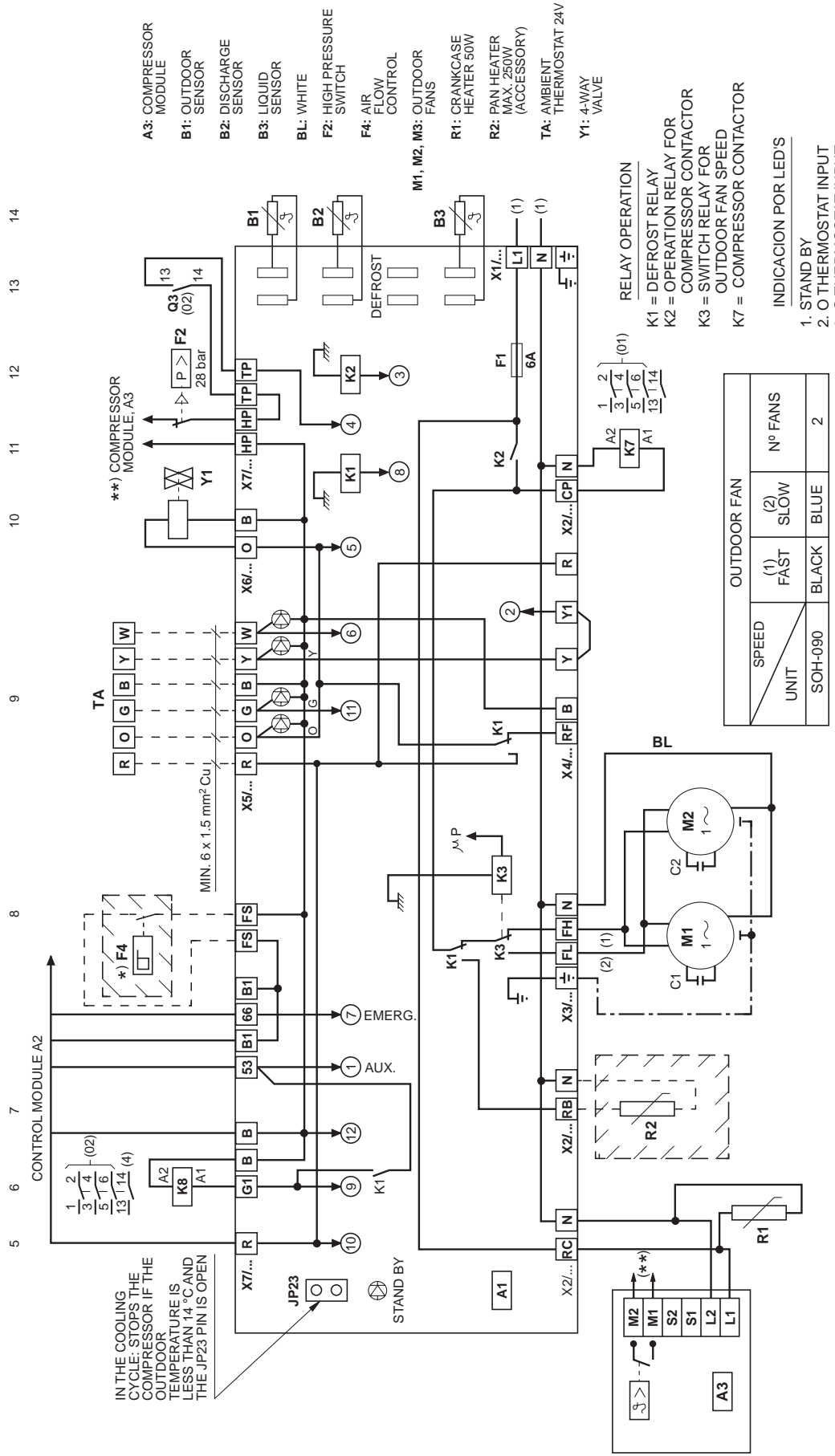
SOH - 076 & 120



YK-1598/a
SOH - 076 & 120

Wiring diagram (Control module A1)

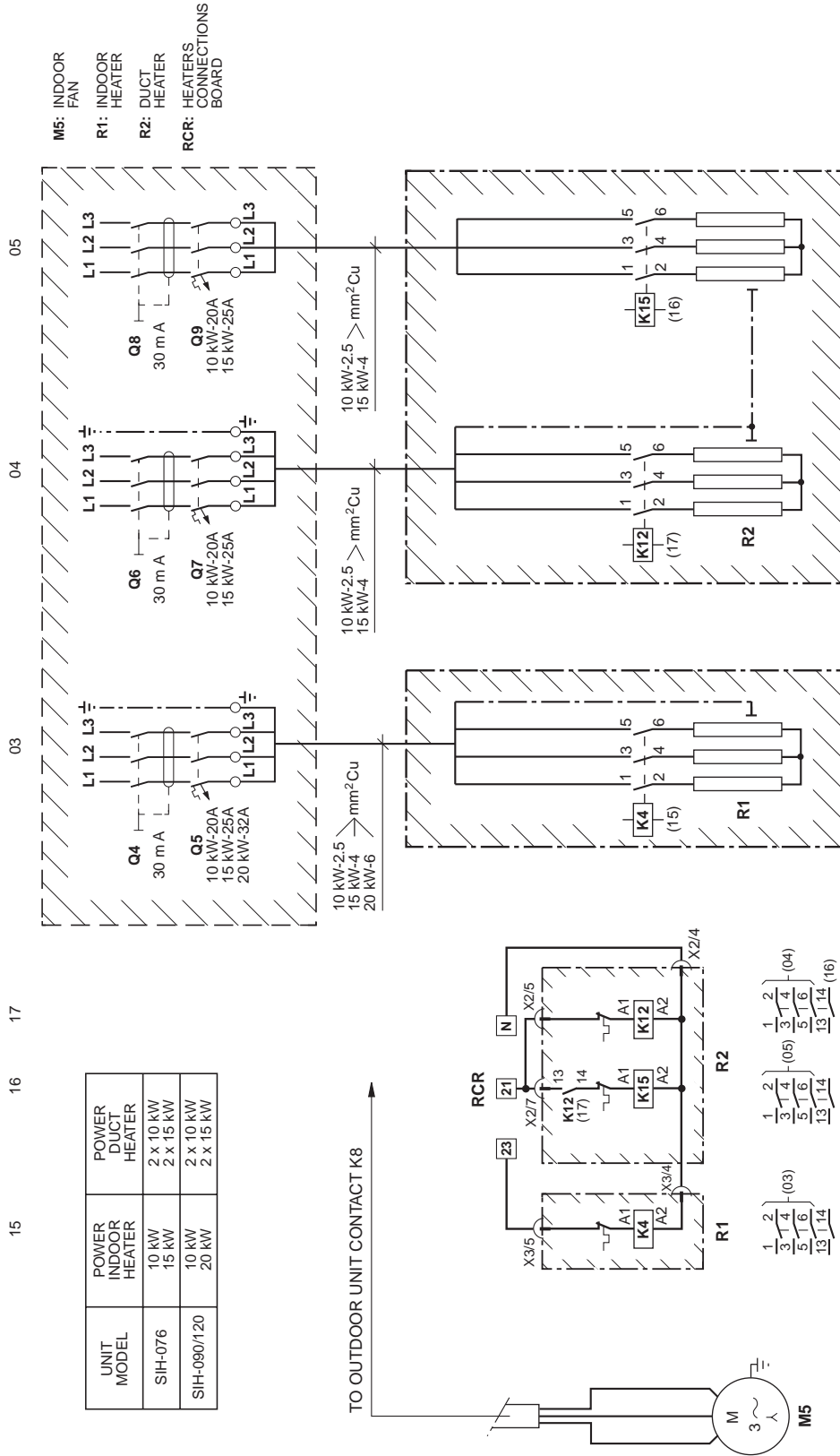
SOH - 090



Y/K-1629/a
SOH - 090

Wiring diagram

SIH - 076 & 090/120



SEE DIAGRAM RC-220/30-220

10 kW/15kW/20kW

20/30 kW

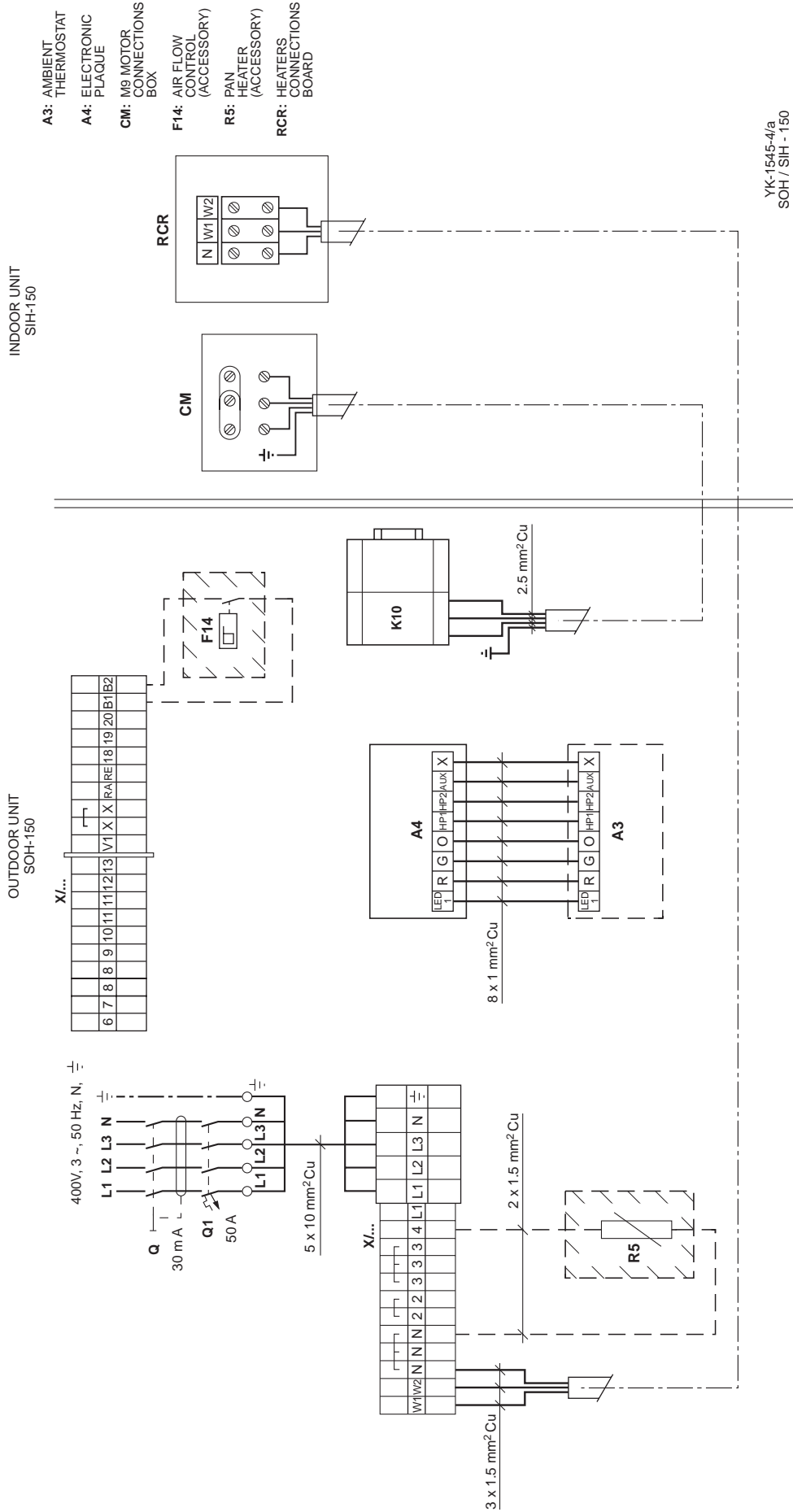
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

YK-1600/a
SIH - 076 & 090/120

Interconnecting diagram

SOH / SIH - 150

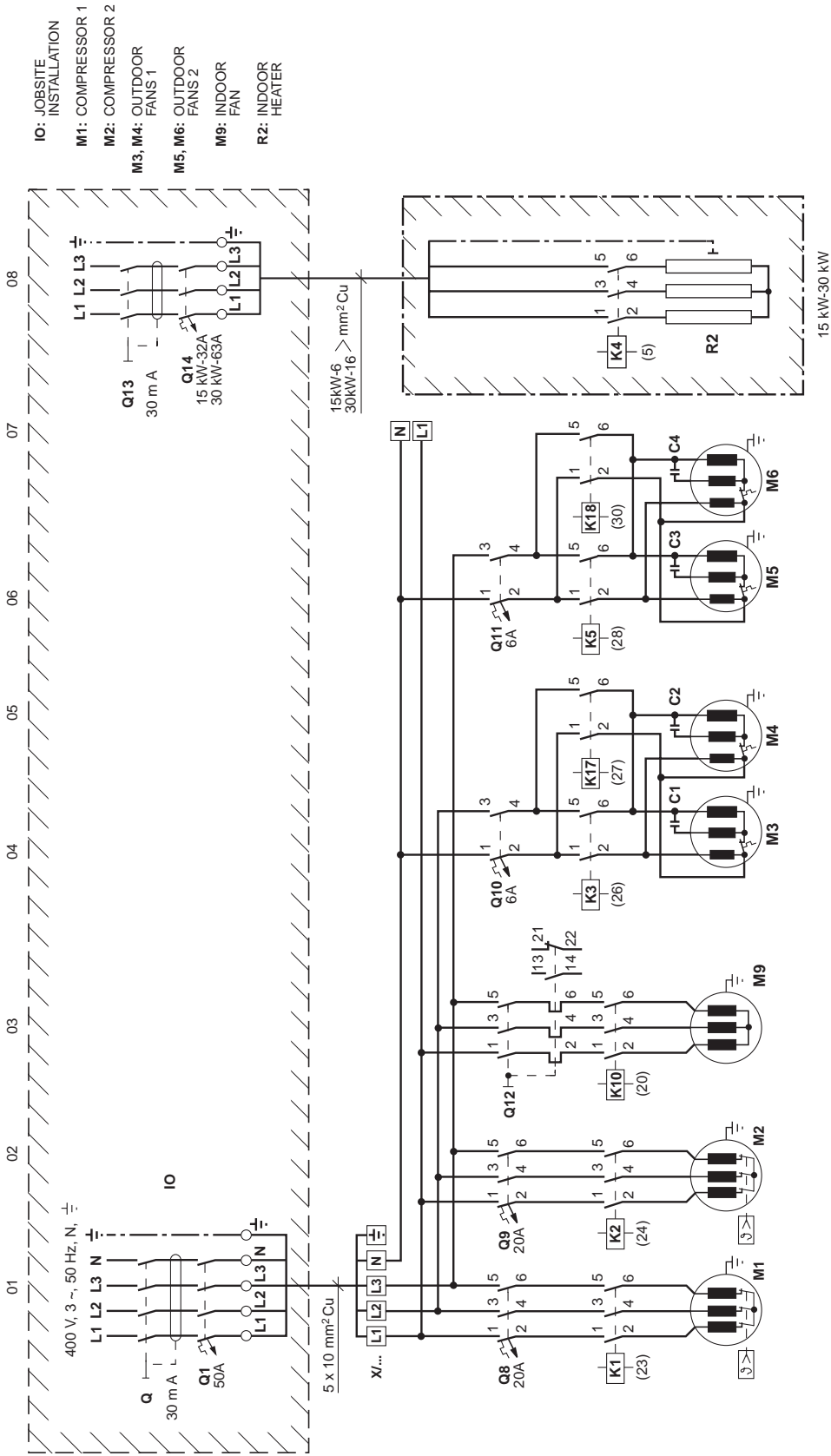


YK-1545-4/a
SOH / SIH - 150

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

Power diagram

SOH / SIH - 150



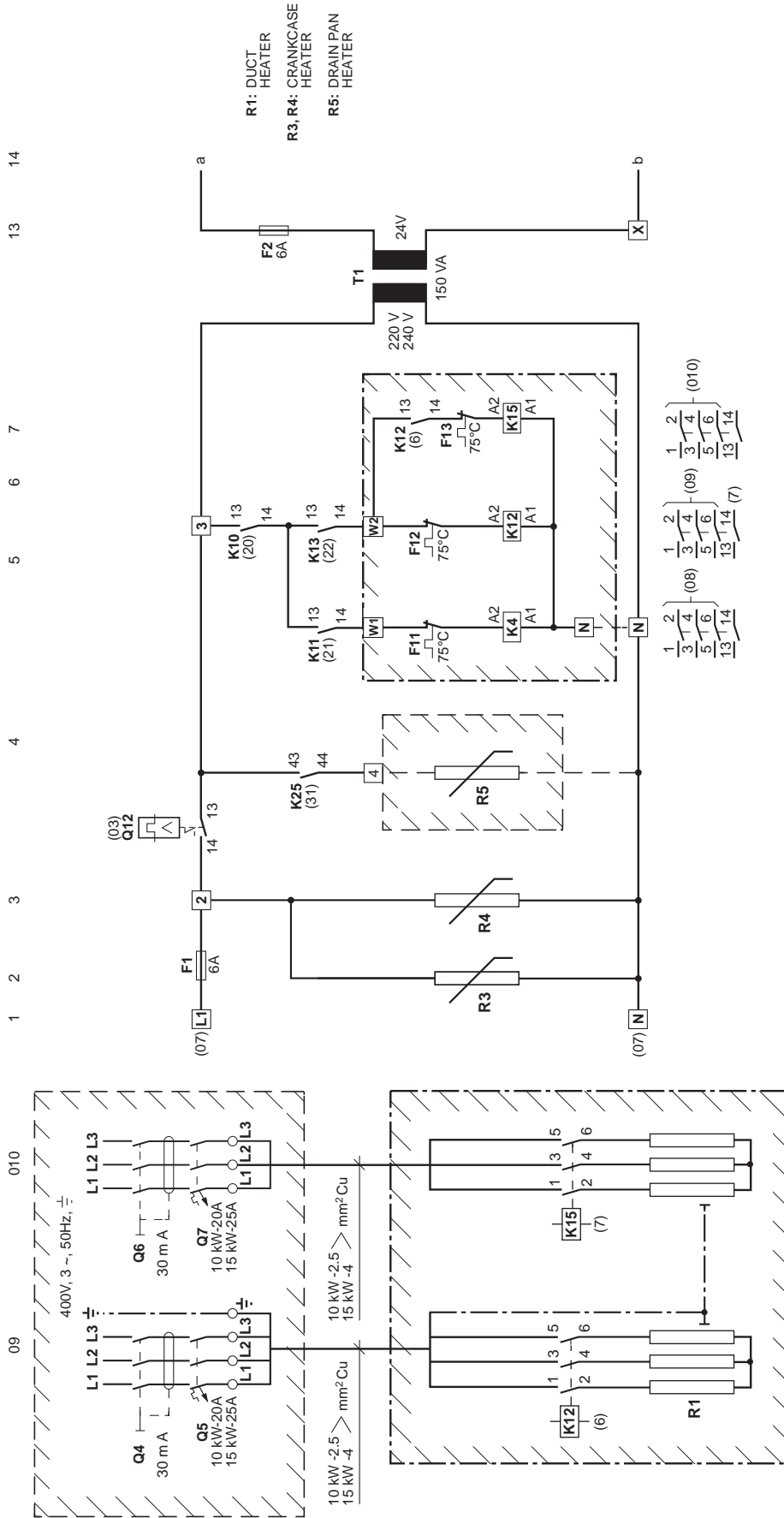
- IO: JOBSITE INSTALLATION
- M1: COMPRESSOR 1
- M2: COMPRESSOR 2
- M3, M4: OUTDOOR FANS 1
- M5, M6: OUTDOOR FANS 2
- M9: INDOOR FAN
- R2: INDOOR HEATER

 THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER
 THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

YK-1545-1/a
SOH / SIH - 150

Wiring diagram

SOH / SIH - 150



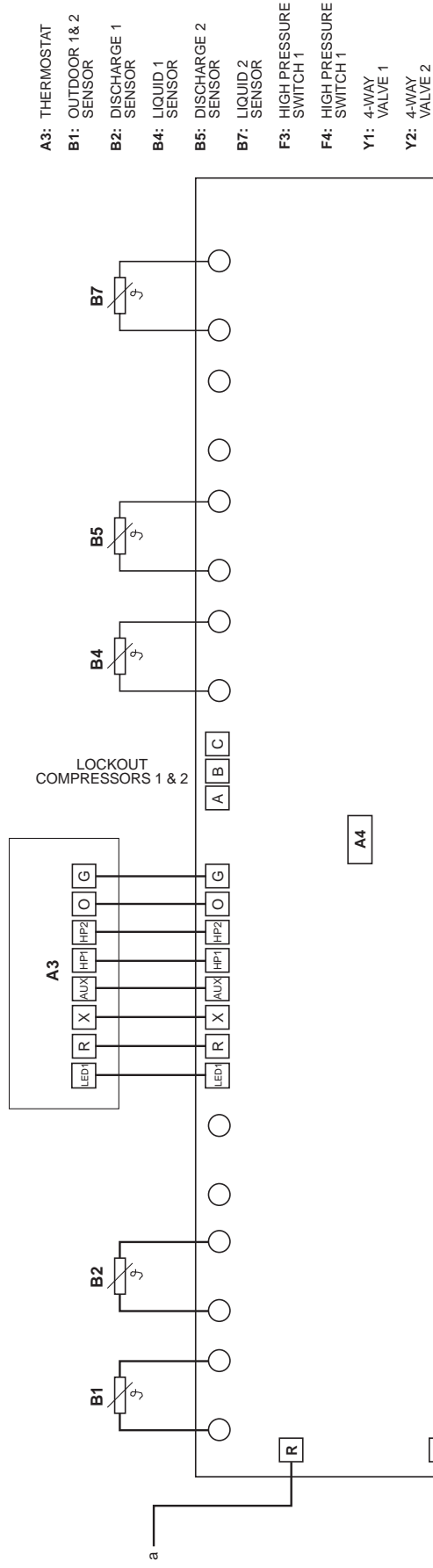
YK-1545-2/a
SOH / SIH - 150

 THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER
 THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

Operating diagram

SOH / SIH - 150

15 16 17 18 19 20 21 22 23 24 26 27 28 29 30 31 32 33



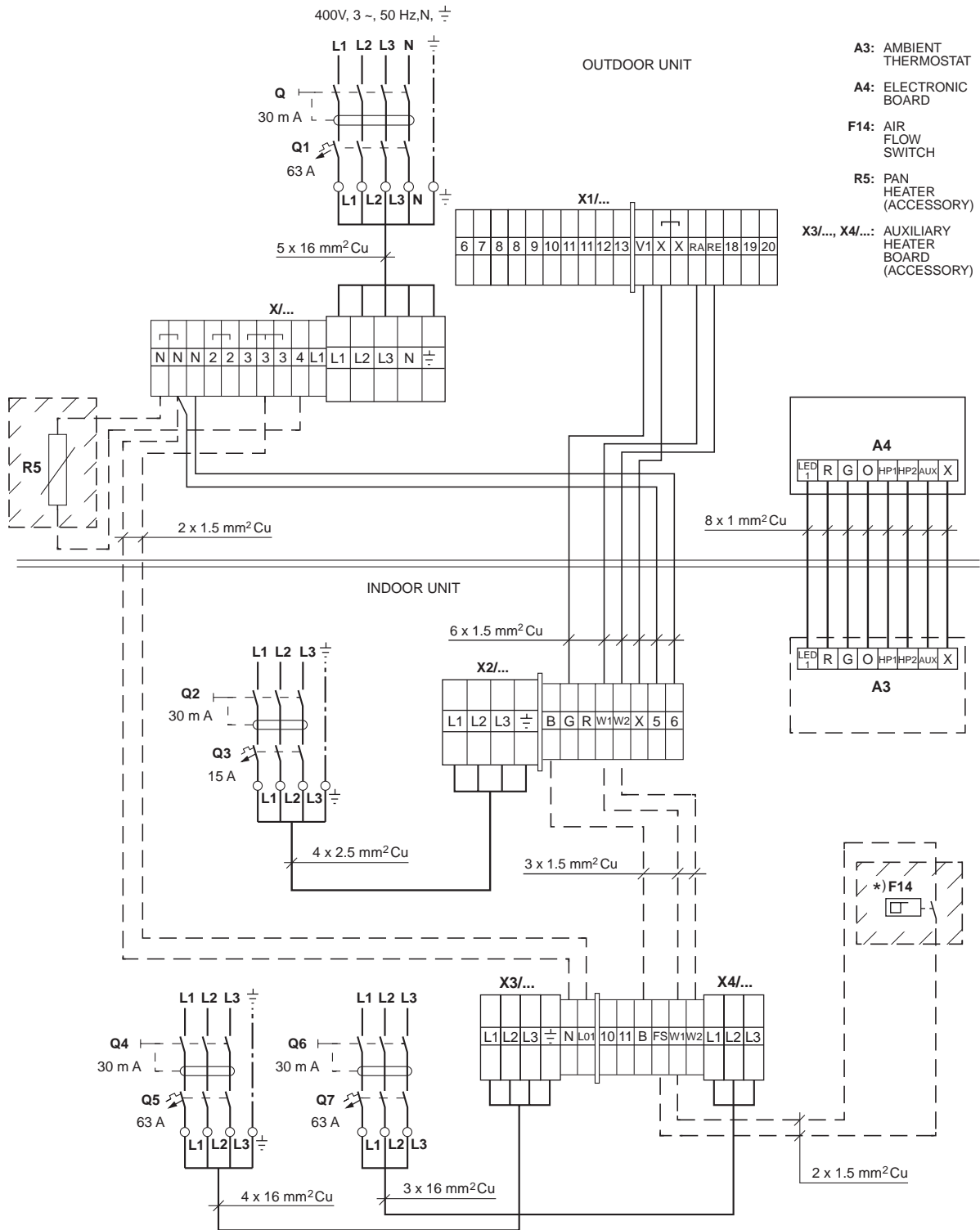
- A3: THERMOSTAT
- B1: OUTDOOR 1&2 SENSOR
- B2: DISCHARGE 1 SENSOR
- B4: LIQUID 1 SENSOR
- B5: DISCHARGE 2 SENSOR
- B7: LIQUID 2 SENSOR
- F3: HIGH PRESSURE SWITCH 1
- F4: HIGH PRESSURE SWITCH 1
- Y1: 4-WAY VALVE 1
- Y2: 4-WAY VALVE 2

YK-1545-3/a
SOH / SIH - 150

*) WHEN AN ELECTRIC HEATER IS INSTALLED, FIT AN F14 AIR FLOW CONTROL
THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

Interconnecting diagram

SOH / SIH - 180



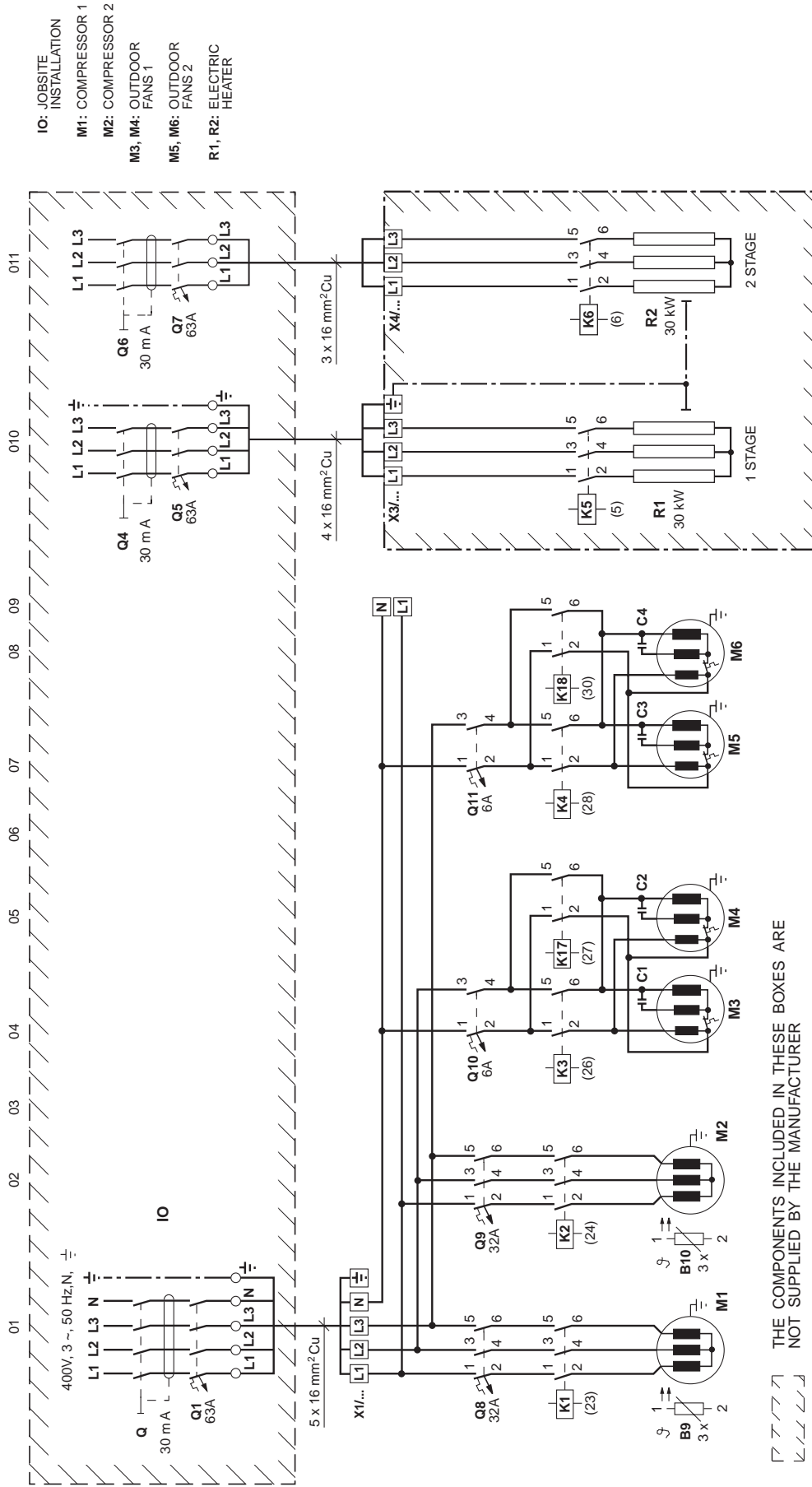
*) WHEN AN ELECTRIC HEATER IS INSTALLED, FIT AN F14 AIR FLOW CONTROL

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

YK-1544-4/a
SOH / SIH - 180

Power diagram

SOH / SIH - 180



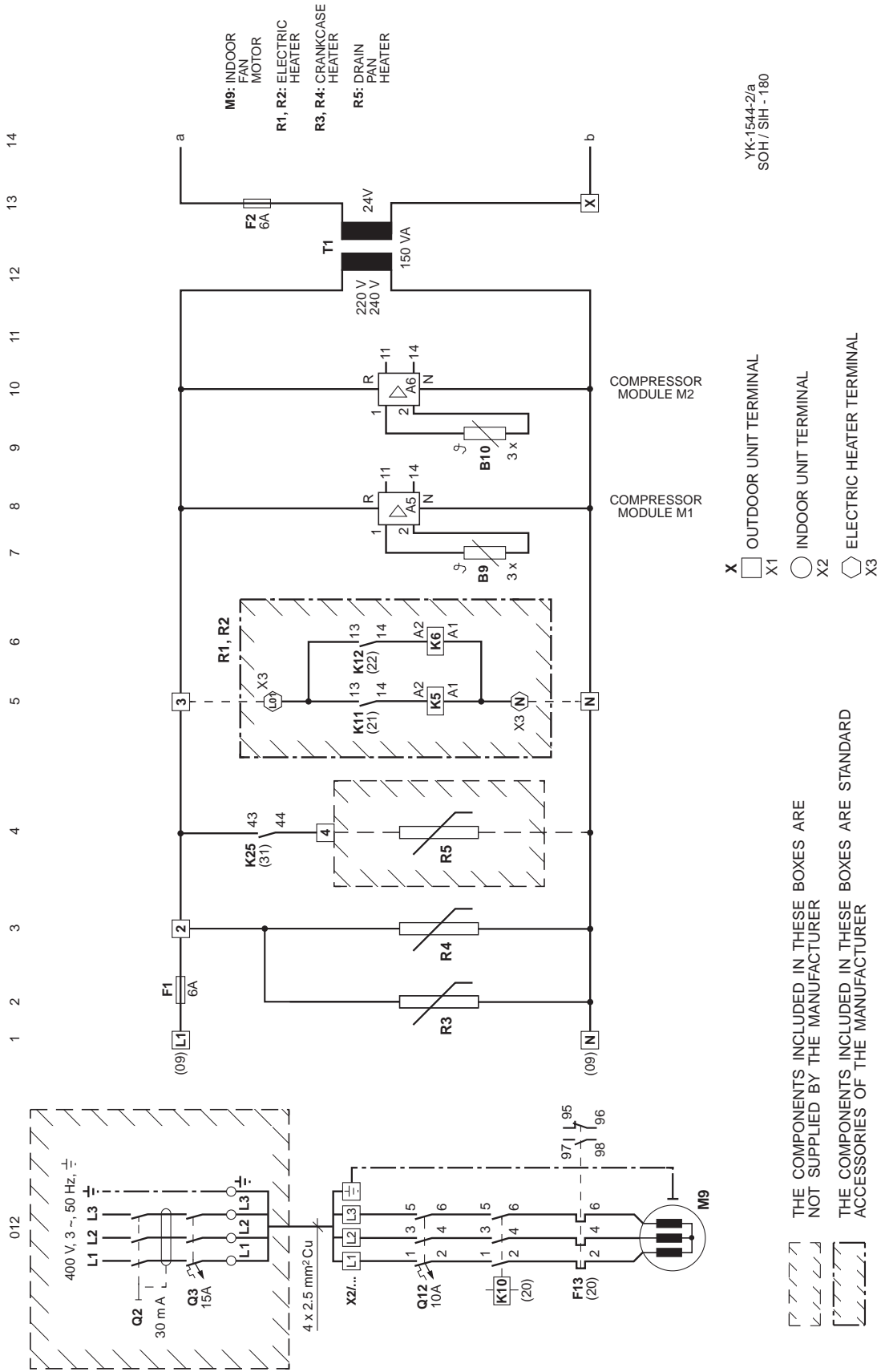
- IO: JOBSITE INSTALLATION
- M1: COMPRESSOR 1
- M2: COMPRESSOR 2
- M3, M4: OUTDOOR FANS 1
- M5, M6: OUTDOOR FANS 2
- R1, R2: ELECTRIC HEATER

 THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER
 THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

YK-1544-1/a
SOH / SIH - 180

Wiring diagram

SOH / SIH - 180

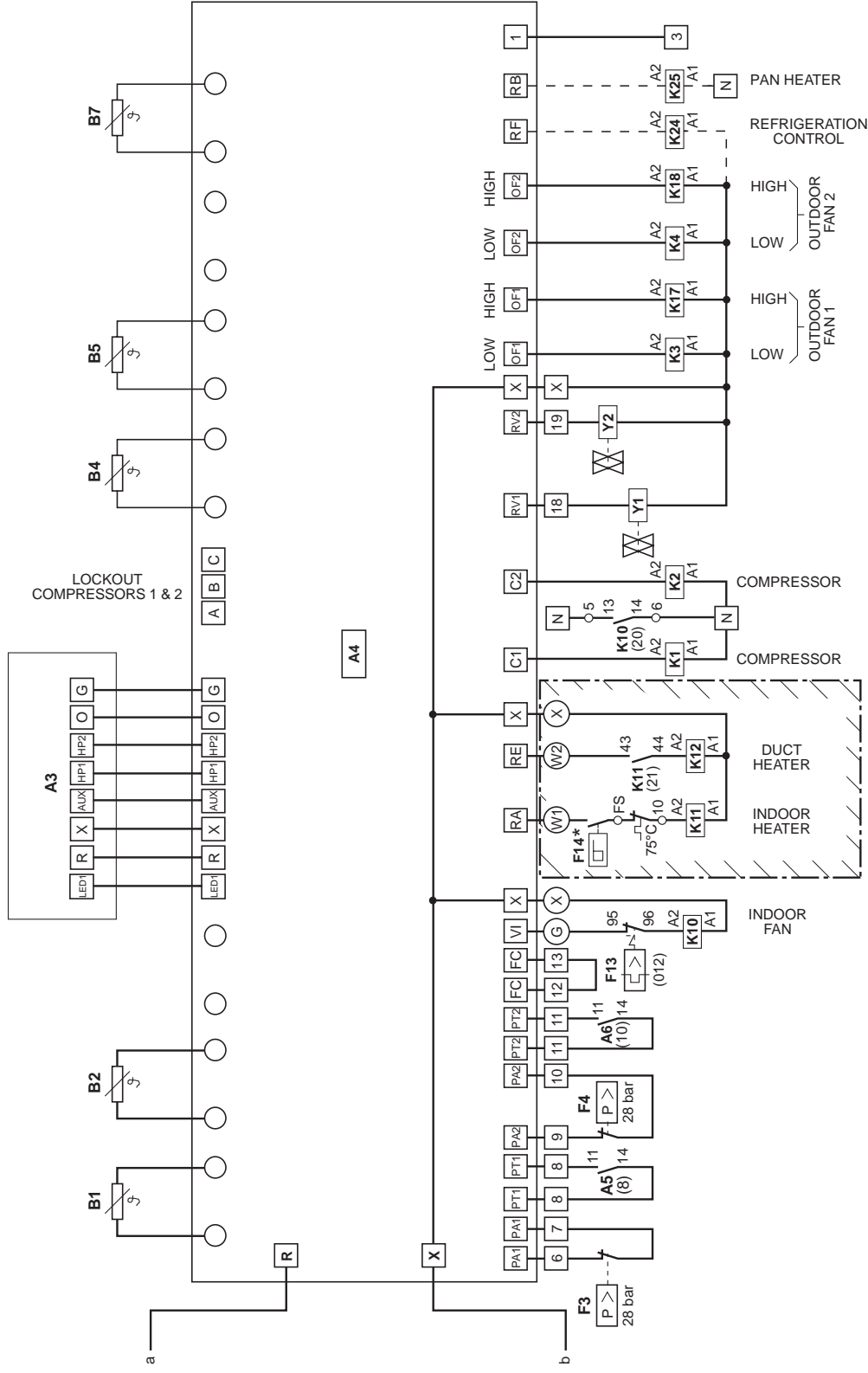


Operating diagram

SOH / SIH - 180

15 16 17 18 19 20 21 22 23 24 26 27 28 29 30 31 32 33

- A3: THERMOSTAT
- A5: COMPRESSOR MODULE M1
- A6: COMPRESSOR MODULE M2
- B1: OUTDOOR SENSOR 1 & 2
- B2: DISCHARGE SENSOR-1
- B4: LIQUID SENSOR-1
- B5: DISCHARGE SENSOR-2
- B7: LIQUID SENSOR-2
- F3: HIGH PRESSURE SWITCH 1
- F4: HIGH PRESSURE SWIRCH2
- Y1: 4-WAY VALVE 1
- Y2: 4-WAY VALVE 2



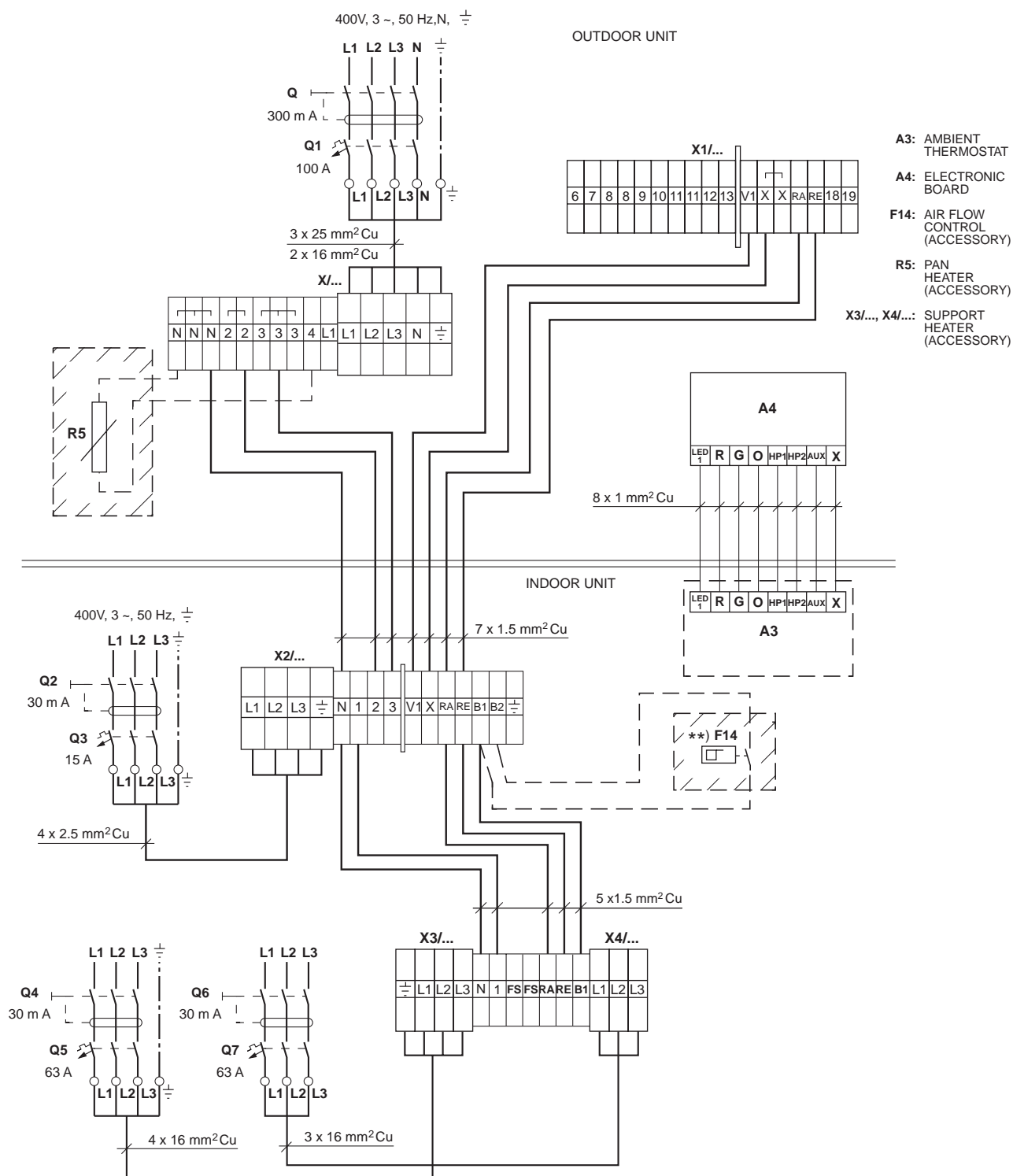
*) WHEN AN ELECTRIC HEATER IS INSTALLED, FIT AN F14 AIR FLOW CONTROL

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

YK-1544-3/a
SOH / SIH - 180

Interconnecting diagram

SOH / SICH - 240



- A3: AMBIENT THERMOSTAT
- A4: ELECTRONIC BOARD
- F14: AIR FLOW CONTROL (ACCESSORY)
- R5: PAN HEATER (ACCESSORY)
- X3/..., X4/...: SUPPORT HEATER (ACCESSORY)

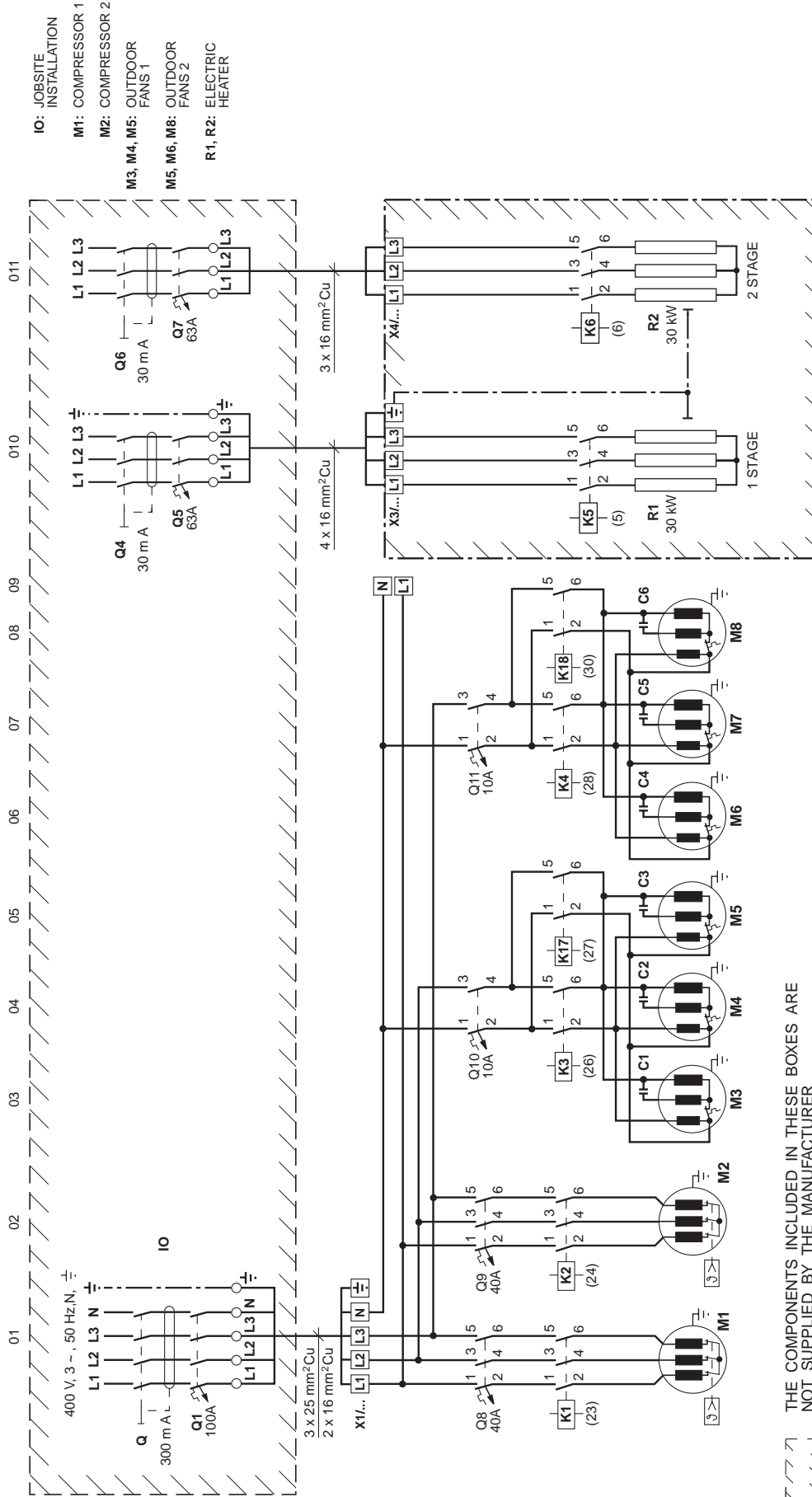
**) WHEN AN ELECTRIC HEATER IS INSTALLED, FIT AN F14 AIR FLOW CONTROL

$\square \ / \ / \ / \ /$ THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

YK-1371-4/a
SOH / SICH - 240

Power diagram

SOH / SICH - 240



IO: JOBSITE
INSTALLATION

M1: COMPRESSOR 1
M2: COMPRESSOR 2
M3, M4, M5: OUTDOOR
FANS 1
M5, M6, M8: OUTDOOR
FANS 2
R1, R2: ELECTRIC
HEATER

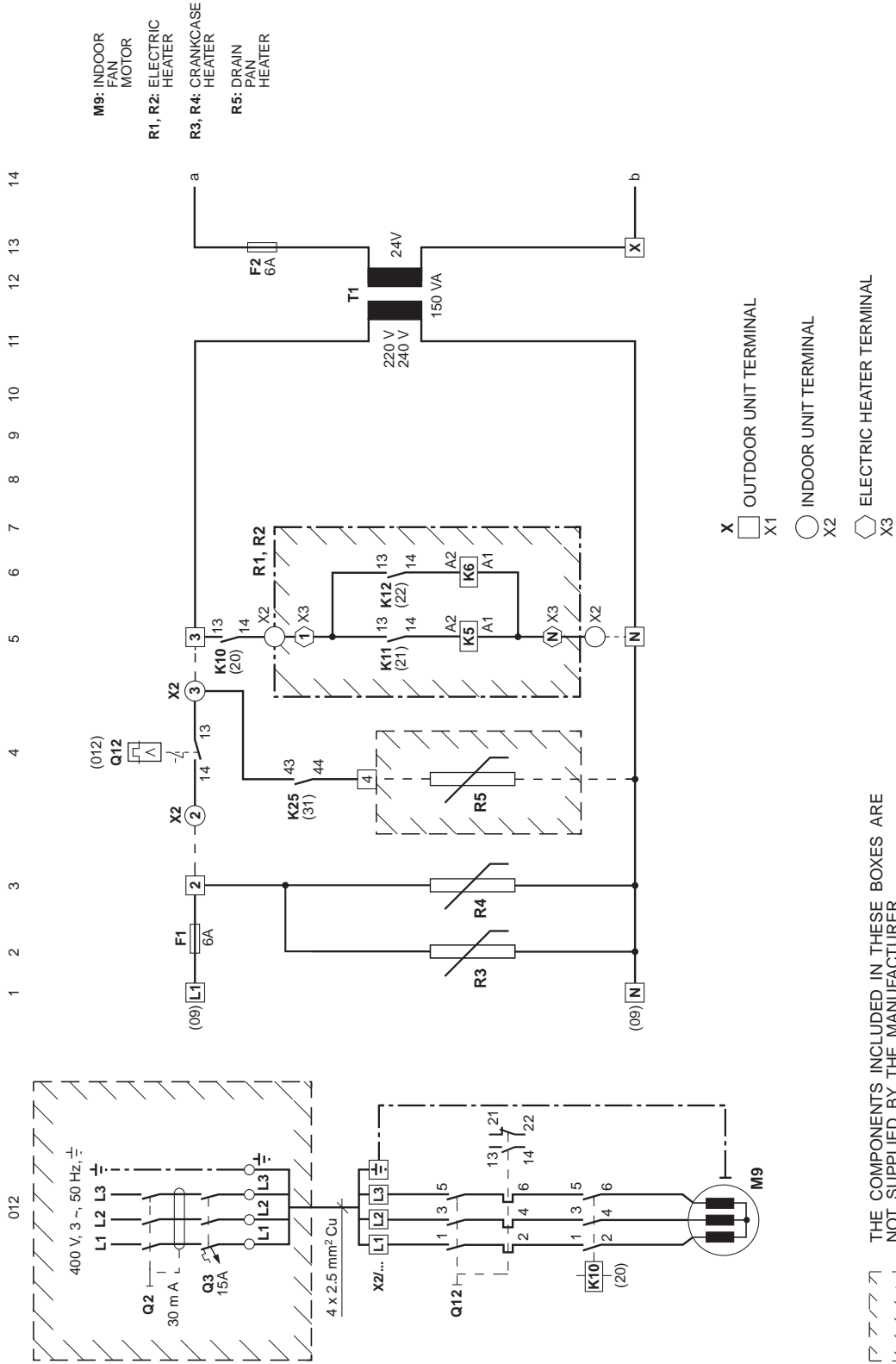
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

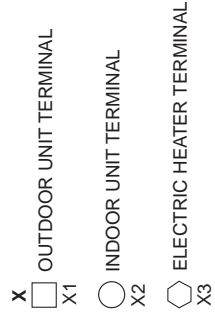
YK-1371-1/a
SOH / SICH - 240

Wiring diagram

SOH / SICH - 240



M9: INDOOR FAN MOTOR
 R1, R2: ELECTRIC HEATER
 R3, R4: CRANKCASE HEATER
 R5: DRAIN FAN HEATER

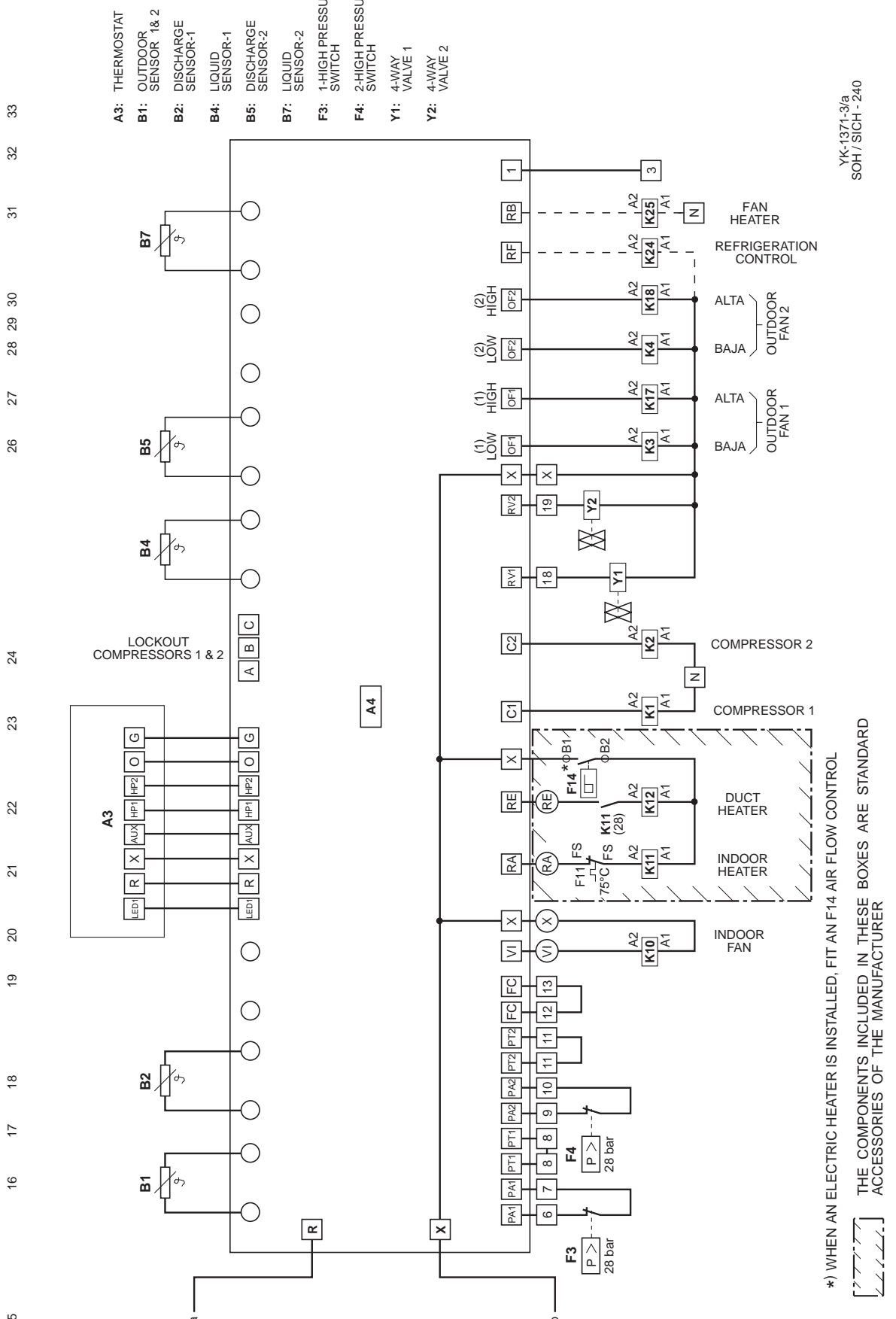


[/ / / /] THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER
 [- - - -] THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

YK-1371-2/a
 SOH / SICH - 240

Operating diagram

SOH / SICH - 240



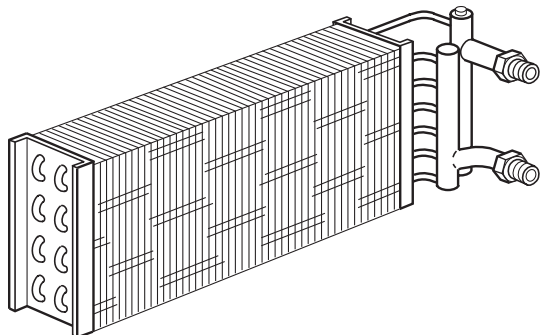
- A3: THERMOSTAT
- B1: OUTDOOR SENSOR 1 & 2
- B2: DISCHARGE SENSOR-1
- B4: LIQUID SENSOR-1
- B5: DISCHARGE SENSOR-2
- B7: LIQUID SENSOR-2
- F3: 1-HIGH PRESSURE SWITCH
- F4: 2-HIGH PRESSURE SWITCH
- Y1: 4-WAY VALVE 1
- Y2: 4-WAY VALVE 2

15 16 17 18 19 20 21 22 23 24 26 27 28 29 30 31 32 33

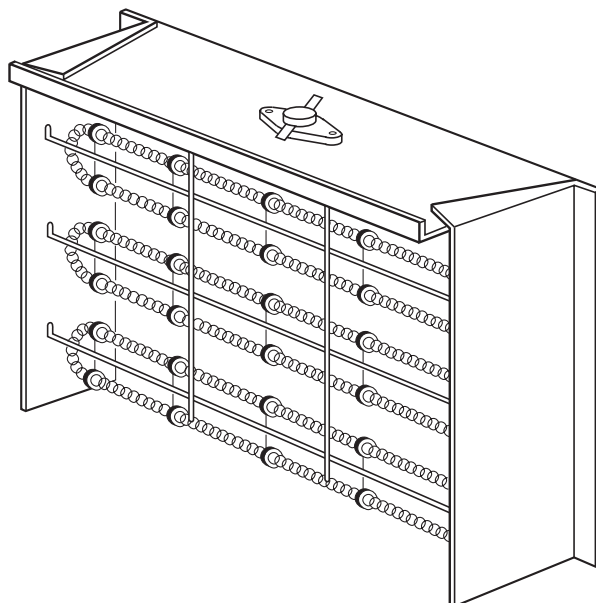
YK-1371-3/a
SOH / SICH - 240

*) WHEN AN ELECTRIC HEATER IS INSTALLED, FIT AN F14 AIR FLOW CONTROL
 [] THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES OF THE MANUFACTURER

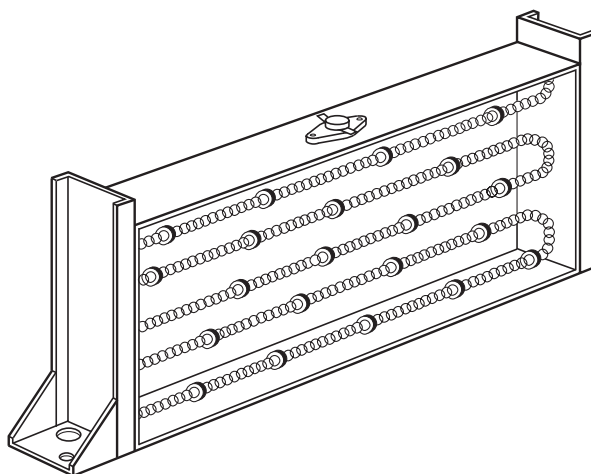
**Optional accessories for heat pump
models SOH / SIH**



**Hot water heater for
SIH-076, 090 & 150**



**Indoor electric heater for
SIH-076, 090 & 150**



**Indoor electric heater for
SIH-180**

Table of standard accessories

Accessory	Model SIH/SICH			
	076	090	150	180
Electric heater for model SIH-076 10 kW	X			
Electric heater for model SIH-76 15 kW	X			
Electric heater for model SIH-090 10 kW		X		
Electric heater for model SIH-090 20 kW		X		
Electric heater for model SIH-150 15 kW			X	
Electric heater for model SIH-150 30 kW			X	
Electric heater for model SIH-180 60 kW				X
Hot water coil for model SIH-076	X			
Hot water coil for model SIH-090		X		
Hot water coil for model SIH-150			X	
Transformation kit vertical for model SIH-180				X

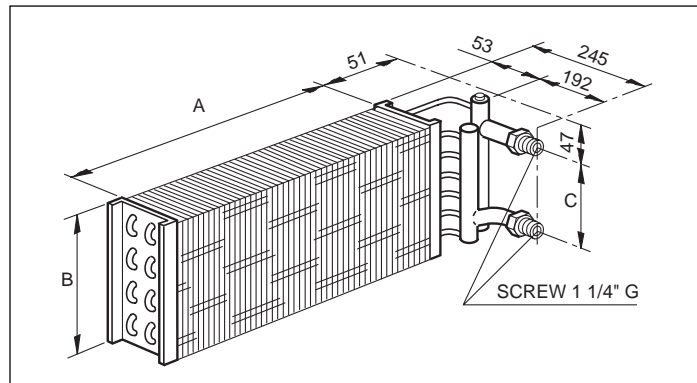
Hot water coil for SIH-076, 090 & 150

Made of copper tubes and aluminium fins.

Designed to fit inside the conditioner on galvanised steel supports.

Equipped with a 1/8" air purge.

General dimensions mm



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

Physical data

For model	SIH-076	SIH-090	SIH-150
Tubes depth	2	2	2
Tubes height	16	19	19
Fins/inch	12	12	12
Surface area	m ² 0.49	0.70	0.93
Tubes diameter	3/8"	3/8"	3/8"
Entry/outlet GAS male thread connections	1 1/4"	1 1/4"	1 1/4"

Heating capacity

For model	Nominal flow-rate		Heating capacity (*)	Charge loss air circuit	
	m ³ /h	m ³ /s	kW	mm WG	Pa
SIH-076	5 130	1.42	40.7	3.9	38.2
SIH-090	7 500	2.08	59.3	4.4	43.0
SIH-150	10 000	2.77	79.1	4.4	43.0

* The heating capacities given in this table are valid for water temperatures of 90°C at entry, 80°C at outlet and air entry at 13°C. For different conditions apply the correction factors from the relevant table.

Correction factors for the heating capacities of the hot water heating coil

These correction factors are for water intake and outlet temperatures and air entry different from the nominal ones.

Air temperature	Temperature °C water entry/outlet					
	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

Capacity correction in the water circuit of the hot water coil

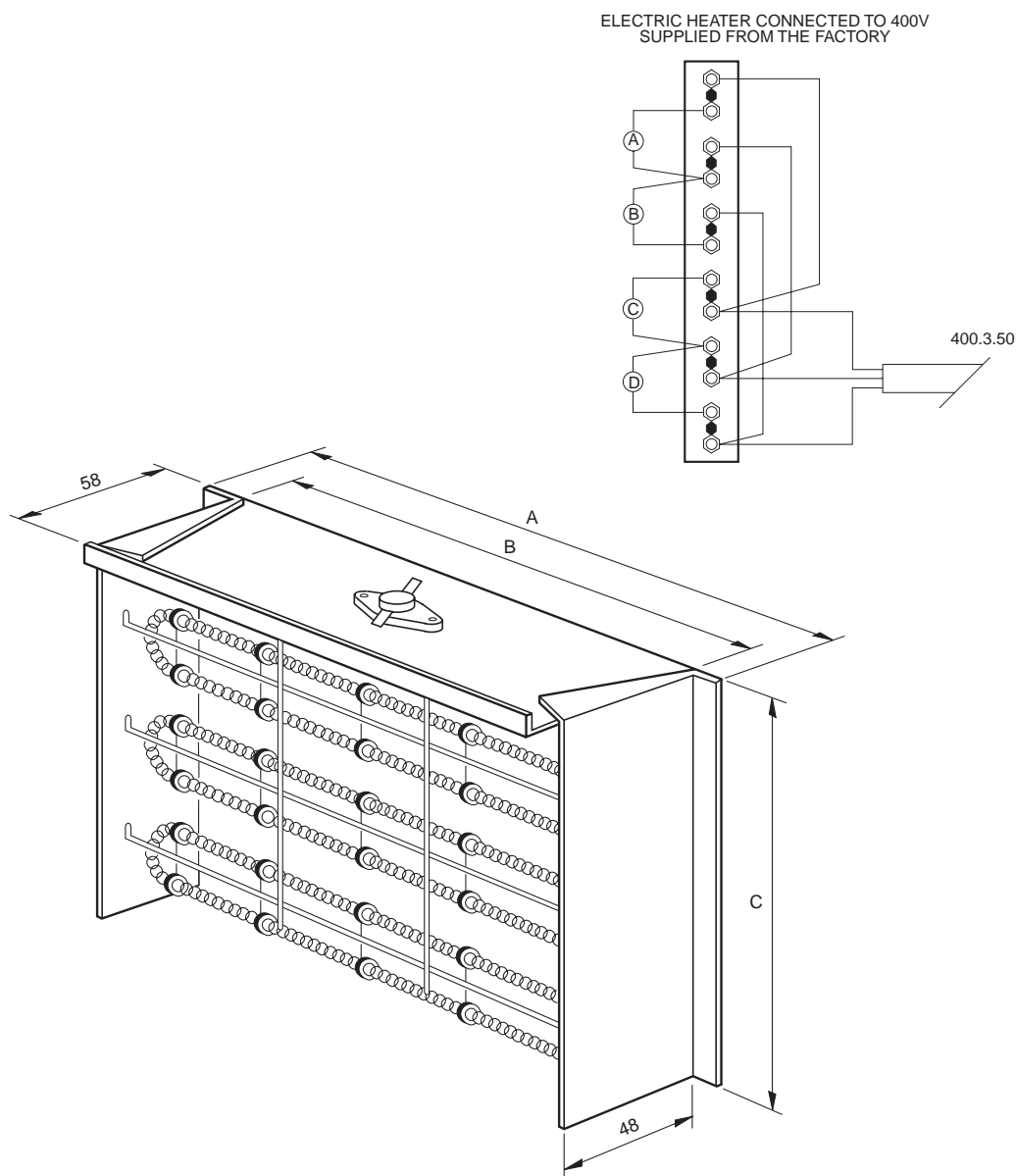
		Hot water flow-rate												
		m ³ /h	1.00	1.30	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	6.00	7.00
For model SIH-076	m WG		0.08	0.10	0.17	0.24	0.33	0.42	0.48					
	kPa		0.78	0.98	1.66	2.35	3.23	4.11	4.70					
For model SIH-090	m WG				0.13	0.20	0.27	0.36	0.46	0.54	0.66			
	kPa				1.27	1.96	2.64	3.52	4.50	5.28	6.46			
For model SIH-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	

Indoor electric heater for SIH-076, 090 & 150

Made of chrome-nickel air-exposed wires on soapstone supports and with a galvanised sheet steel frame designed to fit inside the unit. It is supplied with a thermal protector which disconnects the control circuit if it detects an abnormally high temperature.

This heater must function always with the air current provided by the indoor unit and the placings, or relays to achieve this end must be calculated. It is necessary to fit an air flow-rate control (see electrical diagrams).

General dimensions mm



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

For model	Nominal power kW	Power supply V.ph.Hz	Nº of stages	Packaged dimensions mm
SIH-076	10	400.3.50	1	1 200 x 550 x 125
	15			
SIH-090	10	400.3.50	1	1 440 x 620 x 125
	20			
SIH-150	15	400.3.50	1	1 920 x 620 x 125
	30			

Electric indoor heater for SIH-180

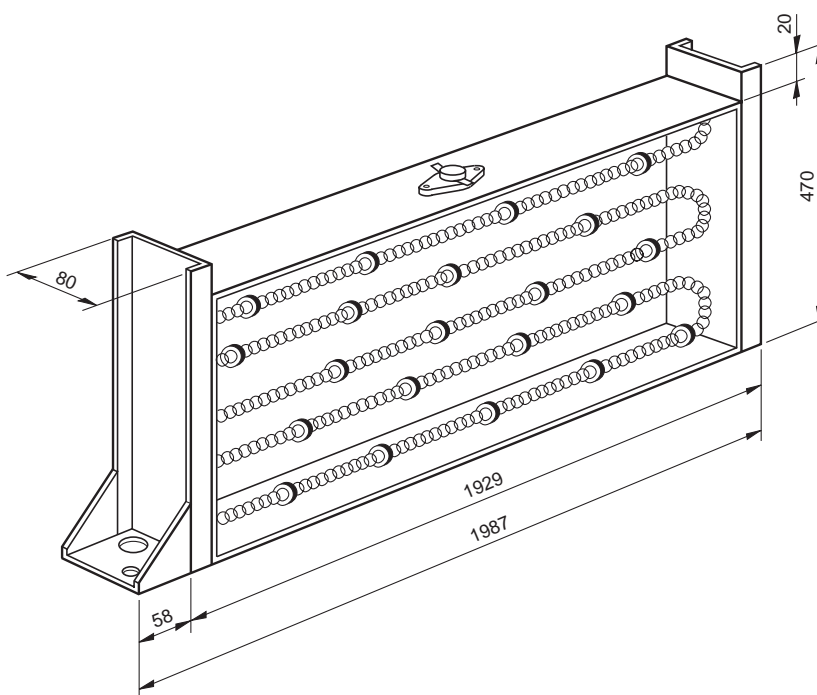
This 60 kW electric heater operates in two stages of 30 kW each; the first is used as an auxiliary heater and the second as an emergency one.

It is made of air-exposed chrome-nickel wires on soapstone supports and with galvanised sheet steel frame designed to fit inside the unit.

It is supplied with a thermal protector which disconnects the control circuit when it detects an abnormally high temperature.

This heater has to function always with the current of air provided by the indoor unit, so that the placements, or relays to achieve this end must be calculated. It is necessary to fit an air flow-rate control (see electrical diagrams).

General dimensions mm



Characteristics

For model	Nominal capacity kW	Power supply V.ph.Hz	N° of stages	Packaged dimensions mm
SIH-180	60	400.3.50	2	510 x 2 405 x 165

All data subject to change without notice.

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 servicing must be done by qualified personnel, wearing protective clothing, in compliance with applicable safety rules.



Rear the Manual



Risk of electrocution

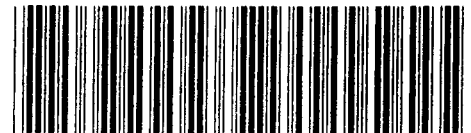


Remote-controlled unit
May start up unexpectedly



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 electric 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 - Ø 0005



Manufacturer reserves the right to change specifications without prior notice.

York, Europe

Paseo Espronceda, 278
08204 Sabadell (Barcelona) - Spain
Telephone (34) 937 489 000
Telefax (34) 937 117 285

YORK®

E-TEC - Ø 0005 0900