
Split Air Conditioners
Cooled by air
SOC-076 to 240B/
SICH-070 to 240B



Ref.: E-TI-SOC-SICH-B-01

Technical information



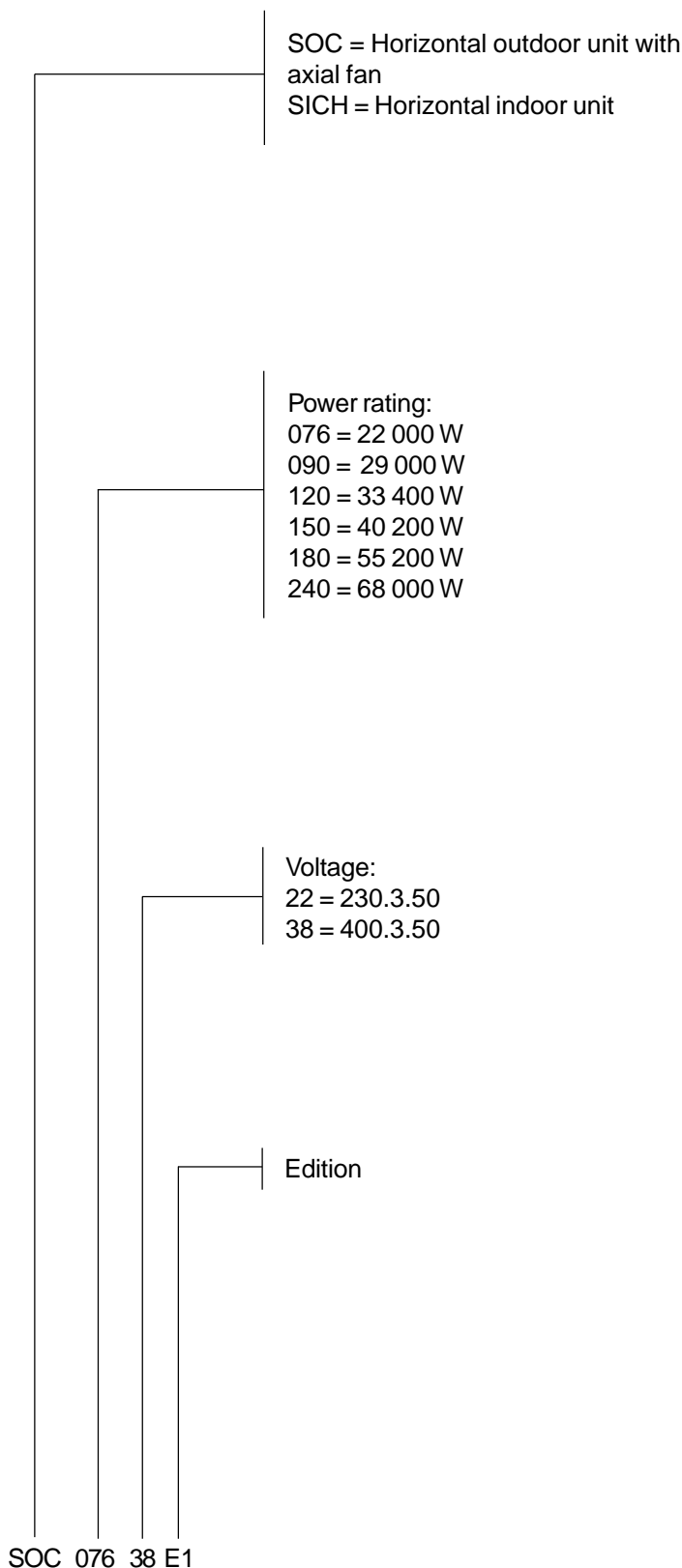
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General information

Nomenclature



General description

The SOC series units are the outdoor units of a split type air conditioner, equipped with a vertical discharge axial fan and ready to be installed directly outdoors.

The SOC-076 to 180B units are compatible with indoor units SICH-070 to 180B. The SOC-240B outdoor unit is compatible with the SICH-240B 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 has internal motor protection. Includes 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.

Fan (indoor units)

Centrifugal, with dual helix and a shaft in common, except in models SICH-070 and 076B, that have a single helix. 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-070 to 150B indoor units allows either vertical or horizontal orientation of the fans.

Cooling circuit

Made of welded 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 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.

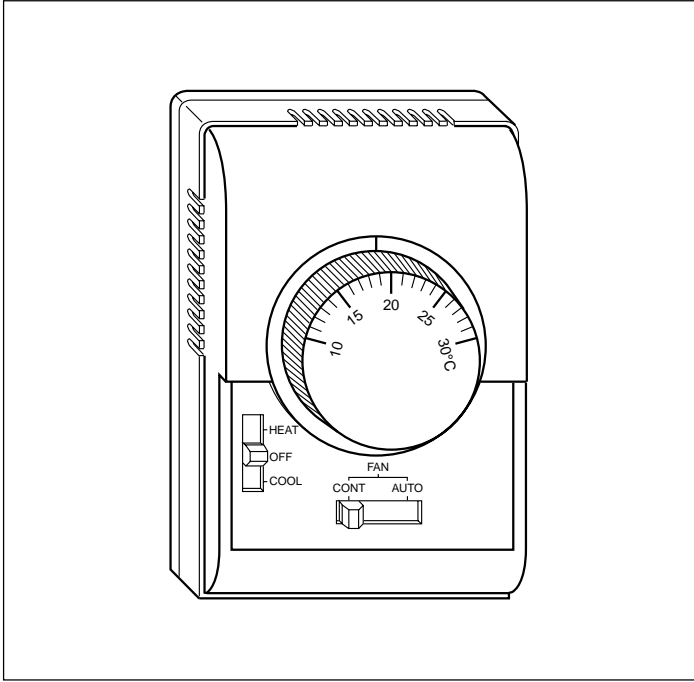
Thermostat

The SOC-076, 090 and 120B units include, as standard equipment, a T-11 electromagnetic thermostat. Nevertheless, upon request and as an accessory, the digital ARTTH001S one-stage electronic thermostats, as well as the ARTTH003S thermostat, programmable for one stage and with communication possibilities.

Models SOC-150, 180 and 240B include, as standard equipment, a ARTTH003S two-stage electronic thermostat with communication possibilities.

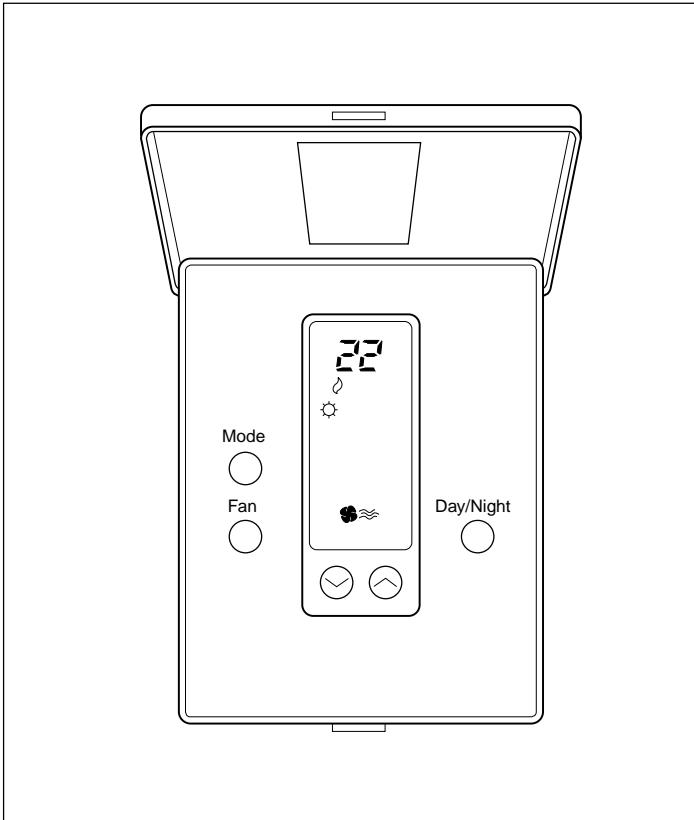
Thermostat T-11

24 Vac electromechanical type. To control one cool stage and one heat stage. Allows AUTO/ON operation of the indoor fan. See the Operating and Maintenance Instructions.



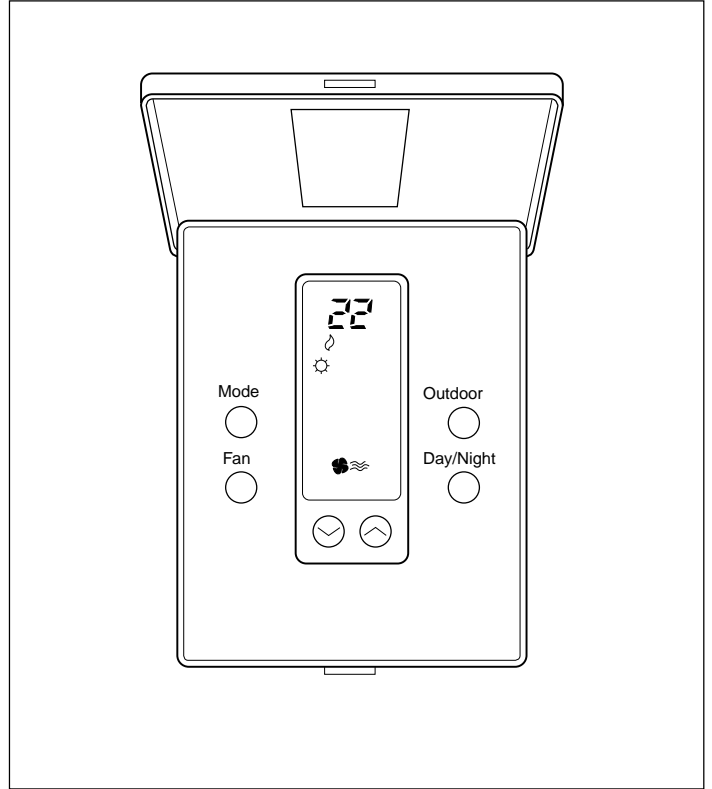
Thermostat ARTTH001S

24 Vac digital electronic type. To control one cool stage and one heat stage. Designed to give a precise control of the ambient temperature and graphic information of the mode in which the air conditioner 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. Allows AUTO/ON operation of the indoor fan. See the Operating and Maintenance Instructions.



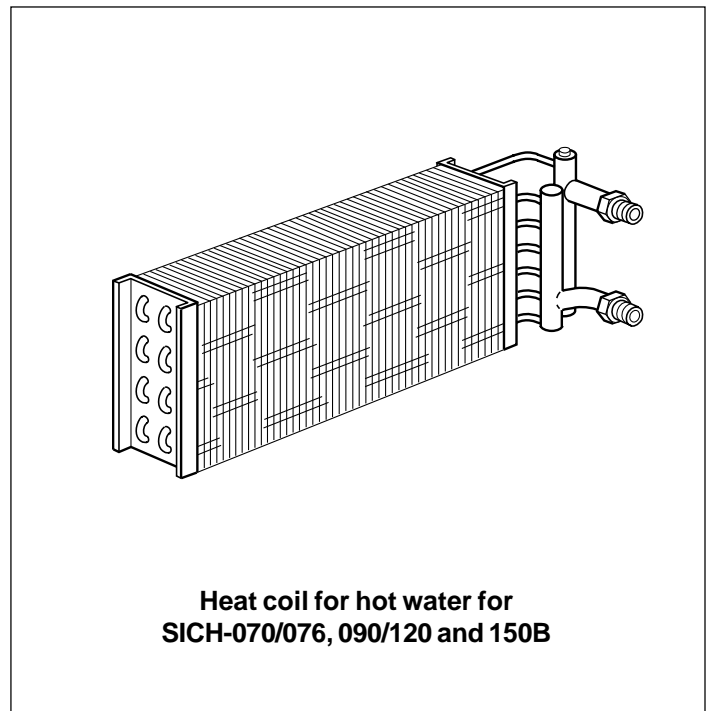
Thermostat ARTTH003S

24 Vac digital electronic type. To control two cool stages and two heat stages. Programmable for one cool and heat stage only. Designed to give a precise control of the ambient temperature and graphic information of the mode in which the air conditioner is operating. This is a Proportional-Differential-Integral response control in accordance with the difference between the programmed temperature and the ambient temperature. Allows communication with a PC and AUTO/ON operation of the indoor fan. See the Operating and Maintenance Instructions.

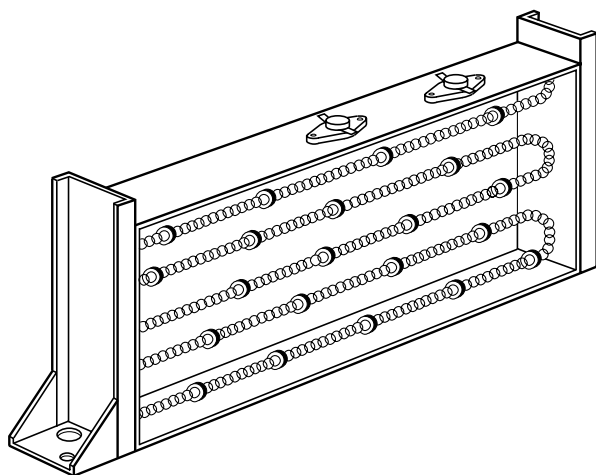


Accessories

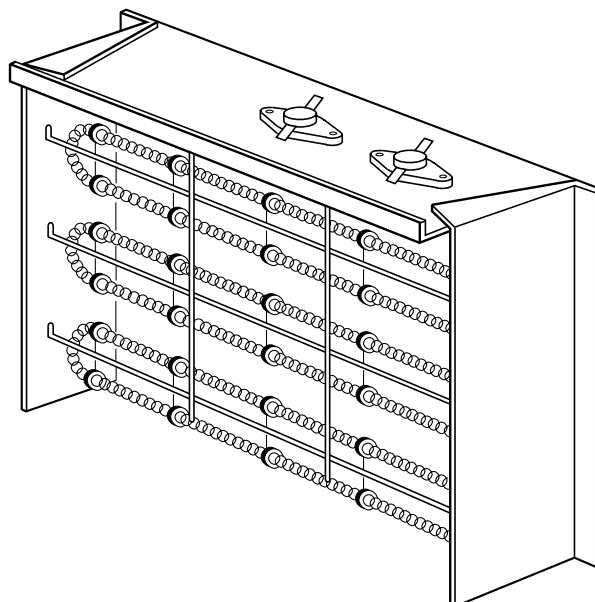
The SICH indoor units are equipped for the installation of water coils or electric heaters for supplying auxiliary heat.



**Heat coil for hot water for
SICH-070/076, 090/120 and 150B**



**Inner electric heater for
SICH-180B**



**Inner electric heater for
SICH-070/076, 090/120 and 150B**

Physical data

Outdoor units

| Model | | SOC-076B | SOC-090B | SOC-120B | SOC-150B | SOC-180B | SOC-240B |
|----------------------------------|------------------------|----------------------|----------|----------|----------|----------|----------|
| Compressor | Amount | 1 | 1 | 1 | 2 | 2 | 2 |
| | Type | Alternative | | | | | |
| | 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 | | | | | |
| | Number of 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 | 2 x 36 | 2 x 42 | 2 x 42 | 2 x 42 | 2 x 44 | 2 x 42 |
| | Diameter tubing | 3/8" | | | | | |
| | Surface m ² | 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 | 184 | 192 | 296 | 364 | 396 | 488 |
| | Gross kg | 188 | 196 | 300 | 368 | 400 | 492 |

Indoor units

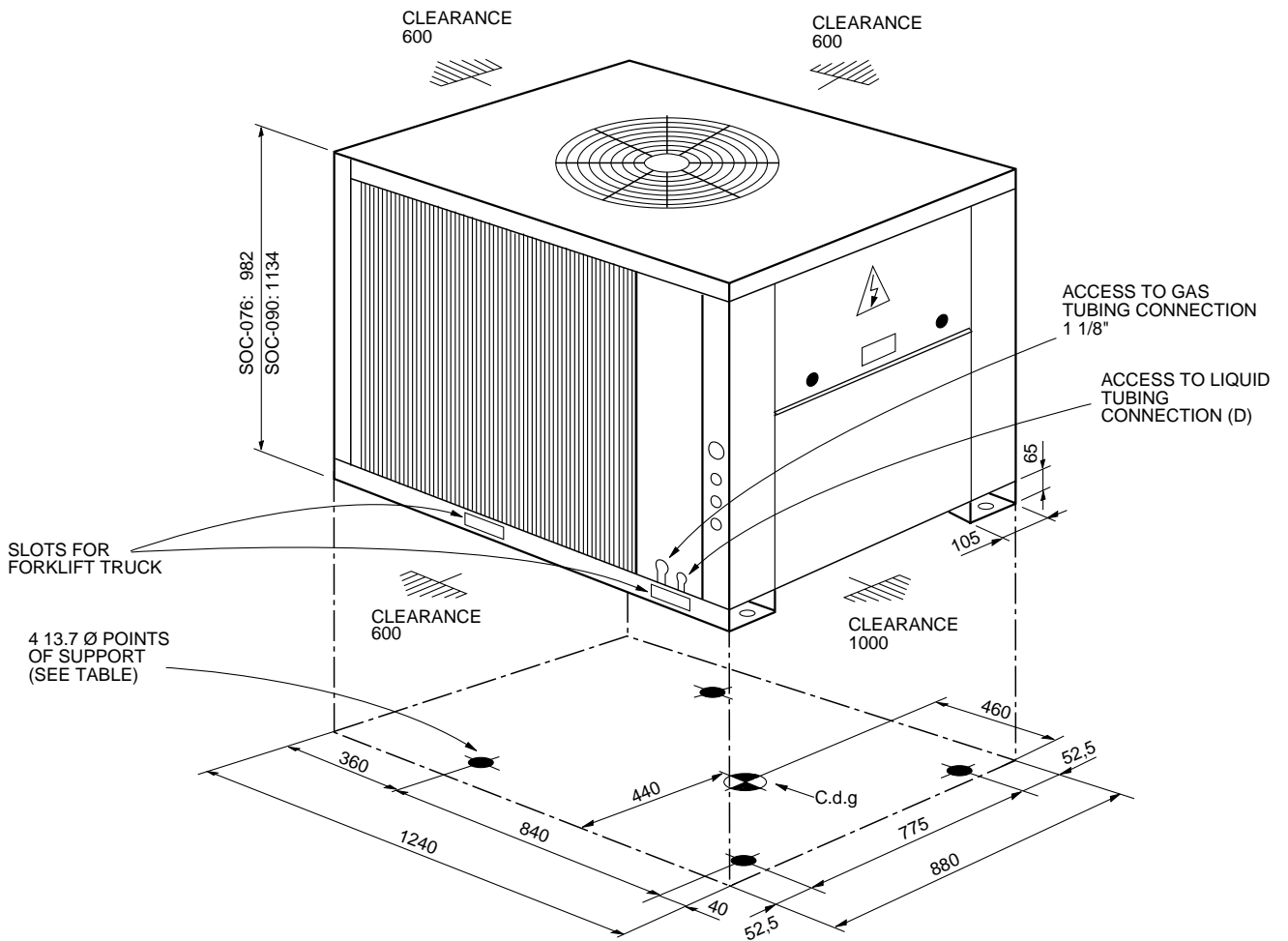
| Model | | SICH-070/076B | SICH-090/120B | SICH-150B | SICH-180B | SICH-240B |
|-------------------------|------------------------|----------------------|---------------|-----------|-----------|-----------|
| Fan | Motor power rating W | 750 | 1 472 | 1 472 | 3 000 | 3 000 |
| | Power supply V.ph.Hz | 230.3.50 or 400.3.50 | | | | 400.3.50 |
| | Motor rpm | 1 400 | | | | |
| | Number of turbines | 1 | 2 | 2 | 2 | 2 |
| | Turbine Ø 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 |
| | Ø tubing | 3/8" | | | | |
| | Surface m ² | 0,57 | 0,83 | 1,11 | 1,42 | 1,72 |
| Dimensions with packing | Height 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 condensing coil DB | | Air intake temperature to the evaporating coil WB | |
|---|---------|------------------|---------|--|------------|---|------------|
| Nominal at 230 V | | Nominal at 400 V | | | | | |
| Maximum | Minimum | Maximum | Minimum | Maximum °C | Minimum °C | Maximum °C | Minimum °C |
| 254 | 198 | 436 | 342 | 46 | 2 | 22 | 14 |
| Notes: WB = wet bulb. DB = dry bulb. | | | | | | | |

General dimensions mm.

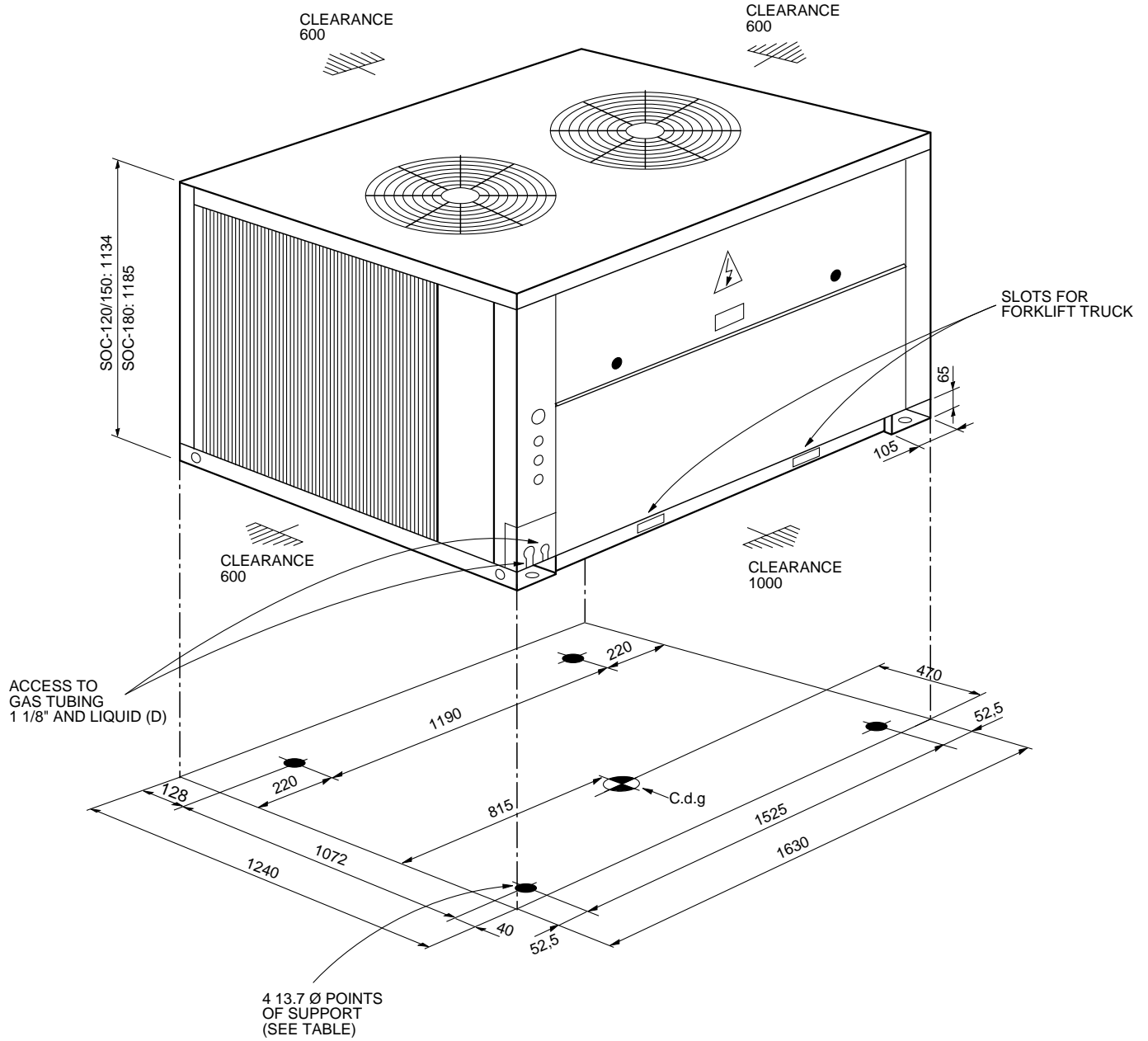
SOC-B, 076 and 090



| Unit | (D) Liquid tubing diameter | Weight kgs. per point of support |
|-------------|----------------------------|----------------------------------|
| 076B | 1/2" | 46 |
| 090B | 5/8" | 48 |

General dimensions mm.

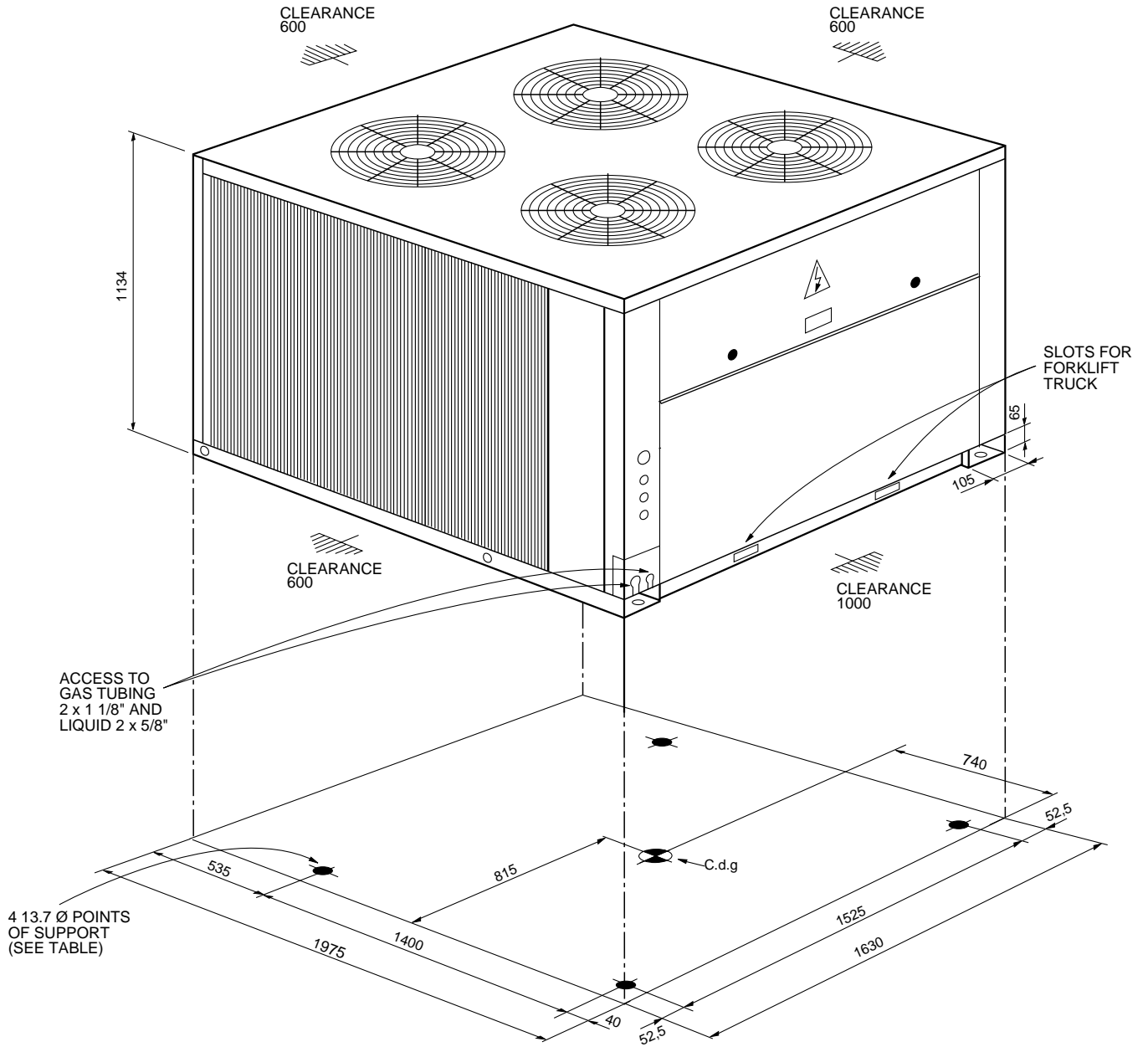
SOC-B, 120, 150 and 180



| Unit | (D) Liquid tubing diameter | Weight kgs. per point of support |
|-------------|----------------------------|----------------------------------|
| 120B | 1 x 5/8" | 74 |
| 150B | 2 x 1/2" | 91 |
| 180B | 2 x 5/8" | 99 |

General dimensions mm.

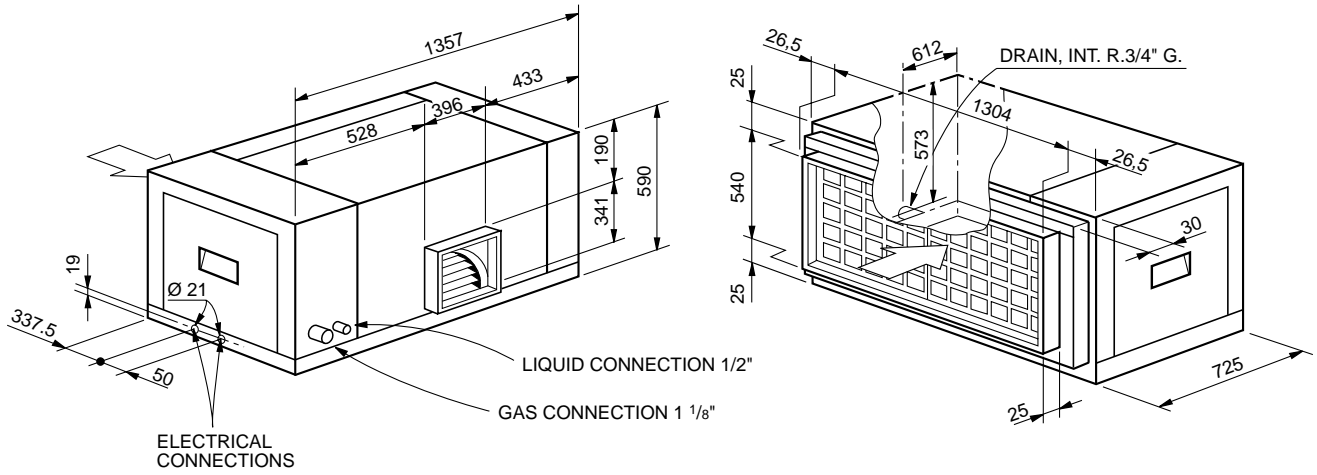
SOC-B, 240



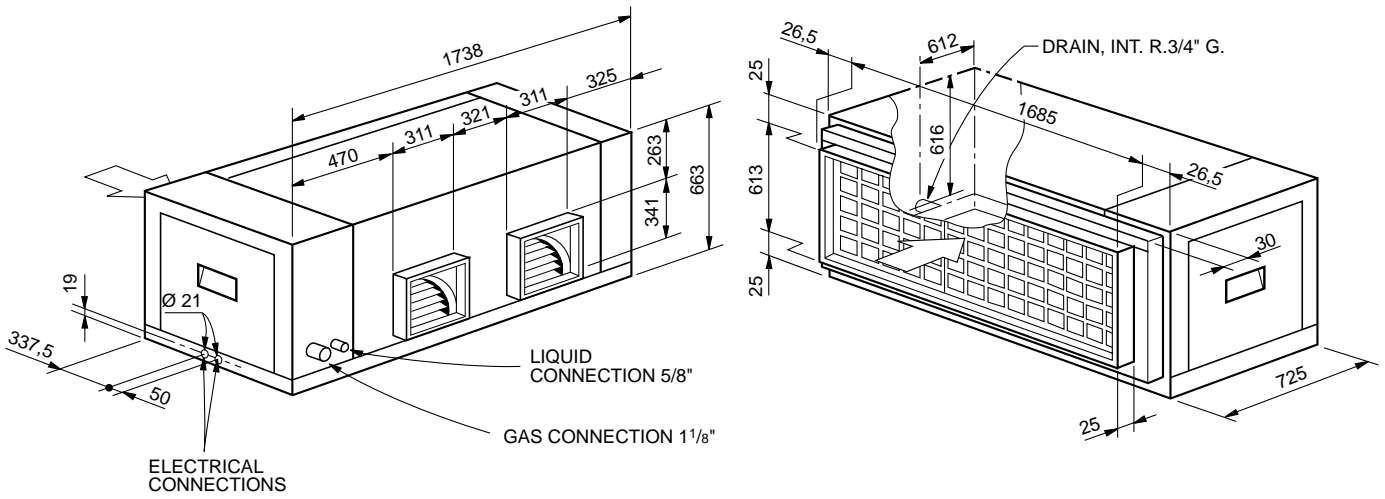
| Unit | Weight kgs. per point of support |
|-------------|----------------------------------|
| 240B | 122 |

General dimensions mm.

SICH - 070 and 076B

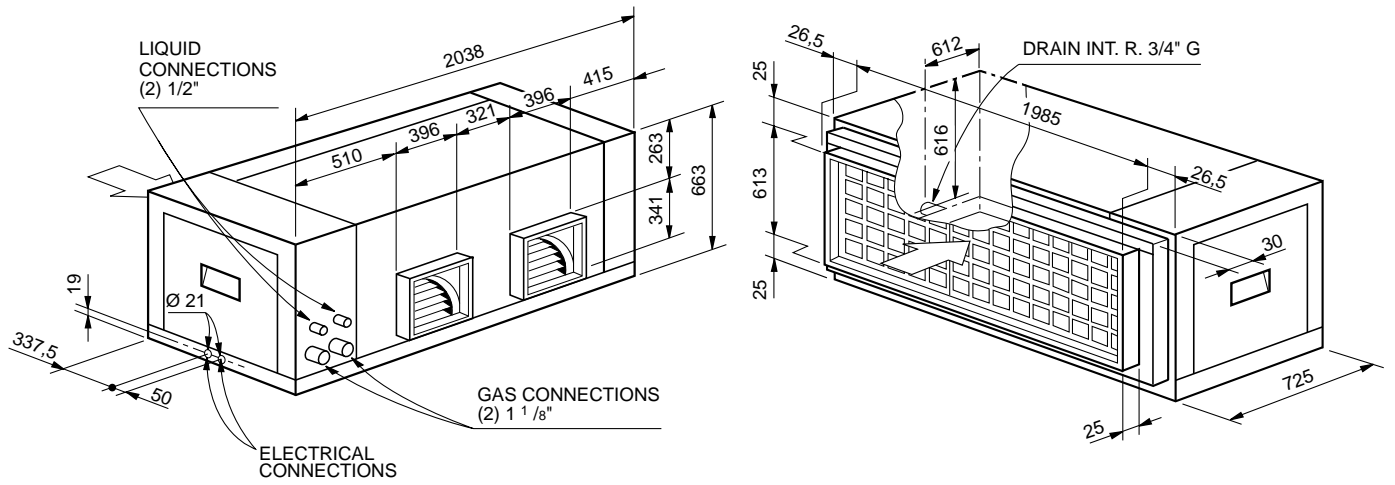


SICH - 090 and 120B

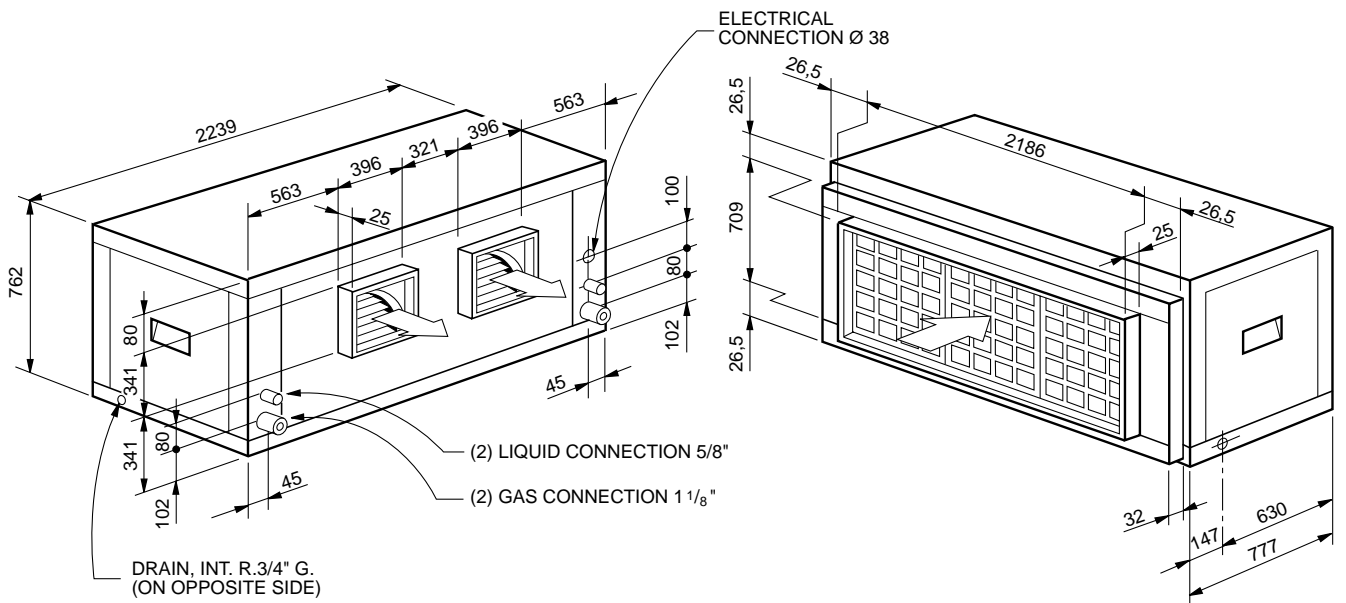


General dimensions mm.

SICH - 150B

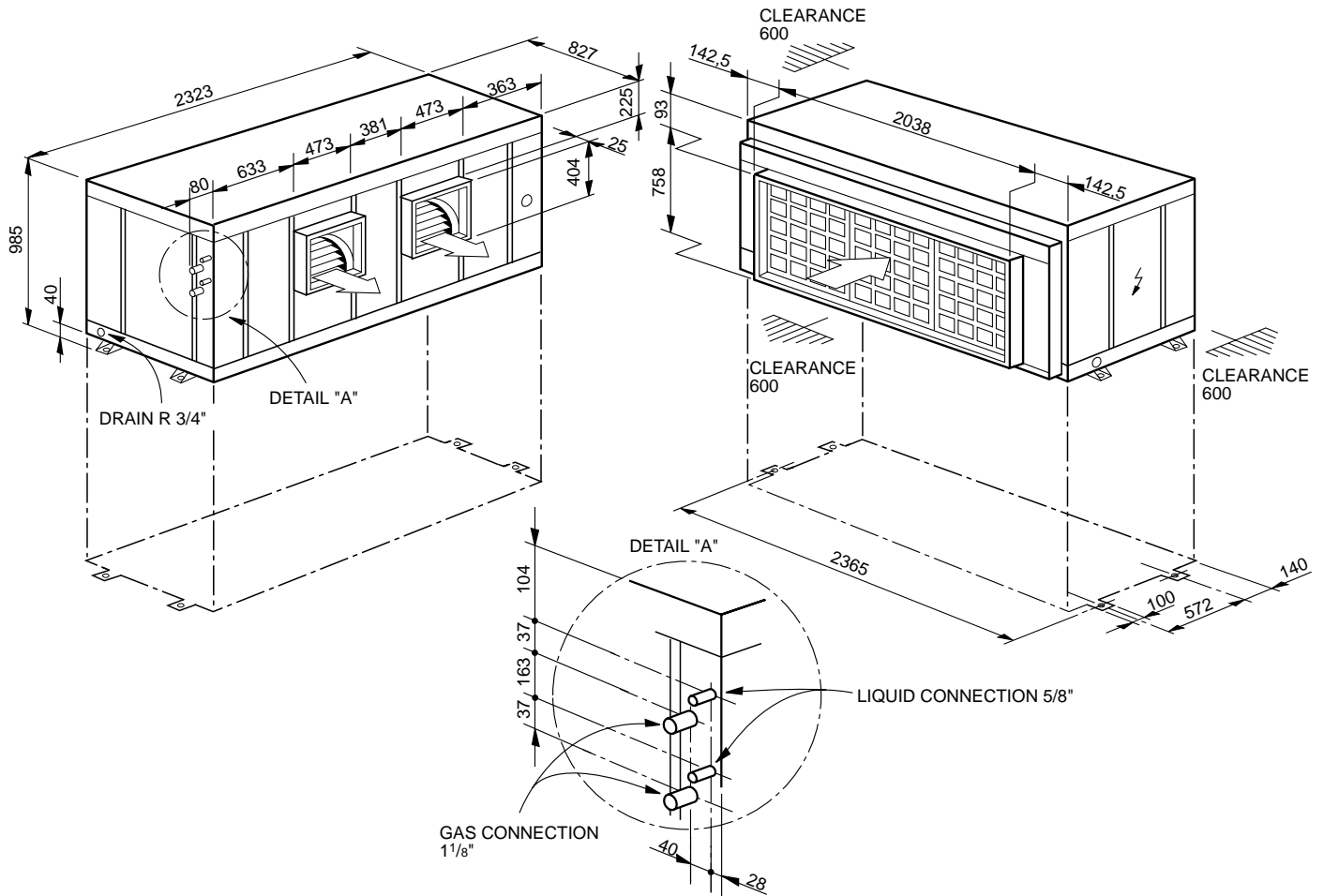


SICH - 180B

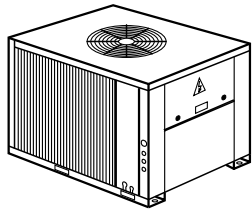


General dimensions mm.

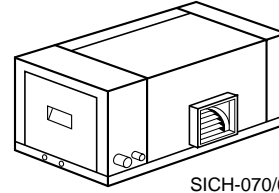
SICH - 240B



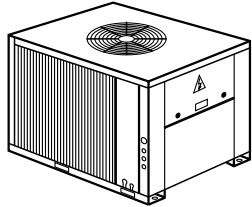
Variant chart



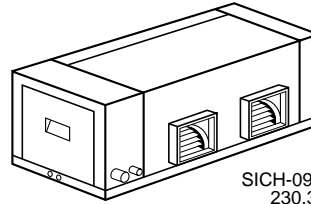
SOC-076B
230.3.50
400.3.50



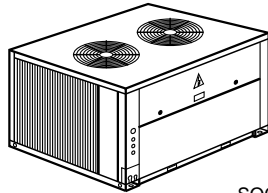
SICH-070/076B
230.3.50
400.3.50



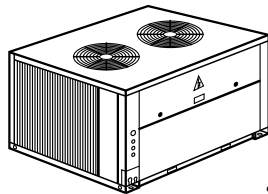
SOC-090B
230.3.50
400.3.50



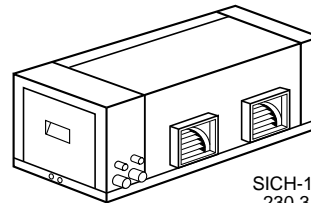
SICH-090/120B
230.3.50
400.3.50



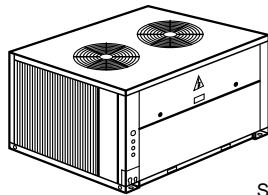
SOC-120B
230.3.50
400.3.50



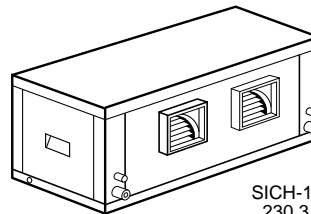
SOC-150B
230.3.50
400.3.50



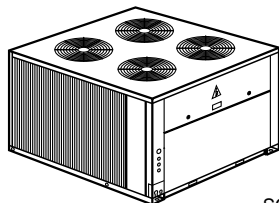
SICH-150B
230.3.50
400.3.50



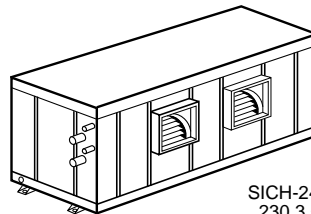
SOC-180B
230.3.50
400.3.50



SICH-180B
230.3.50
400.3.50



SOC-240B
230.3.50
400.3.50



SICH-240B
230.3.50
400.3.50

Nominal characteristics

| Outdoor unit | Indoor unit | Cooling capacity W | Consumption W |
|-----------------|----------------------|--------------------|---------------|
| SOC-076B | SICH-070/076B | 22 000 | 8 560 |
| SOC-090B | SICH-090/120B | 29 000 | 11 385 |
| SOC-120B | SICH-090/120B | 33 000 | 15 640 |
| SOC-150B | SICH-150B | 40 200 | 18 900 |
| SOC-180B | SICH-180B | 55 200 | 25 690 |
| SOC-240B | SICH-240B | 68 000 | 31 280 |

Correcting factors

Correcting factors of the cooling capacities

Cooling capacity correcting factors for flows that vary from the nominal flows in the indoor coil.

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

Correction of the real temperature of 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 |

Sensible cooling capacities

| Model | Dry outdoor air temperature °C (DB) | Humid air intake temperature °C (WB) | Total capacity W/h | Sensible capacity (W/h) | | | | Compressor absorbed power kW |
|--------------------------------|-------------------------------------|--------------------------------------|-----------------------|--|--------|--------|--------|---------------------------------|
| | | | | Dry air intake temperature to the coil °C (DB) | | | | |
| | | | | 22 | 24 | 27 | 29 | |
| SOC-076B/ SICH-076B | 25 | 22 | 26 400 | 8 108 | 10 954 | 15 223 | 18 073 | 6.43 |
| | | 19.5 | 23 760 | 11 644 | 14 491 | 18 760 | 21 611 | 6.74 |
| | | 17 | 22 000 | 15 438 | 18 284 | 22 000 | 22 000 | 7.04 |
| | 35 | 22 | 24 420 | 7 424 | 10 270 | 14 539 | 17 385 | 7.27 |
| | | 19.5 | 22 000 | 10 982 | 13 828 | 18 097 | 20 994 | 7.66 |
| | | 17 | 20 240 | 13 848 | 16 694 | 20 240 | 20 240 | 8.04 |
| | 45 | 22 | 22 000 | 6 665 | 9 511 | 13 780 | 16 626 | 8.42 |
| | | 19.5 | 19 800 | 10 228 | 13 074 | 17 343 | 19 800 | 8.80 |
| | | 17 | 18 040 | 13 822 | 16 668 | 18 040 | 18 040 | 9.19 |

Sensible cooling capacities

| Model | Dry outdoor air temperature °C (DB) | Humid air intake temperature °C (WB) | Total capacity | Sensible 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 |
| SOC-090B/ SICH-090 | 25 | 22 | 34 800 | 10 350 | 15 243 | 22 581 | 27 480 | 8.26 |
| | | 19.5 | 31 320 | 16 492 | 21 385 | 28 723 | 31 320 | 8.66 |
| | | 17 | 29 000 | 22 957 | 27 850 | 29 000 | 29 000 | 9.05 |
| | 35 | 22 | 32 190 | 9 495 | 14 387 | 21 726 | 26 619 | 9.35 |
| | | 19.5 | 29 000 | 15 659 | 20 552 | 27 890 | 29 000 | 9.84 |
| | | 17 | 26 680 | 20 723 | 25 616 | 26 680 | 26 680 | 10.33 |
| | 45 | 22 | 29 000 | 8 541 | 13 433 | 20 772 | 25 564 | 10.82 |
| | | 19.5 | 26 100 | 14 706 | 19 599 | 26 100 | 26 100 | 11.31 |
| | | 17 | 23 780 | 20 911 | 23 780 | 23 780 | 23 780 | 11.81 |
| SOC-120B/ SICH-120B | 25 | 22 | 40 080 | 12 151 | 16 927 | 24 090 | 28 874 | 9.99 |
| | | 19.5 | 36 072 | 18 114 | 22 890 | 30 054 | 34 838 | 10.46 |
| | | 17 | 33 400 | 24 460 | 29 235 | 33 400 | 33 400 | 10.94 |
| | 35 | 22 | 37 074 | 11 136 | 15 910 | 23 075 | 27 850 | 11.30 |
| | | 19.5 | 33 400 | 17 128 | 21 904 | 29 068 | 33 400 | 11.89 |
| | | 17 | 30 728 | 21 892 | 26 668 | 30 728 | 30 728 | 12.49 |
| | 45 | 22 | 33 400 | 10 005 | 14 780 | 21 945 | 26 720 | 13.08 |
| | | 19.5 | 30 060 | 16 002 | 20 778 | 27 942 | 30 060 | 13.68 |
| | | 17 | 27 388 | 22 045 | 26 820 | 27 388 | 27 388 | 14.27 |
| SOC-150B/ SICH-150B | 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 |

Sensible cooling capacities

| Model | Dry outdoor air temperature °C (DB) | Humid air intake temperature °C (DB) | Total capacity | Sensible 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 |
| SOC-180B/ SICH-180B | 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 |
| SOC-240B/ SICH-240B | 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 | Outdoor temp. °C | | Indoor temp. °C | |
|------------|------------------|----|-----------------|----|
| | DB | WB | DB | WB |
| 230 or 400 | 35 | 24 | 27 | 19 |

Nominal flows

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

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

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

Indoor fan features

| Model | Static pressure available | | Air flow | | Absorbed power W |
|----------------------|---------------------------|--------|-------------------|-------------------|---------------------|
| | mm WG ⁽¹⁾ | Pa | m ³ /h | m ³ /s | |
| SICH-070/076B | 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-090/120B | 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-150B | 17.9 | 175.4 | 7 000 | 1.94 | 896 |
| | 17.1 | 167.6 | 7 500 | 2.08 | 970 |
| | 16.0 | 156.8 | 8 000 | 2.22 | 1 045 |
| | 14.8 | 137.2 | 8 500 | 2.36 | 1 100 |
| | 13.3 | 130.3 | 9 000 | 2.50 | 1 175 |
| | 12.1 | 118.6 | 9 500 | 2.64 | 1 275 |
| | 10.0 | 98.0 | 10 000 | 2.78 | 1 375 |
| | 8.5 | 83.3 | 10 500 | 2.92 | 1 450 |
| | 6.5 | 63.7 | 11 000 | 3.05 | 1 600 |
| | 4.3 | 42.1 | 11 500 | 3.19 | 1 700 |
| | 2.0 | 19.6 | 12 000 | 3.33 | 1 802 |
| 0.0 | 0.0 | 12 500 | 3.47 | 1 970 | |
| SICH-180B | 15.9 | 155.8 | 11 500 | 3.19 | 2 004 |
| | 14.2 | 139.1 | 12 000 | 3.33 | 2 139 |
| | 12.6 | 123.4 | 12 500 | 3.47 | 2 240 |
| | 11.0 | 107.8 | 13 000 | 3.61 | 2 408 |
| | 8.6 | 84.2 | 13 500 | 3.75 | 2 535 |
| | 6.5 | 63.7 | 14 000 | 3.89 | 2 732 |
| | 3.9 | 38.2 | 14 500 | 4.02 | 2 843 |
| | 1.3 | 12.7 | 15 000 | 4.16 | 3 000 |
| | 0.0 | 0.0 | 15 200 | 4.22 | 3 150 |
| SICH-240B | 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.

Electrical characteristics

Outdoor units

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

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

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

Indoor units

| Model | Power supply V.ph.Hz. | | Consumption A | | Power supply cable section mm ² |
|----------------------|-----------------------|--|---------------|---------|---|
| | Fan | | Fan | | |
| | | | Start | Nominal | |
| SICH-070/076B | 230.3.50 | | 14 | 3.2 | 4 x 1.5 |
| | 400.3.50 | | 8 | 1.8 | 4 x 1.5 |
| SICH-090B | 230.3.50 | | 30 | 5.5 | 4 x 1.5 |
| | 400.3.50 | | 17.2 | 3.2 | 4 x 1.5 |
| SICH-120B | 230.3.50 | | 30 | 5.8 | 4 x 1.5 |
| | 400.3.50 | | 17.2 | 3.4 | 4 x 1.5 |
| SICH-150B | 230.3.50 | | 30 | 5.8 | 4 x 1.5 |
| | 400.3.50 | | 17.2 | 3.4 | 4 x 1.5 |
| SICH-180B | 230.3.50 | | 59 | 10.8 | 4 x 2.5 |
| | 400.3.50 | | 34 | 6.3 | 4 x 1.5 |
| SICH-240B | 230.3.50 | | 59 | 10.8 | 4 x 2.5 |
| | 400.3.50 | | 34 | 6.3 | 4 x 1.5 |

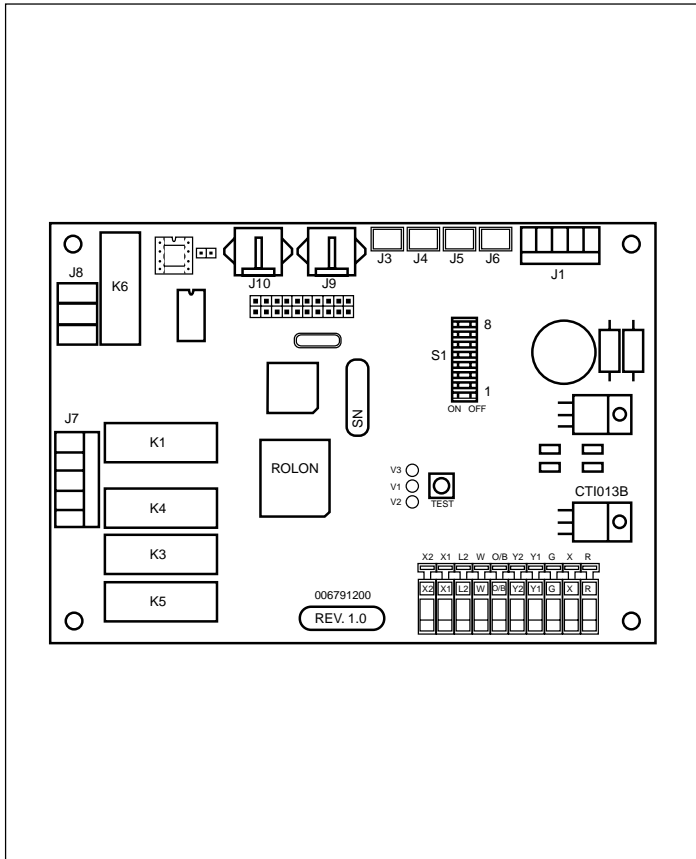
Important: The dimensioning of the automatic switch and power supply line sections are orientative and should be corrected in accordance with job site conditions, length between units and legislation in force.

Standard accessories

| Accessory | Model SICH | | | |
|--|------------|---------|-----|-----|
| | 070-076 | 090-120 | 150 | 180 |
| Electric coil for model SICH-076B 10 kW | X | | | |
| Electric coil for model SICH-076B 15 kW | X | | | |
| Electric coil for model SICH-090B 10 kW | | X | | |
| Electric coil for model SICH-090B 20 kW | | X | | |
| Electric coil for model SICH-150B 15 kW | | | X | |
| Electric coil for model SICH-150B 30 kW | | | X | |
| Electric coil for model SICH-180B 15 kW | | | | X |
| Electric coil for model SICH-180B 30 kW | | | | X |
| Water coil for model SICH-076B | X | | | |
| Water coil for model SICH-090B | | X | | |
| Water coil for model SICH-150B | | | X | |
| Vertical conversion kit for model SICH-180B | | | | X |

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. Equipment control is carried out by means of software that is resident in the board. System operation 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.

Four-way valve (heat pump only)

When SW6 of the control board is set to ON, the four-way valve activates when the thermostat requests heat. When a defrost cycle 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 (heat pump only)

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 four-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

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.

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.

Microswitches

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 microswitches 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.

In said search the board will also detect 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 | Cool only | |
|-----------|------------|----------|
| | Obligatory | Optional |
| Discharge | x | |
| Liquid | | x |
| Outdoor | | x |
| Suction | x | |

Installation of accessories

The accessories are used to support extended functions of

the unit.

Said accessories can be either factory mounted or installed at the client's facilities. 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 (heat pump only)

A cable heater is used, 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 disactivated 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 (heat pump only)

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 3 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 indicated, it is inhibited, 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 (heat pump only)

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

- If the outdoor temperature is below -20°C , the compressor turns off. An incident of low outdoor temperature (only in heat mode) is indicated.
- 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.
- 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.
- 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.
- 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 probe

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 not reset will be indicated.

| Type | Flashes | | Incident |
|-----------------|-----------------|-----------------|--|
| | 2 nd | 3 rd | |
| Probes | 1 | 1 | Discharge probe open or $>150^{\circ}\text{C}$ |
| | 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 failures:

| 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

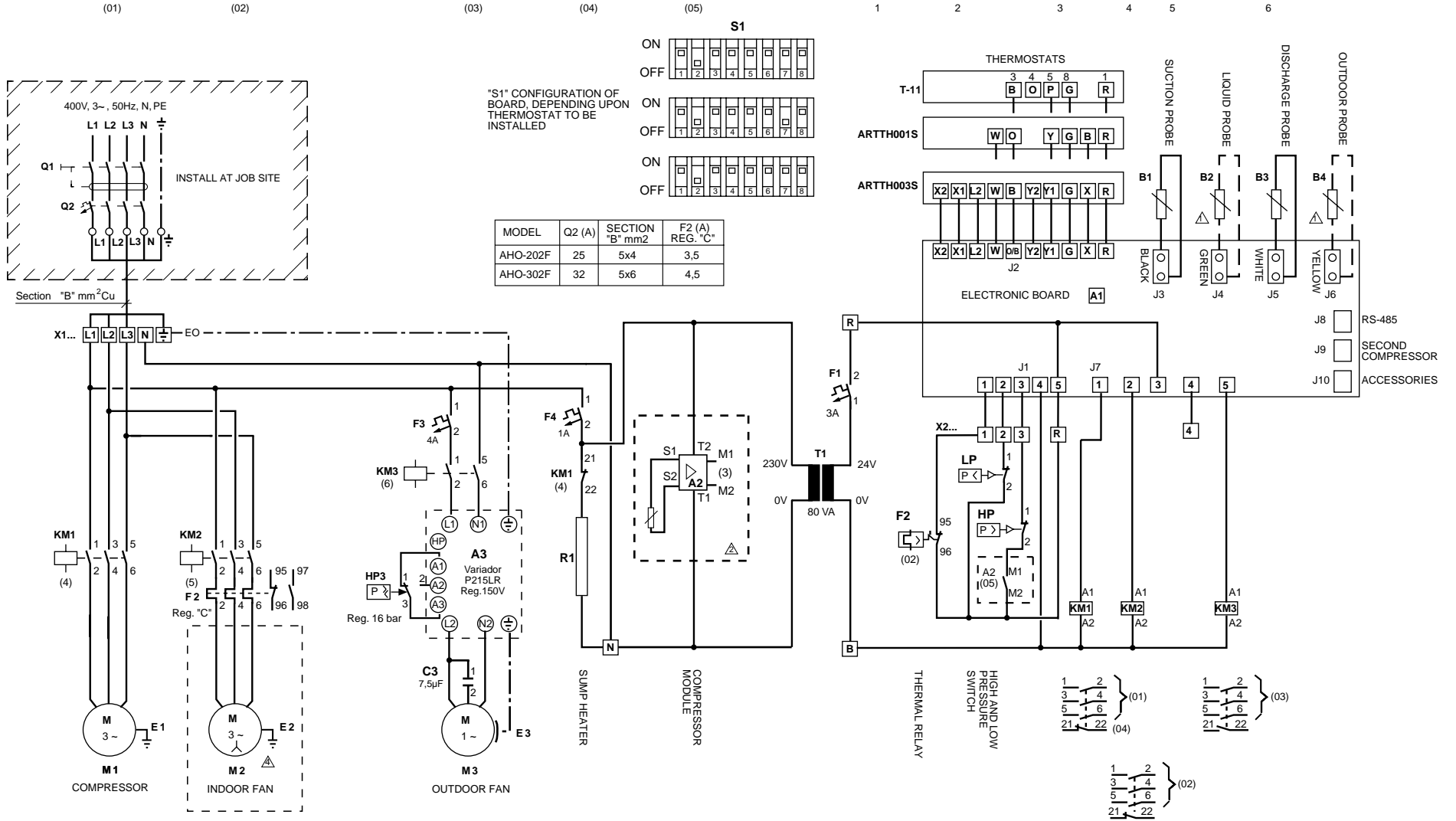
The incidents, with a few exceptions, do not need to be reset. They reset automatically once the cause has disappeared. The following incidents require resetting, and are reset in the same way as the alarms:

- 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:

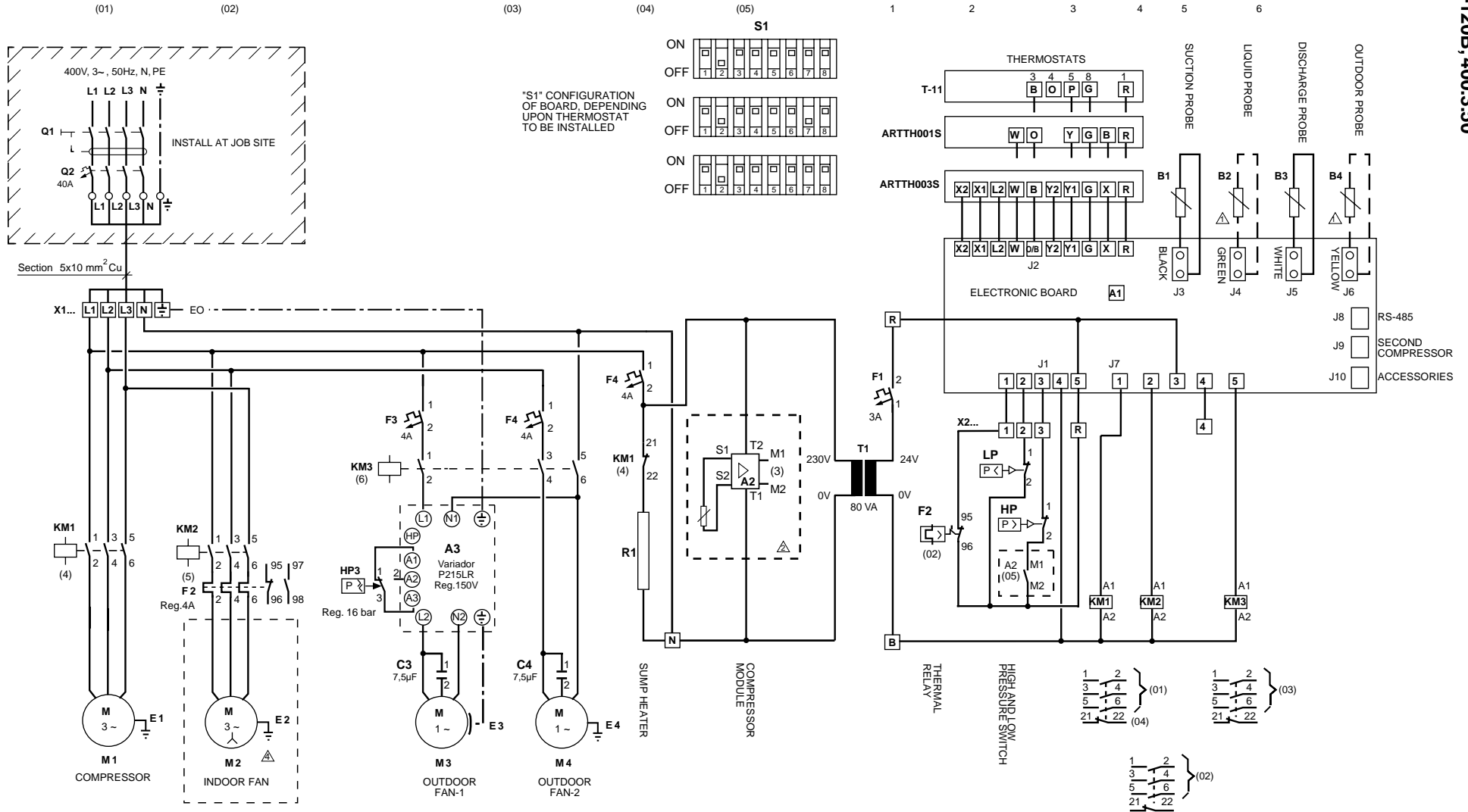
- 1) Setting the thermostat to OFF, if communication with the thermostat has been implemented.
- 2) Pressing the reset button on the electronic board.
- 3) Disconnecting and reconnecting power supply to the electronic board.
- 4) By means of the communications trunk.

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.



- NOTE: - PROBES B2 AND B4 OF THE ELECTRONIC BOARD ARE OPTIONAL
- MODULE A2 IS MOUNTED ON SCROLL COMPRESSORS ONLY
- INDOOR FAN "M2" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm²

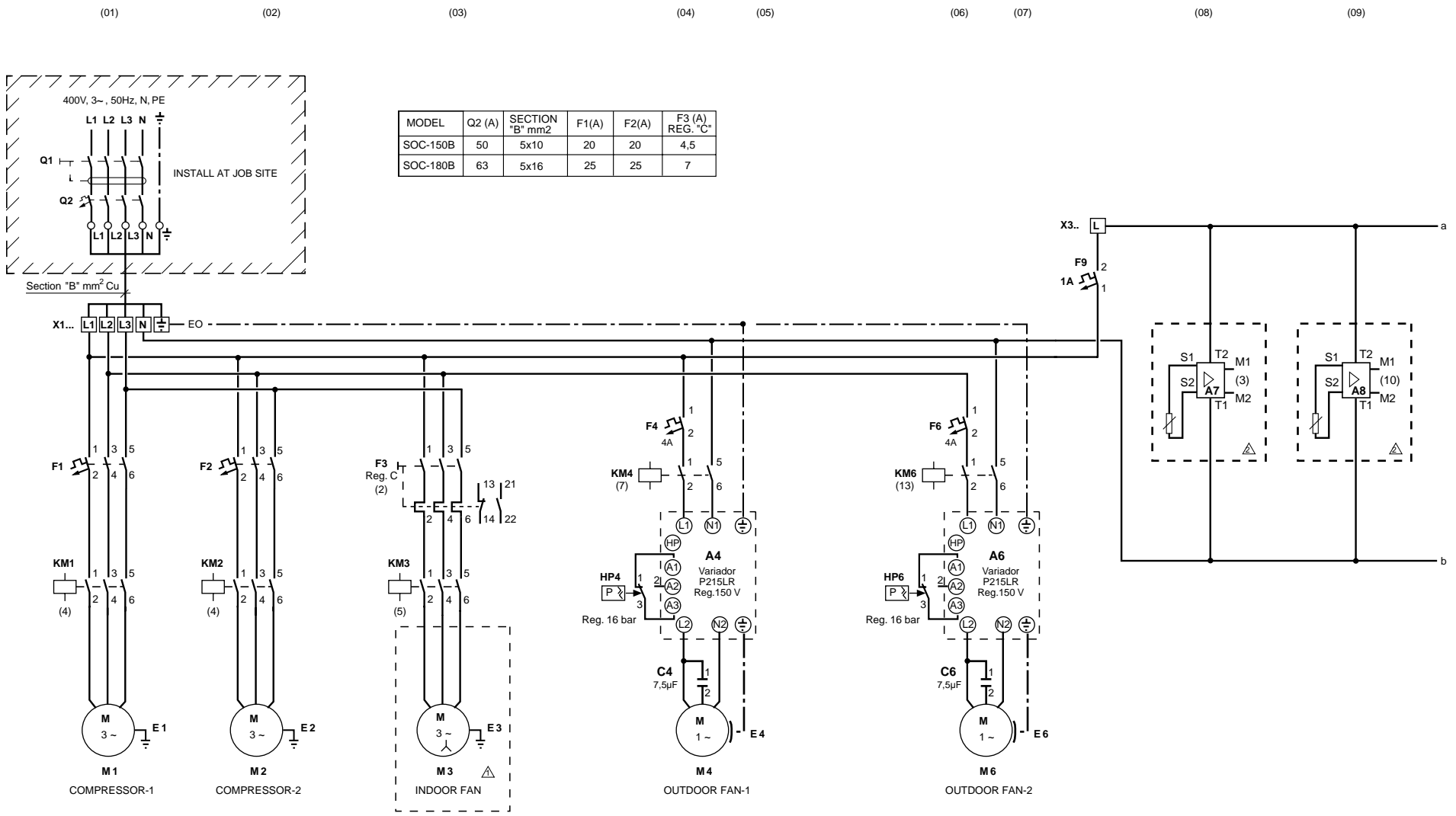
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER



NOTE: - PROBES B2 AND B4 OF THE ELECTRONIC BOARD ARE OPTIONAL
 - MODULE A2 IS MOUNTED ON SCROLL COMPRESSORS
 - INDOOR FAN "M2" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm²

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

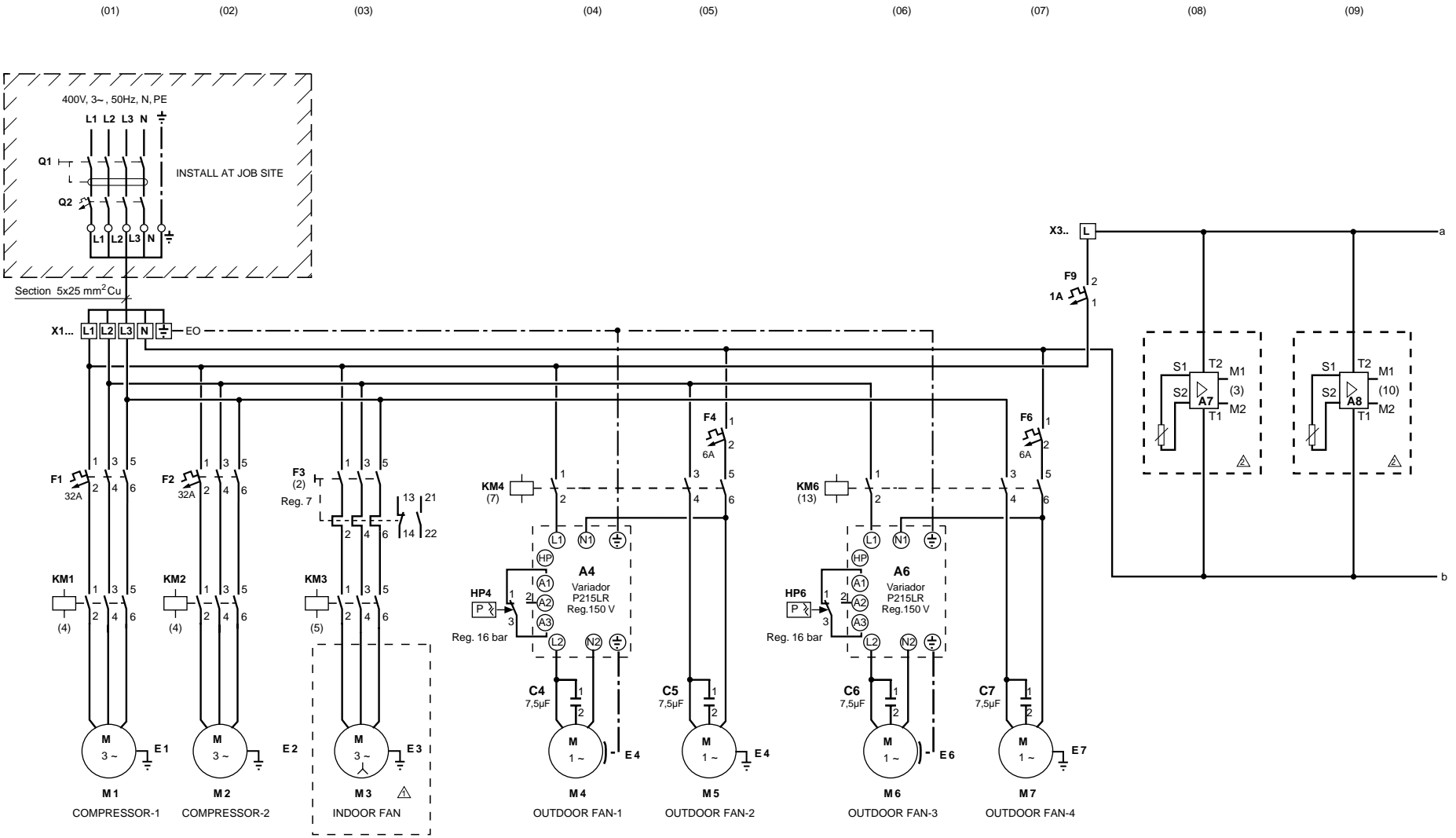
I-1980d
SOC-120B
400.3.50



NOTE: - INDOOR FAN "M2" IS TO BE CONNECTED AT JOB SITE. CABLES SECTION 1.5 mm²
 - PROTECTION MODULES A3 AND A4 ARE MOUNTED ON SCROLL COMPRESSORS ONLY

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

I-1990-1b
 SOC-150,180B
 400.3.50

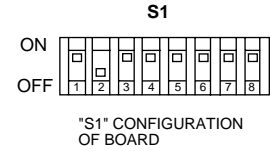
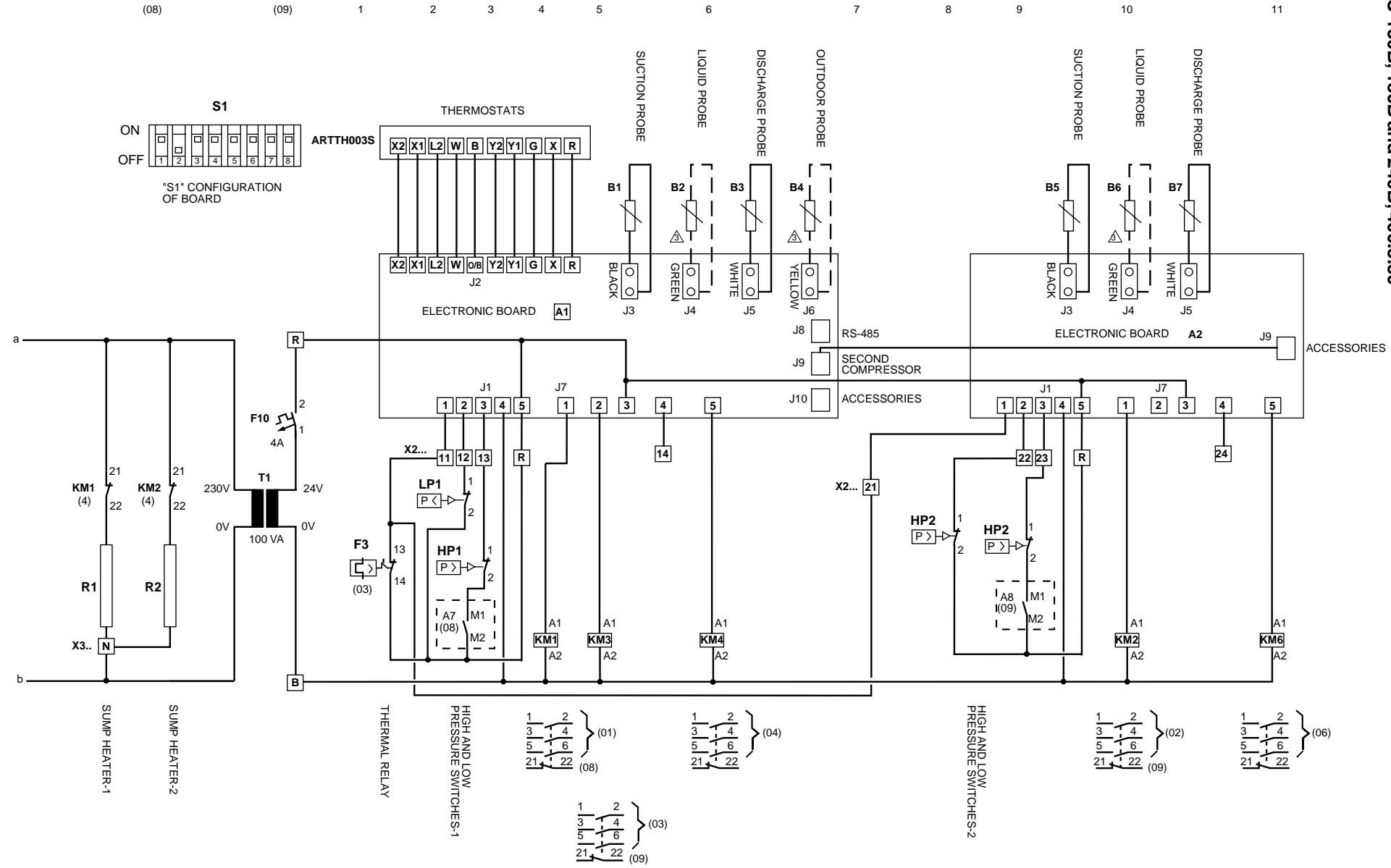


NOTE: - INDOOR FAN "M2" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm²

- PROTECTION MODULES A7 AND A8 ARE MOUNTED ON SCROLL COMPRESSORS ONLY

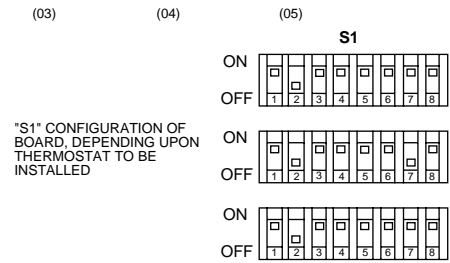
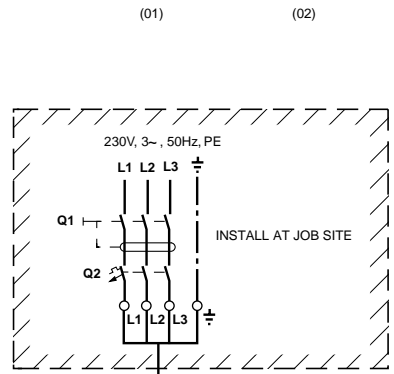
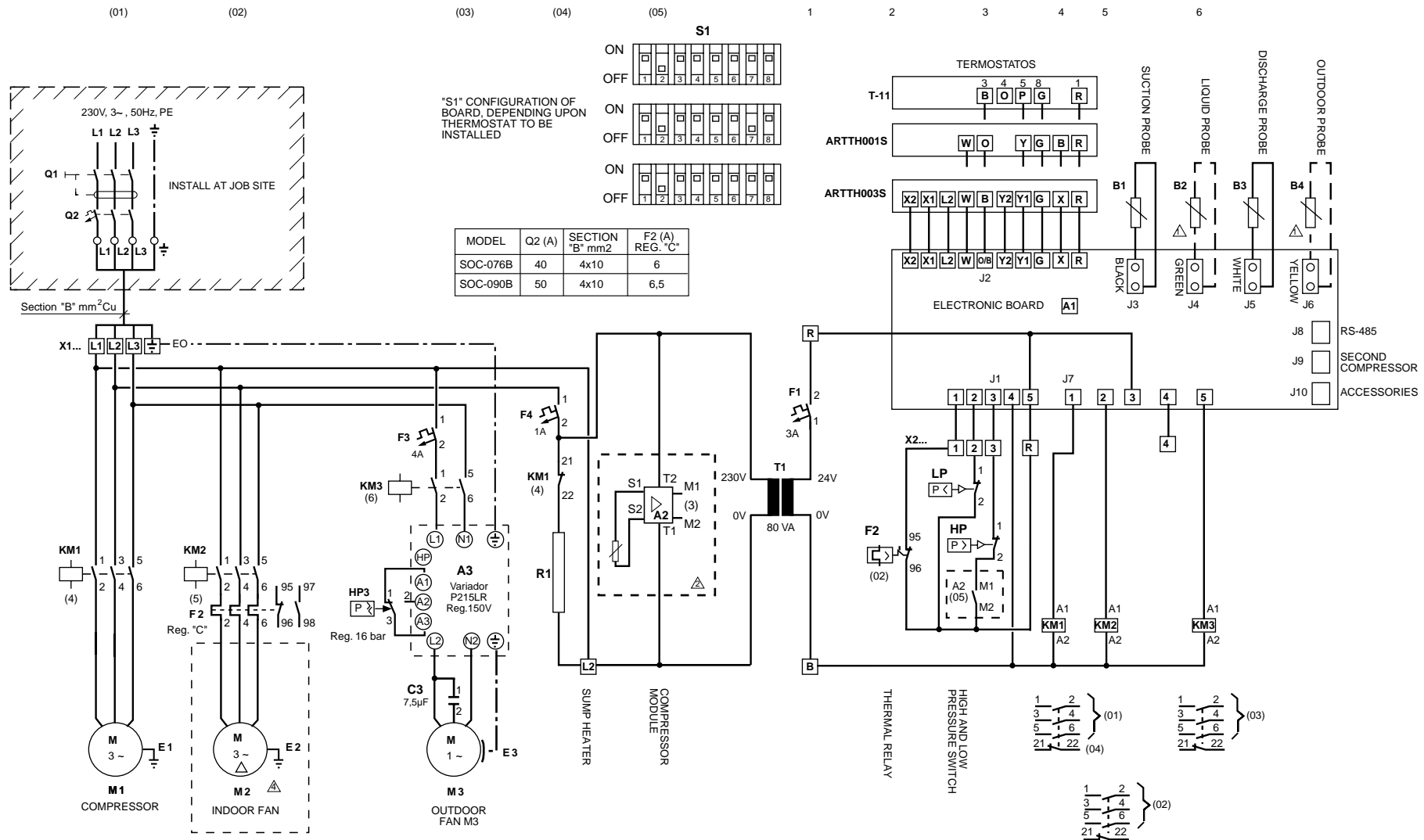
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

I-1990-2b
SOC-240B
400.3.50



NOTE: - PROBES B2, B4 AND B6 OF THE ELECTRONIC BOARD ARE OPTIONAL

I-1990-3b
SOC-150, 180, 240B
400.3.50

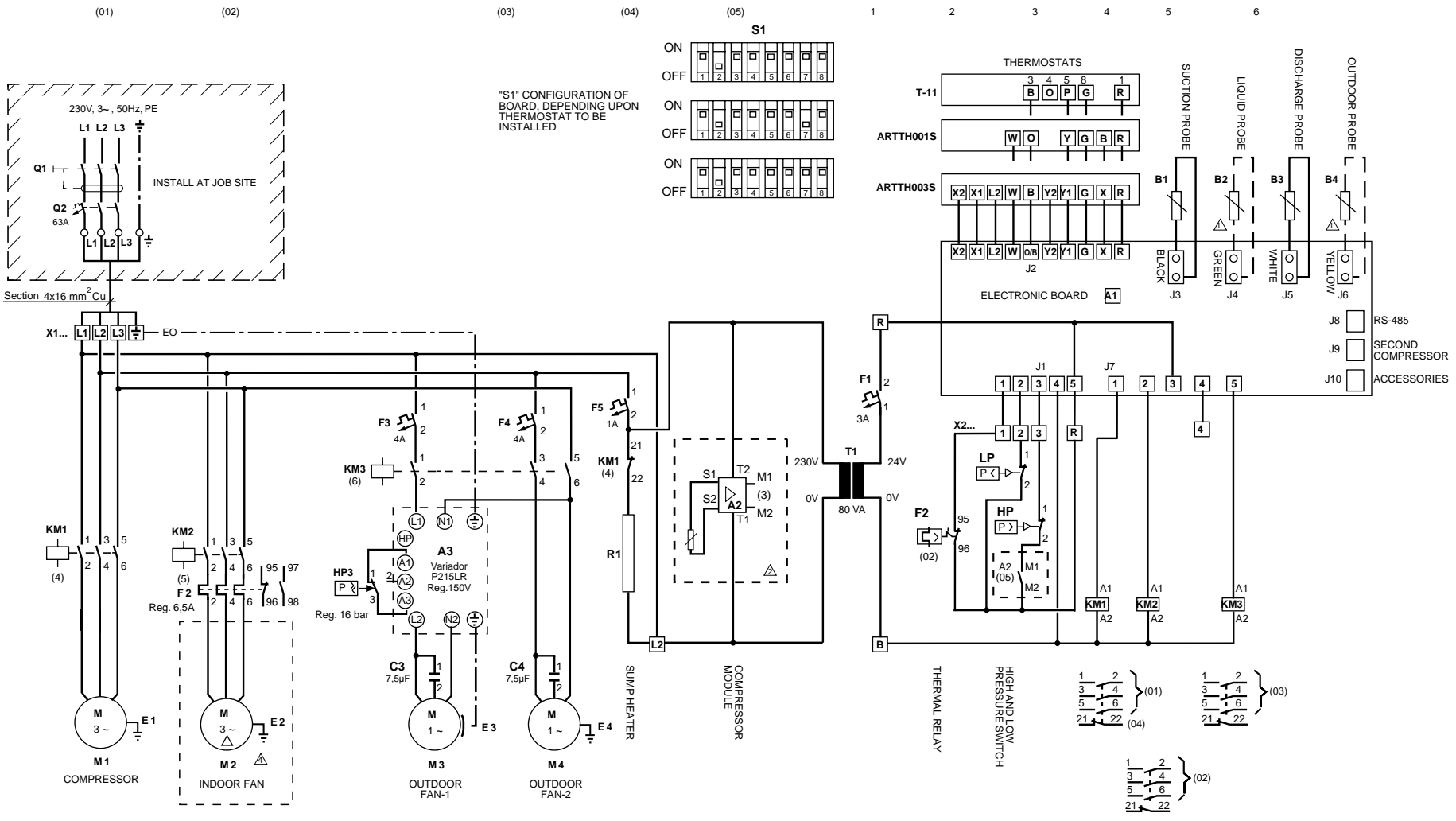


| MODEL | Q2 (A) | SECTION "B" mm ² | F2 (A) REG. °C° |
|----------|--------|-----------------------------|-----------------|
| SOC-076B | 40 | 4x10 | 6 |
| SOC-090B | 50 | 4x10 | 6,5 |

NOTE: - PROBES B2 AND B4 OF THE ELECTRONIC BOARD ARE OPTIONAL
 - MODULE A2 IS MOUNTED ON SCROLL COMPRESSORS
 - INDOOR FAN "M2" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm²

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

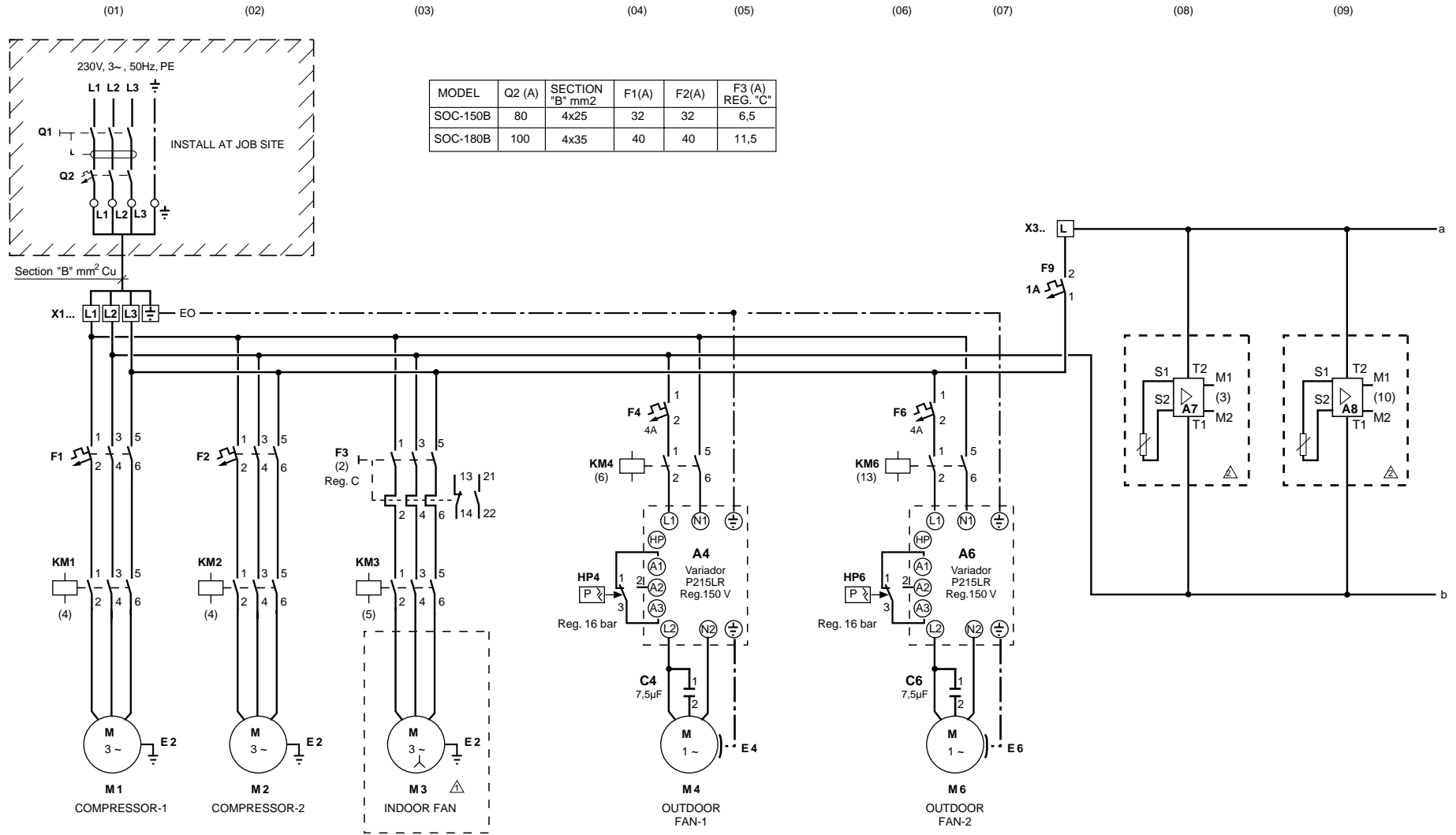
I-1999d
SOC-076.090B
230.3.50



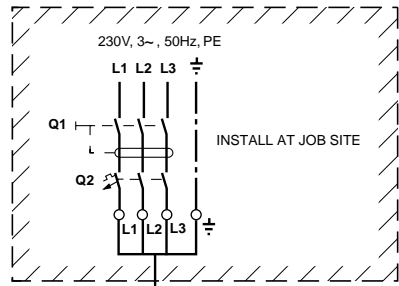
NOTE: - PROBES B2 AND B4 OF THE ELECTRONIC BOARD ARE OPTIONAL
 - MODULE A2 IS MOUNTED ON SCROLL COMPRESSORS
 - INDOOR FAN "M2" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm²

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

I-1981d
 SOC-120B
 230.3.50



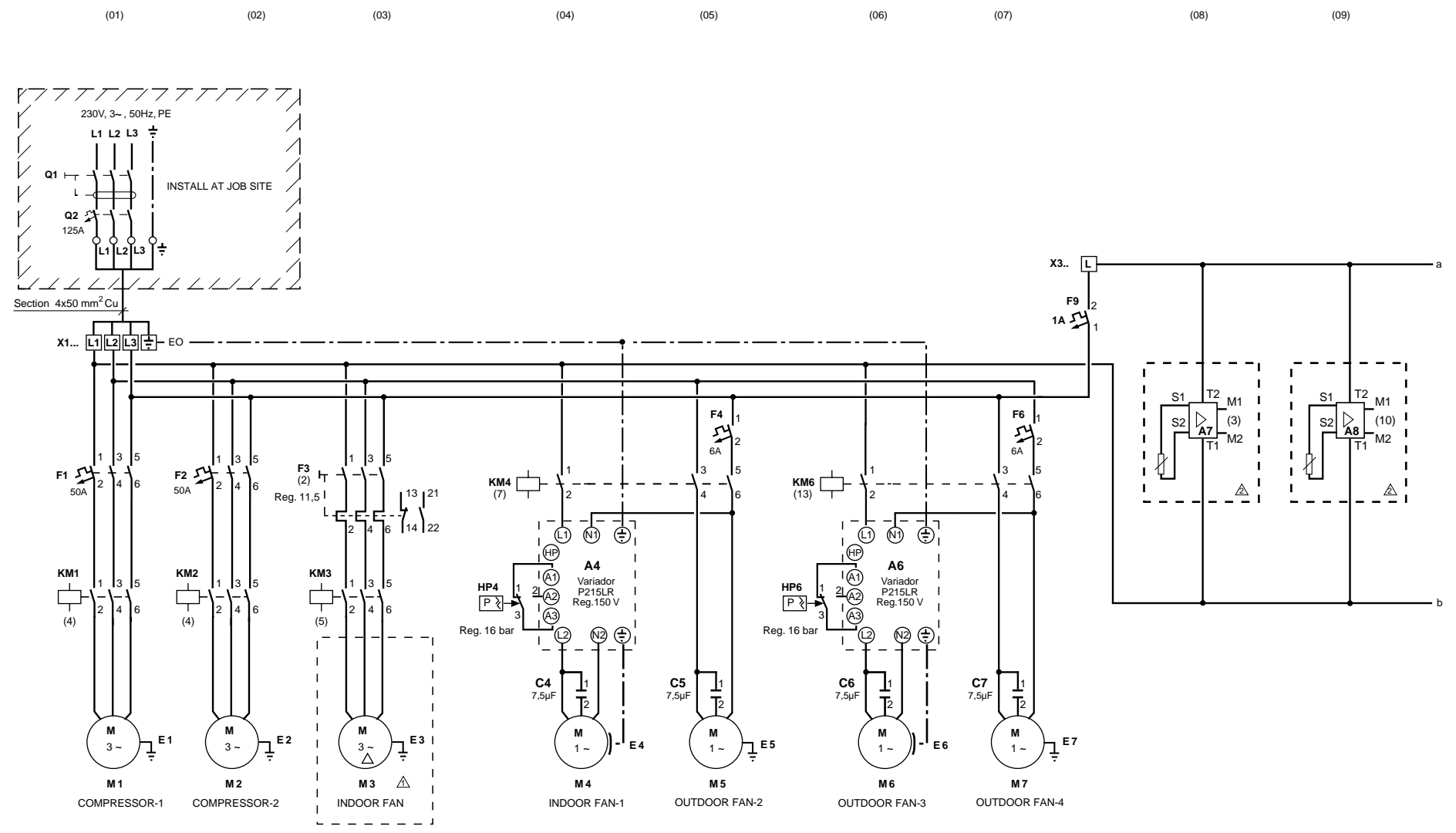
| MODEL | Q2 (A) | SECTION "B" mm ² | F1(A) | F2(A) | F3 (A) REG. "C" |
|----------|--------|-----------------------------|-------|-------|-----------------|
| SOC-150B | 80 | 4x25 | 32 | 32 | 6,5 |
| SOC-180B | 100 | 4x35 | 40 | 40 | 11,5 |



NOTE: - INDOOR FAN "M3" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm²
 - PROTECTION MODULES A7 AND A8 ARE MOUNTED ON SCROLL COMPRESSOR ONLY

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

I-1989-1b
SOC-150, 180B
230.3.50



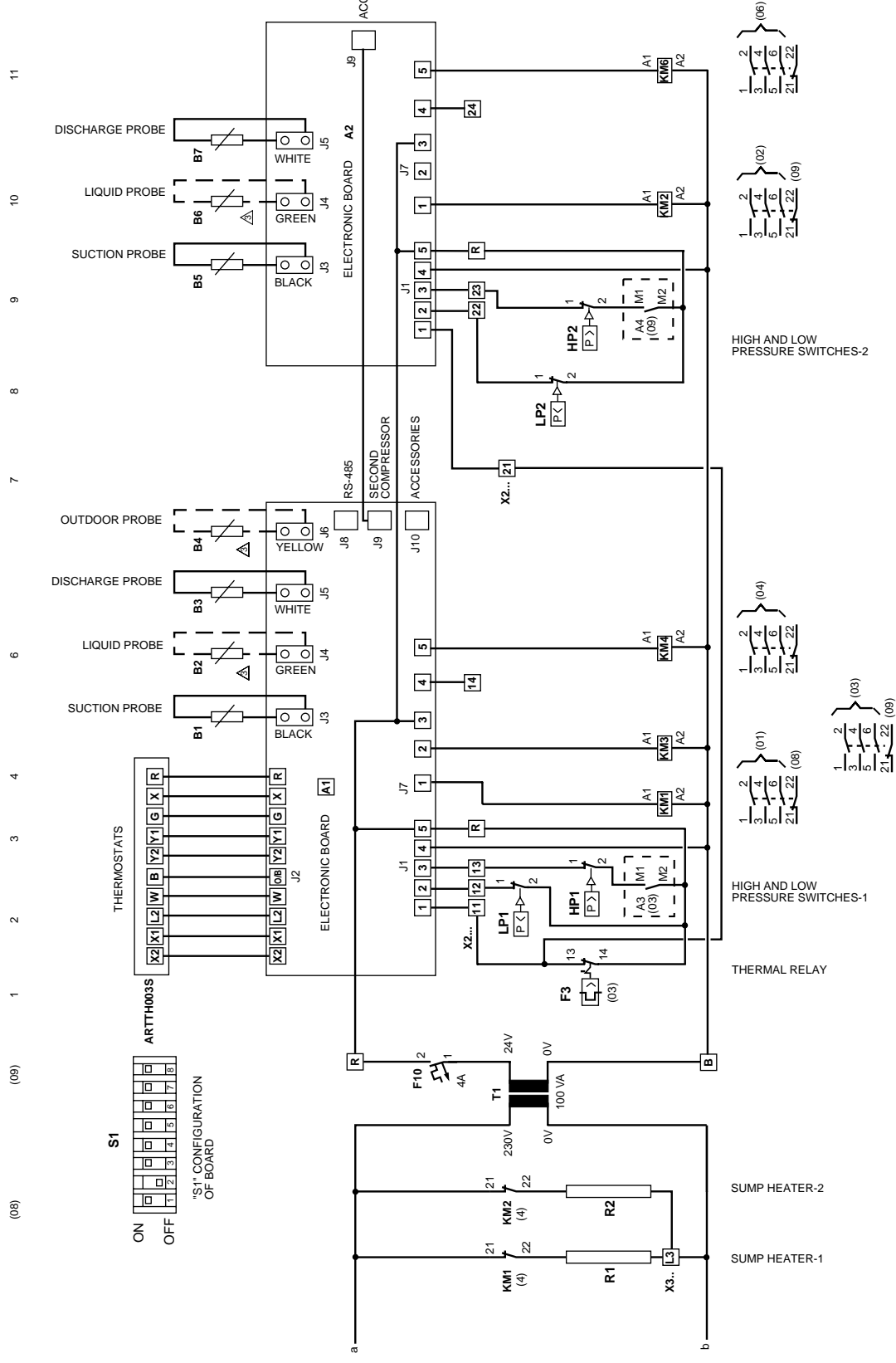
NOTE: - INDOOR FAN "M3" IS TO BE CONNECTED AT JOB SITE. CABLE SECTION 1.5 mm².
 - PROTECTION MODULES A7 AND A8 ARE MOUNTED ON SCROLL COMPRESSORS ONLY

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

I-1989-2b
 SOC-240B
 230.3.50

Wiring diagram

SOC-150B, 180B and 240B, 230.3.50



1-1989-3b
SOC-150, 180, 240B
230.3.50

NOTE: PROBES B2 AND B4 OF THE ELECTRONIC BOARD ARE OPTIONAL

All data subject to change without notice.

AIR CONDITIONING

HEATING

TILES

BATHROOMS

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