

# Air-cooled unitary conditioners models ASAO/ASAI



Ref.: N-26454 0599

## Technical information



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## Index

|                                                                | Page    |                                                                     | Page    |
|----------------------------------------------------------------|---------|---------------------------------------------------------------------|---------|
| <b>General</b>                                                 | 5       | - Limits of use                                                     | 17      |
|                                                                |         | - Before final approval of the installation                         | 17      |
| - General description                                          | 5       |                                                                     |         |
| - Nomenclature                                                 | 5       |                                                                     |         |
|                                                                |         | <b>Operating instructions</b>                                       | 18      |
| <b>Technical specifications</b>                                | 5       | - General information                                               | 18      |
| - Mechanical specifications                                    | 5       | - Important warning                                                 | 18      |
| - Physical data                                                | 6       | - Recommendations for better functioning                            | 18      |
| - Rated performance                                            | 7       | - Ambient thermostat                                                | 18      |
| - Test conditions                                              | 7       | - Start-up process                                                  | 18      |
| - Correction factors for the cooling capacities                | 7       | - Pressostats                                                       | 19      |
| - Nominal flow-rates                                           | 7       |                                                                     |         |
| - Sensible cooling capacities                                  | 7 - 8   | <b>Maintenance</b>                                                  | 19      |
| - Indoor fan performances                                      | 9       | - Indoor unit discharge ducts                                       | 19      |
| - Outdoor fan performances                                     | 10      | - Cleaning the filters                                              | 19      |
|                                                                |         | - Cleaning the outdoor unit                                         | 19      |
| <b>Installation instructions</b>                               | 11      | - Filling the drain trap                                            | 19      |
| - General description                                          | 11      | - Checking belt tension                                             | 19      |
| - Protection of the environment                                | 11      | - Access to the units for maintenance servicing                     | 19      |
| - Warning signs                                                | 11      |                                                                     |         |
| - Transport                                                    | 11      |                                                                     |         |
| - Location                                                     | 12      | <b>General dimensions</b>                                           | 20 - 23 |
| - Clearances                                                   | 12      |                                                                     |         |
| - Air ducts                                                    | 12      |                                                                     |         |
| - Drain connections                                            | 12      | <b>Wiring diagram</b>                                               | 24 - 40 |
| - Orientation of the air intake and discharge                  | 12      |                                                                     |         |
| - On-site modifications                                        | 12      |                                                                     |         |
| - Transformation process from horizontal to vertical discharge | 13 - 14 | <b>Optional accessories for the ASA and ASAI model conditioners</b> | 41      |
| - Compact installation of the units                            | 15      | - Table of standard accessories                                     | 42      |
| - Installation with separated units                            | 15      | - Hot water heating coil                                            | 43      |
|                                                                |         | - Inner electric heater ASA-15/ASAI-25, 30 & 45                     | 44      |
| <b>Electrical installation</b>                                 | 16      | - Inner electric heater ASAI-60                                     | 45      |
| - Electrical characteristics                                   | 17      | - Duct electric heaters RC-24                                       | 46      |



## General

### General description

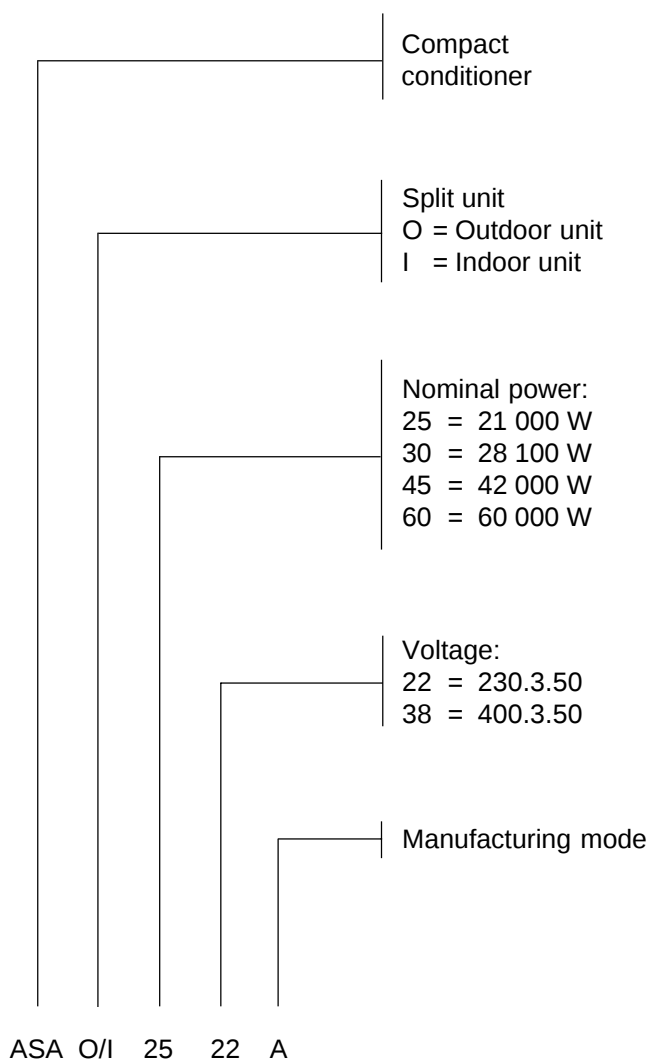
The ASAO/I model conditioners are air-to-air units with centrifugal fans in both the evaporator and the condenser. The outdoor unit ASAO includes the compressor, condenser, centrifugal fan and controls. The indoor unit ASAI includes the evaporator coil, filter and fan. If necessary, the form as delivered can easily be modified on site to change it to the other form compact.

The exterior unit can be installed indoors or outdoors as it is protected to withstand the elements out of doors, and the fans are of the centrifugal type which accept ducting.

They are delivered fully equipped and factory tested. It is designed to have a long operating life. Start-up and automatic temperature regulation are controlled through a 24 volt-ambient.

Coils for heating the air, either electrically or through hot water, can be fitted in the interior.

### Nomenclature



## Technical specifications

### Mechanical specifications

#### Compressor

Of the vertical, hermetic type on anti-vibration elements and with a low-consumption motor. The ASAO-25, 30 units have a single compressor, whilst the ASAO-45 & 60 have two. They are delivered with a charge of special oil which avoids foaming and is resistant to herating.

#### Compressor crankcase heater

This keeps the crankcase oil warm to facilitate starting and to avoid oil being drawn out of the compressor.

#### Coils

They have a large surface area and are made of copper tubes and aluminium fins. As they are inside the casing, they are protected against blows during transport and installation.

#### Indoor fan (ASAI-25)

A belt-driven centrifugal fan with an independent motor is fitted.

#### Indoor fan (ASAI-30, 45, 60) and outdoor (ASAO-25, 30, 60)

These have two centrifugal fans on a common axle, with transmission by belt driven by a single motor and connected to a single cowling.

#### Outdoor fan (ASAO-45)

These have two independent centrifugal fans connected to a common cowling. Each one is driven by a separate motor and they are belt driven.

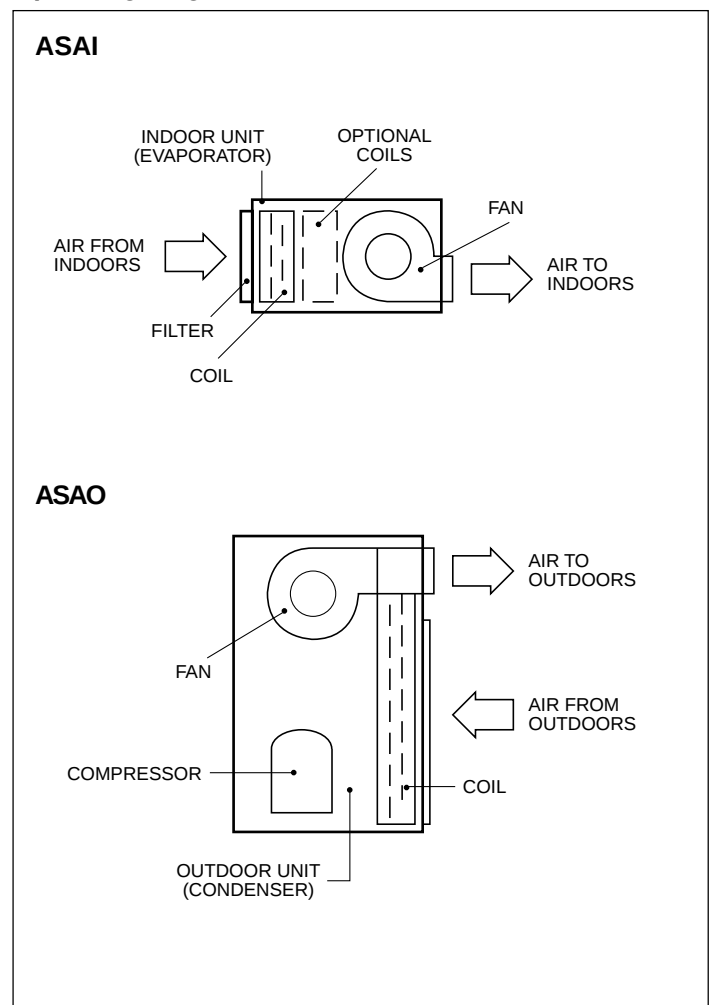
#### Cooling circuit

Made of brazed copper, fitted with access connections on the high and low pressure sides.

#### Refrigerant

The ASAO and ASAI units are supplied with connections ready for soldering. La carga de refrigerante debe hacerse totalmente en obra. Ver en el capítulo de instrucciones de instalación, el apartado carga de refrigerante.

### Operating diagram



## Casing

Made of sheet steel with aluminium-zinc, enamelled with epoxy polyester powder paint permitting outdoor installation.

## Accessories

Provision is made for installing the standard accessories inside, between the evaporator coil and the fan:

- Electric heaters.
- Hot water coils.

## Physical data

| Model                            |                      |              |    | ASAO/I-25             | ASAO/I-30 | ASAO/I-45 | ASAO/I-60 |
|----------------------------------|----------------------|--------------|----|-----------------------|-----------|-----------|-----------|
| Compressor                       | Quantity             |              |    | 1                     | 1         | 2         | 2         |
|                                  | Nominal power kW     |              |    | 9.1                   | 10        | 2 x 8.4   | 2 x 10.2  |
|                                  | Power supply V.ph.Hz |              |    | 230.3.50 or 400.3.50  |           | 400.3.50  | 400.3.50  |
| Indoor fan                       | Nominal power W      |              |    | 950                   | 1 472     | 1 472     | 2 240     |
|                                  | Power supply V.ph.Hz |              |    | 2300.3.50 or 400.3.50 |           | 400.3.50  | 400.3.50  |
|                                  | rpm motor            |              |    | 1 400                 | 1 400     | 1 400     | 1 400     |
|                                  | Diameter turbines mm |              |    | 320                   | 320       | 320       | 320       |
|                                  | Width turbines mm    |              |    | 320                   | 240       | 320       | 320       |
| Indoor fan                       | Nominal power W      |              |    | 1 450                 | 2 944     | 2 x 2 200 | 4 500     |
|                                  | Power supply V.ph.Hz |              |    | 230.3.50 or 400.3.50  |           | 400.3.50  | 400.3.50  |
|                                  | rpm motor            |              |    | 1 400                 | 1 400     | 1 400     | 1 430     |
|                                  | Diameter turbines mm |              |    | 270                   | 320       | 320       | 380       |
|                                  | Width turbines mm    |              |    | 270                   | 320       | 320       | 380       |
| Indoor coil                      | Quantity             |              |    | 1                     | 1         | 1         | 1         |
|                                  | Tubes depth x height |              |    | 4 x 21                | 4 x 25    | 4 x 25    | 4 x 29    |
|                                  | Diameter turbines    |              |    | 3/8"                  | 3/8"      | 3/8"      | 3/8"      |
| Outdoor coil                     | Quantity             |              |    | 1                     | 1         | 2         | 2         |
|                                  | Tubes depth x height |              |    | 5 x 37                | 5 x 40    | 6 x 40    | 5 x 42    |
|                                  | Diameter turbines    |              |    | 3/8"                  | 3/8"      | 3/8"      | 3/8"      |
| Approx. weight                   | Nett                 | Outdoor unit | kg | 305                   | 370       | 526       | 520       |
|                                  |                      | Indoor unit  | kg | 118                   | 160       | 190       | 235       |
|                                  | Gross                | Outdoor unit | kg | 340                   | 420       | 584       | 560       |
|                                  |                      | Indoor unit  | kg | 140                   | 190       | 225       | 325       |
| Indoor unit packaged dimensions  | Height               |              | mm | 760                   | 833       | 833       | 935       |
|                                  | Width                |              | mm | 1 444                 | 1 825     | 2 125     | 2 390     |
|                                  | Length               |              | mm | 930                   | 930       | 930       | 955       |
| Outdoor unit packaged dimensions | Height               |              | mm | 1 404                 | 1 534     | 1 534     | 1 720     |
|                                  | Width                |              | mm | 1 444                 | 1 825     | 2 125     | 2 270     |
|                                  | Length               |              | mm | 930                   | 930       | 930       | 935       |

Rated performance

| Outdoor unit | Indoor unit | Summer             |               | Available pressure indoor fan Pa |
|--------------|-------------|--------------------|---------------|----------------------------------|
|              |             | Cooling capacity W | Consumption W |                                  |
| ASAO-25      | ASAI-25     | 21 000             | 10 000        | 62                               |
| ASAO-30      | ASAI-30     | 28 100             | 13 400        | 62                               |
| ASAO-45      | ASAI-45     | 42 000             | 20 000        | 75                               |
| ASAO-60      | ASAI-60     | 57 800             | 28 100        | 80                               |

Test conditions

| Voltage                             | Length of interconnection tubing | Summer           |    |                 |    |
|-------------------------------------|----------------------------------|------------------|----|-----------------|----|
|                                     |                                  | Outdoor temp. °C |    | Indoor Temp. °C |    |
|                                     |                                  | DB               | WB | DB              | WB |
| 400                                 | 7.5 metres                       | 35               | 24 | 27              | 19 |
| Note: WB = Wet bulb. DB = Dry bulb. |                                  |                  |    |                 |    |

Correction factors for the cooling capacities

Correction factors for flow-rates different from the nominal ones in the indoor coil.

|                   |       |       |     |       |       |       |
|-------------------|-------|-------|-----|-------|-------|-------|
| % 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 temperature of air at entry to the outdoor coil for flow-rates different from the nominal ones.

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

Nominal flow-rates

The cooling capacities in the preceding table are valid for the following flow-rates:

|           |                 |                  |
|-----------|-----------------|------------------|
| Model     | Indoor fan m³/h | Outdoor fan m³/h |
| ASAO/I-25 | 4 725           | 7 650            |
| ASAO/I-30 | 7 500           | 13 300           |
| ASAO/I-45 | 10 000          | 13 600           |
| ASAO/I-60 | 12 560          | 19 000           |

For different flow-rates, apply the correction factors from the corresponding table.

Sensible cooling capacities

| Model     | Outside<br>air dry<br>temperature<br>°C DB | Air intake<br>humid<br>temperature<br>°C NB | Total<br>capacity | Sensible capacity (W/h)               |        |        |        | Compressor<br>power<br>absorbed |
|-----------|--------------------------------------------|---------------------------------------------|-------------------|---------------------------------------|--------|--------|--------|---------------------------------|
|           |                                            |                                             |                   | Temperature at condenser intake °C DB |        |        |        |                                 |
|           |                                            |                                             |                   | 22                                    | 24     | 27     | 29     |                                 |
|           |                                            |                                             | W                 | W                                     | W      | W      | W      | kW                              |
| ASAO/I-25 | 25                                         | 22                                          | 25 200            | 7 600                                 | 10 735 | 15 438 | 18 577 | 6.59                            |
|           |                                            | 19.5                                        | 22 680            | 11 521                                | 14 656 | 19 358 | 22 499 | 6.91                            |
|           |                                            | 17                                          | 21 000            | 15 680                                | 18 815 | 21 000 | 21 000 | 7.22                            |
|           | 35                                         | 22                                          | 23 310            | 6 967                                 | 10 102 | 14 805 | 17 940 | 7.46                            |
|           |                                            | 19.5                                        | 21 000            | 10 905                                | 14 040 | 18 743 | 21 000 | 7.85                            |
|           |                                            | 17                                          | 19 320            | 14 107                                | 17 242 | 19 320 | 19 320 | 8.24                            |
|           | 45                                         | 22                                          | 21 000            | 6 262                                 | 9 397  | 14 099 | 17 234 | 8.64                            |
|           |                                            | 19.5                                        | 18 900            | 10 203                                | 13 338 | 18 040 | 18 900 | 9.03                            |
|           |                                            | 17                                          | 17 220            | 14 172                                | 17 220 | 17 220 | 17 220 | 9.42                            |

Sensible cooling capacities

| Model     | Outside<br>air dry<br>temperature<br>°C (DB) | Air intake<br>humid<br>temperature<br>°C (WB) | Total<br>capacity | Sensible capacity (W/h)                  |        |        |        | Compressor<br>power<br>absorbed |
|-----------|----------------------------------------------|-----------------------------------------------|-------------------|------------------------------------------|--------|--------|--------|---------------------------------|
|           |                                              |                                               |                   | Temperature at condenser intake, °C (DB) |        |        |        |                                 |
|           |                                              |                                               | 22                | 24                                       | 27     | 29     |        |                                 |
|           |                                              |                                               | W                 | W                                        | W      | W      | W      | kW                              |
| ASAO/I-30 | 25                                           | 22                                            | 35 640            | 10 708                                   | 15 289 | 22 160 | 26 748 | 8.65                            |
|           |                                              | 19.5                                          | 32 076            | 16 443                                   | 21 024 | 27 896 | 32 076 | 9.06                            |
|           |                                              | 17                                            | 29 700            | 22 514                                   | 27 095 | 29 700 | 29 700 | 9.48                            |
|           | 35                                           | 22                                            | 32 967            | 9 817                                    | 14 399 | 21 270 | 25 851 | 9.79                            |
|           |                                              | 19.5                                          | 29 700            | 15 578                                   | 20 159 | 27 030 | 29 700 | 10.30                           |
|           |                                              | 17                                            | 27 324            | 20 288                                   | 24 869 | 27 324 | 27 324 | 10.82                           |
|           | 45                                           | 22                                            | 29 700            | 8 826                                    | 13 407 | 20 279 | 24 860 | 11.33                           |
|           |                                              | 19.5                                          | 26 730            | 14 589                                   | 19 170 | 26 042 | 26 730 | 11.85                           |
|           |                                              | 17                                            | 24 354            | 20 392                                   | 24 354 | 24 354 | 24 354 | 12.36                           |
| ASAO/I-45 | 25                                           | 22                                            | 48 000            | 14 279                                   | 21 015 | 31 120 | 37 864 | 13.69                           |
|           |                                              | 19.5                                          | 43 200            | 22 735                                   | 29 471 | 39 576 | 43 200 | 14.34                           |
|           |                                              | 17                                            | 40 000            | 31 637                                   | 38 373 | 40 000 | 40 000 | 15.00                           |
|           | 35                                           | 22                                            | 44 400            | 13 099                                   | 19 835 | 29 940 | 36 676 | 15.49                           |
|           |                                              | 19.5                                          | 40 000            | 21 586                                   | 28 322 | 38 426 | 40 000 | 16.30                           |
|           |                                              | 17                                            | 36 800            | 30 257                                   | 36 800 | 36 800 | 36 800 | 17.12                           |
|           | 45                                           | 22                                            | 40 000            | 11 782                                   | 18 519 | 28 623 | 35 359 | 17.93                           |
|           |                                              | 19.5                                          | 36 000            | 20 271                                   | 27 008 | 36 000 | 36 000 | 18.75                           |
|           |                                              | 17                                            | 32 800            | 28 814                                   | 32 800 | 32 800 | 32 800 | 19.56                           |
| ASAO/I-60 | 25                                           | 22                                            | 64 800            | 19 662                                   | 27 333 | 38 841 | 46 524 | 15.20                           |
|           |                                              | 19.5                                          | 58 320            | 29 237                                   | 36 909 | 48 417 | 56 102 | 15.93                           |
|           |                                              | 17                                            | 54 000            | 39 432                                   | 47 104 | 54 000 | 54 000 | 16.65                           |
|           | 35                                           | 22                                            | 59 940            | 18 017                                   | 25 689 | 37 197 | 44 869 | 17.20                           |
|           |                                              | 19.5                                          | 54 000            | 27 641                                   | 35 313 | 46 820 | 54 000 | 18.10                           |
|           |                                              | 17                                            | 49 680            | 35 362                                   | 43 034 | 49 680 | 49 680 | 19.01                           |
|           | 45                                           | 22                                            | 54 000            | 16 187                                   | 23 859 | 35 367 | 43 039 | 19.91                           |
|           |                                              | 19.5                                          | 48 600            | 25 819                                   | 33 491 | 44 999 | 48 600 | 20.82                           |
|           |                                              | 17                                            | 44 280            | 35 525                                   | 43 197 | 44 280 | 44 280 | 21.72                           |

## Indoor fan performances

| Model                                                                   | Static pressure available <sup>(1)</sup> |       | Air-flow-rate |      | Power input |
|-------------------------------------------------------------------------|------------------------------------------|-------|---------------|------|-------------|
|                                                                         | mm WG                                    | Pa    | m³/h          | m³/s | W           |
| ASAI-25                                                                 | 0                                        | 0     | 5 281         | 1.46 | 1 070       |
|                                                                         | 2                                        | 19.6  | 5 058         | 1.4  | 1 005       |
|                                                                         | 4                                        | 39.2  | 4 860         | 1.35 | 955         |
|                                                                         | 5                                        | 49    | 4 723         | 1.31 | 920         |
|                                                                         | 6                                        | 58.8  | 4 653         | 1.29 | 900         |
|                                                                         | 8                                        | 78.4  | 4 399         | 1.22 | 840         |
|                                                                         | 10                                       | 98    | 4 130         | 1.14 | 785         |
|                                                                         | 12                                       | 117.6 | 3 885         | 1.07 | 740         |
|                                                                         | 14                                       | 137.2 | 3 577         | 0.99 | 680         |
| ASAI-30                                                                 | 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       |
| ASAI-45                                                                 | 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       |
| ASAI-60                                                                 | 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       |
| <b>Note:</b> (1) Performance calculated for wet coil including filters. |                                          |       |               |      |             |

Outdoor fan performances

| Model   | Static pressure available |       | Air-flow-rate |      | Power input |
|---------|---------------------------|-------|---------------|------|-------------|
|         | mm WG                     | Pa    | m³/h          | m³/s | W           |
| ASAO-25 | 24.3                      | 238.1 | 5 500         | 1.53 | 875         |
|         | 22.4                      | 219.5 | 6 000         | 1.66 | 960         |
|         | 20.0                      | 196.0 | 6 500         | 1.80 | 1 050       |
|         | 17.0                      | 166.6 | 7 000         | 1.94 | 1 150       |
|         | 14.0                      | 137.2 | 7 500         | 2.08 | 1 280       |
|         | 11.1                      | 108.8 | 8 000         | 2.22 | 1 400       |
|         | 7.0                       | 68.6  | 8 500         | 2.36 | 1 530       |
|         | 3.6                       | 35.3  | 9 000         | 2.50 | 1 690       |
|         | 0.0                       | 0.0   | 9 500         | 2.64 | 1 840       |
| ASAO-30 | 22.5                      | 220.5 | 9 280         | 2.58 | 1 480       |
|         | 22.2                      | 217.6 | 9 500         | 2.64 | 1 500       |
|         | 20.6                      | 201.9 | 10 000        | 2.78 | 1 680       |
|         | 19.3                      | 189.1 | 10 500        | 2.92 | 1 800       |
|         | 18.1                      | 177.4 | 11 000        | 3.05 | 1 940       |
|         | 16.3                      | 159.7 | 11 500        | 3.19 | 2 050       |
|         | 14.3                      | 140.1 | 12 000        | 3.33 | 2 200       |
|         | 12.5                      | 122.5 | 12 500        | 3.47 | 2 250       |
|         | 10.7                      | 104.8 | 13 000        | 3.61 | 2 490       |
|         | 8.3                       | 81.3  | 13 500        | 3.75 | 2 630       |
|         | 6.2                       | 60.8  | 14 000        | 3.89 | 2 745       |
|         | 3.4                       | 33.3  | 14 500        | 4.03 | 2 980       |
|         | 1.5                       | 14.7  | 15 000        | 4.16 | 3 150       |
|         | 0.0                       | 0.0   | 15 200        | 4.22 | 3 240       |
| ASAO-45 | 22.5                      | 220.5 | 10 000        | 2.78 | 1 800       |
|         | 21.4                      | 209.7 | 10 500        | 2.92 | 1 930       |
|         | 19.8                      | 194.0 | 11 000        | 3.05 | 2 050       |
|         | 17.7                      | 173.5 | 11 500        | 3.19 | 2 150       |
|         | 15.7                      | 153.9 | 12 000        | 3.33 | 2 320       |
|         | 14.0                      | 137.2 | 12 500        | 3.27 | 2 480       |
|         | 12.0                      | 117.6 | 13 000        | 3.61 | 2 660       |
|         | 9.5                       | 93.1  | 13 500        | 3.75 | 2 830       |
|         | 7.3                       | 71.5  | 14 000        | 3.88 | 3 000       |
|         | 4.6                       | 45.1  | 14 500        | 4.03 | 3 150       |
|         | 1.3                       | 12.7  | 15 000        | 4.16 | 3 320       |
|         | 0.0                       | 0.0   | 15 300        | 4.25 | 3 410       |
| ASAO-60 | 20.7                      | 202.8 | 17 000        | 4.72 | 3 428       |
|         | 19.5                      | 191.1 | 17 500        | 4.86 | 3 607       |
|         | 17.9                      | 175.4 | 18 000        | 5.00 | 3 785       |
|         | 16.5                      | 161.7 | 18 500        | 5.14 | 3 892       |
|         | 14.9                      | 146.0 | 19 000        | 5.28 | 4 050       |
|         | 13.3                      | 130.3 | 19 500        | 5.42 | 4 125       |
|         | 12.1                      | 118.6 | 20 000        | 5.55 | 4 312       |
|         | 10.1                      | 99.0  | 20 500        | 5.69 | 4 500       |
|         | 8.4                       | 82.3  | 21 000        | 5.83 | 4 655       |
|         | 6.2                       | 60.7  | 21 500        | 5.97 | 4 821       |
|         | 4.4                       | 43.1  | 22 000        | 6.11 | 5 035       |
|         | 2.4                       | 23.5  | 22 500        | 6.25 | 5 250       |
|         | 0.0                       | 0.0   | 23 000        | 6.39 | 5 464       |

# Installation instructions

## General description

The ASAO/I model conditioners are supplied in standard form as separate units. They are designed for installation with ducting, on terraces, roof-tops, in lofts and basements. When necessary, and at the moment of installation, these two units can easily be joined together, transforming them into a compact set of equipment.

Control of stopping and starting and temperature regulation are carried out through a special 24V thermostat which is supplied with every ASAO outdoor unit.

## Protection of the environment



### Packing

Packing is made of recyclable material. The disposal of same should be carried out in accordance with the regulations on selective residue disposal established by the local authorities.

### Disposal of the unit

When dismantling after a long service life, its components should be ecologically salvaged. The cooling circuit is full of HCFC-22 refrigerant which should be salvaged and, finally, returned to the gas manufacturer for recycling.

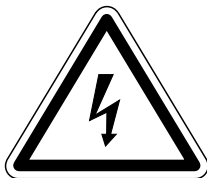
Oil will remain in the airtight compressor so, it will be returned along with the sealed circuit.

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

## Warning signs

The following signs indicate the presence of potentially dangerous conditions for the 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: It is compulsory to read the instructions prior to any handling.



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 in operation.



Attention: Not to touch the hot surfaces.



Attention: Wheel and belt transmission.



Attention: Possible escape of gas if incorrectly handled.

## Transport

The outdoor units must always be transported in a vertical position so that the oil cannot escape from the compressor. If for some reason it is necessary from time to time to vary this position, the unit should be left in the new position for as short a time as possible.

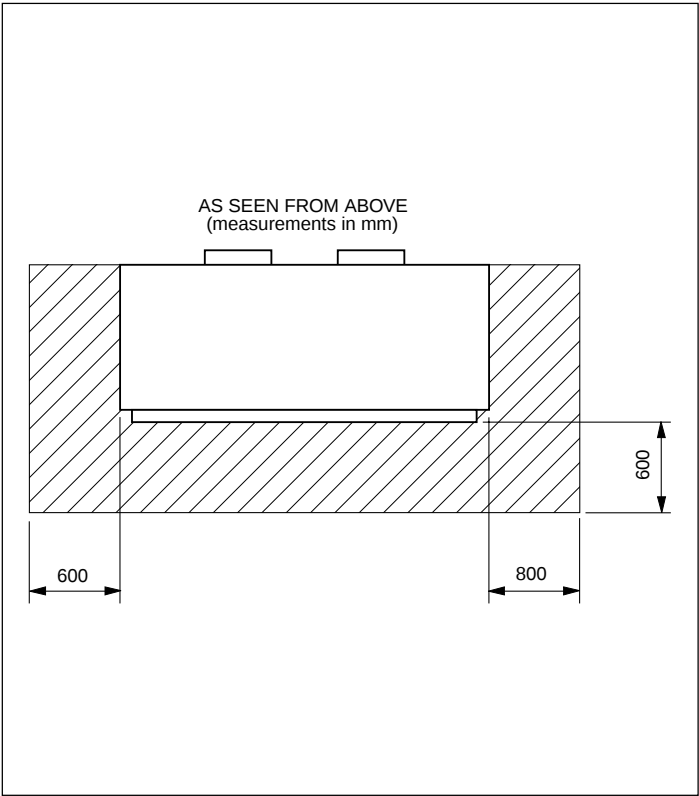
Location

The location must be chosen providing permanent access for maintenance service, both through the lateral and rear panels.

The outdoor unit can be installed directly out doors. If it is installed indoors, in basements, lofts, etc., ducting must be fitted to bring in exterior air and for its extraction.

Clearances

- In the installation of each apparatus, clearance must be left for:
- a) Intake and discharge of air to and from the outdoor unit.
  - b) Connection of drain and electrical tubing.
  - c) Air ducts.
  - d) Maintenance service.
  - e) Electrical wiring.
  - f) Cleaning the filters



Air ducts

- 1- Connect the ducts, insulating them from the apparatus with a flexible coupling, preferably of non-inflammable material, to avoid transmission of vibration from the apparatus itself. If the ducts are made of flexible material they will not transmit vibration.
- 2- It is recommended that a register be fitted on each section of the ducting to ensure correct balance of the system.
- 3- Leave easy access for cleaning and changing the air filters.
- 4- With the ASAO-45 units, two separate ducts, one from each fan, to the discharge, must be fitted to avoid recirculation of air.

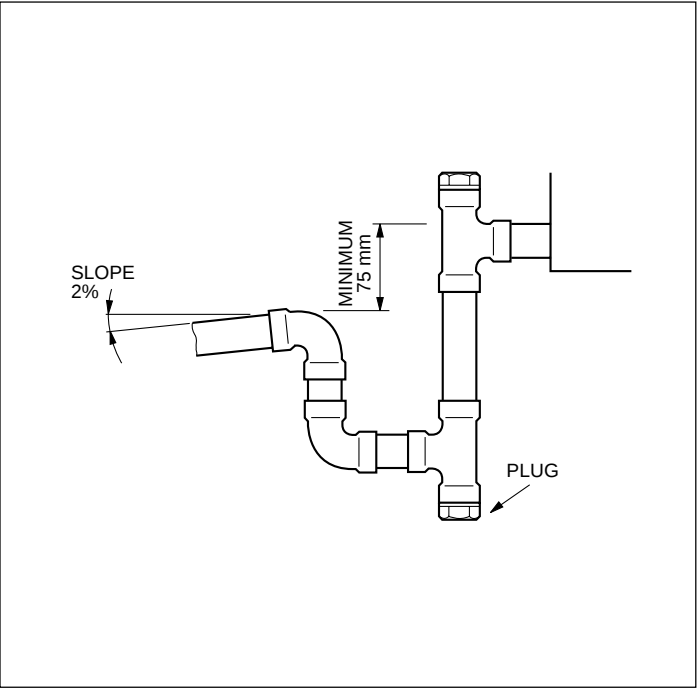
Drain connections

Run the drain tubes for each pan though a trap. Leave a minimum level difference of 75 mm. between the height of the connection to the apparatus and the line after the trap (see drawing). This is to prevent the depression produced by the fan from interfering with the emptying of the pan. Access

should be left for filling the trap with water at the beginning of each season.

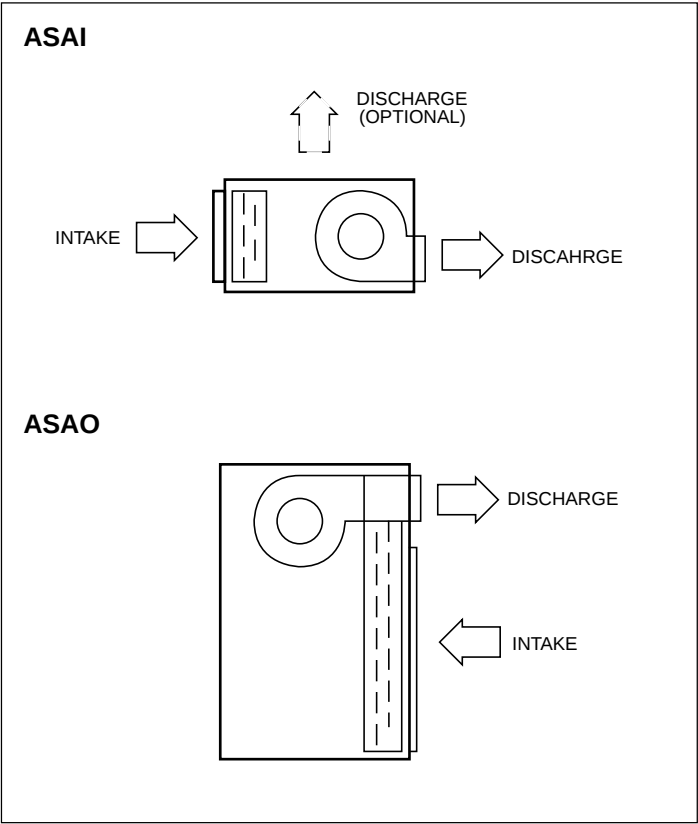
The drain line must have a minimum slope of 2 cm. for each metre of length.

The connections on the apparatus are of steel tube with 3/4" G. interior thread.



Orientation of the air intake and discharge

The standard orientations for air intake and discharge are as shown in the drawing.



On-site modifications

If the installation conditions require it, the discharge from the indoor fan ASAI can easily be modified on site to provide discharge vertically.

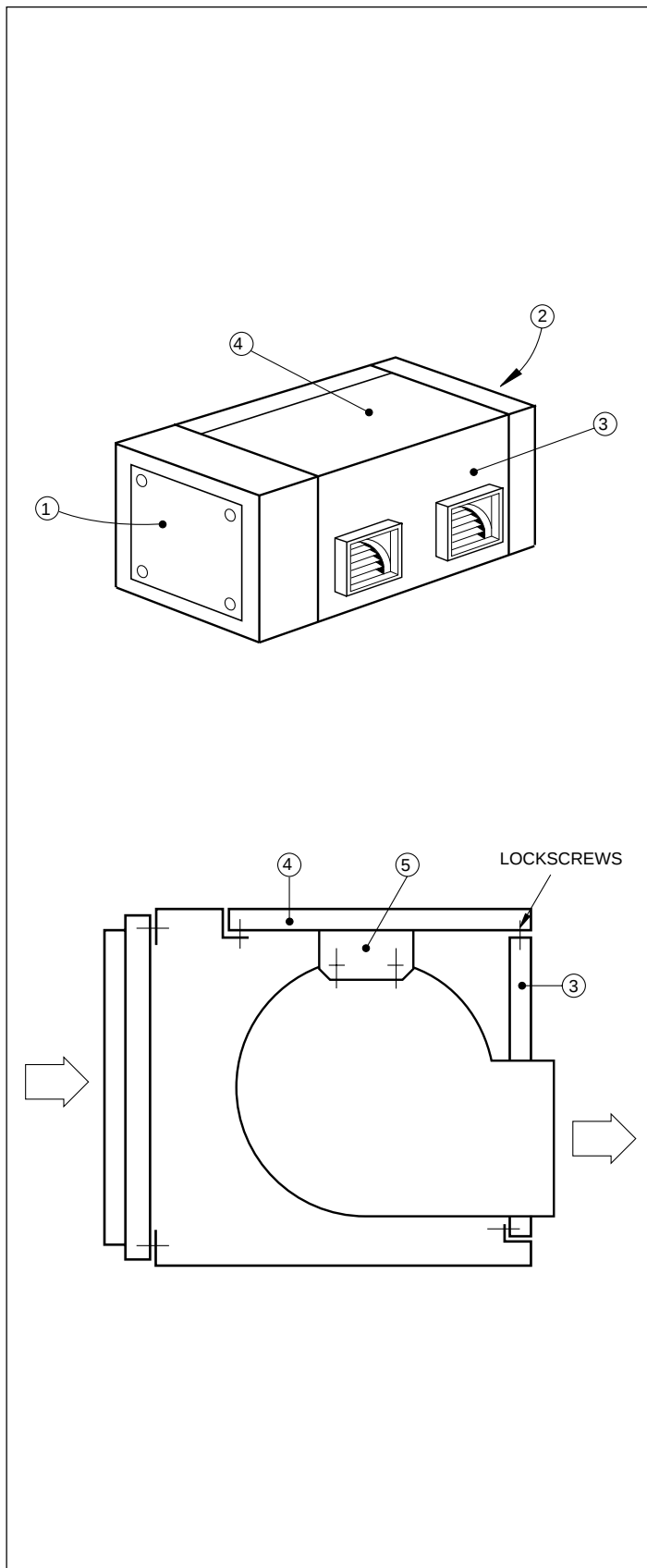
## Transformation process from horizontal to vertical discharge

(ASAI-25, 30, 45)

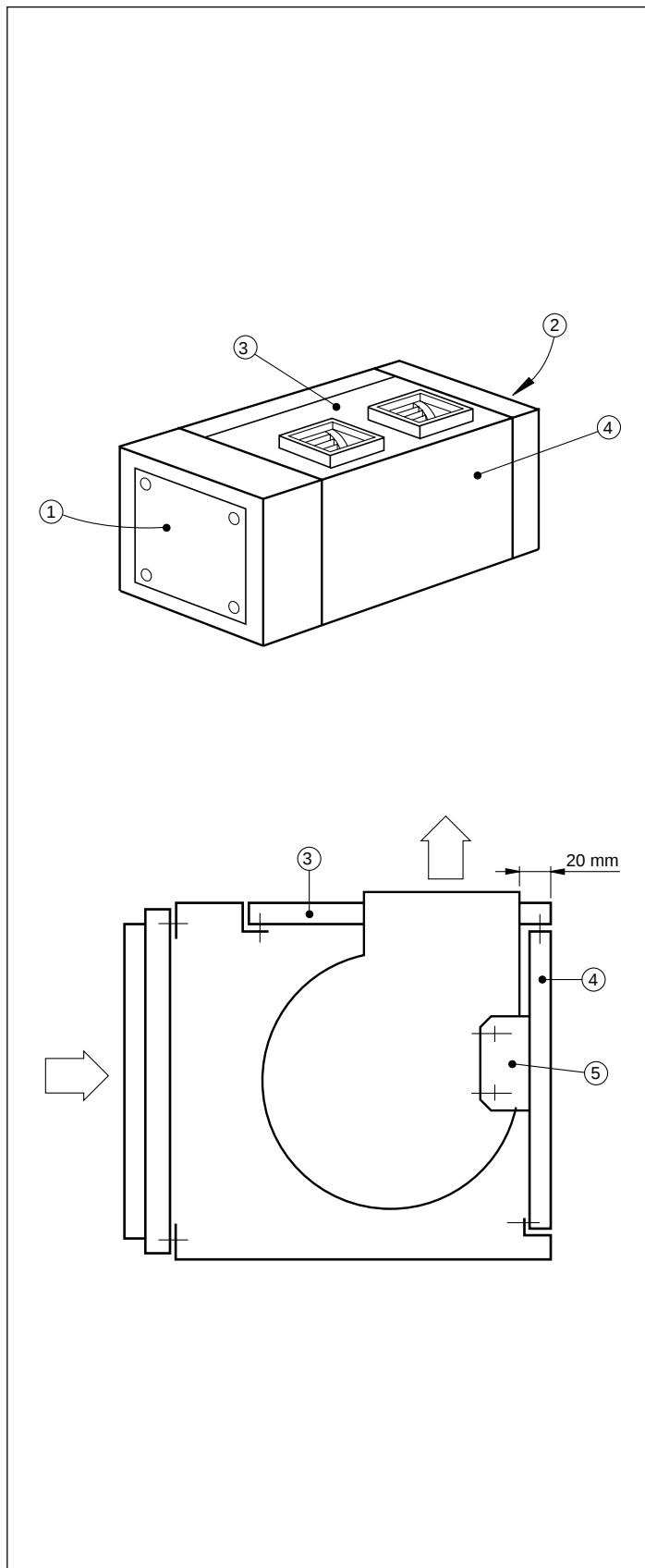
- 1- Remove the attachment screws from the side panels 1 and 2 on the upper unit.
- 2- Remove side panels 1 and 2.
- 3- Loosen the screws attaching the fan motor to its base and take off the drive belf.

- 4- Through the lateral accesses, unscrew panels 3 and 4, as shown in the standard orientation drawing.
- 5- Unscrew the attachment of the fan to support 5.
- 6- Place panel 3 in the former position of panel 4, and panel 4 in the former position of panel 3.
- 7- Screw home the panels and the fan to support 5.
- 8- Replace the drive belt and attach the motor to its base.
- 9- Screw on the side panels 1 and 2.

### Standard orientation



### Orientation as modified on site



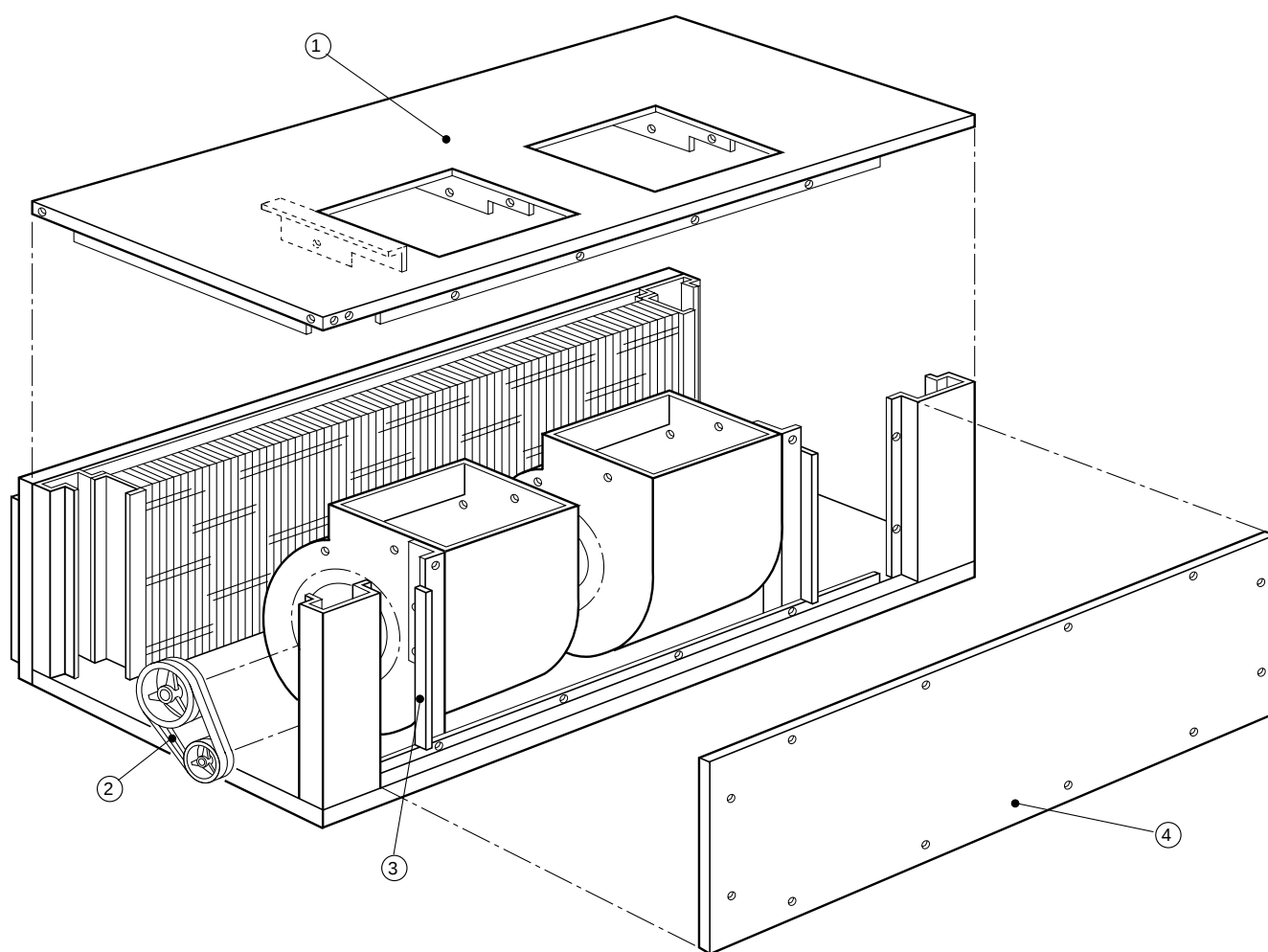
### ASAI-60 unit

The ASAI-60 needs a transformation kit which includes: rear and upper panel, belts, motor pulleys and fan.

- 1- Dismantle the standard upper, rear and side panels and the fans, and orientate them as shown in the drawing, attaching them to the upper panel together with the transformation kit.
- 2- Once the fans have been installed, attach the upper panel

ref. 1 to the unit.

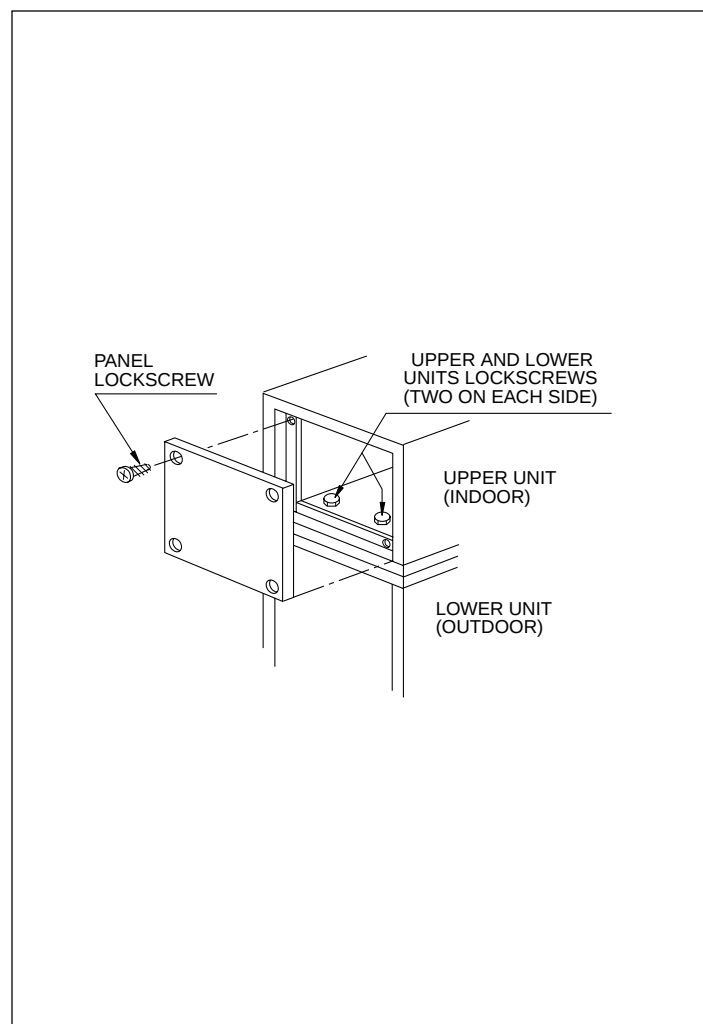
- 3- Attach the left-hand side angle support and right-hand fan support ref. 3 to the unit.
- 4- Change the motor pulleys, fan and belts ref. 2 for those included in the kit.
- 5- Fit the upper panel ref. 4.
- 6- Finally, fit the standard side panels.



## Compact installation of the units

The units are supplied prepared for connection of their cooling circuits and electrically.

To install the units as a compact system, the outdoor ASAO unit and the indoor ASAI one have to be joined through the holes provided in them by the screws provided. These will be found in a bag inside the electrical box in the ASAO-60 and in the indoor unit in the ASAI-25, 30 & 45.



The indoor and outdoor units are supplied with the cooling circuit connections ready for soldering and to be interconnected on the outside of the casing.

The ASAO/I-25 and ASAO/I-30 units have one sole circuit. The ASAO/I-45 and ASAO/I-60 units has two circuits.

The refrigerant load should be applied onsite.

### Charge process

- 1 - Depressurise the units.
- 2 - Drain the refrigerant.
- 3 - Clean out with dry nitrogen.
- 4 - Solder the tubing under dry nitrogen inside the tubes.
- 5 - For soldering use low melting-point rods with a minimum silver content of 5%.
- 6 - Fill with 2 kg. R-22 refrigerant to detect leaks.
- 7 - Drain off the refrigerant.
- 8 - Clean out with dry nitrogen.
- 9 - Create a vacuum down to 200 microns.
- 10 - Put in the refrigerant, using scales or a calibrated cylinder. Charge accuracy should be within 30 grams.

The outdoor unit is fitted with plug-in points at the connection outlets for verification of pressure and temperature, Super-

heat and Sub-cooling. Check that these values are in the order of 5°C.

## Installation with separated units

### Separation between the units

The length of connecting tubing should be kept down to the minimum possible.

Maximum admissible distances with the circuit and standard diameter tubes are:

| Total length of tubes<br>m | Maximum level difference between units<br>m |
|----------------------------|---------------------------------------------|
| 20                         | 10                                          |

For greater lengths the installation must be made after a previous project approved by our technical service.

This project may require modification of any of the following elements:

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

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

| Installation type                                                     |   |    |
|-----------------------------------------------------------------------|---|----|
| Units at same level, maximum length                                   | m | 50 |
| Outdoor unit higher than indoor. Maximum length and level difference. | m | 50 |
| Outdoor unit lower than indoor. Maximum length and level difference.  | m | 15 |

### Cooling interconnections

When forming the tubing to join the two units special care should be taken to keep the tubes clean and dry even before installation. The following recommendations should be observed:

- 1 - Use only copper tubing of refrigerant quality.
- 2 - Do not carry out outdoor work if it is raining.
- 3 - The ends of the tubes should be kept closed during the installation.
- 4 - The dryer filters and compressor should not be left exposed 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, a current of dry nitrogen should be kept up to avoid the formation of oxides which could cause contamination and blockage.
- 7 - For copper-copper unions stripper should not be used.

## Diameter of the interconnection tubing

| Model           | Gas line diameter (wide tube) | Liquid line diameter (narrow tube) |
|-----------------|-------------------------------|------------------------------------|
| ASAO/I-25 en 45 | 1 1/8" (28.5 mm)              | 1/2" (12.7 mm)                     |
| ASAO/I-30 en 60 |                               | 5/8" (15.87 mm)                    |

## Refrigerant charge

The nominal charge show in the table below is calculated for functioning as a compact unit.

When a split system is installed, the refrigerant charge has to be increased as a function of the length of liquid tubing.

| Model     | Nominale vulling R-22 kg | Aantal circuits | Diameter vloeistofleiding | Extra vulling in gr (per meter) |
|-----------|--------------------------|-----------------|---------------------------|---------------------------------|
| ASAO/I-25 | 11                       | 1               | 1/2"(12.7mm)              | 104 grs.                        |
| ASAO/I-30 | 15                       | 1               | 5/8"(15.87mm)             | 170 grs.                        |
| ASAO/I-45 | 11.6 x 2                 | 2               | 1/2"(12.7mm)              | 104 grs.                        |
| ASAO/I-60 | 7 x 2                    | 2               | 5/8"(15.87mm)             | 170 grs.                        |

## Charge process

- 1 - Depressurise the units.
- 2 - Drain the refrigerant.
- 3 - Clean out with dry nitrogen.
- 4 - Solder the tubing under dry nitrogen inside the tubes.
- 5 - For soldering use low melting-point rods with a minimum silver content of 5%.
- 6 - Fill with 2 kg. R-22 refrigerant to detect leaks.
- 7 - Drain off the refrigerant.
- 8 - Clean out with dry nitrogen.
- 9 - Create a vacuum down to 200 microns.
- 10- Put in the refrigerant, using scales or a calibrated cylinder. Charge accuracy should be within 30 grams.

The outdoor unit is fitted with plug-in points at the connection outlets for verification of pressure and temperature, Super-heat and Sub-cooling. Check that these values are in the order of 5°C.

## Insulation of tubing

The interconnecting cooling tubing must be insulated.

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

To avoid deterioration through exposure to sunlight it is recommended that it be painted with water-enamel.



CAUTION

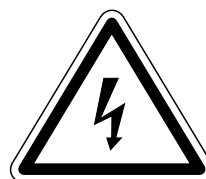
After the tube has been insulated, do not try to bend it in excess because it could become cracked or broken.

## Electrical installation

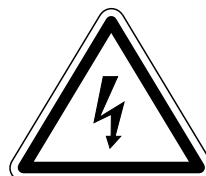
Each conditioner is delivered with a control box for connection to the mains through a main switch with fuses or an automatic cut-out.

The electric heater, if there is one, must be installed with power line and switches independent of those of the conditioner.

In all cases **established national regulations must be observed.**



Loose cables can cause overheating of the connectors or an inadequate operation of the unit. Fire risk could also exist. For this reason, make sure that all cables are properly connected.



Do not supply power to the unit and do not start up operations until the tubing and electrical connections with the outdoor unit have been completed.

Make sure that electrical supply is correctly connectec to the units, as shown in the electrical diagrams.

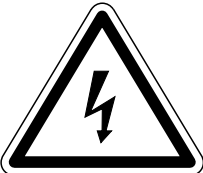
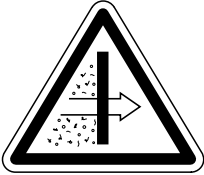
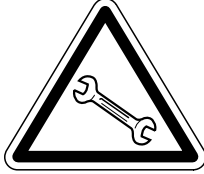
## Electrical characteristics

| Model                                                                                                                                                          | Power supply V.ph.Hz. |                 | Vermogen A |          |          |               |         |                |         | Power<br>sup. cable<br>cross<br>section<br><br>mm <sup>2</sup> | Automatic<br>circuit<br>breaker<br><br>A |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------|------------|----------|----------|---------------|---------|----------------|---------|----------------------------------------------------------------|------------------------------------------|
|                                                                                                                                                                | Compressor            | Fan             | Compressor |          |          | Indoor<br>fan |         | Outdoor<br>fan |         |                                                                |                                          |
|                                                                                                                                                                |                       | Ext.   -   Int. | Start      | Nominal  | Maximum  | Start         | Nominal | Start          | Nominal |                                                                |                                          |
| ASAO/I-25                                                                                                                                                      | 230.3.50              | 230.3.50        | 183        | 22.8     | 34.5     | 14            | 5.2     | 23             | 5.2     | 10                                                             | 50                                       |
|                                                                                                                                                                | 400.3.50              | 400.3.50        | 90         | 13.2     | 20       | 7             | 2       | 10             | 3       | 6                                                              | 32                                       |
| ASAO/I-30                                                                                                                                                      | 230.3.50              | 230.3.50        | 170        | 28.5     | 33       | 23            | 4.7     | 31             | 6.6     | 16                                                             | 80                                       |
|                                                                                                                                                                | 400.3.50              | 400.3.50        | 100        | 16.5     | 19       | 10            | 2.7     | 25             | 3.8     | 10                                                             | 50                                       |
| ASAO/I-45                                                                                                                                                      | 400.3.50              | 400.3.50        | 2 x 91     | 2 x 12.5 | 2 x 14.5 | 10            | 3.5     | 2 x 13         | 2 x 3   | 16                                                             | 63                                       |
| ASAO/I-60                                                                                                                                                      | 400.3.50              | 400.3.50        | 2 x 100    | 2 x 16.5 | 2 x 19   | 25            | 7.1     | 80             | 13      | 25                                                             | 100                                      |
| Important: The automatic switch sizing and the power line section are orientative, and should be corrected in accordance with site conditions and legislation. |                       |                 |            |          |          |               |         |                |         |                                                                |                                          |

## Limits of use

| Voltage limits                            |         |            |         | Air intake temperature evaporating unit °C |         |                |         | Air intake temperature condensing unit °C |         |
|-------------------------------------------|---------|------------|---------|--------------------------------------------|---------|----------------|---------|-------------------------------------------|---------|
| Nom. 230 V                                |         | Nom. 400 V |         | Temperature WB                             |         | Temperature DB |         | Temperature DB                            |         |
| Minimum                                   | Maximum | Minimum    | Maximum | Minimum                                    | Maximum | Minimum        | Maximum | Minimum                                   | Maximum |
| 198                                       | 254     | 342        | 436     | 14                                         | 23      | 19             | 32      | 19                                        | 46      |
| <b>Notes:</b> WB- Wet bulb. DB- Dry bulb. |         |            |         |                                            |         |                |         |                                           |         |

## Before final approval of the installation

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

# Operating instructions

## General information

Start-up and automatic temperature regulation are carried out through the ambient thermostat.

Place the thermostat about 1.5 metres above floor level, where no obstacle can prevent it from measuring the real temperature of the room.

## Important warning

The thermostat should be located on a wall that is not exposed to direct sunlight. Should this not be the case, the temperatures would not be real, and operation would be inadequate.

Before starting up, turn on the main switch to activate the electric heater in the compressor crankcase.

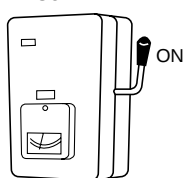
**The compressor must not be started up until at least eight hours have elapsed.**

This is to allow for evaporation of any refrigerant in liquid form which may have mixed with the compressor oil.



CAUTION

ELECTRICAL  
SUPPLY



Connection:

To heat the system, the electrical supply must be switched on at least 8 hours before the conditioner is put into operation.

Leave the supply connected unless you are going to leave the conditioner idle for a long period of time.

## Recommendations for better functioning

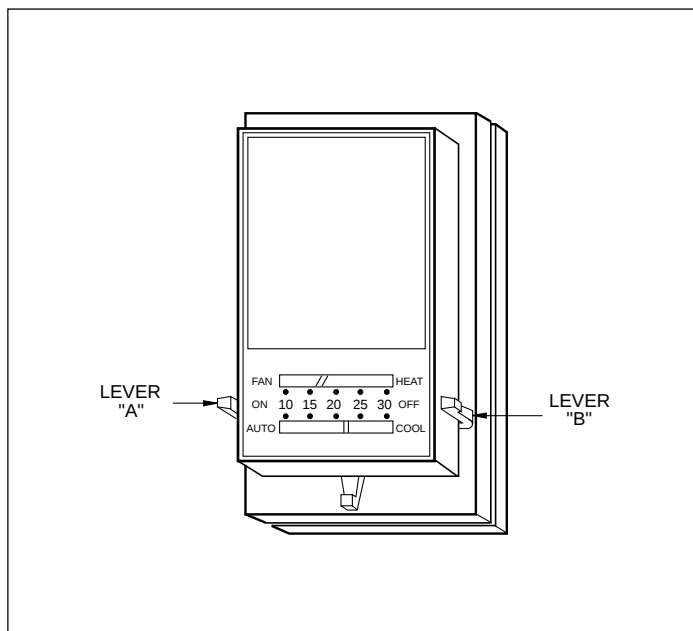
- Turn the console on before the room gets hot. The heat accumulated on furniture, walls, etc. makes the console take longer to achieve the desired temperature.
- It is advisable to inspect and service your unit in the spring; this avoids damage and insures a long service of your console.

## Ambient thermostat

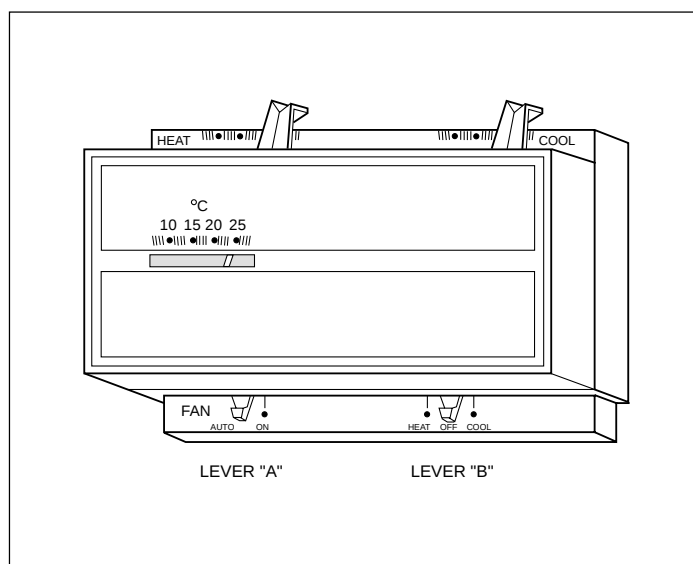
### Characteristics:

- Operating voltage 24V.
- Admissible strength 2 A.
- With a switch for the functioning of COOL-OFF-HEAT, and another for the fan, with positions AUTO-ON (Automatic-Continuous).
- With heat and cold anticipators adjustable between 0.1 and 1.2 A.
- With a bi-metal thermometer.

## Thermostat for ASAO/I-25 & 30



## Thermostat for ASAO/I-45 & 60



## Start-up process

Connect the main and earth wires to the board provided in the control box.

Connect the ambient thermostat cable to 24 V on the board provided in the control box.

Once the equipment has been installed in accordance with the instructions given previously, and the appropriate checks have been made, the start-up process can be initiated. This is done through the thermostat.

### a) For ventilation only:

- Lever A in ON position.
- Lever B in OFF position.
- Dial in any position.

### b) Summer conditioning:

- Lever A in ON or AUTO position.
- Lever B in COOL position.
- Dial indicating the temperature desired.

### c) Winter conditioning:

- (With heating coils)
- Lever A in ON or AUTO position.
- Lever B in HEAT position.
- Dial indicating the temperature desired.

In the OFF position the cooling group does not operate. When the lever A is in the ON position only the fan functions. In the position COOL or HEAT and AUTO the fan starts up in conjunction with the compressor or electric heater, if fitted (as indicated by the thermostat and the room temperature). The group is switched off completely when the A lever is in the AUTO position and the B lever in OFF.

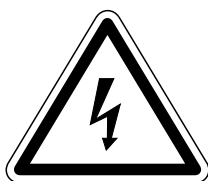
### Pressostats

The conditioner is fitted with a cut-out in the high circuit, functioning when pressure becomes excessive, and another in the low circuit, when it is insufficient. When one of the cut-outs is activated, it opens the control circuit, stopping the compressor. Before re-setting the corresponding cut-out, the thermostat should be switched off through the thermostat and the anomaly which produced the abnormal pressure dealt with.

To reconnect, press the tab on the cut-out spring and put the thermostat in the operating positions.

### Maintenance

Clean the casing with a vacuum cleaner or a cloth moistened in a mild liquid detergent.



Do not pour water on the unit to clean it. Water could damage the internal components and cause electrical discharges.

### Indoor unit discharge ducts

The indoor unit discharge, intended for ducts, is supplied without a protective grill. When maintenance work is being done this must be taken into account.



CAUTION

In cases of unrestricted discharge installations for an indoor unit intended for ducting, the outlet opening must be protected with a grill. Failure to fit this protection could result in damages being caused by the fan turbine.

### Cleaning the filters

Keep the battery filters in good condition, servicing them at least once a month. If the filters become dirty they will reduce the air-flow and the performance of the unit.

### Cleaning the outdoor unit

Dirt must not be allowed to accumulate on the outdoor unit. This must be cleaned as often as necessary with a brush,

vacuum cleaner or detergent.



CAUTION

For safety reasons make sure you switch off the air-conditioner, and disconnect it from the mains before cleaning.



CAUTION

Check the outdoor unit periodically to see whether either the outlet or the inlet are blocked up with dirt or leaves, etc.

The internal coil and other components of the outdoor unit must also be periodically cleaned. Contact your concessionary or maintenance service.

### Filling the drain trap

To avoid problems with water condensation, we recommend that at start-up and before the beginning of each season, the drain trap be filled with water, to prevent air being drawn through this tube from the beginning.

### Checking belt tension

The tension and wear of the motor belts should be checked once a year, and must be changed if necessary. Before doing this, turn the general main switch off.



CAUTION

For safety reasons, make sure to turn your air conditioner off and unplug the mains before any cleaning is performed or fan motor belts are checked.

### Access to the units for maintenance servicing



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 in operation.

**ASAI-25**

**ASAI-30**

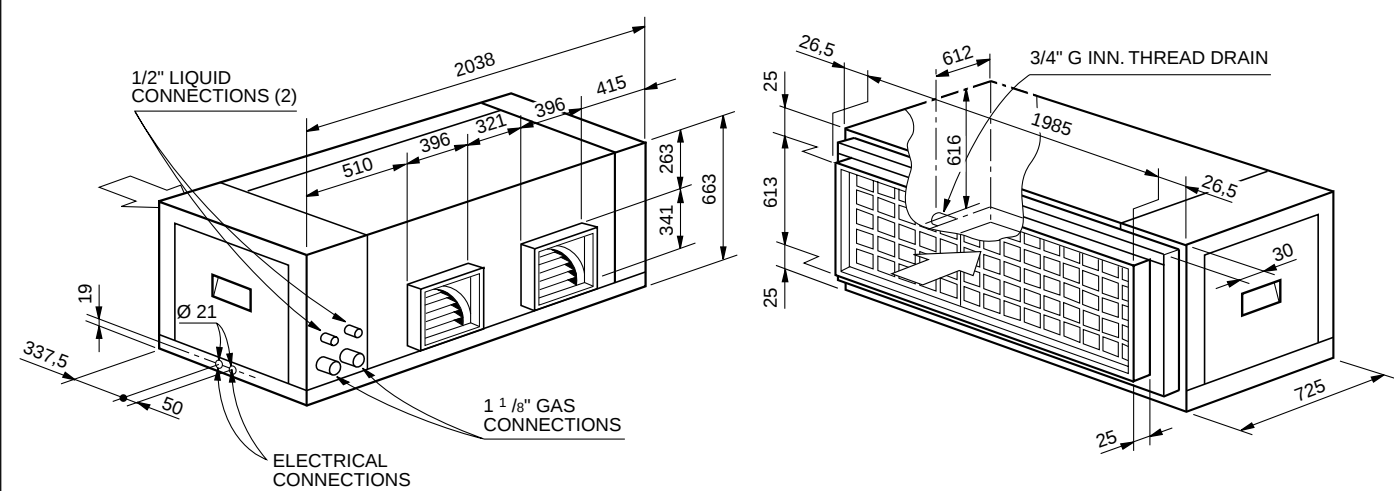
Technical drawing of the ASAI-30 unit. The left view shows the front and side with dimensions: 1738 (width), 663 (height), 325 (depth), 470 (top left offset), 311 (top middle offset), 321 (top right offset), 263 (bottom right offset), 341 (bottom right offset), 19 (top left offset), 337.5 (bottom left offset), 50 (bottom left offset), Ø 21 (hole), ELECTRICAL CONNECTION, 5/8" LIQUID CONNECTION, and 1 1/8" GAS CONNECTION. The right view shows the top and side with dimensions: 26.5, 612, 3/4" G. INN. THREAD DRAIN, 1685, 26.5, 30, 725, 25, 613, 25, and 1685.

**ASAO-30**

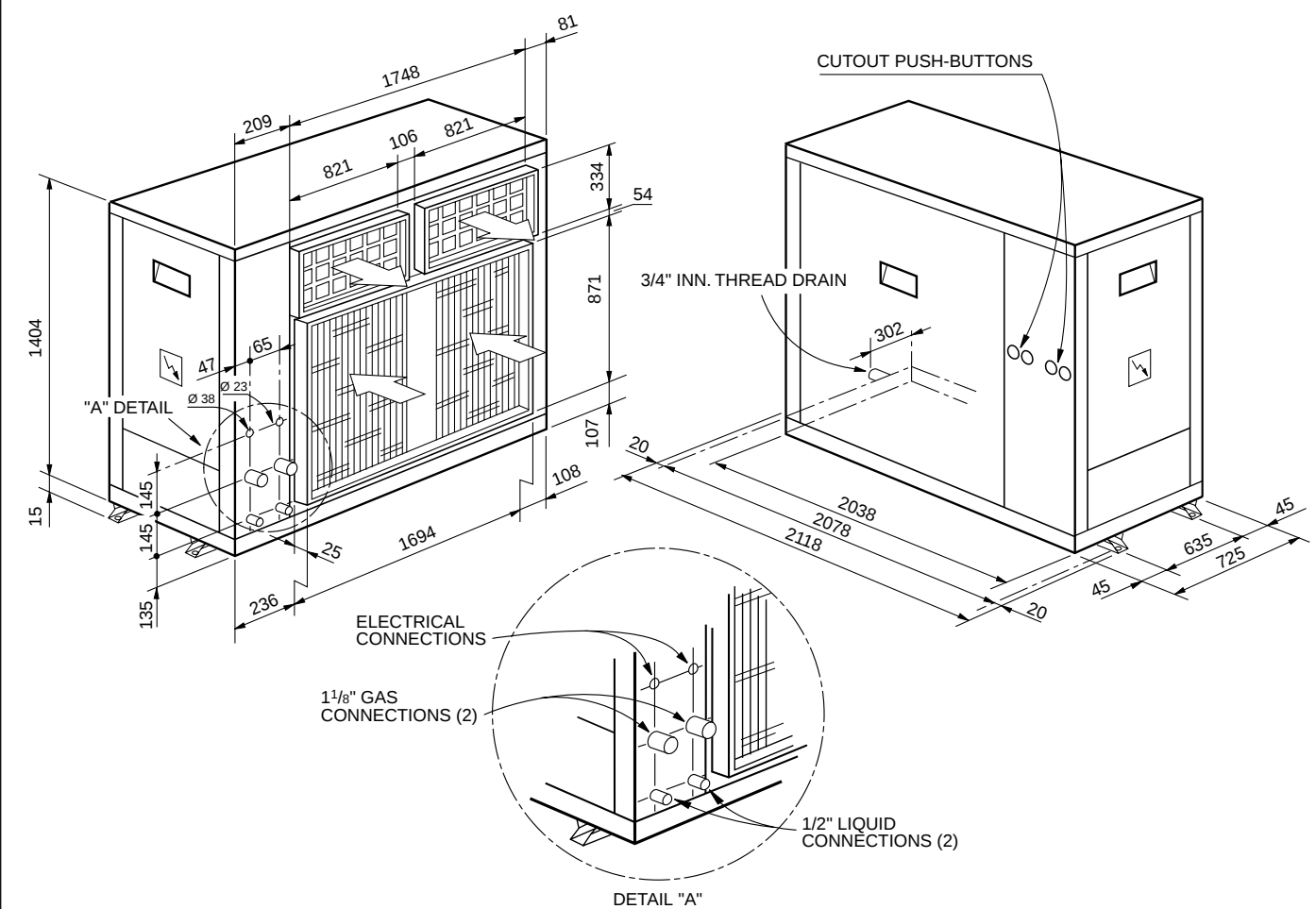
Technical drawing of the ASAO-30 unit. The left view shows the front and side with dimensions: 1404 (height), 1448 (width), 81 (depth), 209 (top left offset), 334 (top right offset), 54 (top right offset), 871 (height), 107 (bottom right offset), 108 (bottom right offset), 1394 (width), 236 (bottom left offset), 25 (bottom left offset), 156 (bottom left offset), 127 (bottom left offset), 15 (bottom left offset), 67 (hole), 70 (hole), Ø 23 (hole), Ø 38 (hole), DETALLE "A", 3/4" INN. THREAD DRAIN, and CUTOUT PUSH-BUTTONS. The right view shows the top and side with dimensions: 1738 (width), 1778 (width), 1818 (width), 45 (depth), 635 (depth), 725 (depth), 20 (depth), 45 (depth), 20 (depth), 302 (hole), and 3/4" INN. THREAD DRAIN. A circular inset labeled "A" DETAIL shows the bottom left corner with dimensions: 1 1/8" GAS CONNECTION, 5/8" LIQUID CONNECTION, and ELECTRICAL CONNECTIONS.

General dimensions mm

ASAI-45



ASAO-45



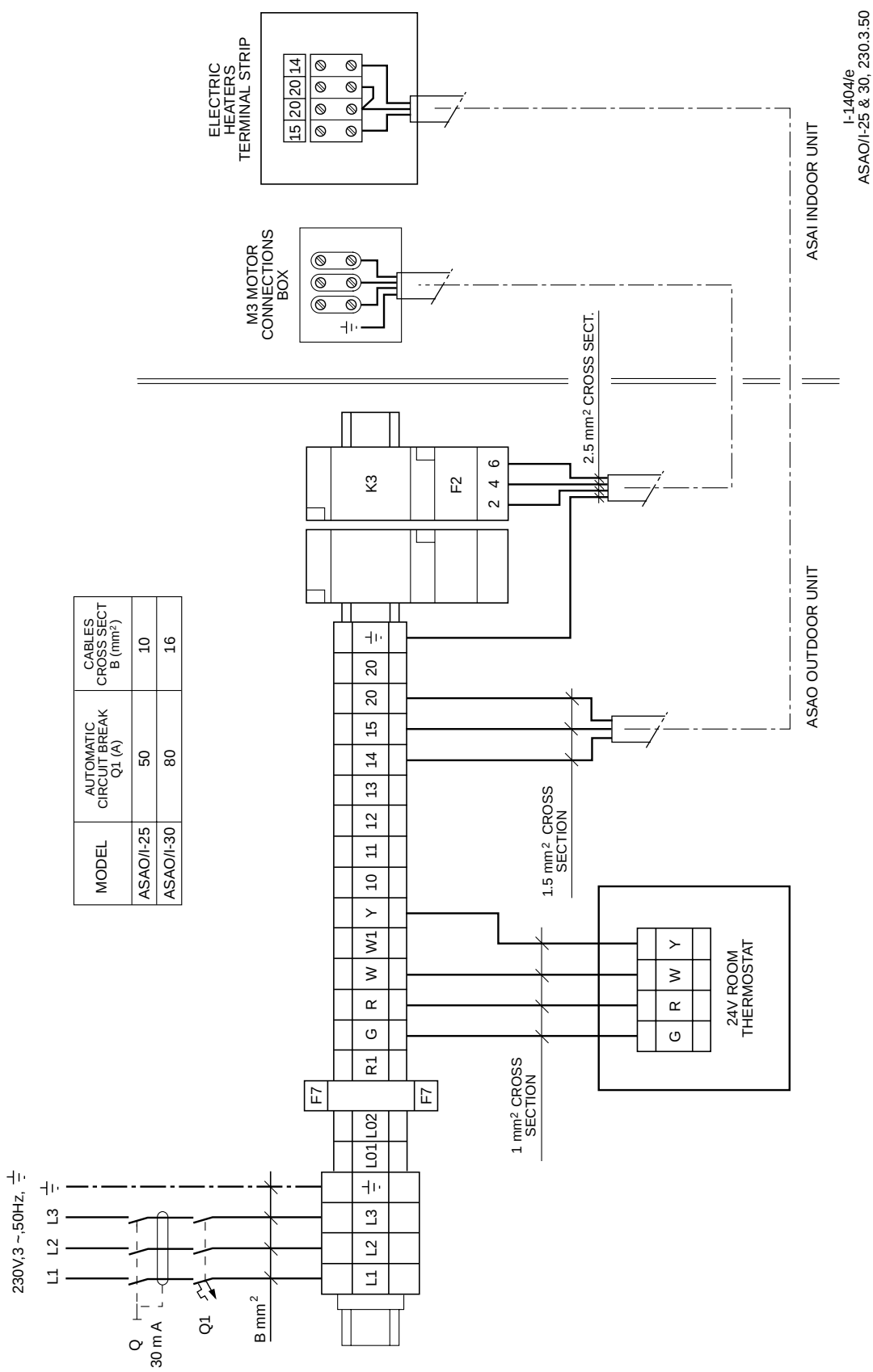
The image contains two sets of technical drawings for air conditioning units, labeled ASAI-60 and ASAO-60.

**ASAI-60:** This set includes two views. The left view is a perspective drawing of a rectangular unit with dimensions: 2239 (length), 762 (height), and 563 (width). It shows two air outlets on the front face, labeled with arrows. Dimensions for the outlets are 396, 321, and 396. The unit has two 5/8" liquid connections and two 1 1/8" gas connections on the side. A 3/4" inn. thread drain is located on the opposite side. A 38 diam. electrical connection is shown on the top. The right view is a side elevation showing the unit's profile with dimensions: 2186 (length), 709 (height), and 630 (width). It shows a grid of 16 small square vents on the front face. Dimensions for the vents are 26.5, 25, and 26.5. The unit has a 32mm gap at the bottom and a 147mm gap at the top. A 777mm dimension is shown for the base.

**ASAO-60:** This set includes two views. The left view is a perspective drawing of a rectangular unit with dimensions: 2035 (length), 102 (height), and 1975 (width). It shows two air outlets on the front face, labeled with arrows. Dimensions for the outlets are 102, 25, and 102. The unit has two 5/8" liquid connections and two 1 1/8" gas connections on the side. A 3/4" inn. thread drain is located on both sides. A 38 diam. electrical connection is shown on the top. The right view is a side elevation showing the unit's profile with dimensions: 2239 (length), 1534 (height), and 777 (width). It shows a grid of 16 small square vents on the front face. Dimensions for the vents are 26.5, 25, and 26.5. The unit has a 32mm gap at the bottom and a 147mm gap at the top. A 777mm dimension is shown for the base.

Interconnection diagram

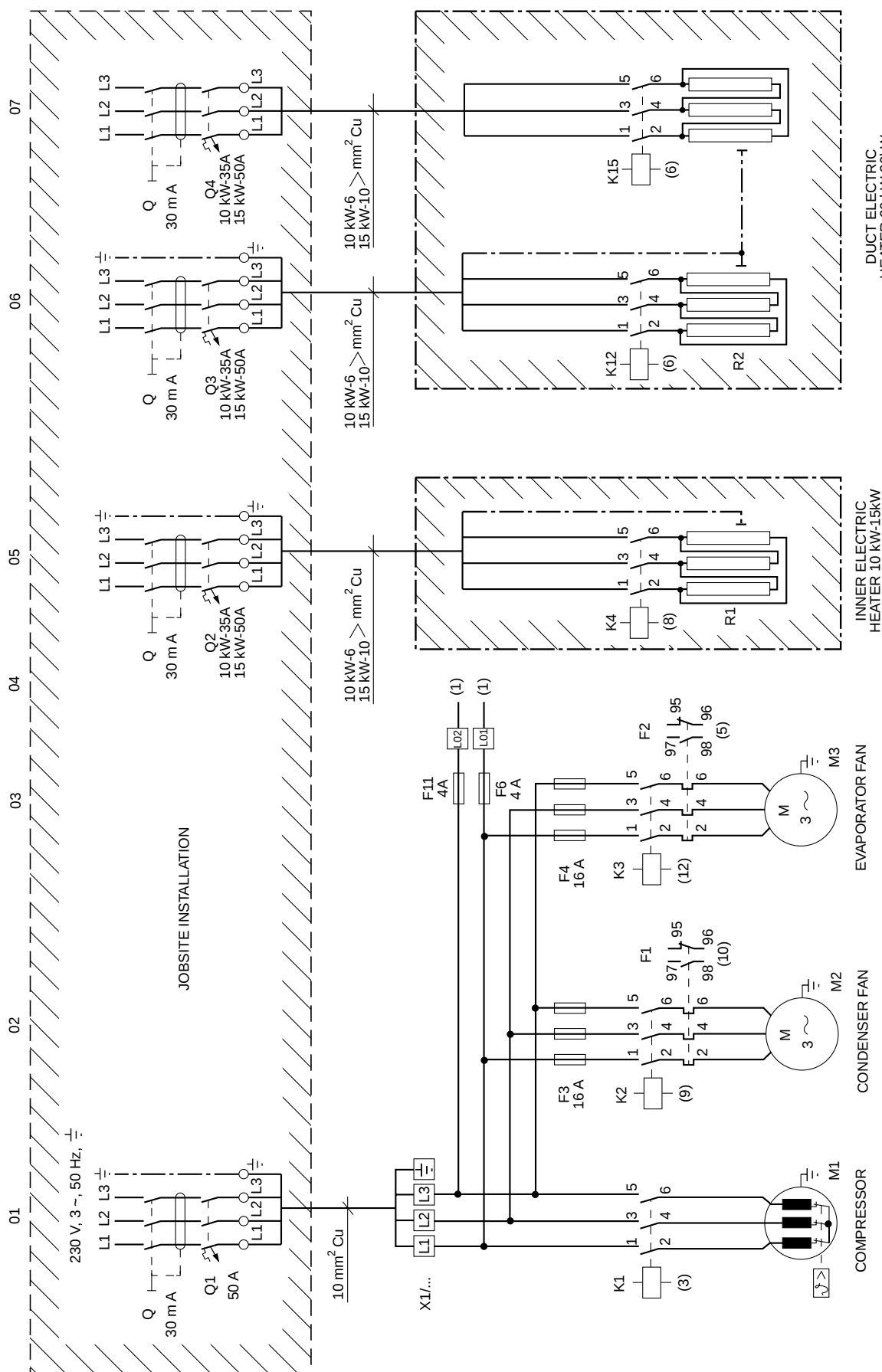
ASAO/I-25 & 30, 230.3.50



I-1404/e  
ASAO/I-25 & 30, 230.3.50

## Power diagram

**ASAO/I-25, 230.3.50**



DUCT ELECTRIC  
HEATER 20 kW-30kW  
SEE DIAGRAM RC-20-24/30-24

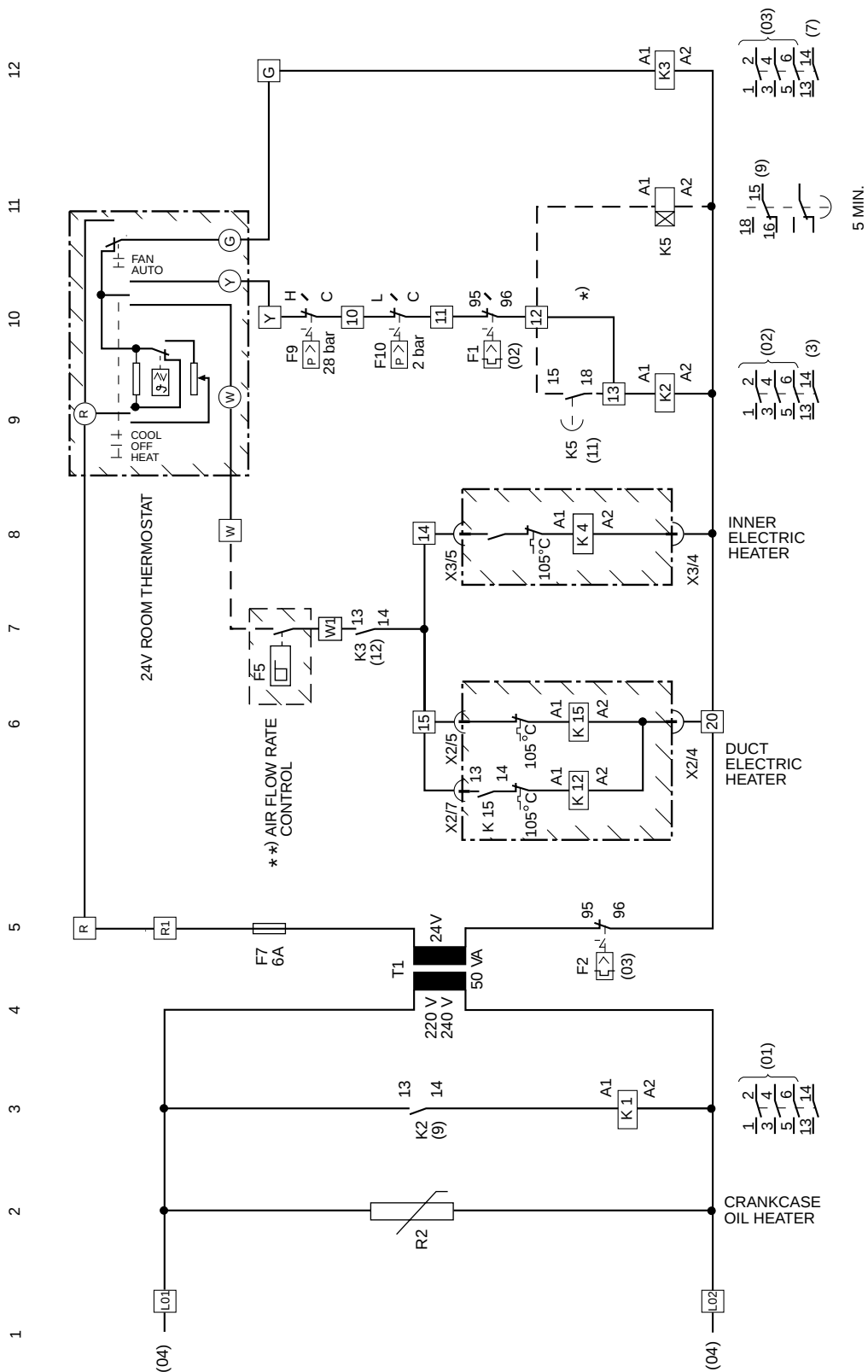
THE COMPONENTS INCLUDED IN THESE BOXES  
ARE NOT SUPPLIED BY THE MANUFACTURER

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1125-1/g  
ASAO/I-25, 230.3.50

Control diagram

ASAO/I-25, 230.3.50



\*) REMOVE JUMPER 12-13 WHEN A START TIMER IS INSTALLED

\*\*) INSTALL AIR FLOW RATE CONTROL F5 WHEN AN ELECTRIC HEATER IS INSTALLED

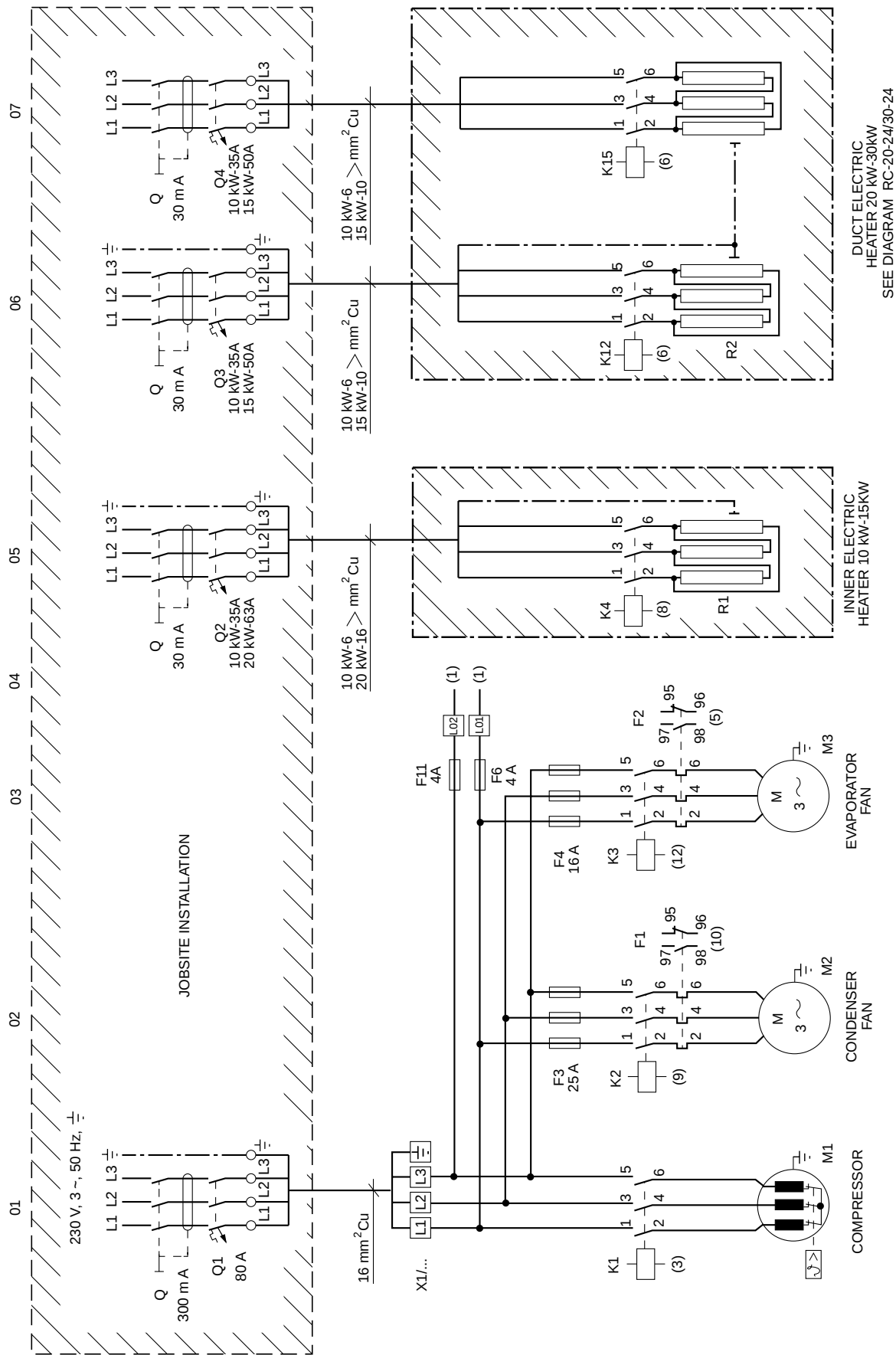
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1125-2/d  
ASAO/I-25, 230.3.50

Power diagram

ASAO/I-30, 230.3.50



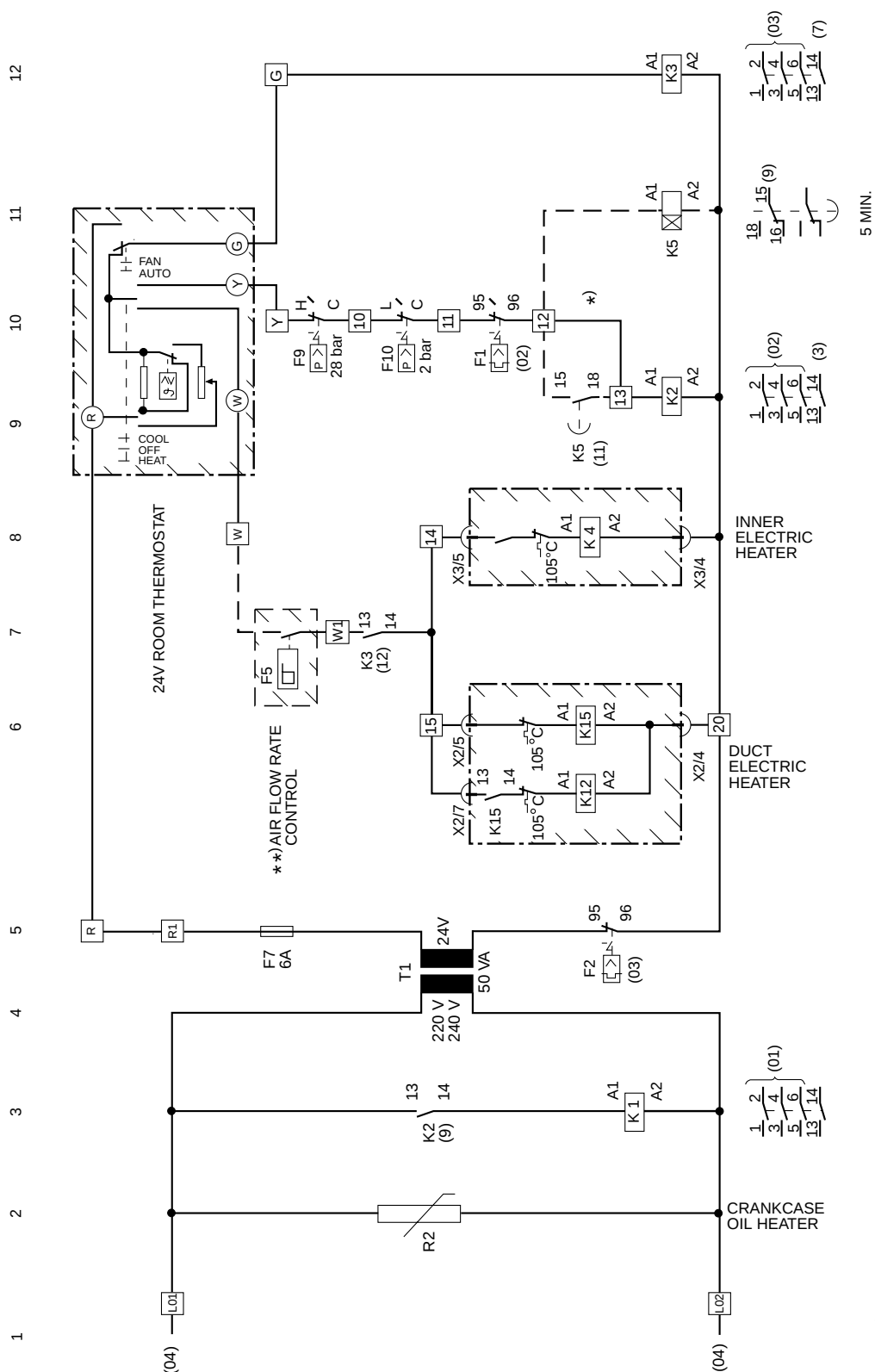
THE COMPONENTS INCLUDED IN THESE BOXES  
ARE NOT SUPPLIED BY THE MANUFACTURER  
THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD  
ACCESSORIES SUPPLIED BY THE MANUFACTURER

DUCT ELECTRIC  
HEATER 20 kW-30kW  
SEE DIAGRAM RC-20-24/30-24

I-1124-1/f  
ASAO/I-30, 230.3.50

## 28

I-1124-2/d  
ASAO/I-30, 230.3.50



\*) REMOVE JUMPER 12-13 WHEN A START TIMER IS INSTALLED

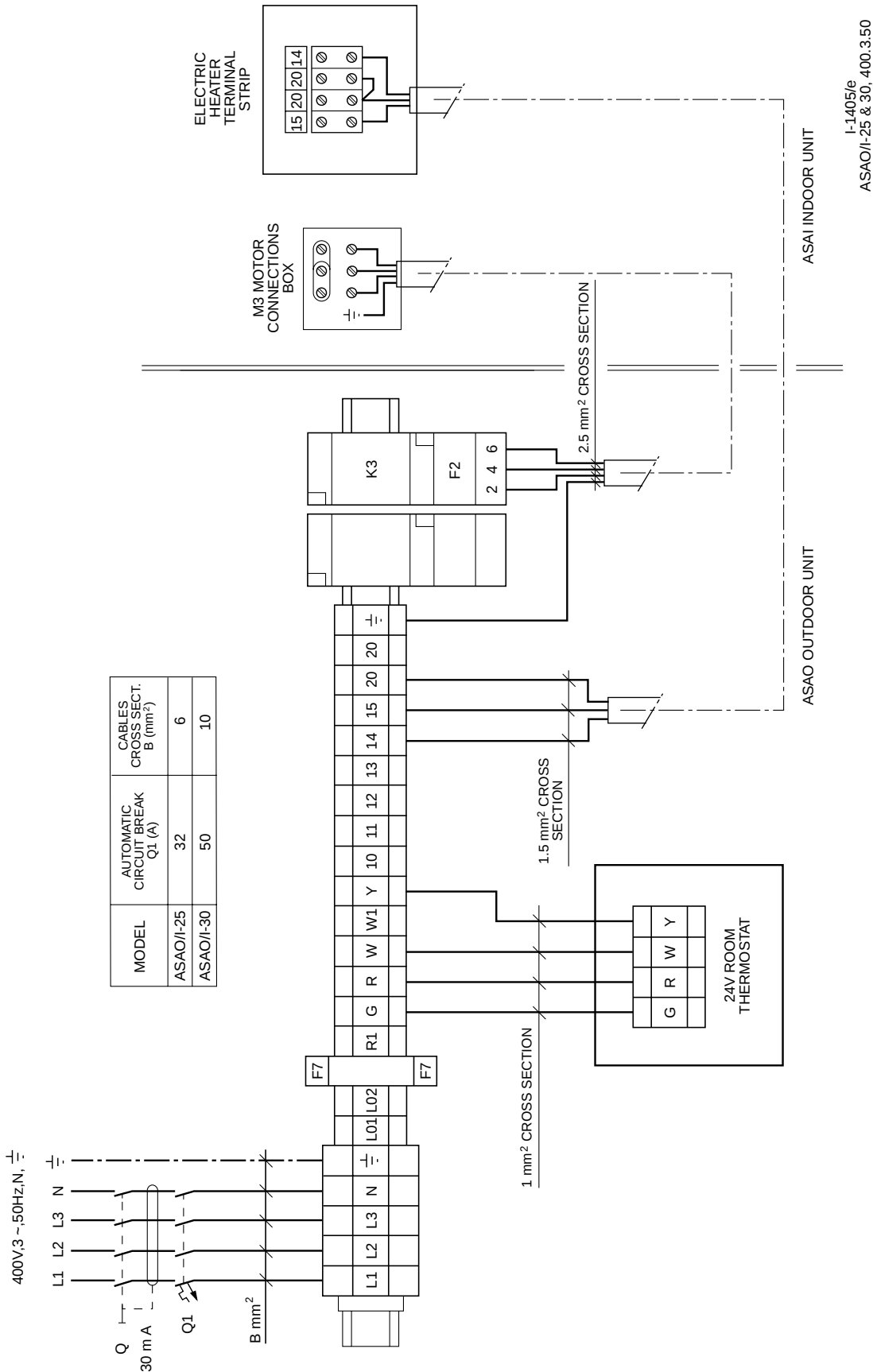
\*) INSTALL AIR FLOW RATE CONTROL F5 WHEN AN ELECTRIC HEATER IS INSTALLED

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

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

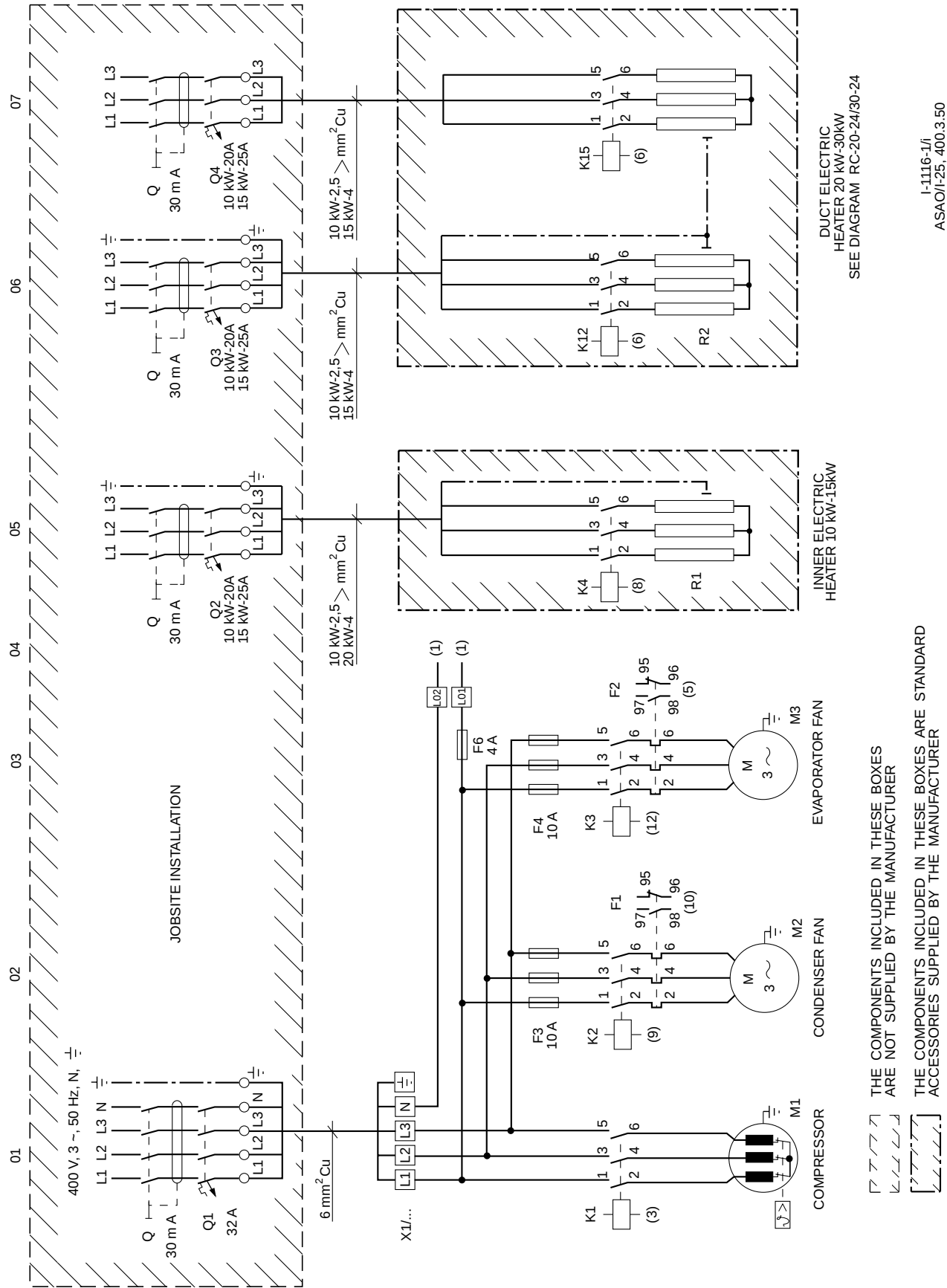
Interconnection diagram

ASAO/I-25 & 30, 400.3.50



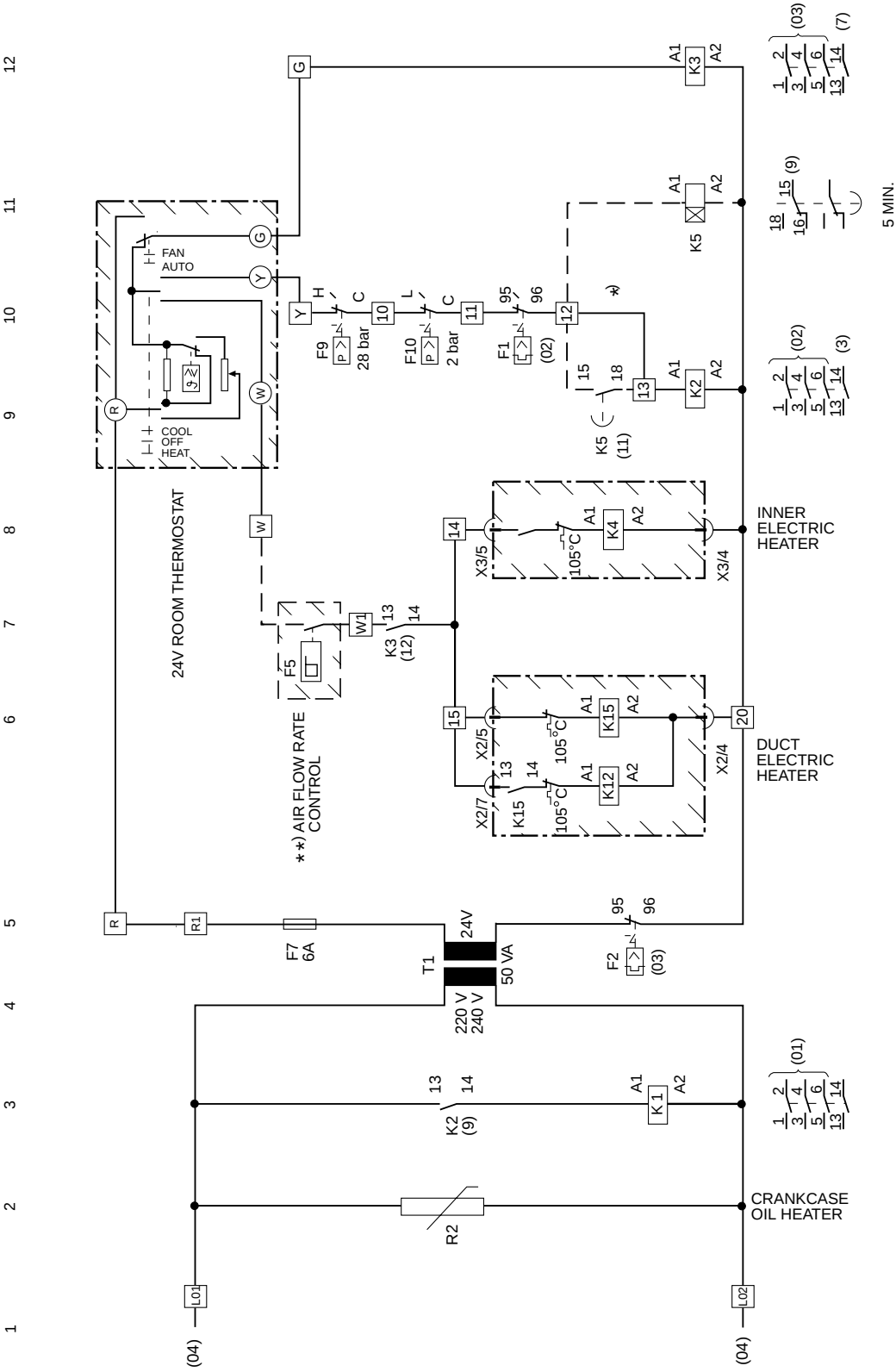
Power diagram

ASAO/I-25, 400.3.50



Main diagram

ASAO-25, 400.3.50



\*) REMOVE JUMPER 12-13 WHEN A START TIMER IS INSTALLED

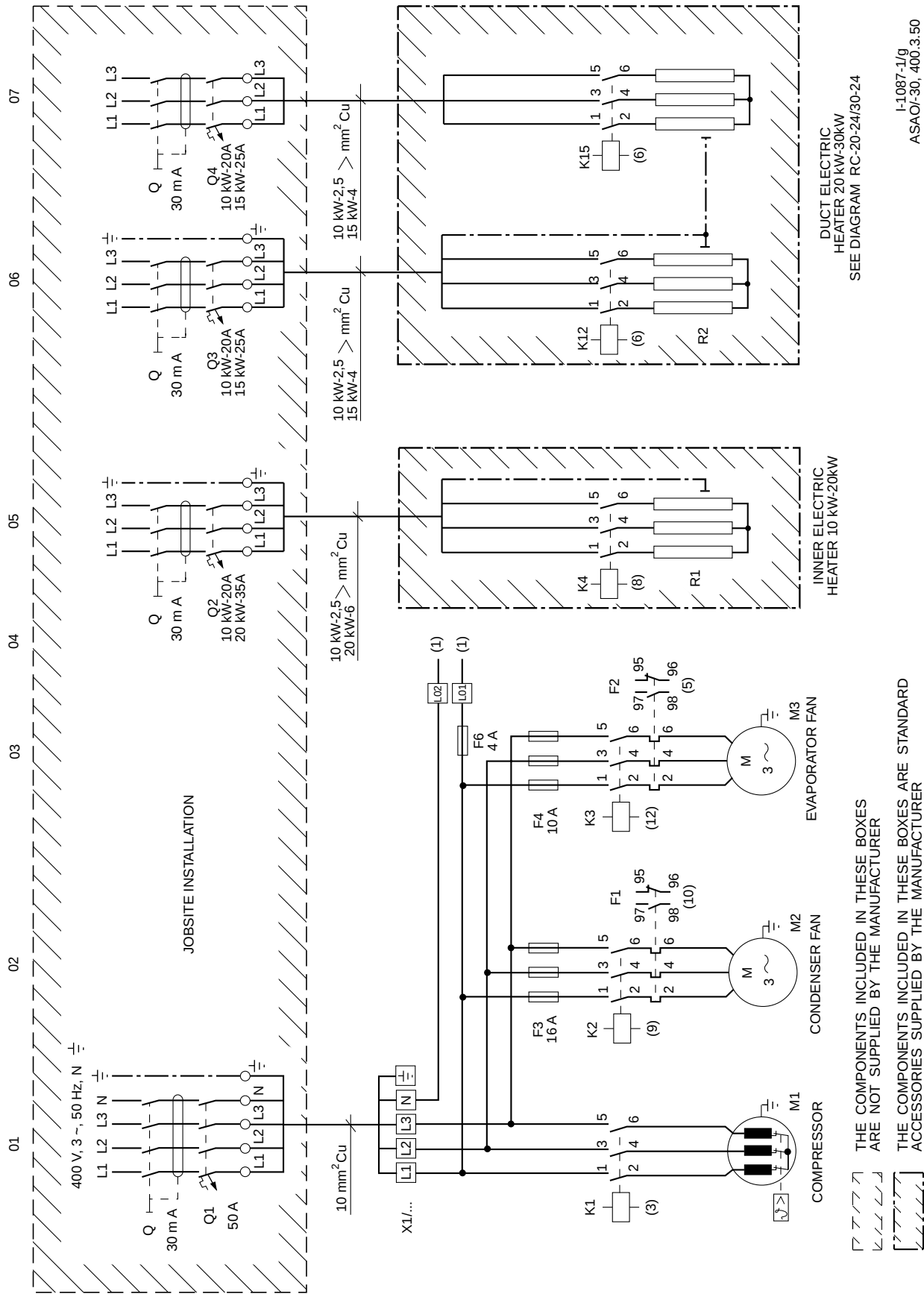
\*\*) INSTALL AIR FLOW RATE CONTROL F5 WHEN AN ELECTRIC HEATER IS INSTALLED

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

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1116-2/d  
ASAO/I-25, 400.3.50

ASAO/I-30, 400.3.50



I-1087-1/g  
ASAO/I-30, 400.3.50

ASAO/I-30, 400.3.50

The diagram illustrates the electrical control system for the ASAO/I-30, 400.3.50 engine. It shows the following components and their interconnections:

- Engine (1-12):** The main power source, connected to the 24V room thermostat and the air flow rate control.
- 24V ROOM THERMOSTAT:** Controls the engine's cooling and heating. It includes a 24V power supply (T1) and a 50 VA transformer (F2).
- AIR FLOW RATE CONTROL (F5):** Monitors the air flow rate and provides feedback to the engine. It includes a 6A fuse (F7) and a 24V supply.
- DUCT ELECT. HEATER (X2/4):** Heats the duct air. It is controlled by the engine (12) and the air flow rate control (F5).
- INNER ELECT. HEATER (X3/4):** Heats the inner engine compartment. It is controlled by the engine (12) and the air flow rate control (F5).
- CRANKCASE OIL HEATER (R2):** Heats the engine oil. It is controlled by the engine (12).
- Other components:** Various relays (K1, K2, K3, K4, K5), switches (F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12), and sensors (A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12) are shown throughout the system.

\*) REMOVE JUMPER 12-13 WHEN A START TIMER IS INSTALLED

\*\*) INSTALL AIR FLOW RATE CONTROL F5 WHEN AN ELECTRIC HEATER IS INSTALLED

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

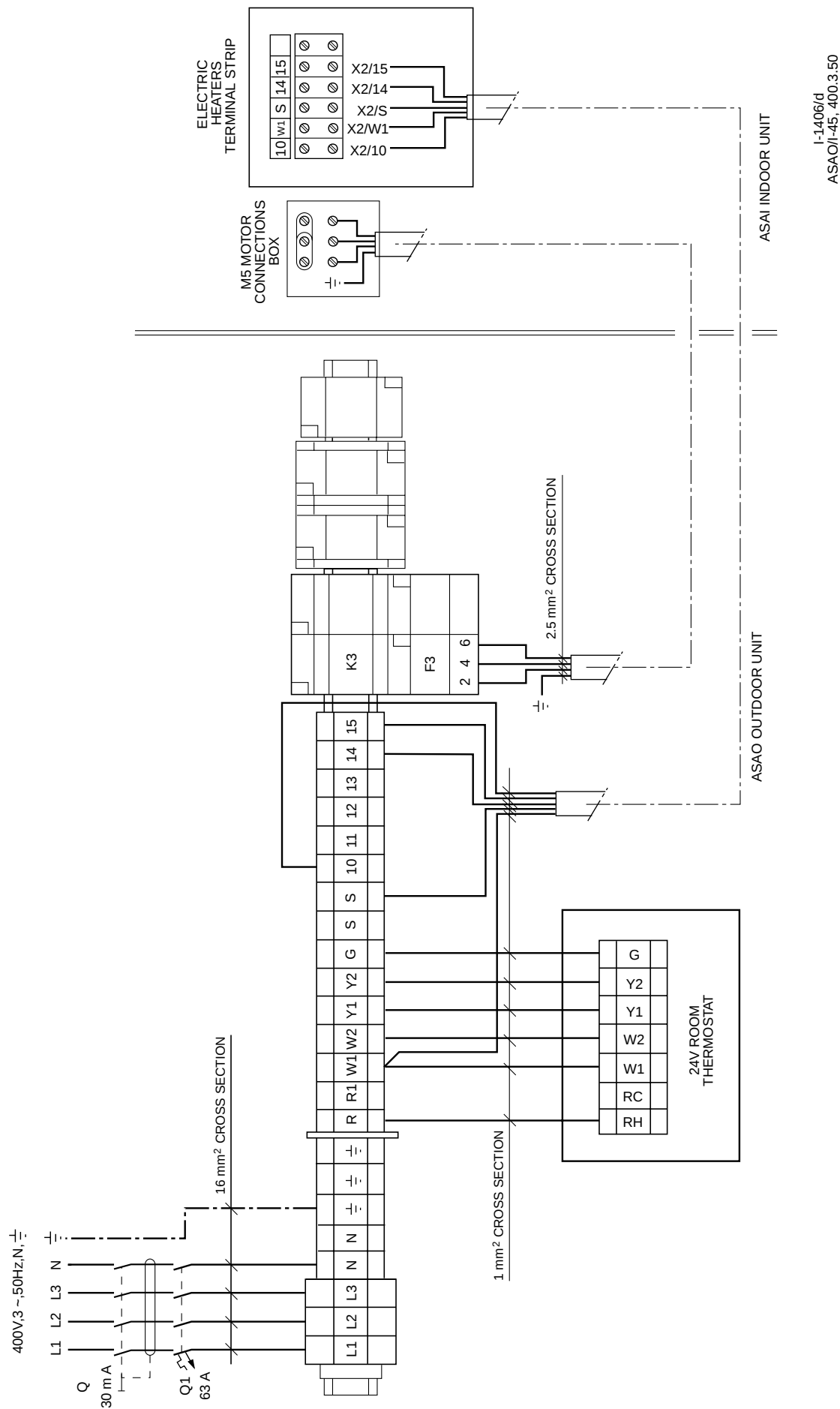
THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1087-2/d  
ASAO/I-30, 400.3.50

|                                                                                    |                                                                                        |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <p>THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER</p> | <p>THE COMPONENTS INCLUDED IN THESE BOXES ACCESSORIES SUPPLIED BY THE MANUFACTURER</p> |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|

Interconnection diagram

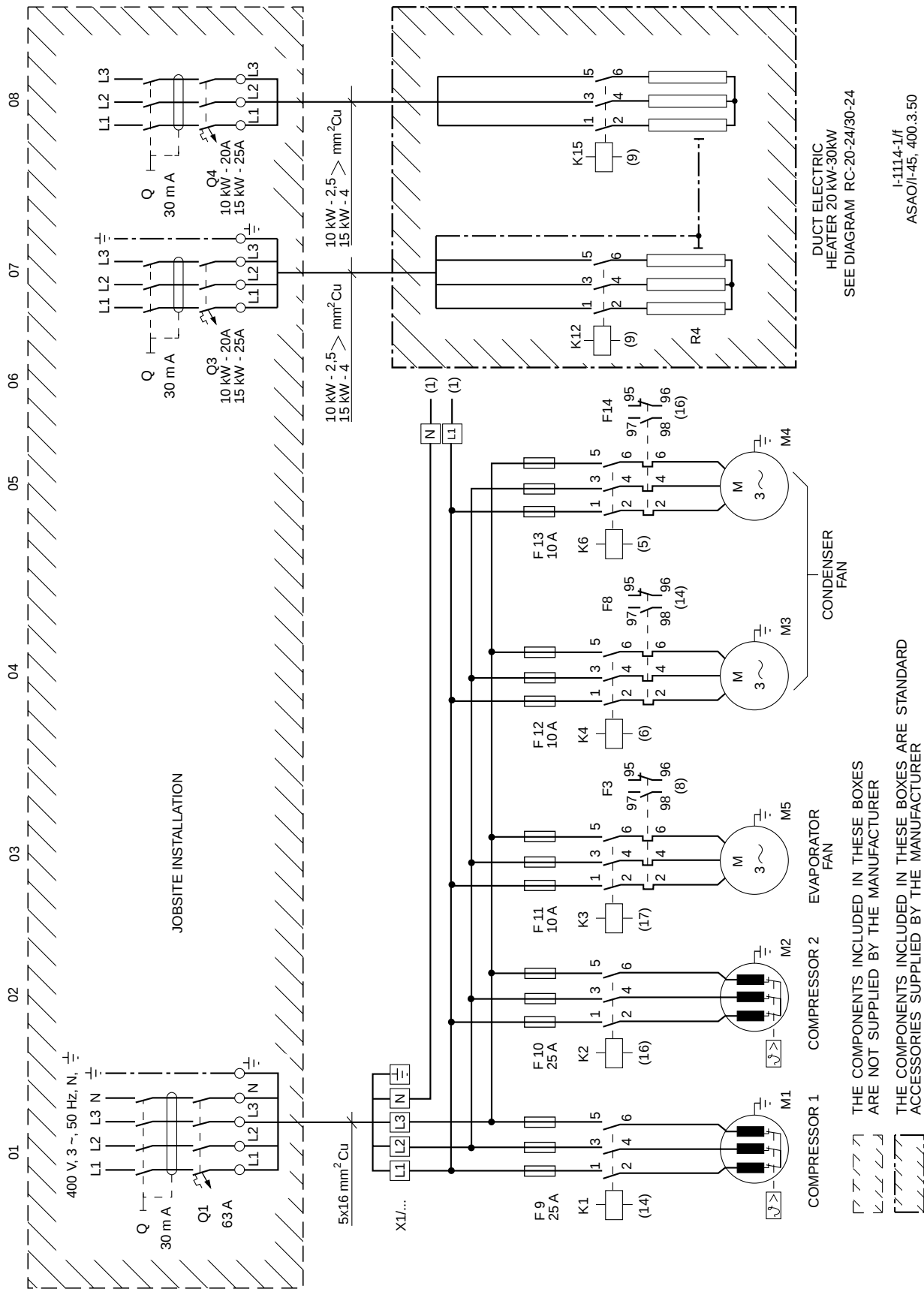
ASAO/I-45, 400.3.50



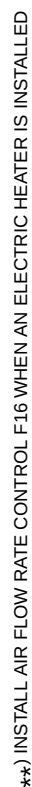
I-1406/d  
ASAO/I-45, 400.3.50

## Power diagram

**ASAO/I-45, 400.3.50**



## 36

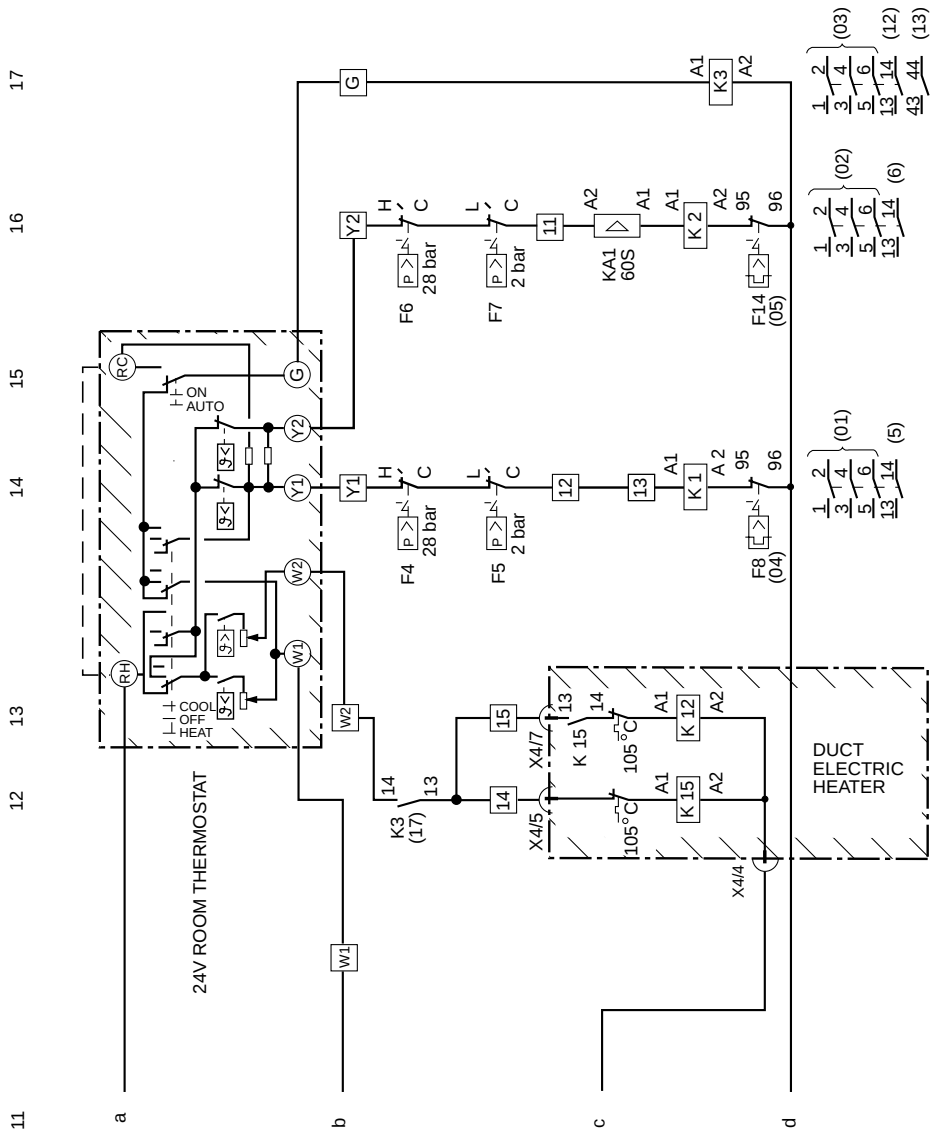


THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1114-2/f  
ASA01-45, 400.3.50 (1 of 2)

## Main diagram

**ASAO/I-45, 400.3.50 (2 of 2)**



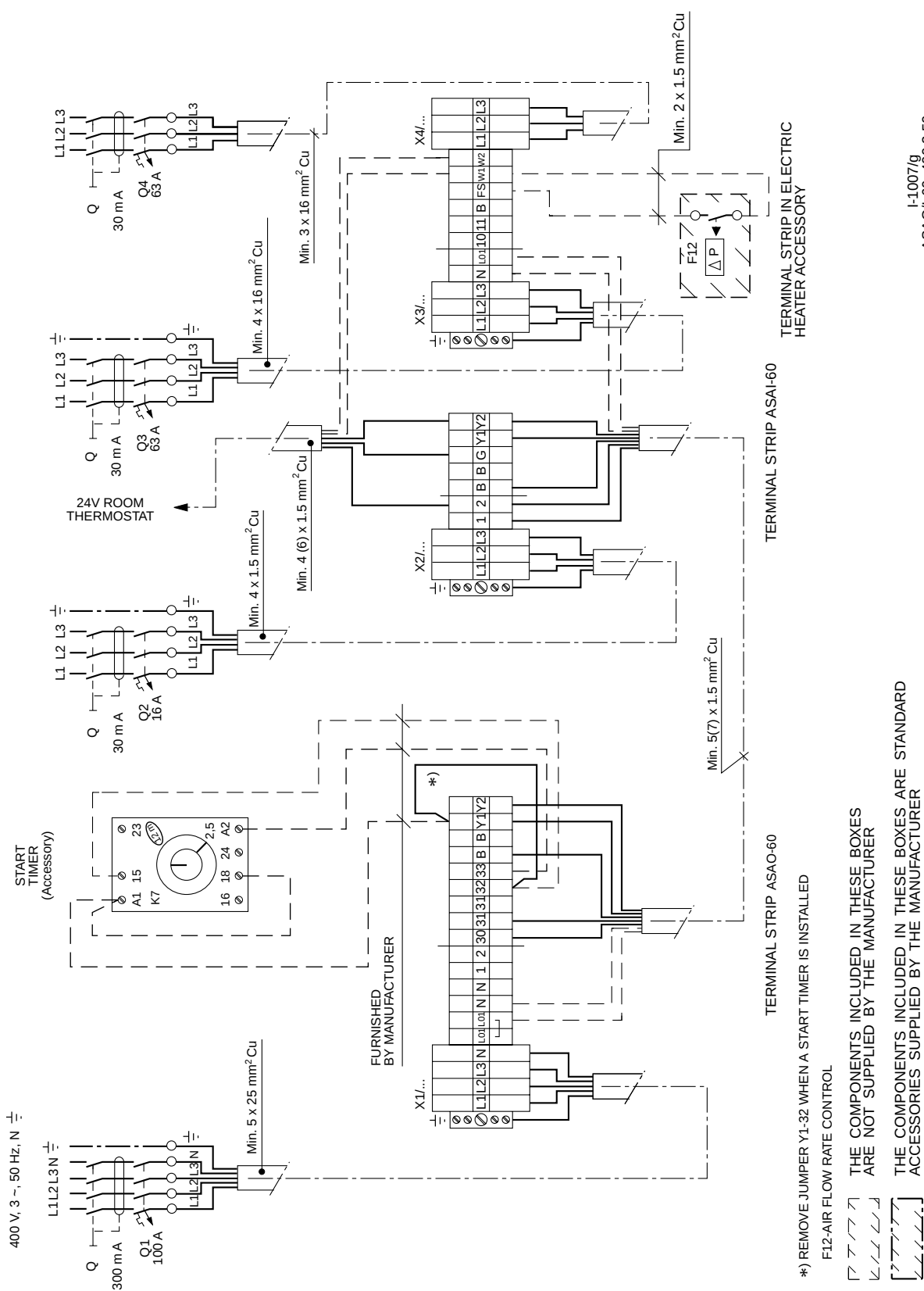
THE COMPONENTS INCLUDED IN THESE BOXES  
ARE NOT SUPPLIED BY THE MANUFACTURER

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1114-3/g  
ASAO/I-45, 400.3.50 (2 of 2)

Interconnection diagram

ASAO/I-60, 400.3.50



\*) REMOVE JUMPER Y1-32 WHEN A START TIMER IS INSTALLED

F12-AIR FLOW RATE CONTROL

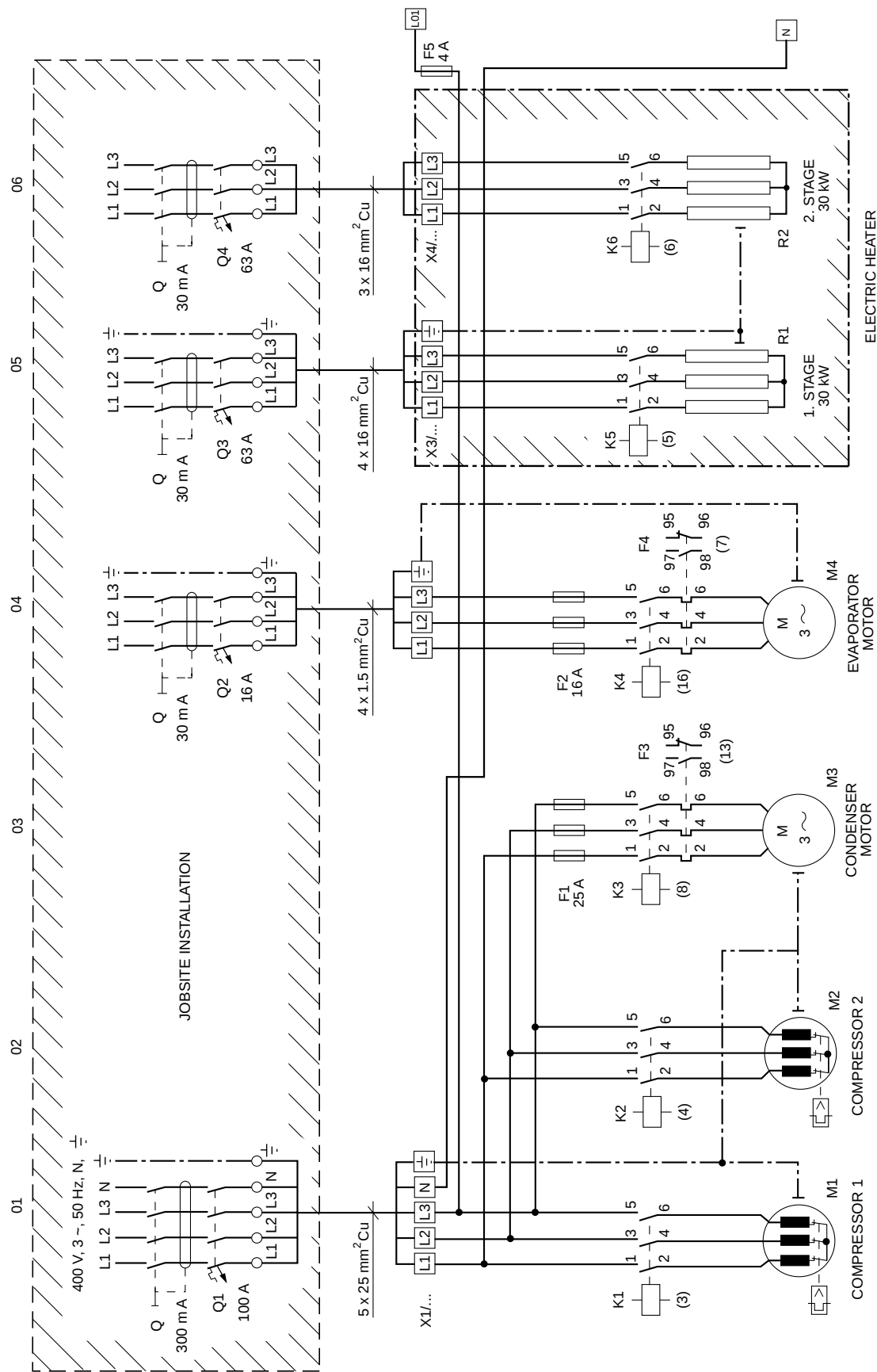
THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER

I-1007/g  
ASAO/I-60, 400.3.50

Power diagram

ASAO/I-60, 400.3.50



I-1005/h  
ASAO/I-60, 400.3.50

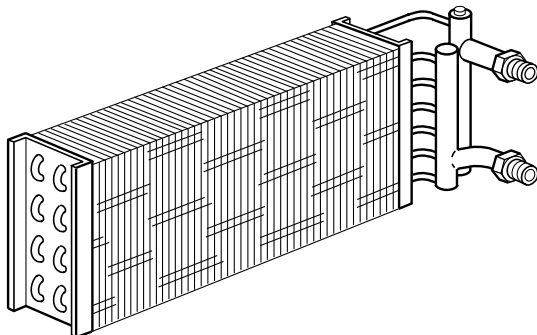
## 40

|  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|--|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|

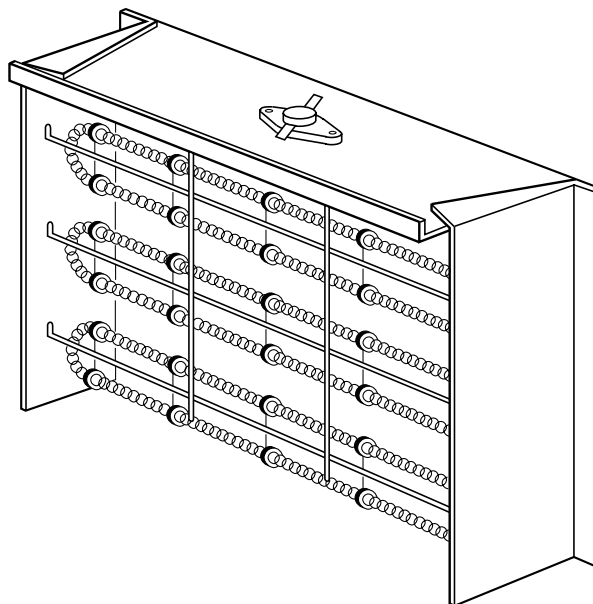


THE COMPONENTS INCLUDED IN THESE BOXES  
ARE NOT SUPPLIED BY THE MANUFACTURER

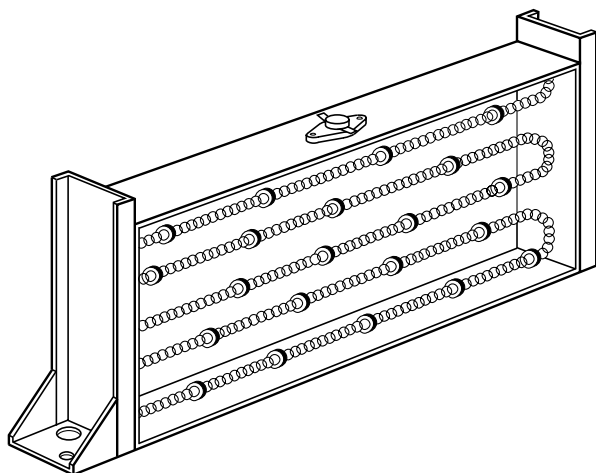
## Optional accessories for the ASAI model conditioners



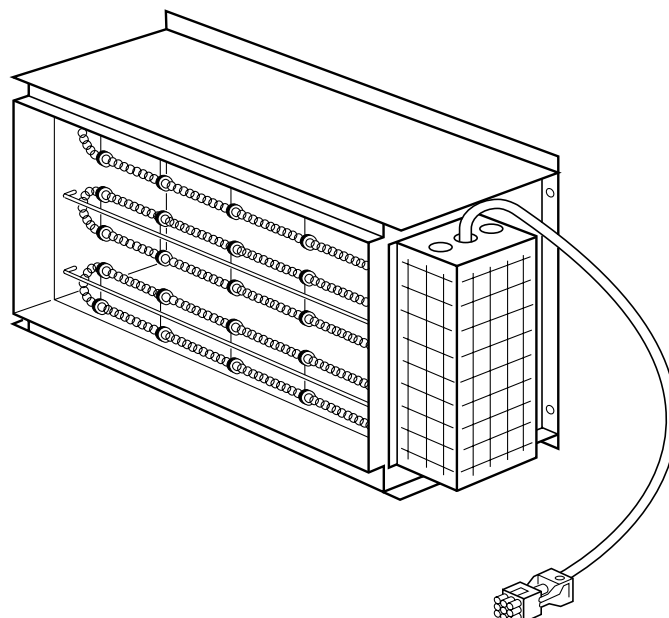
**Hot water heating coil**  
**ASAI-25, 30 & 45**



**Inner electric heater**  
**ASAI-25, 30 & 45**



**Inner electric heater**  
**ASAI-60**



**Duct electric heater**  
**ASAI-25, 30 & 45**

Table of standard accessories

| Accessory                                 |              |       | Size ASAI |    |    |    |
|-------------------------------------------|--------------|-------|-----------|----|----|----|
|                                           |              |       | 25        | 30 | 45 | 60 |
| Water coil for model                      | ASAI-25      |       |           | X  |    |    |
| " "                                       | ASAI-30      |       |           |    | X  |    |
| " "                                       | ASAI-45      |       |           |    |    | X  |
| Inner electric heater for model           | ASAI-25 - 24 | 10 kW | X         |    |    |    |
| " "                                       | ASAI-25 - 24 | 15 kW | X         |    |    |    |
| " "                                       | ASAI-30 - 24 | 10 kW |           | X  |    |    |
| " "                                       | ASAI-30 - 24 | 20 kW |           | X  |    |    |
| " "                                       | ASAI-45 - 24 | 15 kW |           |    | X  |    |
| " "                                       | ASAI-45 - 24 | 30 kW |           |    | X  |    |
| " "                                       | ASAI-60 - 24 | 60 kW |           |    |    | X  |
| Duct electric heater for model            | RC - 20 - 24 | 20 kW | X         | X  | X  |    |
| " "                                       | RC - 30 - 24 | 30 kW | X         | X  | X  |    |
| Transformation kit for vertical discharge | ASAI-60      |       |           |    |    | X  |

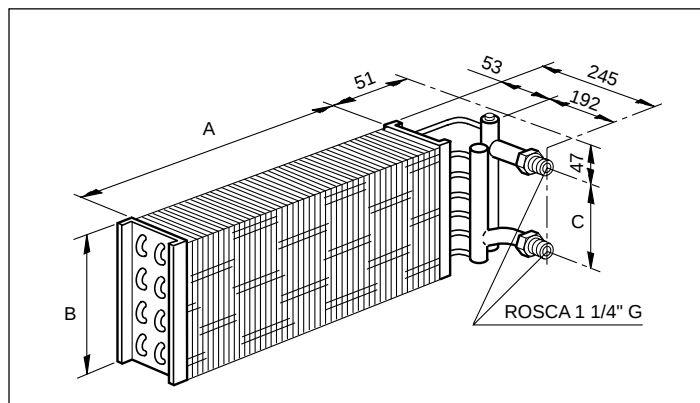
## Hot water heating coil

Of copper tubes and aluminium fins.

Designed to fit inside the conditioner on galvanised steel supports.

Equipped with an 1/8" air purger.

### General dimensions mm



| Model          | A     | B   | C   |
|----------------|-------|-----|-----|
| <b>ASAI-25</b> | 1 069 | 458 | 340 |
| <b>ASAI-30</b> | 1 312 | 534 | 416 |
| <b>ASAI-45</b> | 1 750 | 534 | 416 |

### Physical data

| Model                                     | ASAI-25             | ASAI-30 | ASAI-45 |
|-------------------------------------------|---------------------|---------|---------|
| Tubes depth                               | 2                   | 2       | 2       |
| Tubes height                              | 16                  | 19      | 19      |
| Fins/inch                                 | 12                  | 12      | 12      |
| Frontal area                              | m <sup>2</sup> 0,49 | 0,70    | 0,93    |
| Tubes diameter                            | 3/8"                | 3/8"    | 3/8"    |
| Intake/outlet connections male GAS thread | 1 1/4 "             | 1 1/4 " | 1 1/4 " |

## Heating capacity

| Model          | Nominal flow-rate |                   | Heating capacity (*) | Air circuit pressure drop |      |
|----------------|-------------------|-------------------|----------------------|---------------------------|------|
|                | m <sup>3</sup> /h | m <sup>3</sup> /s |                      | mm WK                     | Pa   |
| <b>ASAI-25</b> | 5 130             | 1,42              | 40,7                 | 3,9                       | 38,2 |
| <b>ASAI-30</b> | 7 500             | 2,08              | 59,3                 | 4,4                       | 43,0 |
| <b>ASAI-45</b> | 10 000            | 2,77              | 79,1                 | 4,4                       | 43,0 |

\* Heating capacities shown in this table are valid for water entering at 90°C, leaving at 80°C, and air entering at 13 °C.  
For different conditions, apply the correction factors from the corresponding 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 | Water temperature °C on entry and 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  |

### Hot water coil circuit pressure drop

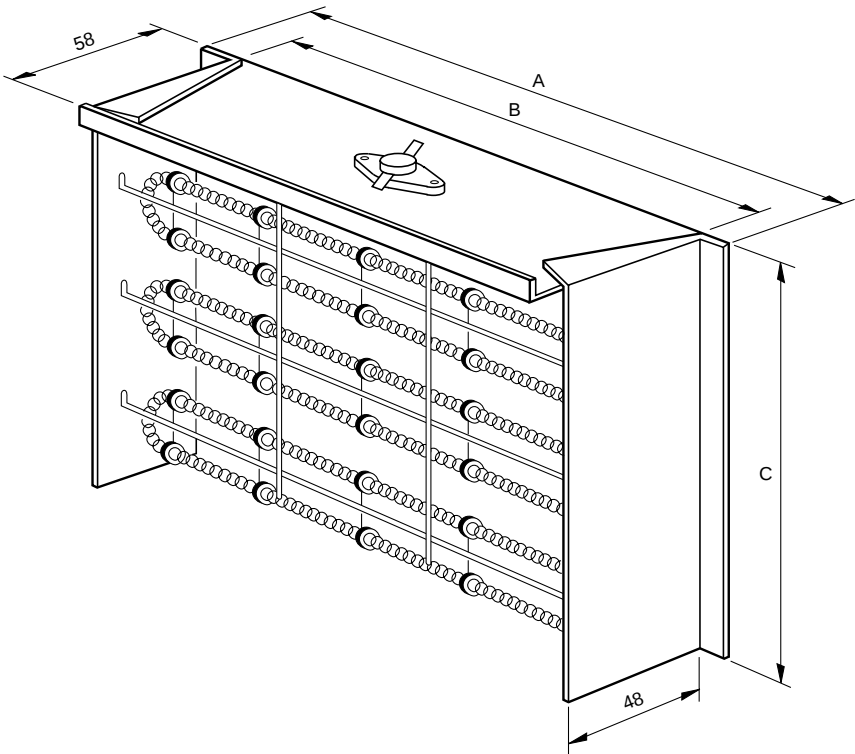
| Hot water flow-rate |                   |      |      |      |      |      |      |      |      |      |      |       |       |
|---------------------|-------------------|------|------|------|------|------|------|------|------|------|------|-------|-------|
|                     | m <sup>3</sup> /h | 1,00 | 1,30 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 4,50 | 5,00 | 6,00  | 7,00  |
|                     | l/s               | 0,28 | 0,36 | 0,42 | 0,56 | 0,69 | 0,83 | 0,97 | 1,11 | 1,25 | 1,39 | 1,67  | 1,94  |
| <b>ASAI-25</b>      | 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 |      |      |       |       |
| <b>ASAI-30</b>      | 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 |       |       |
| <b>ASAI-45</b>      | 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 |

Inner electric heater ASAI-25, 30 & 45

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

This heater must always function with the air flow from the indoor unit and connections, or relays suitable to achieve this object must be provided. The installation of an air flow-rate control is necessary (see electrical diagrams).

General dimensions mm



| Model        | A     | B     | C   |
|--------------|-------|-------|-----|
| ASAI-25 - 24 | 1 103 | 1 069 | 480 |
| ASAI-30 - 24 | 1 339 | 1 305 | 552 |
| ASAI-45 - 24 | 1 777 | 1 743 | 552 |

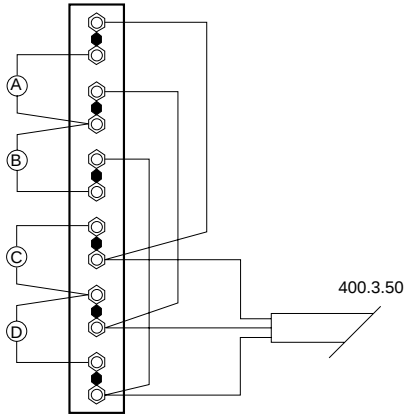
Technical instructions for changing the voltage of the heaters

The electric heaters are delivered form the factory connected for a triphasic voltage of 400V. Sizing of the contactors as well as of the power lines have been prepared for a strength corresponding to triphasic 230V.

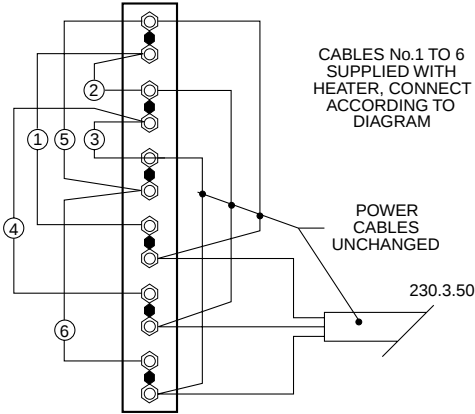
For a power supply of 230V, triphasic, the following modifications will have to be made on site.

- Eliminate the cables marked: A, B, C, D.
- Fit the cables marked 1 to 6 supplied with the heater, following the indication in the diagrams below.

ELECTRIC HEATER CONNECTED FOR 400V  
SUPPLIED FROM FACTORY



ELECTRIC HEATER CONNECTED FOR 230V  
JOBSITE MODIFICATION



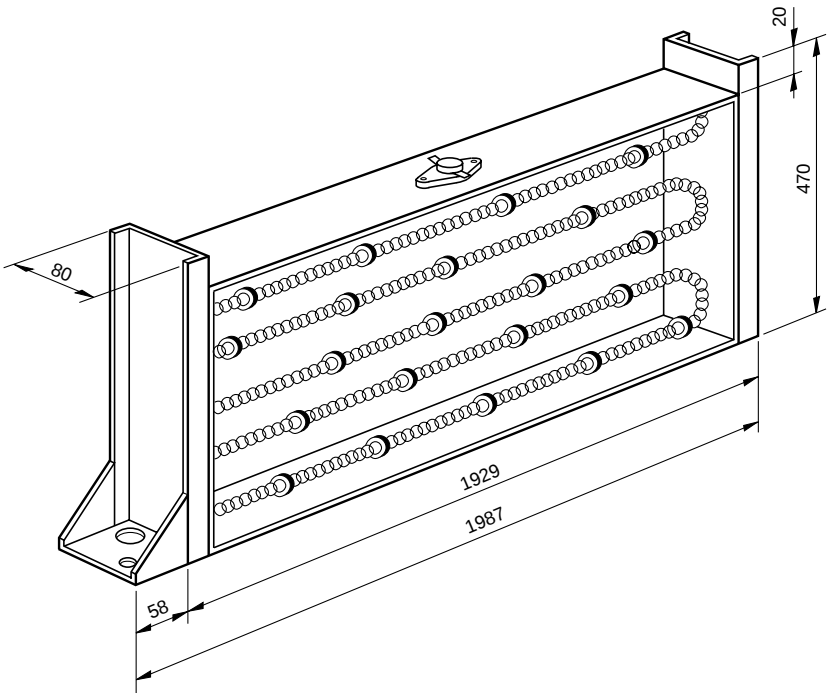
| Model        | Nominal power | Power supply<br>V.ph.Hz. | N° stages | Packaged<br>dimensions<br>mm |
|--------------|---------------|--------------------------|-----------|------------------------------|
|              | kW            |                          |           |                              |
| ASAI-25 - 24 | 10            | 230.3.50<br>400.3.50     | 1         | 1 200 x 550 x 125            |
|              | 15            |                          |           |                              |
| ASAI-30 - 24 | 10            |                          |           | 1 440 x 620 x 125            |
|              | 20            |                          |           |                              |
| ASAI-45 - 24 | 15            |                          |           | 1 920 x 620 x 125            |
|              | 30            |                          |           |                              |

Inner electric heater ASAI-60

Made of exposed, chrome-nickel wires on soapstone supports and with a galvanised sheet steel chassis designed to fit inside the unit. Includes contactors and power strip. It is delivered with a thermal protector which disconnects the

control circuit if it detects an abnormally high temperature. This heater must always function with the air flow from the indoor unit and connections, or relays suitable to achieve this object must be provided. The installation of an air flow-rate control is necessary (see electrical diagrams).

General dimensions mm



Characteristics

| Electric heater model | Nominal power | Power supply<br>V.ph.Hz. | N <sup>a</sup><br>stages | Packaged dimensions<br>mm |
|-----------------------|---------------|--------------------------|--------------------------|---------------------------|
|                       | kW            |                          |                          |                           |
| ASAI-60 - 24          | 60            | 400.3.50                 | 2                        | 510 x 2 405 x 165         |

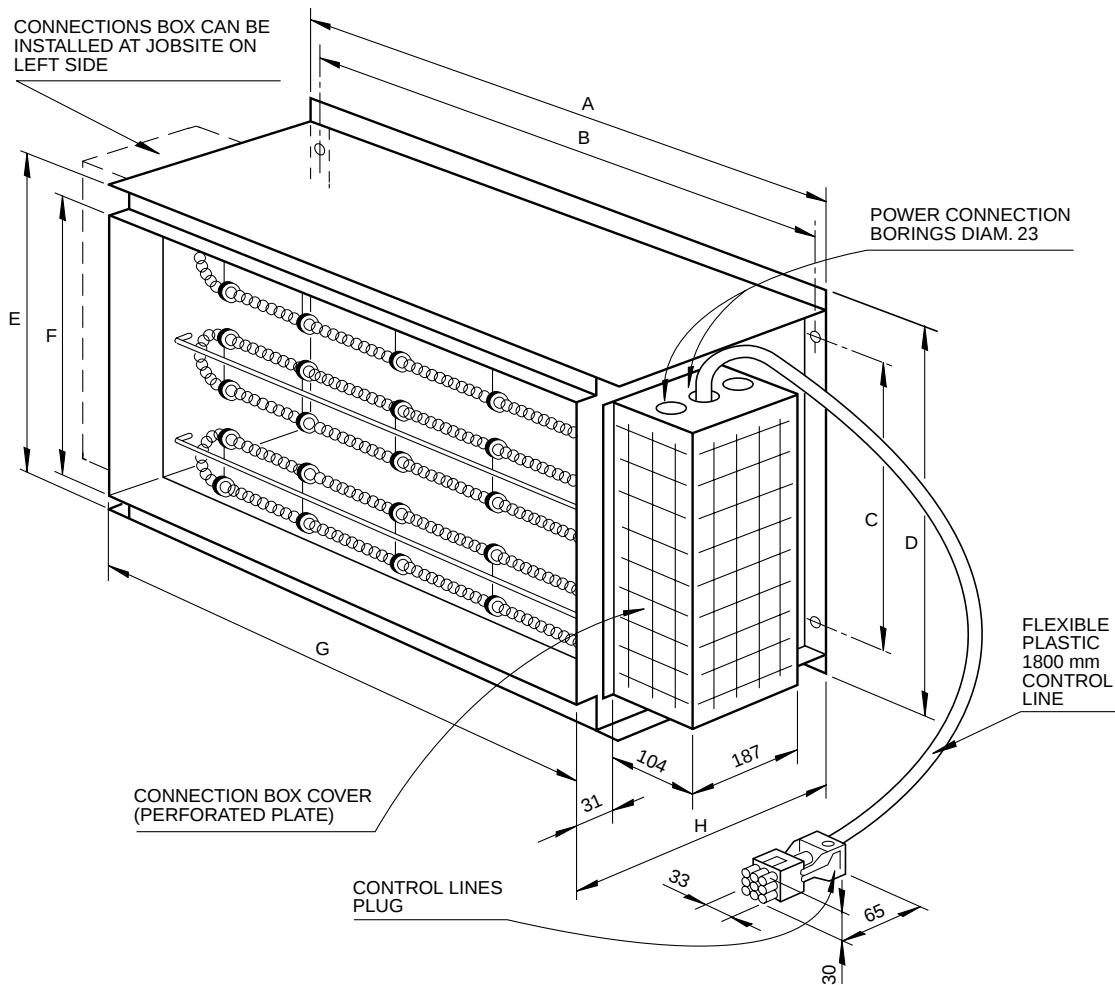
Duct electric heaters RC-24

For installing in the mouth of the outlet from the indoor fan.  
Its fonction is to act as an emergency heater.  
The charge loss calculated for these coils in any functioning

state is of 1 mm WG.  
**Attetion:**  
Whenever an electric heater is installed, a flow-rate control must be fitted to ensure that the heater does not function unless the fan is connected.

General dimensions mm

**Note:** For fuller information see relevant leaflet.



Electrical characteristics

| Electric heater model | Nominal power |
|-----------------------|---------------|
|                       | kW            |
| RC-20 - 24            | 20            |
| RC-30 - 24            | 30            |

| Grootte verwarming-selement | A   | B   | C   | D   | E   | F   | G   | H   |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 20                          | 582 | 562 | 330 | 408 | 376 | 345 | 542 | 321 |
| 30                          | 823 | 803 | 435 | 517 | 482 | 451 | 783 | 351 |

All data subject to change without notice.

AIR CONDITIONING  
HEATING  
TILES  
BATHROOMS

**Clima Roca York, S.L.**

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