Air-cooled unitary conditioners models ASAO/ASAI

Ref.: N-26454 0599

Technical information

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General

General description

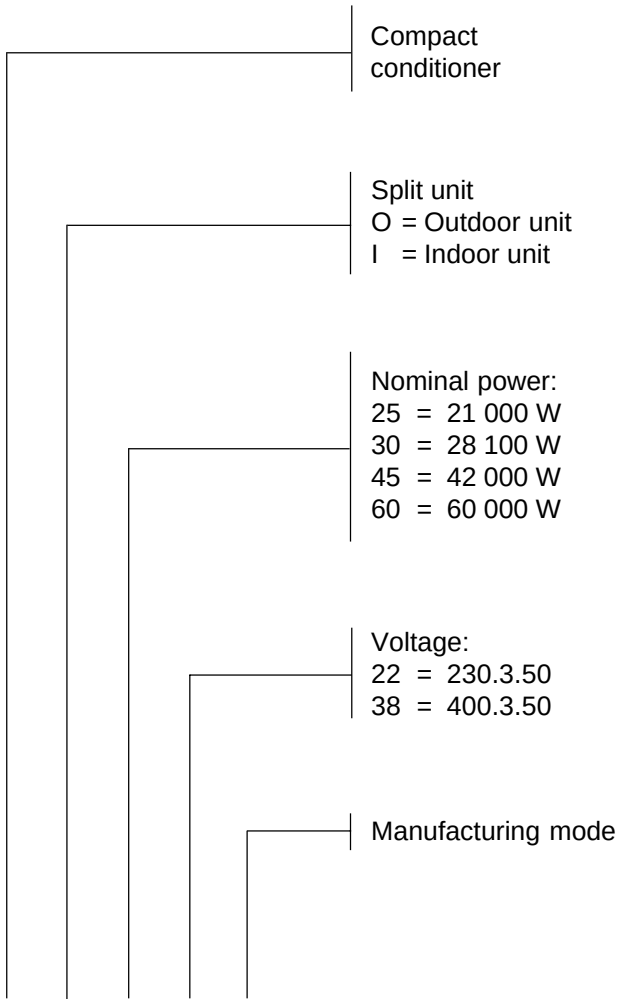
The ASAO/I model conditioners are air-to-air units with centrifugal fans in both the evaporator and the condenser. The outdoor unit ASAO includes the compressor, condenser, centrifugal fan and controls. The indoor unit ASAI includes the evaporator coil, filter and fan. If necessary, the from as delivered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

The exterior unit can be installed indoors or outdoors as it is protected to with stand 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 voltam-bient.

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 centrigugal 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

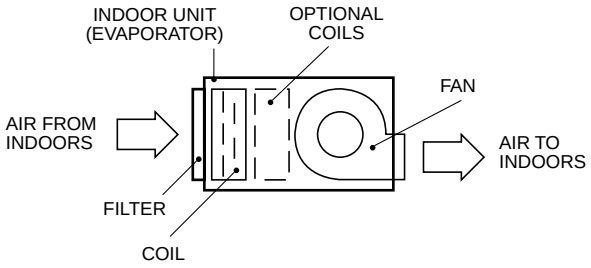
Made of brazed copper, fitted with access connections on the high and low pressure sides.

Refrigerant

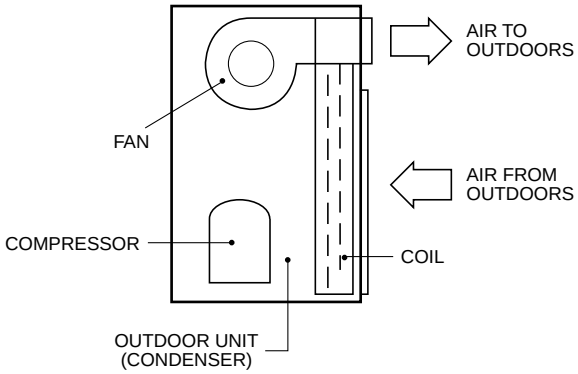
The ASAO and ASAI units are supplied with connections ready for soldering. La carga de refrigerante debe hacerse totalmente en obra. Ver en el capítulo de instrucciones de instalación, el apartado carga de refrigerante.

Operating diagram

ASAI



ASAO



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

Accesories
Provision is made for installing the standard accessoires 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 intercon-nection 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 intet 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 m^3/h	Outdoor fan m^3/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 air dry temperature °C DB	Air intake humid temperature °C NB	Total capacity	Sensible capacity (W/h)				Compressor power 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 air dry temperature °C (DB)	Air intake humid temperature °C (WB)	Total capacity	Sensible capacity (W/h)				Compressor power 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 (1)		Air-flow-rate		Power input
	mm WG	Pa	m^3/h	m^3/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

Note: (1) Performance calculated for wet coil including filters.

Outdoor fan performances

Model	Static pressure available		Air-flow-rate		Power input
	mm WG	Pa	m^3/h	m^3/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

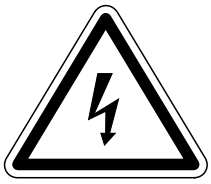
Packing is made of recyclable material. The disposal of same should be carried out in accordance with the regulations on selective residue disposal established by the local authorities.

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.



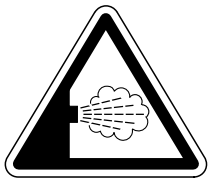
This sign indicates an electrical risk or danger.

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

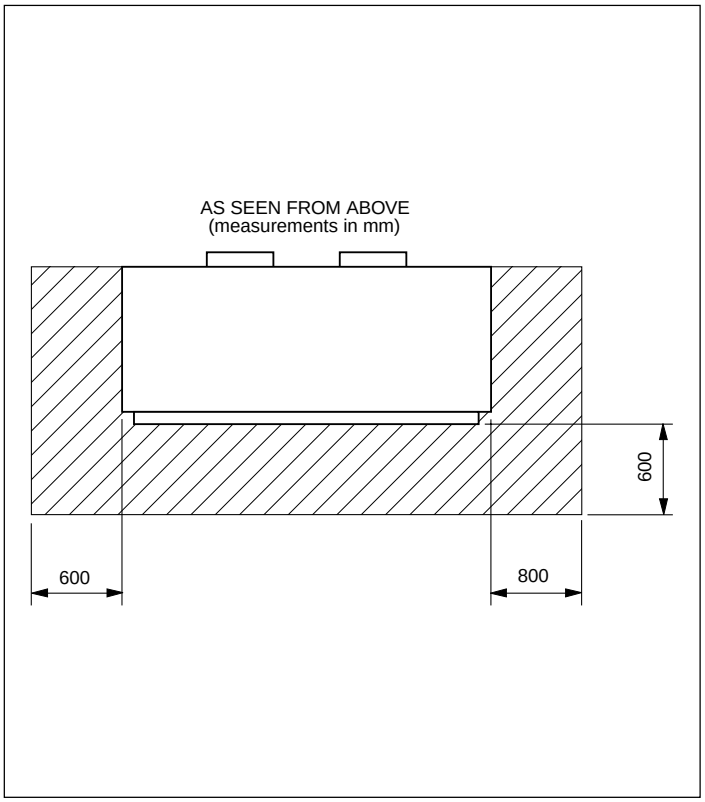
The location must be chosen providing permanent access for maintenance service, both through the lateral and rear panels.

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

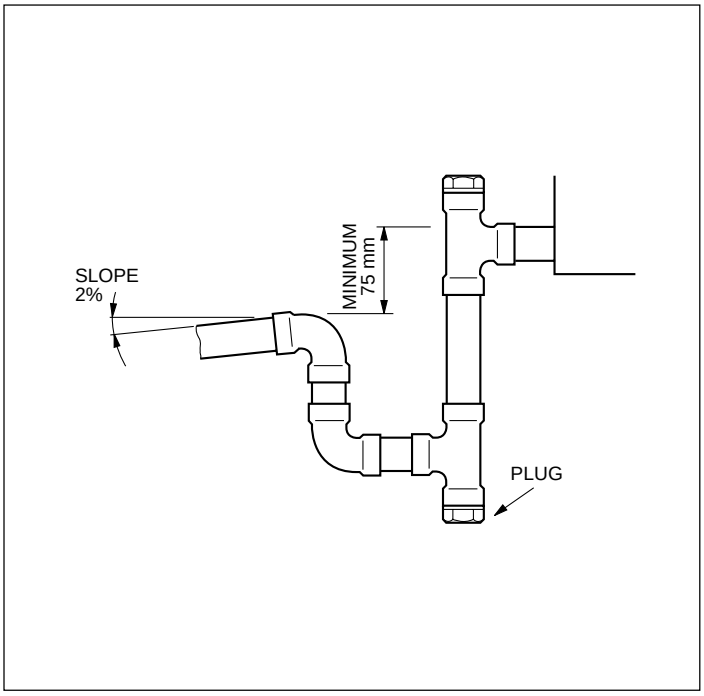
1- Connect the ducts, insulating them from the apparatus with a flexible coupling, preferably of non-inflammable material, to avoid transmission of vibration from the apparatus itself. If the ducts are made of flexible material they will not transmit vibration.
2- It is recommended that a register be 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 filing the trap with water at the beginning of each season.

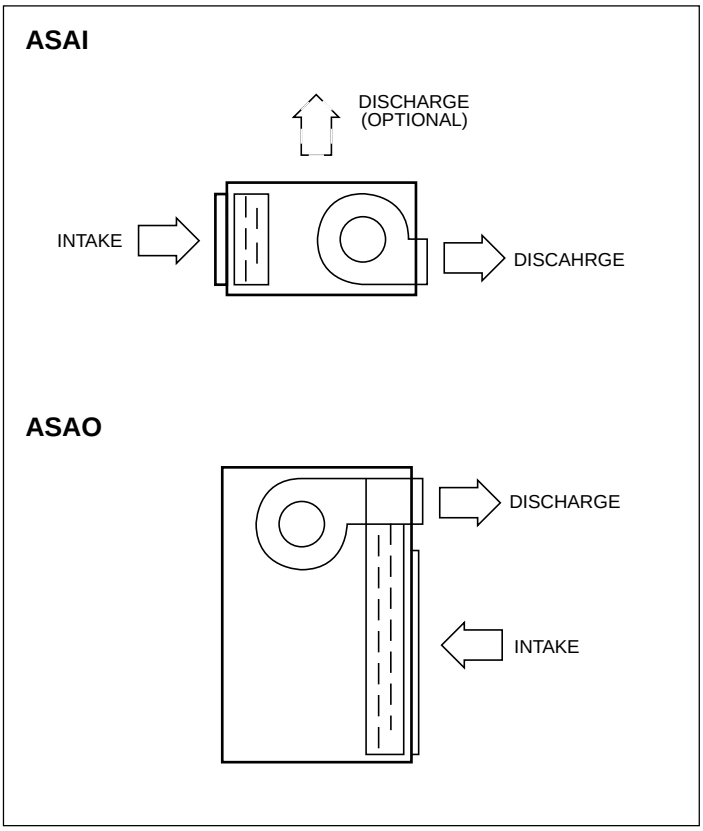
The drain line must have a minimum slope of 2 cm. for each metre of length.

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

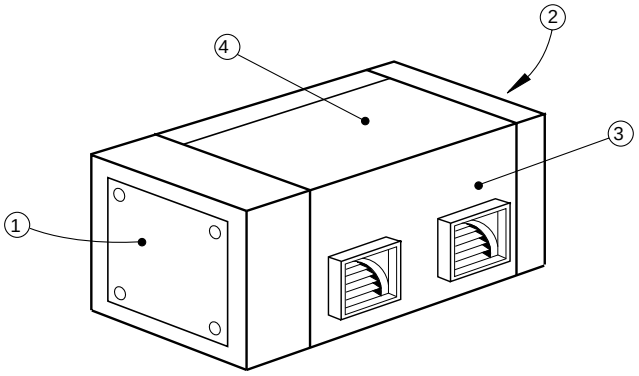
If the installation conditions require it, the discharge from the indoor fan ASAI can easily be modified on site to provide discharge vertically.

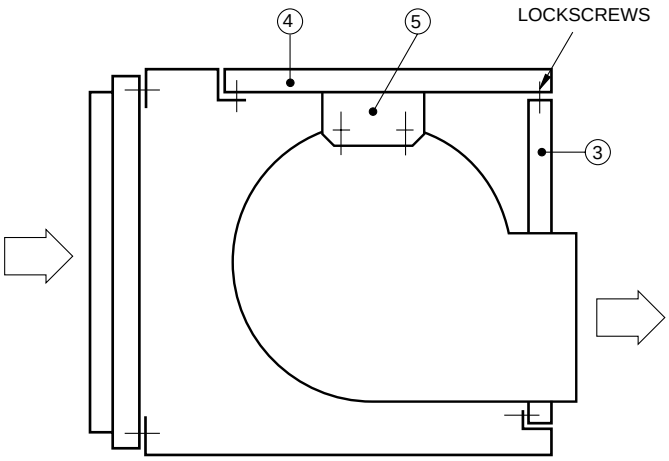
Transformation process from horizontal to vertical discharge

(ASAI-25, 30, 45)

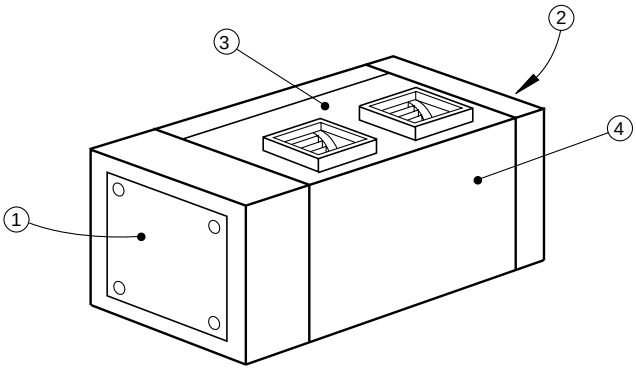
1- Remove the attachment screws from the side panels 1 and 2 on the upper unit.
2- Remove side panels 1 and 2.
3- Loosen the screws attaching the fan motor to its base and take off the drive belf.
4- Through the lateral accesses, unscrew panels 3 and 4, as shown in the standard orientation drawing.
5- 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.

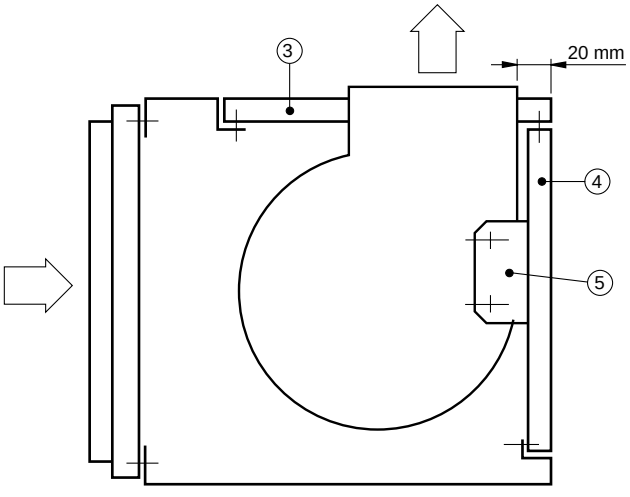
Standard orientation





Orientation as modified on site

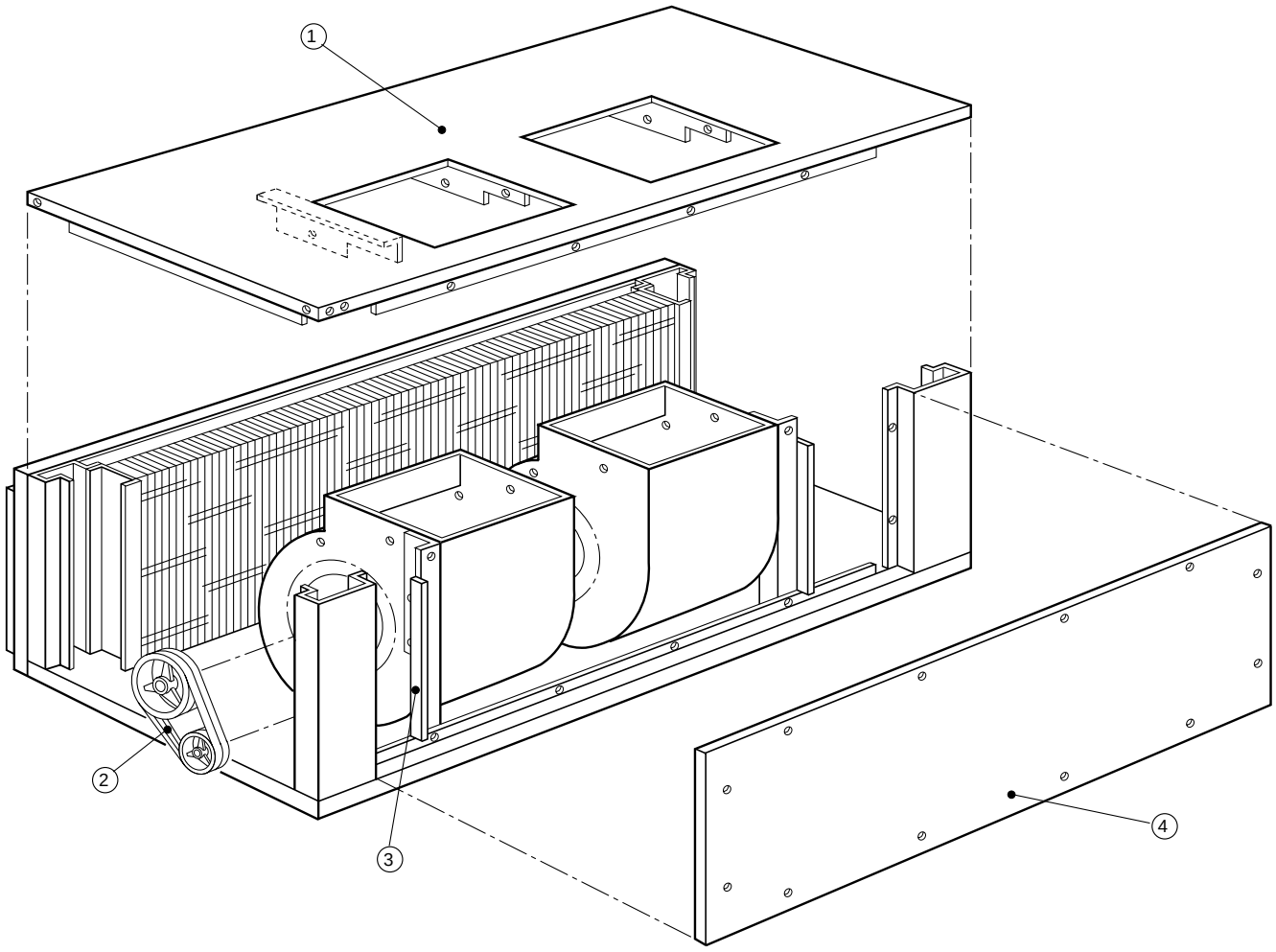




ASAI-60 unit

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

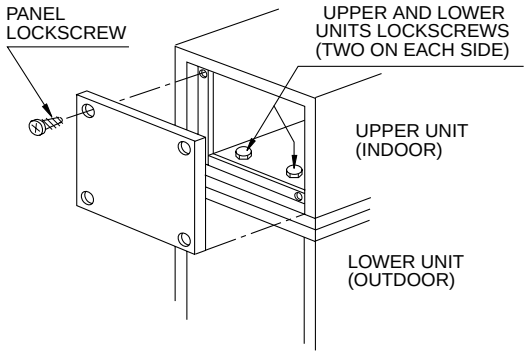
1- Dismantle the standard upper, rear and side panels and the fans, and orientate them as shown in the drawing, attaching them to the upper panel together with the transformation kit.
2- Once the fans have been installed, attach the upper panel ref. 1 to the unit.
3- Attach the left-hand side angle support 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, Superheat 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 m	Maximum level difference between units 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, Superheat 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.

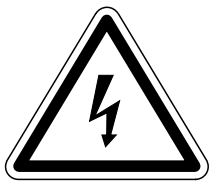
After the tube has been insulated, do not try to bend it in excess because it could become cracked or broken.

Electrical installation

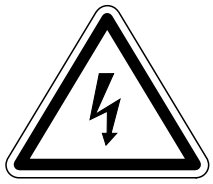
Each conditioner is delivered with a control box for connection to the mains through a main switch with fuses or an automatic cut-out.

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 sup. cable cross section	Automatic circuit breaker
	Compressor	Fan	Compressor			Indoor fan		Outdoor fan			
		Ext. - Int.	Start	Nominal	Maximum	Start	Nominal	Start	Nominal	mm^2	A
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

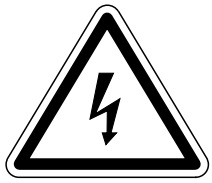
Important: The automatic switch sizing and the power line section are orientative, and should be corrected in accordance with site conditions and legislation.

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

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

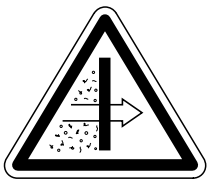
Before final approval of the installation



Verify:
- Voltage is always belween 198 - 254 V or 342 - 436 V.
- The section of the supply cable is at least that recommended in the corresponding wiring diagrams.

- Condensation drainage is carried out perfectly and there are no leaks in the water circuit.

- Operating instructions have been give to the user.



- The need to clean the air filter has been notified.

- The guarantee card bas has been filled out.
- Maintenance instructions have been given, or a regular servicing contract has been signed.

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.

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

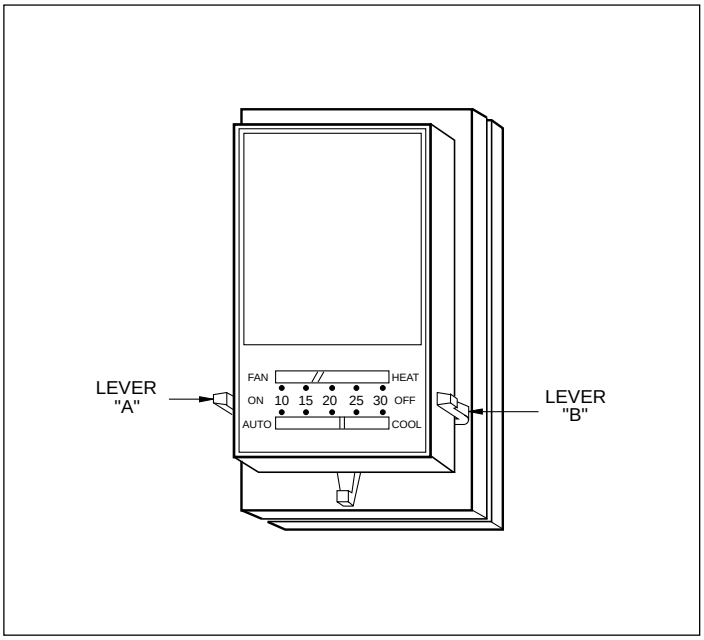
- Turn the console on before the room gets hot. The heat accumulated on furniture, walls, etc. makes the console take longer to achieve the desired temperature.
- It is advisable to inspect and service your unit in the spring; this avoids damage and insures a long sevice of your console.

Ambient thermostat

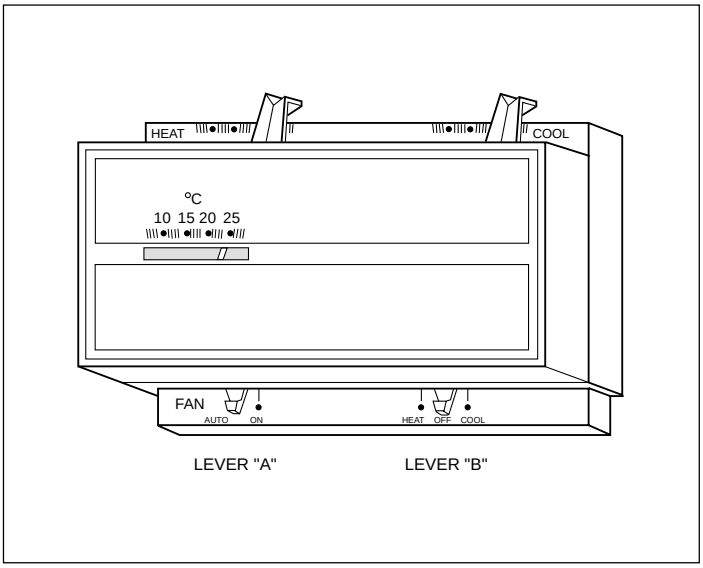
Characteristics:

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

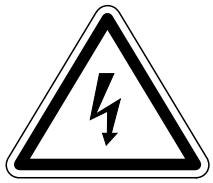
In the OFF position the cooling group does not operate. When the lever A is in the ON position only the fan functions. In the position COOL or HEAT and AUTO the fan starts up in conjunction with the compressor or electric heater, if fitted (as indicated by the thermostat and the room temperature). The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

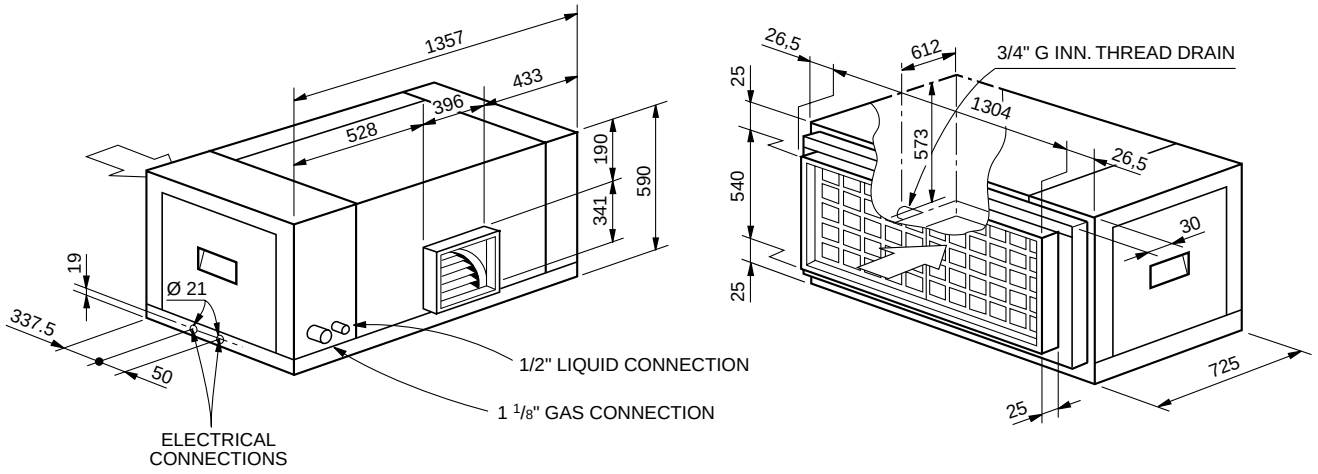
For safety reasons, make sure to turn your air conditioner off and unplug the mains before any cleaning is performed or fan motor belts are checked.

Access to the units for maintenance servicing

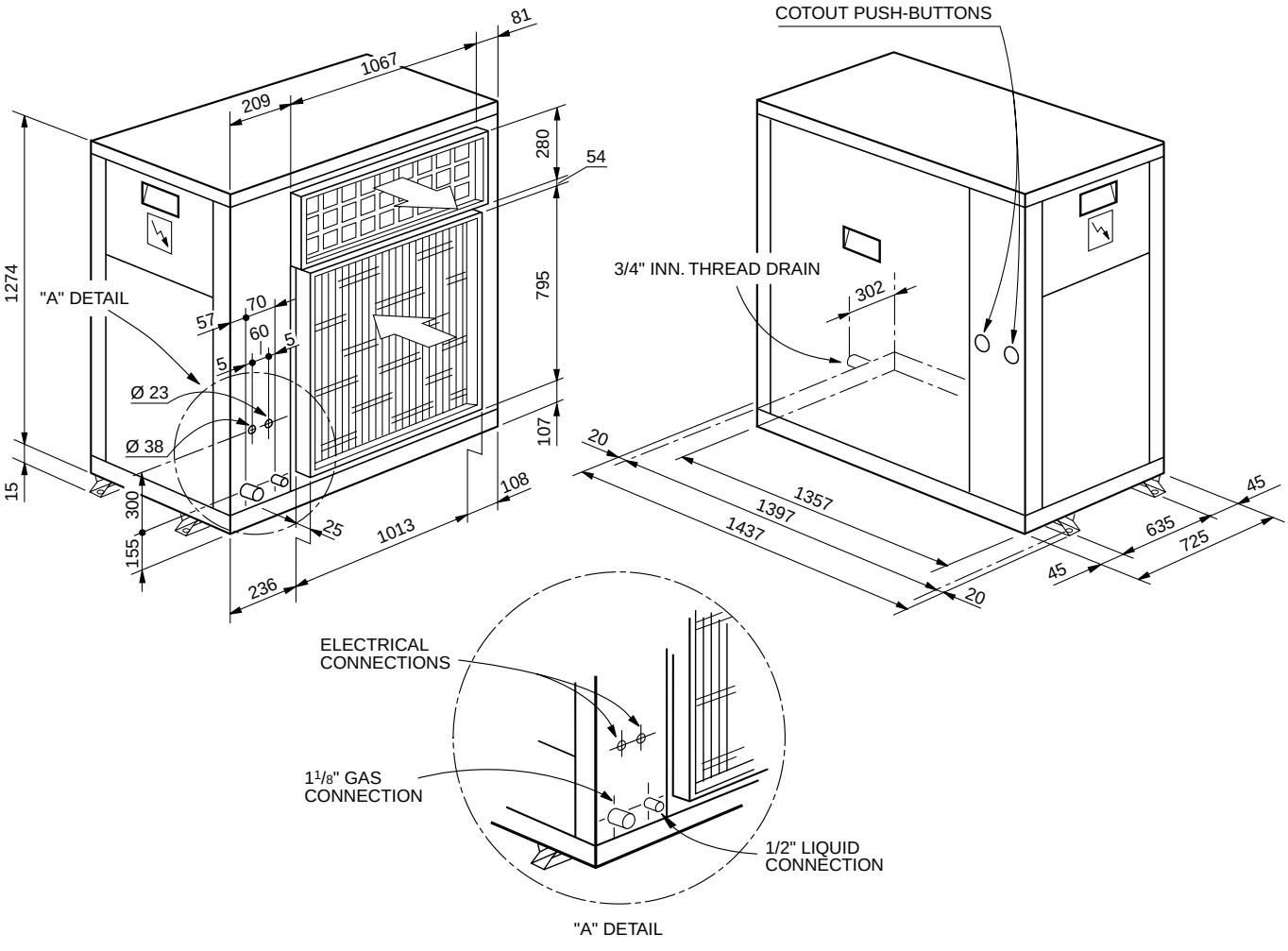
Attention: The unit has a remote control system and can start automatically. Two minutes prior to having access to the interior, the power supply should be disconnected so as to avoid any contact with the fan turbine in operation.

General dimensions mm

ASAI-25

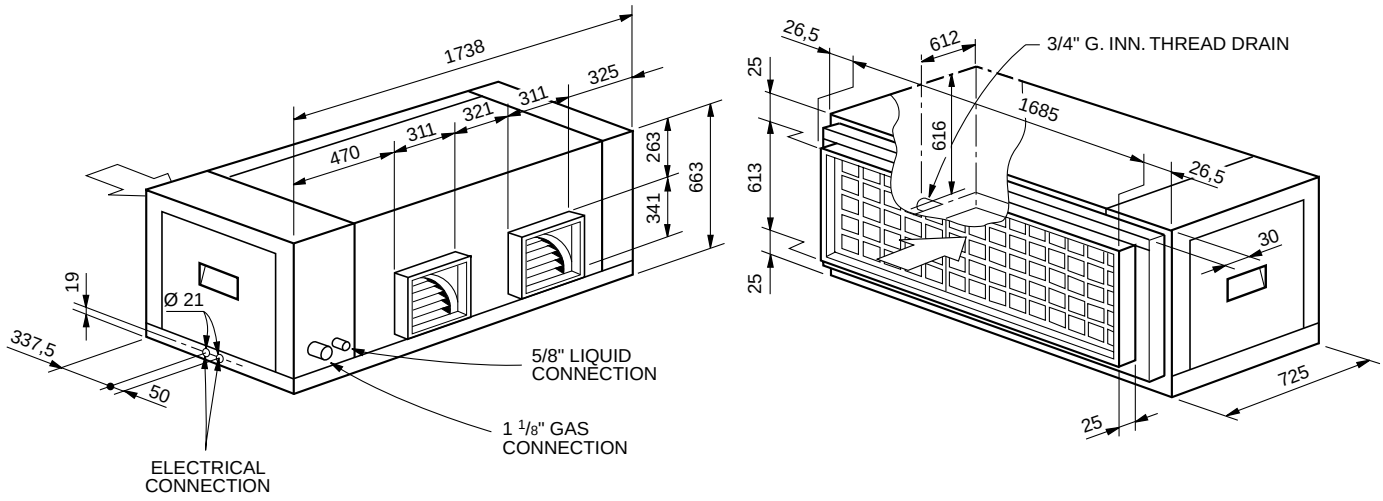


ASAO-25

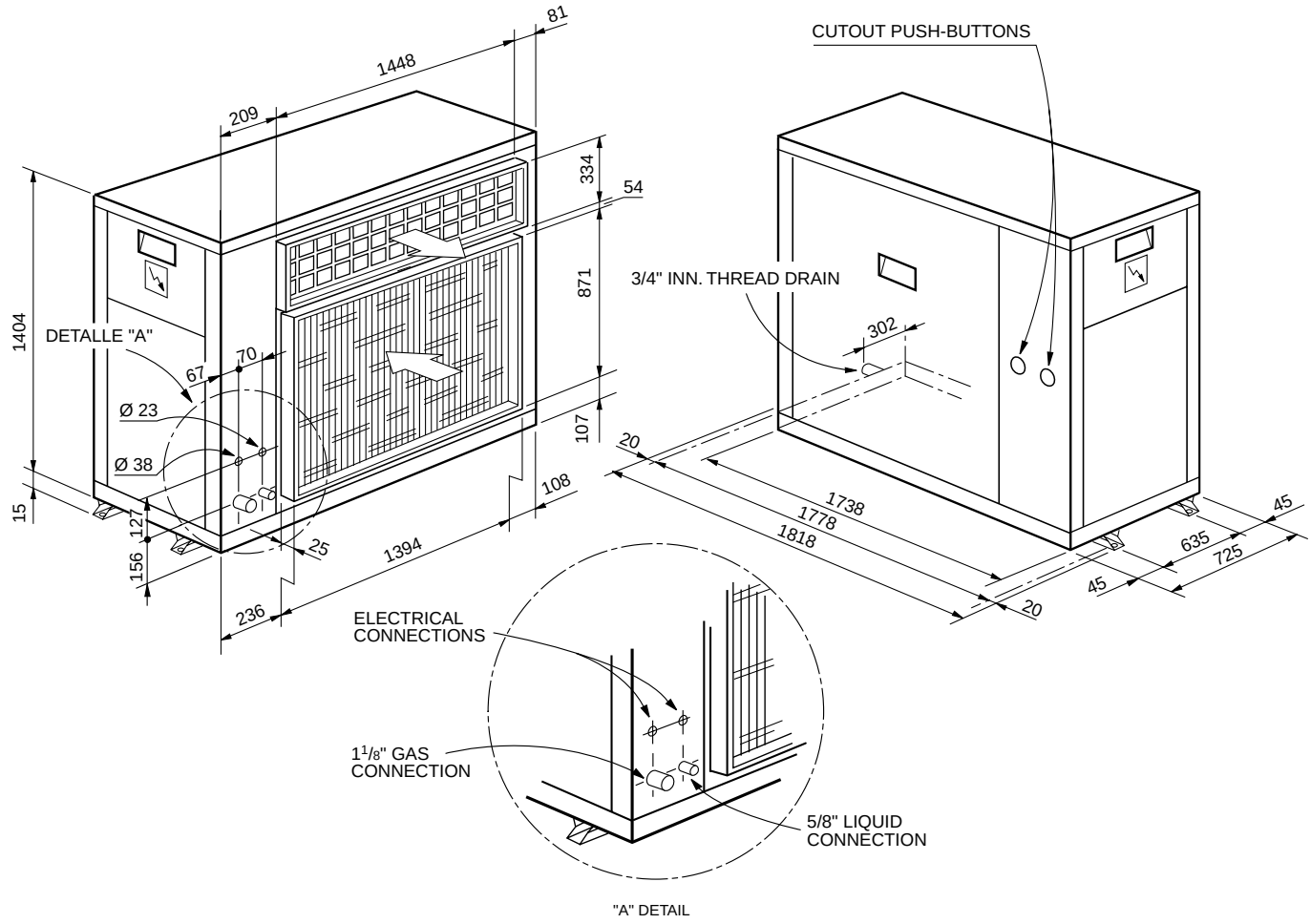


General dimensions mm

ASAI-30

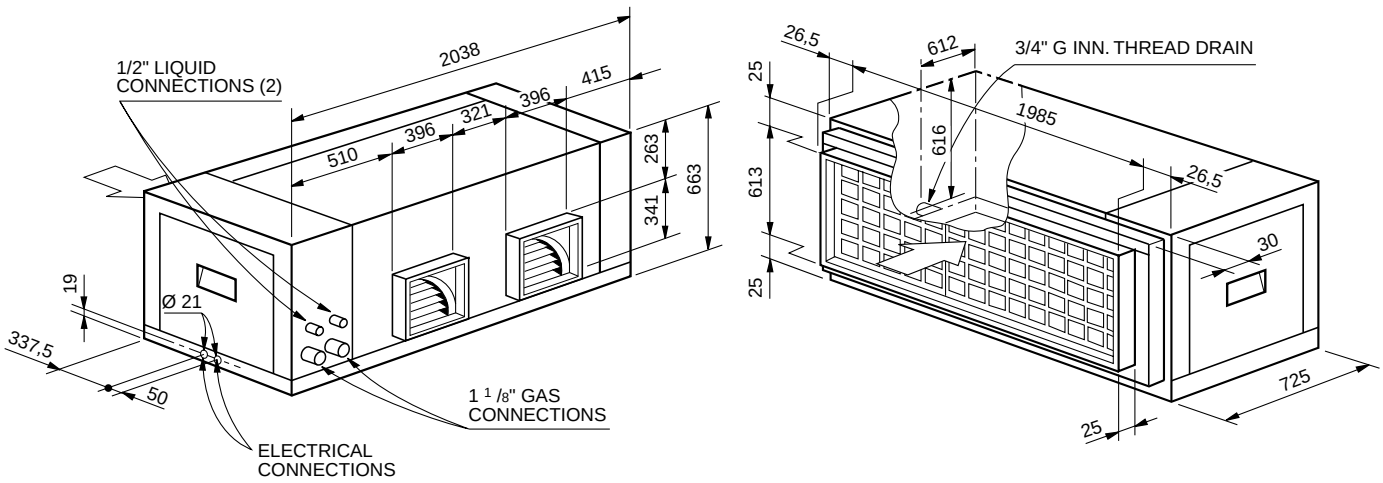


ASAO-30

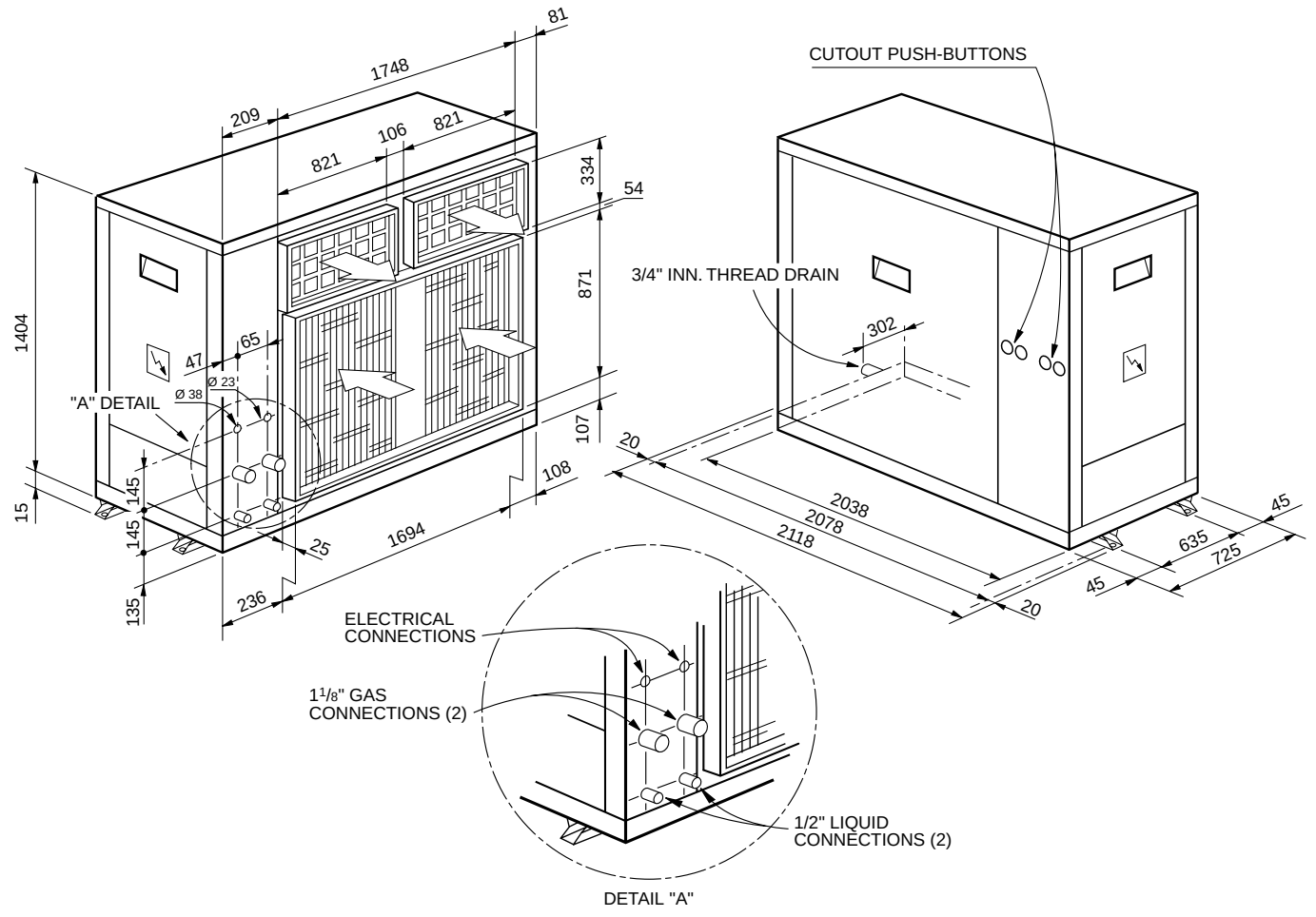


General dimensions mm

ASAI-45

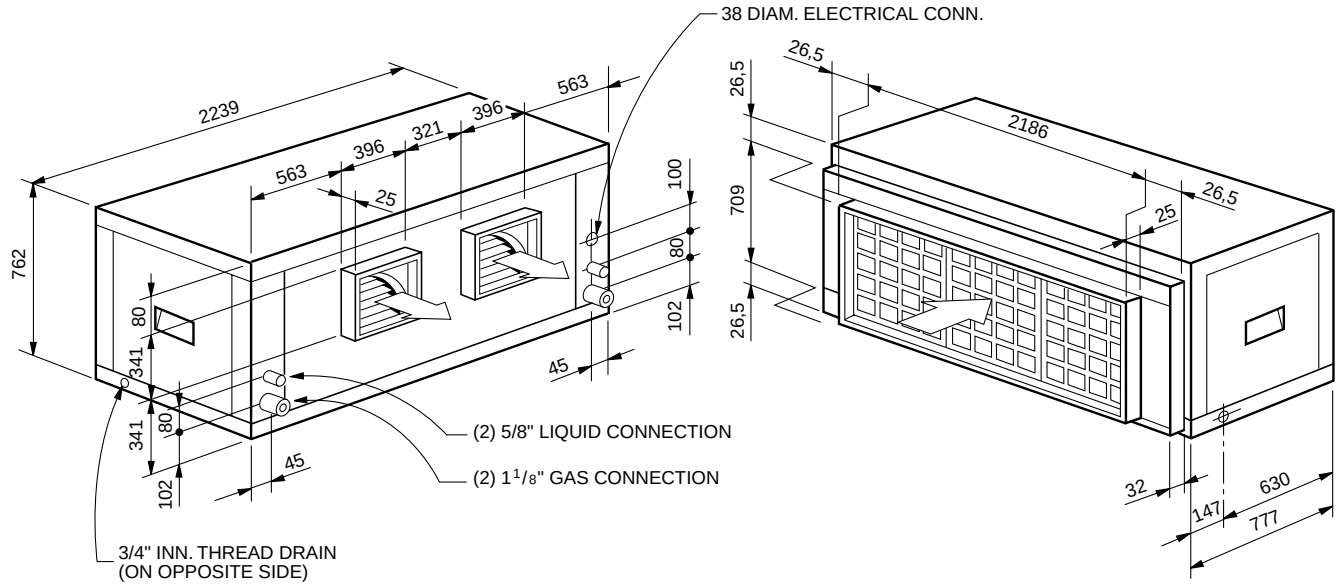


ASAO-45

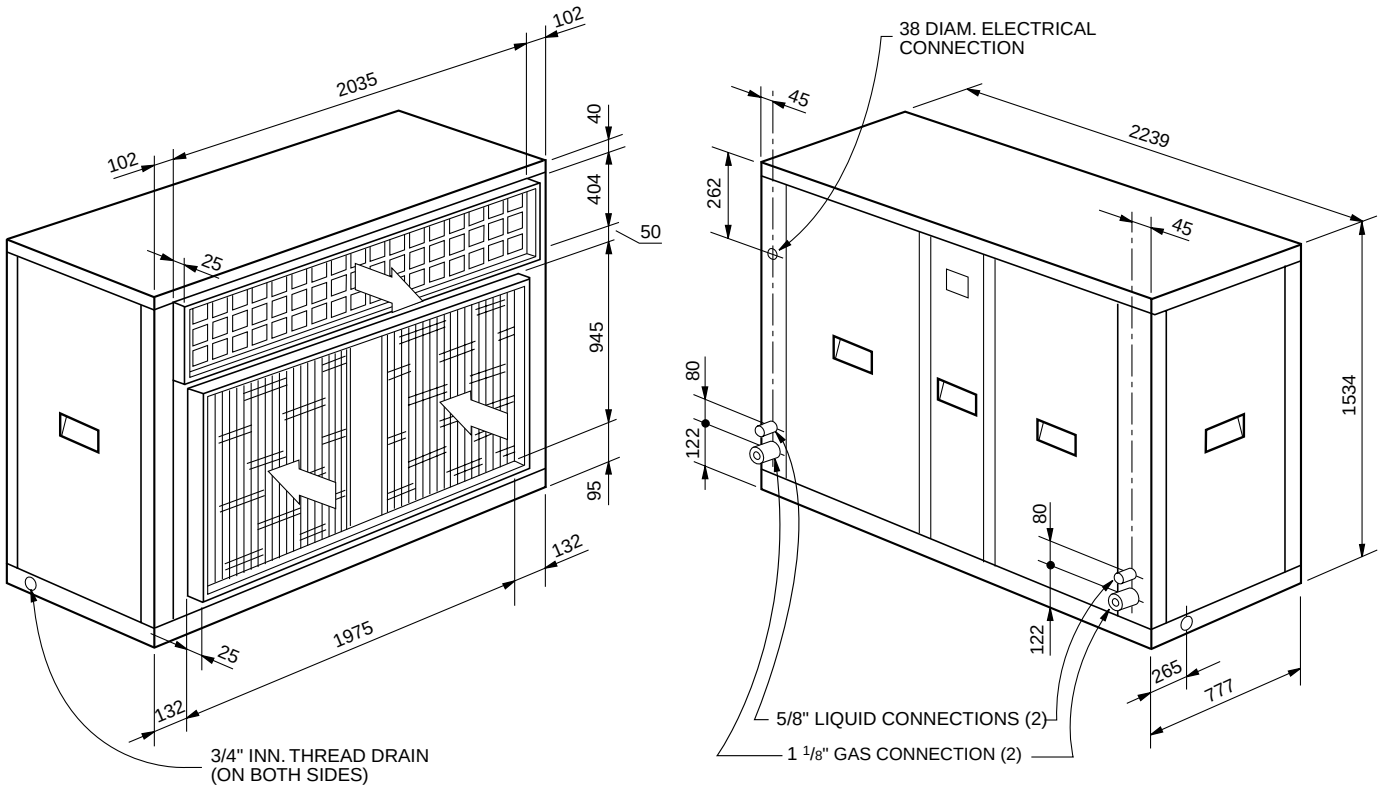


General dimensions mm

ASAI-60

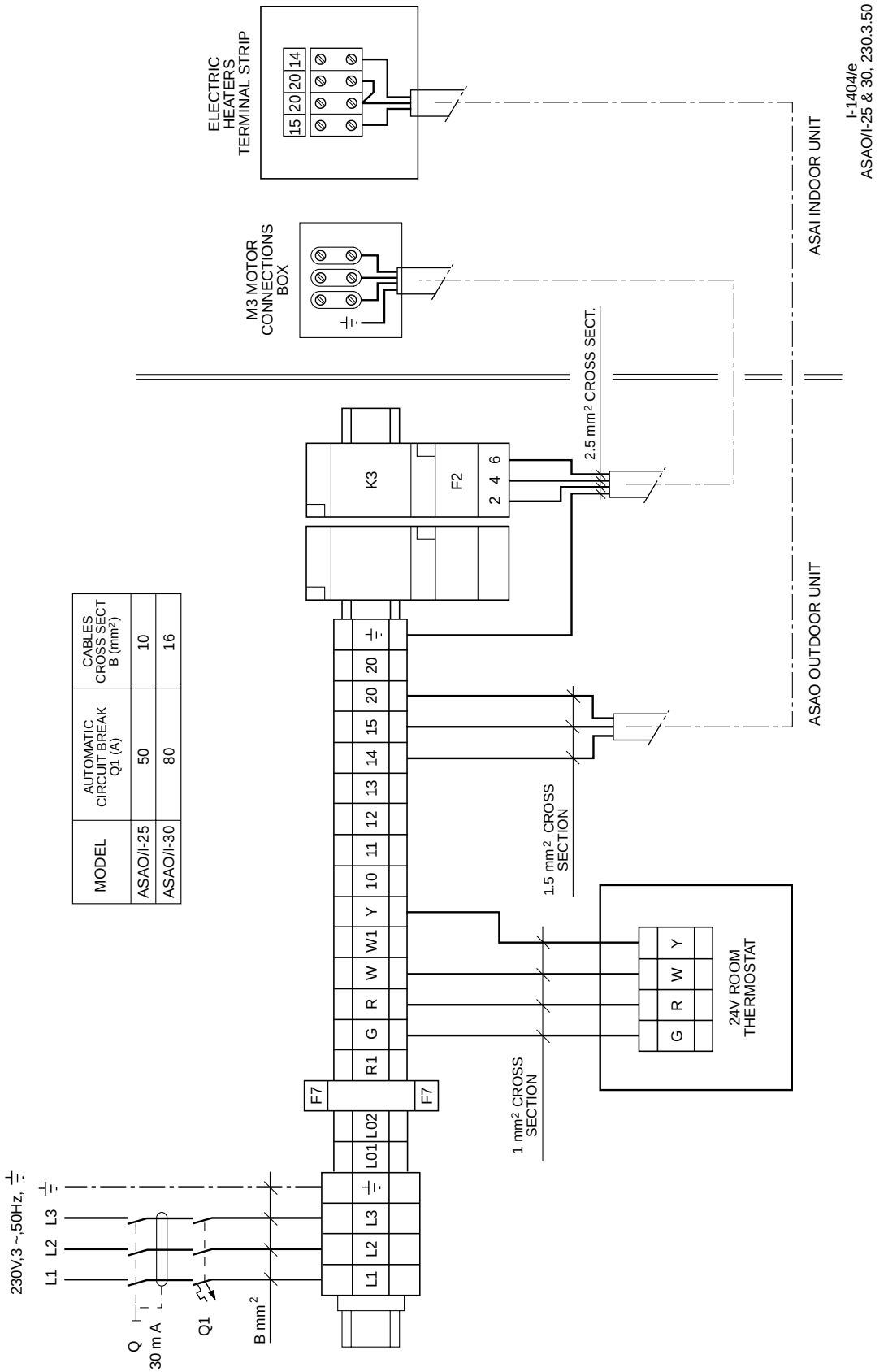


ASAO-60



Interconnection diagram

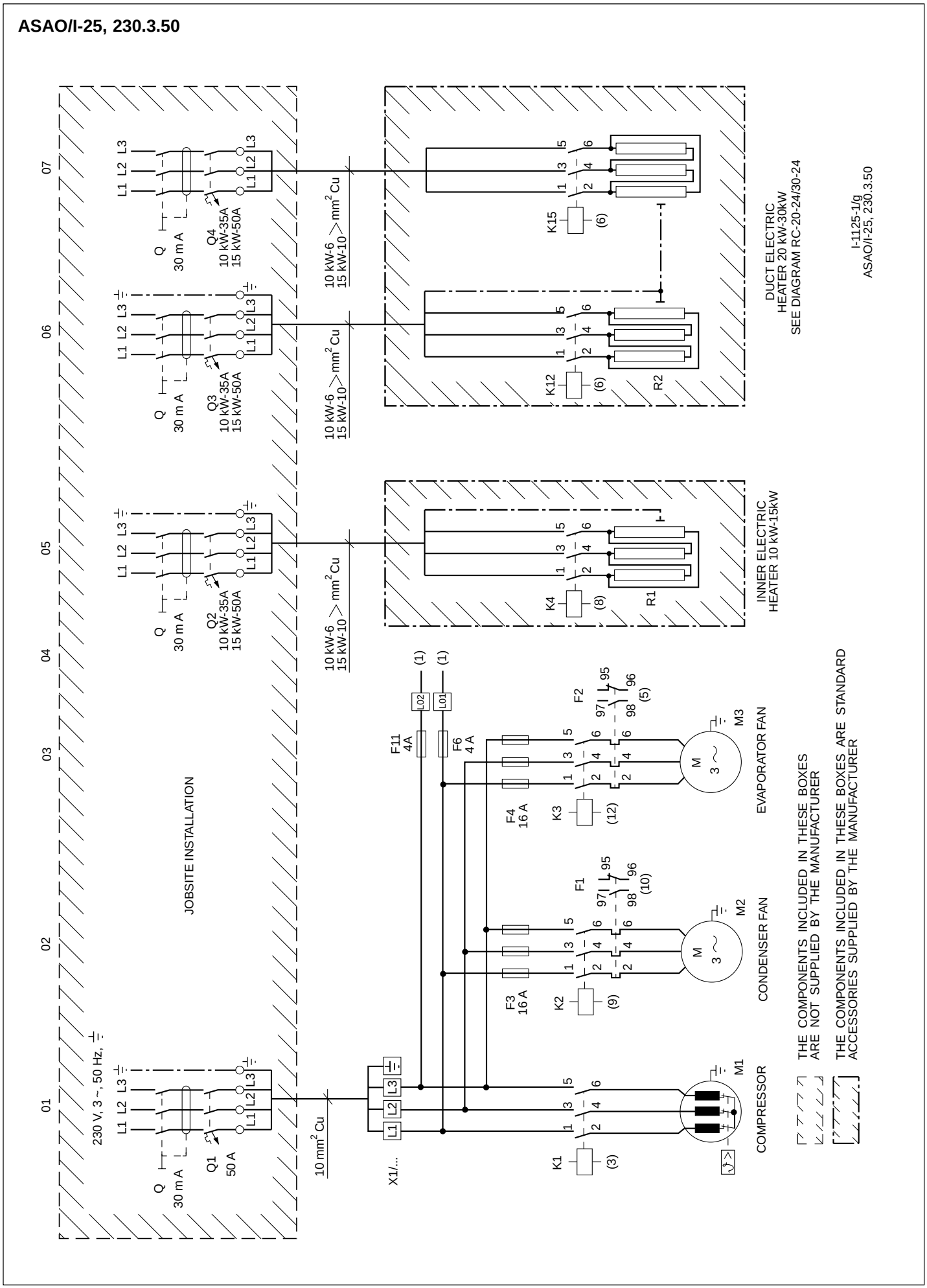
ASAO/I-25 & 30, 230.3.50



MODEL	AUTOMATIC CIRCUIT BREAK Q1 (A)	CABLES CROSS SECT B (mm²)
ASAO/I-25	50	10
ASAO/I-30	80	16

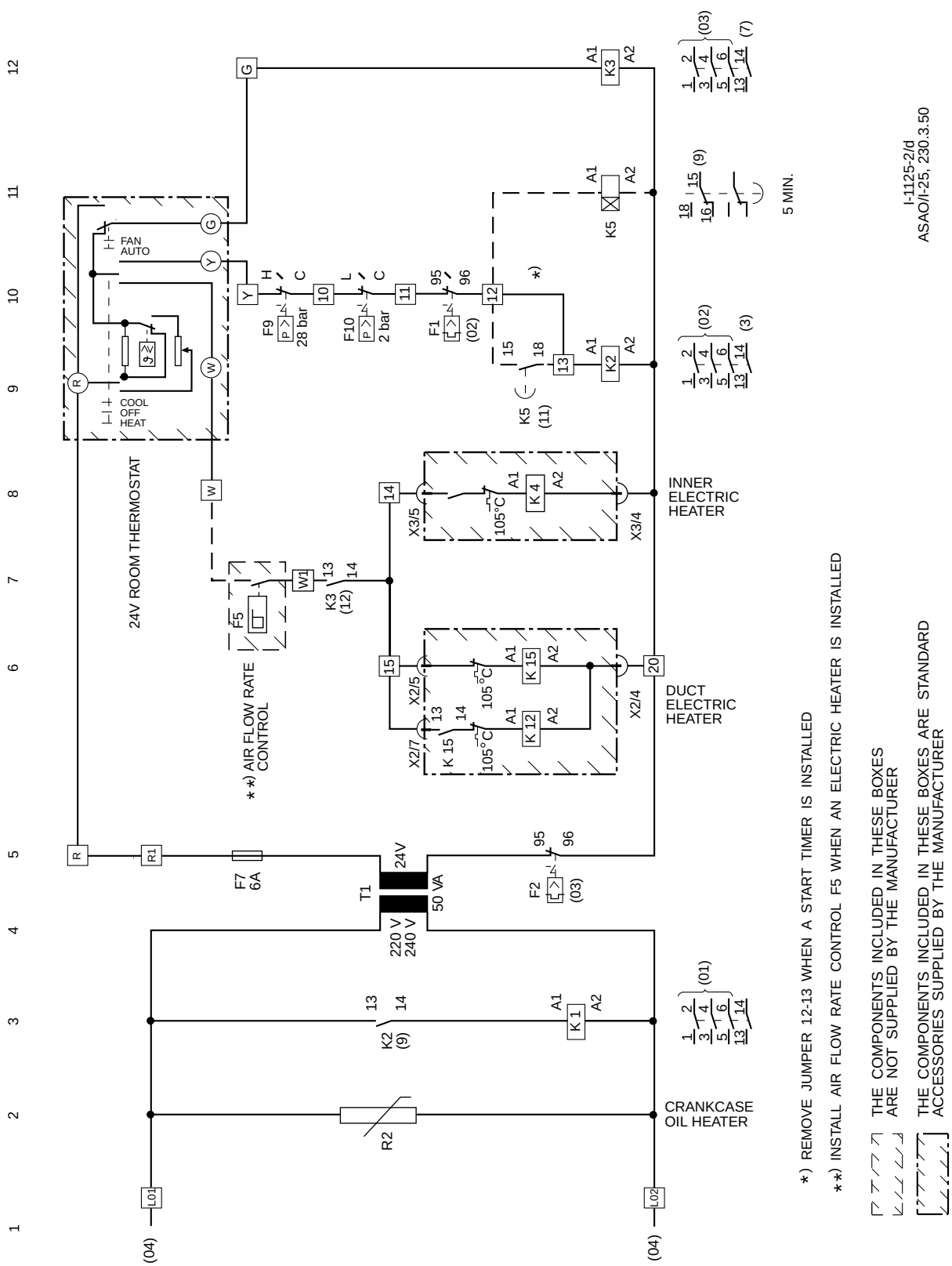
Power diagram

ASAO/I-25, 230.3.50



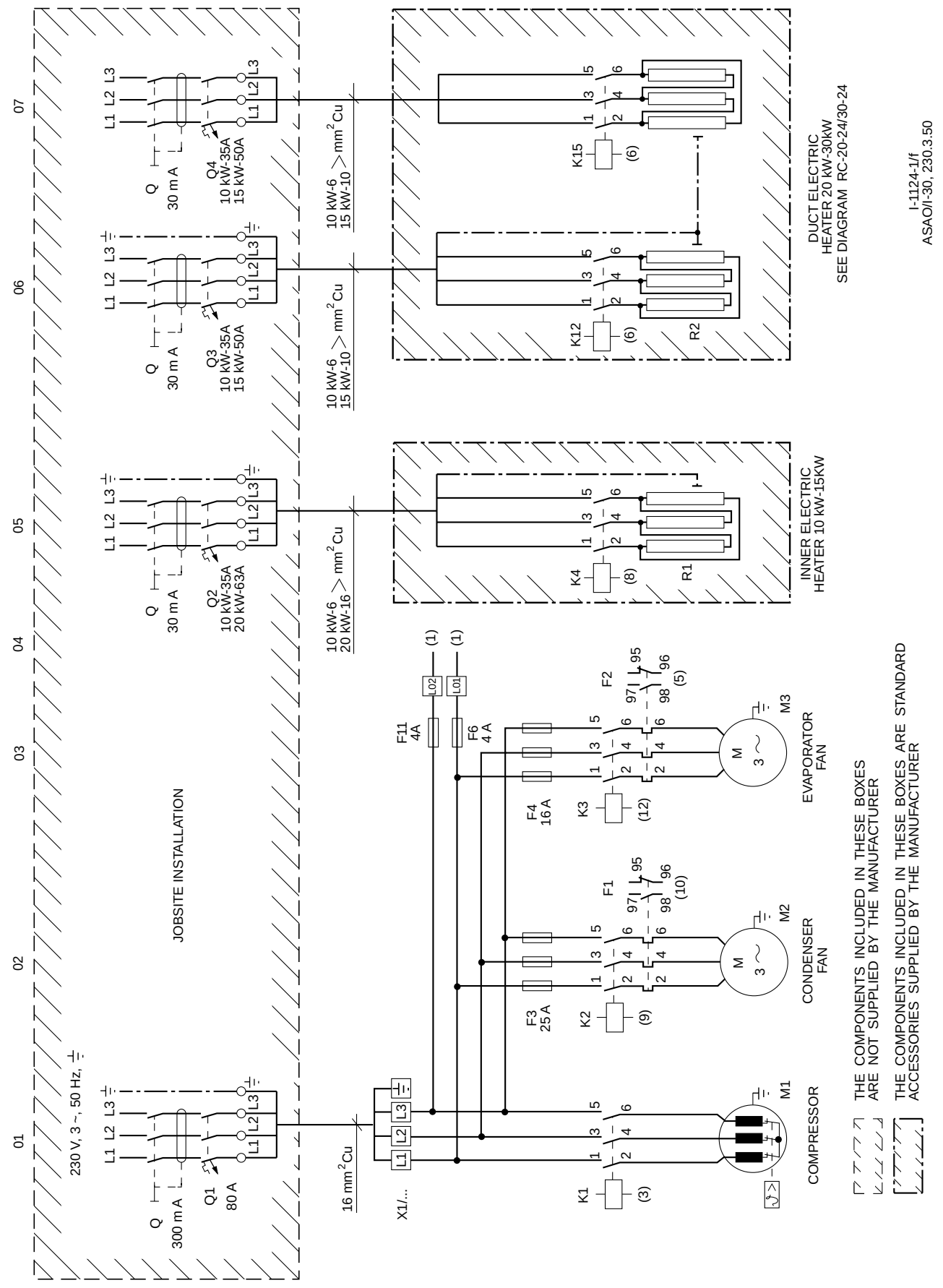
Control diagram

ASAO/I-25, 230.3.50



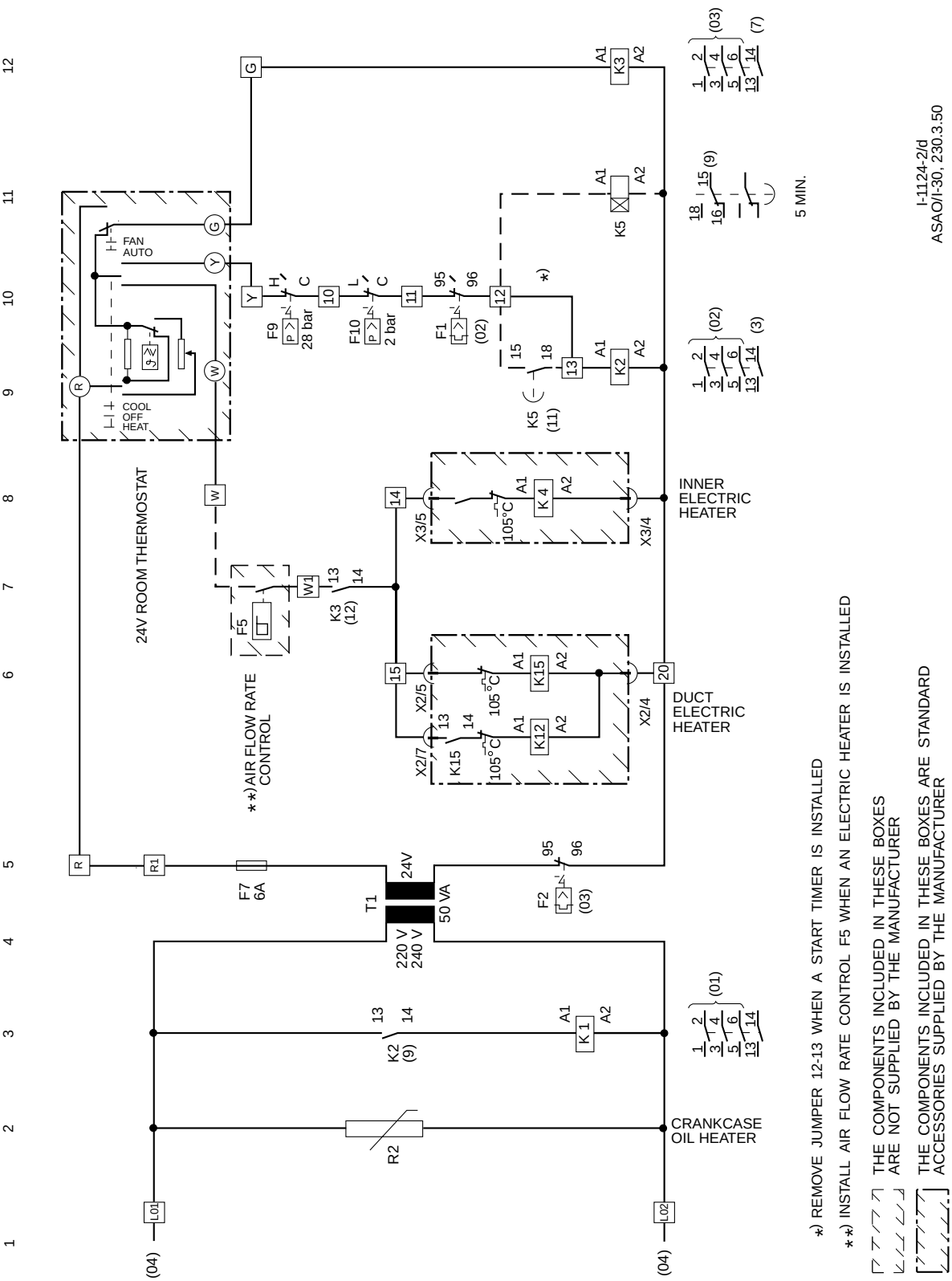
Power diagram

ASAO/I-30, 230.3.50



Main diagram

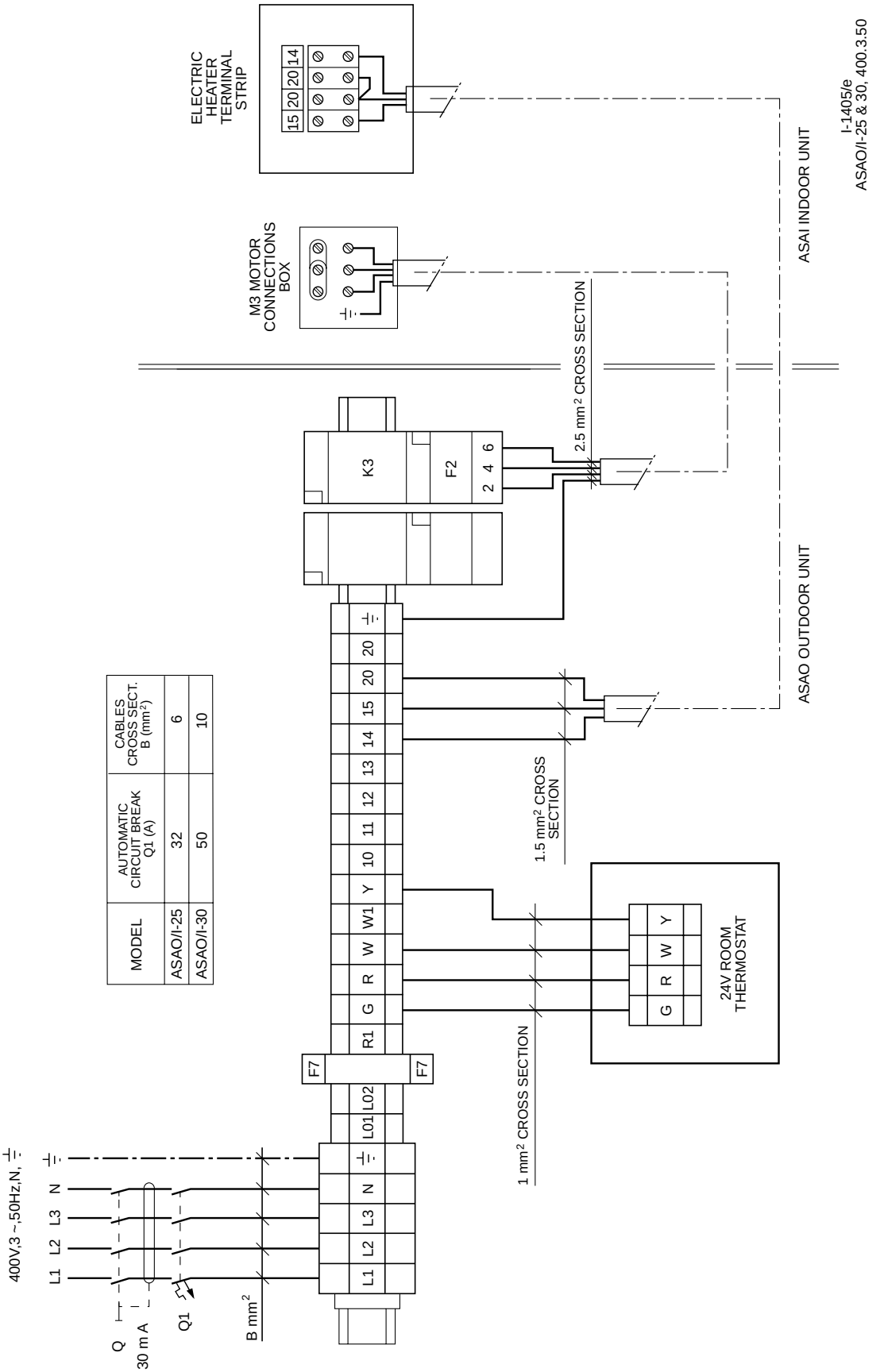
ASAO/I-30, 230.3.50



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

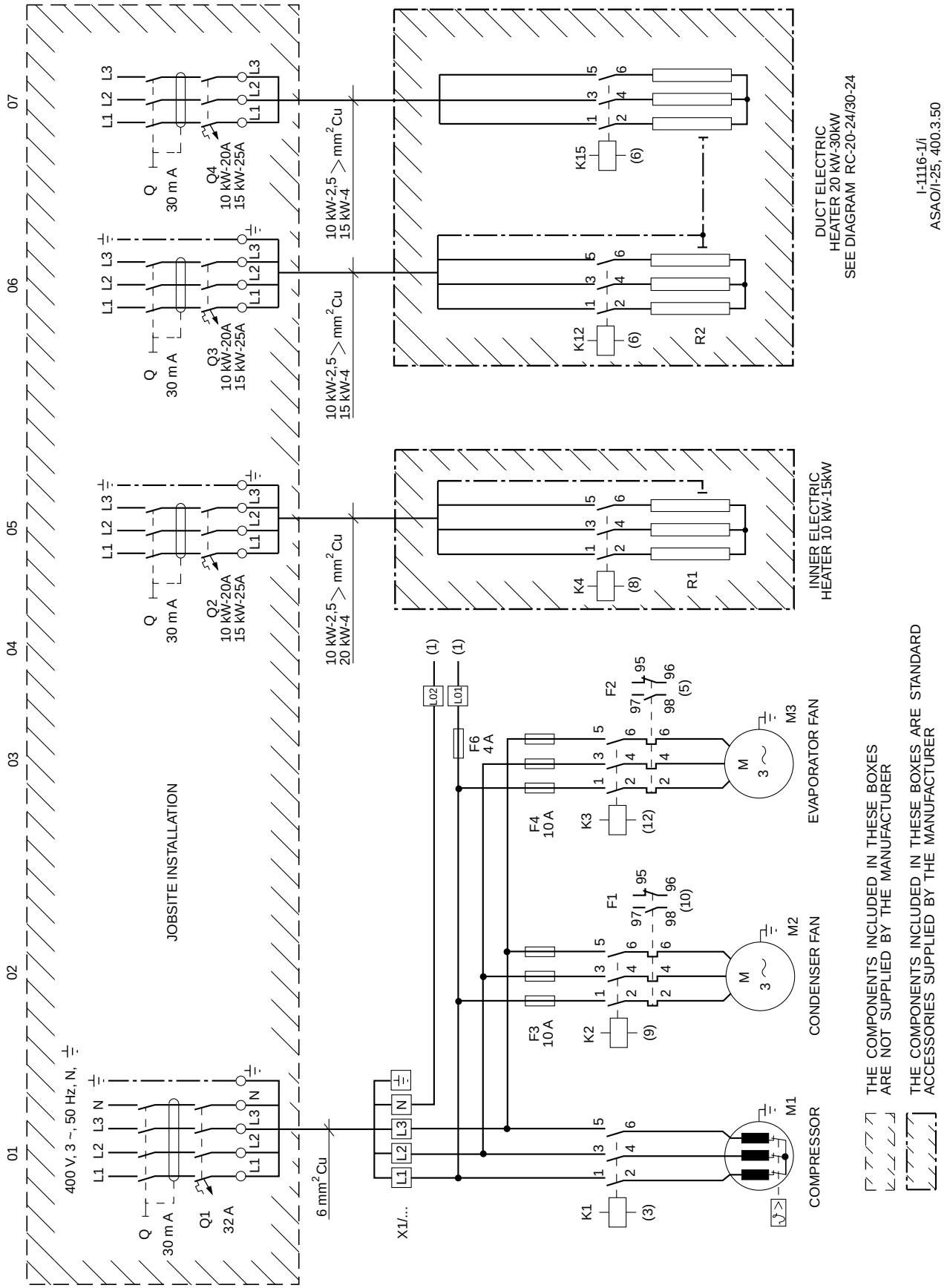
Interconnection diagram

ASAO/I-25 & 30, 400.3.50



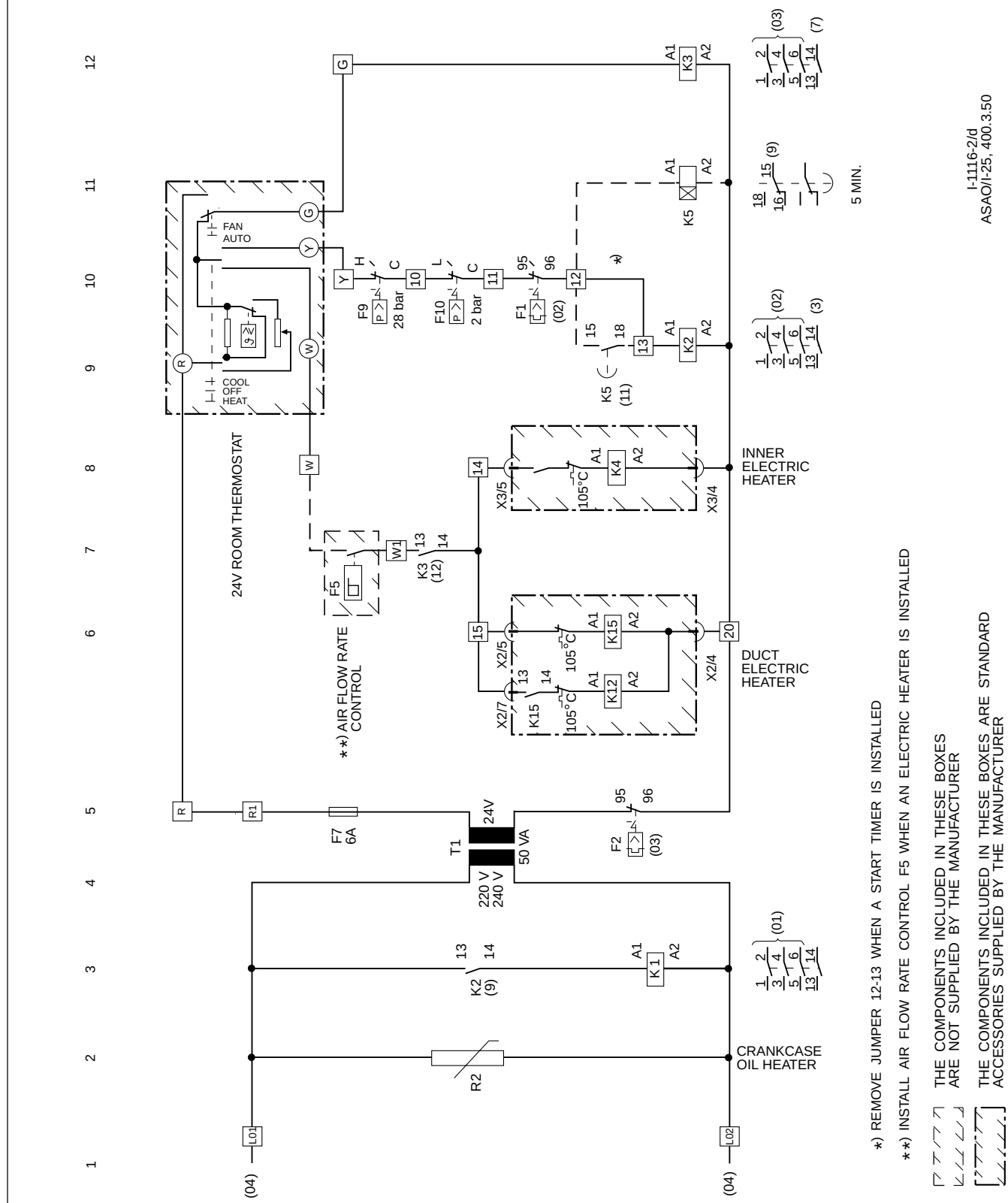
Power diagram

ASAO/I-25, 400.3.50



Main diagram

ASAO-25, 400.3.50



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

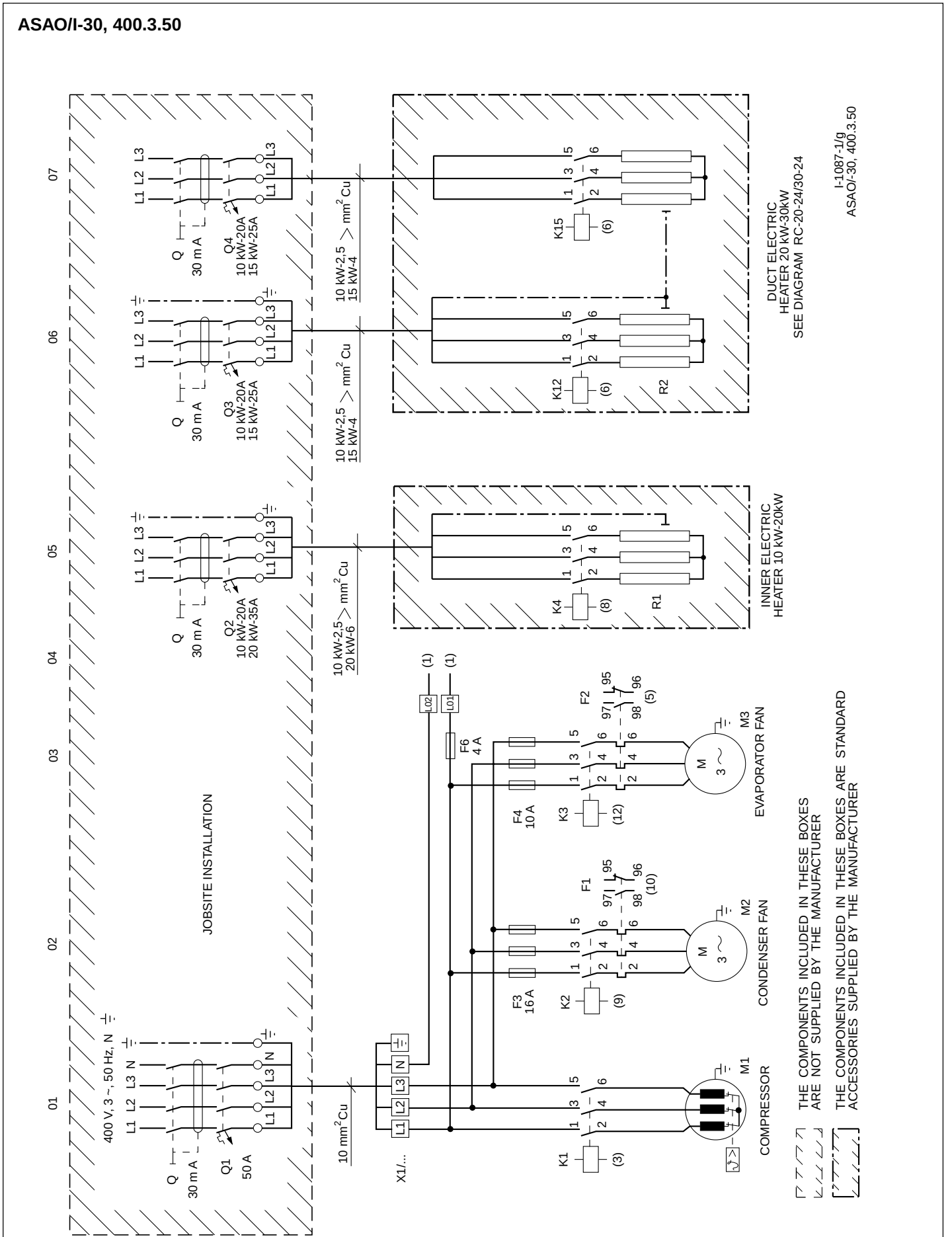
**) INSTALL AIR FLOW RATE CONTROL F5 WHEN AN ELECTRIC HEATER IS INSTALLED

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

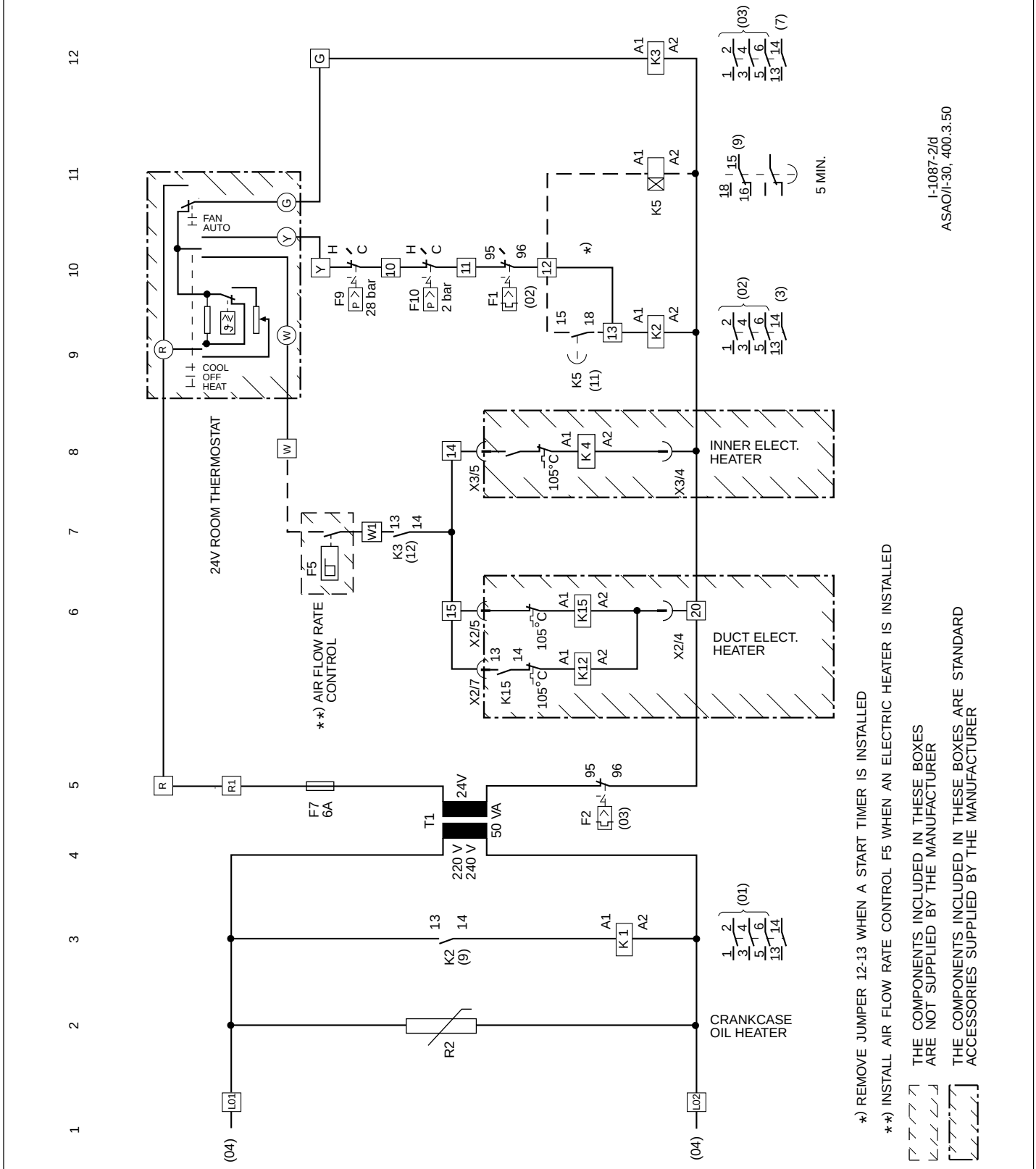
Power diagram

ASAO/I-30, 400.3.50



Main diagram

ASAO/I-30, 400.3.50



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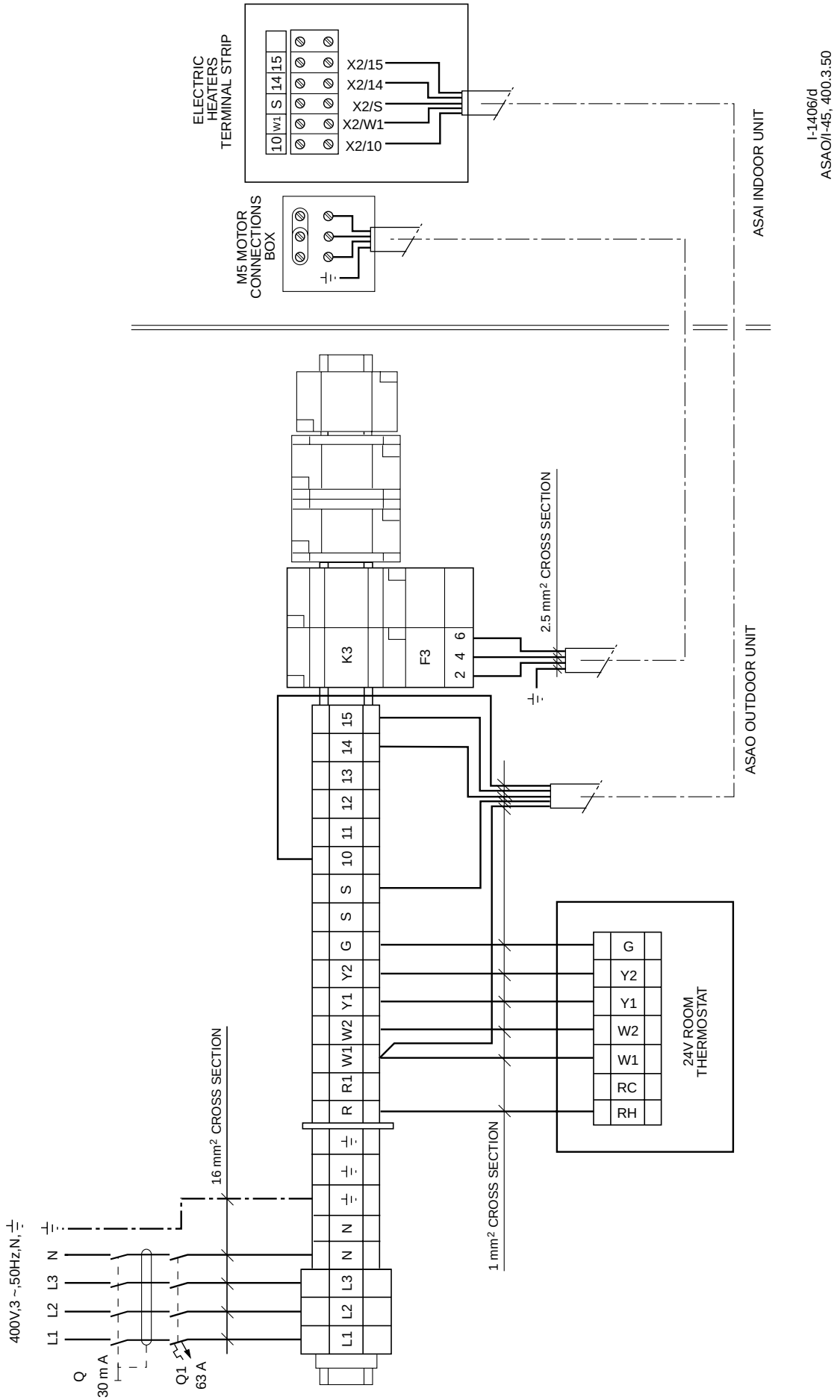
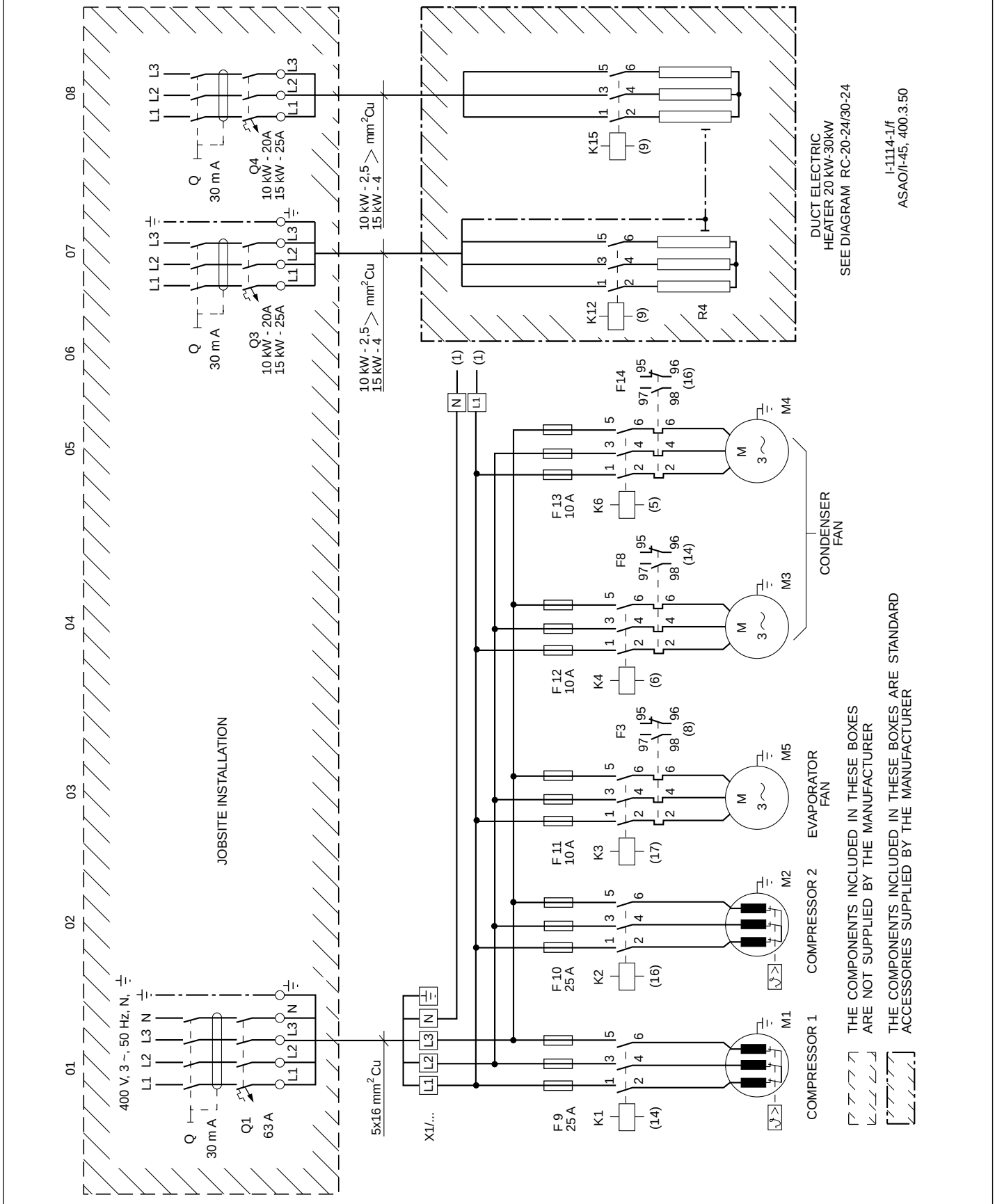
Interconnection diagram

ASAO/I-45, 400.3.50



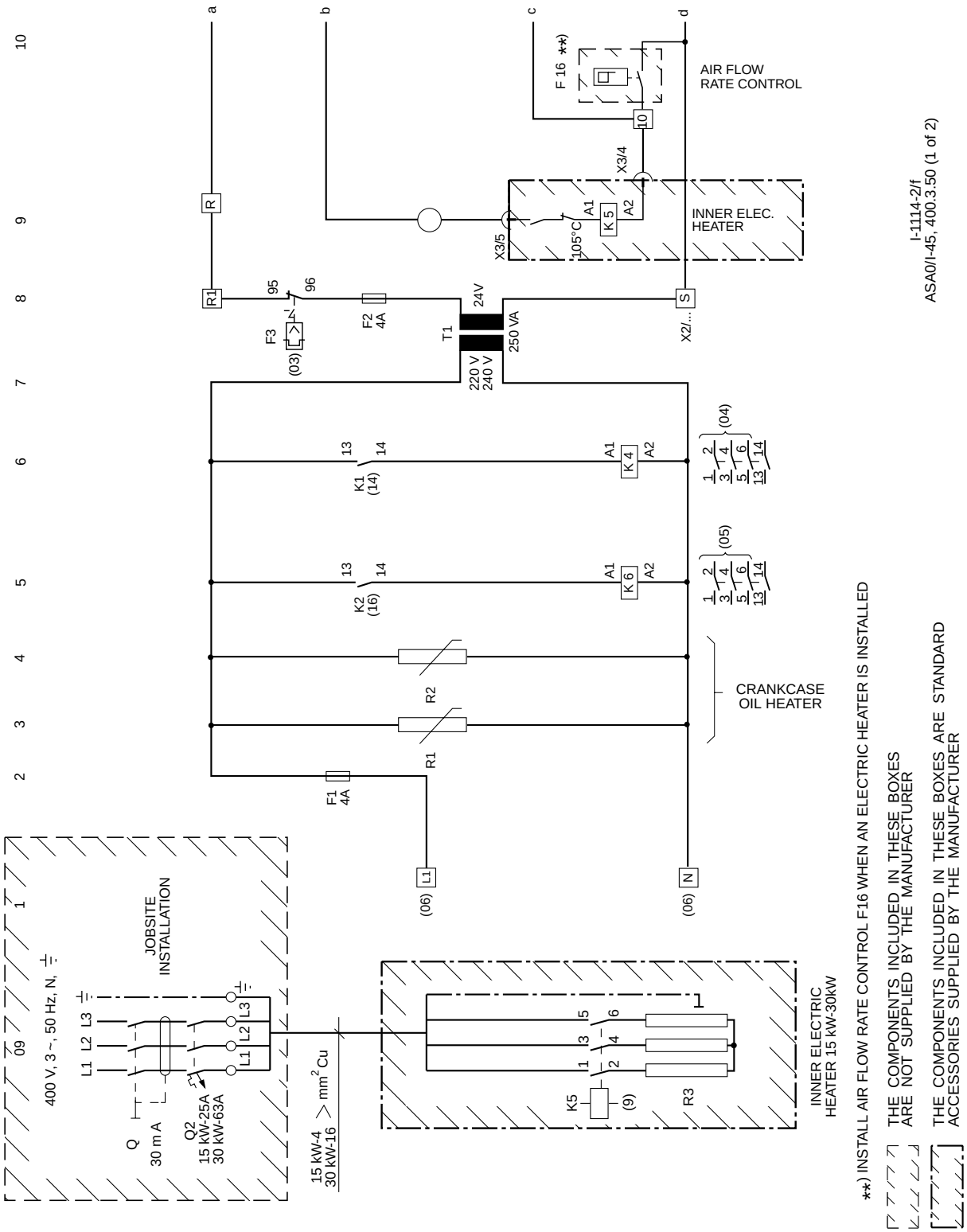
Power diagram

ASAO/I-45, 400.3.50



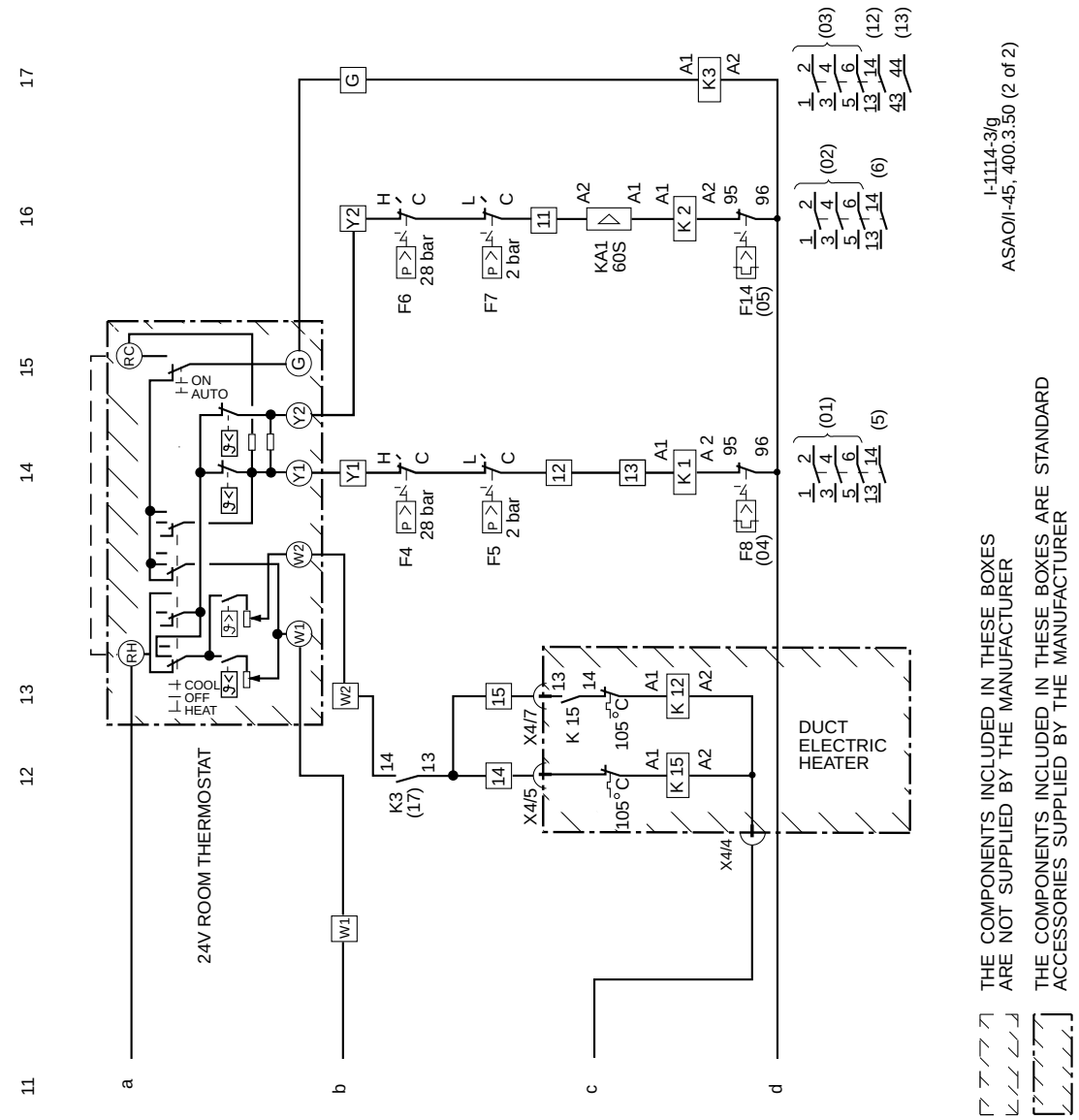
Main diagram

ASAO/I-45, 400.3.50 (1 of 2)



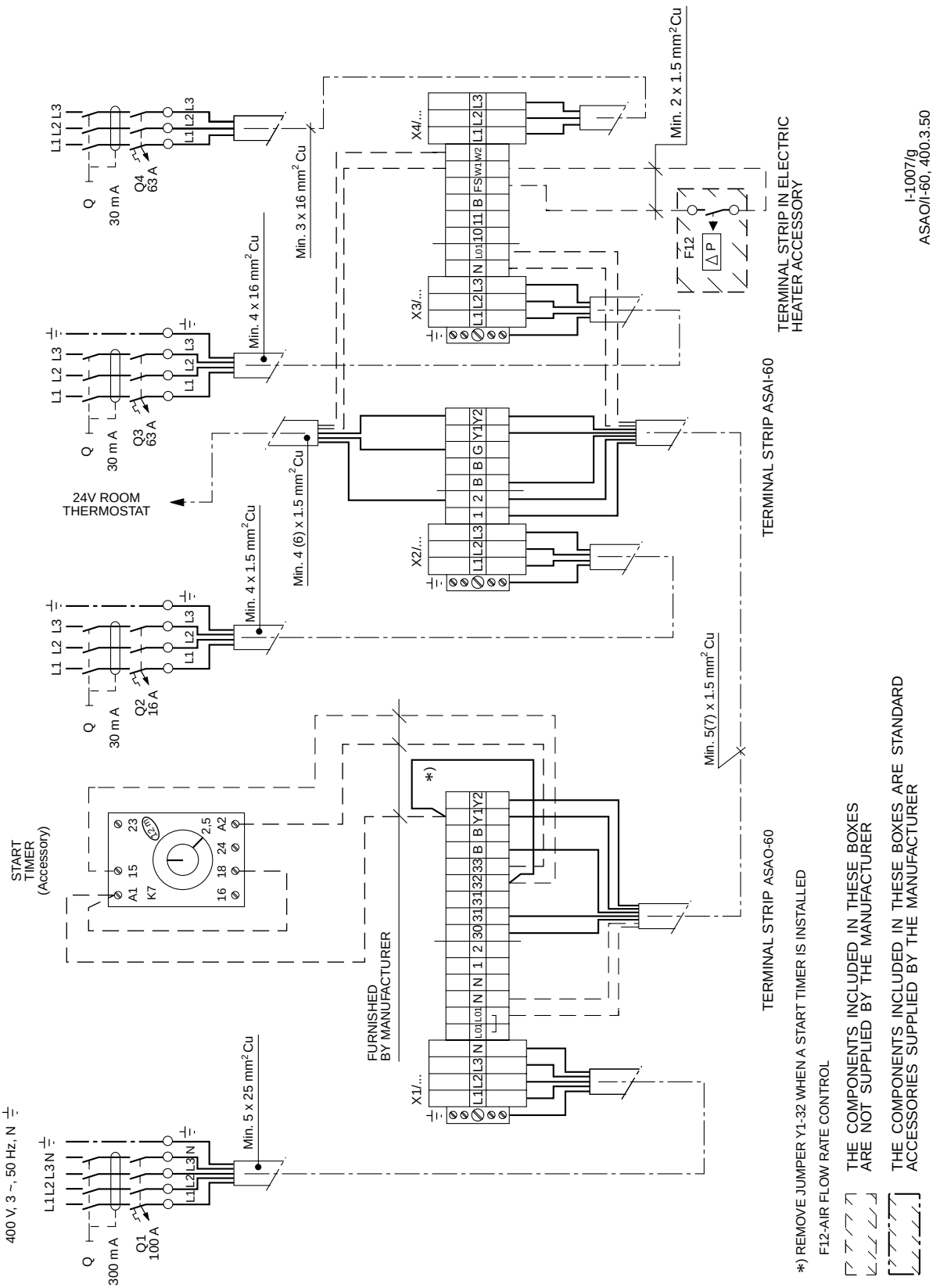
Main diagram

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



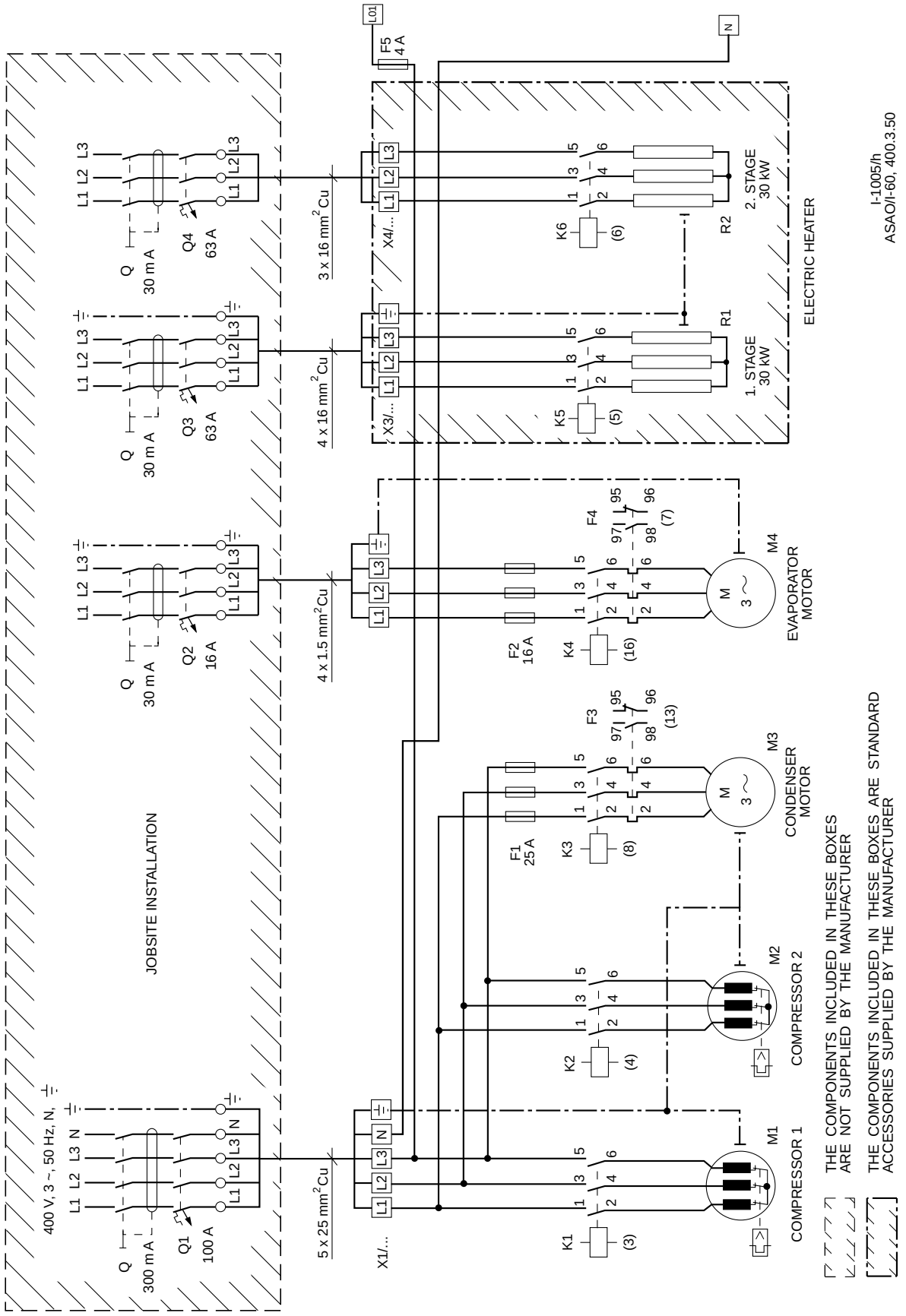
Interconnection diagram

ASAO/I-60, 400.3.50



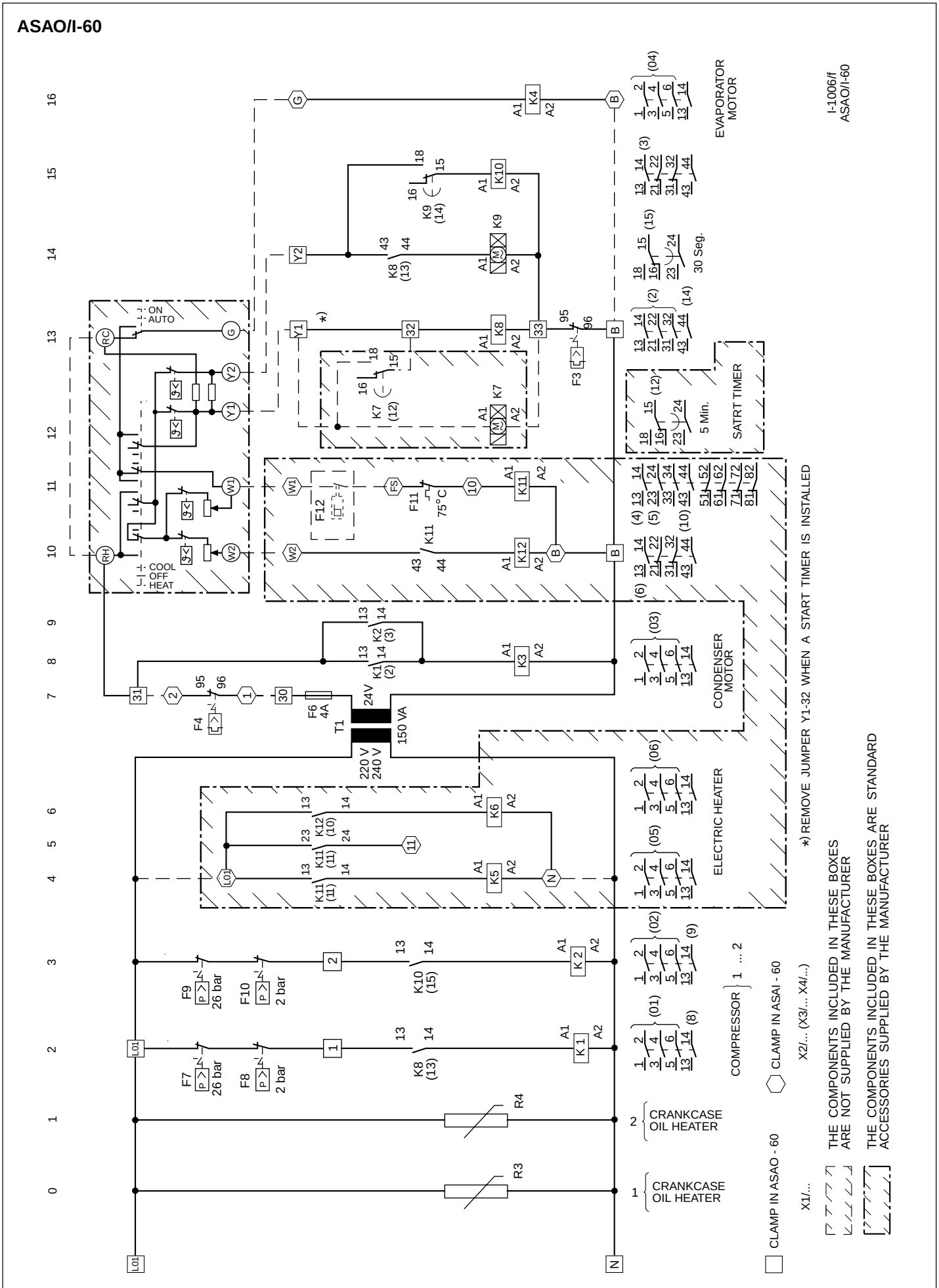
Power diagram

ASAO/I-60, 400.3.50

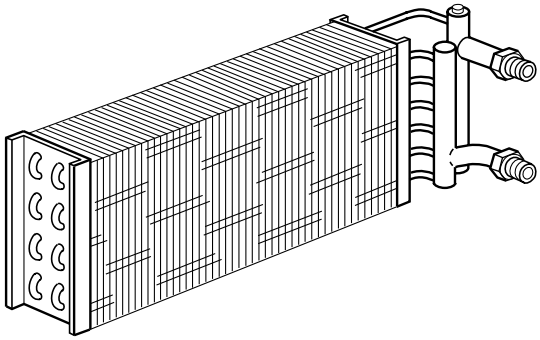


Main diagram

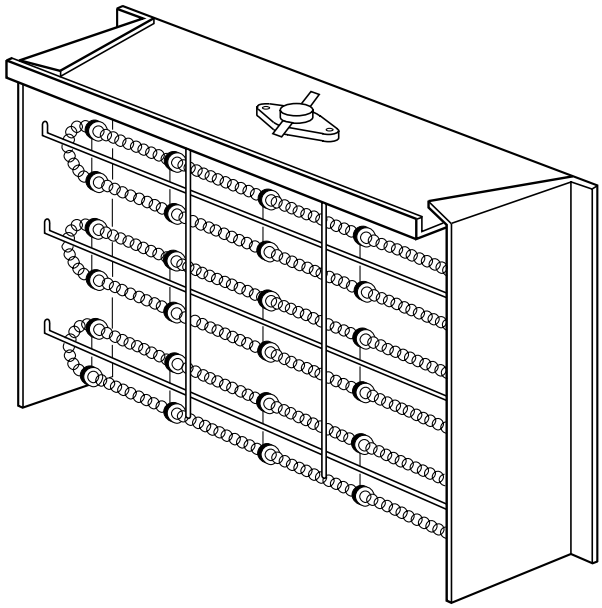
ASAO/I-60



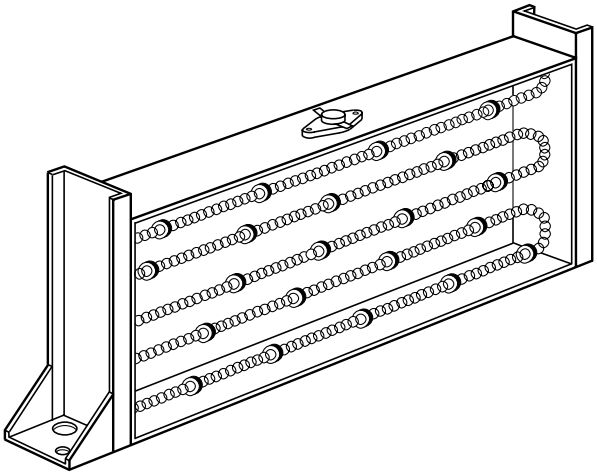
Optional accessories for the ASAI model conditioners



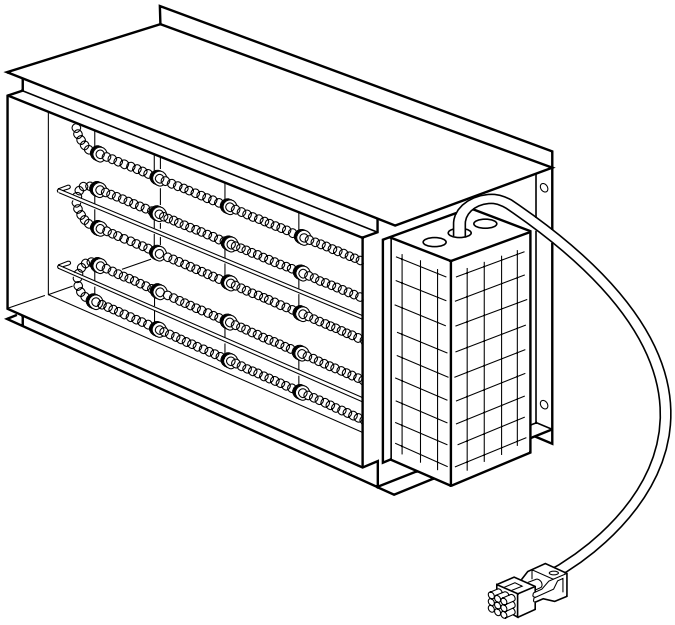
Hot water heating coil
ASAI-25, 30 & 45



Inner electric heater
ASAI-25, 30 & 45



Inner electric heater
ASAI-60



Duct electric heater
ASAI-25, 30 & 45

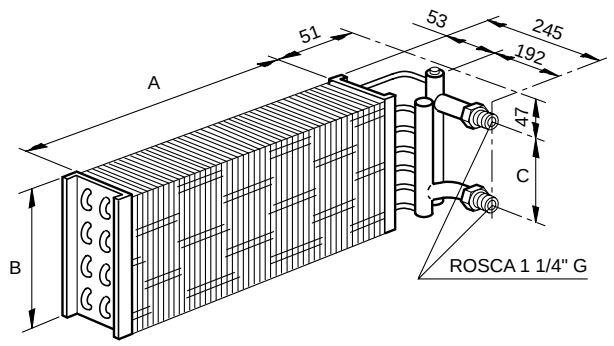
Table of standard accessories

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
ASAI-25	1 069	458	340
ASAI-30	1 312	534	416
ASAI-45	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^2	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^3/h	m^3/s	kW	mm WK	Pa
ASAI-25	5 130	1,42	40,7	3,9	38,2
ASAI-30	7 500	2,08	59,3	4,4	43,0
ASAI-45	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^3/h	1,00	1,30	1,50	2,00	2,50	3,00	3,50	4,00	4,50	5,00	6,00	7,00
	l/s	0,28	0,36	0,42	0,56	0,69	0,83	0,97	1,11	1,25	1,39	1,67	1,94
ASAI-25	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				
ASAI-30	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		
ASAI-45	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 sheel steel chassis designed to fit inside the unit. It is delivered with a thermal protecter 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 provised. The installation of an air flow-rate control is necessary (see electrical diagrams).

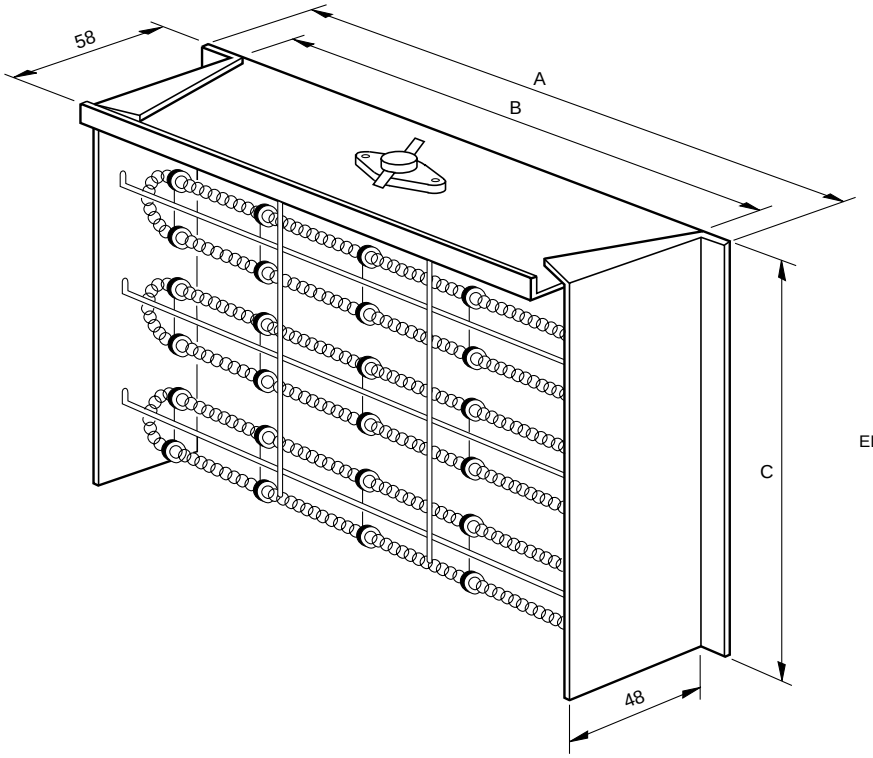
Technical instructions for changing the voltage of the heaters

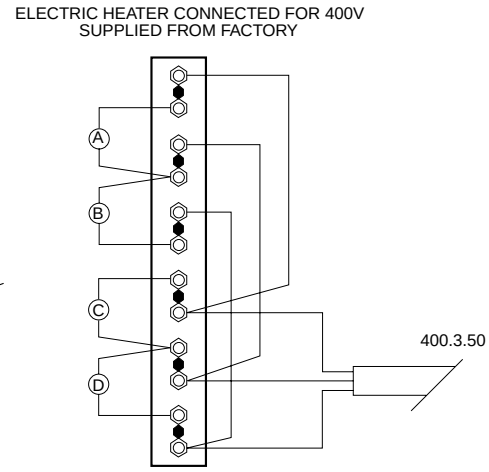
The electric heaters are delivered form the factory connected for a triphasic voltage of 400V. Sizing of the contactors as well as of the power lines have been prepared for a strength corresponding to triphasic 230V.

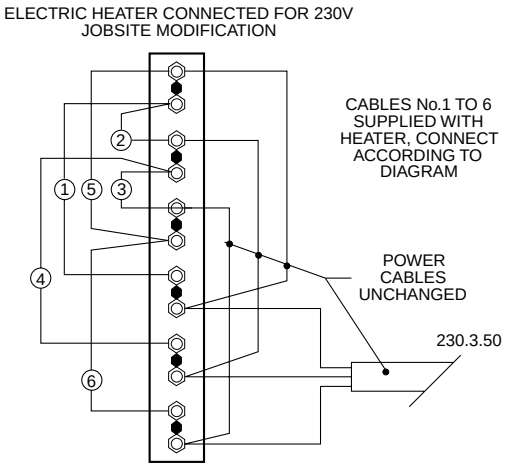
For a power supply of 230V, triphasic, the following modifications will have to be made on site.

- 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.

General dimensions mm







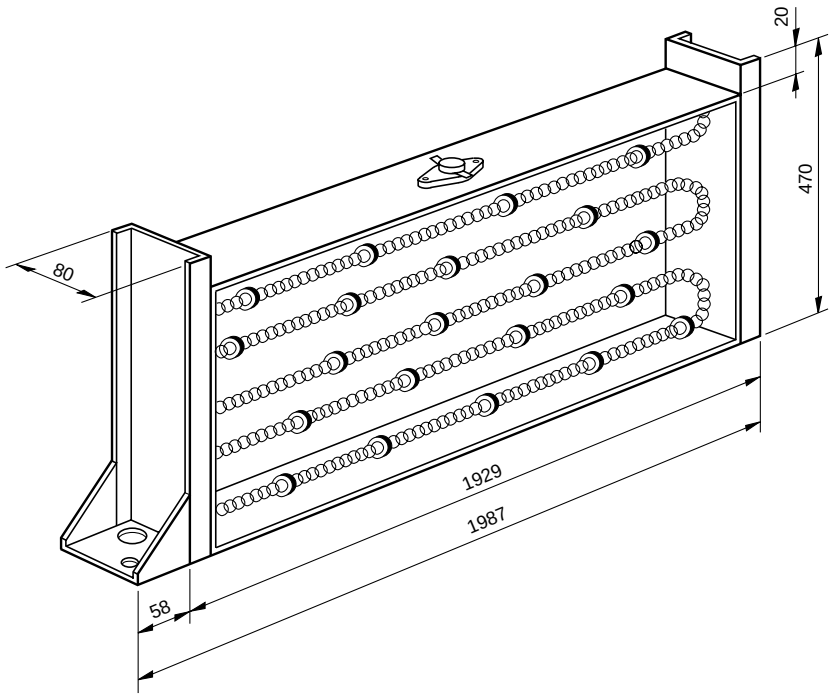
Model	A	B	C
ASAI-25 - 24	1 103	1 069	480
ASAI-30 - 24	1 339	1 305	552
ASAI-45 - 24	1 777	1 743	552

Model	Nominal power kW	Power supply V.ph.Hz.	Nº stages	Packaged dimensions mm
ASAI-25 - 24	10	230.3.50 400.3.50	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 protecter 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 kW	Power supply V.ph.Hz.	N[a] stages	Packaged dimensions mm
ASAI-60 - 24	60	400.3.50	2	510 x 2 405 x 165

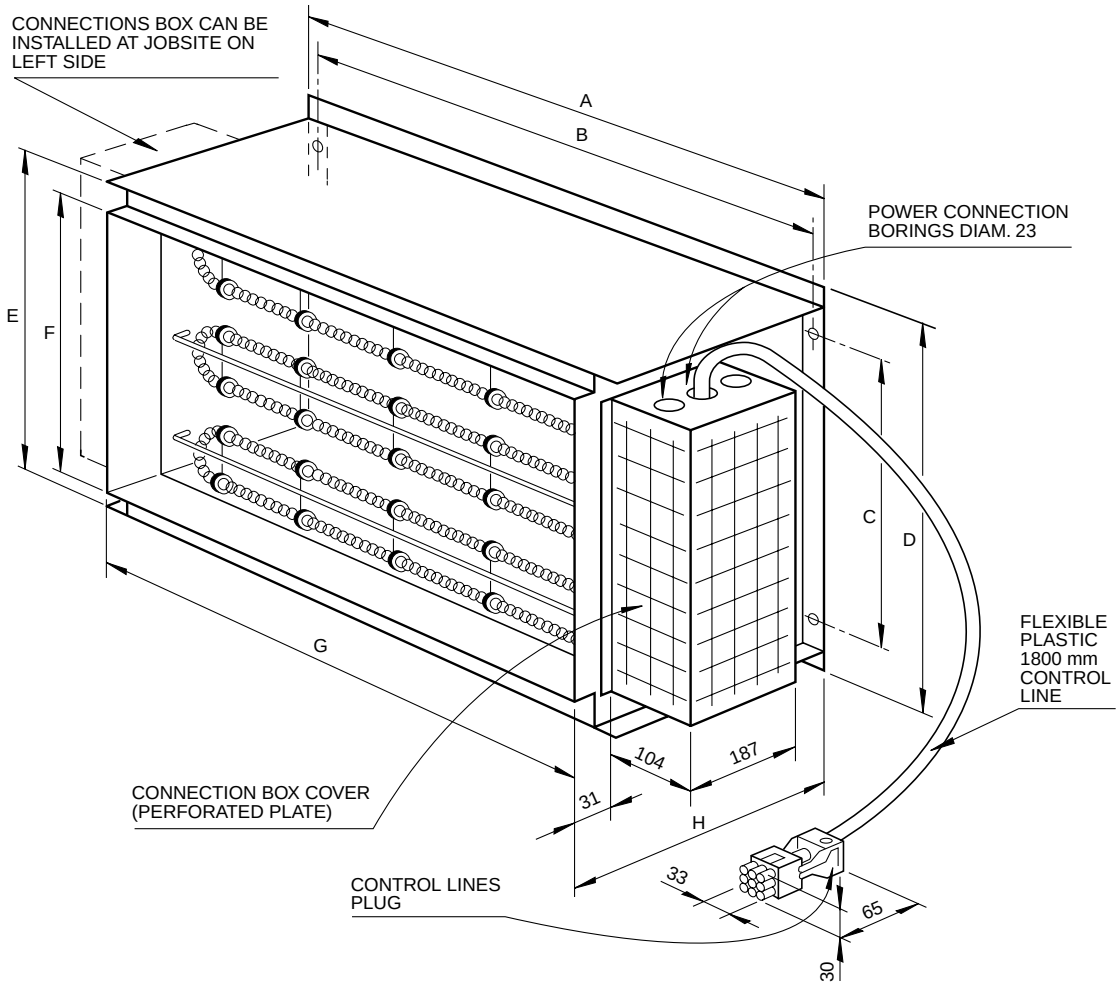
Duct electric heaters RC-24

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.

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