

Institut Municipal de Mercats de Barcelona

Mercat de Sant Antoni

Licitació de les actuacions a realitzar per reduir l'impacte acústic
dels equips de climatització

Gener 2025

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1. ANTECEDENTS

Per l'obtenció de la llicència ambiental del Mercat de Sant Antoni de Barcelona s'han realitzats Mesura de nivells d'immissió sonora en activitats, segons Ordenança de Medi Ambient de l'Ajuntament de Barcelona, en diversos punts de l'edifici, amb resultat desfavorable en dos d'ells degut al funcionament dels equips de climatització.

S'ha realitzat un estudi de l'impacte acústic dels equips de climatització per determinar les mesures necessàries per adequar-se als valors màxims permesos per l'OMA de Barcelona.

2. OBJECTE

L'objecte d'aquesta memòria tècnica es definir les actuacions a realitzar per reduir l'impacte acústic dels equips de climatització amb l'objectiu de licitar la seva execució per part d'una empresa especialitzada.

3. PROMOTOR

El promotor de la reforma es l'Institut I Municipal de Mercats de Barcelona, (IMMB), organisme autònom de l'Ajuntament de Barcelona que s'encarrega de la gestió i l'administració dels mercats municipals de la ciutat

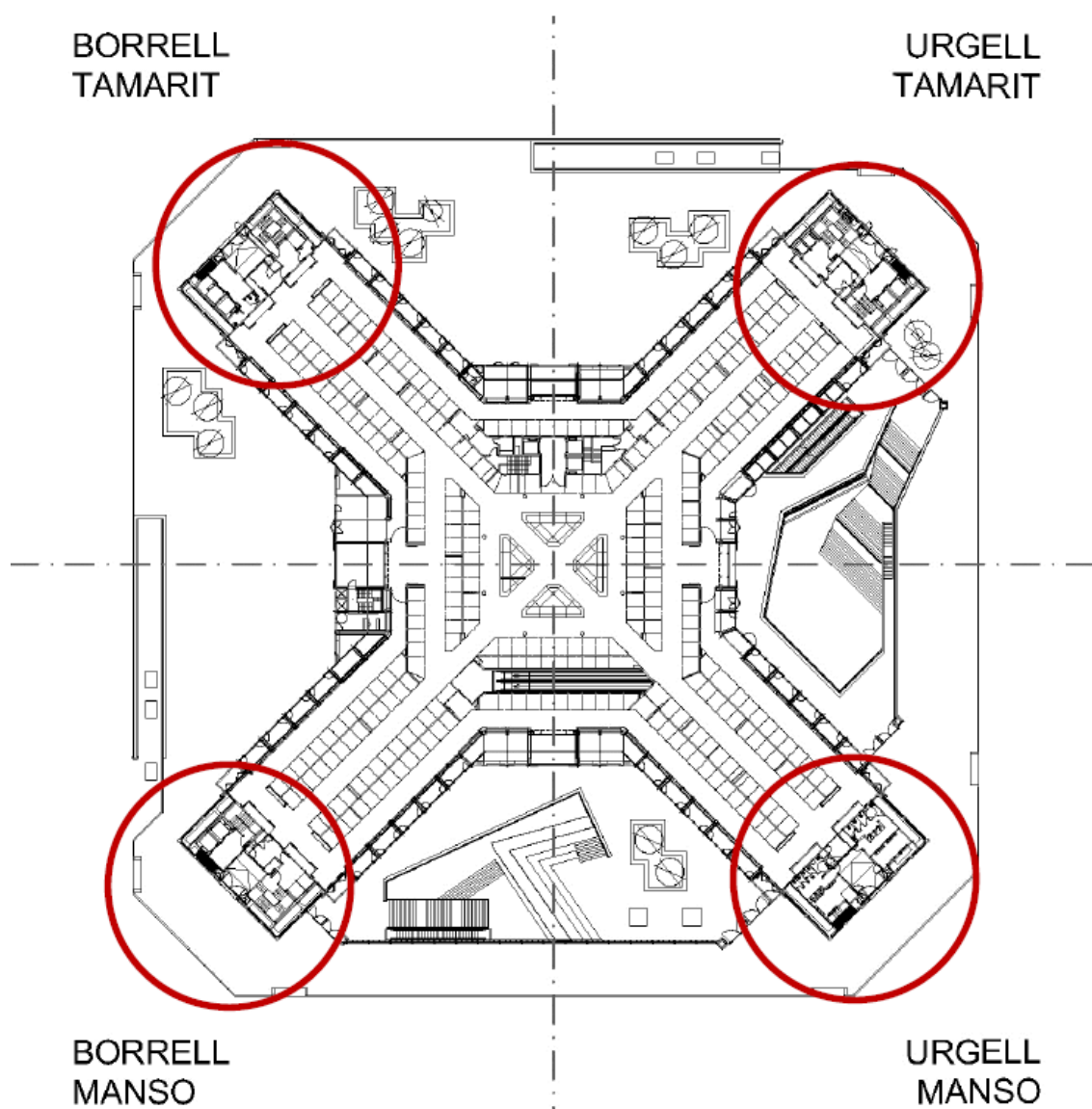
4. EMPLAÇAMENT

El Mercat de Sant Antoni esta situat en:

Comte d'Urgell, 1

08011 Barcelona

Les instal·lacions de climatització estan situades sobre les portes d'accés en les quatre cantonades, on estan situats els nuclis d'instal·lacions. Les afectades per la reducció de l'impacte acústic es corresponen amb els nuclis Borrell – Tamarit (BT) i Borrell – Manso (BM).



5. JUSTIFICACIÓ DE LA ACTUACIÓ

Les sonometries realitzades van registrar nivell nivells d'immissió sonora superiors als 60 db , que es el nivell màxim permès l'OMA en horari diürn, per la en els nuclis de Borrell – Tamarit (BT) i Borrell – Manso (BM). Concretament es van mesurar 64 dBA en BT i 63 dBA en BM. L'objectiu de l'actuació es reduir els nivells d'immissió sonora per sota dels 60 dB

6. DESCRIPCIÓ DE LES INSTAL·LACIONS

Les fonts sonores objecte d'aquesta memòria tècnica son les sales de climatització del situades en els nuclis de Borrell-Tamarit y Borrell-Manso, donat que generen nivells de d'immissió sonora en els habitatges veïns mes pròximes que superen els nivells màxims permesos.

A cadascuna d'aquestes sales de climatització, dos per façana, es troben situades dos unitats de tractament d'aire, UTA, i diverses unitats bomba de calor per aerotèrmia

En Borrell-Tamarit

- Costat dret (vista exterior): 2 unitats d'aerotèrmia
- Costat esquerra (vista exterior): 1 unitat d'aerotèrmia

En Borrell-Manso`

- Costat dret (vista exterior): 1 unitats d'aerotèrmia
- Costat esquerra (vista exterior): 2 unitat d'aerotèrmia

Les UTAs i les aerotermies capten aire fresc a través d'uns patis situats a les cobertes del mercat. Les UTAs expulsen l'aire de retorn per les façanes laterals mentre que les aerotermies expulsen l'aire de condensació per les finestres de les façanes principals de les cantonades. S'ha de tenir en compte que al tractar-se d'un edifici històric i protegit no es pot modificar la façana amb noves obertures i reixes.

L'evacuació de l'aire de les aerotermias no es produeix directament, sinó que es descarrega en uns espais situats entre les sales i les façanes, per on puja l'escala. Sobre les finestres de les façanes s'han muntat uns ventiladors helicoidals per extreure l'aire calent a l'exterior.



Imatge 1. Façana de la cantonada amb dos unitats de climatització a cada costat



Imatge 2. Conduccions dels equips d'aerotèrmia a l'espai intermedi



Imatge 3. Sortida d'aire de les unitats d'aerotèrmia a l'espai intermedi

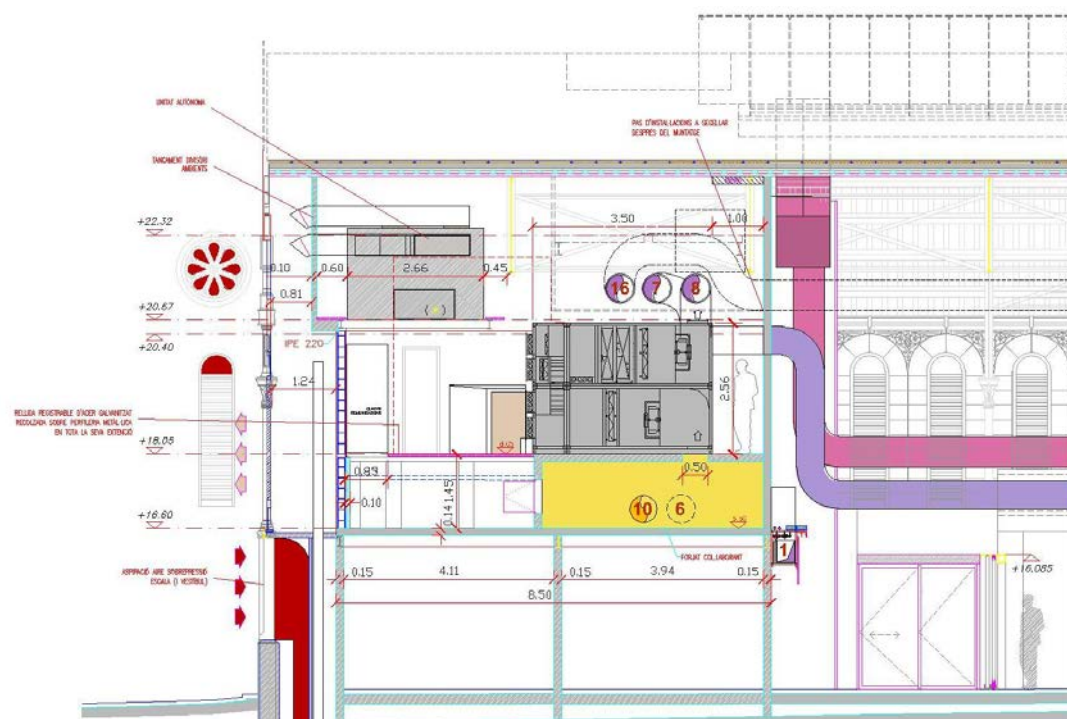


Imatge 4. Ventiladors helicoidals de façana

Es mostra un plano en secció de una sala de climatització amb d'ubicació dels equips i l'espai intermedi entre sala i façana.



Imatge 5. Espai intermedi on s'aprecien els ventiladors i la sortida d'aire d'una aerotèrmia.



Imatge 6. Detall en secció d'una sala de climatització.

7. DESCRIPCIÓ DE L'ACTUACIÓ

Després de consultar amb el fabricant les característiques tècniques de les aerotèrmies s'ha pogut determinar que els seus ventilador de condensació disposen de suficient pressió per permetre la descarrega directa de l'aire a façana degudament conduit.

Es tracta per tant de retirar tres dels quatre ventiladors de cada costat de façana i de embocar els conductes d'expulsió d'aire de les aerotèrmies a les façanes, conduint els conductes. En cada sector es mantindrà un ventilador per evacuar el calor residual.

Les embocadures entre les aerotèrmies i les façanes seran de dimensions suficients per que l'aire no sobrepassi les següents velocitats:

- En conductes: V_{max} : 6 m/s
- En reixes: V_{max} : 4 m/s

Es tindrà que modificar la instal·lació elèctrica i de control per que una vegada retirats els ventiladors les aerotèrmies funcionen correctament, i per mantenir un ventilador per façana.

Una vegada realitzada l'actuació es realitzarà una nova sonometria per part d'una empresa acreditada per comprovar que s'ha assolit els nivells d'immissió sonora.

Pressupost

Codi	Ud	Resumen	CanPres	Pres	ImpPres
01		REDUCCIÓ EMISIÓ ACUSTICA	1	62.076,60	62.076,60
0001	u	Desmuntatge ventiladors	10,00	415,80	4.158,00
		Desmuntatge de ventiladors helicoidals instal·lats a l'espai entre façanes i sala de màquines. Inclòs retirada de línies d'alimentació elèctrica, farratges de subjecció i elements auxiliars necessaris per a la realització dels treballs.			
0002	u	Desmuntatge planxes d'acer	12,00	598,92	7.187,04
		Desmuntatge de planxes d'acer en reixes de façana. Incloent tall amb disc de les planxes, repassos de pintura necessaris, i elements auxiliars necessaris per a la realització dels treballs.			
		Veure els plànols			
0003	u	Embocadura i plenum	6,00	3.840,00	23.040,00
		Subministra i col·locació de conducte par l'embocadura des de conductes existent i plenum en reixes de façana fabricat amb planxes de fibra de vidre i vel acústic tipus Climaver Neto. Inclús p.p. d'elements de fixació, suports i mitjans auxiliars de muntatge, peces auxiliars d'unió. Totalment instal·lat.			
		La partida inclou el conjunt de conductes des de la unitat aerotèrmia fins els los plenums en façana.			
		La secció total de l'embocadura de cada màquina d'aerotèrmia no serà inferior a 1,1 m2.			
		Veure els plànols			
0004	PA	Ajudes de paleta	1,00	10.340,16	10.340,16
		Desmuntatge de pladur per accés a zones de treball.			
		Treball a realitzar en les quatre zones d'actuació			
0005	PA	Estructura auxiliar	1,00	7.879,68	7.879,68
		Estructura auxiliar per el muntatge dels conductes.			
		Treball a realitzar en les quatre zones d'actuació			
0006	u	Seguretat i salut	1,00	1.651,20	1.651,20
		Pla de seguretat i salut, segons el real decreto 1627/1997 de 24 d'octubre, pel que s'estableixen disposicions mínimes de seguretat i salut en les obres de construcció, mitjançant la redacció pel contractista del pla de seguretat i salut, per la seva aprovació per part de direcció facultativa y/o, coordinador en matèria de seguretat i salut, avans de l'inici de les obres. S'inclou la dotació d'epis necessaris per el desenvolupament de les obres. S'inclou les mesures de protecció, seguretat, salut i higiene individuals i col·lectives.			
0007	PA	Línies de vida	1,00	887,40	887,40
		Línies d'ancoratge horitzontal permanent, de cable d'acer, sense amortidor de caigudes. Inclús postes repartits en tota l'extensió.			
		Treball a realitzar en les quatre zones d'actuació			
0008	PA	Probes de funcionament i posada en marxa	1,00	436,68	436,68
		Probes de funcionament i posada en marxa segons RITE			
0009	PA	Señalització i etiquetat	1,00	310,08	310,08
		Senyalització i etiquetat dels elements del sistema de climatització.			
0010	PA	Sonometria	1,00	1.620,00	1.620,00
		Realització de sonometria por parte de empresa especializada			
0011	PA	Informe	1,00	4.566,36	4.566,36
		Realització d'informe d'idoneïtat tècnica per par d'empresa d'inspecció i control			
		Total 01	1	62.076,60	62.076,60
		Total PEM	1	62.076,60	62.076,60
		13% Despeses Generals			8.069,96
		6% Benefici Industrial			3.724,60
		SUBTOTAL			73.871,15
		21% IVA			15.512,94
		TOTAL PRESSUPOST PER CONTRACTE			89.384,09

Air-Air Reversible, VITALITY Series

VCH 20A to 90A

VIR 25A to 90A

Ref.: N-27718 1208M

Technical Information



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General Information

General description

The VITALITY series models are reversible air-air units, with centrifugal fans both in the indoor as well as the outdoor units.

The VCH unit includes compressor, condensing unit, centrifugal fan, controls and the DPC-1 thermostat. The VIR indoor units include evaporating coil, air filter and centrifugal fan. If necessary, the standard version supplied can be modified at the job site so as to achieve a compact unit.

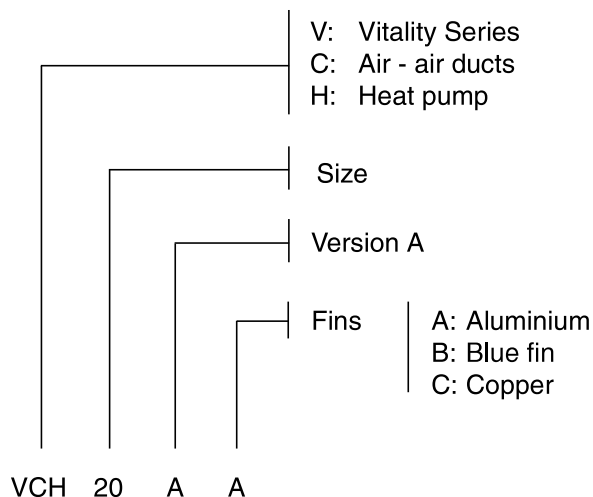
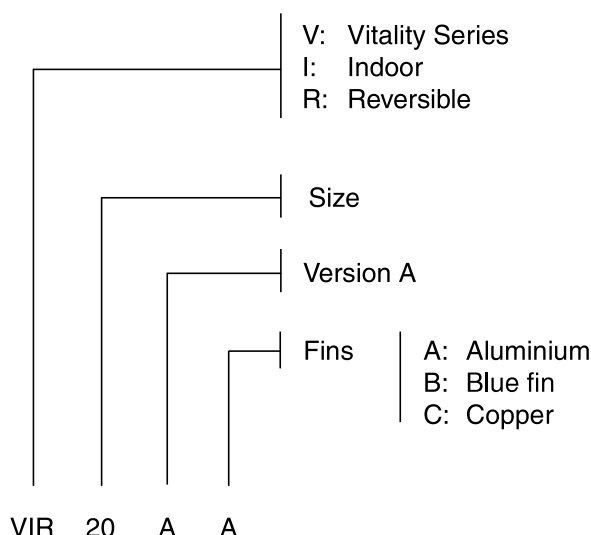
The unit can be located both indoors as well as outdoors since it is protected to withstand outdoor environmental conditions, plus the fans are of the centrifugal type and thus accept ducts.

Supplied completely equipped and factory tested.

Designed to achieve significant energy savings and a long operating life.

Commissioning and automatic temperature control are carried out by means of the 24-volt ambient thermostat.

Nomenclature



Technical Specifications

Mechanical specifications

Compressor

Of the vertical leak-tight type mounted on antivibratory supports, specially designed for heat pump units with over sizing of mechanical components low consumption motor.

The VCH 20A, 25A, 30A and 40A units have one single compressor; the VCH 45A, 60A, 75A and 90A units have two compressors with two independent circuits.

Supplied with a POE oil charge that avoids foaming, and an oil heating element.

Compressor resistance

Keeps the oil in the sump hot to facilitate start-ups and avoid oil leaving the compressor.

Suction accumulator

Coupled to the suction pipe of the compressor, protects same against slugging.

Coils

Of a large surface, made of copper tubing and aluminium fins. Located inside the cabinet, these are totally protected against damage during transportation or installation. As an option, these can be supplied with Blue Fin or copper fins.

Indoor fan (VIR 25A)

The unit is equipped with a centrifugal fan driven by an independent motor and a belt drive.

Indoor fan (VIR 40A, 45A, 60A, 75A and 90A) and outdoor fan (VCH 20A, 25A, 30A and 40A)

The units are equipped with two centrifugal fans with a common shaft and a belt drive, driven by one single motor and coupled to one single plenum.

Outdoor fan (VCH 45A, 60A, 75A and 90A)

The unit is equipped with two independent centrifugal fans. Each one is driven by an independent motor and coupled to one single plenum.

The fan motor is belt driven.

These fans have sufficient available pressure for installing ducts and optional accessories.

Cooling circuit

Made of welded copper tubing and equipped with access connections to the high and low pressure sides. Equipped with cut-off valves on the suction side. These are used at the factory to protect the compressor during the pressure test at 45 bar that all units are subject to obligatorily.

Refrigerant

The VCH and VIR units are supplied with the connections ready for welding. The refrigerant charge should be done fully at the job site. See refrigerant charges in the physical data table.

Control panel

Accessible directly from the outside by means of 1/4 turn locks. Includes: connecting strip, protectors, electronic board and probes, power supply contactors, operating relay, phase control relay and transformer. Complies with the European standards in force. Degree of protection, IP44.

Phase control relay

The control panel of the unit introduces a sequence and phase failure detector if it detects a phase sequence other than R-S-T; or, once the unit is in operation, if there is a phase failure the detector, by means of an internal volt-free contact, will disconnect the power supply to the main board of the unit, leaving same inoperative.

If the phase sequence is correct but the centrifugal fan of the indoor unit (VIR) rotates in the opposite direction, interchange two phase at the bottom of the fan contactor.

Filter-dryer

Coupled to the cooling circuit to protect the components of same against humidity and particles that could be in the refrigerant.

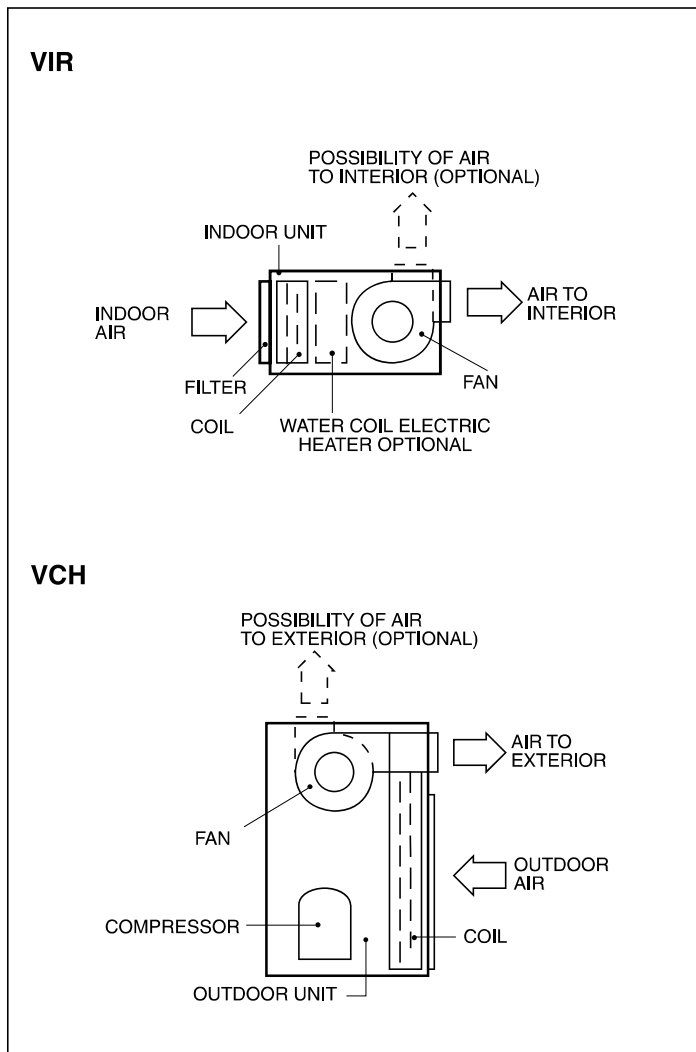
Casing

Made of aluminium zinc-coated steel sheeting, with priming and enamelled with oven polymerized powdered paint; colour RAL 9002, with a quality finish (800 H.N.S. DIN 50021) to guarantee a long operating life of the machine. This allows installing the machine outdoors.

Internal electric heaters (optional)

Of the open air type that allow quick heat dissipation, avoiding the temperature inertia that could affect the components.

Operating diagram



Thermostat

The VCH 20A to 90A units include, as standard equipment, the DPC-1 thermostat. To connect the thermostat to the board, screened 10 x 0.22 mm² communication cable should be used.

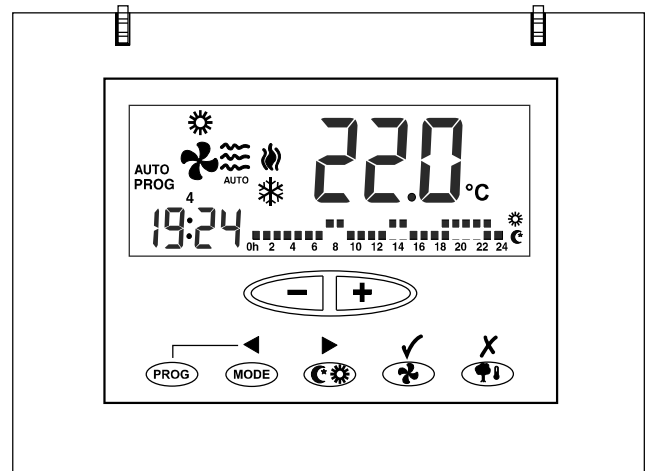
DPC-1 ambient thermostat

Programmable digital thermostat with communication

This thermostat was designed to give close control of the ambient temperature and graphic information regarding the mode it is currently operating in. This control unit, in accordance with the differential between the programmed temperature and the ambient temperature, responds by varying the on/off cycles.

The liquid crystal display (LCD) normally indicates the ambient temperature, operating mode and whether the system is in heat or cool.

It allows selecting different set point temperatures for cool and heat, besides choosing between °C and °F on the display. Fan operation can be in continuous or automatic mode, off or in operation along with the compressor.



International YKtool

The YKtool device is a portable diagnostic and test system for air conditioning units based on the YKtool system. This comprises displaying the main variables of the system as well as the possibility of activating the different stages in diverse modes.

- ① Maintenance
- ② Accessories
- ③ Inputs
- ④ Outputs
- ⑤ Temperatures
- ⑥ Cool test
- ⑦ Heat test
- ⑧ Defrost test
- ⑨ Language



YKphone 485

This is a device designed for the remote supervision, monitoring and diagnosis of installations with air conditioning units (supermarkets, factories, cinemas, etc.). Equipped with an RS485 controller for communication with machines with YKlon boards (version 3.0), and another RS232 controller for communication with the PC.

Allows connecting a maximum of 16 units with YKlon boards. It is necessary to use the accessory RS485 Board, code 006791239, with each unit and configure microswitch SW1 in accordance with the direction of the network.

For communication of the installation with the PC, it is necessary to install the YKViewerIP software.



Physical data

Condensing units

Model		VCH 20A	VCH 25A	VCH 30A	VCH 40A	VCH 45A	VCH 60A	VCH 75A	VCH 90A
Compressor	Amount	1	1	1	1	2	2	2	2
	Nominal power kW	4.9	6.4	7.9	10.5	2 x 6	2 x 8.1	2 x 10.7	2 x 13.4
	Power supply V.ph.Hz	400.3.50							
	Degree of protection IP	21							
Outdoor fan	Nominal power kW	1.5	1.5	3	3	2 x 2.2	2 x 2.2	2 x 4	2 x 4
	Power supply V.ph.Hz	400.3.50							
	Degree of protection IP	55							
	Motor rpm	1 400							
	Turbine diameter (x 2) mm	270	270	320	320	380	380	380	380
	Turbine width (x 2) mm	270	270	320	320	380	380	380	380
Motor pulley	Primitive type/diameter	SPZ / 100		SPZ / 90		SPZ / 100		SPZ / 90	
	No. channels/shaft diam. (No. of pulleys)	2 / 24		2 / 28		2 / 24 (x 2)		2 / 28 (x 2)	
Fan pulley	Primitive type/diameter	SPZ / 150		SPZ / 140		SPZ / 200		SPZ / 170	
	No. channels/shaft diam. (No. of pulleys)	2 / 20		2 / 25		2 / 25 (x 2)		2 / 25 (x 2)	
Belts	Type	SPZ		SPZ		SPZ		SPZ	
	Dimensions	1 010 (x 2)		1 075 (x 2)		1 262 (x 4)		1 200 (x 4)	
Outdoor coil	Amount	1	1	1	1	2	2	2	2
	Pipes, depth x height	5 x 37	5 x 37	5 x 40	5 x 40	5 x 42	5 x 42	5 x 48	5 x 48
	Pipes, diameter	3/8"							
	Surface m ²	1.01	1.01	1.47	1.47	2 x 1.02	2 x 1.02	2 x 1.44	2 x 1.44
Dimensions with packing	Height mm	1 413	1 413	1 546	1 546	1 660	1 660	1 814	1 814
	Width mm	1 460	1 460	1 838	1 838	2 340	2 340	2 760	2 760
	Depth mm	890	890	880	880	880	880	1 000	1 000
Approximate weight	Nett kg	285	310	355	375	578	589	710	715
	Gross kg	290	314	360	380	582	593	715	720

Indoor units

Model		VIR 25A	VIR 40A	VIR 45A	VIR 60A	VIR 75A	VIR 90A
Indoor fan	Nominal power kW	0.75	1.5	1.5	2.2	3	4
	Power supply V.ph.Hz	400.3.50					
	Degree of protection IP	55					
	Motor rpm	1 400					
	Turbine diameter mm	320	320 (x 2)	320 (x 2)	320 (x 2)	380 (x 2)	380 (x 2)
	Turbine width mm	320	240 (x 2)	320 (x 2)	320 (x 2)	380 (x 2)	380 (x 2)
Indoor coil	Amount	1	1	1	1	1	1
	Pipes, depth x height	4 x 21	4 x 25	4 x 29	4 x 29	5 x 32	5 x 32
	Pipes, diameter	3/8"					
	Surface m ²	0.57	0.84	1.40	1.40	1.76	1.76
EU3 filters	Amount	3	3	3		3	
	Dimensions	365 x 543 x 24	447 x 616 x 24	640 x 715 x 24		547 x 789 x 24	
Dimensions with packing	Height mm	760	825	925	925	1 000	1 000
	Width mm	1 470	1 850	2 350	2 350	2 760	2 760
	Depth mm	1 020	1 020	1 020	1 020	1 120	1 120
Approximate weight	Nett kg	128	173	223	223	310	312
	Gross kg	152	198	250	250	340	342

Installation Instructions

Inspection

Upon reception, inspect the goods and notify the carrier and the insurance company, in writing, of any possible damage.

Environmental protection



Packing

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

Refrigerant

During installation and maintenance, keep in mind that HFC-410A with POE oil is used.

Contains greenhouse effect fluorine gas covered by the Kyoto Protocol.

For the type of gas and amount per system, please see the identification plaque.

GWP (Global Warming Potential): 2088.

Elimination of the unit

Upon disassembly of the unit, the components should be recuperated ecologically. The cooling circuit is full of refrigerant that should be recuperated and returned to the gas manufacturer for recycling.

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

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

Safety

Installation and maintenance servicing of this air conditioning system should be carried out by qualified and expert personnel only.

Maintenance servicing, such as cleaning coils and air filters, should be carried out regularly to maintain optimum performance of the units.



CAUTION

This unit should be installed and used in compliance with:

- Low voltage electro technical regulations.
- Safety regulations for cooling plants and installations.
- Pressure device regulations.
- Basic building regulations.
- Local regulations.

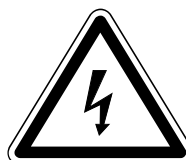
Transportation

The units should always be transported in vertical position so as to avoid oil dripping from the compressor.

If, for any reason, this position need be changed sporadically, they will remain in that position a strictly necessary period of time only.

Warning signs

The following signs indicate the existence of potentially dangerous conditions for users or maintenance service personnel. Whenever found on the unit, take the meaning of each one into account.



This symbol indicates an electrical risk or danger.



Caution: The unit is equipped with a remote control system and can start up automatically.

Before accessing the interior of the unit, disconnect the power supply so as to avoid any contact with the fan turbine in motion.



Caution: Fan in operation.



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



Caution: Do not touch hot surfaces.



Attention: Pulley and belt drive.



Attention: Possible gas leak due to inadequate handling.

Location of VIR 25 to 90A indoor units

Locate the unit preferably near a wall leading to the exterior so as to make installation, maintenance and draining easier.

Location of VCH 20 to 90A outdoor units

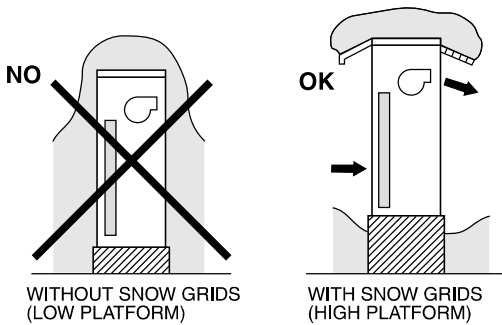
The location of these units should be chosen anticipating a permanent access for maintenance servicing, either through the side panels or the rear panel.

The outdoor unit can be installed directly in exteriors. If installed in interiors, basements, attics, etc., the outdoor air and extraction ducts must be connected.

When installing in interiors, keep in mind that in the summer operating cycle, the outdoor coil condenses a large amount of water that must be evacuated through the drain.

The possibility of an obstruction of the drain by foreign elements, dust or dirt.

Areas where it snows regularly. If the unit is installed outdoors and at ground level, it should be raised on supports so as to avoid accumulations of snow obstructing air flow. These supports should be above the height the snow reaches normally. It is convenient to install anti-snow grids.

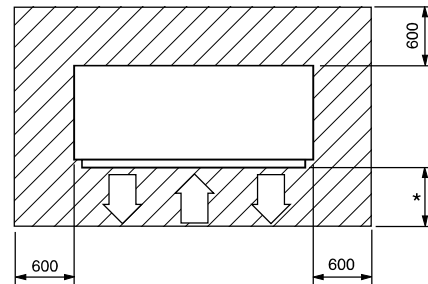


Clearances

When installing each unit, clearances should be left for:

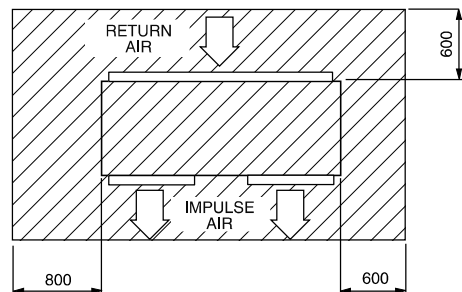
- Air intake and discharge of the outdoor unit.
- Connection of the drain pipes and wiring.
- Air ducts.
- Maintenance servicing.
- Power supply connections.

VCH



- * Return air without ducts (minimum clearance 600 mm)
- Return air with ducts (no clearance needed)

VIR



Fastening the indoor unit to the ceiling

When fastening, make sure it is completely horizontal, or very slightly tilted towards the drain, so as to avoid possible condensed water leaks (use a bubble level).

It is extremely important to be very careful with the support of the indoor unit on the ceiling.

Make sure the ceiling is strong enough to support the weight of the unit.

Before hanging, check the strength of each suspension bolt installed.

Outdoor unit air ducts

- 1.- Connect the ducts, isolating them from the unit by means of a flexible hose, preferably of non-flammable material, so as to avoid the transmission of vibrations of the unit. If the ducts are made of flexible material, they do not transmit vibrations.
- 2.- On units VCH 45A, 60A, 75A and 90A, two different ducts must be installed, one for each fan up to the discharge, to avoid the recirculation of air.
- 3.- If the outdoor air coil air discharge is carried out through the ducts, it is convenient to have the first 1-meter section made of galvanized sheeting so as to avoid deterioration due to a possible creeping of drops.

Indoor unit air ducts

- 1.- Connect the ducts, isolating them from the unit by means of a flexible hose, preferably of non-flammable material, so as to avoid the transmission of vibrations of the unit.
If the ducts are made of flexible material, they do not transmit vibrations.
- 2.- It is recommendable to install a damper at each by-pass of the discharge duct for the purpose of carrying out a correct balance of the system.
- 3.- Leave easy access for cleaning and changing the air filters.

Drain connections, VCH 20 to 90A outdoor unit

Install the drain pipes of each tray through a siphon.

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

The unit connections are made of copper piping with an exterior diameter of 28.5.

Attention:

When the heat pump is operating at outdoor temperatures of less than 5° C, the drain pipe could be obstructed due to freezing.

So, if installed in exteriors, it is convenient to take this possibility into account, installing an electric heater at the drain connection and around the antivibratory elements of the

compressor, connecting same electrically as per the diagrams herein.

Drain connections, VIR 25 to 90A indoor unit

It is necessary to connect a condensed water drain pipe to the evaporating unit.

Install the drain pipe through a siphon.

Leave a minimum level difference of 25 mm. between the height of the unit connection and the line after the siphon.

An access must be left so as to fill the siphon with water at the beginning of each season.

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

Insulate the condensed water drain pipe so as to avoid leaks and damaging the floor.

Drain pipe insulation

Insulate the condensed water drain pipe so as to avoid leaks and damaging the floor.

Make sure water evacuation is being carried out correctly.

Interconnecting units

The installation of a unit comprises:

- Assembly of the unit.
- Connection of refrigerant pipes.
- Wiring of the unit.

When installing Split units, make sure the cooling circuit is completely sealed after assembly, for the purpose of avoiding leaks.

This will contribute to achieving maximum performance with minimum consumption, and will avoid serious damage to the unit. Furthermore, this is an ecological precaution.

Installation of interconnecting pipes

The length of the interconnecting pipes of the units should be as short as possible.

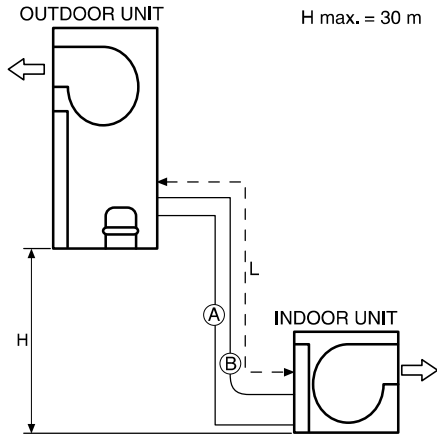
The maximum admissible distances to the circuit and the standard pipe diameter are indicated in the tables and graphs below (without changing the pipe outlet diameter of the units).

When there are horizontal sections of over 20 metres, it is convenient to have the suction line tilt 2% in the direction of the compressor.

- The maximum allowable flow in any section is 15 m/s.
- With the limitations indicated and without changing the diameter of the outgoing unit pipes, no siphons are needed.
- The liquid should have a minimum of 1° C of subcooling at the intake of the expansion valve, so as to avoid accumulation of gas in the ascending liquid lines before entering the expansion system.

- For interconnecting lines of over 25 metres, oil should be added (30 gr/m. of length).

Layout 1 (Outdoor unit up)



- L: Total piping length (vertical + horizontal sections) in course and in one only direction.
H: Vertical distance between units.
A: Cooling liquid line.
B: Cooling gas line.

Pipes to be used

When installing the pipes that join the two units, take special care in checking that the pipes used are kept clean and dry prior to installation.

It is advisable to take the following recommendations into account:

- Use cooling quality copper pipes only (K or L type, S/ASTMB88).
- Do not work outside when raining.
- The ends of the pipes should remain closed throughout the installation.
- Do not leave the filter-dryers nor the compressor out in the open.
- When welding, use low melting point rods. These should contain 5% silver minimum.
- While welding and as long as the pipe remains hot, maintain a current of dry nitrogen so as to avoid rust and scaling inside the pipe. This could cause contamination and obstructions.
- Do not use strippers at the copper-copper joints.
- Connection to the units should be carried out by using the flaring method.

Insulation of refrigerant pipes

Since the interconnecting distribution pipes to the coil are installed in the outdoor unit, both the larger and the smaller diameter pipes are on the relative low pressure side of the system.

Consequently, to avoid condensed water from the pipes dripping on the floor, both must be insulated with adequate insulation. The thickness of same should be at least 8 mm.

Draining and drying

Air does not act as refrigerant because it cannot be liquefied by the compressor.

The air and humidity that remain in the cooling system have undesirable effects, such as those listed below. Consequently, they should be eliminated completely.

- High pressure increases.
- Consumed power increases.
- The performance of the unit decreases.
- The water contained in the air can freeze and block the capillaries.
- Water can cause the corrosion of certain parts of the circuit and the deterioration of the compressor.

Process

In each circuit:

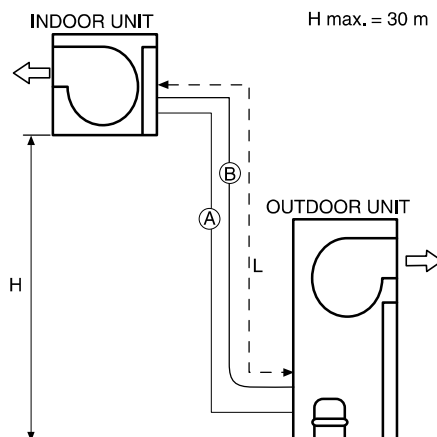
- 1- Connect a vacuum pump and a service pressure gauge.
- 2- Carry out a vacuum of up to 50 microns, minimum.
- 3- Check for leaks.

Refrigerant charge

The refrigerant charge is calculated with a pipe length of 7.5 meters.

See the refrigerant charge in the table below, by models and size.

Layout 2 (Indoor unit up)



- L: Total piping length (vertical + horizontal sections) in course and in one only direction.
H: Vertical distance between units.
A: Cooling liquid line.
B: Cooling gas line.

Refrigerant charge and pipe diameters

Model	Nominal charge R-410A (Kg.)	Number of circuits	Gas line diameter	Liquid line diameter	Additional charge, grs. (per metre)	L Maximum length in straight sections of interconnecting pipes (m)	L _E Maximum equivalent length unit interconnecting pipes (m)
VCH 20A/VIR 25A	8.5	1	1 1/8" (28.5 mm)	1/2" (12.7 mm)	112	50 *	60
VCH 25A/VIR 25A	8.5	1	1 1/8" (28.5 mm)	1/2" (12.7 mm)	112	50 *	60
VCH 30A/VIR 40A	12	1	1 1/8" (28.5 mm)	5/8" (15.87 mm)	170	50	60
VCH 40A/VIR 40A	12	1	1 1/8" (28.5 mm)	5/8" (15.87 mm)	170	50	60
VCH 45A/VIR 45A	9.5 x 2	2	1 1/8" (28.5 mm)	1/2" (12.7 mm)	112	50	60
VCH 60A/VIR 60A	10.5 x 2	2	1 1/8" (28.5 mm)	5/8" (15.87 mm)	170	50	60
VCH 75A/VIR 75A	15 x 2	2	1 3/8" (35 mm)	7/8" (22 mm)	333	50	60
VCH 90A/VIR 90A	16 x 2	2	1 3/8" (35 mm)	7/8" (22 mm)	333	50	60

* Starting from a total of 20 m. in length of straight sections (horizontal and vertical) of interconnecting pipes between units, a minimum 7-litre suction accumulator should be installed in the gas line (of larger diameter).

Maximum length (L): This is the sum of the lengths of all horizontal and vertical straight sections in one single direction (liquid or gas).

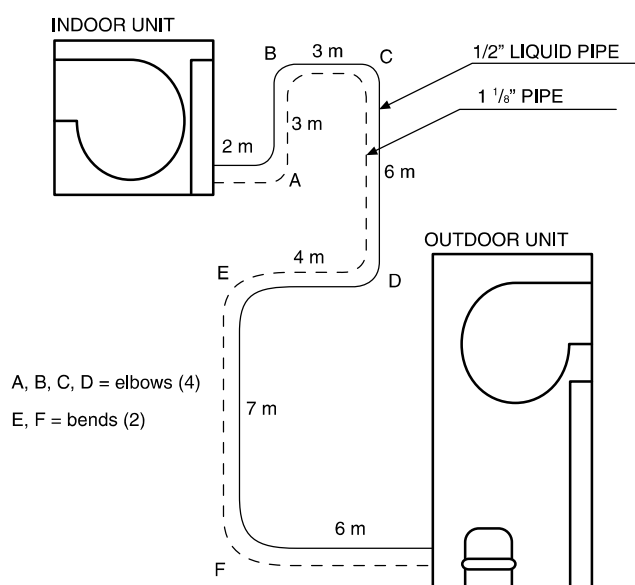
Maximum equivalent length (L_E): This is the sum of the lengths of all straight sections of the interconnecting pipes (liquid or gas) in one single direction, plus the equivalent length of the accessories (basically elbows and bends). The equivalent length due to elbows and bends can be seen in the following table:

Accessory equivalent lengths in meters

Ext. pipe diameter	Elbow (short radius)	90° bend (long radius)
3/8"	0.3	0.2
1/2"	0.4	0.3
5/8"	0.5	0.4
3/4"	0.5	0.4
7/8"	0.6	0.5
1 - 1/8"	0.7	0.6
1 - 3/8"	1	0.7
1 - 5/8"	1.2	0.8

Note: The elbows and 45° bends (used in siphons, for example) have half the equivalent length of the 90° bends.

Example:



$$L = 2 + 3 + 3 + 6 + 4 + 7 + 6 = 31$$

31 < therefore, 50% is correct

To calculate the equivalent length of the interconnecting pipes we use, just as we would for the pressure drop, the data of one of the liquid lines; that is to say 1/2" outer diameter. As we see in the diagram, there are 4 elbows with an equivalent length of 0.5 m. (as per table) and 2 bends of 0.4 (as per table). Therefore, to make sure that the pipe equivalent length is not over the admissible maximum, we have:

$$L_E = 2 + 3 + 6 + 4 + 7 + 6 + 4 (0.5) + 2 (0.4) = 22.8 \text{ m.}$$

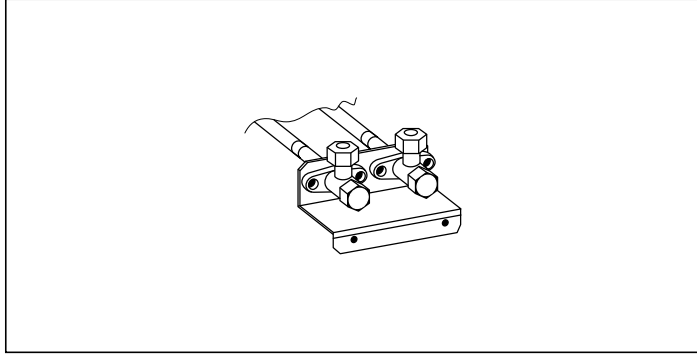
33.8 < therefore, 60 % is correct

Adjusting the refrigerant charge

For lengths over or under 7.5 m., the nominal charge should be increased or decreased by the grams indicated in the corresponding table, depending upon whether the length of the liquid line has been increased or decreased.

Check to see whether the refrigerant is correct by measuring overheating. In normal summer conditions between 5 and 10° K is correct.

Service valves



There are 3/8" suction and discharge service valves that are useful for a quick and correct total drain.

Checking for leaks

Once the charging through the 1/4" nozzles located in the circuit is complete, check for leaks.

Application of R-410A refrigerant

Due to the characteristics of the refrigerant, its evaporation, condensation and discharge temperature, its high operating pressure in the units, and the specific requirements needed for efficient operation (free of humidity and dirt), it is obligatory to have a specialized group of technicians, with a certificate of aptitude, handle the refrigerant.

Wiring

Electrical connections

The **established national regulations** must be followed at all times.

Each unit is supplied with a circuit board to which the power supply is connected by means of a fuse main switch or an automatic switch.

This circuit board includes a phase detector to insure the electric sequence is R-S-T. Should this not be the case, the

electronic control board will not be powered and the unit will not operate. In this case, interchange two of the main power supply intake of the unit.

Connection of the indoor fan VIR 25A to 90A

Should the phase sequence (R-S-T) be correct but the indoor fan turns in the opposite direction, interchange two phases at the bottom of the fan contactor.

Thermostat connection

To connect the thermostat to the control board use a screened 10 x 0.22 communication cable.

Setting the electronic board

For start-up and once the accessories are installed, power the units. To have the electronic board respond in accordance with the accessories installed, press the "test" key for about two seconds, until the red LED goes off.

Selecting cool only operation

To set the VCH outdoor unit in cool only mode set, on the YKlon A1 board, microswitch (S1) No. 5 to position ON. It is necessary to turn the board power supply off to read out the new configuration.

Rotational direction of the Scroll compressors

The Scroll compressors and the fans operate correctly in one single rotational direction. When turning the unit on, make sure the rotational direction is correct.

If it is not correct:

- The compressor does not compress.
- It makes a strange noise.
- The consumption of amperage is reduced.
- Excessive overheating.

All motors are factory wired to rotate in the correct direction.

WARNING

Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected tightly.

Do not power or operate the unit until all pipes and electrical connections are made. Make sure the power supply is connected correctly to the units, as shown in the wiring diagrams.

Limits of use

Model				20	25	30	40	45	60	75	90
Voltage limits		Min./Max.		342 / 457							
Heat pump	Summer cycle	Incoming air temperature to indoor coil	WB ° C min./max.	15 / 23	15 / 23	15 / 23	14 / 23	14 / 23	14 / 23	14 / 23	14 / 23
			DB ° C min./max.	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32	20 / 32
		Outdoor temperature (1) (2)	DB ° C min./max.	10 / 50	10 / 50	10 / 48	10 / 50	10 / 50	10 / 50	10 / 50	10 / 50
	Winter cycle	Incoming air temperature to indoor coil (3)	DB ° C min./max.	10 / 27	10 / 27	10 / 27	10 / 27	10 / 27	10 / 27	10 / 27	10 / 27
		Outdoor temperature (4)	DB ° C min./max.	-20 / 20	-20 / 20	-20 / 20	-20 / 20	-20 / 20	-20 / 20	-20 / 20	-20 / 20

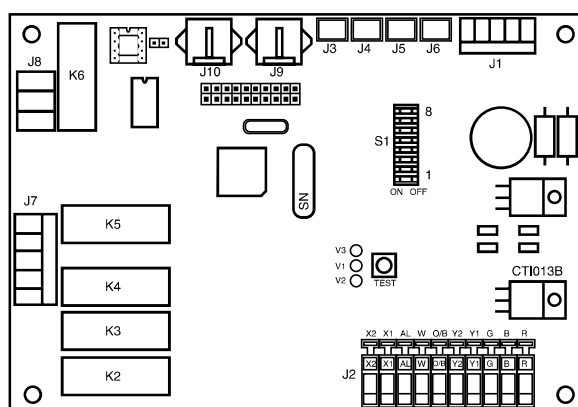
Notes: WB = wet bulb. DB = dry bulb.
 (1) With the condensation control option the limit is -10° C. (2) With nominal indoor and outdoor flows. (3) The units can operate for a short period of time at an indoor temperature of 10° C. (4) Below -10° C, the emergency electric heater or the hot water coil (optional) remain operative.

YKlon control board

The equipment is controlled by means of a resident software in the main board. This system operates in accordance with the position of the microswitches on the main board. The control algorithm also varies in accordance with the accessories detected by the board and installed on the unit.

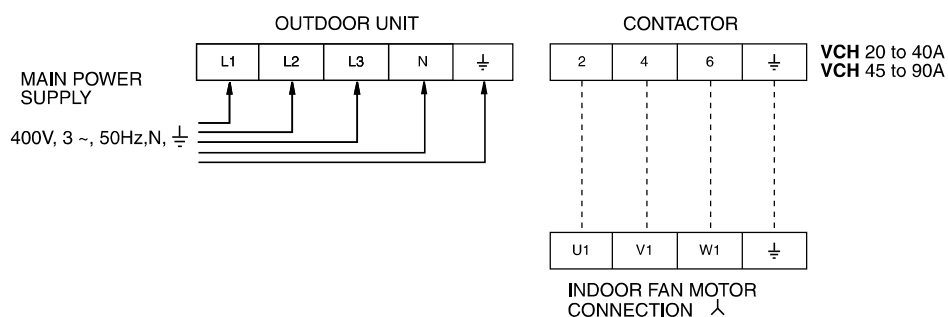
Failures are indicated by the red LED of the board (V3) by means of communications with the DPC 1 thermostat and the activation of the K5 relay with the output of the 24 VAC R phase at terminal AL of connector J2.

For further information please see the Technical Information of the YKlon control board.

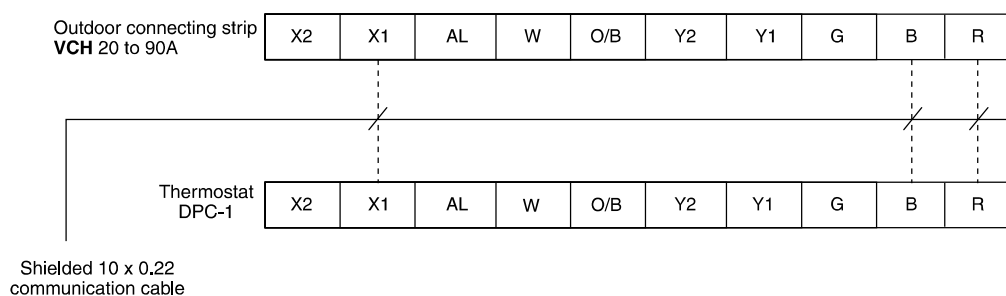


Power supply and interconnecting wiring diagram

Power supply



Thermostat



Electrical characteristics

Outdoor units

Model	Compressor			Fan Out. - Ind.	Outdoor fan motor		Indoor fan motor		Total nominal power (Equip- ment) kW	Total nominal amperage (Equip- ment) A	Total ma- ximum power (Equip- ment) kW	Total maximum amperage (Equip- ment) A	Automatic switch (K curve) (1) A	Power supply cable section mm ² (2)
	Power supply V.ph.Hz	Nominal amperage A	Starting ampera- ge A	Power supply V.ph.Hz.	kW	Nominal amperage A	kW	Nominal amperage A						
VCH 20A	400.3.50	8.5	74	400.3.50	1.5	2.5	0.75	1.8	6.7	13	9	17	20	4
VCH 25A	400.3.50	11.8	111	400.3.50	1.5	2.5	0.75	1.8	8.3	16	11	20	25	4
VCH 30A	400.3.50	15	118	400.3.50	3	4.9	1.5	2.7	12	22	17	29	32	6
VCH 40A	400.3.50	19.3	140	400.3.50	3	4.9	1.5	2.7	14	27	19	33	40	10
VCH 45A	400.3.50	2 x 12	95	400.3.50	2 x 2.2	2 x 3.4	1.5	3.1	17	33	24	44	50	10
VCH 60A	400.3.50	2 x 15	118	400.3.50	2 x 2.2	2 x 4.4	2.2	4.6	23	43	31	55	63	16
VCH 75A	400.3.50	2 x 19	140	400.3.50	2 x 4	2 x 7.9	3	4.7	32	59	39	76	80	25
VCH 90A	400.3.50	2 x 25	198	400.3.50	2 x 4	2 x 7.9	4	7.0	39	72	49	86	100	35

Important: The dimensioning of the automatic switch and power supply lines is orientative and should be corrected in accordance with the site conditions, distance between units and legislation in force.

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

Electrical characteristics

Indoor units

Model	Power supply V.ph.Hz	Nominal power (kW)	Nominal amperage A	Starting amperage A	Power supply cable section mm ²
VIR 25A	400.3.50	0.75	1.8	8	4 x 1.5
VIR 40A	400.3.50	1.5	2.7	17	4 x 1.5
VIR 45A	400.3.50	1.5	3.1	17	4 x 1.5
VIR 60A	400.3.50	2.2	4.6	22	4 x 1.5
VIR 75A	400.3.50	3	4.7	36	4 x 1.5
VIR 90A	400.3.50	4	7	42	4 x 2.5

Important: The dimensioning of the power supply lines is orientative and should be corrected in accordance with the site conditions, distance between units and legislation in force.

Prior to approving the installation

Make sure that:



- Voltage is always between 198 and 254 V in 230 V units, and 342 - 436 in 400 V units.
- The recommended power supply cable section is at least a minimum.



- The need of regular cleaning of the air filters has been notified.



- The condensed water drain is perfect and there are no leaks in the water circuit.



- The guarantee card has been filled out.
- Maintenance instructions have been given, or a periodical check-up contract has been signed.



- The user has received operating instructions.



- The rotational direction of the fans is correct.

Maintenance of the units

To assure proper operation of the units with minimum electric consumption and a long operating life, a regular maintenance schedule should be established.

The following table recommends the frequency of the usual maintenance operations, although it may be necessary to vary these, depending upon the operating and ambient conditions of each unit.

Qualified technical personnel only should carry out maintenance operations, updating the log of all maintenance.

Attention: Prior to accessing the interior of the units disconnect all power supplies.

- **Outdoor and indoor fan belts:** Check belt conditions and tension. If replaced with new belts, these should be of the same type and gauge as the originals, and tension should be checked within the next 24 hours of operation.
- **Air filters:** Slide them out of the units on their guide rails and wash.
- **Indoor coil:** A visual inspection is recommended when servicing the filters. The entire surface of the fins must be kept free of dirt. If it requires cleaning, use a soft brush or a vacuum cleaner, making sure not to damage the fins. Never use water hoses in the interior of the compartment.
- **Condensed water tray and siphon:** Eliminate all dirt and residues. Make sure the water drain and the siphon are not obstructed. Make sure the water is evacuated correctly. Prime the siphon (fill with water) if necessary.
- **Outdoor coils:** Eliminate all dirt and residues found on the surface of both sides of the coils. Clean the surface of the fins with a soft brush or a vacuum cleaner, making

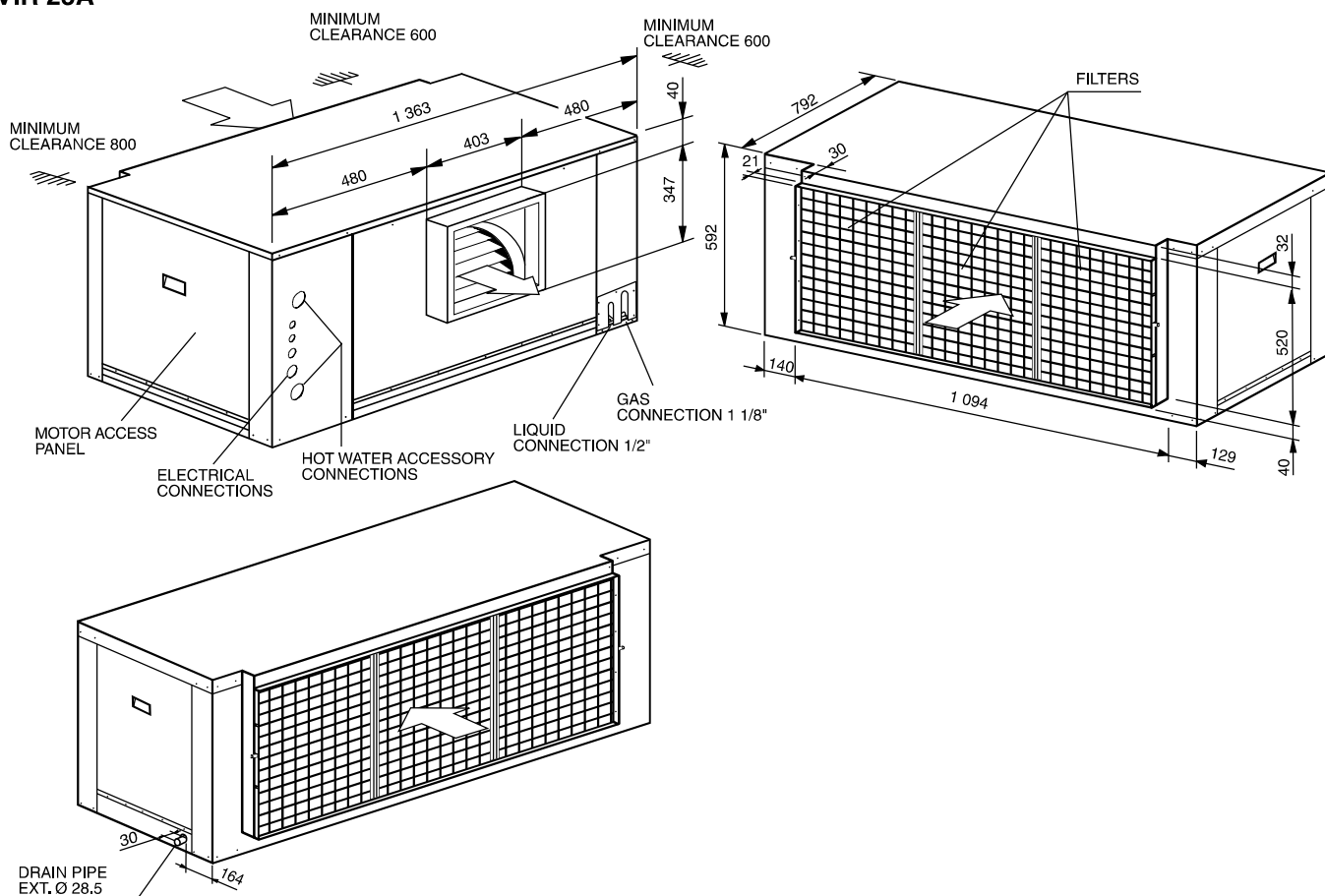
sure not to damage them. Since the units are exposed to the outdoor environment, it may be necessary to use water and an detergent for cleaning. In this case, always apply from inside to the exterior, and up and down.

- **Outdoor air intake:** If the unit includes any of the accessories, such as an economizer or a return fan, the dampers should be serviced by checking correct operation of their components (shafts, fins, motor).
- **Refrigerant circuit:** At the beginning of each cooling and heating season, check carefully: Operating pressures, control elements, temperature variations, and carry out any other checks needed.
- **Mechanical and electrical operation:** Also at the beginning of each season, check the amperage of all motors, the conditions of electrical connections and the operation of the safety controls.
The bearings of both the indoor as well as the outdoor fan motors are of the permanent lubrication type and require no maintenance.
- **Integrity of the structure and components of the unit:** Check the conditions of the outdoor structure and components of the unit, the non-existence of impacts or dents and correct fastening of the bolts.
Check correct closing of the access doors, including the conditions of the sealing gaskets and the locks.
- **Hot water coil: If the equipment is equipped with this accessory:** At the beginning of the heating season, check the operation of the control elements, the water in the system and the purging of air in the coil. Depending upon the area and installation, and if necessary, make sure the proportion of antifreeze is correct.

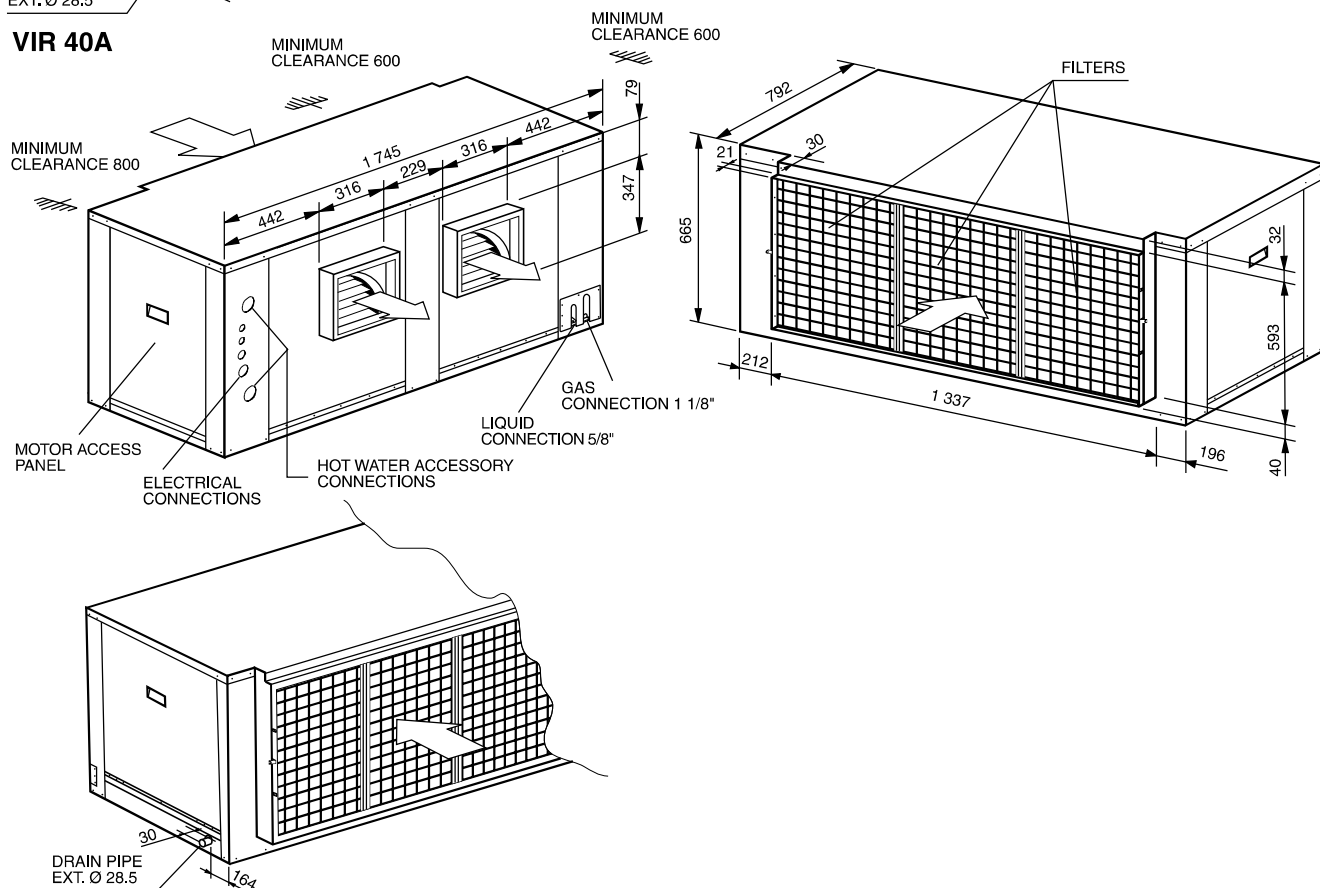
	Frequency			
	1 month	2 months	6 months	Annually
Belts (indoor/outdoor fans)		X		
Air filters	X			
Indoor coil (evaporator)		X		
Water tray and siphon		X		
Outdoor coils (condenser)		X		
Outdoor air intake (accessory)	X			
Refrigerant circuit			X	
Mechanical and electrical operation			X	
Structure and components integrity				X
Hot water coil (accessory)				X

General dimensions mm.

VIR 25A

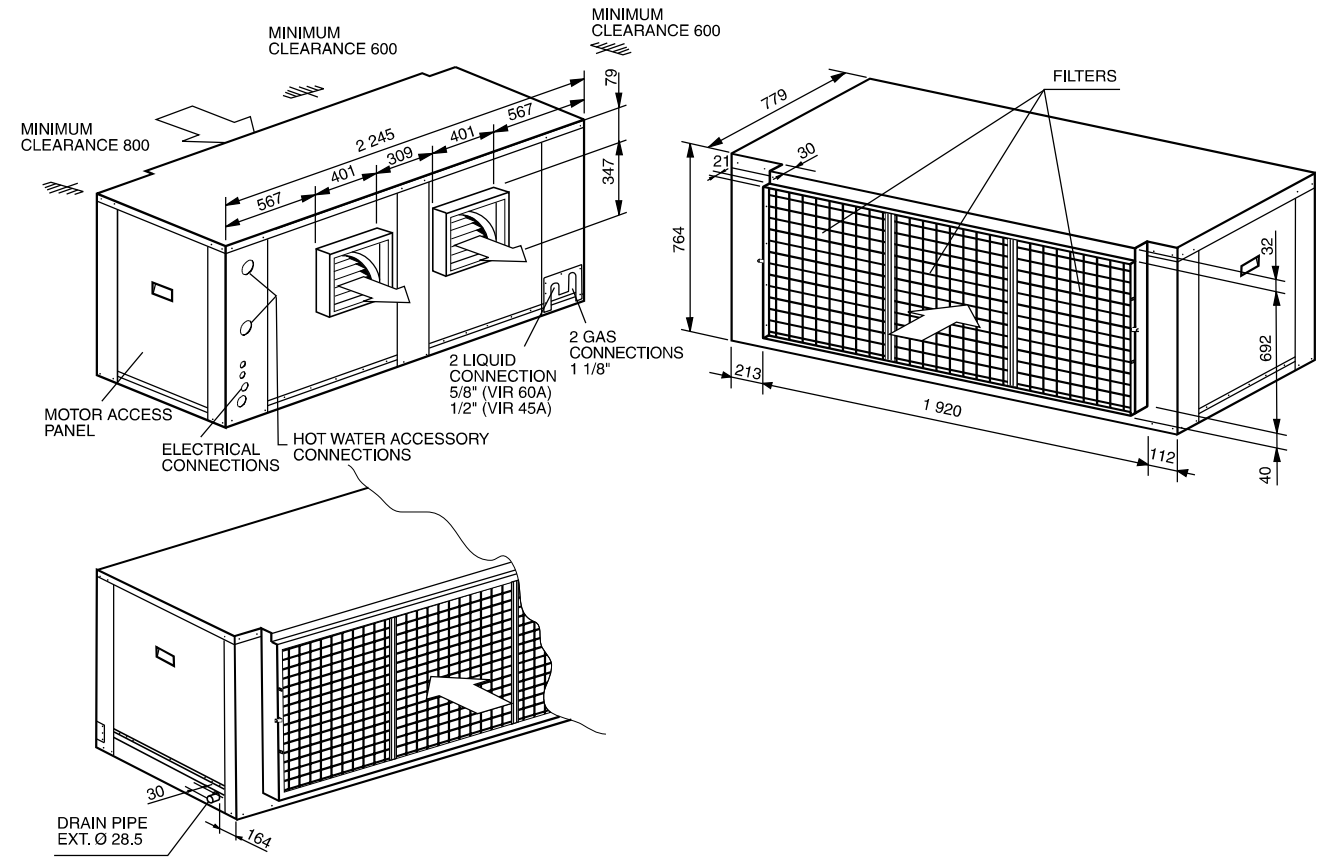


VIR 40A

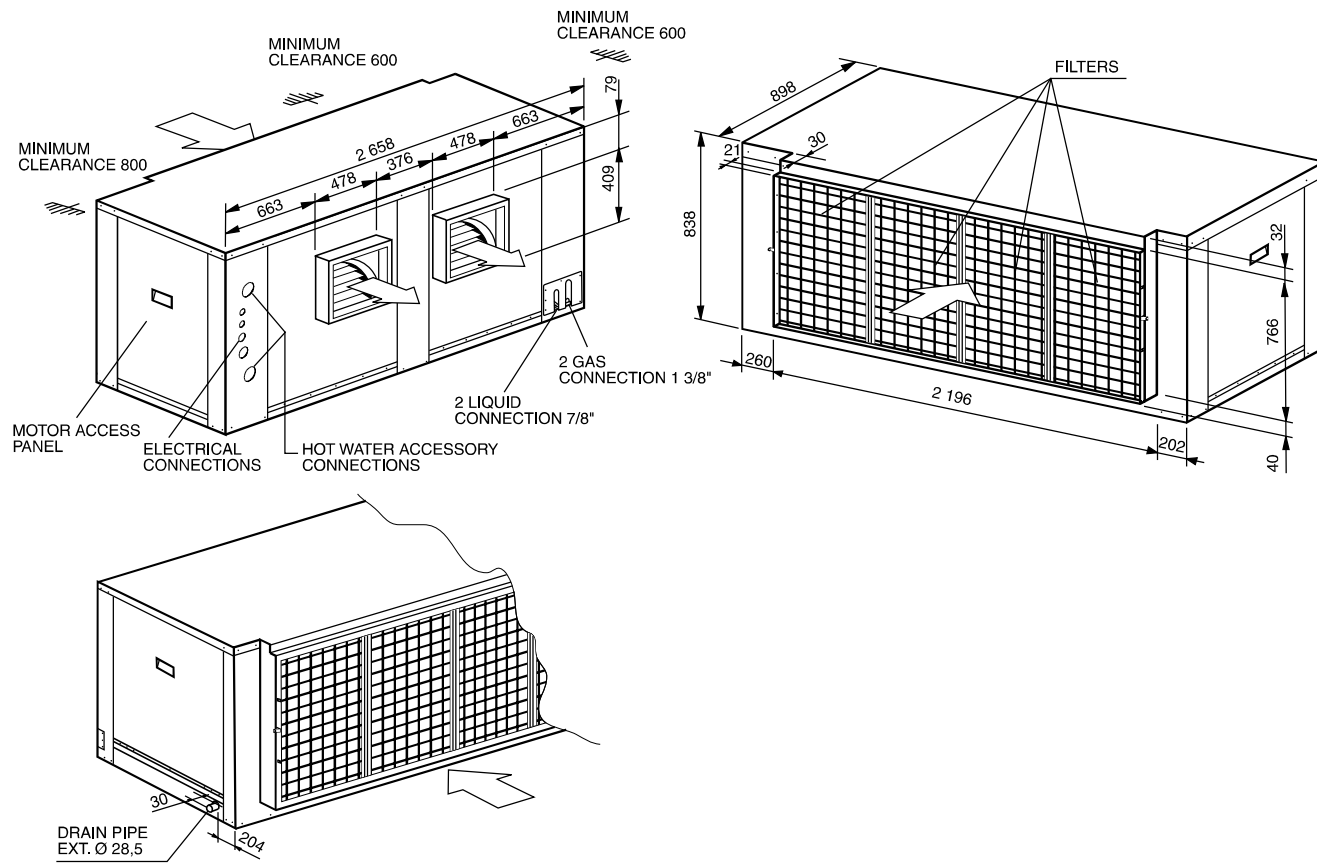


General dimensions mm.

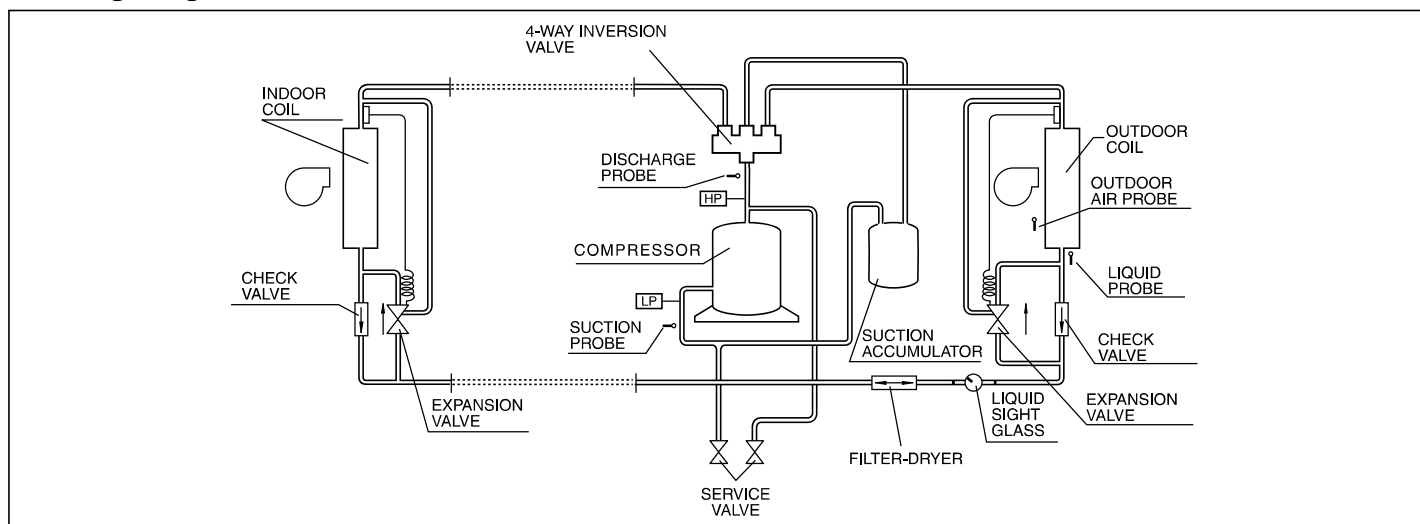
VIR 45A and 60A



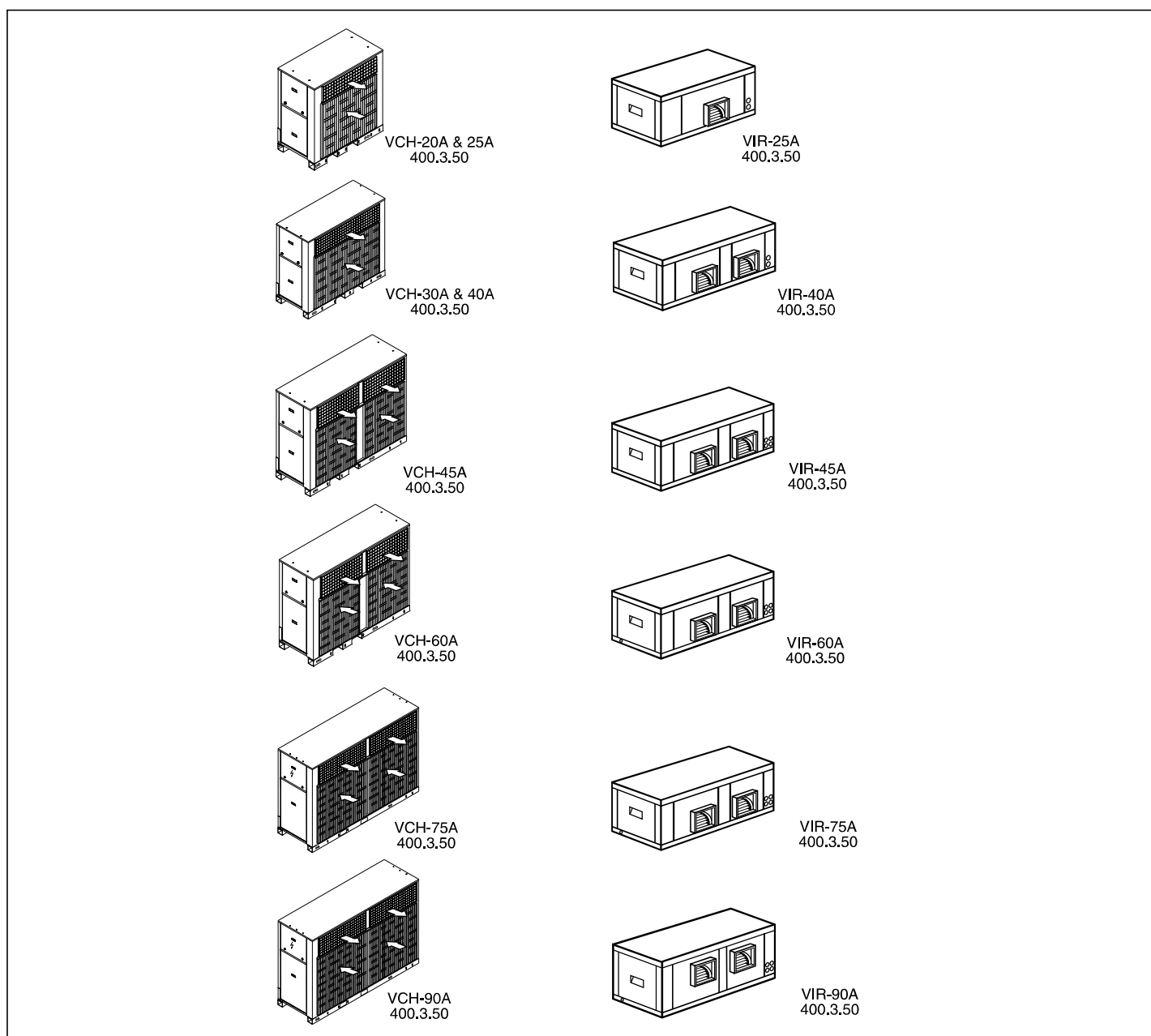
VIR 75A and 90A



Cooling diagram



Variant chart



Nominal performances

Outdoor unit		Indoor unit		Summer			Winter		
Model	Air flow m³/h	Model	Air flow m³/h	Cooling capacity W	Consumption (W)	E.E.R.	Heating capacity W	Consumption (W)	C.O.P.
VCH 20A	6 235	VIR 25A	4 590	16 800	5 900	2.85	21 500	5 680	3.79
VCH 25A	6 235	VIR 25A	4 590	20 600	7 480	2.75	23 200	6 840	3.39
VCH 30A	11 975	VIR 40A	7 500	28 700	10 250	2.80	32 300	9 950	3.25
VCH 40A	11 975	VIR 40A	7 500	32 400	12 810	2.53	39 300	12 870	3.05
VCH 45A	17 250	VIR 45A	9 000	43 500	14 810	2.94	47 400	13 750	3.45
VCH 60A	20 340	VIR 60A	10 500	54 100	20 860	2.60	53 000	20 000	2.80
VCH 75A	25 200	VIR 75A	13 700	76 100	29 210	2.61	77 700	27 560	2.82
VCH 90A	25 200	VIR 90A	16 000	87 300	34 920	2.50	89 900	33 190	2.71

Test conditions

Voltage	Interconnecting pipes length	Summer				Winter			
		Outdoor temp. °C		Indoor temp. °C		Outdoor temp. °C		Indoor temp. °C	
		DB	WB	DB	WB	DB	WB	DB	WB
400	7.5 metre	35	24	27	19	7	6	20	12

Correcting factors

Correcting factors for cooling capacities

Cooling capacity correcting factors for flows that differ from the nominal flows of the indoor coil.

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

Correction of the real temperature of air intake to the outdoor coil for flows that differ from the nominal values.

Flow %	70	80	90	100	110	120	130
Correction in °C on real temperature of air going to the outdoor coil	5	3	1.5	0	-1	-2	-2.5

Correcting factors for the heating capacities

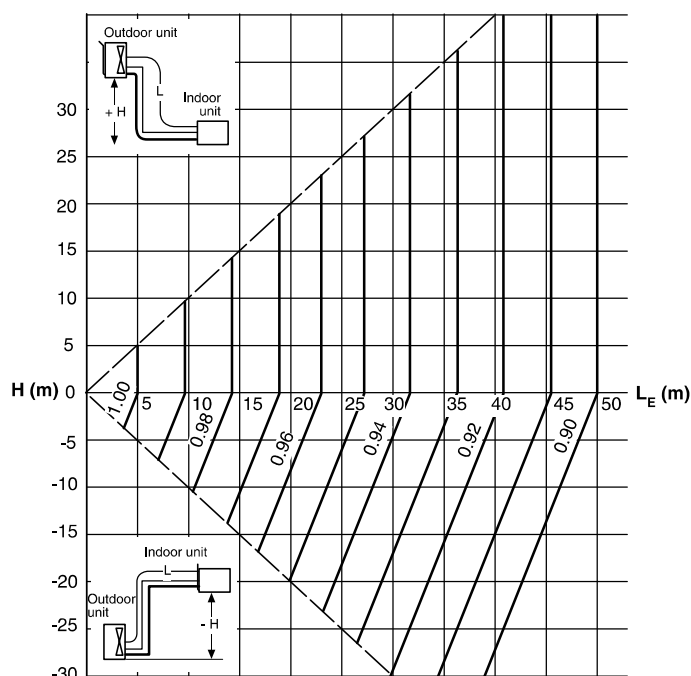
Indoor unit air intake temperature °C DB	Outdoor unit air temperature °C WB				
	14	10	6	0	-8
23	1.20	1.04	0.96	0.77	0.58
20	1.25	1.10	1.00	0.80	0.69
17	1.30	1.13	1.04	0.83	0.63

Correction of the real temperature of intake air to the outdoor unit for flows that differ from the nominal values.

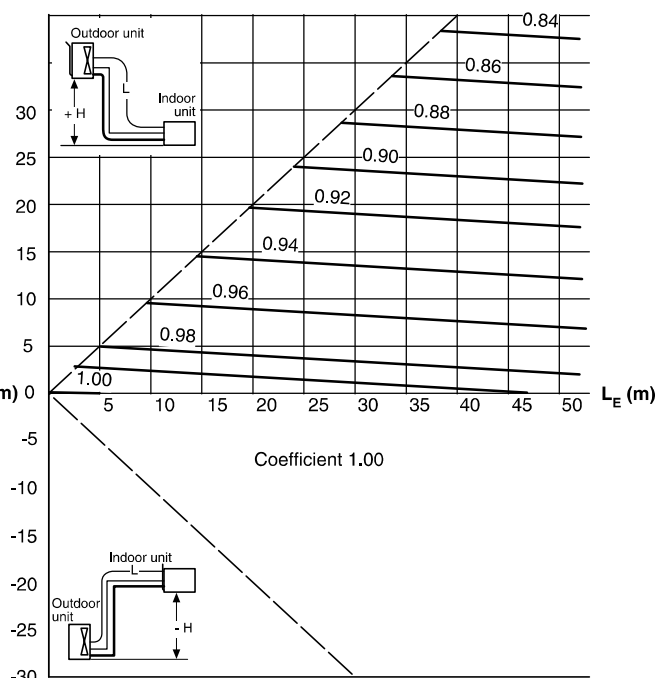
Flow %	70	80	90	100	110	120	130
Correction in °C on real temperature of air intake to the outdoor unit	-2	-1.5	-0.5	0	0.5	1	1.2

Capacity correcting factors in accordance with the length and height between units

Cooling capacity



Heating capacity



H = Vertical distance between the indoor and outdoor units.

L_E = Equivalent length of pipes between the indoor and outdoor units. Consider one line only.

H = (>0), or (<0). Position of the indoor unit with regard to the outdoor unit.

Sound level (Nominal flow and static pressure available)

Models	OUTDOOR. Sound spectrum per dB (A) octave band							Power sound level dB (A)
	125 Hz	250 Hz	500 Hz	1 000 Hz	2 000 Hz	4 000 Hz	8 000 Hz	
VCH 20A								
VCH 25A								
VCH 30A								
VCH 40A								
VCH 45A								
VCH 60A								
VCH 75A								
VCH 90A								

Models	INDOOR. Sound spectrum per dB (A) octave band							Power sound level dB (A)
	125 Hz	250 Hz	500 Hz	1 000 Hz	2 000 Hz	4 000 Hz	8 000 Hz	
VIR 25A								
VIR 40A								
VIR 45A								
VIR 60A								
VIR 75A								
VIR 90A								

* Our reverberation chamber does not allow us to measure the sound pressure level at 63 Hz, and therefore the determination of the NC (Noise Criteria ISO) will be carried out as of 125 Hz.

In the case of having to deduct the sound pressure value to 63 Hz, add between 0 and 10 dB to the pressure obtained at 125 Hz.

Sensible cooling capacities

Model	Dry outdoor air temperatu- re °C (DB)	Humid intake air temperatu- re °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power
				Dry intake air temperature to coil °C (DB)				
			22	24	27	29	W	
VCH 20A VIR 25A	25	22	20 160	5 996	8 828	13 076	15 912	4.08
		19.5	18 144	9 552	12 384	16 632	18 144	4.28
		17	16 800	13 294	16 126	16 800	16 800	4.47
	35	22	18 648	5 501	8 333	12 581	15 413	4.62
		19.5	16 800	9 069	11 901	16 149	16 800	4.86
		17	15 456	12 106	14 938	15 456	15 456	5.10
	45	22	16 800	4 948	7 780	12 028	14 860	5.35
		19.5	15 120	8 517	11 349	15 120	15 120	5.59
		17	13 776	12 109	13 776	13 776	13 776	5.83
VCH 25A VIR 25A	25	22	24 720	7 532	10 364	14 612	17 448	5.38
		19.5	22 248	11 061	13 893	18 141	20 978	5.63
		17	20 600	14 829	17 661	20 600	20 600	5.89
	35	22	22 866	6 900	9 732	13 980	16 812	6.08
		19.5	20 600	10 449	13 281	17 529	20 361	6.40
		17	18 952	13 352	16 184	18 952	18 952	6.72
	45	22	20 600	6 198	9 030	13 278	16 110	7.04
		19.5	18 540	9 750	12 582	16 830	18 540	7.36
		17	16 892	13 331	16 163	16 892	16 892	7.68
VCH 30A VIR 40A	25	22	34 440	10 361	14 738	21 303	25 686	6.64
		19.5	30 996	15 838	20 215	26 781	30 996	6.95
		17	28 700	21 641	26 018	28 700	28 700	7.27
	35	22	31 857	9 499	13 876	20 441	24 818	7.51
		19.5	28 700	15 000	19 377	25 943	28 700	7.90
		17	26 404	18 997	23 374	26 404	26 404	8.30
	45	22	28 700	8 539	12 916	19 481	23 858	8.69
		19.5	25 830	14 043	18 420	24 985	25 830	9.09
		17	23 534	19 587	23 534	23 534	23 534	9.48
VCH 40A VIR 40A	25	22	38 880	11 872	16 249	22 815	27 198	8.82
		19.5	34 992	17 323	21 700	28 265	32 650	9.24
		17	32 400	23 149	27 526	32 400	32 400	9.66
	35	22	35 964	10 875	15 252	21 817	26 194	9.98
		19.5	32 400	16 356	20 733	27 298	31 675	10.50
		17	29 808	20 142	24 519	29 808	29 808	11.03
	45	22	32 400	9 767	14 144	20 709	25 086	11.55
		19.5	29 160	15 254	19 631	26 196	29 160	12.08
		17	26 568	20 786	25 163	26 568	26 568	12.60

Sensible cooling capacities

Model	Dry outdoor air temperatu- re °C (DB)	Humid intake air temperatu- re °C (WB)	Total capacity	Sensible capacity (W)				Compressor absorbed power
				Dry intake air temperature to coil °C (DB)				
			22	24	27	29	kW	
			W	W	W	W	W	
VCH 45A VIR 45A	25	22	52 080	15 976	21 638	30 131	35 801	10
		19.5	46 872	23 015	28 677	37 170	42 841	10.47
		17	43 400	30 560	36 222	43 400	43 400	10.95
	35	22	48 174	14 630	20 292	28 785	34 447	11.31
		19.5	43 400	21 711	27 373	35 866	41 527	11.90
		17	39 928	27 766	33 428	39 928	39 928	12.50
	45	22	43 400	13 135	18 797	27 290	32 951	13.09
		19.5	39 060	20 225	25 887	34 380	39 060	13.69
		17	35 588	27 376	33 038	35 588	35 588	14.28
VCH 60A VIR 60A	25	22	64 200	19 879	26 398	36 176	42 704	13.44
		19.5	57 780	27 952	34 471	44 249	50 779	14.08
		17	53 500	36 659	43 178	52 956	53 500	14.72
	35	22	59 385	18 194	24 712	34 490	41 009	15.20
		19.5	53 500	26 322	32 841	42 619	49 138	16.00
		17	49 220	32 905	39 424	49 202	49 220	16.80
	45	22	53 500	16 324	22 842	32 620	39 139	17.60
		19.5	48 150	24 467	30 986	40 764	47 282	18.40
		17	43 870	32 686	39 205	43 870	43 870	19.20
VCH 75A VIR 75A	25	22	91 320	28 477	37 304	50 546	59 387	17.89
		19.5	82 188	39 375	48 203	61 445	70 288	18.74
		17	76 100	51 185	60 013	73 255	76 100	19.60
	35	22	84 471	26 051	34 879	48 120	56 948	20.24
		19.5	76 100	37 032	45 860	59 101	67 929	21.30
		17	70 012	46 954	55 782	69 024	70 012	22.37
	45	22	76 100	23 362	32 190	45 431	54 259	23.43
		19.5	68 490	34 367	43 195	56 436	65 264	24.50
		17	62 402	45 481	54 309	62 402	62 402	25.56
VCH 90A VIR 90A	25	22	104 760	32 625	42 844	58 172	68 407	22.34
		19.5	94 284	45 249	55 468	70 797	81 034	23.41
		17	87 300	58 916	69 135	84 464	87 300	24.47
	35	22	96 903	29 848	40 067	55 396	65 615	25.27
		19.5	87 300	42 566	52 785	68 114	78 333	26.60
		17	80 316	53 753	63 973	79 301	80 316	27.93
	45	22	87 300	26 769	36 989	52 317	62 536	29.26
		19.5	78 570	39 514	49 733	65 062	75 281	30.59
		17	71 586	52 384	62 603	71 586	71 586	31.92

Nominal flows

The cooling and heating capacities of the corresponding ta-

bles are valid for the following nominal flows. For other flows, apply the correcting factors of the corresponding table.

Model	Nominal flow		Minimum flow		Maximum flow		Indoor fan nominal available pressure
	m³/h	m³/s	m³/h	m³/s	m³/h	m³/s	
VIR 25A	4 590	1.3	3 600	1	5 500	1.5	117
VIR 40A	7 500	2.1	6 000	1.7	8 300	2.3	118
VIR 45A	9 000	2.5	7 200	2	12 600	3.5	130
VIR 60A	10 500	2.9	8 400	2.3	12 600	3.5	137
VIR 75A	13 700	3.8	11 000	3.1	17 500	4.9	125
VIR 90A	16 000	4.4	12 800	3.6	17 500	4.9	175

Performances of indoor fan assembly: Standard and with High Speed Drive

Available static pressure (Pa)/Consumed power (W)

Unit	Fan assembly	Code	Flow m³/h													
			3 600		3 900		4 250		4 590		4 900		5 200		5 500	
			Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W
VIR 25	Standard	-	172	720	156	790	137	825	117	895	92	965	-	-	-	-
	H.S.D.	611991087	267	900	253	980	-	-	-	-	-	-	-	-	-	-
	H.S.D.M.	611991088	267	900	253	980	238	1 040	222	1 100	200	1 160	180	1 220	158	1 290

Unit	Fan assembly	Code	Flow m³/h													
			6 000		6 500		7 000		7 500		7 800		8 000		8 300	
			Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W
VIR 40	Standard	-	153	1 070	150	1 100	137	1 200	118	1 305	105	1 355	98	1 390	85	1 440
	H.S.D.	611991089	242	1 280	241	1 340	233	1 460	217	1 585	206	1 655	200	1 700	188	1 760

Unit	Fan assembly	Code	Flow m³/h													
			7 200		7 800		8 400		9 000		10 500		12 000		12 600	
			Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W
VIR 45	Standard	-	150	1 375	146	1 405	141	1 430	130	1 490	-	-	-	-	-	-
	H.S.D.	611991091	203	1 575	201	1 615	197	1 650	188	1 720	-	-	-	-	-	-
	H.S.D.M.	611991090	203	1 575	201	1 615	197	1 650	188	1 720	141	2 030	65	2 400	52	2 570

Unit	Fan assembly	Code	Flow m³/h													
			8 400		9 100		9 800		10 500		11 100		11 800		12 600	
			Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W
VIR 60	Standard	-	178	1 475	175	1 600	160	1 750	137	1 920	122	2 065	90	2 270	50	2 450
	H.S.D.	611991092	277	1 865	276	2 010	266	2 170	246	2 360	-	-	-	-	-	-
	H.S.D.M.	611991093	277	1 865	276	2 010	266	2 170	246	2 360	234	2 510	206	2 700	172	2 940

Unit	Fan assembly	Code	Flow m³/h													
			11 000		12 000		12 900		13 700		15 000		16 300		17 500	
			Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W
VIR 75	Standard	-	170	1 660	156	1 830	140	2 010	125	2 170	97	2 450	65	2 775	28	3 000
	H.S.D.	611991091	289	2 150	282	2 380	271	2 640	260	2 830	-	-	-	-	-	-
	H.S.D.M.	611991094	289	2 150	282	2 380	271	2 640	260	2 830	235	3 200	207	3 600	175	3 930

Unit	Fan assembly	Code	Flow m³/h													
			12 800		14 000		15 000		16 000		16 500		17 000		17 500	
			Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W	Pa	W
VIR 90	Standard	-	240	2 570	222	2 910	200	3 150	175	3 420	161	3 575	146	3 730	131	3 900
	H.S.D.	611991095	399	3 350	388	3 770	374	4 090	-	-	-	-	-	-	-	-
	H.S.D.M.	611991096	399	3 350	388	3 770	374	4 090	354	4 450	342	4 630	328	4 830	313	5 000

H.S.D.: High Speed Drive.

H.S.D.M.: High Speed Drive with motor included.

Indoor fan High Speed Drive

H.S.D. and H.S.D.M. configuration for VIR units

		Fan pulley			Motor pulley			Motor		Automatic switch	
Description	Code	Prim. dia.	Type	Shaft dia.	Prim. dia.	Type	Shaft dia.	Power (kW)	Amount	Adjustment (1) (A)	Code
H.S.D. VIR 25	611991087	125	SPZ (x 2)	25	-	-	-	-	-	-	-
H.S.D.M. VIR 25	611991088	140	SPZ (x 2)	25	95	SPZ (x 2)	24	1.1	1	3	-
H.S.D. VIR 40	611991089	150	SPZ (x 2)	25	-	-	-	-	-	-	-
H.S.D. VIR 45/75	611991091	160	SPZ (x 2)	25	-	-	-	-	-	-	-
H.S.D.M. VIR 45	611991090	160	SPZ (x 2)	25	100	SPZ (x 2)	28	3	1	6	006776702
H.S.D. VIR 60	611991092	140	SPZ (x 2)	25	-	-	-	-	-	-	-
H.S.D.M. VIR 60	611991093	140	SPZ (x 2)	25	95	SPZ (x 2)	28	3	1	6	-
H.S.D.M. VIR 75	611991094	160	SPZ (x 2)	25	-	-	-	4	1	9.5	006776704
H.S.D. VIR 90	611991095	160	SPZ (x 3)	25	-	-	-	-	-	-	-
H.S.D.M. VIR 90	611991096	160	SPZ (x 3)	25	-	-	-	5.5	1	12.5	006776705

H.S.D.: High Speed Drive.

H.S.D.M.: High Speed Drive with motor included.

(1) **Important:** Adjustment is orientative and should be adapted to the conditions of the installation.

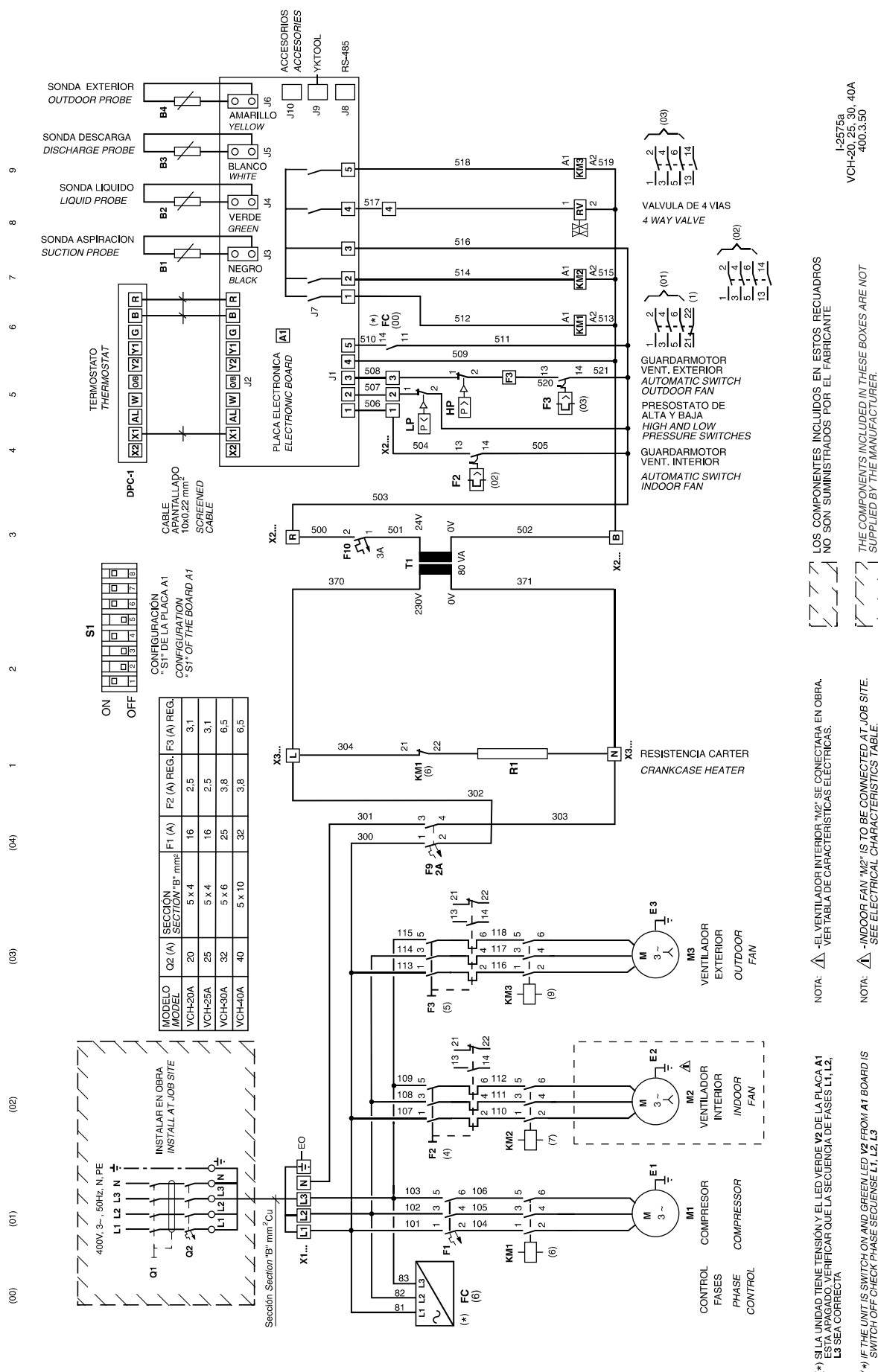
H.S.D. and H.S.D.M. codes for VIR units

Description	Code	VIR 25	VIR 40	VIR 45	VIR 60	VIR 75	VIR 90
High Speed Drive	611991087	X					
	611991089		X				
	611991091			X		X	
	611991092				X		
	611991095						X
High Speed Drive with motor included	611991088	X					
	611991090			X			
	611991093				X		
	611991094					X	
	611991096						X

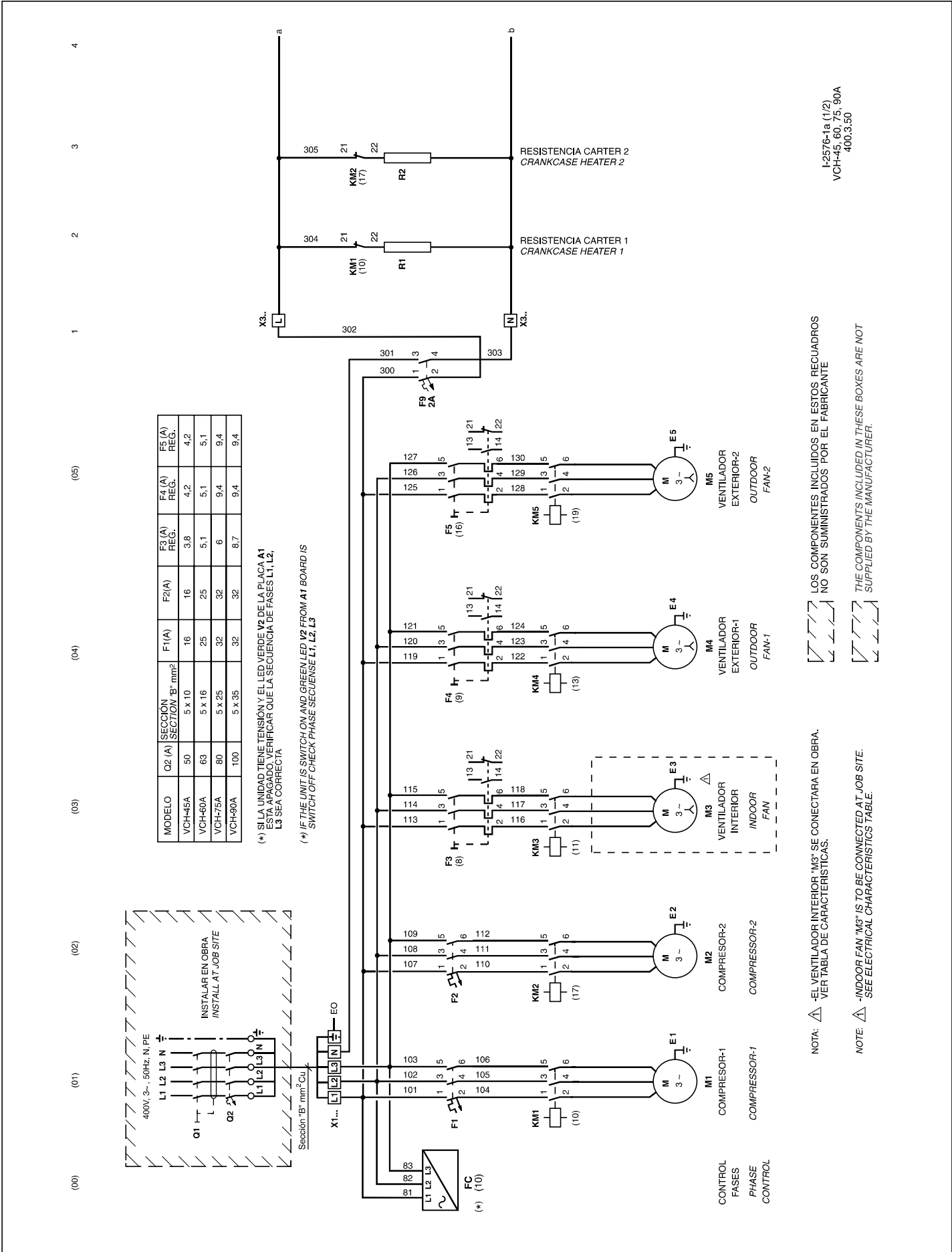
Outdoor fan services

Model	Available static pressure		Air flow		Absorbed power
	mm WG	Pa	m³/h	m³/s	W
VCH 20A VCH 25A	0	0	7 055	1.96	1 090
	4	39	6 420	1.78	985
	5.1	50	6 235	1.73	955
	7.96	78	5 715	1.59	905
	12.03	118	4 990	1.38	785
	16	157	3 580	0.99	685
VCH 30A VCH 40A	0	0	12 700	3.54	2 900
	2.04	20	12 500	3.47	2 800
	4	39	12 175	3.38	2 750
	5.1	50	11 975	3.33	2 700
	7.96	78	11 460	3.18	2 660
	12.03	118	10 470	2.91	2 350
	13.97	137	9 880	2.74	2 225
	16	157	9 200	2.56	2 065
VCH 45A	0	0	18 340	5.09	3 860
	5.10	50	17 250	4.79	3 540
	10.20	100	15 860	4.41	3 140
	15.30	150	13 480	3.74	2 600
	17.35	170	12 390	3.44	2 370
	17.86	175	12 000	3.33	2 290
VCH 60A	0	0	21 250	5.90	5 910
	5.10	50	20 340	5.65	5 610
	6.02	59	20 170	5.60	5 550
	10.20	100	19 280	5.36	5 220
	15.30	150	17 780	4.94	4 680
	20.41	200	16 040	4.46	4 090
	25.51	250	13 630	3.79	3 360
	30.61	300	9 660	2.68	2 560
VCH 75A VCH 90A	0	0	25 650	7.13	8 400
	5.10	50	25 200	7.00	8 240
	15.30	150	24 100	6.69	7 830
	22.96	225	22 670	6.30	7 300
	25.51	250	22 020	6.12	7 010
	30.61	300	19 840	5.51	6 080
	35.71	350	17 320	4.81	5 100

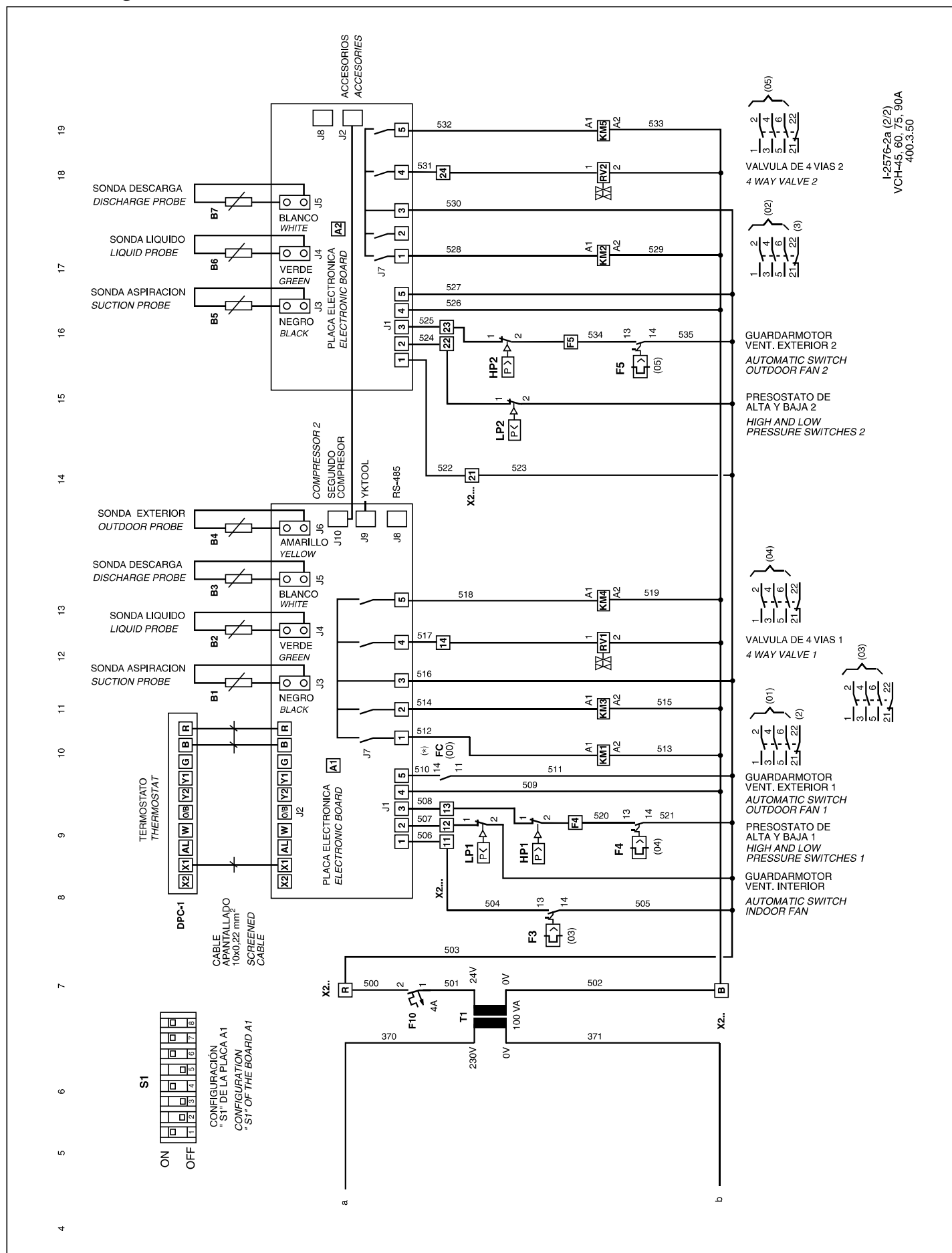
Electric diagram, VCH 20, 25, 30, 40A, 400.3.50



Electric diagram, VCH 45, 60, 75, 90A, 400.3.50



Electric diagram, VCH 45, 60, 75, 90A, 400.3.50



Configuration of switches

Configuration of switches

The microswitches establish the following configurations:

Number	Status	Meaning
1 / 2	OFF/OFF	Ignore SW, programmed by communications
	ON/OFF	Time between defrosts 30'
	OFF/ON	Time between defrosts 60'
	ON/ON	Time between defrosts 90'
3	ON	Crossed coils
	OFF	Independent coils
4	ON	2' compressor delay
	OFF	5' compressor delay
5	ON	Cool mode
	OFF	Heat pump mode
6	ON	4-way valve active in heat
	OFF	4-way valve active in cool
7	ON	Receives signal B from thermostat (active in heat)
	OFF	Receives signal O from thermostat (active in cool)
8	ON	Fan operative during defrost
	OFF	Fan inoperative during defrost

It is necessary to disconnect power supply to the board to read out the new configuration.

Failures (Lockouts)

Lockouts are indicated by the red LED on the YKLON board. If no lockouts exist, the LED remains off.
When a lockout is generated, this LED produces two series of flashes with a constant sequence.
The first series indicates the affected circuit: one flash for the first compressor, two for the second, three for the third and four for the accessories. This is followed by a brief pause. The second series indicates the element or situation producing the lockout.

Lockout table (red LED)

Flashes	Failure
1	Discharge temperature surpassed.
2	High pressure switch, outdoor fan thermal switch or compressor module thermal switch.
3	Low pressure switch.
4	Indoor fan thermal switch.
5	Repeated start-ups in cool or suction temperature <-25° C.
1	Gas 1 control or heater 1 failure
2	Gas 2 control or heater 2 failure
3	Heater 3 stage failure
4	Heater 4 stage failure
5	Failure in economiser or hot water coil (outdoor impulse probe, water return)
6	Smoke detection or high temperature (accessories) or impulse temperature > 80° C

Incidence

Incidences are indicated by the green LED on the YKLON board. If no lockouts exist, this LED flashes at a constant frequency.

When an incident is generated, this LED produces three series of flashes with a constant sequence.

The first series indicates the affected circuit: one flash for the first compressor, two for the second, three for the third and four for miscellaneous incidences. This is followed by a brief pause. The second and third series indicate the direct cause of the incidence.

Incidence table

Flashes	Type	Incidence
1 1	1	Discharge probe open or short circuited
2 1	2	Liquid probe open or short circuited
3 1	3	Suction probe open or short circuited
4 1	4	Repeated defrosts
5 1	5	Discharge temperature not recovered
6 1	6	Discharge temperature not recovered
7 1	7	Return probe open or short circuited
8 1	8	Outdoor probe open or short circuited
9 1	9	Water probe open or short circuited
10 1	10	Enthalpy probe error
11 1	11	Signal Y1 or Y2 without G
12 1	12	Signal W without B
13 1	13	Thermostat
14 1	14	Signal W without G
15 1	15	Signal Y2 without Y1
16 1	16	Thermal switch of heater 1
17 1	17	Thermal switch of heater 2
18 1	18	Thermal switch of heater 3
19 1	19	Thermal switch of heater 4
20 1	20	Water coil temp. not recovered
21 1	21	Outdoor temp. too low
22 1	22	Water coil in antifreeze function
23 1	23	Impulse temp. over 55° C
24 1	24	Impulse temp. < 25° C with gas
25 1	25	Transceiver ID unknown
26 1	26	At least one accessory not found
27 1	27	Air quality demand
28 1	28	Dirty filters
29 1	29	Occupation sensor in unoccupied
30 1	30	Suction temperature < 0° C, economiser

Test button

- If pressed until the green LED goes on, certain timings are shortened and any detected failure is reset.
- If pressed until the red LED goes on, two accessories and optional probes connected to the board are identified.
- If there is communication between units and this button is pressed, the Neuron ID is sent by the LonWorks network.

DPC-1 thermostat

When a lockout is generated, and there is communication, the thermostat indicates, alternatively, the time and failure produced, in accordance with the lockout table of the unit.

Also indicates other incidences of the thermostat.

Type	Thermostat numbers	Incidence
Thermostat	9 1	Ambient probe open or short circuited
	9 2	Internal probe not calibrated
	9 3	Communication error
	9 4	External entry of failure
Thermostat	9 5	Digital probe S5 is not detected
	9 6	Digital probe S6 is not detected
	9 7	Digital probe S7 is not detected
	9 8	Digital probe S8 is not detected
	9 9	Digital probe S9 is not detected

I-2367c

Cooling capacities (VCH only)

If the outdoor VCH unit is used with a different indoor unit other than the VIR range, this can be selected from the fol-

lowing table. This coupling is recommended only for use of the cool only model (see cool only operation, page 12). Keep in mind that the indoor unit will need an expansion valve.

Cooling capacities

Model	Compressor	Saturated suction temperature (°C)	Temperature of air intake to outdoor coil				
	Amount		25	30	35	40	45
VCH 20A	1	-5					
		0					
		+5					
		+7					
		+10					
VCH 25A	1	-5					
		0					
		+5					
		+7					
		+10					
VCH 30A	1	-5					
		0					
		+5					
		+7					
		+10					
VCH 40A	1	-5					
		0					
		+5					
		+7					
		+10					
VCH 45A	2	-5					
		0					
		+5					
		+7					
		+10					
VCH 60A	2	-5					
		0					
		+5					
		+7					
		+10					
VCH 75A	2	-5					
		0					
		+5					
		+7					
		+10					
VCH 90A	2	-5					
		0					
		+5					
		+7					
		+10					

Cooling capacities at 25° C of suction gas without subcooling.

Accessories and Options

Indoor unit accessories	VIR	Model					
		25A	40A	45A	60A	75A	90A
Internal electric heater	10 kW	O					
Internal electric heater	15 kW	O					
Internal electric heater	10 kW		O				
Internal electric heater	20 kW		O				
Internal electric heater	15 kW			O	O		
Internal electric heater	30 kW			O	O		
Internal electric heater	30 kW					O	O
Internal electric heater	40 kW					O	O
50-m. connecting cable		A	A	A	A	A	A
Hot water coil (20 m.)		O					
Hot water coil (20 m.)			O				
Hot water coil (20 m.)				O	O		
Hot water coil (20 m.)						O	O
Vertical conversion kit for model		A					
Vertical conversion kit for model			A				
Vertical conversion kit for model				A	A		
Vertical conversion kit for model						A	A
H.S.D. / H.S.D.M.		O	O	O	O	O	O
Economiser (20 m.)		A	A	A	A	A	A
Communication cable (economiser or water coil) 50 m.**		A	A	A	A	A	A
Fan soft start				O	O	O	O

Outdoor unit accessories VCH	Model							
	20A	25A	30A	40A	45A	60A	75A	90A
Vertical conversion kit	A	A	A	A	O/A	O/A	O/A	O/A
Head pressure control LAK-1*	O	O	O	O				
Head pressure control LAK-2*					O	O	O	O
Tray heater - 1	O/A	O/A	O/A	O/A				
Tray heater - 2					O/A	O/A	O/A	O/A
Fan soft start			O	O	O	O	O	O

Weight of VIR accessories

Models		VIR 25	VIR 40	VIR 45/60	VIR 75/90
Economiser	kg	54	69	78	90
Electric heater	kg	15	18	20	29
Hot water coil	kg	16	20	37	43
Extra weight for Cu/Cu coil	kg	14	19	38	56

Weight of VCH accessories

Models		VCH 20/25	VCH 30/40	VCH 45/60	VCH 75/90
Head pressure control	kg	16	18	22	28
Extra weight for Cu/Cu coil	kg	31	47	75	109

* Without protection against outdoor conditions.

(O) Optional: Factory fitted.

(A) Accessory: Supplied separately.

Note: An electric heater and a hot water coil cannot be installed in the same machine.

****Note:** If the indoor unit is equipped with an economiser and a hot water coil, only a 50-m. cable is needed.

Hot Water Coil

General information

This hot water coil (optional) is factory-installed; it includes the control board, cables and all material needed for connection at job site.

Located inside the VIR unit and fastened to the coil with the anchor points supplied.

Technical specifications

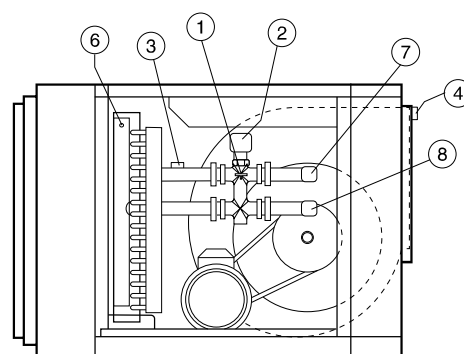
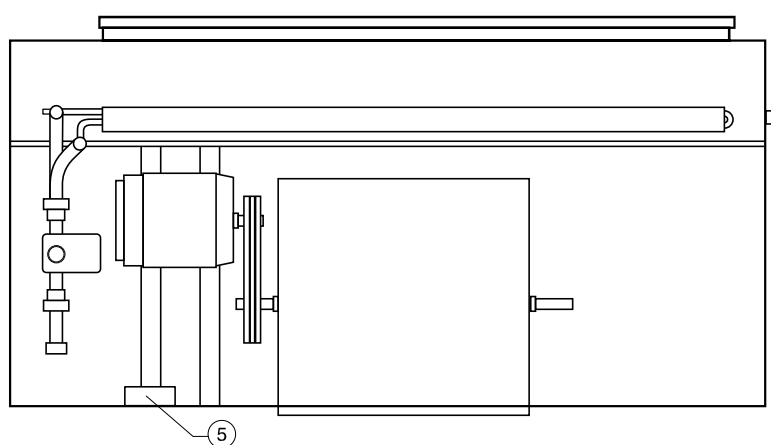
This accessory includes the following components:

- Coil: With steel sheet frame, copper tubing and aluminium fins.

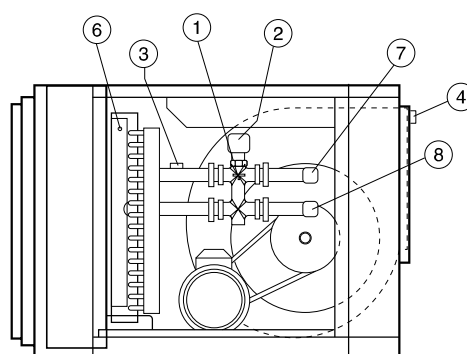
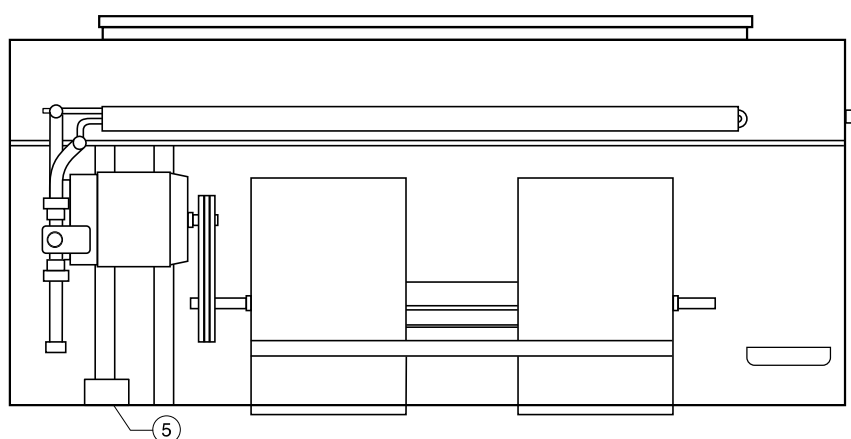
- 3-way valve: Bronze body.
 - Electric actuator: 0-10 V, 24 VAC proportional control.
 - Control board.
 - Temperature probe for water intake, B17.
 - Temperature probe for air impulse, B16.
 - Manual air purger.
 - Operating connection cables between the control panel of the outdoor unit (VCH) and the water coil (length, 20 m.).
- As an option, a connection kit for 50 m.

Location of components

VIR - 25A

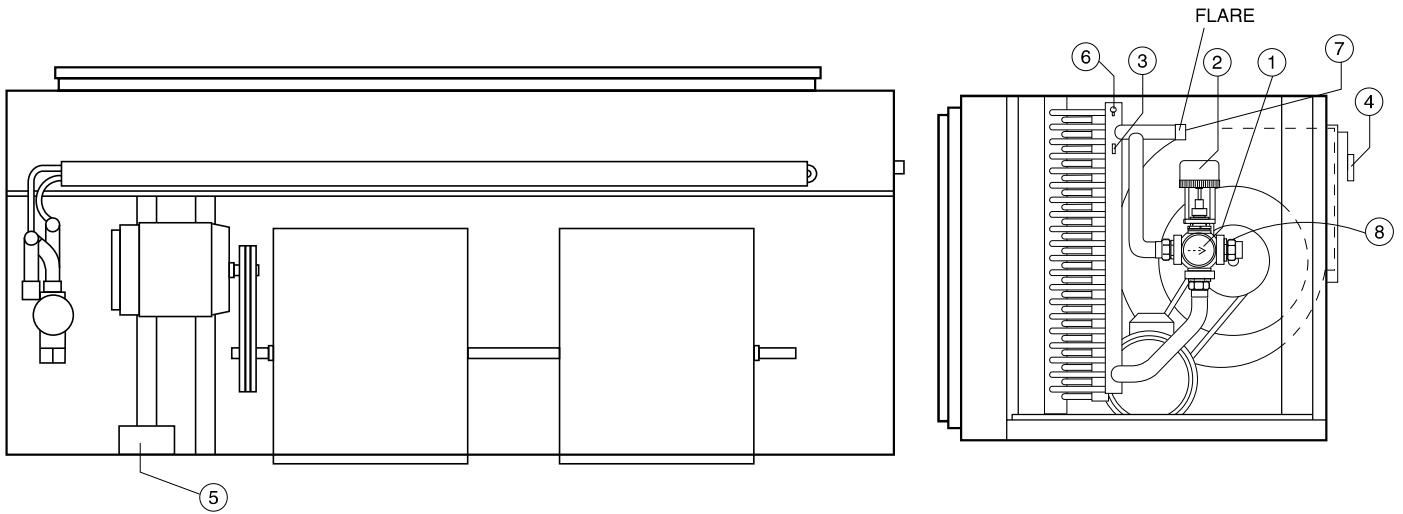


VIR - 40A

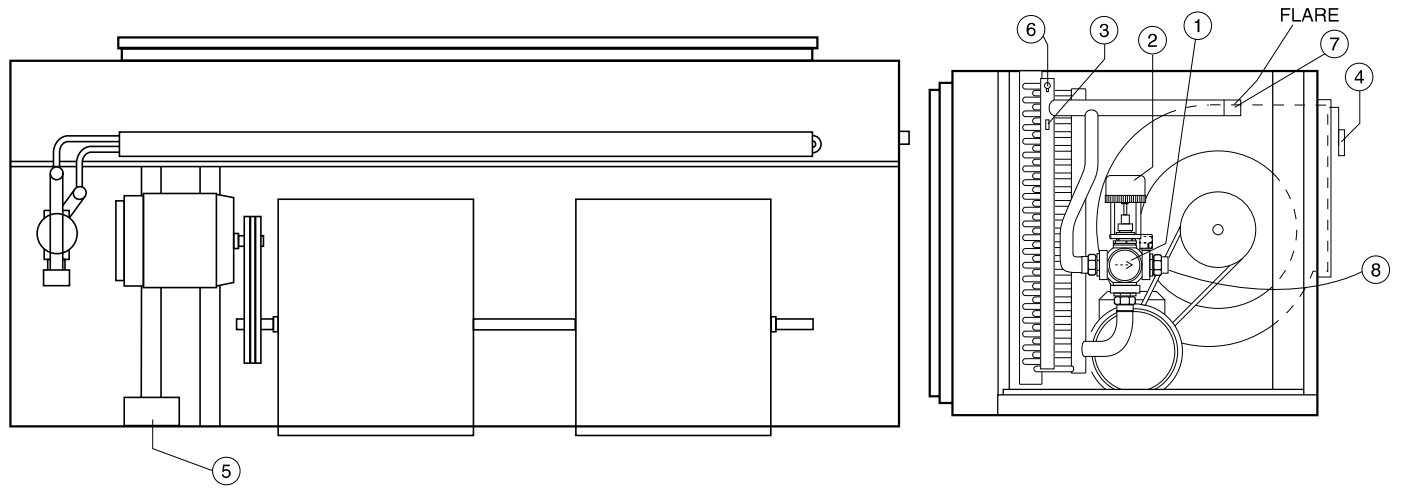


- ① 3-way valve
- ② Actuator
- ③ Water intake probe, B17
- ④ Air impulse probe, B16
- ⑤ Water coil control
- ⑥ Automatic air purger
- ⑦ Water connecting pipe intake
- ⑧ Water connecting pipe outlet

VIR - 45/60



VIR - 75/90



- ① 3-way valve
- ② Actuator
- ③ Water intake probe, B17
- ④ Air impulse probe, B16
- ⑤ Water coil control
- ⑥ Automatic air purger
- ⑦ Water connecting pipe intake
- ⑧ Water connecting pipe outlet

Installation

As all components are factory-fitted, at the job site it is necessary to merely connect the 3-way valve intake and output to the hot water line.

Turn main power supply to the unit off. See Figs. 1, 2, 3, 4 and wiring diagram for coil connection details.

Commissioning

1. Remove the access panel to the 3-way valve, side panel motor side.
2. The water intake and outlet connections are carried out from the front (remove the valve actuator [ref. 2] for welding and reinstall afterwards).

Attention: It is recommendable to install manual valves on the intake and outlet lines, so as to be able to isolate the unit from the general installation if necessary.

3. Hot water coil control board.

The control board, the water intake probe and the air impulse probe are factory-installed. The wiring of the valve actuator has also been completed as per the wiring diagram.

When installing at the job site, connect the telephone cable between the hot water coil accessory board (J15 or J16) and the YKlon board or the board of the second compressor located in the outdoor unit (VCH).

Also connect the 24 VAC power supply hose supplied.

Attention: It is recommendable to install the impulse probe (B16) in the impulse duct at one meter from the indoor unit (VIR), for improved display and readout.

Once the water intake and outlet connections are completed, turn the power supply to the machine on.

Make sure the green LED (V1) on the coil control board (A6) is flashing (accessory board configured).

Should this not be the case, carry out a search and configuration of accessories by pressing the test button on the YKlon board (A1) for over three seconds, until the red LED goes on. Once this search and configuration process begins, the red LED goes on and stays on until this operation is completed. Once it goes off, make sure the green LED (V1) on the coil board is flashing to indicate the accessory has been configured.

4. Check valve actuator operation.

A potentiometer, P1, on the coil control board allows modulating the 3-way valve manually to check its operation.

The actuator will go back to its operating position after 30 seconds.

5. Jumper S2 (ENTALP) selection

By defect, factory-set to open, selects the priority of the compressors in heat pump models. If closed, selects operating priority of the hot water coil over the compressors. Adequate for installations with very economical hot water.

6. Water pump operation relay output.

The control board has a relay (K1) that, through connector J14, gives output to a volt-free contact for the operation of an installation water pump.

VIR Unit

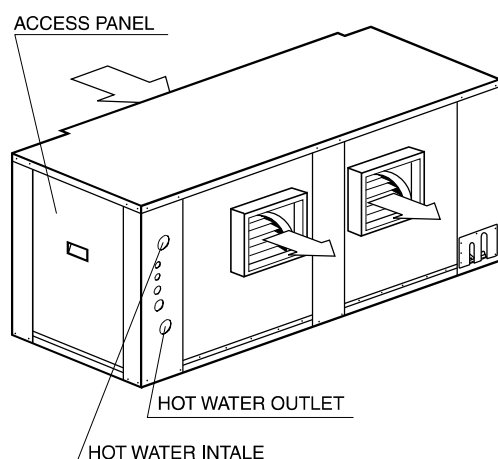


Fig.1

Hot water coil control board

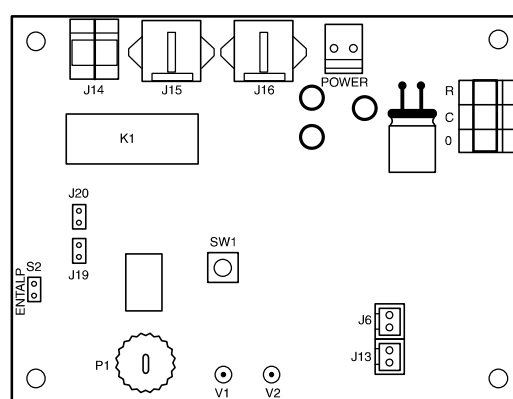
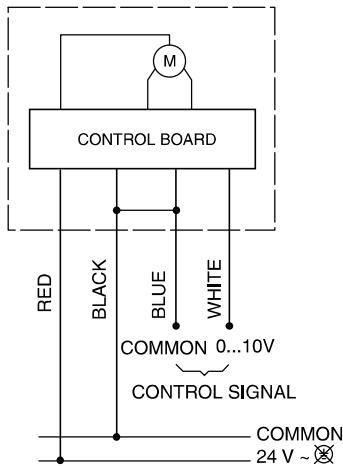


Fig.2

Led	Status	Indication
V1	Off	Board is not connected
V1	On	Board is not in service
V1	Flashing	Normal operation
V2	On	Favourable condition
V2	Flashing	Antifreeze protection

Electric actuators, proportional control

VA - 7472 - 9001 (VIR - 25A and 40A)



VA - 7152 - 1001 (VIR - 45A and 90A)

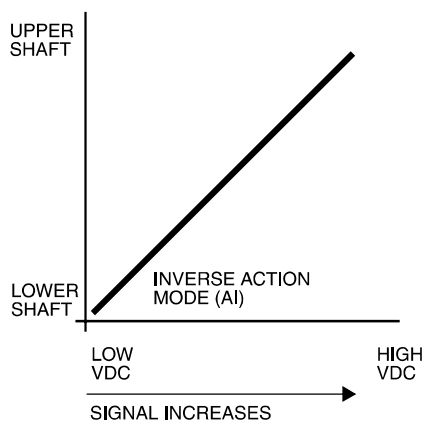
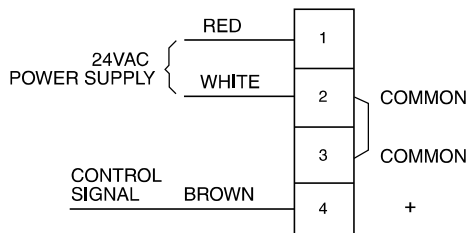


Fig.3



Attention:

Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected tightly.

Operation

Allows generating heat, if conditions are favourable, by modulating the valves in accordance with the impulse probe, in an attempt to reach a maximum temperature of 50° C.

Up to four stages of the hot water coil can be controlled to start in accordance with the demand manager, and are limited by the impulse temperature (30, 40, 45 and 50° C).

Favourable conditions are understood as water temperature being over 30° C 5' after the valve opens. Once the system is in operation, constantly check to make sure conditions remain favourable.

Should unfavourable conditions be detected, and there is a call, 20' will be timed and conditions will be checked again.

If opening is over 20%, water pump relay K1 is activated. If opening is below 5%, this relay is deactivated.

If conditions are favourable, the yellow LED (V2) will be on permanently. If not, it will be off.

When water temperature is below 3° C, the pump is activated and the valve opens 100% to protect the hot water coil against the risk of freezing, and this condition is maintained until the water temperature rises above 6° C. This protection is in operation as long as the fan is off, even if the machine is off or in lockout. As long as the antifreeze protection is in operation, the yellow LED (V2) flashes. As long as the hot water coil heating is in operation, the indoor fan is also on. There is a minimum air impulse temperature protection of 15° C when this accessory is installed. In this way, we avoid the discomfort that can be created when there is a very high renewal percentage with low outdoor temperatures and the indoor fan in continuous mode. If there is a call for cool, the water coil valve closes.

The VA-7472-9001 (VIIR-25A and 40A) valve actuator is powered by 24 VAC by means of the red and black cables. The control signal is from 0 to 10 VAC between the blue and white cables. With 0 VAC the valve is closed (by-pass) and with 10 VDC the valve is open 100%.

The actuator has 6 input selection jumpers to coincide with the operating range desired.

Jumper 1.

Selection of the anti-sticking function. The actuator carries out a complete cycle of open and closed valve every 24 hours. Then it goes back to the position indicated by the control. By factory default, function activated.

Jumper 2 and 3.

Selection of input voltage. Jumper at 2 and 3 (0 to 10 VDC). Jumper at 2 (5 to 10 VDC). No jumper at 2 and 3 (0 to 5 VDC). By factory default, position 2 and 3 with jumper (0 to 10 VDC).

Jumper 4.

No function. By factory default, with jumper.

Jumper 5.

Configures the direct/inverse action jumper so that the valve shaft goes in the desired direction. By factory default, without jumper, inverse action (A).

Jumper 6.

No function. By factory default, with jumper.

Actuator selection jumpers VA - 7472 - 9001 (VIR - 25A and 40A)

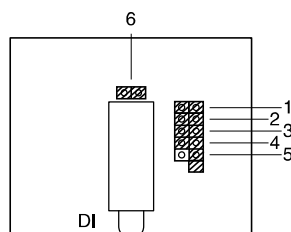


Fig.4

The VA-7151-1001 (VIIR-45A and 90A) valve actuator is powered by 24 VAC between terminals 1 and 2. The control signal is from 0 to 10 VAC between terminals 3 and 4. With 0 VAC the valve is closed (by-pass) and with 10 VDC the valve is open 100%.

The actuator has 4 input selection jumpers to coincide with the operating range desired (Fig. 5).

Jumper 1.

Selection of input voltage: Upper jumper (0 to 10 VDC), centre jumper (0 to 5 VDC) and bottom jumper (5 to 10 VDC). By default, factory-set to upper position (0 to 10 VDC).

Jumper 2.

Configures the short (stroke lengths of 1/2 inch or less),

long (stroke length of over 1/2 inch) stroke selection jumper. By default, factory-set to long position (L).

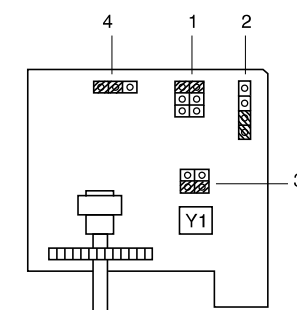
Jumper 3.

Configures the direct/inverse action jumper so that the valve shaft goes in the desired direction. By default, factory-set to lower position, inverse action (A1).

Jumper 4.

Configures the failure position jumper. If the signal is lost in the actuator (connection closed), the actuator, by default, will go to the established position. Factory-set to closed position.

Actuator selection jumpers VA - 7152 - 1001 (VIR - 45A and 90A)



1, 2, 3, 4 = Selection jumpers

Fig.5

Physical data

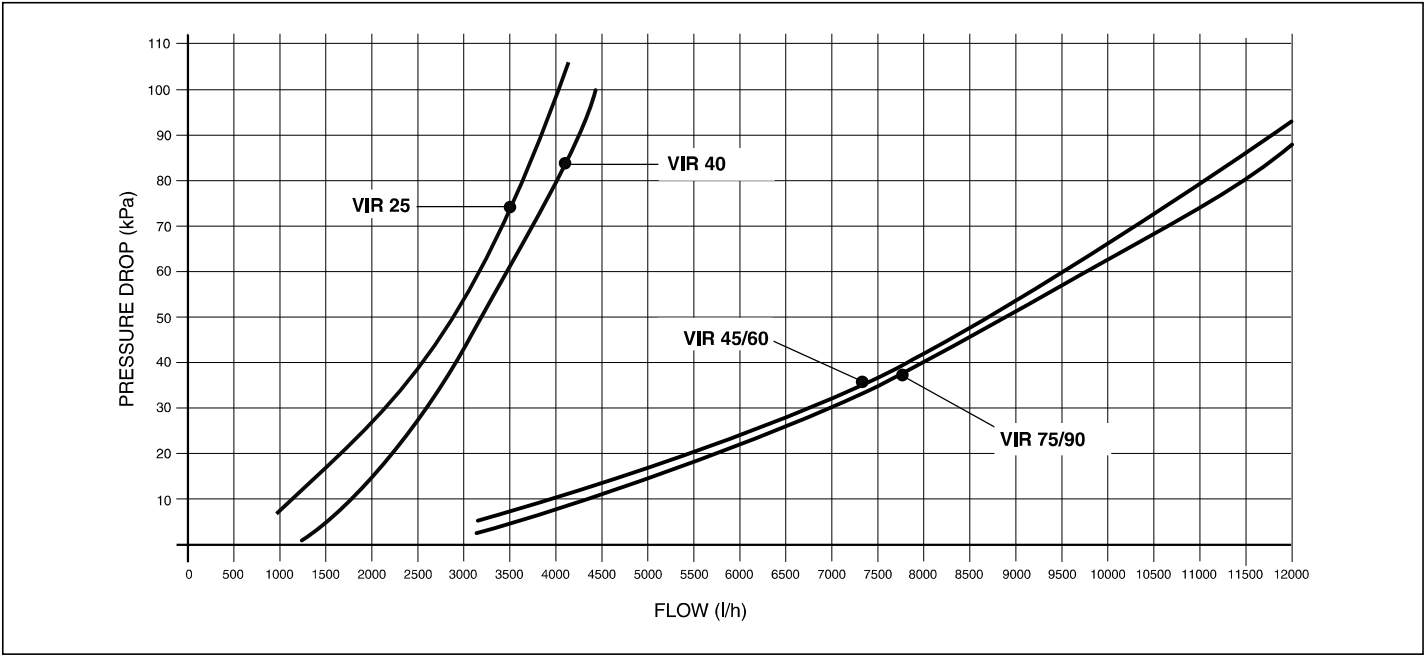
For models	VIR 25A	VIR 40A	VIR 45A and 60A	VIR 75A and 90A
Depth pipes	2	2	2	2
Height pipes	16	19	20	22
Diameter pipes	3/8"	3/8"	1/2"	1/2"
Length fins	1 069	1 312	1 895	2 155
Front area m ²	0.49	0.70	1.32	1.64
Intake/output connections diameter (weld)	1 1/8"	1 1/8"	1 3/8"	1 3/8"
Weight kg	16	20	37	43

Data with water, without GLYCOL

Unit	Water volume in circuit (L)	Air flow m³/h	Water temperature (intake - outlet)								
			90 - 70			80 - 60			70 - 50		
			Heat. cap. kW	H ₂ O flow m³/h	Δ air temp. °K	Heat. cap. kW	H ₂ O flow m³/h	Δ air temp. °K	Heat. cap. kW	H ₂ O flow m³/h	Δ air temp. °K
VIR 25A	3.7	Min. 3 600	36.1	1.51	29.3	29.2	1.22	23.7	22.3	0.94	18.1
		Nom. 4 530	41.4	1.76	26.8	33.5	1.40	21.6	25.6	1.08	16.5
		Max. 5 100	44.4	1.87	25.4	35.9	1.51	20.5	27.4	1.15	15.7
VIR 40A	5	Min. 6 000	58.0	2.45	28.2	47.4	2.02	23	36.6	1.55	17.8
		Nom. 7 500	65.9	2.77	25.7	53.9	2.27	21	41.7	1.76	16.2
		Max. 8 000	68.4	2.88	25	56.2	2.38	20.5	43.2	1.84	15.8
VIR 45A	11.5	Min. 7 200	93.2	3.96	37.6	76.7	3.24	31	59.2	2.52	23.9
		Nom. 9 000	107.0	4.50	34.7	88.1	3.74	28.6	68.0	2.88	22
		Max. 12 600	131.4	5.58	30.3	107.8	4.57	24.9	83.6	3.53	19.3
VIR 60A	11.5	Min. 8 400	102.6	4.36	35.6	84.4	3.60	29.3	65.1	2.77	22.6
		Nom. 10 500	117.7	4.97	32.6	96.8	4.10	26.9	74.7	3.17	20.7
		Max. 12 600	131.4	5.58	30.3	107.8	4.57	24.9	83.6	3.53	19.3
VIR 75A	14	Min. 11 000	133.6	5.69	35.3	110.0	4.64	29	85.9	3.64	22.7
		Nom. 13 700	152.8	6.48	32.4	125.7	5.33	26.7	98.6	4.21	20.9
		Max. 16 800	172.0	7.27	29.8	141.5	6.01	24.5	110.8	4.72	19.2
VIR 90A	14	Min. 12 800	146.4	6.19	33.3	120.6	5.11	27.4	94.0	4.00	21.4
		Nom. 16 000	167.1	7.06	30.4	137.5	5.83	25	107.7	4.57	19.6
		Max. 16 800	172.0	7.27	29.8	141.5	6.01	24.5	110.8	4.72	19.2

- Incoming air to the coil, 18° C

Hydraulic circuit flow/pressure characteristics, hot water coil VIR 25A to 90A

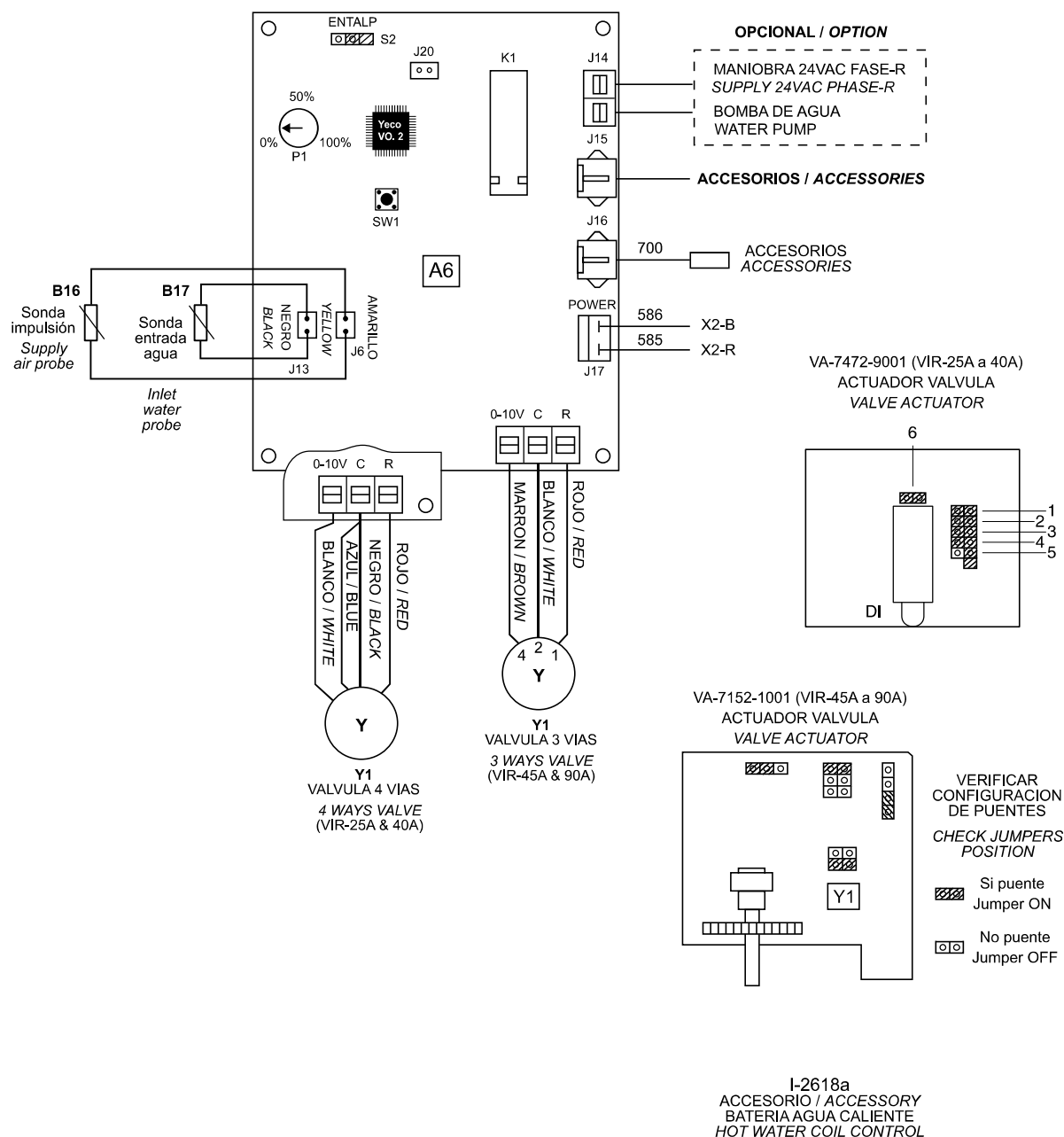


- Pressure drop of hydraulic circuit with the valve open completely (0% by-pass).

Air circuit pressure drop

Machine	Nominal air flow m³/h	Pressure drop in water coil (Pa)
VIR - 25A	4 590	30
VIR - 40A	7 500	50
VIR - 45A	9 000	32
VIR - 60A	10 500	32
VIR - 75A	13 700	38
VIR - 90A	16 000	41

Wiring diagram VIR 45/90



Internal Electric Heaters for VIR 25A to 90A

The internal electric heaters are designed to provide backup or complementary heat in the VIR units. On and off cycles are governed by the air conditioning equipment control system. They are to be fitted on to the internal supports of the indoor unit.

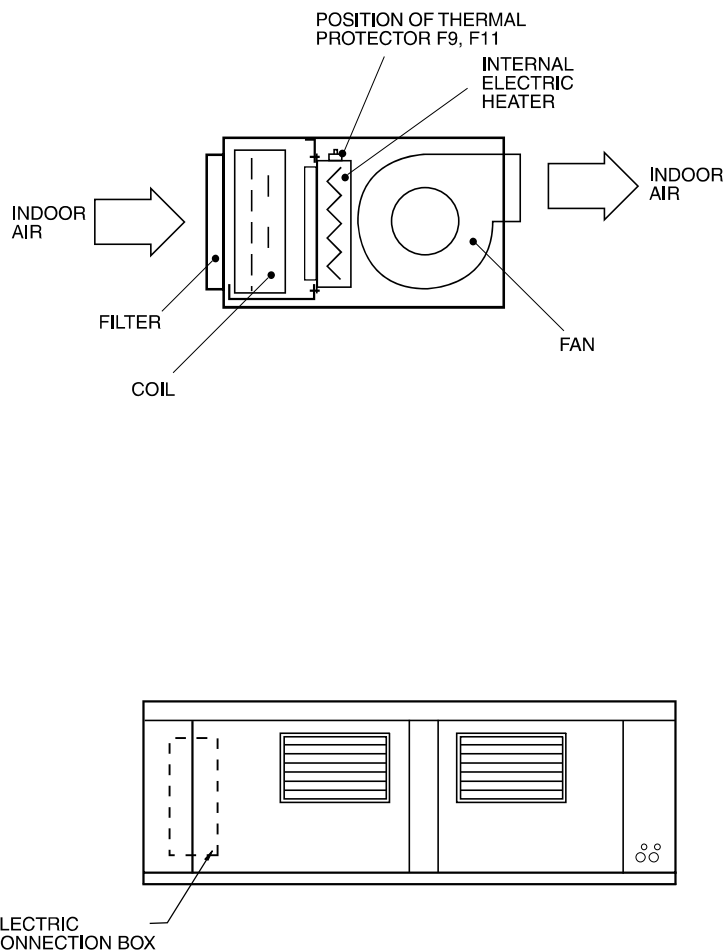
Technical specifications

These internal electric heaters include the following components:

- Galvanised sheet casing and supports.
- Exposed nickel-chrome wire electric resistances mounted on steatite supports.
- Control board of auxiliary heater A3 (A3 and A4 in 2 stages).

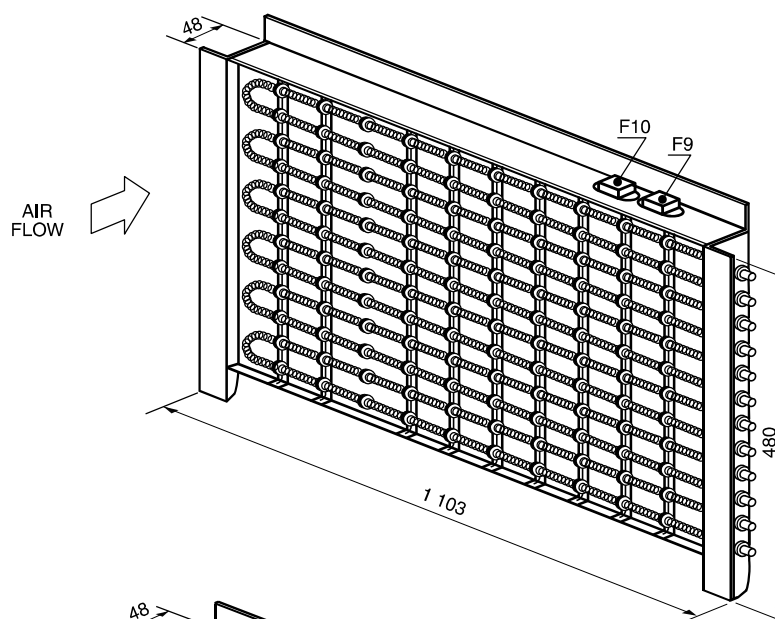
- Power supply contactor with a 24 V coil.
- Two thermal protectors located at the top of the heater. The first, with automatic reset, disconnects the heater when a temperature of 77° C is reached. The second, accessible from the outside the unit and with manual reset, disconnects the heater when a temperature of 138° C is reached. The 2-stage heaters are quipped with four thermal protectors, two per stage.
- Interlocking with the heat relay of the indoor fan. The unit control system does not allow the heater to be in operation in the case of a failure of the indoor fan heat relay.
- Quick connector for interconnecting the unit control panel and the heater (length 20 m). There is a kit for 50 m connections (option).

Assembly and general dimensions mm.

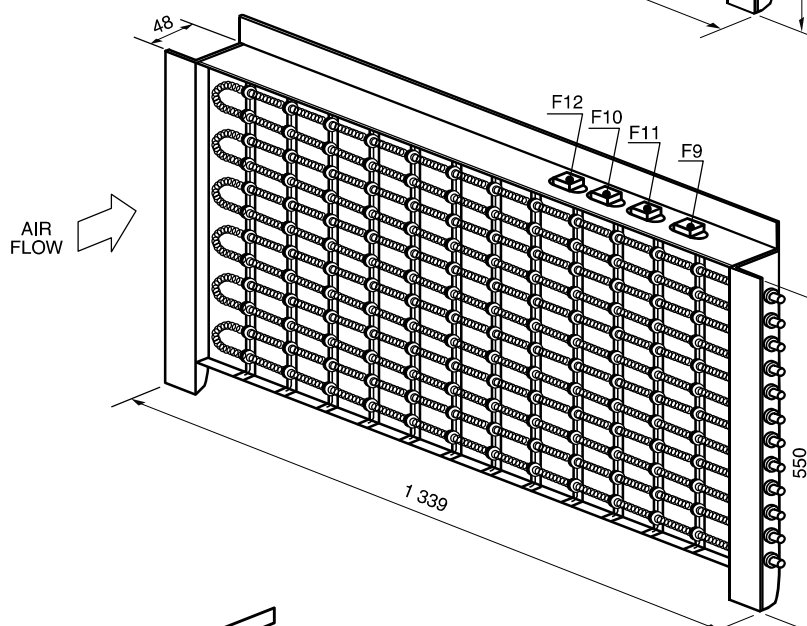


General dimensions mm.

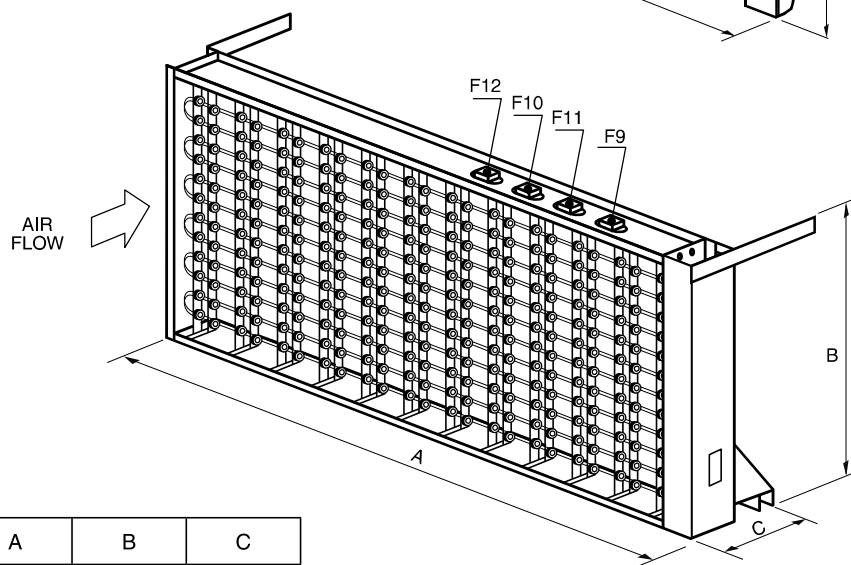
VIR 25A



VIR 40A



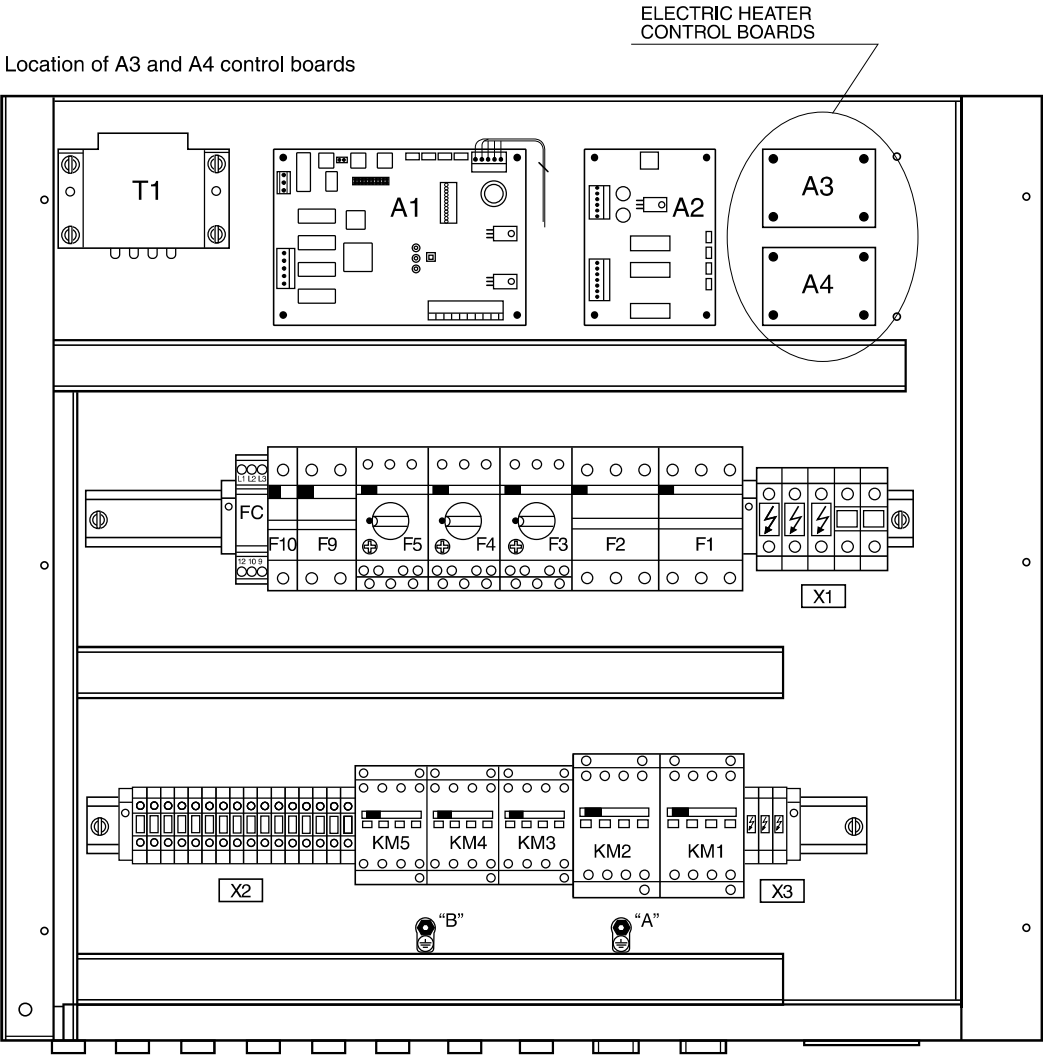
VIR 90A



For installing in	A	B	C
VIR 45A and 60A	1 160	630	116
VIR 75A and 90A	1 380	700	136

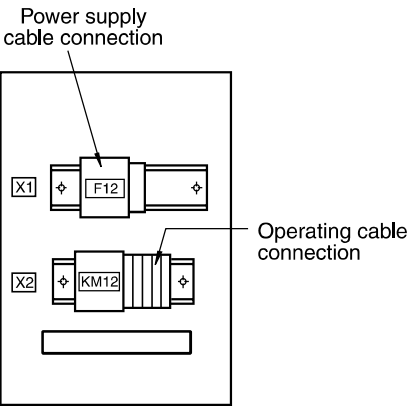
Assembly and general dimensions mm

Electric box of the VCH unit

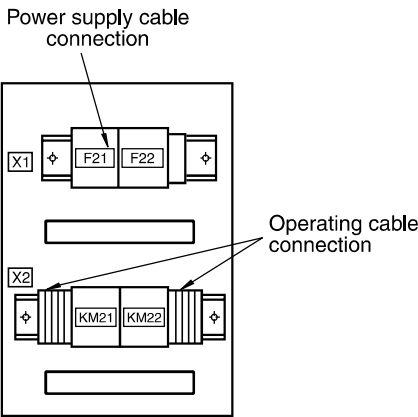


Location of connecting elements and the accessory control of the internal heater, VIR

VIR 25A to 60A 1 STAGE



VIR 40A to 90A 2 STAGES



General characteristics

Heater model	Power supply	Power	Consumption	Stages	Automatic switch (1) Q1	Power supply cable section (2)	Front surface	Pressure drop (3)
	V.ph.Hz	kW	A		A	mm ²	m ²	Pa
VIR 25A	400.3.50	10	15	1	20	2.5	0.53	2.9
VIR 25A	400.3.50	15	22	1	25	4	0.53	2.9
VIR 40A	400.3.50	10	15	1	20	2.5	0.74	4.9
VIR 40A	400.3.50	20	30	2	40	6	0.74	4.9
VIR 45 and 60A	400.3.50	15	22	1	25	4	0.98	7.1
VIR 45 and 60A	400.3.50	30	46	2	50	10	0.98	7.1
VIR 75 and 90A	400.3.50	30	46	2	50	10	0.16	7.1
VIR 75 and 90A	400.3.50	40	60	2	80	25	0.16	7.1

Notes: 1.- K curve (DIN, VDE 0660-104). 2.- Based on copper conductors. 3.- Considered the nominal air flow of the indoor section.

Dimensions with packing and weights

Heater model	Dimensions with packing mm.			Weight kg
	Height	Width	Depth	
VIR 25A	720	1 650	180	15
VIR 40A	720	1 650	180	18
VIR 45 and 60A	720	1 650	180	20
VIR 75 and 90A	720	1 650	180	29

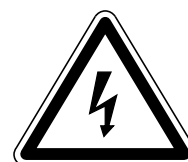
Installation

Install the electric heater in the VIR unit as follows:

- 1) In all cases, the **established national regulations** should be followed.
- 2) Disconnect the power supply to the air conditioning unit.
- 3) Install the magnetothermal and differential switches for the heater in accordance with the table of General Characteristics and the Wiring Diagrams.
- 4) Remove the access panels of the VCH units.
- 5) Unpack the accessory, opening the top of the box. Make sure the heater assembly has not been damaged during transportation. Check the ceramic insulation and that the heater wires are not in contact with any metal parts.
- 6) Remove the side covers of the VIR unit and fit the electric heater on the two internal vertical supports of the coil, making the tab coincide with the drilled hole (VIR 25A and 40A). On models VIR 45A to 90A, fit the electric heater on the tray guide and fasten the fan with the side sheets and to the tray guides, with the self-threading screws supplied. Make sure the reset push button of the F9 (F9 and F11 in 2-stage) thermal protector is accessible and at the top.
See Assembly and General Dimensions diagram.
- 7) Mount the control support on the side of the unit, or within the electrical box, depending upon the VIR unit, and fasten with the screws provided.
- 8) Install the A3 board (A3 and A4 in 2-stages) in the electric box of the VCH unit. Then connect hoses W1, W2 (W1, W2, W3 and W4 in 2-stages), included with this accessory, between the X2 connecting strip and the VCH control board to the VIR unit. Connect the power supply cables to connecting strip X1 of the VIR unit (automatic switch 12 or automatic switch F21 in 2-stages). See wiring diagram in accordance with the corresponding model.

- 9) The installer should complete the electric circuit of the heater by fitting an air flow switch F14 (F14 and F15 in 2-stage) at the most convenient point of the ducts to make sure the heater operates only when there is sufficient air flow.
- 10) Connect power supply to the VCH/VIR units and the heater.
- 11) For configuration of the accessory, press the test button on control board A1 for over 2 seconds, until the red LED goes on. Configuration is finalized once the LED goes off.
- 12) Check operation of the heater by selecting the Emergency Heat mode at the ambient thermostat of the air conditioning unit.
- 13) Assemble the covers of the VCH/VIR units.

Note: Should the system respond incorrectly, see the Operation section of the VCH/VIR Installation Instructions. This section details the control functions of the A1 electronic board with regard to the heater, as well as its configuration, identification of incidents, etc.

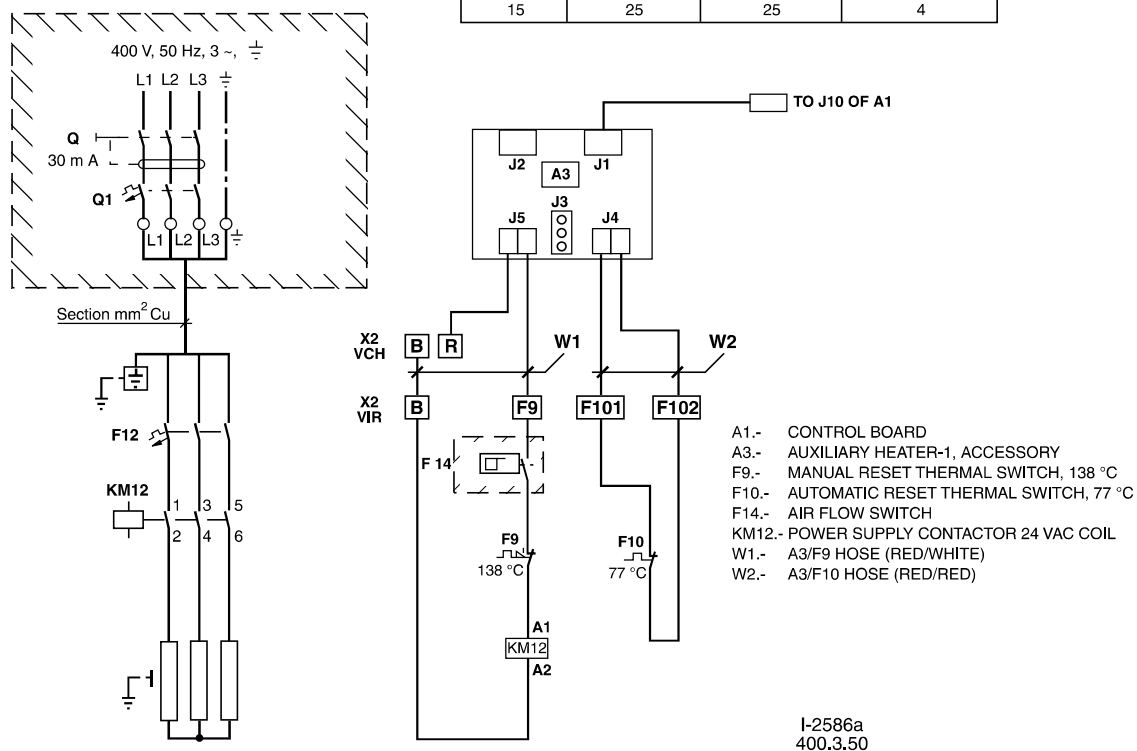


Loose cables can cause overheating of the terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected tightly.

Wiring diagram

**Heater 10, 15kW, 400.3.50 /
VIR 25A, 40A, 45A and 60A**

POWER SUPPLY kW	AUTOMATIC SWITCH Q1	AUTOMATIC SWITCH F12	MIN. CABLE SECTION mm²
10	20	20	2.5
15	25	25	4



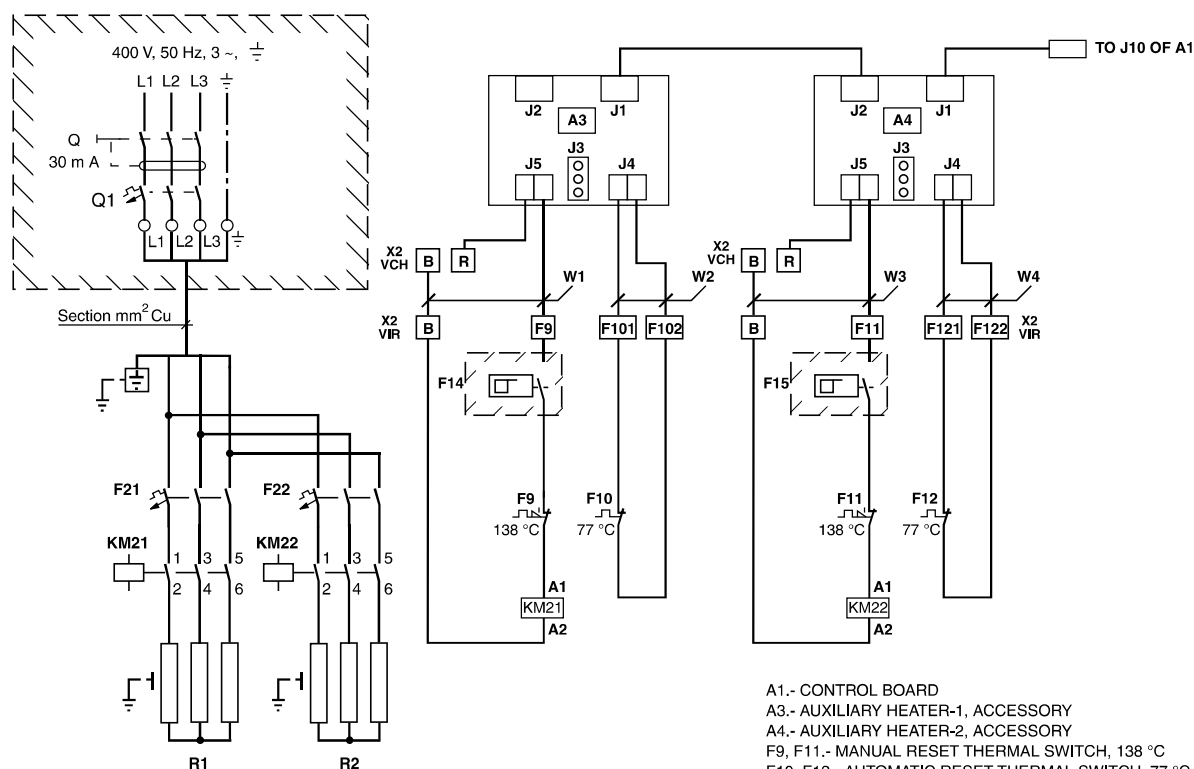
 THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER

IMPORTANT: THE AUTOMATIC SWITCH SIZING AND POWER SUPPLY LINE SECTION ARE ORIENTATIVE AND SHOULD BE CORRECTED IN ACCORDANCE WITH JOB SITE CONDITIONS AND LEGISLATION IN FORCE.

Wiring diagram

Heater 20, 30, 40kW, 400.3.50 /
VIR 40A, 45A, 60A, 75A and 90A

POWER SUPPLY kW	AUTOMATIC SWITCH Q1	AUTOMATIC SWITCH F21 F22		MIN. CABLE SECTION mm ²
20	40	20	20	6
30	50	25	25	10
40	80	40	40	25



- A1.- CONTROL BOARD
- A3.- AUXILIARY HEATER-1, ACCESSORY
- A4.- AUXILIARY HEATER-2, ACCESSORY
- F9, F11.- MANUAL RESET THERMAL SWITCH, 138 °C
- F10, F12.- AUTOMATIC RESET THERMAL SWITCH, 77 °C
- F14, F15.- AIR FLOW SWITCH
- F21, F22.- AUTOMATIC SWITCH
- KM21, KM22.- POWER SUPPLY CONTACTOR, 24 VAC COIL
- R1.- 1st STAGE HEATER
- R2.- 2nd STAGE HEATER
- W1.- A3/F9 HOSE (RED/RED)
- W2.- A3/F10 HOSE (RED/RED)
- W3.- A4/F11 HOSE (RED/WHITE)
- W4.- A4/F12 HOSE (RED/RED)

I-2587a
400.3.50

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

IMPORTANT: THE AUTOMATIC SWITCH SIZING AND POWER SUPPLY LINE SECTION ARE ORIENTATIVE AND
SHOULD BE CORRECTED IN ACCORDANCE WITH JOB SITE CONDITIONS AND LEGISLATION IN FORCE.

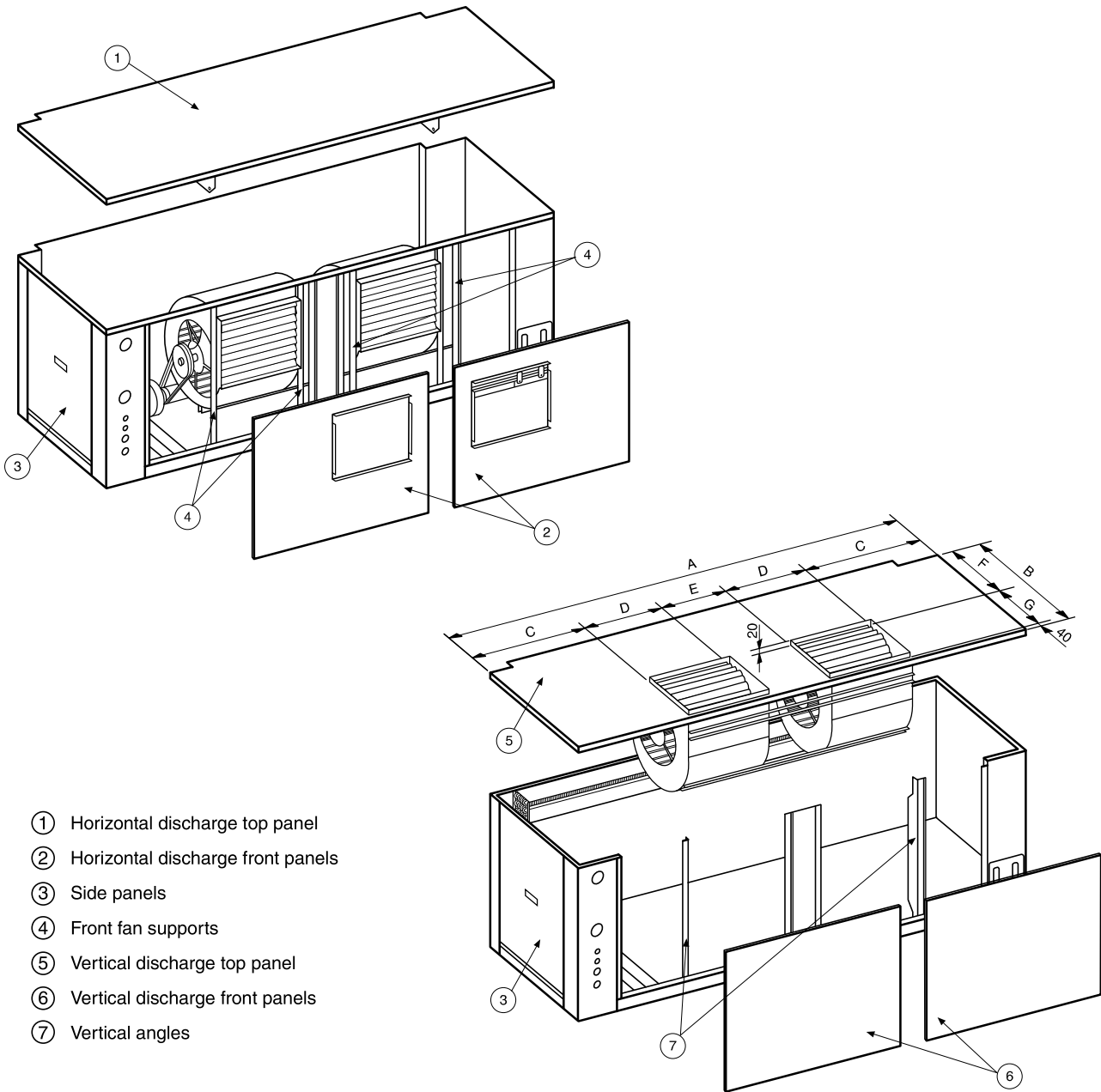
Vertical air discharge for VIR 25A to 90A

The VIR 25A to VIR 90A units require a conversion that includes:

Upper panel ⑤, front panels ⑥ (one only on model 25A), belts and front fan supports ⑦.

- 1.- Remove the top ①, front ② and side ③ panels, as well as the fan front supports ④ and the fan itself.
- 2.- Orient and fasten the fan to the top support ⑤, along with the conversion kit, keeping the 20 mm. projection out the mouth of the fan on the panel surface.

- 3.- Once the fan is fastened to the top panel ⑤, install same on the unit.
- 4.- Fit angles ⑦ to the unit and fasten the fan to these angles.
- 5.- If the conversion kit includes new belts, install these between the motor and fan pulleys.
- 6.- Install the blind front panels ⑥ (one only on VIR 25A) included in the kit.
- 7.- Lastly, install the standard panels ③.



	A	B	C	D	E	F	G
VIR 25A (1 turbine)	1 365	822	484	397	-	439	343
VIR 40A	1 747	822	443.5	313	234	439	343
VIR 45A/60A	2 247	807	571	396	313	424	343
VIR 75A/90A	2 660	928	664.5	475	381	483	405

Vertical air discharge conversion for VCH 20A, 25A 30A and 40A

This Kit allows converting the standard horizontal air discharge, in outdoor units VCH 20A to 40A, to a vertical discharge. The conversion process is as follows:

- 1.- Remove and discard the upper panel (1) and the grids (2) (Fig. 1).
- 2.- Remove the fan, standard motor assembly on support "A" (Fig. 2).
- 3.- Change the motor and its support, the fastening rod, the support and screws to B in the 8 diameter drilled holes proportioned at the limits indicated, making sure the pul-

leys are aligned (the centre of the tensor will be at about 20 mm. from the face of the fan) (Fig. 3).

- 4.- Fasten the fan to the tabs "C" and supports "D" of the upper panel (3), before or after mounting same on the machine, with the new self-threading screws included in the Kit (Fig. 3).
- 5.- Install the upper panel (3) and the plenum cover (4) (Fig. 4).
- 6.- If the machine is to be used without ducts, install, in the fan mouths, the protecting grids supplied with the Kit (self-threading screws are included for assembly).

General dimensions mm.

Fig.1

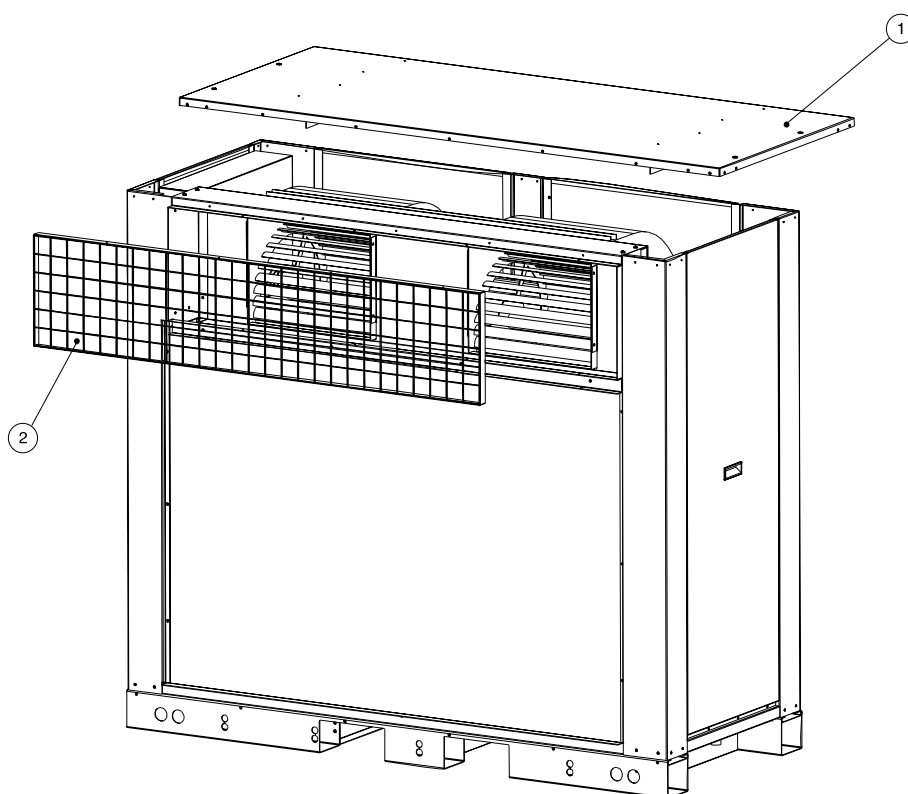


Fig.2

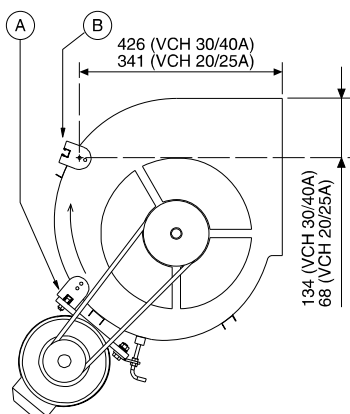
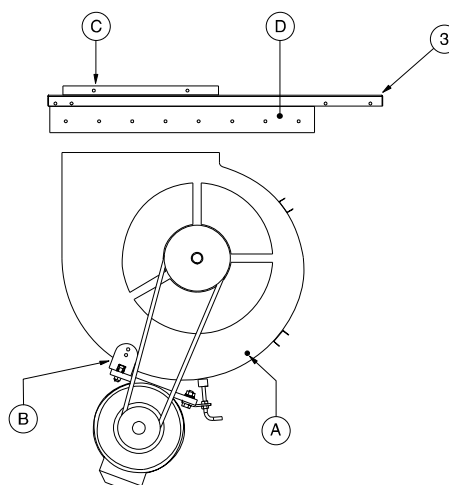
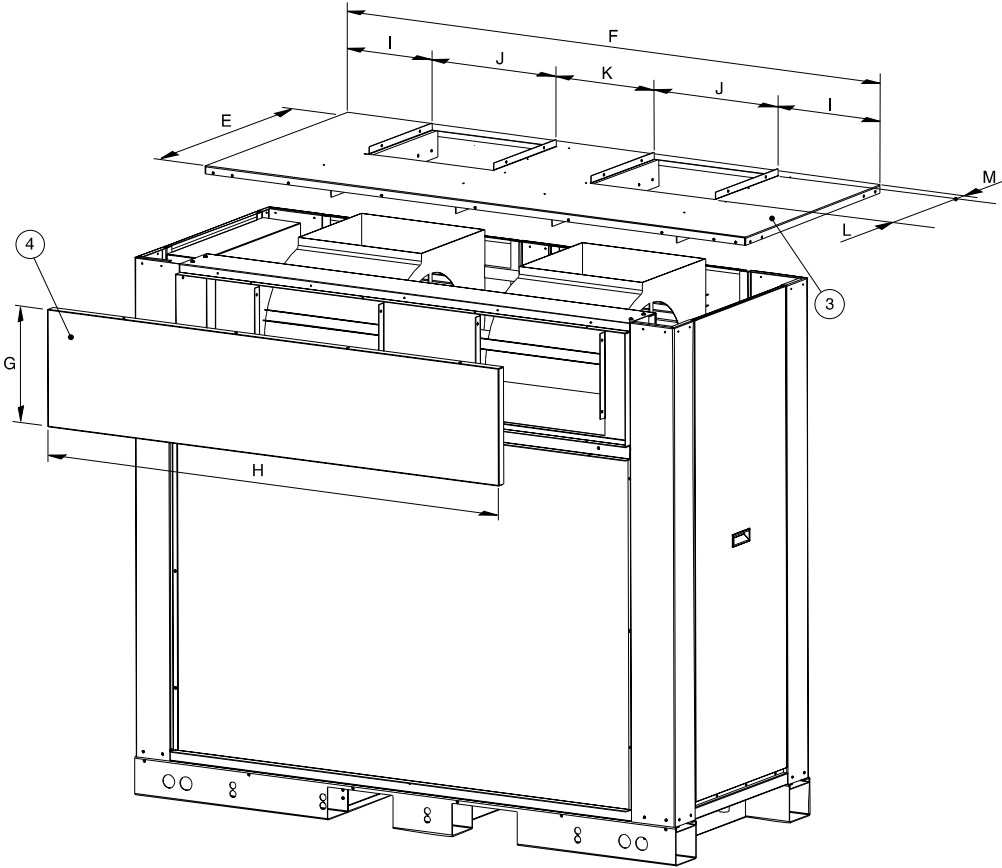


Fig.3



General dimensions mm.

Fig.4



Model	E	F	G	H	I	J	K	L	M
VCH 20A and 25A	793	1 364	273	1 063	211	342	258	290	151
VCH 30A and 40A	781	1 741	328	1 440	310	405	311	341	71

Vertical air discharge conversion for VCH 45A, 60A 75A and 90A

This Kit allows converting the standard horizontal air discharge, in outdoor units VCH 45A to 90A, to a vertical discharge. The conversion process is as follows:

- 1.- Remove and discard the upper panel ① and the grids ② (Fig. 1).
- 2.- Remove the fan, standard motor assembly on support "A" (Fig. 2).
- 3.- Change the motors and their supports, the fastening rods, the support and nuts to B in the 8 diameter drilled holes proportioned at the limits indicated, making sure the pul-

leys are aligned (the centre of the tensor will be at about 20 mm. from the face of the fan) (Fig. 3).

- 4.- Fasten the fan to the tabs "C" and supports "D" of the upper panel ③, before or after mounting same on the machine, with the new self-threading screws included in the Kit (Fig. 3).
- 5.- Install the upper panel ③ and the plenum cover ④ (Fig. 4).
- 6.- If the machine is to be used without ducts, install, in the fan mouths, the protecting grids supplied with the Kit (self-threading screws are included for assembly).

General dimensions mm.

Fig.1

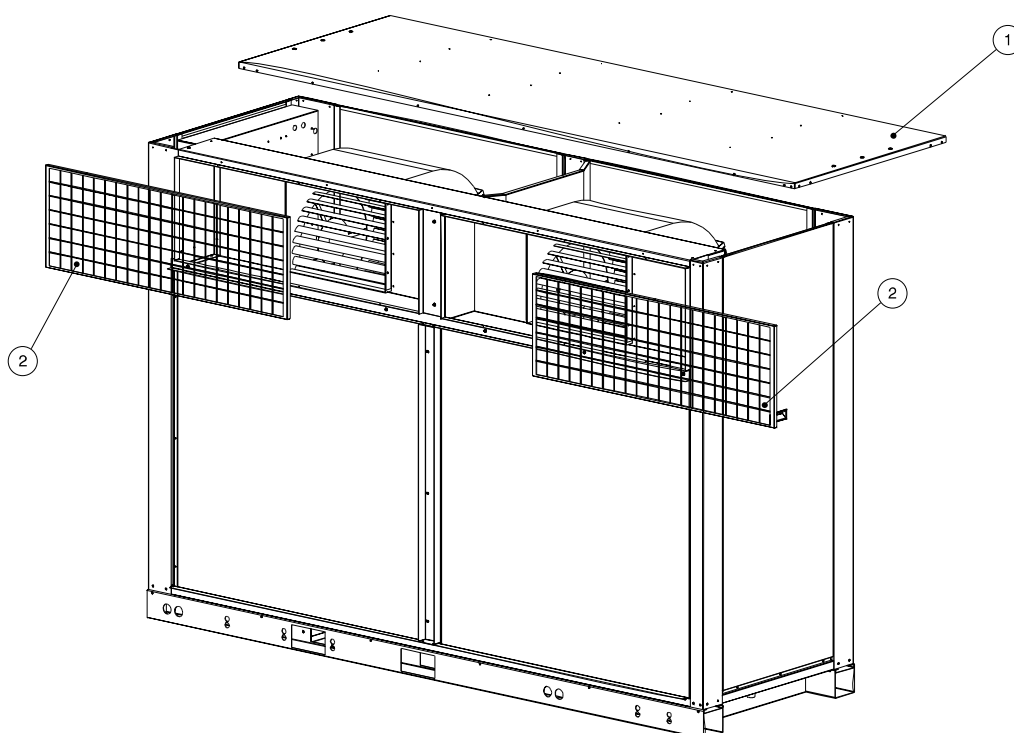


Fig.2

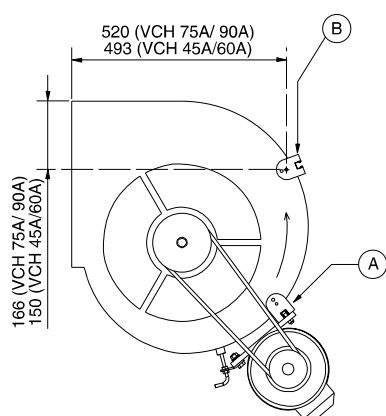
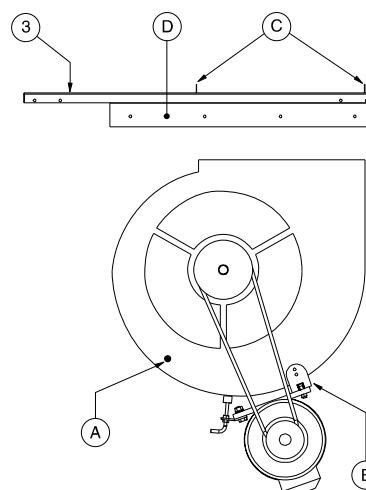
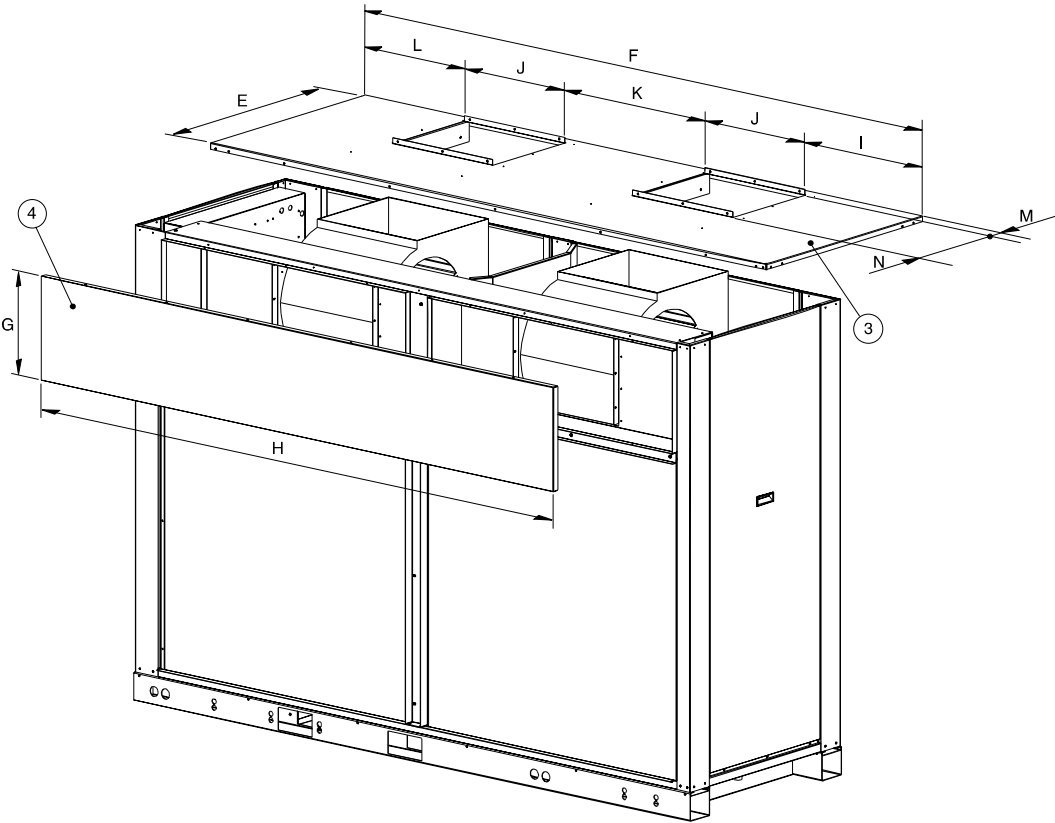


Fig.3



General dimensions mm.

Fig.4



Model	E	F	G	H	I	J	K	L	M	N
VCH 45A and 60A	781	2 240	394	1 990	281	479	562	439	21	408
VCH 75A and 90A	898	2 660	394	2 410	45	475	759	500	30	412

Condensation Control VCH 20 to 90A

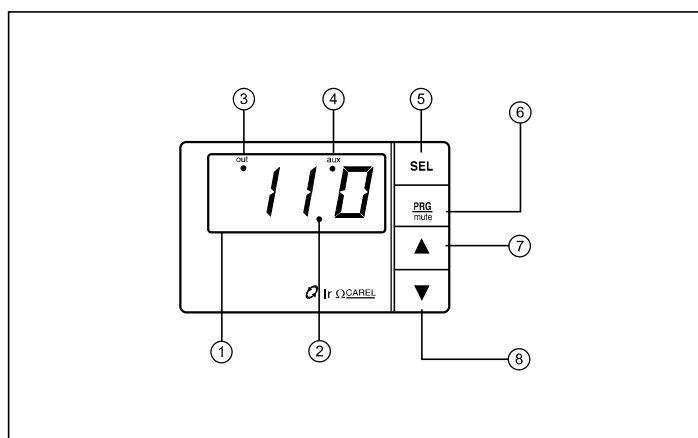
This option controls the head pressure in the summer cycle by varying air flow in the outdoor coils. This air flow variation keeps the head pressure constant when outdoor temperatures are low.

Operation

By means of the pressure detected by the control unit through the analogical pressure switches installed in the cooling circuit, and carrying out the appropriate calculations in accordance with the settings, this control unit gives off an analogical signal that positions the opening of the dampers in such a way that the previously programmed head pressure is maintained.

Programming and adjustment

Keys and display (description of the control unit)



- 1) Display:
 - Displays the value of the pressure switches.
 - Displays the code of the alarms produced.
- 2) Decimal LED:
 - Is lit when the value has a decimal part.
- 3) OUT LED:
 - Is lit constantly when the 0v output is different.
 - Flashes when the output is at the maximum programmed value.
- 4) AUX LED:
 - Is lit or flashes, depending upon the operating mode selected.
- 5) SEL key (SEL)
 - Displays and/or selects the set point value.
 - If pressed along with the (Prg) key for 5 seconds, 00 appears on the display. Using the (▲) (▼) keys, select the access code to access the main programming mode, parameters "Cxx".
- 6) (Prg/Mute) key:
 - If pressed for 5 seconds, the basic programming mode is accessed, parameters "Pxx".
 - If an alarm is produced, pressing once deactivates the acoustic signal. If pressed a second time, the alarm is reset.
- 7) (▲) key:
 - In standby mode, displays pressure switch 1 value.
 - In programming mode, it is used to move on to the next parameter and to increase the values of same.

8) (▼) key:

- In standby mode, displays pressure switch 2 value.
- In programming mode, it is used to move on to the previous parameter and to decrease the values of same.

Necessary settings

- 1 compressor unit:

VCH 20 to 40

Parameter	Value
St1	26
C00	3
P01	2
C03	0
C04	0%
C05	100%
C10	0
C13	6
C14	0
C15	0.0
C16	44.8
C19	0
C30	4

- 2-compressor unit:

VCH 45 to 90

Parameter	Value
St1	26
C00	3
P01	2
C03	0
C04	0%
C05	100%
C10	0
C13	6
C14	0
C15	0.0
C16	44.8
C19	2
C30	4

Programming sequence

- 1.- Press (SEL) for 2 or more seconds, until "St1" appears on the display. After displaying "St1" for one second, the present "St1" value will appear.
- 2.- By means of the (▲) (▼) keys, change this value to the value indicated in the above tables.
- 3.- Press (SEL) to confirm the new value. "St2" will appear on the display, but it should not be programmed. Press (SEL) once again to exit the programming mode.
- 4.- To program C00, press (SEL) and (Prg) simultaneously for 5 seconds, until "00" appears on the display.
- 5.- By means of the (▲) and (▼) keys, enter the password "77" to access the "Cxx" parameters. Press (SEL) to confirm.
- 6.- Use the (▲) and (▼) keys to move through the different "Cxx" parameters, until reaching "C00".
- 7.- Press (SEL) to view current value.
- 8.- By means of the (▲) and (▼) keys, set the values indicated in the above tables, as required.

- 9.- Press (SEL) to confirm the change.
- 10.- Press (Prg/Mute) to save the changes and exit the programming mode.
- 11.- To program "P01", press (Prg/Mute) for 5 seconds, until "P01" appears on the display.
- 12.- Press (SEL) to access the current value.
- 13.- Use the (▲) and (▼) keys to modify the value in accordance with the above tables.
- 14.- Press (SEL) to confirm the change.
- 15.- Press (Prg/Mute) to save these values and exit the programming mode.
- 16.- To program the remaining "Cxx" parameters, press (SEL) and (Prg/Mute) simultaneously for 5 seconds, until "00" appears on the display. Enter the password "77" and press SEL to confirm.
- 17.- By means of the (▲) and (▼) keys, move through the different "Cxx" parameters, and then use (SEL) to access and validate the values and the (▲) and (▼) keys to modify these parameters in accordance with the above tables.

Horizontal air discharge assembly

- 0.- Check to see the packing is not damaged. Unblock the motor and make sure the slits open and close correctly by applying force.
- 1.- Disconnect power supply to the unit.
- 2.- Discard the 2 "┐" supports and the 2 "└" gaskets provided for the vertical air discharge version.
- 3.- Install the lower support supplied, as in the figure. Fasten the support with the self-threading screws of the accessory.
- 4.- Lean the dampers on the previously fitted support, with the motor at the point nearest the control panel.
- 5.- Install the top support and fasten it to the chassis of the unit by means of the drilled holes and the self-threading screws supplied.
- 6.- Fasten the dampers to the lower and top supports with the self-threading screws supplied.
- 7.- Install the side gaskets as shown in the figure.
- 8.- Open the control unit panels, as well as the right rear panel (compressor zone).
- 9.- Install control CP1 and the relays RL1 and RL2 (on VCH-45/90A only) on the DIN guide on connecting strip X1.
- 10.- Move contactors KM1 and KM2 (compressors) so as to attach the side auxiliary contacts supplied.
- 11.- Screw the pressure switches on to the upper inputs that are not connected to the corresponding high cooling circuits. But first unscrew and remove the plugs that protect same.
- 12.- Connect the pressure switch hoses and fasten them by means of the clamps supplied, along with the existing wiring cables.
- 13.- Insert the pressure switch hoses through the hole indicated on the electric box diagram, using the 19 mm. Ø wall hole guide supplied.
- 14.- Connect the pressure switch hoses to the control unit (for 2-compressor hoses only).
- 15.- Remove the damper motor cover, insert the damper hoses and connect as indicated on the corresponding

diagram.

- 16.- Drill a 22 mm. Ø hole on the left side front panel (next to damper motor) and insert the guide. Insert the motor hose.
- 17.- Then insert the motor hose through the guide at the base of the electric box and connect the cables.
- 18.- Connect all cables supplied, in accordance with the corresponding wiring diagram.
- 19.- Turn main power supply on and program the control unit.
- 20.- Close all panels.

Vertical air discharge assembly

- 0.- Check to see the packing is not damaged. Unblock the motor and make sure the slits open and close correctly by applying force.
- 1.- Disconnect power supply to the unit.
- 2.- Discard the top support "L" and the bottom support "┐" or "└", as per models, provided for the horizontal air discharge version.
- 3.- Install the "┐" type vertical discharge supports at the points indicated in the vertical discharge assembly diagram, by means of the self-threading screws supplied. On models VCH 20 to 60, both "┐" supports are fastened on the roof. On models VCH 75 to 90, the "┐" support for the coil side is fastened on the roof, and on the panel side it is fastened on the vertical surface of the longitudinal reinforcement of the roof.
- 4.- Lean the dampers on the previously fitted supports, with the motor at the point nearest the control panel.
- 5.- Fasten the damper to the supports with the self-threading screws supplied.
- 6.- Fasten the vertical discharge gaskets to the supports with the self-threading screws supplied.
- 7.- Open the control unit panels, as well as the right rear panel (compressor zone).
- 8.- Install control CP1 and the relays RL1 and RL2 (on VCH-45/90A only) on the DIN guide on connecting strip X1.
- 9.- Move contactors KM1 and KM2 (compressors) so as to attach the side auxiliary contacts supplied.
- 10.- Screw the pressure switches on to the upper inputs that are not connected to the high cooling circuits. But first unscrew and remove the plugs that protect same.
- 11.- Connect the pressure switch hoses and fasten them by means of the clamps supplied, along with the existing wiring cables.
- 12.- Insert the pressure switch hoses through the hole indicated on the electric box diagram, using the 19 mm. Ø wall hole guide supplied.
- 13.- Connect the pressure switch hoses to the control unit (for 2-compressor hoses only).
- 14.- Remove the damper motor cover, insert the damper hoses and connect as indicated on the corresponding diagram.
- 15.- Drill the 22 mm. Ø hole on the left side front panel (next to damper motor) and insert the wall hole guide for the damper hose. Insert the motor hose.
- 16.- Then insert the motor hose through the guide at the base of the electric box and connect the cables.

- 17.- Connect all cables supplied, in accordance with the corresponding wiring diagram.
- 18.- Turn main power supply on and program the control unit.
- 19.- Close all panels.

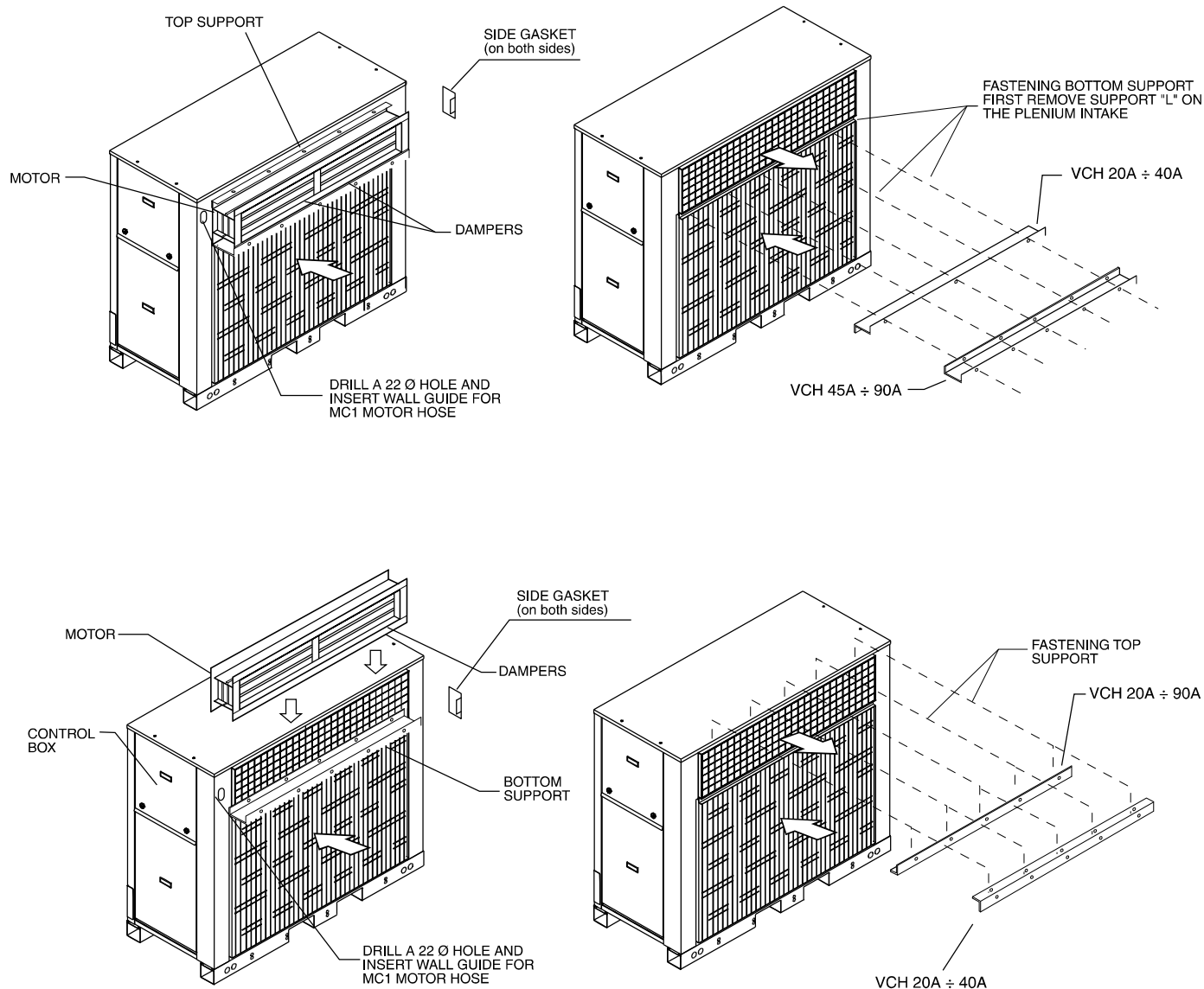
Checking

- 1.- Program the thermostat in the winter cycle, start the compressors and make sure the dampers open completely.

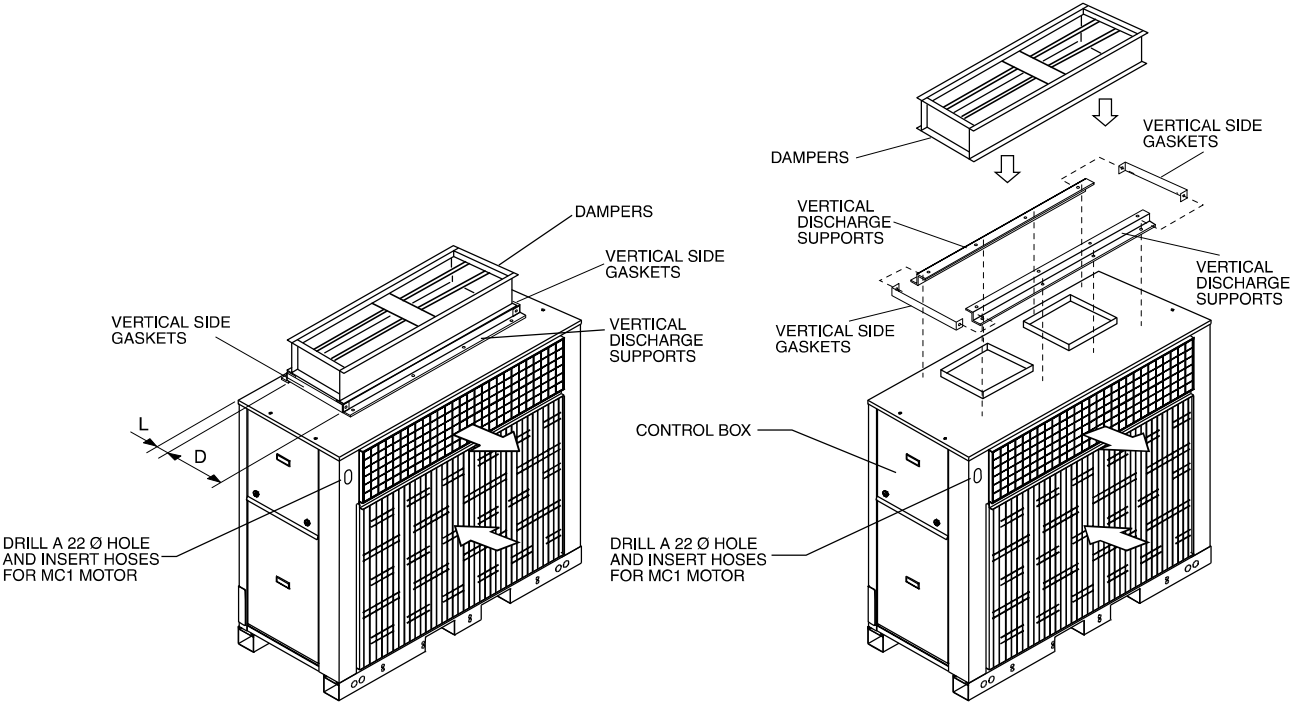
- 2.- Turn the unit off and program the thermostat in the summer cycle.
- 3.- Start the compressors and check to be sure that when the pressure begins to rise above the programmed 26 bar, the dampers begin to close. Once this pressure is reached, the dampers open to a specific position, depending upon the outdoor temperature. With a very low outdoor temperature, the dampers should be fully closed.

Location of components

Horizontal air discharge VCH 20 to 90A

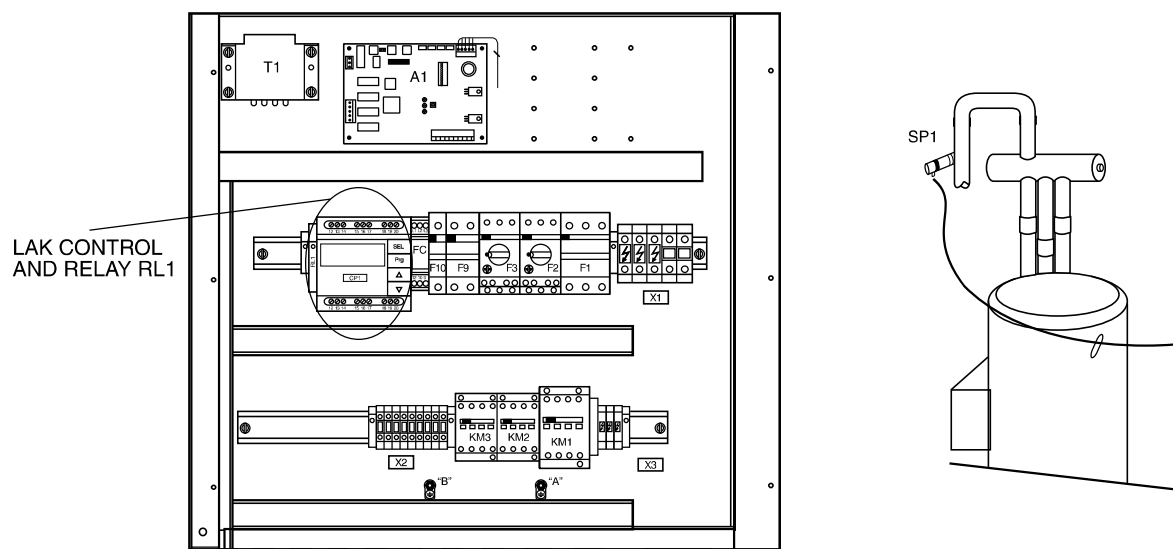


Vertical air discharge
VCH 20 - 90A

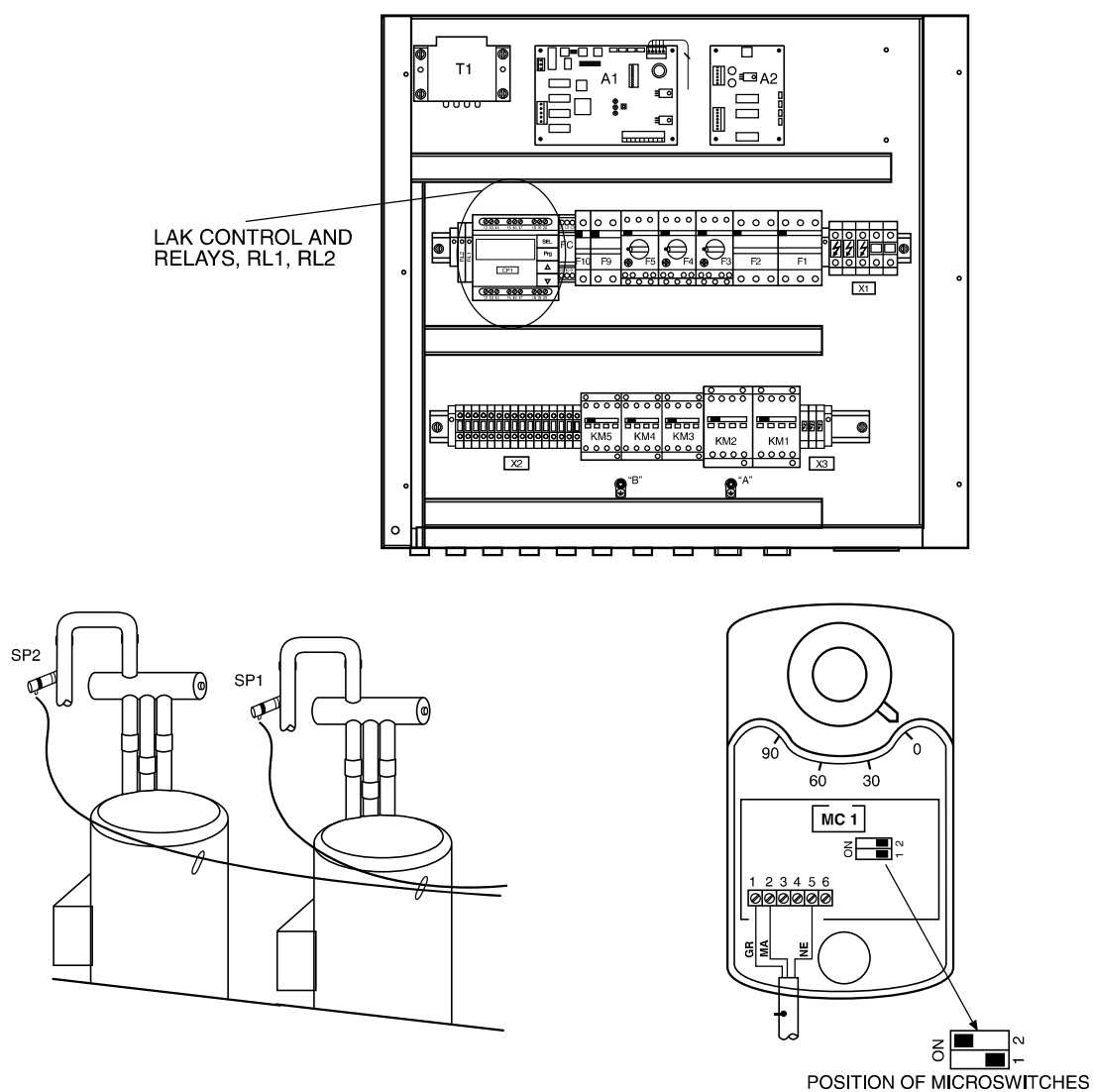


Machine	A	D
VCH-20 to 25A	115	363
VCH-30 to 40A	60	363
VCH-45 to 60A	20	463
VCH-75 to 90A	29	463

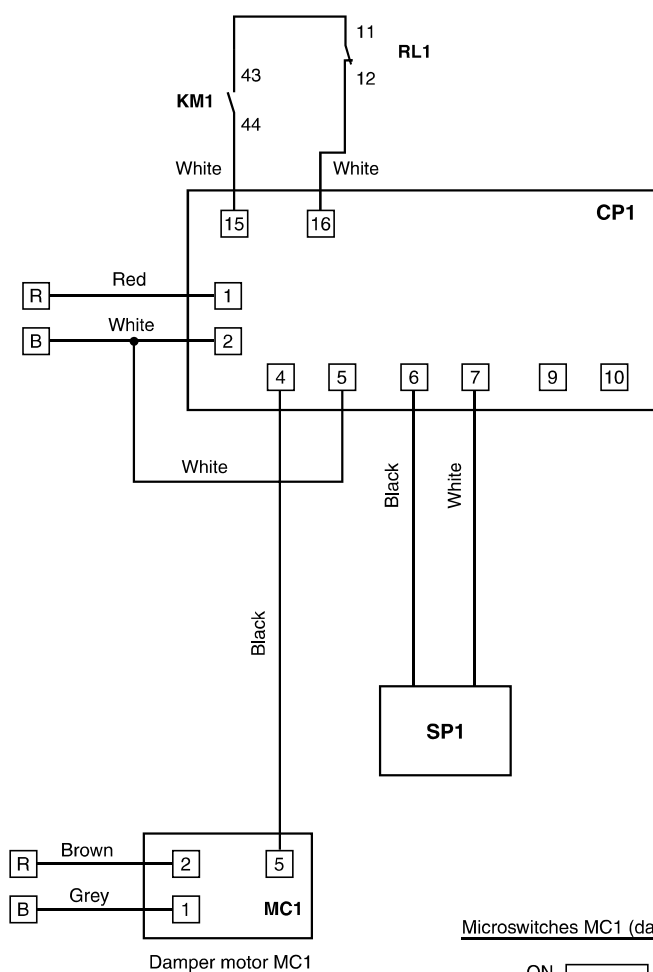
VCH-20A to 40A



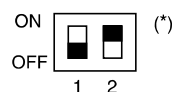
VCH-45 to 90A



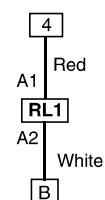
Wiring diagrams



Microswitches MC1 (damper motor)



(*) The position of the damper in standby (0v set point between 1 and 5 of MC1) should be open. With signal (0-10 Vdc), the damper should close. Set switch 2 to ON/OFF to carry out this logic.



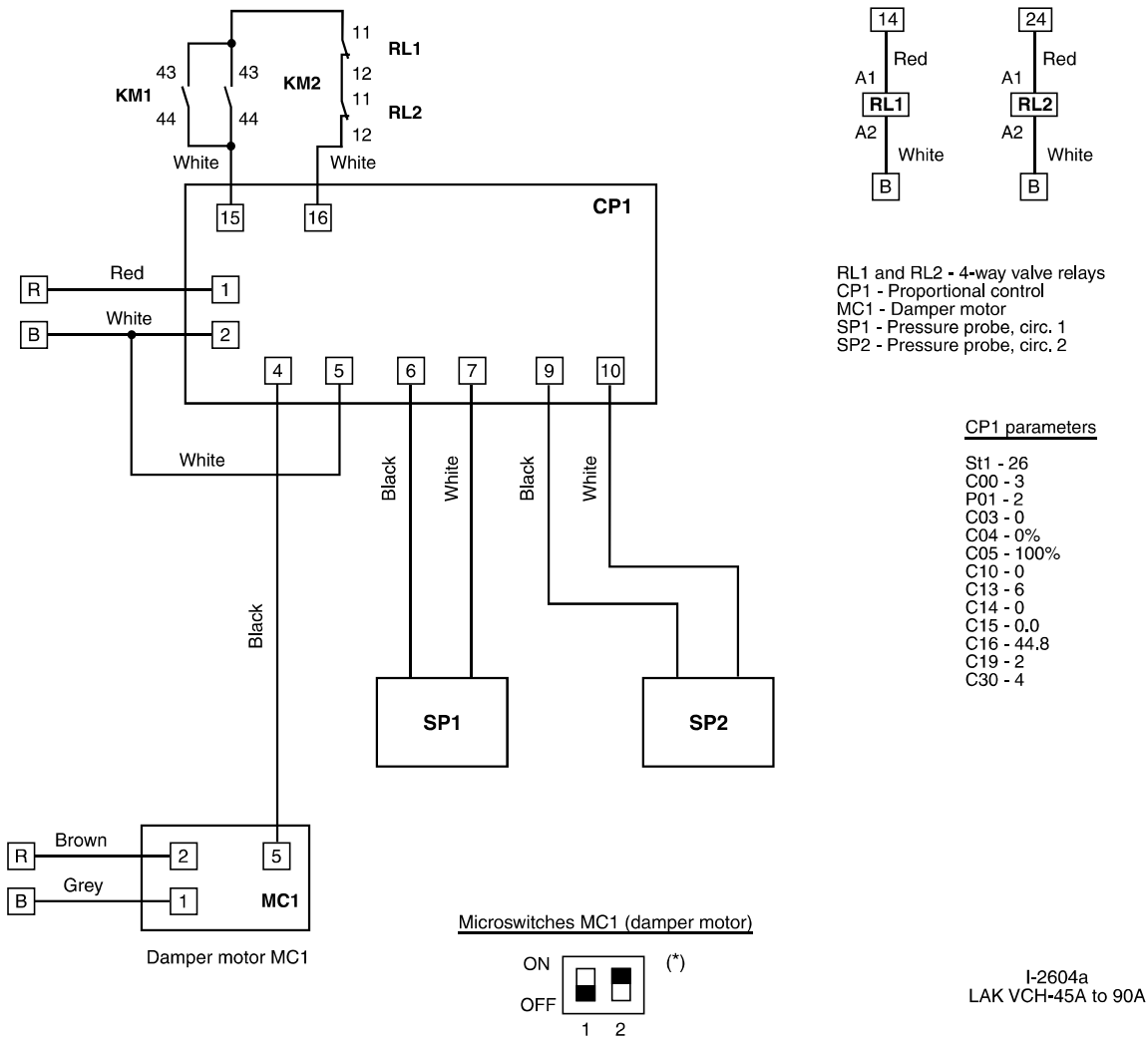
RL1 - 4-way valve relay
CP1 - Proportional control
MC1 - Damper motor
SP1 - Pressure probe, circ. 1

CP1 parameters

St1 - 26
C00 - 3
P01 - 2
C03 - 0
C04 - 0%
C05 - 100%
C10 - 0
C13 - 6
C14 - 0
C15 - 0.0
C16 - 44.8
C19 - 0
C30 - 4

I-2603a
LAK VCH-20A to 40A

Wiring diagrams



(*) The position of the damper in standby (0v set point between 1 and 5 of MC1) should be open. With signal (0-10 Vdc), the damper should close. Set switch 2 to ON/OFF to carry out this logic.

I-2604a
LAK VCH-45A to 90A

Tray Heater

This flexible cable heater can be used in cold climates to avoid the forming of ice and the subsequent obstruction at the tray drain of the heat pumps.

This accessory includes:

Models VCH 20 to 40A

- 1 Flexible cable heater with a thermostat.
- 2 m. of 50 mm. self-adhesive aluminium tape.
- Connecting hose

Models VCH 45 to 90A

- 2 Flexible cable heaters with a thermostat.
- 4 m. of 50 mm. self-adhesive aluminium tape.
- Connecting hose

Heater characteristics:

Current: 230.1.50

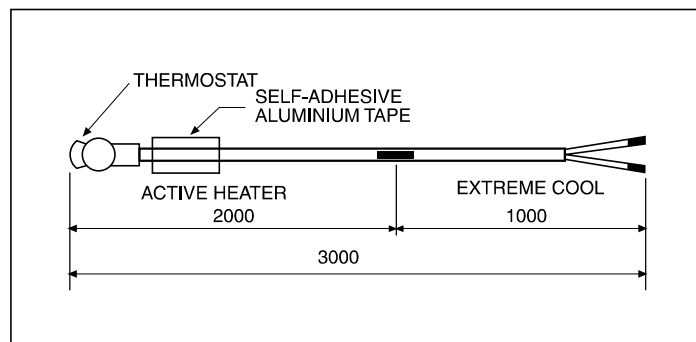
Total power: 80 W

Total length: 3 m.

Active heater length: 2 m. (contact with the coil)

Extreme cool: 1 m. (open-air cable and connecting strip connection).

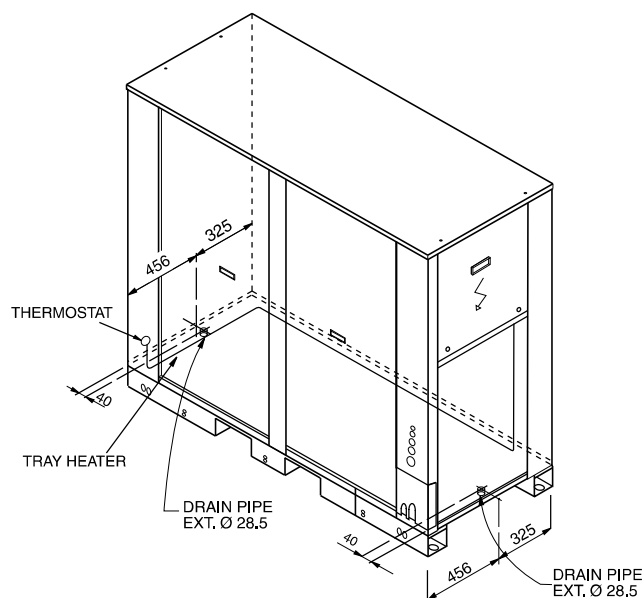
Heater activation temperature: Indoor ambient 4° C.



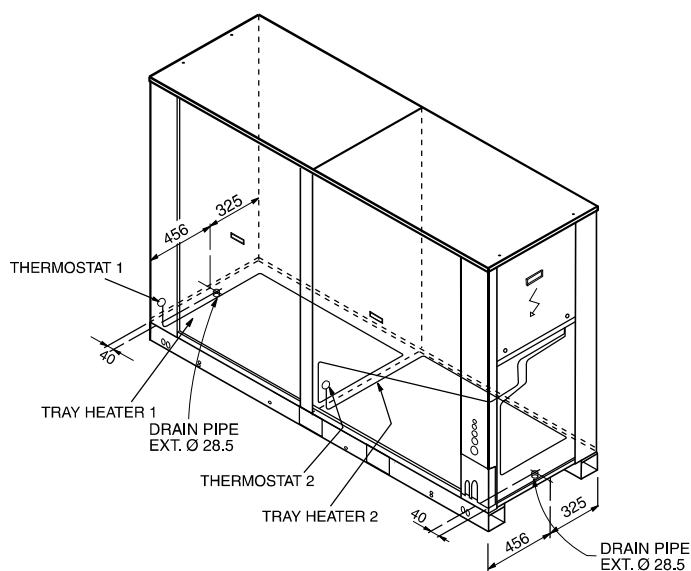
Installation

- 1- With the power supply turned off, remove the front and side panels.
- 2- Fasten the end with the thermostat to the side corner on the inside.
To fasten said end, use the self-adhesive aluminium tape strip that is inserted.
- 3- Locate the cable heater over the tray.
- 4- Fasten the cable heater to the tray with the self-adhesive aluminium tape supplied. Avoid covering the tray drain.
- 5- Connect the two terminal cables of the heater to terminals L1 and N (230.1.50) on the connecting strip.

VCH 20 and 40A



VCH 45 and 90A



Economiser

These instructions provide the necessary information for correct installation, at the job site, of the economiser dampers. The economiser is located in the return section of the VIR indoor unit (see Fig. 1).

The control board, cables and all material necessary for installation are supplied with this accessory.

Technical specifications

This accessory includes the return and outdoor air dampers and a drive motor with a return spring modulated by temperature control (enthalpy probes optional).

This accessory is comprised of:

- Damper assembly, with motor, for outdoor air.
- Damper assembly, with motor, for return air.
- Control board, plastic partitions and protecting cover.
- Temperature sensors for return and outdoor air and air impulsion.
- Wiring assembly, ready for connection to unit wiring.
- A set of panels and supports.
- Screws and wall hole guides for assembly.

Installation

Turn main power supply to the unit off by means of main switch Q1.

Prior to installing the economiser it is indispensable to know how the outdoor air duct will be connected at the job site. There are two possibilities: Top or bottom duct (Figs. 1 and 2).

Install the economiser as follows:

1. Assembly of outdoor air intake by means of top duct (standard configuration). The outdoor air damper will be at the top, and the economiser cabinet should be confronted with the frame of the corresponding VIR unit filter. To fasten, use the screws, nuts and washers supplied. The panels must be removed first so to insert the screws.
2. Assembly of the outdoor air intake at the bottom duct. Remove the side supports and fit them on the opposite side. Then turn the unit fully around, as shown in the figure. For coupling to the VIR indoor unit, proceed as in the standard configuration.
3. Position of the of dampers. The stand-by position of the dampers is: outdoor air closed and return air, open. Check the position of the dampers.
4. Connection of the economiser control board wiring. Connect the economiser hose cables as shown on the wiring diagram: power supply cables (J17, 580 and 581), accessory communication cable (J16, 700), motor cables (R-red, C-black, 0-10V-grey), return probe (J13-black), outdoor probe (J3-white) and impulse probe (J6-yellow).
5. Assembly of return, outdoor and impulse air temperature sensors. Depending upon the assembly of the dampers, it is advisable to install the sensor supports as well as the return (B15), outdoor (B17) and impulse (B16) air temperature sensors at a minimum distance of at least 1 m.

from the mouth of the duct connected to the machine.

6. Assembly of enthalpy probe, Ref. C7400A (option not applicable). The enthalpy probes are an optional accessory that cannot be installed with the VIR unit economiser.
7. J19, J20 and ENTALP jumper selection.
 - J19 jumper: Open by default, selects economiser operation. If closed, selects motor-driven damper operation.
 - J20 jumper: Open by default, selects outdoor damper closed with high temperature/smoke alarm. If closed, selects outdoor damper open with high temperature/smoke alarm.
 - ENTALP jumper, S2: Open by default, selects operation without enthalpy probes.
8. Configuration of economiser control board and adjustment of minimum opening.
Once this accessory is fitted, along with the necessary elements, the unit is powered on once again. Make sure the green LED (V1) of the economiser control board (A4) is on permanently.
To carry out a search and configuration of accessories, press the test button on the Yklon board (A1) located on the outdoor machine for over three seconds, until the red LED goes on. Once this search and configuration process begins, the red LED goes on and stays on until this operation is over. Once it goes off, make sure the green LED (V1) of the economiser board is flashing to indicate the accessory has been configured.
A potentiometer, P1, on the economiser board allows modulating the damper manually to check its operation. The damper will go back to its operating position after 30 seconds.
As long as the indoor fan is on, the damper will be open proportionally to renew air circulation. Factory set default value is 10%. This minimum percentage can be set by means of potentiometer P1, or through the communication network. To set it with the potentiometer, set the minimum value until the minimum opening is reached, and then press configuration button SW1 for 3 seconds to store this value.
9. Air quality probe (optional).

The air quality probe is equipped with a VOC (volatile organic compounds) sensor that compares the VOC concentration in the air with the sensor set point. If this concentration is greater, the probe activates outlet Y1 by means of a relay.

The 230 VAC outlet signal between Y1 and N connects to the 230 VAC to 5VDC conversion board. This board is to be fitted next to the economiser control board and the 5 VDC signal cable should be connected to J18 on the economiser board.

If the room thermostat temperature set point is satisfied and there is a call for air quality, the damper opens to minimum programmed renovation and the indoor fan turns on. Then the damper opening is increased in accordance with the maximum (30° C) and minimum (12° C) impulse temperatures. If the air quality call signal disappears, or if the thermostat calls for air quality, or if the thermostat

calls for cool or heat, the damper goes back to minimum renovation. If there is no call from the thermostat and the indoor fan is in auto mode, the fan turns off and the dampers close.

The probe can select three levels of air quality, depending upon the position of the jumper:

Caution:



Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected tightly.

Operation

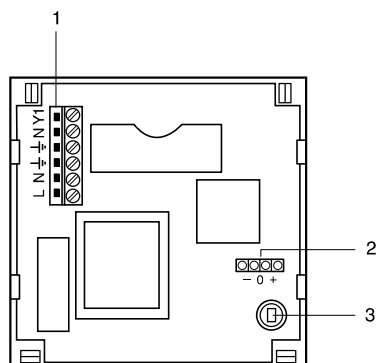
Allows generating cold air by modulating the outdoor air intake damper. If conditions are favourable, the yellow LED V2 will be on and the damper will adjust to achieve an impulse temperature of 12° C. Favourable conditions in temperature mode are understood as an outdoor temperature of below 20° C and, at the same time, below the return temperature. The yellow LED on the board will be off when conditions are not favourable.

Whenever the indoor fan is in operation, the outdoor damper is open proportionally to renew the air in the room. (By default, 10% adjustable value.)

In winter cycle, if the thermostat calls for heat but no heat phase can be activated due to a failure, the outdoor damper will remain closed with the indoor fan in operation.

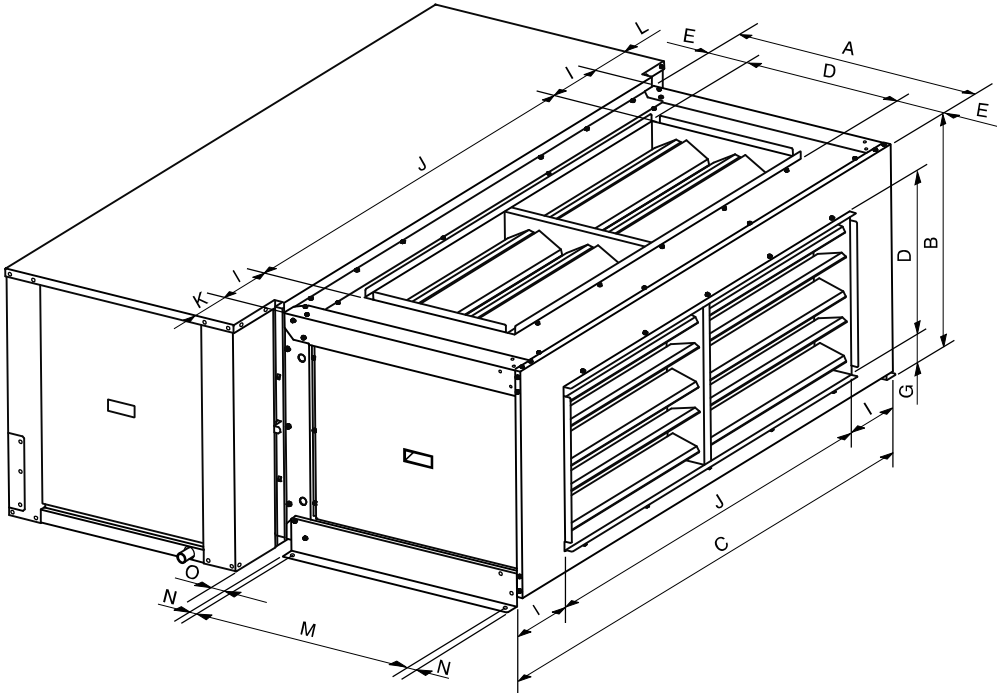
Should the indoor fan fail and this is detected by the Yklon board, the outdoor air damper closes completely.

Air quality probe



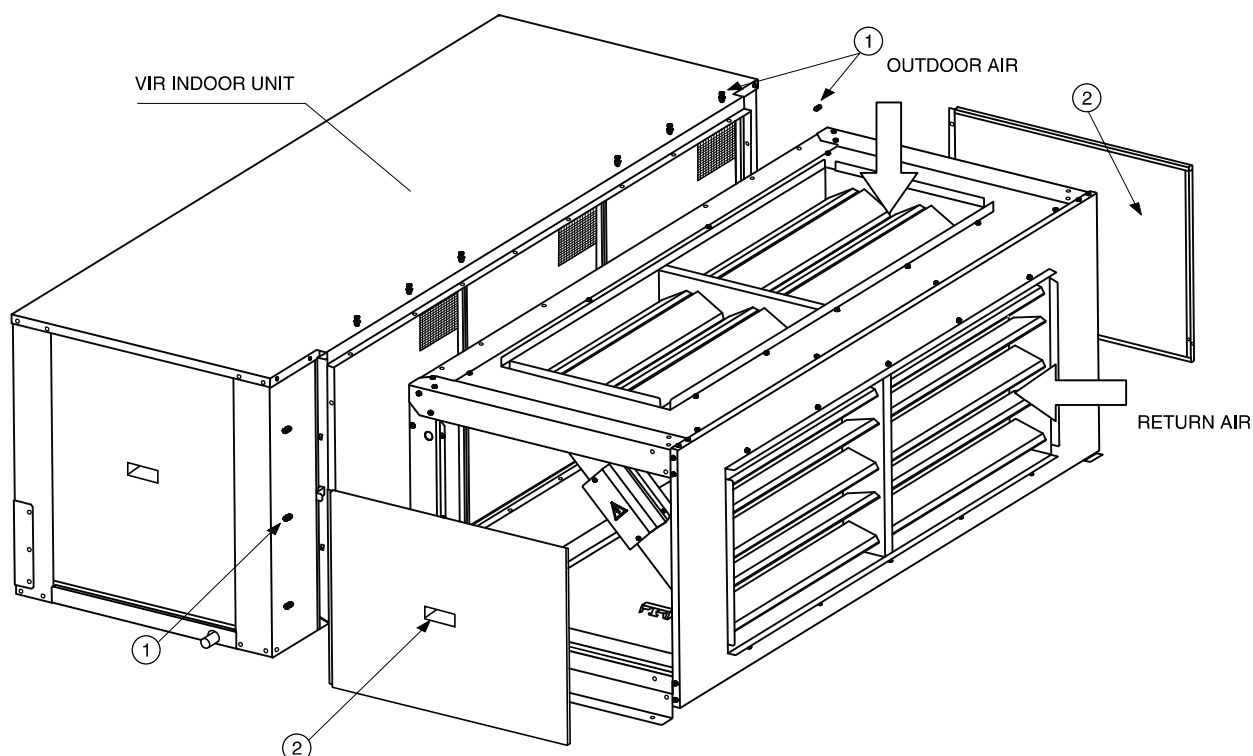
- 1.- Connecting terminals
- 2.- Air quality level selection
 - 0 = Normal position by default
 - = Acceptable
 - + = Very good
- 3.- VOC sensor

Economiser
General dimensions mm.



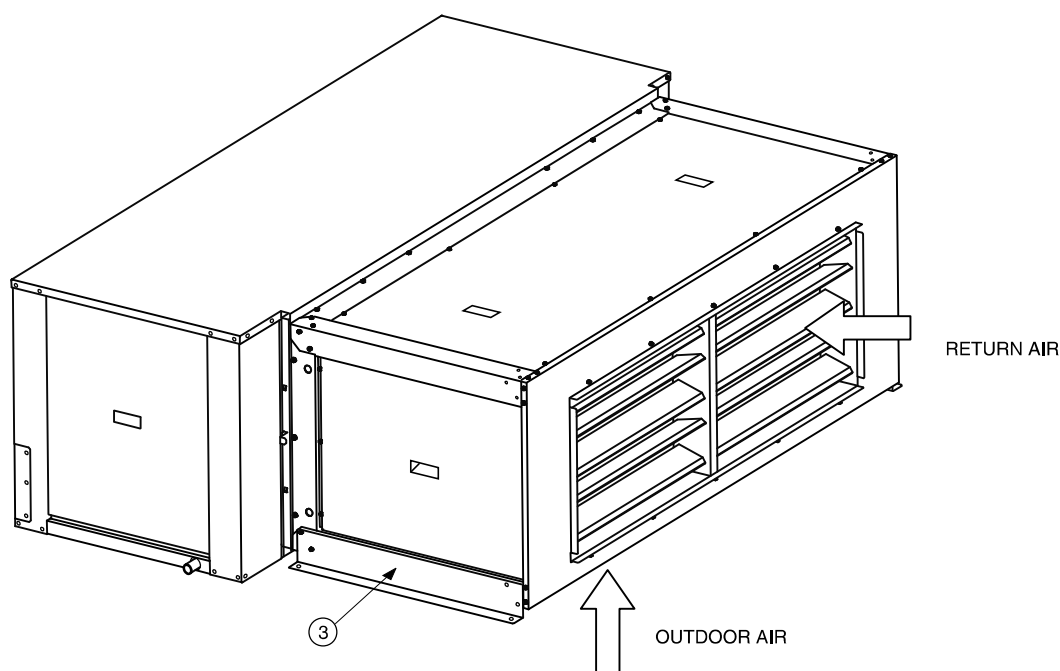
Economiser	Weight	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
VIR 25A	54	729	566	1 109	408	159	162	95	63	205	699	140	130	605	40	55
VIR 40A	69	729	639	1 352	408	159	162	131	100	227	898	212	196	605	40	55
VIR 45A / 60A	78	809	739	1 935	508	164	137	101	130	218	1 499	213	112	685	40	55
VIR 75A / 90A	90	729	812	2 205	508	79	142	138	166	228	1 724	260	202	605	40	55

Economiser assembly, standard configuration



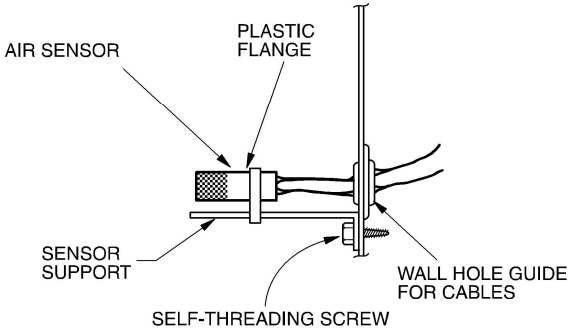
The outdoor air damper is at the top. Confront the economiser with the frame of the corresponding VIR unit. To fasten use the screws, nuts and washers ① supplied. To install said screws ①, first remove the side panels ②.

Outdoor air at the bottom

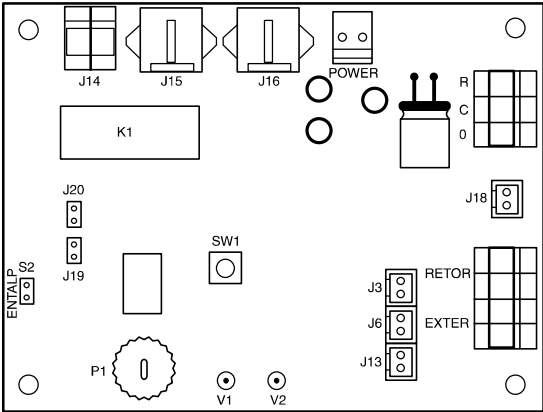


Remove supports ③ from the economiser and fit them on the opposite side, as shown in the figure. Then turn the unit fully around. For coupling to the VIR indoor unit, proceed as in the standard configuration.

Return, outdoor and impulse air sensor

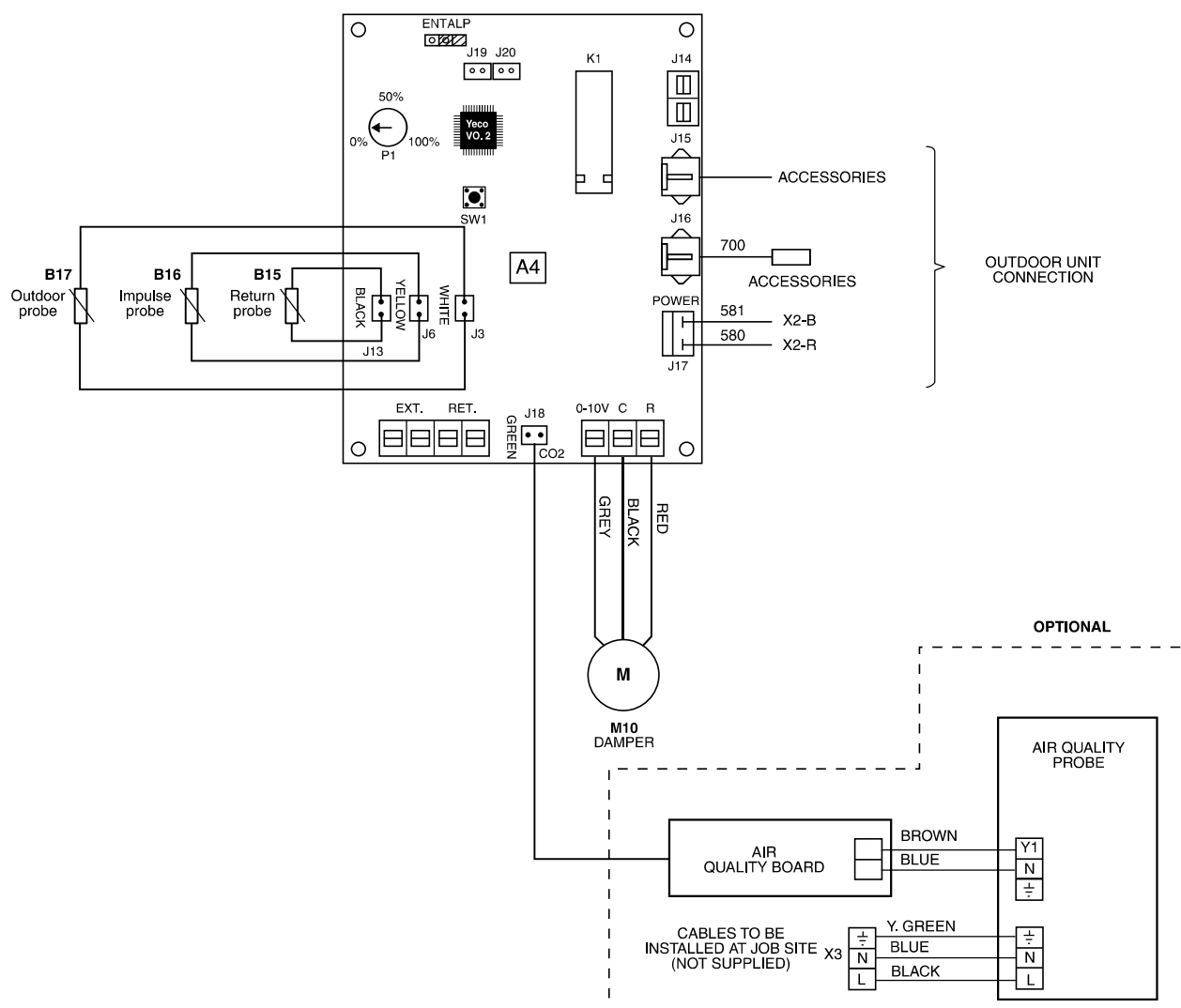


Economiser control board



Led	Status	Indication
V1	Off	Board is not connected
V1	On	Board is not in service
V1	Flashing	Normal operation
V2	On	Favourable condition

Wiring diagram

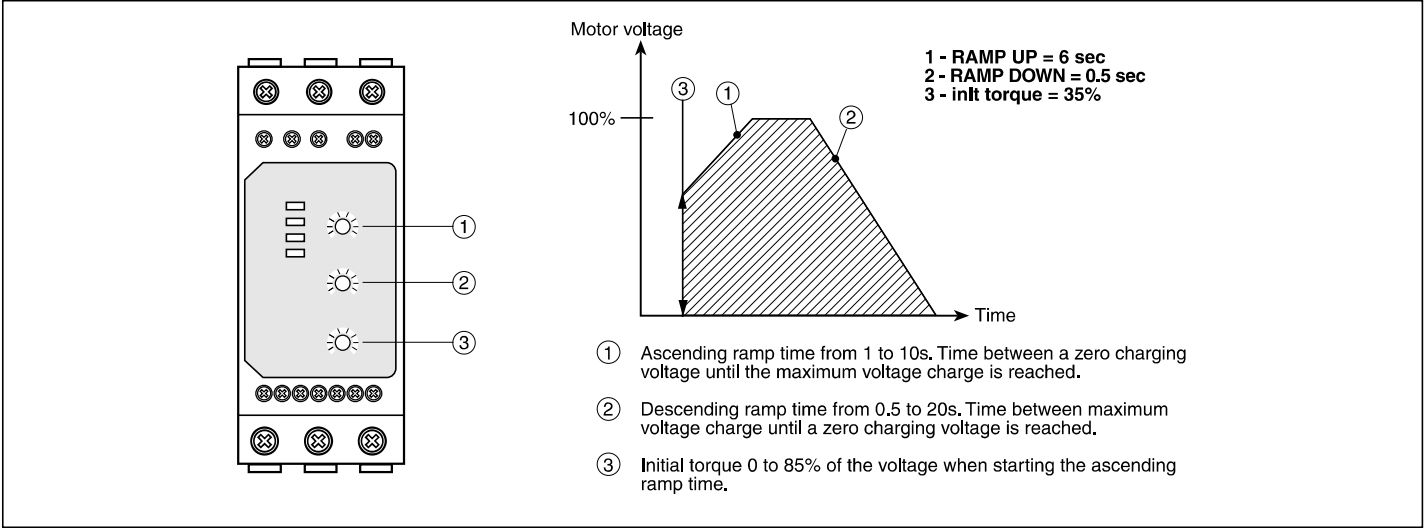


I-2617a
ECONOMISER ACCESSORY

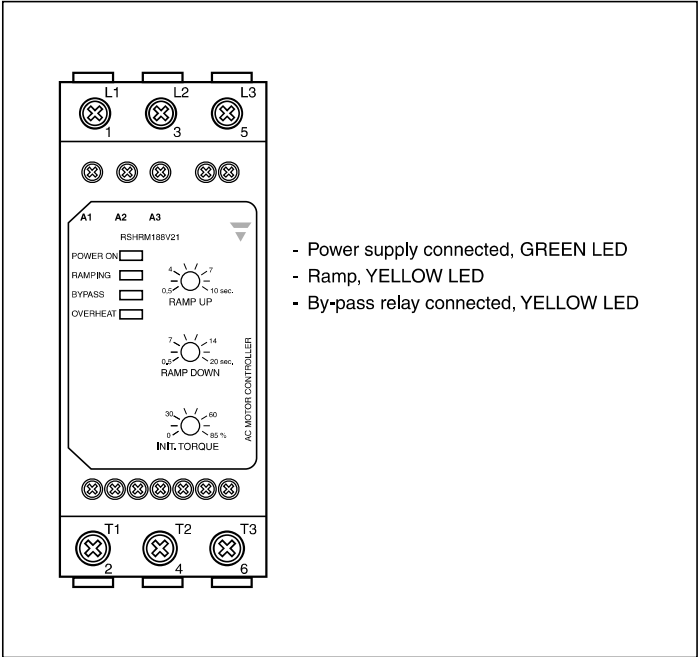
Static starter (Soft Start)

The RSHR4012BV20 starter is a compact control unit with a motor with AC semiconductors, designed for soft starting and stopping of three-phase motors for centrifugal fans, with a rated operational current of up to 12A (5.5 kW). The soft starts and stops are carried out by means of the voltage control unit of the motor. It is equipped with internal electro-

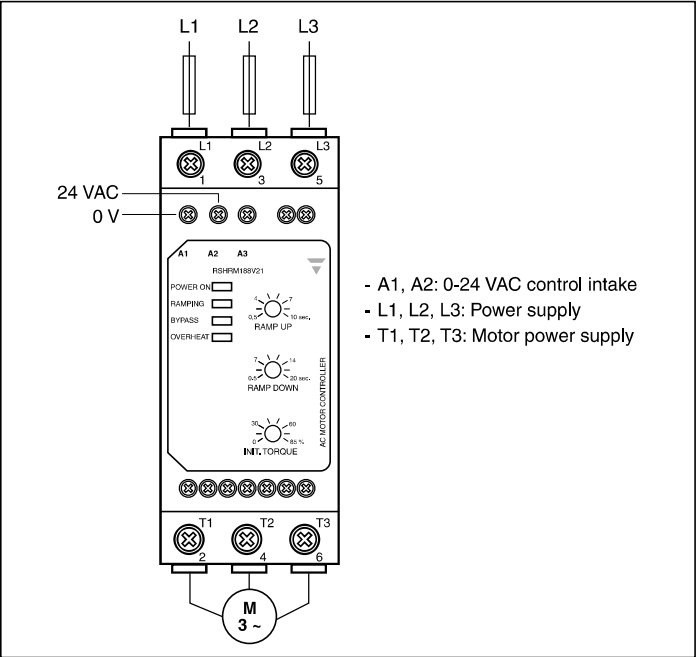
magnetic relays that plot the semiconductors during active operation when the ramps are activated. The starting time, the stopping time and the initial torque are adjusted by means of independent potentiometers. The LEDs indicate the status of the controller. The starter is equipped with a trigger and is designed to be mounted on a DIN rail.



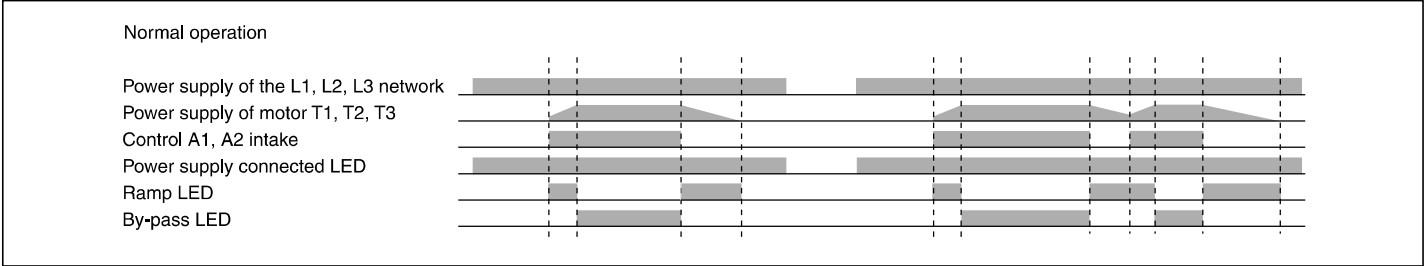
Status indicating LEDs



Electrical interconnections



Operating diagram



All data subject to change without notice.



www.johnsoncontrols.com