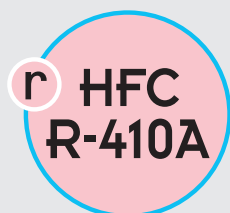




Air/water chillers and heat pumps with axial-flow fans with and without pump assemblies



BRAT(N) 0011÷0121
FF / FFT

BRAT(N) 0071÷0121
FF SL / FFT SL

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The following symbols are used in some parts of this publication and inside the unit:



User



Important



Danger high temperatures



Installer



Prohibition



Assistance



Danger voltage



Eurovent certification program.

The manufacturer reserves the right to modify the data in this manual without warning.

ENVIRONMENTAL INFORMATION: This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. The maintenance and disposal operations must only be carried out by qualified personnel.

⚠ These appliances have been designed to chill and/or heat water and must be used in applications compatible with their performance characteristics; these appliances are designed for residential or similar applications. Incorrect installation, regulation and maintenance or improper use absolve the **manufacturer** from all liability, whether contractual or otherwise, for damage to people, animals or things.

Only those applications specifically indicated in this list are permitted

Read this manual carefully. All work must be carried out by qualified personnel in conformity with legislation in force in the country concerned.

The warranty is void if the above instructions are not respected and if the unit is started up for the first time without the presence of personnel authorised by the Company (where specified in the supply contract) who should draw up a "start-up" report.

The documents supplied with the unit must be consigned to the owner who should keep them carefully for future consultation in the event of maintenance or service.

When the items are consigned by the carrier, check that the packaging and the unit are undamaged.

If damage or missing components are noted, indicate this on the delivery note. A formal complaint should be sent via fax or registered post to the After Sales Department within eight days from the date of receipt of the items.

All repair or maintenance work must be carried out by the Company's Technical Service or qualified personnel following the instructions in this manual.

Do not modify or tamper with the appliance as this may create situations of danger; in such cases the manufacturer of the appliance is not liable for any damage caused.

WAIVER OF LIABILITY

This publication is the sole property of **Climaveneta**. Any reproduction or disclosure of such is strictly prohibited without the written authorisation of **Climaveneta**.

This document has been prepared with maximum care and attention paid to the content shown. Nonetheless, **Climaveneta** waives all liability deriving from the use of such document.

Read this document carefully.

All work must be performed, components selected and materials used professionally and in complete accordance with the legislation in force in material in the country concerned, and considering the operating conditions and intended uses of the system, by qualified personnel.

FUNDAMENTAL SAFETY RULES

When operating equipment involving the use of electricity and water, a number of fundamental safety rules must be observed, namely:

⚠ The unit must not be used by children or by unfit persons without suitable supervision.

Do not touch the unit with bare feet or with wet or damp parts of the body.

Never perform any cleaning operations before having disconnected the unit from the mains power supply.

Do not modify safety or control devices without authorisation and instructions from the manufacturer.

Do not pull, detach or twist the electrical cables coming from the unit, even when disconnected from the mains electricity supply.

Do not open doors or panels providing access to the internal parts of the unit without first ensuring that the mains switch is in the off position.

Do not introduce pointed objects through the air intake and outlet grills.

Do not dispose of, abandon or leave within reach of children packaging materials (cardboard, staples, plastic bags, etc.) as they may represent a hazard.

⚠ The BRAT/N 0011-0061 appliances are supplied without the main switch.

Power supply to the unit must be disconnected using a switch with suitable characteristics, to be supplied and installed by the installer.

⚠ Respect safety distances between the unit and other equipment or structures. Guarantee adequate space for access to the unit for maintenance and/or service operations (see the figure on page 5).

Power supply: the size of the electrical cables must be adequate for the power of the unit and the power supply voltage must correspond with the value indicated on the respective units. All units must be earthed in conformity with legislation in force in the country concerned.

⚠ Some terminals in the electrical panel may be powered even after the unit is disconnected.

Make sure power is not connected before proceeding.

Water connections should be carried out as indicated in the instructions to guarantee correct operation of the unit.

Add glycol to the water circuit if the unit is not used during the winter or the circuit is not emptied.

Handle the unit with the utmost care (see weight distribution table) to avoid damage.

The chillers are supplied accompanied by:

- installation, user and maintenance manual;
- CE declaration;

CHOICE OF INSTALLATION SITE

Before installing the unit, agree with the customer the site where it will be installed, taking the following points into consideration:

- Check that the fixing points are adequate to support the weight of the unit;
- Pay scrupulous respect to safety distances between the unit and other equipment or structures to ensure that air entering the unit and discharged by the fans is free to circulate.

HANDLING AND POSITIONING

The unit should always be handled by qualified personnel using equipment adequate for the weight of the chiller.

- Before handling the unit, check the capacity of the lift equipment used, respecting the instructions on the packaging.
- To move the unit horizontally, make appropriate use of a lift truck or similar, bearing in mind the weight distribution of the unit.

To lift the unit, insert tubes long enough to allow positioning of the lifting slings and safety pins in the special feet on the unit.

For the sizes of these tubes, see the figures shown in the corresponding section.

- To avoid the slings damaging the unit, place protection between the slings and the unit.

Position the unit in the site indicated by the customer. Place either a layer of rubber (min. thickness 10 mm) or vibration damper feet (optional) between the base and support surface.

Fix the unit, making sure it is level and that there is easy access to water and electrical components.

If the site is exposed to strong winds, fix the unit adequately using tie rods if necessary.

If a heat pump unit is being installed, make sure the condensate is drained using the drain hose supplied as standard.

Prevent leaves, branches or snow from accumulating around the unit. These could reduce the efficiency of the unit.

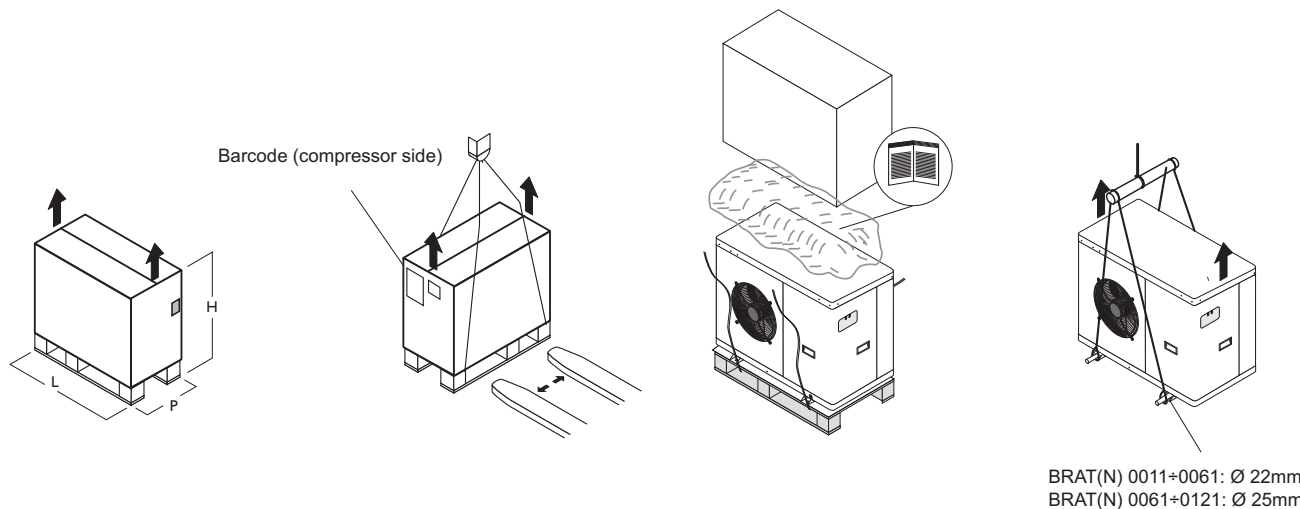
- ⚠ **The installation, user and maintenance manual** is an integral part of the unit and should therefore be read and kept carefully.

It is recommended that the packaging should not be removed until the unit is located in the installation site.

During transport, the chiller should be kept in a vertical position

The weight of the chiller is biased towards the compressor side (side of the packaging with the barcode, see the figure at the foot of the page).

- ⚠ **Do not** dispose of packaging materials in the environment or leave them within reach of children as they may represent a hazard.

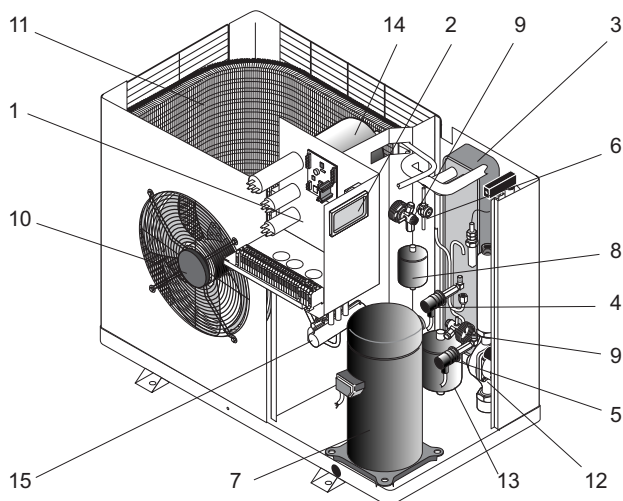


Size		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Dimension W	mm	950	950	950	950	950	950	950	1450	1450	1450	1450
Dimension D	mm	450	450	450	450	450	450	550	550	550	550	550
Dimension H	mm	650	650	950	950	1250	1250	1390	1200	1200	1700	1700
Gross weight BRAT FF/FFT	kg	95	100	115	120	145	165	175	260	265	340	345
Gross weight BRAN FF/FFT	kg	105	105	125	130	160	180	190	280	285	360	365

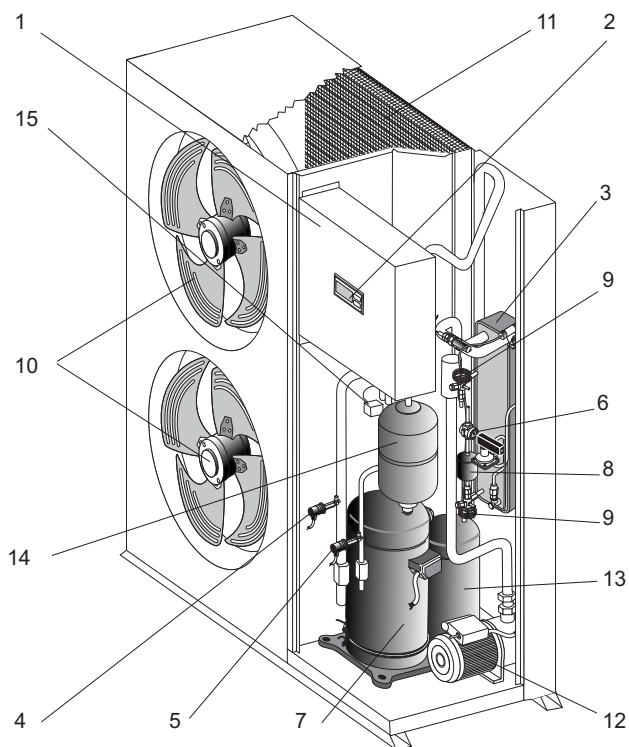
The BRAT(N) appliances are air-water units operating on R-410A and refrigerant are suitable for outdoor installation. The units are CE marked, as established by the EU directives, including the latest amendments, and the corresponding approximated national legislation. They are factory tested and on site installation is limited to water and electrical connections.

- 1 Electrical panel
- 2 Control panel
- 3 Heat exchanger, side
- 4 Low pressure switch
- 5 High pressure switch
- 6 Liquid and moisture indicator
- 7 Scroll compressor
- 8 Filter
- 9 Thermostatic valve
- 10 Axial-flow fan
- 11 Heat exchanger, outdoor side
- 12 Pump (FF model only)
- 13 Liquid receiver (BRAN FF / SL only)
- 14 Expansion vessel (FF models only)
- 15 Reversing valve (BRAN FF / SL only)

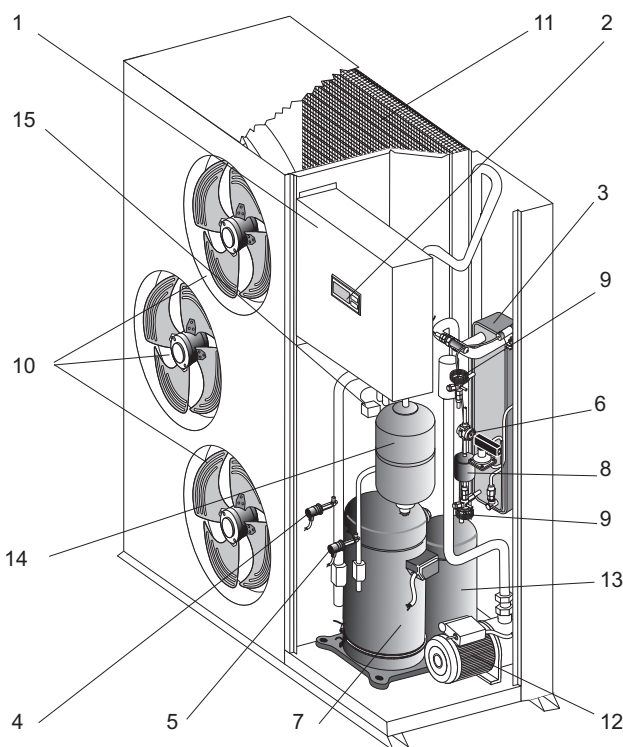
0011÷0061

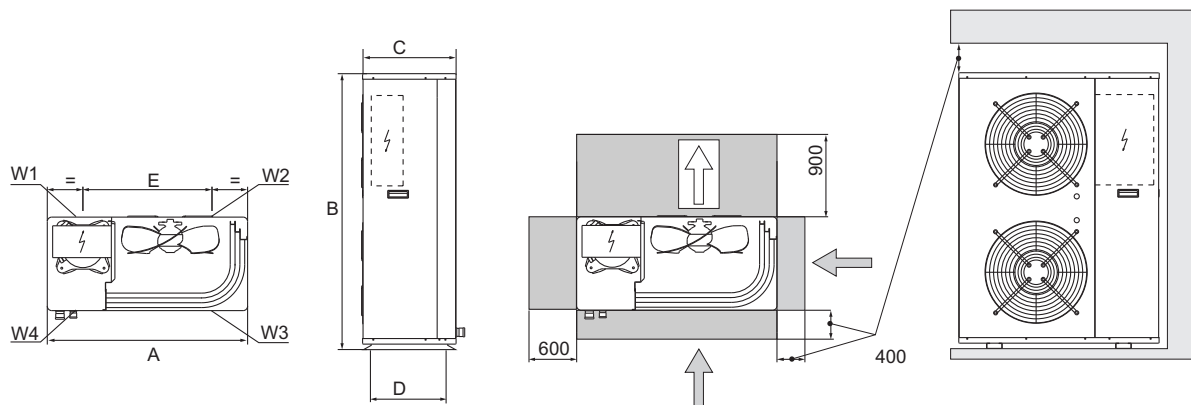


0071÷0121



0071÷0121 SL





Dimension		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
A	mm	900	900	900	900	900	900	900	1450	1450	1450	1450
B	mm	640	640	940	940	1240	1240	1390	1200	1200	1700	1700
C	mm	370	370	370	370	370	370	420	550	550	550	550
D	mm	320	320	320	320	320	320	370	497	497	497	497
E	mm	580	580	580	580	580	580	580	1450	1450	1450	1450

Weight distribution BRAT FF / FFT		0011	0021	0025	0031	0041	0051	0061	0071*	0091*	0101*	0121*
W1	kg	32	33	39	41	49	57	60	83	84	110	111
W2	kg	11	12	14	14	18	20	22	42	43	54	55
W3	kg	10	11	13	14	16	19	20	39	40	51	52
W4	kg	27	29	34	36	43	49	53	81	83	105	107
Total in operation	kg	80	85	100	105	125	145	155	245	250	320	325

Weight distribution BRAN FF / FFT		0011	0021	0025	0031	0041	0051	0061*	0071*	0091*	0101*	0121*
W1	kg	35	37	43	45	55	62	66	92	93	119	120
W2	kg	13	13	15	16	20	23	24	43	44	55	56
W3	kg	11	13	15	15	17	21	22	40	41	52	53
W4	kg	31	32	37	39	48	54	58	90	92	114	116
Total in operation	kg	80	85	100	105	125	145	155	245	250	320	325

* The values refer both to standard units and the unit in the low noise version (SL)

WATER CONNECTIONS

The choice and installation of components is the responsibility of the installer who should follow good working practice and current legislation. Construction of a bypass is recommended to enable the pipes to be washed through without having to disconnect the unit (see drain valves).

The connection piping should be supported in such a way as to avoid it weighing on the unit.

The following devices must be installed on the water circuit:

1. Two pressure gauges with a suitable scale (intake and outlet);
2. Two vibration damper joints (intake and outlet);
3. Two shut off valves (normal in intake and calibrating in outlet);
4. **Flow switch (inlet) in the system section of the circuit.**
5. Two thermometers (intake and outlet).
6. **An intake filter must be installed as close as possible to the evaporator and positioned to allow easy access for routine maintenance. 500 micron filter mesh.**

Failure to install the flow switch will mean the heat exchanger is not protected in the event of no flow of liquid.

Climaveneta cannot be held liable for any damage to the unit and/or the system following the failure to install these devices or the filter.

The correct operation of the components that help ensure the safety of the appliance and the system should be checked regularly.

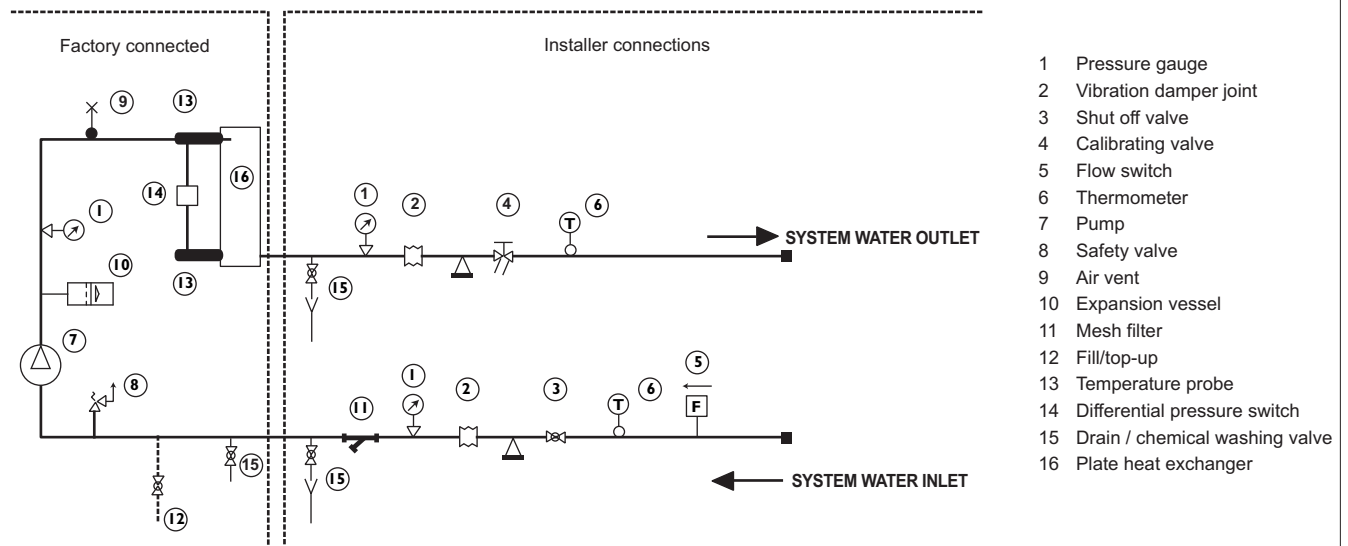
Specifically, this involves cleaning the filters and checking the operation of the flow switches installed.

Water flow to the chiller unit must conform to the values shown in the section on "General Technical Data".

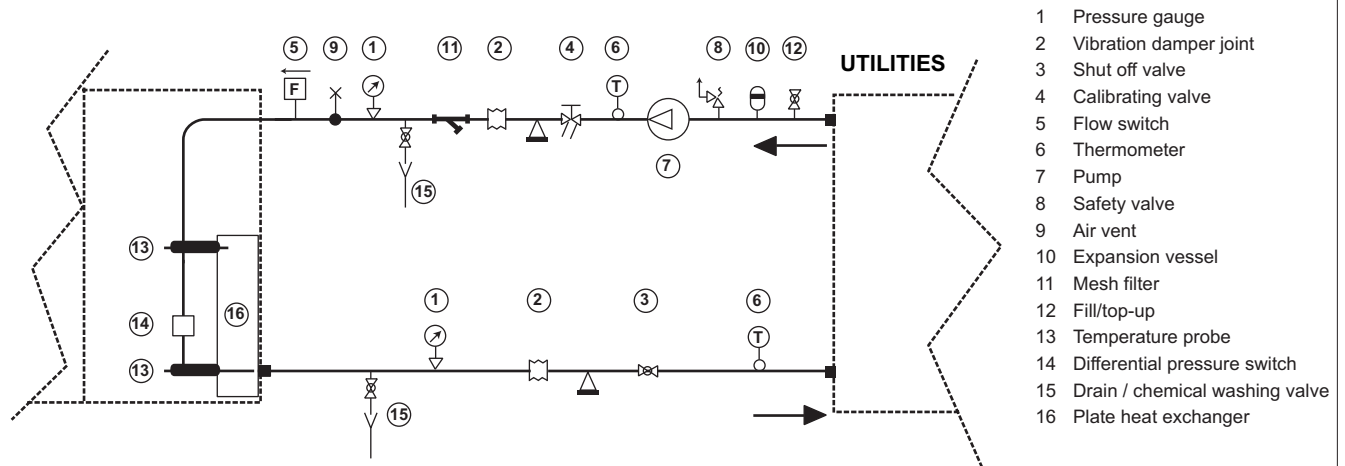
The flow of water must be maintained constant during operation.

The water content of the unit must be such as to avoid disturbing operation of the refrigerant circuits.

BRAT(N) FF



BRAT(N) FFT



For BRAT (N) 0041 and 0061 units only, if a useful head higher than that obtained by installing a pump assembly and storage tank is required, it is recommended that an additional pump is installed on the unit.

The pump can be easily installed on the unit by removing the special pipe stub provided.

For fastening the pump and electrical connections, use the dedicated terminals on the panel.

⚠ The chillers must be provided with a filling/top-up system connected to the return line and a drain cock in the lowest part of the installation.

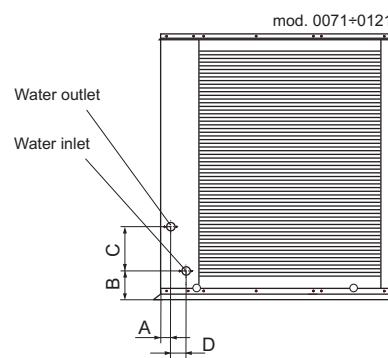
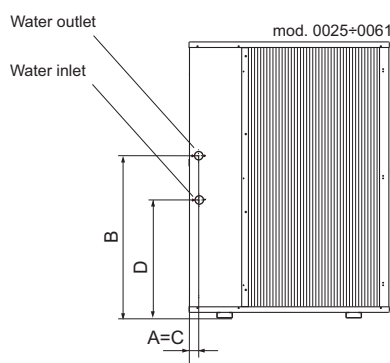
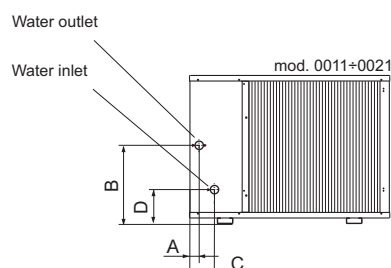
Installations containing antifreeze or covered by specific legislation must be fitted with water circuit disconnectors.

⚠ The manufacturer is not liable for obstruction, breakage or noise resulting from the failure to install filters or vibration dampers.

Particular **types of water used for filling or topping up** must be treated with appropriate treatment systems.

For reference values, see the table.

PH	6-8
Electrical conductivity	less than 200 mV/cm (25°C)
Chlorine ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	None
Ammonia ions	None
Silicon ions	less than 30 ppm



SIZE AND LOCATION OF CONNECTIONS

Size		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
A	mm	900	900	900	900	900	900	900	55,5	55,5	55,5	55,5
B	mm	285	285	465	465	670	670	820	181,5	181,5	181,5	181,5
C	mm	158	158	65	65	65	65	65	414,5	414,5	414,5	414,5
D	mm	135	135	415	415	520	520	655	60,5	60,5	60,5	60,5
Water connections	Ø	3/4"	3/4"	3/4"	3/4"	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4	1"1/4

FILLING THE SYSTEM

- Before filling, check that the system drain valve is closed.
- Open all system and terminal air vents.
- Open system shut off valves.
- Start filling by slowly opening the system water fill cock outside the unit.
- When water begins to leak out of the terminal air vent valves, close them and continue filling until the pressure gauge indicates a pressure of 1.5 bar.

⚠ The system must be filled to a pressure of between 1 and 2 bars.

It is recommended that this operation be repeated after the unit has been operating for a number of hours. The pressure of the system should be checked regularly and if it drops below 1 bar, the water content should be topped-up.

Check the tightness of the joints.

EMPTYING THE SYSTEM

- Before emptying, place the mains switch in the "off" position.
- Make sure the system fill/top-up water cock is closed.
- Open the drain cock outside the unit and all the system and terminal air vent valves.

⚠ If the fluid in the circuit contains antifreeze, it should not be allowed to drain freely, as it is pollutant. It should be collected for possible reuse. When draining after heat pump operation, take care as the water may be hot (up to 50°).

ELECTRICAL CONNECTIONS

I A

The **BRAT (N) FF** leave the factory already wired, and require the installation of a circuit breaker, a lockable mains disconnect switch for the connection to the mains power supply, and the connection of the flow switch to the corresponding terminals. All the above operations must be carried out by qualified personnel in compliance with the legislation in force.

For all electrical work, refer to the electrical wiring diagrams in this manual. It is also recommended to check that:

- The characteristics of the mains electricity supply are adequate for the power ratings indicated in the electrical specifications below, also bearing in mind the possible use of other equipment at the same time.

⚠ Power to the unit must be turned on only after installation work (water and electrical) has been completed.

All the electrical connections must be performed by qualified personnel according to the relevant standards in force in the country concerned.

Respect instructions for connecting phase, neutral and earth conductors.

The power line should be fitted upstream with a suitable device to protect against short-circuits and leakage to earth, isolating the installation from other equipment.

⚠ Voltage must be within a tolerance of $\pm 10\%$ of the rated power supply voltage for the unit (for three phase units, the unbalance between the phases must not exceed 3%).

If these parameters are not respected, contact the electricity supply company. **For electrical connections**, use double insulation cable in conformity with legislation in force in the country concerned.

⚠ A circuit breaker and a lockable mains disconnect switch, in compliance with the CEI-EN standards (contact opening of at least 3mm), with adequate switching and residual current protection capacity based on the electrical data table shown below, must be installed as near as possible to the appliance.

 **The devices** on the unit must be lockable.
An efficient earth connection is **obligatory**.

The manufacturer cannot be held liable for any damage caused by the failure to correctly earth the unit.

In the case of three phase units, ensure the phases are connected correctly.

 **Do not** use water pipes to earth the unit.

BRAT ELECTRICAL DATA

Size	Power supply	Rated values (1)											Fuses (5x20T 250V)				
		Compressors			Fan/fans		Pump (2)		Total		Max values (3)						
		F.L.I.	F.L.A.	L.R.A.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	F.L.I.	F.L.A.	FU4	FU3	FU2	FU1 (FF)	FU1 (FFT)
	(kW)	(A)	(A)	(kW)	(A)	(kW)	(A)	(kW)	(A)	(kW)	(A)						
0011	230~50	1,8	8,6	58	0,15	0,64	0,22	0,92	2,17	10,16	3,6	17,6	-	2A	1,25A	6,3A	4A
0021	230~50	1,9	9,2	61	0,15	0,64	0,22	0,92	2,27	10,76	3,7	17,6	-	2A	1,25A	6,3A	4A
0025	230~50	2,4	11,8	82	0,15	0,64	0,22	0,92	2,77	13,36	4,1	20,6	-	2A	1,25A	6,3A	4A
0031	230~50	3,3	15,0	97	0,15	0,64	0,22	0,92	3,67	16,56	4,9	24,6	-	2A	1,25A	6,3A	4A
0041	230~50	3,8	18,0	130	0,30	1,28	0,22	0,92	4,32	20,2	4,8	28,6	-	2A	2A	6,3A	4A
0021	400-3N~50	1,9	3,6	32	0,15	0,64	0,22	0,92	2,27	5,16	3,2	7,1	-	2A	1,25A	6,3A	4A
0025	400-3N~50	2,3	3,8	35	0,15	0,64	0,22	0,92	2,67	5,36	3,9	7,6	-	2A	1,25A	6,3A	4A
0031	400-3N~50	3,0	5,3	48	0,15	0,64	0,22	0,92	3,37	6,86	4,5	9,6	-	2A	1,25A	6,3A	4A
0041	400-3N~50	3,9	7,1	64	0,30	1,28	0,22	0,92	4,42	9,3	5,6	11,6	-	2A	2A	6,3A	4A
0051	400-3N~50	4,4	7,7	64	0,30	1,28	0,22	0,92	4,92	9,9	6,9	13,4	-	2A	2A	6,3A	4A
0061	400-3N~50	4,9	8,4	74	0,30	1,28	0,22	0,92	5,42	10,6	8,8	16,6	-	2A	2A	6,3A	4A
0071	400-3N~50	6,2	11,1	95	0,6	3,50	0,55	3,80	7,35	18,4	9,8	22,6	1A	1A	8A	6,3A	4A
0091	400-3N~50	7,2	12,3	111	0,6	3,50	0,55	3,80	8,35	19,6	12,7	27,6	1A	1A	8A	6,3A	4A
0101	400-3N~50	7,5	14,7	118	1,2	7,00	0,55	3,80	9,25	25,5	13,0	28,6	1A	1A	8A	6,3A	4A
0121	400-3N~50	9,9	17,6	140	1,2	7,00	0,55	3,80	11,65	28,4	17,3	37,6	1A	1A	8A	6,3A	4A
0071 SL	400-3N~50	6,2	11,1	95	0,30	1,28	0,55	3,80	7,05	16,2	9,8	22,6	1A	1A	8A	6,3A	4A
0091 SL	400-3N~50	7,2	12,3	111	0,30	1,28	0,55	3,80	8,05	17,4	12,7	27,6	1A	1A	8A	6,3A	4A
0101 SL	400-3N~50	7,5	14,7	118	0,45	1,92	0,55	3,80	8,5	20,5	13,0	28,6	1A	1A	8A	6,3A	4A
0121 SL	400-3N~50	9,9	17,6	140	0,45	1,92	0,55	3,80	10,9	23,4	17,3	37,6	1A	1A	8A	6,3A	4A

F.L.I. Power consumption

F.L.A. Current input

L.R.A. Compressor start-up current

(1) Outside air temperature 35°C - Evaporator water temperature 12/7°C.

(2) FF models only

(3) Use these values when sizing protection switches and power cables.

BRAN ELECTRICAL DATA

Size	Power supply (V-Ph-Hz)	Rated values (1)											Fuses (5x20T 250V)				
		Compressors			Fan/fans		Pump (2)		Total		Max values (3)						
		F.L.I. (kW)	F.L.A. (A)	L.R.A. (A)	F.L.I. (kW)	F.L.A. (A)	F.L.I. (kW)	F.L.A. (A)	F.L.I. (kW)	F.L.A. (A)	F.L.I. (kW)	F.L.A. (A)	FU4	FU3		FU1 (FF)	FU1 (FFT)
0011	230~50	2,1	10,0	58	0,15	0,64	0,22	0,92	2,47	11,56	3,6	17,6	-	2A	1,25A	6,3A	4A
0021	230~50	2,2	10,7	61	0,15	0,64	0,22	0,92	2,57	12,26	3,7	17,6	-	2A	1,25A	6,3A	4A
0025	230~50	2,7	13,3	82	0,15	0,64	0,22	0,92	3,07	14,86	4,1	20,6	-	2A	1,25A	6,3A	4A
0031	230~50	3,4	15,5	97	0,15	0,64	0,22	0,92	3,77	17,06	4,9	24,6	-	2A	1,25A	6,3A	4A
0041	230~50	4,2	19,9	130	0,30	1,28	0,22	0,92	4,72	22,1	4,8	28,6	-	2A	2A	6,3A	4A
0021	400-3N~50	2,2	4,2	32	0,15	0,64	0,22	0,92	2,57	5,76	3,2	7,1	-	2A	1,25A	6,3A	4A
0025	400-3N~50	2,6	4,3	35	0,15	0,64	0,22	0,92	2,97	5,86	3,9	7,6	-	2A	1,25A	6,3A	4A
0031	400-3N~50	3,1	5,5	48	0,15	0,64	0,22	0,92	3,47	7,06	4,5	9,6	-	2A	1,25A	6,3A	4A
0041	400-3N~50	4,4	8,0	64	0,30	1,28	0,22	0,92	4,92	10,2	5,6	11,6	-	2A	2A	6,3A	4A
0051	400-3N~50	4,7	8,2	64	0,30	1,28	0,22	0,92	5,22	10,4	6,9	13,4	-	2A	2A	6,3A	4A
0061	400-3N~50	5,1	8,7	74	0,30	1,28	0,22	0,92	5,62	10,9	8,8	16,6	-	2A	2A	6,3A	4A
0071	400-3N~50	6,5	11,6	95	0,6	3,50	0,55	3,80	7,65	18,9	9,8	22,6	1A	1A	8A	6,3A	4A
0091	400-3N~50	7,2	12,3	111	0,6	3,50	0,55	3,80	8,35	19,6	12,7	27,6	1A	1A	8A	6,3A	4A
0101	400-3N~50	8,9	17,4	118	1,2	7,00	0,55	3,80	10,65	28,2	13,0	28,6	1A	1A	8A	6,3A	4A
0121	400-3N~50	10,6	18,8	140	1,2	7,00	0,55	3,80	12,35	29,6	17,3	37,6	1A	1A	8A	6,3A	4A
0071 SL	400-3N~50	6,5	11,6	95	0,30	1,28	0,55	3,80	7,35	16,7	9,8	22,6	1A	1A	8A	6,3A	4A
0091 SL	400-3N~50	7,2	12,3	111	0,30	1,28	0,55	3,80	8,05	17,4	12,7	27,6	1A	1A	8A	6,3A	4A
0101 SL	400-3N~50	8,9	14,7	118	0,45	1,92	0,55	3,80	9,9	20,5	13,0	28,6	1A	1A	8A	6,3A	4A
0121 SL	400-3N~50	10,6	18,8	140	0,45	1,92	0,55	3,80	11,6	24,6	17,3	37,6	1A	1A	8A	6,3A	4A

F.L.I. Power consumption

F.L.A. Current input

L.R.A. Compressor start-up current

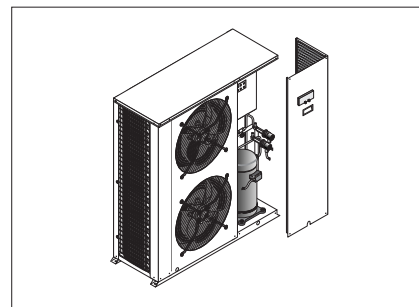
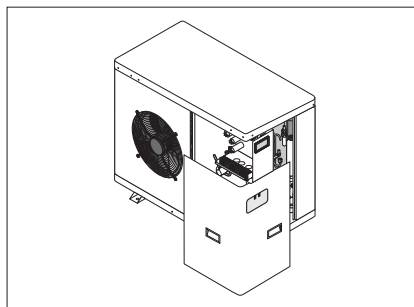
(1) Outside air temperature 7°C - Condenser water temperature 40/45°C.

(2) FF models only

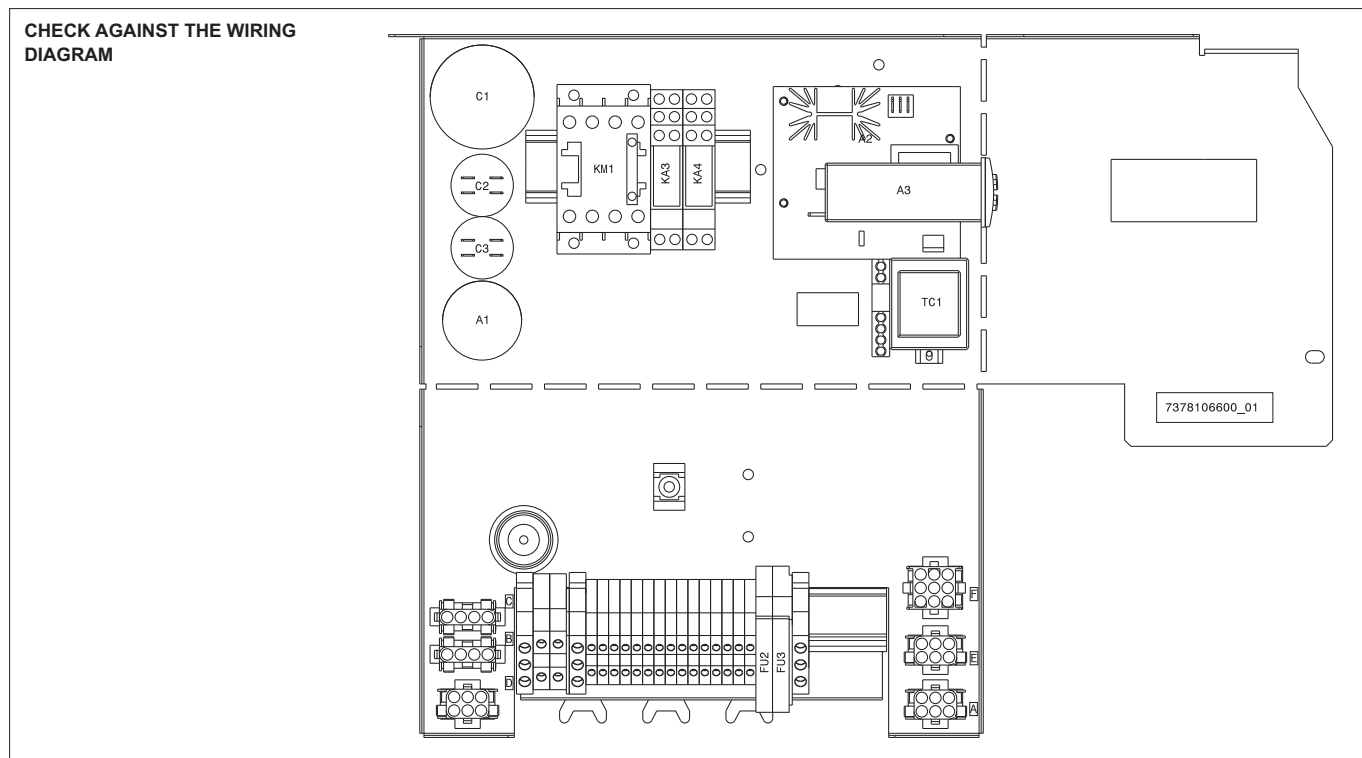
(3) Use these values when sizing protection switches and power cables.

ELECTRICAL PANEL

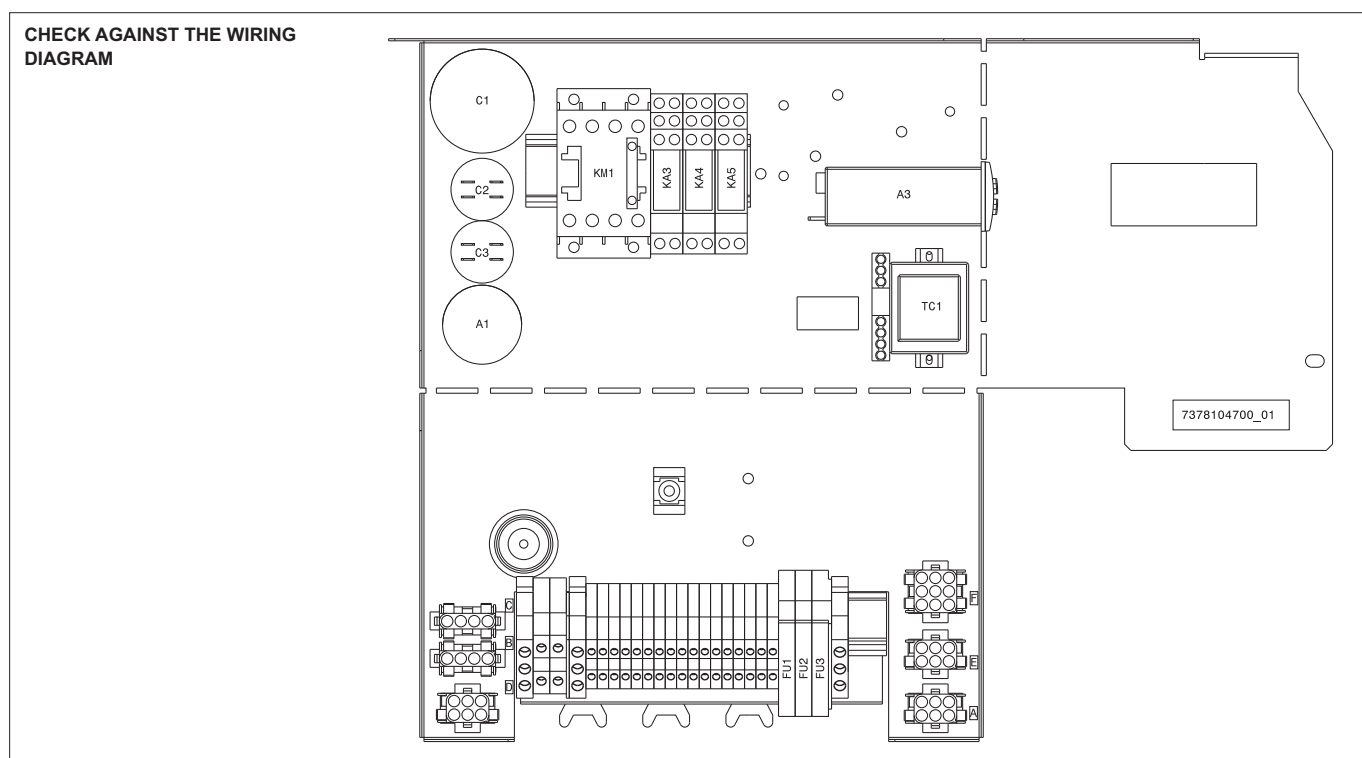
The electrical panel is located inside the unit at the top of the technical compartment where the various components of the refrigerant circuit are also to be found. To access the electrical panel, remove the front panel of the unit by undoing the screws.



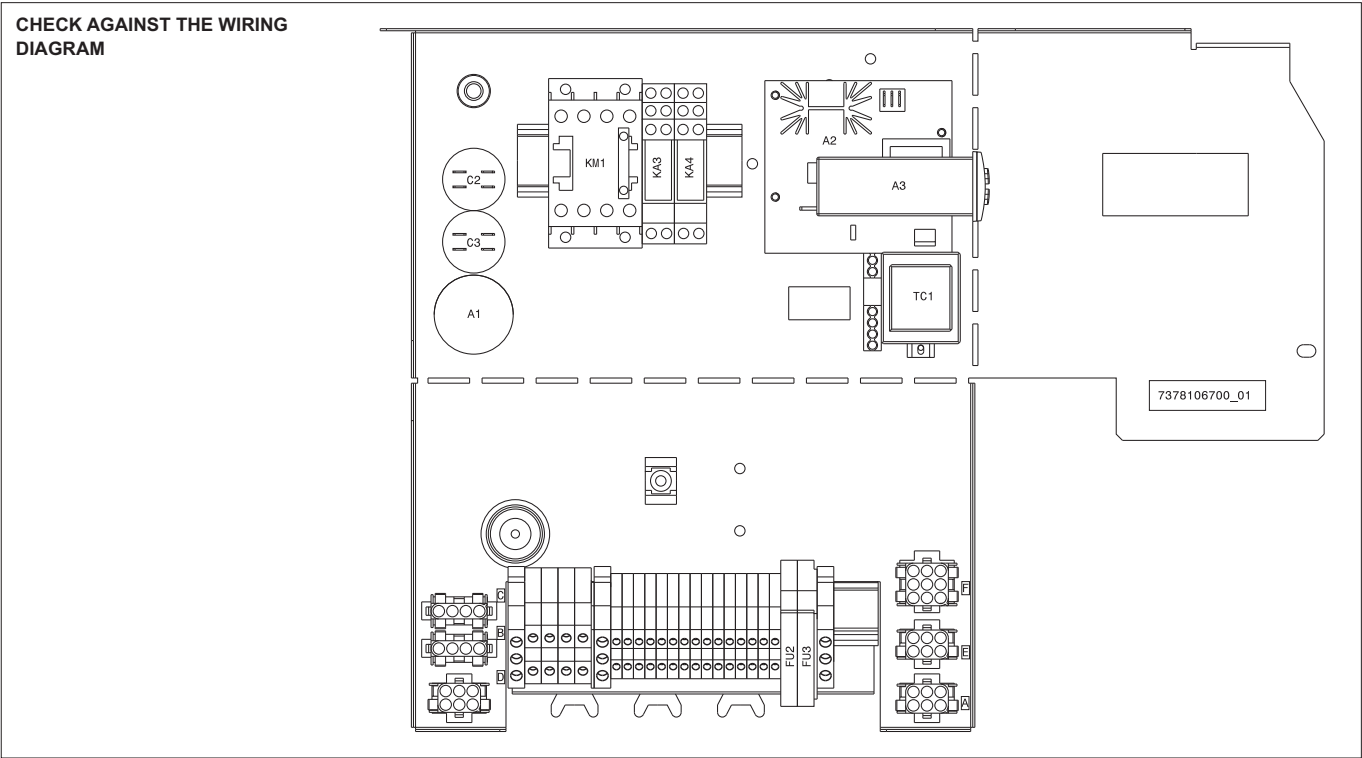
BRAT-BRAN FF 0011÷0041 SINGLE-PHASE ELECTRICAL PANEL LAYOUT



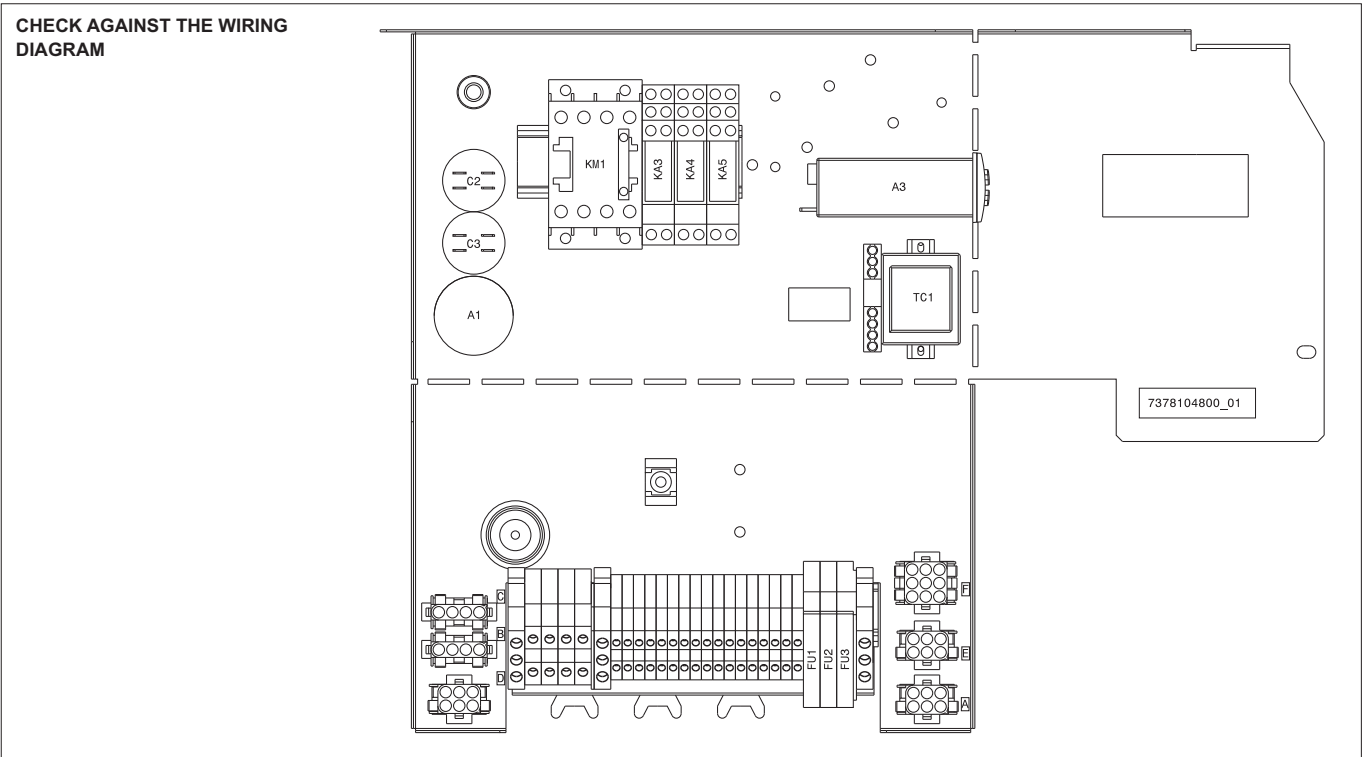
BRAT-BRAN FFT 0011÷0041 SINGLE-PHASE ELECTRICAL PANEL LAYOUT



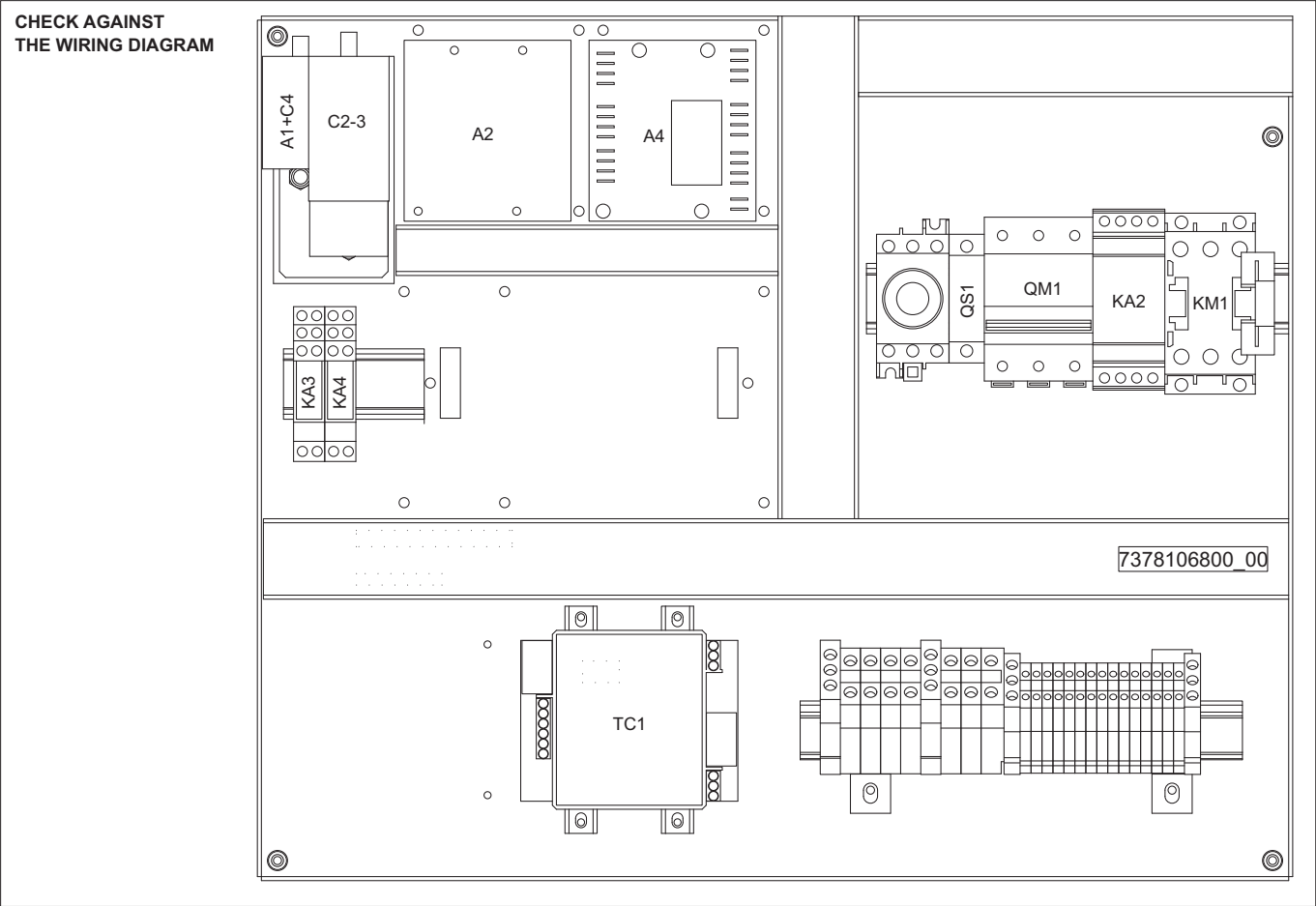
BRAT-BRAN FF 0021÷0061 THREE-PHASE ELECTRICAL PANEL LAYOUT



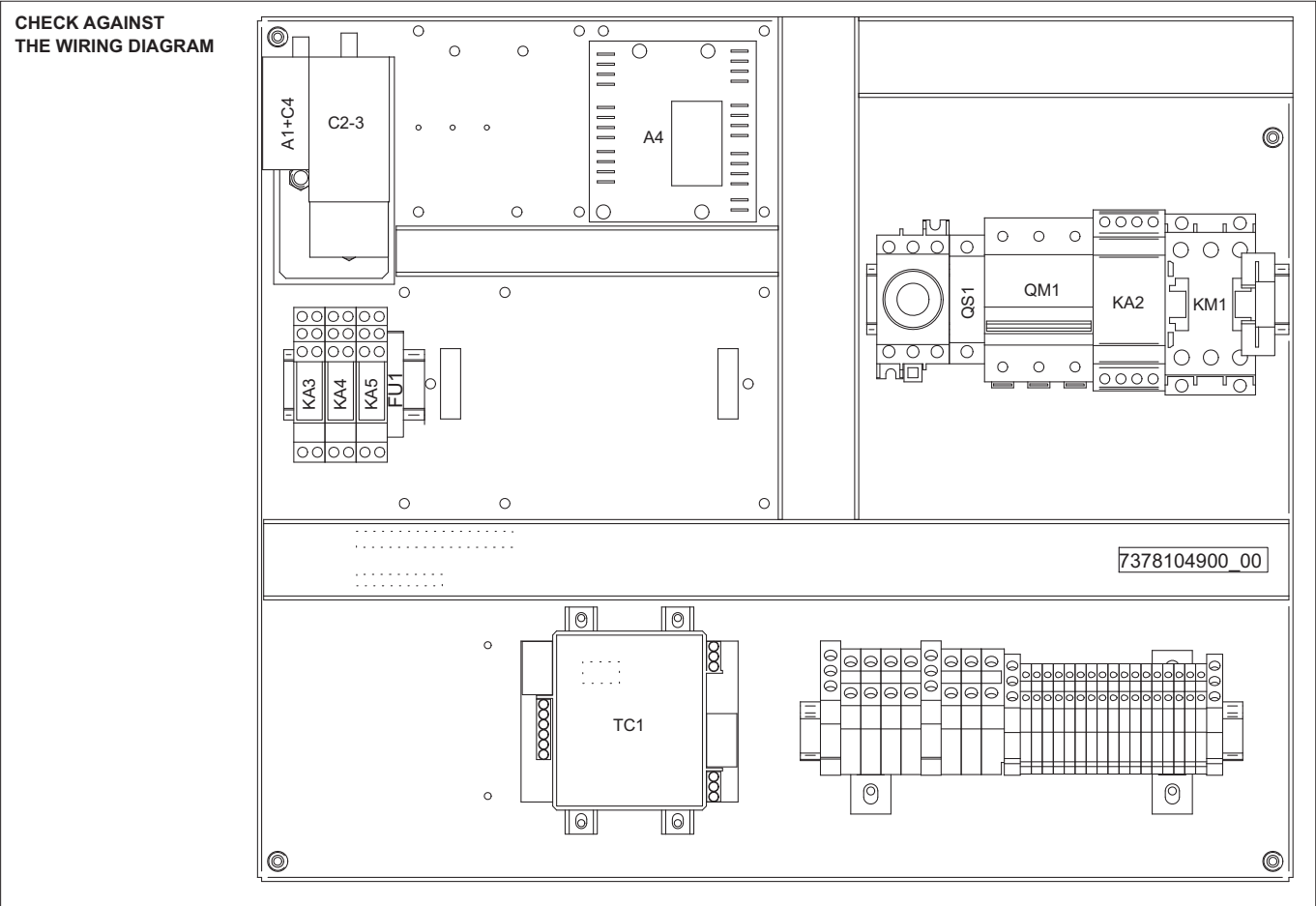
BRAT-BRAN FFT 0011÷0061 THREE-PHASE ELECTRICAL PANEL LAYOUT



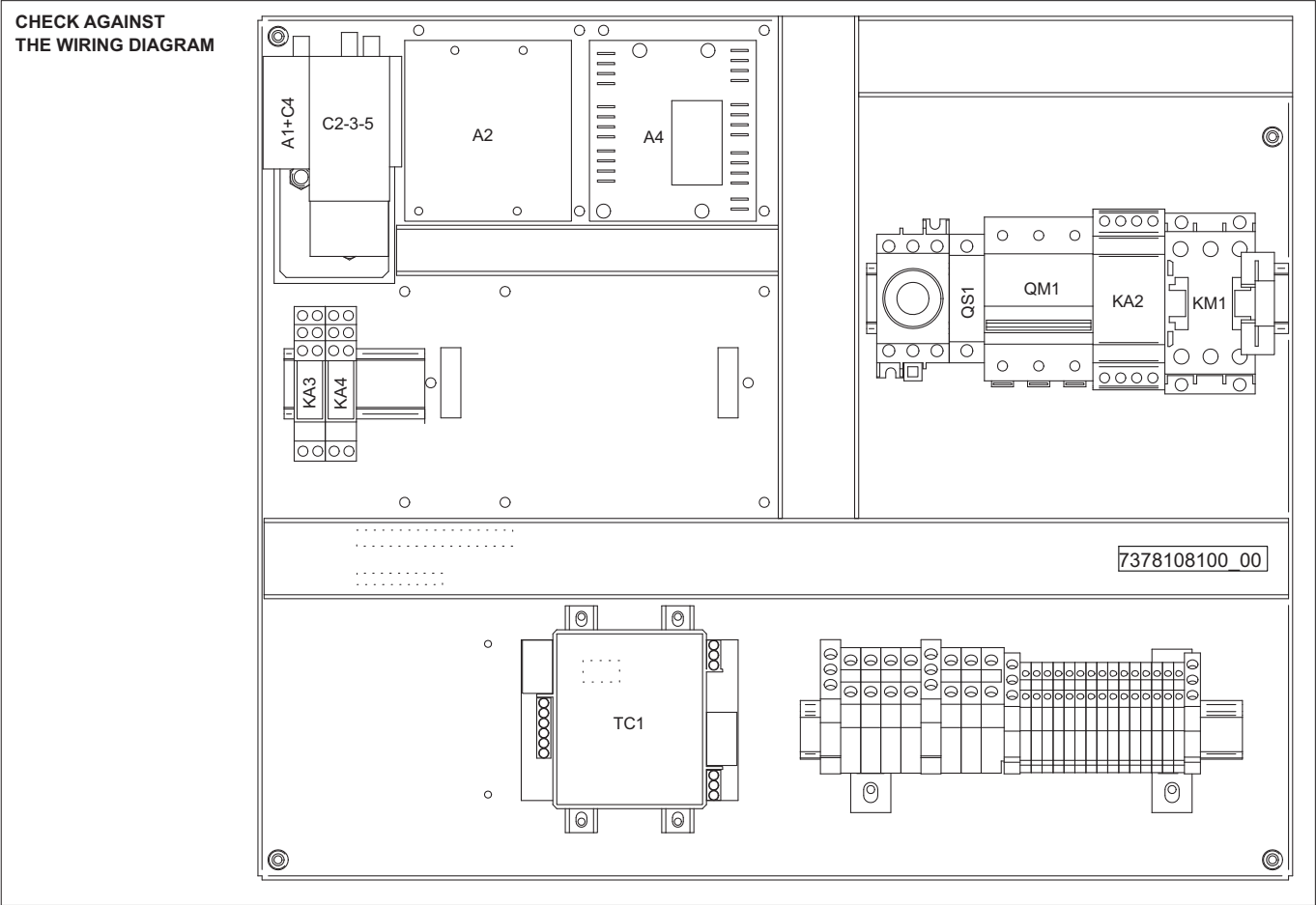
BRAT-BRAN FF 0071+0121 THREE-PHASE ELECTRICAL PANEL LAYOUT



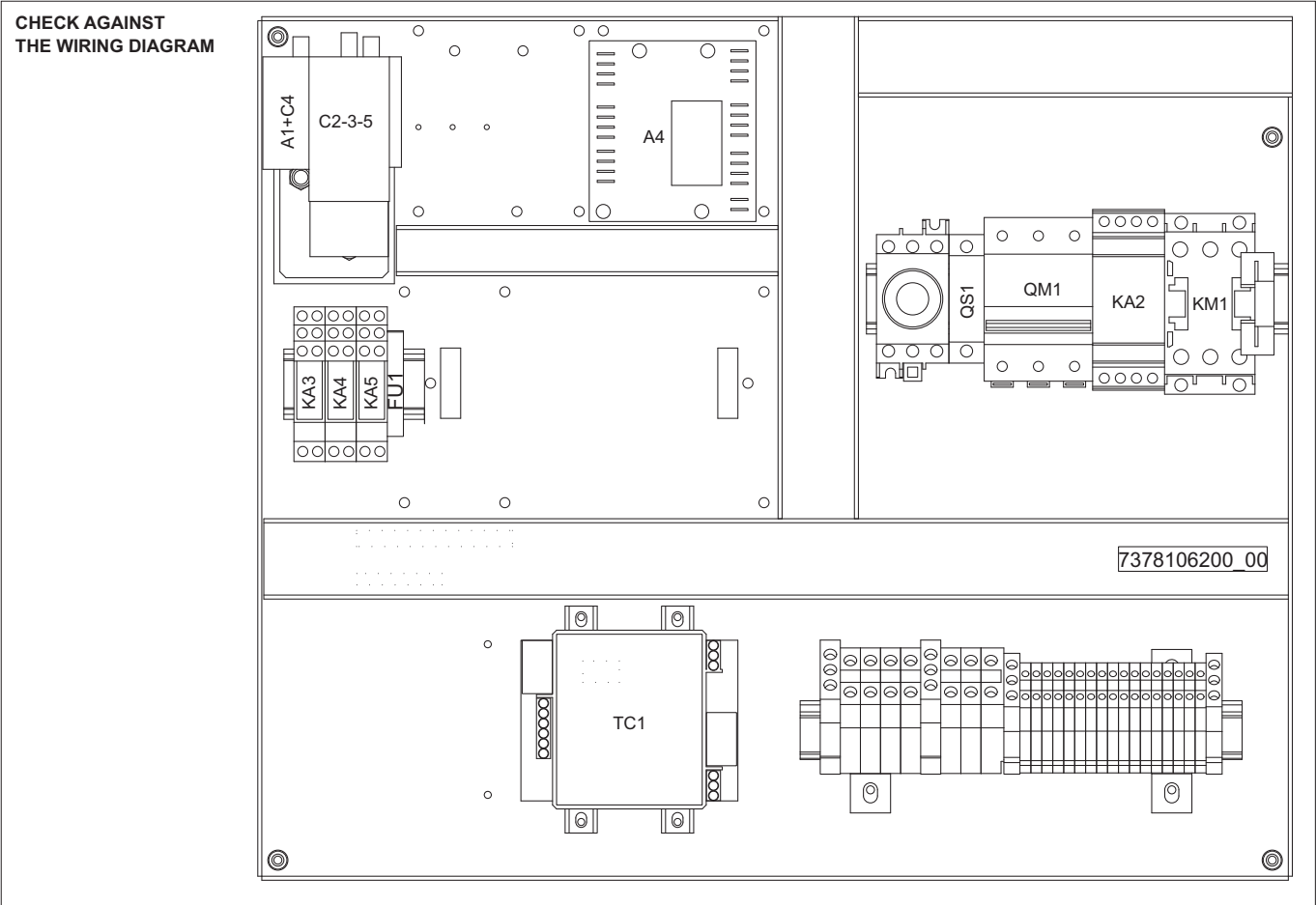
BRAT-BRAN FFT 0071+0121 THREE-PHASE ELECTRICAL PANEL LAYOUT



BRAT-BRAN FF SL 0071÷0121 THREE-PHASE ELECTRICAL PANEL LAYOUT



BRAT-BRAN FFT SL 0071÷0121 THREE-PHASE ELECTRICAL PANEL LAYOUT



POWER CONNECTIONS

For the functional connection of the unit, bring the power supply cable to the electrical panel inside the unit and connect it to terminals U-N and PE, respecting the (U) phase, (N) neutral and (PE) earth in the case of single phase units or U-V-W phases, N neutral and PE earth in three phase units (400V-3N~ 50Hz).

AUXILIARY CONNECTIONS

All terminals referred to in the explanations below are to be found on the terminal block inside the electrical panel and described as "installer terminals".

REMOTE ON/OFF

To use a remote on/off device, an external contactor must be connected to installer terminals 14 and 15, setting parameter CL42 to -1 (CL42=-1).

For timed operation, connect a daily or weekly timer between terminals 14 and 15.

REMOTE ALARM

For remote display of unit shut-down, an audible or visual alarm warning device can be connected between terminals 12 and 13.

Connect the phase to terminal 12 and the alarm signal device between terminal 13 and the neutral (max load applicable 500mA at 24V).

REMOTE COOLING/HEATING CHANGEOVER

To use a remote cooling/heating changeover device, connect the contact of the device to installer terminals 16 and 17. To activate the device, proceed as follows:

- From the HSW15 control panel select parameter CL43 and set it to the value +3 (contact closed = cooling, contact open = heating) or -3 (contact closed = heating, contact open = cooling)

REMOTE KEYPAD KIT

The remote keypad kit can be used to display all unit functions and access the parameters of the electronic board from a point located at some distance from the unit itself. It consists of a remote control module.

To install the kit, proceed as follows:

- access the unit's electrical panel after having disconnected the power supply (using the door lock disconnect switch QSI);
- connect the remote control module with 3 wires to terminals 22, 23 and 24 on the installer terminal block:
- terminal 22 connected to the GND terminal on the module;
- terminal 23 connected to the Signal terminal on the module;
- terminal 24 connected to the +12V terminal on the module;

FLOW SWITCH CONNECTION

The system flow switch must be connected to terminals 18 and 19.

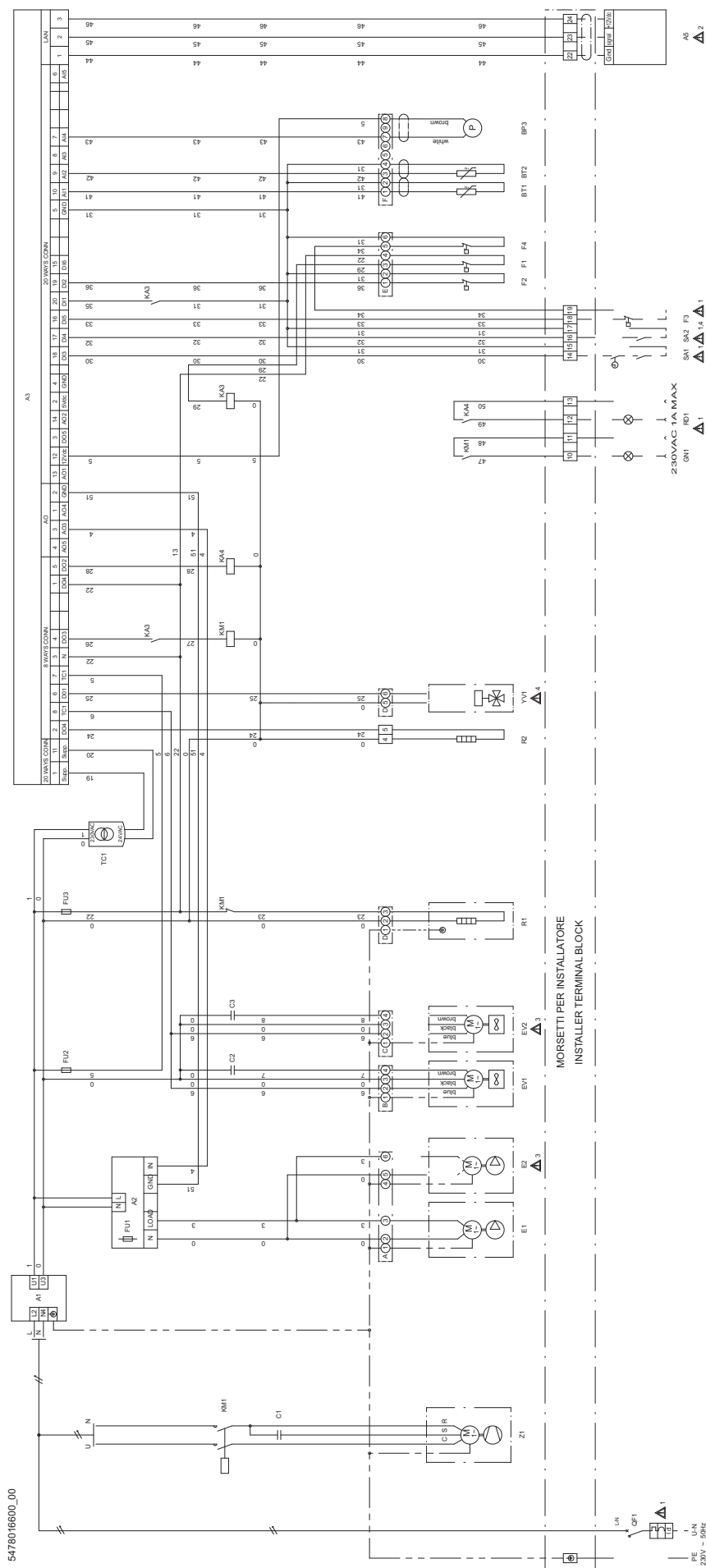
If this is not connected, the unit will not be able to operate and the controller will display alarm code ER20 (see "Displaying alarms").

DIGITAL INPUT FOR THE ECONOMY FUNCTION

To enable the ECONOMY function connect an external contactor to installer terminals 16 and 17, and set the following parameters

- CL43 to 22
- Tr15 to the desired offset in COOL mode
- Tr25 to the desired offset in HEAT mode

BRAT-BRAN FF 0011+0041 SINGLE-PHASE WIRING DIAGRAM



Outline wiring diagram, see the diagram on the unit's electrical panel

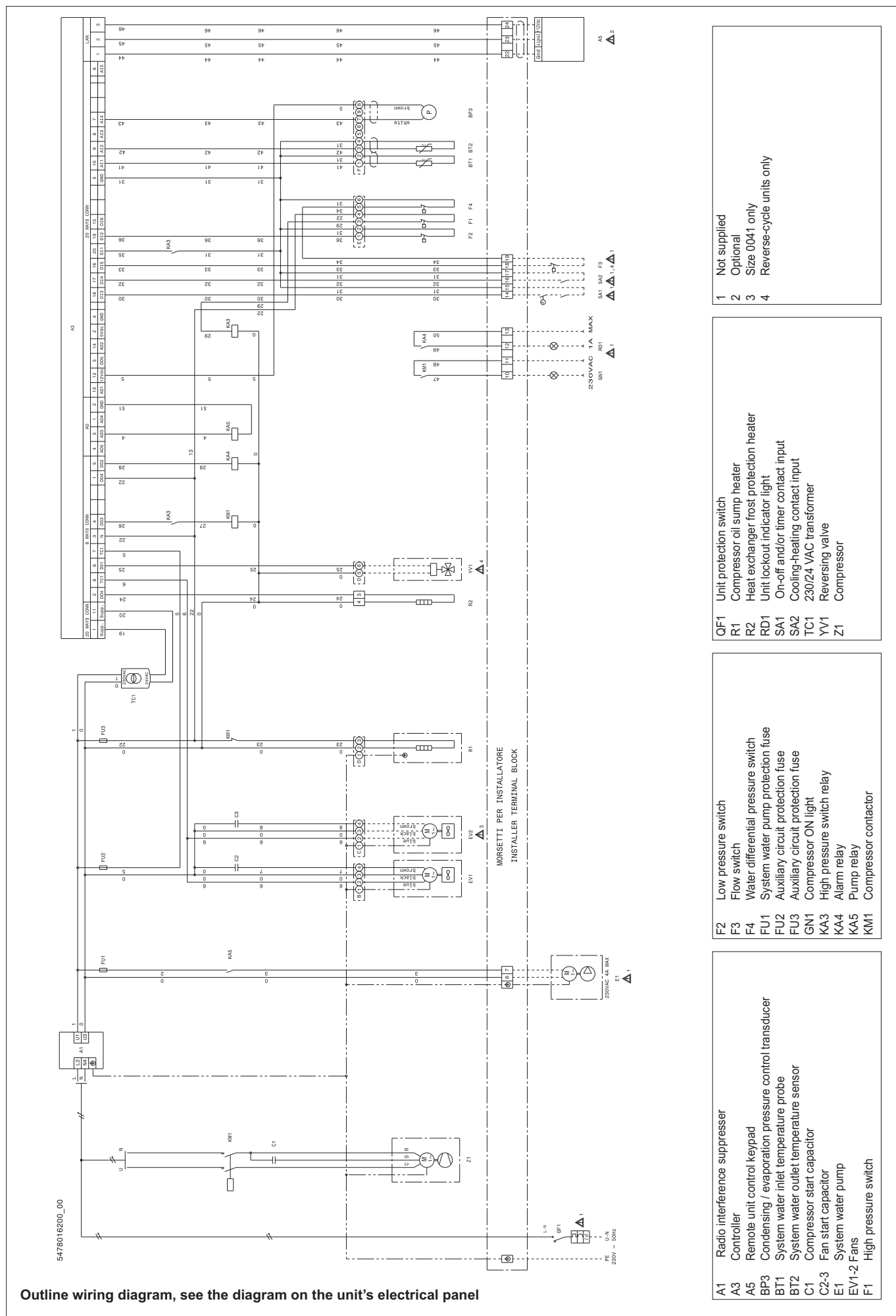
A1 Radio interference suppressor
A2 Pump control module
A3 Controller
A5 Remote unit control keypad
BP3 Condensing / evaporation pressure control transducer
BT1 System water inlet temperature probe
BT2 System water outlet temperature sensor
C1 Compressor start capacitor
C2-3 Fan start capacitor
E1-2 System water pumps
EV1-2 Fans

F1 High pressure switch
F2 Low pressure switch
F3 Flow switch
FU1 Water differential pressure switch
FU2 System water pump protection fuse
FU3 Auxiliary circuit protection fuse
GN1 Auxiliary circuit protection fuse
KA3 Compressor ON light
KA4 High pressure switch relay
KA4 Alarm relay
KM1 Compressor control power contactor

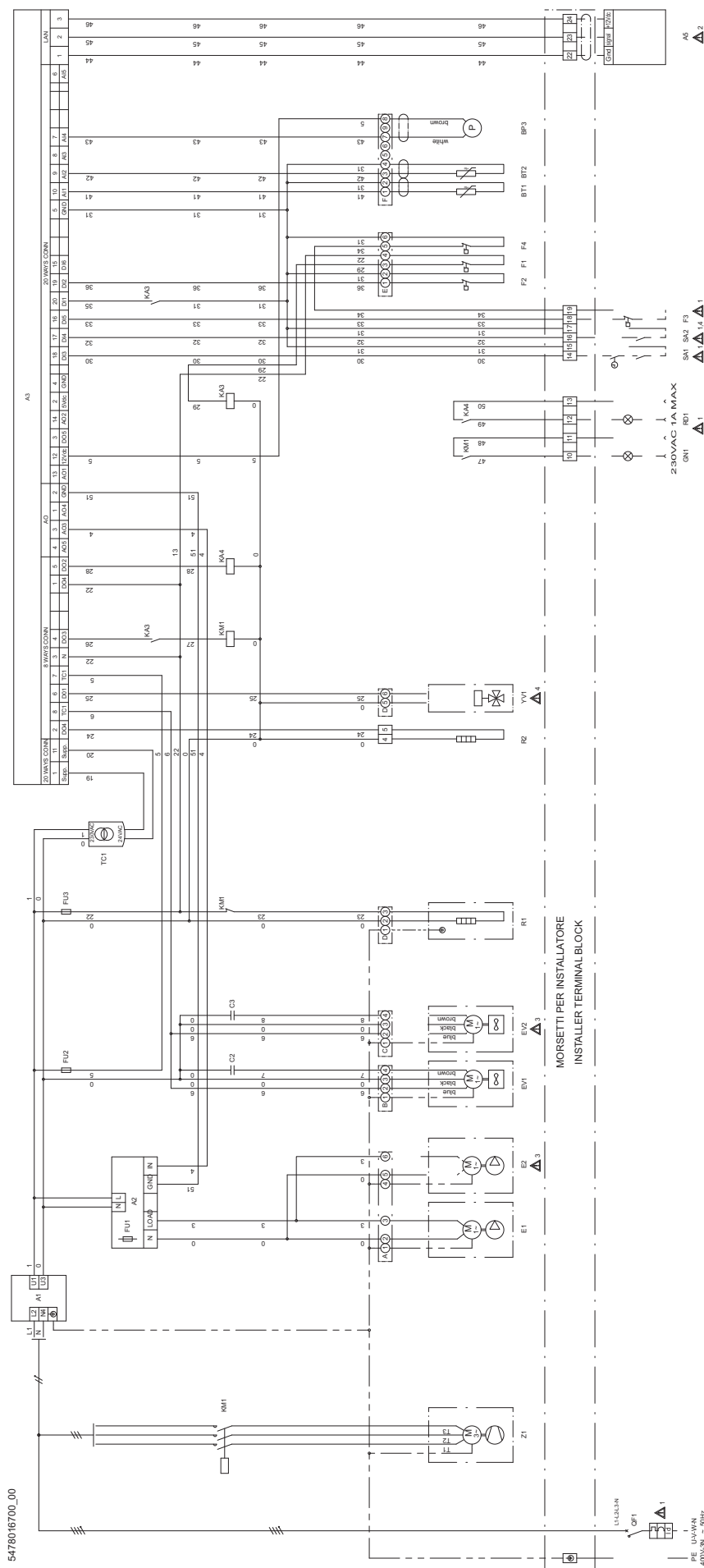
QF1 Unit protection switch
R1 Compressor oil sump heater
R2 Heat exchanger frost protection heater
RD1 Unit lockout indicator light
SA1 On-off and/or timer contact input
SA2 Cooling-heating contact input
TC1 230/24 VAC transformer
YV1 Reversing valve
Z1 Compressor

1 Not supplied
2 Optional
3 Size 0041 only
4 Reverse-cycle units only

BRAT-BRAN FFT 0011+0041 SINGLE-PHASE WIRING DIAGRAM

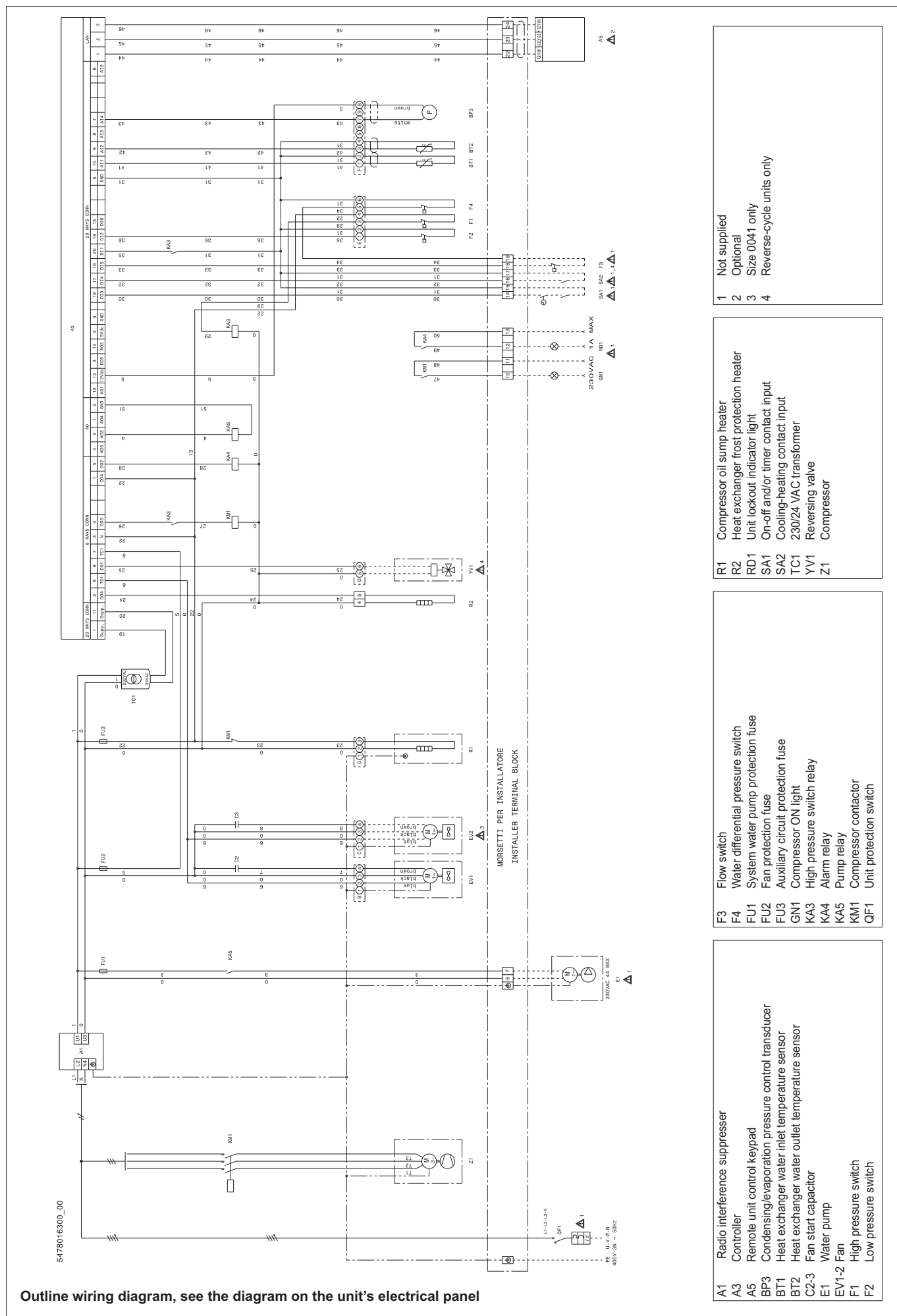


BRAT-BRAN FF 0021÷0061 THREE-PHASE WIRING DIAGRAM

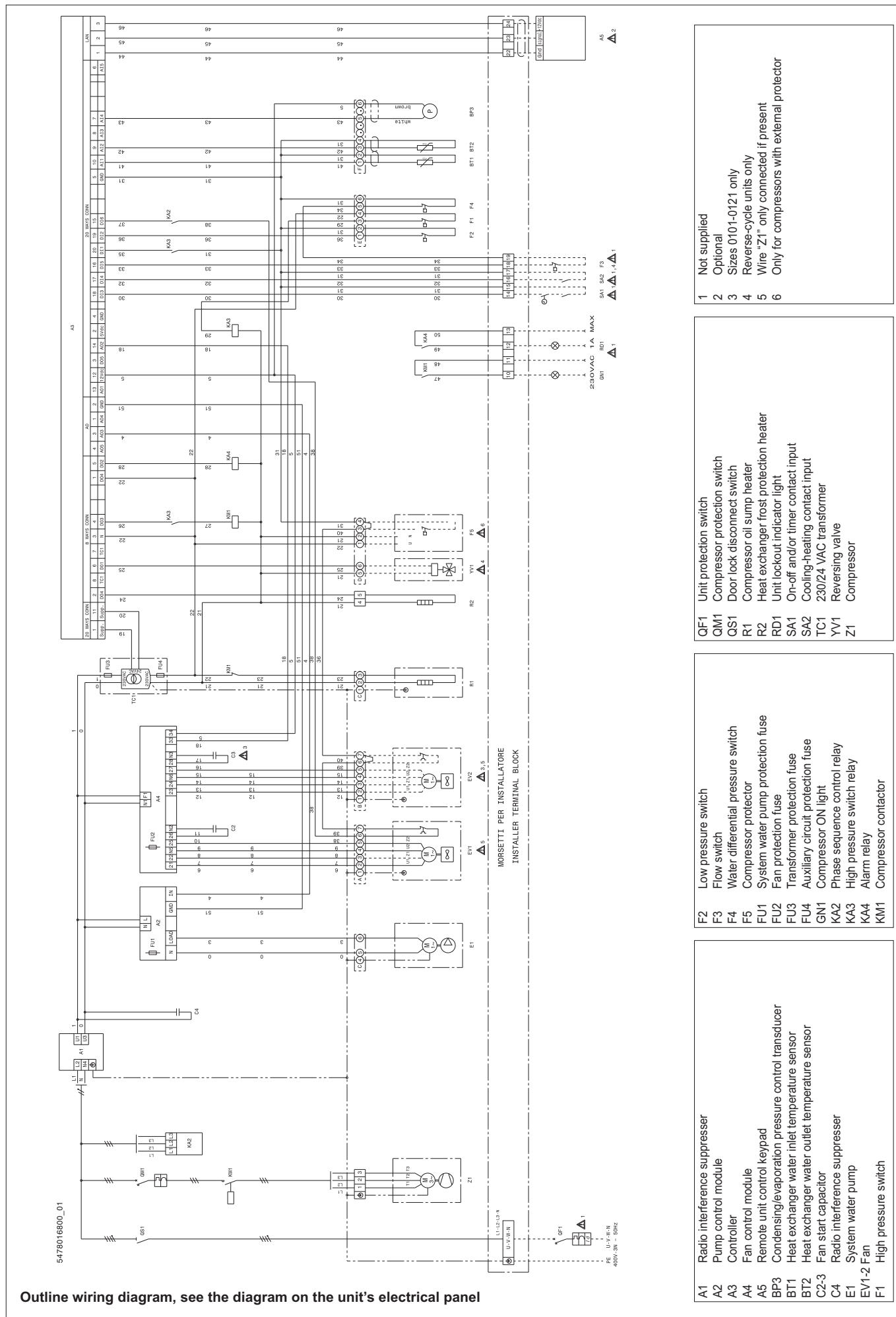


Outline wiring diagram, see the diagram on the unit's electrical panel

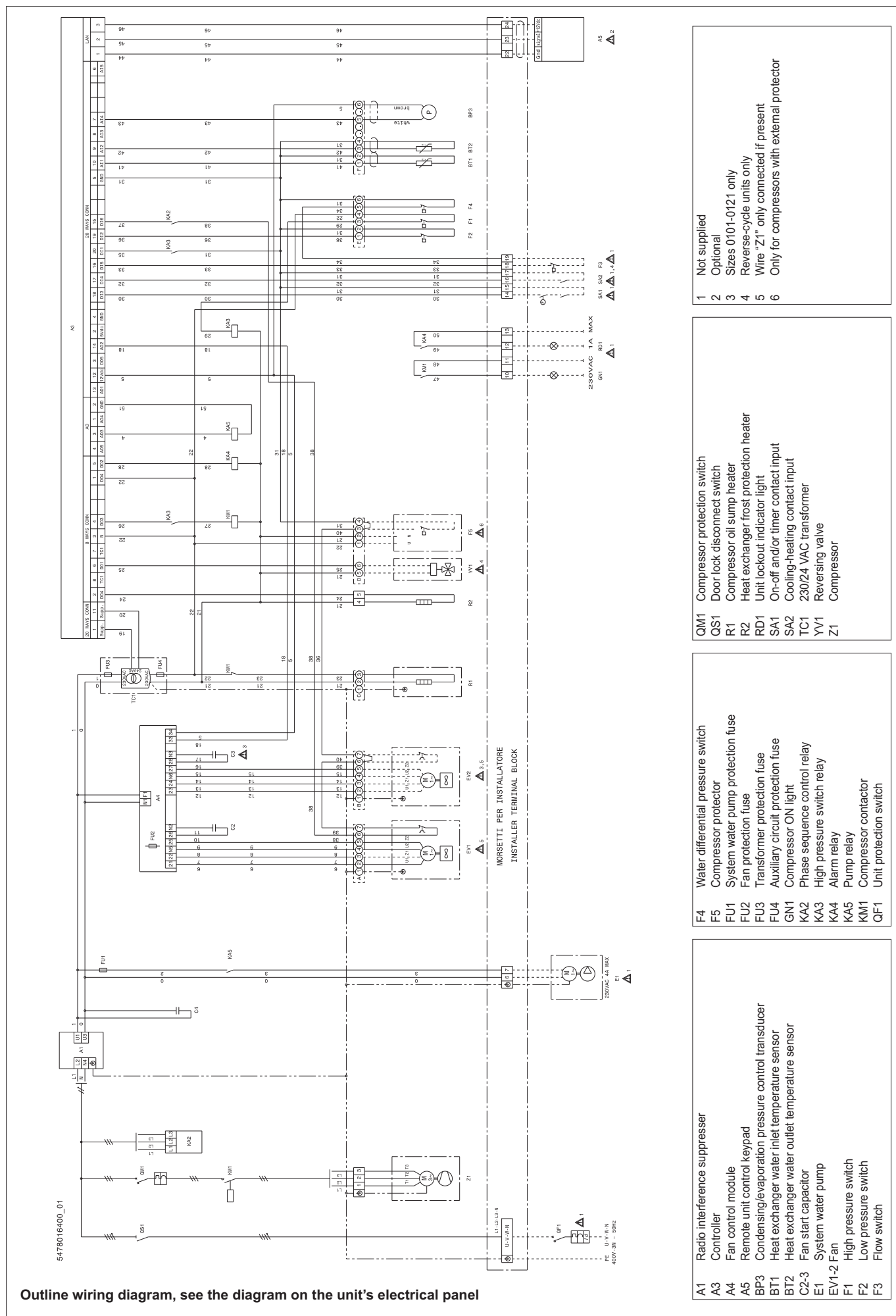
BRAT-BRAN FFT 0021+0061 THREE-PHASE WIRING DIAGRAM



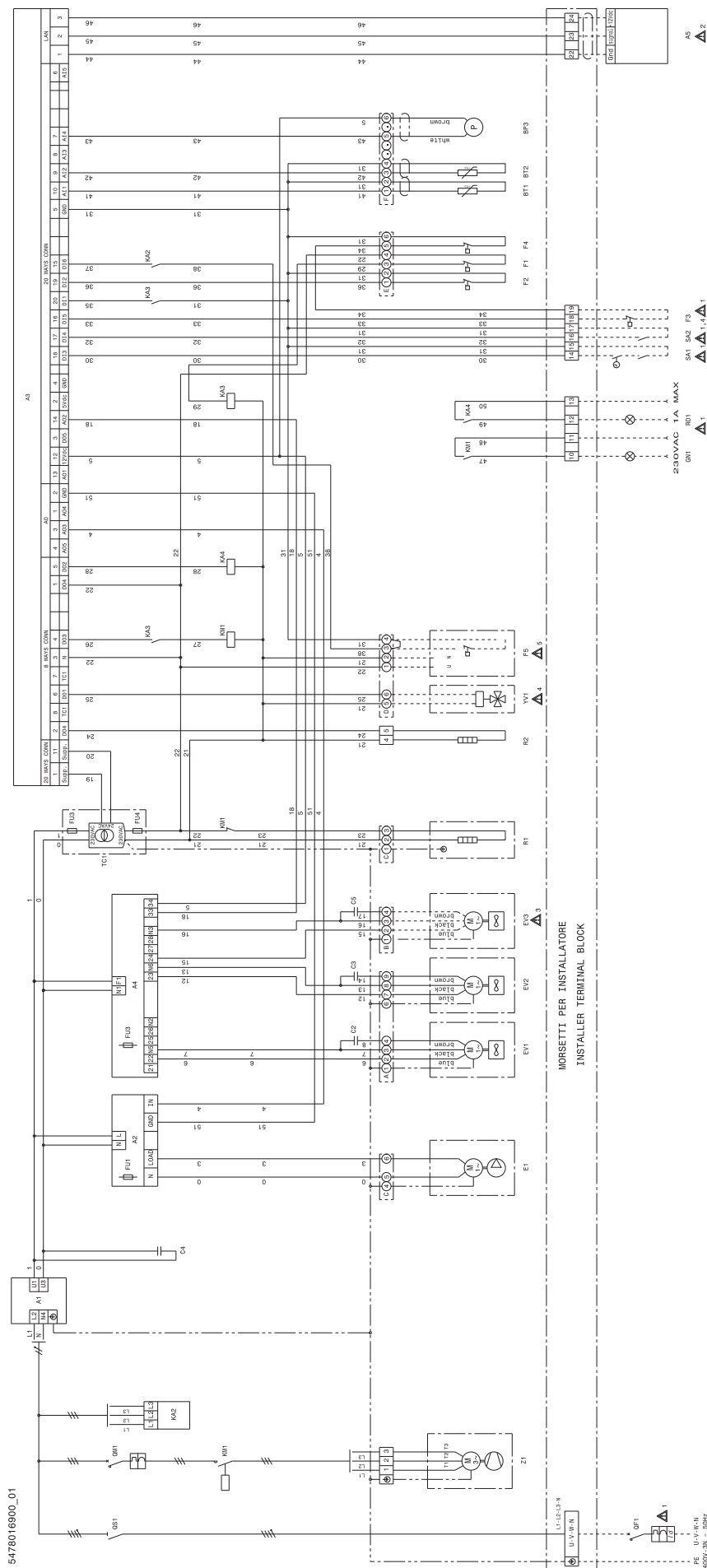
BRAT-BRAN FF 0071+0121 THREE-PHASE WIRING DIAGRAM



BRAT-BRAN FFT 0071+0121 THREE-PHASE WIRING DIAGRAM



BRAT-BRAN FF SL 0071+0121 THREE-PHASE WIRING DIAGRAM



Outline wiring diagram, see the diagram on the unit's electrical panel

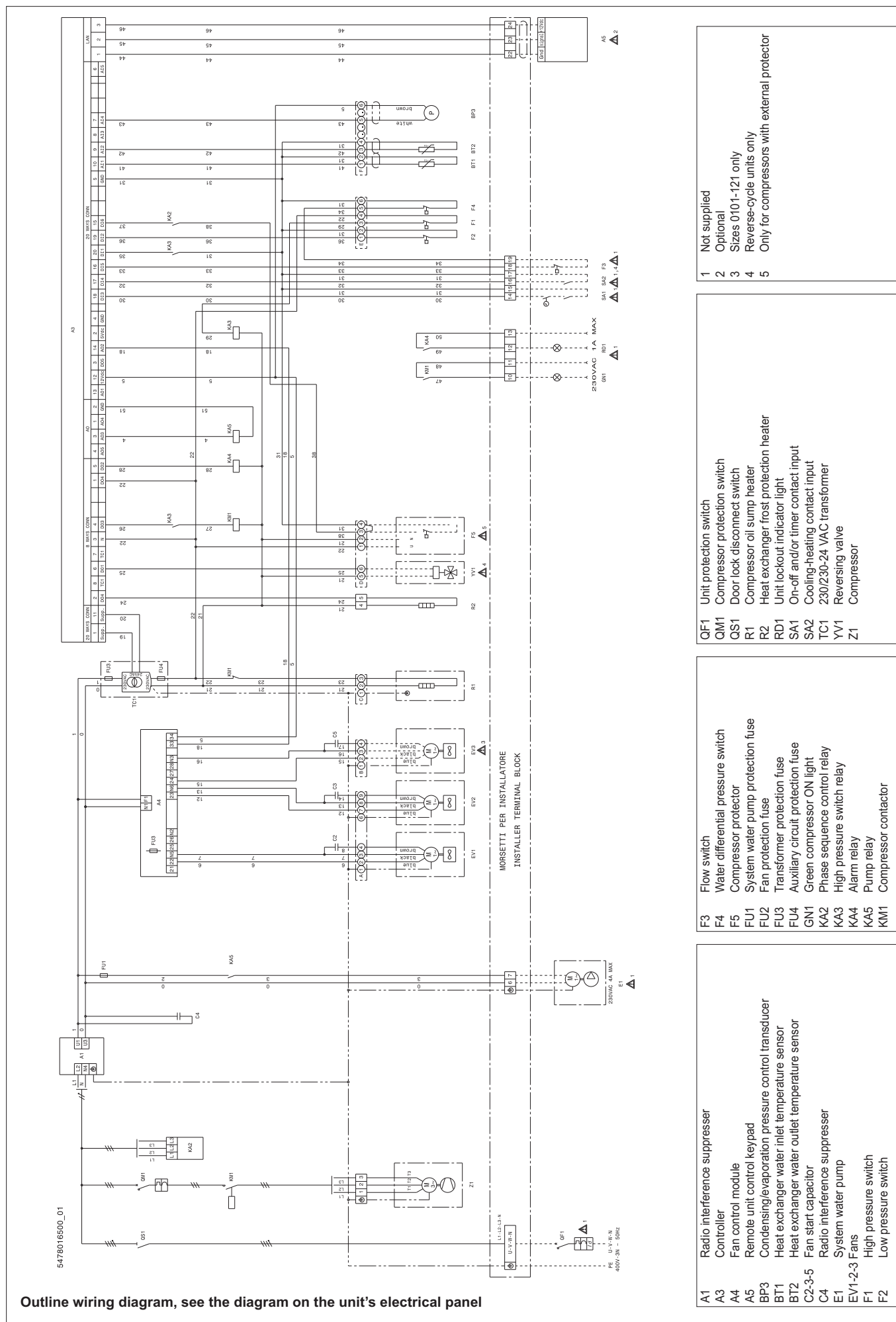
- A1 Radio interference suppressor
- A2 Pump control module
- A3 Controller
- A4 Fan control module
- A5 Remote unit control keypad
- BP3 Condensing/evaporation pressure control transducer
- BT1 Heat exchanger water inlet temperature sensor
- BT2 Heat exchanger water outlet temperature sensor
- C2-3-5 Fan start capacitor
- C4 Radio interference suppressor
- E1 System water pump
- EV1-2-3 Fans
- F1 High pressure switch

- F2 Low pressure switch
- F3 Flow switch
- F4 Water differential pressure switch
- F5 Compressor protector
- FU1 System water pump protection fuse
- FU2 Fan protection fuse
- FU3 Transformer protection fuse
- FU4 Auxiliary circuit protection fuse
- GN1 Green compressor ON light
- KA2 Phase sequence control relay
- KA3 High pressure switch relay
- KA4 Alarm relay
- KM1 Compressor contactor

- QF1 Unit protection switch
- QM1 Compressor protection switch
- QS1 Door lock disconnect switch
- R1 Compressor oil pump heater
- R2 Heat exchanger frost protection heater
- RD1 Unit lockout indicator light
- SA1 On-off and/or timer contact input
- TC1 Cooling-heating contact input
- YV1 230V/230-24 VAC transformer
- Z1 Reversing valve
- Z1 Compressor

- 1 Not supplied
- 2 Optional
- 3 Sizes 0101-121 only
- 4 Reverse-cycle units only
- 5 Only for compressors with external protector

BRAT-BRAN FFT SL 0071+0121 THREE-PHASE WIRING DIAGRAM



BRAT FF/FFT		0011	0021	0025	0031	0041	0021	0025	0031	0041	0051	0061
Cooling capacity (1)	kW	4,9	5,6	6,9	8,6	11,0	5,6	7,0	8,7	11,4	13,2	15,4
Compressor power consumption (1)	kW	1,8	1,9	2,4	3,3	3,8	1,9	2,3	3,0	3,9	4,4	4,9
Compressors	no.	1	1	1	1	1	1	1	1	1	1	1
Rated water flow (1)	m³/h	0,8	1,0	1,2	1,5	1,9	1,0	1,2	1,5	2,0	2,3	2,7
Residual head (1)(4)	kPa	49	46	42	41	43	46	42	41	43	35	32
Maximum allowable pressure PS _L _H (3)	MPa	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93
Power supply	V/ph/Hz	230 ~ 50					400-3 N ~ 50					
Total power consumption (unit) (1) *	kW	1,9	2,1	2,5	3,4	4,1	2,0	2,4	3,1	4,2	4,7	5,2
Index of protection	IP	X4										
Fans	no.	1	1	1	1	2	1	1	1	2	2	2
Min rotation speed RPM	g/min	430	430	430	430	430	430	430	430	430	430	430
Max rotation speed RPM	g/min	760	870	870	760	870	870	870	760	870	870	860
Max. air flow	m³/s	0,9	0,9	1,0	1,0	1,9	0,9	1,0	1,0	1,9	1,8	1,9
Sound power	dB(A)	65	66	66	66	69	66	66	66	69	69	69
R410A refrigerant charge	kg	1,35	1,70	2,65	2,35	2,35	1,70	2,65	2,35	2,35	3,25	3,75
Mobil EAL Arctic 22 cc oil **	l	1,1	1,1	1,25	1,25	1,95	1,1	1,25	1,25	1,95	1,90	1,90
ICI Emkarate RL 32 CF**												

BRAN FF/FFT		0011	0021	0025	0031	0041	0021	0025	0031	0041	0051	0061
Cooling capacity (1)	kW	4,6	5,4	6,6	8,2	10,4	5,3	6,7	8,2	10,8	12,6	14,6
Compressor power consumption (1)	kW	1,8	1,9	2,4	3,3	3,8	1,9	2,3	3,0	3,9	4,4	4,9
Heating capacity (2)	kW	5,7	6,5	8,1	10,0	12,4	6,4	8,8	9,7	12,8	14,4	16,8
Compressor power consumption (2)	kW	2,1	2,2	2,7	3,4	4,2	2,2	2,6	3,1	4,4	4,7	5,1
Compressors	no.	1	1	1	1	1	1	1	1	1	1	1
Rated water flow (2)	m³/h	1,0	1,1	1,4	1,7	2,1	1,1	1,4	1,7	2,2	2,5	2,9
Rated water flow (1)	m³/h	0,8	0,9	1,1	1,4	1,8	0,9	1,2	1,4	1,9	2,2	2,5
Residual head (1)(4)	kPa	49	46	42	41	43	46	42	41	43	35	32
Maximum allowable pressure PS _L _H (3)	MPa	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93
Power supply	V/ph/Hz	230 ~ 50					400-3 N ~ 50					
Total power consumption (unit) (2) *	kW	2,3	2,4	2,9	3,6	4,5	2,4	2,7	3,2	4,7	5,0	5,4
Index of protection	IP	X4										
Fans	no.	1	1	1	1	2	1	1	1	2	2	2
Min rotation speed RPM	g/min	430	430	430	430	430	430	430	430	430	430	430
Max rotation speed RPM	g/min	760	870	870	760	870	870	870	760	870	870	860
Max. air flow	m³/s	0,9	0,9	1,0	1,0	1,9	0,9	1,0	1,0	1,9	1,8	1,9
Sound power	dB(A)	65	66	66	66	69	66	66	66	69	69	69
R410A refrigerant charge	kg	1,50	1,75	2,90	3,00	3,00	1,75	2,90	3,00	3,00	4,00	4,60
Mobil EAL Arctic 22 cc oil **	l	1,1	1,1	1,25	1,25	1,95	1,1	1,25	1,25	1,95	1,90	1,90
ICI Emkarate RL 32 CF**												

(1) outside air 35°C; evaporator water IN/OUT 12/7°C

(2) outside air 7°C; condenser water in/out 40/45°C

(3) the maximum and minimum operating pressure refer to activation of the pressure switches

(4) only models supplied as standard with pump on the unit (FF models)

* total power consumption does not include the water circulating pump. Add the values taken from page 9

** the two types of oil are equivalent

BRAT FF/FFT		0071	0091	0101	0121
Cooling capacity (1)	kW	19,3	21,9	26,4	32,9
Compressor power consumption (1)	kW	6,2	7,2	7,5	9,9
Compressors	no.	1	1	1	1
Rated water flow (1)	m ³ /h	3,3	3,8	4,5	5,7
Residual head (1)(4)	kPa	116	90	130	108
Maximum allowable pressure PS _L _H (43)	MPa	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93
Power supply	V/ph/Hz	400-3 N ~ 50			
Total power consumption (unit) (1) *	kW	6,8	7,8	8,7	11,1
Index of protection	IP	X4			
Fans BRAT FF/FFT	no.	1	1	2	2
Fans BRAT FF/FFT SL	no.	2	2	3	3
Min rotation speed RPM	g/min	430	430	430	430
Max rotation speed RPM	g/min	910	870	905	905
Max. air flow	m ³ /s	2,4	2,4	4,4	4,4
Sound power BRAT FF/FFT	dB(A)	76	76	79	79
Sound power BRAT FF/FFT SL	dB(A)	74	74	76	76
R410A Refrigerant charge	kg	4,20	4,76	5,90	6,00
Olio Mobil EAL Arctic 22 cc **	Lt	2,50	3,25	3,25	4,00
ICI Emkarate RL 32 CF **					

BRAN FF/FFT		0071	0091	0101	0121
Cooling capacity (1)	kW	18,4	20,8	25,1	31,3
Compressor power consumption (1)	kW	6,2	7,2	7,5	9,9
Heating capacity (2)	kW	21,0	23,6	28,8	35,5
Compressor power consumption (2)	kW	6,5	7,2	8,9	10,6
Compressors	no.	1	1	1	1
Rated water flow (1)	m ³ /h	3,2	3,6	4,3	5,4
Rated water flow (2)	m ³ /h	3,6	4,1	5,0	6,2
Residual head (1)(4)	kPa	116	90	130	108
Maximum allowable pressure PS _L _H (3)	MPa	2,80 3,93	2,80 3,93	2,80 3,93	2,80 3,93
Power supply	V/ph/Hz	400-3 N ~ 50			
Total power consumption (unit) (2) *	kW	7,1	7,8	10,1	11,8
Index of protection	IP	X4			
Fans BRAN FF/FFT	no.	1	1	2	2
Fans BRAN FF/FFT SL	no.	2	2	3	3
Min rotation speed RPM	g/min	430	430	430	430
Max rotation speed RPM	g/min	910	870	905	905
Max. air flow	m ³ /s	2,4	2,4	4,4	4,4
Sound power BRAN FF/FFT	dB(A)	76	76	79	79
Sound power BRAN FF/FFT SL	dB(A)	74	74	76	76
R410A Refrigerant charge	kg	6,30	7,00	8,60	8,70
Olio Mobil EAL Arctic 22 cc **	Lt	2,50	3,25	3,25	4,00
ICI Emkarate RL 32 CF **					

(1) outside air 35°C; evaporator water IN/OUT 12/7°C

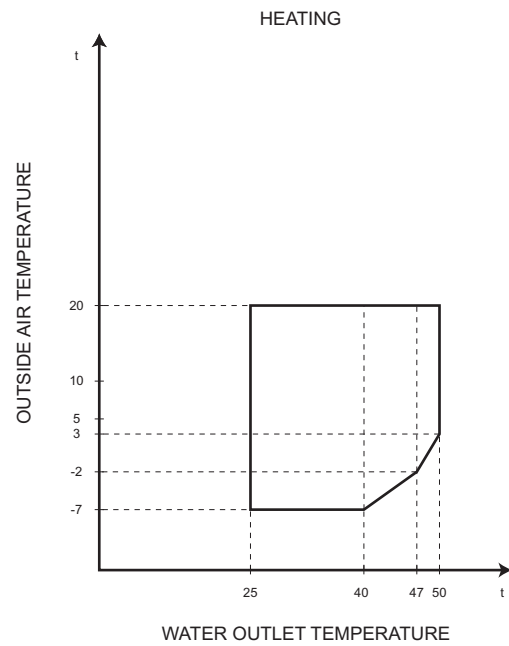
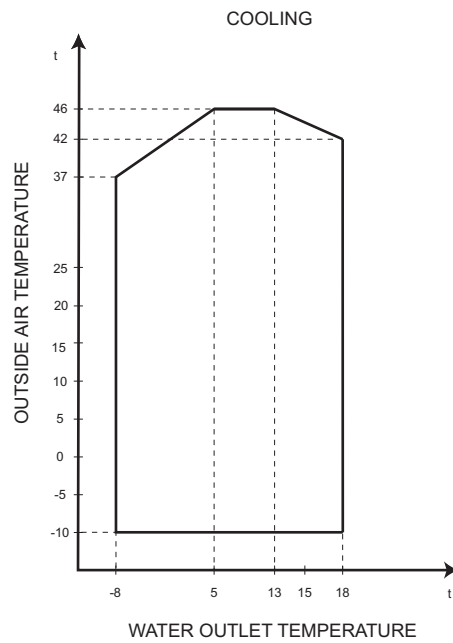
(2) outside air 7°C; condenser water IN/OUT 40/45°C

(3) the maximum and minimum operating pressure refer to activation of the pressure switches

(4) only models supplied as standard with pump on the unit (FF models)

* total power consumption does not include the water circulating pump. Add the values taken from page 9

** the two types of oil are equivalent



Thermal head min. max	4÷6
Water circuit pressure (bars)	1÷3
Max. storage temperature (°C)	63

WATER CIRCUIT DATA

I A

Water content in the system

Size		0011	0021	0025	0031	0041	0051	0061	0071	0091	0101	0121
Minimum water content BRAT	I	14	18	20,3	24	30,5	36	43,5	55	65	78	94
Minimum water content BRAN	I	19	24	27,3	31,5	40	46	57	74	85	103	124

PREPARING FOR FIRST START UP or restarting after shutting down for long periods.

The unit must be started up for the first time by the **Technical Service**.

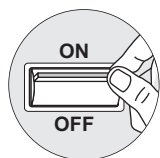
Before starting up the units, make sure that:

- All safety conditions have been respected;
- The unit is adequately fixed to the surface it rests on;
- Clearances have been respected
- Water connections have been carried out as indicated in the instruction manual;
- The water circuit is filled and vented.
- The water valves are open;
- Electrical connections have been carried out correctly
- Voltage is within a tolerance of 10% of the rated voltage for the unit;
- The unit is correctly earthed;
- All electrical connections are tight and all water connections have been carried out correctly.

⚠ The unit must be started up for the first time with standard settings. Set Point values may be modified only after testing has been completed.

Before starting up, power up the unit for at least two hours by switching QF1 and QS1 ON (see "wiring diagram" and the control panel in standby) so as to allow the oil in the compressor sump to heat up.

ACTIVATING AND DEACTIVATING THE UNIT



- Move the contact on the on/off device SA1 (if featured) to ON.

⚠ During this phase, if the following indications appear on the display, follow the instructions:

- ER20 check the water flow-rate and the connection of the flow switch.
- ER01 (three-phase heat pumps only): check the power supply connection and if necessary reverse two phases.

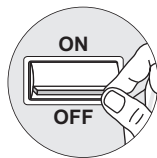
⚠ At every change of season, make sure the operating conditions fall within the limits specified.

Make sure the current input of the compressor is less than the maximum shown in the table of technical specifications.

Make sure the voltage is within the established limits and that, for three phase units, the unbalance between the phases is less than 3%.

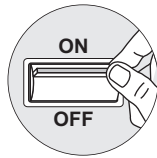
Check that the cover is closed again following the setting procedure.

STARTING UP FOR THE FIRST TIME (after two hours)



Before starting the chiller:

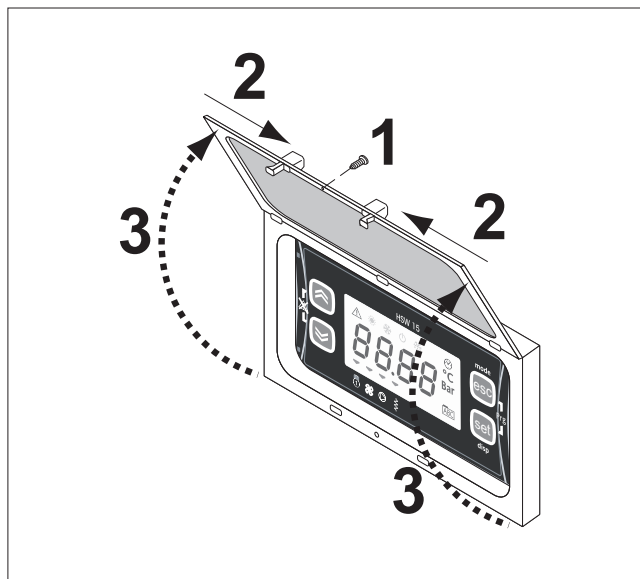
- Make sure the switch QF1 is in the OFF position.
- Make sure the contact of the on/off device SA1 (see the wiring diagram) is open (if featured).



- Close the door of the electrical panel.
- Move the main unit switch QS1 to the ON position.
- Move the switch QF1 (outside the unit) to "ON".

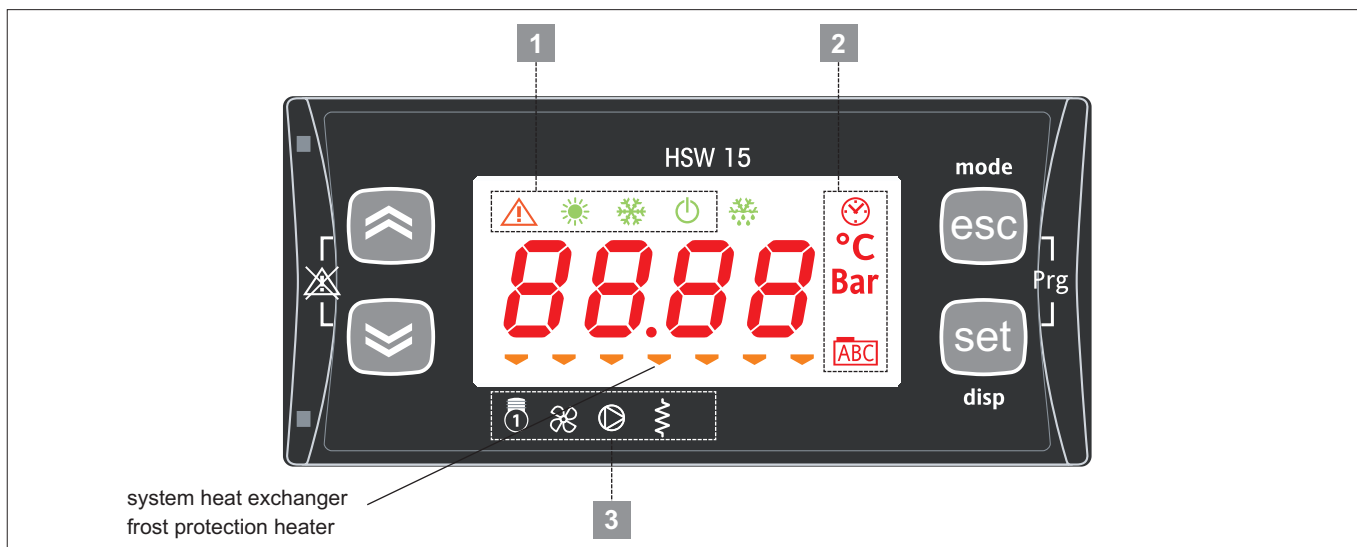
- The icon with the off symbol (⏻) lights up on the control panel, indicating power is connected.

⚠ For the position of internal components, see the diagrams.



To access the control panel, open the door:

- remove the screw 1;
- press the points 2 simultaneously and lift the door 3.



1 STATUS AND OPERATING MODE LEDs

	Alarm
	Heating
	Cooling
	Standby
	Not used

2 VALUE AND UNIT OF MEASURE LEDs

	Not used
	Degrees centigrade
	Pressure (Bar)
	Menu (ABC)

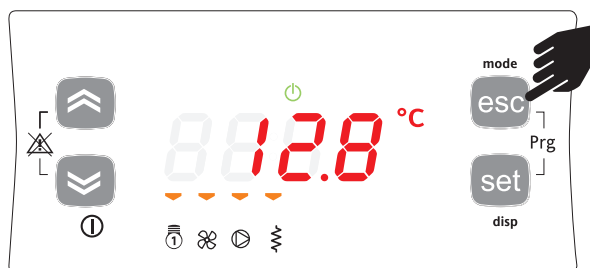
3 UTILITY LEDs

	Compressor
	Fans
	System pump
	Frost protection heater

SELECTING THE OPERATING MODE

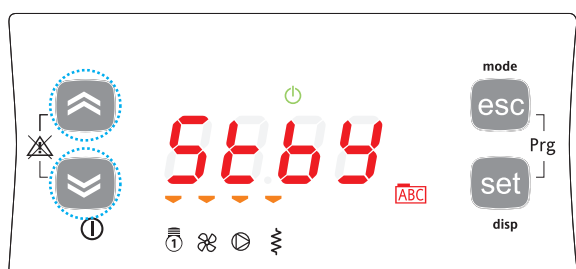
There are three different modes:

- Standby mode (StbY)
- Cooling mode (COOL)
- Heating only mode (HEAT)



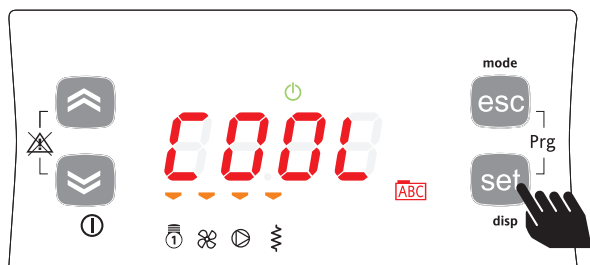
For example, to switch operation from StbY to COOL.

To change the operating mode, press and hold the mode button for at least 2 seconds.

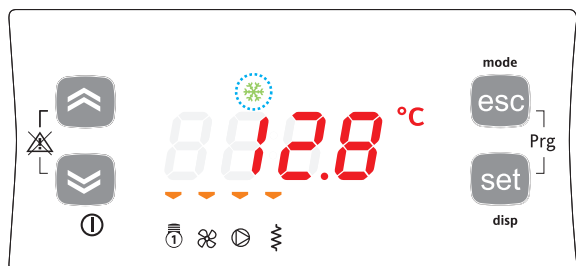


A scroll menu will start flashing with the values StbY (standby) and COOL (cool).

Use the up and down buttons to select the desired operating mode.



The unit will automatically return to the main display and the StbY LED, previously on, will now be off and the COOL LED will be on.

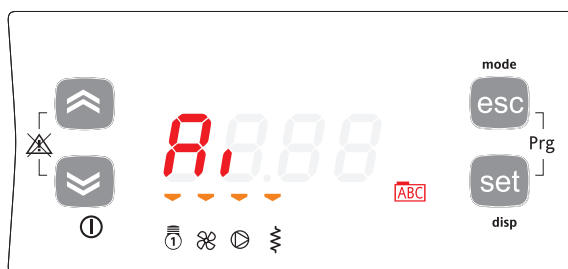


SETTING THE SET POINTS

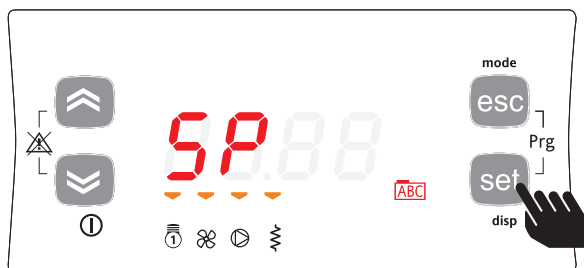
As an example, the Set Point in COOL mode will be changed from 12.0 degrees centigrade to 12.5 degrees centigrade.



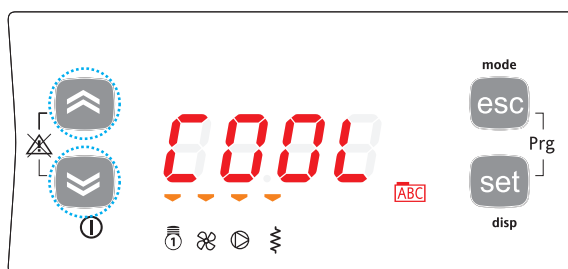
To change the set point, starting from the main display, press the set button.



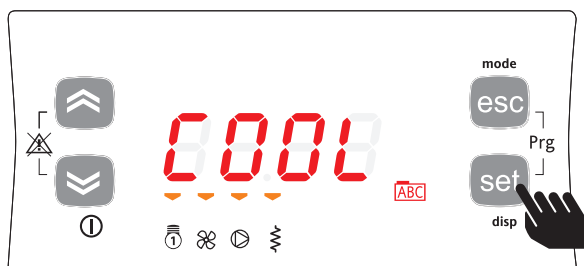
Pressing the set button once displays the various directories. Scroll the menu using the up and down buttons until reaching the SP directory.



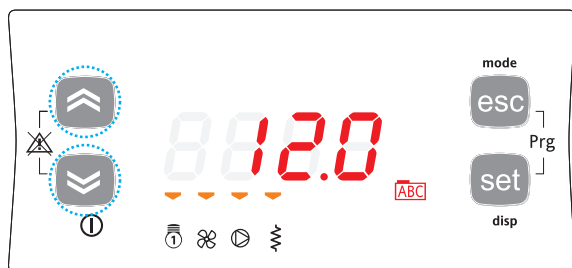
To enter the SP directory press the set button.



The active mode will be displayed (COOL).



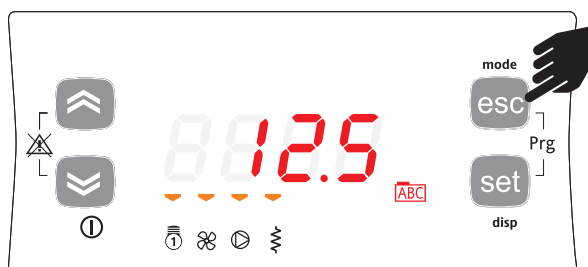
Taking the example of changing the set point for the operating mode. Press the SET button.



The instrument will display the current set point (in this case 12.0 degrees centigrade).
To increase or decrease the value, use the up and down buttons.
For example, to change the set point to 12.5 degrees, press the up button until the desired value is displayed.



Once having reached the desired set point, press the set button. In this way, the instrument will save the value 12.5.



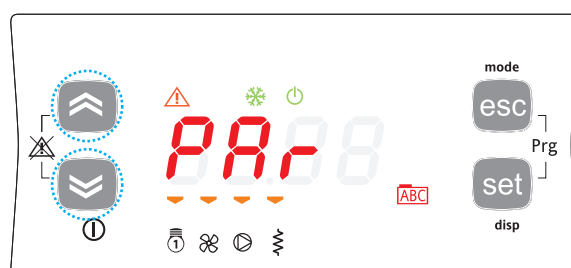
To return to the main display, press esc or wait for the menu timeout to expire (15 seconds).

SETTING THE PARAMETERS

Accessing the PASS directory (from the main display, pressing the esc and set buttons together [esc+set] and scrolling to the directory with up / down) and setting the PASS accesses the parameters visible for the password entered.



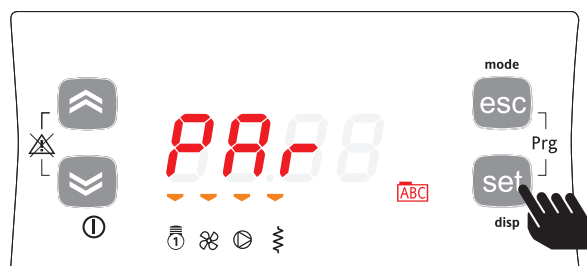
To access the PASS directory from the main display, press esc and set together [esc+set].



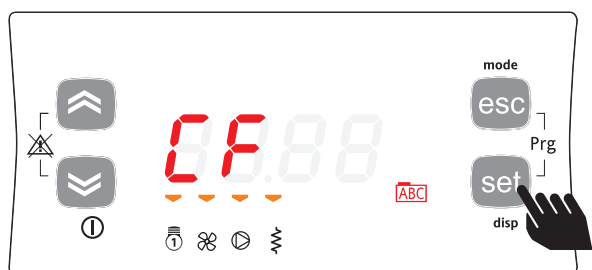
Pressing the two buttons accesses the menu listing the directories.
Scroll using the up and down buttons to the PASS directory.



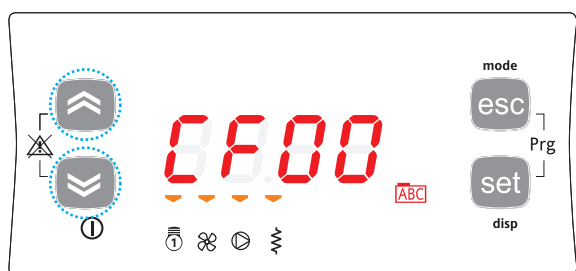
To enter the PASS directory press the set button.
Then enter the password (installer or manufacturer), press set and exit.
Access the parameters to display or change the values.



Press the up and down buttons to select the Par submenu.
Press the set button to display the desired directory.

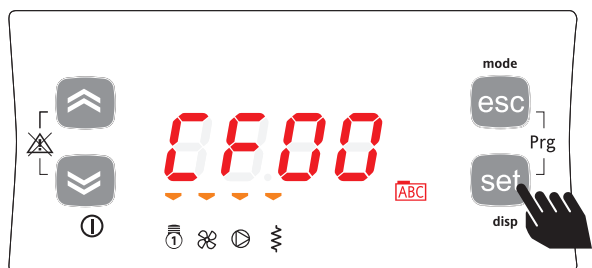


The first directory displayed by the instrument will be the CF directory (configuration).
To set the individual CF parameters, simply press set again.

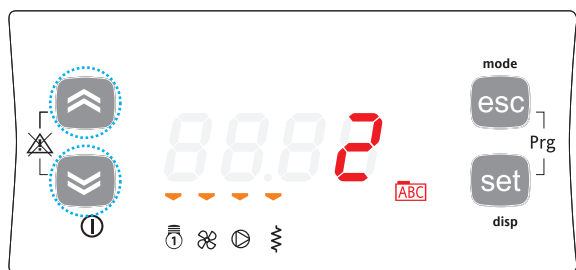


The instrument will display parameter CF00 (default factory settings). To scroll the various parameters, simply press the up button to go to the next parameter (in this case CF01) or the down button to go to the previous parameter (in this case CF47).
CF00->CF01->CF02->...->CF47->CF00
CF47<-CF00<-CF01->...<-CF46<-CF47

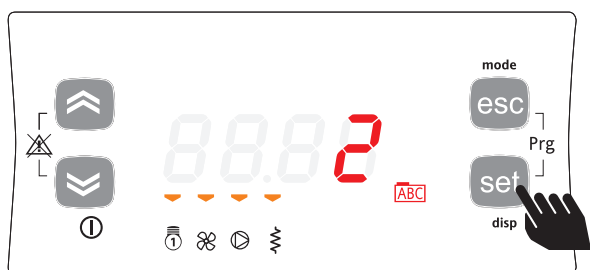
NOTE: -> UP, <-DOWN



To display the value of the parameter (in this case CF00), press the set button.



For parameter CF00, the value displayed will be 2.
To change the value of the parameter, press the up or down button.

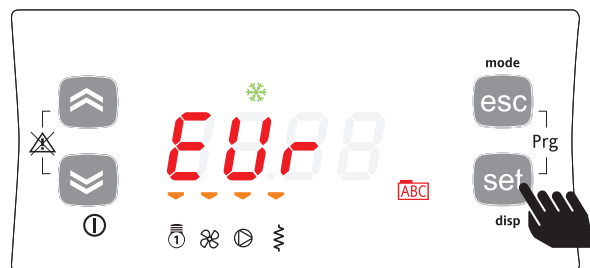


When having selected the value, press the set button. **
To exit the display and return to the previous level, press esc.

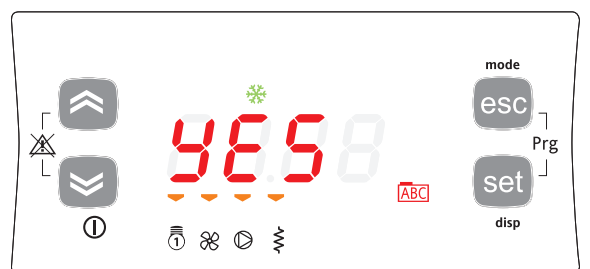
**NOTE: pressing the set button confirms the new value; pressing the esc button returns to the previous level without changing the existing value.

RESETTING THE ALARM LOG

From the main display press "esc + set", the display will show "Par". Scroll using the UP and DOWN buttons until displaying the label "FnC". Press the SET button, the display will show "dEF". Scroll using the UP and DOWN buttons until displaying "EUR".



Press the SET button for 3 seconds.



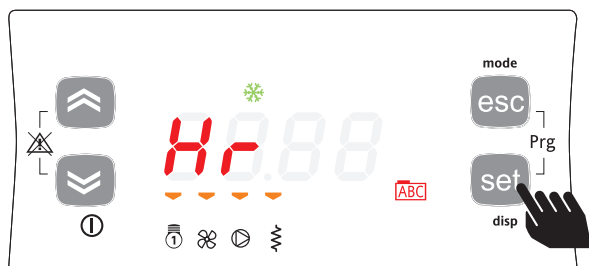
The display shows YES, to confirm that the alarm log has been reset.

DISPLAYING AND RESETTNG COMPRESSOR / PUMP HOURS

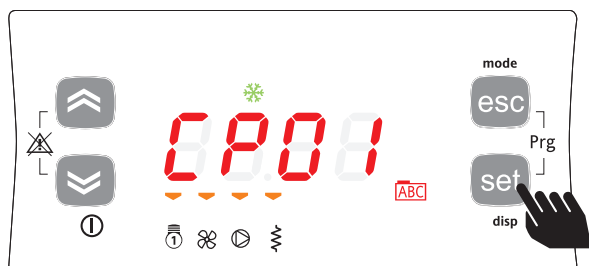


Example of displaying and resetting (tens) the Pump operating hours.

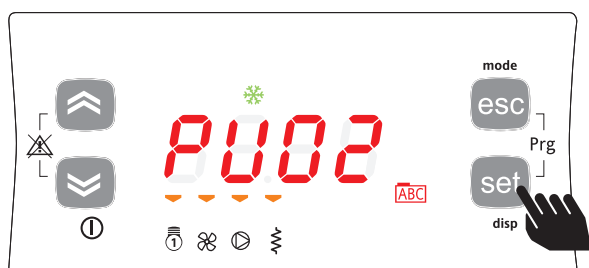
From the main display, press the set button.



The display will show label Ai. Scroll the labels using the UP and DOWN buttons until reaching label Hr.

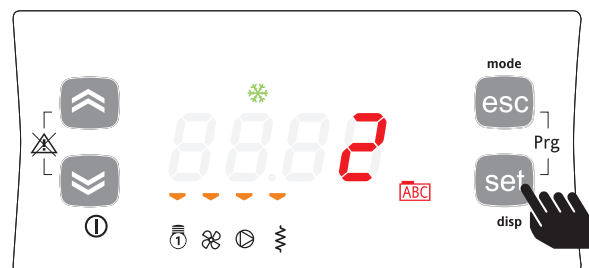


Press the set button to display the first label, in this case the operating hours for compressor 1 (CP01).



Scroll using the UP and DOWN buttons until displaying (if featured among the resources) the operating hours for compressor 2 (CP02) and the operating hours for the pump (PU02).

Press the set button to display the operating hours for the pump PU02.



The tens of operating hours are equal to 2.

(The hours are expressed in tens: 2 indicates 20 operating hours).

To reset the operating hours for the pump PU02, press and hold [set].

Note: to reset the operating hours for the other resources, repeat the procedure described.

To exit the menu, press esc until returning to the main display.

LIST OF ACCESSIBLE PARAMETERS			
	Directory label	Parameters	Parameters for:
	CF	CF00... CF77	Configuration
	Ui	UI00... UI18	User interface
	tr	tr00... tr20	Temperature control
	St	St00... St04	Operating status
	CP	CP00... CP10	Compressor
Primary pump	PI	PI00... PI24	Primary water circuit pump
Fans	FE	FE00... FE30	Fans
Electric heater	HI	HI00... H15	System heat exchanger electric heater
	dS	dS00... dS07	Dynamic set point
	Ad	Ad00... Ad07	Adaptive
	AF	AF00... AF03	Frost protection
	AL	AL00... AL48	Alarms
	CL	C00... CL97	Local I/O configuration

Note 1: when setting the parameters the **COMPRESSOR** and **HEATER** LEDs will flash alternating with the **DEFROST** LED.

Note 2: the above table shows a list of parameters that are all or partly available only on entering the password.

DISPLAYING ALARMS I A

FAULT	CAUSE	SOLUTION
Values display indication Er01	High pressure switch tripped, manual reset after 3 activations in one hour, incorrect connection of power supply phases (three-phase models only)	Check fault (see high discharge pressure) Reset manually Change the position of two phases.
Values display indication Er05	Low pressure switch tripped manual reset after 4 activations per hour	Check fault
Values display indication Er 10	Fan circuit breaker tripped Manual reset if active for more than 30 seconds	Check fan circuit breaker Check compressor circuit breaker Check correct sequence of power supply phases (versions 0071-0121)
Values display indication Er20	Differential pressure switch or flow switch tripped Manual reset if active for more than 30 seconds	Check inadequate water flow Check for air in water circuit Check electrical connection (see unit wiring diagram)
Values display indication Er30	System frost prevention alarm (manual reset)	Check water outlet temperature Check water flow Check temperature set point Check correct positioning of sensor BT2
Display indication Er47	HSW15 communication error with remote keypad (only if remote keypad featured)	Check electrical connection
Values display indication Er60	Faulty BT1 system water return sensor (automatic reset)	Check electrical connections Replace component

FAULT	CAUSE	SOLUTION
Values display indication Er61	Faulty BT2 system water outlet sensor (automatic reset)	Check electrical connections Replace component
Display indication Er75	Pressure transducer malfunction	Check electrical connection (see unit wiring diagrams) Replace component
Display indication Er81	Compressor maintenance interval	Check operating pressure Check condition of the compressor Reset the clock
Display indication Er85	Water pump maintenance interval	Check condition of the water pumps Reset the clock
Display indication Er90	Maximum alarm log size exceeded	Reset alarm log

OPERATING CHARACTERISTICS



Cooling set point

(factory setting) = 12°C, Hysteresis = 3°C.

The compressor starts at outlet water temperatures above 12°C+3°C (15°C).

The compressor stops at water temperatures below 12°C.

In the event of temporary power failure, when power returns, the mode set previously will be retained in the memory.

Heating set point

(factory setting) = 40°C, Hysteresis = 3°C.

The compressor starts at water outlet temperatures below 37°C.

The compressor stops at water temperatures above 40°C.

In the event of temporary power failure, when power returns, the mode set previously will be retained in the memory.

COMPRESSOR START-UP DELAY

Two functions prevent the compressor from starting up too frequently.

- Minimum time since last shut-down 180 seconds.
- Minimum time since last start-up 300 seconds.

CIRCULATING PUMP

The electronic board includes a pump control output. The pump starts when "cool" mode is activated and stops a few seconds after "standby" mode is selected.

After the first few seconds of pump operation when the water flow is at full speed, the water flow alarm functions are activated (differential pressure switch and flow switch).

FAN SPEED CONTROL

To enable the unit to function correctly at different outside temperatures, a microprocessor with pressure reading via pressure sensor controls the fan rotation speed. This allows the exchange of heat to be increased and/or decreased, maintaining condensing or evaporation pressures essentially constant.

The fan operates independently of the compressor.

FROST ALARM

The frost protection function is always active, so as to prevent the water freezing and damaging the plate heat exchanger; to do this, the microprocessor shuts down the compressor if the temperature measured by the heat exchanger outlet temperature sensor is less than: +4°C on the system side.

The frost prevention temperature set point can be modified by an authorised service centre only and only after verifying that the water circuit contains antifreeze.

Tripping of this alarm shuts down the compressor but not the pump, which remains active.

To reset normal functions, the water outlet temperature must rise to more than: +7°C on the system side.

Reset is manual.

WATER FLOW ALARM

The microprocessor provides for the management of a water flow alarm controlled by a differential pressure switch fitted as standard on the appliance and flow switches to be installed on the water inlet piping.

This safety device may trip after the first 60 seconds of pump operation when the water flow is up to speed.

Tripping of this alarm shuts down the compressor but not the pump, which remains active.

The alarm is reset automatically if it lasts less than 20 sec.

If it lasts longer, it must be reset manually.

After deactivating the chiller:

- Make sure the remote switch SA1 (if featured) is off.
- Make sure the remote keypad (if featured) shows "OFF".
- Place QF1 in the OFF position (see wiring diagram)
- Deactivate the indoor terminal units by placing the switch of each unit in the "OFF" position.
- Close the water valves.

⚠ If the mains switch is turned to "off" for more than four hours, after turning it on and before reactivating the unit, leave the power on but the unit deactivated for at least two hours to preheat the oil in the compressor sump.

ROUTINE MAINTENANCE

Never perform any cleaning operations before having disconnected the unit from the mains power supply.

Terminals 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 may be live even when the unit has been disconnected.

Make sure power is not connected before proceeding.

Regular maintenance is fundamental to maintain the efficiency of the unit both in terms of operation and energy consumption.

The Technical Service maintenance plan must be observed, with an annual service which includes the following operations and checks:

- Filling of the water circuit;
- Presence of air bubbles in the water circuit
- Efficiency of safety devices
- Power supply voltage
- Power consumption

- Tightness of electrical and water connections
- Condition of the compressor contactor
- Verification of operating pressure, superheat and subcooling
- Efficiency of the compressor heater

During the maintenance operations, the chiller inspection panel may need to be removed.

If this is the case, proceed as follows:

- Open the door of the electrical panel.
- Undo the screws as shown in the figure
- Remove the inspection panel

To replace the inspection panel, repeat the procedure in reverse.

UNSCHEDULED MAINTENANCE

Never perform any cleaning operations before having disconnected the unit from the mains power supply.

Terminals 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 may be live even when the unit has been disconnected.

Make sure power is not connected before proceeding

CHEMICAL WASHING

It is recommended to chemically flush the plate heat exchanger after every 3 years of operation.

For instructions on how to carry out this operation, call the toll free number.

REFRIGERANT GAS CONTENT

The chillers are charged with R-410A refrigerant gas and tested in the factory.

In normal conditions, there should be no need for the Technical Service to intervene to check the refrigerant gas.

However, over time, small leaks may develop at the joints leading to loss of refrigerant and draining of the circuit, causing the unit to function poorly.

In this case, the leaks of refrigerant must be identified and repaired and the refrigerant circuit recharged.

Proceed as follows:

- Empty and dry the entire refrigerant circuit using a vacuum pump connected to the low and high pressure tap until the vacuumometer reads about 10 Pa.
- Wait a couple of minutes and check that this value does not rise to more than 50 Pa.
- Connect the refrigerant gas cylinder or a filling cylinder to

the low pressure line pressure gauge connection.

- Charge the quantity of refrigerant indicated on the unit's rating plate.
- Always check the superheat and subcooling values, which should be between 5 and 10 °C and 4 and 8 °C.
- After a couple of hours operation, check that the liquid indicator indicates a dry circuit (dry-green).

⚠ In the event of partial leaks, the circuit must be completely emptied before being recharged.

The R-410A refrigerant must only be charged in the liquid state.

Operating conditions other than rated conditions may produce considerably different values.

Tightness testing or identification of leaks must only be carried out using R-410A refrigerant gas, checking with a suitable leak detector.

The refrigerant circuit **must not be charged** with a refrigerant other than that indicated.

The use of a different refrigerant may cause serious damage to the compressor.

- ⊖ Oxygen, acetylene or other flammable or poisonous gases **must never be used** in the refrigerant circuit as they may cause explosion or poisoning. Oils other than those indicated on page 16 **must not be used**.

The use of a different oil may cause serious damage to the compressor.

DISPOSAL

The unit must be disposed of according to the legislation in force in the country concerned.

FAULT	CAUSE	SOLUTION
The unit doesn't start	Power failure	Check presence of voltage Check safety systems upstream of the appliance
	Switch QF1 in OFF position Remote switch (if featured) in OFF position Control panel in standby Main switch QS1 in OFF Compressor circuit breaker OFF	Switch ON
	Power supply voltage too low	Check power line
	Contactator coil faulty HSW15 controller fault Start-up capacitor faulty (if featured) Compressor faulty Reversed phases (three-phase units only)	Replace the component
Insufficient capacity	Insufficient refrigerant Unit sized too small Operation outside recommended limits	Check
Compressor noisy	Liquid returning to compressor Inadequate fastening	Check
Noise and vibrations	Contact between metal bodies	Check
	Weak foundations	Repair
	Loose screws	Tighten screws
Protection devices trip and shut down the compressor	Excessive discharge pressure Low suction pressure Low voltage Electrical connections not sufficiently tight Operation outside permitted limits	Check
	Faulty operation of pressure switches	Replace the component
	Replace the component	Circuit breaker tripped Check supply voltage Check electrical insulation of windings

FAULT	CAUSE	SOLUTION
High discharge pressure (greater than 32 bars)*	High outside water temperature High utility water inlet temperature	Check
	Insufficient water flow-rate in outside heat exchanger	Check pump operation
	Faulty operation of outside heat exchanger control (pressure regulating valves)	Check
	Air in water circuit	Vent
	Excessive refrigerant charge	Check
Low discharge pressure (less than 16 bars)*	Low utility water inlet temperature	Check
	Moisture in the refrigerant circuit (flow indicator - moisture yellow)	Empty and refill
	Faulty operation of outside heat exchanger control (pressure regulating valves)	Check
	Air in water circuit	Vent
	Insufficient gas charge	Check
High suction pressure (greater than 20 bars)*	High utility water inlet temperature Thermostatic expansion valve faulty or excessively open	Check
Low suction pressure (less than 4 bars)*	Low utility water inlet temperature Low outside water inlet temperature Thermostatic expansion valve faulty or blocked Blocked water filter Blocked plate heat exchanger	Check

*Values indicative only

For information on technical assistance and obtaining spare parts, contact:

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