FOSTER
REFRIGERATOR

Service Manual

SOLO PLUS

WALL MOUNTED UNITS

2001 to 2009

ISO 14001 ISO 9001

SOLO PLUS UNITS 2003

Introduction

It is important to note that all work should be carried out by a competent person.
Solo plus is a range of self contained refrigeration units for small and large coldrooms.
The systems are pre-charged with refrigerant and pre-wired ready for installation into a coldroom with only electrical connections to be made.
Under certain conditions a drain pipe may be required to drain any excess defrost water to an external source

Basic Description of Operation
Hot gas defrost with crankcase protection
Capillary control
Hot gas vaporisation plus 2 additional electric back up heaters with variable voltage depending on water contact.

Routine Maintenance
In order to keep the unit operating reliably and energy efficient periodical cleaning of the condenser is necessary. (The frequency being determined by site conditions)
This operation is to be carried out with the unit turned OFF. We advise the use of an air jet blowing from inside to the outside. If an air jet is not available then use a soft long haired brush on the outside of the condenser taking care not to damage the fins.
Warning: Condenser fins have sharp edges so care must be taken to avoid injury

Model Table

Unit Type	**Refrigerator**		**Meat**	**Freezer**
Temp	**+ 10°C**	**+1°C to +4°C**	**0°C to –2°C**	**-18°C to -21°C**
Model	SP101HW SP201HW SP301HW SP401HW SP501HW SP601HW	SP101HW SP201HW SP301HW SP401HW SP501HW SP601HW	SP101HW SP201HW SP301HW SP401HW SP501HW SP601HW	SP101LW SP201LW SP301LW

NOTE: Nomenclature **"W"** refers to Wall Model
As each model operates at different temperatures it will be necessary to set the required operating temperature.
See controller instructions on pages 7 to 9 for models with serial number ending in A, B and E and 19 for models with serial number ending in F.
See the parameter lists on page 10 for models with serial number ending in A, B and E and page 20 for models with serial number ending in F.

For Foster spare parts information and prices go to www.fosterrefigerator.co.uk.

Once you have accessed the home page select 'Spares' from the menu on the left hand side of the page.
The screen will change to the 'Welcome to Foster WebSpares' page.
Click on 'Browse Product' and from there and select the product range you require followed by the model.
From there select the part you require from the list or use the mouse pointer to highlight the part from the drawing, click the left mouse button for the part number, description and price to be displayed on the right hand side of the screen.
For service manuals click on Service Documentation and select from the list.

.Environmental Management Policy.

Product Support and Installation Contractors

Foster Refrigerator recognises that its activities, products and services can have an adverse impact upon the environment.
The organisation is committed to implementing systems and controls to manage, reduce and eliminate its adverse environmental impacts wherever possible, and has formulated an Environmental Policy outlining our core aims. A copy of the Environmental Policy is available to all contractors and suppliers upon request.

The organisation is committed to working with suppliers and contractors where their activities have the potential to impact upon the environment. To achieve the aims stated in the Environmental Policy we require that all suppliers and contractors operate in compliance with the law and are committed to best practice in environmental management.

Product Support and Installation contractors are required to:

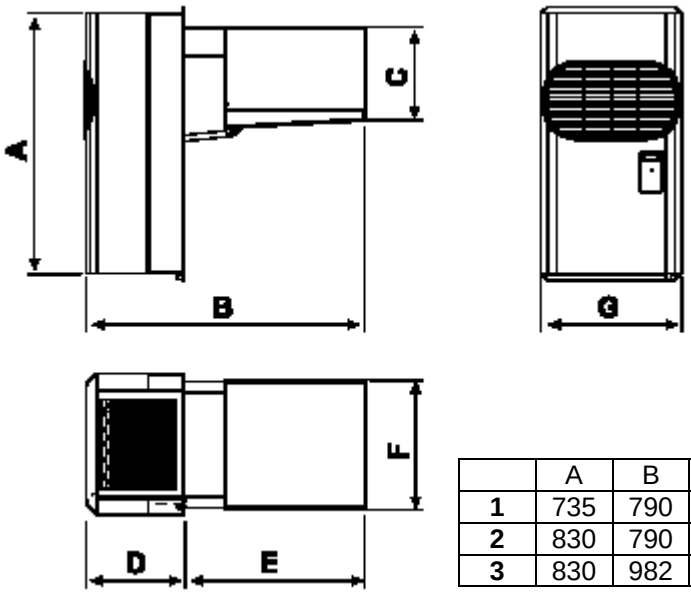
1. Ensure that wherever possible waste is removed from the client's site, where arrangements are in place all waste should be returned to Foster Refrigerator's premises. In certain circumstances waste may be disposed of on the client's site; if permission is given, if the client has arrangements in place for the type of waste.
2. If arranging for the disposal of your waste, handle, store and dispose of it in such a way as to prevent its escape into the environment, harm to human health, and to ensure the compliance with the environmental law. Guidance is available from the Environment Agency on how to comply with the waste management 'duty of care'.
3. The following waste must be stored separately from other wastes, as they are hazardous to the environment: refrigerants, polyurethane foam, oils.
4. When arranging for disposal of waste, ensure a waste transfer note or consignment note is completed as appropriate. Ensure that all waste is correctly described on the waste note and include the appropriate six-digit code from the European Waste Catalogue. Your waste contractor or Foster can provide further information if necessary.
5. Ensure that all waste is removed by a registered waste carrier, a carrier in possession of a waste management licence, or a carrier holding an appropriate exemption. Ensure the person receiving the waste at its ultimate destination is in receipt of a waste management licence or valid exemption.
6. Handle and store refrigerants in such a way as to prevent their emission to atmosphere, and ensure they are disposed of safely and in accordance with environmental law.
7. Make arrangements to ensure all staff who handle refrigerants do so at a level of competence consistent with the City Guilds 2078 Handling Refrigerants qualification or equivalent qualification.
8. Ensure all liquid substances are securely stored to prevent leaks and spill, and are **not** disposed of to storm drains, foul drain, surface water to soil.

DISPOSAL REQUIREMENTS

If not disposed of properly all refrigerators have components that can be harmful to the environment. All old refrigerators must be disposed of by appropriately registered and licensed waste contractors, and in accordance with national laws and regulations.

Wall Mount Units

Dimensions



	A	B	C	D	E	F	G
1	735	790	264	280	510	368	400
2	830	790	264	280	510	585	620
3	830	982	364	350	632	585	620

1 SP101HW – 201HW – 301HW – 101LW **2** SP401HW – 501HW – 201LW **3** SP601HW – 301LW

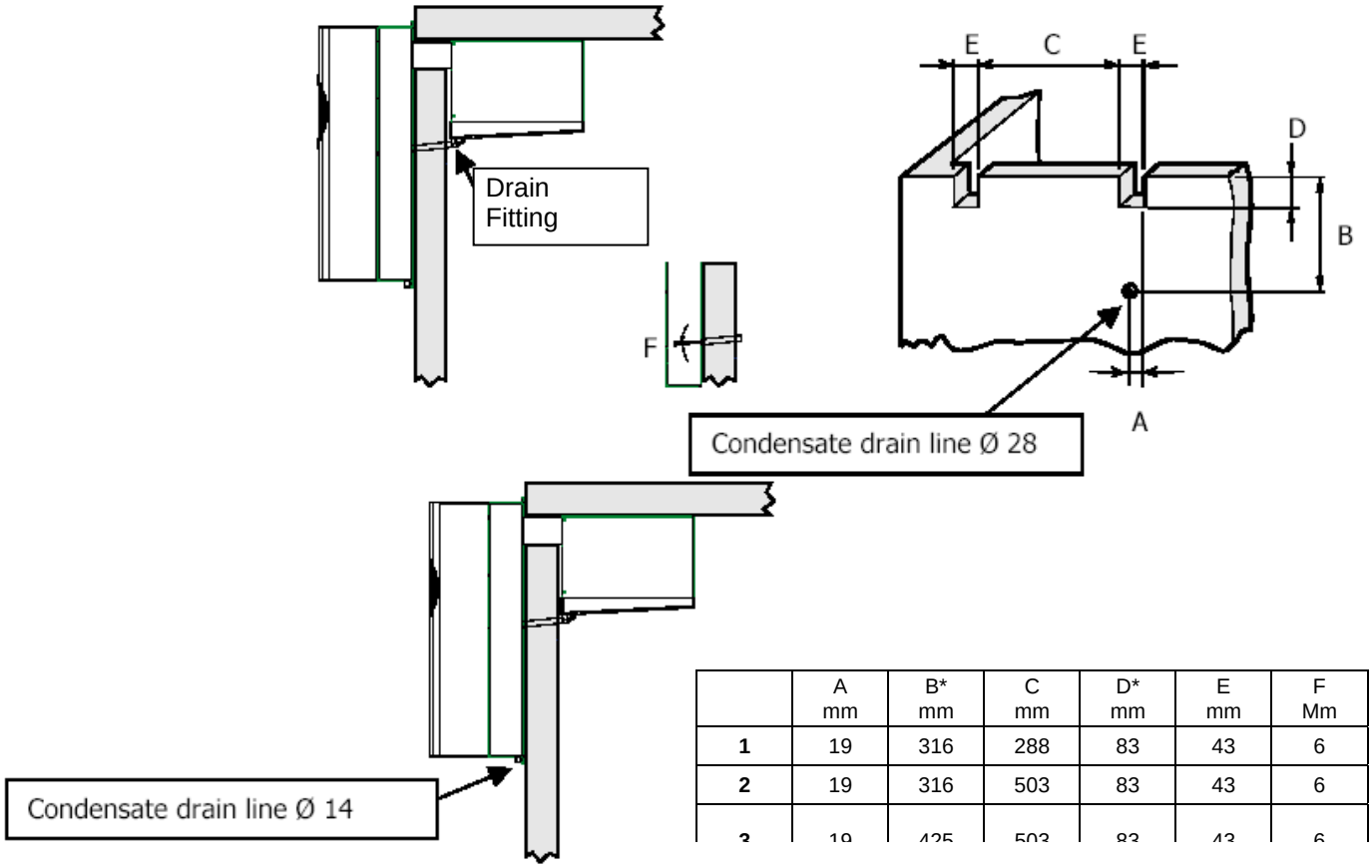
Location.

To obtain the optimum operation of the unit the following is recommended:

A) Place the unit in a room away from any heat source.
B) Limit the number of door openings
C) Make sure the unit has adequate ventilation
D) Fit a drain pipe to the Condensate drain line **Ø** 14 from the vaporisation vessel at the bottom of the unit where required

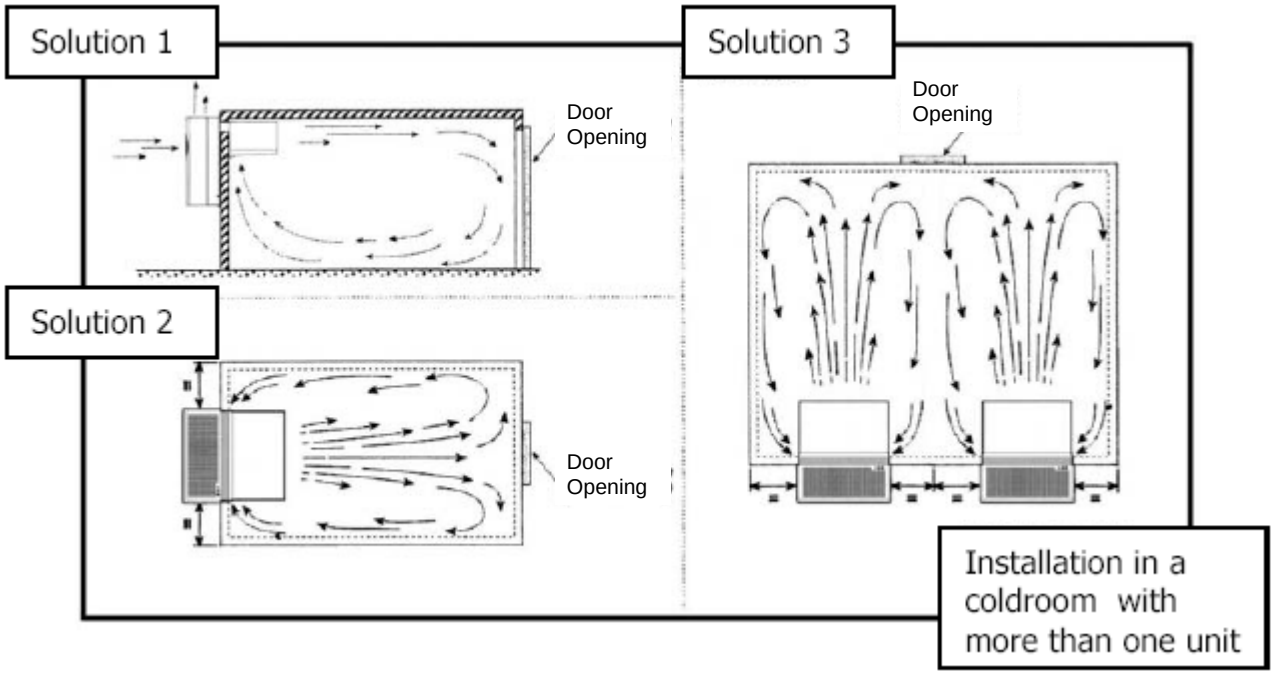
Note: The units are fitted with two additional self regulating heaters in the vaporisation tray but under extreme circumstances it may be necessary to fit the drain pipe avoiding water spillage over the floor.

Installation.



	A mm	B* mm	C mm	D* mm	E mm	F Mm
1	19	316	288	83	43	6
2	19	316	503	83	43	6
3	19	425	503	83	43	6

1 SP101HW – 201HW – 301HW – 101LW **2** SP401HW – 501HW – 201LW **3** SP601HW – 301LW
***NOTE:** Dimension for 75mm insulation increase by 24mm if 100mm insulation is used.
On low temperature models a drain line heater is inserted into the drain fitting.



Wall Mount Solo Units Power Absorption Table

Model	Electrical Supply	Compressor		Unit Absorption			
		Supplier	Model	Max	Start	Run	
				Amp	Amp	Amp	KW
SP 101HW	230-1-50	Aspera	E9213GK/CSR	5.9	17	4.9	0.9
SP 101HWLA	230-1-50	Aspera	E9213GK/CSR	5.9	17	4.9	0.9
SP201 HW	230-1-50	Le Unite	CAJ9480Z/F/CSR	9.1	26	5.5	1
SP201 HWLA	230-1-50	Le Unite	CAJ9480Z/F/CSR	9.1	26	5.5	1
SP301HW	230-1-50	Le Unite	CAJ9513Z/F/CSR	12.6	34	6.9	1.2
SP301HWLA	230-1-50	Le Unite	CAJ9513Z/F/CSR	12.6	34	6.9	1.2
SP301HWLARP	230-1-50	Le Unite	CAJ9513Z/F/CSR	12.6	34	6.9	1.2
SP401HW	230-1-50	Le Unite	CAJ9513Z/F/CSR	13.8	36	8.1	1.4
SP401HWLN	230-1-50	Le Unite	CAJ9513Z/F/CSR	13.8	36	8.1	1.4
SP401HWLA	230-1-50	Le Unite	CAJ9513Z/F/CSR	13.8	36	8.1	1.4
SP501HW	400-3-50	Le Unite	TAJ4519Z/T	7.9	28	6.6	2.1
SP501HWLA	400-3-50	Le Unite	TAJ4519Z/T	7.9	28	6.6	2.1
SP501HWLARL	400-3-50	Le Unite	TAJ4519Z/T	7.9	28	6.6	2.1
SP601HW	400-3-50	Maneurop	MTZ28JE4	9.9	27	6.2	2.5
SP601HWNG	400-3-50	Maneurop	MTZ28JE4	9.9	27	6.2	2.5
SP601HWLA	400-3-50	Maneurop	MTZ28JE4	9.9	27	6.2	2.5
SP101LW	230-1-50	Le Unite	CAJ2446Z/F/CSR	8.5	30	5.3	1
SP101LW	230-1-50	Le Unite	CAJ2464Z/F/CSR	12.2	42	6.4	1.1
SP101LWLA	230-1-50	Le Unite	CAJ2464Z/F/CSR	12.2	42	6.4	1.1
SP200LW	230-1-50	Le Unite	CAJ2464Z/F/CSR	13	44	7.2	1.3
SP201LW	400-3-50	Le Unite	TFH2480Z/T	7	28	5.4	1.7
SP201LWLA	400-3-50	Le Unite	TFH2480Z/T	7	28	5.4	1.7
SP201LWPS	400-3-50	Le Unite	TFH2480Z/T	7	28	5.4	1.7
SP201LWspe	230-1-50	Le Unite	FH2480Z/F/CSR	22.3	73	8.8	1.5
SP301LW	400-3-50	Le Unite	TFH2511Z/T	7.5	32	5.4	2
SP301LWLA	400-3-50	Le Unite	TFH2511Z/T	7.5	32	5.4	2
SP301LWLARP	400-3-50	Le Unite	TFH2511Z/T	7.5	32	5.4	2
SP301LWPS	400-3-50	Le Unite	TFH2511Z/T	7.5	32	5.4	2

Wall MOUNT SOLO PLUS TECHNICAL DATA

STORAGE TEMP +10°C

Foster Model No	Ref Gas	Qty Grms	Capillary size No x Dia X Len
SP 101HW	R404A	0.67	1 x 1.5x 2500
SP 201HW	R404A	0.67	1 x 1.5 x 2500
SP 301HW	R404A	0.64	1 x 1.8 x 2000
SP 401HW	R404A	1.10	1 x 2.0 x 2900
SP 501HW	R404A	0.88	2 x 1.8 x 2500
SP 601HW	R404A	1.11	2 x 2.0 x 2000

STORAGE TEMP +1/4°C

Foster Model No	Ref Gas	Qty Grms	Capillary size No x Dia X Len
SP 101HW	R404A	0.67	1 x 1.5x 2500
SP 201HW	R404A	0.67	1 x 1.5 x 2500
SP 301HW	R404A	0.64	1 x 1.8 x 2000
SP 401HW	R404A	1.10	1 x 2.0 x 2900
SP 501HW	R404A	0.88	2 x 1.8 x 2500
SP 601HW	R404A	1.11	2 x 2.0 x 2000

STORAGE TEMP 0/-2°C

Foster Model No	Ref Gas	Qty Grms	Capillary size No x Dia X Len
SP 101HW	R404A	0.67	1 x 1.5x 2500
SP 201HW	R404A	0.67	1 x 1.5 x 2500
SP 301HW	R404A	0.64	1 x 1.8 x 2000
SP 401HW	R404A	1.10	1 x 2.0 x 2900
SP 501HW	R404A	0.88	2 x 1.8 x 2500
SP 601HW	R404A	1.11	2 x 2.0 x 2000

STORAGE TEMP –18/-21°C

Foster Model No	Ref Gas	Qty Grms	Capillary size No x Dia X Len
SP 101LW	R404A	0.53	1 x 1.5 x 2500
SP 201LW	R404A	0.84	1 x 1.8 x 2500
SP 301LW	R404A	1.13	2 x 1.6 x 2800

STORAGE TEMP +10°C

Foster Model No	Nom HP	HP Cut Out Press. Bar	HP Cut In Press. Bar	Suction Valve Press. Bar	Noise Level dBa	Heat Rejected Max Watts @ 32°C	Room Vent. m³/ h #	32°C Ambient		43°C Ambient		Air	Air Vol	Volts	Electrical Phase	Hz	Nominal		**Defrost** Type	Condensate Vaporisation	Net. Wt. Kg	Gross Wt. Kg
								Watts	Room Cap	Watts	Room Cap	Throw mts	m³/ h				Amps	Watts				
SP 101HW	0.75	28	23	-------	58	1900	700	1300	11	1160	8	4	600	230	1	50	3.9	600	Hot Gas	Auto	53	74
SP 201HW	0.5	28	23	-------	60	2050	700	1450	13	1200	11	4	600	230	1	50	5.5	600	Hot Gas	Auto	56	77
SP 301HW	0.75	28	23	-------	60	2700	700	1800	16	1550	14	4	600	230	1	50	5.6	900	Hot Gas	Auto	64	85
SP 401HW	0.75	28	23	-------	60	3650	1400	2550	25	2200	20	4	1200	230	1	50	7	1100	Hot Gas	Auto	80	110
SP 501HW	1	28	23	-------	62	5100	1400	3100	33	2700	27	4	1200	400	3	50	5.2	1800	Hot Gas	Auto	80	110
SP 601HW	1.5	28	23	-------	63	6900	1500	4700	58	4000	48	9.5	1800	400	3	50	5.9	2200	Hot Gas	Auto	100	135

STORAGE TEMP +1/4°C

Foster Model No	Nom HP	HP Cut Out Press. Bar	HP Cut In Press. Bar	Suction Valve Press. Bar	Noise Level dBa	Heat Rejected Max Watts @ 32°C	Room Vent. m³/ h #	32°C Ambient		43°C Ambient		Air	Air Vol	Volts	Electrical Phase	Hz	Nominal		**Defrost** Type	Condensate Vaporisation	Net. Wt. Kg	Gross Wt. Kg
								Watts	Room Cap	Watts	Room Cap	Throw mts	m³/ h				Amps	Watts				
SP 101HW	0.75	28	23	-------	58	1650	700	1050	7	900	6	4	600	230	1	50	3.9	600	Hot Gas	Auto	53	74
SP 201HW	0.5	28	23	-------	60	1756	700	1150	9	1050	7	4	600	230	1	50	5.5	600	Hot Gas	Auto	56	77
SP 301HW	0.75	28	23	-------	60	2356	700	1450	13	1300	10	4	600	230	1	50	5.6	900	Hot Gas	Auto	64	85
SP 401HW	0.75	28	23	-------	60	3000	1400	1900	20	1600	14	4	1200	230	1	50	7	1100	Hot Gas	Auto	80	110
SP 501HW	1	28	23	-------	62	4500	1400	2700	30	2350	24	4	1200	400	3	50	5.2	1800	Hot Gas	Auto	80	110
SP 601HW	1.5	28	23	-------	63	6300	1500	4100	50	3300	35	9.5	1800	400	3	50	5.9	2200	Hot Gas	Auto	100	135

STORAGE TEMP 0/-2°C

Foster Model No	Nom HP	HP Cut Out Press. Bar	HP Cut In Press. Bar	Suction Valve Press. Bar	Noise Level dBa	Heat Rejected Max Watts @ 32°C	Room Vent. m³/ h #	32°C Ambient		43°C Ambient		Air	Air Vol	Volts	Electrical Phase	Hz	Nominal		**Defrost** Type	Condensate Vaporisation	Net. Wt. Kg	Gross Wt. Kg
								Watts	Room Cap	Watts	Room Cap	Throw mts	Air Vol				Amps	Watts				
SP 101HW	0.375	28	23	-------	58	1450	700	850	6	750	5	4	600	230	1	50	3.9	600	Hot Gas	Auto	53	74
SP 201HW	0.5	28	23	-------	60	1550	700	950	7	850	6	4	600	230	1	50	5.5	600	Hot Gas	Auto	56	77
SP 301HW	0.75	28	23	-------	60	2100	700	1300	11	1200	9	4	600	230	1	50	5.6	900	Hot Gas	Auto	64	85
SP 401HW	0.75	28	23	-------	60	2800	1400	1700	15	1400	11	4	1200	230	1	50	7	1100	Hot Gas	Auto	80	110
SP 501HW	1	28	23	-------	62	4100	1400	2300	21	2000	17	4	1200	400	3	50	5.2	1800	Hot Gas	Auto	80	110
SP 601HW	1.5	28	23	-------	63	5550	1500	3350	36	2800	26	9.5	1800	400	3	50	5.9	2200	Hot Gas	Auto	100	135

STORAGE TEMP –18/-21°C

Foster Model No	Nom HP	HP Cut Out Press. Bar	HP Cut In Press. Bar	Suction Valve Press. Bar	Noise Level dBa	Heat Rejected Max Watts @ 32°C	Room Vent. m³/ h #	32°C Ambient		43°C Ambient		Air	Air Vol	Volts	Electrical Phase	Hz	Nominal		**Defrost** Type	Condensate Vaporisation	Net. Wt. Kg	Gross Wt. Kg
								Watts	Room Cap	Watts	Room Cap	Throw mts	Air Vol				Amps	Watts				
SP 101LW	1.25	28	23	2.5	62	1950	700	1050	7	850	5	4	600	230	1	50	5.2	900	Hot Gas	Auto	64	85
SP 201LW	1.5	28	23	2.5	63	3200	1400	1700	14	1400	10	4	1200	400	3	50	4.3	1500	Hot Gas	Auto	80	110
SP 301LW	2.2	28	23	2.5	63	4440	1500	2700	28	2250	20	9.5	1800	400	3	50	4.5	1700	Hot Gas	Auto	105	140

NOTE: Noise levels taken in a room with a concrete floor, no sound attenuation and ceiling height of 7 metres with the unit base 1.5 metres from floor level, installed in a coldroom and the Sound Metre at 3 metres distance.

NOTE: The condenser fan pressure thermostat fitted on Low Ambient units should be set at 17bar with a 1.5bar differential; this applies to high and low temperature models.

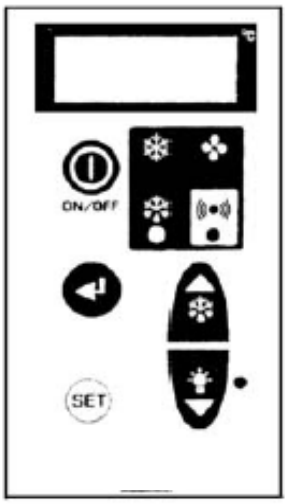
ACCESS TO THE UNIT COMPARTMENT AND EVAPORATOR HOUSING

Wall Model

Front Panel:	Grasp each side of the front panel and “pull forward” releasing it from the spring clips located down each edge, it may be necessary to separate the front panel from the main body using a flat blade screwdriver and gently ease away.
Condenser Fan Assembly	After removing the front panel “pull upwards” the condenser fan housing assembly to release it from the 4 “spring clips” located in each corner. It may be necessary to separate the fan housing assembly from the main body using a flat blade screwdriver and gently easing upwards.
Evaporator fan assembly	Remove the screw securing the drain tube to the drip tray and remove the drain tube Remove the four screws securing the drain pan and remove. Remove the three remaining screws securing the side panel and remove it allowing access into the evaporator fan assembly.

Controller Operation

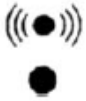
Description of electronic panel



1. Control LED (Green):
LIT: Compressor running, Unit is refrigerating
FLASHING: Compressor is in start delay mode (waiting for signal to start)
OFF: Compressor is OFF. Room is down to temperature.

2. Control LED (Green):
ON: evaporator fan is running.
Flashing: evaporator fan is in start mode.
OFF: evaporator is off. Defrost in operation

3. Control LED (Yellow):
LIT: Unit in defrost mode (auto or manual)
Flashing: Manual defrost mode in operation.



4. Alarm LED (Red):
LIT: Alarm is active – see separate ALARMS section.
OFF: Unit is functioning normally

5. Display: When connected to the mains the display will read OFF indicating the condition of the unit. By pressing the ON/OFF key for 5 seconds the unit will turn ON and display the room temperature. During programming mode the various parameters will be displayed and during alarm mode an alarm code will be displayed.

6. SET/ESC key: Pressed for 3 seconds, the led is lit and setting of required room temperature is enabled. During programming it is used to pass from a sub menu to an upper one.

7. DOWN/ ROOM LIGHT Key: During programming mode or setting of room temperature it serves to reduce the displayed value. At other times it serves to control the room light

8. DEFROST/ UP Key: By pressing for more than 4 seconds it activates a manual defrost. During programming mode or setting of room temperature it serves to increase the displayed value

9. ON/OFF Key: To turn the unit ON or OFF press and hold for more than 3 seconds.

10. ENTER Key: Permits access to the programming menu and passage to the sub menu. Access to this programming mode should be by qualified persons only.

Note:

Prior to switching on the unit the following checks should be made.
Connect the mains supply.
All electrical connections are terminated correctly.
All fixing screws are fully tightened.
Having made the pre start checks switch on the unit:
The display will illuminate and OFF appears on the display.
It is important to note that the condenser fan will run continuously when there is power to the unit and the display is illuminated.

Room temperature settings.

Set the required room temperature.

Turn the unit **ON** using the **ON/OFF** 

key.

Programming room temperature.

To set the required room temperature press the **SET** 

key for more than 3 seconds.
The Green LED will light and the previous set temperature will be displayed.

To increase the set value press the **UP**  key until the desired temperature is achieved.

To lower the set value press the **DOWN**  key until the desired temperature is achieved.

On completion press the **SET** 

key or wait 5 seconds for the changes to be saved.

Controller Parameters Access Instruction for Models with Serial Number Ending in A, B, C, D and E

Turn the unit **ON** using the **ON/OFF** 

key.

Hold the **ENTER**  key for at least 3 seconds (the green LED above SET (6) will illuminate) entry is permitted to the **thr** level menu.

Use the **UP**  key **PL1** will be displayed.
On reaching **PL1** in the menu press the **ENTER**  key **PRC** will be displayed.

Press the **UP**  key **rE1** will be displayed.

Listed are the codes and the menu they relate to in the parameter list

rE1 menu =	**coP** =	Compressor
rE2 menu =	**deF** =	Defrost
rE3 menu =	**Fan** =	Fans
rE4 menu =	**Luc** =	Light
rE5 menu =	**ALP** =	Temperature Alarms
rE6 menu =	**PP** =	Pressure Alarms
rE7 menu =	**ALP** =	Condensing Alarm

Use the **up**  or the **down**  key to scroll through the parameter labels.

When you have made the selection press the **ENTER**  key to access the parameters.

Press the **ENTER**  key to get to the next level.

Press the **ENTER**  key to display the value and use the **UP** key or the **DOWN** key to  change the value.

Press the **ENTER**  key to store the changes.

Use the **UP** or the **DOWN** key to scroll through the parameter  labels.  

Press the **ENTER**  key to regain access to the code menu.

Press the **ENTER**  key to confirm the changed value.

When all of the changes have been completed press the **SET**  key 3 times to save the changes and return to the menu.

Parameter Description for models with serial numbers ending A, B, C, D and E.

dro: Allows for the temperature to be displayed in either Celsius or Fahrenheit. 0 = °C. 1 = °F.
CA1: Calibration of Probe 1. Allows the value read by the probe to be adjusted up or down to suit site conditions. Range –12°C to +12°C.

Compressor rE1 menu. coP

diF: differential**.** Allowable temperature rise between cut in and out of compressor. Range –12°C to +12°C.
HSE: Maximum set point. The maximum value that the set point can be adjusted in the operator functions. Range from Lower set point to plus 150
LSE: Minimum set point. The minimum value that the set point can be adjusted in the operator functions. Range from Maximum set point to minus 50.
dbi: Timed delay between 2 compressor start ups. (0 = no delay). Range in minutes 0 to 15.
dOF: Timed delay between compressor Off and next start (0 = no delay). Range in minutes 0to 15.
Ont: Compressor run time in the event of room sensor failure. Range 0 to 250 minutes.
CFt: Compressor Off time in the event of room sensor failure. Range 0 to 250 minutes.

Defrost rE2 menu. dEF

dit: Timed interval between two subsequent defrost. Range 0 to 37 hours.
dEt: Timed defrost termination. Maximum timed duration of defrost even if termination temperature has not been achieved. Range 1 to 250 minutes.
dCt: Defrost interval time count mode. Allows the setting of the defrost interval time against certain functions (i.e. compressor run time = 0). Range 0 to 3.
0 = Compressor run time.
1 = Real time, interval of defrosts determined on a real time basis (i.e. with dit set for 4, defrost would occur every 4 hours).
2 = Defrost occurs each time the compressor stops.
3 = Defrost occurs at set times using the real time clock.

dtY Defrost type selection (timed , electric, hot gas off cycle). Range 0 to 3.
0 = Timed defrost.
1 = Electric defrost.
2 = Hot gas defrost.
3 = Off cycle.

dt: Drain down time. After the defrost has been completed the compressor and evaporator fan stay off for the duration of the fan delay period. Range 0 to 250 minutes.

dSt: Defrost termination temperature. The temperature at which the defrost relay is de-energised. Range -50°C to +150°C

Fans rE3 menu. FAn

Fdt: Fan delay time. Time in minutes to delay the evaporator start after a defrost. Range 0 to 15 minutes.

FCO: Evaporator fan/s runs continuously. Allows selection of the fans to cycle with the compressor or to run continuously. Range Y for fan/s to run continuously or N for fan/s to cycle with the compressor.

dFd: fan/s stops during defrost. Allows for the option of the fan/s to run during defrost or to stop during defrost. Range N to run during defrost or Y to stop during defrost.

Fod: Fan/s OFF when door opened. Allows selection of the fan/s to run or not when the door is opened. Range on for fan/s to run during door openings, no for fan/s to stop during door openings.

Fst: Fan/s stop temperature. Allows the setting of the temperature that fan/s will be stopped at. The fan/s will remain off as long as the value read by the defrost probe (placed on the evaporator) is higher than the set temperature value.

Room Light rE4 menu. LUc
No parameters.

Temperature Alarms rE5 menu. ALP

LAL: Low temperature alarm. In the event of the air temperature dropping below the low temperature set point the alarm will sound and the alarm relay will be energised. The alarm set point is the value from the air temperature set point. Warning: the LAL parameter must be set to a negative value. Range HAL -50°C

HAL: High temperature alarm. In the event of the air temperature going higher than the high temperature set point the alarm will sound and the alarm relay will be energised. The alarm set point is the value from the air temperature set point.

AFd: alarm differential. Range -12°C to +12°C.
PAO: Alarm delay after start up. Temperature alarms are overridden, in hours, when the unit is switched on. Range 0 to 10 hours.

dAo: Alarm delay after defrost. Temperature alarms are overridden, in minutes, after defrost. Range 0 to 250 minutes.

OAO: Alarm delay after opening. Temperature alarms are overridden, in hours, after door closure. Range 0 to 10 hours.

Pressure Alarms rE6 menu. PP

PEI: Time period for pressure trips. Time interval during which the number of times the high pressure trip is activated for an alarm condition to occur and the subsequent stopping of the compressor. Range 1 to 99 minutes.

Pen: **Number of high-pressure trips.**
Number of high-pressure trips during the time as set in PEI for an alarm condition to be activated with the subsequent stopping of the compressor.
Range 0 to 15.

Condensing Temperature Alarms rE7 menu. ALP

AL: **Maximum condensing temperature alarm setpoint.**
In the event of the Condenser temperature going higher than the condenser temperature set point the alarm will sound and the alarm relay will be energised.
Range 0°C to 99°C.

Afd: **Alarm Differential.**
Allowable temperature rise between alarm activation and de-activation.
Range -12°C to +12°C

Controller Part Numbers for Models with Serial Number Ending in ‘A’ ‘B’ and ‘E’.

Front Display PCB for all models 15344010
Controller PCB Kit for all Models 16250206

Parameter List for models with serial number ending A, B, C, D and E.

				Medium	Low
Label	**Description**	**Unit of measure**	**Range**	**Hot gas defrost**	**Hot gas defrost**
dro	Display Readout °C or °F (0=°C. 1=°F)	Flag	0 or 1	0	0
CA1	Calibration of room sensor	°C	-12 to +12	0	0
Compressor rE1 menu. coP					
diF	Differential	°C/1	2	2	2
HSE	Max.imum set point	°C/1	LSE to 150	10	-15
LSE	Minimum set point	°C/1	-50 to HSE	-5	-25
dbi	Time delay between 2 compressor starts	Minutes	0 to 15	2	2
dOF	Timedelay between compressor OFF and next start	Minutes	0 to 15	2	2
Ont	Compresor ON time if room sensor fails	Minutes	0 to 250	10	10
OFt	Compressor OFF time if room sensor fails	Minutes	0 to 250	20	20
Defrost rE2 menu. dEF					
dit	Time interval between 2 defrosts	Hour	0 to 31	3	3
dEt	Defrost time override	Minutes	1 to 250	20	20
dCt	Defrost interval time count mode	Number	0 to 3	0	0
	0 = compressor run time				
	1 = unit run time				
	2 = each time compressor stops				
	3 = determined on a real time basis				
dtY	Defrost type selection	Number	0 to 3	2	2
	0 = Timed defrost				
	1 = Electric defrost				
	2 = hot gas				
	3 = Off cycle				
dt	Drain down time	Minutes	0 to 250	2	2
dSt	Defrost termination temperature	°C/1	-50 to 150	15	15
Evaporator Fans rE3 menu. FAn					
Fdt	Fan delay time	Minutes	0 to 15	3	3
FCO	Evaporator fan/s runs Continuously	Flag	n / y	y	y
dFd	Fan/s stops during defrost	Flag	n / y	y	y
Fod	Fan/s off when door opened	Flag	on/off	on	on
FSt	Fan stop temperature	°C/1	-50 to 150	50	50
Room Light rE4 menu. LUc					
No parameters					
Temperature Alarms rE5 menu. ALP					
LAL	Low temperature alarm	°C/1	-50 to HAL	-5	-5
HAL	High temperature alarm	°C/1	LAL to 150	5	5
AFd	Alarm differential	°C/1	-12 to 12	2	2
PAO	Alarm delay after start-up	Hour	0 to 10	3	6
dAo	Alarm delay after defrost	Minutes	0 to 250	60	60
OAO	Alarm delay after door opening	Hour	0 to 10	1	1
Pressure alarms rE6 menu. PP					
PEi	Time period for pressure trips	Minutes	1 to 99	60	60
Pen	Numbers of pressure trips	Number	0 to 15	10	10
Condensing temperature alarms rE7 menu. ALP					
HAL	Maximum condensing temperature alarm setpoint	°C/1	0 to 99	55	55
AFd	Alarm differential	°C/1	-12 to 12	2	2

Controller Alarms and Alarm Descriptions for models with Serial Number End Letter from "A" to "E"

When an alarm condition occurs the unit will display an alarm code, the alarm LED will illuminate and the buzzer will sound.
The alarm buzzer can be muted by pressing any of the keys but the alarm LED will continue to flash for as long as the alarm persists.

Press the **ENTER**  key for more than three seconds and **FnC** will be displayed.

Press the **DEFROST/UP**  key until **AL** is displayed and then press the **ENTER**  key.

At this point the alarm code will be displayed indicating the nature of the alarm.

CODE	DESCRIPTION
E0	High Pressure
E1	Ambient Probe
E2	End Defrost Probe
E3	Reserved
E4	Condenser Probe
E6	Software-Wrong Programming
E7	reserved
E8	Supply Monitor
E10	Reserved
Lx	Low temperature on channel "x"
Hx	high temperature on channel "x"

Probe Resistance Values

The air and defrost probes have the following temperature resistance values (K ohms)

Temperature	Kohms		Temperature	Kohms		Temperature	Kohms
+50°C	4,161		+20°C	12,090		-10°C	42,450
+40°C	5,828		+10°C	17,960		-20°C	67,740
+30°C	8,313		0°C	27,280		-30°C	111,300
						-40°C	188,400

Fuse Ratings and Wiring Diagram Numbers for Models with Serial Numbers Ending in A, B, C, D and E.

Model	Internal fuse	Wiring diagram		Model	Internal fuse	Wiring diagram
SP101HW	16 A	J1018		SP101HW LA	16 A	J1019
SP201HW	16 A	J1018		SP201HW LA	16 A	J1019
SP301HW	20 A	J1018		SP301HW LA	20 A	J1019
SP401HW	25 A	J1018		SP401HW LA	25 A	J1019
SP501HW	No fuses	J2020		SP501HW LA	No fuses	J2021
SP601HW	No fuses	J2019		SP601HW LA	No fuses	J2022
SP101LW	20 A	J1018		SP101LW LA	20 A	J1019
SP201LW	No fuses	J2019		SP201LW LA	No fuses	J2022
SP301LW	No fuses	J2019		SP301LW LA	No fuses	J2022

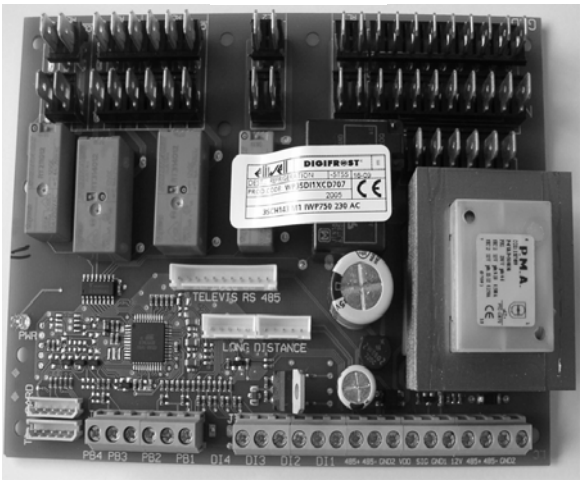
Note: LA indicates Low Ambient models.

Wiring Diagram Code Identifications

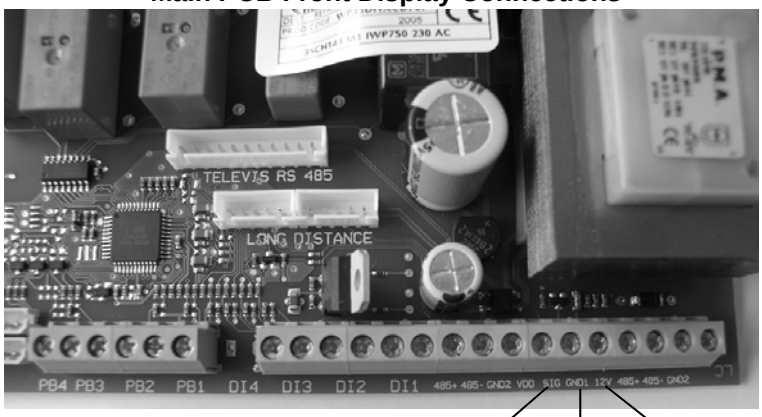
BA	Room Sensor		**FTE**	Emergency ‘Stat
BC	Condenser Alarm Sensor		**HI**	Alarm
BS	Defrost Sensor		**K1**	Contactor
BVR	Speed Regulator		**K11**	Defrost Contactor
BVRS	Speed Regulator Sensor		**M1**	Compressor Motor Nr.1
E	Defrost Heater		**MPC**	Door Microswitch (Room)
E1	Resistenza Carter Compressore		**MVC**	Condenser Fan Motor
M1	Compressor Crankcase Heater		**MVE**	Evaporator Fan Motor
EP	Door Heater Circuit		**P1MX**	Cond. Fan Starting Pressure Switch
ER1	Control Board Heater		**PMI**	L/P Switch
ER2	Voltage Regulator Heater		**PMX**	H/P Switch
ES	Condensate Drain Heater		**Q1**	Main Switch
F13	Voltage Regulator Fuse		**Q3**	Cond. Fan Speed Regulator “Off” Switch
F1	Compressor Fuse		**T**	Transformer
F1E	Electronic Control Cab		**X**	Terminal Board-Connector
F20	Auxiliary Fuse		**YG**	Refrigerant Solenoid
FL	Room Light Fuse		**YS**	Hot Gas Solenoid
FM	Voltage Regulator			

Controller Connections for Controller Kit Part Number 16250206

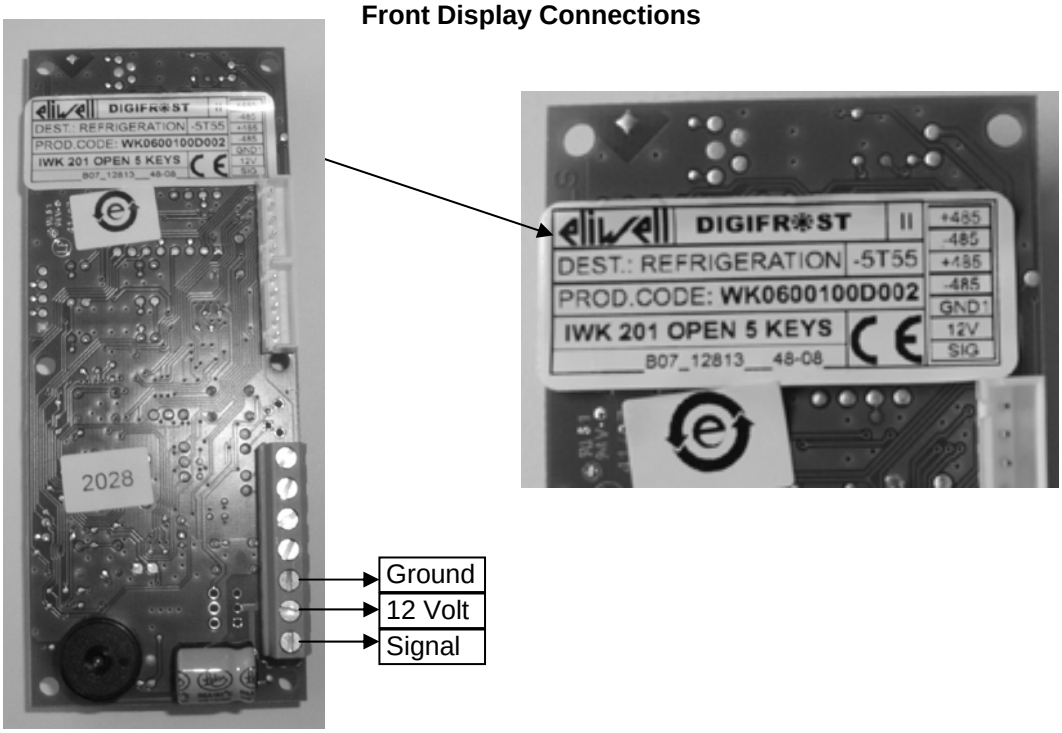
Main PCB



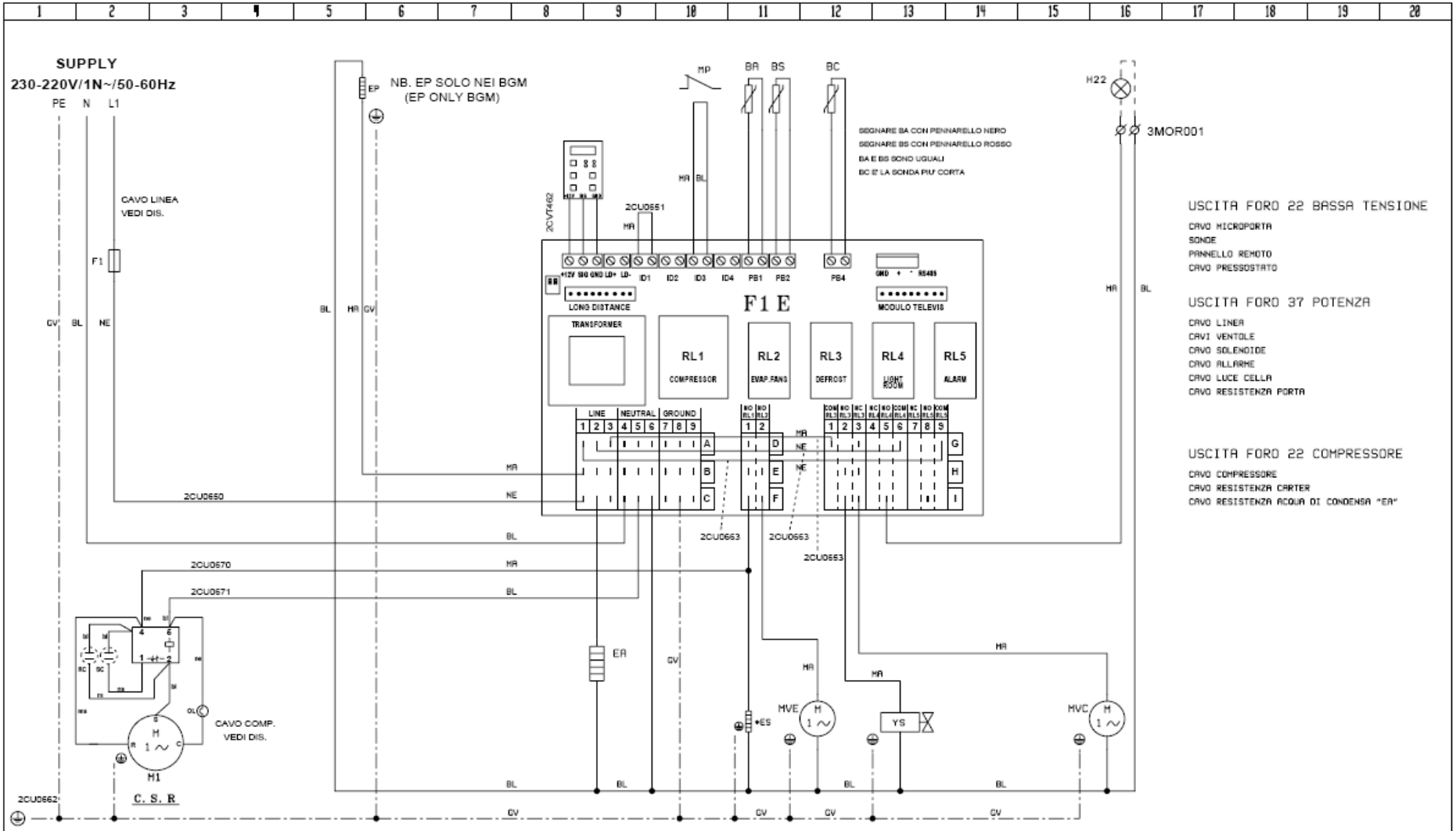
Main PCB Front Display Connections



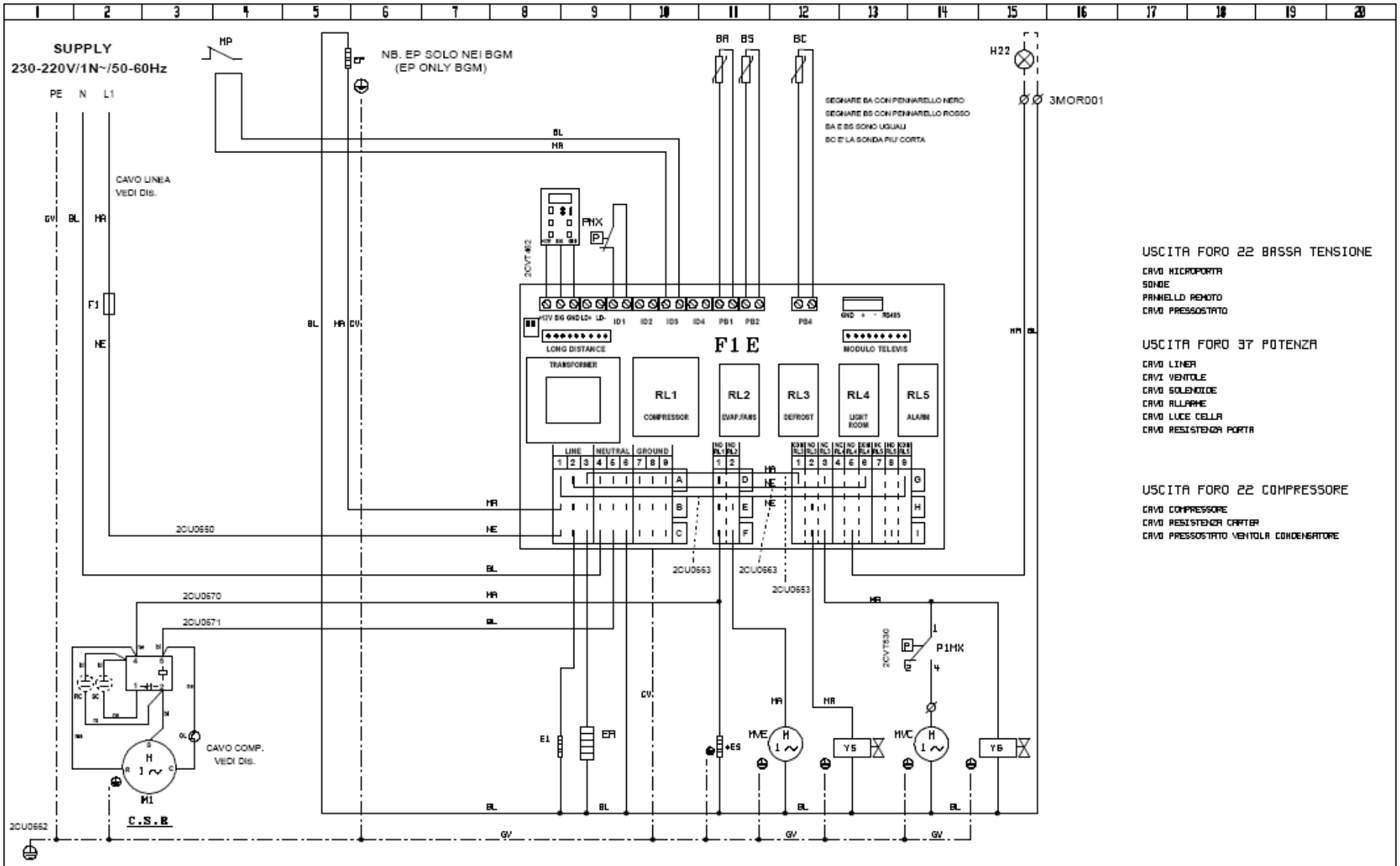
Front Display Connections



Wiring Diagrams for Models with Serial Numbers Ending in A, B or E



MODEL		REV.no		DRAWING no		SHEET no :
SP101LW-SP101LW SPE	SP401HW-SP401HW LN	02	Collegamento "ES"	J1018		1 DI 1
SP101HW	SP100LW-SP200LW	DATE:	Approved	Drawed	Approved	DATE:
SP201HW-SP201HW SPE	SP401HW 60 CYCLE	07-01-2002	Soncini	Soncini	Soncini	28-03-2001
SP301HW	SP301HW 60 CYCLE					



MODEL

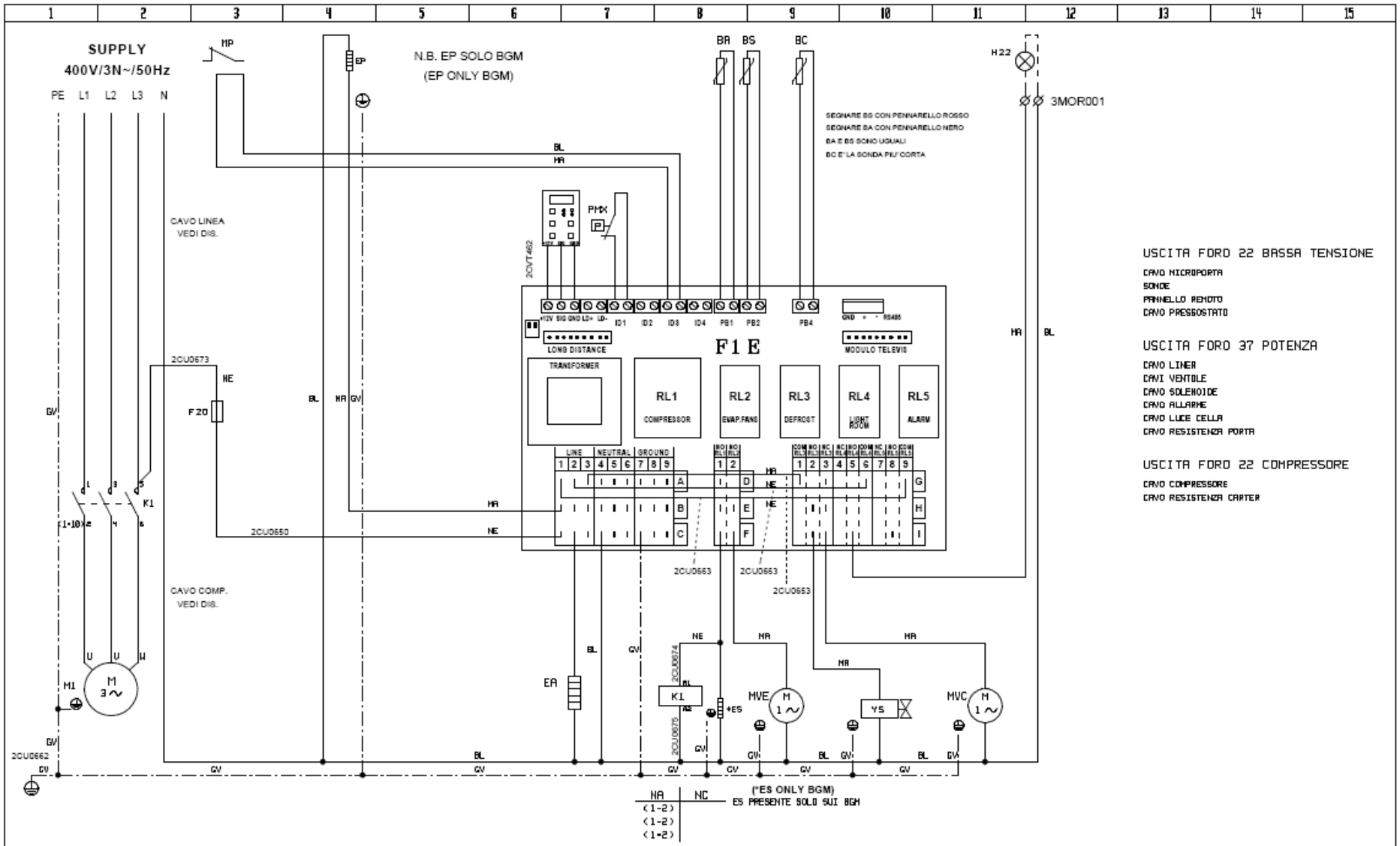
SP 101 LW LA
SP 101 HW LA
SP 201 HW LA
SP 301 HW LA

SP 401 HW LA

SP 301 HW LARP

REV./n°			
03	Aggiunto PMX		
DATE:		Approved	
29-05-2003		Soncini	

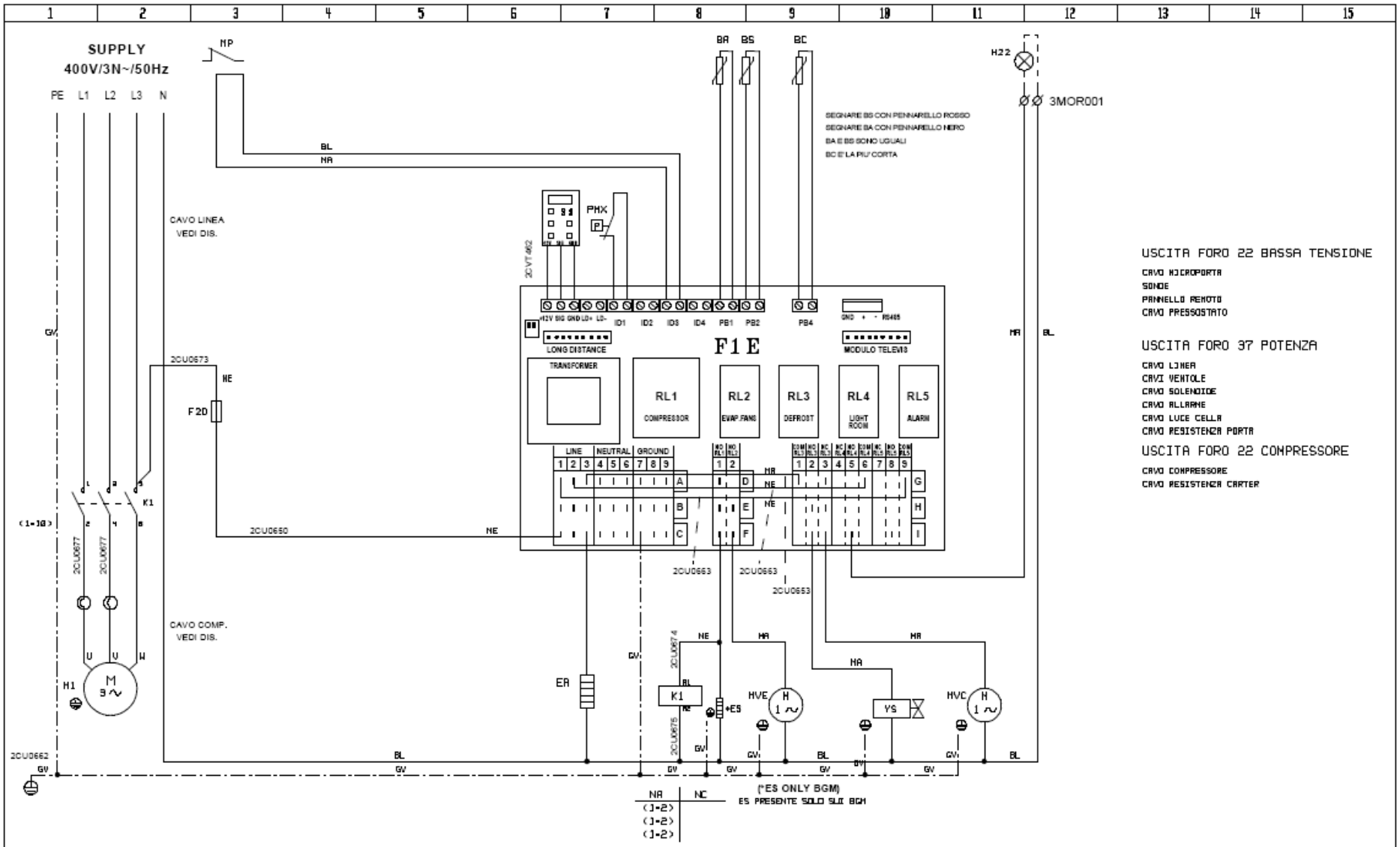
DRAWING no		SHEET no :
J1019		1 DI 1
Drawed	Approved	DATE:
Varvella	Soncini	28-03-2001



MODEL

SP 201 LW
SP 301 LW
SP 601 HW
SP 601 HW NG

REV./no		DRAWING no		SHEET no :
02	Collegamento "ES"	J2019		1 DI 1
DATE:	Approved	Drawed	Approved	DATE:
07-01-2002	Soncini	Varvella	Soncini	28-03-2001



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	DATE:	Approved	Drawed / Approved	DATE:
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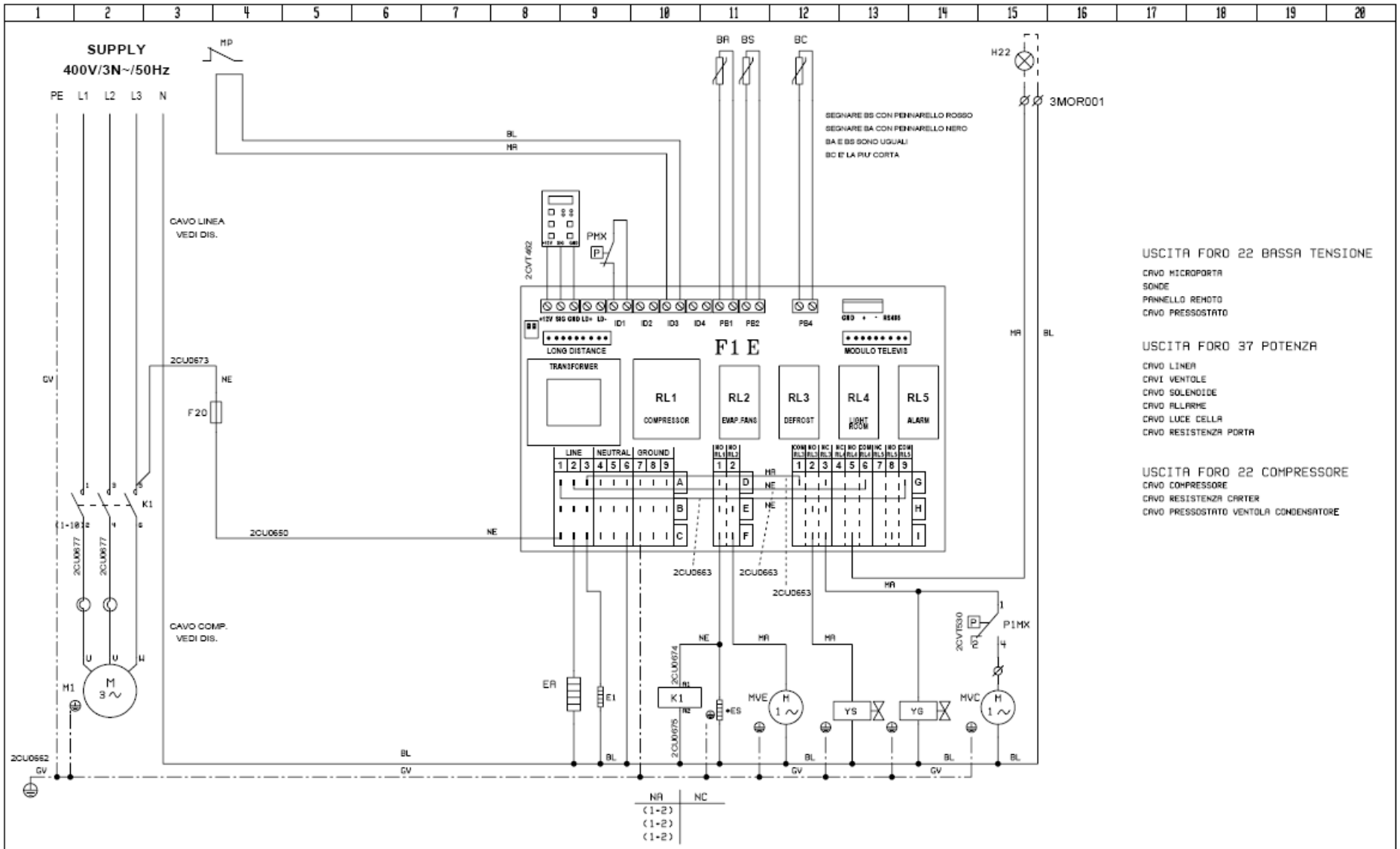
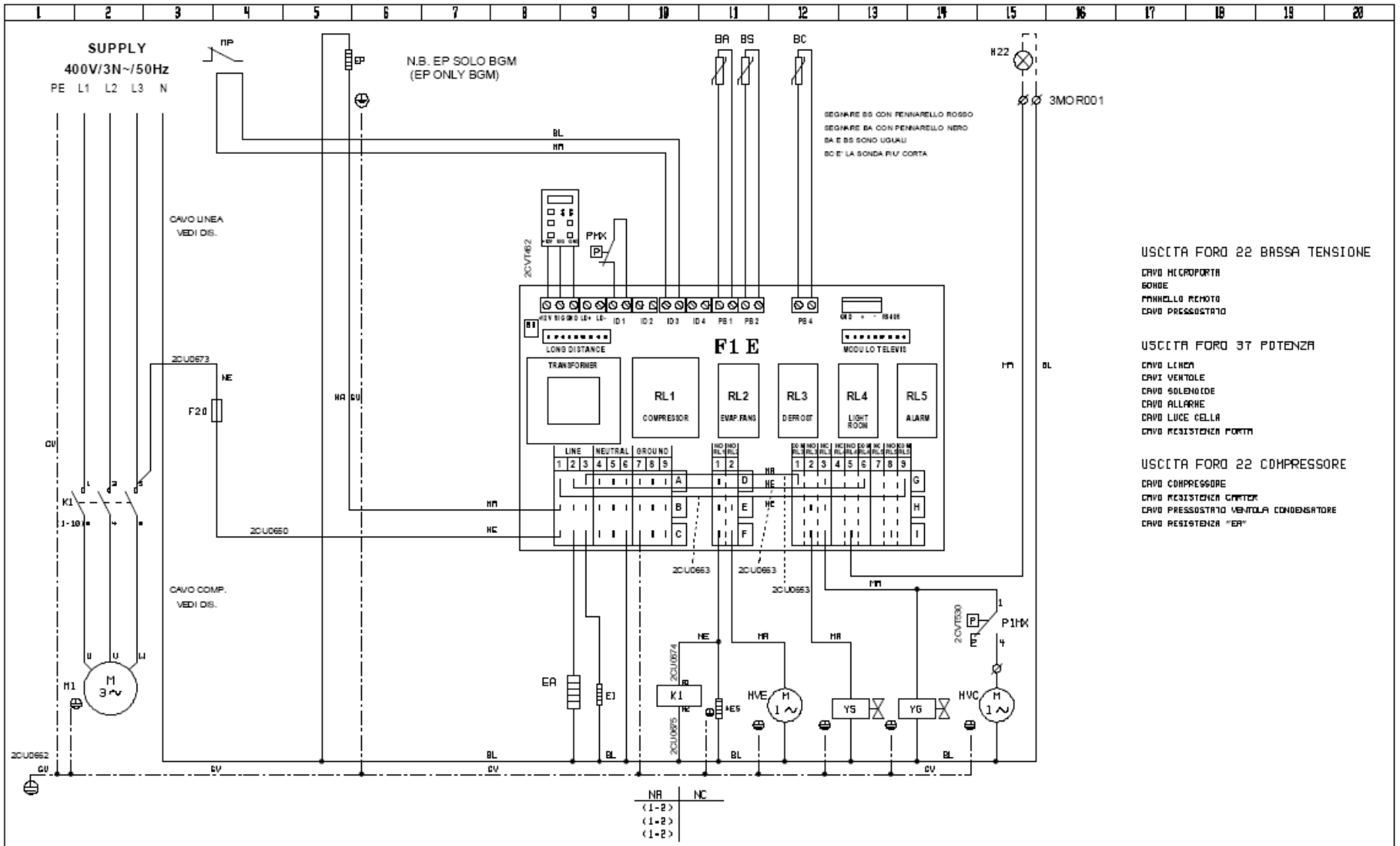


MODEL

SP501HW LA
SP501HW LARL

REV.no		DRAWING no		SHEET no :
02	Collegamento "ES"	J2021		1 DI 1
DATE:	Approved	Drawed	Approved	DATE:
07-01-2002	Soncini	Soncini	Soncini	28-03-2001



MODEL

SP201LW LA
SP301LW LA
SP301LW LARP
SP601HW LA

REVno		DRAWINGno		SHEETno:
		J2022		1 DI 1
DATE	Approved	Drawed	Approved	DATE
		Varvella	Soncini	28-03-2001

Parameter Modification Instruction for Models with Serial Number Ending in 'F', 'G' and 'H'.

Turn the unit **ON** using the ON/OFF 

key.

Press and hold the **ENTER**  key for five seconds.

CP (Compressor Parameters) will be displayed

Listed below are the codes and the menu they relate to in the parameter list

- **CP** = **Compressor Parameters**
- **dEF** = **Defrost Parameters**
- **FAn** = **Fan Parameters**
- **AL** = **Alarm Parameters**
- **PrE** = **Pressure Switch Input Parameters**
- **DiS** = **Display Parameters**
- **CnF** = **Configuration Parameters**

Press the **ENTER**  key to move to the first parameter

Use the **UP**  or **DOWN**  key to scroll through the parameter list

Select the required parameter and press the **ENTER**  key to display the value.

Use the **UP**  or **DOWN**  key to modify the value.

Press the **ENTER**  key to store the change

When the required changes have been made press the **SET** 

key to move to the next sub folder.

Continue using the same instruction and complete all of the required changes.

Once all of the changes have been completed press the **SET** 

key twice or wait for ten seconds to return to the temperature display screen.

Alarm Descriptions with Serial Number End Letter ending in 'F', 'G' and 'H'.

CODE	DESCRIPTION
E1	Ambient Probe
E2	End Defrost Probe
E3	Condenser Probe
E7	Bad Cominication To Keyboard
EA	SUPPLY MONITOR
AHx	HIGH TEMPERATURE ON CHANNEL "x"
Opd	DOOR OPEN
LPA	LOW PRESSURE PRESSOSTAT
HPA	HIGH PRESSURE PRESSOSTAT

Controller Part Numbers for Models with Serial Number Ending in 'F', 'G' and 'H'.

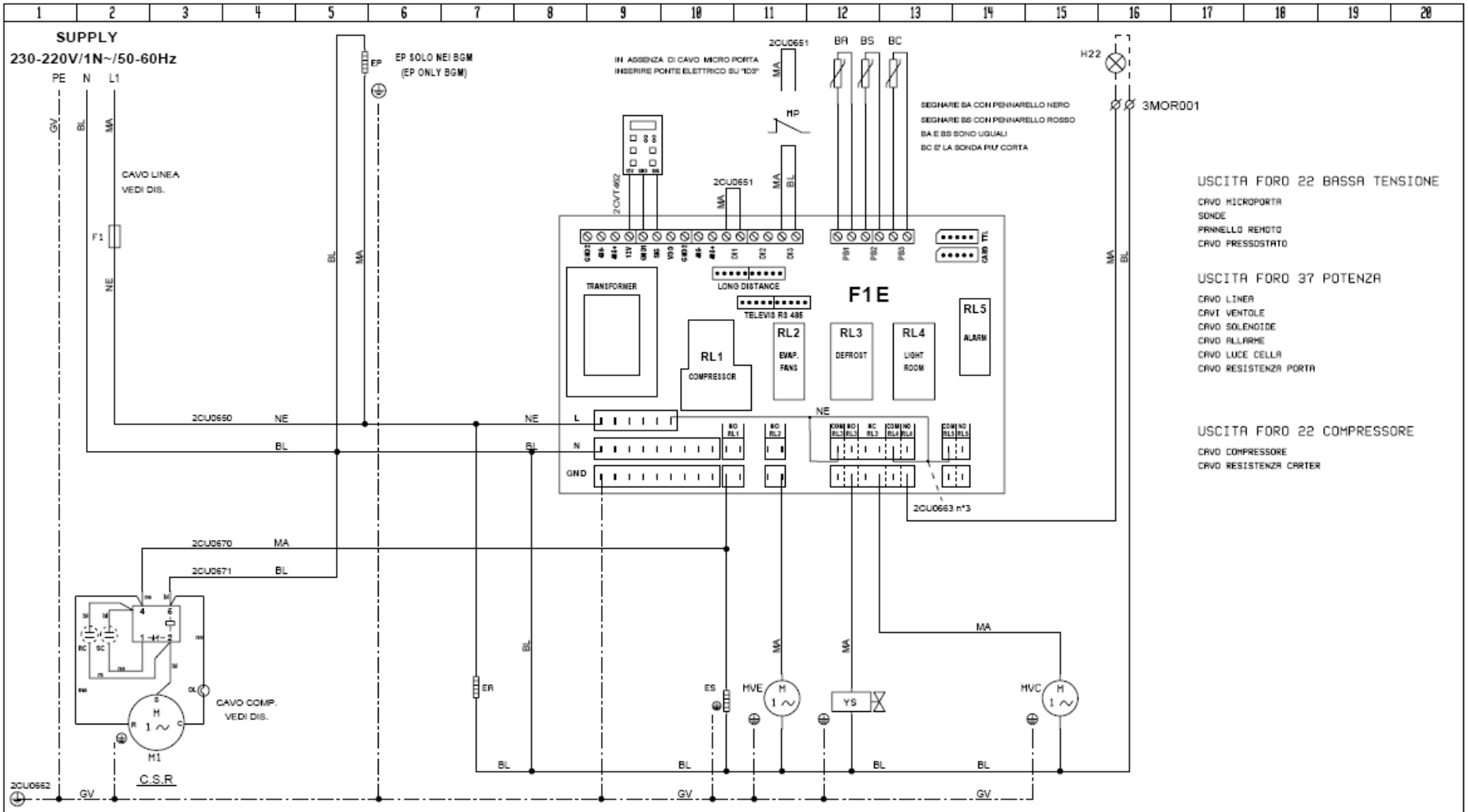
Front Display PCB for all models 15344138
Controller PCB for all Models 15344131

Label	Description	DIM	Medium Temp Settings	Low Temp Settings
CP	**Compressor Parameters**			
dIF	Differential	°C/1	2	2
HSE	Maximum allowed set point	°C/1	10	-15
LSE	Minimum allowed set point	°C/1	-5	-25
Ont	Compressor ON time if room sensor fails	min	10	10
OFt	Compressor OFF time if room sensor fails	min	20	20
dOF	Time between Compressor OFF and next start	min	2	2
dbi	Time between 2 compressor starts	min	2	2
dEF	**Defrost Parameters**			
dtY	Defrost type: 1= Hot Gas. 0 = Electric	num	1	1
Dit	Time interval between 2 defrosts	hours	3	3
dCt	Defrost interval time count mode	num	0	0
dEt	Defrost time override	min	20	20
dSt	Defrost termination temperature	°C/1	15	15
FAn	**Fan Parameters**			
FSt	Fan stop temperature	°C/1	50	50
Fdt	Fan delay time	min	3	3
dt	Drain down time	min	2	2
dFd	Fans OFF during defrost	flag	Y	Y
FCO	Fans ON when compressor OFF	flag	Y	Y
FOd	Fans OFF when door open	flag	n	n
AL	**Alarm Parameters**			
AFd	Alarm differential	°C/1	2	2
HAL	High temperature alarm set point	°C/1	5	5
LAL	Low temperature alarm set point	°C/1	-5	-5
PAO	Alarm delay after start up	hours	3	6
dAo	Alarm delay after defrost	min	60	60
OAO	Alarm delay after door opening	hours	1	1
SA3	High temperature alarm set point	°C/1	55	55
dA3	Differential	°C/1	2	2
PrE	**Pressure Alarm Parameters**			
PEn	Number of pressure trips	num	10	10
PEI	Time period for pressure trips	min	60	60
diS	**Display Parameters**			
CA1	Room sensor calibration	°C	0	0
drO	Celsius or Fahrenheit temperature: 0 =°C. 1 = °F	flag	0	0
CnF	**Configuration Parameters**			

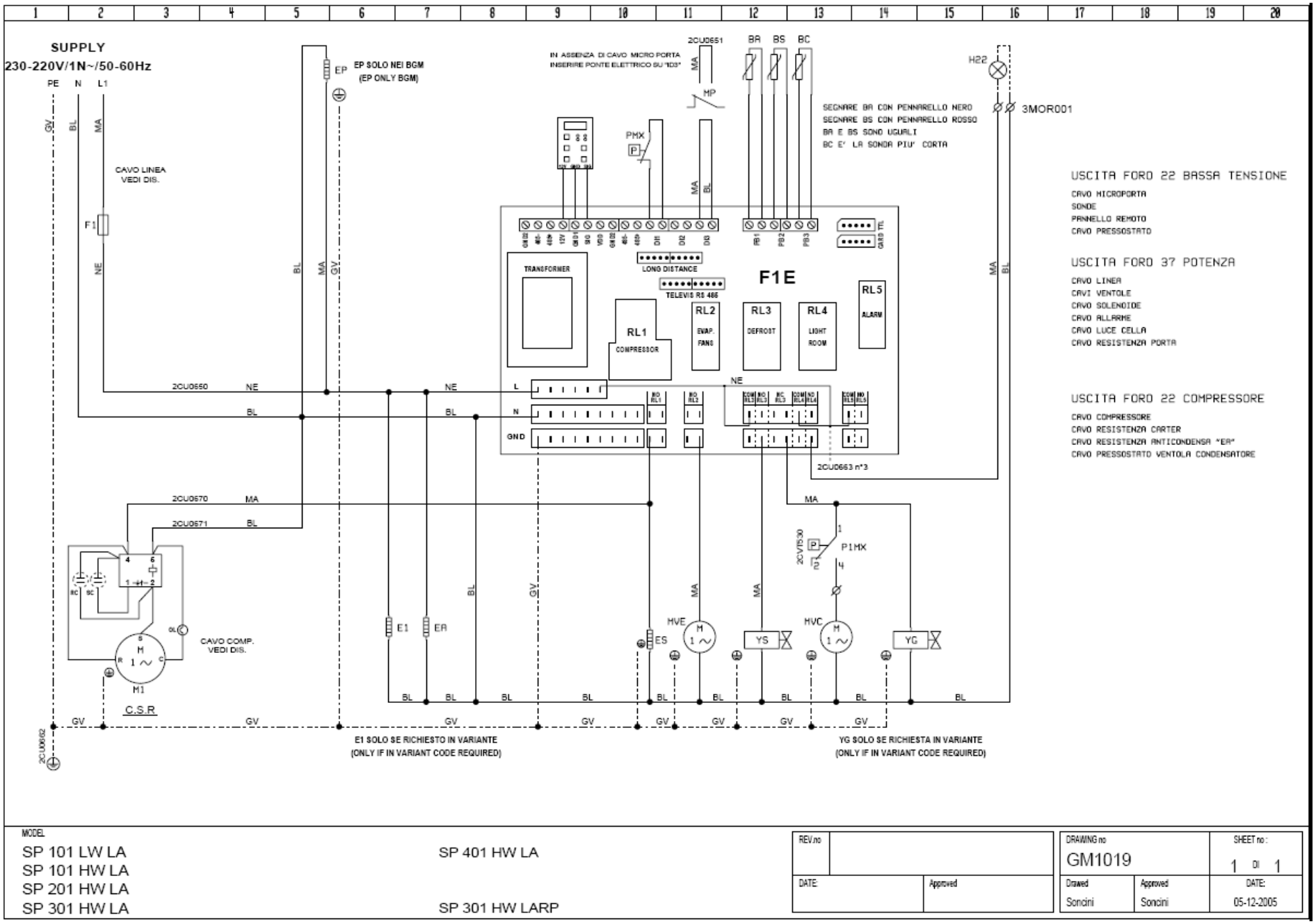
Wiring Diagram Code Identifications

BA	Room Sensor		**FTE**	Emergency ‘Stat
BC	Condenser Alarm Sensor		**HI**	Alarm
BS	Defrost Sensor		**K1**	Contactor
BVR	Speed Regulator		**K11**	Defrost Contactor
BVRS	Speed Regulator Sensor		**M1**	Compressor Motor Nr.1
E	Defrost Heater		**MPC**	Door Microswitch (Room)
E1	Resistenza Carter Compressore		**MVC**	Condenser Fan Motor
M1	Compressor Crankcase Heater		**MVE**	Evaporator Fan Motor
EP	Door Heater Circuit		**P1MX**	Cond. Fan Starting Pressure Switch
ER1	Control Board Heater		**PMI**	L/P Switch
ER2	Voltage Regulator Heater		**PMX**	H/P Switch
ES	Condensate Drain Heater		**Q1**	Main Switch
F13	Voltage Regulator Fuse		**Q3**	Cond. Fan Speed Regulator “Off” Switch
F1	Compressor Fuse		**T**	Transformer
F1E	Electronic Control Cab		**X**	Terminal Board-Connector
F20	Auxiliary Fuse		**YG**	Refrigerant Solenoid
FL	Room Light Fuse		**YS**	Hot Gas Solenoid
FM	Voltage Regulator			

Wiring Diagrams for Models with Serial Numbers Ending in ‘F’, ‘G’ and ‘H’.



MODEL		REV.no		DRAWING no	SHEET no :
SP101LW-SP101LW SPE	SP401HW-SP401HW LN			GM1018	1 DI 1
SP101HW	SP100LW	DATE:	Approved	Drawed: Soncini	Approved: Soncini
SP201HW-SP201HW SPE	SP200LW				DATE: 05-12-2005
SP301HW					



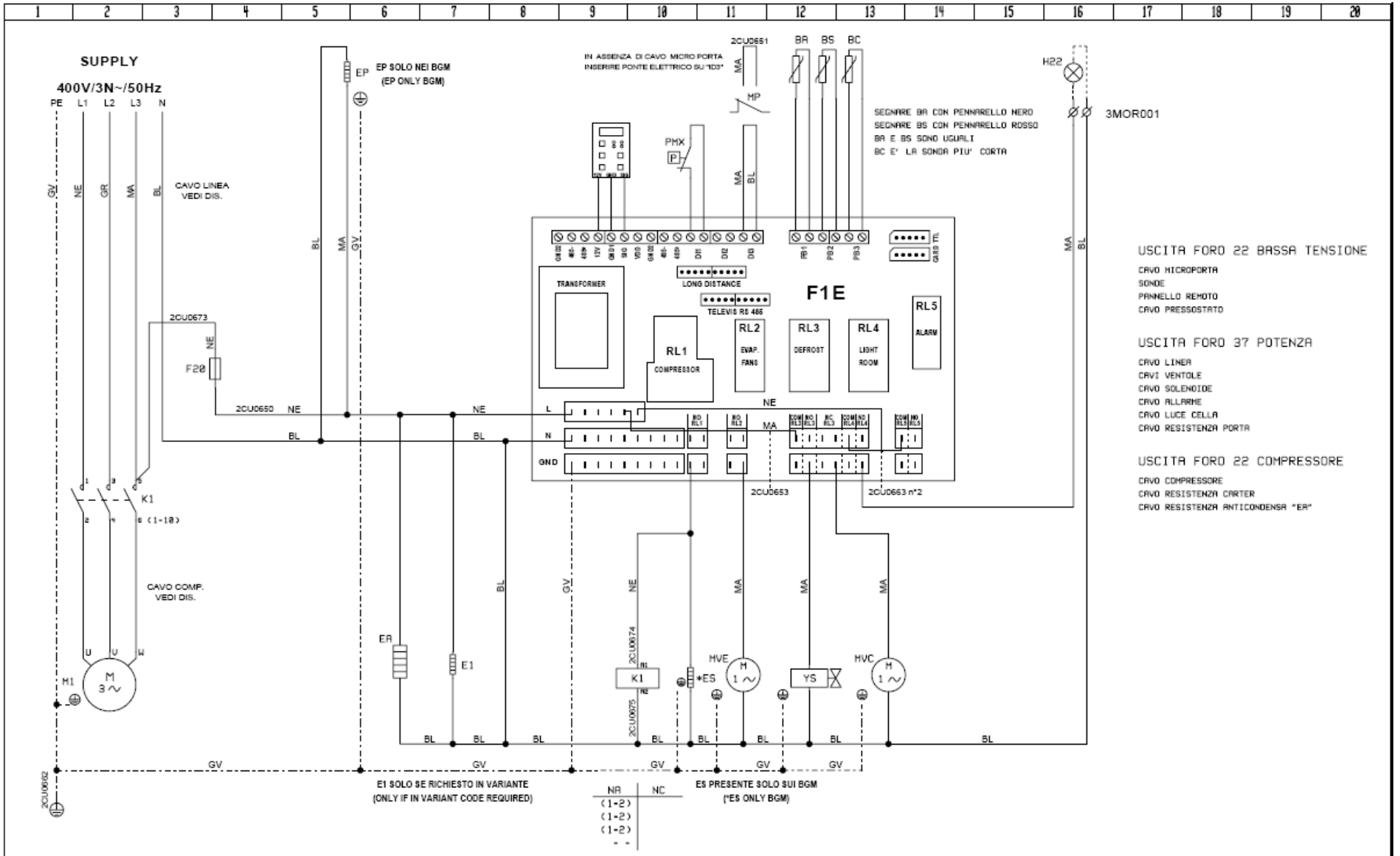
MODEL

SP 101 LW LA
SP 101 HW LA
SP 201 HW LA
SP 301 HW LA

SP 401 HW LA

SP 301 HW LARP

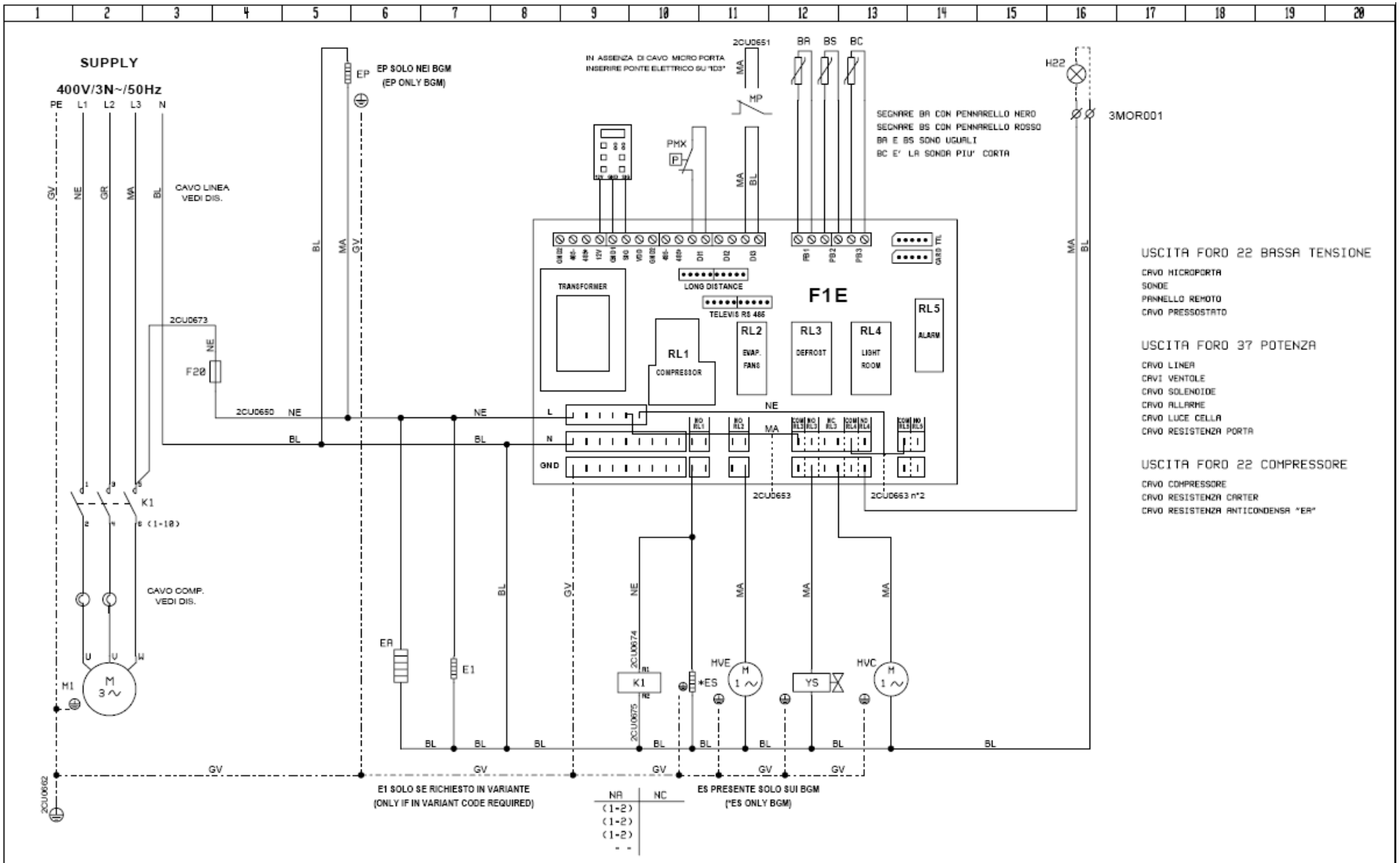
REV.no		DRAWING no		SHEET no :
		GM1019		1 DI 1
DATE	Approved	Drawed	Approved	DATE:
		Soncini	Soncini	05-12-2005



MODEL

SP 201 LW
SP 301 LW
SP 601 HW
SP 601 HW NG

REV.no		DRAWING no		SHEET no :
		GM2019		1 DI 1
DATE:	Approved	Drawed	Approved	DATE:
		Pedrazzoli	Soncini	05-12-2005



MODEL	REV.no	DRAWING no	SHEET no :
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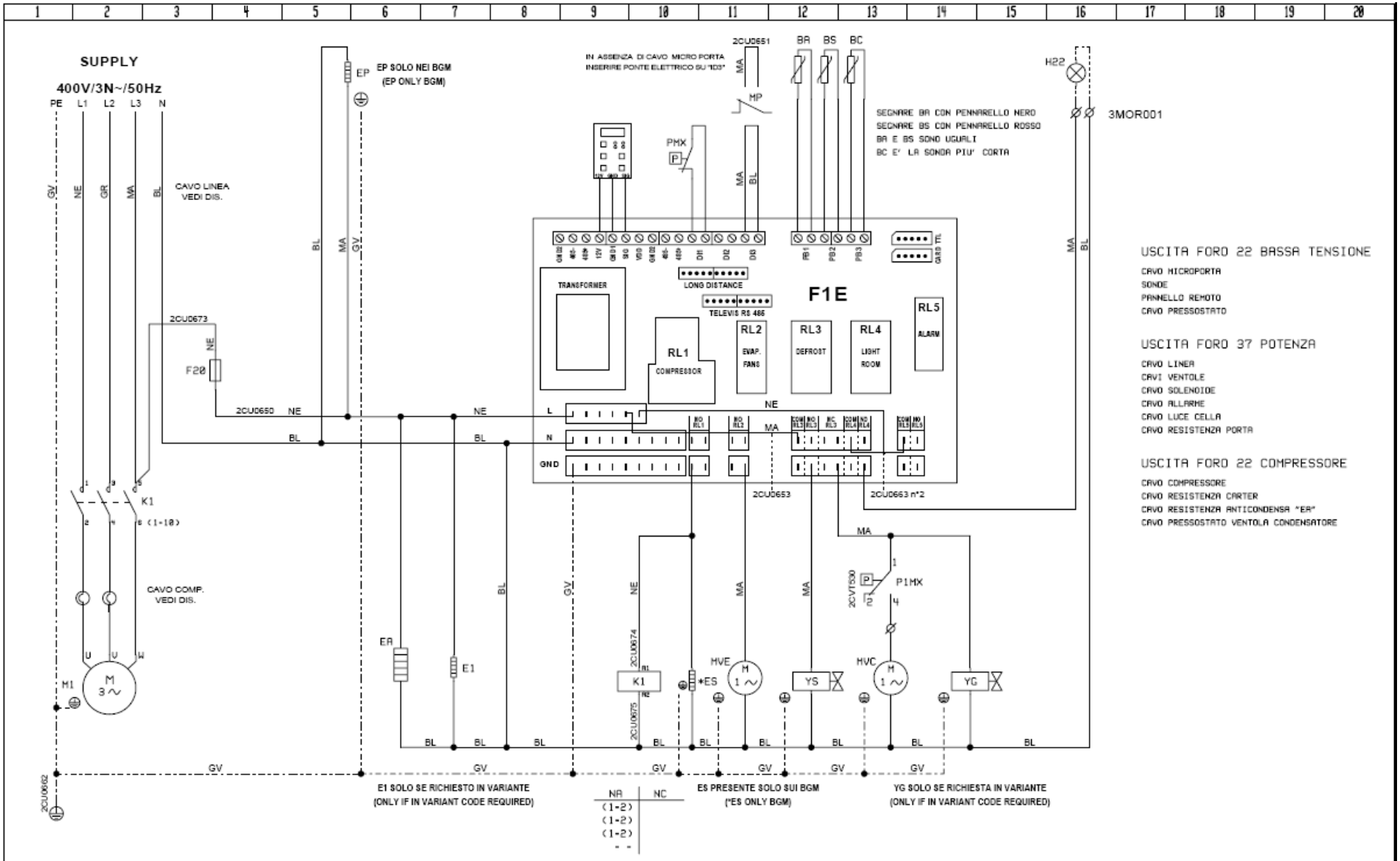
		Pedrazzoli / Soncini	05-12-2005



MODEL
SP501HW LA
SP501HW LARL

REV.no		DRAWING no		SHEET no :
		GM2021		1 DI 1
DATE	Approved	Drawed	Approved	DATE:
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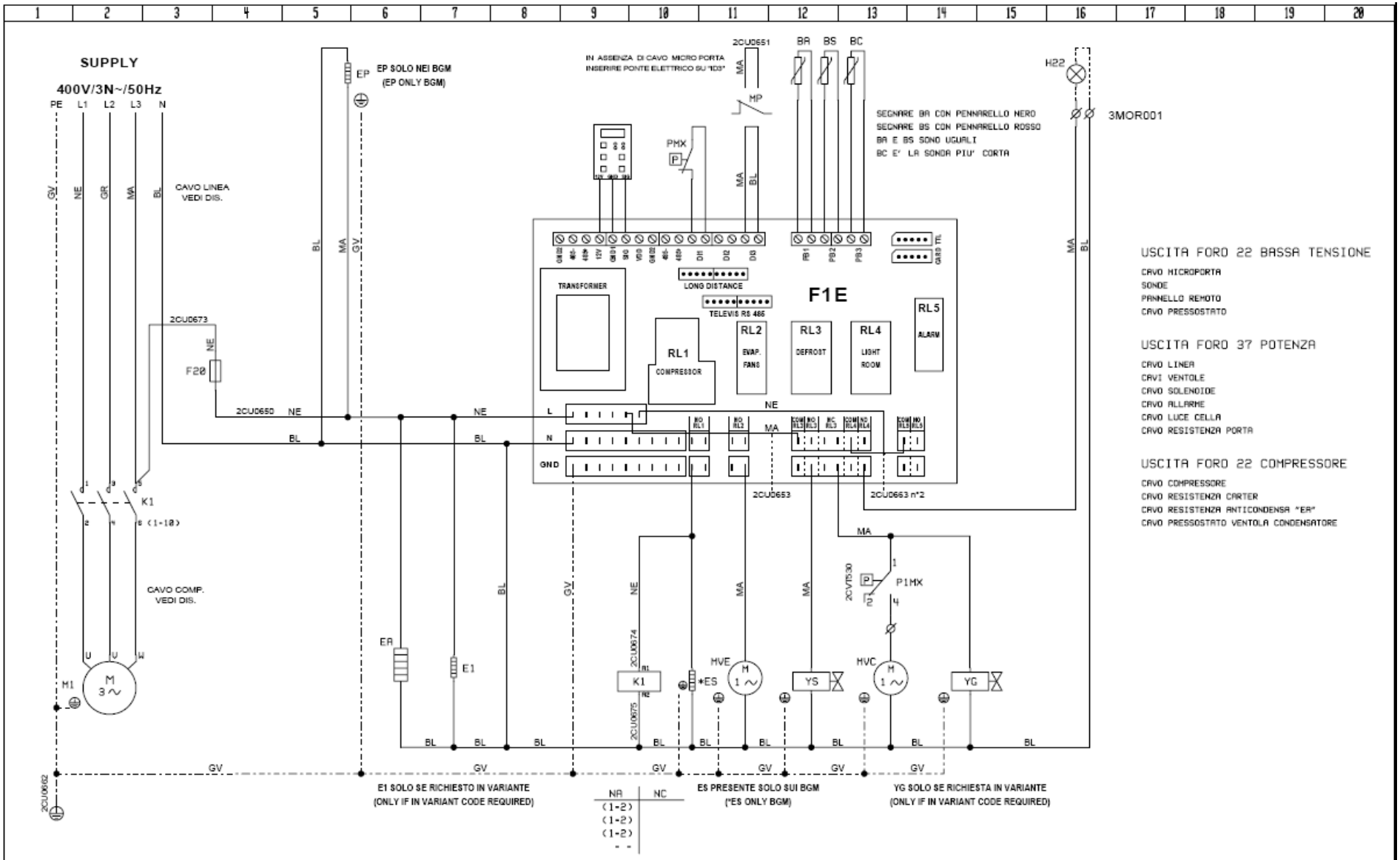

MODEL

SP 201 LW LA
SP 301 LW LA
SP 301 LW LARP
SP 601 HW LA

REV.no		DRAWING no		SHEET no :
		GM2022		1 DI 1
DATE:	Approved	Drawed	Approved	DATE:
		Pedrazzoli	Soncini	05-12-2005

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