S&P PACKAGED INVERTER IP54

EN

ENGLISH

INDEX

1. RECOMMENDATIONS

You have purchased a frequency inverter designed specifically by Soler & Palau to perform the functions described in the table of contents.

Before you install and start up this product, please read this instruction book carefully because it contains important information for your safety and the safety of users during installation, use and maintenance. Once installation is complete, please pass the instruction book on to the end user. Please check that the equipment is in perfect condition when you unpack it since any factory defect is covered under the S&P guarantee. Please also check that the equipment is the one that you have ordered and that the information on the instruction plate meets your requirements.

ATTENTION: Not every fan can be adjusted using frequency drive, therefore, make sure that the fan you want to control is compatible with the frequency drive you have purchased.

2. GENERAL

The Packaged Inverter range comprises of single-phase 230V power supply with a three-phase 230V output (3PH) Variable Frequency Inverters specifically intended to control S&P 3PH 230V/400V fans.

3. TRANSPORT AND HANDLING

- The equipment packaging has been designed to withstand normal transport conditions. The equipment must not be transported without its original packaging as it could become damaged.
- The product must be stored in its original packaging and in a dry and clean place until it is installed. Do not accept any equipment that is not supplied in its original packaging or that shows signs of having been tampered with.
- Prevent the packaging from falling or being knocked
- Do not place heavy loads on top of it.

4. SAFETY RULES

4.1. ON INSTALLATION

- Installation and commissioning must be done by a qualified professional specialist.
- Ensure that installation complies with mechanical and electrical regulations in each country.
- The unit meets the EMC requirements of EN 61000-3-3:2015 and EN 61000-3-2:2015
- Do not use this equipment in explosive or corrosive atmospheres.
- Do not place an isolator between the fan and inverter.

ATTENTION: In a domestic environment, this product may cause radiated interference, in which case additional mitigation measures may be necessary to be evaluated by the installer.

- The connection cable between the frequency converter and the fan terminal box must be shielded with a recommended maximum length of 25m.

- Fan plus Inverter Pack as supplied – MAX. CABLE LENGTH 25m
- Fan plus Inverter Pack + EMC Filter – MAX. CABLE LENGTH 50m
- Fan plus Inverter Pack + EMC Filter + Choke – CABLE LENGTH ABOVE 50m

INVERTER MODEL	MAXIMUM INPUT CURRENT	CABLE SIZES	
		INPUT CABLE	OUTPUT CABLE
DIG VFD 1PH>3PH 2.2KW 10A	32A	4.0mm^2	2.5mm^2
DIG VFD 1PH>3PH 3.7KW 16A	32A	4.0mm^2	2.5mm^2

ATTENTION: The metal mesh of the shielded cable has to be grounded in the fan terminal box. If the fan is delivered with an external terminal box and, therefore, with a hose cable between the motor and mentioned terminal box, connect the shielded cable of the converter directly to the motor terminal box. Disable external terminal box and hose cable.

4.2. AT START UP

- Before you handle this equipment, ensure it is disconnected from the mains power supply.
- Check that the mains voltage and frequency are the same as specified on the name plate.
- Follow the wiring diagram to make the electrical connections.
- Check that the earthing, if any, is correct and that the thermal and surge protection has been connected and are within the relevant limits.
- S&P recommend that you do not isolate the power to the inverter whilst it is running.
- S&P recommend that you do not isolate the fan whilst the inverter is running.

5. MECHANICAL INSTALLATION

- The Inverter is intended to be supplied ONLY with a corresponding S&P three-phase ventilation fan. Check that the size and the speed of the fan can be safely controlled by this Inverter.
- Install the Inverter in a dry sheltered position.
- Leave an air space of not less than 150mm around the controller to allow cooling air to flow freely. Leave an additional gap in front of the Inverter to allow for access during installation/wiring/maintenance. Do not install in close proximity to other heat sources. The maximum ambient temperature for the controller must not exceed 40°C. The maximum humidity for the controller must not exceed 90% R.H.
- The product should be vertically mounted only. In this orientation it is suitable for fitment onto a suitable supportive structure and secured through the 4 fixing holes provided.

6. LOCAL CONTROL PANEL

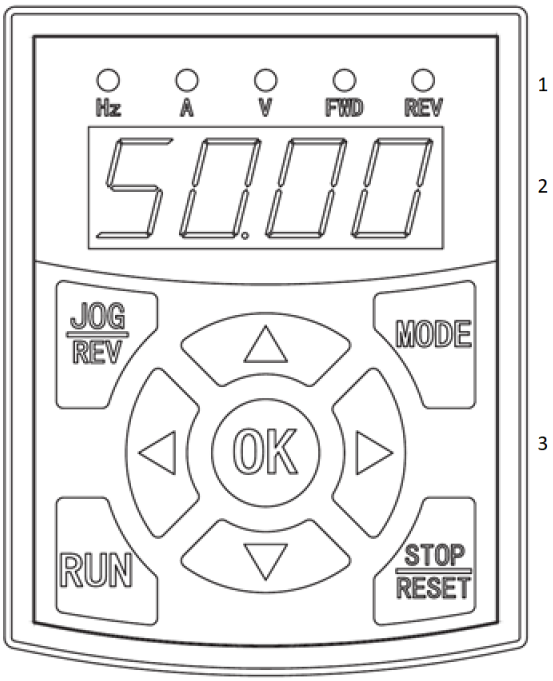
6.1. KEYPAD SECTIONS

The local control panel is split into 3 sections of operation:

1. LED indication, expressing what will be shown on the graphical display.

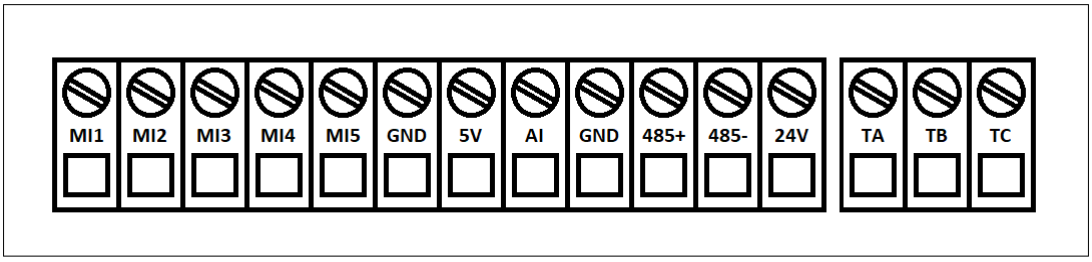
2. Graphical display, expressing the operation of the inverter.

3. Menu keys and indicator lights (LEDs) – selecting mode, changing parameters, and switching between display functions.

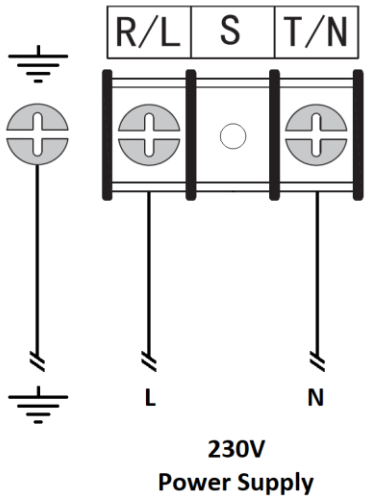


7. INVERTER CONNECTIONS

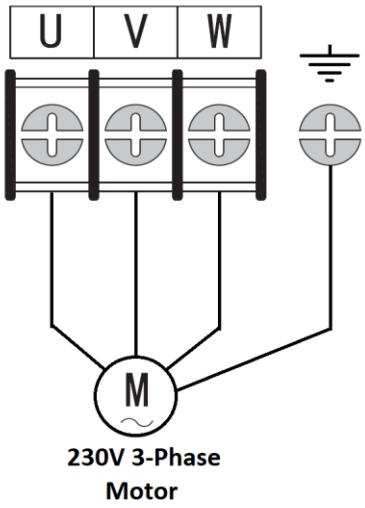
7.1. CONTROL CONNECTIONS



7.2. 230V AC POWER CONNECTIONS



230V
Power Supply



230V 3-Phase
Motor

8. MOTOR PARAMETERS

This section goes through how to set up the S&P inverter for the motor specific parameters:

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F2**'.
- Press '**OK**', and then '**F2.00**' will appear.
- Using the arrows change '**F2.00**' to '**F2.01**'.
- Press '**OK**', change the value to the motor KW rating. For example, '00.75'.
- Press '**OK**', and then '**F2.02**' will appear.
- Press '**OK**', change the value to the motor frequency. For example, '050.0'.
- Press '**OK**', and then '**F2.03**' will appear.
- Press '**OK**', change the value to the motor RPM. For example, '1470'.
- Press '**OK**', and then '**F2.04**' will appear.
- Press '**OK**', change the value to the motor voltage. For example, '400'.
- Press '**OK**', and then '**F2.05**' will appear.
- Press '**OK**', change the value to the motor current. For example, '1.8'.
- Press '**OK**', and then '**F2.06**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The motor parameters are now complete.

9. OVER-CURRENT PROTECTION (F8.20)

The over-current protection parameter varies depending on the fan and inverter being connected, this parameter must be configured by the installer to allow the inverter to safety operate and provide protection to the fan which it needs to control.

<u>Calculation</u>
To calculate the over-current protection parameter, complete the equation below:

$$\text{F8.20} = \frac{\text{Fan full load current}}{\text{Inverter current rating}} \text{ X } 110$$

Example:

Fan full load current: 4.3A
Inverter current rating: 10A

$$\text{F8.20} = \frac{4.3\text{A}}{10\text{A}} \times 110 = 47.3$$

<u>Parameters</u>
- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F8**'.
- Press '**OK**', and then '**F8.00**' will appear.
- Using the arrows change '**F8.00**' to '**F8.20**'.
- Press '**OK**', change the value from '**001.0**' to '**047.3**'.
- Press '**OK**', and then '**F8.21**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The over-current protection parameter is now complete.

10. SPEED PARAMETERS

10.1. MINIMUM AND MAXIMUM SPEED (DIGITAL INPUT)

Maximum Frequency

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.05**'.
- Press '**OK**', and then change the value to the maximum frequency required.
- Press '**OK**', and then '**F0.06**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The maximum frequency parameter is now complete.

S&P recommend that the maximum frequency indicated on the rating plate of the product is not exceeded.

Minimum Frequency

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.06**'.
- Press '**OK**', and then change the value to the minimum frequency required.
- Press '**OK**', and then '**F0.07**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The minimum frequency parameter is now complete.

S&P recommend that this is set to '20.00' as a minimum value, so that the drive will run no less than 20Hz.

10.2. MINIMUM AND MAXIMUM SPEED (0-10V) WITH SCAILING

The section goes through how to alter the minimum and maximum speeds when using a 0-10V input, whilst defining the range of operation from the given signal.

F5.11 – Lower limit voltage
F5.12 – Lower limit frequency
F5.13 – Higher limit voltage
F5.14 – Higher limit frequency

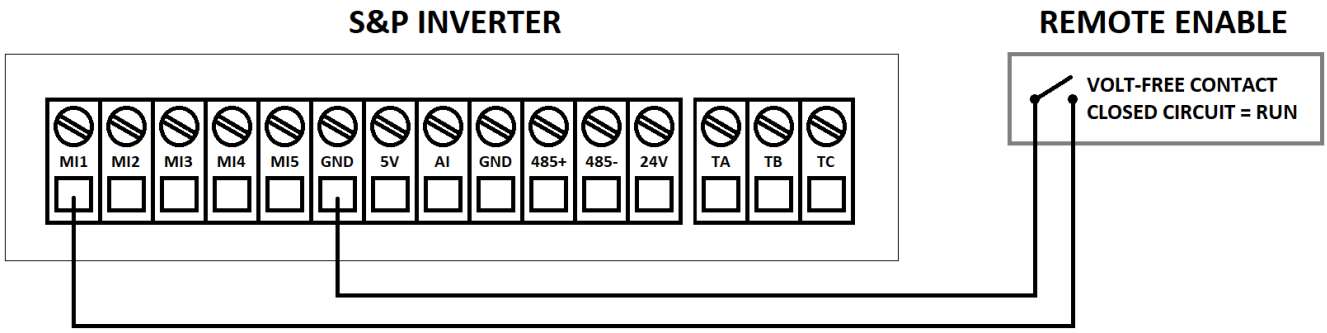
Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.03**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.04**' will appear.
- Press '**MODE'** once and '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.11**'.
- Press '**OK**', and then change the value to the lower limit voltage required.
- Press '**OK**', and then '**F5.12**' will appear.
- Press '**OK**', and then change the value to the lower limit frequency required (Value table below).
- Press '**OK**', and then '**F5.13**' will appear.
- Press '**OK**', and then change the value to the higher limit voltage required.
- Press '**OK**', and then '**F5.14**' will appear.
- Press '**OK**', and then change the value to the higher limit frequency required (Value table below).
- Press '**OK**', and then '**F5.15**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The 0-10V control parameter section is now complete.

Duty	Frequency	Display		Duty	Frequency	Display
10%	5 Hz	010.0		60%	30 Hz	060.0
20%	10 Hz	020.0		70%	35 Hz	070.0
30%	15 Hz	030.0		80%	40 Hz	080.0
40%	20 Hz	040.0		90%	45 Hz	090.0
50%	25 Hz	050.0		100%	50 Hz	100.0

11. CONTROL WIRING WITH SETUP

11.1. REMOTE ENABLE

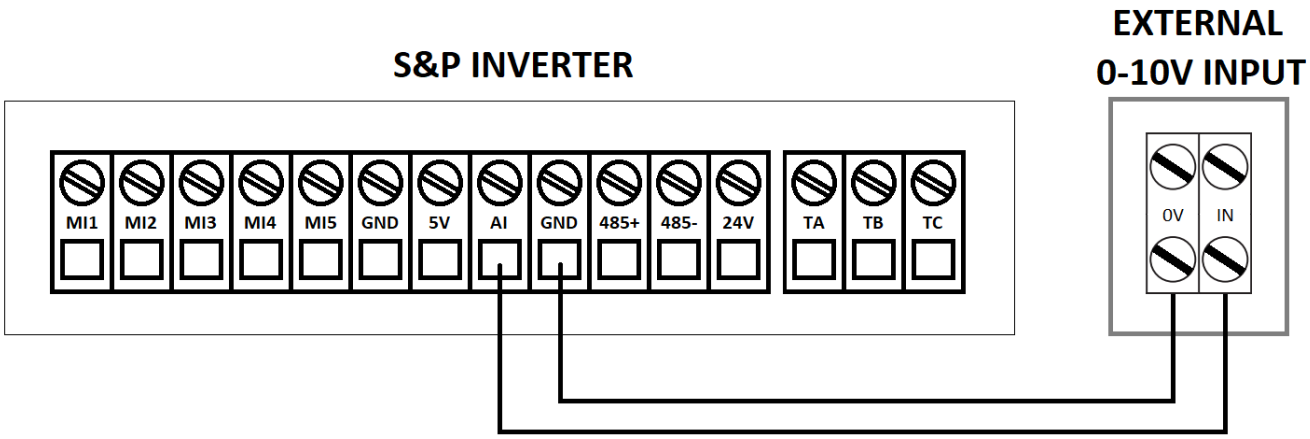


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Ensure that the remote enable switch is in the '**OFF**' position.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.01**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The remote enable parameter section is now complete.

The operating speed is defined by the arrows on the front of the inverter.

11.2. 0-10V SIGNAL WITH SCALING

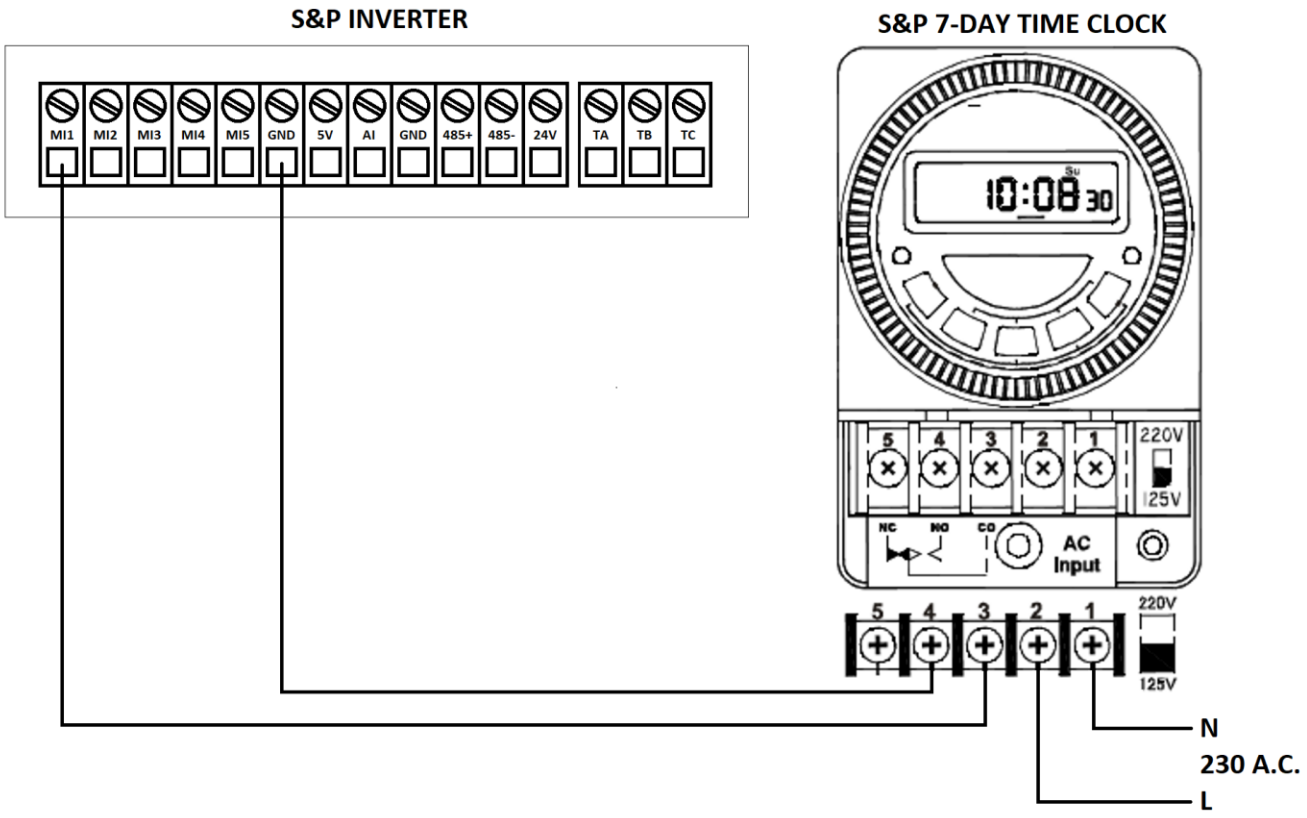


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.03**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.04**' will appear.
- Press '**MODE**' once and '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.11**'.
- Press '**OK**', and then change the value to the lower limit voltage required.
- Press '**OK**', and then '**F5.12**' will appear.
- Press '**OK**', and then change the value to the lower limit frequency required (Value table below).
- Press '**OK**', and then '**F5.13**' will appear.
- Press '**OK**', and then change the value to the higher limit voltage required.
- Press '**OK**', and then '**F5.14**' will appear.
- Press '**OK**', and then change the value to the higher limit frequency required (Value table below).
- Press '**OK**', and then '**F5.15**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The 0-10V control parameter section is now complete.

Duty	Frequency	Display		Duty	Frequency	Display
10%	5 Hz	010.0		60%	30 Hz	060.0
20%	10 Hz	020.0		70%	35 Hz	070.0
30%	15 Hz	030.0		80%	40 Hz	080.0
40%	20 Hz	040.0		90%	45 Hz	090.0
50%	25 Hz	050.0		100%	50 Hz	100.0

11.3. S&P 7-DAY TIME CLOCK (L0111000000388) (REMOTE ENABLE)

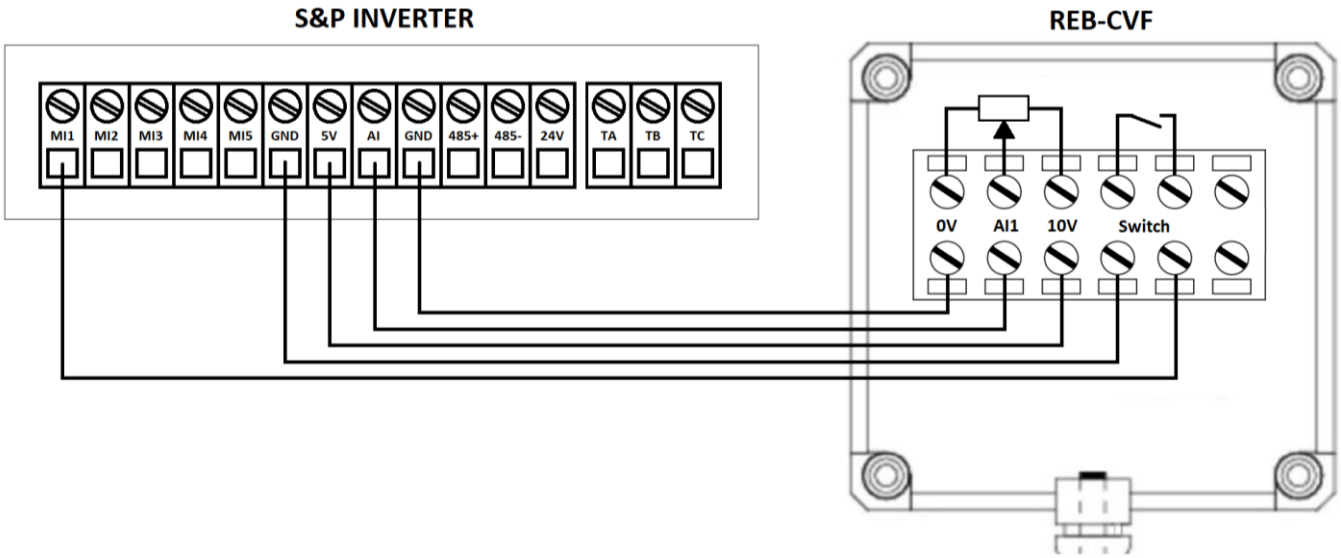


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Ensure that the timer is in the '**OFF**' position.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.01**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The remote enable parameter section is now complete.

The operating speed is defined by the arrows on the front of the inverter.

11.4. S&P REB-CVF (5401304100)

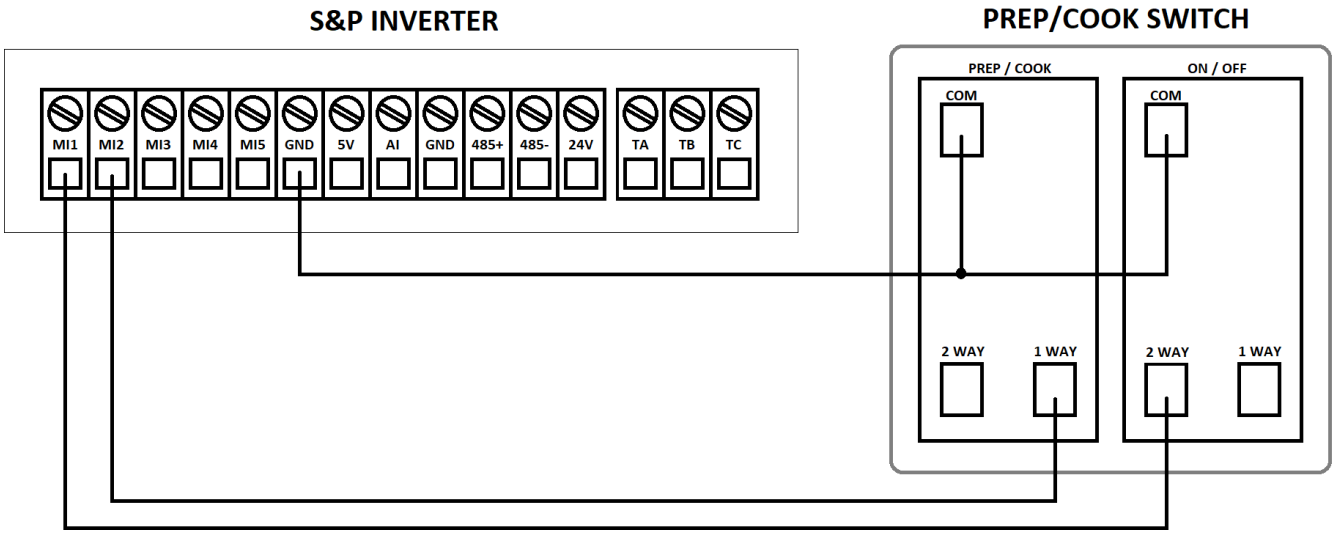


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Ensure that the timer is in the '**OFF**' position.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.01**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.02**' will appear.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**2**'.
- Press '**OK**', and then '**F0.03**' will appear.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.04**' will appear.
- Press '**MODE**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.12**'.
- Press '**OK**', and then change the value to the lower limit frequency required (Value table below).
- Press '**OK**', and then '**F5.13**' will appear.
- Using the arrows change '**F5.13**' to '**F5.14**'
- Press '**OK**', and then change the value to the higher limit frequency required (Value table below).
- Press '**OK**', and then '**F5.15**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The REB-CVF parameter section is now complete.

Duty	Frequency	Display		Duty	Frequency	Display
10%	5 Hz	010.0		60%	30 Hz	060.0
20%	10 Hz	020.0		70%	35 Hz	070.0
30%	15 Hz	030.0		80%	40 Hz	080.0
40%	20 Hz	040.0		90%	45 Hz	090.0
50%	25 Hz	050.0		100%	50 Hz	100.0

11.5. S&P PREP/COOK SWITCH (L1000000681)

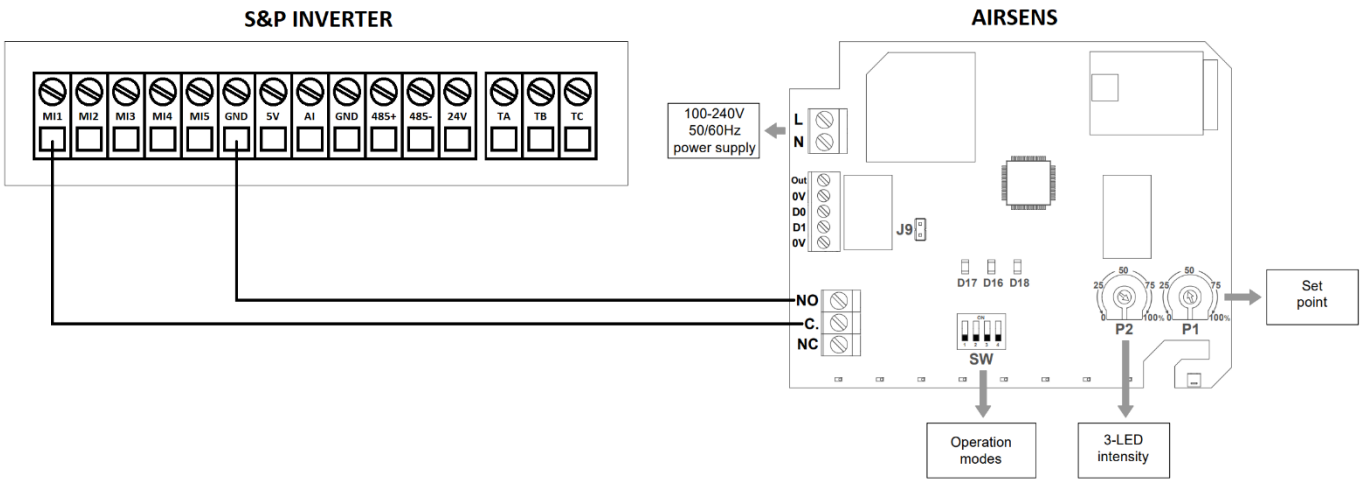


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Ensure that the prep/cook switch is in the '**OFF**' position.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.01**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.02**' will appear.
- Press '**MODE**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.01**'.
- Press '**OK**', and then '**02**' will appear.
- Using the arrows change '**02**' to '**12**'.
- Press '**OK**', and then '**F5.02**' will appear.
- Press '**MODE**', and then '**F5**' will appear.
- Using the arrows change '**F0**' to '**FA**'.
- Press '**OK**', and then '**FA.00**' will appear.
- Using the arrows change '**FA.00**' to '**FA.01**'.
- Press '**OK**', and then change the value to the required prep speed (20.00Hz - 50.00Hz).
- Press '**OK**', and then '**FA.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The prep/cook switch parameter section is now complete.

To set the cook speed, put the Prep/Cook Switch to "Cook" and then use the up and down arrows on the front of the inverter to change the value displayed to the desired boost speed.

11.6. S&P AIRSENS (REMOTE ENABLE)



Parameters

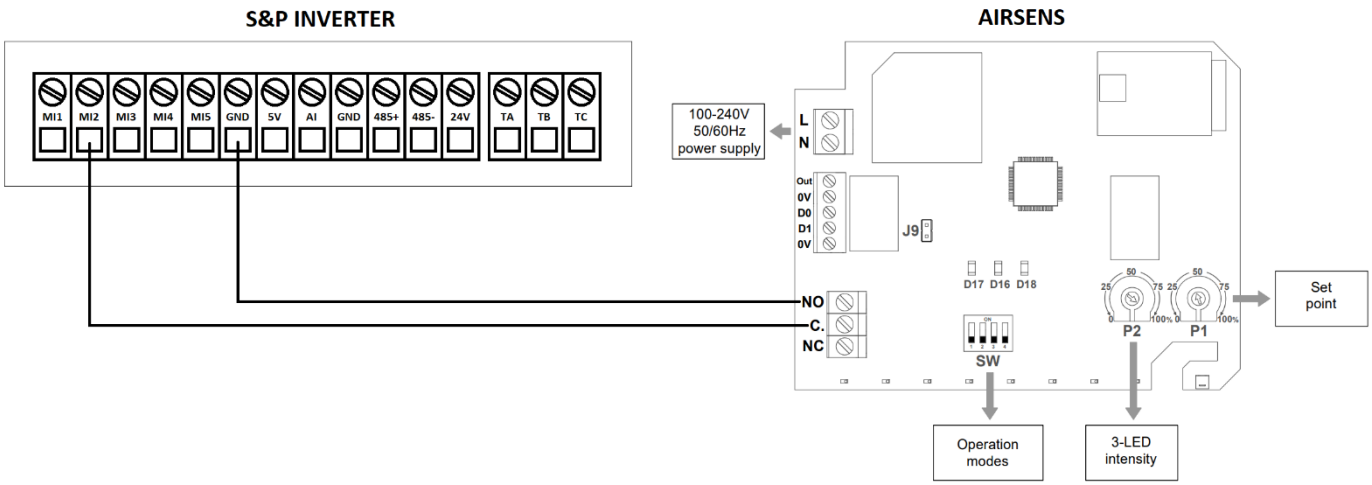
- Energise the inverter and the running frequency should flash on the screen.
- Ensure that the AIRSENS is in the '**OFF**' position.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.01**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The remote enable parameter section is now complete.

The operating speed is defined by the arrows on the front of the inverter.

NOTE!!! The AIRSENS is a S&P accessory which can be purchased, there are three variations relative humidity (RH), carbon dioxide (CO2) and volatile organic compounds (VOC); Below lists the product descriptions and codes to be ordered. Please read this instruction booklet in conjunction with the AIRSENS booklet.

5416845300	AIRSENS CO2
5416845500	AIRSENS RH
5416845400	AIRSENS VOC

11.7. S&P AIRSENS (TRICKLE/BOOST)



Parameters

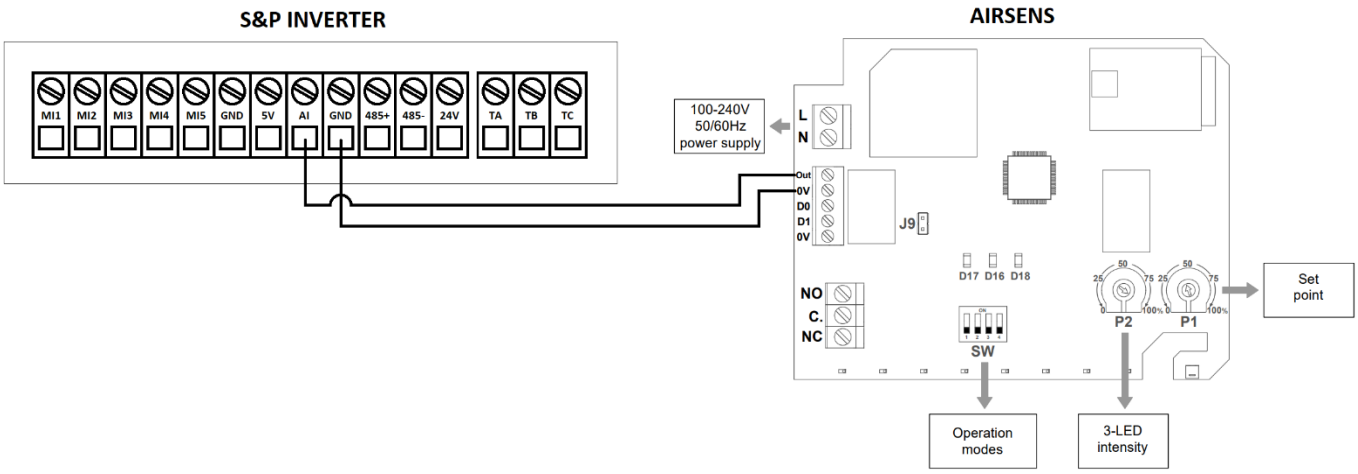
- Energise the inverter and the running frequency should flash on the screen.
- Ensure that the prep/cook switch is in the '**OFF**' position.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.01**'.
- Press '**OK**', and then '**02**' will appear.
- Using the arrows change '**02**' to '**12**'.
- Press '**OK**', and then '**F5.02**' will appear.
- Press '**MODE**', and then '**F5**' will appear.
- Using the arrows change '**F0**' to '**FA**'.
- Press '**OK**', and then '**FA.00**' will appear.
- Using the arrows change '**FA.00**' to '**FA.01**'.
- Press '**OK**', and then change the value to the required trickle speed (20.00Hz - 50.00Hz).
- Press '**OK**', and then '**FA.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The prep/cook switch parameter section is now complete.

To set the boost speed, activate the AIRSENS to "Boost" and then use the up and down arrows on the front of the inverter to change the value displayed to the desired boost speed.

NOTE!!! The AIRSENS is a S&P accessory which can be purchased, there are three variations relative humidity (RH), carbon dioxide (CO2) and volatile organic compounds (VOC); Below lists the product descriptions and codes to be ordered. Please read this instruction booklet in conjunction with the AIRSENS booklet.

5416845300	AIRSENS CO2
5416845500	AIRSENS RH
5416845400	AIRSENS VOC

11.8. S&P AIRSENS (0-10V)



Parameters

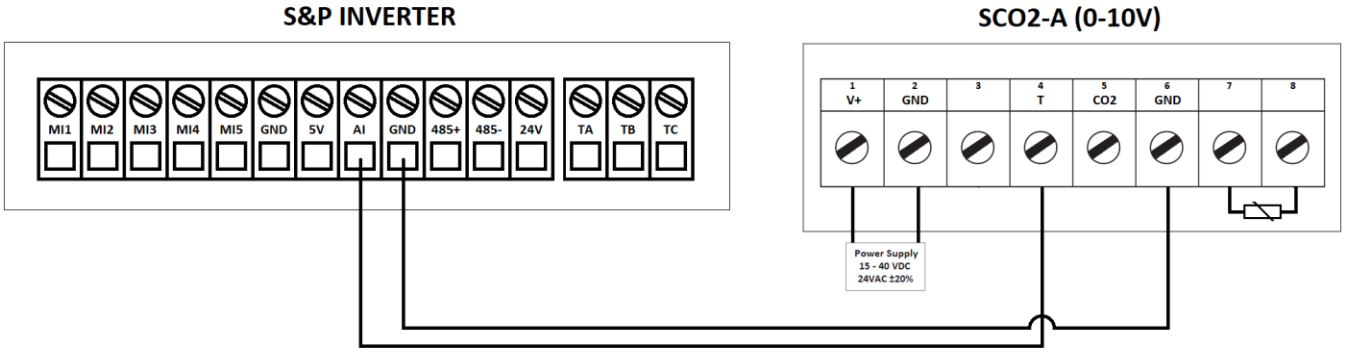
- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.03**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.04**' will appear.
- Press '**MODE'** once and '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.11**'.
- Press '**OK**', and then change the value to the lower limit voltage required.
- Press '**OK**', and then '**F5.12**' will appear.
- Press '**OK**', and then change the value to the lower limit frequency required (Value table below).
- Press '**OK**', and then '**F5.13**' will appear.
- Press '**OK**', and then change the value to the higher limit voltage required.
- Press '**OK**', and then '**F5.14**' will appear.
- Press '**OK**', and then change the value to the higher limit frequency required (Value table below).
- Press '**OK**', and then '**F5.15**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The 0-10V control parameter section is now complete.

Duty	Frequency	Display		Duty	Frequency	Display
10%	5 Hz	010.0		60%	30 Hz	060.0
20%	10 Hz	020.0		70%	35 Hz	070.0
30%	15 Hz	030.0		80%	40 Hz	080.0
40%	20 Hz	040.0		90%	45 Hz	090.0
50%	25 Hz	050.0		100%	50 Hz	100.0

NOTE!!! The AIRSENS is a S&P accessory which can be purchased, there are three variations relative humidity (RH), carbon dioxide (CO2) and volatile organic compounds (VOC); Below lists the product descriptions and codes to be ordered. Please read this instruction booklet in conjunction with the AIRSENS booklet.

5416845300 AIRSENS CO2
5416845500 AIRSENS RH
5416845400 AIRSENS VOC

11.9. S&P SCO2-A (TEMPRATURE)



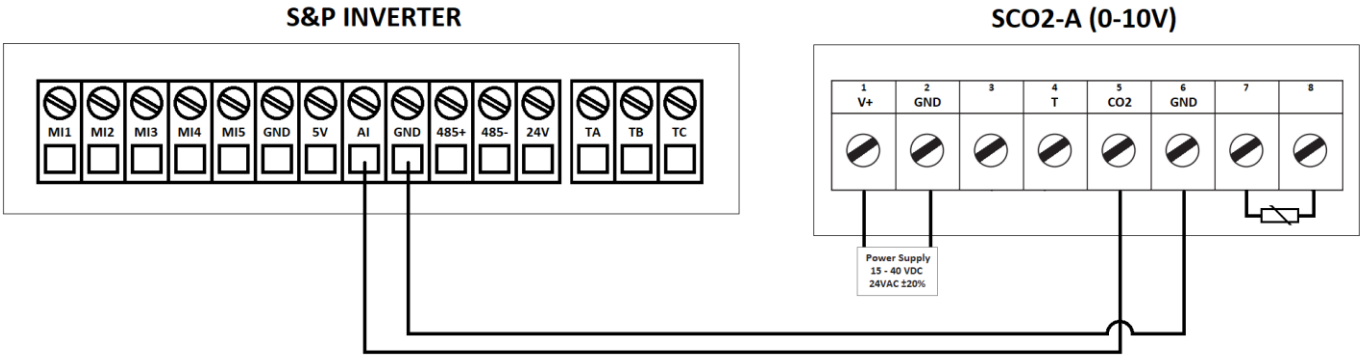
Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.03**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.04**' will appear.
- Press '**MODE**' once and '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.11**'.
- Press '**OK**', and then change the value to the lower limit voltage required.
- Press '**OK**', and then '**F5.12**' will appear.
- Press '**OK**', and then change the value to the lower limit frequency required (Value table below).
- Press '**OK**', and then '**F5.13**' will appear.
- Press '**OK**', and then change the value to the higher limit voltage required.
- Press '**OK**', and then '**F5.14**' will appear.
- Press '**OK**', and then change the value to the higher limit frequency required (Value table below).
- Press '**OK**', and then '**F5.15**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The 0-10V control parameter section is now complete.

Duty	Frequency	Display		Duty	Frequency	Display
10%	5 Hz	010.0		60%	30 Hz	060.0
20%	10 Hz	020.0		70%	35 Hz	070.0
30%	15 Hz	030.0		80%	40 Hz	080.0
40%	20 Hz	040.0		90%	45 Hz	090.0
50%	25 Hz	050.0		100%	50 Hz	100.0

NOTE!!! The SCO2-A is a S&P accessory which can be purchased using the product code 5401221000. Please read this instruction booklet in conjunction with the SCO2-A booklet.

11.10.S&P SCO2-A (CO2)



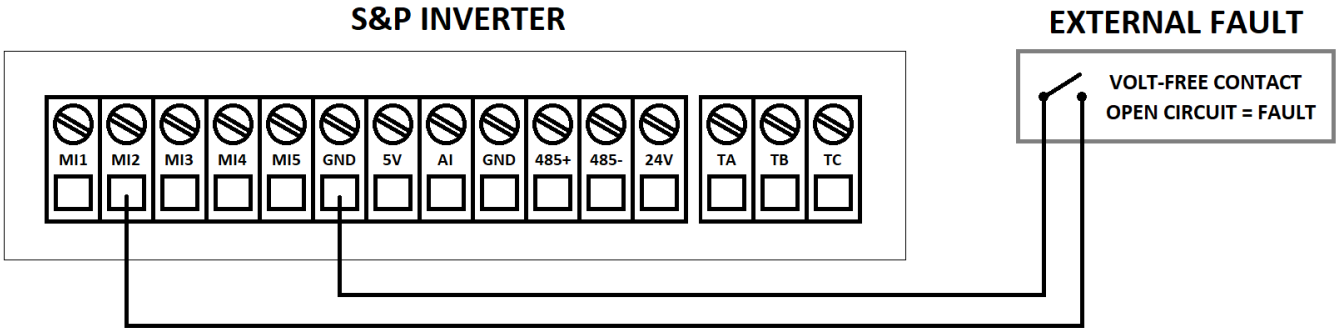
Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Press '**OK**', and then '**F0.00**' will appear.
- Using the arrows change '**F0.00**' to '**F0.03**'.
- Press '**OK**', and then '**0**' will appear.
- Using the arrows change '**0**' to '**1**'.
- Press '**OK**', and then '**F0.04**' will appear.
- Press '**MODE'** once and '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.11**'.
- Press '**OK**', and then change the value to the lower limit voltage required.
- Press '**OK**', and then '**F5.12**' will appear.
- Press '**OK**', and then change the value to the lower limit frequency required (Value table below).
- Press '**OK**', and then '**F5.13**' will appear.
- Press '**OK**', and then change the value to the higher limit voltage required.
- Press '**OK**', and then '**F5.14**' will appear.
- Press '**OK**', and then change the value to the higher limit frequency required (Value table below).
- Press '**OK**', and then '**F5.15**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The 0-10V control parameter section is now complete.

Duty	Frequency	Display		Duty	Frequency	Display
10%	5 Hz	010.0		60%	30 Hz	060.0
20%	10 Hz	020.0		70%	35 Hz	070.0
30%	15 Hz	030.0		80%	40 Hz	080.0
40%	20 Hz	040.0		90%	45 Hz	090.0
50%	25 Hz	050.0		100%	50 Hz	100.0

NOTE!!! The SCO2-A is a S&P accessory which can be purchased using the product code 5401221000. Please read this instruction booklet in conjunction with the SCO2-A booklet.

11.11. EXTERNAL FAULT (OPEN CIRCUIT = FAULT)

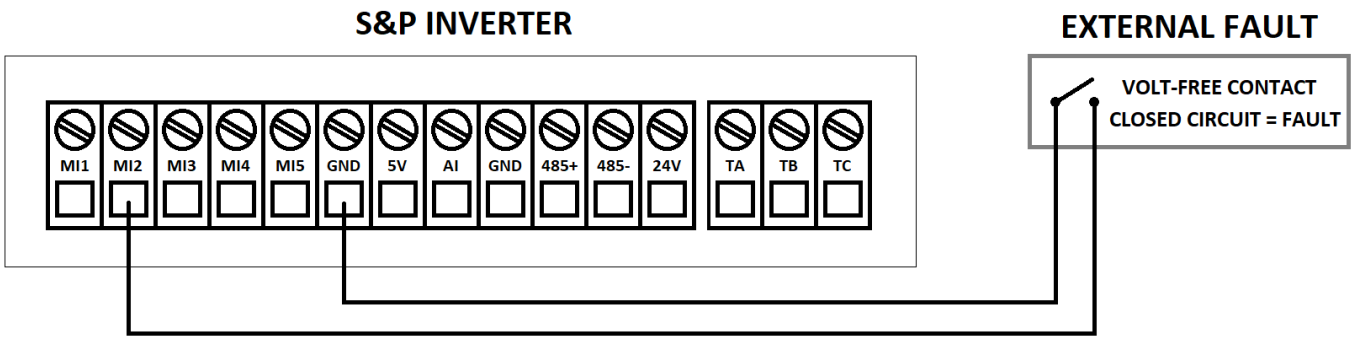


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F1**'.
- Press '**OK**', and then '**F1.00**' will appear.
- Using the arrows change '**F1.00**' to '**F1.12**'.
- Press '**OK**', and then '**000**' will appear.
- Using the arrows change '**000**' to '**002**'.
- Press '**OK**', and then '**F1.13**' will appear.
- Press '**MODE**', and then '**F1**' will appear.
- Using the arrows change '**F1**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.01**'.
- Press '**OK**', and then '**02**' will appear.
- Using the arrows change '**02**' to '**08**'.
- Press '**OK**', and then '**F5.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The external fault parameter section is now complete.

When the link becomes open circuit from your fire alarm it will show "EF" and stop the inverter, once the link is then made it will need a manual reset on the inverter to start it back up.

11.12. EXTERNAL FAULT (CLOSED CIRCUIT = FAULT)

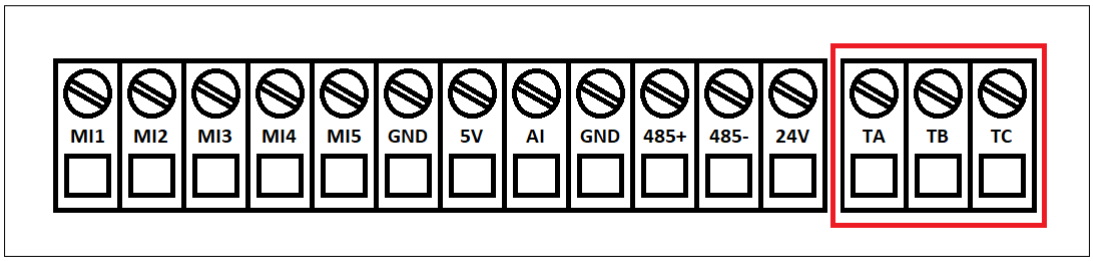


Parameters

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F5**'.
- Press '**OK**', and then '**F5.00**' will appear.
- Using the arrows change '**F5.00**' to '**F5.01**'.
- Press '**OK**', and then '**02**' will appear.
- Using the arrows change '**02**' to '**08**'.
- Press '**OK**', and then '**F5.02**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The external fault parameter section is now complete.

When the link is made by the fire alarm it will show "EF" and stop the inverter, once the link becomes open circuit it will need a manual reset on the inverter to start it back up.

11.13. RUN RELAY



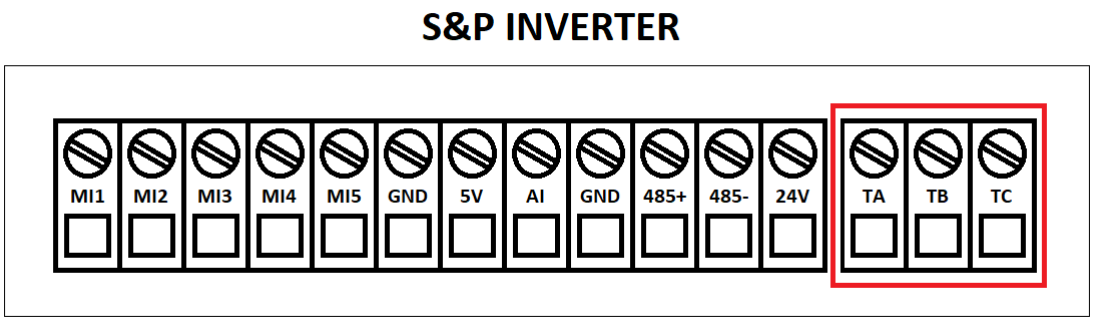
Parameters – 1A Maximum

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F6**'.
- Press '**OK**', and then '**F6.00**' will appear.
- Using the arrows change '**F6.00**' to '**F6.02**'.
- Press '**OK**', and then change this value to '**09**'
- Press '**OK**', and then '**F6.03**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The relay parameter section is now complete.

If the inverter is in running condition there will be continuity between 'TA' and 'TC'.

If the inverter is in a non-running condition there will be continuity between 'TA' and 'TB'.

11.14. FAULT RELAY



Parameters – 1A Maximum

- Energise the inverter and the running frequency should flash on the screen.
- Press '**MODE**', and then '**0.0.0.0**' will appear.
- Using the arrows change '**0.0.0.0**' to '**1.9.5.1**'.
- Press '**OK**', and then '**F0**' will appear.
- Using the arrows change '**F0**' to '**F6**'.
- Press '**OK**', and then '**F6.00**' will appear.
- Using the arrows change '**F6.00**' to '**F6.02**'.
- Press '**OK**', and then change this value to '**03**'
- Press '**OK**', and then '**F6.03**' will appear.
- Press '**MODE**', until you are back at the running frequency.
- The relay parameter section is now complete.

If the inverter is in normal running condition there will be continuity between 'TA' and 'TB'.

If the inverter is in fault condition there will be continuity between 'TA' and 'TC'.

12. FAULT CODES

The below table goes through the most common fault codes, and in the event any fault codes the installer must investigate and correct before re-energising.

Fault Code	Fault Description	Solutions
OL3	Overload alarm	• Check the impeller rotation is correct for the installed fan • Check the input voltage into the inverter • Check the over-current protection value, see section 8 • Check the output voltage from the inverter at 50Hz • Check the cable between the inverter and motor for a voltage leak • Check that the screened cable has been earthed • Check that the fan and inverter have been wired correctly
OCA	Over-current on acceleration	
OCN	Over-current whilst constantly running	
LU	Loss of power whilst running	• Check the supply voltage • Check the power supply cable • Check the main PCB on the inverter for damage
SPO	Output phase loss	• Check the cable resistance between the fan and inverter • Check the output voltage to the motor • Check the output voltage with the motor disconnected • Check the main PCB on the inverter for damage • Check that the motor has not failed to ground
OH1	Inverter over-heat	• Check that the ambient air temperature is not too high • Check that the cooling fan is operating • Check that the cooling veins are now blocked

13. EMC Filters

The Inverter as standard is supplied for connection to the fan with up to a 25m long connection cable. In the event of any installations exceeding 25m require additional components. In the event of cable exceeding 25m and up to 50m should be fitted with an S&P EMC Filter on the mains side of the inverter. These components are accessories with the part description and codes listed below:

S&P Inverter	EMC Description	EMC Code
S&P VFD-M 10A (1-PH)	EMC FILTER 1PH -> 3PH 10A	L0111000000683
S&P VFD-M 16A (1-PH)	EMC FILTER 1PH -> 3PH 25A	L0111000000685

14. MAINTENANCE

Before manipulate the device, make sure that it is disconnected from the mains and that no one can turn it on during the intervention.

The apparatus must be regularly inspected. These inspections should be carried out bearing in mind the ventilator's working conditions, in order to avoid dirt or dust accumulating on the impeller, motor or back-draught shutter. This could be dangerous and perceptibly shorten the working life of the ventilator unit.

While cleaning, great care should be taken not to unbalance the impeller or motor.

In all maintenance and repair work, the safety regulations in force in each country must be observed.

15. WARRANTY

S&P Limited Warranty

36 (THIRTY-SIX) MONTH PRODUCT WARRANTY

S&P UK Ventilation Systems Limited warrants that the S&P UK PACKAGED DIGITAL INVERTER will be free from defective materials and workmanship for the period of 36 (thirty-six) months from the date of original purchase. In the event that we find any part is defective the product will be repaired or at the company's discretion, replaced without charge provided that the product has been installed in accordance with the enclosed instructions and all applicable standards and national and local building standards.

IF CLAIMING UNDER WARRANTY

Please return the completed product, carriage paid, to your local authorized distributor. All returns must be accompanied by a valid Invoice of Sale. All returns must be clearly marked "Warranty Claim", with an accompanying description stating the nature of the fault.

THE FOLLOWING WARRANTIES DO NOT APPLY

- Damages resulting from improper wiring or installation.
- Damages resulting when using the fan/control with fans/motors/controls/sensors other than those supplied and manufactured by the S&P Group of Companies.
- Removal or alteration of the S&P data plate label.

WARRANTY VALIDATION

- The end user must keep a copy of the Invoice of Sale to verify a purchase date.

16. EC DECLARATION OF CONFORMITY

We declare that the fan/control designated below, on the basis of its design and construction in the form brought onto the market by us is, in accordance with the relevant EC Council Directives on Electromagnetic Compatibility. If alterations are made to the apparatus without prior consultations with us, this declaration becomes invalid. We further declare that the equipment identified below may be intended to be assembled with other equipment/machines to constitute machinery, which shall not be put into service until the assembled machinery has been declared in conformity with the provisions of these relevant EC Council Directives.

17. DESIGNATION OF EQUIPMENT

Relevant EC Council Directives, Electromagnetic Compatibility Directive 2014/30/EU.

18. RECYCLING

Dismantling and recycling must be carried out by qualified personnel and in compliance with local and international regulations.

Disconnect the electrical equipment from the power supply making sure that no one can start it during the operation.

Disassemble and eliminate the parts to be replaced according to current national and international standards.

EEC legislation and our consideration of future generations mean that we should always recycle materials where possible; please do not forget to deposit all packaging in the appropriate recycling bins. If your device is also labelled with this symbol, please take it to the nearest Waste Management Plant at the end of its serviceable life.

S&P UK VENTILATION SYSTEMS LTD

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