# KV DUO 250 EC

Hub office TEF

Centrifugal circular duct fan

Item Number: 76832

Variant: 230V 1~ 50Hz

- Speed-controllable
- Integrated electronic motor protection
- Safe and maintenance free operation
- Energy-saving
- Suitable for External Mounting as standard
- Low noise level
- Twin fan – Run & Standby

The KV DUO fans are driven by EC-external rotor motors. These are energy saving motors with high efficiency. The power electronics are integrated in the motor housing. All models have one potential-free terminal for error message. All motors are suitable to be used for 50/60Hz. The input voltage for single phase units can vary between 200 and 277V, for three phase units between 380 and 480V. Speed control by a 0-10V signal.

The fans are easy to connect to spiral ducts using FK mounting clamps.

The KV DUO models are manufactured from Aluzinc sheet steel with acoustic insulation and are suitable for external mounting on roofs. All models are equipped with backward curved centrifugal impellers wired out to an IP65 Terminal box.

## Technical parameters

| Nominal data | | |
|---|---|---|
| Voltage (Nominal) | 230 | V |
| Frequency | 50 | Hz |
| Phase(s) | 1~ | |
| Input power | 168 | W |
| Input current | 1.19 | A |
| Impeller speed | 2,810 | r.p.m. |
| Air flow | max 0.32 | m³/s |
| Temperature of transported air | max 60 | °C |
| Max temperature of transported air, when speed controlled | 60 | °C |

| Sound data | | |
|---|---|---|
| Sound pressure level at 3m (20m² Sabin) | 50 | dB(A) |

| Protection/Classification | | |
|---|---|---|
| Enclosure class, motor | IP54 | |
| Insulation class | B | |

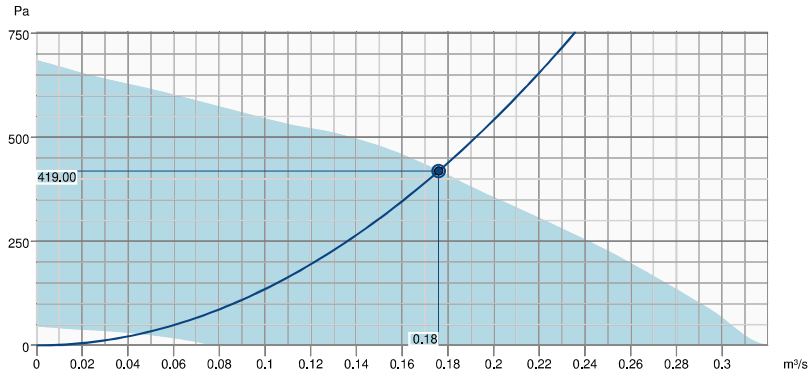
| Data according to ErP | |
|---|---|
| ErP ready | ErP 2016; ErP 2018 |

| Dimensions and weights | | |
|---|---|---|
| Duct dimension; Circular, inlet | 250 | mm |
| Duct dimension; Circular, outlet | 250 | mm |
| Weight | 24.5 | kg |

| Others | |
|---|---|
| Duct connection type | Circular |
| Motor type | EC |

## Performance

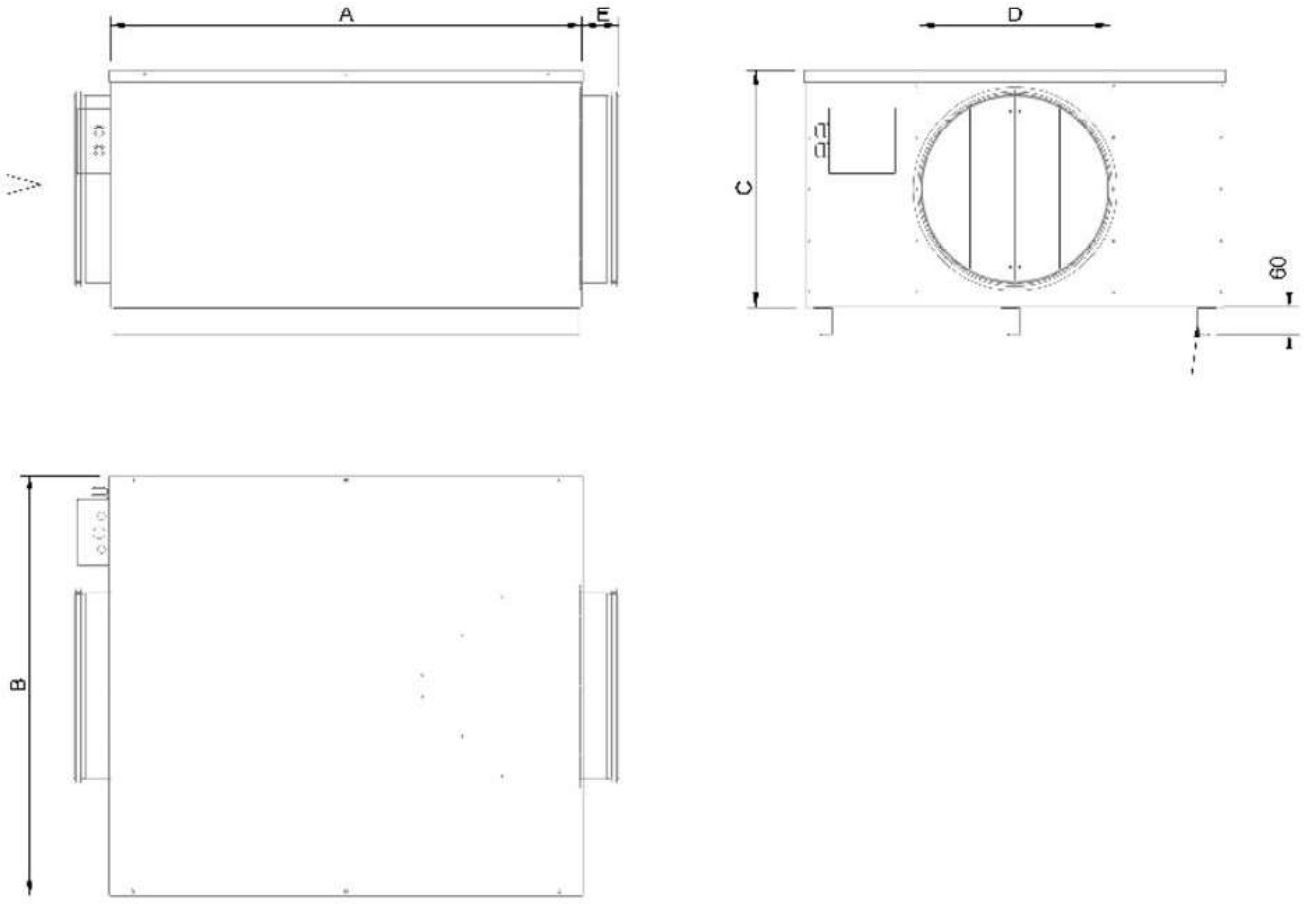
### Performance curve




| Hydraulic data | |
|---|---|
| Required air flow | 0.18 m³/s |
| Required static pressure | 419 Pa |
| Working air flow | 0.18 m³/s |
| Working static pressure | 419 Pa |
| Air density | 1.204 kg/m³ |
| Power | 162.6 W |
| Fan control - RPM | 2817 rpm |
| Current | 1.17 A |
| SFP | 0.924 kW/m³/s |
| Control voltage | 10.0 V |
| Supply voltage | 230 V |

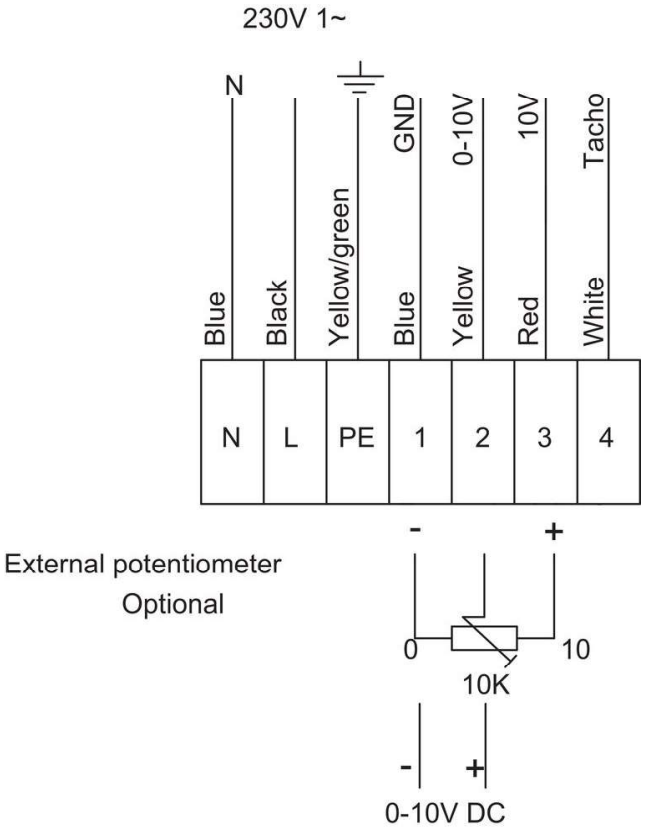
| Sound power level | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Inlet | dB(A) | 52 | 57 | 70 | 69 | 62 | 61 | 56 | 50 | 73 |
| Outlet | dB(A) | 53 | 57 | 71 | 70 | 65 | 68 | 59 | 56 | 75 |
| Surrounding | dB(A) | 25 | 42 | 51 | 53 | 49 | 47 | 36 | 34 | 57 |
| Sound pressure level at 3m (20m² Sabine) | dB(A) | - | - | - | - | - | - | - | - | 50 |
| Sound pressure level at 3m free field | dB(A) | - | - | - | - | - | - | - | - | 36 |

## Dimension




| KV DUO | A | B | C | D | E |
|---|---|---|---|---|---|
| 150 | 500 | 360 | 280 | 150 | 40 |
| 250 | 580 | 430 | 360 | 250 | 60 |
| 315 | 740 | 650 | 425 | 315 | 60 |
| 400 | 1000 | 895 | 505 | 400 | 65 |
| 500 | 1265 | 940 | 605 | 500 | 80 |
| 630 | 1383 | 1205 | 884 | 630 | 80 |

## Wiring




| N | Blue |
|---|---|
| L | Black |
| PE | Yellow/green |
| 1 | Blue |
| 2 | Yellow |
| 3 | Red |
| 4 | White |
| External potentiometer optional | |

## Ecodesign

| Product | | |
|---|---|---|
| Trade name | Systemair | |
| Product name | KV DUO 250 EC | |

| Ecodesign | | |
|---|---|---|
| ErP compliance | 2018 | |
| Unit category | NRVU | |
| Drive | Integrated VSD | |
| Unit type | UVU | |
| Heat recovery type | None | |
| Temperature ratio (UVU) | Not applicable | |
| qv nom | 0.176 | $m^3/s$ |
| P nom | 0.163 | kW |
| Ps nom | 419 | Pa |
| Fan efficiency | 45.2 | % |
| External Leakage | 5 | % |
| Sound power level LWA | 53 | dB(A) |

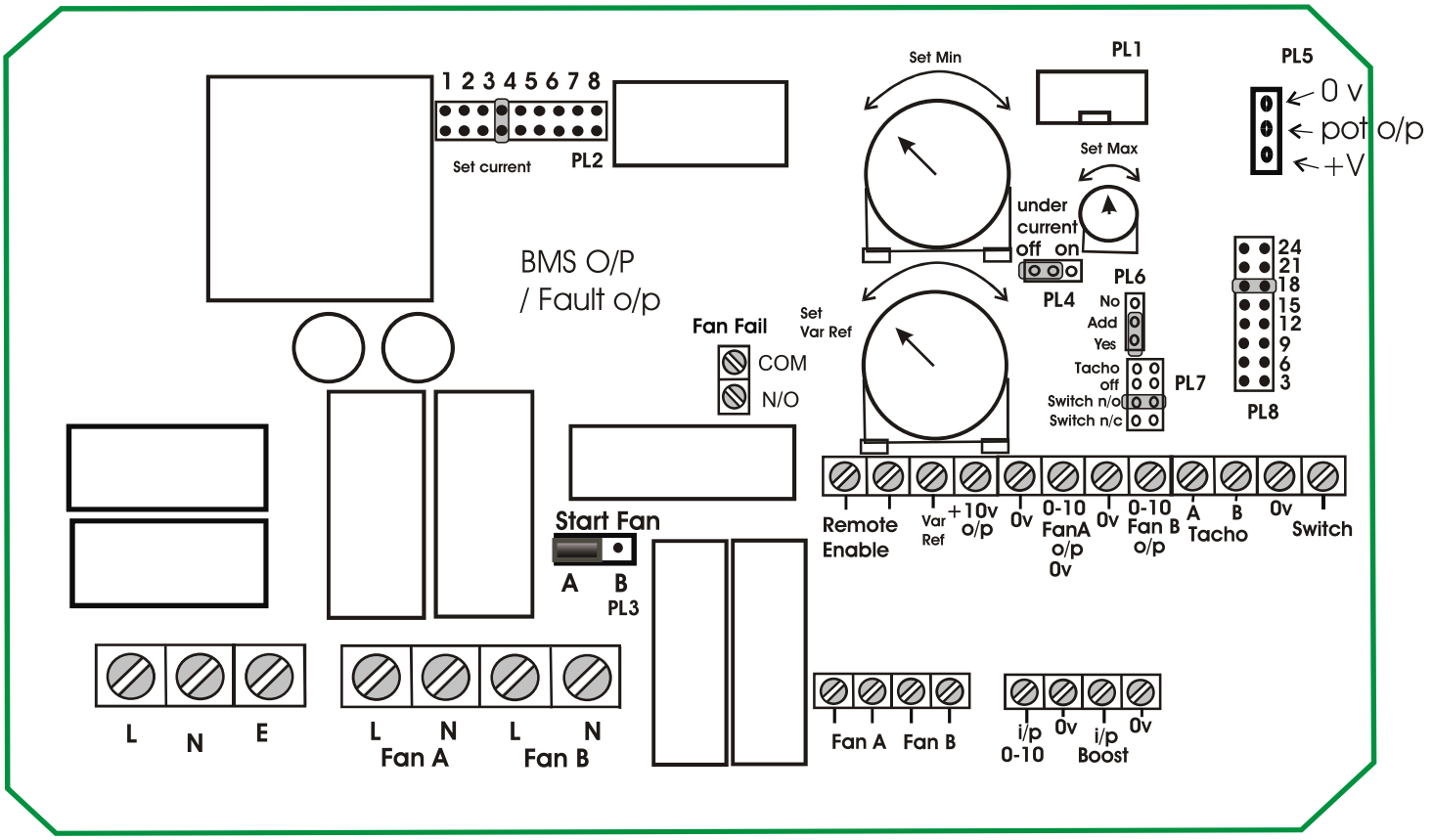
## Accessories

- CXE/AVC Modbus (37256)
- EC-Basic-H humidity (24807)
- EC-Basic-U universal 0-10V (24806)
- EC-Vent control board (3115)
- MTP 10, 10K, Speed control (32731)
- MTV-1/010 Controller 0..10V+ (30650)
- S-5EC/FRQ (76738)
- HR1 Room Humidistat (215150)
- RT 0-30 Room Thermostat (5151)
- EC-Basic-CO2 and temperature (24808)
- EC-Basic-T temperature (24805)
- EC-Selector (9908)
- EC-Vent Room Unit (3018)
- MTP 20, on/off, 3-step (310220)
- PCA 1000D2 Pressure controller (76739)
- CO2RT-R-D Transmitter (6993)
- Presence detector/IR24-P (6995)
- ACO8AC/EC ACO Panel IP40 (93042)

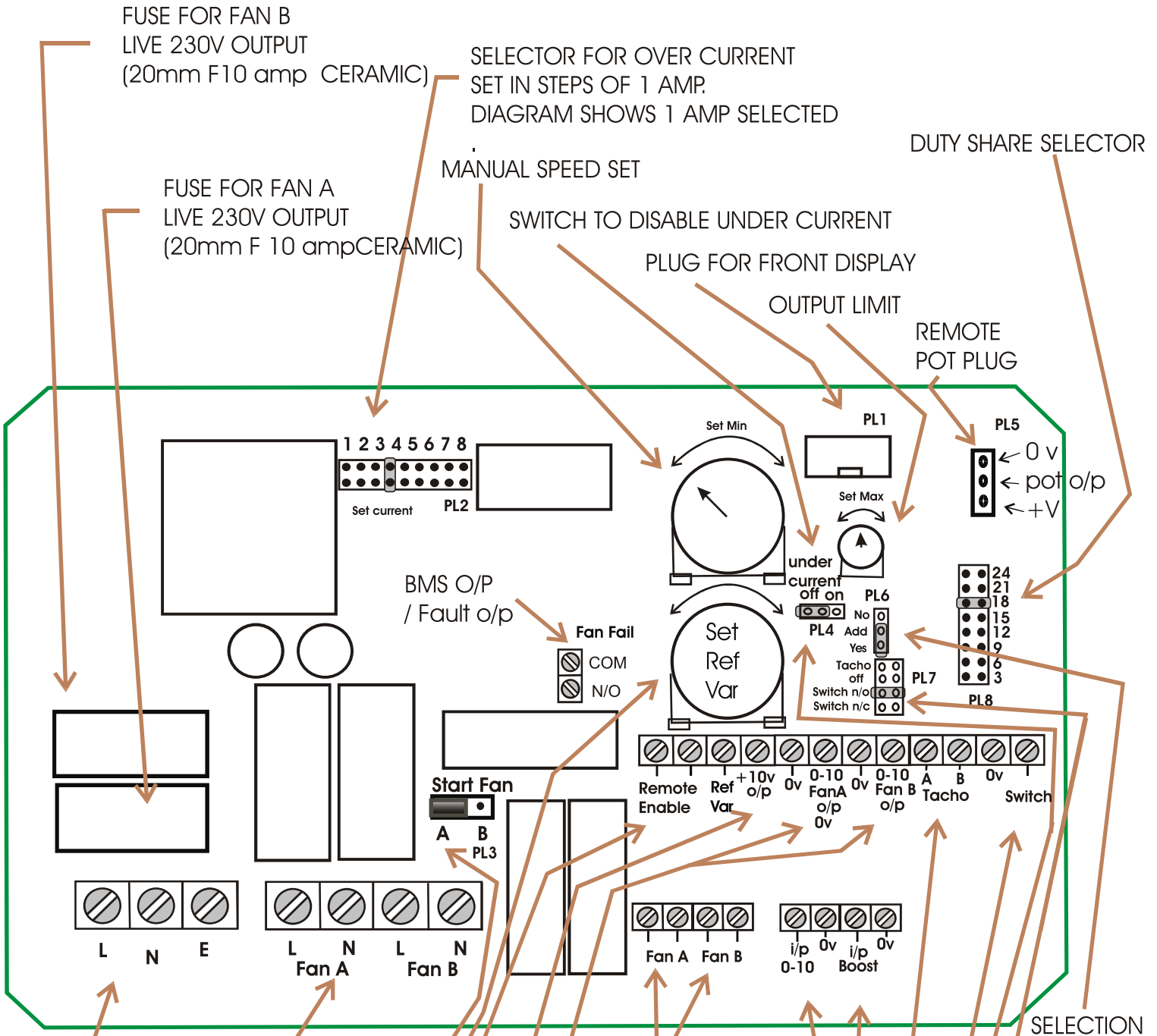
## Documents

- EC-fans_Operating_and_Maintenance_instr _206268_CE_multilingual.pdf
- KV DUO 150-315 EC - ACO EC.PDF

# Building Management System



# BOARD CONNECTION




FUSE FOR FAN B
LIVE 230V OUTPUT
(20mm F10 amp CERAMIC)

SELECTOR FOR OVER CURRENT
SET IN STEPS OF 1 AMP.
DIAGRAM SHOWS 1 AMP SELECTED

DUTY SHARE SELECTOR

MANUAL SPEED SET

FUSE FOR FAN A
LIVE 230V OUTPUT
(20mm F 10 ampCERAMIC)

SWITCH TO DISABLE UNDER CURRENT

PLUG FOR FRONT DISPLAY

OUTPUT LIMIT

REMOTE
POT PLUG

BMS O/P
/ Fault o/p

SELECTION
FOR TACHO
OUTPUT TYPE

SUPPLY IN

VOLT FREE
CONTACTS
CLOSED FOR
FAN SELECTED

SWITCH BETWEEN
SWITCH N/O OR
SWITCH N/C
OR TACHO OR
DISABLE BOTH

MAINS SWITCHED OUTPUT
TO FAN A OR B

FAN A AND B ARE OUTPUT DRIVES
TO FAN AND ARE ONLY ACTIVE
WHEN THAT FAN IS SELECTED

THIS SELECTOR IS USED TO
SELECT THE START UP FAN

SWITCH ON
OR OFF CURRENT
SENSING

ALL OUTPUTS
10V OUT IS A 10 VOLT REF AND
CAN SUPPLY 20mA OUT PUT
CURRENT

Set variable voltage o/p
"Ref Var"

INPUT FROM
VOLT FREE
CONNECTIONS
(normally open or
normally closed
can be selected
by jumper PI7)

REMOTE ENABLE
MUST BE
SWITCHED BY VOLT FREE
CONTACTS

LOW VOLTAGE
CONTROL SIGNALS
FROM BMS OR SENSORS

TACHO SIGNAL FROM
FANS A & B

# FEATURES

Universal as it can be used on conventional AC Fans and DC Fans

Individual fused mains outputs to fans

Remote activation option by switching a low voltage / current by means of a set of external volt free contacts .

Adjustable current sensing from 1 to 8 Amps with the option of disabling by just leaving out the selection jumper.

Low current sensing to indicate an open circuit of a connection problem. This function is of particular importance in small motors where the line current rise is insignificant when the motor is stalled and the motors built in thermal protection is used .

Low current detection disabling via jumper for when a fan is also switched by a secondary source.

Individual volt free contacts for each fan that switch on with the alteration of the corresponding fan. This can be used for enabling low or high voltage up to 230 volts with a maximum current of 8 amps.

BMS output / remote fault indicated by an individual set of contacts capable of maximum controlling a load up to 230 volts at 8 Amps.

Manual speed control from the speed pot on the board or the option of a secondary control via the connector shown in the connection diagram. Whichever of these that have the highest setting takes priority.

Mixing low voltage signals from external sources applied to the Boost ,0 to 10 input along with min speed setting on the board or the signal applied via the pot input on the board.

Individual switching of the low voltage mixed signal to relevant fan that is activated

Duty sharing option selected by the set time jumper with time intervals from 3 hours to 24 hours in 3 hour steps. If this function is unwanted the jumper can be omitted and the selected start up fan will run till a fault occurs.

High limit to control voltage switched to fans by means of the preset marked set max

Tacho sensing on each fan

Tacho pull up resistor selectable for use where one is not incorporated in the fan

Switch input normally open or normally closed can trigger fault depending on PI7 setting
DC Fan switched fault switch can be connected to switch input or air switch .

Deactivation / activation of n/o or n/c switch or tacho achieved by jumper setting on board.

Fan status shown on front of control box by means of an individual LED for each fan. If illuminated Green to indicate fan running , Red to show fault and unilluminated to show fan off.

Controlling input shown by use of illuminated green LED corresponding to the external input overriding the internally set speed or the other external input.

Start up fan selection by means of a jumper, this can also be used on installation to check the operation of both fans.

Front panel detachable via a plug and socket to aid installation

Time delay on fault detection on startup / fan switch over to allow current, switch input n/o or n/c, tacho levels to normalise

Variable voltage set by preset on board that can be used by external switching and fed into either the boost or signal inputs.

## TERMINAL BLOCK CONNECTIONS

1. Supply in is the 230 volt, to power the unit and the fans connected to it.

2. This is the Supply voltage and switched to the designated fan via a fuse in the live line.

3. Remote enable , with this connection in the open circuit state the unit is disabled and all outputs are disabled . This is a low voltage control signal and must be only connected to a volt free switch

4. Var output, this is the voltage set by the set var voltage preset this can be used as a feedback signal and fed in to the boost or signal inputs..

5. 10V out is a reference voltage for use with peripheral sensors , maximum current drain 20 ma.

6. 0-10 A and 0-10 B are the control inputs to the fans, the activated fan has the control voltage present while the other remains at zero potential. The active output voltage is derived from the highest control signal this being either 0 -10 input , boost input, min speed pot or remote pot.

7 Tacho inputs come from a DC fan , There are two inputs marked A B respectively fans and share a common 0V.

8. Switch , this is a connection made to an air switch contact or a DC fan fail contacts , and can accommodate either normally open contact or normally closed, this is achieved by changing the jumper setting on PL7 .
The unit has a delay before tripping on this input so as to allow the Fans to be up and running before triggering a fault .

9. Fan A and Fan B , This connection goes to a volt free relay contact . The letter corresponds to the activated Fan, The relay can be utilised by switching a load up to 230 volts at 8 amps.

10. 0 to 10 and boost input are inputs , these can be connected to sensors , BMS systems, or any device giving a 0 to 10 volt output .

## JUMPER AND PLUG CONNECTION

PI1 This is a Plug and socket to allow the front panel be disconnected to allow a easy installation.

PI2. This Jumper is used to select the trip current , if the jumper is omitted then the current trip is disabled.

PI3 Start up Fan selector and can be used on installation to aid testing fans.

PI4 Used to disable open circuit detection.

PI5 Connection to an external / remote pot for speed control

PI6 When using some DC fans the tacho requires a pull up resister , so this jumper has to be put in the required position for the fan used if a tacho is to be used.

PI7. Allows the choice of using an switch input ( selectable for normally open or closed)or tacho or neither

PI8. Used to control the duty share time in 3 hour steps up to once a day , omission of the jumper disables the duty sharing .

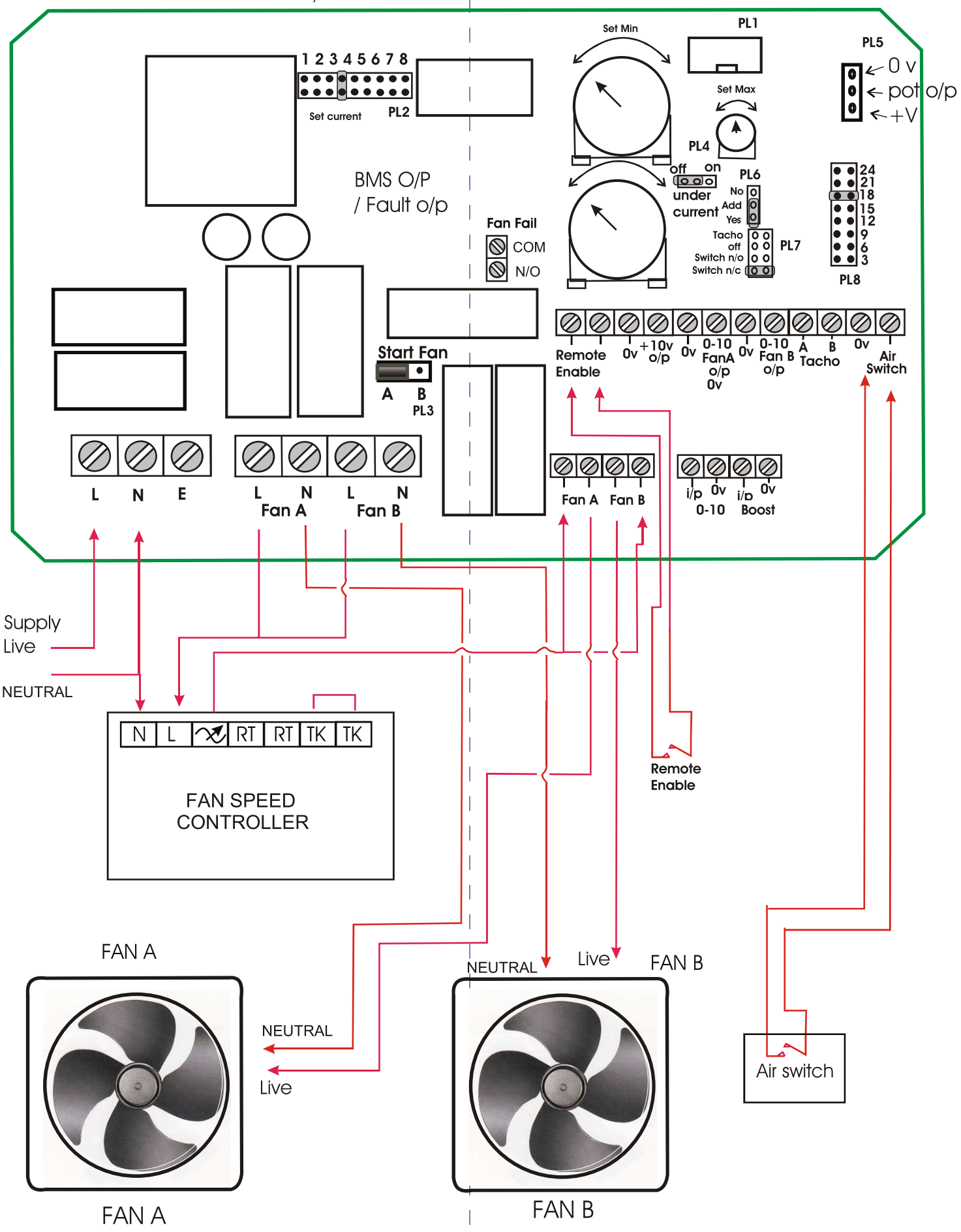
PCB PRESETS

Min speed preset controls the lowest voltage that the controlling 0 to 10 output will go down to. This adjustment will control down to zero when turned fully anticlockwise and up 10 volts fully clockwise if the limit has not been set to a lower level.

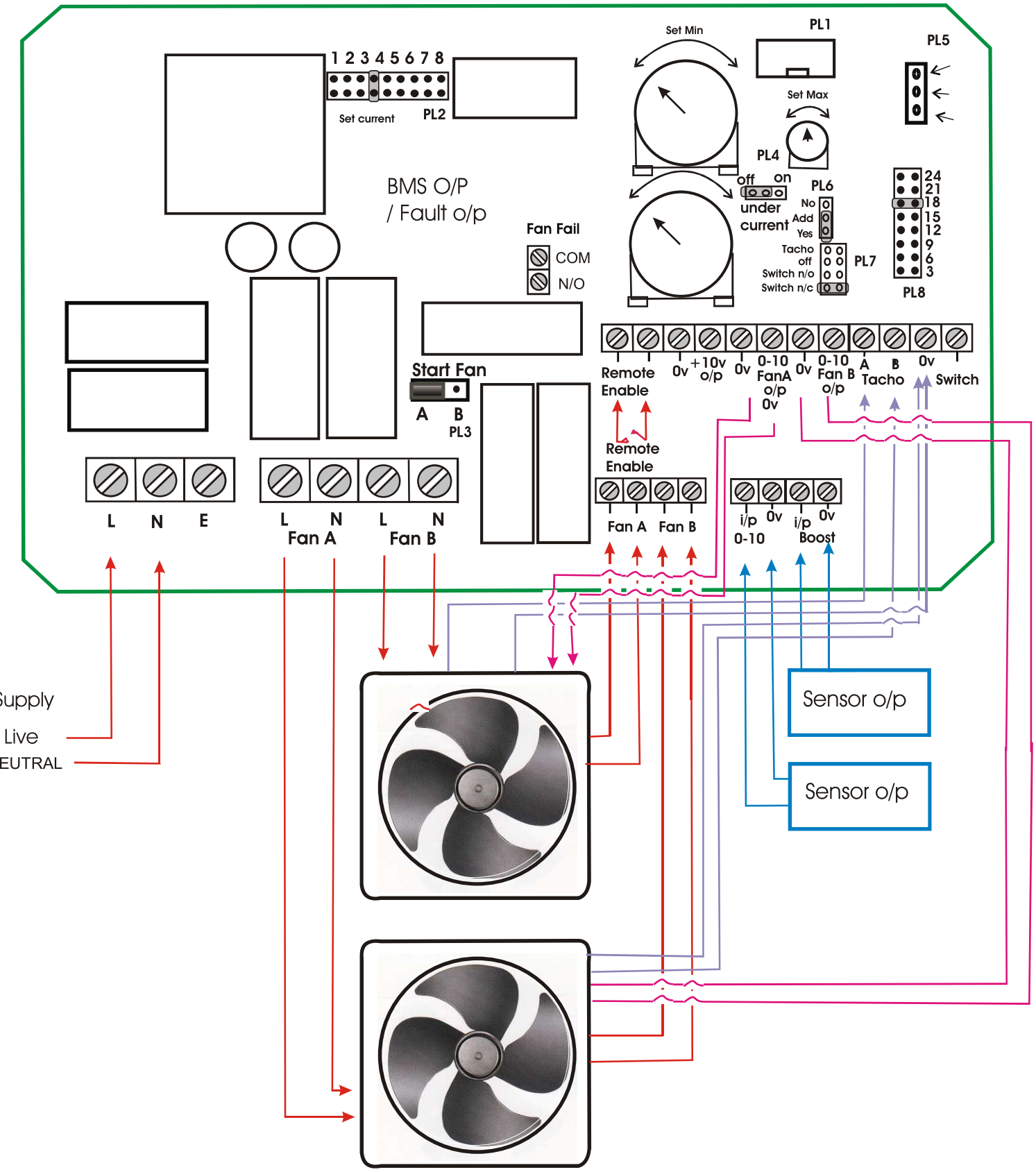
Limit preset limits the maximum voltage that the controlling 0 to ten output will go to . By turning anti clockwise will reduce the possible maximum voltage on the selected 0 to 10 output right down to 4 volts ..

Set variable voltage. This preset sets a voltage between zero to ten on the terminal var of the terminal block and used by remote switch like a PIR and fed into signal or boost input..

CONNECTIONS FOR CONTROLLING AN AC FAN USING TWO WIRE CONTROL
WITH A SHARED CONTROLLER , WITH THE CONTROLLING OUTPUT IN THE LIVE FOR THE FANS



CONNECTIONS FOR CONTROLLING AN EC FAN
USING A TACHO




This connection shows a DC fan connected up with a zero to ten control input along with an enable .