# INSTALLATION & MAINTENANCE INSTRUCTIONS

&

# ELECTRICAL WIRING DIAGRAMS

FANTECH

Installation & Maintenance M-2/4

Warranty M-5

Wiring Diagrams M-6/9

## GENERAL INSTRUCTIONS

### OFF-LOADING

During off-loading inspect fans for damage. If the casings, cowls or impellers are damaged, notify your local Fantech distributor immediately.

Fantech cannot be held responsible for any loss or damage incurred to goods during transport, off-loading or on site.

### SITE STORAGE

The fans must be stored in a clean, dry, protected and vibration-free area. The fan impellers should be rotated daily to prevent bearing damage. Failing to follow these instructions may void the warranty.

### MAINTENANCE

Install fans and accessories to allow service access for maintenance and for the replacement of assemblies and component parts, without disturbance of other items of plant and building elements.

Most motors are fitted with sealed-for-life bearings which are maintenance-free. It is recommended that fans be inspected initially at 3-monthly intervals, to clean the blades and motor and to check for tightness of fastenings.

**Where fans are used for kitchen exhaust or other applications where the air contains high amounts of dust, residue and other contaminants, fans should be cleaned and maintained at more frequent intervals appropriate for the application.**

Motor overloads/contactors should also be inspected to ensure correct operation.

Should external lubricators be fitted, please refer to **LUBRICATION INSTRUCTIONS** in the 'Installation and Maintenance' instructions included with each fan.

If the fans are belt driven, check pulley alignment and belt tension before starting the fan. Belt tension must be checked 2 - 4 weeks after start-up.

### MOTORS

All standard motors are suitable for operation in air temperatures between -20°C and +40°C. If higher temperatures are required, contact your local Fantech supplier.

Standard motors are **not** suitable for handling saturated air containing water droplets or for some corrosive fumes. For severe applications, special motors and finishes may be required. Customers are requested to discuss these applications with our sales engineers to ensure a fan suitable for the application is selected.
**WARNING** - Failure to do so could void warranty.

## ELECTRICAL

### SUPPLY

Read the fan data label to determine the number of phases and amperage drawn by the unit. Check that the available supply is suitable.

### EARTHING

All fans must be earthed in accordance with AS/NZS3000:2000 and local supply regulations.

### WIRING

Wiring must be in accordance with AS/NZS3000:2000 and local supply regulations. Wiring diagrams are provided with all fans. Wiring diagrams are shown on pages *M-6*/*9*.

### PROTECTION

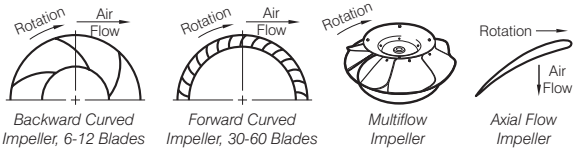
Fuses in the circuit should be regarded as protecting the wiring only against short circuit, they are not suitable for overload protection. Fuses must be able to carry starting loads and these can be taken as a minimum of six times the running current for 25 seconds.

All three-phase motors must be provided with differential action, single-phasing protection and overload current protection. Failure to provide single-phasing protection will void warranty.

Motors fitted with thermistor or thermostatic protection should have these wired into the starting contactors' control circuit to interrupt motor power supply on winding temperature rise.

Wires marked 'TK' are for internal thermal contacts which can be wired directly into the contactor controller circuit. Alternatively, thermal protection devices can be installed into the control circuit therefore negating the need to use the 'TK' contacts. Failure to connect thermal protection devices will void warranty.

### DIRECTION OF ROTATION




*Backward Curved Impeller, 6-12 Blades* | *Forward Curved Impeller, 30-60 Blades* | *Multiflow Impeller* | *Axial Flow Impeller*

The correct rotation and direction of air flow is shown on each individual fan. If backward-curved centrifugal fans rotate in the wrong direction, the motor may overload and the motor warranty will be void.

To change the direction of rotation on three-phase motors, interchange any two supply leads. All single-phase motors will rotate in the correct direction when correctly connected.

### STARTING

All fans are suitable for direct-on-line starting by switch or automatically by contactor up to and including 5.5kW. The number of starts should be limited to no more than four per hour or, in the case of motors of less than 1kW, no more than eight starts per hour. This would be subject to local supply regulations.

**Check List**

- check power supply
- check fan is free to rotate
- check overloads are fitted
- ensure ductwork is free of debris
- check rotation of fan
- check the motor amperage draw does not exceed nameplate rating

## *SAFETY*

**Rotating fan impellers can be a danger to personnel.**

**The following precautions must be taken:-**

- electrically isolate the fan motor prior to undertaking any work.
- regularly check impeller fasteners for tightness.
- where fans are accessible to personnel or directly exposed to habitable areas, it is the responsibility of the installers to ensure that fans will have guards which comply with the latest Australian Standard AS4024.1 safeguarding of machinery.
- prior to fan start-up, ensure loose debris will not be sucked into the fan. All ductwork should be clean.

## *INSTALLATION INSTRUCTIONS*

**Important Notes:**

**With all horizontally mounted axial fans it is preferable that the fan is installed with the motor mounted on top of the motor plate. ie. not suspended under the motor plate.**

**For outside installations, IP66 rated conduit and fittings must be used.**

**To obtain rated performance, the following recommendations should be followed:-**

**Duct Mounted Fans - General**

- inlet and outlet ductwork should be free from obstructions.
- duct transitions should be 60° inlet/15° outlet.
- avoid sharp bends on inlet or outlet.
- do not use ductwork smaller in area than the fan.
- flexible duct connections should be taut.
- ductwork connections should be well aligned.
- inlet cones must be fitted to free inlet applications.
- ensure that the fan orientation is correct for the required air flow direction.

**Belt-Driven Product**

- pulleys must be correctly aligned.
- belts must be correctly aligned and tensioned.
- tension must be checked 2-4 weeks after start-up.

**Roof Ventilators**

- ensure that upstands are flat and true.
- maximum angle of upstand or curb 30°
- fix a sealing strip of neoprene to the top of the upstand to prevent air leakage.
- fit an electrical compression gland to the roof cowl in an appropriate location and pass the electric cable through as the roof cowl is fitted.
- ensure the electric cable is not pinched prior to securing the cowl to the upstand.
- the roof cowl should be secured with roofing screws through the side skirt midway through the skirt.
- inlet ductwork should be free from obstructions.
- avoid sharp bends at the inlet.
- **vertical discharge axial roof units: ensure the damper flap hinge points down the slope of the roof.**

## LUBRICATION INSTRUCTIONS

Most Fantech products are fitted with sealed-for-life pre-lubricated bearings which do not require maintenance for the life of the fan.

Should your fan be fitted with grease nipples, the following instructions should be followed:-

## RECOMMENDED LUBRICATION INTERVALS

| | Working Hours | | | |
|---|---|---|---|---|
| **Motor Frame** | **48 rev/sec** | **24 rev/sec** | **16 rev/sec** | **12 rev/sec** |
| 160 | 4000 | 8000 | 12000 | 20000 |
| 180-200 | 3000 | 7000 | 12000 | 16000 |
| 225-250 | 2000 | 6000 | 10000 | 13000 |
| 280 | 1000 | 5000 | 8000 | 13000 |
| 315 | 1000 | 3500 | 8000 | 10000 |

Maximum interval 12 months.
These times are a guide only and will depend on the motor manufacturer and actual running conditions.

## RECOMMENDED GREASES

Wherever possible the grease used should be identical to the original. When different greases are mixed, even if they are both suitable for the conditions, incompatibility can occur and result in rapid bearing failure.

In the absence of specific instructions supplied with the fan the following greases should be used. STANDARD FANS Shell Alvania R3 or compatible lithium-based grease suitable for 130°C continuous operation. SMOKE SPILL and high temp motors must use the grease stated on the motor to maintain the Smoke Spill approval.

## PROCEDURE

If the grease lines are not extended to the outside of the case the fan must be electrically isolated for safety before work commences.

Clean the grease nipples with a clean cloth.

Introduce the new grease to all points while the fan is rotating until the old grease is purged from the grease relief port normally located at the bottom of the bearing housing. If it is required to manually rotate the impeller, the fan must be electrically isolated to prevent accidental startup.

## WARNING

INCOMPATIBLE GREASE, EXCESSIVE GREASE OR INCORRECT GREASE RELIEF CAN CAUSE DAMAGE TO THE MOTOR.

Fantech warrants products of its manufacture when not misused or neglected to be free of defects in workmanship and/or materials. Our obligation under this warranty is limited to repairing or exchanging F.O.B. factory, any part, assembly or portion found to be defective within one (1) year from the date of commissioning but not to exceed eighteen (18) months from date of shipment from our factory.

The Company assumes no responsibility for labour costs involved in the removal of defective parts, installation of new parts or related service charges.

The Company shall have the option of requiring the return of the defective part (transportation prepaid by the Buyer) to establish the claim.

Warranty will be void if installation is not carried out by qualified personnel in accordance with these instructions and good trade practice.

Fully detailed warranty conditions are contained in Fantech's Standard Conditions of Trading.

# WIRING DIAGRAMS - STANDARD FRAME MOTORS

These diagrams apply to **STANDARD FRAME INDUCTION MOTORS** which are used in the following products:-

| | | Pgs** |
|---|---|---|
| • AD/E..D/V | Alpha/Beta Series<br>Diags. 4, 5, 6, 10 | D-4/7 |
| • AD/E..S | Alpha Series Supply<br>Diags. 4, 5, 6, 10 | D-30/31 |
| • *AL.. | Centrifugal fans<br>Diags. 1, 2, 3 | E-15/18 |
| • *AP.. | Axial Flow fans<br>Diags. 1, 2, 3, 8, 10 | B-31<br>C-1 |
| • *APB.. | Belt-driven axial fans<br>Diags. 1, 2, 3, 7, 8 | B-31<br>C-1 |
| • BFA.. | Bifurcated fans<br>Diags. 1, 2, 3, 7, 8 | B-31<br>C-1 |
| • CGD/E.. | GE Series<br>Diags. 1, 2, 3, 7, 8 | D-40/41 |
| • *CHD/E.. | Heritage Series<br>Diags. 1, 2, 3, 7, 8 | D-16/17 |
| • CPD/E.. | Compact 2000<br>Diags. 1, 4, 5, 6, 10 | A-12/14 |
| • *FAD/E.. | FA Series<br>Diags. 1, 2, 3, 7, 8 | D-18/23 |
| • *FL..BD | FlexLine Series<br>Diags. 1, 2, 3, 7, 8 | E-3<br>E-7/11 |
| • *FL..DD | FlexLine Series<br>Diags. 1, 2, 3, 7, 8 | E-3/6 |
| • *HC.. | High Capacity Series<br>Diags. 1, 2, 3, 7, 8 | D-24/25 |
| • *L.. | Centrifugal fans<br>Diags. 1, 2, 3 | E-15/18 |
| • *MMD/E.. | Multiflow Series<br>Diags. 1, 2, 3, 6, 8 | B-22/26 |
| • *PC..DD | PowerLine Series<br>Diags. 1, 2, 3, 8, 10 | B-18/20 |
| • *RDE.. | New Generation Series<br>Diags. 1, 2, 3, 8 | D-8/11 |
| • *RDS.. | New Generation Series<br>Diags. 1, 2, 3, 8 | D-8/11 |
| • RSS.. | New Generation Series<br>Diags. 1, 2, 3 | D-8/11 |
| • *RVE.. | New Generation Series<br>Diags. 1, 2, 3, 8 | D-8/11 |
| • SCD/E... | Short Cased Series<br>Diags. 4, 5, 6, 10 | B-16/17 |
| • *SQ.. | SQ Series<br>Diags. 1, 2, 3, 8 | A-15/17 |
| • SS.. | Smoke-Spill Series<br>Diags. 1, 2, 3 | D-24/25 |
| • TKD/E... | TopKat Series<br>Diag. 1, 8, 9 | D-42/43 |

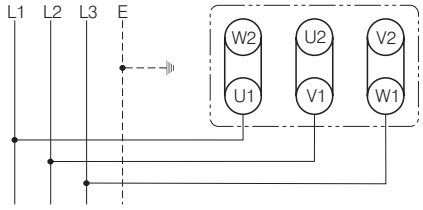
*NOTE: Refer to the motor manufacturer's data on the motor for wiring diagrams on standard frame Ex e, Ex d etc. motors.

## 3Ø WIRING DIAGRAMS

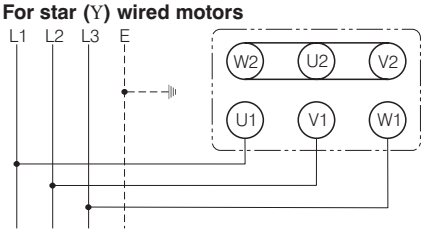
### Diagram 1

**SINGLE SPEED MOTORS**
refer to the name plate data for correct connection

**For delta (Δ) wired motors**



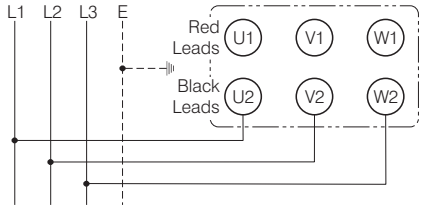

**For star (Y) wired motors**



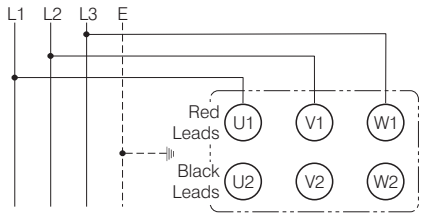

### Diagram 2

**TWO-SPEED MOTORS**
with 2 separate windings (dual winding)

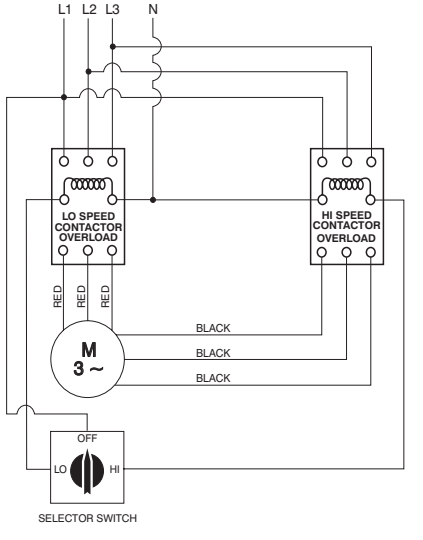
**High speed**




**Low speed**




**Suggested wiring arrangement**

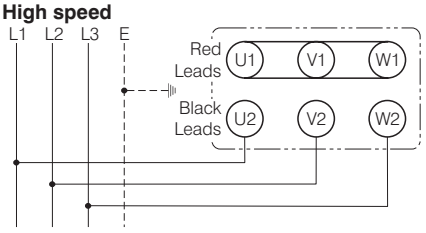



## 3Ø WIRING DIAGRAMS

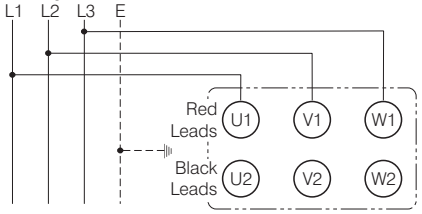
### Diagram 3

**TWO-SPEED MOTORS**
in Dahlander connection (tapped winding)

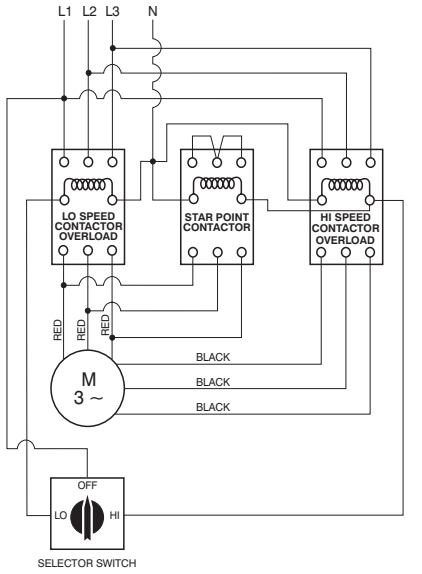
**High speed**




**Low speed**

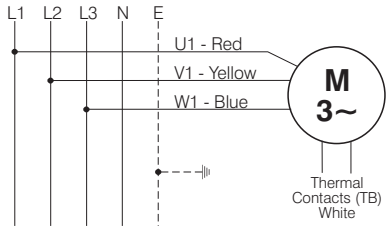



**Suggested wiring arrangement**




### Diagram 4

**Single speed only**
Codes: ..31. and ..35.




**Reference to Fans by Fantech 2004 catalogue.

**These diagrams are current at the time of publication, check the wiring diagram supplied with the motor.**

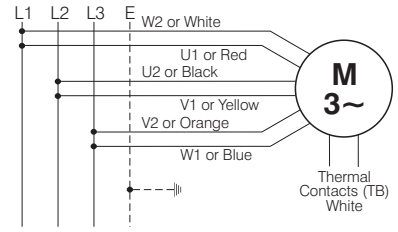
## 3Ø WIRING DIAGRAMS

### Diagram 5

**TWO-SPEED MOTORS**

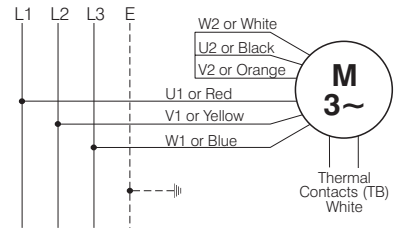
**High speed delta (Δ) connection**

Codes: ..40. to 63.




**Low speed star (Y) connection**

Codes: ..40. and upwards

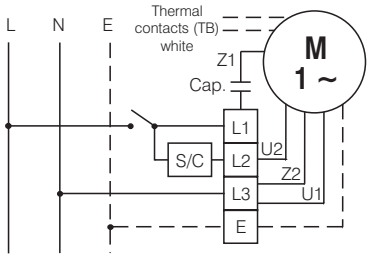



## 1Ø WIRING DIAGRAMS

### Diagram 6

**Anti-Clockwise**

Codes: ..40. to ..63. except supply air models;
..25. to ..35. supply air models;
CPE0314HP & CPE0354HP

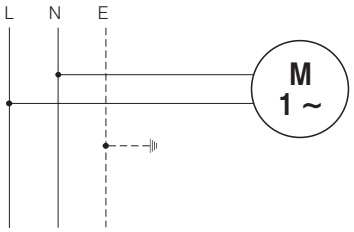



Z2 - Yellow
U2 - Black

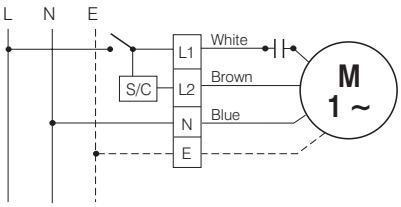
Z1 - Blue
U1 - Red

Bridge L1 and L2 if speed controller (S/C) is not required

### Diagram 7

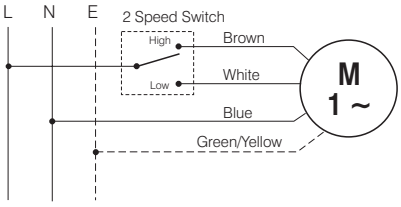



### Diagram 8




Bridge L1 and L2 if speed controller (S/C) is not required

### Diagram 9



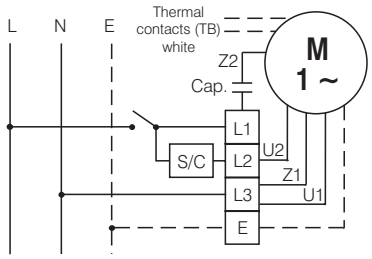

For all other SINGLE-PHASE wiring diagrams refer to the manufacturers data on the motor.

## 1Ø WIRING DIAGRAMS

### Diagram 10

**Clockwise**

Codes: ..25. to ..35. except HP models;
..40. to ..63. supply air models




Z2 - Yellow
U2 - Black

Z1 - Blue
U1 - Red

Bridge L1 and L2 if speed controller (S/C) is not required

**These diagrams are current at the time of publication, check the wiring diagram supplied with the motor.**

# WIRING DIAGRAMS - EXTERNAL ROTOR MOTORS

These diagrams mainly apply to **EXTERNAL ROTOR MOTORS** but some standard frame induction motor diagrams have been included for ease of presentation.

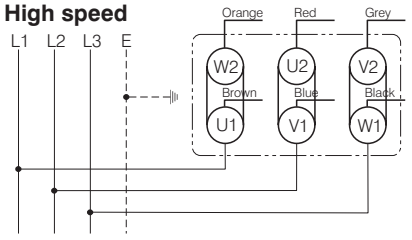

| | | Pgs** |
|---|---|---|
| • *CD/E..D/V | Gamma Series<br>Diags. 1, 2, 3, 7 | D-12/15<br>F-10/11 |
| • *CD/E..VGL | Gamma Series<br>Diags. 1, 2, 3, 7 | D-37/39 |
| • CD/E..S | Gamma Supply Series<br>Diags. 1, 2, 3, 7 | D-32/33 |
| • CF.. | Compact axial fans<br>Single-phase motors<br>Diag. 4 | B-3 |
| • EDM.. | EDM Series<br>Diags. 4, 5 | A-3 |
| • EN.. | EN Series<br>Diag. 4 | A-6 |
| • *FL..ER | FlexLine Series<br>Diags. 1, 2, 3, 7 | E-3/6<br>F-12/13 |
| • FP.. | Compact F/Proof Series<br>Diag. 4 | F-4/5/8 |
| • FSU.. | Filtered Supply Unit<br>Series 1&2; AC motors<br>Diag. 2 | A-21 |
| • FSU-DC and FSU146 | | See M-9 |
| • GDR.. | Sigma Series<br>Diag. 2 | E-2 |
| • GRE.. | Sigma Series<br>Diag. 2 | E-2 |
| • HB.. | Header box<br>Diag. 2 | A-20 |
| • HCE.. | Hideaway Series<br>Diag. 2 | B-12/13 |
| • HCM... | HCM Series<br>Diag. 4 | A-7 |
| • HV.. | Stylvent Series<br>Diags. 4, 6 | A-8/9 |
| • HXM.. | HXM Series<br>Diag. 4 | A-11 |
| • MT.. | Minitube Series<br>Diags. 2, 4 | B-14/15 |
| • MV.. | Minivent Series<br>Diags. 2, 4 | D-2/3<br>D-30/31 |
| • PC..ER | PowerLine Series<br>Diags. 1, 2, 3, 7, 8 | B-18/20<br>F-6/7 |
| • PF.. | Profile Fan Series<br>Diag. 2 | D-26/27 |
| • RP.. | Ring Plate Series<br>Diag. 2 | A-4/5 |
| • TE.. | Turbo Series<br>Diag. 4 | B-10/11 |
| • *TILD/E.. | Twin Neta Series<br>Diags. 1, 2, 3, 7 | B-28/29 |
| • VM.. | Ventmajor Series<br>Diag. 4 | B-4/5 |
| • VRP.. | Ring Plate Series<br>Diag. 2 | A-4/5 |
| • *WCD/E.. | Delta Series<br>Diags. 1, 2, 3, 7 | A-18/19<br>F-2/3 |
| • *TWCD/E.. | Delta Series, Twin fan<br>Diags. 1, 2, 3, 7 | A-18/19 |


## 3Ø WIRING DIAGRAMS

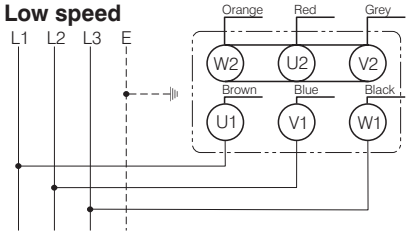
### Diagram 1

**TWO-SPEED MOTORS**

**High speed**



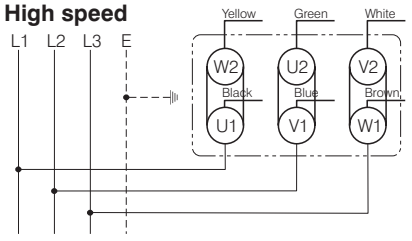

**Low speed**



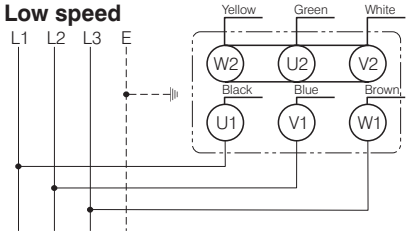

### Diagram 7

**TWO-SPEED MOTORS**

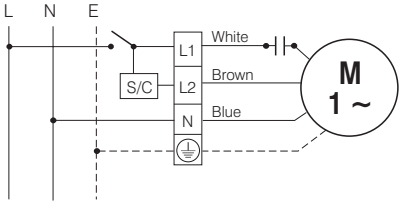
**High speed**




**Low speed**




### Diagram 8



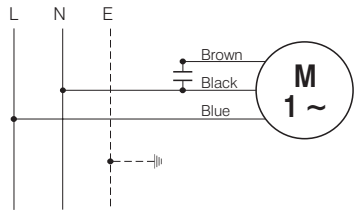

Bridge L1 and L2 if speed controller (S/C) is not required

*NOTE: Units with Ex e motors must be connected in star (Y).

## 1Ø WIRING DIAGRAMS

### Diagram 2

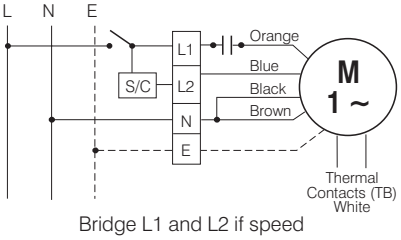
**3 active wires plus auto-reset thermal contacts**




Codes: CE19.. to CE40.. + other fans as shown

### Diagram 3

**4 active wires plus manual-reset thermal contacts**

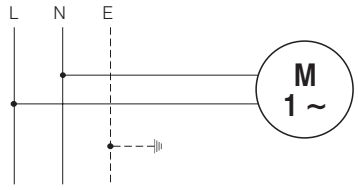



Bridge L1 and L2 if speed controller (S/C) is not required

Codes: CE45.. and over + other fans as shown

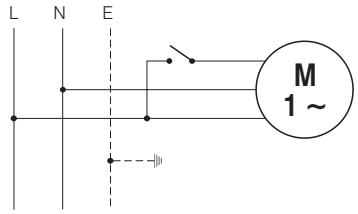
### Diagram 4

**Codes: EDM..S & ..C; HV-150AE; HV-150 & 230M; MT132; MV112 & MV132**




### Diagram 5

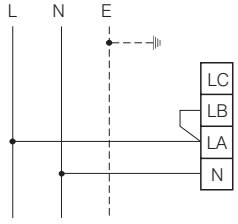
**Codes: EDM..CT & ..CR**




### Diagram 6

**Codes: HV-230AE & HV-300AE**

Exhaust air mode. For supply air mode bridge LC & LA




**Reference to Fans by Fantech 2004 catalogue.

**These diagrams are current at the time of publication, check the wiring diagram supplied with the motor.**

# WIRING DIAGRAMS - EXTERNAL ROTOR & DC MOTORS

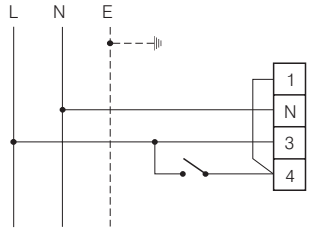
These diagrams apply to **EXTERNAL ROTOR MOTORS** that are fitted to the following products:-

| | | Pgs** |
|---|---|---|
| • EV.. | Window mounted fans Diag. 1 | A-10 |
| • FSU146 | Filtered Supply Units Series 3, Diag. 3 | A-23 |
| • FSU-DC | | See below |
| • Other FSU-AC units | | See page M-8 |
| • TD.. | Mixvent Series Diag. 2 | B-6/8 |
| • WJ.. | WhisperJet Fan Kit Diag. 2 | B-34/35 |

## 1Ø WIRING DIAGRAMS

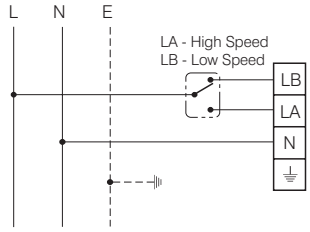
### Diagram 1

**Codes: EV Series**




### Diagram 2

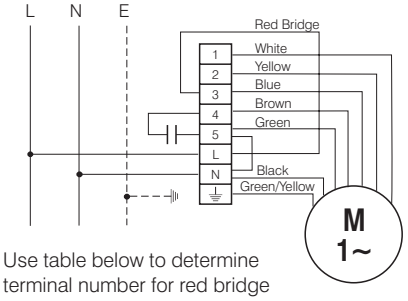
**Codes: All Mixvent units**




## 1Ø WIRING DIAGRAMS

### Diagram 3

**Codes: FSU146-4-A1**




Use table below to determine terminal number for red bridge

| Air Flow, L/sec | 109 | 166 | 199 |
|---|---|---|---|
| **Speed** | Low | Med | High |
| **Terminal** | 1 | 2 | 3 |

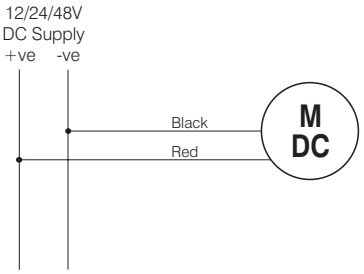
This diagram applies to the following fans fitted with a **DC MOTOR**:-

| | | Pgs** |
|---|---|---|
| • FSU.. | Filtered Supply Unit DC motor Diag. 4 | A-22 |
| • MV..DC DC motor | Minivent Series Diag. 4 | D-44 |

To reverse rotation, switch connections.

## DC SUPPLY WIRING DIAGRAM

### Diagram 4




**Reference to Fans by Fantech 2004 catalogue.

**These diagrams are current at the time of publication, check the wiring diagram supplied with the motor.**

# - IMPORTANT -

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