

Please read and understand this manual prior to installation, and obtain expert assistance if you are not qualified to install this equipment. Make the safety of your installation a priority. This component is hazardous.

POWER RATING

For DC motors rated up to 0.37KW (0.5HP) at 180V armature.

MAXIMUM OUTPUT

Armature: 3A continuous, 200V maximum. Derate by 2.5%/deg C above 40 deg C and 1%/100M above 3000M. Field: 0.5A at 0.9 * AC supply.

AC SUPPLY INPUT

Model 300: 100-110V AC or 220-240V AC.

Model 300LV60: 27-30V AC or 55-60V AC.

} All $\pm 10\%$, 50 to 60Hz.

SPEED RANGE

Full torque speed range 0-100% dependent on motor specification. Full load regulation typically 2% with optimised IR compensation.

ADJUSTMENTS

Maximum speed: 90-200V (20-48V on LV models) set by integral preset pot.

Minimum speed: 0-30% of maximum speed set by integral preset pot.

Ramp: Internally fixed 1 second up and down ramp rate.

IR Comp: Position for user fitted resistor (COMP). R=68K for 10% IR comp.

Current limit: 3 Amps (Set by R16(KOhms) = $I_{max}/0.3$ i.e. 3.3K for 1 Amp).

CONTROL ACTION

Speed loop: Full P+I armature voltage feedback. Current loop: Full P+I current shunt feedback.

INSTALLATION

WARNINGS. All connections to the drive are NON-ISOLATED. Do not connect any of the terminals to earth or other non-isolated equipment. A common cause of drive damage is accidental earthing of the external wiring.

This unit is not designed for use with a remote speed setpoint potentiometer. The unit may be damaged if the integral speed setpoint potentiometer is removed. Any applications requiring this facility should use model 370.

Do not open circuit or reverse the field or armature connections whilst current is flowing.

For applications requiring frequent stop/start or jogging it is important that the period between removal and re-application of the AC supply is greater than 0.25 seconds.

EMC. See page 3 for EMC installation guidelines for systems to be installed in the European Union.

POWER CABLING. Use correctly rated cable minimum 500V AC, 1.5 times armature current.

FUSING. The drive thyristor bridge can only be protected by fitting an external semiconductor fuse.

Recommended fuse rating 5 Amp, minimum 250V, maximum I^2t rating = 50 A^2s .

MECHANICAL. Optimise heatsink airflow. Avoid vibration and ambient temperatures outside -10C and +40C. Protect the drive from dust and pollutants.

MOTOR. Foot mounted motors must be level and secure. Protect motors from ingress of foreign matter during installation. Ensure accurate alignment of motor shaft with couplings. Do not hammer pulleys or couplings onto the motor shaft. If half wave field configuration is required, connect the field to F- and N. This will give a field voltage of 0.45 times AC supply voltage. Permanent magnet motors do not require field connections, leave terminals F- and F+ open circuit.

Before running the motor complete the following check list.

- 1) Check for correct insulation resistance between all windings and earth with all drive cables disconnected
- 2) Check inside connection box for foreign objects, damaged terminals etc.
- 3) Check that brushes are in good condition, correctly seated and free to move in brush boxes. Check correct action of brush springs.
- 4) Motor vents must be freed of any obstruction or protective covers prior to running.

AC SUPPLY. Ensure that the supply selection jumper on the drive matches the incoming supply.

COMMISSIONING

PRESET POT SETTINGS. The 300 unit is shipped to run on the highest supply option at 180V armature (48V for LV60, 36V for LV48 units) . Reduce MAX preset if appropriate.

POWER ON. Check ON lamp lights. Check field output voltage is correct on F-, F+. Gradually increase speed setpoint, check motor rotation. If the direction is wrong, remove power and swap the connections to A+, A-. Increase speed setpoint to maximum, drive should now be running at full speed. Fine adjust full speed with MAX preset. Do not exceed armature voltage rating. Reduce speed setpoint to zero, motor should coast down to zero speed. Adjust MIN preset for desired minimum speed.

INSTALLATION GUIDE FOR SYSTEMS USED IN THE EUROPEAN UNION

Special consideration must be given to installations in member states of the European Union regarding noise suppression and immunity. According to IEC 1800-3 (EN61800-3) the drive units are classified as complex components only for professional assemblers, with no CE marking for EMC. The drive manufacturer is responsible for the provision of installation guidelines. The resulting EMC behaviour is the responsibility of the manufacturer of the system or installation. The units are subject to the LOW VOLTAGE DIRECTIVE 73/23/EEC and are CE marked accordingly.



Following the procedures outlined below will normally be required for the drive system to comply with the European regulations, some systems may require different measures. Installers must have a level of technical competence to correctly install. Although the drive unit itself is not subject to the EMC directive, considerable development work has been undertaken to ensure that the noise emissions and immunity are optimised.

EN61800-3 specifies 2 alternative operating environments. These are the domestic (1st environment) and industrial (2nd environment). There are no limits specified for conducted or radiated emissions in the industrial environment, hence it is usual for the filter to be omitted in industrial systems.

Definition of an industrial environment. All establishments other than those directly connected to a low-voltage power supply network which supplies buildings used for domestic purposes.

DRIVE INSTALLATION REQUIREMENTS FOR EMC COMPLIANCE

Keep parallel runs of power and control cables at least 0.3m apart. Crossovers must be at right angles

The AC supply filter must have a good earth connection to the enclosure back plane. Take care with painted metal to ensure good conductivity.

The metal enclosure will be the RF ground. The AC filter and motor cable screen should connect directly to the metal of the cabinet for best performance.

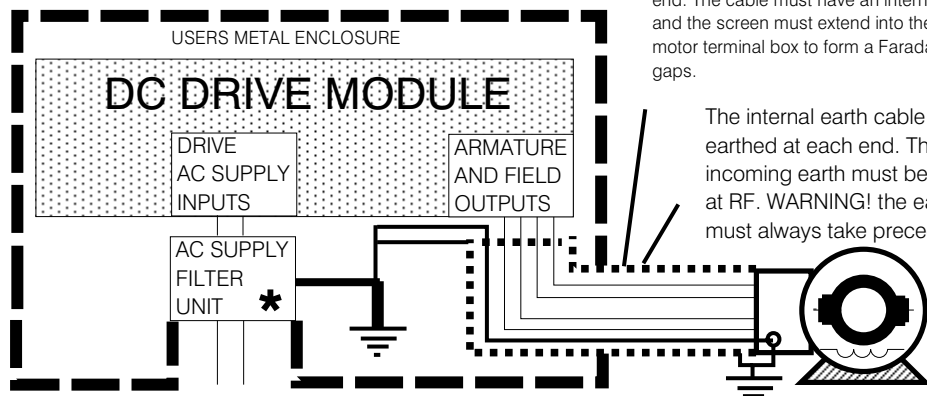
Linear control signal cables must be screened with the screen earthed at the drive end only. Minimise the length of screen stripped back and connect it to an analogue earth point

Keep sensitive components at least 0.3m from the drive and power supply cables

The AC input filter has earth leakage currents. Earth RCD devices may need to be set at 5% of rated current.

The motor cable must be screened or armoured with 360 degree screen terminations to earth at each end. The cable must have an internal earth cable and the screen must extend into the enclosure and motor terminal box to form a Faraday cage without gaps.

The AC connections from the filter to the drive must be less than 0.3m or if longer correctly screened
Do not run filtered and unfiltered AC supply cables together



Control signals must be filtered or suppressed eg control relay coils and current carrying contacts.

The internal earth cable must be earthed at each end. The incoming earth must be effective at RF. WARNING! the earth safety must always take precedence.

IMPORTANT SAFETY WARNINGS



DANGER
ELECTRIC SHOCK RISK

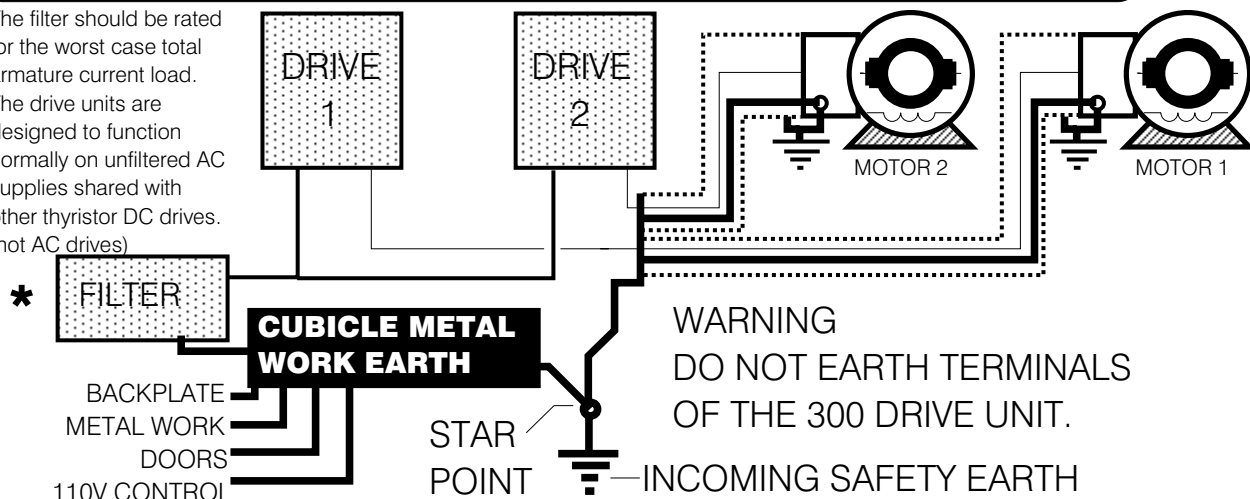
The AC supply filters must not be used on supplies that are un-balanced or float with respect to earth

The drive and AC filter must only be used with a permanent earth connection. No plugs/sockets are allowed in the AC supply

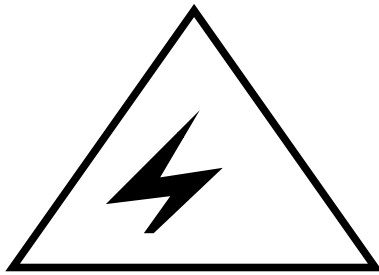
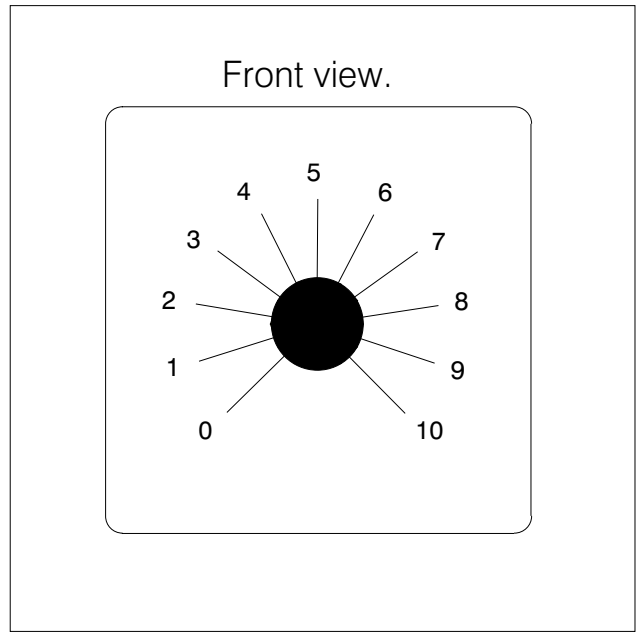
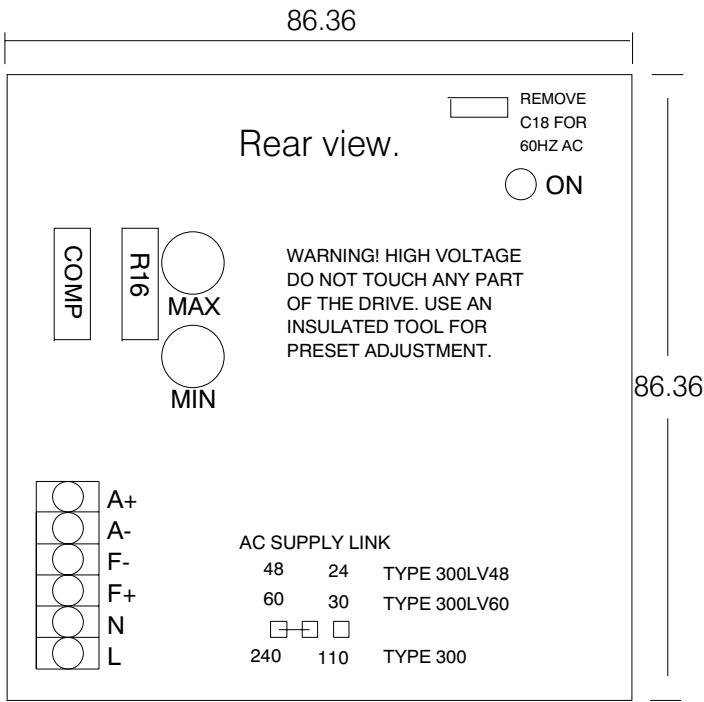
The AC supply filter contains high voltage capacitors and should not be touched for a period of 20 seconds after the removal of the AC supply

MULTIPLE DRIVES WITH ONE FILTER AND EARTHING METHODS

The filter should be rated for the worst case total armature current load. The drive units are designed to function normally on unfiltered AC supplies shared with other thyristor DC drives. (not AC drives)



WARNING
DO NOT EARTH TERMINALS
OF THE 300 DRIVE UNIT.



DANGER

ELECTRIC SHOCK RISK

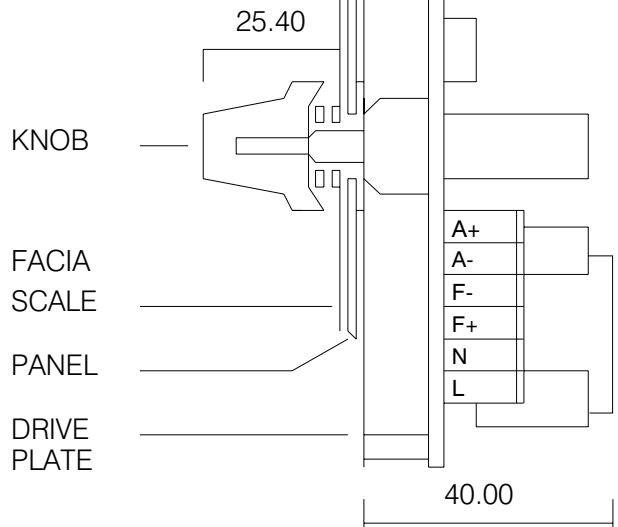
Warning

All terminals at high potential. Do not touch.

HEALTH AND SAFETY AT WORK. ELECTRICAL DEVICES CONSTITUTE A SAFETY HAZARD. IT IS THE RESPONSIBILITY OF THE USER TO ENSURE COMPLIANCE WITH ANY ACTS OR BYLAWS IN FORCE. ONLY SKILLED PERSONS SHOULD INSTALL THIS EQUIPMENT.

BARDAC DRIVES DOES NOT ACCEPT ANY LIABILITY WHATSOEVER FOR THE INSTALLATION, FITNESS FOR PURPOSE OR APPLICATION OF ITS PRODUCTS. IT IS THE USERS RESPONSIBILITY TO ENSURE THE UNIT IS CORRECTLY USED AND INSTALLED.

10.3 MM FIXING HOLE
IN CENTRE



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