

INSTALLATION AND COMMISSIONING

Ensure supply is disconnected before working on unit

POWER CABLING

Use correctly rated cable minimum 600V AC 2 times armature current

FUSING

The drives have built in line fuses.

400	6.3 AMP	HRC
800	15 AMP	HRC
1200	15 AMP	HRC

CONTROL SIGNALS

All control inputs to the drives are NON-ISOLATED. Do not connect any of the terminals to earth or other low voltage. A common HAZARD is accidental earthing of the external pot and contact wiring. Avoid running signal cables close to power cables.

SUPPRESSION

The drives have excellent noise immunity. However installations involving electrical welding or RF induction heating may require further filters on the line and armature terminals. Contactor coils and sparking contacts may also require suppression. A 100R in series with 0.1uF cap. is usually adequate in these situations.

SELECTOR SWITCHES AND JUMPERS

Must not be touched with power on.

MECHANICAL

Optimise heastink airflow. Avoid vibration and ambient temps outside -10C and +40C. Protect the drive from 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. Before running the motor complete the following check list.

- 1) 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.

SUPPLY

Please ensure that the supply selection jumper on the drive matches the incoming supply. Failure to do this may result in permanent damage of the drive unit.

HT100449 SS2

INITIAL SETTINGS

The drive units are shipped to run on the highest supply option at nominal speed in ARMATURE VOLTAGE feedback mode. To change this run through switches S1 to S4 and select accordingly.

- S1 S2 SPEED. Calculate desired full scale feedback voltage and select range. Adjust within the range by using the MAX SPEED preset. Feedback may be tacho OR armature.
- S3 Normally off. This switch allows a Torque signal to be entered when on via signal pad S4 (T1) on top edge. Refer to block diagram on page 4.
- S4 ON for Armature voltage feedback. OFF for Tacho feedback.

PRESET POT SETTINGS

MAX CURRENT. cw rotation gives 0 to 100% current limit. eg. 50% rotation gives 50% current limit. Check motor rating plate to find correct limit.

Anticlockwise

MIN SPEED UP RAMP

DOWN RAMP IR COMP

POWER ON Check ON lamp lights

CLOSE RUN CONTACT

Gradually increase external setpoint, check motor rotation. If the direction is wrong, TURN OFF and swap A+, A-

INCREASE SETPOINT.

Drive should ramp up to full speed. Fine adjust with MAX SPEED preset. Do not exceed armature voltage rating. Reduce setpoint, drive should ramp down to zero. Adjust MIN SPEED to desired level. Run motor up and down and adjust RAMPS.

STABILITY

Adjust STAB to improve response if necessary. Clockwise rotation gives faster response. Excessive rotation in either direction may lead to instability depending on load.

IR COMP

Speed droop may occur where armature voltage feedback is used. This is compensated for by clockwise rotation of IR COMP preset. Excessive rotation may lead to instability. No IR COMP is required for systems with tacho feedback.

TORQUE SYSTEMS

See typical applications. In this mode the lowest setpoint has priority. Hence the speed setpoint is set to demand a speed slightly in excess of the working speed, and then the torque setpoint will always be operating as a limit. In the event of a web break for example, the motor will only run up to the level set on the speed pot.

LAMPS

ON indicates AC power is applied

STALL Stall lamp lights and drive quenches if stall timer trips. see below for description of timer characteristics.

PRESETS

DOWN RAMP Rotate clockwise to increase drive deceleration. Span 1 to 30 seconds. Note, natural coast down is a limit.

UP RAMP Rotate clockwise to increase drive acceleration. Span 1 to 30 seconds

MIN SPEED Rotate clockwise to increase minimum speed. Use to adjust 4-20mA loop burden resistor between 0 and 390R if 4-20mA mode is selected.

MAX SPEED Rotate clockwise to increase speed. Change range with S1 and S2

STAB Rotate clockwise to increase response. Excessive rotation may cause instability. If rated motor voltage is much lower than AC supply anticlockwise is best.

IR COMP Rotate clockwise to increase level of armature voltage droop compensation. Excessive rotation may cause instability

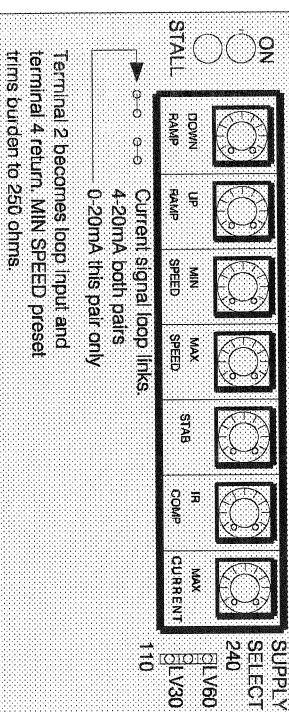
MAX CURRENT Rotate clockwise to increase current. Use S1 and S2 to select range

Anticlock

Midway

Clockwise

CUSTOMER PRESETS AND LOG



S1 These two switches allow four maximum feedback voltage ranges to be selected. Use the MAX SPEED PRESET to adjust within the range. The drive will control from 0V to the selected maximum for a 0-10V input.

S1	12-25V	25-50V	50-100V	100-200V
S2	Both off	S1 on	S1 off	Both on
S3	Both off	S2 off	S2 on	Both on

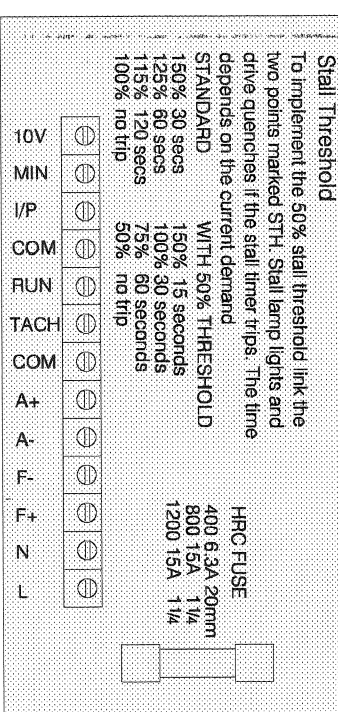
This allows the unit to operate as a torque controller. When ON the drive current will be controlled between 0% and the level set on the MAX CURRENT preset by a 0-10V signal on T64. NOTE the stall timer will be automatically inhibited in this mode.

S4 This switch allows the selection of the source of speed feedback. When ON the ARMATURE VOLTAGE is selected. When OFF, a tacho.

Stall Threshold

To implement the 50% stall threshold link the two points marked STH. Stall lamp lights and drive quenches if the stall timer trips. The time depends on the current demand

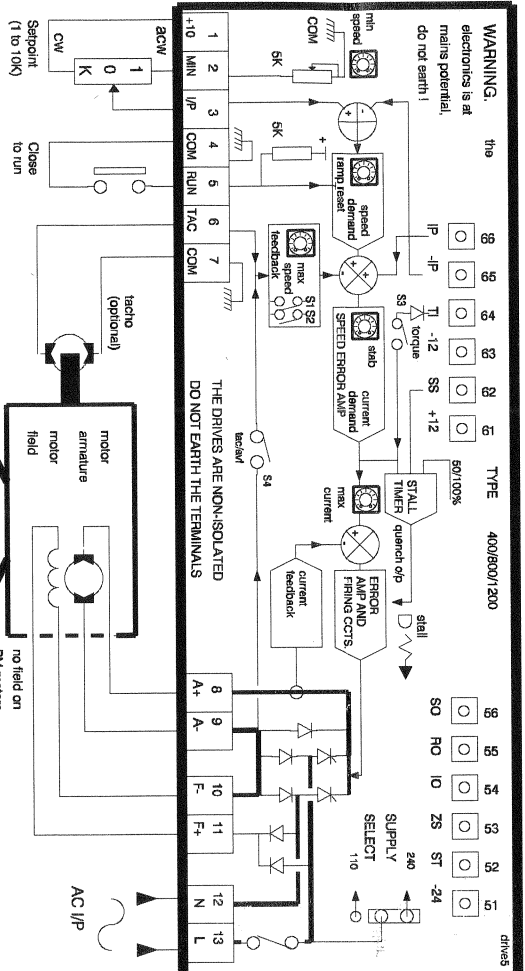
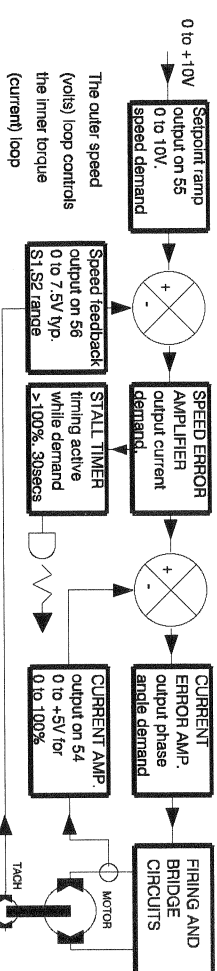
STANDARD	WITH 50% THRESHOLD	HRC FUSE
150% 30 secs	150% 15 seconds	400 6.3A 20mm
125% 60 secs	100% 30 seconds	800 15A 1 1/4
115% 120 secs	75% 60 seconds	1200 15A 1 1/4
100% no trip	50% no trip	



TROUBLE SHOOTING.

The drive consists of 2 high accuracy feedback control loops.

- 1 These units are NON isolated. DO NOT connect the electronics to earth or other low voltage.
- 2 If you need to connect to other instruments, eg panel meter. Ensure that the instrument can float safely at high voltage
- 3 For systems involving connection to other controllers, it is better to use isolated drive models 400i or 1600i
- 4 Remember, all the wires, pots, contacts etc. that are connected to the terminals will be floating at mains potential.
- 5 STALL problems shown by stall lamp coming on after running are caused by the drive unit not able to give set speed
- 6 Typical STALL reasons. a) MAX CURRENT preset not correctly set, hence insufficient torque
- 7 b) Motor not powerful enough for application. c) Speed calibration set beyond capability of supply.
- 8 d) Any factor which prevents motor from rotating at set speed, eg. jammed load, low supply voltage.



- 9 Pot wired with wiper connected to T2 instead of T3. Motor slows down instead of speeding up
- 10 Wires to T2 and T3 transposed. Motor slows down for clockwise rotation
- 11 Any pot wire or internal electrical part of pot earthed. This causes critical damage. Double check before power on.
- 12 Loose or intermittent tacho coupling causes tachy or overspeeding. Make sure coupling is secure and non-elastic
- 13 Incorrect feedback scaling causes over or underspeeding. Calculate the desired max. tacho volts, adjust S1, S2
- 14 Tacho failure. Until a replacement is obtained change to AV feedback S4. Rescale with S1, S2
- 15 Armature resistance should normally be a few hundred ohms. The field must be isolated from earth and the armature
- 16 Shorted turn on motor armature can cause power device failure. Check resistance through volts, adjust S1, S2
- 17 Brushes should be in good condition, correctly seated, and free to move in brush boxes.
- 18 Field resistance should normally be a few hundred ohms. The field must be isolated from earth and the armature
- 19 The AC supply must lie within the limits specified on page 8. Ensure the selection jumper is correct.
- 20 If the unit fuse blows as soon as power is applied, with no motor connections, it is likely to be a damaged unit.

SPECIFICATION

FUNCTION	SPECIFICATION	COMMENTS
CONTROL ACTION	DUAL LOOP PROPORTIONAL + INTEGRAL	
FEEDBACK METHOD	ARMATURE VOLTS	TACHOMETER
0-100% REGULATION	2% TYPICAL	0.1% TYPICAL
MAX TORQUE SPEED RANGE	20 : 1	100 : 1
OVERLOAD	150% CONTINUOUS CURRENT FOR 30 seconds.	
CUSTOMER PRESETS		
MAX SPEED	12V - 200V FULL SCALE FEEDBACK	SWITCH SELECT
MIN SPEED	0-50% OF MAX SPEED	NON-INTERACTIVE
UP/DOWN RAMPS	INDEPENDANTLY ADJUSTABLE 1-30secs	LINEAR RAMPS
STABILITY	VARIES SPEED LOOP GAIN	
IR COMPENSATION	0-30% OF ARMATURE VOLTAGE	
MAX CURRENT	LINEAR SETTING FROM 0-100%	150% OVERLOAD
SWITCH SELECTABLE		
SPEED RANGE	FOUR RANGES OF FEEDBACK VOLTAGE	S1, S2
TORQUE MODE	0-10V INPUT FOR 0-100% CURRENT WITH AUTOMATIC OVERSPEED PROTECTION.	S3
TACHO/AVF	SELECT TACHO OR AV. FEEDBACK	S4
JUMPER FUNCTIONS	DUAL SUPPLY VOLTAGE SELECTOR	
LINK FUNCTIONS		
4-20mA LOOP	ALLOWS 4-20mA LOOP SIGNAL INPUT	
50% STALL LEVEL (STH LINK)	ALLOWS LARGE PEAK CURRENTS	5V COMPLIANCE 150% PEAK
SUPPLY RANGES		
46Hz TO 66Hz	MAX 38V	LV90 110 130V 240
AUTO RANGING	MIN 27V	LV60 72V 100V 200V
SIGNAL OUTPUTS		
RELAY OUTPUTS	SPEED, CURRENT, RAMP	ALL BUFFERED FOR 24V DC
REL OUTPUTS	STALL, ZERO SPEED RELAY DRIVERS	+-20%
RAIL OUTPUTS	-24V UNREGULATED 25mA	0.01%/DEG C 5%
	+12V, +10V, -12V REGULATED 10mA	
FIELD OUTPUT	0.9 TIMES AC SUPPLY, 0.5 AMP MAX	DC VOLTS
ALTITUDE	3000 METRES MAX FOR FULL RATING	
HUMIDITY	85% R.H. AT 40 C. NON-CONDENSING	DERATE 1%/100M
FORM FACTOR	TYPICAL 1.5 AT MAX. OUTPUT	
MAX FUSING	300 ALL MODELS	

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.