7.0 BASIC SETTING UP AND OPERATING INSTRUCTIONS

7.1 PRESET ADJUSTMENT DESCRIPTION

Check the preset potentiometer settings on the larger plug-in card which is accessible under the front cover. The potentiometers are normally factory set to positions which will provide adequate performance in most load/controller configurations. It is recommended that initially the presets are left in these positions and that fine tuning of the system is done, if necessary, at the end of the commissioning process.

The one exception to this is the main current limit preset; note the setting of this control and then turn it fully anticlockwise. The initial setting of the presets should thus be as follows:

<table>
<thead>
<tr>
<th>POT No.</th>
<th>DESCRIPTION</th>
<th>NORMAL INITIAL SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setpoint ramp up rate</td>
<td>Midway</td>
</tr>
<tr>
<td></td>
<td>Clockwise rotation gives more rapid acceleration.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Setpoint ramp down rate</td>
<td>Midway</td>
</tr>
<tr>
<td></td>
<td>Clockwise rotation gives more rapid deceleration.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Zero speed</td>
<td>About midway</td>
</tr>
<tr>
<td></td>
<td>It should not be necessary to adjust this initially on a new factory tested drive.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Standstill threshold</td>
<td>Midway</td>
</tr>
<tr>
<td></td>
<td>Sets low speed drive quench level if the standstill logic switch S8/2 is set to the on position.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clockwise sets lower speed.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Speed Proportional</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Clockwise increases speed loop gain</td>
<td>Clockwise</td>
</tr>
<tr>
<td>6</td>
<td>Speed Integral</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Clockwise decreases speed loop integral time constant.</td>
<td>Clockwise</td>
</tr>
<tr>
<td>7</td>
<td>Main Current Limit</td>
<td>Fully anti-clockwise</td>
</tr>
<tr>
<td></td>
<td>Clockwise increases current limit up to max. 200% FLC* short-term overload.</td>
<td>(Zero current)</td>
</tr>
<tr>
<td>8</td>
<td>Current Proportional</td>
<td>Midway</td>
</tr>
<tr>
<td></td>
<td>Clockwise increase current loop gain.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Current Integral</td>
<td>Fully anti-clockwise</td>
</tr>
<tr>
<td></td>
<td>Clockwise decreases current loop integral time constant.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Speed Calibration</td>
<td>About midway</td>
</tr>
<tr>
<td></td>
<td>Clockwise increases motor speed.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Field</td>
<td>Fully anti-clockwise</td>
</tr>
<tr>
<td></td>
<td>Field Voltage O/P clockwise increases output voltage (see S9/4)</td>
<td></td>
</tr>
</tbody>
</table>
7.2 OPTION SWITCHES

There are two user selectable option switches S8 and S9, which are located under the lower flap of the control board. Selection should only be made when the controller is isolated.

S8/1 BUFFERED CURRENT SIGNAL (terminal 27)
UP = ON = Armature current meter reads ± Amps. For applications employing a centre-zero meter.
DOWN = OFF = Meter reads modulus. For applications employing a uni-directional meter.
DEFAULT: ON
NOTE: In 546 and 548 units the Armature Current Meter will always read + Amps, regardless of the setting of switch S1, since these convertors cannot produce negative output current.

S8/2 STANDSTILL LOGIC
UP = ON = Standstill logic enabled. This will disable the drive whenever the Total Setpoint is zero and the speed is below the standstill threshold set by P4.
DOWN = OFF = Standstill logic inoperative.
DEFAULT: OFF

S8/3 SETPOINT RAMP CONNECTION
UP = ON = Setpoint Ramp Output internally summed with Input No. 1 and Input No. 2.
DOWN = OFF = Setpoint Ramp Output internally disconnected from the summing amplifier (but still available at terminal 8).
DEFAULT: ON

S8/4 SETPOINT RAMP RANGE
UP = ON = Setpoint ramp rate adjustable from 0.25 to 7.5 seconds.
DOWN = OFF = Setpoint ramp rate adjustable from 2.5 to 75 seconds.
DEFAULT: ON

S8/5 HEALTH LATCH ENABLE
UP = ON = Prevents drive restart when fault condition removed (eg, on over-current reset, or motor thermistor reset, drive will not automatically restart) To allow drive to restart, terminal 34 (start) must be taken low (eg, 0V).
DOWN = OFF = Drive restarts automatically on fault reset.
DEFAULT: ON

S8/6 EXTERNAL RAMP RESET
UP = ON = Setpoint ramp reset by either drive quench or terminal 6 to 0V.
DOWN = OFF = Setpoint ramp reset only by terminal 6 to 0V (allows external use of setpoint ramp).
DEFAULT: ON

S8/7 CONTACTOR DROP OUT ON OVER-CURRENT
UP = ON = Contactor does not drop out on over-current trip (this can prevent burning of contactor poles in certain configurations).
DOWN = OFF = Contactor drops out on over-current.
DEFAULT: OFF

S8/8 TACH FILTER (10ms time constant)
UP = ON = Tach filter of 10ms time constant applied to the speed feedback to attempt to remove tach ripple.
Note that this option will have a destabilising effect on the speed loop stability and a reduction in speed loop gain P5, may be required.
DOWN = OFF = No tach filter.
DEFAULT: OFF

S9/1 HALF WAVE FIELD SUPPLY
UP = ON = Half wave rectification field supply. Typically using 415V single phase supply the field voltage will be 180V DC nominal.*
DOWN = OFF = No field supply from this option.
DEFAULT: OFF
S9/2  FULL WAVE FIELD SUPPLY
UP = ON = Full wave rectification field supply. Typically using 415V single phase supply the field voltage will be 360V DC nominal.*
DOWN = OFF = No field supply from this option.
DEFAULT: ON

S9/3  3 PHASE HALF WAVE FIELD SUPPLY
ON = UP = 3 phase half wave field supply. Typically when operating from 3 phase 460/480V supply the field voltage will be 300V DC nominal.*
DOWN = OFF = No field supply from this option
DEFAULT: OFF

* If more accurate field voltage setting is required, refer to option switch S9/4 and P11.

S9/4  ADJUSTABLE FIELD SUPPLY
ON = UP = Adjustable field supply used in conjunction with P11. The adjustment range is typically from 10% to 100% of full wave rectification.
OFF = DOWN = No field supply form this option.
DEFAULT: OFF

S9/5  FIELD FAILURE OVER-RIDE
ON = UP = Field failure condition over-ridden, typically when operating with a permanent magnet motor, or a shunt machine with very low field current, the field failure alarm is made inactive.
DOWN = OFF = Field failure alarm active.
DEFAULT: OFF

S9/6  RESERVED
DEFAULT: OFF (Factory set)

S9/7  2Q/4Q OPERATION
ON = UP = 2 Quadrant operation only, for use with 591A and 599A products.
DOWN = OFF = 4 Quadrant operation only for use with 590A and 598A products.
DEFAULT: Factory set (NOTE: No malfunction will occur if S9/7 is left off on any product).

S9/8  RESERVED
DEFAULT: ON (Factory set)
7.3 CALIBRATION

THE CONTROLLER IS NOT PRE-CALIBRATED TO ORDER DURING MANUFACTURING, HENCE IT IS THE RESPONSIBILITY OF THE USER TO ENSURE THAT THE CORRECT CALIBRATION PROCEDURE HAS BEEN FOLLOWED.

NOTE: DO NOT ADJUST THE CALIBRATION SWITCHES WHEN THE DRIVE IS OPERATIONAL.

7.3.1 SPEED CALIBRATION

Select the source for tach feedback using switch S1 (refer to description for S1).

Adjust calibration switches: 
S2 0 / 100 Volts
S3 0 - 90 Volts
S4 0 - 9 Volts

to obtain the tach feedback voltage at full speed.

Check motor name plate for maximum speed, do not exceed this value.

For full speed tach voltages greater than 200 Volts an external resistor, value RE, is required in series with the tach.

When the maximum value is selected (ie, 199) then RE is approximately given by the formula,

\[
RE = \frac{\text{tach volts} - 200}{5} \quad \text{K ohms}
\]

The power dissipation of this resistor is given by the formula

\[
PE = 5 \times (\text{tach volts} - 200) \quad \text{mW.}
\]

7.3.2 ARMATURE CURRENT CALIBRATION

Before calibration, check the motor name plate for the value of rated current.

Ensure that the power chassis has the appropriate rating value.

Do not exceed the motor name plate value, or the chassis rated value.

Set the calibration switches to motor full load current minus 1 amp.

Use calibration switches: 
S5 0 - 700 Amps
S6 0 - 90 Amps
S7 0 - 9 Amps

NOTE: Settings above 720 are invalid. 598A and 599A are calibrated by burden resistors in the chassis. Calibration in these circumstances is set by the combined value of the burden resistors and S5,S6, and S7 should be set to zero.

\[
RB = \frac{2200}{\text{Full Load Current}} \quad \text{ohms}
\]

NOTE: Full load current = 100% rating

and \[ \frac{1}{RB} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3} \]

Values are selected in the factory on the basis of the best combination of standard resistor values.

NOTE: The armature current calibration switches should not be changed to increase the current above the factory set value without consulting Eurotherm Drives Limited Engineering Department.