The Application Note is pertinent to the Focus 3 Family

Focus 3 Speed Master / Torque Slave

Focus 3 Drives may be used in a Speed Master / Torque Slave arrangement in applications where two motors need to share the machine load. This could involve two motors directly coupled to the same drive shaft or two drive rolls that are “pinched” together. In the case of the “pinched” rolls, since the second drive is a basic torque control, care must be taken that the rolls are always pinched together with positive pressure any time the system is run, otherwise the second motor can run to high uncontrolled motor speeds.

In this application, Figure #1, no over speed protection is required on the Torque Slave since the two motor shafts are directly coupled to the machine. The drives should also be started together. Diagram # 1 on page 4 shows the basic drive interconnections.

In this application, Figure #2, over speed protection is highly recommended on the Torque Slave since the two motor shafts are only coupled to the machine when the rolls are “pinched” together. The drives should also be started together. Diagram # 2 on page 5 shows the basic drive interconnections.
These systems can employ either two regenerative drives or two non-regenerative drives (in general you would not use one regenerative drive with one non-regenerative drive). The decision on what type of drive should be used is typically based on the application. A motor mounted tachometer may be used on the Speed Master motor to provide better speed regulation.

**Non-regenerative** drives are typically used in applications where the motors are always driving (or “pushing”) the load and do not have to reverse rotation or “hold back” the load against an external force.

**Regenerative** drives are typically used in applications that may have to reverse direction, decelerate to zero speed in a controlled ramp that would be faster than a natural coast and or provide a “hold back” torque against an external force.

**Regenerative Requirements**

Since the regenerative drives are “isolated“ drives (drive circuit common is isolated from the drives power circuit) the control circuits can be tied together without any special considerations. Using the transformer arrangement shown on page 3 is not required since in most cases, the 230vac (or 115vac) line voltage supply is derived from a step-down isolation transformer and the drives have isolated control circuits. Therefore the controls can be wired/configured as shown in the diagrams on pages 4 and 5 with a common supply voltage to both drives.
Non-Regenerative Requirements

The non-regenerative Focus 3 drive control circuits are not isolated from the drives power circuit (like the regenerative Focus 3 drives). In order to wire / configure the drives as shown in Diagram #1 and Diagram #2 on pages #4 and #5, the line voltage supply must be supplied from a separate isolation transformer (for EACH Drive). The drawing below shows this requirement.

Transformer Sizing

The transformer KVA rating is based on the motor horsepower rating. For non-regenerative drives the transformer rating should be 1.5 times the motor horsepower (i.e. 1Hp motor would use a 1.5 KVA transformer) and for regenerative drives the transformer rating should be 2 times the motor horsepower (i.e. 1Hp motor would use a 2 KVA transformer). Fusing of the transformer should be based on National or Local Electrical Codes.

Speed potentiometer (SpdPot-5K) and shielded cable (3CONcbl-XXX, XXX in feet required) are available from:

Control Techniques Service Center
1-800-367-8067
Diagram #1
For use with Figure #1
* Interlock Contact – closes only when driven rolls are “pinched” together; accomplished by either a limit switch or proximity sensor.

Diagram #2
For use with Figure #2

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