

DCS800 SMART FAN CONTROL

Description:

This document describes how to modify the DCS800-EP panel so that it can more intelligently control the motor blower and drive module / enclosure cooling fans.

By default, the fans run any time line voltage is applied. Adding a simple ice cube relay will allow the DCS800 to control when the fans turn on and off. By running the fans only when necessary, operators can expect to see an increase in fan life, longer filter change intervals and reduced noise to nearby workers.

Control Wiring Modifications:

All DCS800-EP panels use a control transformer to step the incoming line voltage down to 115V. This control voltage is used to power the drive module fans as well as the starter used to control the motor blower. These various fans are all running anytime line voltage is applied – regardless of whether the main DC drive motor has been started or not. The disadvantages of this approach are obvious as noted above.

The DCS800 measures its own internal temperature and estimates the motor temperature. (If wired, it may also use sensors inside the motor to measure motor temperature.) With this information, the drive knows when the cooling fans are needed. By using a digital output to feed an ice cube relay, this will allow the drive to turn these fans on and off as needed.

See the connection diagrams on the following two pages. Be sure to use the correct drawing for your size DCS800-EP panel.

Modifications / additions are shown in red.

Digital Output 1 will be used to drive an ice cube relay with 24VDC 50mA max coil (shown as “CR” in the figure). The coil is connected between X7:8 GND and X7:1 DO1 (+V output).

Note: Any digital output could be used for this purpose as long as it is programmed correctly. See “Parameter Changes” section below.

The N.O. contact of this relay will be used to switch 115V control power to the module fans and motor blower starter coil as shown.

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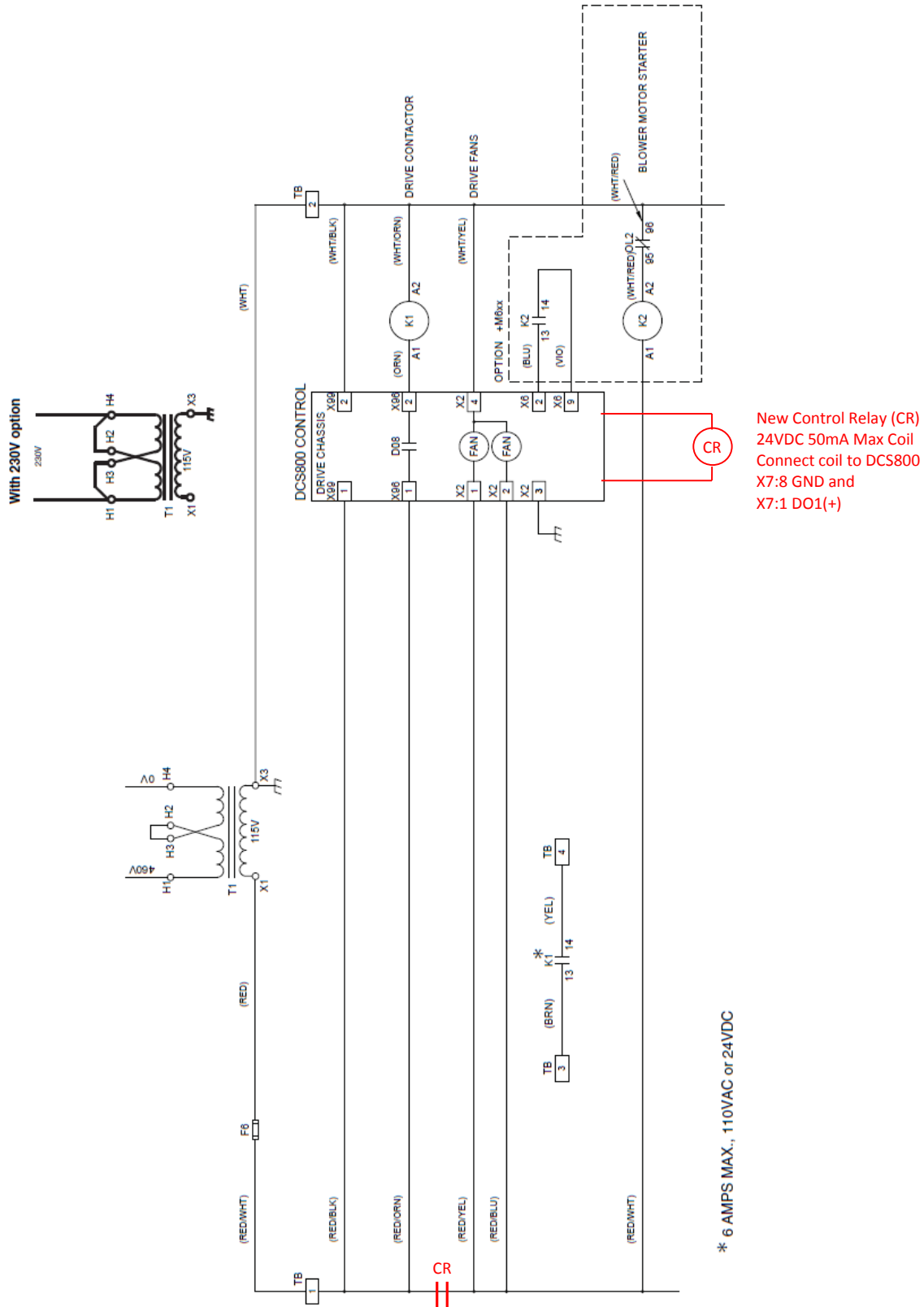


Figure 1. Control Power Diagram C1 – 10-250HP (DCS800-EP1-0020 through EP2-0250)

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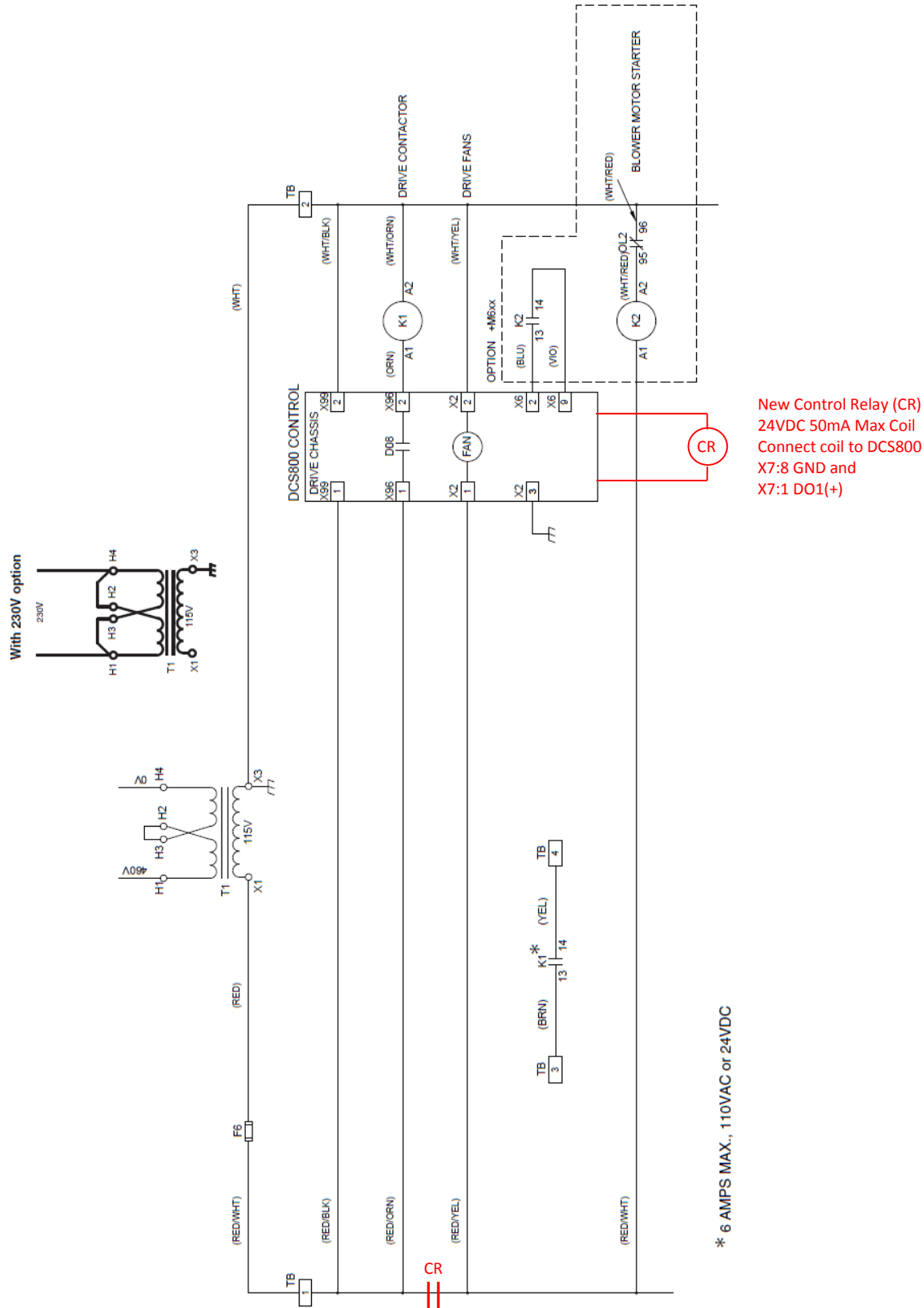


Figure 2. Control Power Diagram C2 – 300-600HP (DCS800-EP1-0610 through EP2-1010)

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Parameter Changes:

If the Factory Macro is used (which is the default setting), Digital Output 1 (DO1) is programmed to be a “FansOn” command. It is advisable to double check this by verifying:

PARAMETER **14.01 DO1Index** = 603

PARAMETER **14.02 DO1BitNo** = 0

Note: If DO1 is already used for something else, feel free to use any other available output. The Group 14 parameters for that particular output must be set the same way as above.

By default, the drive will turn off the fans at the same time the drive is switched off. If the user would like for the fans to run a bit longer, to allow the equipment to cool down for example, the following parameter should be set:

PARAMETER **21.14 FanDly** = 60 seconds (Default is 0, Range is 0-300 sec)

Description of Operation:

Once the drive receives a start command, it will turn on DO1 thus energizing the control relay and providing power to the drive module’s cooling fans as well as the motor blower starter.

When the drive receives a stop command, the fans will turn off immediately unless an “off delay” has been programmed into parameter 21.14 or the drive detects an overtemperature condition within itself or the motor. If that is the case, the drive will continue to run the fans until the overtemperature condition has passed (temperature falls below alarm limit). At that point, the off delay timer starts and the fans will shut off after the delay has expired.

See the DCS800 Firmware Manual -> Fault Tracing section -> Motor Thermal Model for more detailed information on alarm and fault temperature thresholds and their associated parameters.

Documents or other reference material:

DCS800-EP Installation and Start Up Manual
DCS800 Panel Drive (20-1000 Amps)
A supplement to the DCS800 Hardware manual
Document No. 3AUA000007 6338 REV D

Firmware Manual
DCS800 Drives (20 to 5200A)
Document No. 3ADW000193 R0701 REV G

Corrective Actions:

N/A

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