KOHLER. Power Systems **TT-1685 3/16**

INSTALLATION INSTRUCTIONS

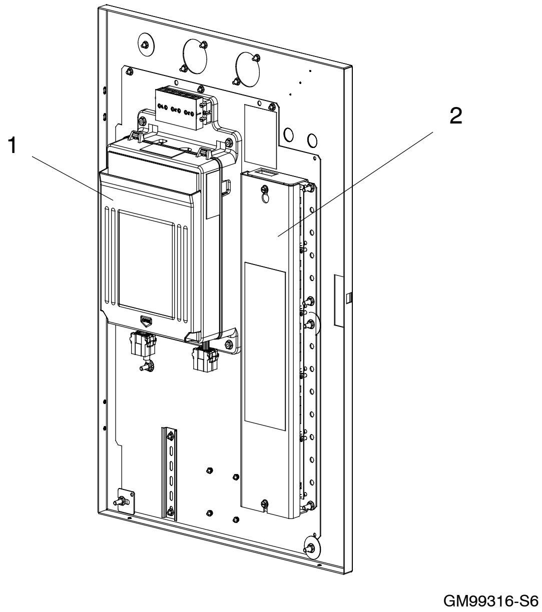
Original Issue Date: **3/16**
Model: **ZCS-6 Programmed-Transition Transfer Switches**
Market: **ATS**
Subject: **M340+ to Decision-Maker® MPAC 1500 Controller Conversion Kit GM99316-S6**

Introduction

The conversion kit allows the replacement of the M340+ controller with a Decision-Maker® MPAC 1500 controller on model ZCS-6 programmed-transition automatic transfer switches.

See Figure 1 for an illustration of the installed kit. See Figure 2 for controller identification, if necessary.

Note: The optional accessory board (I/O) assembly shown in the figures is available separately.



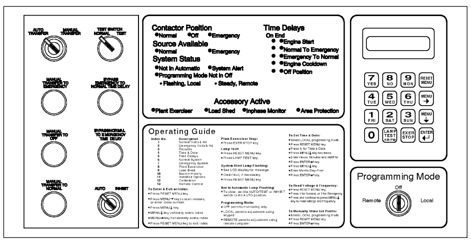
1. MPAC 1500 controller assembly
2. Optional accessory board (I/O) assembly

Figure 1 Decision-Maker® MPAC 1500 Controller Conversion Kit, Installed

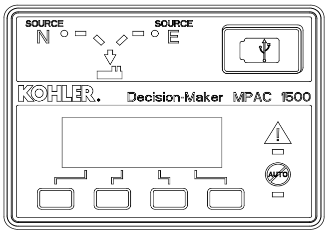
Tools and Materials Required:

- Phillips® screwdriver
- Small flat tip screwdriver
- Wire cutter
- 7/16 nut driver
- 11/32 nut driver
- 5/16 nut driver

Read the entire installation procedure and compare the kit parts with the parts list in this publication before beginning installation. Refer to the wiring diagrams at the end of this publication as needed during the installation. Perform the steps in the order shown.



M340+ Controller



Decision-Maker® MPAC 1500 Controller

TT1685

Figure 2 Controller Identification

Controller Accessories

Many functions that required optional accessories with the M340+ controller are integrated into the Decision-Maker® MPAC 1500 controller operation. For example, an active time delay can be ended by pressing a button on the Decision-Maker® MPAC 1500 controller. Separate time delay bypass switches are not required. See Figure 3 for accessory information.

M340+	Decision-Maker® MPAC 1500
Bypass (end) Time Delay Switches	Integrated
Source Monitor	Integrated
Test Switch	Integrated
Override Switches	Integrated
Preferred Source Switch	Alarm Module required (see Figure 4)
Current Meter (amps)	Current Sensing Kit required (see Figure 6)
Plant Exerciser	Integrated
Manual Switch Operation	Supervised Transfer Control Switch (see Figure 5)
Voltage/Frequency Meters	Integrated
Load Shed Contact	Integrated Load Control Function (one output connection required)

Figure 3 Accessories

Accessory Modules

Optional accessory modules are listed in Figure 4. One module mounting kit holds up to five accessory modules.

Accessory Modules	Part Number
Module Mounting Assembly *	GM46258-S
Standard I/O Module	GM46888-S
High Voltage/Current I/O Module	GM46890-S
Alarm Module	GM40808-S
External Battery Supply Module	GM46889-S
* One mounting assembly holds up to 5 modules.	

Figure 4 Accessory Modules for Decision-Maker® MPAC 1500

Other Accessories

Other Decision-Maker® MPAC 1500 accessories are available. See Figure 5. Contact your local distributor/dealer for more information.

Other MPAC 1500 Accessories	Part Number
Controller Disconnect Switch	GM46770-S3
Supervised Transfer Control Switch †	GM40807-S1
† Includes alarm module GM40808-S.	

Figure 5 Other Accessories

Current Sensing

If current sensing is required (i.e. for current [amps] monitoring and display), obtain the appropriately rated current sensing kit (with 3 m [10 ft.] harness) before starting the conversion procedure. If the transfer switch is equipped with current transformers (CTs), they will need to be replaced with the new current transformers during the controller conversion procedure. See Figure 6 for current sensing kit numbers. Check the amp rating and number of phases of the transfer switch and select the closest current sensing kit with an equal or higher amp rating.

Kit Description		Current Sensing Kit Number
Amps	Phases	
200	3	GM89028-S3
200	1	GM89028-S21
400	3	GM89028-S6
400	1	GM89028-S24
1000	3	GM89028-S8
1000	1	GM89028-S26
1200	3	GM89028-S11
1200	1	GM89028-S28
2000	3	GM89028-S15
3000	3	GM89028-S17

Figure 6 Current Sensing Kits

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

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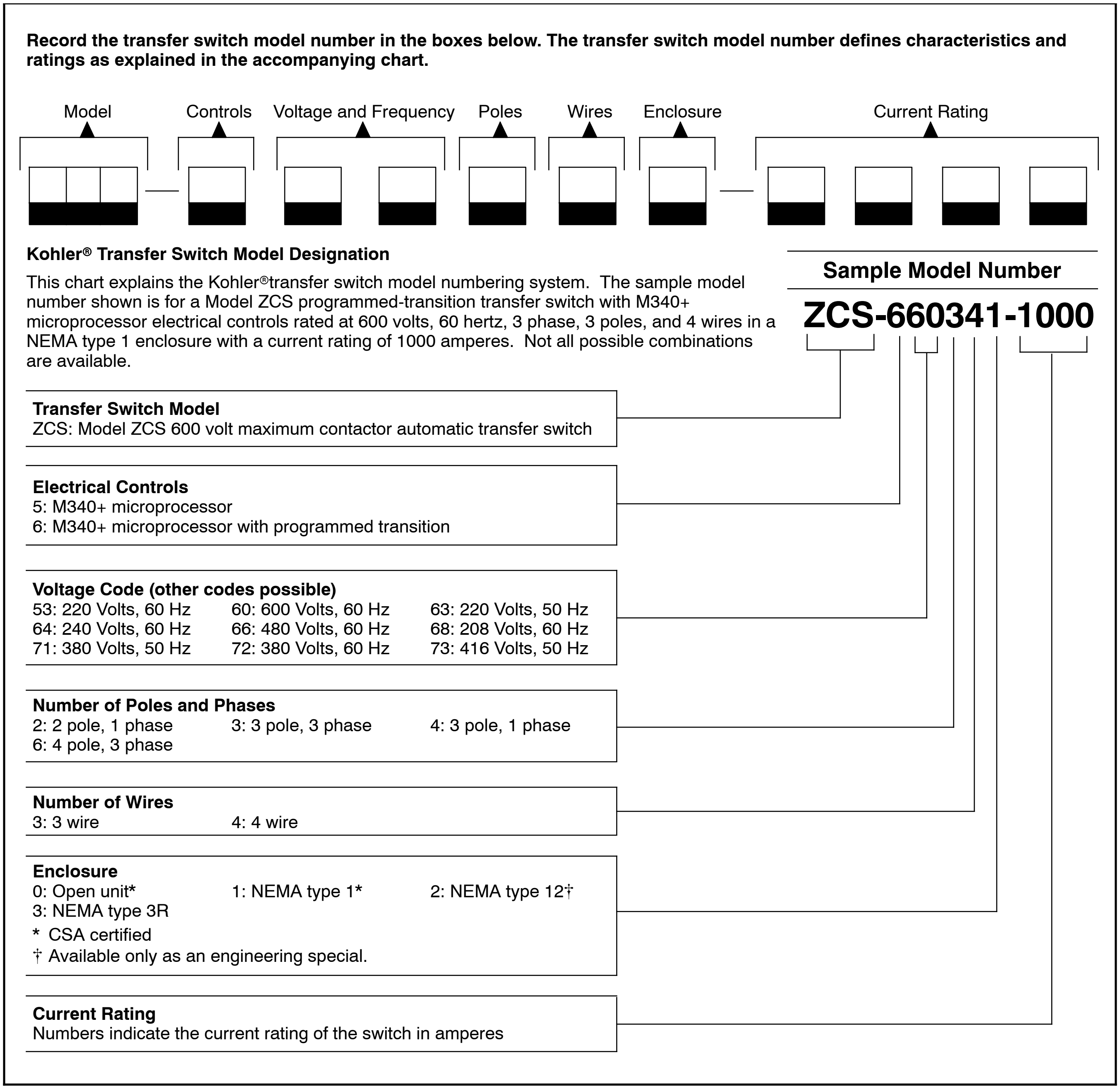
Model Designation

To interpret the transfer switch model designation, see the model designation chart in Figure 7.



Record the transfer switch model number in the boxes below. The transfer switch model number defines characteristics and ratings as explained in the accompanying chart.

Kohler® Transfer Switch Model Designation

This chart explains the Kohler® transfer switch model numbering system. The sample model number shown is for a Model ZCS programmed-transition transfer switch with M340+ microprocessor electrical controls rated at 600 volts, 60 hertz, 3 phase, 3 poles, and 4 wires in a NEMA type 1 enclosure with a current rating of 1000 amperes. Not all possible combinations are available.

Sample Model Number

ZCS-660341-1000

Transfer Switch Model
ZCS: Model ZCS 600 volt maximum contactor automatic transfer switch

Electrical Controls
5: M340+ microprocessor
6: M340+ microprocessor with programmed transition

Voltage Code (other codes possible)

53: 220 Volts, 60 Hz	60: 600 Volts, 60 Hz	63: 220 Volts, 50 Hz
64: 240 Volts, 60 Hz	66: 480 Volts, 60 Hz	68: 208 Volts, 60 Hz
71: 380 Volts, 50 Hz	72: 380 Volts, 60 Hz	73: 416 Volts, 50 Hz

Number of Poles and Phases

2: 2 pole, 1 phase	3: 3 pole, 3 phase	4: 3 pole, 1 phase
6: 4 pole, 3 phase		

Number of Wires

3: 3 wire	4: 4 wire

Enclosure

0: Open unit*	1: NEMA type 1*	2: NEMA type 12†
3: NEMA type 3R		

* CSA certified
† Available only as an engineering special.

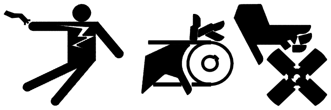
Current Rating
Numbers indicate the current rating of the switch in amperes

Figure 7 Model Designation Key

Safety Precautions

Observe the following safety precautions while installing the kit.

WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

DANGER

Hazardous voltage.
Will cause severe injury or death.

Disconnect all power sources before opening the enclosure.

Servicing the transfer switch. Hazardous voltage can cause severe injury or death. Deenergize all power sources before servicing. Turn off the main circuit breakers of all transfer switch power sources and disable all generator sets as follows: (1) Move all generator set master controller switches to the OFF position. (2) Disconnect power to all battery chargers. (3) Disconnect all battery cables, negative (–) leads first. Reconnect negative (–) leads last when reconnecting the battery cables after servicing. Follow these precautions to prevent the starting of generator sets by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer. Before servicing any components inside the enclosure: (1) Remove all jewelry. (2) Stand on a dry, approved electrically insulated mat. (3) Test circuits with a voltmeter to verify that they are deenergized.

Servicing the transfer switch. Hazardous voltage can cause severe injury or death. Deenergize all power sources before servicing. Turn off the main circuit breakers of all transfer switch power sources and disable all generator sets as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect power to all battery chargers. (3) Disconnect all battery cables, negative (–) leads first. Reconnect negative (–) leads last when reconnecting the battery cables after servicing. Follow these precautions to prevent the starting of generator sets by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer. Before servicing any components inside the enclosure: (1) Remove all jewelry. (2) Stand on a dry, approved electrically insulated mat. (3) Test circuits with a voltmeter to verify that they are deenergized.

Installation Procedure

Note: The photos and diagrams shown in this procedure represent a typical transfer switch. They may not be an exact match for your ATS model.

1. Bypass the ATS to normal. Then rack the ATS out to the isolate position. See the bypass/isolation switch manual for instructions to bypass and isolate the transfer switch.
2. Place the generator set master switch in the OFF position or press the OFF/RESET button on the generator set controller.
3. Disconnect the power to the battery charger, if equipped.
4. Disconnect the generator set engine starting battery(ies), negative (–) lead first.
5. Disconnect power from the transfer switch on both sources, Normal and Emergency.

Remove M340+ Controller and Accessories

6. Remove the plastic protective panel that covers the electronic components on the inside of the enclosure door. See Figure 8.
7. Disconnect plug P9. See Figure 9.

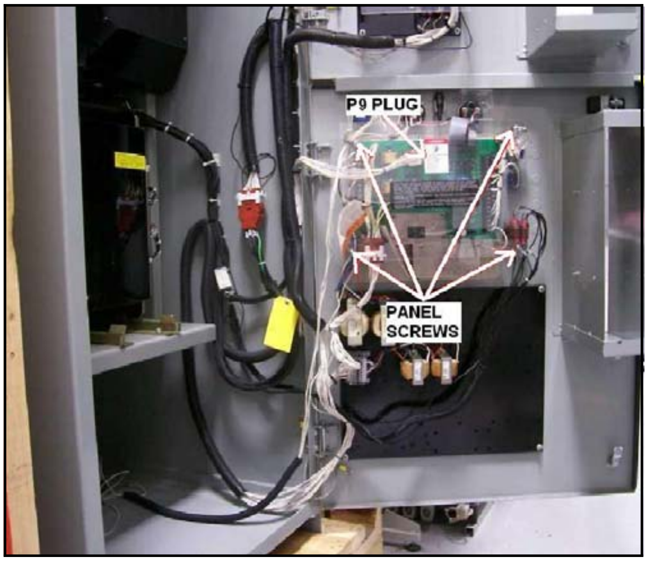
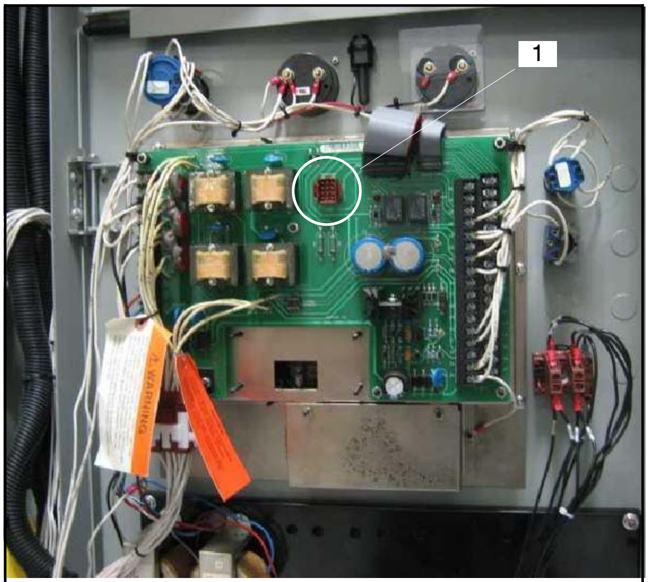


Figure 8 Remove Plastic Panel



1. P9 connection

Figure 9 Plug P9 Disconnected

8. If the transfer switch is equipped with current transformers (CTs), remove all CTs from the power lines of the ATS.
9. Disconnect the Auto/Inhibit ATS disconnect switch. See Figure 10 and Figure 11. Do not remove the individual leads from the plug.

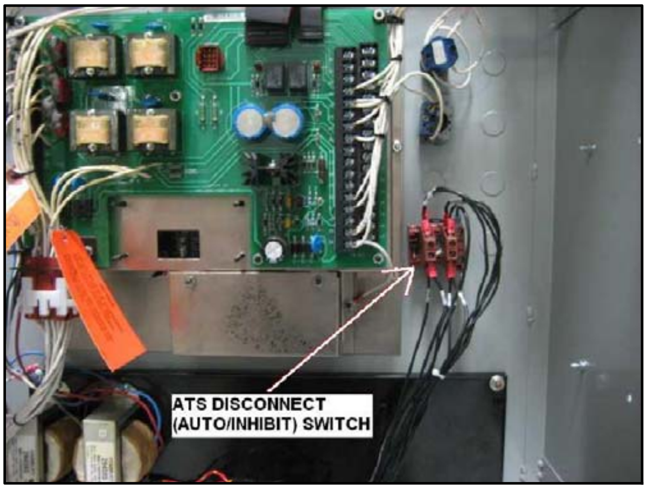


Figure 10 Auto/Inhibit ATS Disconnect Switch

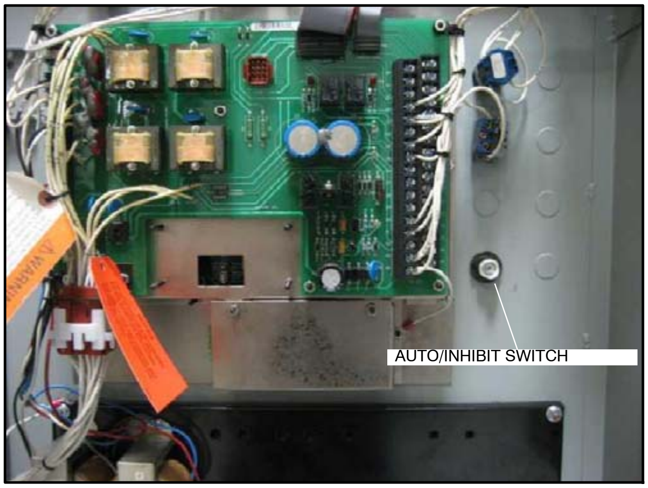


Figure 11 Auto/Inhibit Switch Disconnected

10. Disconnect the AUTO/TEST switch and the bypass time delay pushbutton. See Figure 12.

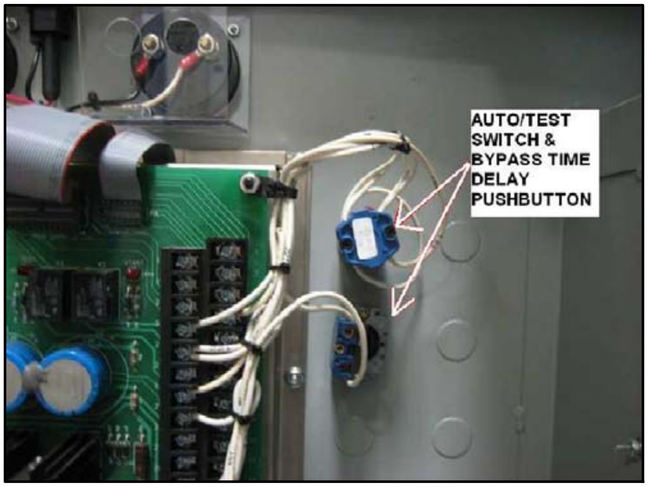


Figure 12 Disconnect the AUTO/TEST Switch and Bypass Time Delay Button

11. Remove the AUTO/TEST switch, the BYPASS TIME DELAY pushbutton, the ATS (AUTO/INHIBIT) disconnect switch, and any other optional switches in this area. See Figure 13.

    Keep the ATS (AUTO/INHIBIT) disconnect switch for reinstallation later in this procedure. Other switch functions are integrated into the new Decision-Maker® MPAC 1500 controller.

Figure 13 Switches and Pushbutton Removed

12. If the transfer switch is equipped with meters, disconnect and remove all meters and the selector switch. See Figure 14 and Figure 15.

    Note: Separate meters are not required with the MPAC 1500 controller. Voltage, frequency, and current (amps)* are shown on the controller display.

* For current monitoring and display, a current sensing kit is required. See Figure 6.

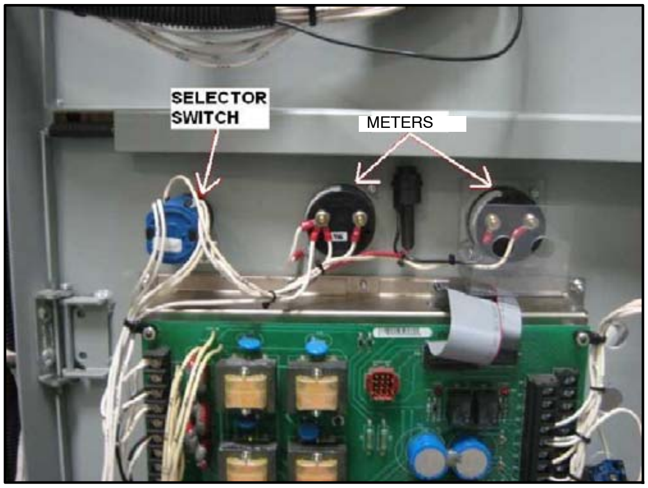


Figure 14 Disconnect the Meters and Selector Switch

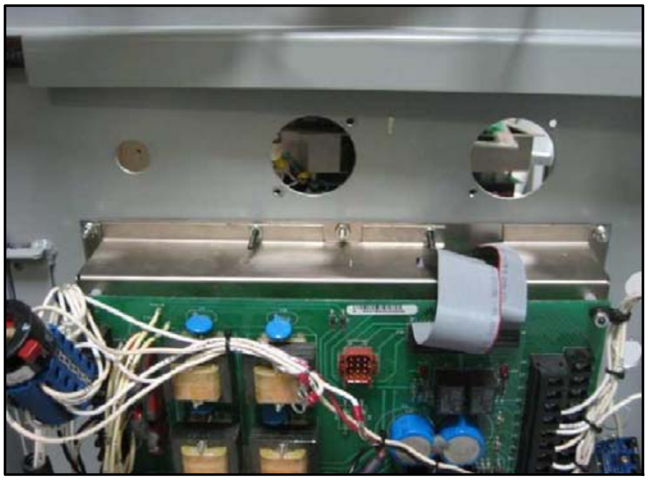


Figure 15 Meters and Selector Switch Removed

13. Disconnect plug P24 and the ground connection. See Figure 16.

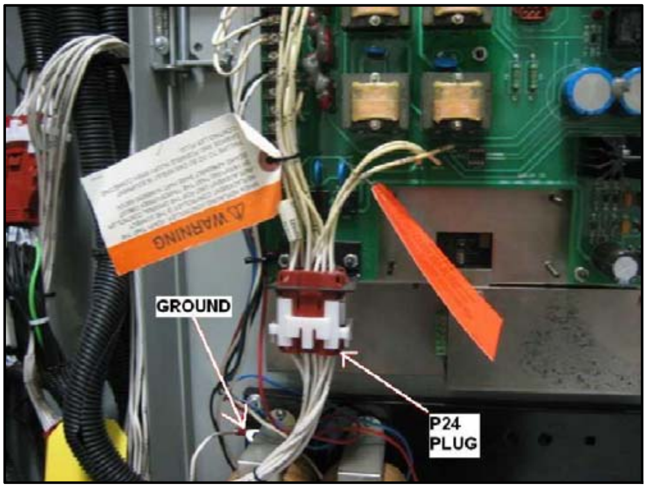


Figure 16 Disconnect P24 and Ground

14. Without disconnecting the leads, remove the mounting screws that secure transformers NCPT and ECPT and the terminal block to the lower panel. See Figure 17 and Figure 18.

    Note: Transformers NCPT and ECPT and the terminal block will be mounted onto the new mounting plate later.

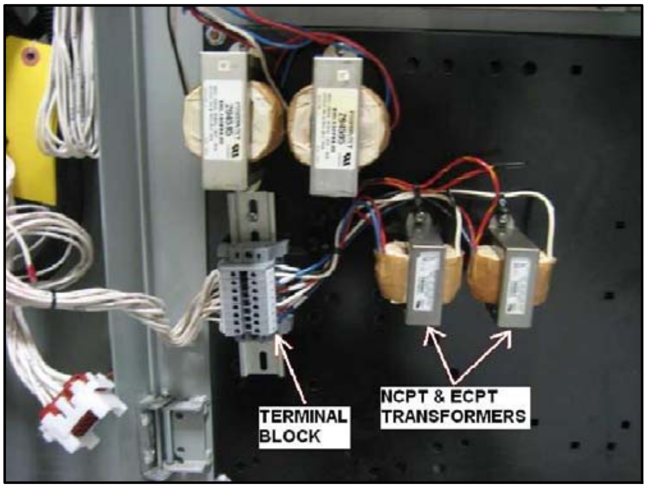


Figure 17 Transformers and Terminal Block on Lower Panel (do not disconnect electrical connections)

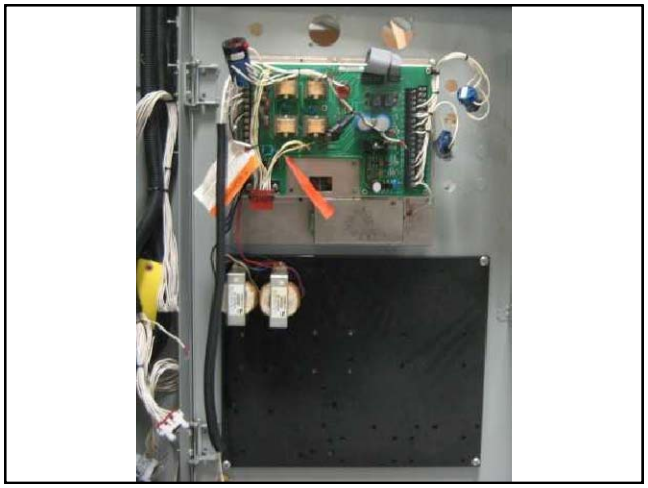


Figure 18 Transformers and Terminal Block Removed from Lower Panel but Not Disconnected

15. Remove the metal cover over the optional communication module, if present. See Figure 19.

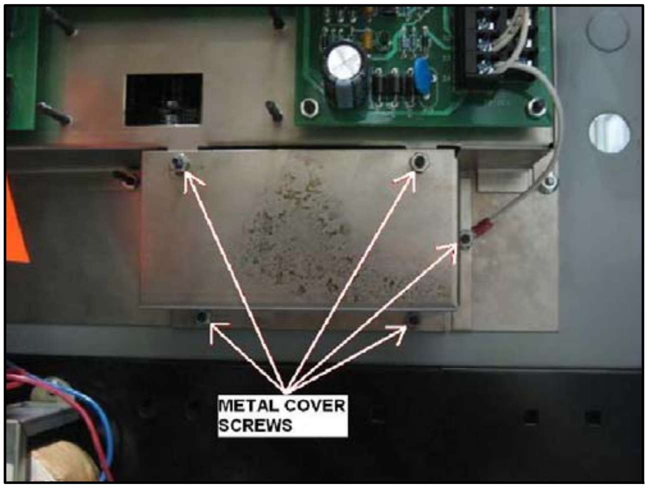


Figure 19 Remove Cover Screws

16. Remove the controller and the lower panel from the lower door of the enclosure. See Figure 20.

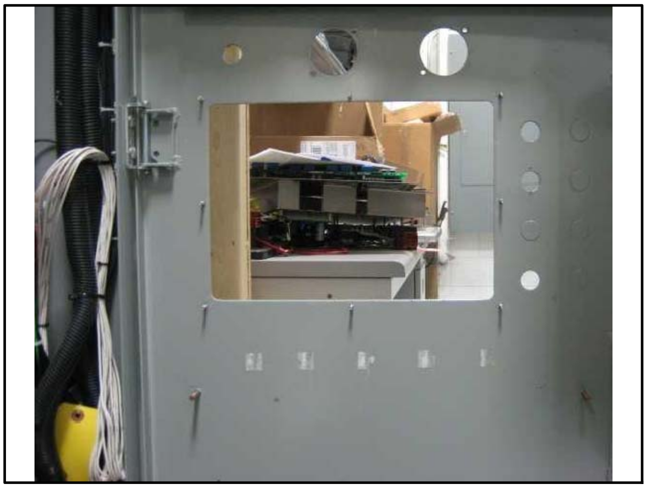


Figure 20 Controller and Lower Panel Removed

Mounting Plate and Cover Plate

Note: Refer to the notes in Figure 22 before installing the mounting plate and switch cover plate. Some door studs may need to be cut off and some mounting holes enlarged in the field, depending on the specific application.

17. Install conversion kit mounting plate GM99317. Use seven lock washers X-22-7 and seven nuts X-6210-4 to install the mounting plate as shown in Figure 21 and Figure 22. Install three flat washers X-25-122 with three nuts X-6210-2 as shown.

18. Install DIN rail GM47488 using two nuts X-6210-4. Install panel retainer GM70051. See Figure 21.

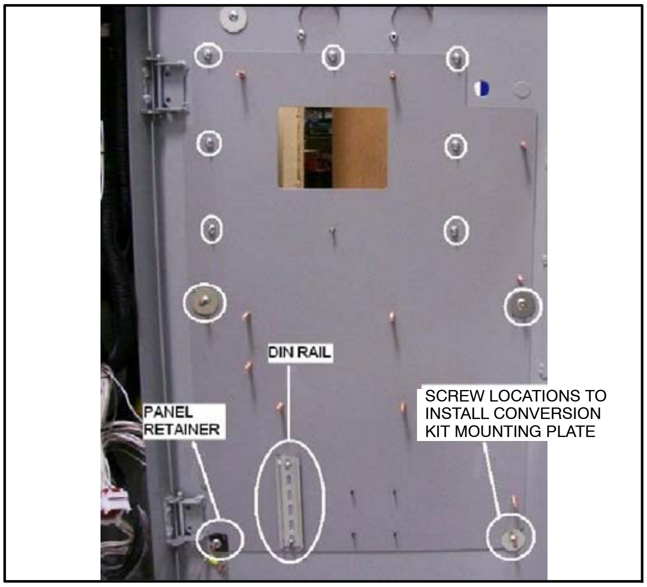
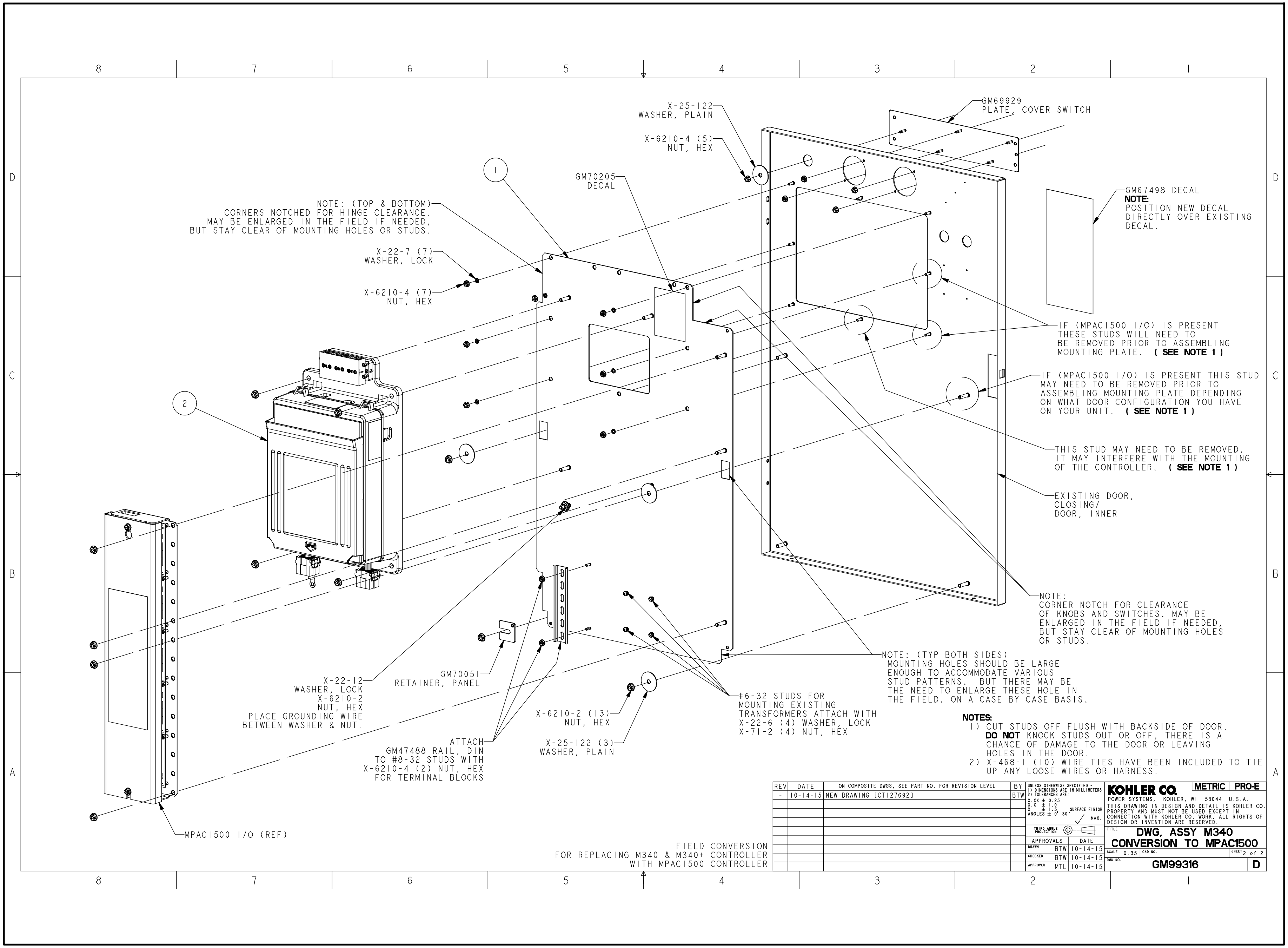


Figure 21 Mounting Plate Installation



NOTES:

1) CUT STUDS OFF FLUSH WITH BACKSIDE OF DOOR. **DO NOT** KNOCK STUDS OUT OR OFF, THERE IS A CHANCE OF DAMAGE TO THE DOOR OR LEAVING HOLES IN THE DOOR.
2) X-468-1 (10) WIRE TIES HAVE BEEN INCLUDED TO TIE UP ANY LOOSE WIRES OR HARNESS.

Figure 22 Conversion Kit Assembly

19. Install switch cover plate GM69929. Use one washer X-25-122 and five nuts X-6210-4 to install the cover plate as shown in Figure 22 and Figure 23.

    The installed plates are shown in Figure 24.

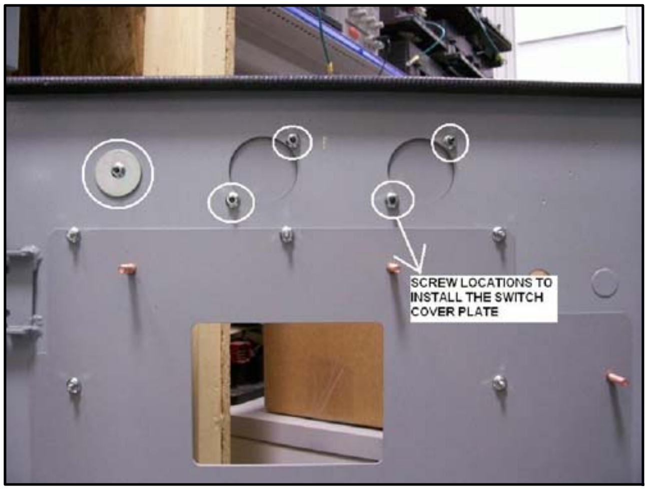


Figure 23 Switch Cover Plate GM69929

Figure 24 Door with Mounting Plate and Switch Cover Plate

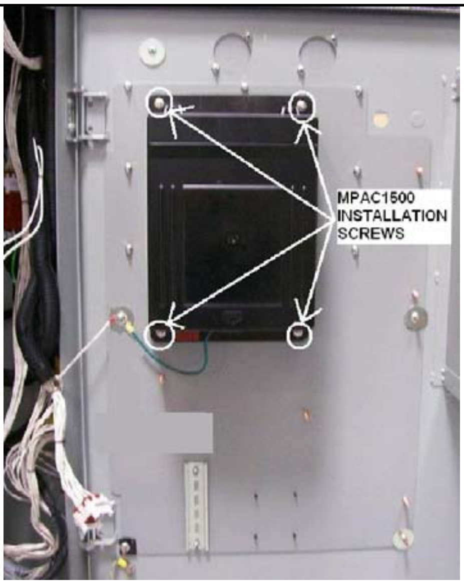
Note: The illustrations in the following steps may not show the latest controller design. See Figure 25 for the updated current sensing kit terminal block, harness connection, and programmed-transition interface board connection.

1. Current sensing terminal block with insulation and harness (optional)
2. Programmed-transition interface board connection
3. Contactor harness
4. Controller user interface

Figure 25 Decision-Maker® MPAC Controller Updated Features

Decision-Maker® MPAC 1500 Controller Assembly

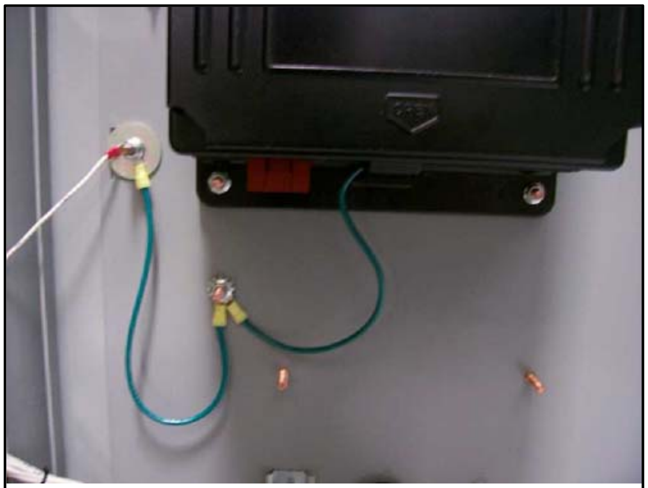
20. Install Decision-Maker® MPAC 1500 controller assembly GM85884-4 onto the conversion kit mounting plate using four nuts X-6210-2. See Figure 26.



Note: This photo does not show the latest controller design. See Figure 25.

Figure 26 Controller Assembly Installation

21. See Figure 27 for ground connections. Use green grounding lead LK-1212-1515 to connect the ground stud on the conversion panel to the ground lug on the door. Using lock washer X-22-12, connect the ground wires to the ground stud on the door. Place the grounding wires between the washer and the nut.



Note: This photo does not show the latest controller design. See Figure 25.

Figure 27 Ground Lead Connections

Transformers and Terminal Block

22. Reinstall the transformers and terminal block that were removed in step 14. See Figure 28 and Figure 29.
    a. Use four lock washers X-22-6 and four nuts X-71-2 to re-install transformers NCPT and ECPT onto the conversion kit mounting plate.
    b. Mount the terminal block onto the DIN rail, which was installed in step 18.

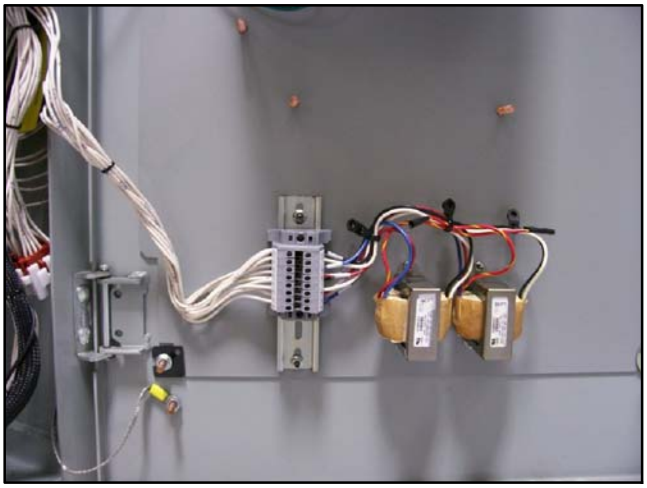
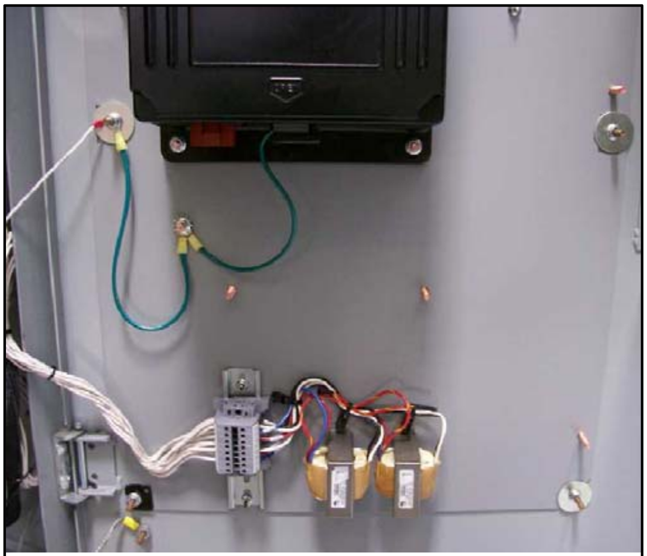


Figure 28 Transformer and Terminal Block Installation



Note: This photo does not show the latest controller design. See Figure 25.

Figure 29 Transformers and Terminal Block Installed

Decals

Note: Photos on this page do not show the latest controller design. See Figure 25.

23. Remove the existing Auto/Inhibit switch decal, if necessary. Verify that the surface is clean and dry, and affix conversion kit decal GM67498 over the old decal on the outside of the bottom door. See Figure 30 and Figure 31.

Figure 30 Remove Auto/Inhibit Switch Decal (if necessary)

Figure 31 Decal GM67498 Installed

Disconnect Switch

24. Re-install the disconnect (AUTO/INHIBIT) switch through the conversion kit mounting plate. See Figure 32 and Figure 33.

Figure 32 Disconnect Switch Re-Installed

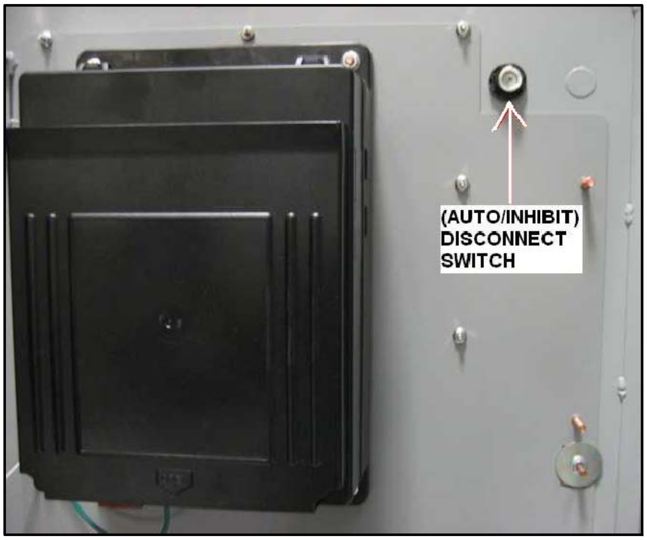


Figure 33 Disconnect Switch (inside door)

25. Connect the AUTO/INHIBIT disconnect switch to the existing plug that was disconnected in step 9. See Figure 34.

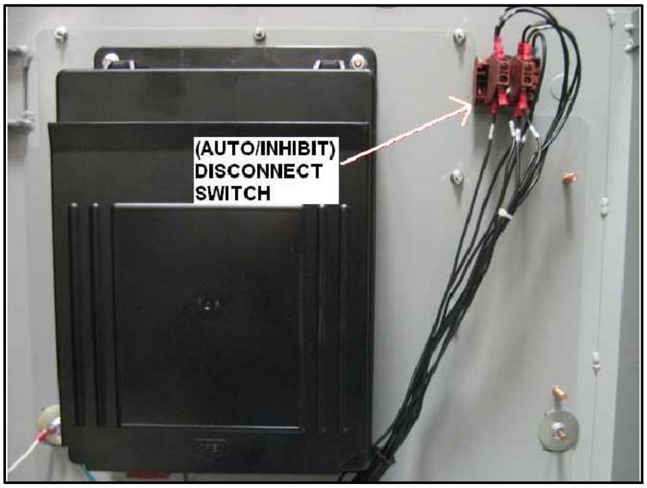
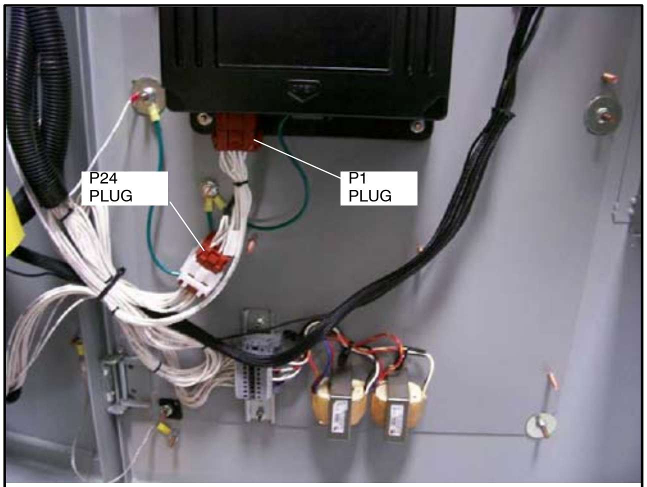


Figure 34 AUTO/INHIBIT Switch Connection

Conversion Kit Wiring Harness

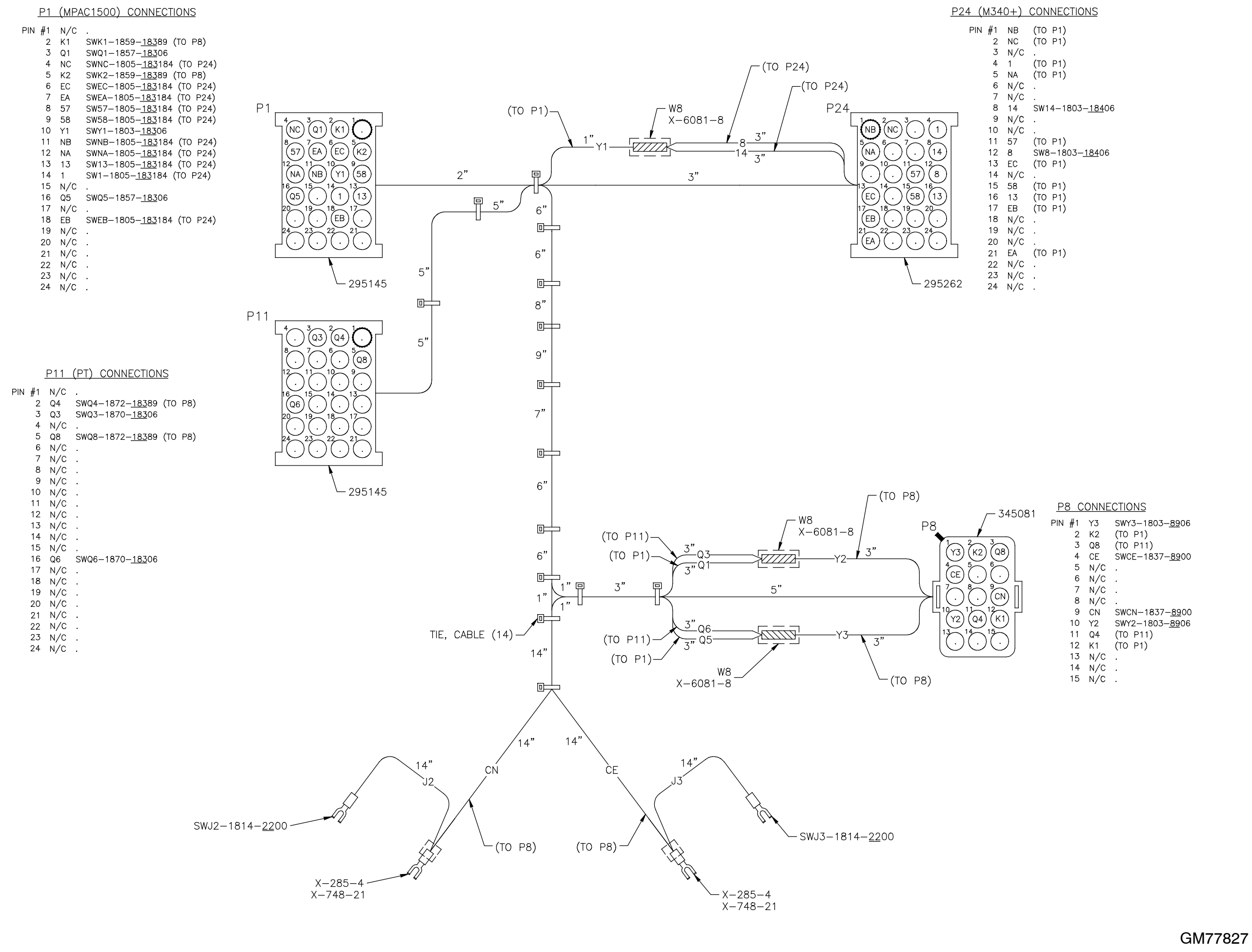
26. Connect plug P24 of conversion kit harness GM77827 to contactor harness plug P24, which was disconnected from the M340+ controller in step 13. See Figure 35.

27. Connect plug P1 of the conversion kit wire harness to the MPAC 1500 controller. See Figure 35.



Note: This photo does not show the latest controller design. See Figure 25.

Figure 35 Conversion Kit Harness Connection to Controller Assembly (PTIB not shown)



P1 (MPAC1500) CONNECTIONS

PIN		
#1	N/C	.
2	K1	SWK1-1859-18389 (TO P8)
3	Q1	SWQ1-1857-18306
4	NC	SWNC-1805-183184 (TO P24)
5	K2	SWK2-1859-18389 (TO P8)
6	EC	SWEC-1805-183184 (TO P24)
7	EA	SWEA-1805-183184 (TO P24)
8	57	SW57-1805-183184 (TO P24)
9	58	SW58-1805-183184 (TO P24)
10	Y1	SWY1-1803-18306
11	NB	SWNB-1805-183184 (TO P24)
12	NA	SWNA-1805-183184 (TO P24)
13	13	SW13-1805-183184 (TO P24)
14	1	SW1-1805-183184 (TO P24)
15	N/C	.
16	Q5	SWQ5-1857-18306
17	N/C	.
18	EB	SWEB-1805-183184 (TO P24)
19	N/C	.
20	N/C	.
21	N/C	.
22	N/C	.
23	N/C	.
24	N/C	.

P24 (M340+) CONNECTIONS

PIN		
#1	NB	(TO P1)
2	NC	(TO P1)
3	N/C	.
4	1	(TO P1)
5	NA	(TO P1)
6	N/C	.
7	N/C	.
8	14	SW14-1803-18406
9	N/C	.
10	N/C	.
11	57	(TO P1)
12	8	SW8-1803-18406
13	EC	(TO P1)
14	N/C	.
15	58	(TO P1)
16	13	(TO P1)
17	EB	(TO P1)
18	N/C	.
19	N/C	.
20	N/C	.
21	EA	(TO P1)
22	N/C	.
23	N/C	.
24	N/C	.

P11 (PT) CONNECTIONS

PIN		
#1	N/C	.
2	Q4	SWQ4-1872-18389 (TO P8)
3	Q3	SWQ3-1870-18306
4	N/C	.
5	Q8	SWQ8-1872-18389 (TO P8)
6	N/C	.
7	N/C	.
8	N/C	.
9	N/C	.
10	N/C	.
11	N/C	.
12	N/C	.
13	N/C	.
14	N/C	.
15	N/C	.
16	Q6	SWQ6-1870-18306
17	N/C	.
18	N/C	.
19	N/C	.
20	N/C	.
21	N/C	.
22	N/C	.
23	N/C	.
24	N/C	.

P8 CONNECTIONS

PIN		
#1	Y3	SWY3-1803-8906
2	K2	(TO P1)
3	Q8	(TO P11)
4	CE	SWCE-1837-8900
5	N/C	.
6	N/C	.
7	N/C	.
8	N/C	.
9	CN	SWCN-1837-8900
10	Y2	SWY2-1803-8906
11	Q4	(TO P11)
12	K1	(TO P1)
13	N/C	.
14	N/C	.
15	N/C	.

Figure 36 Conversion Kit Harness GM77827 for Model ZCS-6

Interface Panel

28. Remove the plastic cover from the interface panel components on the upper door. See Figure 37.

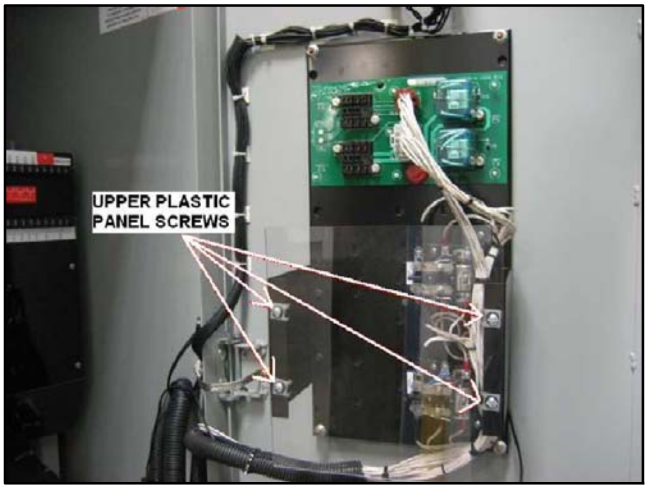


Figure 37 Remove Plastic Cover on Interface Panel

29. On the interface panel assembly, disconnect lead 33 from terminal 1 on the four relays on the interface panel. See Figure 38 and Figure 39.

    The labels on the relays vary by model and may include the following: CCN, CCE, CCN0, CCE0, CN1, CE1, CN0, CE0, SLN, or SLE. Refer to the wiring diagram for your model at the end of this document.

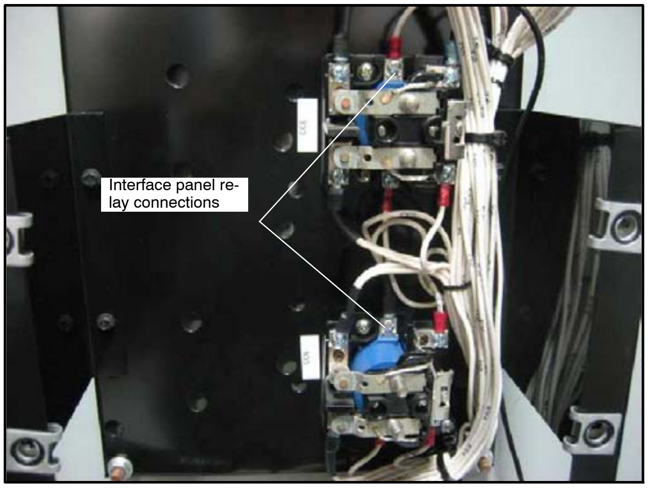
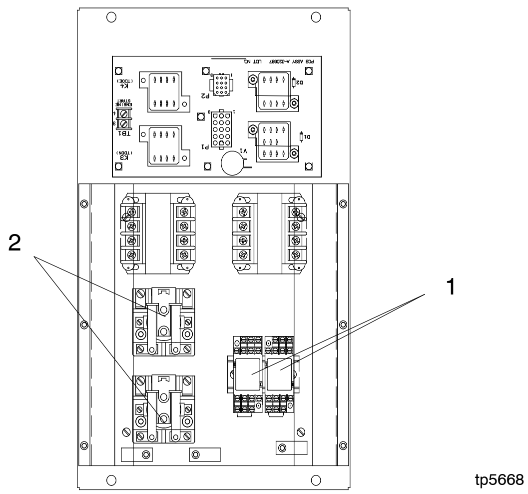


Figure 38 Disconnect Lead 33 from Interface Panel Relays (two relays not shown)



1. SLN and SLE relays
2. CCN and CCE relays

Figure 39 Interface Panel Assembly Relays, typical (relays vary by model)

30. Separate the leads labeled 33 from the harness. Cut the forked terminal from the end of the longer lead 33. See Figure 40. Discard the short jumper leads that were connected between the relays.

31. Lead 33 will not be reconnected. Tape the end of the remaining lead and tuck the lead out of the way.

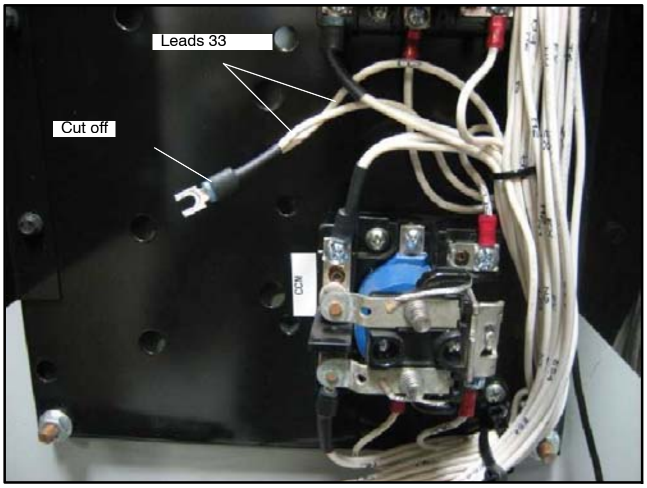


Figure 40 Cut Off Terminal

32. Disconnect plug P8 from the upper board. See Figure 41.

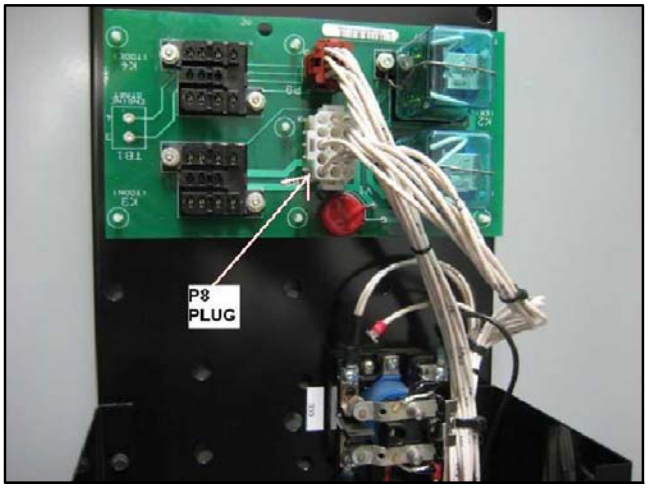


Figure 41 Disconnect Plug P8

33. Connect the conversion kit wire harness GM77827 connector P8 to plug P8 that was disconnected from the upper board in the previous step. See Figure 42.

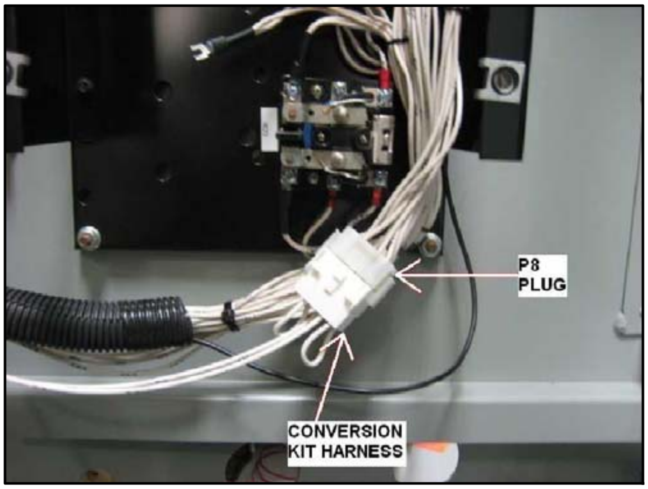


Figure 42 Connect Conversion Kit Wire Harness Connector P8 to Plug P8

34. Disconnect plug P9 from the upper board. See Figure 43. Cut the cable ties to separate the harness from the other wiring and discard the P9 harness. (The other end of this harness was disconnected in step 7.)

Figure 43 Disconnect P9

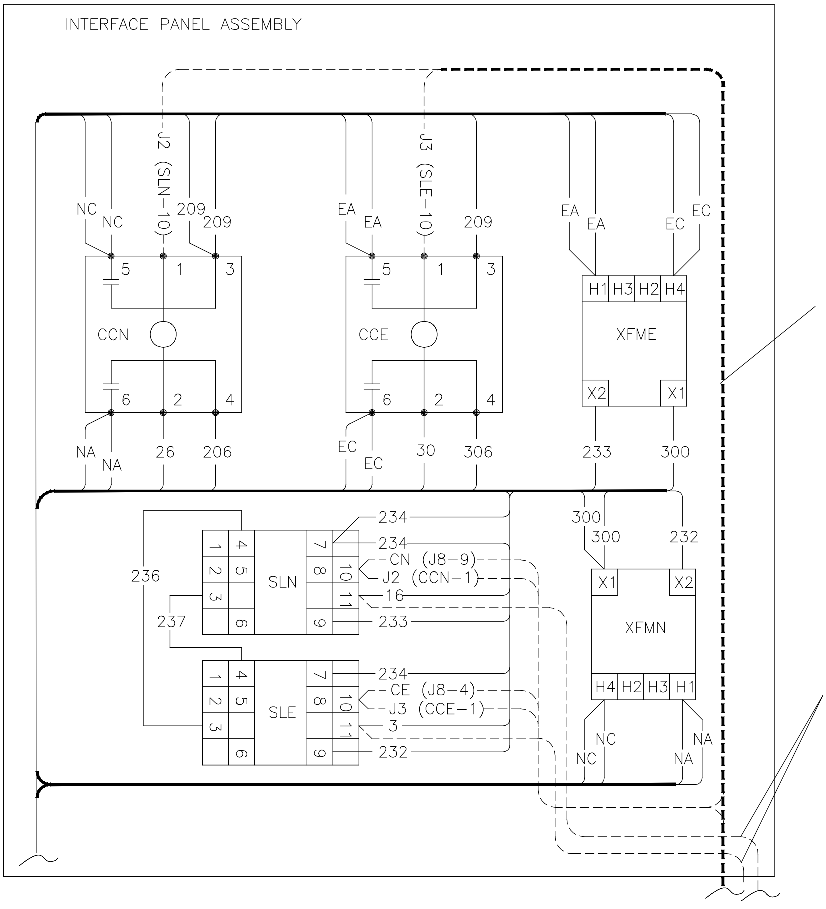
35. Connect leads CN, CE, J2, and J3 of the conversion kit harness GM77827 to the interface panel assembly relays. See Figure 44 and refer to the partial wiring diagrams shown in Figure 45 through Figure 47.

36. Route the conversion kit wire harness neatly using the cable ties provided.

1. Interface panel relays

Figure 44 Interface Panel Relay Locations (two relays not shown)

40-260 Amps



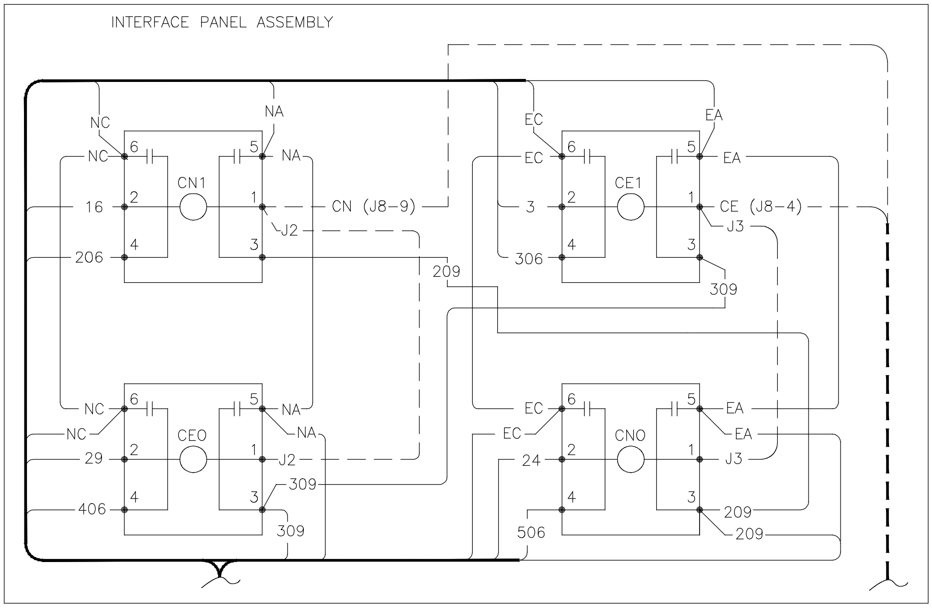
Dashed lines show new conversion kit harness leads.

New customer-provided 18AWG leads.
See steps 39-44.

GM99386-

Figure 45 Interface Panel Relay Connections, 40-260 Amps

400 Amps



Dashed lines show new conversion kit harness leads.

GM99390-

Figure 46 Interface Panel Relay Connections, 400 Amps

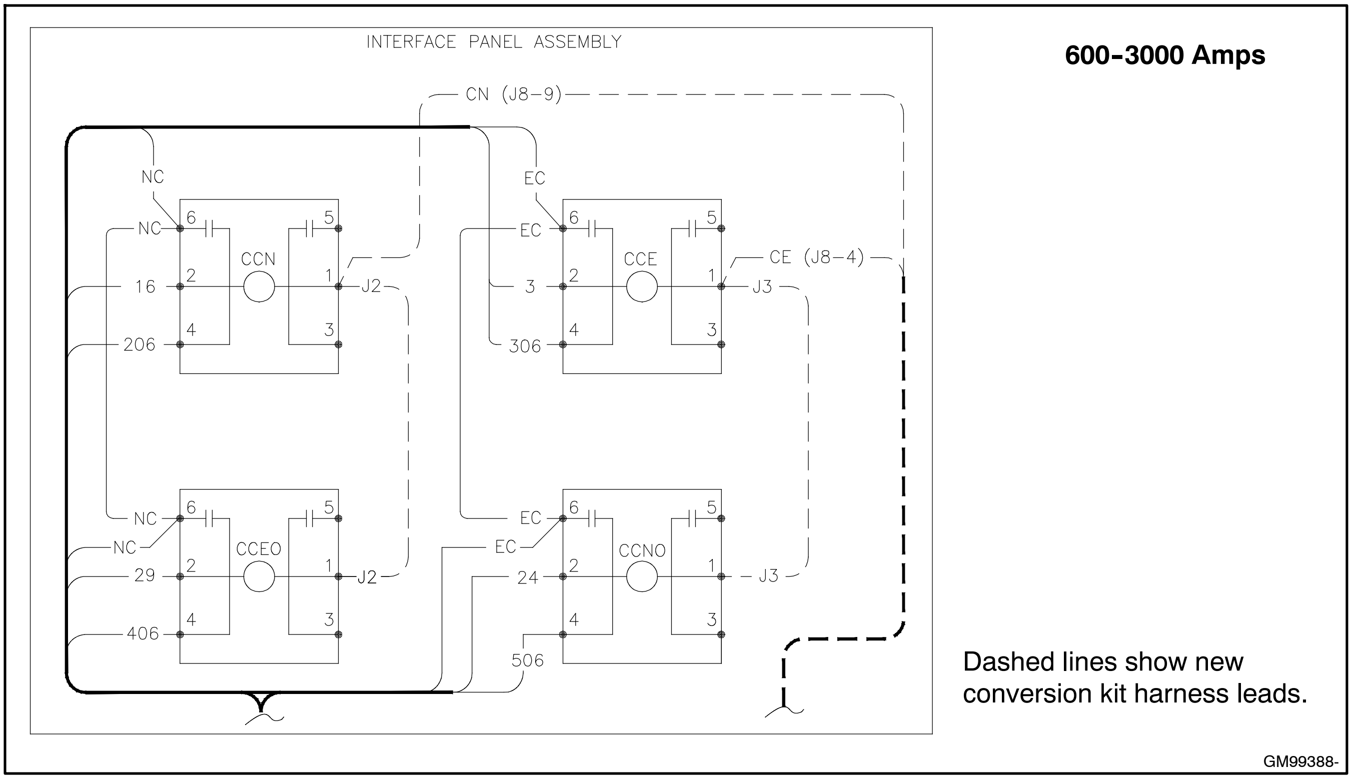


Figure 47 Interface Panel Relay Connections, 600-3000 Amps

37. Remove the circuit board from the upper panel. See Figure 48.

Figure 48 Remove the Upper Panel Circuit Board

38. Re-install the upper plastic cover, and finish routing the conversion kit wire harness neatly using the cable ties provided. See Figure 49.

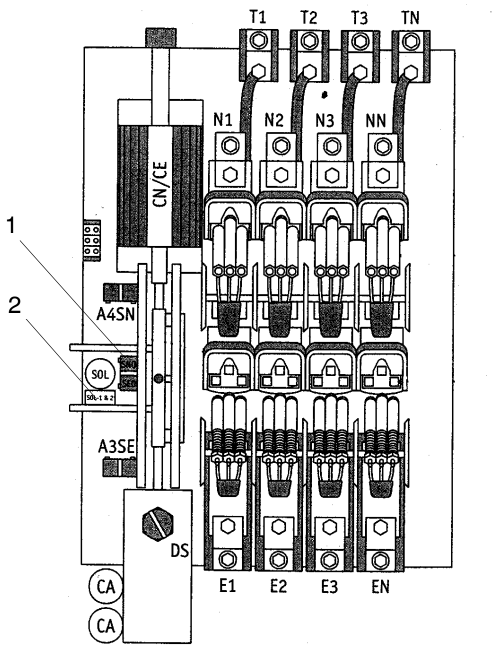
Figure 49 Re-Install Plastic Cover

For 40-260 Amp 2, 3, and 4-pole models only:

Steps 39-44 apply to 40-260 Amp 2, 3, and 4-pole models only. For other models, proceed to step 45.

The following steps require two customer-provided 18 AWG leads.

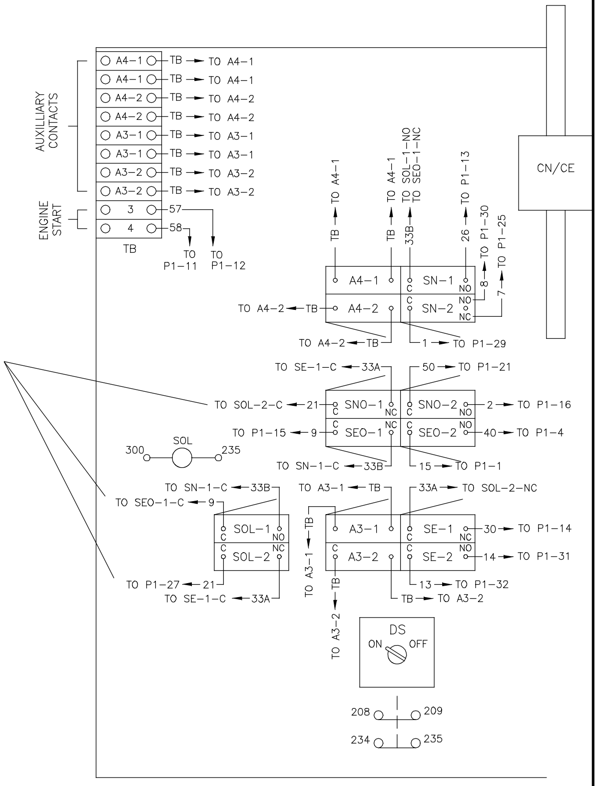
39. Find switches SOL-1, SOL-2, and SNO-1, located on the left side of the contactor assembly. See Figure 50.
40. Disconnect lead 9 from terminal C of SOL-1. See Figure 51. Tape off lead 9 and secure it out of the way.
41. Add a lead (customer-provided 18 AWG lead) from SOL-1-C to relay SLN-11 on the interface panel. See Figure 45 and Figure 52.
42. Disconnect lead 21 from SOL-2 terminal C. See Figure 51.
43. Reroute lead 21 to SNO-1 terminal C. See Figure 52. (Re-use or disconnect and discard the existing lead 21 connected to SNO-1-C.)
44. Add a lead (customer-provided 18 AWG lead) from SOL-2 terminal C to relay SLE-11 on the interface panel. See Figure 45 and Figure 52.



1. SNO
2. SOL-1 and SOL-2

566871-A

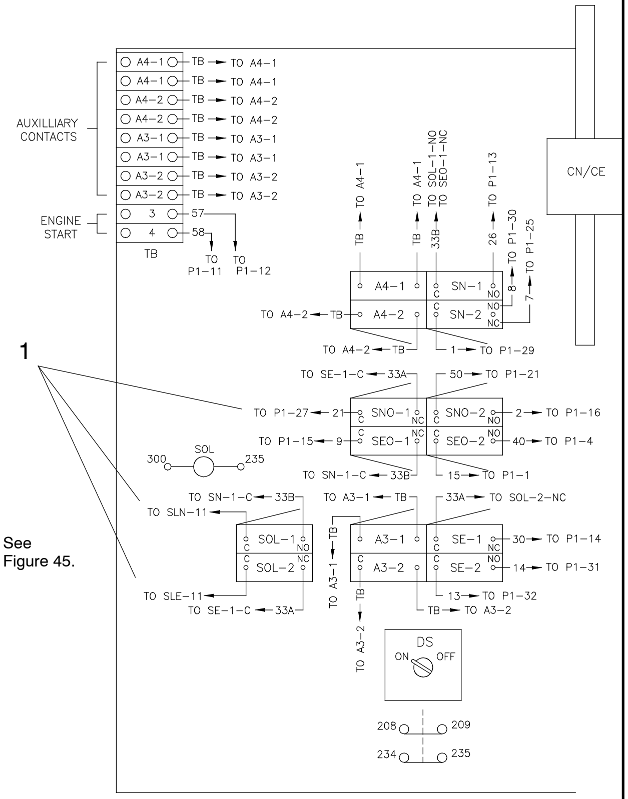
Figure 50 40-260 Amp Contactors



1. Old connections

353179

Figure 51 Old Connections, 40-260 Amp Models



1. New connections

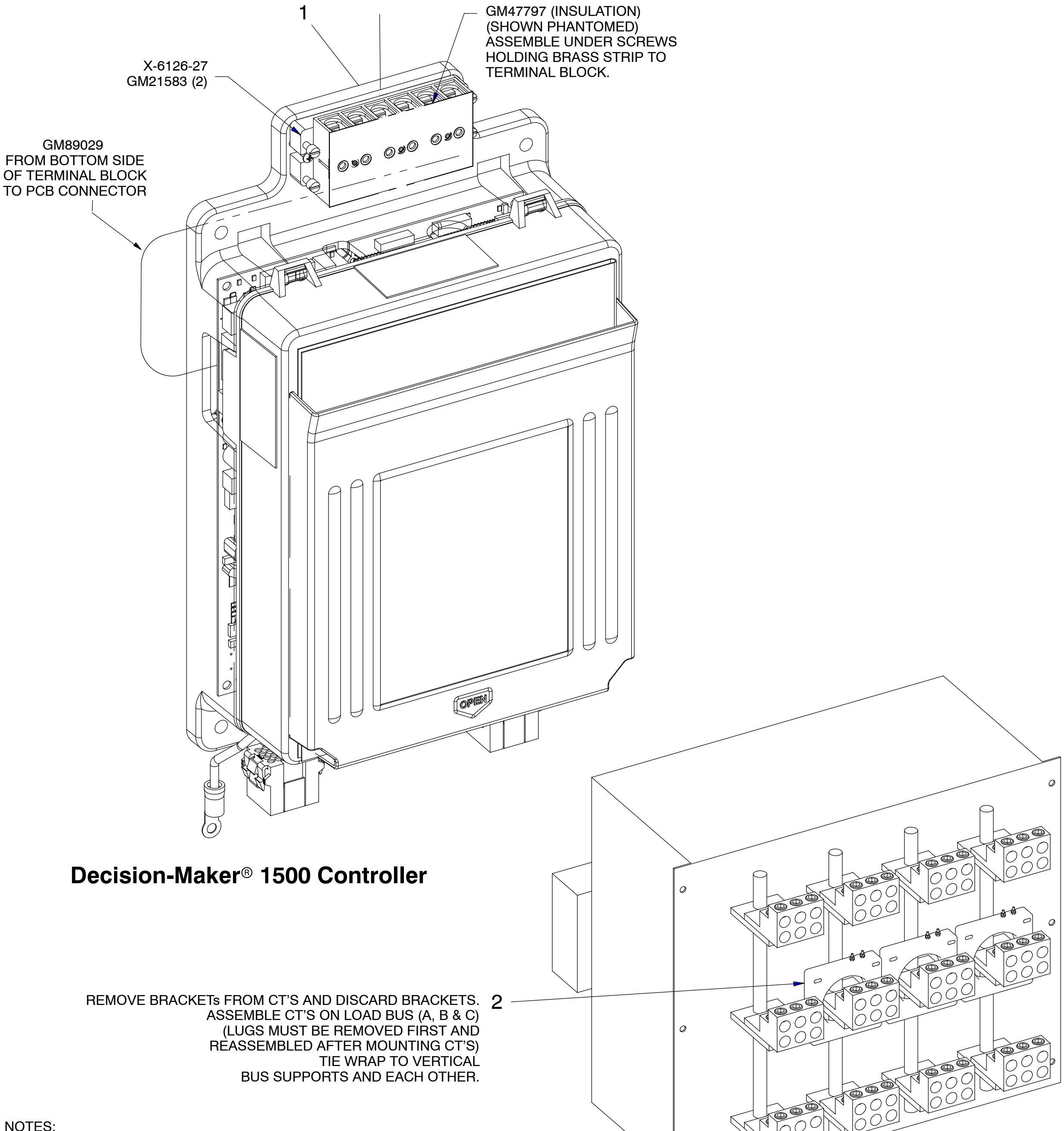
GM99386B-

Figure 52 New Connections, 40-260 Amp Models

Current Sensing Kit Installation

45. If current sensing is required (i.e. for current [amps] monitoring and display), obtain the appropriately rated current sensing kit with 10 foot harness, and install according to Figure 53. See Figure 6 or the Parts Lists for current sensing kit numbers.

46. Connect the current transformers as shown in Figure 54.



NOTES:

HI SIDE OF CT'S MUST ALWAYS FACE TOWARD THE CONTACTOR.
Route CT harness neatly to controller with controller/contactor harness. Use cable ties as necessary.
See wiring diagram GM47803 (Figure 54).

1. Connect harness GM40562 (10 ft. harness). See Figure 54 for electrical connections.
2. Current transformers. See Parts List for part numbers.

Figure 53 Current Sensing Kit Installation

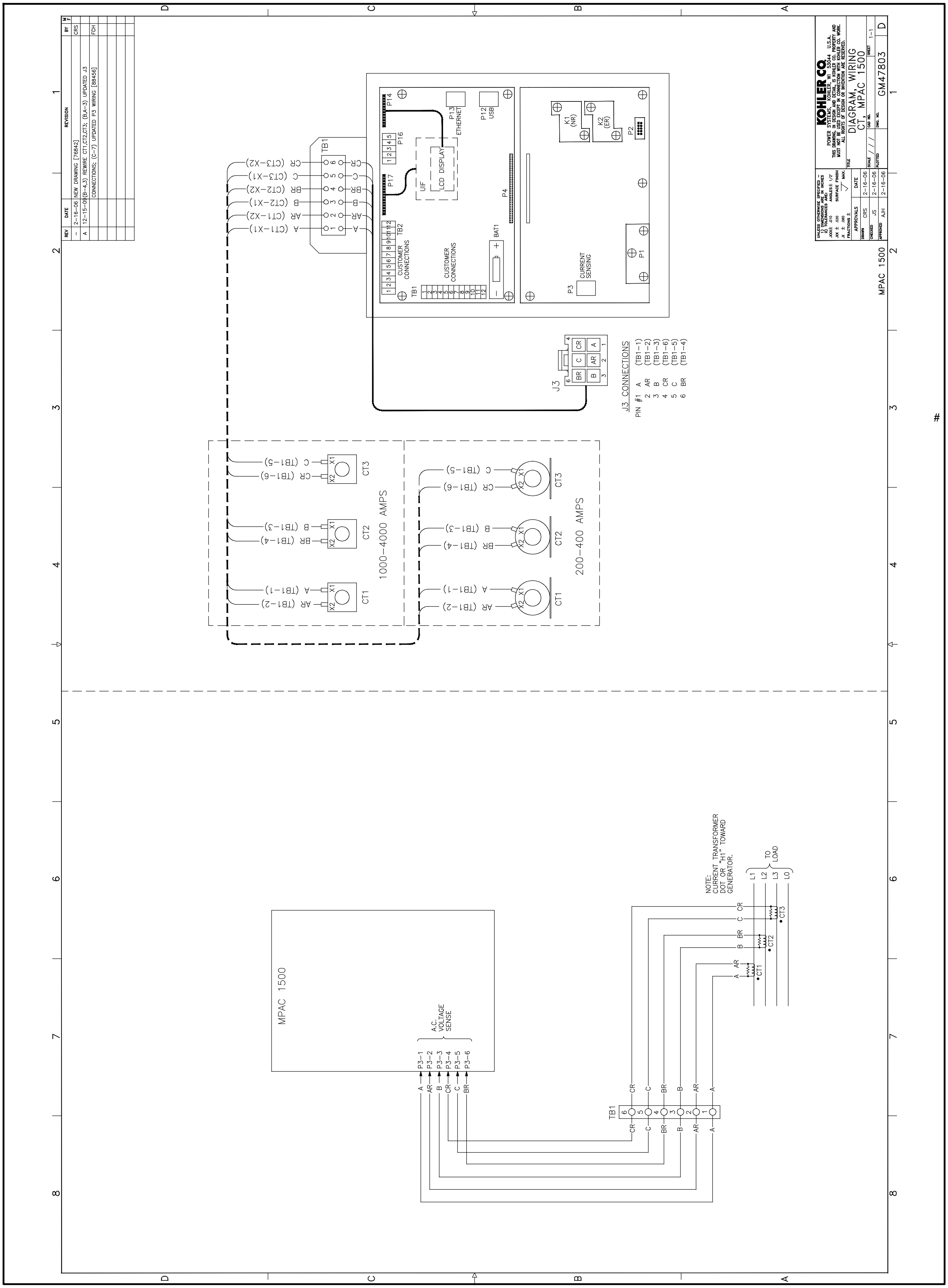
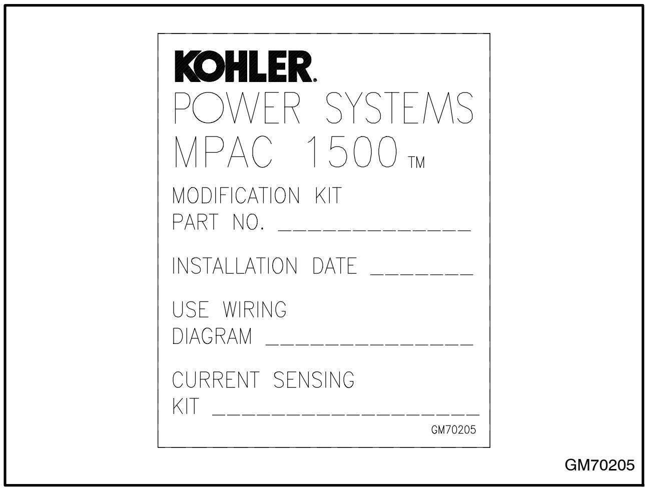


Figure 54 Current Sensing Kit Wiring Diagram, GM47803

47. Record the required information on decal GM70205 (see Figure 55). See Figure 6 or the Parts Lists for the current sensing kit number. See Figure 58 for the wiring diagram number.

48. Verify that the surface is clean and dry, and place decal GM70205 on the mounting plate as shown in Figure 56.



KOHLER.
POWER SYSTEMS
MPAC 1500™
MODIFICATION KIT
PART NO. ______________
INSTALLATION DATE _______
USE WIRING
DIAGRAM _______________
CURRENT SENSING
KIT ____________________
GM70205

GM70205

Figure 55 Decal GM70205

Note: This photo does not show the latest controller design. See Figure 25.

Figure 56 Decal GM70205 Location

Accessories

49. If optional accessory modules are used, attach the accessory mounting kit to the conversion kit mounting plate (GM77130). See Figure 22. Then refer to instruction sheet TT-1449, provided with the accessory mounting kit, to install and connect the modules.

50. For installation of other optional accessories, refer to the instructions provided with the accessory kit or see the Decision-Maker® MPAC 1500 Operation Manual, TP-6883.

Setup and Test

51. Reconnect power to the transfer switch.

52. Check that the generator set master switch is in the OFF position.

53. Reconnect the generator set engine starting battery, negative (–) lead last.

54. Reconnect power to the battery charger, if equipped.

55. On the MPAC 1500 controller , program the system parameters shown in Figure 57. Refer to the transfer switch nameplate for the ATS ratings. Also check time delays and other settings that affect the ATS operation. See TP-6883, Operation Manual, for instructions.

System Parameter	Factory Setting
Standard or programmed transition	Set these parameters to match the transfer switch †
Single/three phase	
Operating voltage	
Operating frequency (50 or 60 Hz)	
Rated current	
Phase rotation	ABC
Commit to transfer (yes or no)	No
Operating mode: Generator-to-Generator, Utility-to-Generator, or Utility-to-Utility	Utility-to-Generator
In-phase monitor	Disabled
In-phase monitor transfer angle	5°
† See the ATS nameplate.	

Figure 57 System Parameters

56. Run the operation tests outlined in Operation Manual TP-6883 to verify system operation.

57. Keep these installation instructions and wiring diagrams with the transfer switch documentation for future reference.

Parts Lists

ZCS-6 M340+ to Decision-Maker® MPAC 1500 Conversion Kit

Kit: GM99316-S6		
Qty.	**Description**	**Part Number**
1	Rail, din	GM47488
1	Decal, conversion	GM67498
1	Plate, cover switch	GM69929
1	Retainer, panel	GM70051
1	Decal, KPS MPAC 1500	GM70205
1	Harness, wiring controller	GM77827
1	MPAC1500 assembly	GM85884-4
1	Plate, mounting	GM99317
1	Lead	LK-1212-1515
1	Operation manual - MPAC1500	TP-6883
1	Installation Instructions	TT-1685
1	Washer, lock .743 in. OD	X-22-12
5	Washer, lock.285 in. OD	X-22-6
8	Washer, lock .333 in. OD	X-22-7
5	Washer, plain 1.5 in. OD	X-25-122
10	Cable tie	X-468-1
2	Cable tie, nylon	X-468-3
13	Nut, flange spiralock 1/4-20	X-6210-2
15	Nut, flabg whiz 8-32	X-6210-4
5	Nut, hex machine screw 6-32	X-71-2

Current Sensing Kit Parts

Description	Part Number	Part Quantity									
		Kit number GM89028:									
		-S3	-S6	-S8	-S11	-S15	-S17	-S21	-S24	-S26	-S28
		200 A	400 A	1000 A	1200 A	2000 A	3000 A	200 A	400 A	1000 A	1200 A
		3 ph	3 ph	3 ph	3 ph	3 ph	3 ph	1 ph	1 ph	1 ph	1 ph
Screw, Plastic Tapping	GM21583	2	2	2	2	2	2	2	2	2	2
Harness, CT 10 FT.	GM40562	1	1	1	1	1	1	1	1	1	1
Transformer, Current	GM47788	3						2			
Transformer, Current	GM47789		3						2		
Transformer, Current	GM47790			3						3	
Transformer, Current	GM47791				3						2
Transformer, Current	GM47792					3					
Transformer, Current	GM47793						3				
Insulation, Terminal Block	GM47797	1	1	1	1	1	1	1	1	1	1
Bracket, CT Mounting	GM47800										1
Diagram, Wiring CT MPAC 1500	GM47803	1	1	1	1	1	1	1	1	1	1
Drawing, Assembly Current Sensing	GM89028	1	1	1	1	1	1	1	1	1	1
Harness, CT	GM89029	1	1	1	1	1	1	1	1	1	1
Terminal Block	X-6126-27	1	1	1	1	1	1	1	1	1	1
Nut, Flange Spirallock	X-6210-2										4
Screw, Thread Forming	X-67-114										8

ATS Wiring Diagrams and Schematics

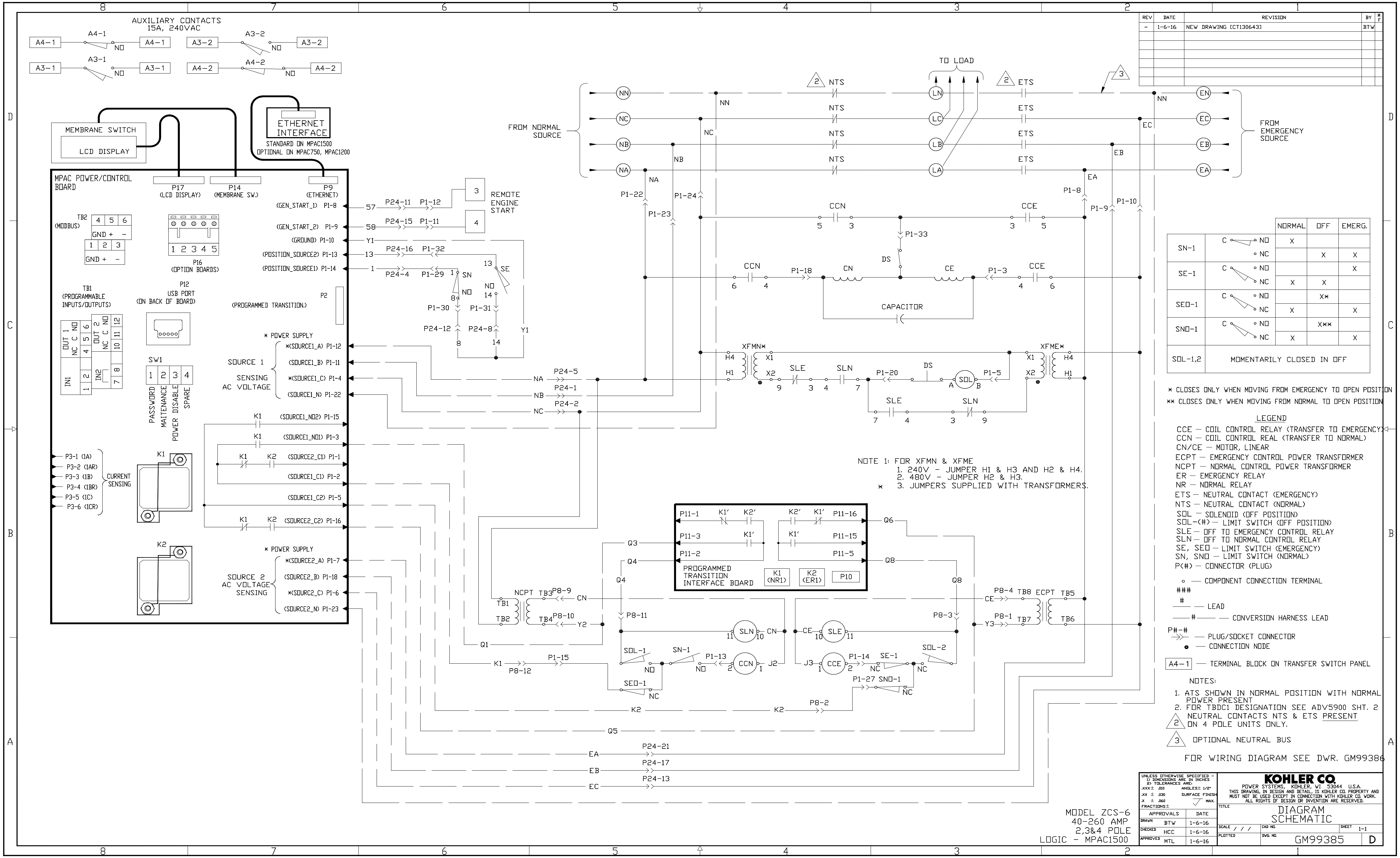
Use the table below to identify the drawings for your Model ZCS-6 programmed-transition transfer switch. The M340+ drawing numbers are shown for reference only. The MPAC 1500 conversion drawings are arranged **in alpha-numeric order** by drawing number on the following pages.

ATS Model *	Poles*	Amps	M340+ Drawing Numbers (for reference only)		MPAC 1500 Conversion Drawings	
			Schematic	Wiring Diagram	Schematic	Wiring Diagram
ZCS-6	2	40-260	353175	353179	GM99385	GM99386
	3					
	4					
	2	400	321300	321297	GM99389	GM99390
	3					
	4					
	3	600-3000	321286	321298	GM99387	GM99388
	4					

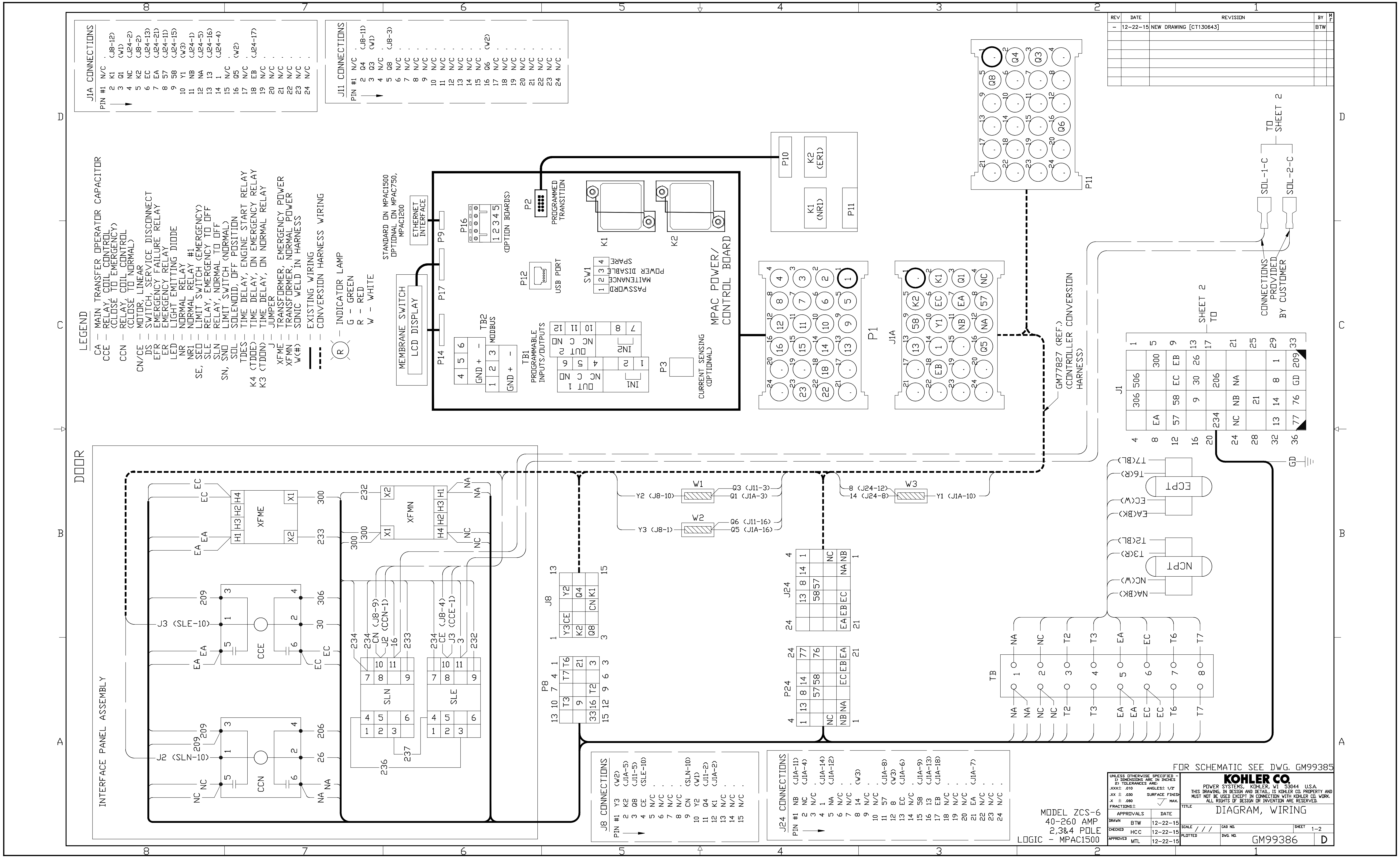
* See Figure 7 to interpret the model designation, if necessary.

Figure 58 Drawing Numbers

Notes



Schematic, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 40-260 Amps, GM99385



J1A CONNECTIONS

PIN		
#1	N/C	.
2	K1	(J8-12)
3	Q1	(W1)
4	NC	(J24-2)
5	K2	(J8-2)
6	EC	(J24-13)
7	EA	(J24-21)
8	57	(J24-11)
9	58	(J24-15)
10	Y1	(W3)
11	NB	(J24-1)
12	NA	(J24-5)
13	13	(J24-16)
14	1	(J24-4)
15	N/C	.
16	Q5	(W2)
17	N/C	.
18	EB	(J24-17)
19	N/C	.
20	N/C	.
21	N/C	.
22	N/C	.
23	N/C	.
24	N/C	.

J11 CONNECTIONS

PIN		
#1	N/C	.
2	Q4	(J8-11)
3	Q3	(W1)
4	N/C	.
5	Q8	(J8-3)
6	N/C	.
7	N/C	.
8	N/C	.
9	N/C	.
10	N/C	.
11	N/C	.
12	N/C	.
13	N/C	.
14	N/C	.
15	N/C	.
16	Q6	(W2)
17	N/C	.
18	N/C	.
19	N/C	.
20	N/C	.
21	N/C	.
22	N/C	.
23	N/C	.
24	N/C	.

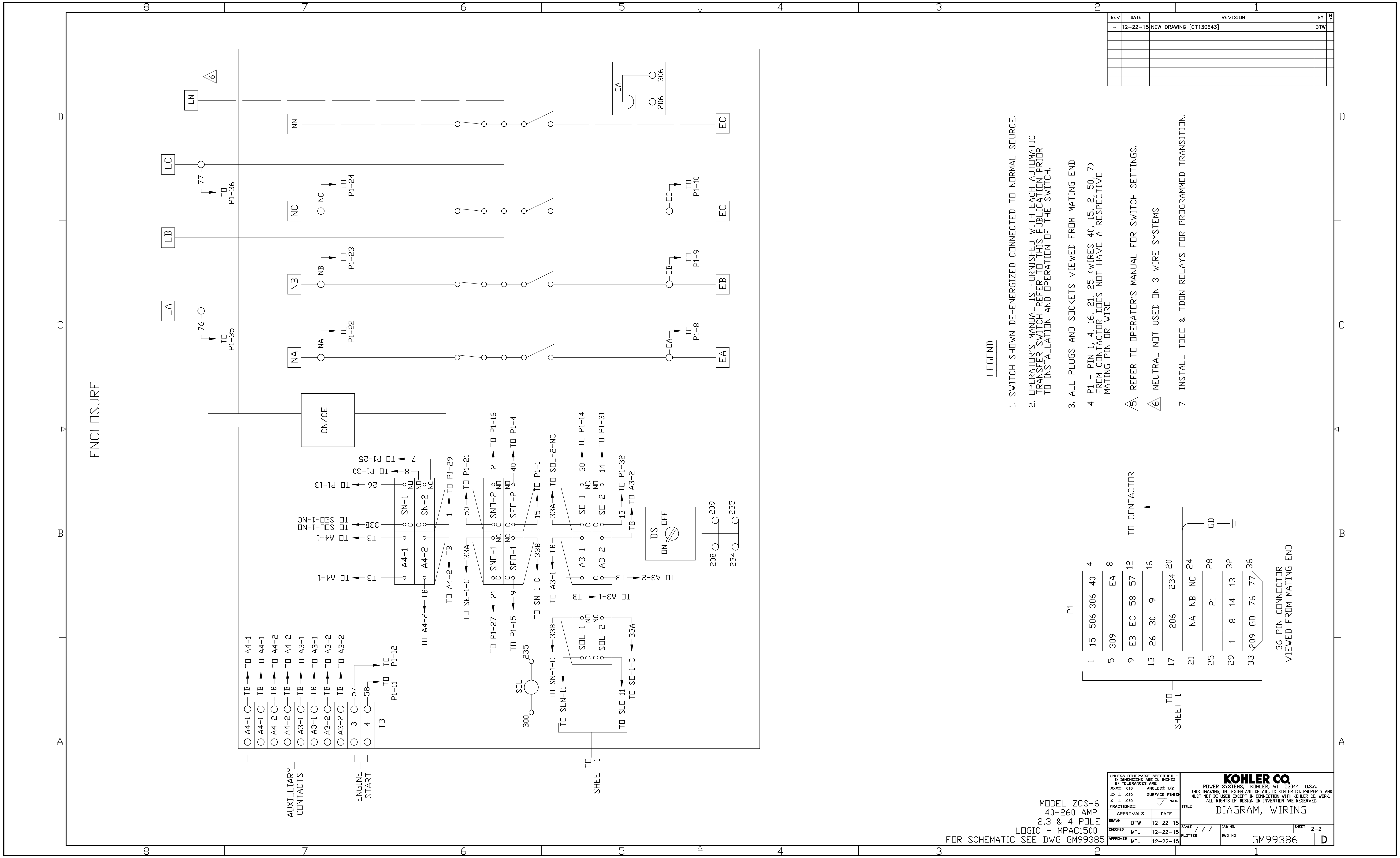
J8 CONNECTIONS

PIN		
#1	Y3	(W2)
2	K2	(J1A-5)
3	Q8	(J11-5)
4	CE	(SLE-10)
5	N/C	.
6	N/C	.
7	N/C	.
8	N/C	.
9	CN	(SLN-10)
10	Y2	(W1)
11	Q4	(J11-2)
12	K1	(J1A-2)
13	N/C	.
14	N/C	.
15	N/C	.

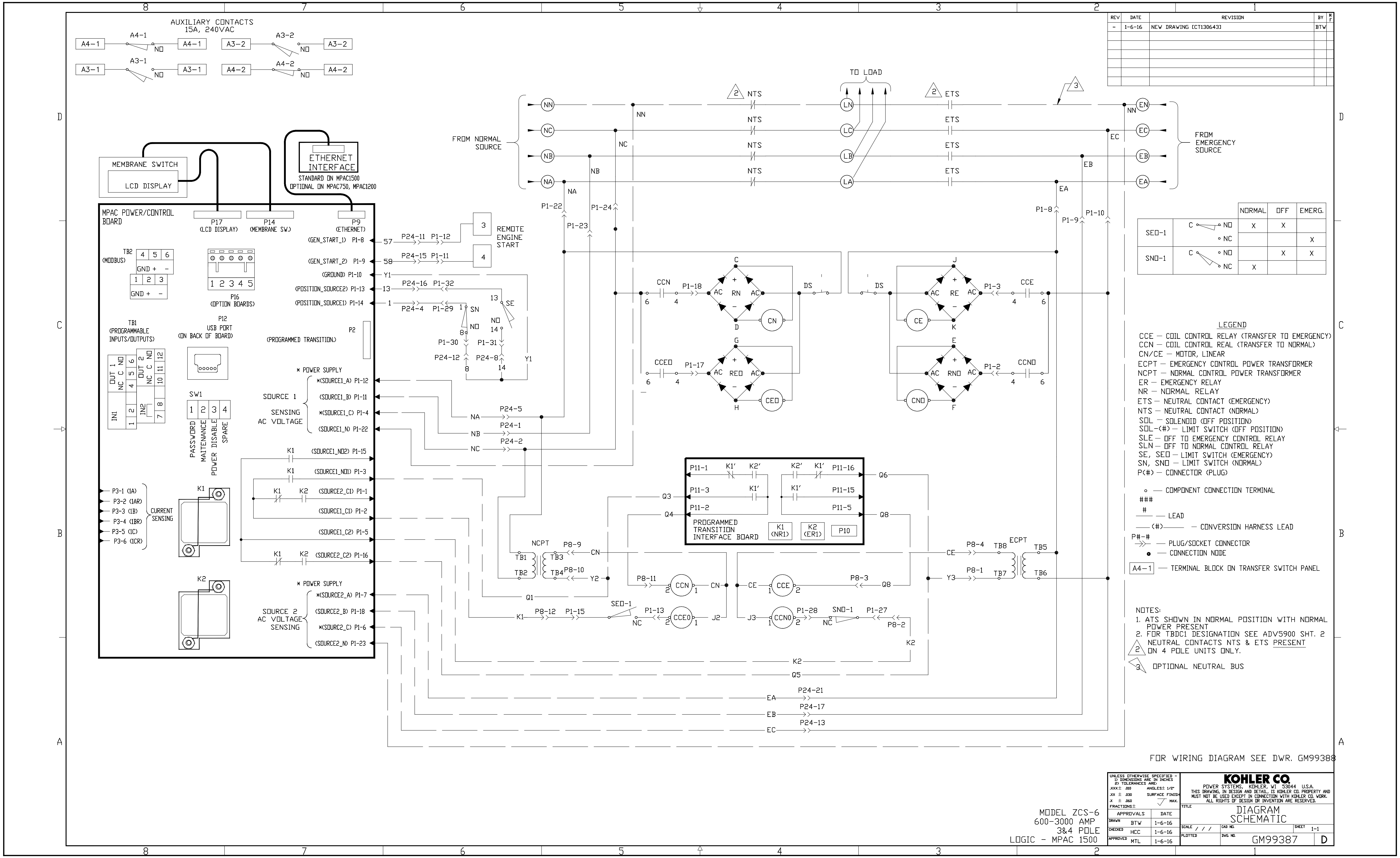
J24 CONNECTIONS

PIN		
#1	NB	(J1A-11)
2	NC	(J1A-4)
3	N/C	.
4	1	(J1A-14)
5	NA	(J1A-12)
6	N/C	.
7	N/C	.
8	14	(W3)
9	N/C	.
10	N/C	.
11	57	(J1A-8)
12	8	(W3)
13	EC	(J1A-6)
14	N/C	.
15	58	(J1A-9)
16	13	(J1A-13)
17	EB	(J1A-18)
18	N/C	.
19	N/C	.
20	N/C	.
21	EA	(J1A-7)
22	N/C	.
23	N/C	.
24	N/C	.

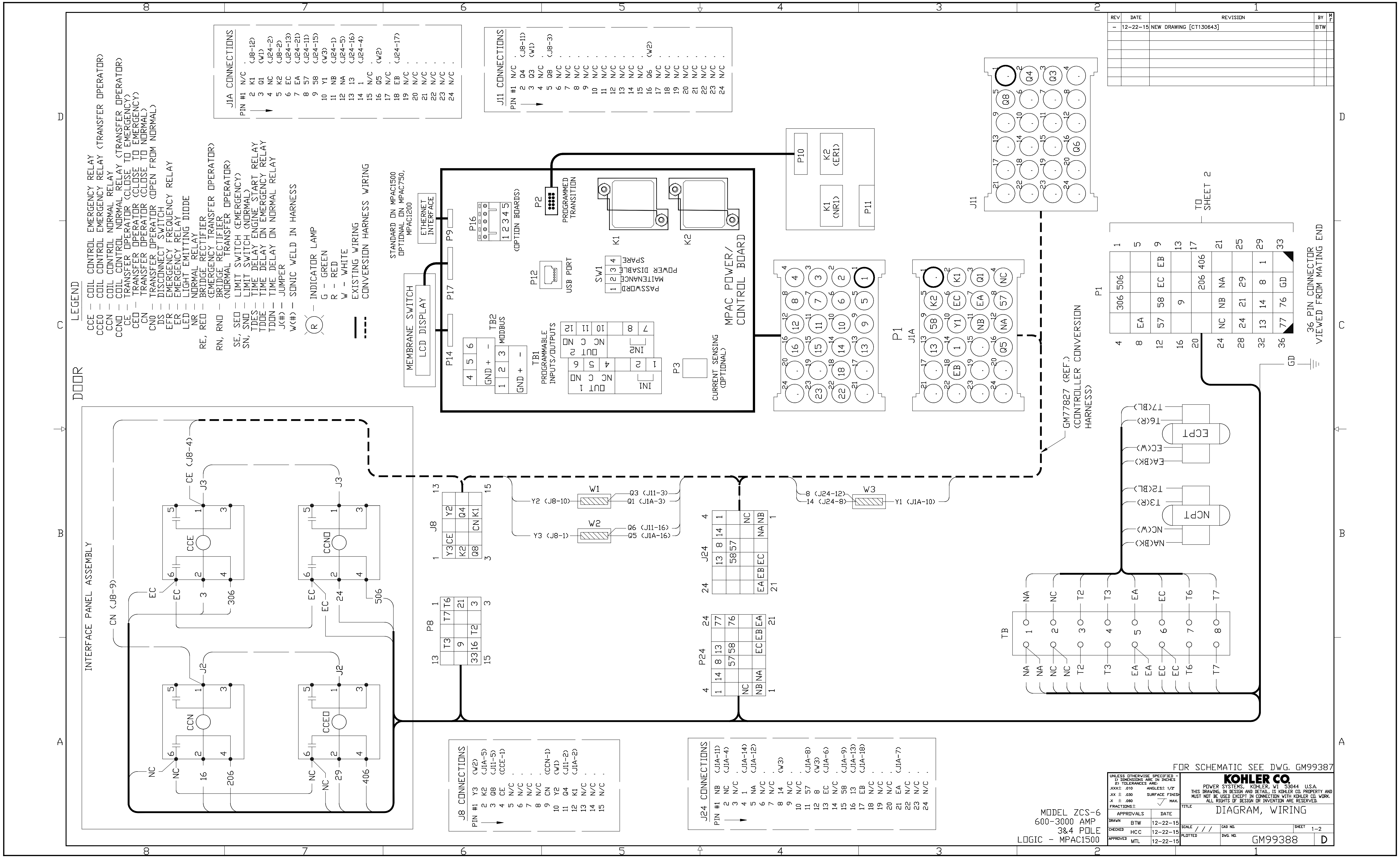
Wiring Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 40-260 Amps, GM99386 Sheet 1



Wiring Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 40-260 Amps, GM99386 Sheet 2

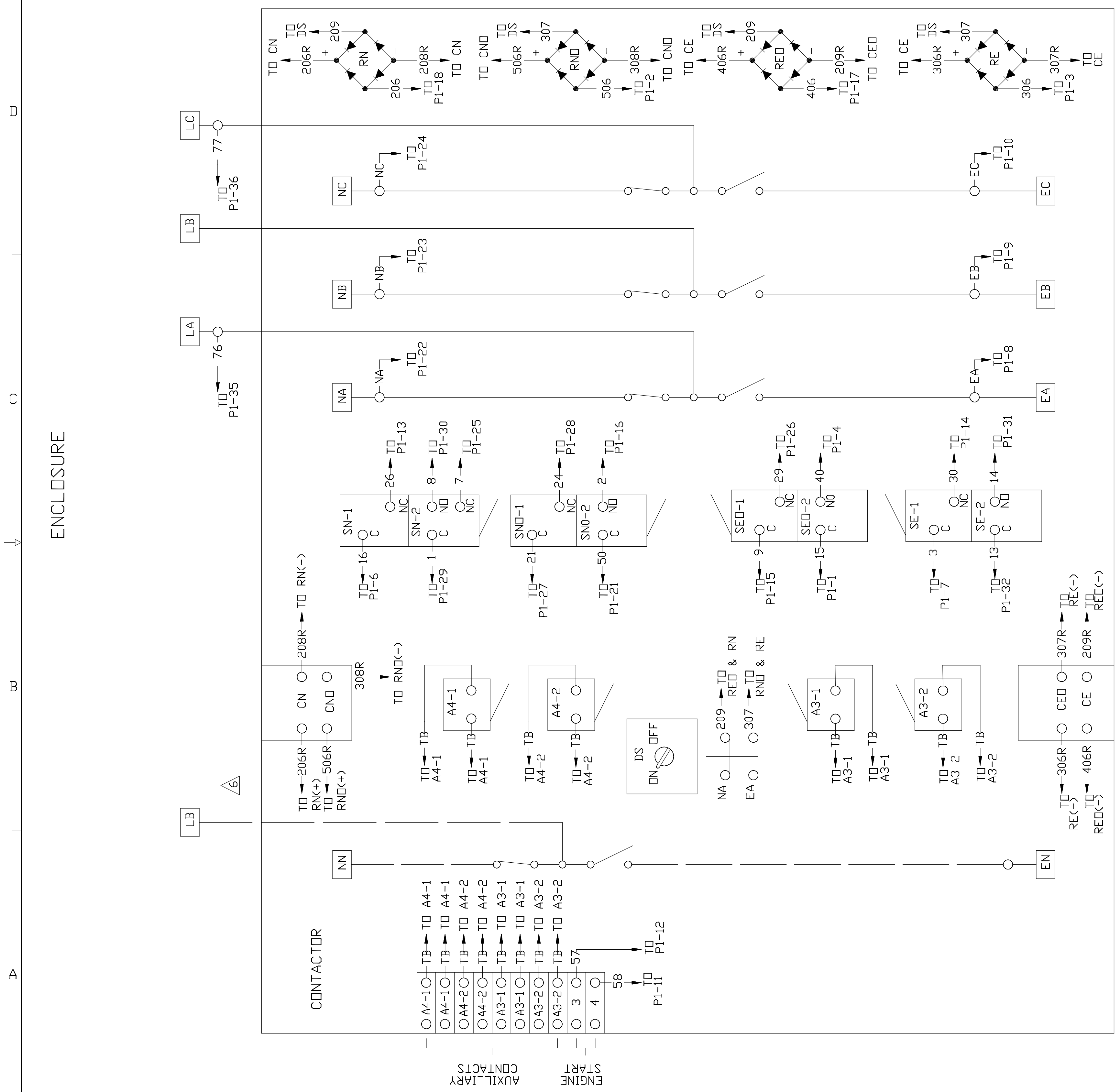


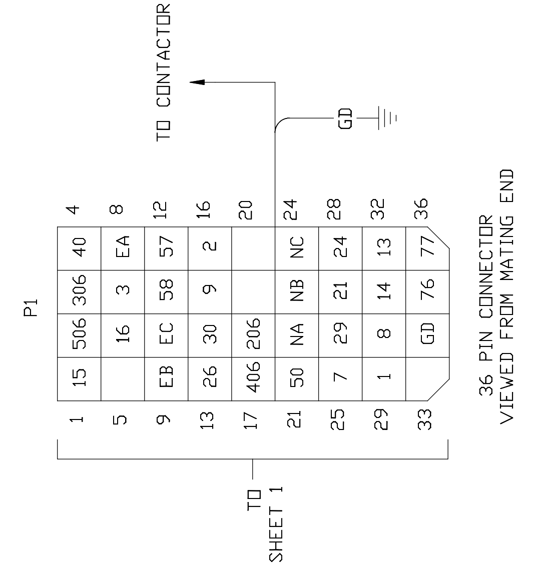
Schematic Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 600-3000 Amps, GM99387



Wiring Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 600-3000 Amps, GM99388-Sheet 1

REV	DATE	REVISION	BY
–	12-22-15	NEW DRAWING [CT130643]	BTW





NOTES:

1. SWITCH SHOWN DE-ENERGIZED CONNECTED TO NORMAL SOURCE.
2. OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.
3. ALL PLUGS AND SOCKETS VIEWED FROM MATING END.
4. P1 - PIN 1, 4, 16, 21, 25 (WIRES 40, 15, 2, 50, 7) FROM CONTACTOR DOES NOT HAVE A RESPECTIVE MATING PIN OR WIRE.

△5 REFER TO OPERATOR'S MANUAL FOR SWITCH SETTINGS.

△6 NEUTRAL NOT USED ON 3 WIRE SYSTEMS.

△7 INSTALL TDOE & TDON RELAYS FOR PROGRAMMED TRANSITION.

MODEL ZCS-6
600-3000 AMP
3 & 4 POLE
LOGIC - MPAC1500
FOR SCHEMATIC SEE DWG GM99387

UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES ARE:
.XXX± .010 ANGLES± 1/2°
.XX ± .030 SURFACE FINISH
.X ± .060 √ MAX.
FRACTIONS±

APPROVALS		DATE
DRAWN	BTW	12-22-15
CHECKED	HCC	12-22-15
APPROVED	MTL	12-22-15

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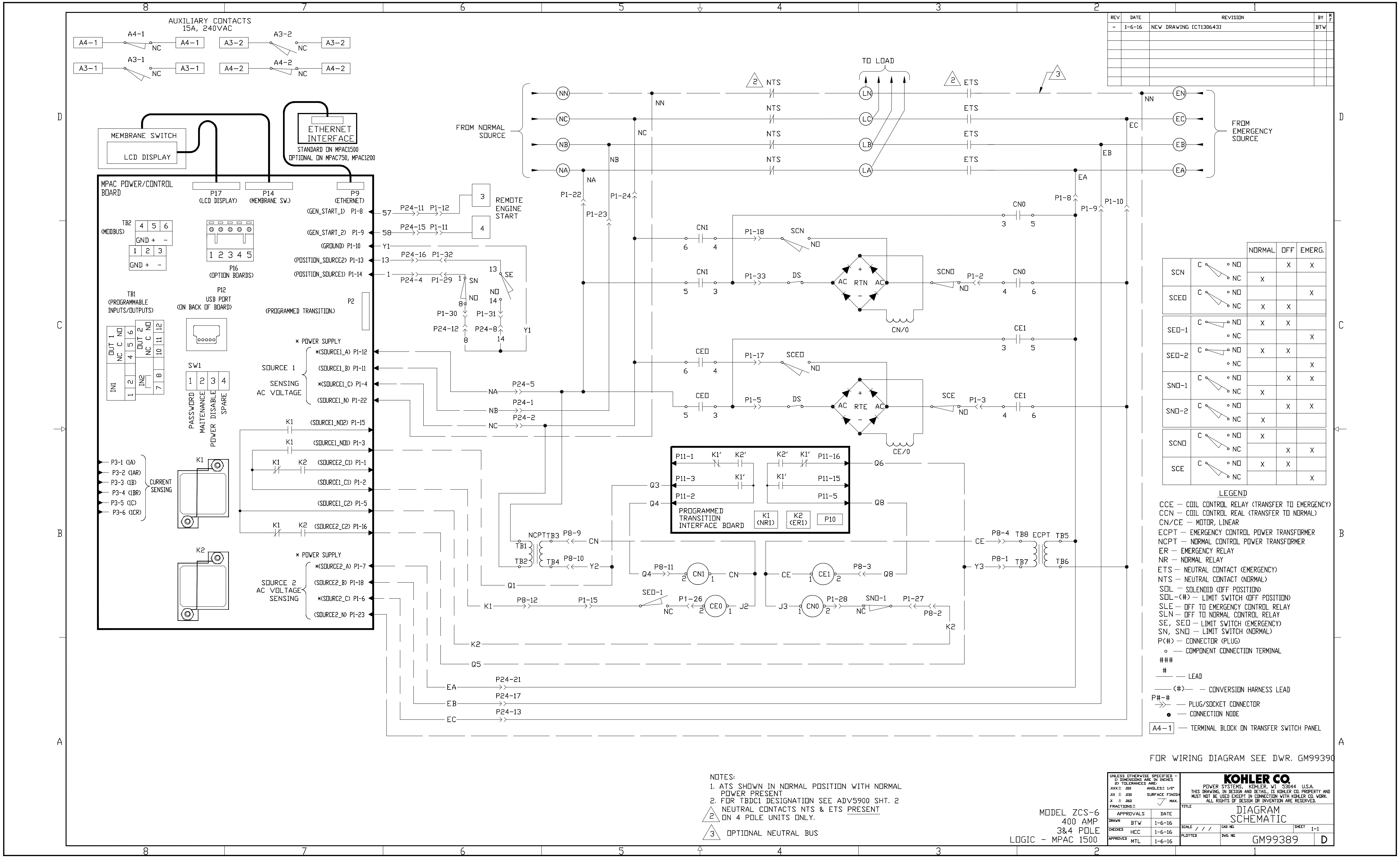
TITLE DIAGRAM, WIRING
SCALE / / /
CAD NO.
SHEET 2-2
PLOTTED
DWG. NO. GM99388 D

Wiring Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 600-3000 Amps, GM99388 Sheet 2



			NORMAL	OFF	EMERG.
SCN	C	NO		X	X
		NC	X		
SCEO	C	NO			X
		NC	X	X	
SEO-1	C	NO	X	X	
		NC			X
SEO-2	C	NO	X	X	
		NC			X
SNO-1	C	NO		X	X
		NC	X		
SNO-2	C	NO		X	X
		NC	X		
SCNO	C	NO	X		
		NC		X	X
SCE	C	NO	X	X	
		NC			X

LEGEND

CCE — COIL CONTROL RELAY (TRANSFER TO EMERGENCY)
CCN — COIL CONTROL REAL (TRANSFER TO NORMAL)
CN/CE — MOTOR, LINEAR
ECPT — EMERGENCY CONTROL POWER TRANSFORMER
NCPT — NORMAL CONTROL POWER TRANSFORMER
ER — EMERGENCY RELAY
NR — NORMAL RELAY
ETS — NEUTRAL CONTACT (EMERGENCY)
NTS — NEUTRAL CONTACT (NORMAL)
SOL — SOLENOID (OFF POSITION)
SOL-(#) — LIMIT SWITCH (OFF POSITION)
SLE — OFF TO EMERGENCY CONTROL RELAY
SLN — OFF TO NORMAL CONTROL RELAY
SE, SEO — LIMIT SWITCH (EMERGENCY)
SN, SNO — LIMIT SWITCH (NORMAL)
P(#) — CONNECTOR (PLUG)
○ — COMPONENT CONNECTION TERMINAL
— LEAD
(#) — CONVERSION HARNESS LEAD
P#-# — PLUG/SOCKET CONNECTOR
● — CONNECTION NODE
A4-1 — TERMINAL BLOCK ON TRANSFER SWITCH PANEL

FOR WIRING DIAGRAM SEE DWR. GM99390

NOTES:
1. ATS SHOWN IN NORMAL POSITION WITH NORMAL POWER PRESENT
2. FOR TBDC1 DESIGNATION SEE ADV5900 SHT. 2
2 NEUTRAL CONTACTS NTS & ETS PRESENT ON 4 POLE UNITS ONLY.
3 OPTIONAL NEUTRAL BUS

MODEL ZCS-6
400 AMP
3&4 POLE
LOGIC - MPAC 1500

REV	DATE	REVISION	BY
-	1-6-16	NEW DRAWING [CT130643]	BTW

UNLESS OTHERWISE SPECIFIED -
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES ARE:
.XXX ± .010 ANGLES ± 1/2°
.XX ± .030 SURFACE FINISH
.X ± .060 MAX.
FRACTIONS ±

APPROVALS		DATE
DRAWN	BTW	1-6-16
CHECKED	HCC	1-6-16
APPROVED	MTL	1-6-16

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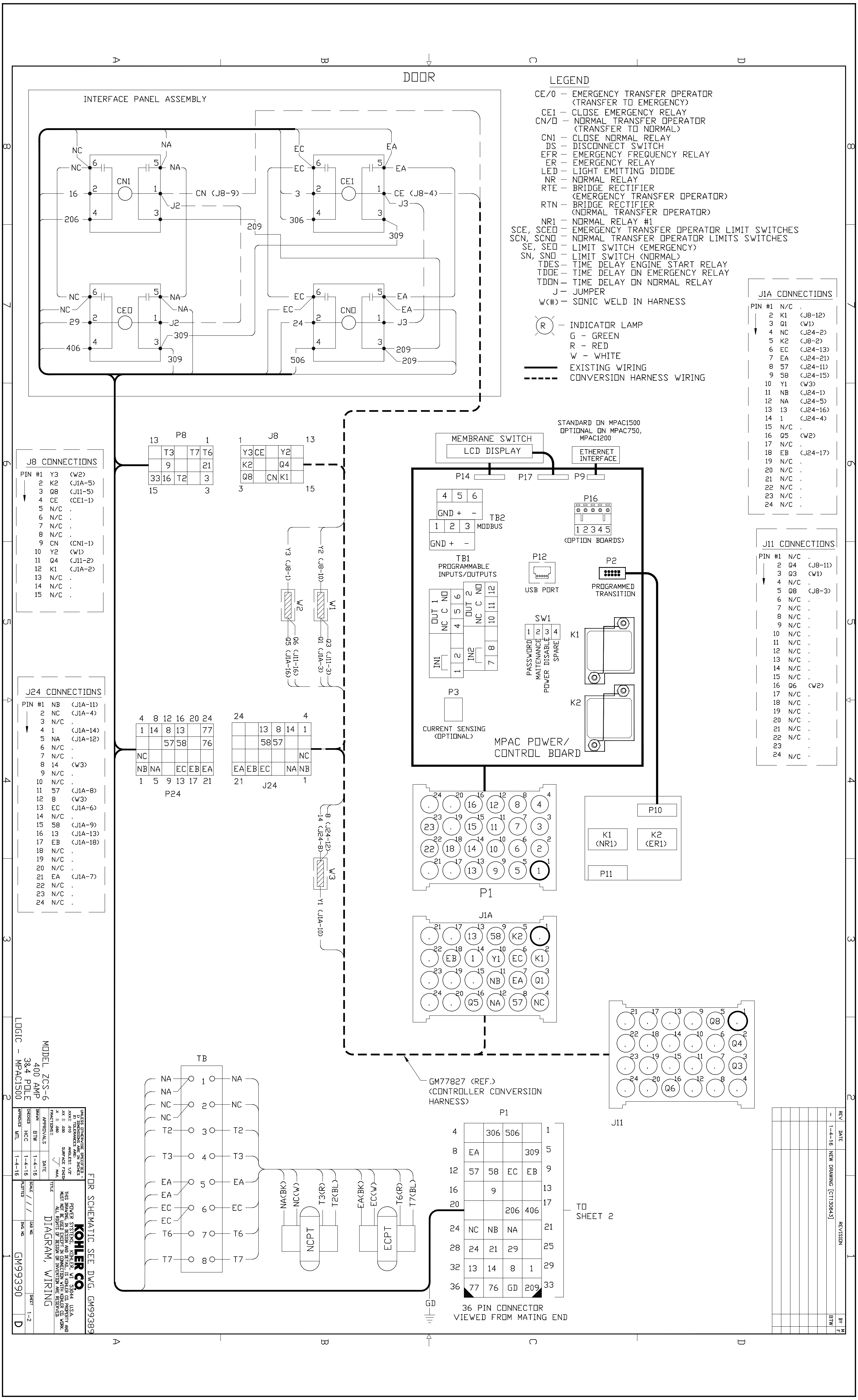
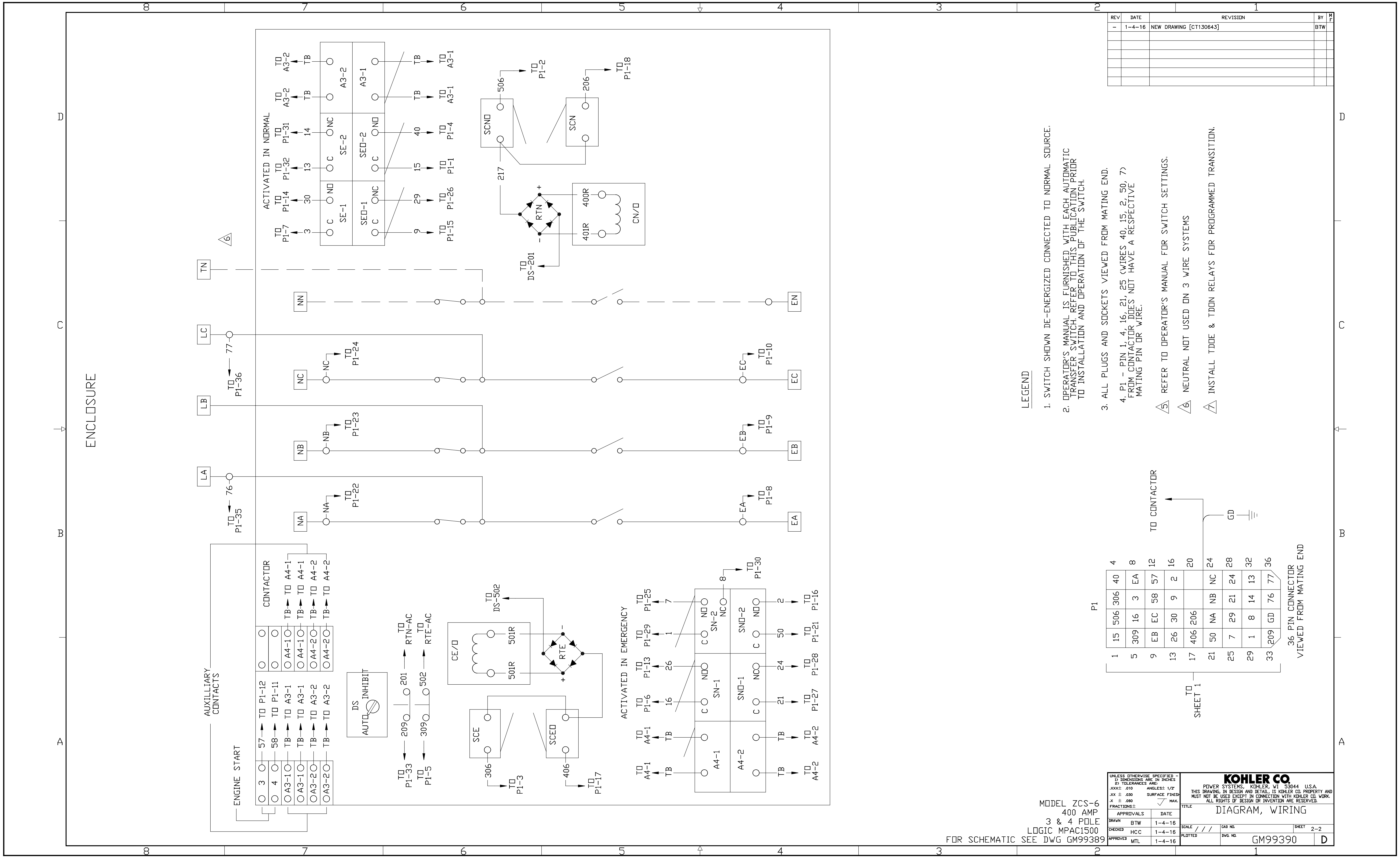
TITLE DIAGRAM SCHEMATIC
SCALE / / /
CAD NO.
SHEET 1-1
PLOTTED
DWG. NO. GM99389 D

Schematic Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 400 Amps, GM99389



Wiring Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 400 Amps, GM99390 Sheet 1



LEGEND

1. SWITCH SHOWN DE-ENERGIZED CONNECTED TO NORMAL SOURCE.
2. OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.
3. ALL PLUGS AND SOCKETS VIEWED FROM MATING END.
4. P1 - PIN 1, 4, 16, 21, 25 (WIRES 40, 15, 2, 50, 7) FROM CONTACTOR DOES NOT HAVE A RESPECTIVE MATING PIN OR WIRE.

5. REFER TO OPERATOR'S MANUAL FOR SWITCH SETTINGS.
6. NEUTRAL NOT USED ON 3 WIRE SYSTEMS
7. INSTALL TDOE & TDON RELAYS FOR PROGRAMMED TRANSITION.

REV	DATE	REVISION	BY
-	1-4-16	NEW DRAWING [CT130643]	BTW

MODEL ZCS-6
400 AMP
3 & 4 POLE
LOGIC MPAC1500
FOR SCHEMATIC SEE DWG GM99389

UNLESS OTHERWISE SPECIFIED - 1) DIMENSIONS ARE IN INCHES 2) TOLERANCES ARE:
.XXX ± .010 ANGLES ± 1/2°
.XX ± .030 SURFACE FINISH MAX.
.X ± .060
FRACTIONS ±

APPROVALS		DATE
DRAWN	BTW	1-4-16
CHECKED	HCC	1-4-16
APPROVED	MTL	1-4-16

KOHLER CO.
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.
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TITLE DIAGRAM, WIRING
SCALE / / / CAD NO. SHEET 2-2
PLOTTED DWG NO. GM99390 D

Wiring Diagram, Model ZCS-6 Programmed Transition with MPAC 1500 Controls, 400 Amps, GM99390 Sheet 2

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