

# WIRING FOR ASCO® 185 SERIES SERVICE EQUIPMENT POWER TRANSFER SWITCH RATED 100 & 200 AMPERES, 240 VOLTS, 50-60 Hz, SINGLE PHASE/3 WIRE, GROUP 4 CONTROLS

## CONTROL FEATURES

### VOLTAGE AND FREQUENCY SENSING

- A. VOLTAGE SENSING – PREFERRED SOURCE  
DROPOUT SETTING ADJUSTABLE AT 187V, 187V, 176V, OR 154V. FACTORY SET AT 187V  
PICKUP VOLTAGE ADJUSTABLE AT 209V OR 198V. FACTORY SET AT 198V  
(IF DROPOUT IS SET AT 198V, PICKUP MUST BE SET AT 209V).  
(REFER TO THE SERIES 185 OPERATOR'S MANUAL, PN 381333-319)
- B. VOLTAGE SENSING – ALTERNATE SOURCE  
NON-ADJUSTABLE DROPOUT SETTING: 165V  
NON-ADJUSTABLE PICKUP SETTING: 198V
- C. FREQUENCY SENSING – ALTERNATE SOURCE  
NON-ADJUSTABLE DROPOUT SETTING:  
51Hz (FREQUENCY SET AT 60Hz NOMINAL), 43Hz (FREQUENCY SET AT 50Hz NOMINAL)  
NON-ADJUSTABLE PICKUP SETTING:  
57Hz (FREQUENCY SET AT 60Hz NOMINAL), 48Hz (FREQUENCY SET AT 50Hz NOMINAL)

### TIME DELAYS

(FOR ADDITIONAL INFORMATION REFER TO THE SERIES 185 OPERATOR'S MANUAL, PN 381333-319)

- A. OVERRIDE MOMENTARY PREFERRED SOURCE OUTAGE DELAY – ACTIVATED WHEN THE PREFERRED SOURCE FAILS. DEACTIVATED WHEN THE PREFERRED SOURCE IS ACCEPTABLE. PROVIDES A SELECTABLE (1 OR 3 SECOND) DELAY ON ENGINE STARTING AND TRANSFER. FACTORY SET AT 3 SECONDS.
- B. TRANSFER TO ALTERNATE SOURCE DELAY – PROVIDES A DELAY TO ALLOW STABILIZATION OF THE ALTERNATE SOURCE. ACTIVATED AFTER THE ALTERNATE SOURCE IS ACCEPTABLE, WHEN THE PREFERRED SOURCE FAILS OR WHEN A TEST IS INITIATED. NON-ADJUSTABLE DELAY SETTING: 10 SECONDS (APPROXIMATE)
- C. OVERRIDE MOMENTARY ALTERNATE SOURCE OUTAGE DELAY – ACTIVATED WHEN THE TRANSFER SWITCH IS IN THE ALTERNATE POSITION AND THE ALTERNATE SOURCE FAILS. DEACTIVATED WHEN THE ALTERNATE SOURCE IS ACCEPTABLE. RETRANSFER TO THE PREFERRED SOURCE WILL OCCUR WHEN THE DELAY EXPIRES IF THE PREFERRED SOURCE IS AVAILABLE. PROVIDES A SELECTABLE (0 OR 4 SECONDS) DELAY. FACTORY SET AT 4 SECONDS.
- D. RETRANSFER TO PREFERRED SOURCE DELAY – ACTIVATED WHEN THE PREFERRED SOURCE IS ACCEPTABLE. DEACTIVATED WHEN THE PREFERRED SOURCE FAILS WITH NO RETRANSFER TO THE PREFERRED SOURCE. ALSO DEACTIVATED WHEN THE ALTERNATE SOURCE FAILS WHILE THE PREFERRED SOURCE IS ACCEPTABLE, RESULTING IN RETRANSFER TO THE PREFERRED SOURCE. NON-ADJUSTABLE DELAY SETTING: 5 MINUTES (APPROXIMATE)
- E. UNLOADED RUNNING (GENERATOR COOL DOWN) DELAY – ACTIVATED AFTER RETRANSFER TO THE PREFERRED SOURCE. PROVIDES A SELECTABLE (2 OR 5 MINUTES) DELAY BEFORE ENGINE SHUTDOWN. FACTORY SET AT 2 MINUTES.

### ENGINE CONTROL CONTACTS

ONE FORM C CONTACT THAT CHANGES POSITION ON EXPIRATION OF THE MOMENTARY PREFERRED SOURCE OUTAGE DELAY AND RESET ON EXPIRATION OF THE UNLOADED RUNNING (GENERATOR COOL DOWN) DELAY. OUTPUT CONTACTS (NR RELAY) ARE RATED 5 AMPS RESISTIVE AT 30 VDC, 2 AMPS RESISTIVE AT 250 VAC.

### OPERATOR INTERFACE INDICATORS & CONTROLS

- A. TRANSFER SWITCH TEST – MOMENTARY PUSHBUTTON TO SIMULATE PREFERRED SOURCE FAILURE SEQUENCE OF OPERATION. PRESS AND HOLD FOR AT LEAST 15 SECONDS TO ALLOW TIME FOR THE GENERATOR SET TO START.
- B. BYPASS TIME DELAY – MOMENTARY PUSHBUTTON TO BYPASS THE ENGINE EXERCISER OPERATION OR THE RETRANSFER TO NORMAL DELAY, DEPENDING ON WHICH FUNCTION IS ACTIVE.
- C. SET ENGINE EXERCISER – MOMENTARY PUSHBUTTON TO ACTIVATE A SEVEN (7) DAY TIMER FOR AUTOMATIC, WEEKLY TESTING OF THE GENERATOR. SETTINGS ALLOW TESTING WITH OR WITHOUT LOAD TRANSFER. FACTORY SET TO OCCUR WITHOUT LOAD TRANSFER.  
THE TIMER IS POWERED BY A 9 VOLT BATTERY WHEN THE PREFERRED AND ALTERNATE SOURCES ARE NOT AVAILABLE.  
DEPRESSING THE MOMENTARY PUSHBUTTON FOR 5 SECONDS CAUSES THE EXERCISE TO OCCUR IMMEDIATELY AND AT THE SAME TIME OF WEEK THEREAFTER. THE FEATURE IS ACTIVATED AS A SETTING ON THE CONTROLLER.  
(REFER TO THE SERIES 185 OPERATOR'S MANUAL, PN 381333-319)
- D. LOAD CONNECTED INDICATORS:  
GREEN LED TO INDICATE WHEN THE LOAD IS CONNECTED TO THE PREFERRED SOURCE.  
RED LED TO INDICATE WHEN THE LOAD IS CONNECTED TO THE ALTERNATE SOURCE.
- E. SOURCE ACCEPTABILITY INDICATORS  
GREEN LED TO INDICATE WHEN THE PREFERRED SOURCE IS ACCEPTABLE.  
RED LED INDICATOR TO INDICATE WHEN THE ALTERNATE SOURCE IS ACCEPTABLE.

### REMOTE CONTROL FEATURES

THE FOLLOWING CONTROL PANEL INPUTS PROVIDE REMOTE CONTROL FUNCTIONS FOR THE AUTOMATIC TRANSFER SWITCH. EACH CONTROL FUNCTION CAN BE IMPLEMENTED BY THE CUSTOMER PROVIDING THE FORM OF CONTROL CONTACT DESCRIBED. EACH CONTROL CONTACT MUST BE SUITABLE FOR A 5 VDC LOW ENERGY CIRCUIT. EACH CONTROL FEATURE IS ACTIVATED BY SETTING A DIP TYPE SELECTOR SWITCH ON THE CONTROL PANEL.  
(REFER TO THE SERIES 185 OPERATOR'S MANUAL, PN 381333-319)

- A. REMOTE TEST FEATURE – REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT SIMULATES A FAILURE OF THE PREFERRED SOURCE. THE TRANSFER SWITCH WILL REMAIN CONNECTED TO THE ALTERNATE SOURCE UNDER ALL CONDITIONS OF THE GENERATOR WHILE THE CONTACT IS OPEN.
- B. REMOTE TRANSFER TO ALTERNATE SOURCE FEATURE – REQUIRES A CUSTOMER SUPPLIED, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT CAUSES ENGINE STARTING AND TRANSFER TO THE ALTERNATE SOURCE. RECLOSURE OF THE CONTACT ACTIVATES THE RETRANSFER TO PREFERRED SOURCE DELAY FOLLOWED BY RETRANSFER TO THE PREFERRED SOURCE. IF THE ALTERNATE SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO IT AND THE REMOTE CONTACT IS OPEN, THE TRANSFER SWITCH WILL RETRANSFER TO THE PREFERRED SOURCE.
- C. BYPASS TRANSFER TIME DELAY FEATURE – REQUIRES A CUSTOMER SUPPLIED, REMOTE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT BYPASSES THE RETRANSFER TO PREFERRED SOURCE DELAY IF ACTIVE.

## GENERAL NOTES

1. SWITCH SHOWN DE-ENERGIZED AND CONNECTED TO PREFERRED SOURCE. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUB. ICS 1-1983, PART 1-101A.
2. ALL WIRING IS #16 AWG, TINNED, STRANDED COPPER UNLESS OTHERWISE INDICATED.
3. ○ INDICATES CUSTOMER CONNECTION POINTS.
4. ● INDICATES FACTORY CONNECTION POINTS.
5. CONNECTION POINTS THAT HAVE BOTH CUSTOMER CONNECTIONS AND FACTORY CONNECTIONS ARE SHOWN OPEN AS CUSTOMER CONNECTION POINTS.
6. A SERIES 185 OPERATOR'S MANUAL (PN 381333-319) IS PROVIDED WITH THE TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION.

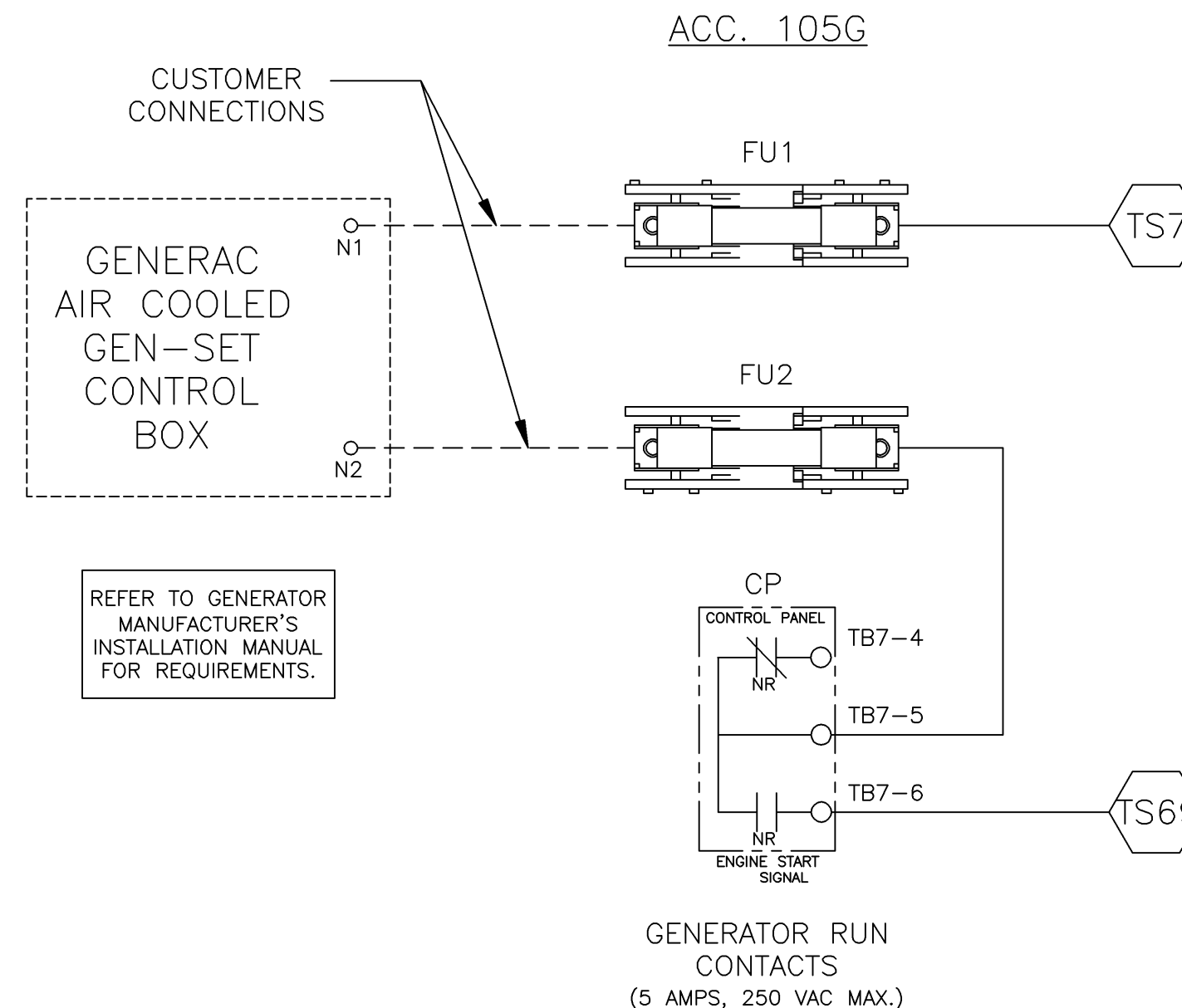
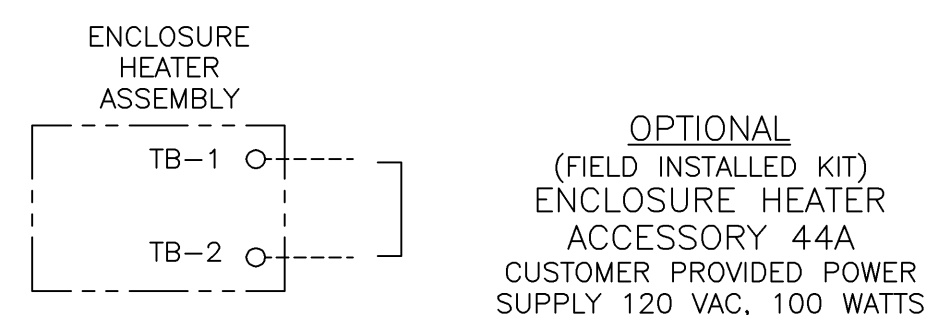
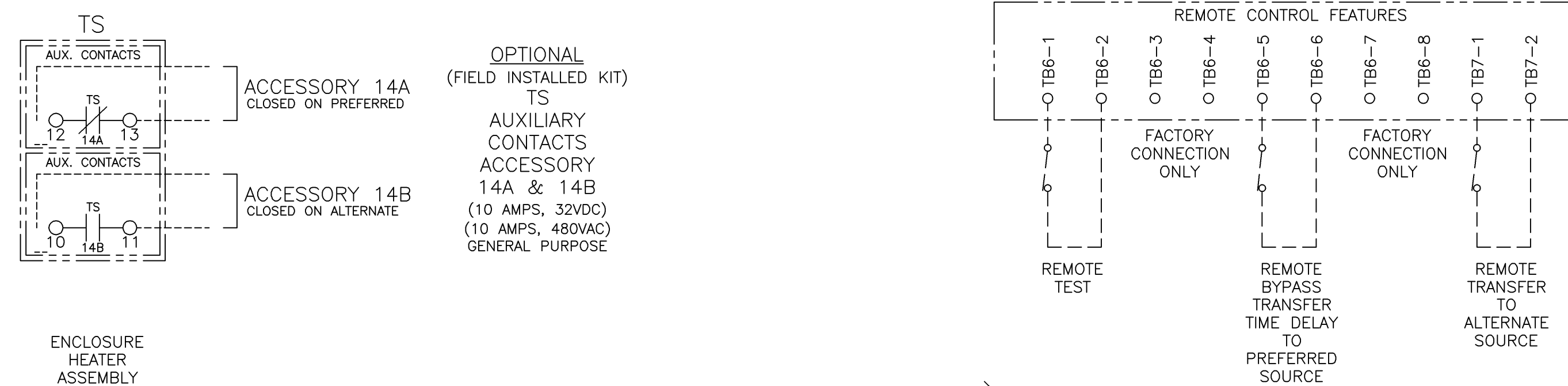
## OPTIONAL ACCESSORIES

- ACC. 14A (1) AUXILIARY CONTACT CLOSED WHEN THE TRANSFER SWITCH IC CONNECTED TO THE PREFERRED SOURCE. FIELD INSTALLED KIT WHEN PROVIDED.
- ACC. 14B (1) AUXILIARY CONTACT CLOSED WHEN THE TRANSFER SWITCH IS CONNECTED TO THE ALTERNATE SOURCE. FIELD INSTALLED KIT WHEN PROVIDED.
- ACC. 44A ENCLOSURE HEATER 120 VAC. FIELD INSTALLED KIT WHEN PROVIDED.
- ACC. 73SL1 PROVIDES SURGE SUPPRESSION ON THE UTILITY OF THE TRANSFER SWITCH. SURGE ARRESTER, SQUARE-D PN: SDSA1175, SERIES 001 SECONDARY SURGE ARRESTER.
- ACC. 105G SPECIAL FUSING AND WIRING FOR GENERAC AIR COOLED GEN-SETS RATED 7-18KW.

### FUSE RATING TABLE:

| ITEM | TYPE | CURRENT | MAX. VOLT |
|------|------|---------|-----------|
| FU1  | BBS  | 5A      | 600V      |
| FU2  | BBS  | 5A      | 600V      |

## FIELD CONNECTIONS



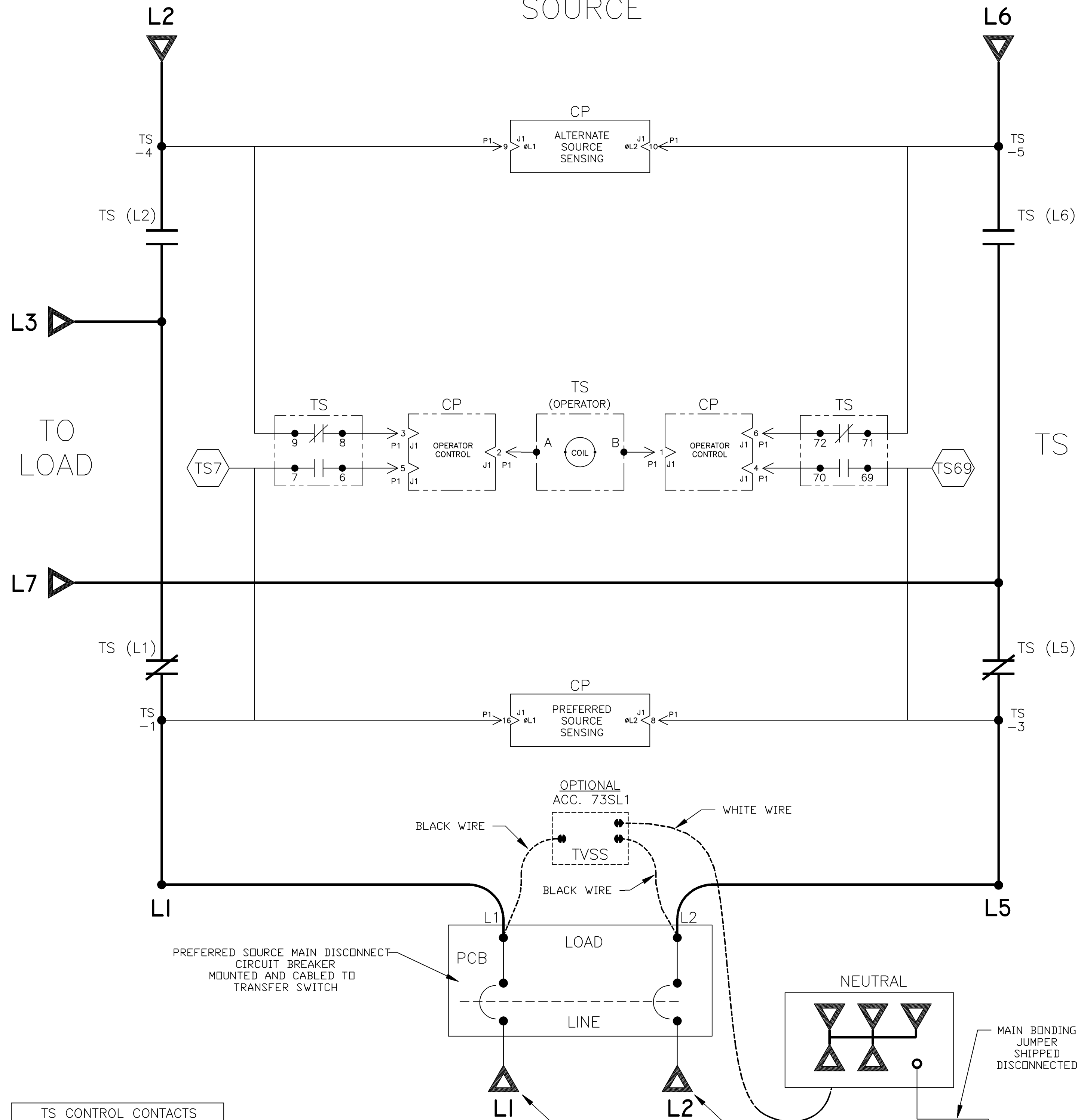
| BASE CATALOG NUMBER |              |              |             | CATALOG NUMBER SUFFIXES |           |            |                    | EXPLANATION OF CATALOG NUMBER CODES |                                                                                                                                                                                                                                                                                                                                                                         |               |                 |      |                                                                                                                                         |
|---------------------|--------------|--------------|-------------|-------------------------|-----------|------------|--------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|------|-----------------------------------------------------------------------------------------------------------------------------------------|
| TS FRAME            | CATALOG TYPE | NEUTRAL TYPE | PHASE POLES | AMPS                    | VOLT CODE | CONTROLLER | OPTIONAL ACCESSORY | ENCLOSURE CODE                      | NEUTRAL TYPE                                                                                                                                                                                                                                                                                                                                                            | VOLTAGE CODES | ENCLOSURE CODES |      |                                                                                                                                         |
|                     |              |              |             |                         |           |            |                    |                                     | CODE                                                                                                                                                                                                                                                                                                                                                                    | DESCRIPTION   | CODE            | TYPE | DESCRIPTION                                                                                                                             |
| D                   | 01AUS        | A            | 2           | 100<br>200              | F         | 4          | X                  | C<br>M                              | A                                                                                                                                                                                                                                                                                                                                                                       | SOLID         | F               | 1    | GENERAL PURPOSE, INDOOR<br>OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT<br>SECURE TYPE: FULL EXTERIOR DOOR WITH INTERNAL DEAD FRONT PANEL. |
|                     |              |              |             |                         |           |            |                    |                                     | <b>ASCO® 185 SERIES</b><br>AUTOMATIC POWER TRANSFER SWITCH<br>RATED 100 OR 200 AMPS, 240 VAC<br>SUITABLE FOR USE AS SERVICE EQUIPMENT – NORMAL SOURCE ONLY.<br>AN ADDITIONAL DISCONNECT MUST BE READILY ACCESSIBLE FOR THE ALTERNATE SOURCE, UNLESS THE ALTERNATE SOURCE IS AN ACCESSIBLE GENERATOR AND CAN BE READILY SHUTDOWN.<br>FOR USE IN OPTIONAL STANDBY SYSTEMS |               |                 |      |                                                                                                                                         |

|                                                            |         |                                                                                                                       |                                            |
|------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| PROJECT NAME:                                              |         | WIRING DIAGRAM                                                                                                        |                                            |
| SERIES 185, D01AUS, SINGLE PHASE, 3 WIRE, SERVICE ENTRANCE |         |                                                                                                                       |                                            |
| D FRAME TRANSFER SWITCH (100, 200 AMPS) GROUP 4 CONTROLS   |         |                                                                                                                       |                                            |
| BY                                                         | DATE    | MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055             | ASSEM. REF. NO.                            |
| CHECKED                                                    | 7/02/09 | PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED. | SCALE 1:1 SIZE DS                          |
| PROJECT APPROVAL                                           | 7/02/09 | 857485-003                                                                                                            | COMPUTER GENERATED DRAWING                 |
| FINAL APPROVAL                                             | 7/02/09 | ASCO POWER TECHNOLOGIES, L.P.<br>FLORHAM PARK, NEW JERSEY 07932 U.S.A.                                                | DWG. NO. 857485-003<br>DRAWING A<br>REV. 1 |

TRANSFER SWITCH POWER POLES, OPERATOR, AND SENSING

PHYSICAL DIAGRAM AND WIRING

TO ALTERNATE SOURCE



| TS CONTROL CONTACTS |                         |                             |                       |
|---------------------|-------------------------|-----------------------------|-----------------------|
| TS                  | SOLENOID POSITION       |                             | TDC (TOP DEAD CENTER) |
|                     | CLOSED BEFORE PREFERRED | BEFORE CLOSED < TDC > ALTER |                       |
| 6-7                 |                         |                             |                       |
| 69-70               |                         |                             |                       |
| 8-9                 |                         |                             |                       |
| 71-72               |                         |                             |                       |

ATS SHOWN CLOSED ON PREFERRED SOURCE

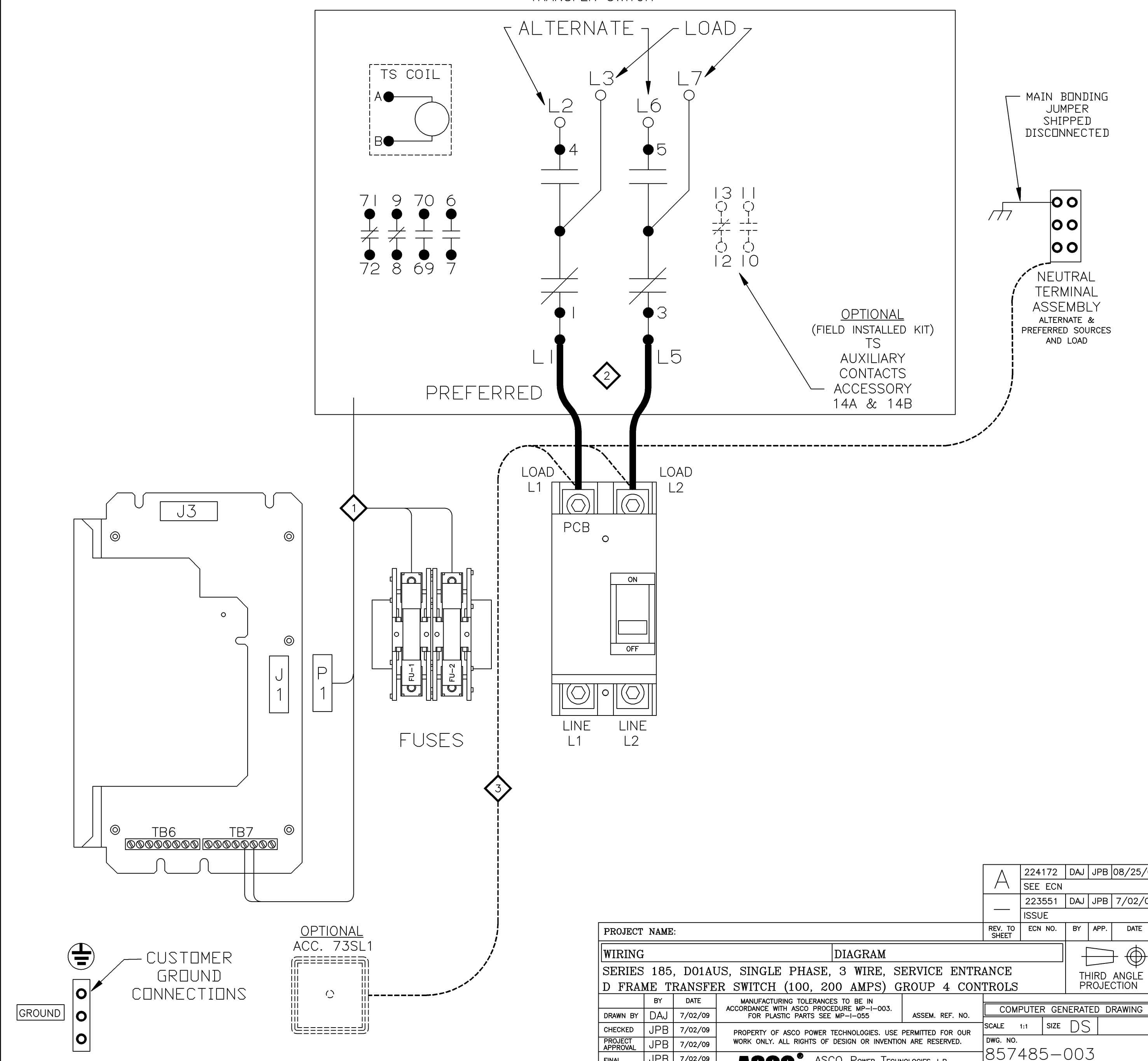
| HARNESS LOCATOR |                    |         |     | BOX CHECKED IF HARNESS IS MODIFIED |
|-----------------|--------------------|---------|-----|------------------------------------|
| WIRE No.        | 702645-002 (P1,P2) | MAIN TS | CLR | AWG                                |
| 1               | TS-8,P1-3          |         |     | 20                                 |
| 2               | TS-B,P1-1          |         |     |                                    |
| 3               | TS-6,P1-5          |         |     |                                    |
| 4               | TS-3,P1-8          |         |     |                                    |
| 5               | TS-A,P1-2          |         |     |                                    |
| 6               | TS-5,P1-10         |         |     |                                    |
| 7               | TS-4,P1-9          |         |     |                                    |
| 8               | TS-1,P1-16         |         |     |                                    |
| 9               | TS-70,P1-4         |         |     |                                    |
| 10              | TS-72,P1-6         |         |     |                                    |
| 11              | TS-7,TS-1          |         |     |                                    |
| 12              | TS-69,TS-3         |         |     |                                    |
| 13              | TS-9,TS-4          |         |     |                                    |
| 14              | TS-71,TS-5         |         |     |                                    |
| REMOVE WIRES    |                    |         |     |                                    |
| 11              | TS-7,TS-1          |         |     |                                    |
| ADD WIRES       |                    |         |     |                                    |
| 11              | TS-7,FU-1          |         |     |                                    |
| 11              | FU-1,TS-1          |         |     |                                    |
| 12              | TS-69,TB7-6        |         |     |                                    |
| 15              | TB7-5,FU-2         |         |     |                                    |

| HARNESS LOCATOR |                                        |     |     | BOX CHECKED IF HARNESS IS MODIFIED |
|-----------------|----------------------------------------|-----|-----|------------------------------------|
| AMPS            | ADDITIONAL WIRES                       | CLR | AWG |                                    |
| 100A            | PCB-LOAD-L1,TS-L1<br>PCB-LOAD-L2,TS-L5 |     |     | 3                                  |
| 200A            | PCB-LOAD-L1,TS-L1<br>PCB-LOAD-L2,TS-L5 |     |     | 3/0                                |

| HARNESS LOCATOR |                     |     |     | BOX CHECKED IF HARNESS IS MODIFIED |
|-----------------|---------------------|-----|-----|------------------------------------|
| WIRE No.        | OPTIONAL ACC 73SL1  | CLR | AWG |                                    |
|                 | TVSS-BLK-1,TS-L1    | BLK |     |                                    |
|                 | TVSS-BLK-2,TS-L5    | BLK |     |                                    |
|                 | TVSS-WHT,TS-NEUTRAL | WHT |     |                                    |

TS TRANSFER SWITCH



|                                                            |         |                                                                                                                       |         |                 |      |                            |
|------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------|---------|-----------------|------|----------------------------|
| PROJECT NAME:                                              |         | REV. TO SHEET                                                                                                         | ECN NO. | BY              | APP. | DATE                       |
| WIRING DIAGRAM                                             |         | A                                                                                                                     | 224172  | DAJ             | JPB  | 08/25/09                   |
| SERIES 185, D01AUS, SINGLE PHASE, 3 WIRE, SERVICE ENTRANCE |         |                                                                                                                       | 223551  | DAJ             | JPB  | 7/02/09                    |
| D FRAME TRANSFER SWITCH (100, 200 AMPS) GROUP 4 CONTROLS   |         |                                                                                                                       |         |                 |      |                            |
| DRAWN BY                                                   | DATE    | MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005             |         | ASSEM. REF. NO. |      | COMPUTER GENERATED DRAWING |
| CHECKED                                                    | 7/02/09 | PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED. |         | SCALE           |      | 1:1                        |
| APPROVAL                                                   | 7/02/09 |                                                                                                                       |         | SIZE            |      | DS                         |
| FINAL APPROVAL                                             | 7/02/09 |                                                                                                                       |         | DWG. NO.        |      | 857485-003                 |
|                                                            |         | ASCO POWER TECHNOLOGIES, L.P.<br>FLORHAM PARK, NEW JERSEY 07932 U.S.A.                                                |         | DRAWING A       |      | 2 OF 2                     |