THREE PHASE WIRING FOR ASCO 7000 SERIES AUTOMATIC CLOSED TRANSITION TRANSFER SWITCHES TYPE 7ACTS RATED 1000-3000 AMPERES

FEATURES, SETTINGS, OPERATION, ACCESSORIES & NOTES

THE FOLLOWING FEATURES AND RELATED SETTINGS ARE PART OF THE GROUP 5 CONTROL PANEL'S USER CONFIGURABLE PARAMETERS. FOR DETAILED INFORMATION REGARDING THE CONFIGURATION OF THESE PARAMETERS AND OTHER FEATURES OF THE GROUP 5 CONTROL PANEL, REFER TO THE GROUP 5 CONTROL PANEL FOR ASCO 7000 SERIES AUTOMATIC TRANSFER SWITCHES USER'S GUIDE (PART NO. 381333-126) PROVIDED WITH EVERY 7000 SERIES AUTOMATIC TRANSFER SWITCH.

THE NOMINAL OPERATING VOLTAGE & FREQUENCY IS PRE-PROGRAMMED AT THE FACTORY BASED ON THE NAMEPLATE DATA PRINTED ON THE TRANSFER SWITCH & CONTROL PANEL NAMEPLATES.

VOLTAGE & FREQUENCY SENSING

THE FOLLOWING SETTINGS ARE EXPRESSED AS A PERCENTAGE OF THE CONTROL PANEL'S NOMINAL VOLTAGE SETTING UNLESS STATED OTHERWISE. ALL SETTINGS ARE ADJUSTABLE IN INCREMENTS OF 1%.

A. RMS VOLTAGE SENSING ON ALL PHASES OF THE NORMAL & EMERGENCY SOURCES.

PARAMETER	RANGE OF SETTINGS	DEFAULT SETTING
NORMAL VOLTAGE DROPOUT	70-98%	85%
NORMAL VOLTAGE PICKUP	85-100%	90%
NORMAL OVER VOLTAGE TRIP	102-115%	OFF
NORMAL VOLTAGE UNBALANCE	YES/NO	NO
NORMAL VOLTAGE UNBALANCE DROPOUT	5-20% OF AVG. NORMAL VOLTAGE	20% (if ON)
NORMAL VOLTAGE UNBALANCE PICKUP	3-18% OF AVG. NORMAL VOLTAGE	10% (if ON)
EMERGENCY VOLTAGE DROPOUT	70-98%	75%
EMERGENCY VOLTAGE PICKUP	85-100%	90%
EMERGENCY OVER VOLTAGE TRIP	102-115%	OFF
EMERGENCY VOLTAGE UNBALANCE	YES/NO	NO
EMERGENCY VOLTAGE UNBALANCE DROPOUT	5-20% OF AVG. EMERGENCY VOLTAGE	20% (if ON)
EMERGENCY VOLTAGE UNBALANCE PICKUP	3-18% OF AVG. EMERGENCY VOLTAGE	10% (if ON)

B. FREQUENCY SENSING OF THE NORMAL & EMERGENCY SOURCES.

PARAMETER	RANGE OF SETTINGS	DEFAULT SETTING
NORMAL FREQUENCY DROPOUT	85-98%	90%
NORMAL FREQUENCY PICKUP	90-100%	95%
NORMAL OVER FREQUENCY TRIP	102-110%	OFF
EMERGENCY FREQUENCY DROPOUT	85-98%	90%
EMERGENCY FREQUENCY PICKUP	90-100%	95%
EMERGENCY OVER FREQUENCY TRIP	102-110%	OFF

TIME DELAYS

THE FOLLOWING TIME DELAY SETTINGS ALL HAVE AN ADJUSTABLE RANGE OF 0-60 min 59 sec UNLESS STATED OTHERWISE. ADJUSTABLE IN INCREMENTS OF 1 sec.
NOTE: SOME TIME DELAYS MAY BE EFFECTED BY CUSTOMER REQUESTED ACCESSORIES PROVIDED WITH THE UNIT. REFER TO THE DESCRIPTIONS PROVIDED UNDER THE "ACCESSORIES" NOTES ON THIS PAGE.

FEATURE	NAME	DEFAULT SETTING
1C	NORMAL SOURCE FAILURE TO ENGINE START	1 sec
2B	TRANSFER TO EMERGENCY ON AVAILABILITY OF EMERGENCY SOURCE	0 sec
1F	EMERGENCY SOURCE FAILURE RETRANSFER (NORMAL SOURCE AVAILABLE)	0 sec
2E	ENGINE COOLDOWN FOLLOWING RETRANSFER TO NORMAL	5 min
3A	RETRANSFER TO NORMAL (NORMAL FAILURE MODE)	30 min
3A	RETRANSFER TO NORMAL (TEST MODE)	30 sec
—	DELAYED TRANSFER (LOAD "OFF" TIME), [0-5 min 59 sec]	3 sec

DESCRIPTIONS OF TIME DELAYS:

FEAT. 1C – DELAY ON NORMAL SOURCE OUTAGE. STARTS ON FAILURE OF NORMAL SOURCE. RESETS IF NORMAL SOURCE IS ACCEPTED BEFORE EXPIRATION. INHIBITS ENGINE STARTING AND AUTOMATIC TRANSFER UNTIL EXPIRATION.

FEAT. 2B – DELAY PRIOR TO TRANSFER TO THE EMERGENCY SOURCE. DELAY STARTS ON EXPIRATION OF FEAT. 1C AND WHEN THE EMERGENCY SOURCE HAS BEEN ACCEPTED. DELAY RESETS IF THE EMERGENCY SOURCE FAILS PRIOR TO EXPIRATION. ON EXPIRATION, TRANSFER TO EMERGENCY IS INITIATED UNLESS THE NORMAL SOURCE HAS RECOVERED AND THE "COMMIT TO TRANSFER" FEATURE IS SET TO "NO" COMMIT. PROVIDES A PERIOD FOR EMERGENCY SOURCE STABILIZATION OR STAGING OF MULTIPLE TRANSFER SWITCH CONTROLLED LOADS TO THE EMERGENCY SOURCE.

FEAT. 1F – DELAY ON RETRANSFER TO NORMAL IN THE EVENT OF EMERGENCY SOURCE FAILURE. DELAY BEGINS ON FAILURE OF THE EMERGENCY SOURCE IF THE NORMAL SOURCE IS ACCEPTABLE. ON EXPIRATION, RETRANSFER TO NORMAL WILL BE INITIATED.

FEAT. 2E – DELAY ON ENGINE SHUTDOWN (ENGINE COOL DOWN PERIOD). DELAY STARTS FOLLOWING RETRANSFER TO THE NORMAL SOURCE. PROVIDES A PERIOD FOR THE ENGINE-GENERATOR SET TO RUN UNLOADED PRIOR TO SHUTDOWN.

FEAT. 3A – RETRANSFER TO NORMAL DELAY (NORMAL FAILURE MODE)
DELAY STARTS WHEN NORMAL SOURCE IS ACCEPTED (FOLLOWING IT'S FAILURE) AND WHILE THE LOAD IS CONNECTED TO EMERGENCY. RESETS IF NORMAL FAILS PRIOR TO EXPIRATION OR IF THE EMERGENCY SOURCE FAILS BEFORE EXPIRATION AND FEAT. 1F EXPIRES (AUTOMATIC BYPASS ON EMERGENCY SOURCE FAILURE). PROVIDES A PERIOD FOR THE NORMAL SOURCE TO STABILIZE PRIOR TO RETRANSFER.

FEAT. 3A – RETRANSFER TO NORMAL DELAY (TEST MODE)
DELAY STARTS WHEN THE "TRANSFER TEST" SWITCH IS RESET TO "AUTO" (FOLLOWING A USER INITIATED TRANSFER TEST) AND WHILE THE LOAD IS CONNECTED TO EMERGENCY. RESETS IF NORMAL FAILS PRIOR TO EXPIRATION OR IF THE EMERGENCY SOURCE FAILS BEFORE EXPIRATION AND FEAT. 1F EXPIRES (AUTOMATIC BYPASS ON EMERGENCY SOURCE FAILURE).

IN SYNC – IN SYNC TIME DELAY BEGINS BEFORE A CLOSED TRANSITION TRANSFER FOLLOWING ACCEPTANCE OF THE SOURCE TO WHICH TRANSFER IS BEING MADE. ON EXPIRATION OF THE DELAY, THE LOGIC AWAITS AN IN SYNC CONDITION FOR SUBSEQUENT CLOSED TRANSITION TRANSFER.

EXTENDED PARALLEL – EXTENDED PARALLEL TIMER BEGINS WHEN THE SOURCES ARE PARALLELED (CN & CE CLOSED). IF THE TWO SOURCES REMAIN IN PARALLEL WHEN THE DELAY EXPIRES, THE CONTROL LOGIC TAKES THE FOLLOWING ACTIONS:

- THE LOGIC WILL ATTEMPT TO OPERATE THE TRANSFER SWITCH TO A "SAFE" STATE WHERE THE SOURCES WILL NO LONGER BE PARALLELED AND THE LOAD WILL BE SERVICED BY AN AVAILABLE SOURCE.
- THE CONTROL PANEL IS LOCKED OUT FROM ANY FURTHER AUTOMATIC OPERATION.
- THE "TS LOCKED OUT" INDICATOR (RED LED) IS LIT.
- THE EXTENDED PARALLEL ALARM TIMER LOCATED ON THE DUAL OPERATOR CONTROL (DOC) IS ENABLED.
- THE UNIT WILL REMAIN LOCKED OUT UNTIL THE "TS LOCKED OUT" PUSH-BUTTON IS DEPRESSED FOR RESET.

FAIL TO SYNC – FAILURE TO SYNC TIMER BEGINS WHEN THE LOGIC BEGINS TO CHECK FOR AN IN SYNC CONDITION FOR WHICH TO ALLOW CLOSED TRANSITION TRANSFER. IF THE DELAY EXPIRES PRIOR TO AN IN SYNC CONDITION OCCURRING, THE "FAILURE TO SYNCHRONIZE" SIGNAL IS ACTIVATED (RED LED) AND CLOSURE OF THE TFR RELAY CONTACT AVAILABLE AT THE FIELD CONNECTIONS TERMINAL BLOCK (TB).

FEAT. 62F – EXTENDED PARALLEL ALARM TIMER BEGINS TIMING WHEN ENABLED FOLLOWING EXPIRATION OF THE EXTENDED PARALLEL TIMER OF THE CONTROL PANEL. THE ENABLING OF THE EXTENDED PARALLEL ALARM TIMER INDICATES THAT THE UNIT HAS ATTEMPTED TO RECOVER TO A "SAFE STATE" AND THAT IT HAS BEEN LOCKED OUT. ON EXPIRATION OF THE DELAY, OUTPUT RELAY (RL3) (2) FORM C CONTACTS, CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB0, TRANSFER. THE DELAY IS ADJUSTABLE VIA A POTENTIOMETER (P2) LOCATED ON THE DUAL OPERATOR CONTROL (DOC) WHICH IS ADJUSTABLE FROM 0-1 SECOND. FACTORY SET AT 1 SEC.

ENGINE EXERCISER

THE ENGINE EXERCISER FEATURE PROVIDES A MEANS TO PERFORM AUTOMATIC EXERCISING OF THE ENGINE-GENERATOR SET EITHER WITH OR WITHOUT LOAD TRANSFER.
THE USER CAN PROGRAM UP TO SEVEN DIFFERENT EXERCISE ROUTINES. EACH ROUTINE INCLUDES;
1. ENABLE OR DISABLE THE ROUTINE
2. ENABLE OR DISABLE TRANSFER OF THE LOAD DURING THE ROUTINE
3. SET START TIME OF ROUTINE –
   - TIME OF DAY
   - DAY OF WEEK
   - WEEK OF MONTH (1st, 2nd, 3rd, 4th, ALTERNATE OR ALL)
4. SET THE DURATION OF THE ROUTINE

PARAMETER	RANGE OF SETTING	DEFAULT SETTING
MONTH (CLOCK SET)	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC	CURRENT DATE
DAY	1-31	↓
YEAR	00-99	↓
HOUR	0-23	Eastern Standard Time
MINUTE	0-59	↓
ENABLE ROUTINE (ROUTINE 1-7)	YES/NO	NO
TRANSFER LOAD	YES/NO	NO
START HOUR	0-23	0
START MINUTE	0-59	0
RUN WEEK	ALL, ALTERNATE, 1st, 2nd, 3rd, 4th, 5th	ALL
RUN DAY	SUN MON TUE WED THU FRI SAT	SUN
DURATION HOURS	0-23	0
DURATION MINUTES	0-59	0

OPERATION

IF THE NORMAL SOURCE FAILS, THE TRANSFER SWITCH INITIATES STARTING OF THE ENGINE-GENERATOR SET. WHEN PROPER VOLTAGE AND FREQUENCY HAVE BEEN ATTAINED, THE LOAD WILL BE TRANSFERRED IN AN OPEN TRANSITION (BREAK BEFORE MAKE) OPERATION TO THE EMERGENCY SOURCE.

WHEN THE NORMAL SOURCE IS RESTORED FOR THE DURATION OF THE FEATURE 3A, RETRANSFER TO NORMAL TIME DELAY SETTING, THE CONTROLS WILL BEGIN MONITORING PHASE, FREQUENCY, AND VOLTAGE DIFFERENTIAL BETWEEN NORMAL AND EMERGENCY SOURCES.

WHEN THE TWO SOURCES ARE APPROACHING SYNCHRONISM, A CLOSED TRANSITION (MAKE BEFORE BREAK) TRANSFER TO THE NORMAL SOURCE WILL BE INITIATED. THE NORMAL AND EMERGENCY CONTACTORS (CN & CE) WILL BE IN AN OVERLAP CONDITION FOR LESS THAN 0.1 SECONDS.

CLOSED TRANSITION TRANSFER WILL ALSO BE INITIATED DURING A TRANSFER TEST OPERATION CAUSED BY OPERATION OF THE FEATURE 5 TRANSFER TEST SELECTOR SWITCH. RETRANSFER WILL ALSO OCCUR IN A CLOSED TRANSITION MANNER AT THE END OF THE TEST.

CLOSED TRANSITION BYPASS OPERATION: THE "CT BYPASS OPTIONS" DISPLAY OF THE CONTROL PANEL ALLOWS SETTING THE TRANSFER SWITCH'S CLOSED TRANSITION BYPASS BEHAVIOR. CLOSED TRANSITION BYPASS CAUSES THE TRANSFER SWITCH TO INTERRUPT POWER TO THE LOAD DURING TRANSFER. THE AVAILABLE OPTIONS ARE:

- FAIL TO SYNC AUTO BYPASS ENABLE – CAUSES A "FAILURE TO SYNCHRONIZE" CONDITION TO RESULT IN AN AUTOMATIC CLOSED TRANSITION BYPASS. DEFAULT SETTING IS NO AUTOMATIC BYPASS.
- CT BYPASS – ALLOWS SELECTIONS AS TO WHETHER THE CLOSED TRANSITION BYPASS WILL OCCUR WITH OR WITHOUT A DELAYED TRANSITION (LOAD "OFF" TIME). DEFAULT SETTING IS OPEN TRANSITION (NO DELAY).
- DT BYPASS – SETS THE LENGTH OF THE DELAYED TRANSFER (LOAD "OFF" TIME) IF THE PREVIOUS PARAMETER HAS BEEN SELECTED TO OPERATE WITH DELAYED TRANSITION. THE DELAY ("OFF" PERIOD) BEGINS FOLLOWING THE OPENING OF THE SOURCE CONTACTOR, (CN OR CE), CONNECTED TO THE SOURCE FROM WHICH TRANSFER IS BEING MADE. UPON EXPIRATION, CLOSURE OF THE OPPOSITE SOURCE CONTACTOR IN INITIATED.

SIGNALS & AUXILIARIES

A. FEATURES 7 & 8– ENGINE START SIGNAL
SIGNAL INITIATED BY DROPOUT OF CONTROL PANEL RELAY (NR) FOLLOWING EXPIRATION OF THE FEATURE 1C TIME DELAY (DELAY TO OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES). FEATURE 7 CLOSES TO SIGNAL ENGINE START. FEATURE 8 OPENS TO SIGNAL ENGINE START. ENGINE STARTING SIGNAL RESETS FOLLOWING RETRANSFER TO THE NORMAL SOURCE AND EXPIRATION OF THE FEATURE 2E (ENGINE COOL DOWN) TIME DELAY. FEATURES 7 & 8 ARE PROVIDED AS A SINGLE FORM C CONTACT CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB). CONTACT RATED 5 AMPS AT 32 VDC/120VAC RESISTIVE.

B. FEATURES 14AF & 14BF – TRANSFER SWITCH AUXILIARY POSITION INDICATING CONTACTS. SEVEN (7) FORM C CONTACTS TO INDICATE CONNECTION OF THE TRANSFER SWITCH TO NORMAL (14A) AND SEVEN (7) FOR EMERGENCY (14B). CONTACTS CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB). CONTACTS RATED 10 AMPS, 32 VDC, 250 VAC.

C. FEATURE 17 – REMOTE TRANSFER TO EMERGENCY,
REQUIRES A CUSTOMER SUPPLIED NORMALLY OPEN CONTACT. CLOSING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. OPENING OF THE CONTACT ACTIVATES THE FEATURE 3A (RETRANSFER TO NORMAL) DELAY PRIOR TO RETRANSFER. IN THE EVENT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO EMERGENCY AND THE REMOTE CONTACT IS CLOSED, THE TRANSFER SWITCH WILL RETRANSFER TO THE NORMAL SOURCE. CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB).

USER CONTROLS AND INDICATIONS

A. FEATURES 5 & 6B – TRANSFER TEST/RETRANSFER TIME DELAY BYPASS CONTROLS.
TRANSFER TEST:
OPERATION CAUSES A NORMAL SOURCE FAILURE SEQUENCE. ACTIVATE AND HOLD FOR AT LEAST 15 SECONDS TO ALLOW TIME FOR THE ENGINE-GENERATOR TO START.
RETRANSFER TIME DELAY BYPASS:
OPERATION WILL BYPASS THE FEATURE 3A (RETRANSFER TO NORMAL DELAY).

B. FEATURES 9A & 9B – TRANSFER SWITCH POSITION INDICATORS.
FEATURE 9A: TRANSFER SWITCH CLOSED ON NORMAL (GREEN LED)
FEATURE 9B: TRANSFER SWITCH CLOSED ON EMERGENCY (RED LED)

C. FEATURES 9C & 9D – SOURCE ACCEPTANCE INDICATORS.
FEATURE 9C: NORMAL SOURCE ACCEPTED (GREEN LED)
FEATURE 9D: EMERGENCY SOURCE ACCEPTED (RED LED)

D. EXTENDED PARALLEL TIME – INDICATES THAT THE MAIN CONTACTORS (CN & CE) HAVE BEEN SIMULTANEOUSLY CLOSED FOR A PERIOD EXCEEDING THE TIME ALLOTTED. (RED LED)

E. FAILURE TO SYNCHRONIZE – INDICATES THE THE TWO SOURCES DID NOT MEET THE PARAMETERS REQUIRED FOR A CLOSED TRANSITION TRANSFER. (RED LED)

F. TS LOCKED OUT – INDICATES THAT A FAILURE OF THE TRANSFER SWITCH OPERATOR HAS OCCURRED AND THAT THE TRANSFER SWITCH HAS TAKEN CORRECTIVE ACTION AS REQUIRED. ONCE THIS FAILURE RECOVERY OPERATION TAKES PLACE, THE TRANSFER SWITCH IS PREVENTED FROM FURTHER OPERATION UNTIL THE CONDITION IS CORRECTED. ONCE THE CONDITION IS CORRECTED, THE TS LOCKED OUT SWITCH MAY BE DEPRESSED TO RESET THE CONTROL PANEL (RED LED).

G. ALARM RESET SWITCH – RESETS FAILURE TO SYNCHRONIZE AND EXTENDED PARALLEL ALARMS.

H. CLOSED TRANSITION BYPASS SWITCH – BYPASSES CLOSED TRANSITION TRANSFER WHEN OPERATED DURING THE PERIOD WHILE THE TRANSFER SWITCH CONTROL PANEL IS MONITORING FOR AN INPHASE CONDITION. CAUSES OPEN TRANSITION TRANSFER TO THE OPPOSITE SOURCE IF CONDITIONS PERMIT.

GENERAL NOTES

1. SWITCH SHOWN DE-ENERGIZED AND CONNECTED TO THE NORMAL SOURCE.
2. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUBLICATION ICS 1-1983, PART 1-101A.
3. ALL WIRING IS #16 AWG, TINNED, STRANDED COPPER UNLESS OTHERWISE INDICATED.
4. ○ ON TERMINAL BLOCKS INDICATES AVAILABLE FIELD CONNECTION POINT.
5. ● ON TERMINAL BLOCKS INDICATES FACTORY CONNECTION POINT.
6. CONTROL AND ACCESSORY WIRING IS ROUTED IN ACCORDANCE WITH ASCO ASSEMBLY PROCEDURE GS451261.
7. AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE UNIT.

BASE CATALOG NUMBER				CATALOG NUMBER SUFFIXES			
CATALOG TYPE	NEUTRAL TYPE	PHASE POLES	AMPS	VOLT CODE	CONTROLLER	OPTIONAL ACCESSORY	ENCLOSURE CODE
7ACTS	A B BLANK FOR NONE	3	1000 1200 1600 2000 2600 3000	A B C D E F G H J K L M N P Q R	5	X BLANK FOR NONE	C E F G H J K L M N P Q BLANK FOR OPEN TYPE

EXPLANATION OF CATALOG NUMBER CODES

NEUTRAL TYPE		VOLTAGE CODES 3 PHASE (3 OR 4 WIRE) 50 OR 60 Hz		ENCLOSURE CODES		
CODE	DESCRIPTION	CODE	NOMINAL VOLTAGE	CODE	TYPE	DESCRIPTION
BLANK	NONE	A	115	BLANK		OPEN TYPE (NO ENCLOSURE)
A	SOLID	B	120	C	1	GENERAL PURPOSE, INDOOR
B	SWITCHING	C	208	E	2	INDOOR, WATER & DUST RESISTANT
		D	220	F	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT
		E	230	G	4	INDOOR/OUTDOOR, WATERTIGHT & DUST TIGHT
		F	240	H	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)
		G	277	J	4X	TYPE 4 PLUS CORROSION RESISTANCE (FIBERGLASS)
		H	380	K	7	EXPLOSION PROOF
		J	400	L	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OIL TIGHT & DUST TIGHT
		K	415			
		L	440			(SECURE ENCLOSURES)
		M	460	M	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT
		N	480	N	4	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT
		P	550	P	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)
		Q	575	Q	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT
		R	600			

CATALOG NUMBER _____
CERTIFIED TO ASCO® S.O. _____
BY _____
DATE _____
FORM REV J

PROJECT NAME:

WIRING DIAGRAM
7000 SERIES (7ACTS)
GROUP 5 CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	BWM	7/98
CHECKED		
DRAFTING APPROVAL		
FINAL APPROVAL	JJC	7/98

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055

ASSEM. REF. NO.

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CHANGE LETTER	ECN NO.	BY	APP.	DATE
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	SEE ECN			
H	161899	SDH	SDH	10/08/02
	SEE ECN			
G	160160	BK	WK	03/06/02
	SEE ECN			
F	159797	WK	WK	01/19/02
	SEE ECN			
E	157978	WK	BK	6/15/01
	SEE ECN			
D	155982	BWM	BK	11/00
	SEE ECN			
C	152217	KMC	WK	7/9/99
	SEE ECN			
B	151433	JPB	JPB	4/20/99
	SEE ECN			
A	149118	KD	YZ	8/98
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—	148765	BWM	JJC	7/98
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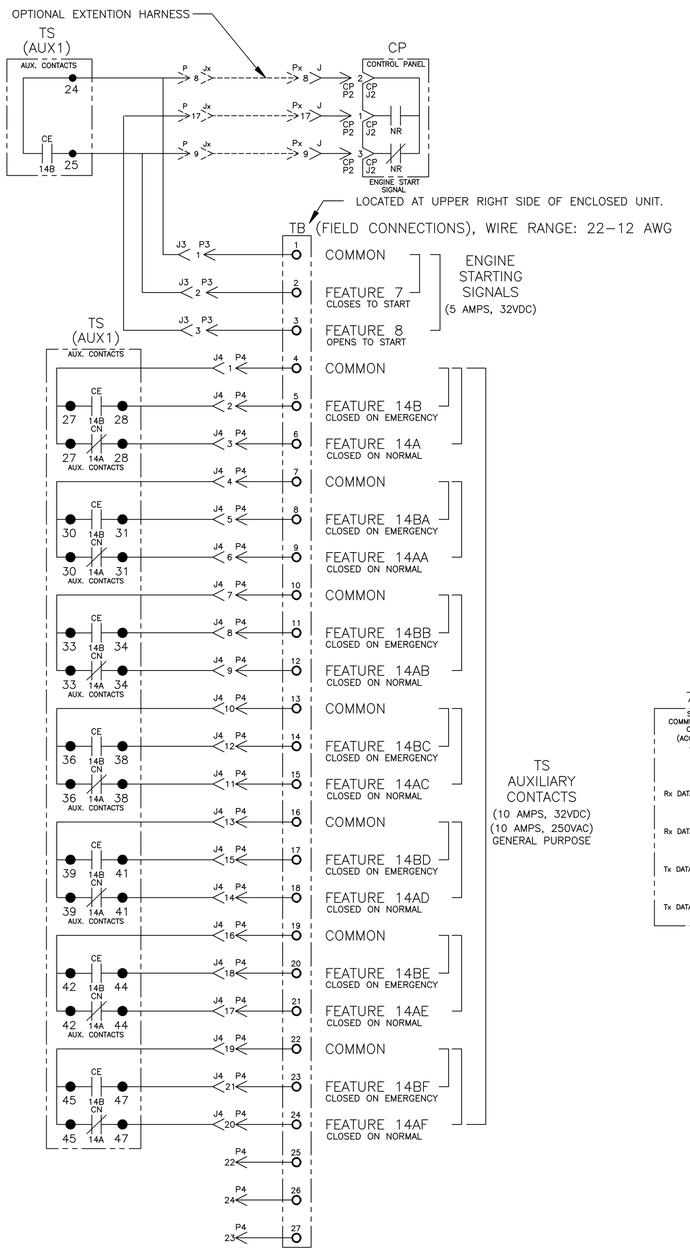
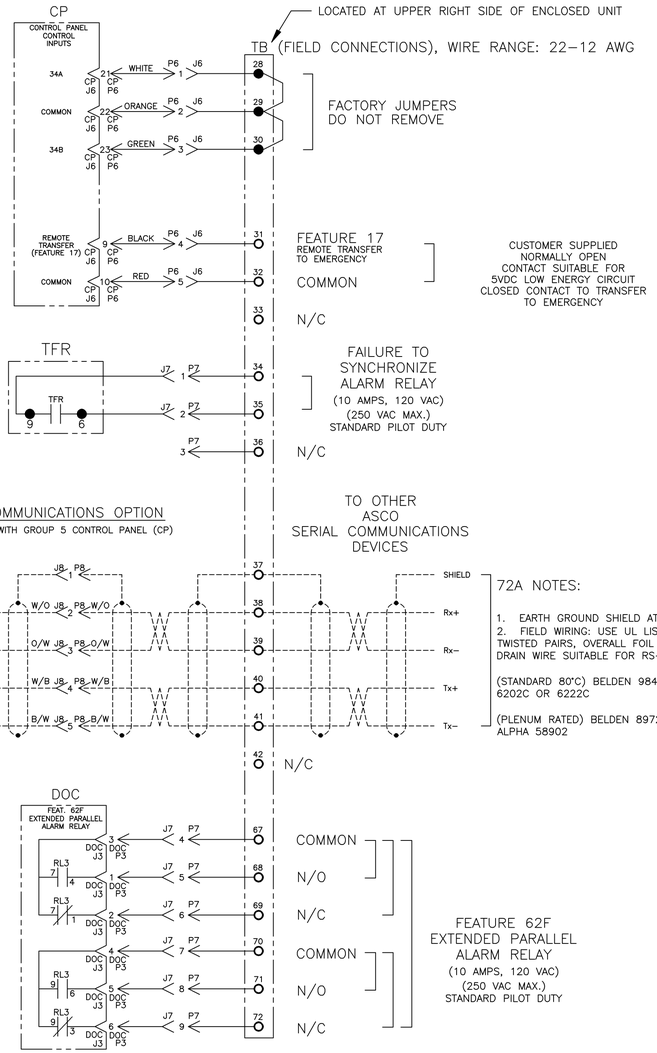
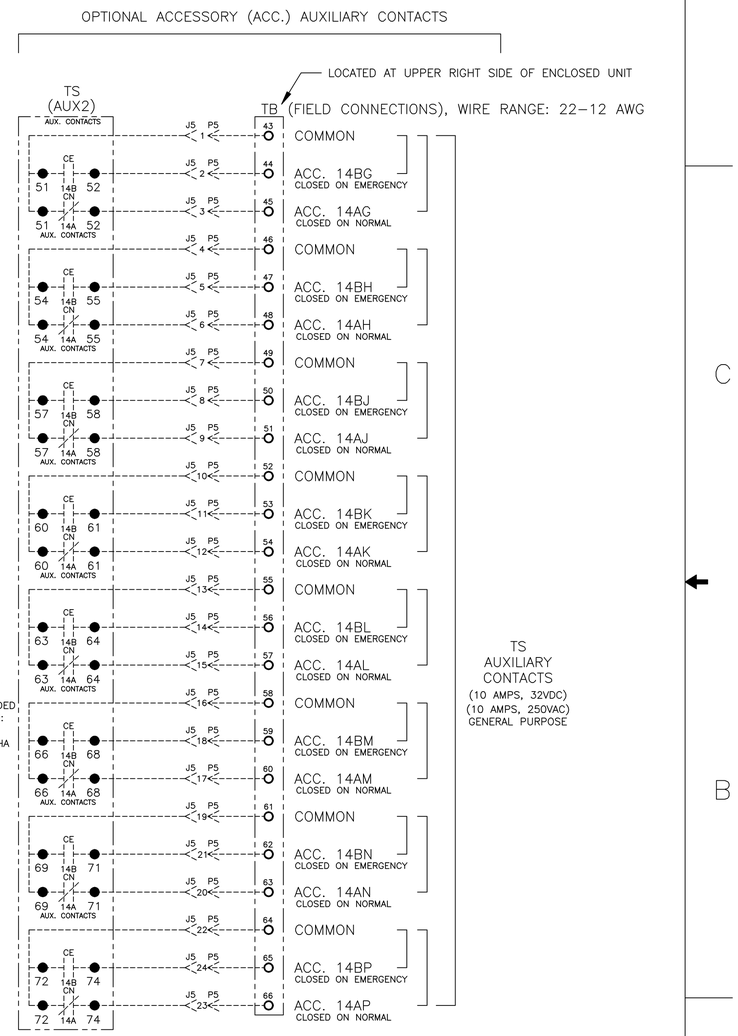
FIELD CONNECTIONS







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	SEE ECN				
CHANGE LETTER	ECN NO.	BY	APP.	DATE	

PROJECT NAME:

WIRING DIAGRAM
7000 SERIES (7ACTS)
GROUP 5 CONTROLS

THIRD ANGLE PROJECTION

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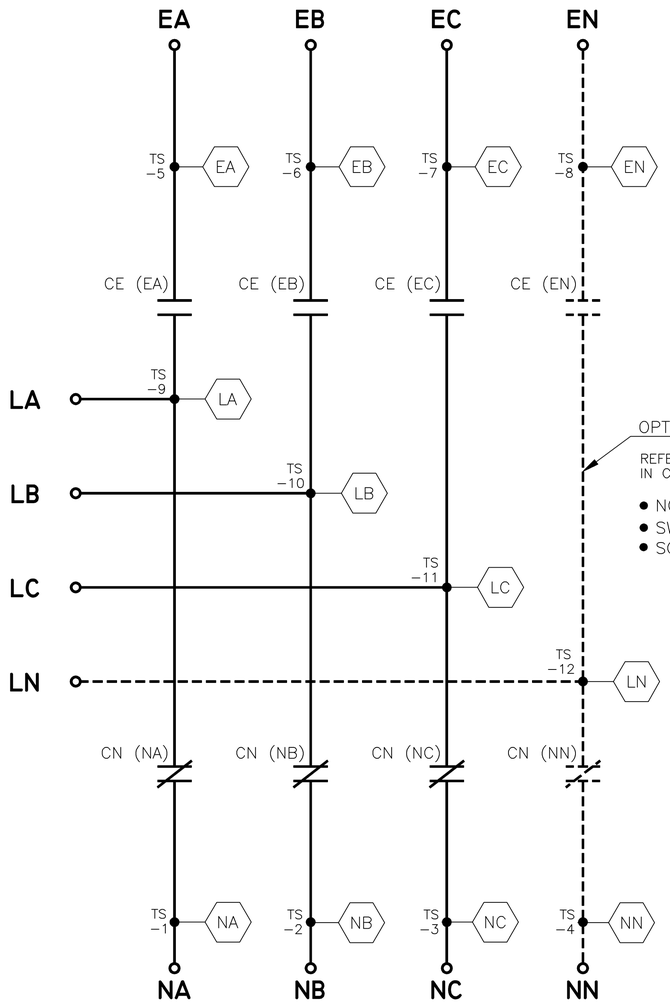
MAIN POWER POLES

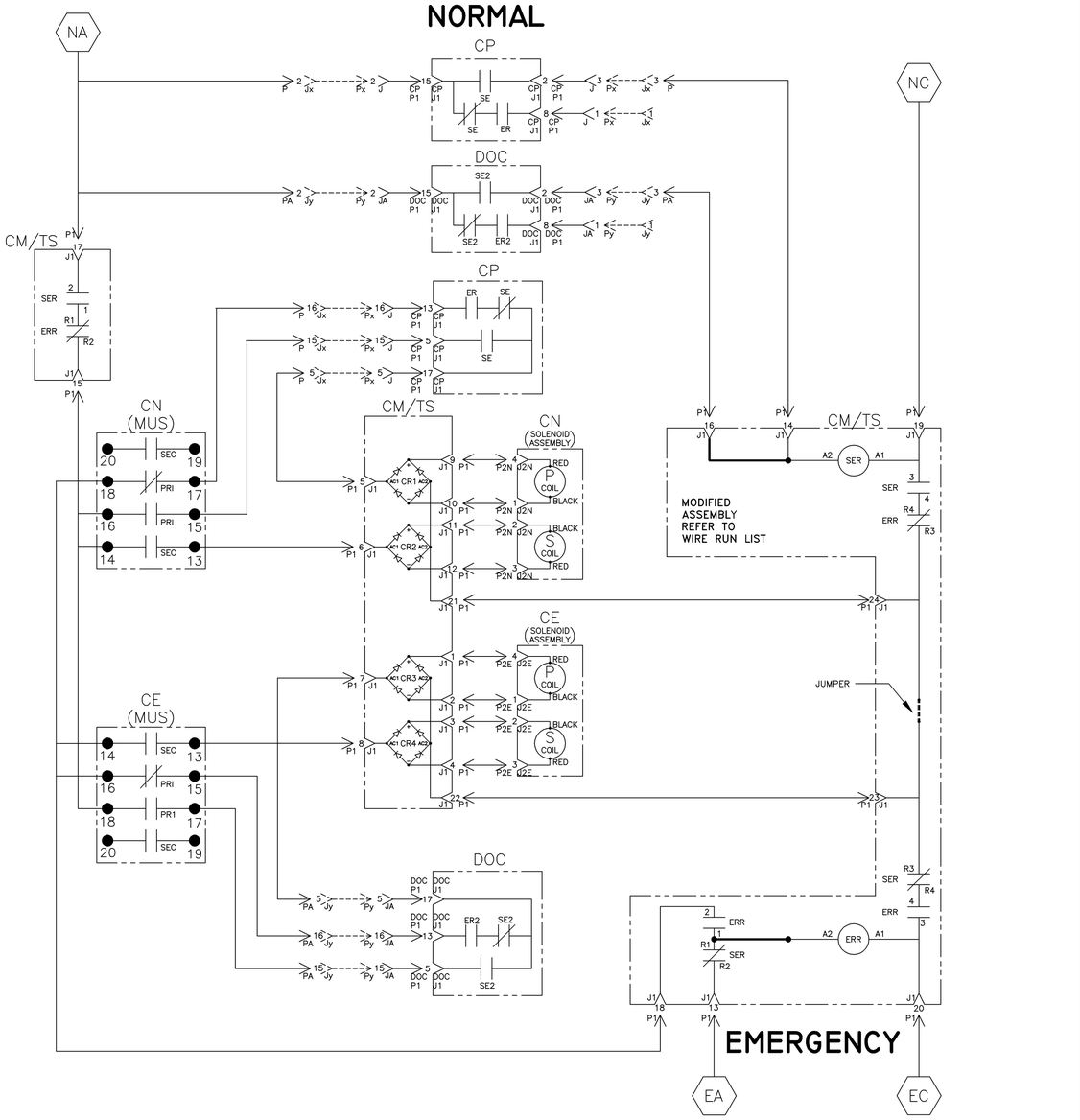
EMERGENCY



NORMAL

NOTE:
ATS SHOWN CLOSED ON NORMAL SOURCE.

TS OPERATOR CIRCUIT



CN (MUS) CONTACTS					
MUS	SOLENOID POSITION				
	NORM	>	AFTER TDC *	<	OPEN
13–14		X	X		
15–16				X	X
17–18	X	X			
19–20			X	X	

CE (MUS) CONTACTS					
MUS	SOLENOID POSITION				
	OPEN	>	AFTER TDC *	<	EMER
13–14		X	X		
15–16	X	X			
17–18				X	X
19–20			X	X	

* AFTER SOLENOID CORE PASSES THROUGH TOP DEAD CENTER POSITION.

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	SEE ECN		
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WIRING DIAGRAM
7000 SERIES (7ACTS)
GROUP 5 CONTROLS

THIRD ANGLE PROJECTION

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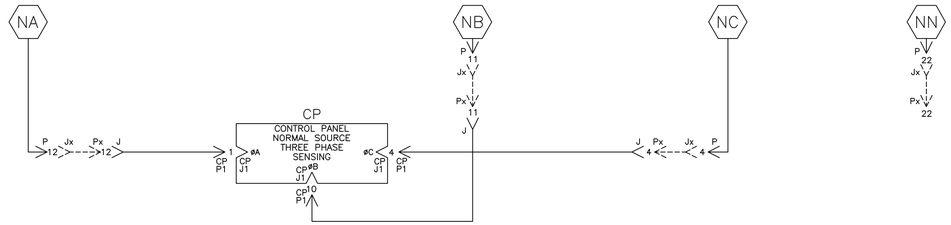
NORMAL SOURCE CIRCUITS

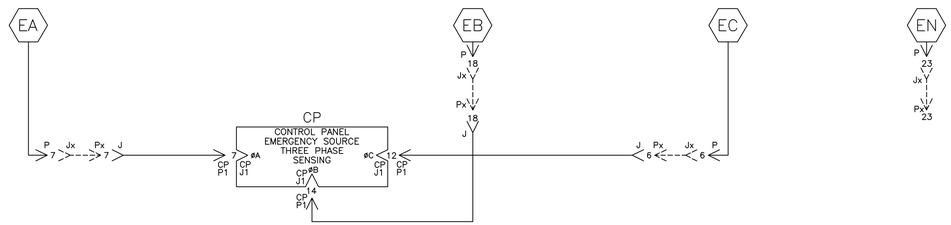
CONTROL SIGNALS & INDICATION

NORMAL



EMERGENCY SOURCE CIRCUITS

EMERGENCY

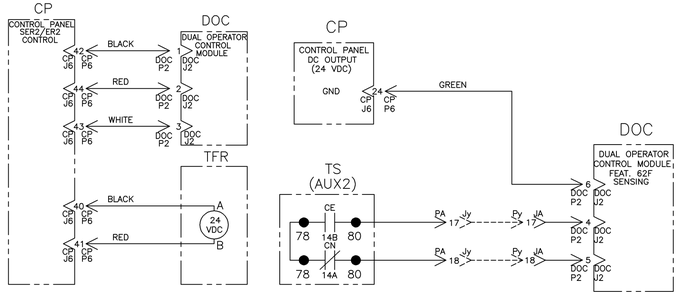


LOAD TERMINAL CIRCUITS

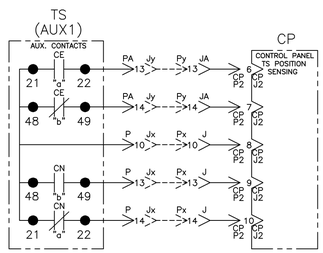
LOAD

CONTROL SIGNALS & INDICATION

SER2/ER2 CONTROL



TS POSITION SENSING



J	201518	SDH	SDH	08/23/04		
	SEE ECN					
CHANGE LETTER	ECN NO.	BY	APP.	DATE		

PROJECT NAME:

WIRING DIAGRAM
7000 SERIES (7ACTS)
GROUP 5 CONTROLS

THIRD ANGLE PROJECTION

SUBSIDIARY DISTRIBUTION
AE AN AM AJ AL
CH AV AA PS AR
AG AP AC AS

	BY	DATE
DRAWN BY	BWM	7/98
CHECKED		
DRAFTING APPROVAL		
FINAL APPROVAL	JJC	7/98

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055

ASSEM. REF. NO.

COMPUTER GENERATED DRAWING

SCALE 1:1 | ACAD | FILE

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

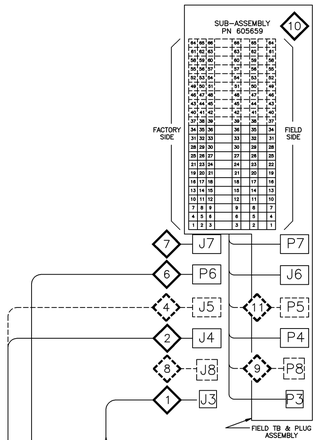
SIZE DWG. NO.
DS617413

CHANGE LETTER J ECN NO. 201518 SHEET 4 OF 6

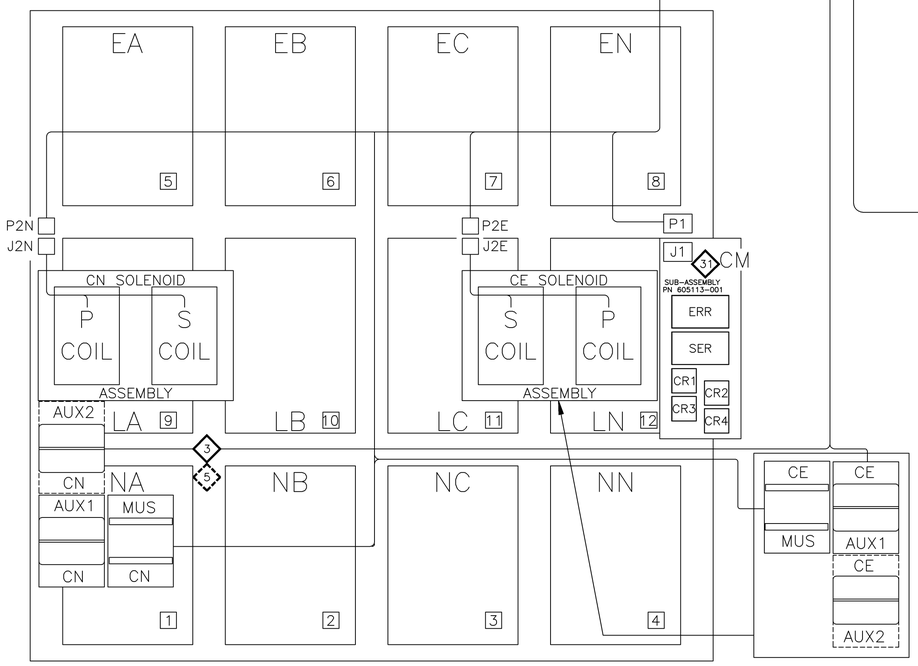
PHYSICAL DIAGRAM

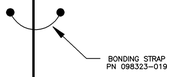
ENCLOSURE

TB

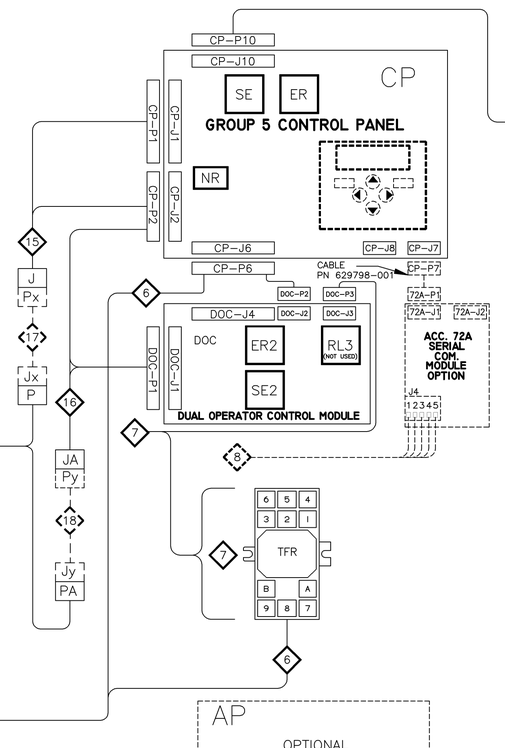


TS (TRANSFER SWITCH)





DOOR, INSIDE



AP

OPTIONAL
ACCESSORY ADD-ON PANEL
MOUNTING

AP2

OPTIONAL
ACCESSORY ADD-ON PANEL
MOUNTING

AP1

OPTIONAL
ACCESSORY ADD-ON PANEL
MOUNTING

AP3

OPTIONAL
ACCESSORY ADD-ON PANEL
MOUNTING

CHANGE LETTER	ECN NO.	BY	APP.	DATE
J	201518	SDH	SDH	08/23/04
	SEE ECN			

PROJECT NAME:

WIRING DIAGRAM
7000 SERIES (7ACTS)
GROUP 5 CONTROLS

THIRD ANGLE PROJECTION

SUBSIDIARY DISTRIBUTION

AE	AN	AM	AJ	AL			
CH	AV	AA	PS	AR			
AG	AP	AC	AS				

COMPUTER GENERATED DRAWING

	BY	DATE
DRAWN BY	BWM	7/98
CHECKED		
DRAFTING APPROVAL		
FINAL APPROVAL	JJC	7/98

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

SCALE 1:1 | ACAD | FILE

SIZE | DWG. NO.
DS 617413

CHANGE LETTER J | ECN NO. 201518 | SHEET 5 OF 6

WIRE RUN LISTING

(1) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 619510-026 (P,P1,P2N,P2E,J3,) MAIN TS	CLR	AWG
1	P-2,TS-1		16
1	P1-17,TS-1		
1	PA-2,TS-1		
2	P-3,P1-14		
3	P-4,TS-3		
3	P1-19,TS-3		
22	P-5,P1-5		
5	P-6,TS-7		
5	P1-20,TS-7		
4	P-7,TS-5		
4	P1-13,TS-5		
6	P-8,CE(AUX1)-24		
6	CE(AUX1)-24,J3-1		
7	P-9,CE(AUX1)-25		
7	CE(AUX1)-25,J3-2		
8	P-10,CE(AUX1)-21		
8	CE(AUX1)-21,CN(AUX1)-21		
8	CN(AUX1)-21,CN(AUX1)-48		
9	P-11,TS-2		
10	P-12,TS-1		
11	P-13,CN(AUX1)-49		
12	P-14,CN(AUX1)-22		
200	P-15,CN(MUS)-15		
13	P-16,CN(MUS)-17		
14	P-17,J3-3		
15	P-18,TS-6		
16	P-19,TS-9		
17	P-20,TS-10		
18	P-21,TS-11		
19	P-22,TS-4		
20	P-23,TS-8		
21	P-24,TS-12		
31	P1-1,P2E-4		
32	P1-2,P2E-1		
33	P1-3,P2E-2		
34	P1-4,P2E-3		
23	P1-6,CN(MUS)-13		
39	P1-8,CE(MUS)-13		
24	P1-9,P2N-4		
25	P1-10,P2N-1		
26	P1-11,P2N-2		
27	P1-12,P2N-3		
29	P1-15,CE(MUS)-18		
29	CE(MUS)-18,CN(MUS)-14		
29	CN(MUS)-14,CN(MUS)-16		
28	P1-18,CE(MUS)-16		
28	CE(MUS)-16,CE(MUS)-14		
28	CE(MUS)14,CN(MUS)-18		
30	P1-21,P1-24		
35	P1-22,P1-23		
202	PA-3,P1-16		
38	PA-5,P1-7		
211	PA-13,CE(AUX1)-22		
212	PA-14,CE(AUX1)-49		
213	PA-15,CE(MUS)-17		
214	PA-16,CE(MUS)-15		
215	PA-17,CE(AUX2)-80		
216	PA-18,CN(AUX2)-80		
223	CE(AUX2)-78,CN(AUX2)-78		
	REMOVE WIRES		
	ADD WIRES		
199	J3-4		
300	P-1		
201	PA-1		
203	PA-4		
204	PA-6		
205	PA-7		
206	PA-8		
207	PA-9		
208	PA-10		
209	PA-11		
210	PA-12		
217	PA-19		
218	PA-20		
219	PA-21		
220	PA-22		
221	PA-23		
222	PA-24		

(2) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [X]

WIRE No.	HARNESS 609051-001 (J4) TS STD. AUX. CONTACTS	CLR	AWG
40	J4-1,CE(AUX1)-27		16
41	J4-2,CE(AUX1)-28		
42	J4-3,CN(AUX1)-28		
43	J4-4,CE(AUX1)-30		
44	J4-5,CE(AUX1)-31		
45	J4-6,CN(AUX1)-31		
46	J4-7,CE(AUX1)-33		
47	J4-8,CE(AUX1)-34		
48	J4-9,CN(AUX1)-34		
49	J4-10,CE(AUX1)-36		
50	J4-11,CN(AUX1)-38		
51	J4-12,CE(AUX1)-38		
52	J4-13,CE(AUX1)-39		
53	J4-14,CN(AUX1)-41		
54	J4-15,CE(AUX1)-41		
55	J4-16,CE(AUX1)-42		
56	J4-17,CN(AUX1)-44		
57	J4-18,CE(AUX1)-44		
58	J4-19,CE(AUX1)-45		
59	J4-20,CN(AUX1)-47		
60	J4-21,CE(AUX1)-47		
61	J4-22,CE(AUX1)-48		
62	J4-23,CN(AUX1)-50		
63	J4-24,CE(AUX1)-50		
	REMOVE WIRES		
61	J4-22,CE(AUX1)-48		
62	J4-23,CN(AUX1)-50		
63	J4-24,CE(AUX1)-50		

(3) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 609051-001-A TS STD. AUX. CONTACTS	CLR	AWG
40	CE(AUX1)-27,CN(AUX1)-27		16
43	CE(AUX1)-30,CN(AUX1)-30		
46	CE(AUX1)-33,CN(AUX1)-33		
49	CE(AUX1)-36,CN(AUX1)-36		
52	CE(AUX1)-39,CN(AUX1)-39		
55	CE(AUX1)-42,CN(AUX1)-42		
58	CE(AUX1)-45,CN(AUX1)-45		
8	CE(AUX1)-48,CN(AUX1)-48		

(4) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 609051-002 (J5) TS OPT. AUX. CONTACTS	CLR	AWG
70	J5-1,CE(AUX2)-51		16
71	J5-2,CE(AUX2)-52		
72	J5-3,CN(AUX2)-52		
73	J5-4,CE(AUX2)-54		
74	J5-5,CE(AUX2)-55		
75	J5-6,CN(AUX2)-55		
76	J5-7,CE(AUX2)-57		
77	J5-8,CE(AUX2)-58		
78	J5-9,CN(AUX2)-58		
79	J5-10,CE(AUX2)-60		
80	J5-11,CE(AUX2)-61		
81	J5-12,CN(AUX2)-61		
82	J5-13,CE(AUX2)-63		
83	J5-14,CE(AUX2)-64		
84	J5-15,CN(AUX2)-64		
85	J5-16,CE(AUX2)-66		
86	J5-17,CN(AUX2)-68		
87	J5-18,CE(AUX2)-68		
88	J5-19,CE(AUX2)-69		
89	J5-20,CN(AUX2)-71		
90	J5-21,CE(AUX2)-71		
91	J5-22,CE(AUX2)-72		
92	J5-23,CN(AUX2)-74		
93	J5-24,CE(AUX2)-74		

(5) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 609051-002-A TS OPT. AUX. CONTACTS	CLR	AWG
70	CE(AUX2)-51,CN(AUX2)-51		16
73	CE(AUX2)-54,CN(AUX2)-54		
76	CE(AUX2)-57,CN(AUX2)-57		
79	CE(AUX2)-60,CN(AUX2)-60		
82	CE(AUX2)-63,CN(AUX2)-63		
85	CE(AUX2)-66,CN(AUX2)-66		
88	CE(AUX2)-69,CN(AUX2)-69		
91	CE(AUX2)-72,CN(AUX2)-72		

(6) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [X]

WIRE No.	HARNESS 619510-005 (P6) FIELD INPUTS	CLR	AWG
100	CP-P6-21,P6-1	WHT	22 (12 COND)
101	CP-P6-22,P6-2	ORG	
102	CP-P6-23,P6-3	GRN	
103	CP-P6-9,P6-4	BLK	
104	CP-P6-10,P6-5	RED	
	ADD WIRES		
305	CP-P6-40,TFR-A	BLK	22 (2 COND)
306	CP-P6-41,TFR-B	RED	
307	CP-P6-42,DOC-P2-1	BLK	22 (4 COND)
308	CP-P6-43,DOC-P2-3	WHT	
309	CP-P6-44,DOC-P2-2	RED	
310	CP-P6-24,DOC-P2-6	GRN	
105	P6-6		
106	P6-7		
107	P6-8		
108	P6-9		
109	P6-10		
110	P6-11		
111	P6-12		
112	P6-13		
113	P6-14		
114	P6-15		
115	P6-16		
116	P6-17		
117	P6-18		
118	P6-19		
119	P6-20		
120	P6-21		
121	P6-22		
122	P6-23		
123	P6-24		

(7) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [X]

WIRE No.	HARNESS (J7) FIELD OUTPUTS	CLR	AWG
130	J7-1,TFR-9		16
131	J7-2,TFR-6		
132	J7-3		
133	J7-4,DOC-P3-3		
134	J7-5,DOC-P3-1		
135	J7-6,DOC-P3-2		
136	J7-7,DOC-P3-4		
137	J7-8,DOC-P3-5		
138	J7-9,DOC-P3-6		
139	J7-10		
140	J7-11		
141	J7-12		
142	J7-13		
143	J7-14		
144	J7-15		
145	J7-16		
146	J7-17		
147	J7-18		
148	J7-19		
149	J7-20		
150	J7-21		
151	J7-22		
152	J7-23		
153	J7-24		

(8) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 605454-005 (J8) OPTIONAL SERIAL I/O	CLR	AWG
160	J8-1,72A-5	SHLD	22 (4 COND)
161	J8-2,72A-1	WHT/ORG	
162	J8-3,72A-2	ORG/WHT	
163	J8-4,72A-3	WHT/BLU	
164	J8-5,72A-4	BLU/WHT	
165	J8-6		
166	J8-7		
167	J8-8		
168	J8-9		

(9) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 605454-007 (P8,TB) OPTIONAL SERIAL I/O	CLR	AWG
160	P8-1,TB-37	SHLD	22 (4 COND)
161	P8-2,TB-38	WHT/ORG	
162	P8-3,TB-39	ORG/WHT	
163	P8-4,TB-40	WHT/BLU	
164	P8-5,TB-41	BLU/WHT	
165	P8-6		
166	P8-7		
167	P8-8		
168	P8-9		

(10) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [X]

WIRE No.	SUB-ASSEMBLY 605659 (P3,P4,J6,P7,TB) STD. FIELD TB	CLR	AWG
6	TB-1,P3-1		16
7	TB-2,P3-2		
14	TB-3,P3-3		
40	TB-4,P4-1		
41	TB-5,P4-2		
42	TB-6,P4-3		
43	TB-7,P4-4		
44	TB-8,P4-5		
45	TB-9,P4-6		
46	TB-10,P4-7		
47	TB-11,P4-8		
48	TB-12,P4-9		
49	TB-13,P4-10		
51	TB-14,P4-12		
50	TB-15,P4-11		
52	TB-16,P4-13		
54	TB-17,P4-15		
53	TB-18,P4-14		
55	TB-19,P4-16		
57	TB-20,P4-18		
56	TB-21,P4-17		
58	TB-22,P4-19		
60	TB-23,P4-21		
59	TB-24,P4-20		
61	TB-25,P4-22		
62	TB-26,P4-24		
63	TB-27,P4-23		
100	TB-28,J6-1		
101	TB-29,J6-2		
102	TB-30,J6-3		
103	TB-31,J6-4		
104	TB-32,J6-5		
130	TB-34,P7-1		
131	TB-35,P7-2		
132	TB-36,P7-3		
	JUMPERS		
	TB-28,TB-29		
	TB-29,TB-30		
	ADD WIRES		
199	P3-4		
105	J6-6		
106	J6-7		
107	J6-8		
108	J6-9		
109	J6-10		
110	J6-11		
111	J6-12		
112	J6-13		
113	J6-14		
114	J6-15		
115	J6-16		
116	J6-17		
117	J6-18		
118	J6-19		
119	J6-20		
120	J6-21		
121	J6-22		
122	J6-23		
123	J6-24		
133	P7-4,TB-67		
134	P7-5,TB-68		
135	P7-6,TB-69		
136	P7-7,TB-70		
137	P7-8,TB-71		
138	P7-9,TB-72		
139	P7-10		
140	P7-11		
141	P7-12		
142	P7-13		
143	P7-14		
144	P7-15		
145	P7-16		
146	P7-17		
147	P7-18		
148	P7-19		
149	P7-20		
150	P7-21		
151	P7-22		
152	P7-23		
153	P7-24		

(11) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 605454-008 (P5,TB) OPT. AUX. CONTACTS	CLR	AWG
70	TB-43,P5-1		16
71	TB-44,P5-2		
72	TB-45,P5-3		
73	TB-46,P5-4		
74	TB-47,P5-5		
75	TB-48,P5-6		
76	TB-49,P5-7		
77	TB-50,P5-8		
78	TB-51,P5-9		
79	TB-52,P5-10		
80	TB-53,P5-11		
81	TB-54,P5-12		
82	TB-55,P5-13		
83	TB-56,P5-14		
84	TB-57,P5-15		
85	TB-58,P5-16		
86	TB-59,P5-18		
87	TB-60,P5-17		
88	TB-61,P5-19		
89	TB-62,P5-21		
90	TB-63,P5-20		
91	TB-64,P5-22		
92	TB-65,P5-24		
93	TB-66,P5-23		

(15) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 483763 (J,CP-P1,CP-P2) CONTROL PANEL	CLR	AWG
350	J-1,CP-P1-8		18
1	J-2,CP-P1-15		
2	J-3,CP-P1-2		
3	J-4,CP-P1-4		
4	J-5,CP-P1-17		
5	J-6,CP-P1-12		
4	J-7,CP-P1-7		
6	J-8,CP-P2-2		
7	J-9,CP-P2-3		
8	J-10,CP-P2-8		
9	J-11,CP-P1-10		
10	J-12,CP-P1-1		
11	J-13,CP-P2-9		
12	J-14,CP-P2-10		
200	J-15,CP-P1-5		
13	J-16,CP-P1-13		
14	J-17,CP-P2-1		
15	J-18,CP-P1-14		
	ADD WIRES		
16	J-19		
17	J-20		
18	J-21		
19	J-22		
20	J-23		
21	J-24		

(16) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [X]

WIRE No.	HARNESS 619385 (JA,CP-P2,CP-P6) CONTROL MODULE	CLR	AWG
1	JA-2,DOC-P1-15		16
202	JA-3,DOC-P1-2		
201	JA-1,DOC-P1-8		
214	JA-16,DOC-P1-13		
213	JA-15,DOC-P1-5		
38	JA-5,DOC-P1-17		
211	JA-13,CP-P2-6	PIN	
212	JA-14,CP-P2-7	PIN	
	ADD WIRES		
203	JA-4		
204	JA-6		
205	JA-7		
206	JA-8		
207	JA-9		
208	JA-10		
209	JA-11		
210	JA-12		
215	JA-17,DOC-P2-4		
216	JA-18,DOC-P2-5		
217	JA-19		
218	JA-20		
219	JA-21		
220	JA-22		
221	JA-23		
222	JA-24		

(17) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 309320-005 OPTIONAL 8 IN. EXTENSION HARNESS	CLR	AWG
350	Jx-1,Px-1		16
1	Jx-2,Px-2		
2	Jx-3,Px-3		
3	Jx-4,Px-4		
4	Jx-5,Px-5		
5	Jx-6,Px-6		
4	Jx-7,Px-7		
6	Jx-8,Px-8		
7	Jx-9,Px-9		
8	Jx-10,Px-10		
9	Jx-11,Px-11		
10	Jx-12,Px-12		
11	Jx-13,Px-13		
12	Jx-14,Px-14		
200	Jx-15,Px-15		
13	Jx-16,Px-16		
14	Jx-17,Px-17		
15	Jx-18,Px-18		
16	Jx-19,Px-19		
17	Jx-20,Px-20		
18	Jx-21,Px-21		
19	Jx-22,Px-22		
20	Jx-23,Px-23		
21	Jx-24,Px-24		

(18) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [ ]

WIRE No.	HARNESS 309320-005 OPTIONAL 8 IN. EXTENSION HARNESS	CLR	AWG
201	Jy-1,Py-1		16
1	Jy-2,Py-2		
202	Jy-3,Py-3		
203	Jy-4,Py-4		
38	Jy-5,Py-5		
204	Jy-6,Py-6		
205	Jy-7,Py-7		
206	Jy-8,Py-8		
207	Jy-9,Py-9		
208	Jy-10,Py-10		
209	Jy-11,Py-11		
210	Jy-12,Py-12		
211	Jy-13,Py-13		
212	Jy-14,Py-14		
213	Jy-15,Py-15		
214	Jy-16,Py-16		
215	Jy-17,Py-17		
216	Jy-18,Py-18		
217	Jy-19,Py-19		
218	Jy-20,Py-20		
219	Jy-21,Py-21		
220	Jy-22,Py-22		
221	Jy-23,Py-23		
222	Jy-24,Py-24		

ADDITIONAL WIRING

WIRE No.	ADDITIONAL WIRING	CLR	AWG
			16

(31) HARNESS LOCATOR — BOX CHECKED IF HARNESS IS MODIFIED [X]

WIRE No.	SUB-ASSEMBLY 605113-001 (J1,CM) DUAL SOLENOID UNIT CONTROL MODULE ASSEMBLY	CLR	AWG
			16
	J1-1,CR3-(+)		
	J1-2,CR3-(-)		
	J1-3,CR4-(+)		
	J1-4,CR4-(-)		
	J1-5,CR1-AC1		
	J1-6,CR2-AC1		
	J1-7,CR3-AC1		
	J1-8,CR4-AC1		
	J1-9,CR1-(+)		
	J1-10,CR1-(-)		
	J1-11,CR2-(+)		
	J1-12,CR2-(-)		
	J1-13,SER-R2		
	J1-14,SER-A2		
	J1-15,ERR-R2		
	J1-16,ERR-A2		
	J1-17,SER-2		
	J1-18,ERR-2		
	J1-19,SER-A1		
	SER-A1,SER-3		
	J1-20,ERR-A1		
	ERR-A1,ERR-3		
	J1-21,CR1-AC2		
	CR1-AC2,CR2-AC2		
	J1-22,CR3-AC2		
	CR3-AC2,CR4-AC2		
	J1-23,SER-R3		
	J1-24,ERR-R3		
	SER-R3,ERR-R3		
	SER-1,ERR-R1		
	SER-R1,ERR-1		
	SER-4,ERR-R4		
	SER-R4,ERR-4		
	NOTE: SUB-ASSEMBLY NO WIRE NUMBERS NEEDED		
	REMOVE WIRES		
	J1-16,ERR-A2		
	ADD WIRES		
	J1-16,SER-A2		
	ERR-1,ERR-A2		

CHANGE LETTER	ECN NO.	BY	APP.	DATE
J	201518	SDH	SDH	08/23/04
	SEE ECN			

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PROJECT NAME:

WIRING DIAGRAM
7000 SERIES (7ACTS)
GROUP 5 CONTROLS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	BWM	7/98
CHECKED		
DRAFTING APPROVAL		
FINAL APPROVAL	JJC	7/98

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE 1:1 — ACAD — FILE

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CHANGE LETTER J — ECN NO. 201518 — SHEET 6 OF 6