

# SINGLE PHASE WIRING FOR ASCO® SERIES 300 AUTOMATIC TRANSFER SWITCHES RATED 600 AMPERES WITH GROUP I CONTROLS

## CONTROL FEATURES

- VOLTAGE AND FREQUENCY SENSING**
- DIFFERENTIAL TYPE VOLTAGE SENSING ON ALL PHASES OF NORMAL SOURCE. DROPOUT SETTING SELECTABLE AT 90, 85, 80 OR 70% OF NOMINAL. FACTORY SET AT 85%. PICKUP VOLTAGE ADJUSTABLE AT 90 OR 95% OF NOMINAL. (DEFAULT IS 95% IF DROPOUT IS SET TO 90%).
  - SINGLE PHASE VOLTAGE SENSING OF EMERGENCY SOURCE. NON-ADJUSTABLE DROPOUT SETTING AT 75% OF NOMINAL. NON-ADJUSTABLE PICKUP SETTING AT 90% OF NOMINAL.
  - FREQUENCY SENSING OF EMERGENCY SOURCE. NON-ADJUSTABLE DROPOUT SETTING AT 85% OF NOMINAL. NON-ADJUSTABLE PICKUP SETTING AT 95% OF NOMINAL.

- TIME DELAYS**
- MOMENTARY NORMAL SOURCE OUTAGE DELAY - ACTIVATED WHEN THE NORMAL SOURCE FAILS. DEACTIVATED WHEN THE NORMAL SOURCE IS ACCEPTABLE. PROVIDES A SELECTABLE (1 OR 3 SECOND) DELAY ON TRANSFER AND ENGINE STARTING SIGNALS. FACTORY SET AT 3 SECONDS. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
  - TRANSFER TO EMERGENCY DELAY - ACTIVATED AFTER THE MOMENTARY NORMAL SOURCE OUTAGE DELAY EXPIRES AND THE EMERGENCY SOURCE IS SENSED TO BE ACCEPTABLE. TRANSFER TO EMERGENCY IS COMMITTED TO ON INITIATION OF DELAY. DEACTIVATED WHEN THE EMERGENCY SOURCE IS UNACCEPTABLE. PROVIDES AN ADJUSTABLE DELAY FROM 0 TO 5 MINUTES. FACTORY SET AT 0 MINUTES. (REFER TO OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
  - RETRANSFER TO NORMAL DELAY - ACTIVATED WHEN THE NORMAL SOURCE IS ACCEPTABLE. DEACTIVATED WHEN THE NORMAL SOURCE FAILS WITH NO TRANSFER TO NORMAL. ALSO DEACTIVATED WHEN THE EMERGENCY SOURCE FAILS WHILE THE NORMAL SOURCE IS ACCEPTABLE WITH TRANSFER TO NORMAL. ADJUSTABLE DELAY FROM 1 SECOND TO 30 MINUTES. FACTORY SET TO 30 MINUTES. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).

- UNLOADED RUNNING (ENGINE COOL DOWN) DELAY - ACTIVATED ON EXPIRATION OF RETRANSFER TO NORMAL DELAY OR FOLLOWING EXPIRATION OF THE NORMAL SOURCE OUTAGE DELAY WITHOUT A COMMIT TO TRANSFER TO EMERGENCY. NON-ADJUSTABLE DELAY OF 5 MINUTES.
- MOMENTARY EMERGENCY SOURCE OUTAGE DELAY - ACTIVATED WHEN THE SWITCH IS IN THE EMERGENCY POSITION AND THE EMERGENCY SOURCE FAILS. FACTORY SET AT 4 SECONDS. RESET IF EMERGENCY RESTORES WITHIN 4 SECONDS.

**ENGINE CONTROL CONTACTS**

ONE SET OF FORM C CONTACTS (1 N/O & 1 N/C) THAT CHANGE POSITION ON EXPIRATION OF THE NORMAL SOURCE OUTAGE DELAY AND RESET ON EXPIRATION OF THE UNLOADED RUNNING (ENGINE COOL DOWN) DELAY. OUTPUT CONTACTS (NR) ARE RATED 5 AMPS RESISTIVE AT 28V DC OR 120V AC MAXIMUM.

**OPERATOR INTERFACE INDICATORS & CONTROLS**  
MEMBRANE TYPE

- TRANSFER SWITCH TEST - MOMENTARY PUSH-BUTTON TO SIMULATE NORMAL SOURCE FAILURE SEQUENCE OF OPERATION. PRESS AND HOLD FOR AT LEAST 15 SECONDS TO ALLOW TIME FOR ENGINE-GENERATOR SET TO START.
- BYPASS TIME DELAY - MOMENTARY PUSH-BUTTON TO BYPASS EITHER THE TRANSFER TO EMERGENCY DELAY, ENGINE EXERCISER PERIOD OR THE RETRANSFER TO NORMAL DELAY DEPENDING ON WHICH DELAY IS ACTIVE AT THE TIME THE PUSH-BUTTON IS ACTIVATED.
- SET ENGINE EXERCISER - MOMENTARY PUSH-BUTTON TO ACTIVATE A SEVEN (7) DAY TIMER FOR AUTOMATIC WEEKLY TESTING OF THE ENGINE GENERATOR SET EITHER WITH OR WITHOUT LOAD TRANSFER. THE TIMER IS POWERED BY A NON-RECHARGEABLE 9V BATTERY WHEN NORMAL AND EMERGENCY SOURCES ARE UNAVAILABLE. DEPRESSING THE MOMENTARY PUSH-BUTTON FOR 5 SECONDS SETS THE TIME OF WEEK AT WHICH TESTING IS TO OCCUR. THE FEATURE IS ACTIVATED BY SETTING A DIP SELECTOR SWITCH ON THE CONTROL PANEL. ENGINE START WITH OR WITHOUT LOAD TRANSFER IS SELECTED WITH A SECOND DIP SELECTOR SWITCH ON THE CONTROL PANEL. FACTORY SET TO DISABLED, NO LOAD. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).
- LOAD CONNECTED TO INDICATORS  
GREEN LED INDICATOR TO INDICATE WHEN THE TRANSFER SWITCH LOAD IS CONNECTED TO THE NORMAL SOURCE.  
RED LED INDICATOR TO INDICATE WHEN THE TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE.
- SOURCE AVAILABLE INDICATORS  
GREEN LED INDICATOR TO INDICATE WHEN THE NORMAL SOURCE IS AVAILABLE.  
RED LED INDICATOR TO INDICATE WHEN THE EMERGENCY SOURCE IS AVAILABLE.

**LOAD DISCONNECT FEATURE**

ONE SET OF FORM C CONTACTS (1 N/O & 1 N/C) THAT CHANGE POSITION ON ACTIVATION OF A SELECTABLE TIME DELAY BEFORE TRANSFER (LD TB1) AND RESET IMMEDIATELY FOLLOWING TRANSFER OR FOR THE SAME DELAY AS SET FOR PRE-SIGNAL BEFORE TRANSFER. SELECTABLE AS 0, 3, 10 OR 20 SECONDS. FACTORY SET AT 0. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS). OUTPUT CONTACTS (OP) ARE RATED 5 AMPS RESISTIVE AT 28 VDC OR 120 VAC MAXIMUM.

**MOTOR LOAD TRANSFER FEATURE**

INPHASE TRANSFER CONTROL LOGIC TO INITIATE AN INPHASE TRANSFER OF MOTOR LOADS BETWEEN LIVE SOURCES. USED TO HELP PREVENT NOISANCE TRIPPING OF DISTRIBUTION CIRCUIT BREAKERS AND POSSIBLE DAMAGE TO MECHANICAL LOADS ASSOCIATED WITH OUT OF PHASE TRANSFER. ACTIVATED BY SETTING A DIP SWITCH ON THE CONTROL PANEL. FACTORY SET AS DISABLED. (REFER TO OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).

**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 OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL SETTINGS).

- REMOTE TEST FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOTE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT SIMULATES A FAILURE OF THE NORMAL SOURCE SIMILAR TO THE SEQUENCE OUTLINED FOR THE TRANSFER SWITCH TEST PUSH-BUTTON. THE TRANSFER SWITCH WILL REMAIN CONNECTED TO THE EMERGENCY SOURCE UNDER ALL CONDITIONS WHILE THE CONTACT IS OPEN.
- REMOTE TRANSFER TO EMERGENCY FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOTE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. RECLOSURE OF THE CONTACT ACTIVATES THE RETRANSFER TO NORMAL DELAY PRIOR TO RETRANSFER. IN THE EVENT THAT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO EMERGENCY AND THE REMOTE CONTACT IS OPEN, THE TRANSFER SWITCH WILL AUTOMATICALLY RETRANSFER TO THE NORMAL SOURCE.
- INHIBIT TRANSFER TO EMERGENCY FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOTE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT WILL PROHIBIT THE TRANSFER SWITCH FROM TRANSFERRING TO THE EMERGENCY SOURCE WHILE CONNECTED TO THE NORMAL SOURCE.
- BYPASS TRANSFER TIME DELAY FEATURE - REQUIRES A CUSTOMER SUPPLIED, REMOTE, NORMALLY CLOSED CONTACT. OPENING OF THE CONTACT BYPASSES THE RETRANSFER TO NORMAL DELAY IF ACTIVE.

## GENERAL NOTES

- SWITCH SHOWN DE-ENERGIZED CONNECTED TO NORMAL SOURCE. DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUB. ICS 1-1983, PART 1-101A.
- TS WIRES: #18 AWG ON 600 AMP, CONTROL PANEL WIRING IS #16 AWG. ALL WIRES ARE STRANDED COPPER.
- INDICATES CUSTOMER CONNECTION POINTS.
- INDICATES FACTORY CONNECTION POINTS.
- CONNECTION POINTS THAT HAVE BOTH CUSTOMER CONNECTIONS AND FACTORY CONNECTIONS ARE SHOWN OPEN AS CUSTOMER CONNECTION POINTS.
- THE TRANSFER UNIT IS MOUNTED ON THE BACK INSIDE SURFACE OF THE ENCLOSURE. THE CONTROL PANEL AND ANY OPTIONAL ACCESSORIES ARE MOUNTED ON THE INSIDE SURFACE OF THE DOOR.
- AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.
- GROUND STRAP ON CONTROL PANEL IS AFFIXED TO CHASSIS (ENCLOSURE) AT LOWER LEFT CONTROL PANEL MOUNTING STUD.

## OPTIONAL ACCESSORIES

**ACCESSORY 11BG - PROGRAMMABLE ENGINE EXERCISER & SOURCE AVAILABILITY SIGNAL MODULES**

**PROGRAMMABLE ENGINE EXERCISER:** A PROGRAMMABLE SEVEN (7) DAY OR FOURTEEN (14) DAY ELECTRONIC TIME SWITCH FOR AUTOMATIC WEEKLY TESTING OF THE ENGINE GENERATOR SET EITHER WITH OR WITHOUT LOAD. EACH DAY OF THE WEEK IS INDIVIDUALLY PROGRAMMABLE. THE TIME OF DAY IS PRESERVED BY A BATTERY BUILT INTO THE GROUP 1 TRANSFER SWITCH CONTROL PANEL.

THE FEATURE IS ACTIVATED BY SETTING A DIP SELECTOR SWITCH ON THE CONTROL PANEL. ENGINE START WITH OR WITHOUT LOAD TRANSFER IS SELECTED WITH A SECOND DIP SELECTOR SWITCH ON THE CONTROL PANEL. (REFER TO THE OPERATOR'S MANUAL FURNISHED WITH EACH TRANSFER SWITCH REGARDING CONTROL PANEL AND TIMER SETTINGS).

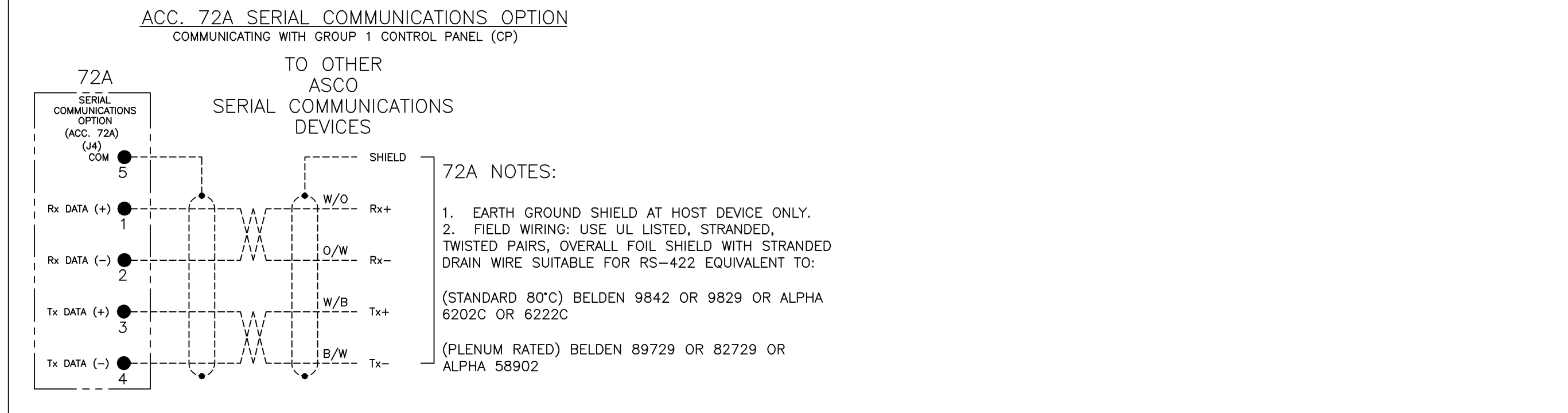
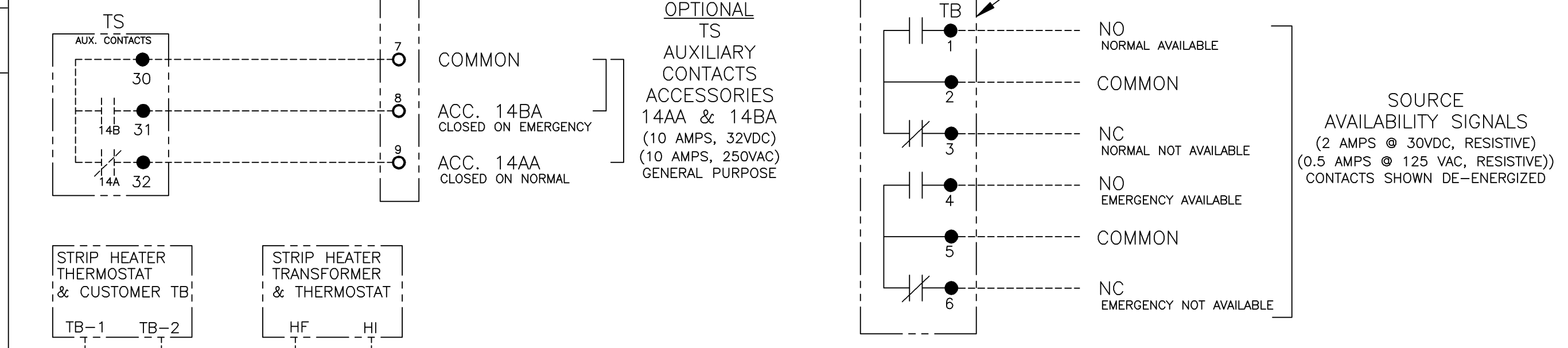
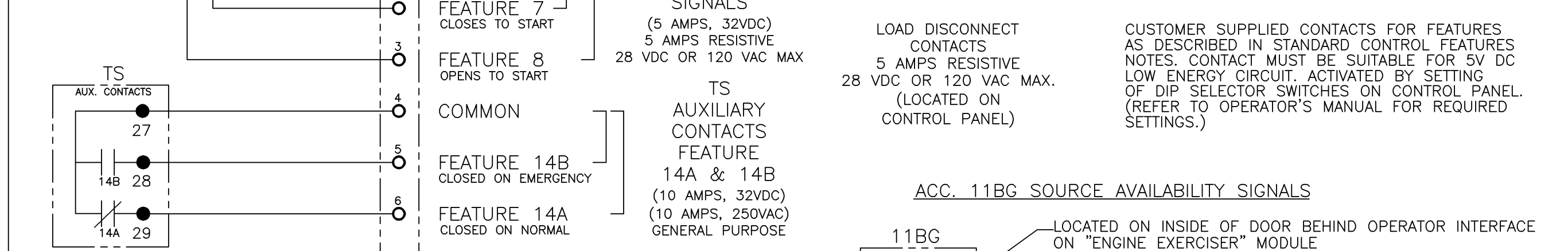
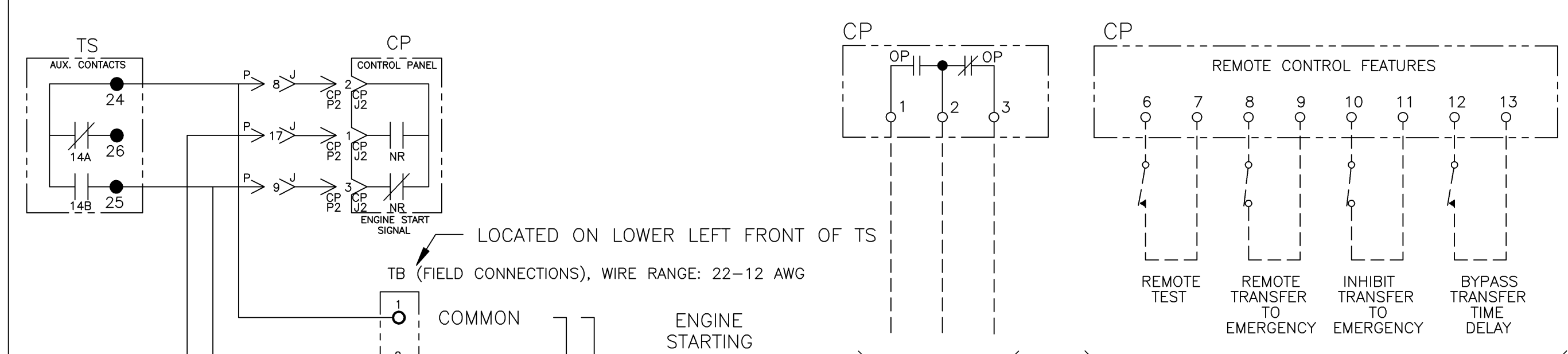
**SOURCE AVAILABILITY SIGNALING:** ONE FORM C CONTACT EACH FOR THE NORMAL & EMERGENCY SOURCES SIGNAL THE ACCEPTABILITY OF THE SOURCE AS SENSED BY THE GROUP 1 CONTROL PANEL. THE SIGNAL CONTACTS OPERATE IN CONJUNCTION WITH THE SOURCE AVAILABILITY LED STATUS INDICATION PROVIDED ON THE OPERATOR INTERFACE. FIELD WIRING TERMINALS ARE PROVIDED AS SHOWN, LOCATED ON THE INSIDE DOOR BEHIND THE OPERATOR INTERFACE. CONTACTS RATED 2 AMPS @ 30VDC, 0.5 AMPS @ 125 VAC (RESISTIVE).

**SERIAL COMMUNICATIONS INTERFACE (ACCESSORY 72A)**

RS-485 SERIAL INTERFACE TO CONTROL PANEL. FOR REMOTE MONITORING AND CONTROL FROM ASCO COMMUNICATIONS BASED PRODUCTS.

- ACC. 14AA (2) AUXILIARY CONTACT CLOSED ON NORMAL.
- ACC. 14BA (2) AUXILIARY CONTACT CLOSED ON EMERGENCY.
- ACC. 44A STRIP HEATER, THERMOSTAT & TB. CUSTOMER POWER SUPPLY 120VAC.
- ACC. 44G STRIP HEATER, THERMOSTAT & TRANSFORMER. POWER SUPPLY FROM LOAD TERMINALS OF TRANSFER SWITCH.

## 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	DESCRIPTION	ENCLOSURE CODES
									CODE	NOMINAL VOLTAGE	CODE	DESCRIPTION	DESCRIPTION
J	300	B	2	600	H	1	X	F	BLANK	208	C	SOLID SWITCHING OVERLAPPING	1
		C			J			G	D	220	F		3R
					K				E	230	G		4
					L				F	240			
					M				H	380	L		12
					N				J	400			
					O				K	415			
					P				L	440			
					Q				M	460			
					R				N	480			
									O	575			
									P	600			

CATALOG NUMBER \_\_\_\_\_

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM REV B

PROJECT NAME: \_\_\_\_\_

WIRING DIAGRAM

SERIES J300 ATS 1PH 600 AMPS

"J" FRAME, GROUP 1 CONTROLS

SCALE: NONE SIZE DS

DWG. NO. 783738

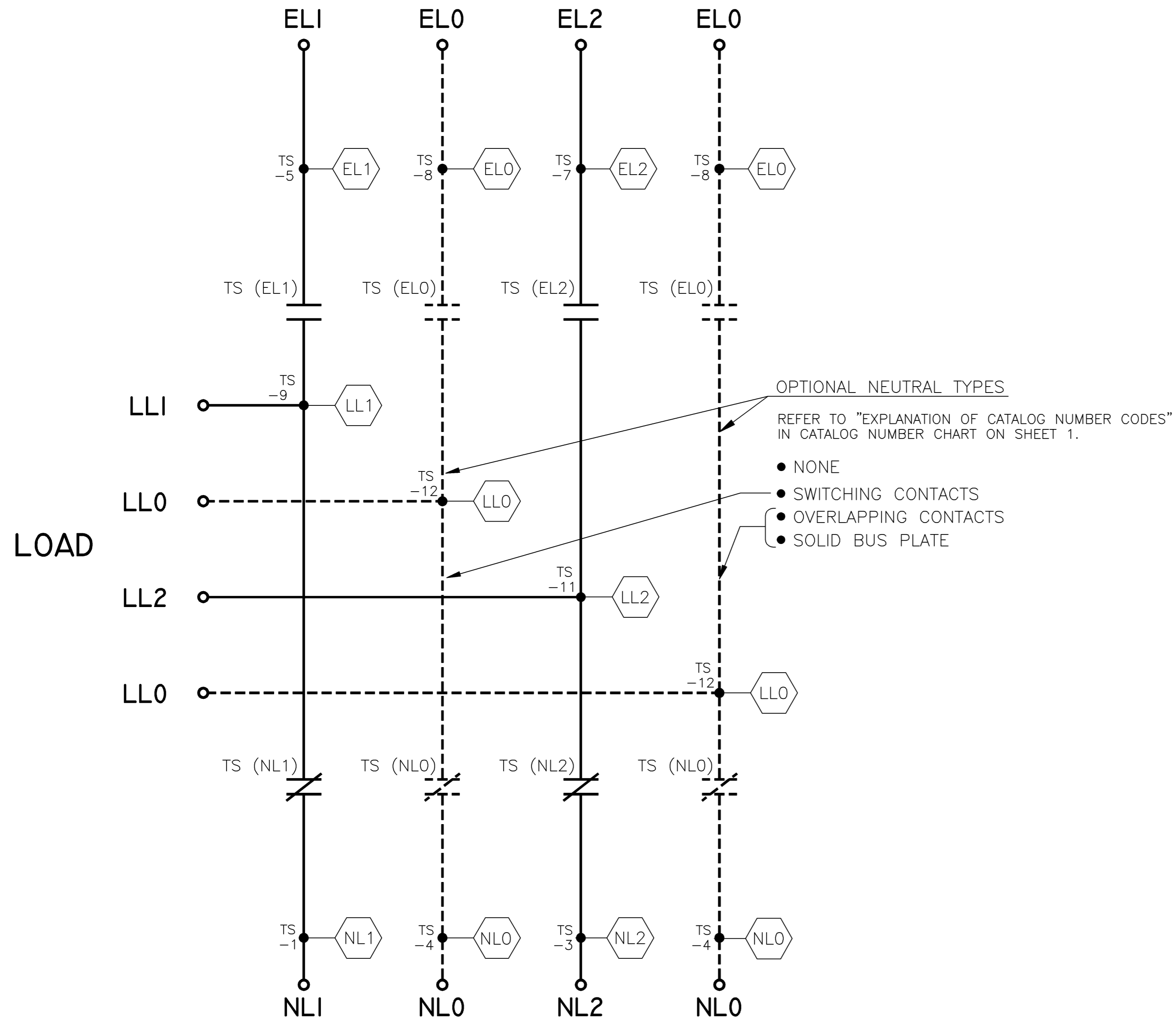
ASCO POWER TECHNOLOGIES, L.P.

MAIN POWER POLES

TS OPERATOR CIRCUIT

EMERGENCY

NORMAL



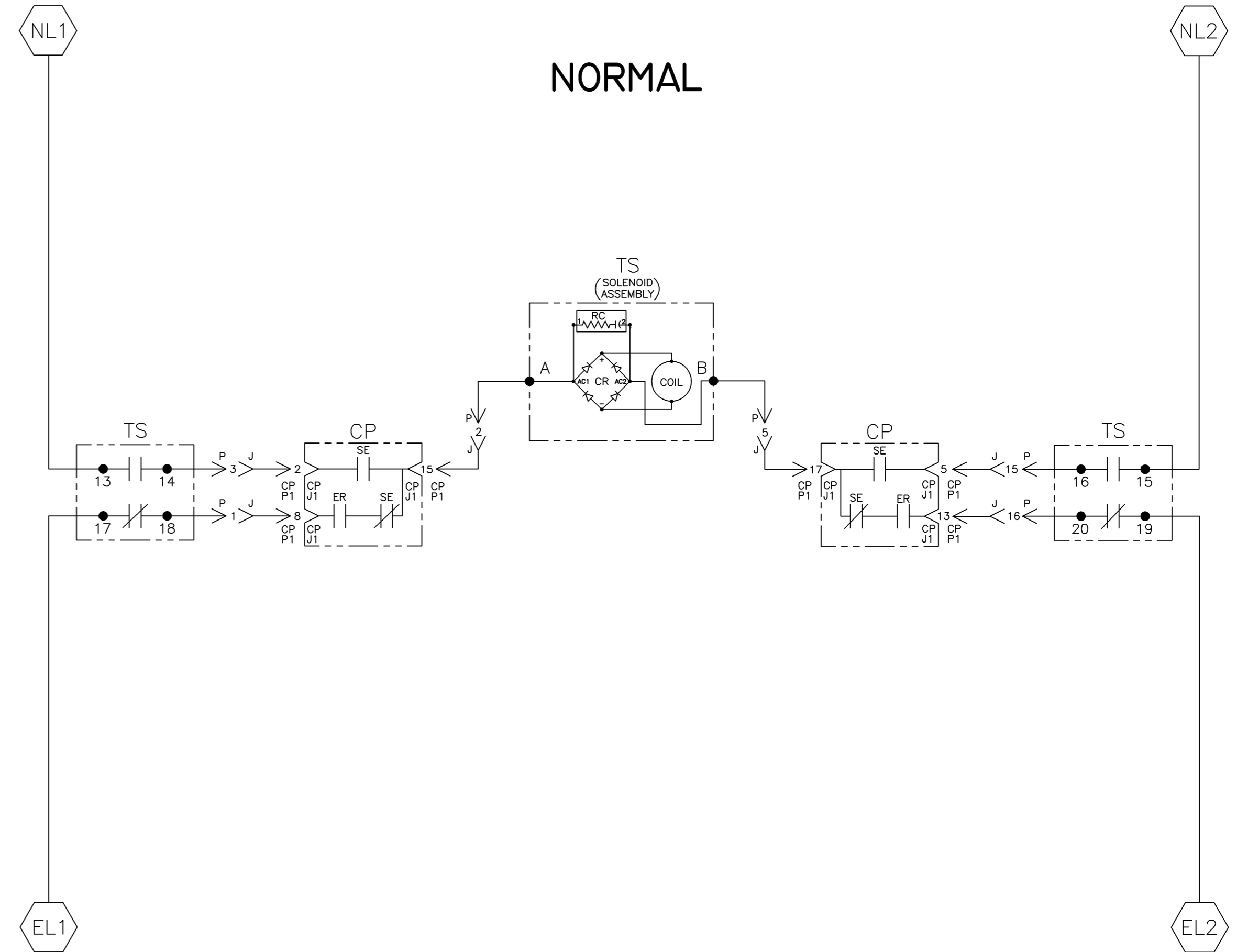
OPTIONAL NEUTRAL TYPES  
 REFER TO "EXPLANATION OF CATALOG NUMBER CODES"  
 IN CATALOG NUMBER CHART ON SHEET 1.

- NONE
- SWITCHING CONTACTS
- OVERLAPPING CONTACTS
- SOLID BUS PLATE

NOTE:  
 ATS SHOWN CLOSED ON NORMAL SOURCE.

NORMAL

EMERGENCY



TS	SOLENOID POSITION			
	CLOSED BEFORE NORMAL	BEFORE TDC	BEFORE CLOSED	EMERG
13-14				
15-16				
17-18				
19-20				

TDC (TOP DEAD CENTER)  
 TRANSFER SWITCH TEST & ADJUSTMENT PROCEDURE  
 SPECIFIES CONTROL CUT-OFF (CONTACT OPENING)  
 SETTING.

C	234078	BK	BK	10/07/11
B	213521	WK	BK	05/29/07
A	208021	JPB	JPB	3/23/06
-	205833	JPB	JPB	9/8/05

PROJECT NAME: **WIRING DIAGRAM**

SERIES J300 ATS 1PH 600 AMPS  
 "J" FRAME, GROUP 1 CONTROLS

SCALE: NONE SIZE: DS

DWG. NO. **783738**

ASCO POWER TECHNOLOGIES, L.P.  
 FLOHAM PARK, NEW JERSEY 07832 U.S.A.

REV. C ECN. 234078 SHEET 2 OF 4

WIRE RUN LISTING

HARNESS LOCATOR		BOX CHECKED IF HARNESS IS MODIFIED	CLR	AWG
HARNESS 781247 (P) MAIN TS				
WIRE No.				18
1	P-1,TS-18			
2	P-2,TS-14			
3	P-3,TS-14			
4	P-4,TS-3			
4	TS-3,TS-15			
5	P-5,TS-B			
6	P-6,TS-7			
6	TS-7,TS-19			
7	P-7,TS-5			
7	TS-5,TS-17			
8	P-8,TS-24			
8	TS-24,TB-1			
9	P-9,TS-25			
9	TS-25,TB-2			
10	P-10,TS-21			
11	P-11,TS-2			
12	P-12,TS-1			
12	TS-1,TS-13			
13	P-13,TS-22			
14	P-14,TS-23			
14	P-15,TS-16			
16	P-16,TS-20			
17	P-17,TB-3			
18	P-18,TS-6			
19	P-19,TS-9			
20	P-20,TS-10			
21	P-21,TS-11			
22	P-22,TS-4			
23	P-23,TS-8			
24	P-24,TS-12			
25	TS-27,TB-4			
26	TS-28,TB-5			
27	TS-29,TB-6			
DEAD END WIRES				
11	P-11,TS-2			
18	P-18,TS-6			
20	P-20,TS-10			

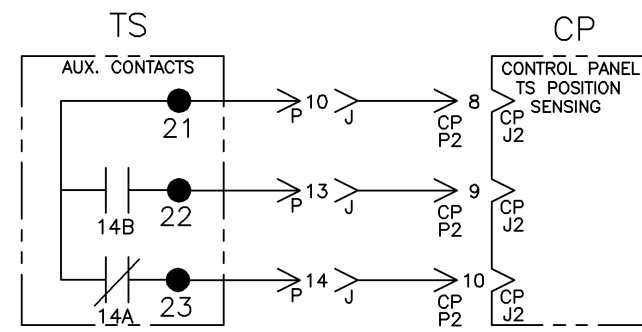
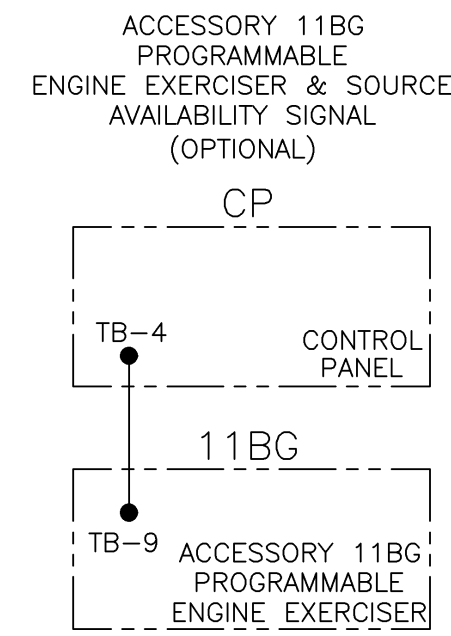
HARNESS LOCATOR		BOX CHECKED IF HARNESS IS MODIFIED	CLR	AWG
HARNESS 483763 (J, P1, P2) TS-CP HARNESS				
WIRE No.				16
1	J-1,CP-P1-8			
2	J-2,CP-P1-15			
3	J-3,CP-P1-2			
4	J-4,CP-P1-4			
5	J-5,CP-P1-17			
6	J-6,CP-P1-12			
7	J-7,CP-P1-7			
8	J-8,CP-P2-2			
9	J-9,CP-P2-3			
10	J-10,CP-P2-8			
11	J-11,CP-P1-10			
12	J-12,CP-P1-1			
13	J-13,CP-P2-9			
14	J-14,CP-P2-10			
15	J-15,CP-P1-5			
16	J-16,CP-P1-13			
17	J-17,CP-P2-1			
18	J-18,CP-P1-14			

OPTIONAL ACCESSORIES

HARNESS LOCATOR		CLR	AWG
OPTIONAL ACC. 11BG CKTS.			
WIRE No.			16
28	CP-TB-4,11BG-TB-9		

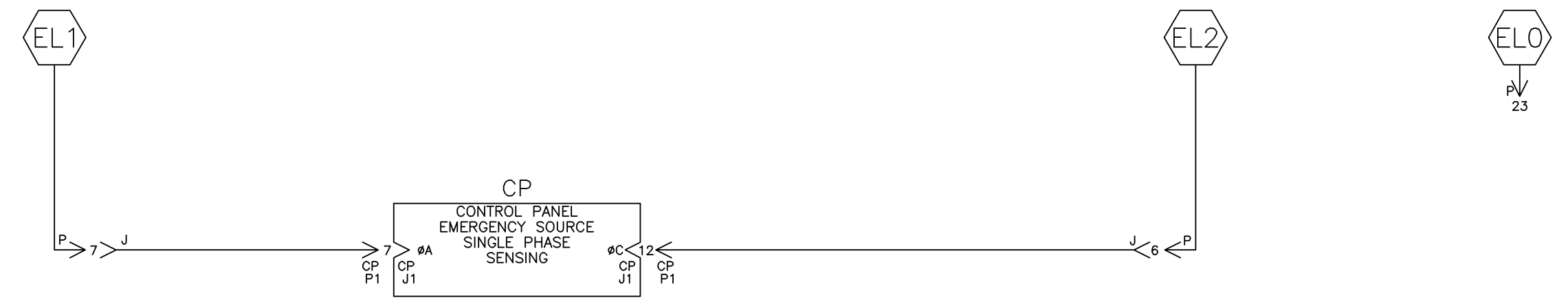
HARNESS LOCATOR		CLR	AWG
OPTIONAL ACC. 14AA & 14BA			
WIRE No.			18
31	TS-30,TB-7		
32	TS-31,TB-8		
33	TS-32,TB-9		

CONTROL SIGNALS & INDICATION



EMERGENCY SOURCE CIRCUITS

EMERGENCY



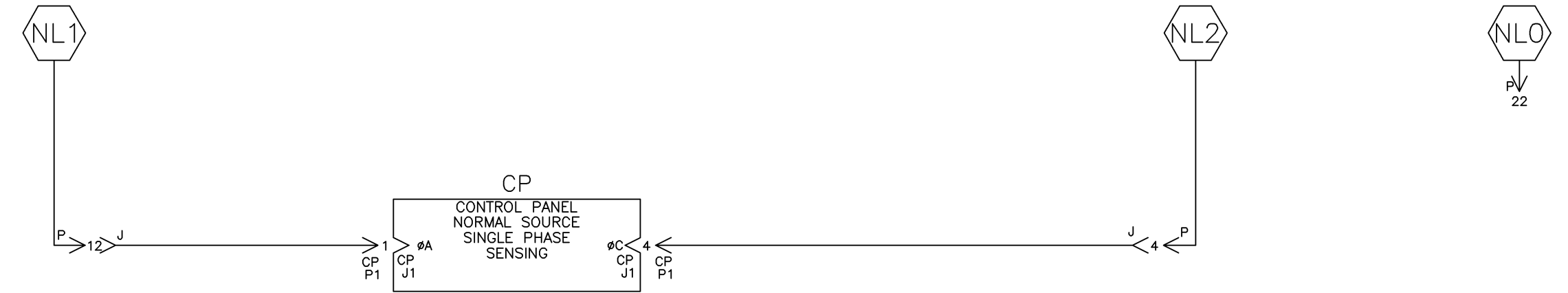
LOAD TERMINAL CIRCUITS

LOAD



NORMAL SOURCE CIRCUITS

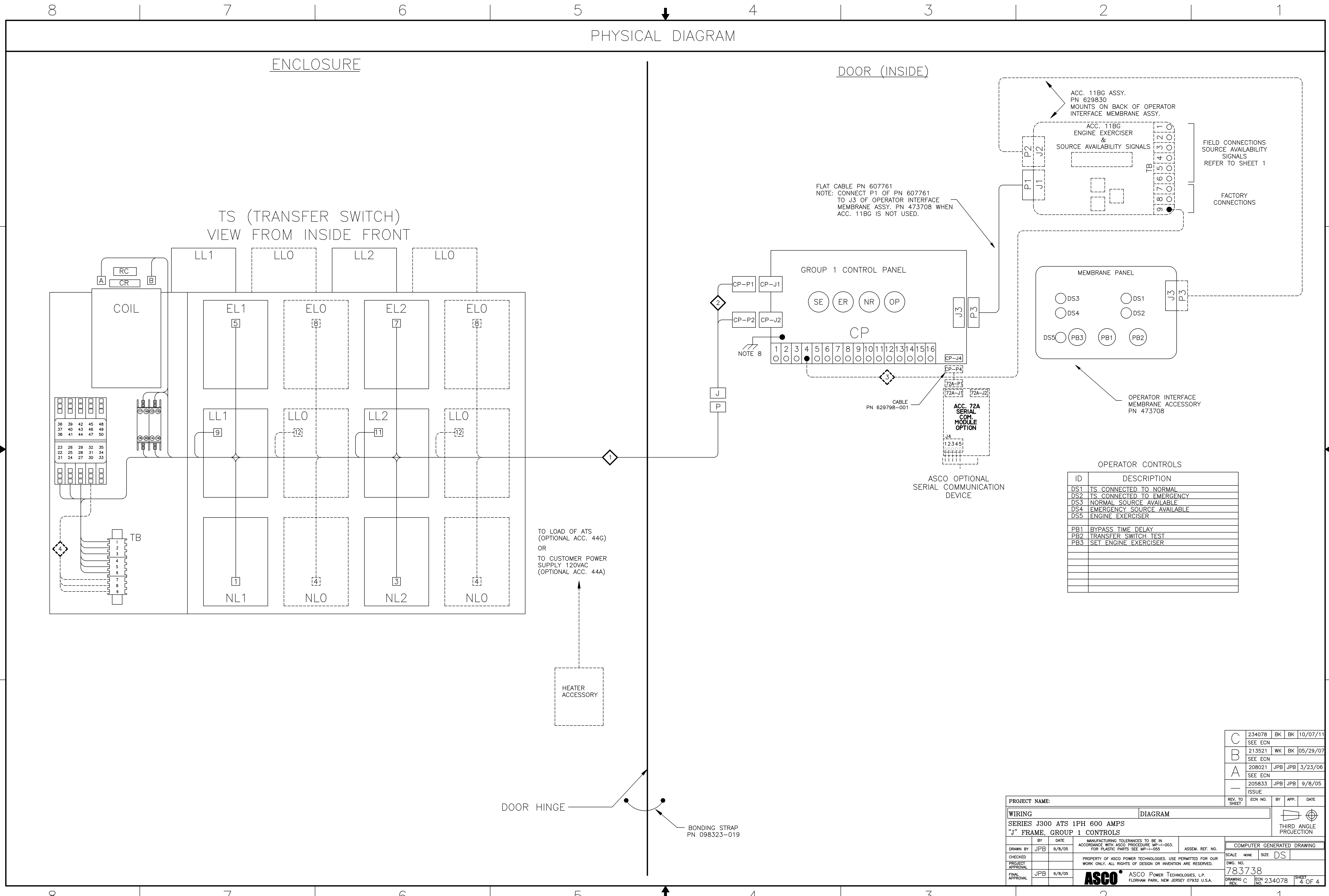
NORMAL



C	234078	BK	BK	10/07/11
	SEE ECN			
B	213521	WK	BK	05/29/07
	SEE ECN			
A	208021	JPB	JPB	3/23/06
	SEE ECN			
-	205833	JPB	JPB	9/8/05
	ISSUE			

PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING DIAGRAM						
SERIES J300 ATS 1PH 600 AMPS		THIRD ANGLE PROJECTION				
"J" FRAME, GROUP 1 CONTROLS						
DRAWN BY	BY	DATE	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	
CHECKED	JPB	9/8/05	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE	NONE
PROJECT APPROVAL					SIZE	DS
FINAL APPROVAL	JPB	9/8/05			DWG. NO.	783738
					DRAWING REV.	C
					ECN NO.	234078
					SHEET	3 OF 4





ENCLOSURE

DOOR (INSIDE)

TS (TRANSFER SWITCH)  
VIEW FROM INSIDE FRONT

FLAT CABLE PN 607761  
NOTE: CONNECT P1 OF PN 607761  
TO J3 OF OPERATOR INTERFACE  
MEMBRANE ASSY. PN 473708 WHEN  
ACC. 11BG IS NOT USED.

OPERATOR CONTROLS

ID	DESCRIPTION
DS1	TS CONNECTED TO NORMAL
DS2	TS CONNECTED TO EMERGENCY
DS3	NORMAL SOURCE AVAILABLE
DS4	EMERGENCY SOURCE AVAILABLE
DS5	ENGINE EXERCISER
PB1	BYPASS TIME DELAY
PB2	TRANSFER SWITCH TEST
PB3	SET ENGINE EXERCISER

TO LOAD OF ATS  
(OPTIONAL ACC. 44G)  
OR  
TO CUSTOMER POWER  
SUPPLY 120VAC  
(OPTIONAL ACC. 44A)

HEATER  
ACCESSORY

DOOR HINGE

BONDING STRAP  
PN 098323-019

PROJECT NAME: **DIAGRAM**

SERIES J300 ATS 1PH 600 AMPS  
"J" FRAME, GROUP 1 CONTROLS

REV. TO SHEET	ECN NO.	BY	APP.	DATE

DRAWN 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	9/8/05		
PROJECT APPROVAL			
FINAL APPROVAL	9/8/05		

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**ASCO** ASCO POWER TECHNOLOGIES, L.P.  
FLORHAM PARK, NEW JERSEY 07832 U.S.A.

COMPUTER GENERATED DRAWING  
SCALE: NONE SIZE: DS  
DWG. NO.: 783738  
DRAWING REV. C ECN NO. 234078 SHEET 4 OF 4

C	234078	BK	BK	10/07/11
				SEE ECN
B	213521	WK	BK	05/29/07
				SEE ECN
A	208021	JPB	JPB	3/23/06
				SEE ECN
	205833	JPB	JPB	9/8/05
				ISSUE