



Critical Loads Demand ASCO

## ASCO 7000 SERIES Power Transfer Switches

### Protecting:

- Healthcare Facilities
- Web Hosting, Internet Data Centers
- Commercial Buildings / Industrial Buildings
- Telecom Central Offices
- Process Manufacturing / Wafer Fabrication Plants
- Distributed Power / Load Management

As we become more dependent on the quality and reliability of electrical power, interruption or complete loss of power can create serious and even crippling financial losses, or impose dangers to life and safety.

ASCO Power Technologies (ASCO) provides the solutions to handle the transfer of critical loads to emergency sources reliably and with state of the art products. Using ASCO products can mean the difference between a minor inconvenience and a major catastrophe. You'll find ASCO Power Transfer Switches wherever there is a critical load to be protected.

When flexibility in power switching is a must, ASCO offers a variety of product solutions to meet virtually every application requirement, including distributed generation applications. That's why the 7000 SERIES is available in open, delayed, closed and closed soft load configurations. Additionally, switched or overlapping neutral options provide for reliable operation of ground fault protection systems and reduction of voltage transients from unbalanced load switching.

ASCO Power Transfer Switches are the first CE Marked, IEC 60947-6-1 compliant Transfer Switches in the world.



The Recognized Leader in Power Transfer Switch Technology Offers the Most Advanced Transfer Switches in the World.



**Fig. 1:** Three Pole 7000 SERIES Automatic Transfer Switch rated 1600 Amperes (shown with optional front connected terminals and Power Manager).

## 7000 SERIES

ASCO Power Transfer Switches are the standard of the industry. High speed transfer of loads between alternate sources of power, regardless of ampacity size, is achieved by a reliable, field proven solenoid operating mechanism. When combined with a programmable microprocessor controller with keypad and LCD display, they offer the most advanced method of transferring all types of loads, such as motors, electronic drives, UPS's and microprocessor based systems. 7000 SERIES Power Transfer Switches are available open or enclosed, in ampacity sizes from 30 through 4000 Amperes with the largest selection of optional accessories offered anywhere. All switching configurations are available with an integrally mounted bypass-isolation switch and/or rated for use in service entrance applications.

## 7000 SERIES Power Transfer Switches Product Features

- Conventional two-position transfer configuration, plus closed and delayed transition modes of operation. All configurations available with either automatic or non-automatic control.
- UL listed to 1008 Transfer Switch Equipment & CSA certified to CSA 22.2 No.178-1978 Automatic Transfer Switches.
- Qualified and certified to IEC 60947-6-1, CE marked (optional). (Limited to certain accessories.)
- Rated up to 600 VAC, 30 through 4000 Amperes.
- Reliable and field proven solenoid operating mechanism.
- High withstand and close-on ratings including short time withstand current rating for optimum flexibility in circuit breaker coordination (600-4000 Amperes).
- Solid, switched, or overlapping neutral conductor options.
- Front replaceable main and arcing contacts (800-4000 Amperes).
- Programmable microprocessor controller with keypad and LCD display.
- Centrally located terminal block for customer control connections (260-4000 Amperes).
- 16mm, industrial grade control switches and indicating lights.
- Switch position LED indicators and source acceptability lights.
- Standard ground conductor connections.
- Four auxiliary contacts, two contacts closed when switch is in normal position and two contacts closed when switch is in emergency position.
- Local/remote communications capability for interfacing with ASCO POWERQUEST® communication products.

## Non-Automatic Transfer Switching

ASCO Non-Automatic Transfer Switches are electrically operated units which are operated with manual control switches mounted locally or at remote locations.

- Sizes from 30 through 4000 Amperes.
- Microprocessor based controller provides for addition of optional accessories.
- Controller prevents inadvertent operation under low voltage conditions.
- Low control circuit operating currents allow for long line runs between remotely mounted manual control switches and the transfer switch.
- Source acceptability lights inform operator if sources are available to accept load.
- Standard inphase monitor can be activated for transferring motor loads.



**Fig. 4:** Three pole Non-Automatic, electrically operated 400 ampere switch shown in Type 1 enclosure.

## Withstand and Close-On Ratings for all 7000 SERIES Products

UL 1008 Withstand and Close-On Ratings <sup>1</sup>

Frame	Switch Rating (Amps)		Current Limiting Fuses				Specific Breaker		Any Breaker 3		Short Time Ratings (RMS Symmetrical)							
			Ratings		Recommended Fuses						@ 480V Max.				@ 600V Max.			
	Transfer Switches	Bypass Switches	RMS Symmetrical Amps	Volts Max.	Max Size, A	Class	RMS Symmetrical Amps	Volts Max.	RMS Symmetrical Amps	Volts Max.	6	8	18	30	6	8	18	30
D	30	-	100kA	480V	60	J			10kA	600V	N/A				N/A			
D	70, 100, 125, 150	-	200kA	480V	200	J	22kA	480V	10kA	600V	N/A				N/A			
D	200	-	200kA	480V	200	J	22kA	480V	10kA	480V	N/A				N/A			
D	230	-	100kA	480V	300	J	22kA	480V	10kA	480V	N/A				N/A			
J	150*, 260, 400, 600 *150 for CTS and DTS only	150, 200, 230, 260, 400, 600	200kA	600V	600	J	50kA	480V	65kA	240V	N/A				N/A			
					800	L	42kA	600V	42kA <sup>6</sup>	480V	N/A				N/A			
									35kA	600V	N/A				N/A			
H	800 - 1200	800 - 1200	200kA	600V	1600	L	65kA	600V	50kA	600V	36kA	N/A		N/A				
G	1600 - 2000	-	200kA	600V	2500	L	-	-	85kA <sup>5</sup>	600V	N/A		N/A		N/A		N/A	
S	800 - 2000	800 - 2000	200kA	480V	3000	L	-	-	100kA	480V	N/A		N/A		N/A		N/A	
S	800 - 2000	800 - 2000	200kA	600V	2500	L	-	-	-	-	65kA		65kA					
S	1600 - 2000	1600 - 2000	200kA	600V	2500	L	-	-	-	-	85kA		N/A		85kA		N/A	
G	1600 - 2000	1600 - 2000	200kA	600V	3000	L	125kA	480V	100kA	600V	42kA		N/A		42kA		N/A	
G	2600 - 3000	2600 - 3000	200kA	600V	4000	L	-	-	100kA	600V	42kA		N/A		42kA <sup>7</sup>		N/A	
G	3200	-	200kA	480V	4000	L	-	-	100kA	480V	N/A				N/A			
G	4000	4000	200kA	600V	5000	L	-	600V	100kA	600V	85kA	65kA		65kA				

Notes: 1) All WCR values indicated are tested in accordance with the requirements of UL 1008. See ASCO Pub. 1128 for more WCR information.  
2) Application requirements may permit higher WCR for certain sizes of switch. Contact ASCO for guidance if application requires higher WCR.  
3) Based on 3 cycles for 260-4000A and 1.5 cycles for 30-230A switches. Applicable to circuit breakers with instantaneous trip elements.  
4) Short Time ratings are provided for applications involving circuit breakers that utilize trip delay settings for system selective coordination.  
5) Optional front connected service (Accy 40MY and 40NY) limits 1600 and 2000A G Frame switches.  
6) Not applicable to for switches utilizing overlapping neutral (code "C").  
7) 3000A ATB does not have 600V short time rating.



## Automatic Transfer Bypass-Isolation Switches



**Fig. 5:** Rated 150-600 Amps



**Fig. 6:** Rated 600- 1200 Amps



**Fig. 7:** Rated 800-3000 Amps



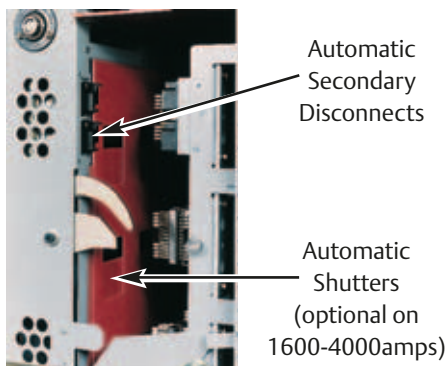
**Fig. 8:** Rated 4000 Amps

ASCO Automatic Transfer & Bypass-Isolation Switches are available in open transition, closed transition and delayed transition designs. The bypass and isolation features allow the primary automatic transfer switch to be inspected, tested, and maintained without any interruption of power to the load. They also provide redundant power transfer in the event the ATS is disabled or removed from service.

- Available 150 to 4000 Amperes.
- Allows bypass-isolation without load interruption.
- Bypass switch and transfer switch have identical electrical ratings.
- Heavy duty mechanical interlocks prevent undesirable operation.
- Bypass contacts carry current only during bypass mode.

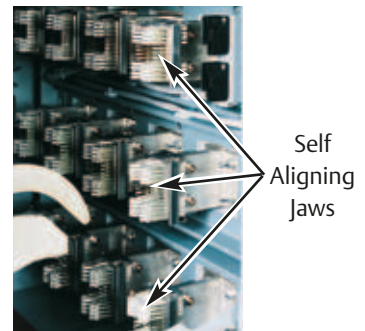
- Transfer switch is drawout design for ease of maintenance.
- Bypass and isolation handles are permanently mounted. The bypass switch has dead front quick-make, quick-break operation for transferring of loads between live sources.
- Bypass switch is fully rated for use as a manual 3-position transfer switch.
- Bypass and isolation functions are simple, requiring a total of two operating handles.
- No toggle switches, push buttons, selector switches or levers are required for bypass-isolation operation.
- Mechanical indicators show bypass and transfer switch positions.
- 800 -1200 ampere available in shallow depth, front connected or rear connected designs.

## Transfer Switch Drawout Features (150-4000 Amperes)



**Fig. 9:** Bypass-Isolation Transfer Switch secondary disconnects and optional automatic shutters.

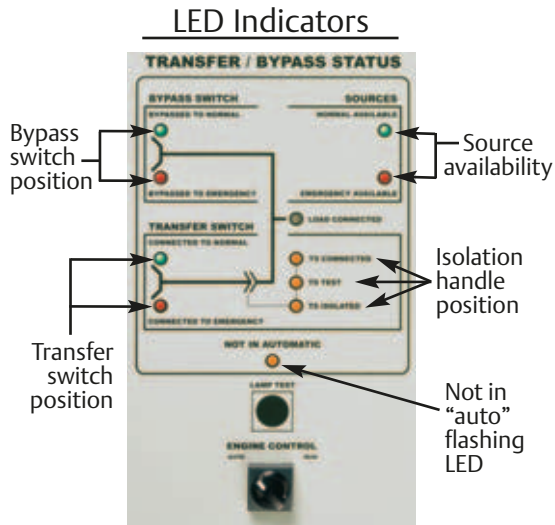
- Automatic secondary disconnects remove all control power as switch is withdrawn.
- Drawout carriage provides for easy transfer switch maintenance and/or removal via commercially available breaker hoists.
- Optional transfer switch lifting yoke kit available
- Optional automatic shutters which close when the transfer switch is withdrawn to provide bus isolation, specify accessory 82C.(1600-4000A only)



**Fig. 10:** Bypass-Isolation Transfer Switch self aligning power jaws.

# ASCO® 7000 SERIES Power Switching Solutions

## Bypass and Isolation Handles - *Simple as 1, 2, 3*



**Fig. 11: Transfer Bypass Status Panel\***

\*Standard on switches up through H 1200A.  
Specify ACC 82E for G frame 1600-4000A

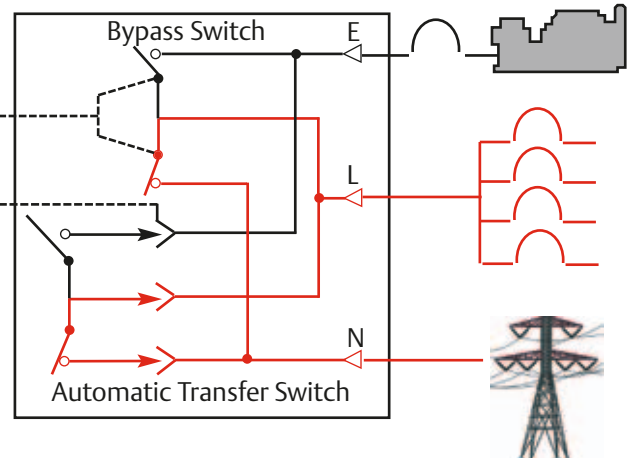


**Fig. 12: Bypass-Isolation Switch user interface**

### 1 Bypass to Normal

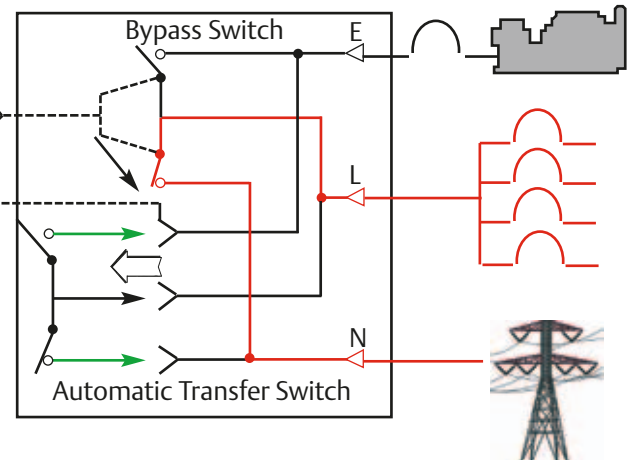
Push in bypass handle and turn it counter clockwise

Bypass Handle  
Isolation Handle



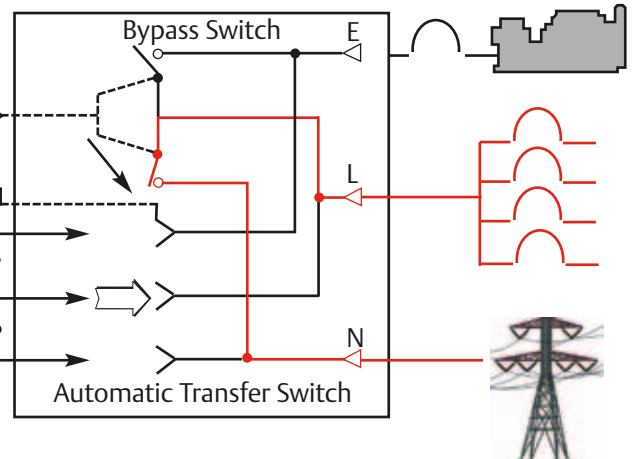
### 2 Test Position

Isolation Handle  
Turn isolation handle counter clockwise until window shows "Test"



### 3 Isolation Position

Isolation Handle  
Turn isolation handle counter clockwise until window shows "Isolate"



**Key:**  
→ Represents Current Flow  
→ In test position control panel remains energized to allow for electrical operation of a transfer switch.

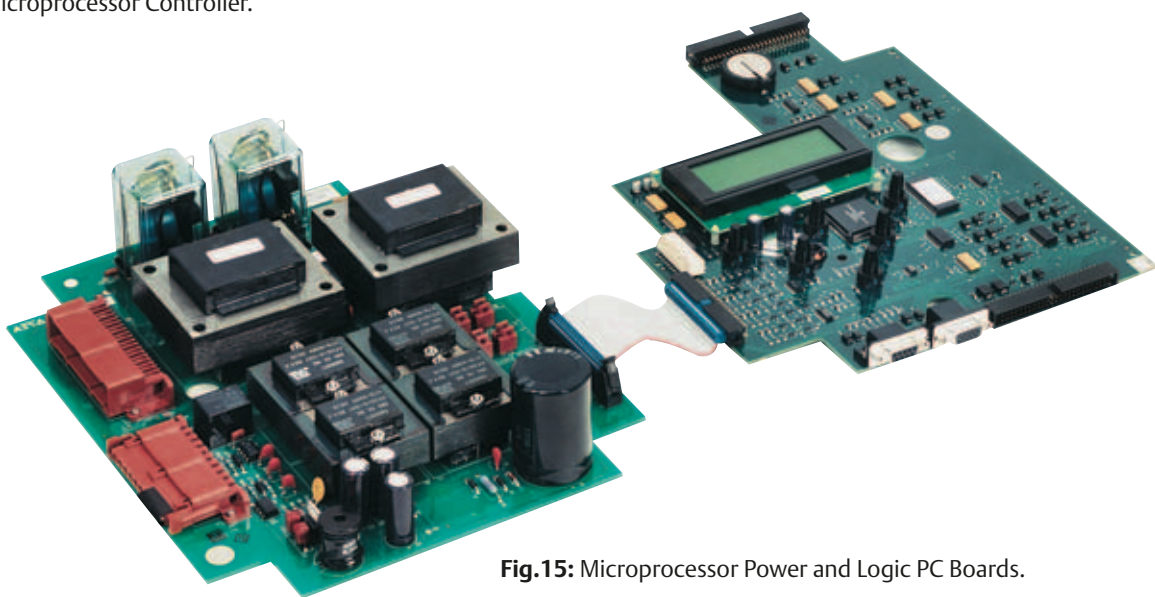
# ASCO<sup>®</sup> 7000 SERIES Microprocessor Controller



**Fig. 14:** 7000 SERIES Microprocessor Controller.

The 7000 SERIES Microprocessor Based Controller is used with all sizes of Power Transfer Switches from 30 through 4000 Amperes. It represents the most advanced digital controller in the industry and includes, as standard, all of the voltage, frequency, control, timing and diagnostic functions required for most emergency and standby power applications.

Because of severe voltage transients frequently encountered with industrial distribution systems, the microprocessor logic board is separated and isolated from the power board as shown below. This improves electrical noise immunity performance and helps assure compliance with the rigorous transient suppression standards highlighted below.



**Fig.15:** Microprocessor Power and Logic PC Boards.

## 7000 SERIES Microprocessor Based Controller

Emission Standard - Group 1, Class A	EN 55011:1991
Generic Immunity Standard, from which:	EN 50082-2:1995
Electrostatic Discharge (ESD) Immunity	EN 61000-4-2:1995
Radiated Electromagnetic Field Immunity	ENV 50140:1993
Electrical Fast Transient (EFT) Immunity	EN 61000-4-4:1995
Surge Transient Immunity	EN 61000-4-5:1995
Conducted Radio-Frequency Field Immunity	EN 61000-4-6:1996
Voltage Dips, Interruptions and Variations Immunity	EN 61000-4-11:1994

## Features

- Digital microprocessor.
- Touch pad programming of features and settings without the need for meters, or variable power supplies.
- Sixteen (16) selectable operating voltages available in a single Controller.
- On-board diagnostics provide control panel and ATS status information to analyze system performance.
- Displays and counts down active timing functions.
- Selectable multi-language display (English, German, Portuguese, Spanish, or French. For others contact ASCO).
- Password protection to prevent unauthorized tampering of settings.
- Remote monitoring and control with ASCO POWERQUEST® communications products. Specify optional accessory 72E.
- Load shed option for bus optimization applications. Specify optional accessory 30B.
- Historical event log
- Statistical ATS systems monitoring information

## Voltage and Frequency Sensing

- 3-Phase under and over voltage settings on normal and emergency sources.
- Under and over frequency settings on normal and emergency.
- True RMS Voltage Sensing with +/- 1% accuracy; Frequency Sensing Accuracy is +/- 0.2%.
- Selectable settings: single or three phase voltage sensing on normal and emergency; 50 or 60Hz.
- Phase sequence sensing for phase sensitive loads.
- Voltage unbalance detection between phases.

## Status and Control Features

- Output contact (N/O or N/C) for engine-start signals.
- Selection between “commit/no-commit” on transfer to emergency after engine start and normal restores before transfer.
- Advanced inphase algorithm which automatically measures the frequency difference between the two sources and initiates transfer at appropriate phase angles to minimize disturbances when transferring motor loads.
- Event log displays 99 logged events with the time and date of the event, event type and event reason.
- Output signals for remote indication of normal and emergency source acceptability
- Statistical ATS/System monitoring data screens which provide:
  - Total number of ATS transfers.
  - Number of ATS transfers caused by power source failure.
  - Total number of days ATS has been in operation.
  - Total number of hours that the normal and emergency sources have been available.

## Time Delays

- Engine start time delay - delays engine starting signal to override momentary normal source outages - adjustable 0 to 6 seconds.
- Transfer to emergency time delay - adjustable 0 to 60 minutes.
- Emergency source stabilization time delay to ignore momentary transients during initial generator set loading - adjustable 0 to 6 seconds.
- Retransfer to normal time delay with two settings:
  - Power failure mode - 0 to 60 minutes.
  - Test mode - 0 to 10 hours.
- Unloaded running time delay for engine cooldown - adjustable 0 to 60 minutes.
- Pre and post transfer signal time delay for selective load disconnect with a programmable bypass on source failures - adjustable 0 to 5 minutes. This signal can be used to drive a customer furnished relay, or for (2) sets of double throw contacts rated 3 amps at 480 volts AC, specify ASCO optional accessory 31Z.
- Fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi-weekly or monthly basis.
- Contains all alarm signals, logic and time delays for use with closed transition switches.
  - Insynch time delay - 0 to 3 seconds.
  - Failure to synchronize - 1 to 5 minutes.
  - Extended parallel - 0.1 to 1.0 seconds.
- Delayed transition load disconnect time delay - adjustable 0 to 5 minutes.



# ASCO<sup>®</sup> 7000 SERIES User Controls and Indicators

## Control Switches and Indicating Lights for Conventional 2-Position Switches

- Switch position indicating lights (16 mm, industrial grade LEDs).
- Source acceptability indicating lights with true indication of the acceptability of each source, as determined by the voltage, frequency, voltage unbalance, and phase sequence settings of the control panel (16mm, industrial grade LEDs).
- Three position (16mm, industrial grade type) selector switch:
- Automatic: Normal maintained position.
- Test: Momentary position to simulate normal source failure for system test function.
- Reset Delay Bypass: Momentary position to bypass transfer and re-transfer time delay.



Fig. 16: 7000 SERIES User Controls and Indicators.

## Control Switches and Indicating Lights for Closed Transition Switches

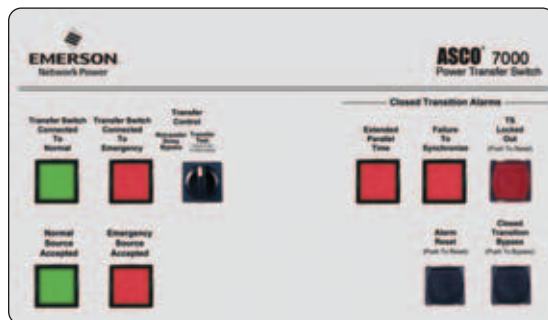


Fig. 17: 7000 SERIES User Controls and Indicators.

- Extended Parallel Time - Provides visual indication when the pre-set extended parallel time has been exceeded. The controls automatically open the emergency or normal main contacts. Separate contact also available to shunt trip external breaker.
- Failure To Synchronize - Visually displays a failure to synchronize alarm if the time delay settings is exceeded, during closed transition transfer operation.
- TS Locked Out - Prevents transfer in either direction if the extended parallel time is exceeded.
- Alarm Reset - Resets extended parallel and failure to synchronize alarms.
- Closed Transition Bypass - Pushbutton allows transfer between sources in an open transition mode.

## 7000 SERIES Power Control Center



Fig. 18: 7000 SERIES Power Control Center.

The 7000 SERIES microprocessor controller is a Power Control Center which allows the user to easily access detailed information on: system status; power source parameters; voltage, frequency and time delay settings; optional feature settings; historical event log; and system diagnostics. A four line, (20) character LCD has a backlit display which enables easy viewing under all conditions. The user can navigate through all screens using only six buttons, which also allows selection of: (18) different source parameter settings; (16) standard time delays; (12) standard feature settings; up to seven independent engine exercise routines; and even the language (English, German, Spanish, French, etc.) which appears on the display.

Since the Power Control Center must be visible and operable through the enclosure door, it has been qualified for use in industrial and outdoor applications. This includes installation in Type 3R (outdoor/rainproof), 4 (weatherproof) and 12 (indoor/industrial) enclosures. For applications with regular exposure to direct sunlight a double door for UV protection is recommended.



# ASCO<sup>®</sup> 7000 SERIES Power Control Center Screens

## Status

### System Status

Normal OK  
Load on Normal

Displays system status in clear, concise language. Message shown indicates normal source is acceptable and the load is connected to the normal source.

### Source Status

Normal Source  
Vab=480V.....ABC  
Vbc=480V.....Vunbal=1%  
Vca=480V.....60.0Hz

Displays voltage for each phase, frequency, phase rotation and voltage unbalance for both normal and emergency sources.

### Time Delay Status

Normal OK  
TD.Engine.Cooldown:  
4min15s

Active time delay status displays time remaining until next control event.

### Inphase Transfer Mode

Emerg OK  
Waiting for In-Sync  
-45° 0.02Hz

Displays the relative phase angle between sources and frequency differential to indicate the controller is awaiting an inphase condition.

## Settings

### Voltage and Frequency Settings

Normal Voltage  
Dropout.....85%.408V  
Pickup.....90%.432V  
O.V. Trip.....110%.528V

Provides voltage and frequency setting values for normal and emergency sources. Voltage pick-up, dropout and trip settings are set in percentage of nominal voltage and are also displayed in rms voltage values.

### Time Delay Settings

TD N>E Xfer Signal  
Bypass if N Fail: No  
Pre Xfer: 0 min 20S  
Post Xfer: 0 min 20S

Provides direct reading display for setting time delays.

### Engine Exerciser

P1.....Engine.Exerciser  
Enable:.....Yes....WLoad:....Yes  
Start:19h30. ALL MON  
Run.Time:.....2h15min

Seven independent programs, load/no load selection, flexible run times and daily, weekly, bi-weekly and monthly exercise routines.

### Feature Settings

Shed Load  
Direction: From E  
Inphase: No TD/0.25

Standard features can be activated with the keypad. As an example, when enabled, the “shed load” option causes the transfer switch to transfer the load off of the specified source. If desired, the load shed transfer can be made inphase.

## Data Logging

### ATS Statistics

ATS Statistics  
ATS Total Xfers: 46  
SRC Fail Tot Xfers: 20  
Days Energized: 36.5

Instant availability of statistical information on total number of ATS transfers, number of transfers caused by power failures and total days controller has been energized, plus more.

### Historical Event Log

16.AUG02/95.....13h10:17  
Eng.Start.....NormFail.  
15.AUG02/95.....13h10:25  
Xfer.N>E.....

Displays detailed information for last 99 events, including time of occurrence, length of event, date and reason for event.

# ASCO<sup>®</sup> 7000 SERIES Optional Accessories

## Time Delays

- 2C** Provides an extended time delay on engine starting. The standard feature one time delay is adjustable from zero to six seconds. Accessory 2C allows this time delay to be adjustable from zero to sixty minutes in one second intervals factory set at five minutes.
- 1G** Similar to accessory 2C except using 24 volt DC external input signal. 7000 SERIES controller remains active when both power sources are de-energized\*
- 1GB** Same as accessory 1G except using 120 volt AC external input\*

\* add suffix 1 to include external power to power manager or power meter when applicable

## Manual Controls for Automatic Transfer Switches

- 6C** Reset switch for manual retransfer to normal with automatic retransfer in the event of emergency source failure.
- 6D** Selector switch for automatic/manual retransfer to normal. Automatic bypass if emergency fails.

## Indicators

- 14A/14B** Additional auxiliary contact sets to indicate switch position. Two sets are standard. Specify total number of sets if more are required.
- 18B** Two-pole, double-throw contacts operate when emergency source voltage is present at transfer switch terminals.
- 18G** Two-pole, double-throw contacts operate when normal source voltage is present at transfer switch terminals.
- 99** "Push-to-Test" feature on all pilot light indicators.

## Customer Control Circuits

- 30A** Load-shedding circuit initiated by opening of a customer-supplied contact.
- 30B\*** Load-shedding circuit initiated by removal of customer-supplied control voltage. \*(Specify voltage).
- 31Z** Selective load disconnect control contacts (two provided) which operate with time delay prior to and/or after load transfer and retransfer.
- 43R** Terminal block for all customer control connections on 30-150 amp only (standard on all other sizes).

*Note: An externally operable quick-make, quick-break (QM QB), manual handle is available on some 7000 SERIES product configurations. (Consult ASCO for guidance.)*

## Neutral Conductor Options

- Solid neutral, with fully-rated terminals. (AL-CU) UL Listed.
- Conventional neutral switching pole.
- Overlapping neutral transfer contacts. Allows for proper ground-fault sensing and avoids generator voltage transients during transfer.

*Note: Specify neutral option in catalog number, see page 22 for instructions.*

## Extension Harness

- 37B** Six foot (6') extension harness to increase distance between transfer switch and control panel on open-type units.

## Communications

- 72E** 5150 Ethernet Connectivity Module offers communication to transfer switch and metering with embedded webpages.
- 72SW** An Industrial Ethernet Switch mounted in the enclosure used in conjunction with 5150 Connectivity Module (acc. 72E) metering device. Includes 2 available Ethernet ports and 2 multimode ST Fiber connectors.

## Surge Protection

ASCO Pulsar 450 rated 65KA

- 73AC1** Normal source protection. (3Ø, 4wire WYE)
- 73AC2** Emergency source protection. (3Ø, 4wire WYE)
- 73AC3** Load side protection. (3Ø, 4wire WYE)

*Note: Other distribution voltages available (Contact ASCO).*

## Special Applications

- 45** Custom Alphanumeric nameplate mounted on the front of the switch
- 111A** Generator - to - Generator for Standby Applications
- 111B** Generator - to - Generator for Prime Power Applications
- 125** Seismic Certification to the requirements of the international building code for electrical equipment
- 131** Certification of compliance with the American Recovery & Reinvestment ACT (Buy American Provision) - Must be specified at time of order placement

## Bypass-Isolation Switch Options

- 14A1** Auxiliary contact to close in "Bypass to Normal" position.
- 14B1** Auxiliary contact to close in "Bypass to Emergency" position.
- 14T** Auxiliary contact to close when transfer switch is in "Automatic" position.
- 14U** Auxiliary contact to close when transfer switch is in "Isolate" position.
- 14V** Auxiliary; contact to close when transfer switch is in "Test" position.
- 82C** Automatic shutters for bus isolation when transfer switch is withdrawn. (see page 6 for details)
- 82E** LED Bypass status indicator, optional on G frame 1600A-4000A only. Standard for all other size switches

## ASCO 5200 SERIES METERING

### Power Manager

The ASCO 5200 SERIES Power Meters are microprocessor based metering devices that provides real-time measurement of single and three phase power systems. The 5200 SERIES uses digital signal processing technology to measure voltage and current per phase; real, reactive and apparent power, and bi-directional energy. All measurements can be viewed locally with a backlit liquid crystal display and/or displayed remotely with ASCO POWERQUEST® products.

Direct voltage input for systems up to 600 Volts AC can be monitored without the use of external potential transformers (PTs). Measures three phase currents and a fourth current input is available for measuring current in the neutral conductor. The 5200 SERIES includes one discrete input for transfer switch position.

### Power Metering

- Voltage:
  - Line - Line: VAB, VBC, VCA, VAVERAGE
  - Line - Neutral: VAN, VBN, VCN, VAVERAGE
- Frequency: 45.0 to 66.0 Hertz
- Current: IA, IB, IC, IAVERAGE
- Unbalance %: Voltage, Amps
- Real Power: KWA, KWB, KWC, KWNET
- Reactive Power: KVARA, KVARB, KVARC, KVARNET
- Apparent Power: KVAA, KVAB, KVAC, KVANET
- Real Energy: KWHIMPORT, KWHEXPORT, KWHNET
- Reactive Energy: KVARHIMPORT, KVARHEXPORT, KVARHNET
- Power Factor: PFA, PFB, PFC, PFNET

### 5220 Power Manager Data Access

- Eight digital inputs, four relay outputs.
- Input/Output 15-character, user definable screen display for identification of input/output signals.

### Communications

- Modbus RTU and TCP/IP capability
- Ethernet compatible when combined with 5150 Connectivity Module (72E).



Fig. 19: ASCO 5210 SERIES Power Meter.



Fig. 20: ASCO 5220 SERIES Power Manager.

### Configurable Designations

- Local - A four line, 20 character LCD backlit display.
- 5220 Power Manager provides user programmable setpoints based on twelve metering and I/O parameters. Each setpoint allows the user to select the parameter, the trip & reset levels, the trip & reset time delays and the alarm type or relay output to trigger. This can be used for protective relaying and peak shaving applications.
- 100 event data logging feature.

### Integrated ATS Features

When configured on load of ATS:

- Displays ATS position.
- Displays power data as a function of ATS position (normal/emergency).
- Accumulates energy data separately for normal and emergency sources.

### Optional Configurations and Connection Arrangements

Connected To:	5210	5220
Load	Acc. 135L	Acc. 85L
Normal	Acc. 135L	Acc. 85N
Emergency	Acc. 135E	Acc. 85M
Load (BPS only)	N/A	Acc. 85SB*

Add suffix A1 to above metering designation if neutral conductor monitoring is required

Note: Accessory 85 and 135 includes component mounting, CTs, shorting blocks and all necessary interwiring.

\*Bypass & isolation switch contacts wired to discrete Power Manager inputs.

Note: The ASCO Power Manager is also available as a separate unit for monitoring electrical parameters anywhere in the power distribution system.



# ASCO® 7000 SERIES Ordering Information

To order an ASCO 7000 SERIES Power Transfer Switch, complete the following catalog number:

7    A                    TS                    +    A                    +    3                    +    400                    +    N                    +    5X                    +    C

		Product		Neutral Code *		Phase Poles	Amperes	Voltage Code		Grp Code	Enclosure	
A	Automatic	TS	Conventional 2-Position	---	No Neutral	2	30	A	115	5	---	No enclosure
		TB	Open Transition Bypass	A	Solid Neutral	3	70	B	120	5X-optional accessories	C	Type 1 enclosure
N	Non-Automatic	CTS	Closed Transition	B	Switched Neutral		100	C	208		F	Type 3R enclosure
							150	D	220		G	Type 4 enclosure
							200*	E	230		H	Type 4X enclosure (stainless steel)
							230*	F	240		L	Type 12 enclosure
M	Manually Operated	CTB	Closed Transition Bypass	C	Overlapping Neutral		260	H	380		M	Type 3R secure double door
							400	J	400		N	Type 4 secure double door
		DTS	Delayed Transition				600	K	415		P	Type 4X secure double door
							800	L	440		Q	Type 12 secure double door
		DTB	Delayed Transition Bypass				1000	M	460		R	Type 3RX secure double door (Stainless Steel)
							1200	N	480			
							1600	P	550			
							2000	Q	575			
							2600	R	600			
							3000					
							4000					

\*Notes: Conventional switch neutral is provided on delayed transition transfer products when specified.  
200 and 230 amp switch limited to 480 volts maximum, on 7ATS, 7CTS and 7DTS only.

The Example Catalog Number above is 7ATS3400N5XC  
(X is used to specify optional accessories).

## Transfer Switch Configurations

7A TS, 7N TS, 7A DTS, 7A CTS, 7N DTS, 7N CTS

Sizes of UL-Listed Solderless Screw-Type  
Terminals for External Power Connections

Switch Rating amps	Max # of Conductors per Terminal	Range of AL-CU Conductor Sizes
30 - 230 <sup>3</sup>	One	#14 to 4/0 AWG
150*, 260, 400 *150 for CTS and DTS Only	One	#4 AWG to 600 MCM
	Two	#1/0 AWG to 250 MCM
600	Two	#1/0 AWG to 600 MCM
800-1200 <sup>1</sup>	Four	#1/0 AWG to 600 MCM
1600-2000 <sup>2</sup>	Six	#1/0 AWG to 600 MCM
2600, 3000 <sup>2</sup>	Twelve	#1/0 AWG to 600 MCM
4000 <sup>2</sup>	Twelve	#2/0 AWG to 600 MCM

Notes: 1. Unit is designed for top cable entry of emergency and load and bottom entry of normal. Optionally, the switch may be supplied with reverse source and/or bottom entry load, when specified.

2. All main terminals are rear connected.

## Transfer/Bypass Configurations

7A TB, 7N TB, 7A DTB, 7A CTB, 7N DTB, 7N CTB

Sizes of UL-Listed Solderless Screw-Type  
Terminal for Power Connections

Switch Rating amps	Max # of Conductors per Terminal	Range of AL-CU Conductor Sizes
150, 200, 230 260, 400	One	#4 AWG to 600 MCM
	Two	#1/0 AWG to 250 MCM
600 <sup>4</sup>	Two	#2 AWG to 600 MCM
800, 1000, 1200 <sup>4</sup>	Four	#1/0 AWG to 600 MCM
1600-2000 <sup>4</sup>	Six	#1/0 AWG to 600 MCM
2600, 3000 <sup>4</sup>	Ten	#2 AWG to 600 MCM
4000 <sup>4</sup>	Twelve	#2 AWG to 600 MCM

3. 200 and 230 amp rating for copper conductors only for transfer switch configurations only.

4. All main terminals are rear connected. A front connected version is available in 600 and 1200 amp ratings only with top cable entry only. See pages 25-27 for dimensional data and additional information.

5. Type 304 stainless steel standard. Specify 316 ST. Steel for installations subject to salt water and corrosive environments

## Automatic Transfer Bypass-Isolation Switching with Transfer Switch Engaged 7A TB, 7N TB

Switch Rating amps	Power Connection Configuration	Poles	Width inches (mm)	Height inches (mm)	Depth inches (mm)
<b>Enclosed UL Type 1</b>					
150, 200, 230, 260, 400 <sup>1, 600</sup>	Front Connected	2, 3 or 3 with neutral A/B/C	34 (864)	85 (2159)	28 (711)
800 <sup>1, 3</sup>	Front Connected	2, 3 or 3 with neutral A/B/C	38 (965)	91 (2311)	32 (813)
1000, 1200	Front Connected	2, 3 or 3 with neutral A/B/C	38 (965)	91 (2311)	34 (864)
800, 1000, 1200 <sup>1, 2</sup>	Side/Rear Connected	2, 3 or 3 with neutral A/B/C	38 (965)	91 (2311)	48 (1219)
1600, 2000 <sup>1, 2</sup>	Side/Rear Connected	2, 3 or 3 with neutral A/B/C	38 (965)	91 (2311)	60 (1524)
2600, 3000 <sup>1, 2</sup>	Side/Rear Connected	3 or 3 with neutral A/B/C	38 (965)	91 (2311)	72 (1829)
4000 <sup>1, 2</sup>	Rear Connected	3 or 3 with neutral A/C	60(1524)	91 (2311)	96 (2438)
<b>Open Configuration</b>					
150, 200, 230, 260, 400 <sup>1</sup>	Front Connected	2, 3 or 3 with neutral B/C	19-3/4 (500) <sup>4</sup>	61-1/2 (1553) <sup>4</sup>	28(711) <sup>4</sup>
600, 800, 1000, 1200 <sup>1, 2</sup>	Rear Connected	2, 3 or 3 with neutral B/C	38 (965)	72 (1829)	38 (965)
1600, 2000, 2600, 3000 <sup>1, 2</sup>	Rear Connected	2, 3 or 3 with neutral B/C	38 (965)	72 (1829)	38 (965)
4000 <sup>1, 2</sup>	Rear Connected	3 or 3 with neutral A/C	60(1524)	91 (2311)	96 (2438)

- Notes: 1. Handles extend 6-1/4 inches (159mm).  
2. Recommended clearance to enclosure: 3 feet (914mm) from rear, 4 feet (1219mm) from front (25 inches required for transfer switch drawout). Side or rear access required.  
3. Specify optional accessory 40JY for 800 Amp front, 40KY for 1000 Amp, and 40LY for 1200 Amp - connected arrangement. All service and load cables limited to top entry only.  
4. Contact ASCO for details.

\*All dimensions and weights shown are approximate and should not be used for construction purposes.  
Certified dimensions can be furnished upon request.

\*\* For S Frame dimensions contact ASCO.

## Shipping Weights Automatic Transfer Bypass-Isolation Switching with Transfer Switch Engaged 7A TB, 7N TB

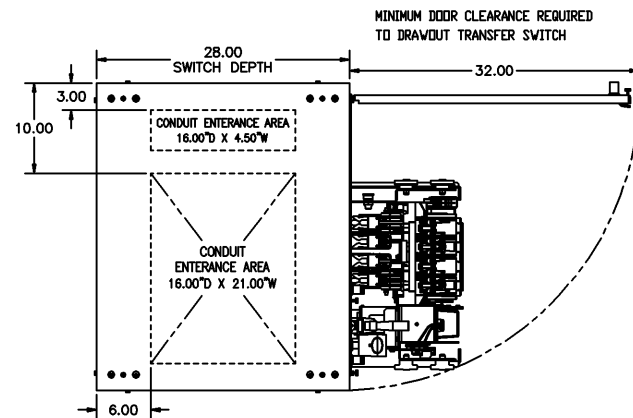
Switch Rating amps	Poles	Enclosed * lb (kg)	Open * lb (kg)
150, 200, 230, 260, 400, 600	2	990 (450)	Contact ASCO
150, 200, 230, 260, 400, 600	3	1050 (477)	Contact ASCO
150, 200, 230, 260, 400, 600	3 with B/C	1110 (505)	Contact ASCO
800, 1000, 1200	2	1510 (685)	920 (417)
800, 1000, 1200	3	1580 (717)	990 (449)
800, 1000, 1200	3 with B/C	1650 (748)	1060 (481)
1600, 2000	2	2180 (989)	1300 (589)
1600, 2000	3	2360 (1070)	1550 (702)
1600, 2000	3 with B/C	2540 (1152)	1800 (815)
2600, 3000	3	2730 (1240)	1690 (768)
2600, 3000	3 with B/C	3360 (1525)	1980 (899)
4000	3	6300 (2858)	-
4000	3 with B/C	6900 (3130)	-

- Notes: 1. Open weights include transfer switch, bypass-isolation switch and controller.  
1600-4000 amp enclosures require ventilation openings, refer to drawings for details.  
Export shipments may require a wooden box, contact ASCO for weights and dimensions.  
\*All dimensions and weights shown are approximate and should not be used for construction purposes.  
Certified dimensions can be furnished upon request.

\*\* For S Frame dimensions contact ASCO.

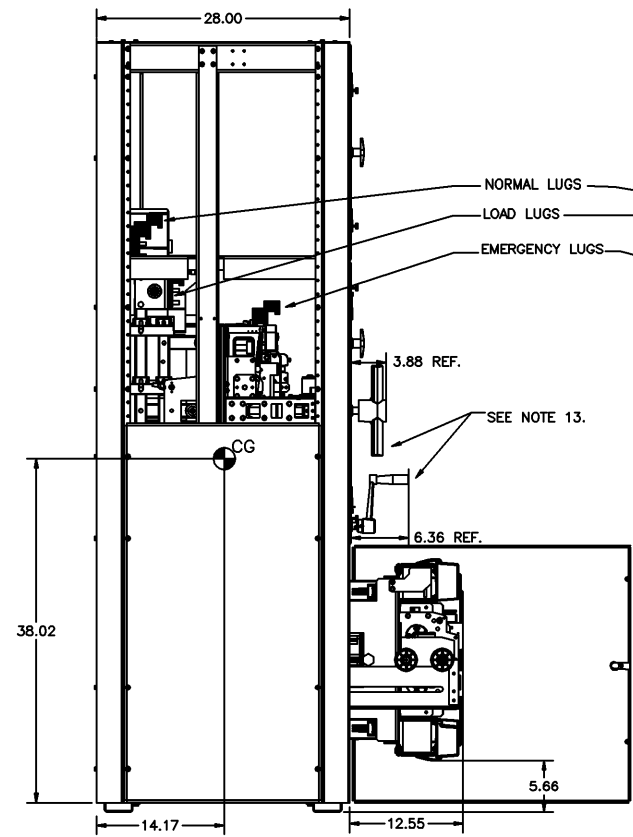
OUTLINE & MOUNTING FOR ASCO® 7000 SERIES FRONT CONNECTED AUTOMATIC TRANSFER & BYPASS-ISOLATION SWITCHES TYPES J7ATB, J7ACTB & J7ADTB RATED 150-600 AMPS

D



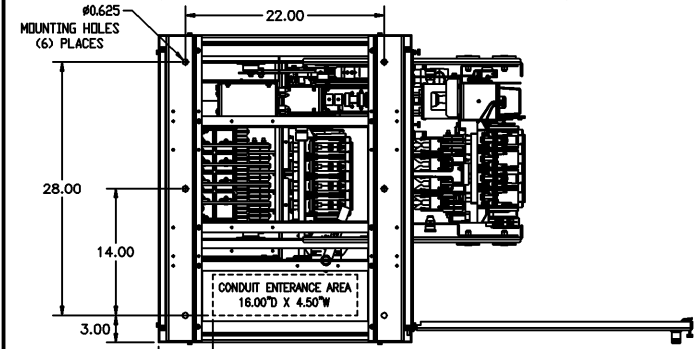
TOP VIEW

C



LEFT SIDE VIEW  
(TOP COVER REMOVED, TS DRAWN OUT)

A



BOTTOM VIEW

POLE 4  
NEUTRAL  
(3ph/4w & 2ph/3w UNITS)  
SWITCHED, OR OVERLAPPING TYPES

POLE 3  
PHASE C (3ph UNIT)  
PHASE L2 (2ph UNIT)

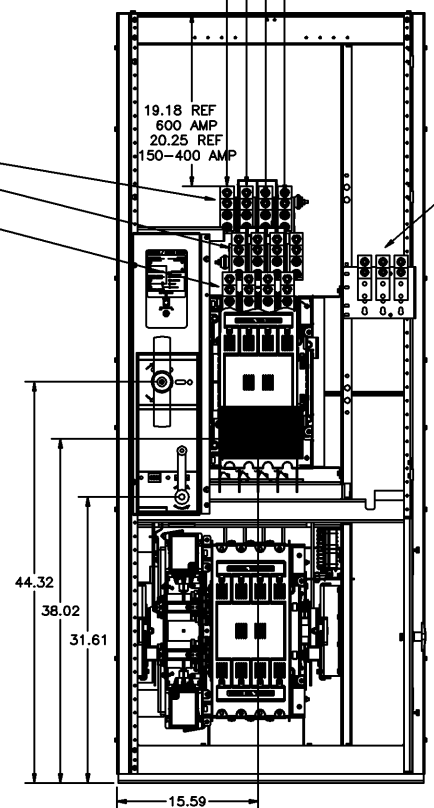
POLE 2  
PHASE B (3ph UNIT)  
BLANK (2ph UNIT)

POLE 1  
PHASE A (3ph UNIT)  
PHASE L1 (2PH UNIT)

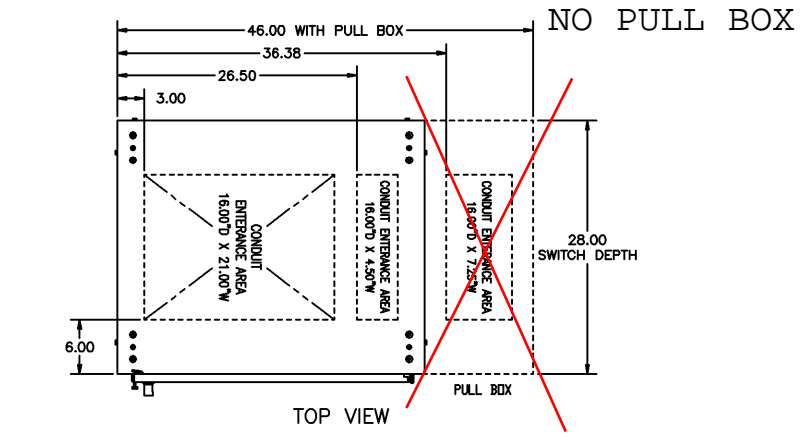
19.18 REF  
600 AMP  
20.25 REF  
150-400 AMP

NORMAL LUGS  
LOAD LUGS  
EMERGENCY LUGS

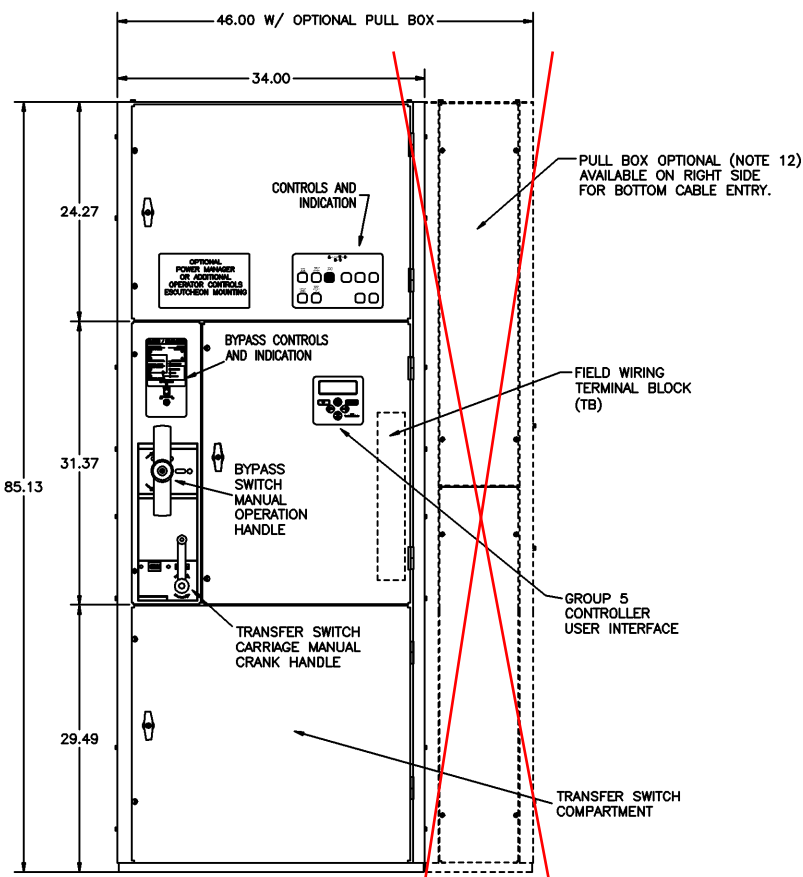
GROUND LUGS  
(MAY BE REVERSED  
FOR BOTTOM ENTRY)



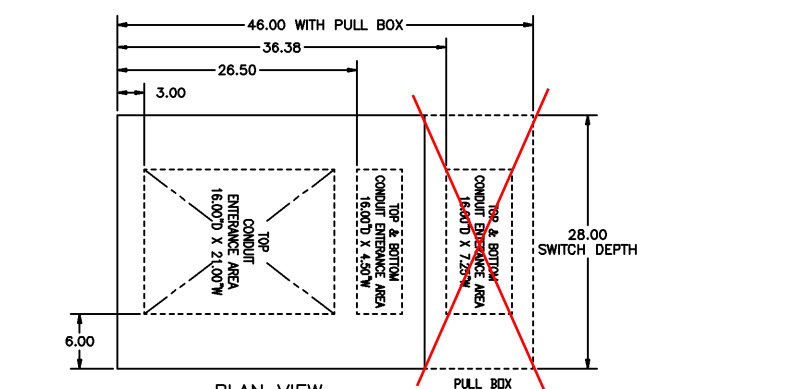
FRONT VIEW  
(COVERS AND DOORS REMOVED)



TOP VIEW



FRONT VIEW  
(DOORS INSTALLED)



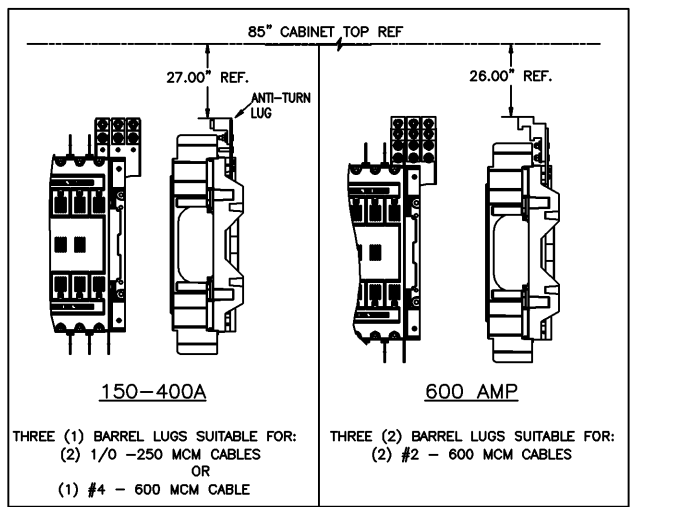
PLAN VIEW

- GENERAL NOTES
- TYPE 1 ENCLOSURES. FREE STANDING. FLOOR MOUNTED. 12 GAUGE FORMED FRAME CONSTRUCTION.
  - NEC STANDARD GAUGE PAN TYPE DOORS WITH LOCKABLE HANDLES AND REMOVABLE COVERS.
  - FINISH: ANSI 61 GRAY, POLYESTER POWDER. UL RECOGNIZED. OTHER ANSI COLORS AVAILABLE. CONSULT FACTORY.
  - CONSTRUCTION IS IN ACCORDANCE WITH UL 1008.
  - PADLOCKING PROVISIONS ARE INCLUDED.
  - ISOLATION HANDLE: THE TRANSFER SWITCH ISOLATION HANDLE MAY BE PADLOCKED WITH THE TRANSFER SWITCH IN THE FULLY ISOLATED (DISCONNECTED POSITION).
  - UNIT CAN BE ADAPTED FOR CONNECTION OF BUS DUCT FLANGES. (CONSULT FACTORY)
  - RECOMMENDED FRONT CLEARANCE: 32 INCHES MINIMUM.
  - A 20% RATED GROUND BUS IS PROVIDED.
  - A FULL RATED NEUTRAL CONNECTION FOR EACH SOURCE AND THE LOAD IS OPTIONAL. WHEN PROVIDED IT IS IN ONE OF THE FOLLOWING FORMATS AS SPECIFIED BY THE CATALOG NO. NEUTRAL TYPE:  
  
TYPE A: SOLID (COPPER BUS) NEUTRAL  
TYPE B: SWITCHED NEUTRAL POLE  
TYPE C: OVERLAPPING NEUTRAL POLE (NOT AVAILABLE ON 7ADTB & 7ACTB UNITS)

- APPROXIMATE WEIGHT: 950 LBS.
- STANDARD OUTLINE FOR A FOUR POLE 600 AMP TRANSFER SWITCH WITH BYPASS/ISOLATION SWITCH SHOWN. SEE DETAIL "A" FOR LUG CONFIGURATION OF SOLID NEUTRAL.
- IF A PULL BOX IS PROVIDED THE RIGHT SIDE SKINS ARE REMOVED FROM SWITCH ENCLOSURE AND (4) MOUNTING BLOCKS P/N 757047 ARE USED TO CONNECT THE TWO SECTIONS TOGETHER. REFER TO DRAWING 805550 FOR PULL BOX DETAILS. PULL BOX AND SWITCH ENCLOSURE CAN BE SHIPPED AS ONE UNIT OR PULL BOX CAN BE SUPPLIED INDEPENDENTLY.
- BOTH BYPASS SWITCH MANUAL OPERATION HANDLE & TRANSFER SWITCH CARRIAGE MANUAL CRANK HANDLE CAN BE REMOVED. ALSO NOTE THAT THE TRANSFER SWITCH CARRIAGE MANUAL CRANK HANDLE CAN BE LEFT IN PLACE AND FOLDED DOWN.
- CENTER OF GRAVITY.

- CABLING NOTES
- ALL SIZES SUPPLIED STANDARD WITH MECHANICAL (SCREW TYPE) LUGS. (SEE AMP SIZE BELOW)  
A. LUG MATERIAL: ALUMINUM ALLOY 6061-T6 WITH ELECTRO TIN PLATED FINISH.  
B. SCREW MATERIAL: ALUMINUM ALLOY 6262-T9 WITH ELECTRO TIN PLATED FINISH.  
C. UL LISTED, CSA CERTIFIED.  
D. LUG MAX WIRE TIGHTENING TORQUE PER UL 486B: SEE TABLE BELOW.
  - OPTIONAL COPPER CRIMP LUGS MAY BE SUPPLIED. CONSULT FACTORY.  
A. LUG MATERIAL: HIGH CONDUCTIVITY WROUGHT COPPER FINISH, ELECTRO TIN PLATED.  
B. UL LISTED, CSA CERTIFIED.  
C. LUG MOUNTING HARDWARE TIGHTENING TORQUE: (REFER TO WITHSTAND CURRENT RATING LABEL PROVIDED ON EACH TRANSFER SWITCH).  
D. SUITABLE WIRE BENDING SPACE IS PROVIDED.
  - GROUND LUGS ARE PROVIDED STANDARD AS FOLLOWS:  
(6) #4-600MCM AL/CU CABLES FOR 600 AMP  
(3) 1/0-250MCM AL/CU CABLES FOR 150-400 AMP.
  - CONSULT FACTORY FOR OTHER TERMINATION REQUIREMENTS.

SIZE	CABLE ACCOMMODATIONS (PER PHASE & NEUTRAL)	LUG TORQUE
150-400	SCREW TYPE (STANDARD)- (2) 1/0 - 250 MCM AL/CU	500 IN.-LBS.
	OR (1) #4 - 600 MCM AL/CU	
600	SCREW TYPE (STANDARD)- (2) #2 - 600 MCM AL/CU	375 IN.-LBS.



DETAIL "A"  
SOLID NEUTRAL

PROJECT NAME:		REV. TO SHEET		ECN NO.	BY	APP.	DATE
OUTLINE & MOUNTING		150-600 AMP TYPE 1 TB/CTB/DTB		FRONT CONNECTED BYPASS		THIRD ANGLE PROJECTION	
CHECKED	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	
THROTTLE	DATE	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE		1:1	SIZE DS
FINAL	DATE	ASCO POWER TECHNOLOGIES, L.P.		DRAWING NO.		802093	
APPROVAL	DATE	FLORHAM PARK, NEW JERSEY 07632 U.S.A.		REV.		219309 1 OF 1	



THREE PHASE WIRING FOR ASCO® 7000 SERIES AUTOMATIC TRANSFER & BYPASS-ISOLATION SWITCHES TYPE J7ATB RATED 150-600 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).

MOTOR LOAD TRANSFER FEATURE

FEAT. 27 - INPHASE TRANSFER CONTROL LOGIC TO INITIATE AN INPHASE TRANSFER OF LOADS BETWEEN LIVE SOURCES. USED TO PREVENT NUISANCE TRIPPING OF CIRCUIT BREAKERS AND POSSIBLE DAMAGE TO MECHANICAL LOADS CAUSED BY OUT OF PHASE TRANSFER.

ACTIVATED VIA THE GROUP 5 CONTROL PANEL USER INTERFACE (TRANSFER CONTROL CENTER) BY SELECTING "IN-PHASE MONITOR ENABLE" = YES. AN ADJUSTABLE DELAY (0.0-3.0 sec, FACTORY SET TO 1.5 sec, IN INCREMENTS OF 0.1 sec) DELAYS SENSING TO PERMIT STABILIZATION OF THE SOURCES PRIOR TO SENSING. FACTORY SETTING IS DISABLED UNLESS SPECIFIED TO BE FACTORY ACTIVATED AT THE TIME OF ORDER.

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

SIGNALS & AUXILIARIES

A. FEATURE 7 - 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 CLOSSES 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.  
FEATURE 7 CONSISTS OF A FORM A CONTACT CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB). CONTACTS RATED 5 AMPS AT 32VDC/120VAC RESISTIVE.

B. FEATURES 14AG & 14BG - TRANSFER SWITCH AUXILIARY POSITION INDICATING CONTACTS. EIGHT (8) FORM C CONTACTS TO INDICATE CONNECTION OF THE TRANSFER SWITCH TO NORMAL (14A) AND EIGHT (8) 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).

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 TO THE EMERGENCY SOURCE.

WHEN THE NORMAL SOURCE IS RESTORED FOR THE DURATION OF THE FEATURE 3A (RETRANSFER TO NORMAL) TIME DELAY SETTING, THE LOAD WILL BE RETRANSFERRED TO THE NORMAL SOURCE.

THE ENGINE WILL CONTINUE TO RUN FOR THE ENGINE COOL DOWN PERIOD, FEATURE 2E.

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)

BYPASS SWITCH & ISOLATION USER CONTROLS & INDICATIONS

A. BYPASS / ISOLATION DISPLAY INDICATORS - LED TYPE, COMMON LAMP TEST

NORMAL SOURCE AVAILABLE - GREEN

EMERGENCY SOURCE AVAILABLE - RED

TRANSFER SWITCH CONNECTED TO NORMAL - GREEN

TRANSFER SWITCH CONNECTED TO EMERGENCY - RED

BYPASS SWITCH CONNECTED TO NORMAL - GREEN

BYPASS SWITCH CONNECTED TO EMERGENCY - RED

LOAD CONNECTED - AMBER

TS IN CONNECTED POSITION - AMBER

TS IN TEST POSITION - AMBER

TS ISOLATED - AMBER

UNIT NOT IN AUTOMATIC - AMBER

B. BYPASS / ISOLATION DISPLAY ENGINE CONTROL SWITCH

TWO (2) POSITION)

"AUTO" - ENGINE STARTING CONTROLLED BY TRANSFER SWITCH CONTROL PANEL

"RUN" - SIGNALS ENGINE TO START

BASE CATALOG NUMBER				CATALOG NUMBER SUFFIXES					
CATALOG TYPE	NEUTRAL TYPE	PHASE POLES	AMPS	VOLT CODE	CONTROLLER	OPTIONAL ACCESSORY	ENCLOSURE CODE	NEUTRAL TYPE	
				C D E F			C	CODE	DESCRIPTION
	A		150					BLANK	NONE
			200					A	SOLID
	B	3	230		5	X		B	SWITCHING
J7ATB			260	H				C	OVERLAPPING
	C		400	J K L M					
			600	N					
				P Q R					

C. BYPASS / ISOLATION INTERLOCKS (SOLENOID ACTUATED)

SL1: INTERLOCKS THE TRANSFER SWITCH ISOLATION CRANK WITH THE TRANSFER AND BYPASS SWITCHES TO INSURE THAT:

THE TRANSFER SWITCH CANNOT BE DISCONNECTED WITHOUT BEING BYPASSED.

THE TRANSFER SWITCH CANNOT BE RECONNECTED UNLESS IT IS IN THE SAME POSITION AS THE BYPASS SWITCH.

SL2: INTERLOCKS THE BYPASS SWITCH OPERATOR WHEN THE TRANSFER SWITCH IS IN THE CONNECTED POSITION TO INSURE THAT THE BYPASS SWITCH CANNOT BE OPERATED TO A SOURCE OTHER THAN THAT WHICH THE TRANSFER SWITCH IS CONNECTED TO.

GENERAL NOTES

1. SWITCH SHOWN DE-ENERGIZED AND CONNECTED TO THE NORMAL SOURCE. THE BYPASS SWITCH OPERATOR IS IN THE "OFF" (AUTOMATIC) POSITION WITH THE ISOLATION CRANK (TS) IN THE FULLY CONNECTED POSITION.

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. O 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.

TECHNICAL DATA

BYPASS SWITCH AUXILIARY CONTACTS

BP AUXILIARY CONTACT	STATUS (*)	BP SWITCH POSITION (AUX3)		
		EMERG	OFF	NORMAL
81-82	●			
83-84	●			
85-86	●			
87-88	●			
89-90	●			
91-92	●			
93-94				
101-102				
103-104				
105-106	●			
107-108	●			
109-110	●			
111-112	●			
113-114				
115-116				
117-118				
125-126				
127-128				

BYPASS SWITCH OPERATOR AUXILIARY CONTACTS

BP AUXILIARY CONTACT	STATUS (*)	BP SWITCH HANDLE POSITION			
		NORMAL (CCW)		OFF	EMERGENCY (CW)
		BYPASS (±90°)	<> ±20°		<> ±20° BYPASS (±90°)
(AUX4)	140-141	●			
	140-142	●			
	146-147	●			
	146-148	●			
	137-138	●			
	137-139	●			
(AUX5)	143-144	●			
	143-145	●			

ISOLATION (TRANSFER SWITCH CARRIAGE POSITION) AUXILIARY CONTACTS

IS AUXILIARY CONTACT	STATUS (*)	TRANSFER SWITCH CARRIAGE POSITION			
		CONNECT	>	TEST	> ISOLATE
1-2	●				
1-3	●				
4-5	●				
4-6	●				
7-8	●				
7-9	●				
10-11	●				
10-12	●				
13-14	●				
13-15	●				
16-17	●				
16-18	●				
19-20	●				
19-21	●				
22-23	●				
22-24	●				
25-26	●				
25-27	●				
28-29	●				
28-30	●				

(\*) CONTACT AVAILABILITY STATUS:

● CONTACT PROVIDED & USED IN CIRCUITRY

"BLANK" CONTACT NOT USED. IF PHYSICALLY AVAILABLE, CONTACT IS FOR FACTORY USE ONLY!

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

ASCO® CERTIFIED TO

S.O. \_\_\_\_\_

BY \_\_\_\_\_

DATE \_\_\_\_\_

FORM REV E

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

WIRING \_\_\_\_\_

7000 SERIES (J7ATB)

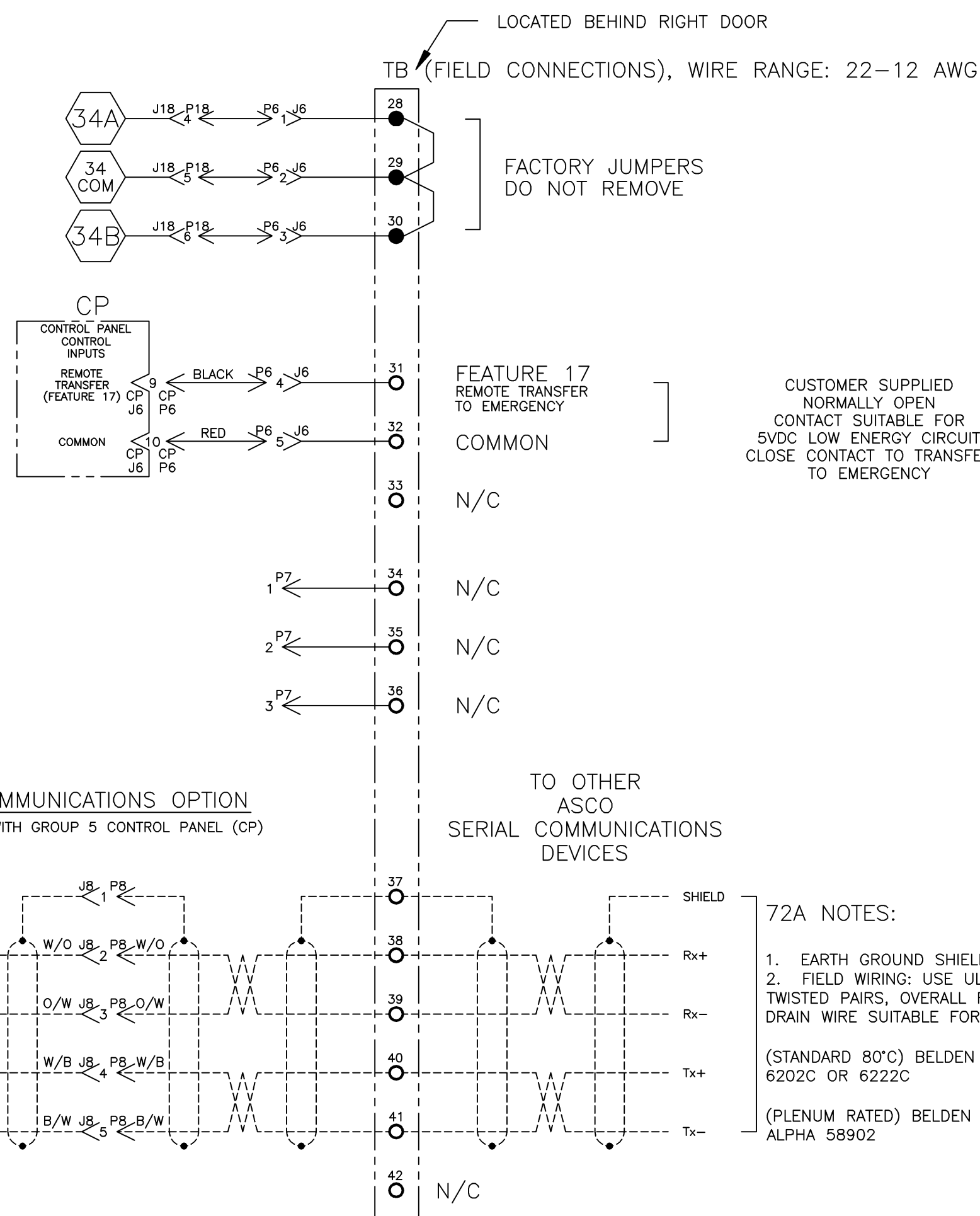
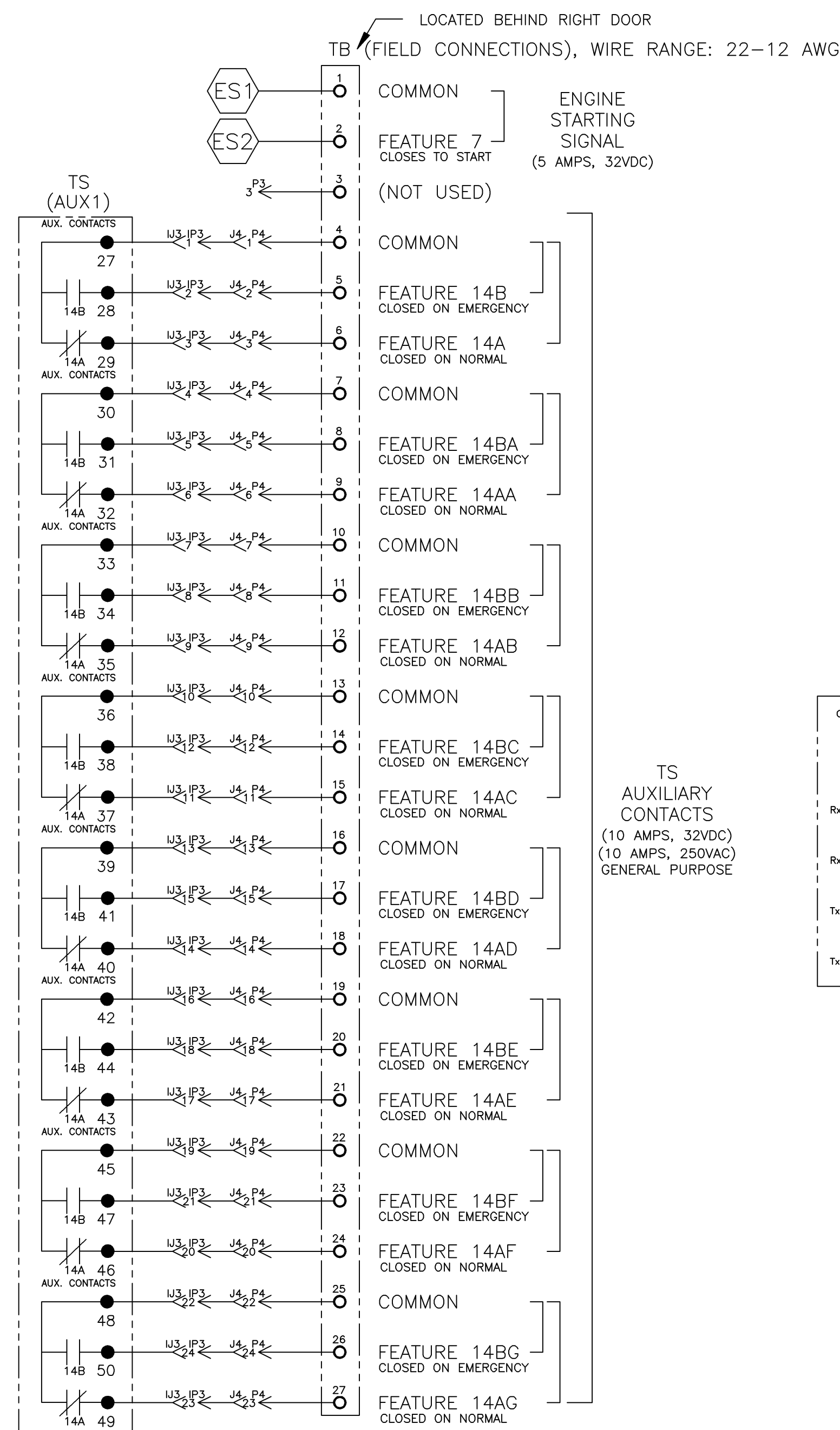
"J" FRAME, GROUP 5 CONTROLS

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	10/17/06	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						DWG. NO. 806095	
FINAL APPROVAL	JPB	10/17/06	ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.			DRAWING E	ECN NO. 212251 SHEET 1 OF 8

E	212251	MR	JPB	03/01/07
D	SEE ECN			
D	211805	MR	JPB	01/26/07
C	SEE ECN			
C	211529	MR	JPB	01/09/07
B	SEE ECN			
B	211031	JPB	JPB	11/27/06
A	210925	JPB	JPB	11/16/06
A	SEE ECN			
-	210421	JPB	JPB	10/17/06
-	ISSUE			



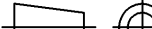
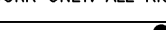
## FIELD CONNECTIONS



72A NOTES:

1. EARTH GROUND SHIELD AT HOST DEVICE ONLY.
2. FIELD WIRING: USE UL LISTED, STRANDED, TWISTED PAIRS, OVERALL FOIL SHIELD WITH STRANDED DRAIN WIRE SUITABLE FOR RS-422 EQUIVALENT TO:  
  
(STANDARD 80°C) BELDEN 9842 OR 9829 OR ALPHA 6202C OR 6222C  
  
(PLENUM RATED) BELDEN 89729 OR 82729 OR ALPHA 58902

E	212251	MR	JPB	03/01/07
	SEE ECN			
D	211805	MR	JPB	01/26/07
	SEE ECN			
C	211529	MR	JPB	01/09/07
	SEE ECN			
B	211031	JPB	JPB	11/27/06
	SEE ECN			
A	210925	JPB	JPB	11/16/06
	SEE ECN			
—	210421	JPB	JPB	10/17/06
	ISSUE			

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM			 THIRD ANGLE PROJECTION	
7000 SERIES (J7ATB)								
"J" FRAME, GROUP 5 CONTROLS								
BY		DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055			ASSEM. REF. NO.		
DRAWN BY		JPB	10/17/16		COMPUTER GENERATED DRAWING			
CHECKED		PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR YOUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			SCALE 1:1		SIZE DS	
PROJECT APPROVAL					DWG. NO.		806095	
FINAL APPROVAL					JPB		ECN NO. 212251	
		10/17/06		 ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.				

D

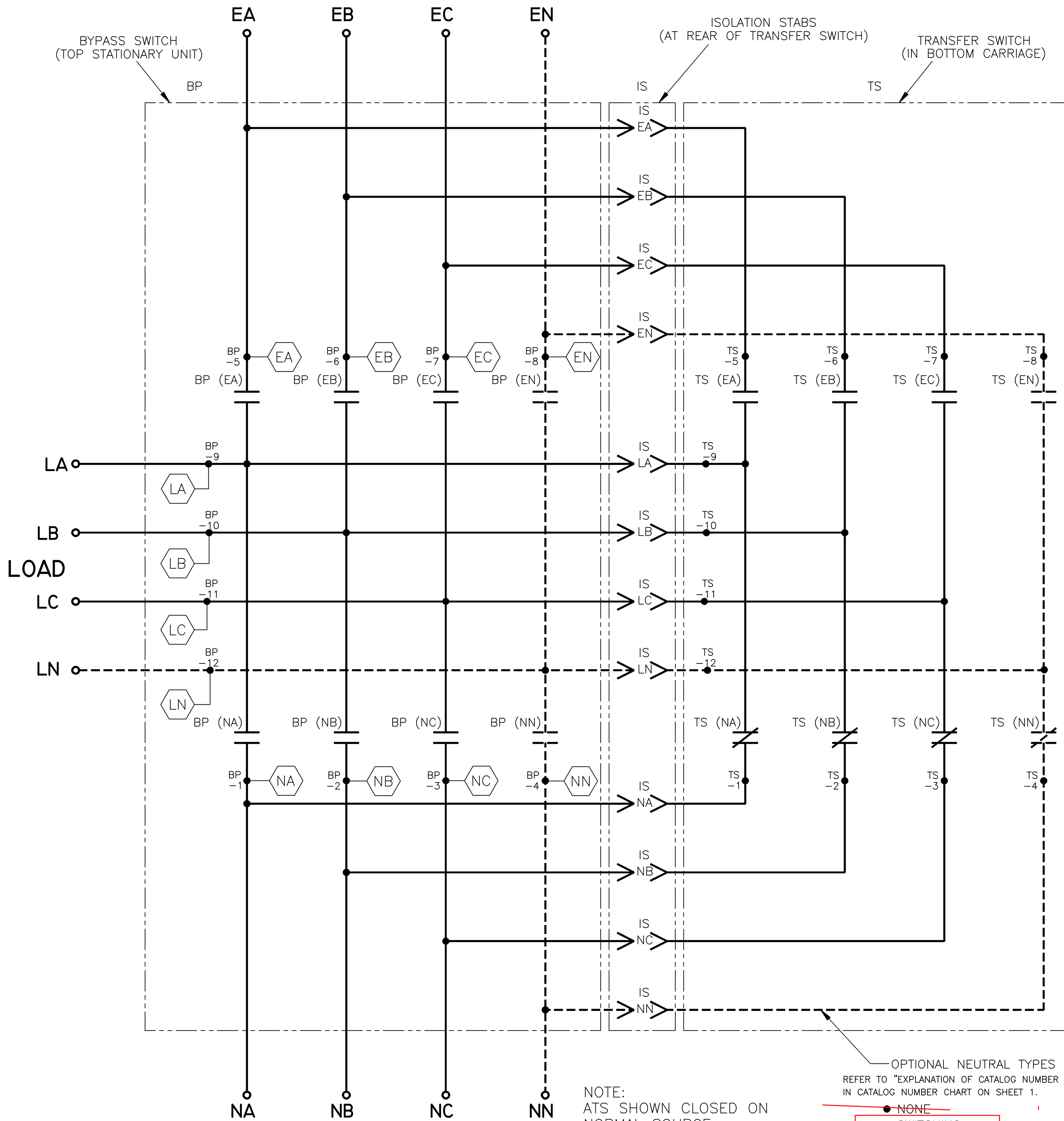
C

B

A

MAIN POWER POLES

EMERGENCY



NORMAL

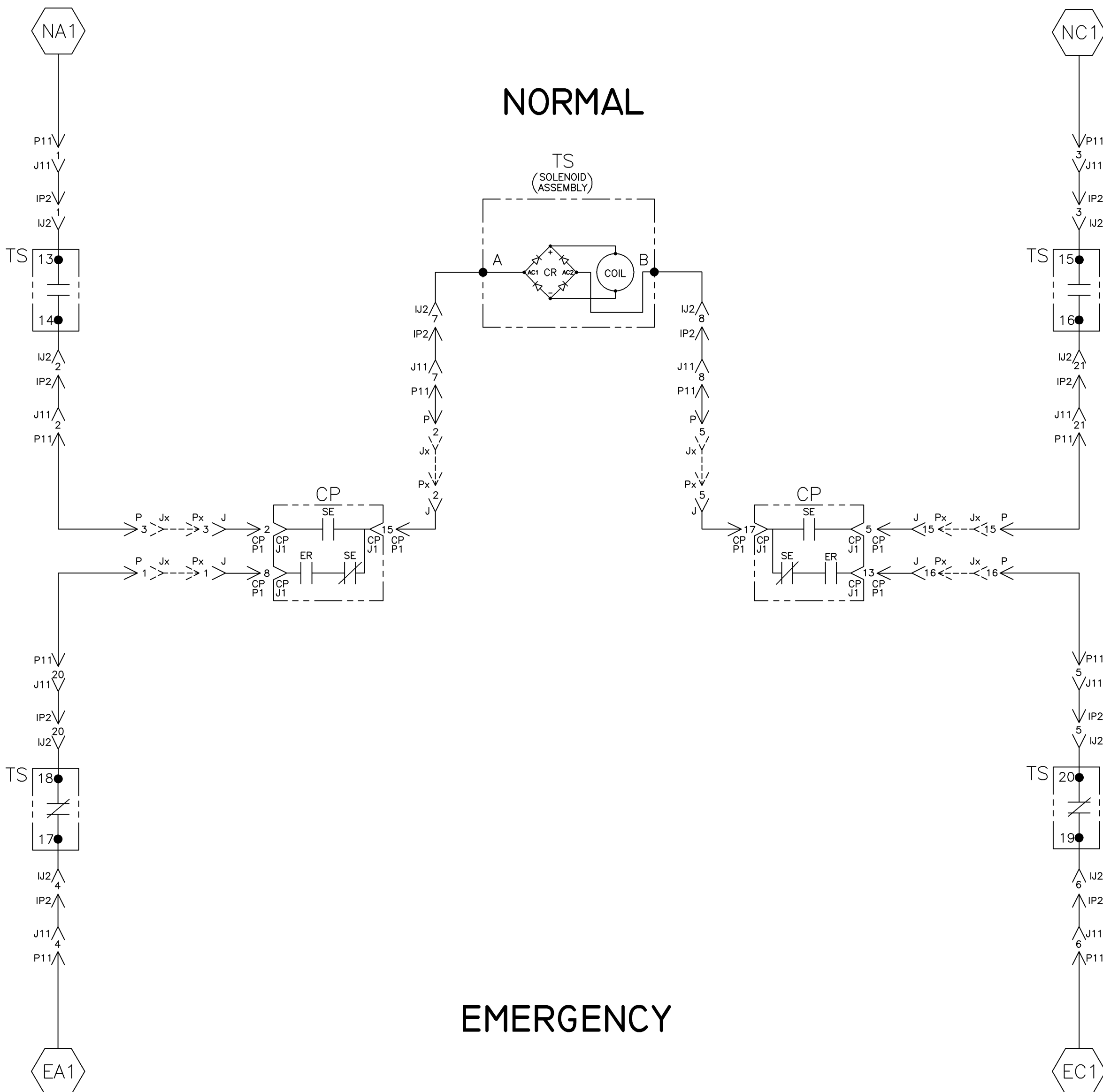
NOTE:  
ATS SHOWN CLOSED ON  
NORMAL SOURCE.  
BYPASS SWITCH IN  
(AUTOMATIC) POSITION.

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

- NONE
- SWITCHING
- OVERLAPPING CONTACTS
- SOLID BUS PLATE

TS OPERATOR CIRCUIT


NORMAL



EMERGENCY

TS CONTROL CONTACTS		SOLENOID POSITION			
TS		CLOSED BEFORE NORMAL TDC>		BEFORE CLOSED <TDC 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.

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM				
7000 SERIES (J7ATB)								
"J" FRAME, GROUP 5 CONTROLS								
CHECKED	BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055		ASSEM. REF. NO.			
PROJECT APPROVAL	JPB	10/17/06						
FINAL APPROVAL	JPB	10/17/06	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		COMPUTER GENERATED DRAWING			
		SCALE 1:1		SIZE DS		DWG. NO. 806095		
		REV. E		ECN NO. 212251		SHEET 3 OF 8		



D

C

B

A

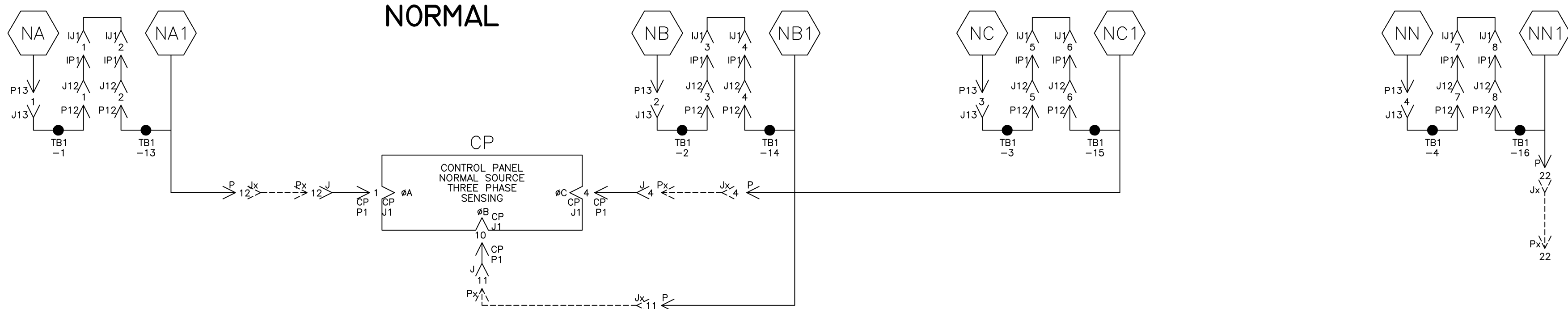
D

C

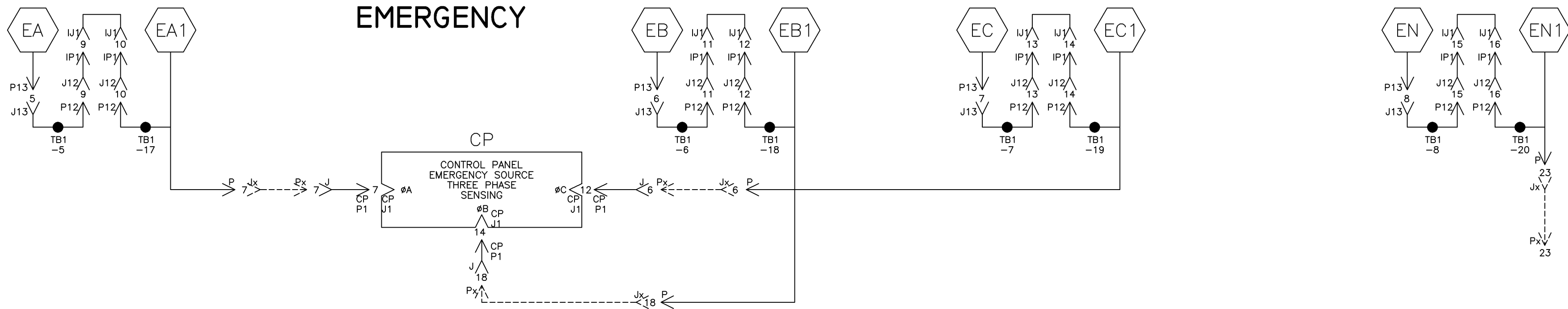
B

A

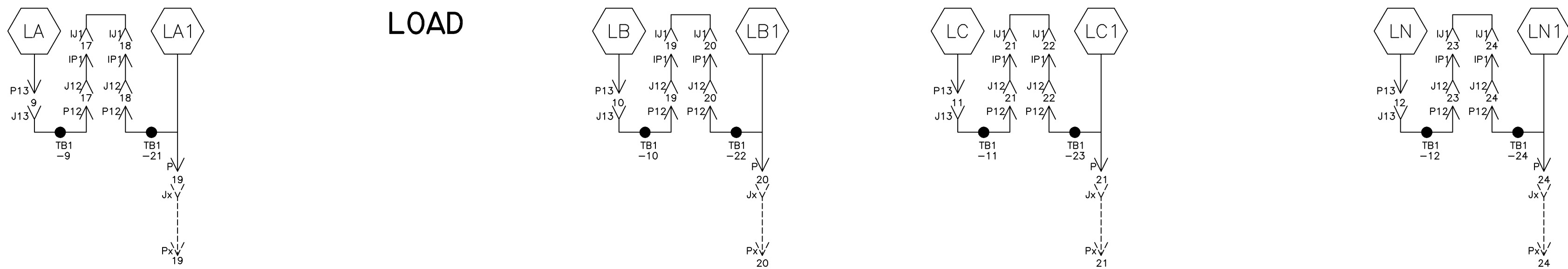
NORMAL SOURCE CIRCUITS



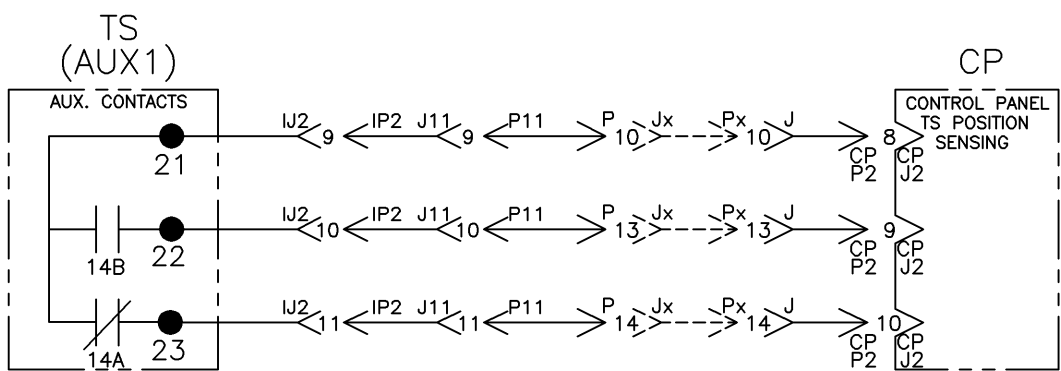
EMERGENCY SOURCE CIRCUITS



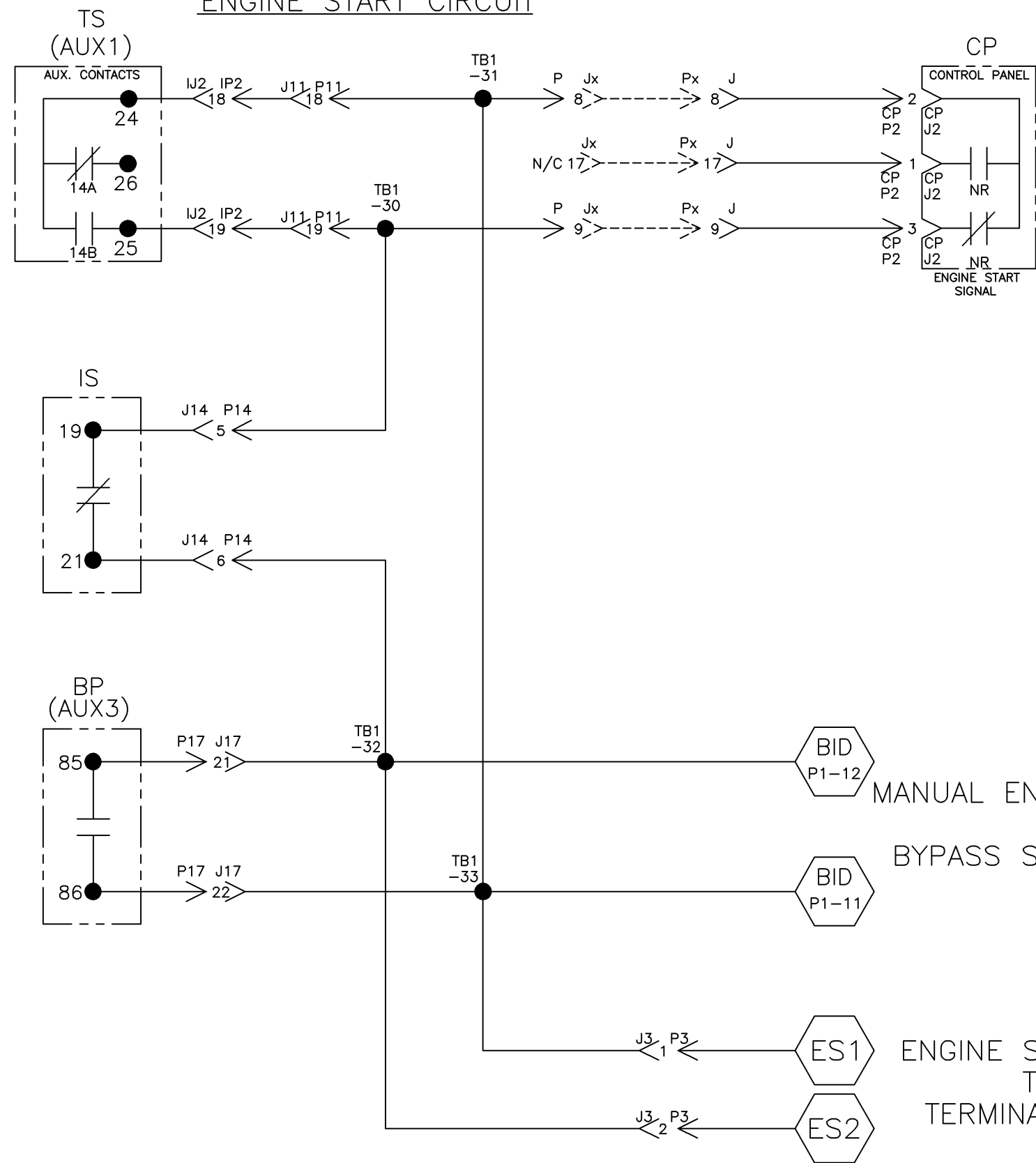
LOAD TERMINAL CIRCUITS



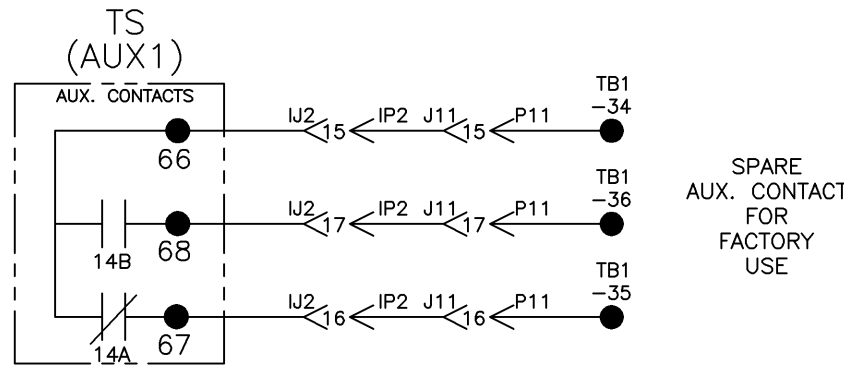
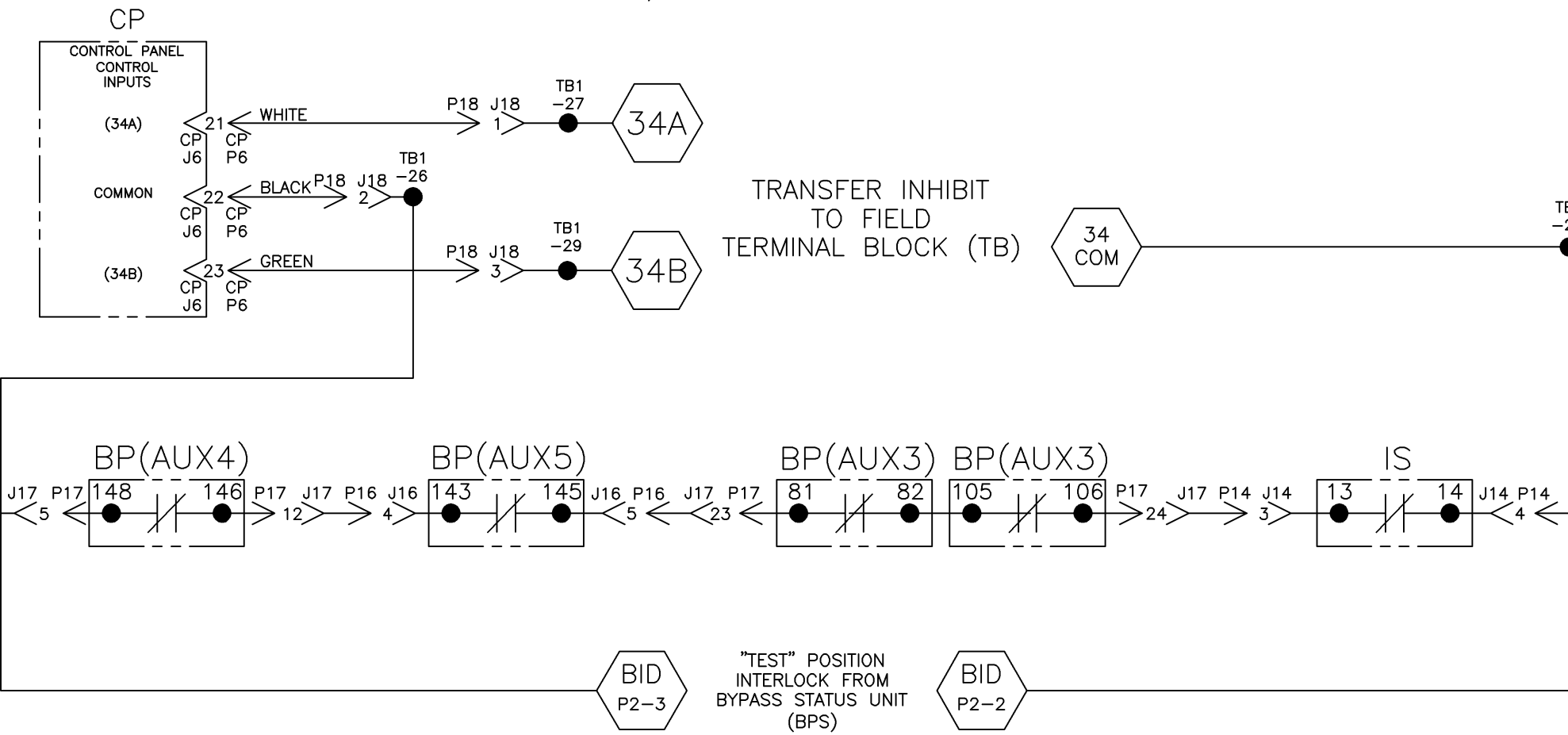
CONTROL SIGNALS & INDICATION



ENGINE START CIRCUIT

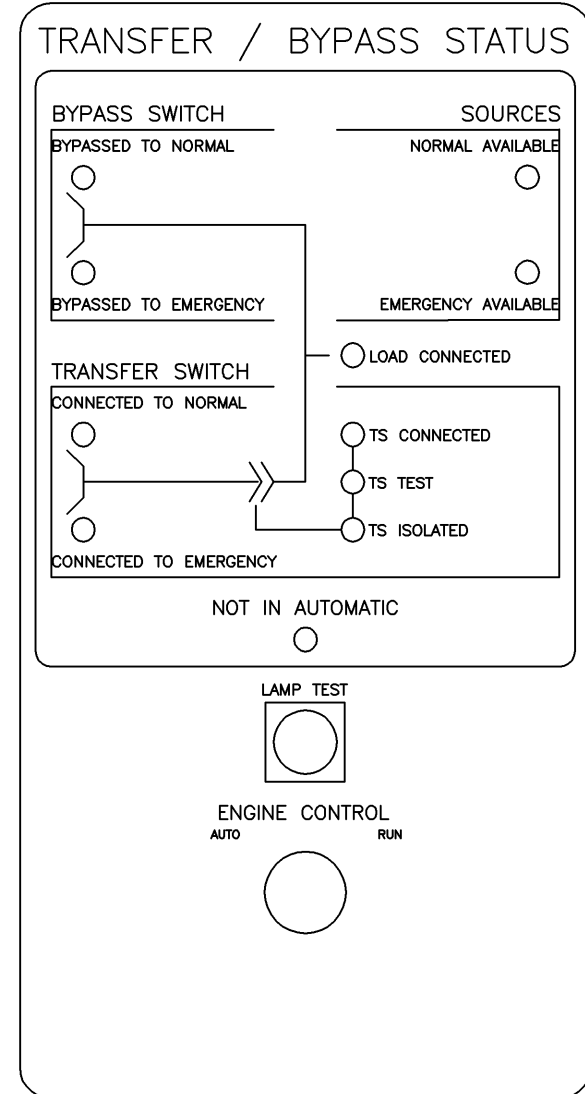


CONTROL PANEL/BYPASS-ISOLATION INTERLOCKS

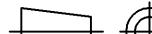



PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING								
7000 SERIES (J7ATB)								
"J" FRAME, GROUP 5 CONTROLS								
DRAWN BY	JPB	DATE	10/17/06	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-005.		ASSEM. REF. NO.		COMPUTER GENERATED DRAWING
CHECKED				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				806095		DWG. NO.		
FINAL APPROVAL	JPB	DATE	10/17/06	ASCO POWER TECHNOLOGIES, L.P.		DRAWING REV.		
				FLORHAM PARK, NEW JERSEY 07932 U.S.A.		ECN NO. 212251		SHEET 4 OF 8

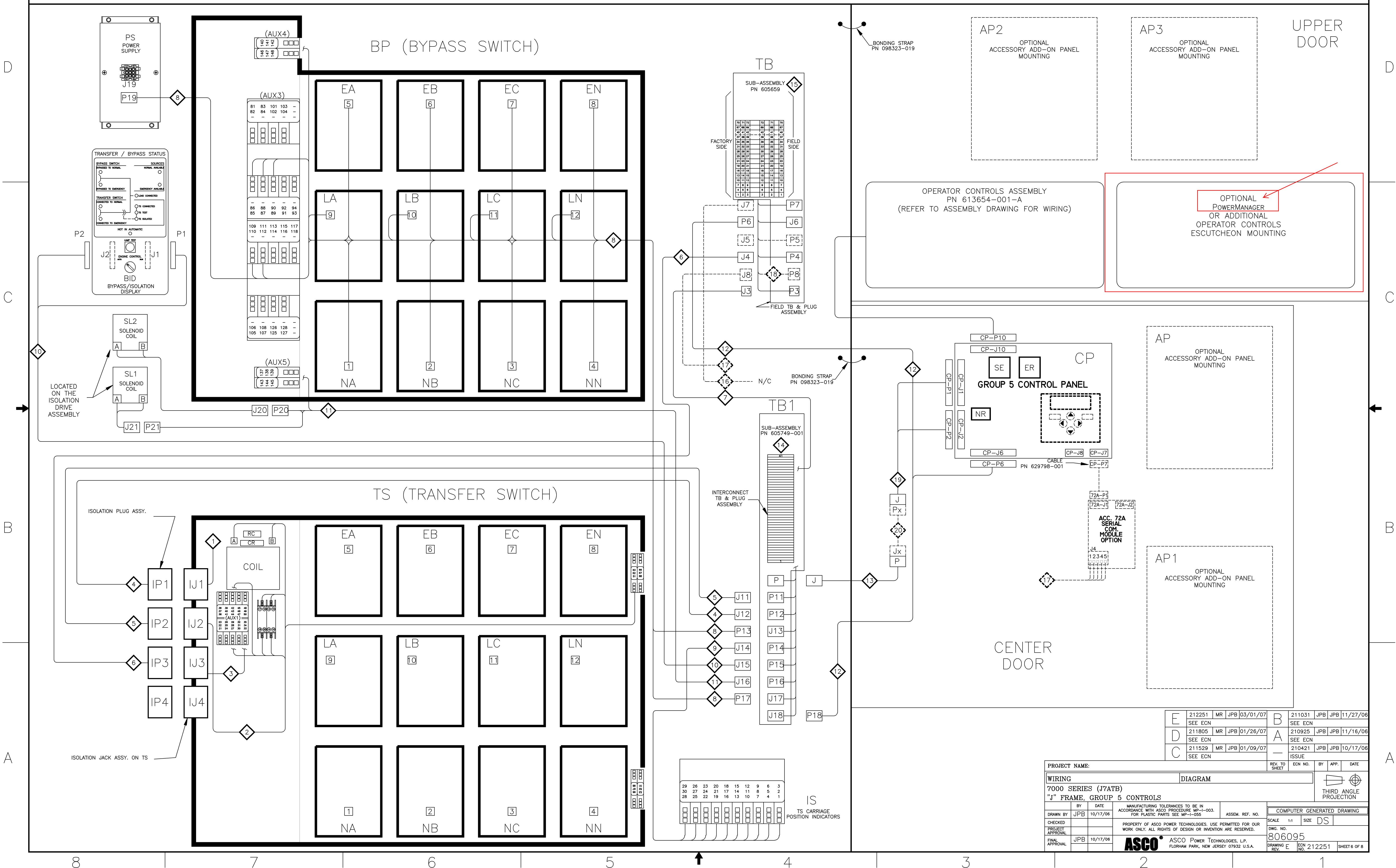
## ADDITIONAL CIRCUITS



E	212251	MR	JPB	03/01/07
	SEE ECN			
D	211805	MR	JPB	01/26/07
	SEE ECN			
C	211529	MR	JPB	01/09/07
	SEE ECN			
B	211031	JPB	JPB	11/27/06
	SEE ECN			
A	210925	JPB	JPB	11/16/06
	SEE ECN			
—	210421	JPB	JPB	10/17/06
	ISSUE			


PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM			 THIRD ANGLE PROJECTION	
7000 SERIES (J7ATB)								
"J" FRAME, GROUP 5 CONTROLS								
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055			ASSEM. REF. NO.			
DRAWN BY	JPB	10/17/06				COMPUTER GENERATED DRAWING		
CHECKED			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						DWG. NO. 806095		
FINAL APPROVAL	JPB	10/17/06	 ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.			DRAWING REV	ECN NO. 212251	SHEETS 5 of 8


PHYSICAL DIAGRAM





# WIRE RUN LISTING

<div><div>1</div><div></div></div> <div>HARNESS LOCATOR</div>		<div>BOX CHECKED IF HARNESS IS WORN</div> <div><input type="checkbox"/></div>	
<div>WIRE No.</div>	<div>HARNESS 605674-001</div> <div>(U1) TS</div>	<div>CLR</div>	<div>AWG</div>
1	U1-1,U1-2		16
2	U1-3,U1-4		
3	U1-5,U1-6		
4	U1-7,U1-8		
5	U1-9,U1-10		
6	U1-11,U1-12		
7	U1-13,U1-14		
8	U1-15,U1-16		
9	U1-17,U1-18		
10	U1-19,U1-20		
11	U1-21,U1-22		
12	U1-23,U1-24		

2  HARNESS LOCATOR		BOX CHECKED IF HARNESS IS WORN	<input type="checkbox"/>
WIRE No.	HARNESS 806064-001 (J2) TS	CLR	AWG
1	J2-1,TS-13		16
21	J2-2,TS-14		
3	J2-3,TS-15		
5	J2-4,TS-17		
24	J2-5,TS-20		
7	J2-6,TS-19		
14	J2-7,TS-CR-AC1		
15	J2-8,TS-CR-AC2		
28	J2-9,TS(AUX1)-21		
30	J2-10,TS(AUX1)-22		
29	J2-11,TS(AUX1)-23		
31	J2-12,TS(AUX1)-51		
32	J2-13,TS(AUX1)-53		
33	J2-14,TS(AUX1)-52		
34	J2-15,TS(AUX1)-66		
35	J2-16,TS(AUX1)-67		
36	J2-17,TS(AUX1)-68		
120	J2-18,TS(AUX1)-24		
38	J2-19,TS(AUX1)-25		
39	J2-20,TS-18		
40	J2-21,TS-16		

[illegible]

3	HARNESS LOCATOR			BOX CHECKED IF HARNESS IS WORN	<input type="checkbox"/>
WIRE No.	HARNESS 806064-002 (U3) TS STD. AUX. CONTACTS			CLR	AWG
50	U3-1,TS(AUX1)-27				16
51	U3-2,TS(AUX1)-28				
52	U3-3,TS(AUX1)-29				
53	U3-4,TS(AUX1)-30				
54	U3-5,TS(AUX1)-31				
55	U3-6,TS(AUX1)-32				
56	U3-7,TS(AUX1)-33				
57	U3-8,TS(AUX1)-34				
58	U3-9,TS(AUX1)-35				
59	U3-10,TS(AUX1)-36				
60	U3-11,TS(AUX1)-37				
61	U3-12,TS(AUX1)-38				
62	U3-13,TS(AUX1)-39				
63	U3-14,TS(AUX1)-40				
64	U3-15,TS(AUX1)-41				
65	U3-16,TS(AUX1)-42				
66	U3-17,TS(AUX1)-43				
67	U3-18,TS(AUX1)-44				
68	U3-19,TS(AUX1)-45				
69	U3-20,TS(AUX1)-46				
70	U3-21,TS(AUX1)-47				
71	U3-22,TS(AUX1)-48				
72	U3-23,TS(AUX1)-49				
73	U3-24,TS(AUX1)-50				

[illegible][illegible]

5	HARNESS LOCATOR		BOX CHECKED IF HARNESS IS WORN	<input type="checkbox"/>
WIRE No.	HARNESS 605674-006-D (IP2,J11)	FRAME	CLR	AWG
1	IP2-1,J11-1			16
21	IP2-2,J11-2			
3	IP2-3,J11-3			
5	IP2-4,J11-4			
24	IP2-5,J11-5			
17	IP2-6,J11-6			
14	IP2-7,J11-7			
15	IP2-8,J11-8			
28	IP2-9,J11-9			
30	IP2-10,J11-10			
29	IP2-11,J11-11			
31	IP2-12,J11-12			
32	IP2-13,J11-13			
33	IP2-14,J11-14			
34	IP2-15,J11-15			
35	IP2-16,J11-16			
36	IP2-17,J11-17			
120	IP2-18,J11-18			
38	IP2-19,J11-19			
39	IP2-20,J11-20			
40	IP2-21,J11-21			
41	IP2-22,J11-22			
42	IP2-23,J11-23			
43	IP2-24,J11-24			

[illegible]

6	HARNESS LOCATOR		BOX CHECKED IF HARNESS IS WOODED	<input type="checkbox"/>
WIRE No.	HARNESS 605674-006-C (IP3,J4)	STATIONARY FRAME	CLR	AWG
50	IP3-1,J4-1			16
51	IP3-2,J4-2			
52	IP3-3,J4-3			
53	IP3-4,J4-4			
54	IP3-5,J4-5			
55	IP3-6,J4-6			
56	IP3-7,J4-7			
57	IP3-8,J4-8			
58	IP3-9,J4-9			
59	IP3-10,J4-10			
60	IP3-11,J4-11			
61	IP3-12,J4-12			
62	IP3-13,J4-13			
63	IP3-14,J4-14			
64	IP3-15,J4-15			
65	IP3-16,J4-16			
66	IP3-17,J4-17			
67	IP3-18,J4-18			
68	IP3-19,J4-19			
69	IP3-20,J4-20			
70	IP3-21,J4-21			
71	IP3-22,J4-22			
72	IP3-23,J4-23			
73	IP3-24,J4-24			


[illegible]


8	HARNESS LOCATOR		BOX CHECKED IF HARNESS IS WORN	
WIRE No.	HARNESS 806064-004 (P13, P17, P19, BP)	BP	CLR	AWG
1	P13-1, BP-1			16
1	BP-1, P19-1			
2	P13-2, BP-2			
3	P13-3, BP-3			
3	BP-3, P19-2			
4	P13-4, BP-4			
5	P13-5, BP-5			
5	BP-5, P19-3			
6	P13-6, BP-6			
7	P13-7, BP-7			
7	BP-7, P19-4			
8	P13-8, BP-8			
9	P13-9, BP-9			
10	P13-10, BP-10			
11	P13-11, BP-11			
12	P13-12, BP-12			
31	P17-1, BP(AUX3)-111			
170	P17-2, P19-6			
171	P17-3, P19-7			
172	P17-4, P19-7			
191	P17-5, BP(AUX4)-148			
177	P17-9, BP(AUX3)-90			
176	P17-10, BP(AUX3)-112			
33	P17-11, BP(AUX3)-88			
33	BP(AUX3)-88, BP(AUX4)-140			
173	P17-12, BP(AUX4)-146			
32	BP(AUX3)-110, BP(AUX3)-137			
149	P17-13, BP(AUX3)-87			
149	BP(AUX3)-87, BP(AUX3)-109			
190	P17-17, BP(AUX4)-141			
121	P17-21, BP(AUX3)-85			
120	P17-22, BP(AUX3)-86			
31	P19-9, BP(AUX3)-89			
31	BP(AUX3)-89, BP(AUX3)-111			
501	BP(AUX3)-82, BP(AUX3)-105			
500	P17-23, BP(AUX3)-81			
150	P17-24, BP(AUX3)-106			

[illegible]

174	P17-6	
504	P17-7	
175	P17-8	
178	P17-14	
505	P17-15	
189	P17-16	
506	P17-18	
420	P17-19	
421	P17-20	


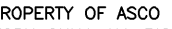
[illegible][illegible]

 <b>HARNESS LOCATOR</b>		BOX CHECKED IF HARNESS IS MODIFIED	<input type="checkbox"/>
WIRE No.	<b>HARNESS 736883</b> <b>(J15, BID-P1, BID-P2)</b> <b>BYPASS ISOLATION DISPLAY</b>	CLR	AWG
121	J15-1,BID-P1-12		22
120	J15-2,BID-P1-11		
31	J15-3,BID-P1-10		
170	J15-4,BID-P1-9		
171	J15-5,BID-P1-8		
172	J15-6,BID-P1-7		
176	J15-10,BID-P1-3		
177	J15-11,BID-P1-2		
32	J15-12,BID-P1-1		
33	J15-13,BID-P2-12		
155	J15-15,BID-P2-10		
157	J15-17,BID-P2-8		
158	J15-18,BID-P2-7		
154	J15-19,BID-P2-6		
149	J15-20,BID-P2-5		
152	J15-21,BID-P2-4		
191	J15-22,BID-P2-3		
151	J15-23,BID-P2-2		
<b>ADD WIRES</b>			
389	J15-7		
390	J15-8		
391	J15-9		
395	J15-14		
508	J15-16		
405	J15-24		

 <b>HARNES LOCATOR</b>		BOX CHECKED IF HARNES IS WORN <input type="checkbox"/>	
WIRE No.	HARNES 806064-006 (J16, P20, P21) BP/IS INTERLOCKS	CLR	AWG
154	J16-1,P21-1		16
170	J16-2,P20-2		
153	J16-3,P20-1		
173	J16-4,BP(AUX5)-143		
500	J16-5,BP(AUX5)-145		
170	J16-6,P21-2		
32	J16-7,BP(AUX5)-137		
190	J16-8,BP(AUX5)-138		

[illegible][illegible]

<div><div><div>13</div><div></div></div></div> <div>HARNESS LOCATOR</div>		<div><div>BOX CHECKED IF HARNESS IS MODIFIED</div><div><input type="checkbox"/></div></div>	
WIRE No.	HARNESS 309320-006 (P,J) CONTROL PANEL EXTENSION	CLR	AWG
39	P-1,J-1		16
14	P-2,J-2		
21	P-3,J-3		
3	P-4,J-4		
15	P-5,J-5		
7	P-6,J-6		
5	P-7,J-7		
120	P-8,J-8		
38	P-9,J-9		
28	P-10,J-10		
2	P-11,J-11		
1	P-12,J-12		
30	P-13,J-13		
29	P-14,J-14		
40	P-15,J-15		
24	P-16,J-16		
312	P-17,J-17		
6	P-18,J-18		
9	P-19,J-19		
10	P-20,J-20		
11	P-21,J-21		
4	P-22,J-22		
8	P-23,J-23		
12	P-24,J-24		

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING				DIAGRAM		 FIRST ANGLE PROJECTION		
7000 SERIES (J7ATB)								
"J" FRAME, GROUP 5 CONTROLS								
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-J-003. FOR PLASTIC PARTS SEE MP-J-055			ASSEM. REF. NO.			
DRAWN BY	JPB	10/17/06				COMPUTER GENERATED DRAWING		
CHECKED			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						DWG. NO.	806095	
FINAL APPROVAL	JPB	10/17/06	 ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.			DRAWING	ECN NO.	SHEET 7 OF 8
						212251		

WIRE RUN LISTING

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	SUB-ASSEMBLY 605749-001 (TB1,P,P11,P12,J13,P14,P15,P16,J17,J18) MAIN INTERCONNECT ASSEMBLY	CLR	AWG	
14	P-2,P11-7		16	
21	P-3,P11-2			
3	P-4,TB1-15			
15	P-5,P11-9			
7	P-6,TB1-19			
5	P-7,TB1-17			
120	P-8,TB1-31			
38	P-9,TB1-30			
28	P-10,P11-9			
2	P-11,TB1-14			
1	P-12,TB1-13			
30	P-13,P11-10			
29	P-14,P11-11			
24	P-16,P11-5			
6	P-18,TB1-18			
9	P-19,TB1-21			
10	P-20,TB1-22			
11	P-21,TB1-23			
4	P-22,TB1-16			
8	P-23,TB1-20			
12	P-24,TB1-24			
1	P11-1,TB1-13			
3	P11-3,TB1-15			
5	P11-4,TB1-17			
7	P11-6,TB1-19			
31	P11-12,TB1-37			
32	P11-13,TB1-39			
33	P11-14,TB1-40			
34	P11-15,TB1-34			
35	P11-16,TB1-35			
36	P11-17,TB1-36			
120	P11-18,TB1-31			
38	P11-19,TB1-30			
39	P11-20,P-1			
40	P11-21,P-15			
1	P12-1,TB1-1			
1	P12-2,TB1-13			
2	P12-3,TB1-2			
2	P12-4,TB1-14			
3	P12-5,TB1-3			
3	P12-6,TB1-15			
4	P12-7,TB1-4			
4	P12-8,TB1-16			
5	P12-9,TB1-5			
5	P12-10,TB1-17			
6	P12-11,TB1-6			
6	P12-12,TB1-18			
7	P12-13,TB1-7			
7	P12-14,TB1-19			
8	P12-15,TB1-8			
8	P12-16,TB1-20			
9	P12-17,TB1-9			
9	P12-18,TB1-21			
10	P12-19,TB1-10			
10	P12-20,TB1-22			
11	P12-21,TB1-11			
11	P12-22,TB1-23			
12	P12-23,TB1-12			
12	P12-24,TB1-24			
1	J13-1,TB1-1			
2	J13-2,TB1-2			
3	J13-3,TB1-3			
4	J13-4,TB1-4			
5	J13-5,TB1-5			
6	J13-6,TB1-6			
7	J13-7,TB1-7			
8	J13-8,TB1-8			
9	J13-9,TB1-9			
10	J13-10,TB1-10			
11	J13-11,TB1-11			
12	J13-12,TB1-12			
151	P14-4,TB1-28			
38	P14-5,TB1-30			
121	P14-6,TB1-32			
31	P14-9,TB1-37			
153	P14-11,P16-3			
154	P14-12,TB1-41			
155	P14-13,P15-15			
157	P14-15,P15-17			
158	P14-16,P15-18			
190	P14-17,J17-17			
121	P15-1,TB1-32			
120	P15-2,TB1-33			
31	P15-3,TB1-37			
170	P15-4,TB1-38			
171	P15-5,J17-3			
172	P15-6,J17-4			
176	P15-10,J17-10			
177	P15-11,J17-9			
32	P15-12,TB1-39			
33	P15-13,TB1-40			
154	P15-19,TB1-41			
149	P15-20,J17-13			
152	P15-21,P14-10			
191	P15-22,TB1-26			
151	P15-23,TB1-28			
154	P16-1,TB1-41			
170	P16-2,TB1-38			
191	P16-4,TB1-26			
170	P16-6,TB1-38			
31	J17-1,TB1-37			
170	J17-2,TB1-38			
32	J17-11,TB1-39			
33	J17-12,TB1-40			
121	J17-21,TB1-32			
120	J17-22,TB1-33			
500	J17-23,P16-5			
150	J17-24,P14-3			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	SUB-ASSEMBLY 605749-001 (TB1,P,P11,P12,J13,P14,P15,P16,J17,J18) MAIN INTERCONNECT ASSEMBLY (CONTINUED)	CLR	AWG	
210	J18-1,TB1-27		16	
191	J18-2,TB1-26			
211	J18-3,TB1-29			
210	J18-4,TB1-27			
151	J18-5,TB1-28			
211	J18-6,TB1-29			
120	TB1-31,TB1-33			
	REMOVE WIRES			
190	P14-17,J17-17			
191	P16-4,TB1-26			
33	J17-12,TB1-40			
32	J17-11,TB1-39			
	ADD WIRES			
312	P-17			
41	P11-22			
42	P11-23			
43	P11-24			
26	J13-13			
140	J13-14			
27	J13-15			
340	J13-16			
341	J13-17			
342	J13-18			
343	J13-19			
344	J13-20			
345	J13-21			
346	J13-22			
347	J13-23			
348	J13-24			
507	P14-1			
160	P14-2			
169	P14-7			
168	P14-8			
156	P14-14			
190	P14-17,TB1-25			
161	P14-18			
162	P14-19			
163	P14-20			
164	P14-21			
165	P14-22			
166	P14-23			
167	P14-24			
389	P15-7			
390	P15-8			
391	P15-9			
395	P15-14			
508	P15-16			
405	P15-24			
173	P16-4,J17-12			
32	P16-7,TB1-39			
190	P16-8,TB1-25			
524	P16-9			
525	P16-10			
526	P16-11			
527	P16-12			
528	P16-13			
529	P16-14			
530	P16-15			
531	P16-16			
532	P16-17			
533	P16-18			
534	P16-19			
535	P16-20			
536	P16-21			
537	P16-22			
538	P16-23			
539	P16-24			
191	J17-5,TB1-26			
174	J17-6			
504	J17-7			
175	J17-8			
33	J17-11,TB1-40			
178	J17-14			
505	J17-15			
189	J17-16			
190	J17-17,TB1-25			
506	J17-18			
420	J17-19			
421	J17-20			
215	J18-7			
216	J18-8			
217	J18-9			
218	J18-10			
219	J18-11			
220	J18-12			
221	J18-13			
222	J18-14			
324	J18-15			
325	J18-16			
36	J18-17			
35	J18-18			
228	J18-19			
229	J18-20			
320	J18-21			
322	J18-22			
321	J18-23			
323	J18-24			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	SUB-ASSEMBLY 605659 (P3,P4,J6,P7,TB) STD. FIELD TB	CLR	AWG	
120	TB-1,P3-1		16	
121	TB-2,P3-2			
122	TB-3,P3-3			
50	TB-4,P4-1			
51	TB-5,P4-2			
52	TB-6,P4-3			
53	TB-7,P4-4			
54	TB-8,P4-5			
55	TB-9,P4-6			
56	TB-10,P4-7			
57	TB-11,P4-8			
58	TB-12,P4-9			
59	TB-13,P4-10			
61	TB-14,P4-12			
60	TB-15,P4-11			
62	TB-16,P4-13			
64	TB-17,P4-15			
63	TB-18,P4-14			
65	TB-19,P4-16			
67	TB-20,P4-18			
66	TB-21,P4-17			
68	TB-22,P4-19			
70	TB-23,P4-21			
69	TB-24,P4-20			
71	TB-25,P4-22			
73	TB-26,P4-24			
72	TB-27,P4-23			
210	TB-28,J6-1			
151	TB-29,J6-2			
211	TB-30,J6-3			
243	TB-31,J6-4			
244	TB-32,J6-5			
270	TB-34,P7-1			
271	TB-35,P7-2			
272	TB-36,P7-3			
	JUMPERS			
	TB-28,TB-29			
	TB-29,TB-30			
	ADD WIRES			
123	P3-4			
245	J6-6			
246	J6-7			
247	J6-8			
248	J6-9			
249	J6-10			
250	J6-11			
251	J6-12			
252	J6-13			
253	J6-14			
254	J6-15			
255	J6-16			
256	J6-17			
257	J6-18			
258	J6-19			
259	J6-20			
260	J6-21			
261	J6-22			
262	J6-23			
263	J6-24			
273	P7-4			
274	P7-5			
275	P7-6			
276	P7-7			
277	P7-8			
278	P7-9			
279	P7-10			
280	P7-11			
281	P7-12			
282	P7-13			
283	P7-14			
284	P7-15			
285	P7-16			
286	P7-17			
287	P7-18			
288	P7-19			
289	P7-20			
290	P7-21			
291	P7-22			
292	P7-23			
293	P7-24			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	HARNESS (J7) OPTIONAL FIELD OUTPUTS	CLR	AWG	
270	J7-1		16	
271	J7-2			
272	J7-3			
273	J7-4			
274	J7-5			
275	J7-6			
276	J7-7			
277	J7-8			
278	J7-9			
279	J7-10			
280	J7-11			
281	J7-12			
282	J7-13			
283	J7-14			
284	J7-15			
285	J7-16			
286	J7-17			
287	J7-18			
288	J7-19			
289	J7-20			
290	J7-21			
291	J7-22			
292	J7-23			
293	J7-24			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	HARNESS 605454-005 (J8) OPTIONAL SERIAL I/O	CLR	AWG	
300	J8-1,72A-5	SHLD	22	
301	J8-2,72A-1	WHI/ORG	4 COND	
302	J8-3,72A-2	ORG/WHI	SHIELDED	
303	J8-4,72A-3	WHI/BLU	TTT	
304	J8-5,72A-4	BLU/WHI		
305	J8-6			
306	J8-7			
307	J8-8			
308	J8-9			

<div><div><div>18</div></div></div> ← HARNESS LOCATOR		BOX CHECKED IF HARNESS IS MODIFIED	<input type="checkbox"/>
WIRE No.	HARNESS 605454-007 (P8,TB) OPTIONAL SERIAL I/O	CLR	AWG
300	P8-1,TB-37	SHLD	22
301	P8-2,TB-38	WHT/ORG	(4 COND) SHIELDED
302	P8-3,TB-39	ORG/WHT	TTP
303	P8-4,TB-40	WHT/BLU	
304	P8-5,TB-41	BLU/WHT	
305	P8-6		
306	P8-7		
307	P8-8		
308	P8-9		