Elevator Systems Inc.

TEERS

Traction Elevator Emergency Return System

OPERATION MANUAL

MANUAL #D21.4001.A01 6-14-13

ESI
ELEVATOR SYSTEMS INC.
THE CONTROLLER PEOPLE

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Only qualified personnel should attempt to start-up or troubleshoot it.

CAUTION:
UPS output still has power on it even if the ON/OFF switch is turned off. Unplug the UPS output or shutdown the UPS to completely shutoff the unit.

Table of Contents

Introduction

The TEERS Traction Elevator Emergnecy Return System monitors the incoming electrical power to the elevator control systems. In the event of a failure of the power, the Traction Elevator Emergnecy Return System will provide single phase power to the controller. The controller will then move the elevator to the nearest floor in the direction of least resistance. The controller will cycle the doors and then shutdown. This will eliminate the entrapment of any passengers during a power outage. When normal power is restored the Traction Elevator Emergnecy Return System will switch over and supply the elevator from incoming electrical power.

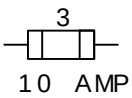
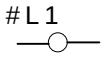
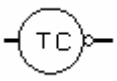
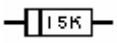
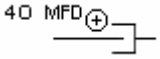
CONVENTIONS

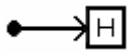
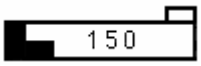
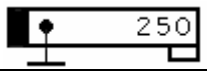
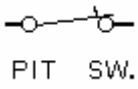
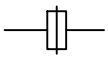
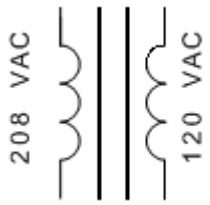
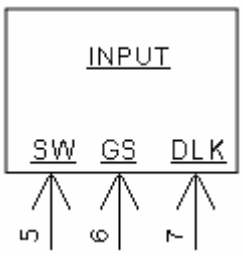
This manual uses the following terms and conventions to indicate parts of the controller and operation:

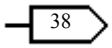
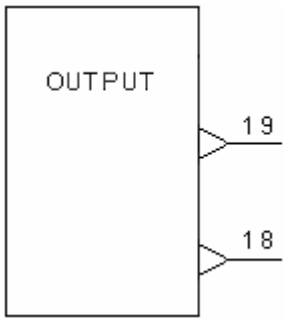
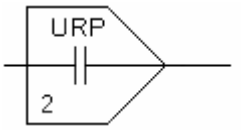
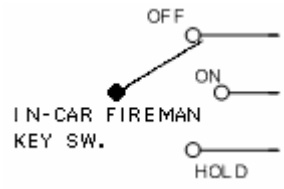
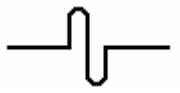
- CPU – The electronic controller board and all of it's associated expansion boards.
- Energized – Power is applied to the relay coil, and the relay has operated.
- De-energized – Power is not applied to the relay coil, and the relay is at rest.
- Activated – A signal is applied to the input terminal on the CPU or CPU expansion board.
- De-activated – A signal is not applied to the input terminal on the CPU or CPU expansion board.
- Symbol – a letter or letter number code referring to a relay or terminal.
  Example: PX
- Symbol number/number – A contact pair on a relay
  Example: PX 1/7
- Symbol{number} – An input / output on the CPU board.
  Example: A{1}
- Symbol{number-number} – An input / output on an expansion board. The first number indicates which I/O board, the second indicates the terminal.
  Example: 1C{1-13}
- #symbol - A terminal on the connection terminal strip.
  Example: #OF1
- #symbol to #symbol – Indicates an external electrical connection between two terminals.
  Example: #27 to #28

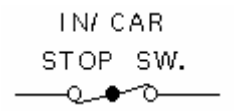
LEGEND

Table 1 outlines the symbols used in the ESI Drawings. Please refer to this table whenever you have any questions regarding symbols on the ESI Drawings.

Symbol	Symbol Name	Notes
	**Fuse**	Top Number represents the fuse number. Bottom Number represents the Amperage.
	**Terminal**	The Lettering (beginning with#) represents the terminal name.
	**Normally Open Contact (Contactor)**	The Lettering represents the Contactor Name (i.e. P) and the Number represents the Contact Number (i.e. 1)
	**Normally Closed Contact (Contactor)**	The Lettering represents the Contactor Name (i.e. P) and the Number represents the Contact Number (i.e. 6)
	**Normally Open Contact (Relay)**	The Lettering represents the Relay Name (i.e. Z) and the Numbers represents the Relay Terminals (i.e. 1 and 7)
	**Normally Closed Contact (Relay)**	The Lettering represents the Relay Name (i.e. I) and the Numbers represents the Relay Terminals (i.e. 5 and 8)
	**Relay Coil**	The Lettering represents the Relay Name (i.e. TC). The small circle to the right of the Relay represents the Right Terminal of the Coil.
	**Resistor**	The Lettering represents the resistor value (i.e. 15kΩ)
	**Capacitor**	The Lettering represents the capacitance value (i.e. 40µF)
	**Diode**	

	**Switch**	The Lettering represents the name of the switch (i.e. BOT FINAL). NOTE: *Switch shown in Closed Position.*
	**Region**	This symbol is used to refer to a different area on the drawing (i.e. Area Labeled H)
	**Resistor**	The Lettering represents the resistor value (i.e. 150Ω)
	**Resistor (Tapped)**	The Lettering represents the resistor value (i.e. 250Ω)
	**Switch**	The Lettering represents the name of the switch (i.e. PIT SWITCH). NOTE: *Switch shown in Closed Position.*
	**Switch**	The Lettering represents the name of the switch (i.e. GOVERNOR SWITCH). NOTE: *Switch shown in Closed Position.*
	**Transformer**	The Lettering on the Left Side represents the Primary Voltage (i.e. 208VAC) and the Lettering on the Right Side represents the Secondary Voltage (i.e. 120VAC).
	**Switch**	The Lettering represents the name of the switch (i.e. FX). NOTE: *Switch shown in Open Position.*
	**CPU Inputs**	The Lettering represents the Input name (i.e. SW, GS, and DLK). The Numbers represent the Input location. (i.e. SW = IN 5, GS = IN 6, DLK = IN 7).

	**CPU Inputs**	The Lettering represents the Input name (i.e. 38
	**CPU Outputs**	The Numbers represent the Output Number on the CPU (i.e. Drawing is showing Outputs 18 and 19).
	**Dry Contact Outputs**	The Lettering represents the Dry Contact Output name. The Number represents the Output Number (i.e. Dry Contact Output URP, Output number 2).
	**Key Switch**	The Lettering represent the Switch Name (i.e. IN CAR FIREMAN KEY SW) and the Pole Names (i.e. OFF, ON and HOLD). *Three position key switch pictured.*
	**Push Button**	The Lettering represents the Button Name (i.e. IN CAR FIREMAN RESET BUTTON).
	**Overload**	Current Sensing Portion of the Overload Protection.
	**Light**	The Lettering represents the name of the Light (i.e. UP).
	**Buzzer**	The Lettering represents the name of the Buzzer (i.e. Door Delay Buzzer).
	**Hall Lantern**	

	**Board Connector**	The Lettering represents the connector name (i.e. J1). The number represents the Pin (i.e. 5).
	**Variable Timer Delay**	
	**Switch**	The Lettering represents the name of the switch (i.e. IN CAR STOP SWITCH). NOTE: *Switch shown in Closed Position.*

Features

The TEERS Traction Elevator Emergnecy Return System includes:

a) On board controller

b) Diagnostic LCD screen and user interface.

c) Lockable shut-off switch.

d) Three phase input

e) UPS bypass control switch.

f) UPS status monitor dry contact output.

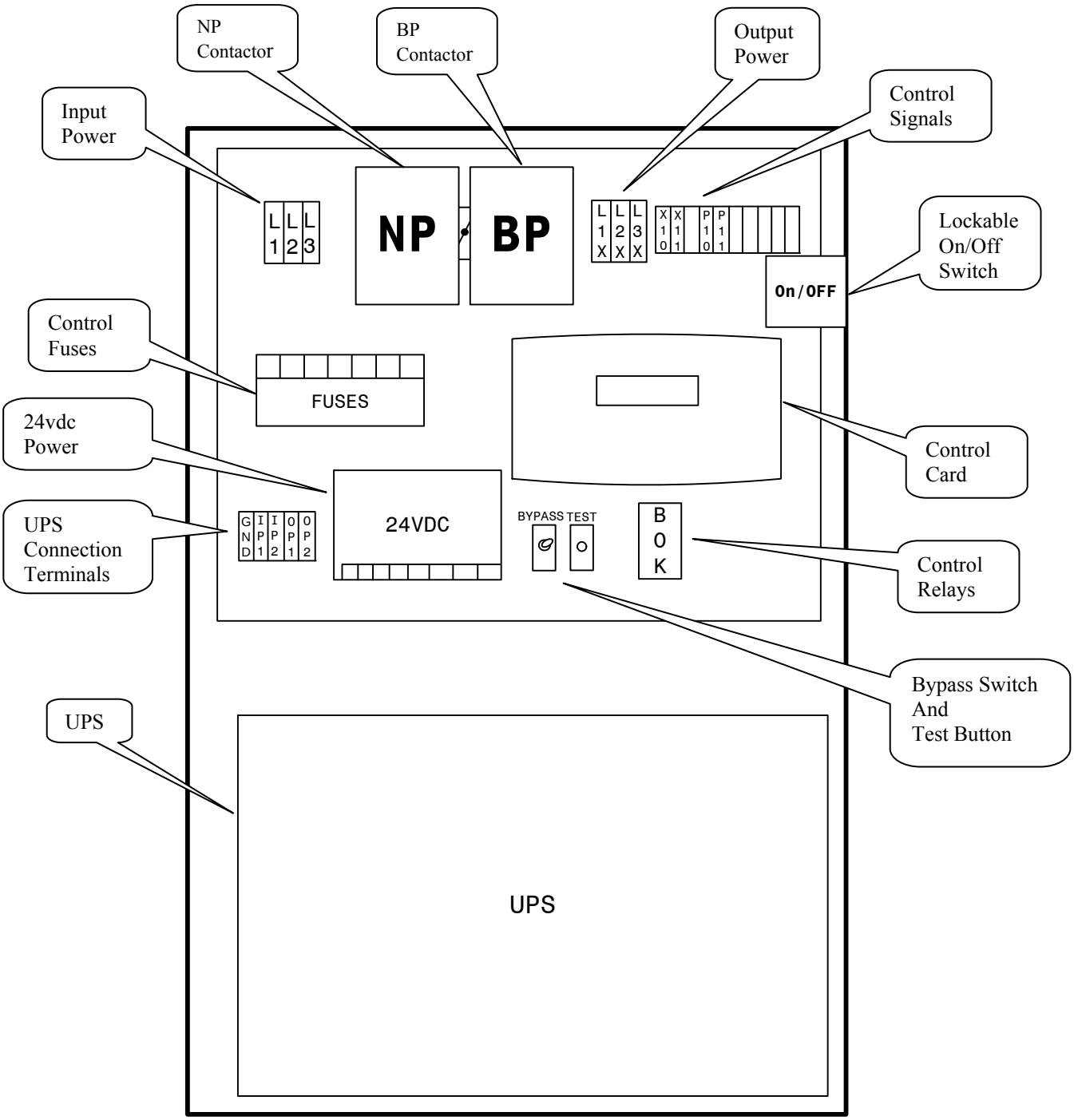
g) Test button to simulate power failure.

h) Optional remote test feature.

i) Disconnect switch monitor.

j) Fully automatic operation.

STANDARD LAYOUT



COMPONENT OVERVIEW

The TEERS Traction Elevator Emergnecy Return System is designed for maximum reliability with minimum maintenance. A solid state control card monitors the in coming power, both voltage and frequency. Normal power is transfer to the control system via the NP contactor. In the event of an outage, the BP contactor will transfer the UPS power to the controller.

The components of the TEERS Traction Elevator Emergnecy Return System are:

a) Input Power Terminal Block : to connect to incoming power.
b) NP Contactor : Normal Power contactor
c) BP Contactor : Backup Power contactor.
d) Output Power Terminal Block : to connect to elevator controller.
e) Control Signals Terminal Block
f) Lockable ON/OFF Switch
g) Fuses : power and logic control fuses.
h) Control Card : Controller with LCD screen to monitor voltage.
i) UPS connection block : For UPS input and output power connections
j) 24vdc power supply : powered by either the Incoming power or UPS output
k) Bypass switch
l) Test button
m) Control relays.
n) UPS : single phase 208 vac output

SEQUENCE OF OPERATION

Under normal power conditions, the control card will detect power to source one "S1" and energize the NP contactor. This contactor will connect the input power directly to the output power terminals. The control card will also detect ups output power on source two "S2". In the event of a incoming power failure, the control card will drop output the "NP" contactor. A drop in voltage, fluctuation in frequency or the loss of a phase will be detected by the control card. After a 5second delay, it will energize the "BP". This contactor will transfer the UPS single phase output to the output terminals. A normally open contact on "BP" provide a dry contact signal to the elevator controller to indicate it is UPS power. Upon the resumption of normal power the control card will wait 10sec, release "BP", wait another 2sec and then energize the "NP" contactor.

CAUTIONS

CAUTION: High Voltage can cause serious and fatal injury. Extreme caution should be exercised when working on this equipment.

CAUTION:
Only qualified personnel should attempt to start-up or troubleshoot it.

CAUTION:
UPS output still has power on it even if the ON/OFF switch is turned off. Unplug the UPS output or shutdown the UPS to completely shutoff the unit.

INTIAL POWER TURN ON

1) Ensure the TEERS ON/OFF switch is in the OFF position.
2) Check that all connections are correct.
3) Place elevator on inspection mode.
4) Make sure the TEERS Bypass switch is in the BYPASS position.
5) Turn on the main line disconnect.
6) Turn the TEERS ON/OFF switch to the ON position.
7) Turn the UPS on by holding the ON button for a few seconds.
8) The TEERS control card screen should be lit.
9) The "S1" and "S2" indicator lights will be on.
10) "NP" will energize.
11) Confirm three phase power is being provided to the controller
12) Switch the Bypass switch to the NORMAL position.

IMPORTANT:

Confirm the fourth pole of the disconnect is connected to #P10 & #P11

Turn TEERS ON/OFF switch to the ON position.

Shut Off the mainline

Confirm that the TEERS is off and the controller is not energized

Functional Test

1) Place the main line disconnect in the ON position.
2) Confirm the TEERS ON/OFF Switch is ON, and the BYPASS switch is NORMAL
3) The “NP” contactor will be energized providing power to the controller.
4) Place the car onto inspection and move the car between floors.
5) Push and hold the TEST button until backup transfer begins.
6) Place the car back onto automatic operation.
7) The “BP” contactor will energize provide single phase to the controller.
8) Terminals #X10 and #X11 will provide a signal to the controller to notify that is on backup power and to go into Backup Power Return Mode.
9) Depending on the controller, It will use either the drive or a load weighting sensor to determine the best direction of travel.
10) The elevator will begin to move at leveling or seek speed until it reaches a floor. It will cycle the doors and shutdown.
11) When normal power is restored and after a 10sec delay TEERS will transfer the elevator back to normal power.

Block Diagram