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Section 1 – Overview

1.1 – System Overview

The 3300 control system is a low-rise, low speed Machine Room Less (MRL) elevator system that utilizes special belts in place of hoist ropes. The motor, brakes, and drive, as well as other components are located in the hoistway. See picture below of the machine and drive in the hoistway:

Equipment at the Top of the Hoistway

The motion controller for the system is all contained in the drive, but at the top floor landing there is what is referred to as an "inspection and test panel." Schindler refers to the panel as the "LDU", or Landing Door Unit.

NOTE: *The LDU will only be located in a different location if the top floor is not available, in which case it will be located at the floor below the top. There is an option for a free standing controller located in a closet or machine space, but this is rarely seen.*

1.1.1 – Inspection and Test Panel 'LDU'

An inspection and test panel is required by ASME Code, and must be located outside of the hoistway. It is used for testing, inspection, and diagnostic purposes. This unit is called the Landing Door Unit, or the LDU. See picture of the LDU with the cover removed below:

1.2 – Control System Overview

As previously mentioned, the 3300 control system is a Machine Room Less (MRL) elevator system. The 'controller' for the system is called the Landing Door Unit (LDU) and is typically located in the top floor door jamb.

To access the LDU, locate the cover at the top floor. In units with side slide doors it will be located in the strike jamb. On center opening doors it could be on either side of the opening.

A special key is required to remove the cover. The key can be purchased from Adams Elevator Equipment and is part number 51519298 (KONE part number KM51275259). It looks like this:

LDU Access Key

Locate the locking mechanism at the top of the LDU cover. It looks like a button or a barrel key, and the access key will fit into it. See picture below.

LDU Lock in Top Floor Door Jamb

Insert the key and rotate it counter-clockwise. Continue to hold counter-clockwise pressure on the lock and push the cover up. It will slide up about ¾ of an inch, and the bottom should pop out slightly. Pull the bottom out further and the top of the cover will clear the top of the door jamb, allowing the cover to be removed. There may be a grounding wire on the bottom of the cover that prevents you from moving it too far, but the cover can be set aside.

1.3 – Required Keys

The most commonly seen key switches use the following standard keys which are available from Adams or KONE Spares:

Function	Key Number	KONE Part #
Independent	J200	US513514
Access in Car	J222	KM51261829
Access at Landing	501CH	KM51261815

Less commonly seen, the following keys are used on older cars:

Function	Key Number	KONE Part #
Independent	OC01	KM51261829
Access in Car	OC04	KM51261828
Access at Landing	501CH	KM51261815

1.3.1 – Escape Hatch Key

The escape hatch on the car top was shipped with 2 keys tie-wrapped to the lock. See picture below:

Escape Hatch Keys – Remove and Store in a Safe Location

NOTE: *These keys need to be kept in a safe location, as if the elevator shuts with a drive or motor issue at the top floor, the only way to access the equipment in the hoistway is through the escape hatch. There is not a standard key for the escape hatch, so the keys need to remain on site in a safe location.*

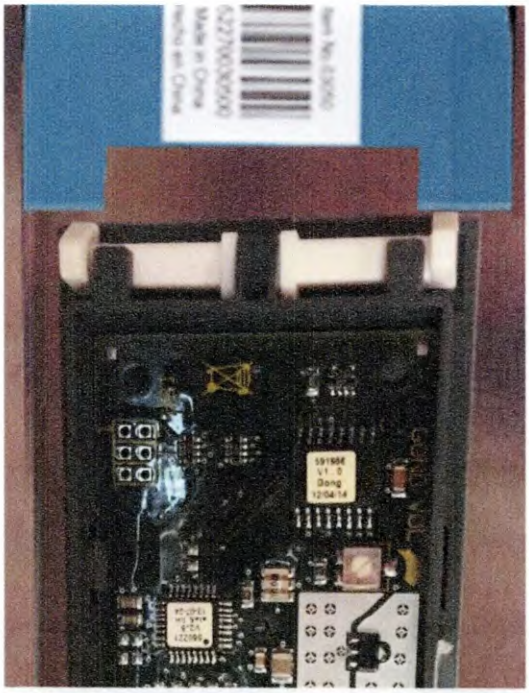
1.4 – Special Tools and Equipment

No special tools or diagnostic equipment are required to work on the 3300 system. The User Interface (Diagnostic Display) is unlocked, and is not possible to be password protected. There are no special diagnostic tools available, as everything necessary to inspect, test, and maintain the system is available through the User Interface.

There are 2 special plug connectors that are required for CAT5 testing purposes. These plugs are inserted into the control panel and will each pick one of the brakes so the other brake can be tested to ensure that it will hold 125% of the elevator's rated capacity. These plug connectors are attached to a red flag, and should be stored with the wiring diagrams. See picture below of the plug connectors.

Test Plugs to Lift Brakes Individually for Performing 125% Load Test

The landing buttons and hall lanterns require a special tool to remove them from the landing door frame. This tool is nothing more than a 2" plastic putty knife with a notch cut into the blade. The putty knife is slipped behind the top of the landing button or lantern, and applying downward pressure forces the plastic tabs holding the button or lantern assembly to the door jamb to release. See picture below.



LOP/LIN Removal with Notched Putty Knife

While pressing down on the putty knife, gently pull the top of the button or lantern assembly away from the door frame.

When reinstalling the assembly, place the bottom tabs into the door frame and push the top into the door frame. The tool is not required to reinstall the button or lantern, as it will snap into place.

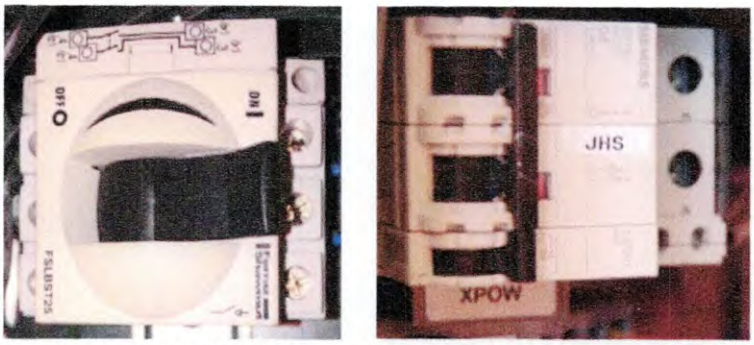
system detects this loss of power and if the elevator is not at a floor, after about 15 seconds it will move it to the nearest floor in the direction of the load in the elevator. If the car is near empty, since the counterweights are heavier, it will run the elevator up to the nearest floor and open the doors. If the car is heavier than the counterweight it will run the elevator down to the nearest floor and open the doors.

NOTE: *Since the load weigh device is necessary to determine how much weight is in the elevator for evacuation purposes, the system cannot be run on Automatic Operation with the load weigh device disabled. Also, if the batteries are not fully charged or are failing, the control system will detect this and not allow the elevator to run on Automatic Operation.*

The batteries are located in the hoistway in a steel box mounted near the top floor and attached to the counterweight rail. This box is called the TSU, or Transfer Switch Unit, and looks like this:

Transfer Switch Unit (TSU)

There is a thumb screw located on the top of the box that secures the front cover. Loosening this thumb screw allows the cover to swing down, revealing the equipment inside the TSU and the batteries. The batteries are located at the bottom of the TSU under the inverter (converts DC power to AC to feed the drive in the event of a power loss) and look like this:



JHS Circuit Breaker (Old Style on Left)

NOTE: *The auxiliary contact on the old style of JHS breaker (on left in picture above) was prone to failure. Frequently, after it had been turned off, the contact would not close. This results in the SEMNA board not picking the 'SH' relay in the TSU, causing a communication fault to the drive (Error 3620).*

3.2.7 – Terminal Block Assembly

Beneath the JHS circuit breaker is a terminal block assembly. The terminal block is used for various connections in the control system.

3.2.8 – 24V-NGL Power Supply

The 24V-NGL power supply is wired to the output of the JHS circuit breaker, and creates the 24 VDC that the control system uses for its logic and safety circuits.


24V-NGL Power Supply

3.2.9 – SPDLIM2 Board

The SPDLIM2 (Speed Limiter 2) board Is installed in the very bottom of the LDU. It is used to monitor the speed of the elevator to ensure that it does not exceed 150 ft/min while on inspection operation or with the doors open. This monitoring of the car speed is required by the ASME A17.1 Code, and the board is only installed on systems that are 150 ft/min. It uses feedback from the motor encoder to determine car speed, and is connected to the WDPNA at the SPDL connector.

Section 8.2.2.1 for the procedure to check the brake pad wear. See picture of one of the brake microswitches below.

Brake Microswitch

NOTE: *If the brake contacts are not operating properly the car will not run, even on Inspection Operation. To run the car on Inspection Operation so the machine can be accessed to adjust the brake contacts, place the car on open-loop operation (Parameter 102). This will allow the car to be moved to a location where the brake can be checked and the contacts can be adjusted.*

3.1.2 – Drive Cabinet

The drive cabinet on the 3300 is mounted in the hoistway. There are several different boards inside the drive cabinet to interface it to the motor and the rest of the control system.

3300 Drive Cabinet

3.1.2.1 – CANIVF Board & Yaskawa L7 Drive

The drive is a Yaskawa L7, and has a special interface board so it can communicate over the control system's CAN network. The board is called the CANIVF, and plugs into the drive's communication port to convert the control system's CAN communication to RS485 for the drive.

CANIVF Board

3.1.2.2 – BCMC Board

Also in the drive enclosure is the BCMC board. This is the Brake Control/Motor Control board. It interfaces the drive to the brake and motor hardware. There are several relays on the BCMC board, and the brakes and the brake microswitches are wired to the board.

BCMC Board

3.1.3 – Transfer Switch Unit (TSU)

The Transfer Switch Unit is mounted at the top of the hoistway on the counterweight guide rail. As previously mentioned, there are two batteries in the Transfer Switch Unit that are used for automatic passenger evacuation in the event of a power failure, and for PEBO (Pulse Emitted Brake Operation) to remove passengers in the event that the control system cannot move the elevator.

The Transfer Switch Unit is used to transfer power from the building supply to the backup batteries. In addition to the batteries inside the TSU, there is a reverse phase relay to monitor the incoming power, and several relays that are used to open the feed from the building supply and connect the backup power source to supply the drive. The backup power source is created by taking the output of the batteries and feeding it into an inverter. The inverter creates a two-

phase, 230 VAC supply to the drive, which is enough power to run the elevator at low speed to the nearest floor.

See picture of TSU below.

Transfer Switch Unit Mounted to Counterweight Guide Rail

3.2 – Landing Door Unit (LDU) Equipment

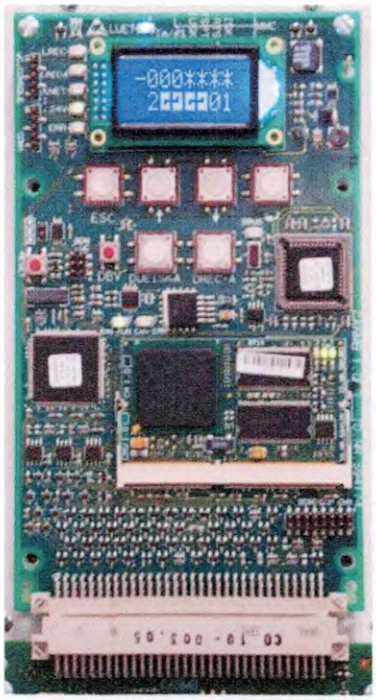
The Landing Door Unit (LDU) is typically located at the top floor. It is basically the controller for the elevator system, but is referred to as the inspection and test panel that is required by ASME Code.

To access the LDU, refer to Section 1.2 and locate the release in the top floor door jamb. Remove the cover with the special key to access the LDU.

There are several PC boards and other devices in the Landing Door Unit.

3.2.1 – CANMB

The CANMB (CAN Mother Board) is the board that has the diagnostic display (user interface). There are also a number of pushbuttons and LED's on the CANMB. The CANMB acts as the interface for the system's processor, and is used to diagnose and configure the control system. See picture of CANMB below.



CANMB Board

3.2.1.1 – CANMB Buttons

The first row of buttons on the CANMB is used for the user interface. The user interface is explained in greater detail in Section 4.3.

Below the user interface buttons there are several other pushbuttons on the CANMB. Not all of these buttons are used in North America. See picture of the buttons below.

CANMB Pushbuttons

The function of the buttons is as follows:

RESET – Processor reset (do not push unless you are sure of you are doing and why a reset is required, as it may cause the system to stop operating)
DBV – Governor set (for testing)
DUEISK-A – Circuit breaker for safety circuit
DRECA – Not used in North America

3.2.1.2 – CANMB LED's

There are also a number of LED's on the CANMB. There are 5 LED just to the left of the display. Not all of these LED's are used in North America. See picture of LED's below:

CANMB LED's

The Function of the LED's is as follows:

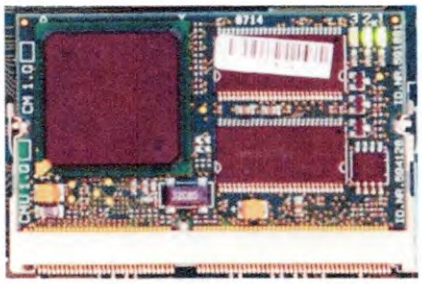
LREC – Not used in North America
LREAC-A – Not used in North America
KNET – Not used in North America
24V – 24 VDC to CANMB present
ERR – System error (fault, etc.)

There is another light that is just above the display. This light is blue, and is labeled LUET. This LED is illuminated when the elevator is in the door zone. See picture of the LUET LED below:

LUET (Door Zone) LED

3.2.2 – CM11 Board

The CM11 board is plugged into the CANMB. The CM11 is the processor for the system. It usually has a label on it with the installed version of software, but the label may not be accurate, as the software can be downloaded via a USB drive. See picture below of the CM11 board:


CM11 Board

3.2.3 – WDPNA Board

The WDPNA (Wiring Distribution Panel, North America) board plugs into the bottom of the CANMB. It has the majority of the field wiring connections to the LDU. See picture of the WDPNA board below.

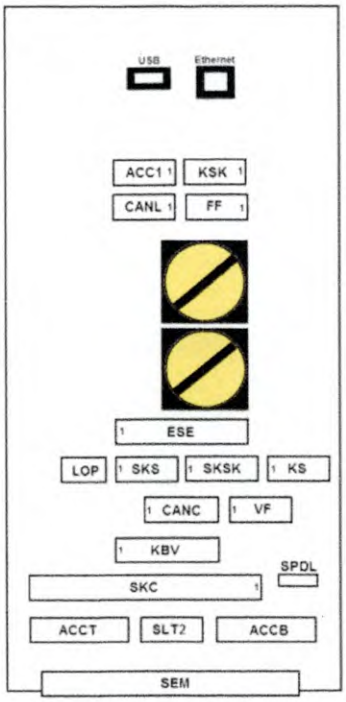
WDPNA Board

The Hoistway Door and Car Door Bypass switches are located on the WDPNA board. Also on the WDPNA is a USB port. The USB port can be used to download software to the system, and also archive the software and parameter configuration.

The connectors on the WDPNA are as follows:

Connector	Description
ACC1	Top & bottom hoistway access switches
KSK	Smoke detectors
CANL	Connection point of CAN Bus to other boards in LDU
FF	Fire Phase 1 switch & indicator in hall
ESE	Controller inspection station
LOP	CAN network for hall fixtures (LOPs and LINs)
SKS	Safety circuit bottom of hoistway
SKSK	Safety circuit top of hoistway
KS	Auxiliary safety devices (water in pit, slack belt, & governor tension sheave switches)
CANC	CAN network to car
VF	Drive connections
KBV	Governor connections
SKC	Traveling cable connections (some are on terminal block)
ACCT	Top hoistway access switch
SKT2	Interlocks for rear doors
ACCB	Bottom hoistway access switch
SEM	SEMNA board plug connector

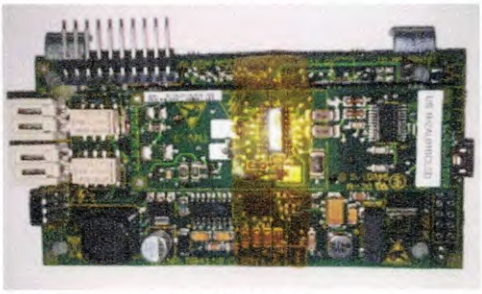
Note that the #1 terminal on all of the connectors are not in the same position. The connectors on the WDPNA board are arranged as follows:



WDPNA Connectors

3.2.4 – CLSD Board

The CLSD (Communication and Line Switching Device) board is the modem board for the system. It is plugged into the WDPNA board just to the left of the door bypass switches. It shares the phone line for use by the in-car emergency phone and the control system's remote monitoring. This board should usually be removed in order to prevent errors from filling up the log when the system cannot communicate with Schindler's Remote Monitoring Center.



CLSD Board

3.2.5 – SEMNA Board

The SEMNA (Service Evacuation Module, North America) board plugs into the bottom of the WDPNA board. The SEMNA board serves 2 primary functions. First, it is used to drift the elevator by lifting the brake in order to evacuate passengers in the event that the motor or the controller is not able to move the car. The switches at the top of the board are used to pulse the brake (PEBO, or Pulse Emitted Brake Operation) to allow the elevator to drift. For instructions

on how to move the elevator with PEBO operation, see the sticker on the back of the LDU cover.

The SEMAN board is also used to move the elevator at slow speed to the nearest floor in the direction of the load if a power failure occurs. This operation occurs automatically, and is a standard feature on the 3300 control system.

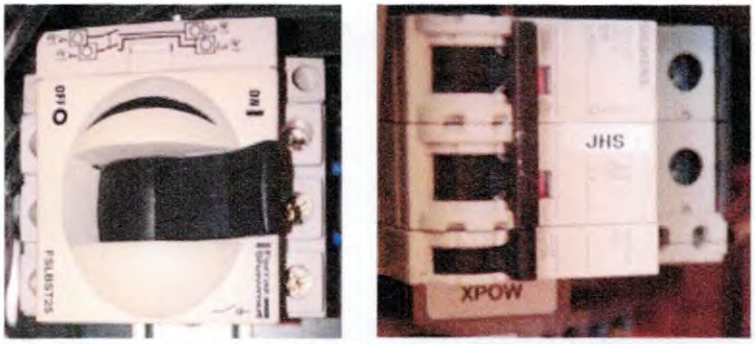
SEMNA Board

The batteries in the hoistway are wired to the SEMNA board at the DCAC connector.

NOTE: *If the controller is going to be powered down for more than 24 hours, unplug the DCAC connector so that the batteries do not drain. The system will not run if both batteries are not charged, and if the batteries are aging draining them can cause them not to charge.*

3.2.6 – JHS Circuit Breaker

The JHS circuit breaker is used to protect and disconnect the 208 VAC supply to the LDU. The breaker will open if an overcurrent occurs, but it is primarily used to remove power while working in the LDU. See pictures of the two different styles of JHS breaker below.



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