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General Specifications

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This section describes features common to most MCE control systems (iControl specifications published separately). Features unique to a certain type of control are in the specifications section unique to that control.

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Code Compliance

The elevator controller shall use a microprocessor based logic system and shall comply with all applicable elevator and electrical safety codes. Following is a partial list of codes with which MCE products comply.

For the United States:

- ANSI/ASME A17.1
- CAN/CSA-B44.1/ASME-A17.5
- NEC

For Canada:

- CAN/CSA-B44
- CAN/CSA-B44.1/ASME-A17.5
- CEC C22.1

For Australia:

- AS 1735

For the United Kingdom:

- BS 5655/EN 81

For IMC-SCR; IMC-AC; VVMC-1000; M3 GROUP:

- CE Label

ADA Requirements

The elevator controllers shall comply with Title III of the Americans with Disabilities Act (ADA).

Leveling Accuracy - The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of 0.5" (12.7 mm) or better under all loading conditions up to the rated load.

Hall Lanterns - The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down.

Car Position Indicators - The controller shall have a position indicator output to drive the required position indicator which shall indicate the corresponding floor numbers as the car passes or stops at a floor. An audible signal shall sound as the position indicator changes floors.

Optional - The controller shall have a voice annunciator output to announce direction and floor number.

Environmental Considerations

- Ambient temperature: 32F degrees to 104F degrees (0C degrees to 40C degrees). Higher temperature range compatibility is available.
- Humidity: non-condensing up to 95%
- Altitude: Up to 7500 feet (2286 m)

Motion Control Engineering specializes in control products for adverse environmental conditions. For example, dust-proof, water-proof, corrosion-resistant, explosion-proof, or air conditioned controller cabinets can be engineered to meet specific applications. Please contact MCE Sales Engineering for details.

Diagnostics

The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator status conditions as an integral part of the controller.

Intended Operation of Critical Components

Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

Status Indicators

Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is closed, when the door locks are made, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection/Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. A means shall be provided to display other special or error conditions detected by the microprocessor.

Out of Service Timer

An out of service timer (T. O. S.) shall be provided to take the car out of service if the car is delayed in leaving the landing while calls exist in the system.

Door Operation

Door protection timers shall be provided for both opening and closing directions to protect the door motor and help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time if the doors are prevented from reaching the open position. In the event that the door closing attempt fails to make up the door locks after a predetermined time, the door close protection timer shall reopen the doors for a short time. If, after a predetermined number of attempts, the doors cannot successfully be closed, the doors shall be opened and the car removed from service.

A minimum of four different door standing open times shall be provided. A car call time value shall predominate when only a car call is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen caused by the safety edge, photo eye, etc., a separate short door time value shall predominate. A separate door standing open time shall be available for lobby return.

Optional - If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at slow speed in the closed direction. A buzzer shall sound during nudging operation.

Door Pre-opening

When selected, this option shall start to open the doors when the car is in final leveling, 3" (76.2 mm) from the floor. If pre-opening is not selected, the doors shall remain closed until the car is at the floor, at which time the doors shall commence opening.

Car and Hall Call Registration

Car and hall call registration and lamp acknowledgment shall be by means of a single wire per call, in addition to the ground and the power bus. Systems that register the call with one wire, and light the call acknowledgment lamp with a separate wire can be handled using relays.

Fire Service Operation

Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to applicable local codes.

Independent Service

Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call push-button or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

Simplex Selective Collective Operation

Simplex selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call pushbuttons shall cause the car to start and run automatically, provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which car or hall calls set for the direction of travel are reached, regardless of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls.

Simplex Home Landing Operation

Optional - If no calls are registered, this operation shall cause the car to travel to a predetermined home landing floor and stop without door operation. If the car is traveling to the home landing and a call appears from the opposite direction, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed nonstop in response to any normal call.

Duplex Operation

Duplex operation is a configuration of series PHC and PTC control systems. Duplex configuration, with a computer for each controller, assigns cars on a real time basis using estimated time of arrival (ETA). Should one computer lose power or become inoperative in any way, the other computer shall be capable of accepting and answering all hall calls. When both computers are in operation, only one shall assume the role of dispatching the hall calls to both elevators.

Number of Stops

IMC, VVMC and VFMC traction controllers serve up to 64 landings; PTC traction controllers serve up to 32 landings; PHC and HS hydraulic controllers serve up to 16 landings.

Leveling

The car shall be equipped with two-way leveling to automatically bring the car level at any landing, within the required range of leveling accuracy, with any load up to full load.

Test Switch

A controller test switch shall be provided. In the test position, this switch shall allow independent operation of the elevator with the door open function deactivated for purposes of adjusting or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with any other car in a duplex or group installation.

Relay Panel Inspection

A relay panel inspection switch and an up/down switch shall be provided in the controller to place the elevator on inspection operation and allow the user to move the car. Activation of the car top inspection switch shall render the relay panel inspection switch inoperative.

Uncanceled Call Bypass

A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call, including stuck pushbuttons. Call demand at another floor shall cause the car, after a predetermined time, to ignore the defective call and continue to provide service in the building.

Anti-nuisance (Photo Eye)

The controller shall cancel all remaining car calls, if a user-determined number of car calls are answered without the computer detecting a change in the photo eye input (indicating that no one is exiting the car).

On-board Diagnostics

The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using non-volatile memory. The microprocessor board shall provide the features listed below:

- On-board diagnostic switches and an alphanumeric display to provide user-friendly interaction between the mechanic and the controller.
- An on-board real time clock shall display the time and date and be adjustable by means of on-board switches.
- Field programmability of specific timer values (i.e., door times, MG shutdown time, etc.) may be viewed and/or altered through on-board switches and pushbuttons.

Optional Peripherals

Optional - As an integral part of the controller, the capability shall be provided to attach on-site or remote computer peripherals for additional adjustment or diagnostic capabilities.