



BUILT STRONG

SPECIFICATIONS

SMARTRISE 

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SPECIFICATIONS

PHILOSOPHY AND DIRECTION

Extensive research coupled with experience in the design, development, field support, sales and manufacturing of elevator controllers has enabled Smartrise to produce the industry's most advanced controller platform.

Before Smartrise, no elevator controller platform seamlessly integrated hardware simplicity, diagnostic convenience and performance to serve the growing vertical transportation industry.

As a result, Smartrise developed a universally serviceable elevator controller based on the known challenges of **INSTALLATION**, **MAINTENANCE** and **SERVICE** of elevator controllers that Building Owner/Managers experience.

Based on this understanding, Smartrise operates under the following principles:

- The end user should be able to **CONTRACT** any elevator service provider to perform maintenance on the elevator controller.
- Smartrise shall not impose restraints on the ability to service and maintain its elevator controllers.
- Parts must be available for inventory or exchange.
- Diagnostics must be built-in, requiring no proprietary service tool and no external tool for any adjustment or maintenance. All manuals and drawings shall be provided.
- Technical and sales training, engineering, and technical phone and field support shall be available to all.
- Smartrise will provide direct support to the "end user" and their designated maintenance company.
- Smartrise will provide support in the selection of equipment for a given project.

Smartrise provides solutions for special requirements that may arise after the completion of a project or during the development of the specification of a project.

CONTROLLERS AND SUPERVISORY SYSTEMS

- A.** Controllers shall be ASME 17.5 Labeled, approved by an OSHA NRTL. All assemblies, power supplies, chassis switches, and relays shall be mounted on a type of metal frame in a NEMA-rated cabinet that is self-supporting and that completely encloses the equipment. A means to control the inside temperature of the cabinet and its contents shall be provided. Solid-state components mounted within the controller shall be designed to operate between 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.
- B.** All controller switches and relays shall have contacts of a design and material to ensure maximum conductivity, long life and reliable operation without overheating or excessive wear, and shall provide a wiping action to prevent sticking due to fusion. Switches carrying highly inductive currents shall be provided with arc shields or suppressors.
- C.** Where time-delay relays are used in the circuits, they shall be of acceptable design, adjustable and reliable. Condenser timing or electronic timing circuits shall be consistent.
- D.** Each device in all panels shall be properly identified by name, letter, or standard symbol which shall be neatly stencil painted or decaled in an indelible and legible manner. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked on all circuit protection devices. All conductors to and within controllers and supervisory panels shall be neatly formed, laced, and identified.
- E.** If elevator travel is anticipated to be extended in the future, controllers shall be provided with wiring and components to accommodate the future travel to additional floors.
- F.** Printed circuit board made by the elevator controller manufacturer shall be kept to a minimum so that:

 - 1.** Longevity of components is assured and not compromised.
 - 2.** Hardware changes over the product lifetime are kept to a minimum.

3. The life of the product is not dependent on the life of the manufacturer.
 4. They are the same across all product lines, to ensure the least amount of inventory.
 5. Training to learn to work with the controller will not be required although field and in-house training will be available if it is desired by the Building Owner's elevator maintenance technicians and/or their selected elevator maintenance company personnel.
 6. All parts shall be available through the controller manufacturer or a third-party vendor.
- G.** The controller electrical drawing and bill of material shall be made available upon request from the end user.
- H.** If a printed circuit board interface for the car operating panel is provided or required by the elevator controller to be installed in the car operating panel, there shall be on that printed circuit board an on-board diagnostic tool displaying in plain English the mode of elevator operation with a menu system written in simple elevator industry jargon (language) to determine the status of signals so as to allow parameter adjustment, and display of faults.
- I.** If a printed circuit board interface is provided for the top of the elevator car, there shall be on that printed circuit board an on-board diagnostic tool displaying in plain English the mode of operation with a menu system written in simple elevator industry jargon (language) to determine the status of signals for parameter adjustments, and to display faults.

MICROPROCESSOR CONTROL SYSTEM

- A.** Provide a microprocessor-based control system with position and speed feedback in accordance with these specifications:
 - 1.** All controllers shall be non-proprietary.
 - 2.** Proprietary tools shall not be necessary for adjusting, maintenance, repair, and testing of equipment.
 - 3.** Controller manufacturer shall provide factory training, engineering and technical support, and all manuals and wiring diagrams to the Building Owner's designated elevator installation and maintenance service provider.
 - 4.** Replacement parts shall be available for the life of the equipment.
- B.** The controller shall provide smooth, step-less acceleration and deceleration of the elevator, automatically and irrespective of the load in the car. All control equipment shall be enclosed in NEMA-rated cabinets with lockable, hinged door(s) and shall be provided with a means of air circulation. All non-conducting metal parts in the machine room shall be grounded in accordance with National Electric Code. All cabinets shall be securely attached to the building structure.
- C.** Circuit boards for the control of each elevator system, dispatching, signals, door operation and special operation shall be installed in a NEMA Enclosure. Circuit boards shall be classified as self-extinguishing and adequate thickness to support the components mounted thereon. They shall be spaced to prevent accidental contact between individual circuit boards and modules.
- D.** Field wiring or alteration shall not be necessary in order to replace defective modules.
- E.** Each device, module and circuit protection device (with voltage and ampere rating) shall be identified by name, letter or standard symbol in an approved indelible and legible manner on the device or panel. Identification markings shall be coordinated with identical markings on wiring diagrams.

- F.** Light-emitting diodes (LED) shall be for visual monitoring of individual modules.
- G.** Circuits shall assure fail-safe operation to prevent elevator movement should a component malfunction.
- H.** Field wiring changes required during construction shall be made only to connection points and not to the individual module circuitry or components. If it is necessary to alter individual modules, they shall be returned to the factory where design changes shall be made and module design records changed so replacement units will be available.
- I.** All logic symbols and circuitry designations shall be in accordance with ASME and NEC Standards.
- J.** Solid-state components shall be designed to operate within a temperature range of 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.
- L.** Wiring connections for operating circuits and for external control circuits shall be brought to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce through serrated washers shall not be used.

TRACTION VVVF AC MOTOR CONTROL WITH REGENERATIVE DRIVE

Variable Voltage Variable Frequency Motor Control:

- A.** Elevator control shall be affected by means of a compact solid-state motor control unit for each and every elevator with electrical characteristics to suit the power supply. The system shall consist of the necessary three phase, full-wave bridge rectifiers and be equipped with regenerative drive.
- B.** Solid-state motor control unit shall operate with high efficiency and low power consumption, have the capacity to handle peak currents typical of elevator service and contain a balanced, coordinated fault protection system which shall accomplish the following:
 - 1.** Protect the complete power circuit, specifically the power semi-conductors from failure under short circuit (bolted fault) conditions.
 - 2.** Protect against limited faults arising from partial grounds, partial shorts in the motor armature or in the power unit itself.
 - 3.** Protect the drive against sustained overloads. A solid-state overload circuit shall be used.
 - 4.** Protect motor and power unit against instantaneous peak overload.
 - 5.** Provide semi-conductor transient protection.
 - 6.** Provide phase sequence protection to ensure incoming line is phased properly.
 - 7.** Removable printed circuit boards shall be provided for the VVVF control.

FEATURES

TYPE	SRA	SRD
Control	Drive Traction AC	Drive Traction DC
Motor	Induction Gear & Gearless PM	Gear and Gearless
Speed	1,000	1,000
Openings	96	96
Car in Group	8	8
HP	75	150
Line Voltage	208 - 460	208 - 460
Speed Regulation	1%	1%
Distance Tracking	Absolute	Absolute
Power Regeneration	Dynamic Braking, Full	Dynamic, Full w/Quattro
Operational Ambient Temp.	32 - 104° F	32 - 104° F
Altitude No Derating	3,300 ft	3,300 ft
Relative Humidity	85% Non-condensing	85% Non-condensing
Vibration	<57Hz	<57Hz
Peak Acceleration	0.5 g	0.5 g
Tuning	Adaptive	Adaptive
Hall Fixtures	Serially Connected	Serially Connected
Cabin Fixtures	Serially Connected	Serially Connected
Diagnostics	Built-in on top of car, inside Cabin & Machine Room	Built-in on top of car, inside Cabin & Machine Room
Compliance	ASME, CSA	ASME, CSA
Delivery	5 Weeks Standard, with option for shorter lead time	6 Weeks Standard, with option for shorter lead time
General Warranty	15 months w/option to extend	15 months w/option to extend
Standard Configuration	Machine Room Controller, Car Top Controller, Car Operating Panel Controller, Selector & Hall Board Fixture Interface	Machine Room Controller, Car Top Controller, Car Operating Panel Controller, Selector & Hall Board Fixture Interface
Enclosure	All Wall Mount Single Door, NEMA 1 Standard. Adverse Conditions for dust, corrosion & water optional	All Wall Mount Single Door, NEMA 1 Standard. Adverse Conditions for dust, corrosion & water optional
Enclosure Sizes	39" X 30" X 14"	48" X 36" X 16"

SRH
Solid-State Hydraulic
Three Phase & Single Phase
200
10
8
125
208 - 460
Valve Controlled
Absolute
N/A
32 - 104° F
3,300 ft
85% Non-condensing
<57Hz
Valve and Pump Controlled
Valve and Pump Controlled
Serially Connected
Serially Connected
Built-in on top of car, inside Cabin & Machine Room
ASME, CSA
4 Weeks Standard, with option for shorter lead time
15 months w/option to extend
Machine Room Controller, Car Top Controller, Car Operating Panel Controller, Selector & Hall Board Fixture Interface
All Wall Mount Single Door, NEMA 1 Standard.
Adverse Conditions for dust, corrosion & water optional
30" X 24" X 10"

- Fire Service I & II
- Hoistway Access
- Inspection
- Independent Service
- Hoistway Locks & Gate Switch Bypass
- Interface to Door Operators
- Calls Lockouts
- Photo-eye, Electric Eye, Safety Edge
- Car Position Indication
- Voice Annunciation
- Hall Lanterns Interface
- Door Hold
- In-Car Inspection
- Front & Rear Door Operation, Staggered & Walk-Through
- Short Floors Operation No Less Than Six (6) Inches
- Selective, Collective Calls
- Group Operation Smart Hall Calls ETA Based, Lobby Car Calls Dispatching Custom Per Job
- Load-Weighing Interface
- Pre-Torque Operation
- Local & Remote Monitoring
- Custom Security Interface
- Emergency Brake Interface – Traction
- Earthquake Operation – Traction
- Interface to Serial Fixture from CE Electronics & E-Motive
- Anti-creep – Hydraulic
- Viscosity Control – Hydraulic
- Low Oil – Hydraulic
- Low Pressure – Hydraulic
- Battery Lowering – Hydraulic
- Emergency Power-Lowering Operation
- Traction Automatic Rescue
- Traction Manual Rescue
- Hospital Service
- Distance & Velocity Feedback
- Customization on Demand

CIRCUIT BOARD REQUIREMENTS

If a printed circuit board interface to the car station operating panel is provided or required by the elevator controller and is to be installed inside the car station operating panel, then there should be an on-board diagnostic tool on that printed circuit board.

This tool should display in plain English the mode of operation and have a menu system written in simple elevator industry jargon showing the status of signals, allowing for parameter adjustments, and displaying faults.

If a printed circuit board is provided on the top of the car, there should be an on-board diagnostic tool on that printed circuit board. This tool should display in plain English the mode of operation and have a menu system written in simple elevator industry jargon showing the status of signals, allowing for parameter adjustments, and displaying faults.

DRAWINGS AND COMPONENTS

The drawings and their related components list shall be made available upon request from the end user so that the manufacturer does not hold the end user hostage when replacement of parts and repair is necessary.

The following are features common to most elevator controller equipment:

- Code Compliance
- ADA Requirements
- Environmental Considerations
- Diagnostics
- Intended Operation of Critical Components
- Status Indicators
- Out-of-Service Timer
- Door Operation
- Fire Service Operation
- Independent Service
- Leveling
- Earthquake Operation
- Emergency Power
- Hospital Emergency
- Load-Weighing
- Security
- Controller
- Dispatching
- Physical Specification

CODE COMPLIANCE

The elevator controller shall use a dual microprocessor-based logic system and shall comply with applicable elevator and electrical safety codes. Smartrise complies with ASME A17/CSA-B44.

ADA REQUIREMENTS

The elevator controllers shall comply with the Americans with Disabilities Act, Title III:

- Leveling accuracy is within a tolerance of 0.5” or better under all loading conditions up to the rated load.
- Hall Lanterns for visible and audible signals at each hall entrance to indicate which elevator car is answering a call.
- Car Position for visible signals to 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 to announce direction, floor label, fire and nudging messages.

ENVIRONMENTAL CONSIDERATIONS

- Ambient Temperature: 32° F to 104° F.
- Humidity: Non-condensing up to 85%.
- Altitude: Up to 7500 feet (2286 m).
- Smartrise provides products for adverse environmental conditions.

DIAGNOSTICS

The microprocessor boards shall be equipped with on-board diagnostics to provide a user-friendly interaction between the mechanic and the controller.

INTENDED OPERATION OF CRITICAL COMPONENTS

The control system shall be manufactured so that the monitoring of critical components and the operation resulting from a failure of a critical component are in compliance with ASME A17/CSA B44.

STATUS INDICATORS

Visible LCD indicators show connectivity status of board wiring as well as an on screen message display shall be provided to indicate the status of the elevator controller and mode operation.

OUT-OF-SERVICE TIMER

An out-of-service timer shall be provided to take the car out of service if the car cannot leave the landing while calls exist in the system.

DOOR OPERATION

Door protection logic shall be provided to determine malfunction of door operation. Audible noise and reduced speed, otherwise called Nudging, shall be used to close the doors if the doors are prevented to close normally.

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 so that actuation of a key switch in the car operating panel will take the car out of automatic service and then respond only to constant pressure car calls placed by an attendant in the car.

LEVELING

The car shall level automatically at a destination landing, within the required range of leveling accuracy, with any load up to full load.

EARTHQUAKE OPERATION

The controller shall be provided with logic for applicable code requirements for earthquake operation.

EMERGENCY POWER

Optional – The elevator system shall be equipped with logic to meet the demand of building transportation when the building is operating under emergency power. The demand is based on the number of elevators the emergency power is designed to operate with, it can be a manual selection of the number of elevators, a number of designated elevators or an automated process by the elevator system.

HOSPITAL EMERGENCY

Optional – A medical emergency capture switch (Blue Code) shall be installed at each floor where medical emergency service is needed. Elevator Logic shall be provided to enable Blue Code operation as per the Hospital requirements.

LOAD-WEIGHING

The controller shall be equipped with the ability to determine load in the car, via an external load-weighing device, to improve dispatching, ride quality and safety.

SECURITY

Optional – The controller shall be equipped with logic to meet the security needs of a building transportation system. Such needs may be to lock out a car or hall call to a floor.

CONTROLLER

The elevator controller shall be designed in compliance with ASME A17/CSA B44 to implement the safety features as required by code. The safety logic shall utilize forcibly guided relays to disengage the motor and brake for Traction controller and to disengage the valves and pump for Hydraulic controller when a fault condition is detected.

Changes in the controller configuration shall only be authorized by the manufacturer. The elevator controller shall not require interaction via an external tool such as a computer or a hand-held.

DISPATCHING

Individual elevators as part of a group of elevators shall be dispatched to efficiently deliver performance based on the following criteria of the NEII operational criteria:

- Average Time of Hall Call Registration
- Coincident Call
- Headway Time
- Demand and Transfer
- Load and Schedule
- Down Peak
- High and Low Call
- Up Peak, Up Peak Booster
- Up Peak Zoning



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