MITSUBISHI ELECTRIC
Changes for the Better

Quality in Motion

SERIES GPM III

HIGH-SPEED TRACTION ELEVATORS

Utilizing Advanced Technologies to Succeed

At Mitsubishi Electric, we produce the most technologically advanced elevators in the world. Our products benefit from our steady cycle of research and development, resulting in cutting edge and revolutionary technology which, when applied through our years of accumulated experience, has created a formula that is unmatched in the industry. Our elevator products continue to establish new precedents for quality and consistently set the industry standard for performance and reliability, and the Series GPM-III high-speed traction elevator line exhibits this philosophy in every detail of its design and performance capabilities.

SERIES GPM III

Contents

MITSUBISHI ELECTRIC

Changes for the Better

Design Features

Higher Speeds

As buildings grow taller, the need for faster elevators rises with them. To meet these ever-increasing market demands, Mitsubishi Electric produced the world's fastest passenger elevator, an achievement verified by the Guinness Book of Records. Series GPM-III technology is available for elevators with rated speed of 200 fpm and higher to cover a wide range of applications.

Futuristic Key Technologies

Series GPM-III elevators use advances in core technology to realize optimum performance and operation efficiency. These advances include new gearless traction machines which utilize the PM (permanent magnet) motor*, VVVF (variable voltage, variable frequency) Inverters, AI (artificial intelligence), and Data Network Systems.

*PM motor is applied to elevators with rated speed of 400 fpm and higher.

Intelligent Door System

An advanced RISC (Reduced Instruction Set Computer) microprocessor and VVVF inverters also control the elevator doors. This intelligent system detects the actual door load conditions at each floor and automatically adjusts the door speed and torque to suit these conditions. The result is stable, sensitive door opening and closing.

DOAS-S

An advanced function of the Artificial Intelligence system, DOAS-S (Destination Oriented Prediction System) allocates passengers to specific elevator cars depending on their destination floor, providing them with the most direct and least crowded route. More information on this system on page 9.

Variety of Features and Functions

A wide variety of both standard and optional features and functions is available with Series GPM-III, helping to improve passenger safety and comfort and simplify building management.

Advanced Technologies

Traction Machine with PM Motor

Delivers Optimal Performance

Pioneered by Mitsubishi

Mitsubishi Electric presents another world first: a new type of gearless traction machine for high speed elevators with a PM motor. This unique application of PM motor and double disk-brake system to the elevator traction machine enables several improvements including higher efficiency, greater comfort and miniaturization.

Improved Efficiency and Response

Because it does not require an exciting current, the PM motor delivers higher efficiency and quicker response times when compared to conventional motors. In addition, the PM motor is able to maintain this high level of efficiency regardless of the number of poles.

A More Comfortable Ride

The PM motor makes it possible to suppress harmonic noise to a level below that of conventional induction motors. Furthermore, the PM motor features a quick response time since it requires no exciting current. This significant reduction in noise and vibration translates into a more comfortable ride for passengers.

Miniaturization

Traction machines with PM motors are smaller and more compact compared to those with conventional induction motors. The PM motor allows for a multi-pole arrangement which conserves space and allows for a more compact machine. The unit's height is also reduced by the application of a double disk-brake system.

VVVF Inverter Drive

Share a Ride in Comfort

Unique to Mitsubishi

We were the first in the world to successfully develop VVVF inverter control technology for high speed elevators. We also introduced inverters throughout the entire lineup- from low- to super high-speed ranges. At Mitsubishi Electric, the innovation never stops, leading to continuous improvements in operation and technology.

Precise, Effective Speed Control

Mitsubishi VVVF inverters make the ride much smoother by precisely adjusting speed control with voltage and frequency regulation. The inverters also include the latest low-noise modules to make the ride even quieter.

Practical Application

Mitsubishi Electric has already installed the world's fastest VVVF inverter-controlled passenger elevators in the Landmark Tower in Yokohama, Japan. These elevators provide unmatched speed without compromising a quiet, comfortable and safe ride, in addition to significant energy savings.

Even More Advances

Series GPM-III elevators use additional advances to control the motor speed. Utilizing the latest in semiconductor technology, Mitsubishi has several control systems and our new high speed digital signal processor on a single System LSI device.

Advanced Technologies

AI Supervisory Control

Incorporates Advanced Artificial Intelligence

Mitsubishi Technology

Using its original Expert System and fuzzy-logic technology, Mitsubishi Electric has developed a supervisory system that improves operation efficiency for increased user satisfaction.

Analytical Decision Process

Series GPM-III elevators use specially designed AI supervisory systems: the ΣAI-22 for two-to-four car and the ΣAI-2200C for three-to-eight car elevator systems. Logical, qualitative judgments are made using traffic databases stored in the system to further enhance service performance.

Greater Passenger Satisfaction

The AI system evaluates the psychological waiting time for users and factors it into the decision process when responding to hall calls. This Mitsubishi-pioneered technology provides optimum service and user satisfaction by eliminating the irritation felt while waiting for a car.

Improved Carrying Efficiency

The ΣAI-2200C system utilizes neural networks and car allocation tuning to improve carrying efficiency during peak periods such as morning, lunchtime and evening rush hours. More details on this system on page 6.

Data Network System

Enhances the Human-Elevator Interface

Increased Flexibility

The distribution of data network microprocessors simplifies modification to features or operation of the system, allowing the system to evolve with the changing needs of the building and its tenants.

Highly Reliable and Efficient System

Each microprocessor is connected via a serial transmission line to ensure higher reliability and efficiency. The system also shares diagnostic programs among the microprocessors and incorporates backup systems to further enhance reliability and passenger safety.

A Proficient Network

The Data Network System uses microprocessors distributed throughout the elevator configuration for more flexible control of the overall system. Each microprocessor is specially designed for thought-processing, thus greatly enhancing the "Human-Elevator Interface."

Advanced AI Supervisory Control

Mitsubishi Electric's **AI Supervisory Control** is the key feature behind manufacturing an ideal elevator system with optimum user service. Two basic systems are available with AI and between them they offer a wide range of special functions to suit the needs of any type of building.

ΣAI - 22 System

This system is designed for small or medium sized buildings with two to four cars in the elevator group.

ΣAI-2200C System

This system is designed for larger buildings with three to eight cars in the elevator group. It suits buildings with dynamic traffic conditions throughout the day and peak carrying times.

Expert System and Fuzzy Logic

The brain of the AI Supervisory Control employs an intelligent Expert System that utilizes the practical knowledge and experience of real elevator group control experts. This information is stored in the system's memory as a 'Knowledge Database.' Drawing from this database, various traffic conditions are monitored and analyzed, applying IF-THEN decision rules to maximize the effectiveness of each elevator operation. Mitsubishi Electric has applied fuzzy logic in a manner that enables the elevator control system to make decisions using fragmentary and fuzzy intelligence concepts. For example, using its 'intelligence' and 'common sense,' the system can determine whether or not potential car assignments will result in longer waiting times for calls in the near future or cause elevator congestion. The assessment results are applied to determine the car assignments in order to improve overall service.

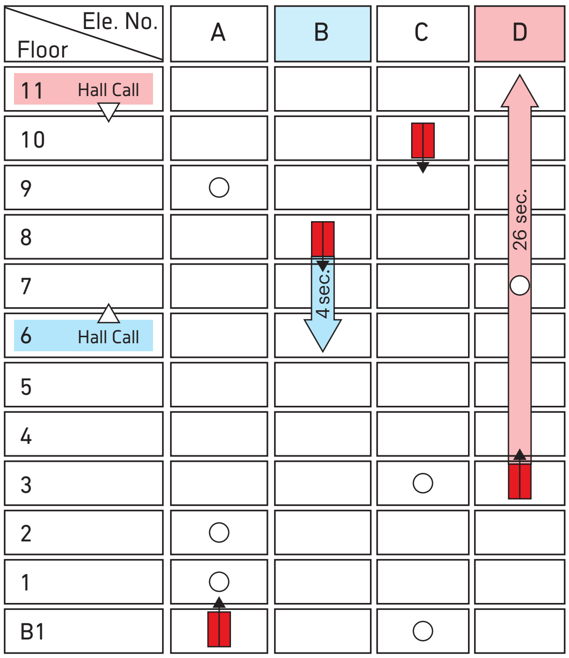
Psychological Waiting Time Evaluation

This evaluation function is Mitsubishi Electric technology that originates from the psychological thought patterns of a passenger waiting for an elevator: the level of irritation of a passenger waiting for elevator arrival is proportional to the square of the actual waiting time. Elevator assignments to hall calls are thus performed on the basis of evaluation results. In addition to forecasted waiting time, such factors as probability of being bypassed for a hall call, probable time required for traveling after car assignment, current car load and many others are applied in the evaluation function owing to its coefficient diversity. Car assignments to hall calls are made as a sum of all factors. (Evaluation factors vary in accordance with the basic system chosen, type of hall display, and other design parameters.)

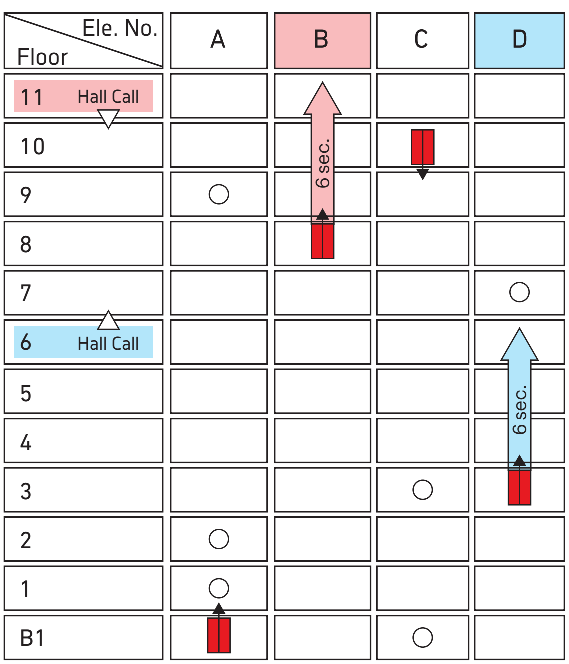
Cooperative Optimization Assignment

When a hall call is registered, the Cooperative Optimization Assignment Algorithm predicts a potential hall call that could reduce transport efficiency, and allocates the best elevator through evaluations of the registered hall call and the forecasted call. Cars are thus ready for any hall call, and cooperate for optimum elevator operation. (See next page for visual representation.)

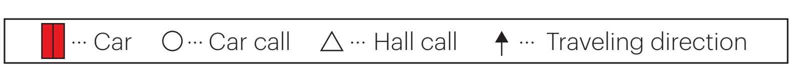
Advanced AI Supervisory Control



Conventional System
[A hall call is registered at 6th floor]
Allocates closest car, B.
[Another hall call is registered at 11th floor]
Allocates D, resulting in long wait of 26 sec.



ΣAI-2200C
[A hall call is registered at 6th floor]
Allocates D, which is running upward.
[Another hall call is registered at 11th floor]
Allocates B, which immediately arrives at the floor.



Car Travel Time Evaluation

The system assigns each car to hall calls taking into consideration the number of registered car calls (as one evaluation factor), thus minimizing car travel time required after assignment.

Immediate Prediction Indication

Once a passenger has registered a hall call, the ideal car to respond is selected. The hall lantern on the waiting passenger's floor lights up and a chime sounds to indicate which door will open. As the car approaches, the lantern begins to flash and the chime sounds twice. This system provides a highly reliable prediction of car arrival and reduces passenger irritation.

For more information, see our ΣAI-2200C AI System brochure.

Enhanced Service with The Neural Network

For the ΣAI-22 Systems

Determination of Traffic Flow with Neural Networks

The operation pattern of an elevator group, accompanied by car allocation and parking functions is one of the major elements that impact how efficiently an elevator supervisory system operates. The system must be able to recognize and respond to daily traffic fluctuations during peak periods such as morning up peak, lunchtime and evening down peak. The ΣAI-2200C system utilizes neural networks to recognize with precision the distinctive patterns of traffic flows in real time. Traffic flows in each zone are distinguished by the number of boarding and exiting passengers (estimated by measuring the change in car load) at each floor. A learning module adopted in this system records such traffic patterns, and uses them to provide an optimum operating pattern that is constantly being updated and revised to respond more efficiently to constantly changing traffic flows.

Energy Saving Operation-Allocation Control

The ΣAI-2200C system minimizes elevator traveling distance for significant energy savings. The near-future traveling distance of all elevators in a group and passenger waiting times are evaluated for a new call. Cars are assigned optimally so that the total traveling distance is shorter, thus reducing both time and energy expenditure. Unlike the conventional energy-saving operations, the new operation allows energy-savings even in the daytime.

Dynamic Rule-Set Optimizer

By selecting optimum car allocations through "Rule-Set" simulations, the Neural Network technology enables the system to continually and accurately predict the passenger traffic within intervals of several minutes. Neural Network is a mathematical model that emulates the structure of the human brain and its information processing mechanism. A high speed Reduced Instruction Set Computer (RISC) runs real-time simulations using multiple Rule-Sets, which function as the simulation's hypothetical rules, and the predicted passenger traffic to select the best Rule-Set which optimizes transport efficiency.

For more information, see our ΣAI-2200C AI System brochure.

Tuning Rule- Increase of Car Allocation:

IF (No cars park at the main floor for extended length, and no tendency to decrease this situation.)
and (Cars with doors closed sometimes park at the upper floors, and no tendency to decrease this situation.)
and (Car parking time at the main floor is short, and no tendency to increase this situation.)
THEN (Car allocation number to the main floor will be increased by one.)

Tuning Rule- Decrease of Car Allocation:

IF (No cars park at the main floor for fewer times, and no tendency to increase this situation.)
and (Cars with doors closed park at the upper floors for fewer times, and no tendency to increase this situation.)
and (Car parking time at the main floor is long, and no tendency to decrease this situation.)
THEN (Car allocation to the main floor will be reduced by one.)

(DOAS-S)

Destination Oriented Prediction System

Allocates passengers to cars depending on destination floors

The Destination Oriented Prediction System (DOAS-S) is a unique allocation system that provides passengers with the fastest and least crowded route to their destinations. When a passenger enters a destination floor number on a hall operating panel, the best car is automatically allocated to the passenger and the elevator number is displayed on the panel. The passenger goes to the assigned car, confirming the elevator identification on a hall lantern with an elevator number plate. The passenger does not need to press the floor buttons on a car operating panel once inside the elevator as the destination floor has already been registered.

Advantages of the Destination Oriented Prediction System

1. Reduces traveling time

The system uses timely and specific destination information to direct each passenger to the right car. Passengers spend less time in a car, as the number of stops per trip is minimized. Working with other features of the ΣAI-2200C, DOAS-S can significantly reduce the total time required for passengers to get to their destinations, as well as the long-wait. Unlike a conventional system, wherein cars make stops at every selected floor and passengers are unable to tell how many stops the car will make before they reach their selected floor, the DOAS-S system minimizes the number of stops by evenly distributing the number of passengers per car according to their destinations.

2. Enhanced usability for passengers at halls

Without the DOAS-S system, passengers wait for cars wondering which will arrive first. Once a car arrives, regardless of the destination passengers rush to get into the car. With DOAS-S, when passengers enter their destination floor number on a hall operating panel, it shows them which elevator to take. As passengers proceed to their assigned elevator, the car is on its way.

3. Enhances passengers usability in car

A conventional system requires passengers to press the destination floor button on a car operating panel inside the car. In a crowded car, passengers often have to fight through many bodies to reach the button. With DOAS-S a passenger's desired floor is registered when they enter it in the hall operating panel. This then allows riders to relax and enjoy as the car skips unnecessary stops and quickly takes them to their destination.

For passengers with special needs

DOAS-S offers dedicated service for passengers with special needs. When the accessibility button on a hall operating panel is pressed, the doors open and close more slowly to allow extra boarding and exiting time. Also, visual and audio guidance is available throughout the journey.

FUNCTIONS

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C

Standard Features

OPERATIONAL AND SERVICE FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Car Call Canceling (CCC)	When a car has responded to the final car call in one direction, the system regards remaining calls in the other direction as errors and clears them from the memory.	√	√	√	√
Continuity of Service (COS)	A car which is experiencing trouble is automatically withdrawn from group control operation to maintain overall group performance.	–	√	√	√
Automatic Hall Call Registration (FSAT)	If one car cannot carry all waiting passengers because it is full, another car will automatically be assigned for the remaining passengers.	√	√	√	√
Backup Operation for Group Control Microprocessor (GCBK)	An operation by car controllers that automatically starts to maintain elevator operation in the event that a microprocessor/transmission line in the group controller has failed.	–	√	√	√
Next Landing (NXL)	If the elevator doors do not open fully at a destination floor, the doors close and the car automatically moves to the next or nearest floor, where the doors will open.	√	√	√	√
Overload Holding Stop (OLH)	A buzzer sounds to alert the passengers that the car is overloaded; the doors remain open and the car does not leave that floor until enough passengers exit the car.	√	√	√	√
Safe Landing (SFL)	If a car has stopped between floors due to an equipment malfunction, the controller checks the cause, and if it is considered safe to move the car, the car will move to the nearest floor at a low speed and the doors will open.	√	√	√	√
Independent Service (IND)	Exclusive operation where a car is withdrawn from group control operation for independent use, such as maintenance or repair, and responds only to car calls.	√	√	√	√
Automatic Bypass (ABP)	A fully loaded car bypasses hall calls to maintain maximum operational efficiency.	√	√	√	√
Car Light Shut Off-Auto. (CLO-A)	If there are no calls for a specified period, the car lighting will automatically shut off to conserve energy.	√	√	√	√
Car Fan Shut Off-Auto. (CFO-A)	If there are no calls for a specified period, the car ventilation fan will automatically shut off to conserve energy.	√	√	√	√
False Call Canceling-Auto. (FCC-A)	If there are no calls for a specified period, the car ventilation fan will automatically shut off to conserve energy.	√	√	√	√

GROUP CONTROL FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Expert System and Fuzzy Logic	Artificial expert knowledge, which has been programmed using "expert system" and "fuzzy logic," is applied to select the ideal operational rule for maximum efficiency of group control operations.	–	–	√	√
Psychological Waiting Time Evaluation	Cars are allocated according to the predicted psychological waiting time for each hall call. The rules evaluating psychological waiting time are automatically changed in response to actual service conditions.	–	–	√	√
Car Travel Time Evaluation	Cars are allocated to hall calls by considering the number of car calls that will reduce passenger waiting time in each hall and the travel time of each car.	–	–	√	√
Peak Traffic Control (PTC)	A floor which temporarily has the heaviest traffic will be served with higher priority than other floors, but not to an extent that interferes with service to other floors.	–	–	√	√
Strategic Overall Spotting (SOHS)	To reduce passenger waiting time cars which have finished service are automatically directed to positions where they can respond to predicted hall calls as quickly as possible.	–	√	√	√
Cooperative Optimization Assignment	The system predicts a potential hall call which could cause a longer wait. Car assignment is performed considering not only current and new calls but also near-future calls.	–	–	–	√
Distinction of Traffic Flow with Neural Networks (NN)	Traffic flows in a building are constantly monitored using neural network technology, and the optimum operational pattern, such as Lunchtime Service or Up Peak Service, is selected or canceled accordingly at the appropriate time.	–	–	–	√
Car Allocation Tuning (CAT)	The number of cars allocated or parked on crowded floors are controlled not just according to the conditions on those crowded floors, but also on the operational status of each car and the traffic on each floor.	–	–	–	√

FUNCTIONS

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Dynamic Rule-Set Optimizer (DRO)	Traffic flows in a building are constantly predicted using neural network technology, and an optimum rule-set for group control operations is selected through real-time simulations based on prediction results.	—	—	—	√
Energy-Saving Operation -Allocation Control (ESO-W)	The system selects the elevator that best balances operational efficiency and energy consumption according to each elevator's current location and passenger load, as well as predicted congestion levels throughout the day.	—	—	—	√

▪ DOOR OPERATION FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Door Load Detector (DLD)	When excessive door load has been detected while opening or closing, the doors immediately move in the reverse direction.	√	√	√	√
Door Sensor Self-Diagnosis (DODA)	Failure of non-contact door sensors is checked automatically, and if a problem is diagnosed, the door-close timing is delayed and the closing speed is reduced to maintain elevator service and ensure passenger safety.	√	√	√	√
Automatic Door Speed Control (DSAC)	Door load on each floor, which can depend on the type of hall door, is monitored to adjust the door speed, thereby making it consistent throughout all floors.	√	√	√	√
Door Nudging Feature (NDG)	The doors slowly close when they have remained open for longer than the preset period with alarm sound.	√	√	√	√
Repeated Door-Close (RDC)	Should an obstacle prevent the doors from closing, the doors will repeatedly open and close until the obstacle is removed.	√	√	√	√
Re-open with Hall Button (ROHB)	Closing doors can be re-opened by pressing the hall button corresponding to the traveling direction of the car.	√	√	√	√
Multi-Beam Door Sensor	Multiple infrared-light beams cover some 5'-10 3/4" in height of the doors as they close to detect passengers or objects.	√	√	√	√
Electronic Doorman (EDM)	Door open time is minimized using safety ray(s) or multi-beam door sensors that detect passengers boarding or exiting.	√	√	√	√
Automatic Door-open Time Adjustment (DOT)	The amount of time that doors are open will automatically adjust depending on whether the stop was called from the hall or the car, to allow smooth boarding of passengers or loading of baggage.	—	—	—	√

▪ SIGNAL AND DISPLAY FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Car/Hall Click Type Call Buttons	Call buttons that click softly when touched are fitted as standard.	√	√	√	√
Basic Announcement (AAN-B)	A synthetic voice (and/or buzzer) that alerts passengers inside a car to the fact that elevator operation has been temporarily interrupted by overloading or a similar cause. (Voice available only in English.)	√	√	√	√
Car Arrival Chime-Car (AECC)	Electronic chimes that sound to indicate that a car will soon arrive. (The chimes are mounted on the top and bottom of the car.)	√	√	√	—
Flashing Hall Lantern (FHL)	A hall lantern, which corresponds to a car's service direction, flashes to indicate that the car will soon arrive.	√	√	√	√
Inter-Communication System (ITP)	A system that allows communication between passengers inside a car and the building personnel.	√	√	√	√

▪ EMERGENCY OPERATIONS AND FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Firefighter's Emergency Operation (FE)	In case of fire, the elevator performs firefighter's emergency operation (Phase I and Phase II) conforming to the local code.	√	√	√	√
Earthquake Emergency Operation (EER-DS)	In case of earthquake detection, the elevator stops at the nearest available floor and shuts down with the door open. (Detailed operation conforms to the local code.)	√	√	√	√

Notes: — ··· Not applicable

FUNCTIONS

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C

Optional Features

■OPERATIONAL AND SERVICE FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Landing Open (LO)	Doors start opening right before the car has completely stopped at a floor.	√	√	√	√
Car Call Erase (FCC-P)	If the wrong car button is pressed, it can be canceled by quickly pressing the same button again twice.	√	√	√	√
Non-Service to Specific Floors-Car Button Type (NS-CB)	To enhance security, service to desired floors can be set to disable using the car operating panel. This function is automatically deactivated during emergency operations.	√	√	√	√
Non-Service to Specific Floors-Switch Type (NS)	To enhance security, service to desired floors can be set to disable using a manual switch. This function is automatically deactivated during emergency operations.	√	√ (1)	√	√
Out-of-Service - Remote (RCS)	With a key switch on the supervisory panel, etc., a car can be called to a specified floor after responding to all car calls, and then automatically be taken out of service.	√	√	√	√
Secret Call Service (SCS-B)	To enhance security, car calls for desired floors can be registered only by entering secret codes using the car buttons on the car operating panel. This function is automatically deactivated during emergency operations.	√	√	√	√
Regenerative Converter (PCNV)	For energy conservation, power regenerated by a traction machine can be used by other electrical systems in the building.	√	√	√	√

■ GROUP CONTROL FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Bank-Separation Operation (BSO)	Hall buttons and the cars called by each button can be divided into several groups for independent group control operation to serve special needs or different floors.	–	–	√	√
Closest-Car Priority Service (CNPS)	A function to give priority allocation to the car closest to the floor where a hall call button has been pressed, or to reverse the closing doors of the car closest to the pressed hall call button on that floor. (Cannot be combined with Hall Position Indicators.)	–	–	√ (1)	√
Energy Saving Operation-Number of Cars (ESO-N)	To save energy, the number of service cars is automatically reduced to some extent but not so much as to adversely affect passenger waiting time.	–	–	√	√
Forced Floor Stop (FFS)	All cars in a bank automatically make a stop at a predetermined floor on every trip without being called.	√	√	√	√
Main Floor Parking (MFP)	An available car always parks on the main floor with the doors open to reduce passenger waiting time.	√	√	√	√
Special Car Priority Service (SCPS)	Special cars, such as observation elevators and elevators with basement service, are given higher priority to respond to hall calls. (Cannot be combined with Hall Position Indicators.)	–	–	√ (1)	√
Special Floor Priority Service (SFPS)	Special floors, such as floors with VIP rooms or executive rooms, are given higher priority for car allocation when a call is made on those floors. (Cannot be combined with Hall Position Indicators.)	–	–	√ (1)	√
Main Floor Changeover Operation (TFS)	This feature is effective for buildings with two main floors. The floor designated as the “Main floor” in a group control operation can be changed as necessary using a manual switch.	√	√	√	√
Light-Load Car Priority Service (UCPS)	When traffic is light, empty or lightly loaded, cars are given priority to respond to hall calls in order to minimize passenger travel time. (Cannot be combined with Hall Position Indicators.)	–	–	√ (1)	√
Swing Service (SWSV)	A car is temporarily split from the group to work as a single car. This dedicates one car to mail deliveries or facility maintenance through certain parts of the day. The swing car is operated from an inconspicuous riser of pushbuttons mounted in the doors jamb.	√	√	√	√
Destination Oriented Allocation System (DOAS)	When a passenger enters a destination floor at a hall, the hall operating panel indicates which car will serve the floor. The passenger does not need to press a button in the car. Dispersing passengers by destination prevents congestion in the cars and minimizes waiting and traveling time. (Cannot be combined with some features. Consult your local sales office for details.)	–	–	–	√ (3)

FUNCTIONS

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Intense Up Peak (IUP)	To maximize transport efficiency, an elevator bank is divided into two groups of cars to serve upper and lower floors separately during up peak. In addition, the number of cars to be allocated, the timing of car allocation to the lobby floor, the timing of door closing, etc., are controlled based on predicted traffic data.	—	—	—	√
Up Peak Service (UPS)	Controls the number of cars to be allocated to the lobby floor, as well as the car allocation timing, in order to meet increased demands for upward travel from the lobby floor during office starting time, hotel check-in time, etc., and minimize passenger waiting time.	—	—	√	√
Down Peak Service (DPS)	Controls the number of cars to be allocated and the timing of car allocation in order to meet increased demands for downward travel during office leaving time, hotel check-out time, etc., and minimize passenger waiting time.	—	—	√	√
Congested-floor Service (CFS)	The timing of car allocation and the number of cars to be allocated to floors where meeting rooms or ballrooms exist and the traffic intensifies for short periods of time are controlled according to the detected traffic density data for those floors.	—	—	√	√
Lunchtime Service (LTS)	During the first half of lunchtime, calls for a restaurant floor are served with higher priority, and during the latter half, the number of cars allocated to the restaurant floor, the allocation timing for each car and the door opening and closing timing are all controlled based on predicted data.	—	—	√	√

▪ DOOR OPERATION FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Extended Door-Open (Door Hold) Button (DKO-TB)	A button located inside a car which keeps the doors open for a longer period than usual to allow loading and unloading of a stretcher, baggage, etc.	√	√	√	—
3D Multi-Beam Door Sensor	Multiple infrared-light beams cover some 5'-10 3/4" in height of the doors as they close to detect passengers or objects. The 3D sensor can also monitor the hall by expanding multiple infrared light beams.	√	√	√	√

▪ SIGNAL AND DISPLAY FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Voice Guidance System (AAN-G)	Information on elevator service such as the current floor or service direction that is heard by the passengers inside a car. (Voice guidance available only in English.)	√	√	√	√
Car Arrival Chime-Hall (AECH)	Electronic chimes that sound to indicate that a car will soon arrive. (The chimes are mounted in each hall.)	√	√	√	√ (2)
Immediate Prediction Indication (AIL)	When a passenger has registered a hall call, the best car to respond to that call is immediately selected, the corresponding hall lantern illuminates and a chime sounds once to indicate which doors will open.	—	—	—	√
Second Car Prediction (TCP)	When a hall is crowded to the extent that one car cannot accommodate all waiting passengers, the hall lantern will light up to indicate the next car to serve the hall.	—	—	—	√
Inter-Communication System (ITP)	A system which allows communication between passengers inside a car and the building personnel.	√	√	√	√

Notes: — ··· Not applicable
(1) Please consult your local sales office for lead times and details.
(2) AECH is standard feature when 3-8 car ΣAI-2200C is applied.
(3) DOAS cannot be combined with BSO, IUP, UPS, TFS, FSAT, FCC-A, DKO-TB or TCP feature.

FUNCTIONS

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C

Optional Features

■EMERGENCY OPERATIONS AND FEATURES

Feature	Description	1Car 2BC	2Car 2BC	3-4Car ΣAI-22	3-8Car ΣAI-2200C
Emergency Car Lighting (ECL)	Car lighting which turns on immediately when power fails to provide a minimum level of lighting within the car. (Choice of dry-cell battery or trickle-charger battery.)	√	√	√	√
Mitsubishi Emergency Landing Device (MELD)	In case of power failure, a car equipped with this function automatically moves and stops at the nearest floor using a rechargeable battery, and the doors open to ensure passenger safety. (Max. allowable floor-to-floor distance is 32'-10".)	√	√	√	√
Mitsubishi Elevators & Escalators Monitoring and Control System MelEye (WP-W)	Each elevator's status and operations can be monitored and controlled using an advanced Web-based technology which provides an interface through personal computers. Special optional features, such as preparation of traffic statistics and analysis, are also available.	√	√	√	√
Operation by Emergency Power Source- Auto. (OEPS-AU)	Each elevator's status and operations can be monitored and controlled using an advanced Web-based technology which provides an interface through personal computers. Special optional features, such as preparation of traffic statistics and analysis, are also available.	—	√	√	√
Supervisory Panel (WP)	A panel installed in a building's supervisory room, which monitors and controls each elevator's status and operations by remotely using indicators and switches provided on request.	√	√	√	√

Notes: — ··· Not applicable

Information on Elevator Planning

Work Not Included in Elevator Contract

The following items are excluded from Mitsubishi Electric's elevator installation work, and are therefore the responsibility of the building owner or general contractor:

- Architectural finishing of the walls and floors in the vicinity of the entrance hall, after installation has been completed.
- Construction of an illuminated, ventilated, and waterproofed elevator hoistway.
- A ladder to the elevator pit.
- Provisions for cutting the necessary openings and joints.
- Separate beams, when the hoistway dimensions markedly exceed the specifications, and intermediate beams when two or more elevators are installed.
- All other work related to building construction.
- 3-phase, horsepower rated, lockout type, fused disconnect or circuit breaker, including provision of 3-phase electrical service to elevators.
- Elevator group control disconnect switch, if applicable.
- Control room lighting and duplex outlets.
- Power source for seismic switch, if applicable.
- The laying of conduits and wiring between the elevator pit and the terminating point for the devices installed outside the hoistway, such as the emergency bell, intercom monitoring and security devices, etc.
- The power consumed during installation work and test operations.
- Test provisions and subsequent alteration as required, eventual removal of the scaffolding as required by the elevator contractor, and any other protection of the work as may be required during the process.
- A suitable, locked space for the storage of elevator equipment and tools during elevator installation.
- The security system, such as a card reader, connected to Mitsubishi Electric's elevator controller, when supplied by the building owner or general contractor.
- Divider beams and structural attachment points for rail brackets are by others and will be located as needed on Mitsubishi Electric shop drawings.
- Temporary work platform overhead.
- Smoke detectors in the hoistway near the machines, as required by code.

*Work responsibilities in installation and construction shall be determined according to local laws, please consult your local sales office for details.

Elevator Site Requirements

- The temperature of the elevator hoistway and control panel room shall be above 23° F (-5° C) and below 104° F (40° C).
- The following conditions are required for maintaining elevator performance:
  - a. The relative humidity shall be below 90% on a monthly average and below 95% on a daily average.
  - b. Prevention shall be provided against icing and condensation occurring due to a rapid drop in the temperature in the elevator hoistway.
  - c. The elevator hoistway shall be finished with mortar or other materials so as to prevent concrete dust.
- Voltage fluctuation shall be within a range of +5% to -10%.

Ordering Information

Please include the following information when ordering or requesting estimates:

- The desired number of units, speed and loading capacity
- The number of stops or number of floors to be served
- The total elevator travel and each floor-to-floor height
- Operation system
- Selected design and size of car
- Entrance design
- Signal equipment
- A sketch of the part of the building where they elevators are to be installed
- The voltage, number of phases and frequency of the power source for the motor and lighting

Contact your Mitsubishi Electric representative for more information.

Mitsubishi Electric US, Inc.
Locations

Corporate Headquarters
5900-A Katella Avenue
Cypress, CA 90630
Phone: 800.988.8474
Fax: 714.844.4564

DC Metro
9730-M Martin Luther King Jr Hwy
Lanham, MD 20706
Phone: 240.495.6004
Fax: 240.607.8941

Hawaii
99-075A Koaha Way
Aiea, HI 96701
Phone: 808.486.0433
Fax: 808.486.2622

Midwest
5218 S. Dansher Road
Countryside, IL 60525
Phone: 708.354.2900
Fax: 708.354.4261

Nevada
5850 Polaris Ave., Suite 1000
Las Vegas, NV 89118
Phone: 702.289.4279
Fax: 702.541.9113

Northern California
7303 Edgewater Drive, Suite E
Oakland, CA 94621
Phone: 510.430.2567
Fax: 510.568.3768

Pacific Northwest
127 10th Street South, Suite 100
Kirkland, WA 98033
Phone: 425.202.7671
Fax: 425.896.8471

San Diego
8940 Activity Road, Suite A
San Diego, CA 92126
Phone: 858.880.0806
Fax: 858.271.4863

for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group’s environmental statement, and expresses the Group’s stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

Mitsubishi Electric US, Inc. Elevator/Escalator Division

Phone: 800.988.8474 / Fax: 714.844.4564 / 5900-A Katella Avenue, Cypress, California 90630, U.S.A.

Website: http://www.mitsubishielevator.com

Email: EEDSALES@meus.mea.com

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

http://www.MitsubishiElectric.com