

Equipment List

New Equipments used for modernization and their Functions.

Necessity of → → → → → → → → Modernization

Even with periodic maintenance, it is generally difficult to maintain optimal elevator performance beyond the original service life. As user requirements and social needs change over time, the original elevator performance itself no longer meets the needs of the times.

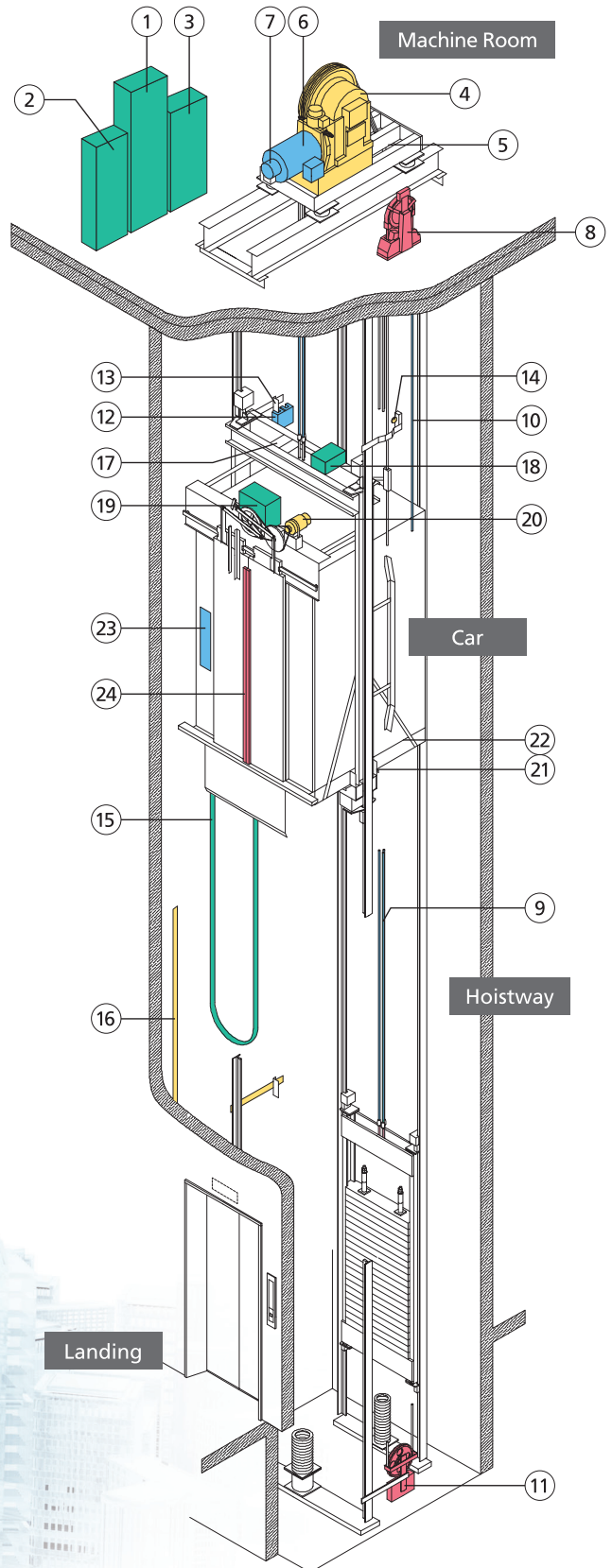
Under such circumstances, owners and managers are now **requested to maintain elevator safety and security from the standpoint of elevator users.**

Safety
Low cost
Comfort
Modernization
Energy saving
Renewal
Equipment

Equipment List and Location

Location	No.	Equipment	Page
Machine Room	1	COP(Controller / LVF)	02
	2	GSP(Group Supervisory Panel)	02
	3	Inverter Panel / DC Chopper Panel	02
	4	Machine (PM021 / FM35A / FM55A / PM048)	03
	5	Deflector Sheave	03
	6	Motor	03
	7	Encoder	04
	8	Governor	04
Hoistway	9	Main Rope	04
	10	Governor Rope	04
	11	Tension Pulley	04
	12	IR(Inductor Relay)	04
	13	IR Plate (Inductor Relay Plate)	04
	14	Limit Switch	05
	15	Travelling Cable	05
	16	Hoistway Cable	05
Car	17	Car Top Junction Box	05
	18	Car Top Service Switch Box	05
	19	Door Drive Unit (DR13)	05
	20	Door Motor	06
	21	Load Weighing Device	06
	22	Load Cell	06
	23	COB(Car Operation Board)	06
	24	Multibeam Sensor	06
Others including Up Grades	25	EL VIC (Elevator Visual Communication System)	06
	26	DFGS (Destination Floor Guidance System)	06

[Layout of Main Elevator Equipment]



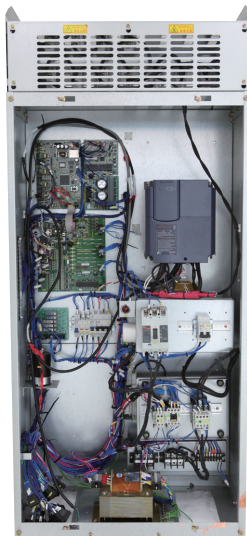
*The figure shows a schematic diagram of general elevator equipment.





①-1 COP (Controller)

The controller (COP) controls the whole operation of elevator. When an elevator malfunction is detected, COP will make the affected elevator(s) operate in a safe mode. COP consists of the microcomputers, power-supply units, electronic connectors, breakers and batteries etc. for elevator control.



①-2 COP (Controller LVF)

The controller (COP) integrated with the inverter will apply to the lower capacity speed control system.

② GSP (Group Supervisory Panel)

When a hall call is registered, the GSP will assign an available elevator to serve that call in the shortest amount of time based on the current position and traveling direction of each car. Even if the operating status has been changed after the car assignment, this GSP flexibly accounts for such a change. It always assigns an elevator able to serve a hall call in the shortest amount of time.



③-1 Inverter Panel

The Inverter Speed control unit will be applied for AC Motor with Geared Machine and PM Machine.



③-2 DC Chopper Panel

The DC Chopper Speed Control Unit will be applied for DC Control Machine.

- ④ **Machine** A machine is the driving unit of an elevator car. It applies a driving force to the hoisting ropes to move a car. Stopping a moving car and maintaining the stopped position are implemented by the brake unit installed in the machine.



- ④-1 **PM021 (Permanent Magnet Machine)**

Capacity ~1350KG Speed ~4m/sec.



- ④-4 **PM048 (Permanent Magnet Machine)**

Capacity ~1630KG Speed ~7m/sec.



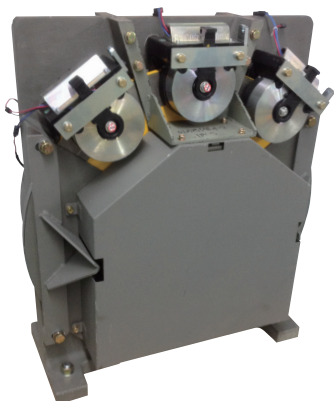
- ④-2 **FM35A (Flat Shape, Permanent Magnet Machine)**

Capacity ~1050KG Speed ~2.5m/sec.



- ⑤ **Deflector Sheave**

A deflector Sheave is a type of sheave that aligns and maintains alignment of the center core of each suspension rope hung across the main sheave of a machine to a car and a counterweight.



- ④-3 **FM55A (Flat Shape, Permanent Magnet Machine)**

Capacity ~2050KG Speed ~2.5m/sec.



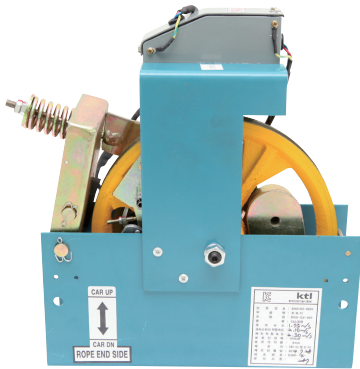
- ⑥ **Motor**

A motor rotates the sheaves of a machine. The speed of an elevator car is controlled by the motor connected to an inverter which controls input/output voltage and frequency of supplied electricity.



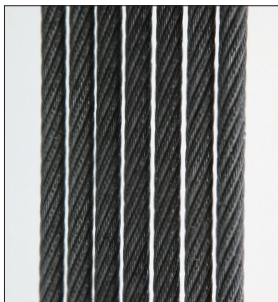
⑦ Encoder

An encoder is a device that generates a pulse, as it rotates. The number of pulses generated by a single rotation is limited. This device is connected to an inverter for motor control.



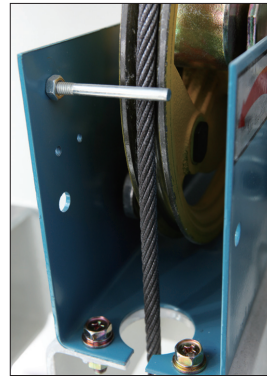
⑧ Governor

Part of safety systems, a governor monitors an elevator's running speeds. It cuts electricity to the motor or activates an on-car mechanical emergency brake, thus stopping the elevator, when detected speed exceeds the rated speed.



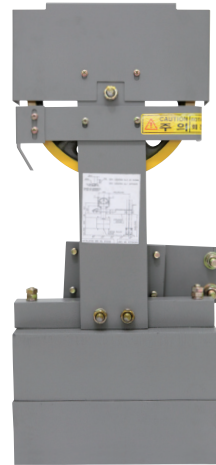
⑨ Main Rope

A main rope is a type of rope whose ends are attached respectively to a car and a counterweight. A machine's driving force is applied to the main ropes which move the car up and down.



⑩ Governor Rope

A governor rope is a type of rope that conveys the condition of a moving car to a governor device.



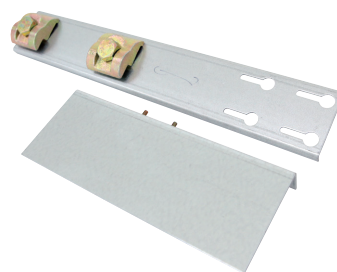
⑪ Tension Pulley

A tension pulley is a type of pulley that applies tension on a governor rope of an operating governor for stabilization.



⑫ IR (Inductor Relay)

An IR (Inductor Relay) unit is composed of multiple switches. It is located on top of a car. Depending on the proximity between the car-top IR and a hoistway-wall-side IR plate, a car's position can be monitored, which enhances landing-level accuracy and detects the door opening zone.



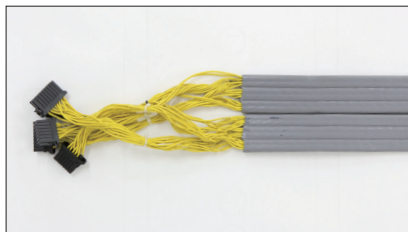
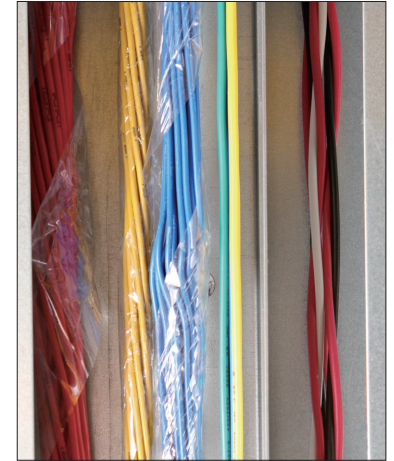
⑬ IR Plate (Inductor Relay Plate)

An IR plate is a car position detection device. It is installed adjacent to every landing door in a hoistway. The function of this plate is to actuate a car position detection device (or an IR switch) installed on a car top.



⑭ Limit Switch

A limit switch is a type of switch that decelerates and stops a running car, in a case when the normal speed-reducing function doesn't work in time before a car stops at the upper or lower terminal floor. This in-hoistway switch also has another fail-safe function, which prevents the moving car from overshooting the upper/lower terminal floor by an excessive margin.



⑮ Traveling Cable

A traveling cable is a type of cable that connects a control panel to a car. It carries electrical signals between them. Flexible cables shall be used for traveling cables.

⑯ Hoistway Cable

A hoistway cable carries electrical signals between a control panel and hoistway equipment and between a control panel and landing fixtures.

⑰ Car-Top Junction Box

A car-top junction box is a car-top box which connects in-hoistway traveling cables to peripheral equipment located on the car top and in the car's interior. This junction box also includes a partial group of printed circuit boards which control the functions of car-interior fixtures and equipment.



⑲ Door Drive Unit (DR13)

A door drive unit is a unit to control car door opening and closing operations: responding to an incoming command signal from a control panel, it controls door opening and closing operations. In the case of an incoming emergency signal, it reverses door opening and closing directions. The inverter employed in this drive unit regulates door opening/closing force and acceleration/deceleration speeds, and maintains the closed door state.



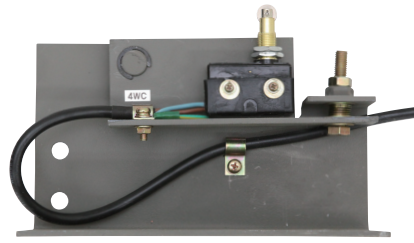
⑱ Car-Top Service Switch Box

A car-top service switch box is a switch box located on top of the car for elevator maintenance purposes. This switch box includes manual switches for upward and downward car movement, for door opening and closing operations, and for other elevator-maintenance-required operations.



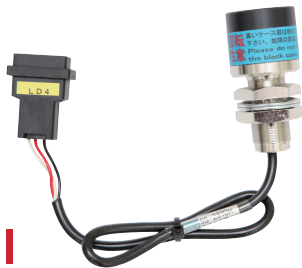
20 Door Motor

Under the control of an inverter, a door motor exerts a driving force for door opening and closing operations.



21 Load Weighing Device

A load weighing device is a device that detects a car overload in excess of its rated capacity (a maximum number of passengers).



22 Load Cell

A load cell is a device that detects a car's loaded weight. Measuring the passenger and cargo weight in a car, it controls traction- machine-generated torque and ensures smooth elevator operation. These devices are also used for full-load warning announcements and other purposes.



23 COB (Car Operating Board)

A car operating board is a car-interior functional board for car operation. Fixtures provided on a car operating board include buttons for destination floor access, for door opening and closing operations, and for intercom activation. This board also includes switches for other operations, if any.

24 Multibeam Sensor

Installed in a car door, a multibeam sensor detects a person and objects passing through elevator entrances. Detection is done by interrupting or obstructing any sensor- emitted light beam. When a person or object is detected in the door opening by interrupting or obstructing any beam, the door closing operation will be stopped and then, the door will reopen. This sensor enhances detection of a moving person and object and the likes, by emitting infrared beams covering the entire doorway.

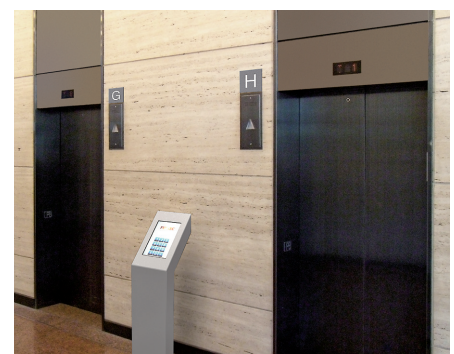


25 EL VIC (Elevator Visual Communication System)

ELVIC is the optimal elevator monitoring system developed for intelligent buildings. The system offers real-time monitoring of elevator operating statuses, allows users to manually change elevator operations, and performs on-going traffic analyses.

26 DFGS (Destination Floor Guidance System)

Installing a Destination Floor Guidance System (DFGS) as well as updating the elevator group supervisory control system can also lead to a further increase in passenger handling capacity.



FUJITEC

<http://www.fujitec.com/>