

### Pressurized ventilators (for device cooling)

	Model	Blade diameter (cm)	Indoor or outdoor
200 V type	EF-35UDT-GL	35	
	EF-40UET-GL	40	
	EF-50UFT-GL	50	Indoor
400 V type	EF-35UDT40A-GL	35	indoor
	EF-40UET40A-GL	40	
	EF-50UFT40A-GL	50	



### Installation/Instruction Manual

#### (For customers)

Please read this manual carefully before use for proper and safe use.

After reading, store the manual in a handy location for easy access.

#### For electrical contractors

Be sure to read this manual before starting installation work to ensure correct and safe installation. Dealers and electrical contractors shall perform installation in accordance with the standards of each country.

- This fan is a three-phase product. Check the type of power supply before performing the installation work.
- This fan is for exhaust use only.
   Blades cannot be replaced and wire connections cannot be changed.

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After you are finished with the installation work, be sure to give this manual to the customer.

# Explanation of installation work For electrical contractors

## **1. Safety Precautions**

The type and degree of danger resulting from incorrect handling are denoted by the following symbols.

Incorrect handling could result in death or serious WARNING iniurv When using the fan to exhaust air from Do not install the fan in a place where explosive dust or gas is a room where a combustion appliance generated or could be generated. for exhausting air through a chimney is - Failure to heed this warning may installed, install an air supply opening large enough to prevent flowing of result in explosion or fire. exhaust air back into the room. Do not use the fan at other than the - Failure to heed this warning may rated voltage and frequency result in carbon monoxide poisoning. - Failure to heed this warning may Prohibited result in fire or electric shock. Install the fan in such a way that a wood structure covered with metal Do not use the fan for purposes other lath, wire lath, or metal sheeting and than ventilation and blowing air the metal body part do not directly - Failure to heed this warning may Follow contact each other. result in fire, electric shock or injury. instructions - It could cause fire when electrical Be sure to install the ground wire. leakage occurs. - Device failure and electric leakage Be sure to install the electric may cause electric shock. Check leakage breaker grounding - Electric leakage may cause electric shock. Because this product is designed to Be sure to turn off the distribution be installed at a higher location, panel circuit breaker before proceeding install the product at least 2.3 m with maintenance and inspection. above the floor. Follow instructions - Failure to heed this warning may - Failure to heed this warning may result in electric shock or injury. result in injury.

		1				
	CAUTION Incorrect har to buildings a	ndling cou and mach	uld result in injury or property damage ninery			
Prohibited	<ul> <li>Do not install the fan in a place where it could be exposed to flame directly.</li> <li>Failure to heed this warning may result in fire.</li> </ul>	Follow	Electrical work must be performed according to the standards of each country. Never perform connection by hand-twisting wires.			
Cannot be installed in	Do not install the fan in a location with high humidity such as a bathroom (relative humidity 90% or higher). - Failure to heed this warning may		<ul> <li>Furthermore, power lines must be connected inside a box and box cover for rigid metal conduit.</li> <li>Connection failure and faulty wiring work could result in electric shock or fire.</li> </ul>			
a bathroom	result in electric shock or fire. Securely install the fan on a solid, vibration-free location. - Injury may result if the fan should fall.		Wear gloves before proceeding with unpacking, installation, maintenance/ inspection and cleaning. - Failure to heed this warning may			
Follow	Securely install blades and parts. - Injury could result if parts fall.		example, the edge of the plate.			
instructions	Electrical contractors shall perform electrical work and grounding work. - Electrical work by a person other than a qualified electrician could result in electric shock or fire.		<ul> <li>Do not install the fan in a place where there is a possibility of snow accumulation or avalanche.</li> <li>Injury could result if parts are damaged or fall.</li> </ul>			
2						

# 2. Usage and usage environment

#### **Environment and restriction condition**

Protection Rating	IPXX
Class of protection	Class I
Over voltage category	Class II
Pollution degree	Class I
Permissible Temp. in use	- 15°C to 50°C (The unit must not be frozen.)
Permissible Humidity in use	90% at 20°C
Permissible Altitude in use	1000m or less
Installation condition	High place installation (2.3m or higher from the floor) Indoor installation

### **3. Precautions before Installation**

- The fan must have a structure that allows easy maintenance and always consider a fail-safe design if secondary damage can be assumed when the end of the service life of the fan is reached or in case of a failure.
  When attaching the fan using an orientation in which the axis vertical blade is facing down (models with a blade diameter of 50 cm), you must move the blade spring in the motor to the opposite side. This procedure should be requested from your dealer.
  Because this product is designed to be installed in higher locations, install the fan at least 2.3 m above the floor. To prevent danger, do not install the fan in a location where people can easily touch it.
- At the opposite side to the fan installed side of the room, install an air intake port, which has a size equivalent to or larger than the mounting frame of the fan.
- When this fan is used for a cubicle, it should meet the standards of each country.
- This fan is dedicated for exhaust use only. The fan cannot be used for air supply by changing the blade direction.
- When installing in proximity, depending on the installation conditions, vibration or noise may occur in the fan or the motor burning protection device may be activated.
- Do not install in the following locations (doing so could cause failure)
  - Locations having a blocking object at the suction side or extreme bending in air ducts, as shown in the figure on the right (Draft currents may occur, which could damage the blades)
  - Locations where the temperature could be over 50  $^{\circ}\mathrm{C}$
  - Locations with obstacles
  - Locations where the temperature could be under -15 °C
  - Locations subject to salt damage
  - Locations where there is a possibility of freezing such as freezing chambers
  - Locations where the temperature may be under 0 °C constantly
  - Locations where corrosive gas may be present or chemicals are handled
  - Locations subject to extremely high static pressure
  - Locations where large amounts of dust or oily smoke is present
  - Locations where the fan is directly exposed to oil smoke or steam



# 4. Outside Dimensions

EF-35UDT-GL, EF-35UDT40A-GL



### 5. Installation Procedure



Because this fan is designed to be installed in a higher location, install the fan at least 2.3 m above the floor.

- Failure to heed this warning may result in injury.

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Wear gloves when unpacking or installing.

- Failure to heed this warning may result in injury caused by, for example, the edge of the plate.

Securely install the fan on a solid,

vibration-free place - Injury may result if the fan should fall.

When unclean air is discharged, a place where fresh air enters is required. Install an air intake port, which has a size equivalent to or larger than the mounting frame of the fan, at the opposite side to the fan installed side of the room.

### Preparation for installation

#### • Remove the drain cap (drain plug) ... If the fan is used in a location with high humidity

If the fan is used in a location with high humidity, install the fan in such a way that the drain cap (drain plug) provided on the motor and motor cover comes to the bottom. Remove the drain cap (drain plug) on the bottom.

#### Note:

• In dusty places, use the fan with the drain cap (drain plug) attached and open the drain from time to time.



#### (Without the motor cover)



### Installation of main unit

#### •When the fan is directly installed on a wall surface as exhaust heat





1. Provide an opening and mount the mounting bolts in the locations indicated on the figure on the left.

#### 2. Mount the fan.

Put the mounting bolts through the mounting holes and then use washers and nuts to secure them properly.

#### Note:

 Do not use the knock out holes for product mounting. (Product vibration, drop/deformation cause)

# 6. Electrical Work

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### Do not use the fan at other than the rated voltage and frequency

- Failure to heed this warning may result in fire or electric shock.

#### Be sure to install the ground wire

- Device failure and electric leakage may cause electric shock.
- Perform connection after checking that the power supply is correct. If the fan is operated with the wrong power supply, the motor could burn out.
- Be sure to install an electric leakage breaker.
- Always ground the grounding terminal.
- Circuit breakers conforming to EN60947-2 must be used. Circuit breakers of which contact gaps are 3 mm or more must be used. We recommended a Mitsubishi Electric non-fuse circuit breaker (Model: NF32-SVF [Rated current: 15 A, number of poles: 3]).
- · Connect the TN system to a 3-phase, 3-wire power supply.
- The ground wire must always be connected.
- For wires that are to be connected to the power cord including the grounding wire, use electrical wire with a copper conductor size of 0.75 mm<sup>2</sup> or above rated for a voltage of 300 V between conductor and ground and a voltage of 500 V, 7 A, or above between conductors.
- To connect to the power supply, install a metal electrical conduit box near the fan installation area (within 0.8 m in direct distance) and make connections inside the box.
- Install another separate metal box, and connect the circuit breaker and the electromagnetic switch together inside the box.
- To protect against overload on the motor, use overload protection equipment that employs a magnetic switch (magnetic contact + thermal relay). Overload protection equipment must be attached for every unit. A magnetic switch conforming to EN60947-4-1 must be used. We recommend a magnetic switch manufactured by Mitsubishi (model: MSO-N10 (The specification is described in Table 1)). The setting current value of the magnetic switch must be set per the information described in Table 2.

# 7. Trial Operation

### After installation work, check the following items.

- 1. Is the fan installed correctly?
- 2. Is not the power cord damaged?
- 3. Has grounding work been performed correctly?
- 4. Is the power supply voltage correct?

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Electrical work must be performed according to the standards of each country. Never perform connection by hand-twisting wires. Furthermore, power lines must be connected inside a box and box cover for rigid metal conduit

- Connection failure and faulty wiring work could result in electric shock or fire.



The terminals are labeled on the end of the power cord as shown left. (Ground is marked with this symbol: ) The conductor wire gauge for the power cord is 18 AWG (Min 0.824 mm<sup>2</sup>).



Metal electrical conduit box (ventilator's power cord connection)

#### Table 1. Specification of MSO-N10

	Coil (kW)	Auxiliary Contact				
220-220V 380-440V 500-550V			Standard (spec.)			
2.2	2.7	1a (1b)				
Combination with Thermal Relay						
Model		Heater Desig.(A)				
TH-N12	0.12, 0.17, 0.24, 0.35, 0.5, 0.7, 0.9, 1.3,					
(KP)	1.7, 2.1, 2.5, 3.6, 5, 6.6, 9					

Table 2. Magnetic Switch Setting Current Value

Power Supply	Model	Magnetic Sv Current	Heater Desig.	
		50Hz	60Hz	(A)
Three-phase	EF-35UDT-GL	1.3	1.4	1.3
50/60Hz 200-220V	EF-40UET-GL	2.3	2.7	2.5
	EF-50UFT-GL	3.2	3.2	3.6
Three-phase	EF-35UDT40A-GL	0.7	0.65	0.7
50/50/50/60/60Hz	EF-40UET40A-GL	1.2	1.2	1.3
380/400/415/400/440V	EF-50UFT40A-GL	1.7	1.7	1.7

#### Turn ON the breaker to perform trial operation.

- Is not there abnormal vibration or noise? (Where there is an abnormality, stop operation and check the electrical work.)
- Is the rotation direction reversed? (If the rotation direction is reversed, switch two of the three power wires.)

# Handling Explanation (For customers)



# **1. Safety Precautions**

The type and degree of danger resulting from incorrect handling are denoted by the following symbols

пе цре					
	WARNING Incorrect handling could result in death or serious injury		<b>CAUTION</b> Incorrect handling could result in injury or property damage to buildings and machinery		
No water exposure	<ul> <li>Refrain from immersing in water or splashing the product with water.</li> <li>Failure to heed this warning could result in short circuit, electric</li> </ul>	Prohibited	Do not use the fan when it is subject to abnormal vibration. - Injury may result if the fan or parts should fall. Do no use the fan in such a way that it is started and stopped more than 50		
No disassembly	shock or fire. Never make modification under		times a day - Injury could result if parts are damaged or fall.		
	any circumstances. Only qualified personnel can perform disassembly and repair. - Failure to heed this warning may result in fire, electric shock or injury. For repair, contact the dealer from	Follow	If the fan will not be operated for a long time, be sure to turn off the circuit breaker on the power distribution panel. - Failure to heed this warning may result in electric shock due to deteriorated insulation or fire due to electric leakage.		
	whom you purchased the fan. Do not insert fingers or objects into the fan during operation as doing so is dangerous		<ul> <li>When the blades are stained badly, make sure to clean them.</li> <li>Injury could result if parts are damaged or fall due to vibration.</li> </ul>		
	<ul> <li>Failure to heed this warning may result in injury.</li> <li>Never touch the fan when it is</li> </ul>		Be sure to wear gloves during cleaning, maintenance and inspection. - Failure to heed this warning may result in injury		
Touching prohibited	<ul> <li>stopped with the power on, when there is an abnormality (for example, if you smell burning), or when there is a power outage.</li> <li>It may start suddenly, resulting in injury or electric shock.</li> </ul>		caused by, for example, the edge of the plate. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way		
No wet hands	<ul> <li>Do not operate with wet hands.</li> <li>Failure to heed this warning may result in electric shock or injury.</li> </ul>		and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision. (EN60335-2-80/EN60335-1)		
Follow	Turn off the distribution board circuit breaker before proceeding with cleaning, maintenance, and inspection. - Failure to heed this warning may result in electric shock or injury.		This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.		
			(IEC60335-2-80/IEC60335-1) If the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similar qualified persons in order to avoid a hazard.		

### 2. How to Use the Fan

**To operate ...** Turn ON the breaker. **To stop ...** Turn OFF the breaker.

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Do not insert fingers or objects into the fan during operation as doing so is dangerous

- Failure to heed this warning may result in injury.

Do not operate with wet hands

- Failure to heed this warning may result in electric shock or injury.

### 3. Maintenance

Be sure to turn off the distribution panel circuit breaker before proceeding with cleaning and maintenance.

- Failure to heed this warning may result in electric shock or injury.

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Wear gloves during cleaning and maintenance.

- Failure to heed this warning may result in injury caused by, for example, the edge of the plate.

#### Cleaning of blades, etc.)

#### Cleaning should be performed about every three months.

- Wipe with a piece of cloth soaked in neutral detergent, and then wipe with a dry cloth so as not to leave any detergent behind.
- When the fan is used in a dusty location, approximately once every three months remove the drain cap (drain plug) on the bottom to drain off and then put the drain cap (drain plug) back on.

#### Overall cleaning)

If flammable material such as oil or dust adheres to the fan, the material could catch fire due to flying sparks.

Always perform periodic cleaning (about once a year).

#### Note:

#### - Do not use the following solvents when performing maintenance:

Paint thinner, alcohol, benzene, gasoline, kerosene, spray solvents, alkaline detergents, chemicals from wipes, or detergents containing abrasives such as cleansers, or the like. (Using such solvents could cause materials to become altered or discolored.)

### 4. Maintenance and Inspection

### \land WARNING -

Be sure to turn OFF the distribution panel circuit breaker before proceeding with maintenance and inspection.

- Failure to heed this warning may result in electric shock or injury.

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Be sure to wear gloves during maintenance and inspection

- Failure to heed this warning may result in injury caused by, for example, the edge of the plate.

When performing cleaning once every three months, inspect the following items:

ltem	Inspection content	Action
	Is there rust on the fan itself or the nuts or bolts used to mount the product rusted?	Use urethane paint to address partial rusting. If there is rust on a significant portion of a part, replace the part. (Injury could result if the fan falls.)
Rust	Is there rust on the blade fix nuts or the blades?	Use urethane paint to address partial rusting. If there is rust on a significant portion of a part, the part must be replaced. Ask your dealer or an electrical contractor to repair the unit. (Injury could result if the blades are damaged or the fan falls.)
Wobbling	Are the nuts used to mount the fan loose? Are the blades and motor properly secured?	Tighten the nuts so that the fan does not wobble. (Injury may result if the fan or blades fall)
	Does the motor appear to be discolored?	The motor needs to be replaced. Ask your dealer or an electrical contractor to repair the fan.
Damage	Is the power cable damaged?	The motor needs to be replaced. Ask your dealer or an electrical contractor to repair the fan.
	Are there cracks on the blades?	The blades need to be replaced. Ask your dealer or an electrical contractor to repair the fan. (Injury could result if the blades are damaged or the fan falls.)
Dust	Is there dust on high temperature parts such as the motor? If a filter or insect screen is used, is it clogged?	Perform cleaning.
Abnormal noise	Is there abnormal noise while the fan is turning?	The bearing or motor needs to be replaced. Ask your dealer or an electrical contractor to repair the fan. Note: The service life of the bearing is about 30,000 hours under continuous operation in a 50 °C environment. (The service life may get shorter depending on the operating environment) Inspect and replace if necessary.

# 5. Before Requesting Repair

# After the fan used for a long time for safety, it is recommended that the fan be checked even if the fan has no trouble.

If the following phenomenon is found and cannot be corrected after inspection by the customer, turn off the breaker and ask your dealer or an electrical contractor to inspect and repair the fan. Please ask your dealer or an electrical contractor about the cost of repairs.

Phenomenon		Cause/Action
The fan does not start even though the power is ON	The breaker is OFF	Turn ON the breaker
Stop and operation are repeated (For 200 V type)	The overload protection equipment of the motor is running	Turn OFF the power, remove the cause, wait until the motor gets cool and then turn ON the power (Note)
There is abnormal	The blades are loose	Tighten blade fix nuts
sound or vibration	The main unit is loose	Tighten main unit fix nuts
during operation	There are abnormal sounds from the bearing	Change the bearing. Ask your dealer or an electrical contractor to repair the fan.
	Rust has occurred over a wide range	Replace rusted parts. Ask your dealer or an electrical contractor to repair the fan.
There is a burnt smell	Something is caught on the blades	Remove the caught object
	The ambient temperature has exceeded 50 °C	The fan cannot be used in a location where the ambient temperature exceeds 50 °C. Lower the ambient temperature or use another model.
	There is corrosion inside the motor	Change the motor. Ask your dealer or an electrical contractor to repair the fan.

#### Note:

The fan has a built-in auto-resetting thermal protector inside for protection against the damage by a fire. (200 V type)

The above overload protection equipment will activate automatically to stop rotation in the case of locked operation, overloading, open-phase operation, application of incorrect voltage, or an ambient temperature in excess of the rated level. If this should occur, turn OFF the power and eliminate the cause of the problem.

(Use of a filter or insect screen could cause clogging.)

To restart operation, take the following action.

<Action>

Turn OFF the power, remove the cause and wait until the motor gets cool, then use the fan after confirming that the motor operates normally.

If power is not switched OFF and continues to be supplied, the thermal protector will trip repeatedly, resulting in a contact failure or contact welding.

If this should happen, the motor must be changed. Switch OFF the power and ask a qualified electrical contractor to change the motor.

## 6. After-Sales Service

For after-sales service, ask the sales agent from whom you purchased the product. To change the motor, contact your dealer and tell the fan model name to request repair.

### 7. Specifications

Model	Blade diameter (cm)	Voltage (V)	Frequency (Hz)	Air volume (m <sup>3</sup> /h)	Noise (dB)	Current (A)	Power Consumption (VV)	Maximum load current (A)	Starting current (A)	Weight (kg)
EF-35UDT-GL	35	Three-	50	3000	45-45.5	0.85-1.0	130-145	0.98-1.06	5.37-6.01	9.2
EF-40UET-GL	40			4800	52-52	1.45-1.67	245-273	1.90-1.95	15.0-16.0	13.2
EF-50UFT-GL	50			7200	52-52	2.00-2.25	370-400	2.75-2.65	20.1-21.3	19.5
EF-35UDT-GL	35	200-220		3600	49-49.5	0.8-0.85	180-185	1.15-1.14	4.96-5.28	9.2
EF-40UET-GL	40		60	5520	55-55.5	1.44-1.50	355-374	2.3-2.1	13.6-14.5	13.2
EF-50UFT-GL	50			8400	56-56.5	2.1-2.1	530-560	2.75-2.7	18.4-19.3	19.5
EF-35UDT40A-GL	35	Three-		3000	44.5/45/45	0.47/0.5/0.54	136/145/150	0.55/0.57/0.59	3.00/3.12/3.20	9.2
EF-40UET40A-GL	40	phase	50	4800	51.5/52/52	0.76/0.78/0.86	265/275/285	1.0/1.02/1.04	7.00/7.35/7.50	13.2
EF-50UFT40A-GL	50	380/400/415		7200	52/52/52	0.95/1.00/1.05	345/365/375	1.39/1.40/1.40	9.9/10.5/10.7	19.5
EF-35UDT40A-GL	35	Three- phase 60 400/440		3600	49/49.5	0.44/0.47	185/195	0.54/0.56	2.89/3.05	9.2
EF-40UET40A-GL	40		60	5520	55/55.5	0.77/0.80	370/390	1.01/1.00	6.72/7.10	13.2
EF-50UFT40A-GL	50		8400	56/56	1.03/1.05	540/545	1.46/1.28	9.56/10.3	19.5	

### Fan Efficiency

Ite	m Model Name	EF-35UDT-GL	EF-40UET-GL	EF-50UFT-GL	EF-35UDT40A-GL	EF-40UET40A-GL	EF-50UFT40A-GL			
1	Overall Efficiency	28.5	30.5	31.8	28.7	30.6	31.8			
2	Measurement Category		A							
3	Efficiency Category	Static								
4	Efficiency Grade	40	40	40	40	40	40			
5	VSD			N	/A					
6	Year of Manufacture	2014	2014	2014	2014	2014	2014			
7	Manufacturer Information	Tokyo E	MITSUE 81dg., 2-7-3, N	BISHI ELECT Iarunouchi, C	RIC CORPOF hiyoda-ku, To	RATION kyo 100-8310	, Japan			
8	Model Number	EF-35UDT-GL	EF-40UET-GL	EF-50UFT-GL	EF-35UDT40A-GL	EF-40UET40A-GL	EF-50UFT40A-GL			
	Motor Power Input (kW)	0.15	0.31	0.51	0.17	0.32	0.51			
9	Flow Rate (m <sup>3</sup> /s)	0.56	0.92	1.25	0.55	0.89	1.25			
	Total Static Pressure (Pa)	80	99	145	83	106	148			
10	Rotations per Minute	1436	1460	1445	1436	1458	1445			
11	Specific Ratio				1					
12	Information relevant for facilitating disassembly, recycling or disposal at end- of-life	This fan should be disposed of separately from household waste in line with local laws and regulations. When this fan reaches its end of life, dispose of it at your local waste collection point/recycling centre. The separate collection and recycling of this fan at the time of disposal will help at end- te								
13	Information relevant to minimise impact on the environment and ensure optimal life expectancy as regards installation, use and maintenance of the fan	<ul> <li><cleaning blades,="" etc.="" of=""> Cleaning should be performed about every three months.</cleaning></li> <li><overall cleaning=""> If flammable material such as oil or dust adheres to the fan, the material could catch the fire due to flying sparks. Always perform periodic cleaning (about once a year).</overall></li> <li>Do not use the following solvents when performing maintenance: Paint thinner, alcohol, benzene, gasoline, kerosene, spray solvents, alkaline detergents, chemicals from wipes, or detergents containing abrasives such as cleansers, or the like.</li> </ul>								
14	Description of additional items used when determining the fan energy efficiency	The optimal f	an efficiency	is measured i	n the conposi	tion of fan on	ly.			

### MITSUBISHI ELECTRIC CORPORATION