DAIKIN

OIL COOLING UNIT

AKZ/AKZJ 8 SERIES

New Refrigerant

Amazingly Improved Energy-Saving Inverter Oil Cooling Unit,
Daikin Core Inverter Control Technology Developed
For Air Conditioner Adapted.

8 SERIES

AKZ 8 series
(Circulation Type)

AKZJ 8 series
(Immersion Open Type)

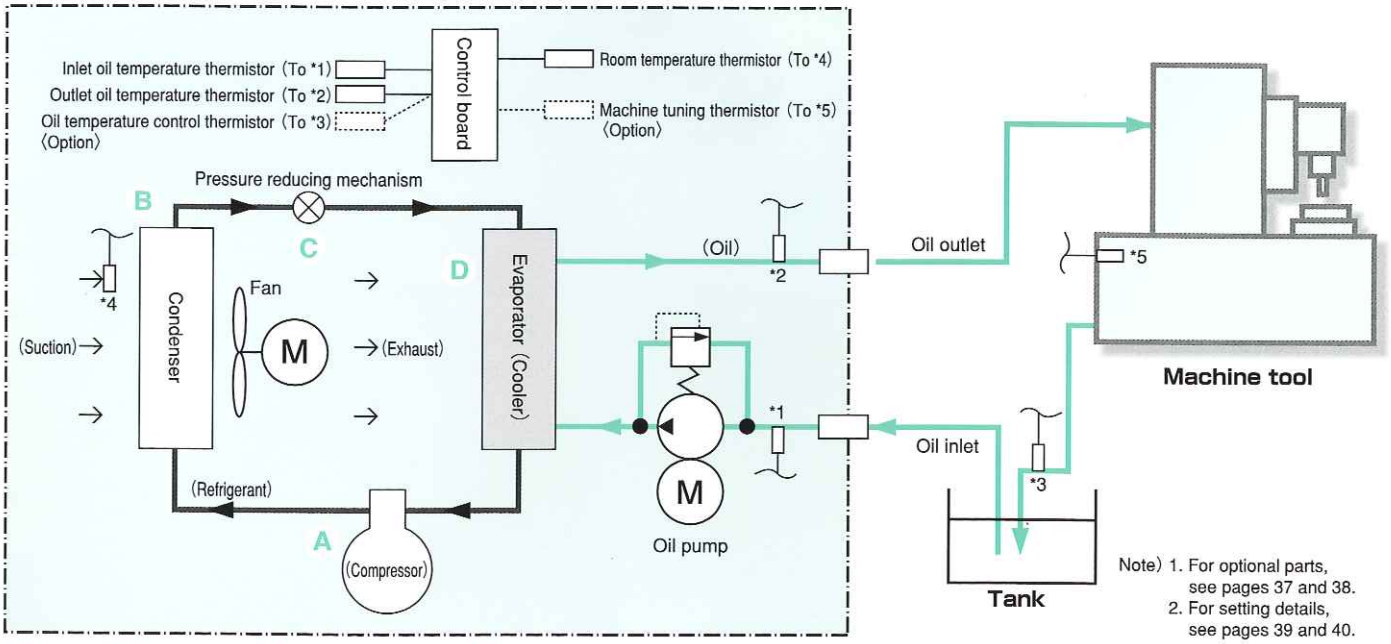
INDEX

DAIKIN INDUSTRIES, LTD.
Oil Hydraulic Division
Oil Hydraulic Equipment

FUSION TECHNOLOGY FOR CONTROL

Amazingly improved high-accuracy temperature control and first class energy saving by fusing "Hydraulic Technology" and "Inverter Technology".
The shortest delivery attained by listing all optional specifications as semi-standard.

Principle of Oil Cooling Unit and outline of the general system



Note) 1. For optional parts, see pages 37 and 38.
2. For setting details, see pages 39 and 40.

[Description on refrigeration cycle]

A: Using compressor, refrigerant gas is made into high-temperature high-pressure compressed gas so that it can be easily cooled and liquefied at the condenser.
B: At the condenser, this high-temperature high-pressure gas is cooled by air and condensed, and becomes high-temperature high-pressure liquid.
C: In the pressure reducing mechanism, this high-temperature high-pressure liquid is squeezed to reduce pressure, and made into low-temperature low-pressure liquid so that it can be easily evaporated at the cooler.
D: At the cooler, this low-temperature low-pressure liquid deprives heat from oil and becomes low-temperature low-pressure gas.

DAIKIN manufactures environmentally-friendly products with paying attention to energy-saving production, waste reduction by recycling, and others.
Higher energy-saving effects and multi-functions have been further pursued.
Amazingly improved energy-saving inverter "Oil Cooling Unit" 8 series, equipped with DAIKIN original high efficient IPM motor for air conditioners, has been developed.
The "Oil Cooling Unit", supported by excellent hybrid systems to operate machine tools under the best conditions at any time, is the fruit of DAIKIN's enthusiasm for highly-advanced technology.

Why machine tools require Oil Cooling Unit?

Latest machine tools needs

High-speed rotation: Improving surface roughness and accuracy

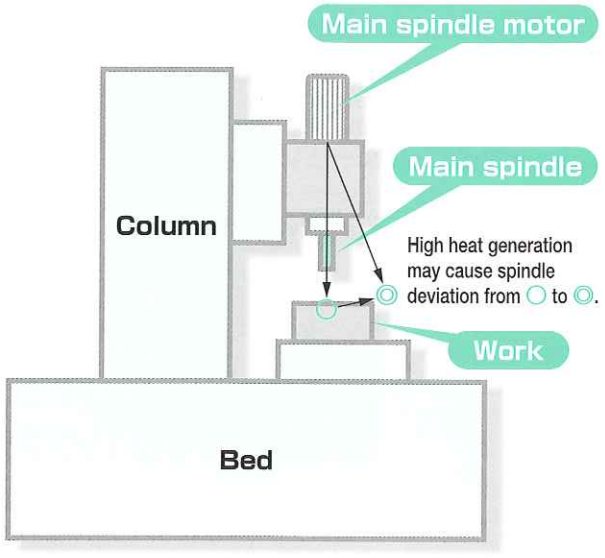
Heat is generated at headstock bearings and gears. The entire main spindle is warmed and the spindle deviates from the center of the column and the head, which results in poor accuracy. It is because there are differences in temperature among machine parts.
Oil Cooling Unit can control heat generation at the headstock, and the deviation can be corrected. Oil Cooling Unit lubricates the headstock gears and removes the heat generated. It is helpful to improve machine accuracy. (AKZ8 series)

Increased machining accuracy of work and extension of tool life

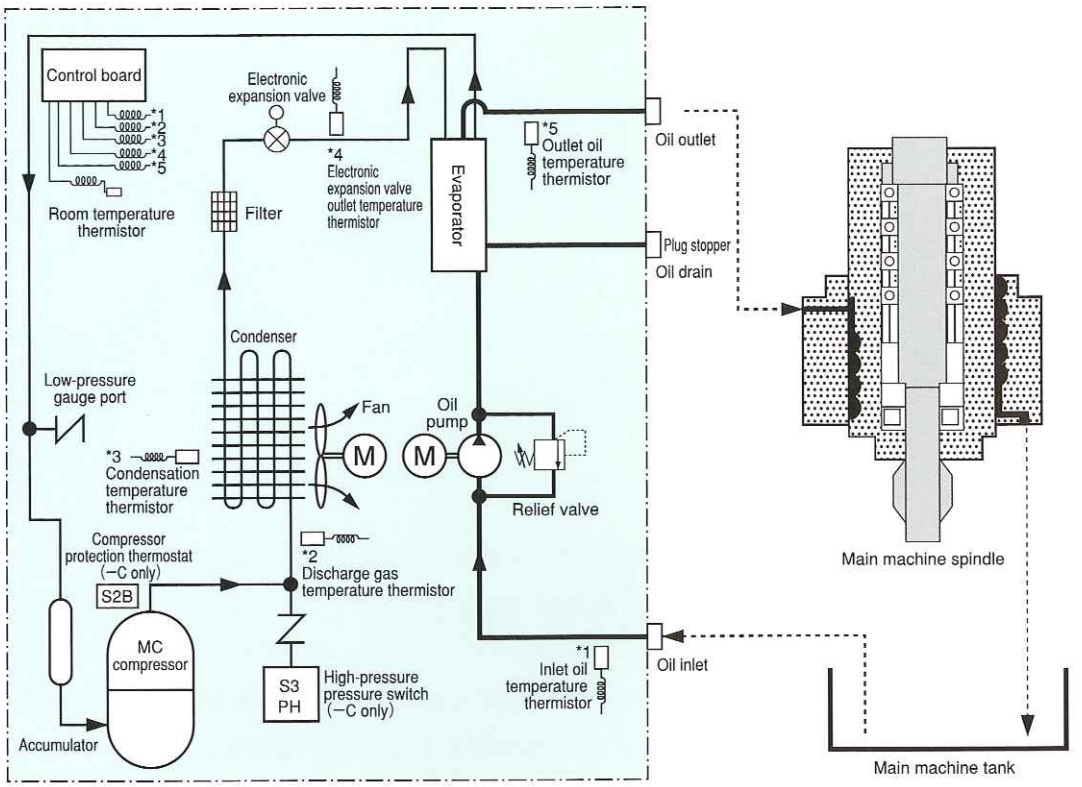
Highly accurate processing can be attained by controlling temperature of cutting and grinding fluids. In addition, longer tool life can be attained and deterioration of coolant can be reduced. Oil Cooling Unit contributes to improve machine operation efficiency. (AKZJ8 series)

Controlling oil temperature to optimum value according to heat generation of main machine

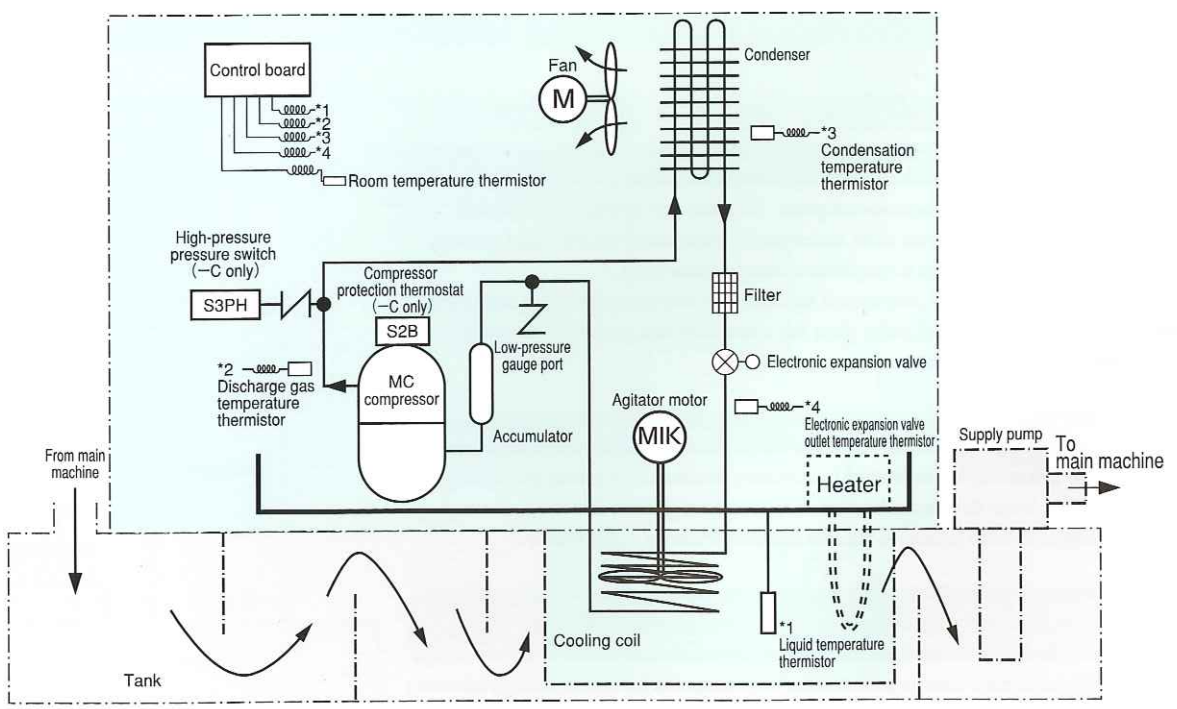
Oil Cooling Unit compressor frequency valuable control gives appropriate cooling capacity according to the heat generated on the main machine side to meet the operating condition.
The fluid temperature can be controlled accurately depending on load fluctuation from lowest to highest. Unlike the conventional non-inverter Oil Cooling Unit, the cooling capacity can be controlled in a wider range. Not only inlet fluid oil temperature control; but outlet fluid oil temperature control, return fluid oil temperature control, room temperature tuning, machine temperature tuning, and other operation modes can be selected according to the conditions of main machine.



AKZ series system piping diagram



AKZJ series system piping diagram



Note) 1.The above [ ] are locally supplied (outside of our scope).
2.Heater is applied to AKZJ-H only.

Nomenclature

AKZ	14	8	-	C	-	
1	2	3		4		5

1 Standard model (Standard type Oil Cooling Unit)

AKZ: High-accuracy inverter oil cooling unit, Circulating type, for main shaft and lubricating oil

AKZJ: High-accuracy inverter oil cooling unit, Immersion open type, for cutting and grinding liquid (oil)

2 Nominal cooling capacity (kW)×10

Adoption from the sequence of JIS Z8601 (2 digits)

Ex.) 14 means nominal cooling capacity of 1.4 kW.
14, 18, 32, 35, 43, 45, 56, 90, etc.

3 Design No. (Model change No.)

6,7,8……

4 Semi-standard (B, C, E, H, T)

Easily selecting optional specifications until previous series as semi-standard from the list.
According this system, delivery of optional spec was shorten.
* For combination, separately contact us.

5 Individual order symbol (4-digit alphanumerical characters)

Non-standard specifications for meeting individually required specifications not included in the semi-standard.
* For special specifications (UL compliance, Tropical treatment specifications, or others), separately contact us.

Contents of Standard, Semi-standard, Non-standard Models

■AKZ8 (Circulating type)

	Standard specifications	Semi-standard items	Non-standard	Remarks
Low-viscosity oil	○			Viscosity of oil : 1.4 to 200 ㎟/s
Relief pressure : 0.5MPa	○			Pump relief clacking pressure
Timer	○			99-hour timer
Outlet oil temperature sensor	○			
Circuit breaker		B		
CE specifications		C		European Safety Standard
Different voltage specifications (Transformer)		E*		*1, 2, 3 as shown available E1:AC220,230V 50/60Hz E2:AC380,400,415V 50/60Hz E3:AC440,460,480V 50/60Hz
Oil heater		H		
Oil tank		T		15L (AKZ148), 30L (AKZ328・AKZ438), 50L (AKZ568), 60L (AKZ908)
Relief pressure : 0.98MPa			○	Pump-separate-type unit
Relief pressure : 1.47MPa			○	Pump-separate-type unit
Tandem-pump			○	Pump-separate-type unit
Specified coating color			○	
Serial/Parallel communication extension board			SP	For AKZ148, AKZ328, AKZ438 Standard, −C, −E*, −T

■AKZJ8 (Immersion type)

	Standard specifications	Semi-standard items	Non-standard	Remarks
Low-viscosity oil (liquid)	○			Viscosity of oil (liquid) : 0.5 to 200 ㎟/s
Timer	○			99-hour timer
Circuit breaker		B		
CE specifications		C		European Safety Standard
Different voltage specifications (Transformer)		E*		*1, 2, 3 as shown available E1:AC220,230V 50/60Hz E2:AC380,400,415V 50/60Hz E3:AC440,460,480V 50/60Hz
Oil heater		H		
Specified coating color			○	
Serial/Parallel communication extension board			SP	For AKZJ188, AKZJ358, AKZJ458 Standard, −C, −E*

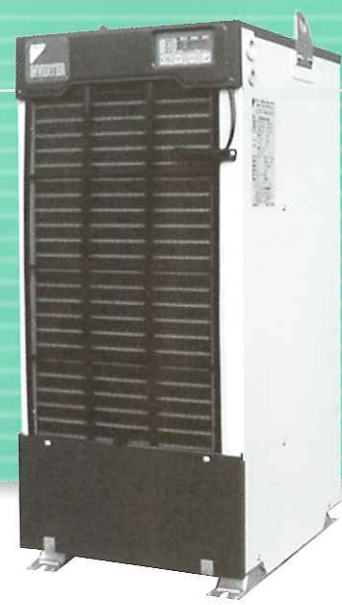
■Optional parts (See pages 37 and 38.)

- Machine tuning thermistor (Lead wire length: 5 m, 10 m)
- Oil temperature control thermistor (Lead wire length: 5 m, 10 m)
- Main machine communication extension board (Serial communication and Serial/Parallel communication are possible)

OIL COOLING UNIT

AKZ8

Circulation type SERIES

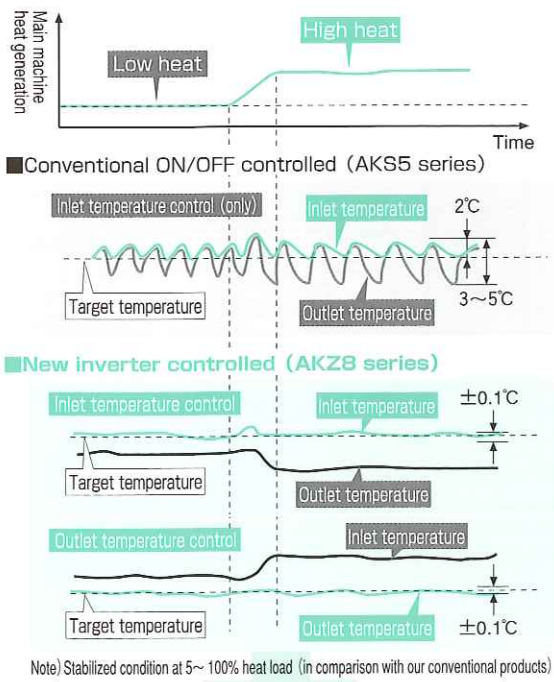


AKZ8 SERIES General

- **High-accuracy type with inverter compressor and electronic expansion valve**
- **Circulation type Oil Cooling Unit (Built-in circulation pump)**
- **Closed type cooler**
- **New refrigerant R410A (Modulus of rupture of ozone layer : 0)**
- **Temperature control in low-load range attained by wide cooling capacity control**
  (Conventional : 10~100%→8 series : 5~100%)
- **Wide operating temperature range (Room temperature : 5~45℃, Inlet oil temperature : 5~50℃)**

AKZ8 SERIES Features

High-accuracy temperature control

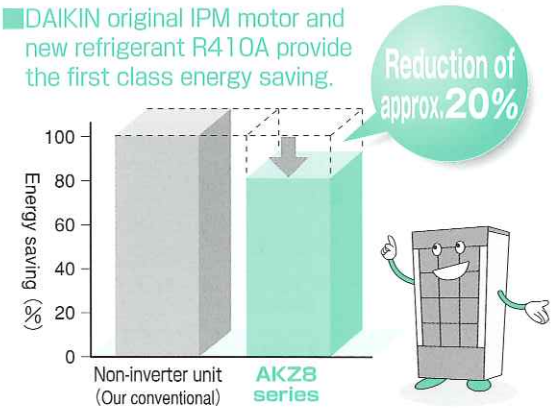


Note) Stabilized condition at 5~ 100% heat load (in comparison with our conventional products)

■The inverter-controlled unit keeps the best machine operation conditions at any time to improve the processing accuracy.

The first class energy saving

■DAIKIN original IPM motor and new refrigerant R410A provide the first class energy saving.



*In comparison with our existing ON/OFF unit (AKS5 series) as 100

Low noise

68dB (A) ➡ 62dB (A)
with AKZ1.2HP class, corresponding value in anechoic chamber

Generally, people can talk at the distance of 1m at the noise level of 60 dB.

AKZ8 SERIES Features

0.5 MPa relief pressure standardized

0.3 MPa for conventional unit, Piping pressure loss problem solved

Low-viscosity pump standardized

■Viscosity of oil : 1.4 to 200 mm²/s

New useful functions added to current oil temperature warning functions

■Auto tuning function

Only operate main machine at no load for 10 ~ 20 minutes, and temperature control gain is set automatically.
The tuning time during test run can be greatly shortened.

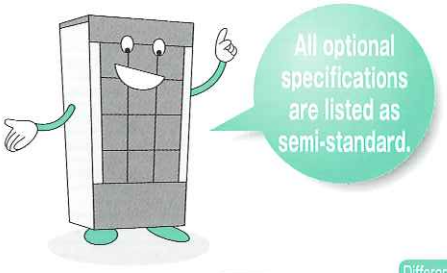
■Refrigerant gas runout detection function

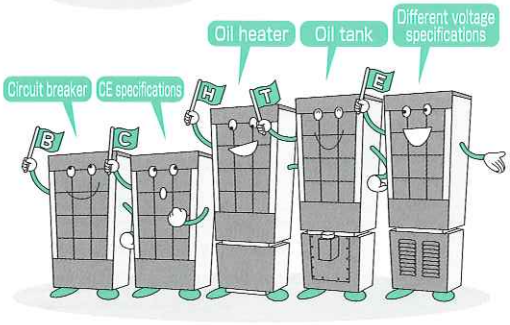
Alarm signal is output at the time of refrigerant gas runout (cooling failure). Burn-out of spindle can be indirectly prevented.

■99-hour timer function

Max. 99-hour warming up can be easily performed.

The shortest delivery, Five-type specifications available in addition to the standard model





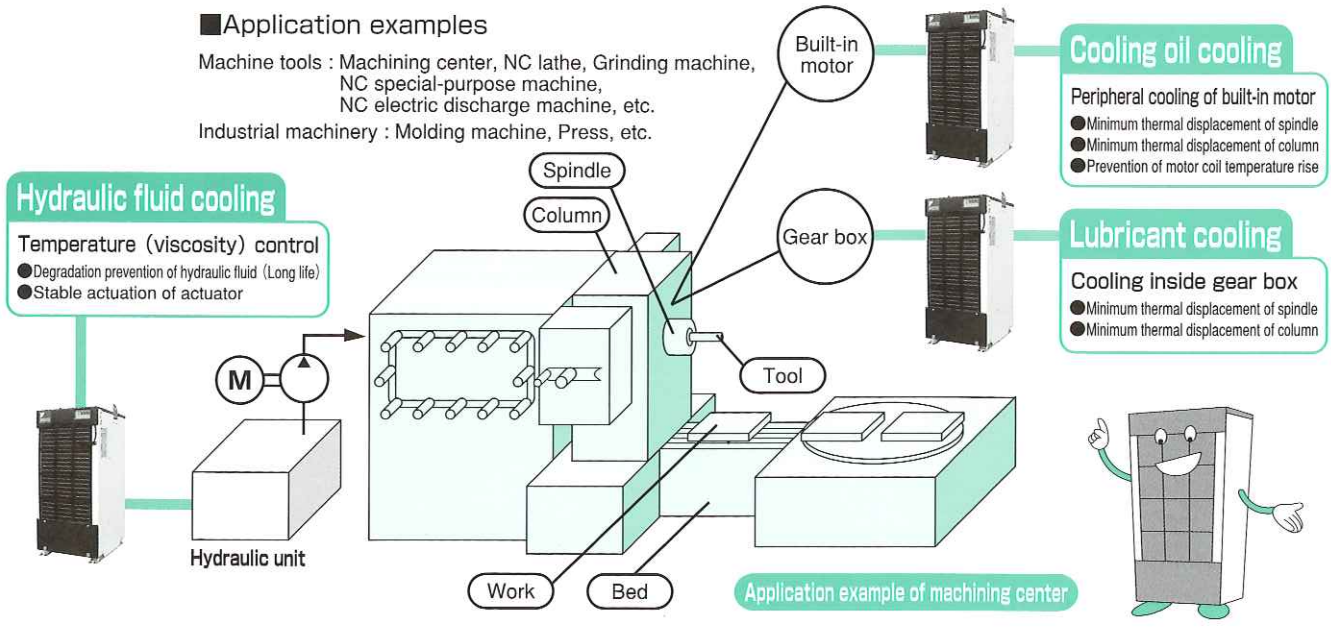
The smallest size in the class

*AKZ328 class (Unit : mm)

AKZ8 SERIES Application

■Application examples

Machine tools : Machining center, NC lathe, Grinding machine, NC special-purpose machine, NC electric discharge machine, etc.
Industrial machinery : Molding machine, Press, etc.



Hydraulic fluid cooling

Temperature (viscosity) control
- Degradation prevention of hydraulic fluid (Long life)
- Stable actuation of actuator

Cooling oil cooling

Peripheral cooling of built-in motor
- Minimum thermal displacement of spindle
- Minimum thermal displacement of column
- Prevention of motor coil temperature rise

Lubricant cooling

Cooling inside gear box
- Minimum thermal displacement of spindle
- Minimum thermal displacement of column

Application example of machining center

AKZ8 SERIES

Specifications (AKZ148・328・438)

Equivalent horse power (HP)		0.5						1.2						1.5					
Model		AKZ148						AKZ328						AKZ438					
		Standard	−B	−C	−H	−T	−E *3	Standard	−B	−C	−H	−T	−E *3	Standard	−B	−C	−H	−T	−E *3
Cooling capacity (50/60Hz) *1	kW	1.3/1.4						2.8/3.2						3.8/4.3					
Heater	kW	−			1		−	−			1		−	−			1		−
Power supply *2		AC 3-phase 200/200・220V 50/60Hz					*3	AC 3-phase 200/200・220V 50/60Hz					*3	AC 3-phase 200/200・220V 50/60Hz					*3
Circuit power supply	Main circuit	AC 3-phase 200/200・220V 50/60Hz																	
	Control circuit	DC12/24V																	
Max. power consumption, Max. current consumption	200V 50Hz	1.20kVA/3.5A						1.70kVA/5.3A						2.31kVA/6.6A					
	200V 60Hz	1.32kVA/3.7A						1.73kVA/5.5A						2.35kVA/6.8A					
	220V 60Hz	1.33kVA/3.9A						1.75kVA/5.7A						2.45kVA/7.0A					
Transformer capacity		−					2.6kVA	−					2.6kVA	−					2.6kVA
Painted color		White																	
Dimensions (H×W×D)	mm	650×360×440			950×360×440	820×360×465	950×360×440	790×360×440		1090×360×440	1055×360×465		1090×360×440	990×360×440		1290×360×440	1225×360×465		1290×360×440
Compressor (Hermetic DC swing type)		Equivalent to 0.4 kW						Equivalent to 0.75 kW						Equivalent to 1.1 kW					
Evaporator		Shell end coil type																	
Condenser		Cross fin coil type																	
Propeller fan	Electric motor	ϕ300、75W																	
Oil pump	Electric motor	0.4kW×4P																	
	Discharge L/min	12/14.4						24/28.8											
	Clacking pressure MPa	0.5						0.6											
Temperature control (Selectable) Tuning type	Reference	Room temperature or machine surface temperature *4 (At the time of factory shipments: Room temperature: Mode 3)																	
	Control subject	Inlet oil temperature or outlet oil temperature (At the time of factory shipments: Inlet oil temperature)																	
	Tuning range K	−9.9 to +9.9 at reference temperature (At the time of factory shipments: 0.0)																	
Fixed type	Control subject	Inlet oil temperature or outlet oil temperature																	
	Control range ℃	5~50																	
Refrigerant control		Compressor capacity control by inverter + Electronic expansion valve																	
Refrigerant (New refrigerant: R410A) *5 Amount of filling	kg	0.49						0.72						1.13					
Protector		Overcurrent relay (Motor for pump), Reverse phase protector, Restart prevention timer, Low-room temperature protection thermostat, High-oil temperature protection thermostat, Low-oil temperature protection thermostat, Relief valve for pump, Discharge pipe temperature thermostat, Condenser temperature thermostat, Refrigerant leak detector, Full set of Inverter protector, High-pressure pressure switch (−C only), Compressor protection thermostat (−C only), Overheat prevention thermostat (−H only), Dry-firing prevention switch (−H only)																	
Operating range	Room temperature ℃	5~45																	
	Inlet oil temperature ℃	5~50																	
	Oil viscosity mm²/s	1.4~200 (ISO VG2~32)																	
	External pressure loss Discharge side	0.5 MPa or lower																	
	Suction side	Within −30.7 kPa																	
Usable oil		Lubricating oil, Mineral oil based hydraulic fluid (however, not usable for Phosphate ester based hydraulic fluid, Water, Water-soluble liquid, Chemicals, Foods, Fuel, Cutting and grinding liquids)																	
Connection piping	Oil inlet	Rc3/4																	
	Oil outlet	Rc3/4		Rc1 1/4		Rc3/4		Rc1 1/4			Rc3/4			Rc1 1/4			Rc3/4		
	Oil drain	Rc1/4 (Plug stopper)																	
Noise (Front 1m, Height 1m, corresponding value in anechoic chamber)	dB(A)	62												65					
Transportation vibration		Vertical 14.7 m/s² (1.5G) × 2.5 Hr (10 ~ 100 Hz sweep/5 min)																	
Weight	kg	52		62		67	110	58		68		88	116	67		77		97	125
Wiring circuit breaker (Rated current)	A	−	10		−			−	10		−			−	10		−		
Oil tank (capacity)	L	−				15	−	−			−	30	−	−				30	−
Local supply Wiring circuit breaker (Rated current)	A	10 (Required by models other than −B)																	

Note) *1.Cooling capacity means the rate at standard point (inlet oil temperature: 35℃; room temperature: 35℃; Oil: ISO VG32). Capacity tolerances are about ±5%.
*2.Fluctuation of input voltage should be less than ±10%. If it is beyond ±10%, separately contact us.
*3.Different voltage specificaion has three kinds of −E1, −E2, and −E3. (For particulars, see page 4.)
*4.Optional machine tuning thermistor is required. (For particulars, see page 37.)
*5.MSDS (Material Safety Data Sheet) of R410A is attached to Product −C.
*6.The breaker for wiring is not attached to this product. It should be prepared by the user.
*7.The conventional 1HP models (AKS105AK, AKZ (S) 257 class) are united into 1.2HP AKZ328.

AKZ8 SERIES

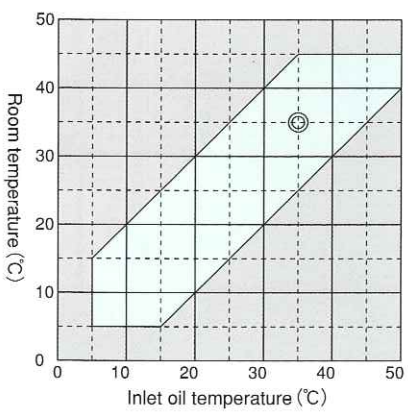
Specifications (AKZ568・908)

Equivalent horse power (HP)			2.0						3.0					
Model			AKZ568						AKZ908					
			Standard	−B	−C	−H	−T	−E *3	Standard	−B	−C	−H	−T	−E *3
Cooling capacity (50/60Hz) *1		kW	5.0/5.6						8.0/9.0					
Heater		kW	−			2	−		−			3	−	
Power supply *2			AC 3-phase 200/200・220V 50/60Hz					*3	AC 3-phase 200/200・220V 50/60Hz					*3
Circuit power supply	Main circuit		AC 3-phase 200/200・220V 50/60Hz											
	Control circuit		DC12/24V											
Max. power consumption, Max. current consumption	200V 50Hz		3.21kVA/9.4A						5.02kVA/15.2A					
	200V 60Hz		3.30kVA/9.5A						5.14kVA/15.6A					
	220V 60Hz		3.34kVA/9.2A						5.20kVA/14.5A					
Transformer capacity			−					5kVA	−					6kVA
Painted color			White											
Dimensions (H×W×D)		mm	1110×470×560			1410×470×560	1375×470×580	1360×470×590	1220×560×620			1520×560×680	1485×560×700	1470×560×695
Compressor (Hermetic DC swing type)			Equivalent to 1.5 kW						Equivalent to 2.2 kW					
Evaporator			Shell end coil type											
Condenser			Cross fin coil type											
Propeller fan	Electric motor		φ400、90W×4P						φ450、150W×4P					
Oil pump	Electric motor		0.75kW×4P											
	Discharge	L/min	30/36											
	Clacking pressure	MPa	0.6											
Temperature control (Selectable) Tuning type	Reference		Room temperature or machine surface temperature *4 (At the time of factory shipments: Room temperature: Mode 3)											
	Control subject		Inlet oil temperature or outlet oil temperature (At the time of factory shipments: Inlet oil temperature)											
	Tuning range K		−9.9 to +9.9 at reference temperature (At the time of factory shipments: 0.0)											
Fixed type	Control subject		Inlet oil temperature or outlet oil temperature											
	Control range	℃	5~50											
Refrigerant control			Compressor capacity control by inverter + Electronic expansion valve											
Refrigerant (New refrigerant: R410A) *5 Amount of filling		kg	1.25						1.53					
Protector			Overcurrent relay (Motor for pump), Reverse phase protector, Restart prevention timer, Low-room temperature protection thermostat, High-oil temperature protection thermostat, Low-oil temperature protection thermostat, Relief valve for pump, Discharge pipe temperature thermostat, Condenser temperature thermostat, Refrigerant leak detector, Full set of Inverter protector, High-pressure pressure switch (−C only), Compressor protection thermostat (−C only), Overheat prevention thermostat (−H only), Dry-firing prevention switch (−H only)											
Operating range	Room temperature	℃	5~45											
	Inlet oil temperature	℃	5~50											
	Oil viscosity	mm²/s	1.4~200 (ISO VG2~32)											
	External pressure loss Discharge side		0.5 MPa or lower											
	Suction side		Within −30.7 kPa											
Usable oil			Lubricating oil, Mineral oil based hydraulic fluid (however, not usable for Phosphate ester based hydraulic fluid, Water, Water-soluble liquid, Chemicals, Foods, Fuel, Cutting and grinding liquids)											
Connection piping	Oil inlet		Rc 1 1/4				Rc 1	Rc 1 1/4	Rc 1 1/4				Rc 1	Rc 1 1/4
	Oil outlet		Rc 1 1/4											
	Oil drain		Rc1/4 (Plug stopper)											
Noise (Front 1m, Height 1m, corresponding value in anechoic chamber)		dB(A)	65						67					
Transportation vibration			Vertical 14.7 m/s² (1.5G) × 2.5 Hr (10 ~ 100 Hz sweep/5 min)											
Weight		kg	97			115	130	182	125			150	160	210
Wiring circuit breaker (Rated current)		A	−	15		−			−	20		−		
Oil tank (capacity)		L	−				50	−	−				70	−
Local supply Wiring circuit breaker (Rated current)		A	15 (Required by models other than −B)						20 (Required by models other than −B)					

Note) *1.Cooling capacity means the rate at standard point (inlet oil temperature: 35℃; room temperature: 35℃; Oil: ISO VG32). Capacity tolerances are about ±5%.
*2.Fluctuation of input voltage should be less than ±10%. If it is beyond ±10%, separately contact us.
*3.Different voltage specificaion has three kinds of −E1, −E2, and −E3. (For particulars, see page 4.)
*4.Optional machine tuning thermistor is required. (For particulars, see page 37.)
*5.MSDS (Material Safety Data Sheet) of R410A is attached to Product −C.
*6.The breaker for wiring is not attached to this product. It should be prepared by the user.
*7.The conventional 1HP models (AKS105AK, AKZ(S)257 class) are united into 1.2HP AKZ328.

Operating range

Note) 1. Mark◎means the standard point.
2. Operate in the range of the above □.
(The use outside of the usable range may cause failures.)



AKZ8 SERIES

Dimensional outline drawing

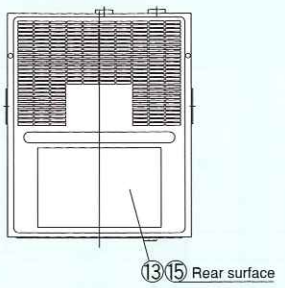
AKZ148(-B,-C)

Standard specifications

Circuit breaker

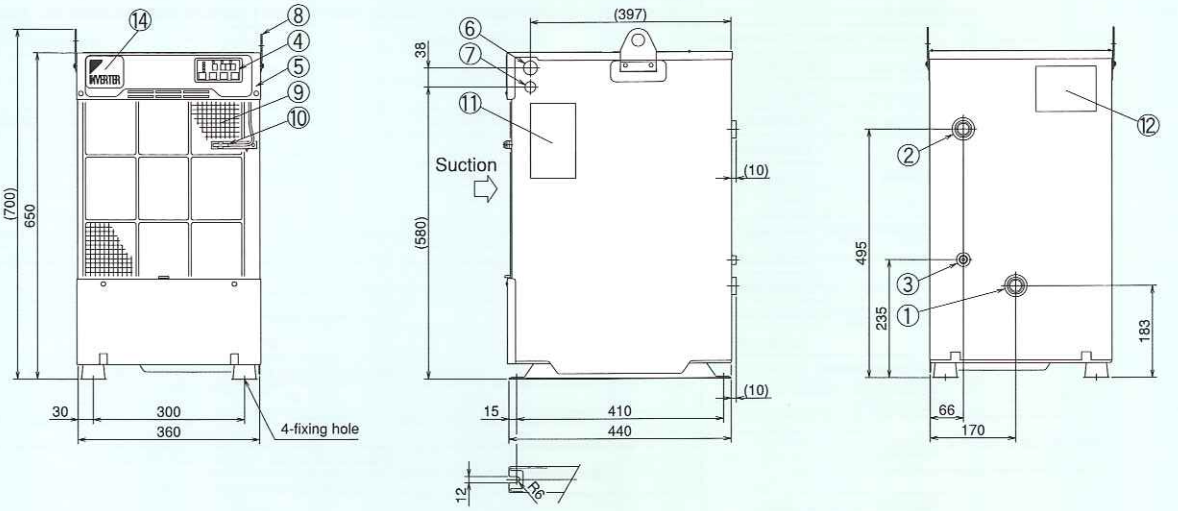
CE specifications

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

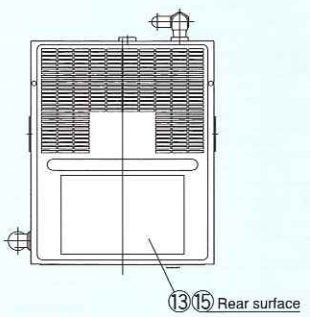
Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	



AKZ148-H

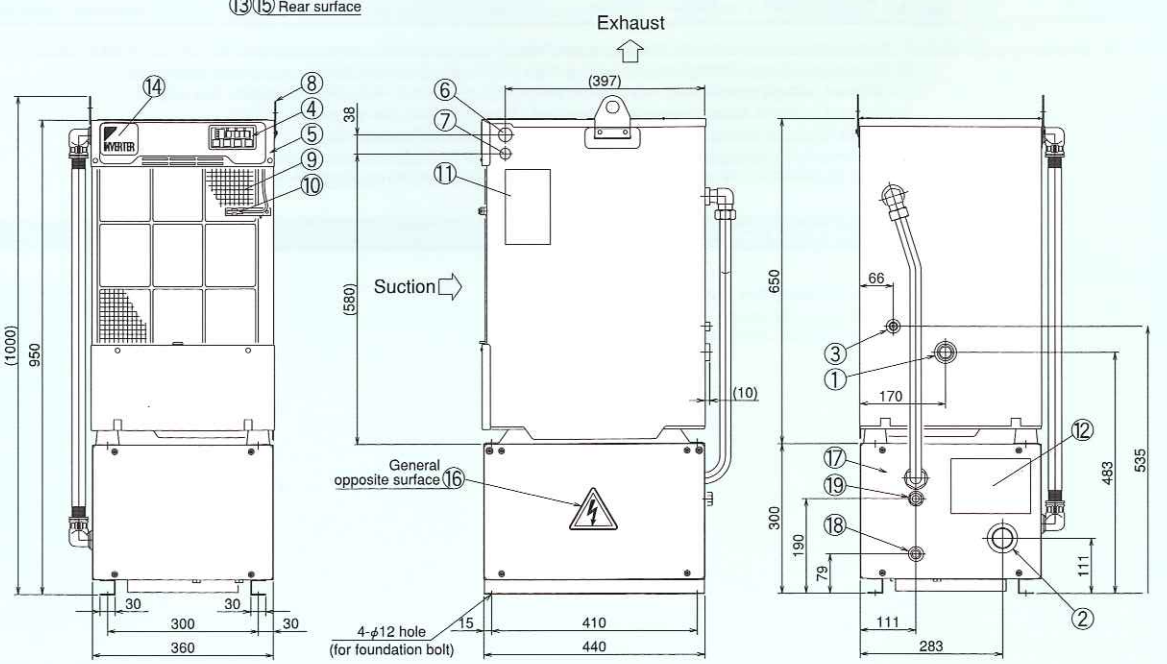
Heater

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Charged mark plate	
17	Heater box	
18	Heater drain	Rc1/4
19	Air purge	Rc1/4



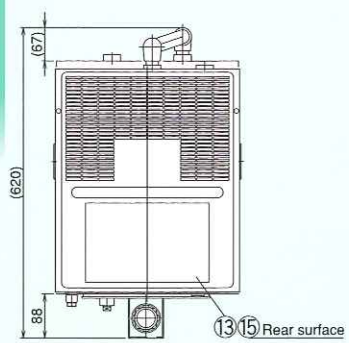
AKZ8 SERIES

Dimensional outline drawing

AKZ148-T

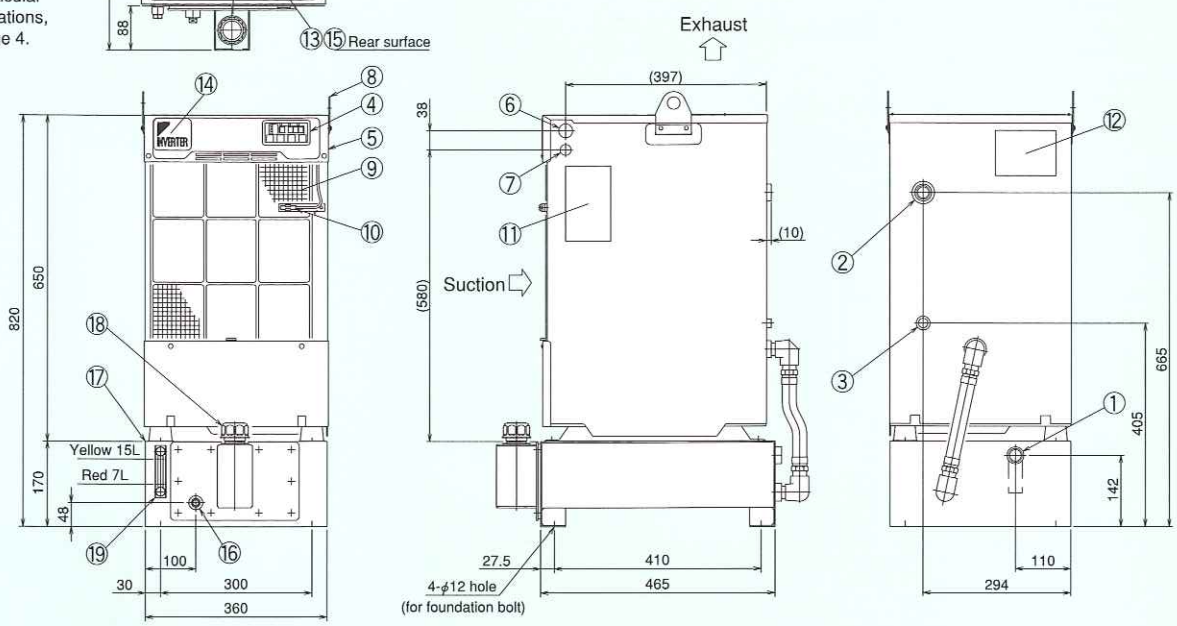
Tank

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

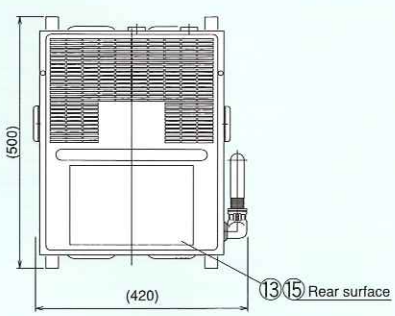
Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Tank drain	Rc3/8 Plug stopper
17	Oil tank	15L
18	Lubrication port and air breezer	HY-06T
19	Oil level gauge	KLA-80A



AKZ148-E※

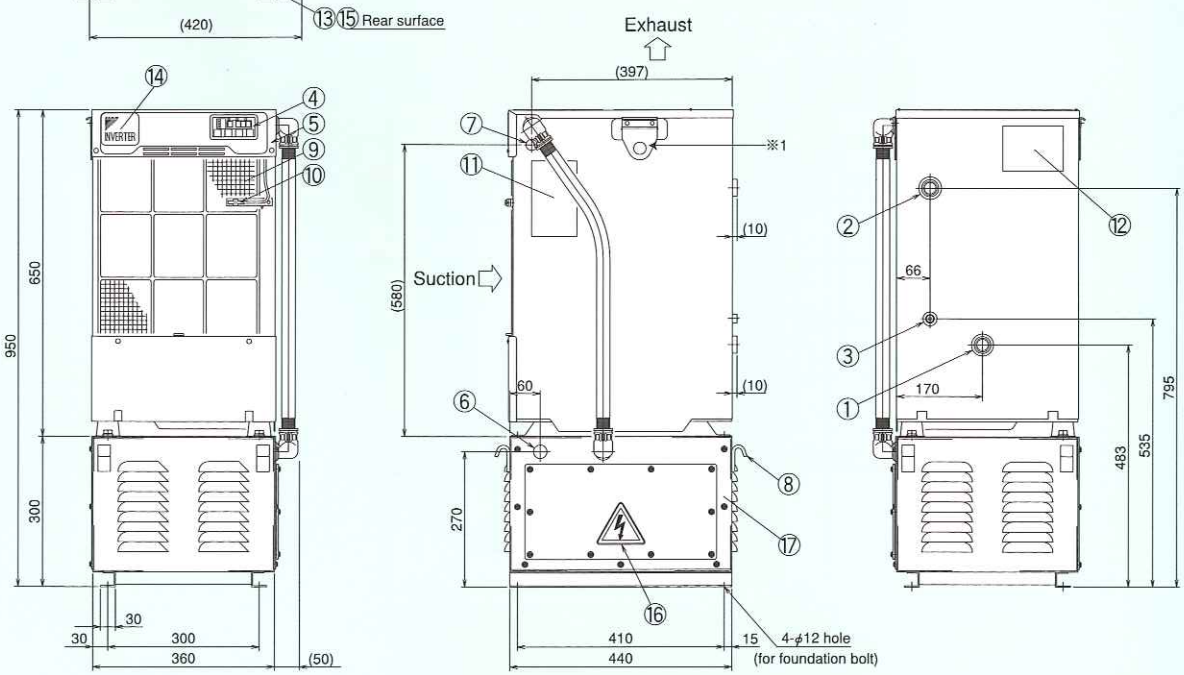
Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Hanger	
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Charged mark plate	
17	Transformer box	



Note)※1.Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZ328(-B,-C)

Standard specifications

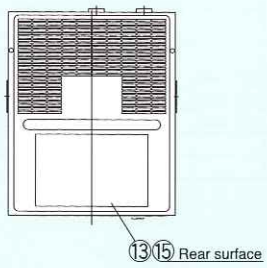
Circuit breaker

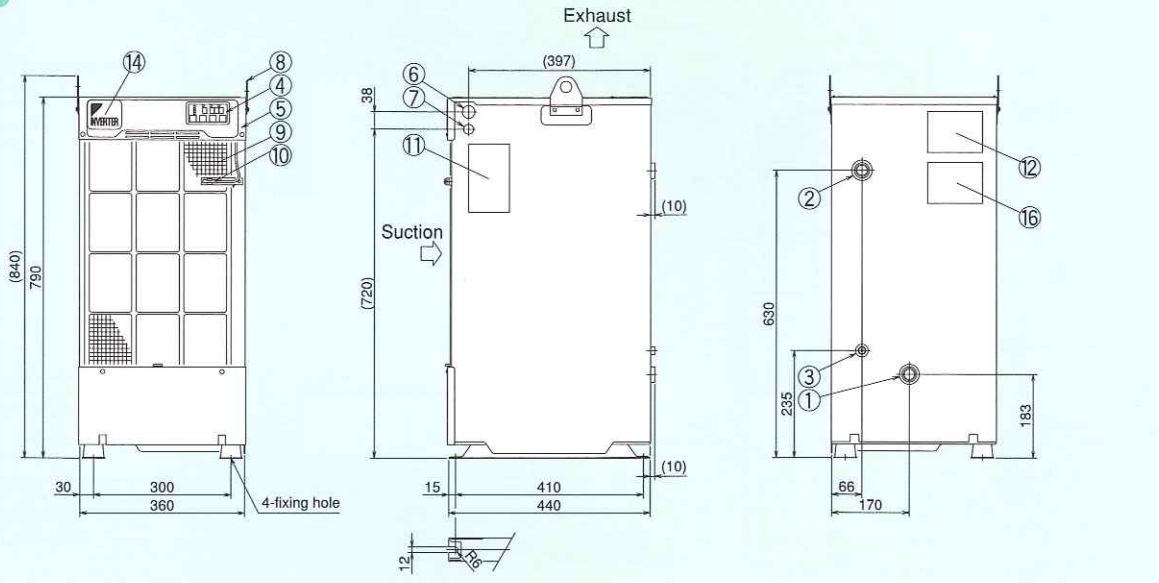
CE specifications

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	





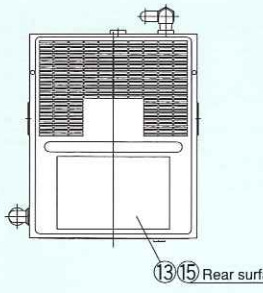
AKZ328-H

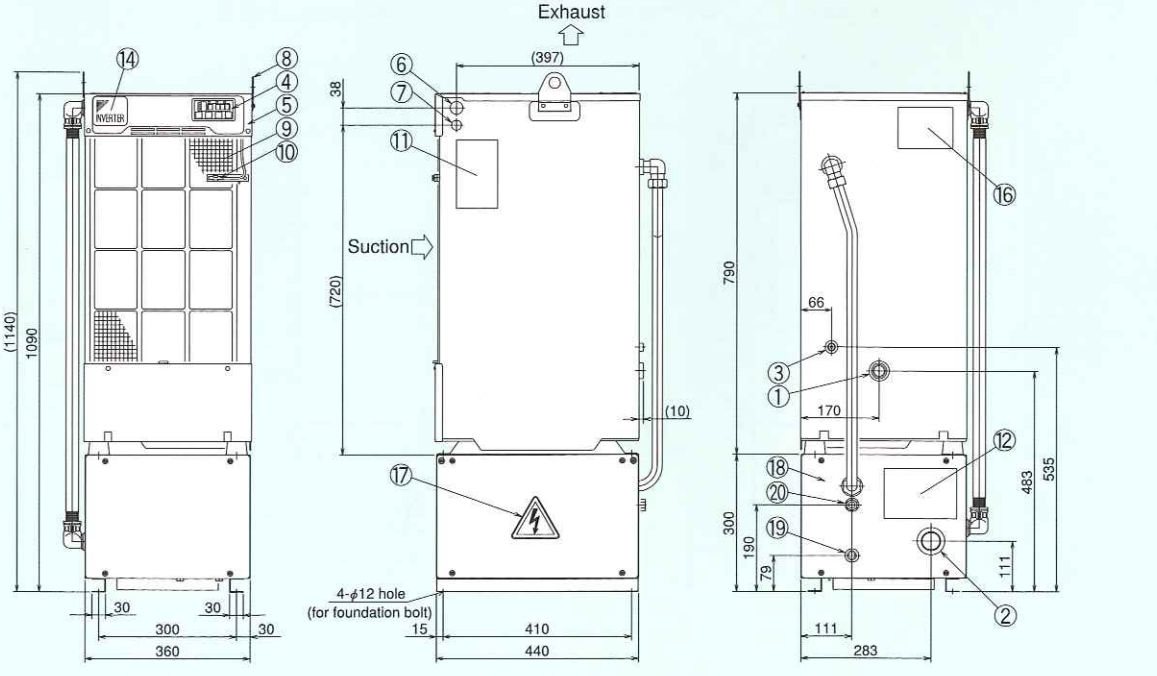
Heater

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	
17	Charged mark plate	
18	Heater box	
19	Heater drain	Rc1/4
20	Air purge	Rc1/4





AKZ8 SERIES

Dimensional outline drawing

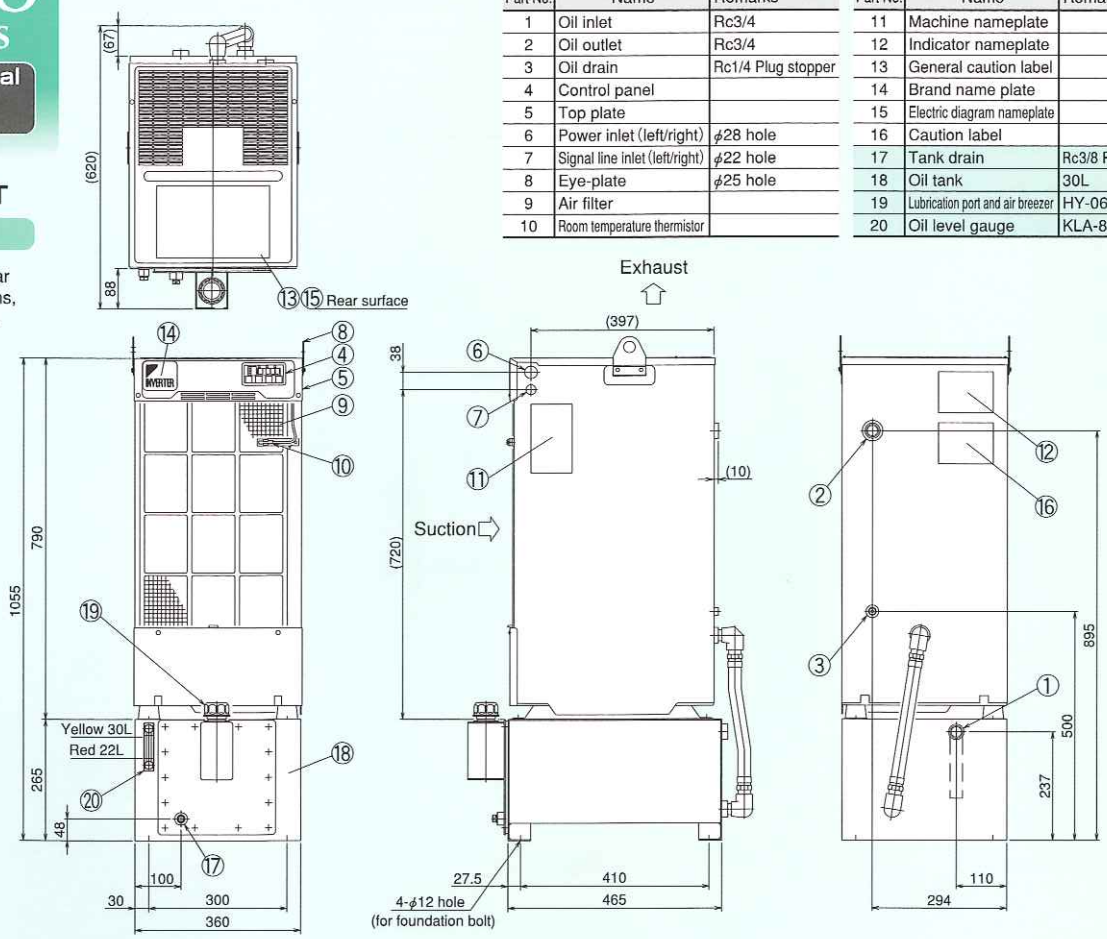
AKZ328-T

Tank

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	
17	Tank drain	Rc3/8 Plug stopper
18	Oil tank	30L
19	Lubrication port and air breezer	HY-06T
20	Oil level gauge	KLA-80A



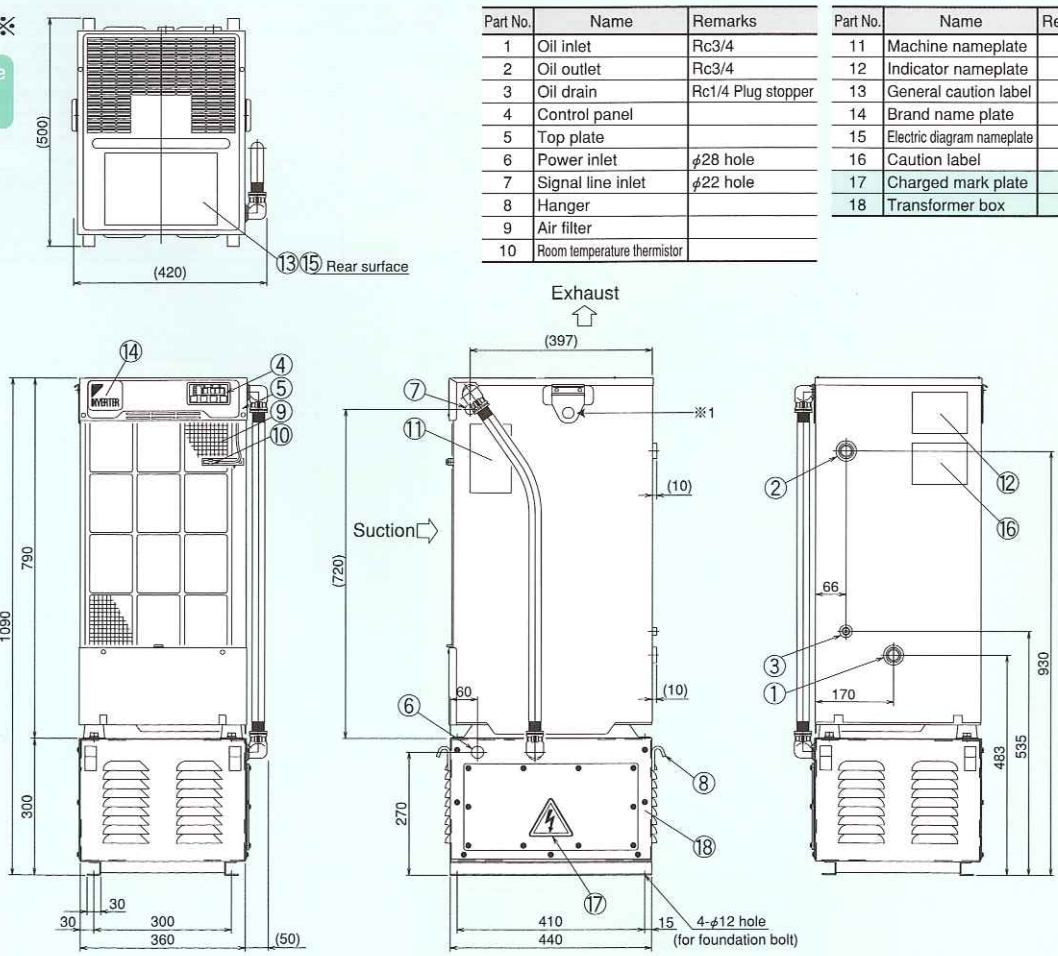
AKZ328-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Hanger	
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	
17	Charged mark plate	
18	Transformer box	



Note)※1.Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZ8 SERIES

Dimensional outline drawing

AKZ438(-B,-C)

Standard specifications

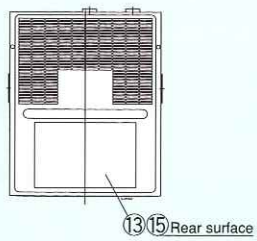
Circuit breaker

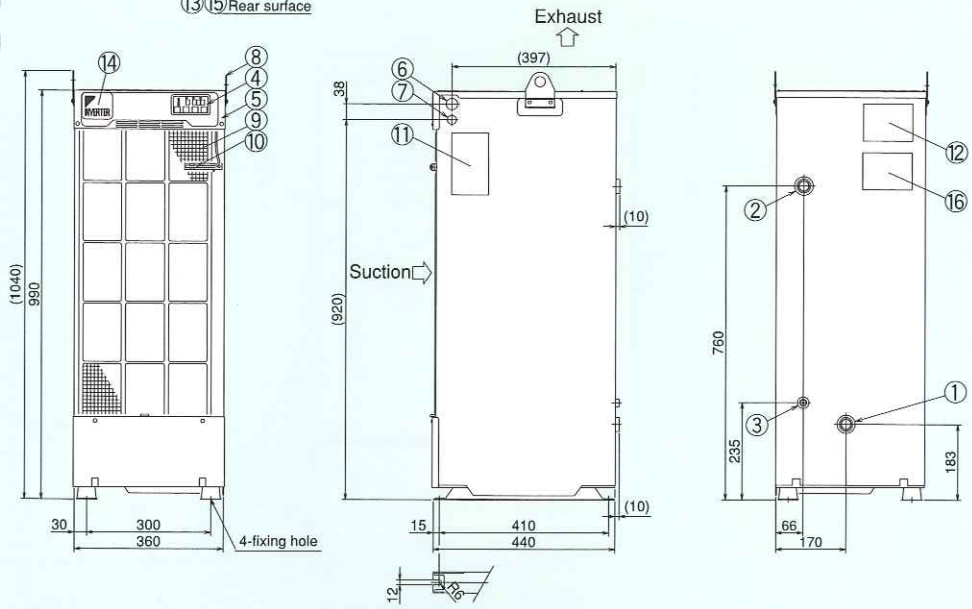
CE specifications

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	





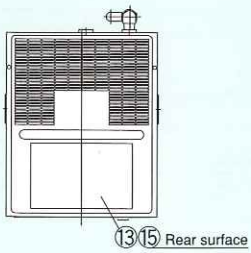
AKZ438-H

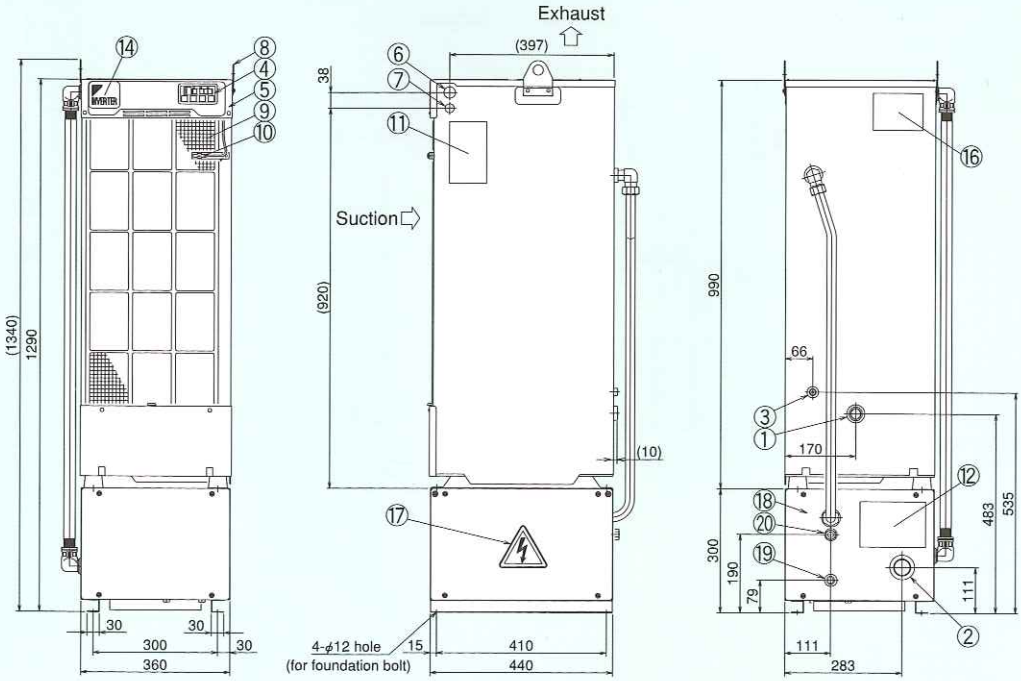
Heater

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	
17	Charged mark plate	
18	Heater box	
19	Heater drain	Rc1/4
20	Air purge	Rc1/4





AKZ8 SERIES

Dimensional outline drawing

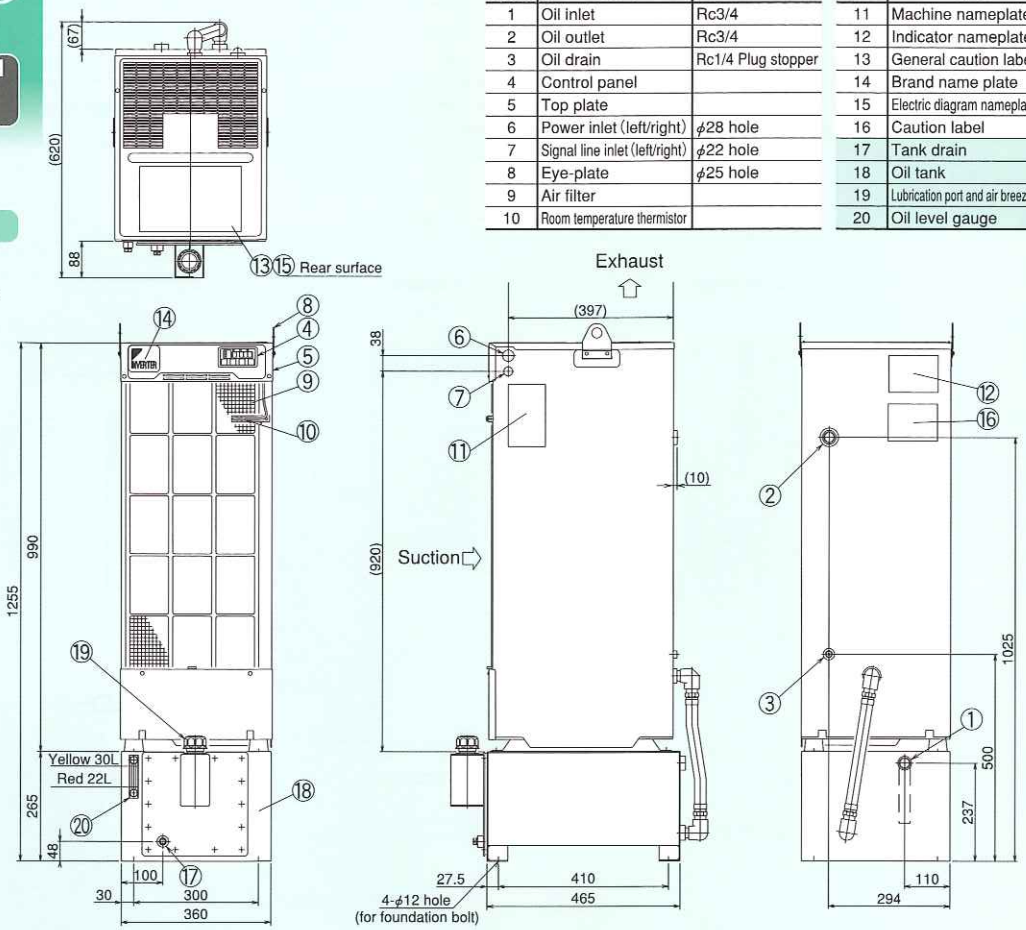
AKZ438-T

Tank

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	
17	Tank drain	Rc3/8 Plug stopper
18	Oil tank	30L
19	Lubrication port and air breezer	HY-06T
20	Oil level gauge	KLA-80A



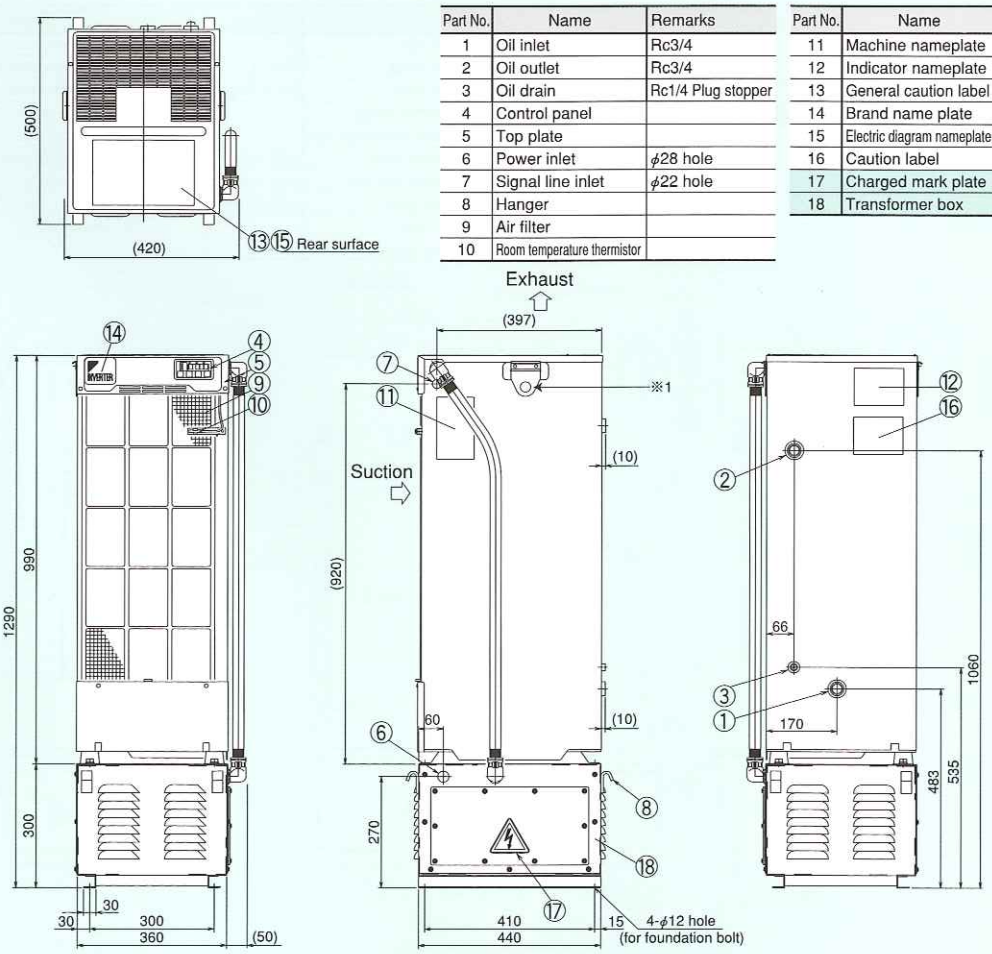
AKZ438-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc3/4
2	Oil outlet	Rc3/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Hanger	
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Caution label	
17	Charged mark plate	
18	Transformer box	



Note) ※1.Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZ8 SERIES

Dimensional outline drawing

AKZ568(-B,-C)

Standard specifications

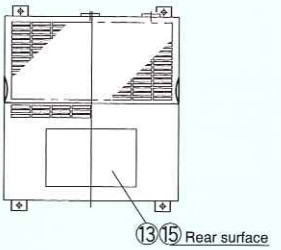
Circuit breaker

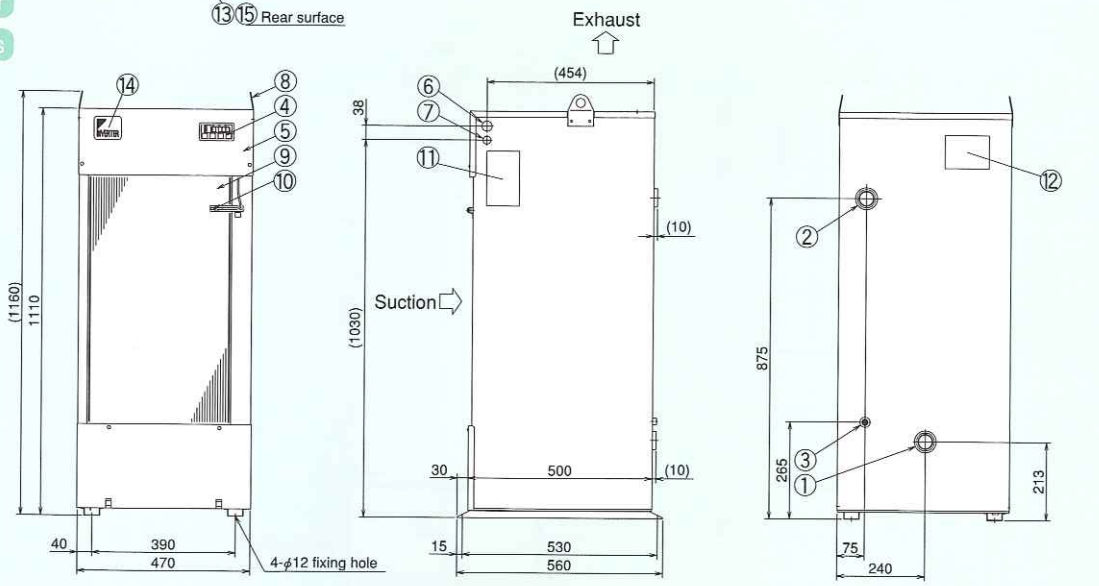
CE specifications

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc1 1/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	





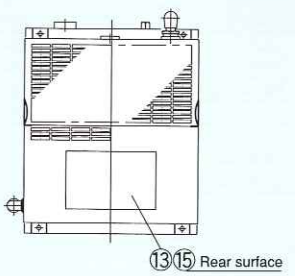
AKZ568-H

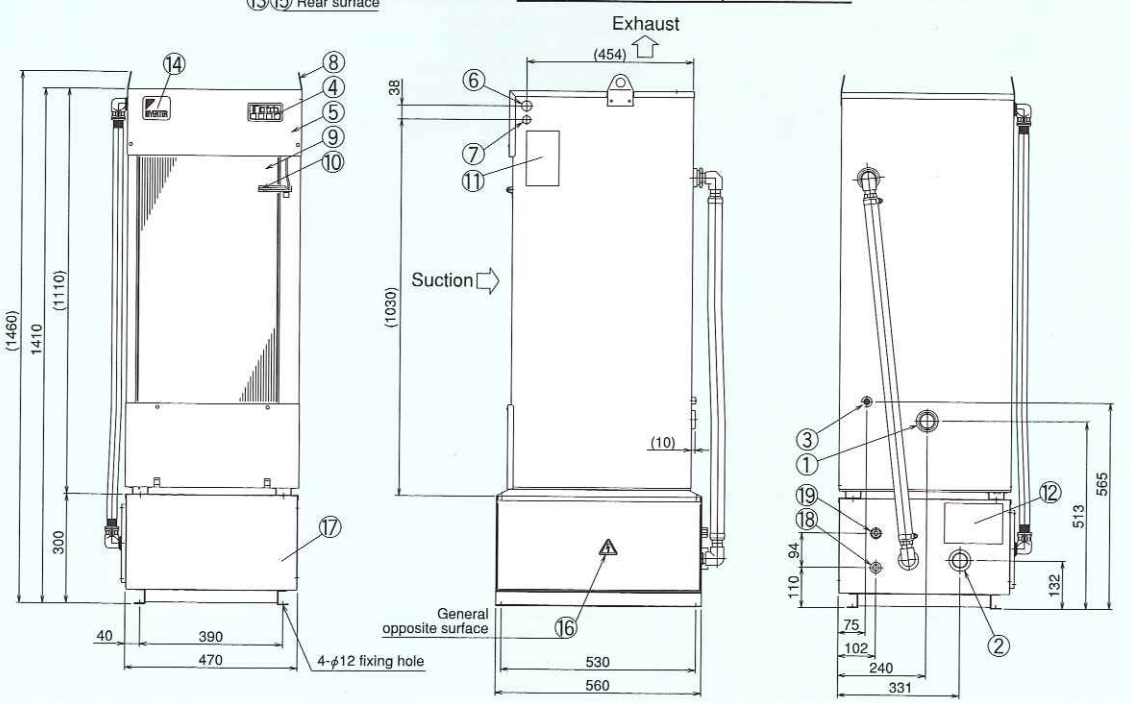
Heater

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc1 1/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Charged mark plate	
17	Heater box	
18	Heater drain	Rc1/4
19	Air purge	Rc1/4





AKZ8 SERIES

Dimensional outline drawing

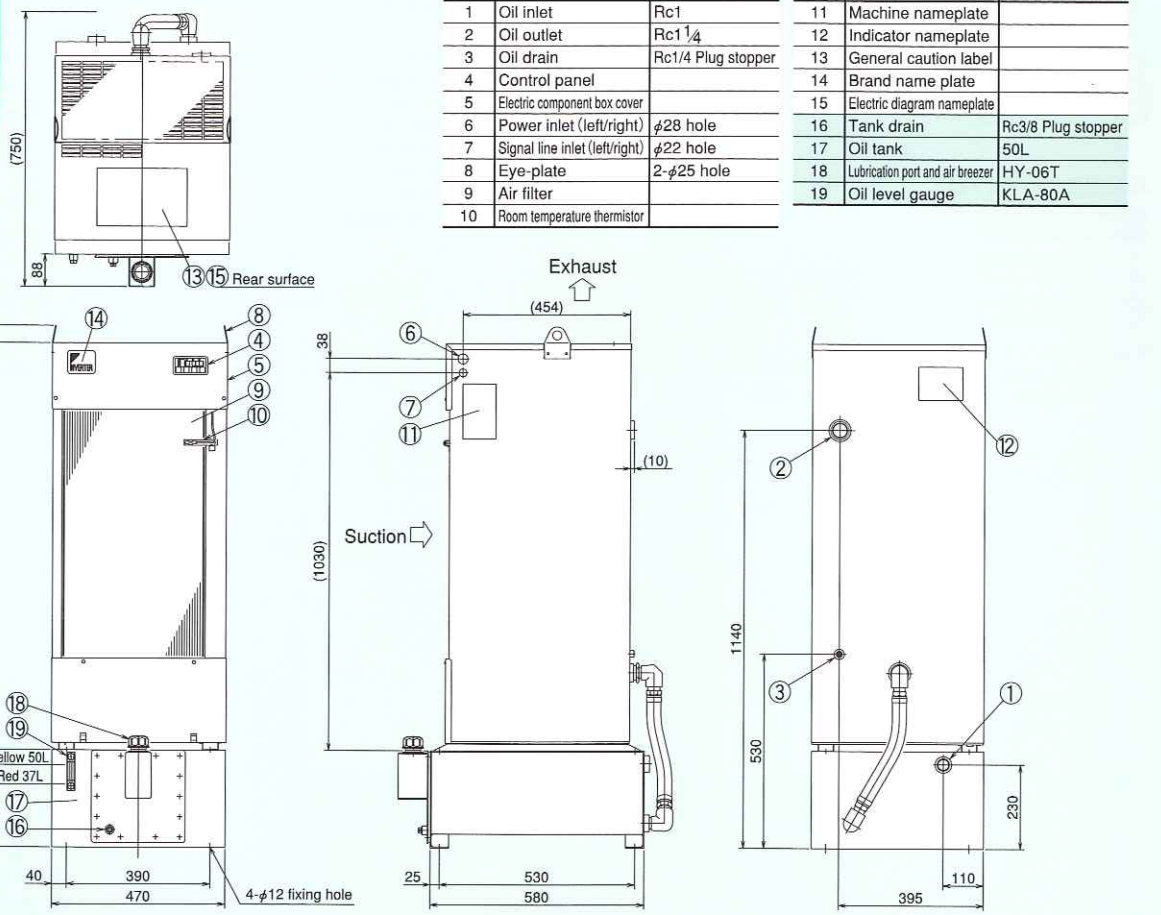
AKZ568-T

Tank

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc1
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	2-ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Tank drain	Rc3/8 Plug stopper
17	Oil tank	50L
18	Lubrication port and air breezer	HY-06T
19	Oil level gauge	KLA-80A



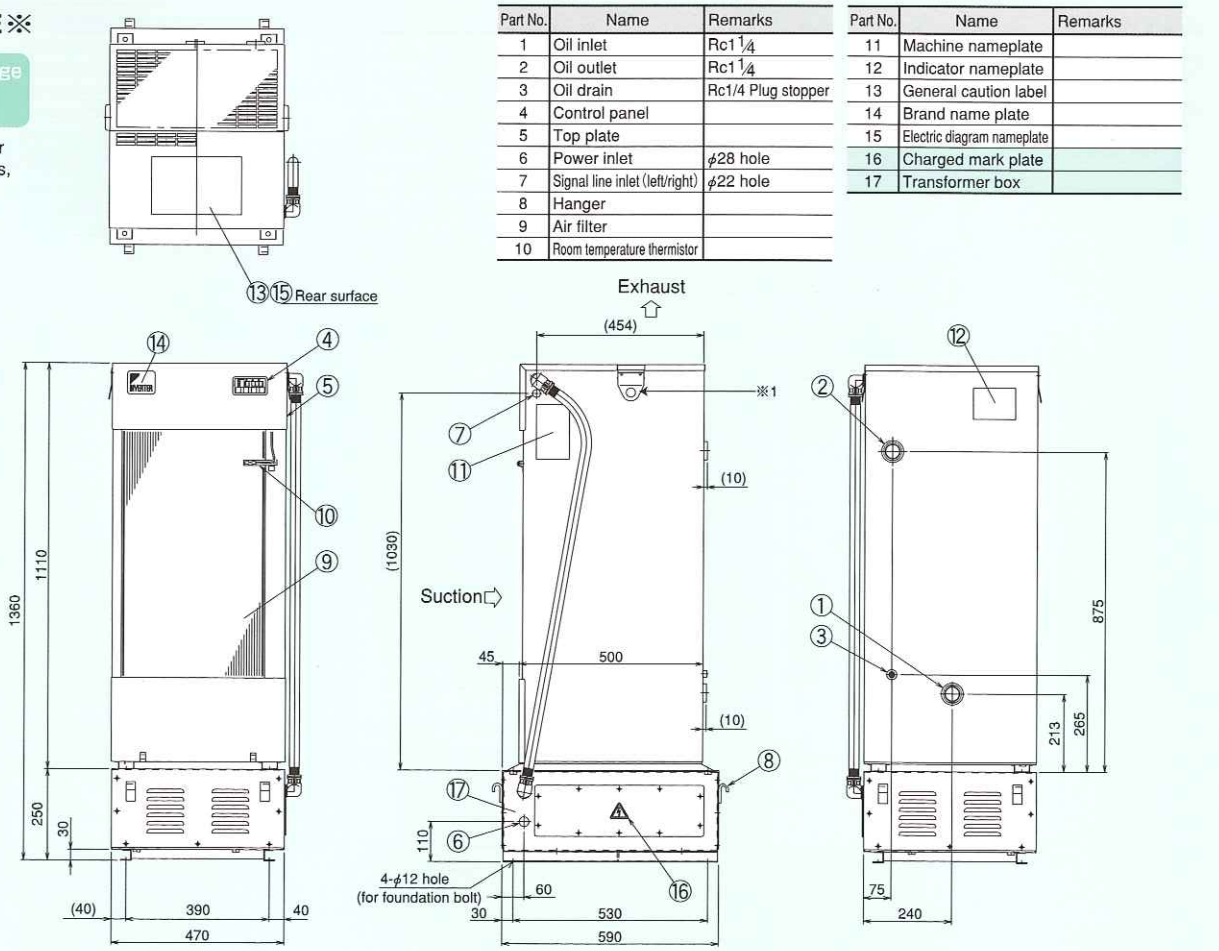
AKZ568-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc1 1/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Top plate	
6	Power inlet	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Hanger	
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Charged mark plate	
17	Transformer box	



Note)※1.Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZ8 SERIES

Dimensional outline drawing

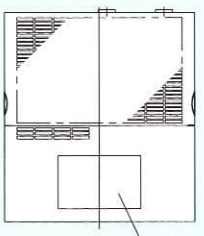
AKZ908(-B,-C)

Standard specifications

Circuit breaker

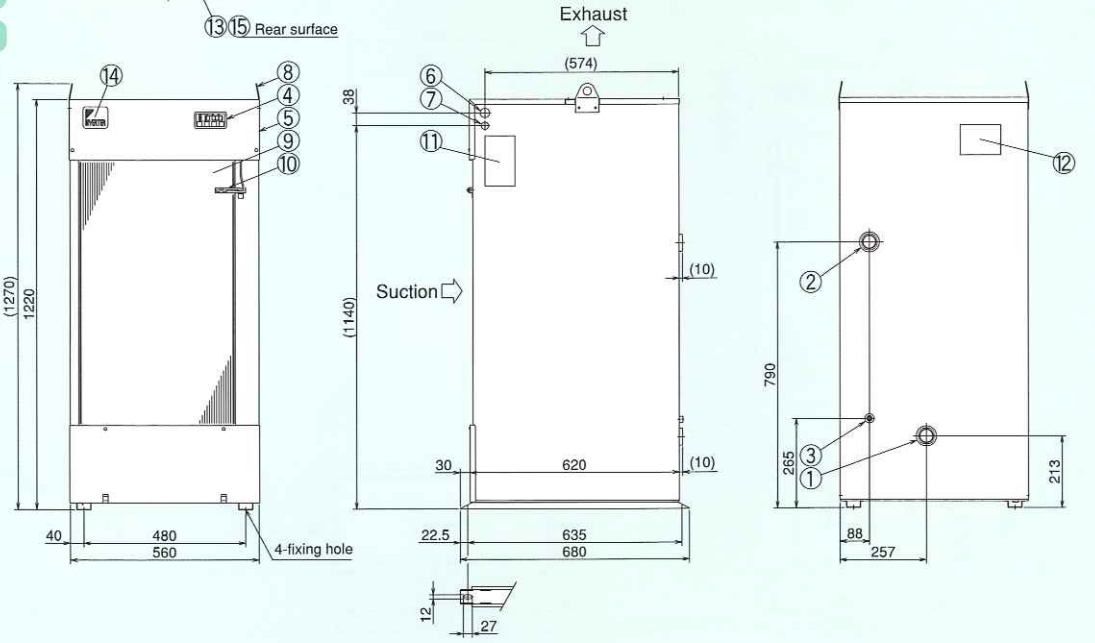
CE specifications

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Oil inlet	Rc1 1/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

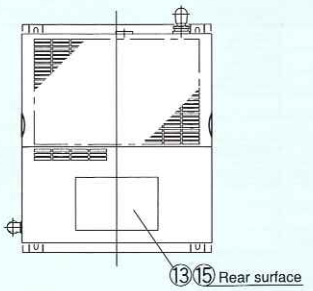
Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	



AKZ908-H

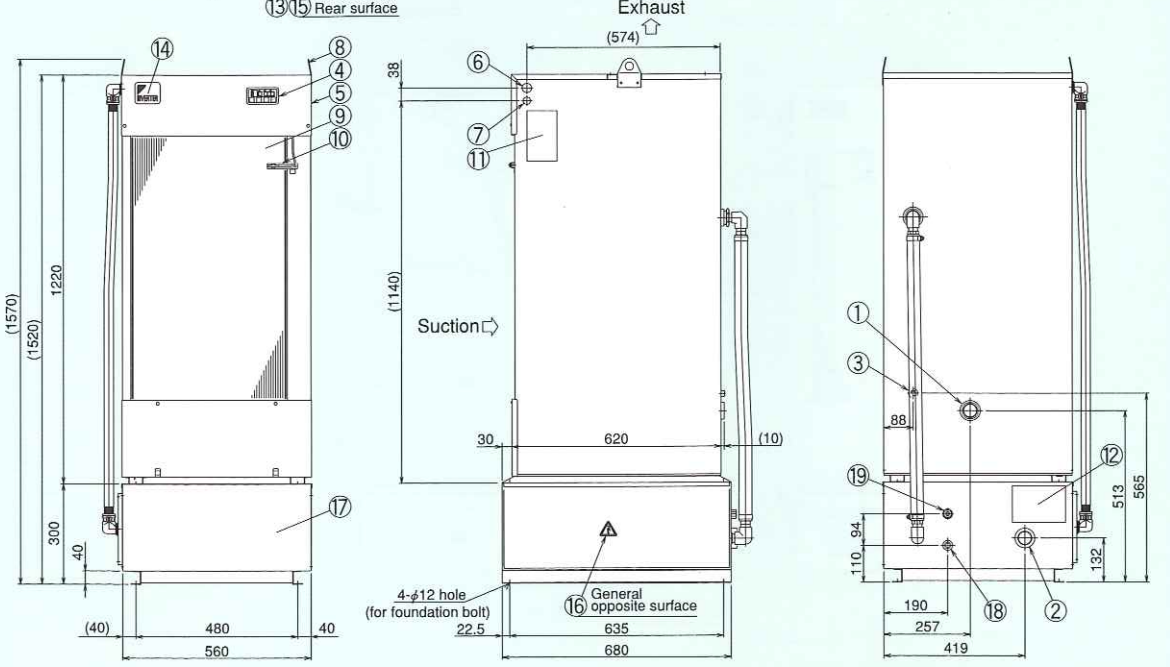
Heater

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Oil inlet	Rc1 1/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet	ϕ28 hole
7	Signal line inlet	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Charged mark plate	
17	Heater box	
18	Heater drain	Rc1/4
19	Air purge	Rc1/4



AKZ8 SERIES

Dimensional outline drawing

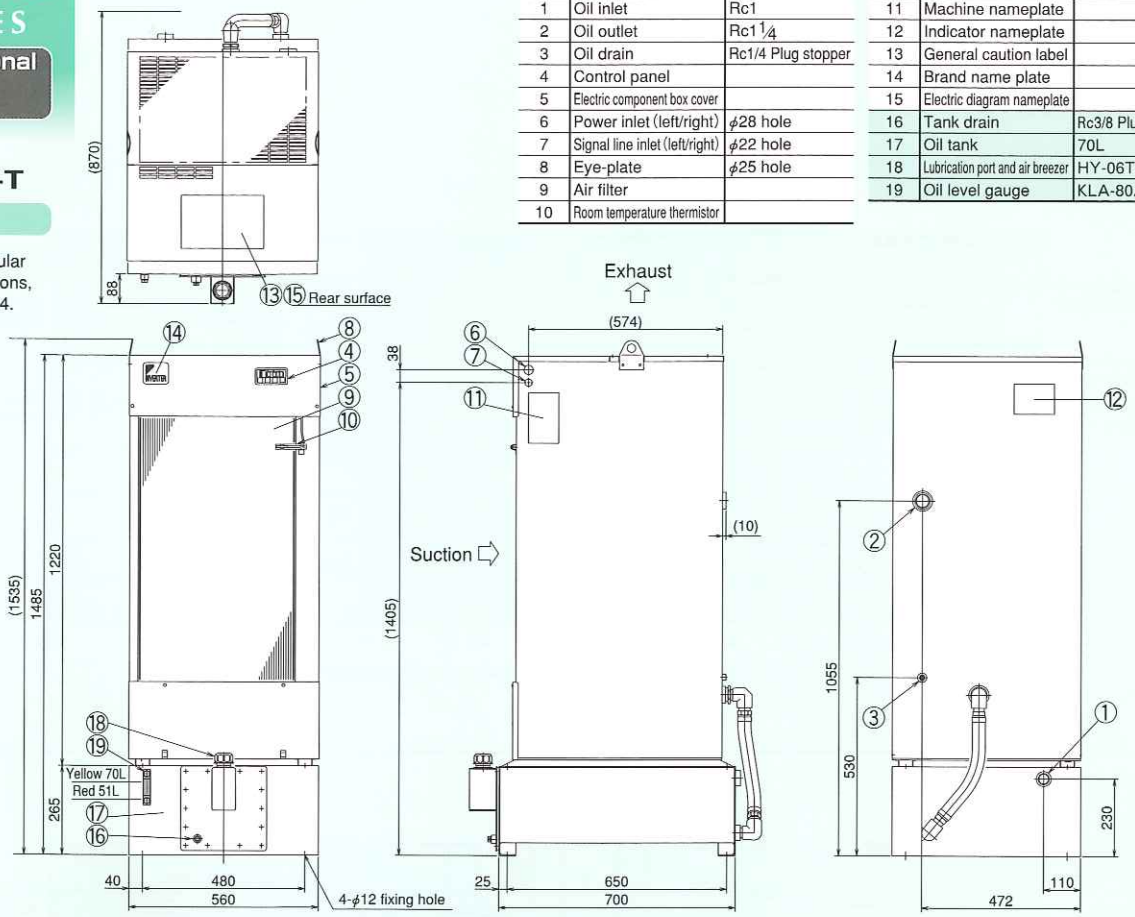
AKZ908-T

Tank

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc1
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet (left/right)	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Eye-plate	ϕ25 hole
9	Air filter	
10	Room temperature thermistor	

Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Tank drain	Rc3/8 Plug stopper
17	Oil tank	70L
18	Lubrication port and air breezer	HY-06T
19	Oil level gauge	KLA-80A



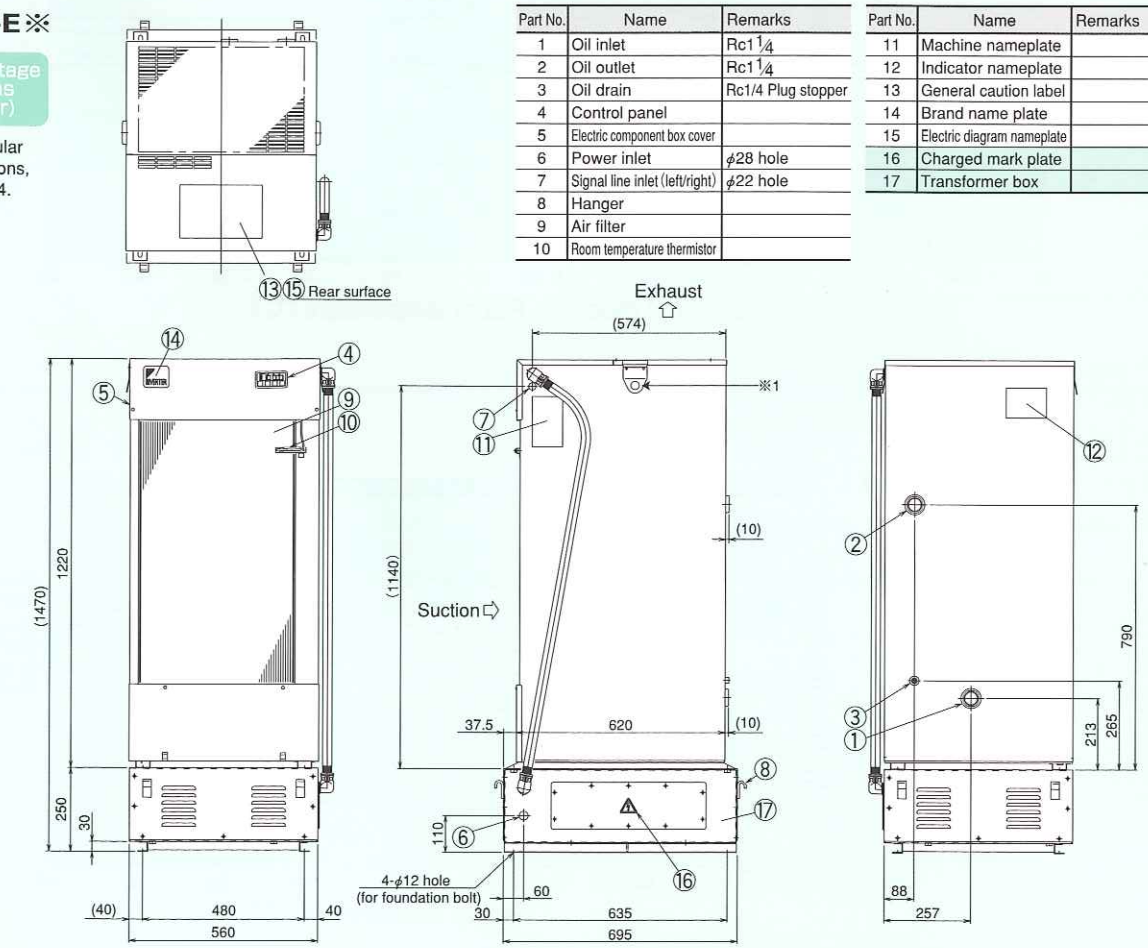
AKZ908-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Oil inlet	Rc1 1/4
2	Oil outlet	Rc1 1/4
3	Oil drain	Rc1/4 Plug stopper
4	Control panel	
5	Electric component box cover	
6	Power inlet	ϕ28 hole
7	Signal line inlet (left/right)	ϕ22 hole
8	Hanger	
9	Air filter	
10	Room temperature thermistor	

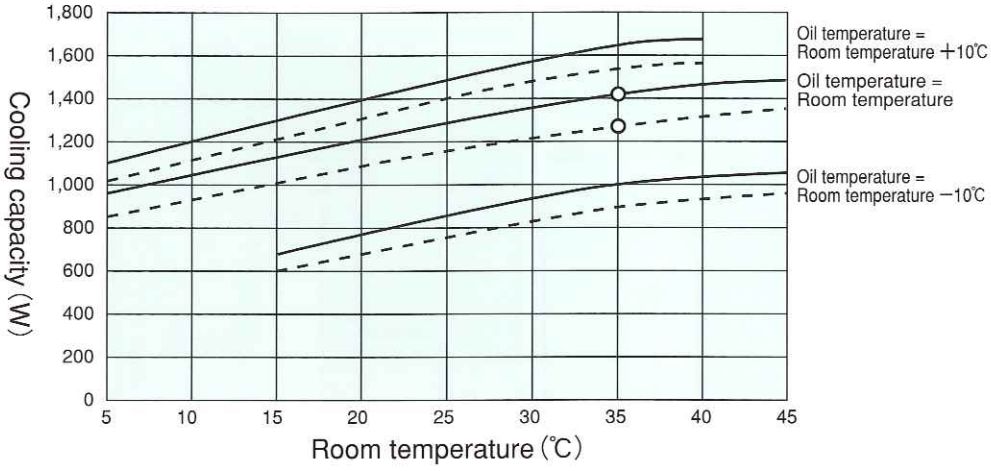
Part No.	Name	Remarks
11	Machine nameplate	
12	Indicator nameplate	
13	General caution label	
14	Brand name plate	
15	Electric diagram nameplate	
16	Charged mark plate	
17	Transformer box	



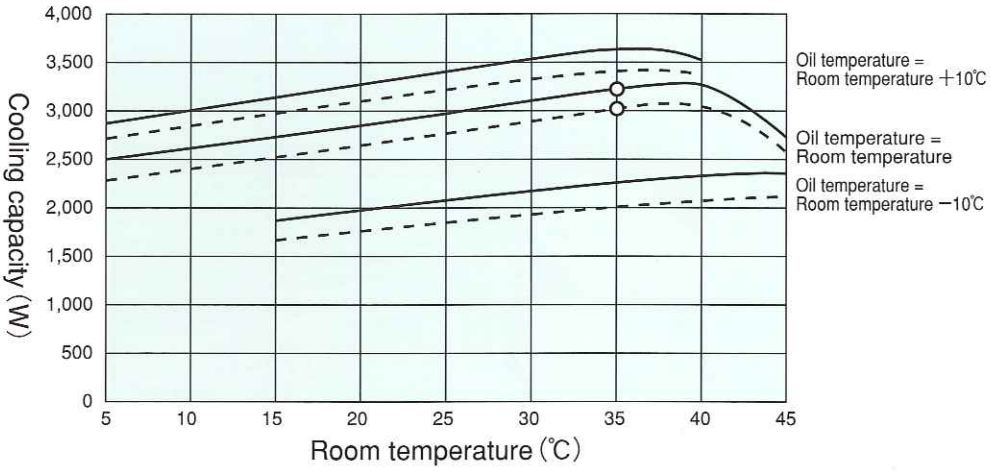
Note)※1.Hanger is placed in the lower area. Do not use this fixture as hanger.

Performance curve

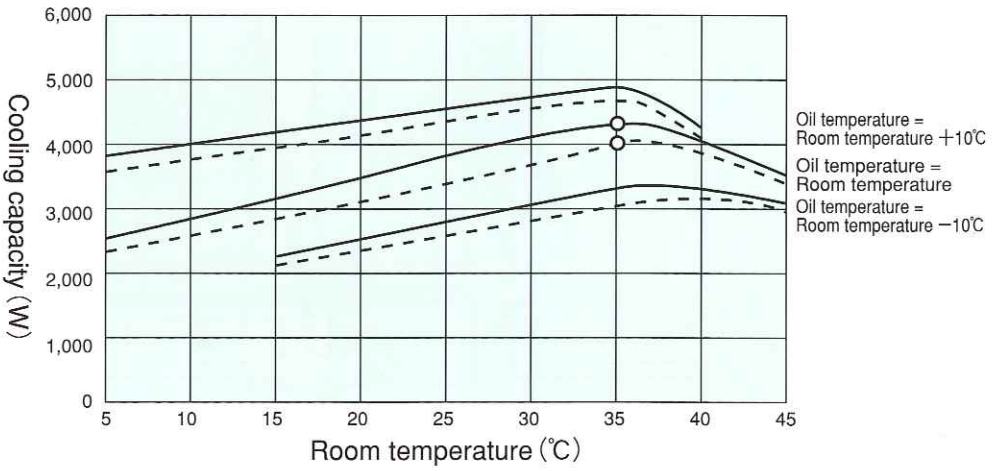
AKZ148



AKZ328



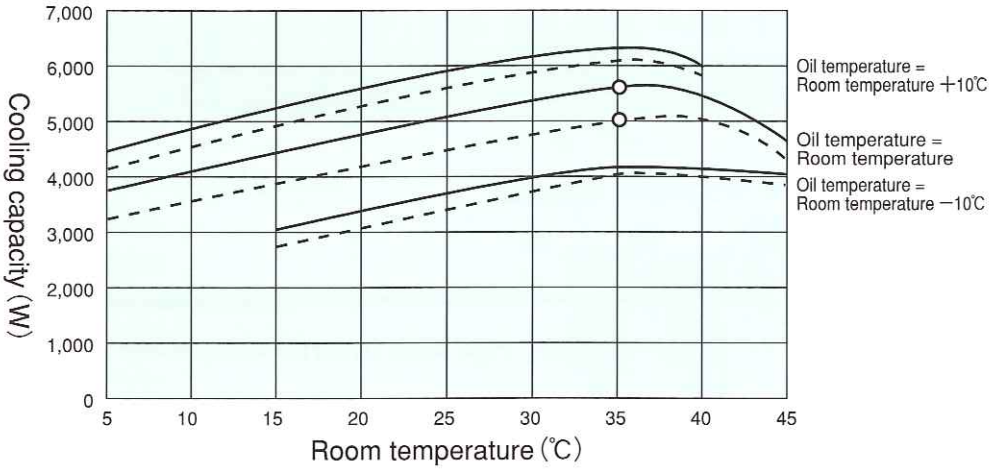
AKZ438



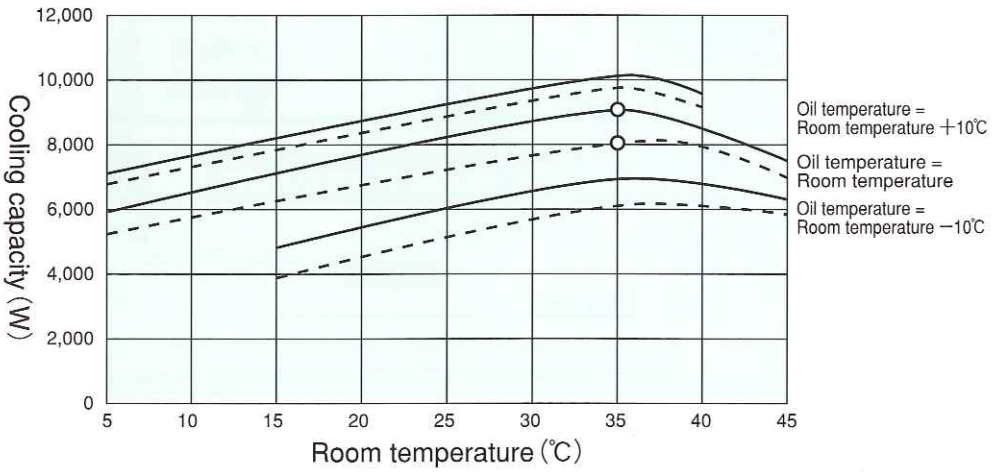
AKZ8 SERIES

Performance curve

AKZ568



AKZ908



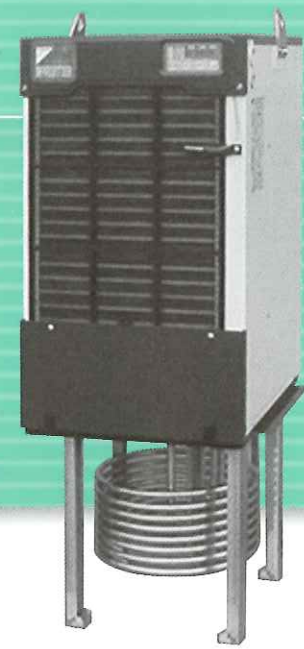
■**Solid line ——: 60Hz** ■**Broken line - - - : 50Hz**

1. Mark ○ is the standard point. (Room temperature : 35˚C/Inlet oil temperature : 35˚C /Oil used : ISO VG32)
2. Cooling capacity varies depending on conditions such as room temperature, inlet oil temperature, oil kinematic viscosity, etc.

OIL COOLING UNIT

AKZJ8

Immersion type SERIES

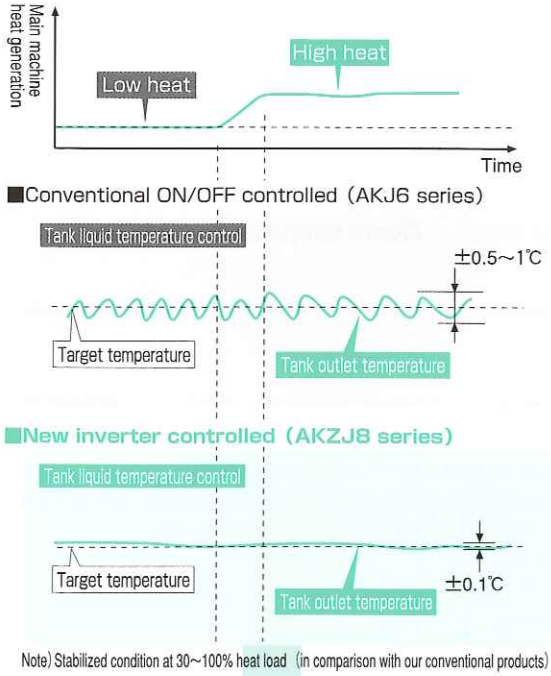


AKZJ8 SERIES General

- **High-accuracy type with inverter compressor and electronic expansion valve**
- **Immersion type Oil Cooling Unit (directly installed onto the upper tank)** No circulation pumps are included.
- **Open type cooler of stainless steel**
- **New refrigerant R410A (Modulus of rupture of ozone layer : 0)**
- **Wide operating temperature range** (Room temperature : 5~45℃, Tank oil temperature : 5~50℃)

AKZJ8 SERIES Features

High-accuracy temperature control

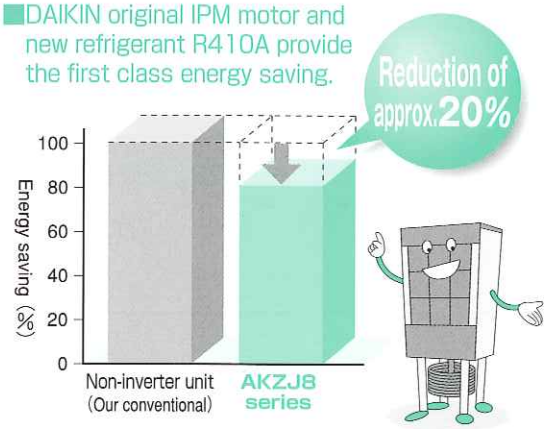


Note) Stabilized condition at 30~100% heat load (in comparison with our conventional products)

■The inverter-controlled unit keeps the best machine operation conditions at any time to improve the processing accuracy.

The first class energy saving

■DAIKIN original IPM motor and new refrigerant R410A provide the first class energy saving.



*In comparison with our existing ON/OFF unit (AKJ series) as 100

Low noise

68dB (A) ➡ 62dB (A)
with AKZJ1.2HP class, corresponding value in anechoic chamber

Generally, people can talk at the distance of 1m at the noise level of 60 dB.

AKZJ8 SERIES Features

New useful functions added to current oil temperature warning functions

■Auto tuning function

Only operate main machine at no load for 10 ~ 20 minutes, and temperature control gain is set automatically.
The tuning time during test run can be greatly shortened.

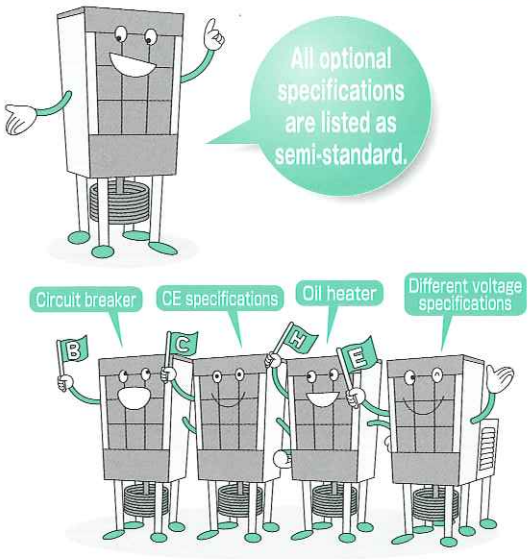
■Refrigerant gas runout detection function

Alarm signal is output at the time of refrigerant gas runout (cooling failure).
Mechanical damage caused by cooling failure can be indirectly prevented.

■99-hour timer function

Max. 99-hour warming up can be easily performed.

The shortest delivery, Four-type specifications available in addition to the standard model



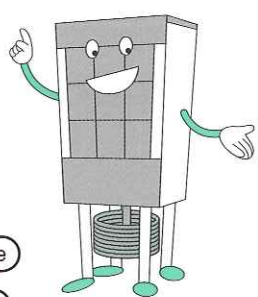
The smallest size in the class

*AKZJ358 class (Unit : mm)

AKZJ8 SERIES Application

■Application examples

Machine tools : Machining center, NC lathe, Grinding machine, NC special-purpose machine, NC electric discharge machine, etc.
Industrial machinery : Molding machine, Press, etc.

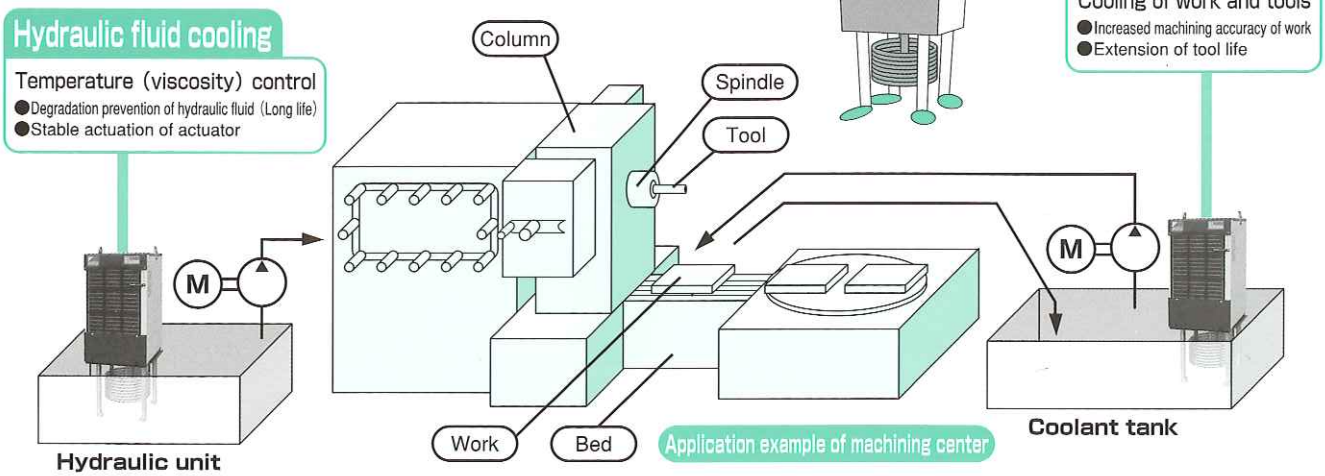


Cutting oil cooling

Cooling of work and tools
- Increased machining accuracy of work
- Extension of tool life

Hydraulic fluid cooling

Temperature (viscosity) control
- Degradation prevention of hydraulic fluid (Long life)
- Stable actuation of actuator



AKZJ8 SERIES

Specifications (AKZJ188・358・458)

Equivalent horse power (HP)			0.5					1.2					1.5				
Model			AKZJ188					AKZJ358					AKZJ458				
			Standard	−B	−C	−H	−E *3	Standard	−B	−C	−H	−E *3	Standard	−B	−C	−H	−E *3
Cooling capacity (50/60Hz) *1		kW	1.6/1.8					3.2/3.5					4.2/4.5				
Heater		kW	−			1	−	−			1	−	−			1	−
Power supply *2			AC 3-phase 200/200・220V 50/60Hz				*3	AC 3-phase 200/200・220V 50/60Hz				*3	AC 3-phase 200/200・220V 50/60Hz				*3
Circuit power supply	Main circuit		AC 3-phase 200/200・220V 50/60Hz														
	Control circuit		DC12/24V														
Max. power consumption, Max. current consumption	200V 50Hz		1.07kVA/3.1A			1.35kVA/5.7A	Same as standard	1.76kVA/5.2A			1.76kVA/5.9A	Same as standard	1.94kVA/5.7A			1.94kVA/5.9A	Same as standard
	200V 60Hz		1.09kVA/3.2A			1.35kVA/5.6A	Same as standard	1.78kVA/5.2A			1.78kVA/5.8A	Same as standard	1.96kVA/5.7A			1.96kVA/5.8A	Same as standard
	220V 60Hz		1.07kVA/2.8A			1.62kVA/6.1A	Same as standard	1.79kVA/4.9A			1.79kVA/6.3A	Same as standard	1.98kVA/5.3A			1.98kVA/6.3A	Same as standard
Transformer capacity			−				2.2kVA	−				2.2kVA	−				2.2kVA
Painted color			White														
Dimensions (H×W×D)		mm	980×360×440				980×450×630	1120×360×440				1120×450×630	1320×360×440				1320×450×630
Compressor (Hermetic DC swing type)			Equivalent to 0.4 kW					Equivalent to 0.75 kW					Equivalent to 1.1 kW				
Evaporator			Open coil type														
Condenser			Cross fin coil type														
Propeller fan	Electric motor		φ300、75W														
Agitator	Electric motor		1φ、50W、4P														
Temperature control (Selectable)	Tuning type	Reference	Room temperature or machine surface temperature *4 (At the time of factory shipments: Room temperature: Mode 3)														
		Control subject	Tank liquid temperature														
		Tuning range K	−9.9 to +9.9 at reference temperature (At the time of factory shipments: 0.0)														
	Fixed type	Control subject	Tank liquid temperature														
		Control range ℃	5~50														
Refrigerant control			Compressor capacity control by inverter + Electronic expansion valve														
Refrigerant (New refrigerant: R410A) *5 Amount of filling		kg	0.58					0.81					1.15				
Protector			Fan motor inner thermostat, Agitator inner thermostat, Reverse phase protector, Restart prevention timer, Low-room temperature protection thermostat, High-oil temperature protection thermostat, Low-oil temperature protection thermostat, Discharge pipe temperature thermostat, Condenser temperature thermostat, Refrigerant leak detector, Full set of Inverter protector, No-fuse breaker (−B only), High-pressure pressure switch (−C only), Compressor protection thermostat (−C only), Overheat prevention thermostat (−H only), Fuse (−H only)														
Operating range	Room temperature ℃		5~45														
	Tank liquid temperature ℃		5~50														
	Oil viscosity	mm²/s	0.5~200														
Usable oil			Water-soluble cutting and grinding liquids, cutting and grinding oil, Lubricating oil, Hydraulic fluid, Industrial water (however, not usable for Chemicals, Foods, and Fuel)														
Noise (Front 1m, Height 1m, corresponding value in anechoic chamber)		dB(A)	62														
Transportation vibration			Vertical 14.7 m/s² (1.5G) ×2.5 Hr (10 ~ 100 Hz sweep/5 min)														
Weight		kg	38			41	103	44			47	109	53			56	118
Wiring circuit breaker (Rated current)		A	−	10	−			−	10	−			−	10	−		
Local supply	Wiring circuit breaker (Rated current)	A	10 (Required for models other than −B)														
	Other than wiring circuit breaker		Tank (400 mm or deeper), Supply pump, Float switch, Return filter														

Note) *1.Cooling capacity means the rate at standard point (inlet oil temperature: 35℃; room temperature: 35℃; Oil: ISO VG32). Capacity tolerances are about ±5%.
*2.Fluctuation of input voltage should be less than ±10%. If it is beyond ±10%, separately contact us.
*3.Different voltage specificaion has three kinds of −E1, −E2, and −E3. (For particulars, see page 4.)
*4.Optional machine tuning thermistor is required. (For particulars, see page 37.)
*5.MSDS (Material Safety Data Sheet) of R410A is attached to Product −C.
*6.The breaker for wiring is not attached to this product. It should be prepared by the user.
*7.The conventional 1HP models (AKJ106, AKZJ287 class) are united into 1.2 HP AKZJ358.

AKZJ8 SERIES

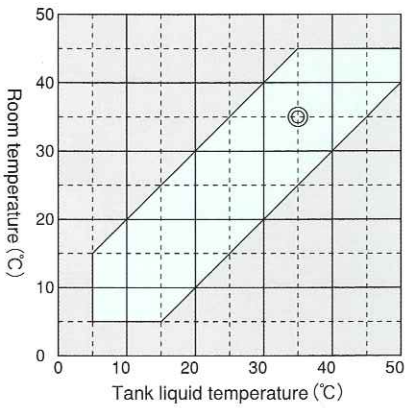
Specifications (AKZJ568・908)

Equivalent horse power (HP)			2.0					3.0				
Model			AKZJ568					AKZJ908				
			Standard	−B	−C	−H	−E *3	Standard	−B	−C	−H	−E *3
Cooling capacity (50/60Hz) *1		kW	5.0/5.6					8.0/9.0				
Heater		kW	−			2	−	−			4	−
Power supply *2			AC 3-phase 200/200・220V 50/60Hz				*3	AC 3-phase 200/200・220V 50/60Hz				*3
Circuit power supply	Main circuit		AC 3-phase 200/200・220V 50/60Hz									
	Control circuit		DC12/24V									
Max. power consumption, Max. current consumption	200V 50Hz		3.3kVA/9.4A			4.0kVA/11.4A	Same as standard	3.9kVA/11.2A			7.5kVA/21.6A	Same as standard
	200V 60Hz		3.3kVA/9.4A			4.0kVA/11.4A	Same as standard	4.1kVA/11.7A			7.5kVA/21.6A	Same as standard
	220V 60Hz		3.4kVA/9.0A			4.8kVA/12.5A	Same as standard	4.3kVA/11.2A			9.0kVA/23.7A	Same as standard
Transformer capacity			−				5kVA	−				6kVA
Painted color			White									
Dimensions (H×W×D)		mm	1450×470×500				1450×560×710	1630×560×620				1630×655×830
Compressor (Hermetic DC swing type)			Equivalent to 1.5 kW					Equivalent to 2.2 kW				
Evaporator			Open coil type									
Condenser			Cross fin coil type									
Propeller fan	Electric motor		φ400、90W×4P					φ450、150W×4P				
Agitator	Electric motor		1φ、50W、4P									
Temperature control (Selectable) Tuning type	Reference		Room temperature or machine surface temperature *4 (At the time of factory shipments: Room temperature: Mode 3)									
	Control subject		Tank liquid temperature									
	Tuning range	K	−9.9 to +9.9 at reference temperature (At the time of factory shipments: 0.0)									
Fixed type	Control subject		Tank liquid temperature									
	Control range	℃	5~50									
Refrigerant control			Compressor capacity control by inverter + Electronic expansion valve									
Refrigerant (New refrigerant: R410A) *5 Amount of filling		kg	1.25					1.65				
Protector			Fan motor inner thermostat, Agitator inner thermostat, Reverse phase protector, Restart prevention timer, Low-room temperature protection thermostat, High-oil temperature protection thermostat, Low-oil temperature protection thermostat, Discharge pipe temperature thermostat, Condenser temperature thermostat, Refrigerant leak detector, Full set of Inverter protector, No-fuse breaker (−B only), High-pressure pressure switch (−C only), Compressor protection thermostat (−C only), Overheat prevention thermostat (−H only), Fuse (−H only)									
Operating range	Room temperature	℃	5~45									
	Tank liquid temperature	℃	5~50									
	Oil viscosity	mm²/s	0.5~200									
Usable oil			Water-soluble cutting and grinding liquids, cutting and grinding oil, Lubricating oil, Hydraulic fluid, Industrial water (however, not usable for Chemicals, Foods, and Fuel)									
Noise (Front 1m, Height 1m, corresponding value in anechoic chamber)		dB(A)	65					68				
Transportation vibration			Vertical 14.7 m/s² (1.5G) ×2.5 Hr (10 ~ 100 Hz sweep/5 min)									
Weight		kg	83			86	160	132			140	220
Wiring circuit breaker (Rated current)		A	−	15	−			−	20	−		
Local supply	Wiring circuit breaker (Rated current)	A	15 (Required for models other than −B)					20 (Required for models other than −B)			30	20
	Other than wiring circuit breaker		Tank (400 mm or deeper), Supply pump, Float switch, Return filter									

Note) *1.Cooling capacity means the rate at standard point (inlet oil temperature: 35℃; room temperature: 35℃; Oil: ISO VG32). Capacity tolerances are about ±5%.
*2.Fluctuation of input voltage should be less than ±10%. If it is beyond ±10%, separately contact us.
*3.Different voltage specificaion has three kinds of −E1, −E2, and −E3. (For particulars, see page 4.)
*4.Optional machine tuning thermistor is required. (For particulars, see page 37.)
*5.MSDS (Material Safety Data Sheet) of R410A is attached to Product −C.
*6.The breaker for wiring is not attached to this product. It should be prepared by the user.
*7.The conventional 1HP models (AKJ106, AKZJ287 class) are united into 1.2 HP AKZJ358.

Operating range

Note) 1. Mark◎means the standard point.
2. Operate in the range of the above □.
(The use outside of the usable range may cause failures.)



AKZJ8 SERIES

Dimensional outline drawing

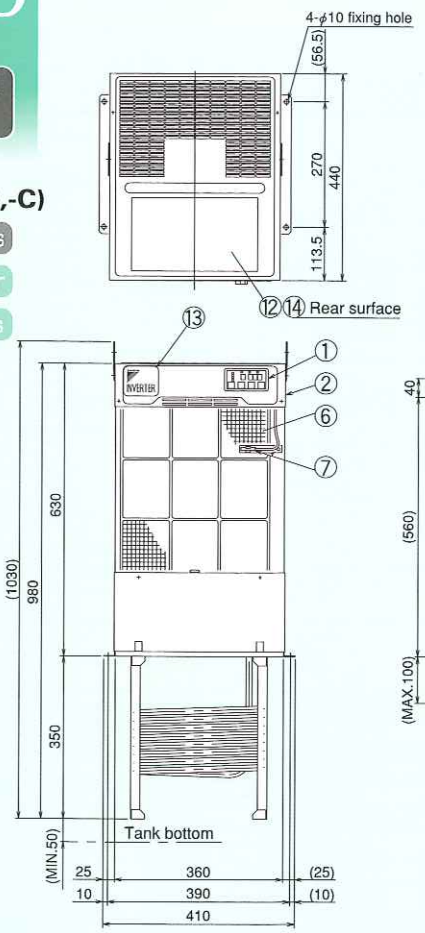
AKZJ188(-B,-C)

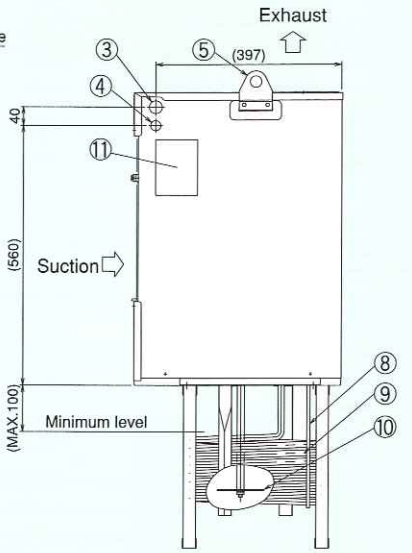
Standard specifications

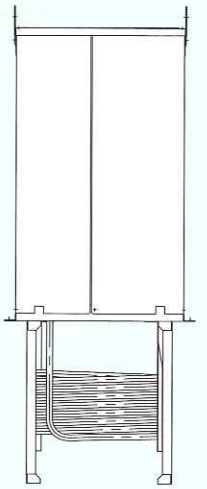
Circuit breaker

CE specifications

Note) For particular specifications, see page 4.







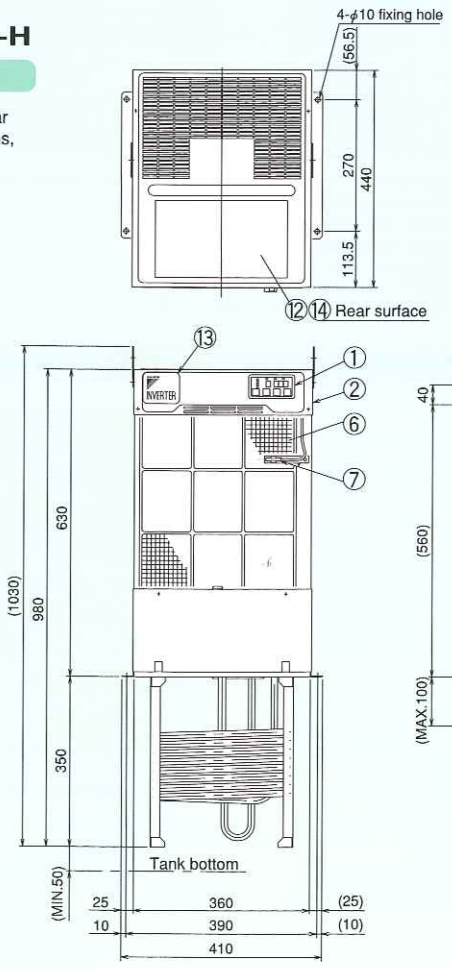
Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

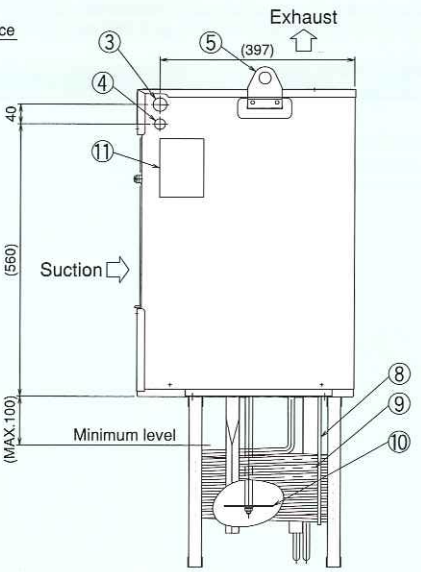
Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	

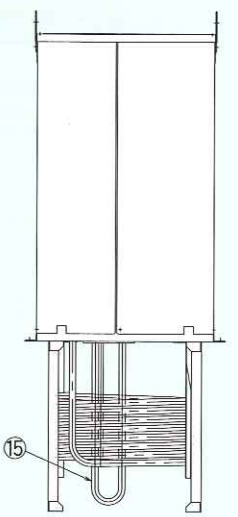
AKZJ188-H

Heater

Note) For particular specifications, see page 4.







Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Heater	

AKZJ8 SERIES

Dimensional outline drawing

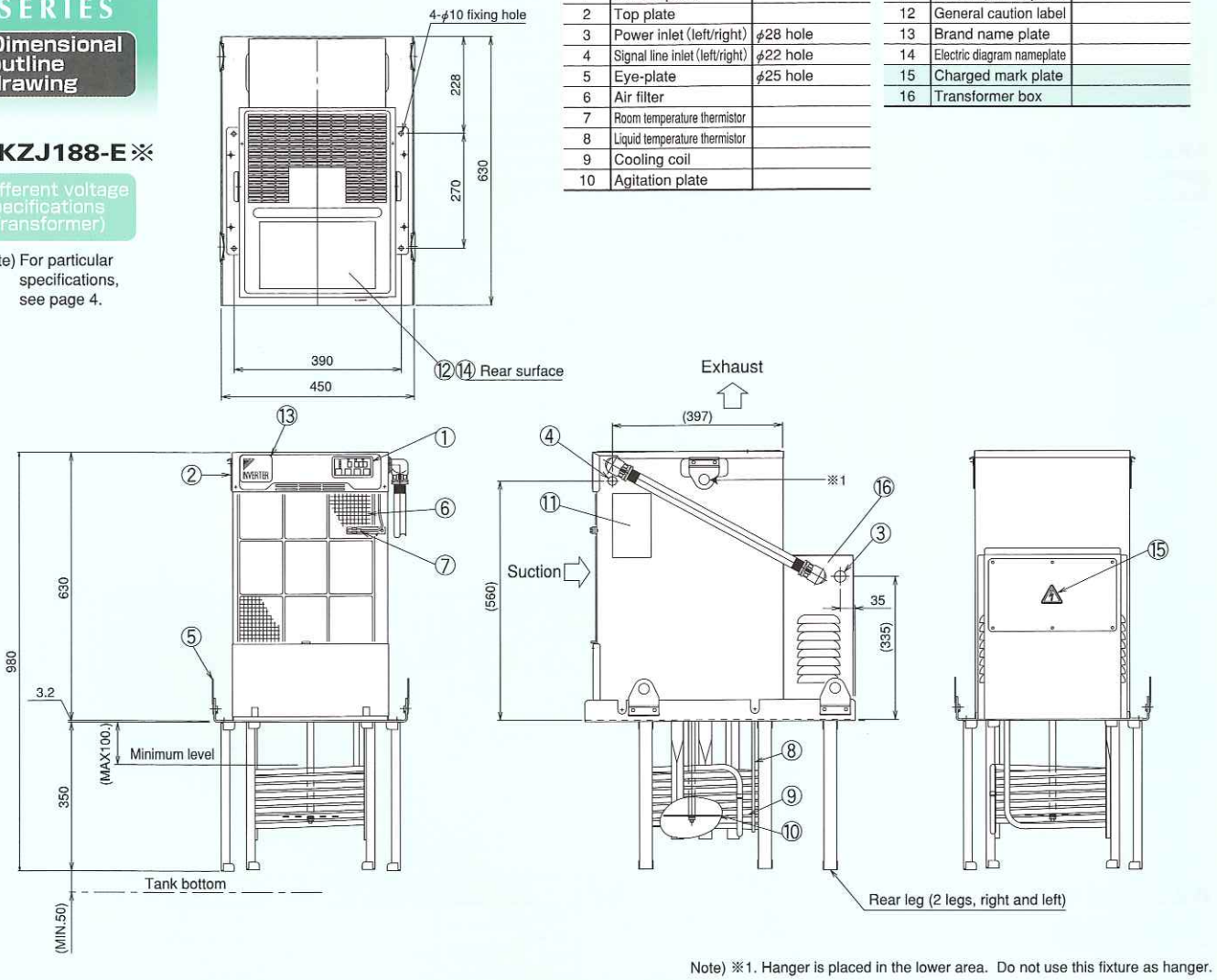
AKZJ188-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	ϕ28 hole
4	Signal line inlet (left/right)	ϕ22 hole
5	Eye-plate	ϕ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Charged mark plate	
16	Transformer box	



Note) ※1. Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZJ8 SERIES

Dimensional outline drawing

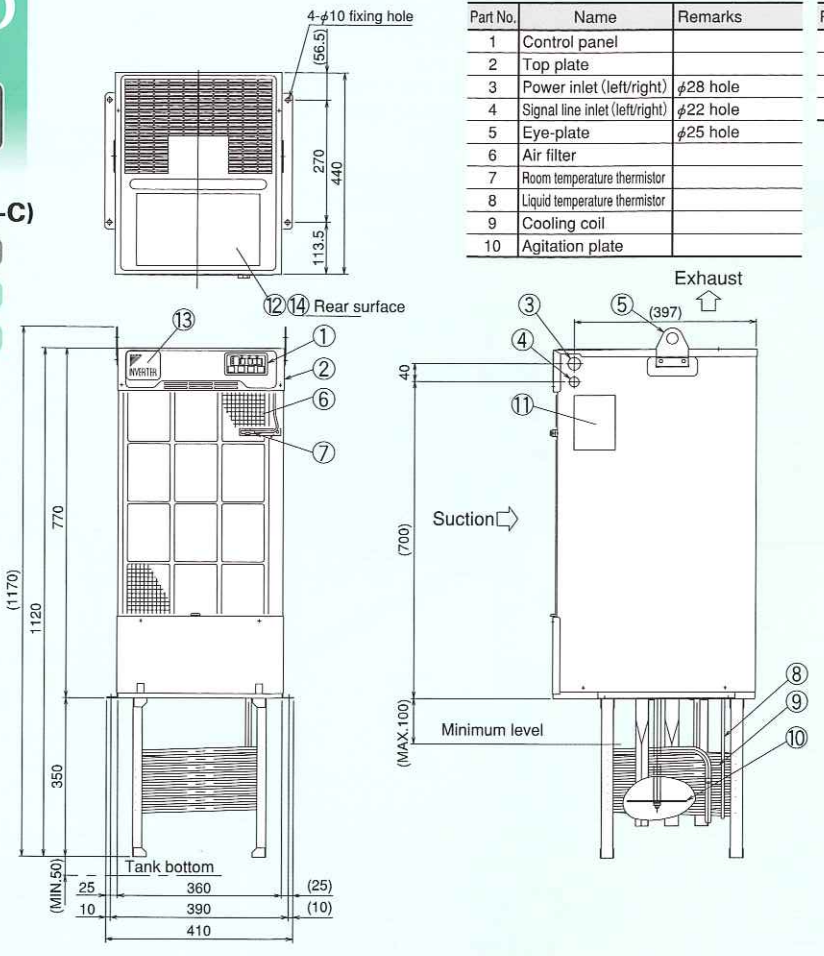
AKZJ358(-B,-C)

Standard specifications

Circuit breaker

CE specifications

Note) For particular specifications, see page 4.



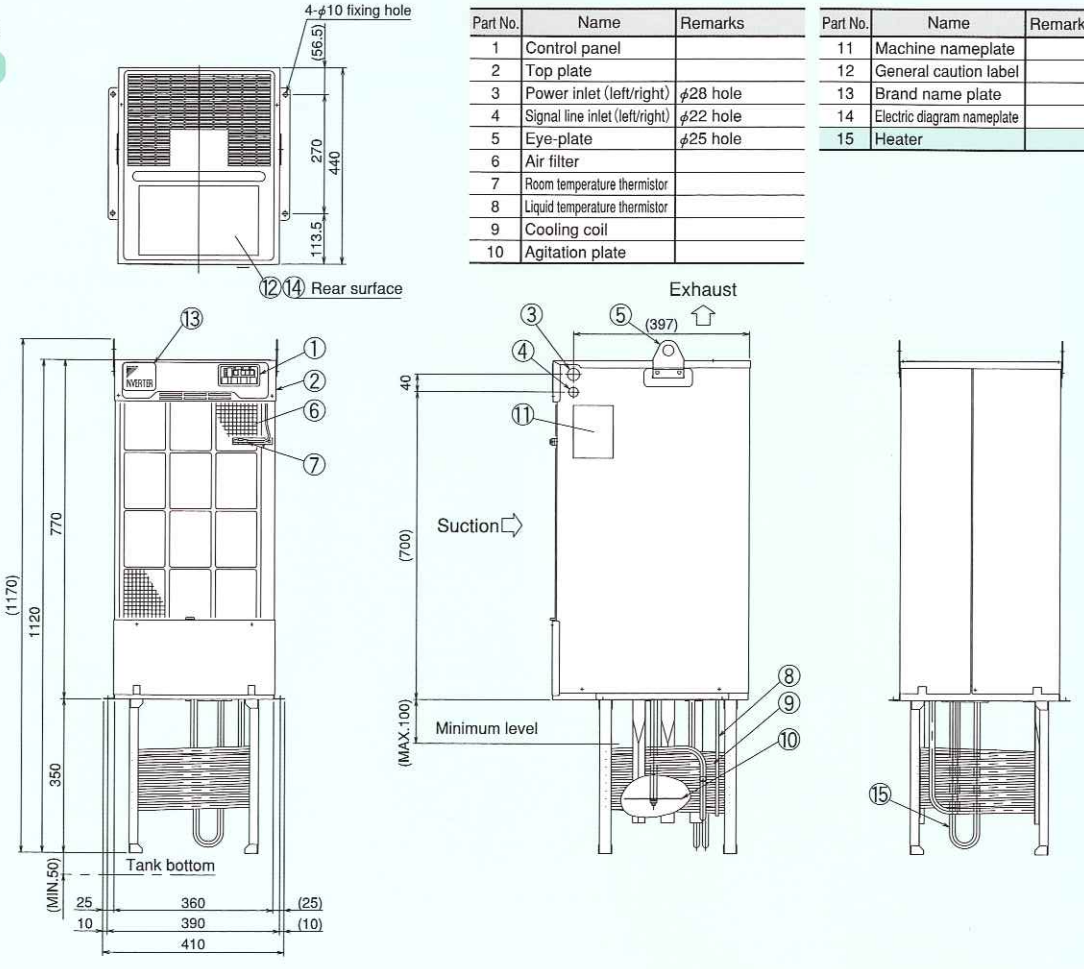
Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	

AKZJ358-H

Heater

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Heater	

AKZJ8 SERIES

Dimensional outline drawing

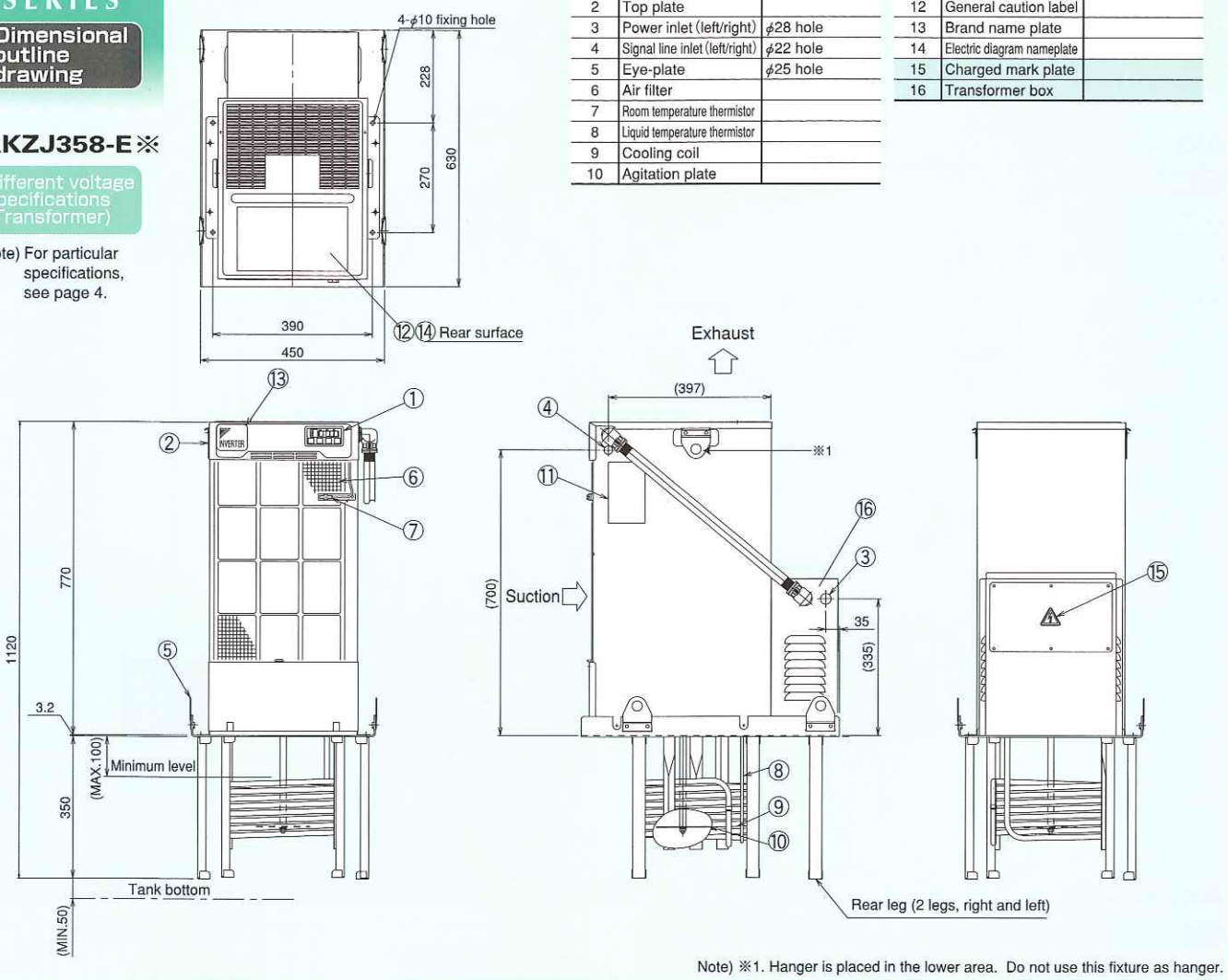
AKZJ358-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	ϕ28 hole
4	Signal line inlet (left/right)	ϕ22 hole
5	Eye-plate	ϕ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Charged mark plate	
16	Transformer box	



Note) ※1. Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZJ8 SERIES

Dimensional outline drawing

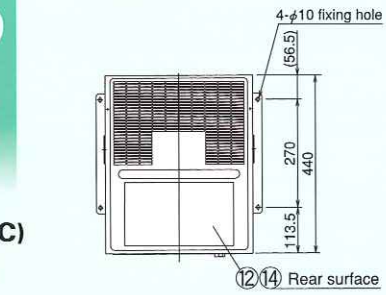
AKZJ458(-B,-C)

Standard specifications

Circuit breaker

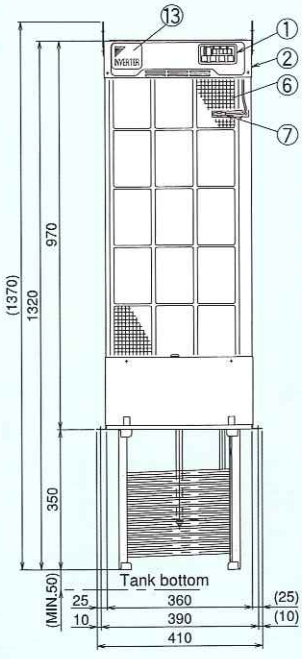
CE specifications

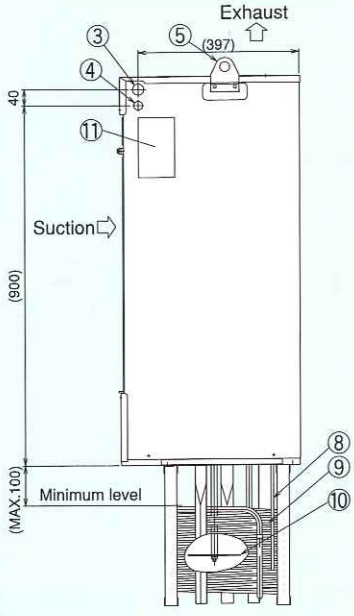
Note) For particular specifications, see page 4.

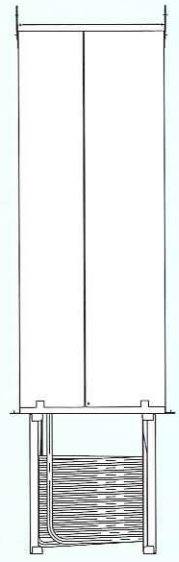


Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	



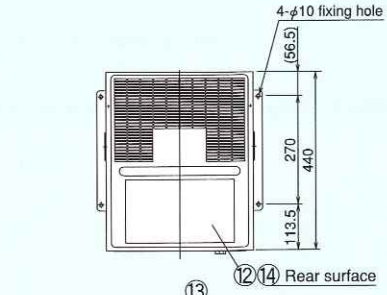




AKZJ458-H

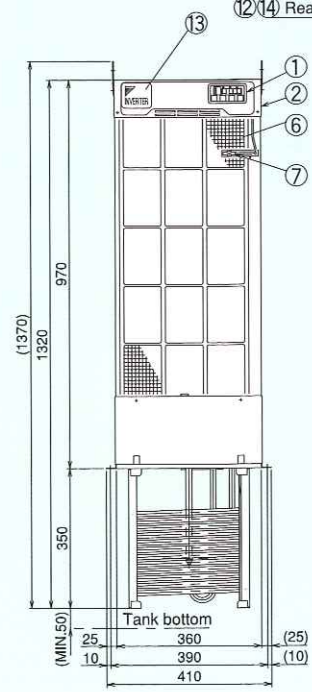
Heater

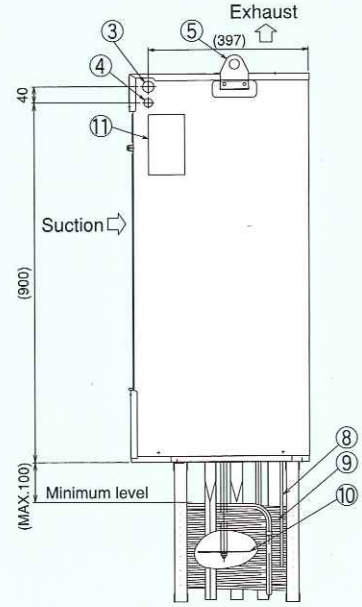
Note) For particular specifications, see page 4.

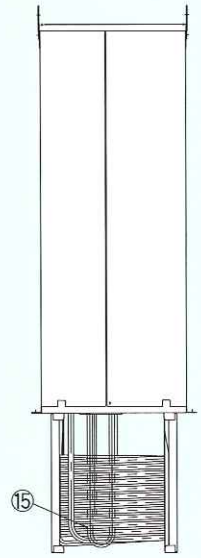


Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Heater	







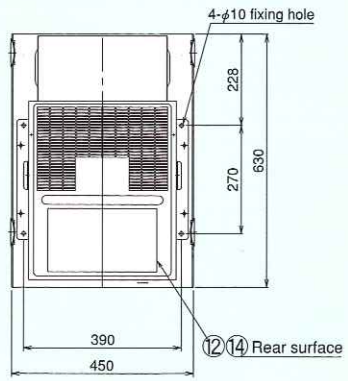
AKZJ8 SERIES

Dimensional outline drawing

AKZJ458-E※

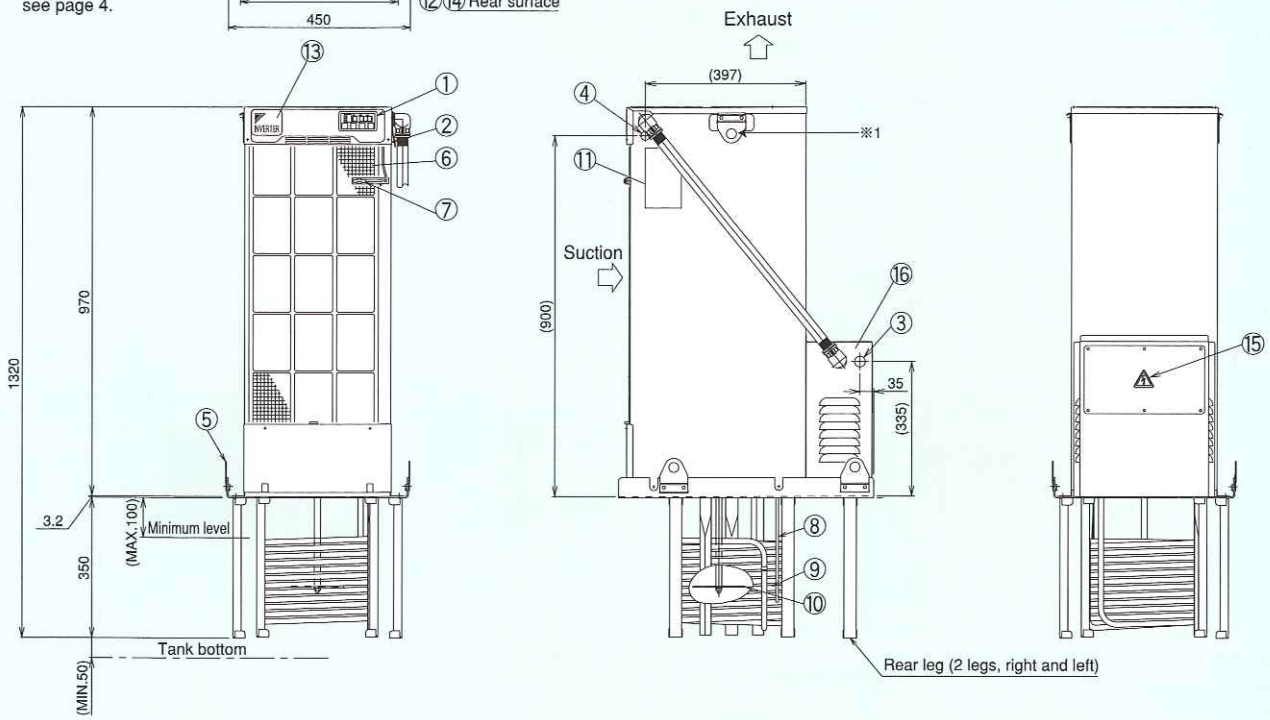
Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Control panel	
2	Top plate	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Charged mark plate	
16	Transformer box	



Note) ※1. Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZJ8 SERIES

Dimensional outline drawing

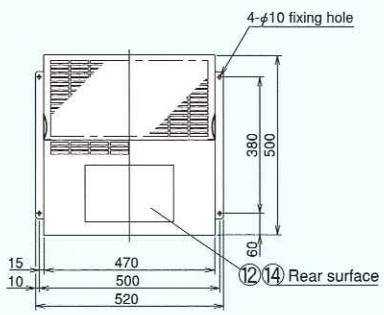
AKZJ568(-B,-C)

Standard specifications

Circuit breaker

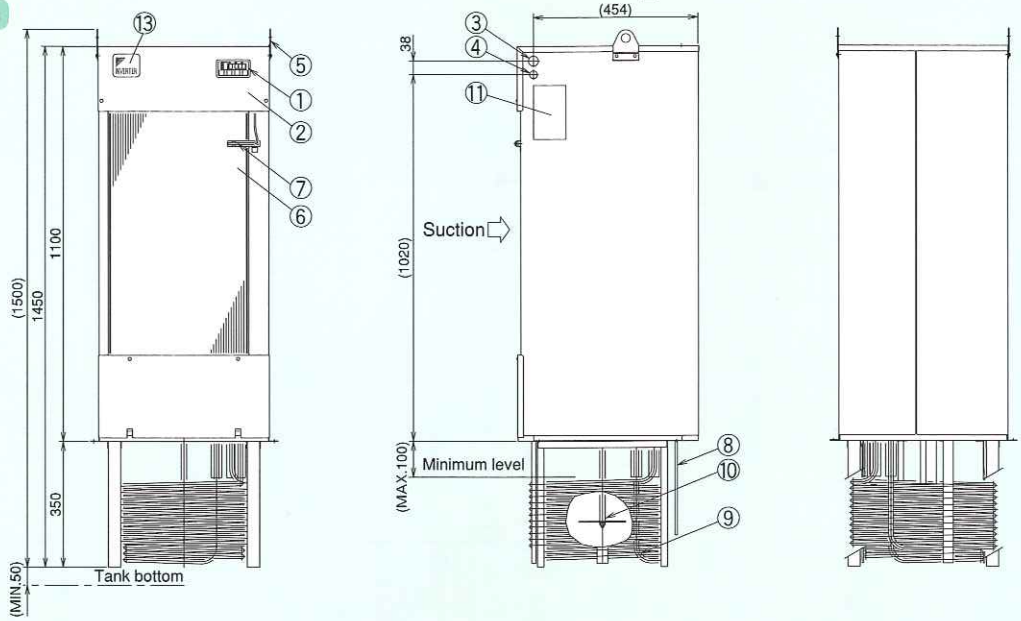
CE specifications

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Control panel	
2	Electric component box cover	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

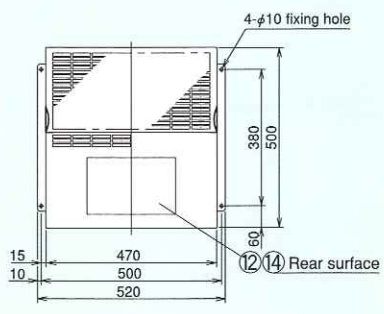
Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	



AKZJ568-H

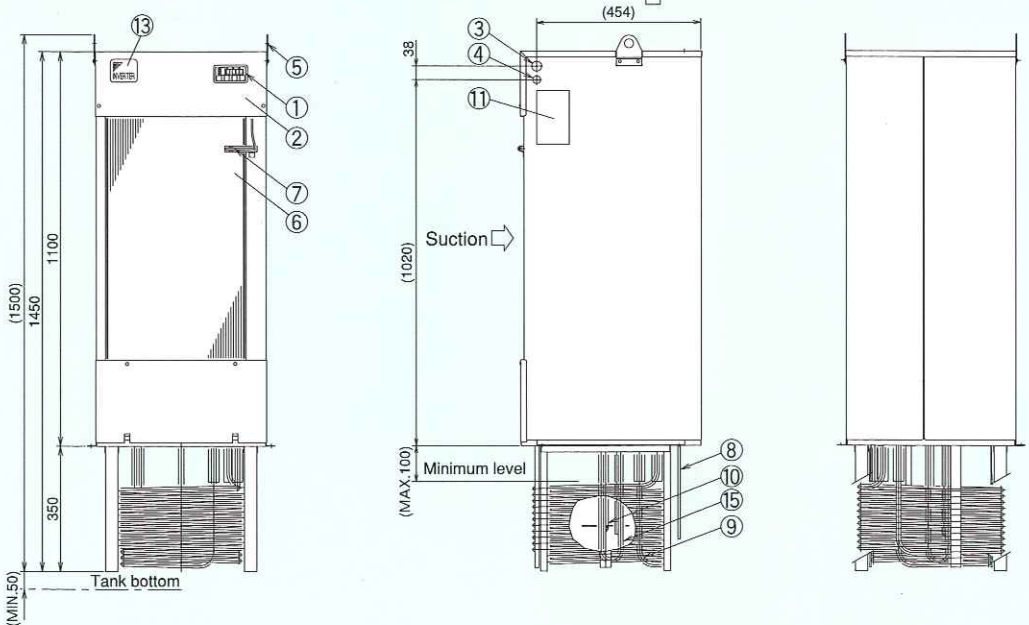
Heater

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Control panel	
2	Electric component box cover	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Heater	



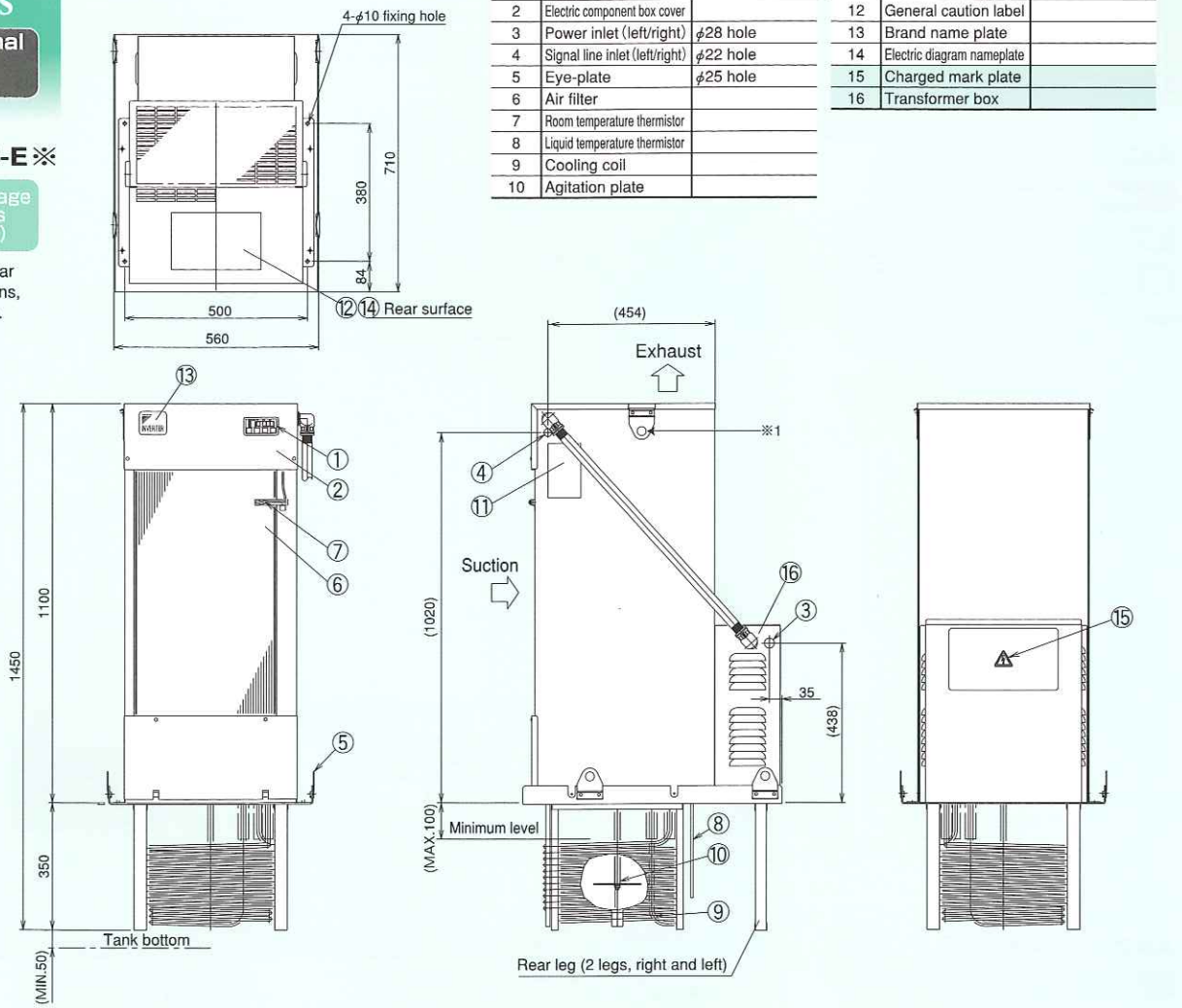
AKZJ8 SERIES

Dimensional outline drawing

AKZJ568-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Control panel	
2	Electric component box cover	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Charged mark plate	
16	Transformer box	

Note) ※1. Hanger is placed in the lower area. Do not use this fixture as hanger.

AKZJ8 SERIES

Dimensional outline drawing

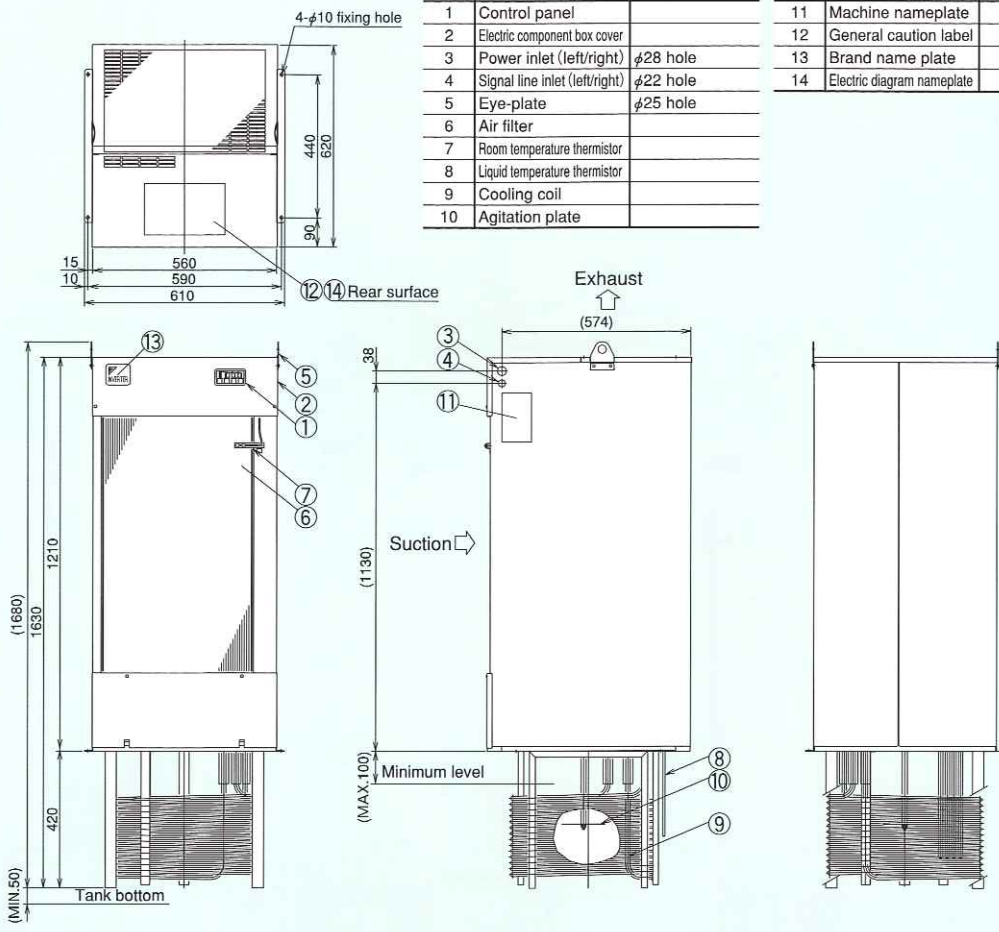
AKZJ908(-B,-C)

Standard specifications

Circuit breaker

CE specifications

Note) For particular specifications, see page 4.



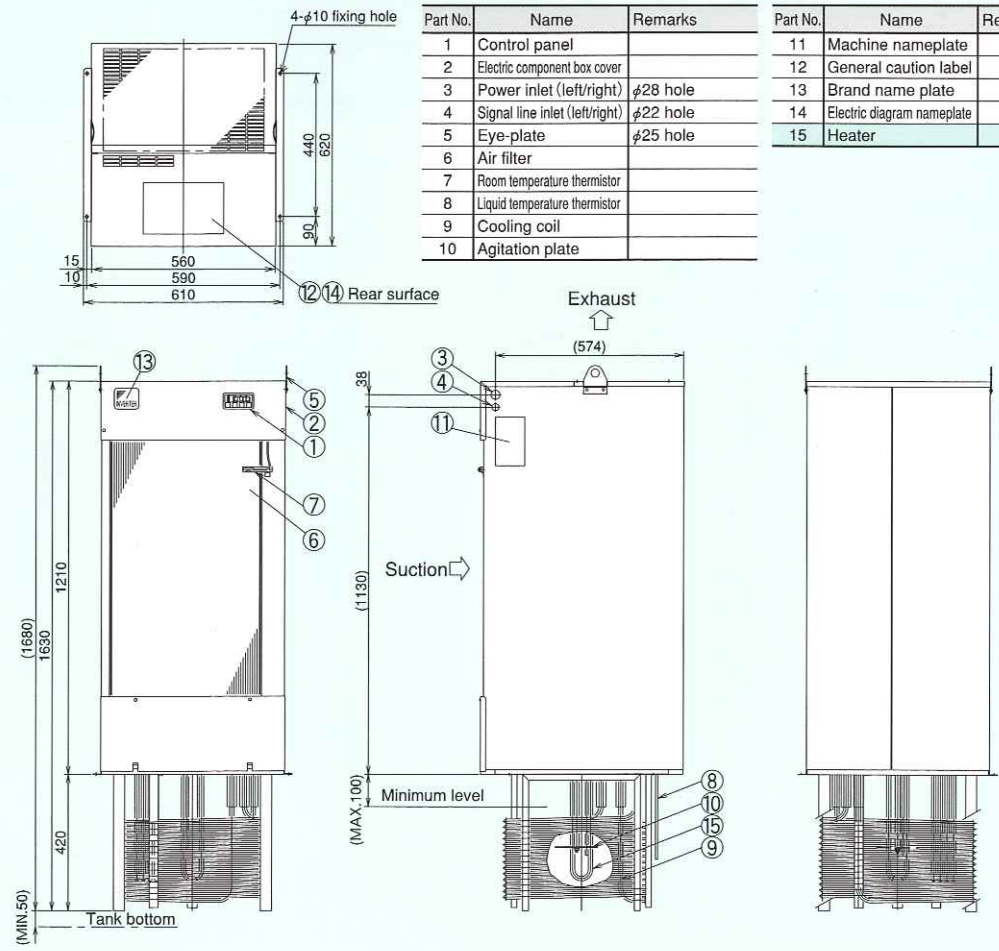
Part No.	Name	Remarks
1	Control panel	
2	Electric component box cover	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	

AKZJ908-H

Heater

Note) For particular specifications, see page 4.



Part No.	Name	Remarks
1	Control panel	
2	Electric component box cover	
3	Power inlet (left/right)	φ28 hole
4	Signal line inlet (left/right)	φ22 hole
5	Eye-plate	φ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Heater	

AKZJ8 SERIES

Dimensional outline drawing

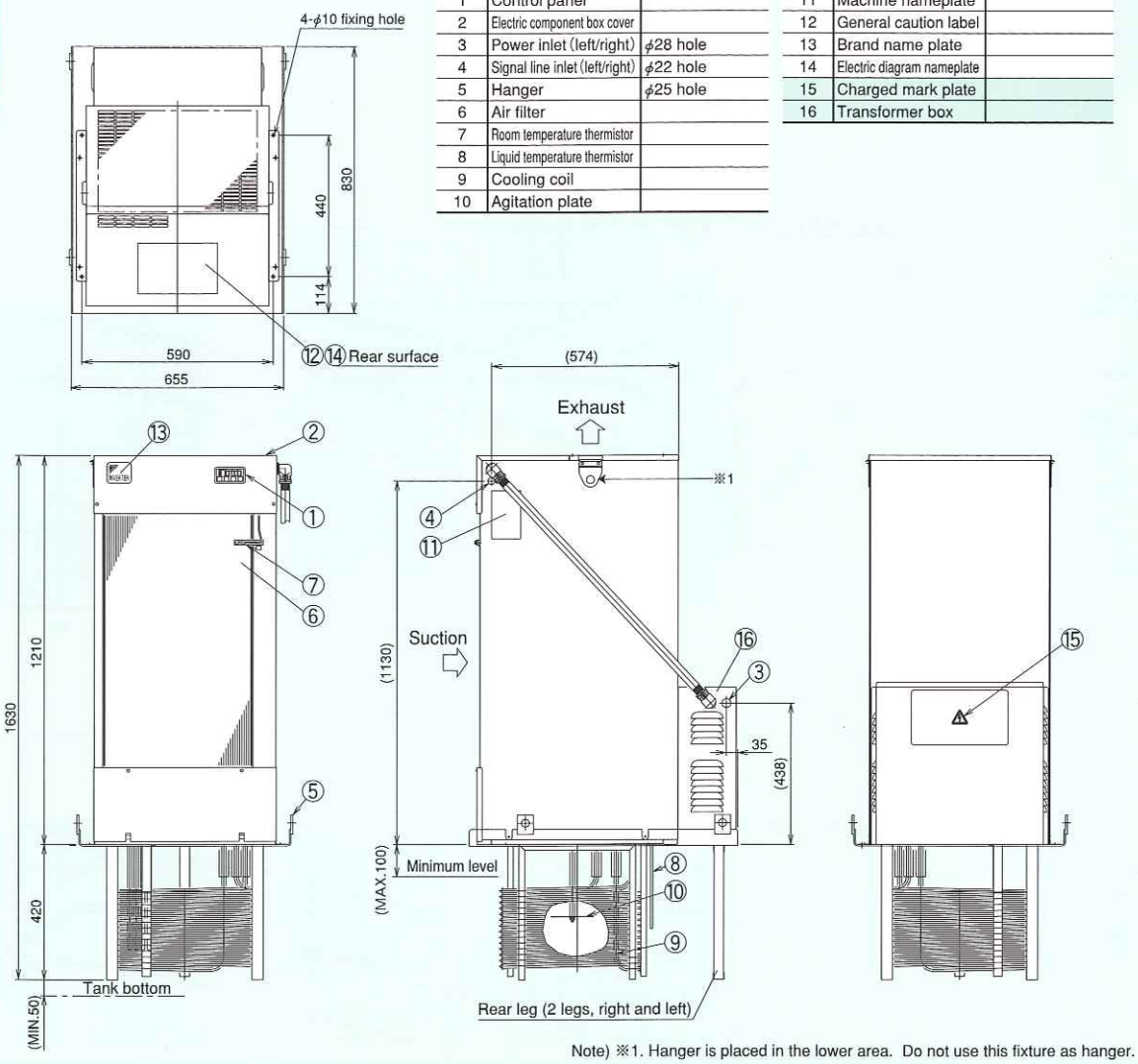
AKZJ908-E※

Different voltage specifications (Transformer)

Note) For particular specifications, see page 4.

Part No.	Name	Remarks
1	Control panel	
2	Electric component box cover	
3	Power inlet (left/right)	ϕ28 hole
4	Signal line inlet (left/right)	ϕ22 hole
5	Hanger	ϕ25 hole
6	Air filter	
7	Room temperature thermistor	
8	Liquid temperature thermistor	
9	Cooling coil	
10	Agitation plate	

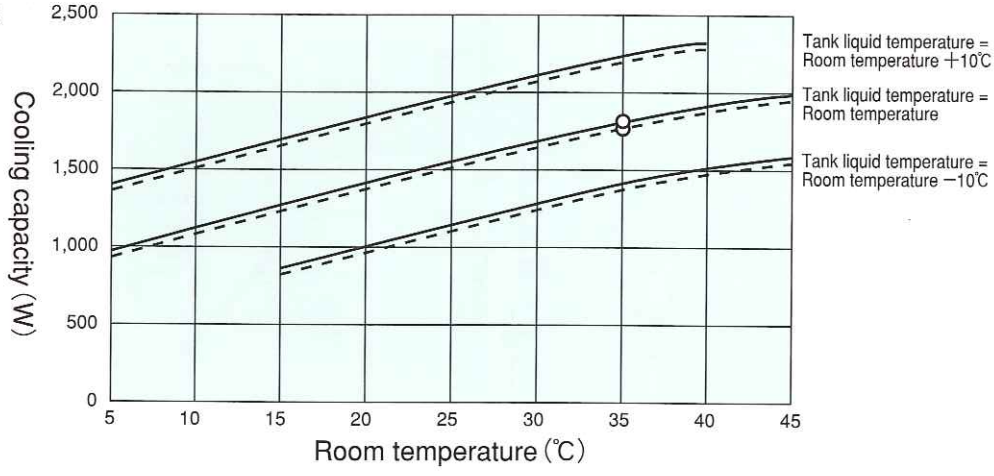
Part No.	Name	Remarks
11	Machine nameplate	
12	General caution label	
13	Brand name plate	
14	Electric diagram nameplate	
15	Charged mark plate	
16	Transformer box	



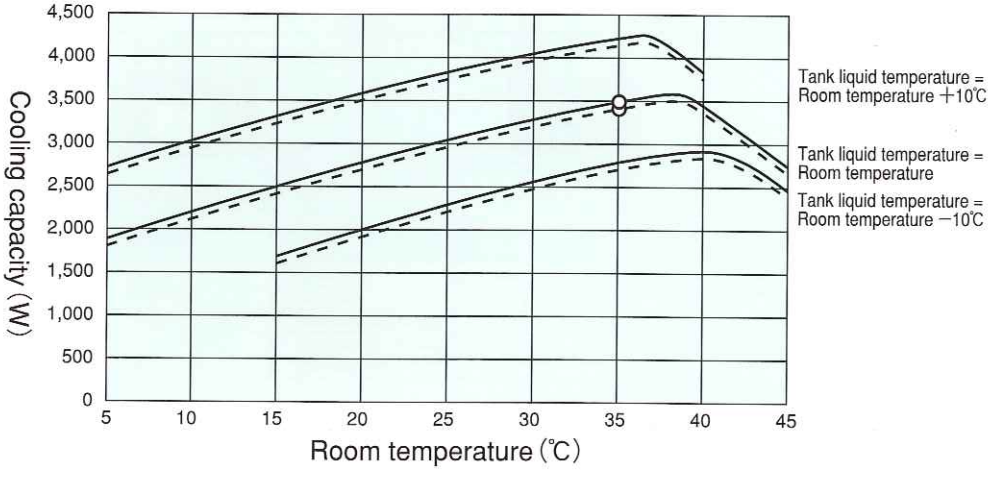
Note) ※1. Hanger is placed in the lower area. Do not use this fixture as hanger.

Performance curve

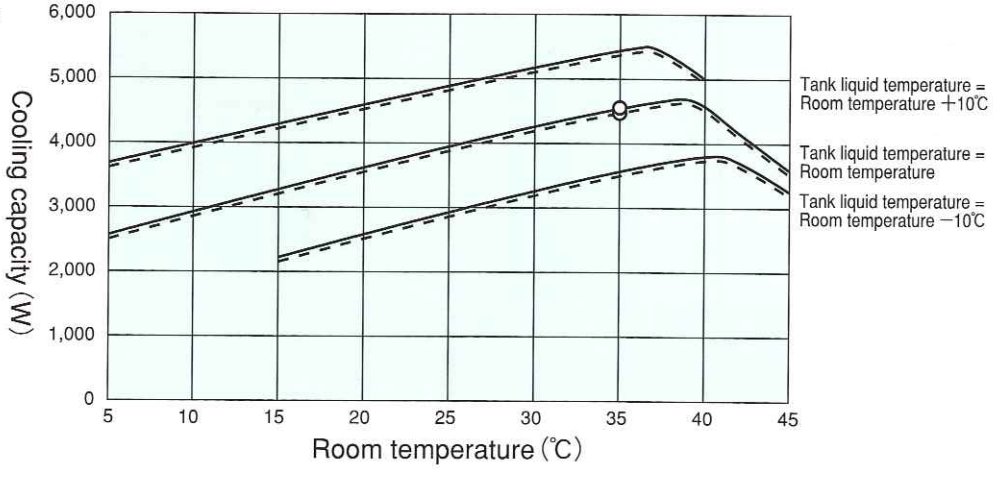
AKZJ188



AKZJ358



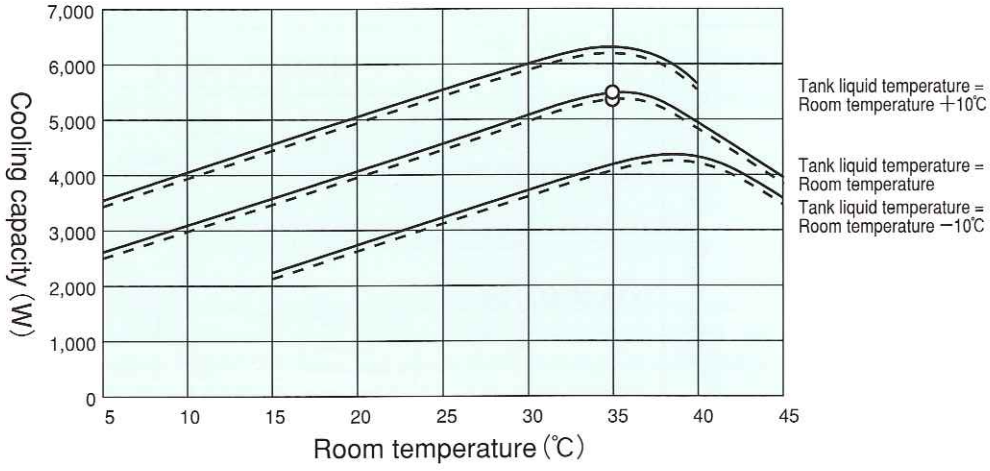
AKZJ458



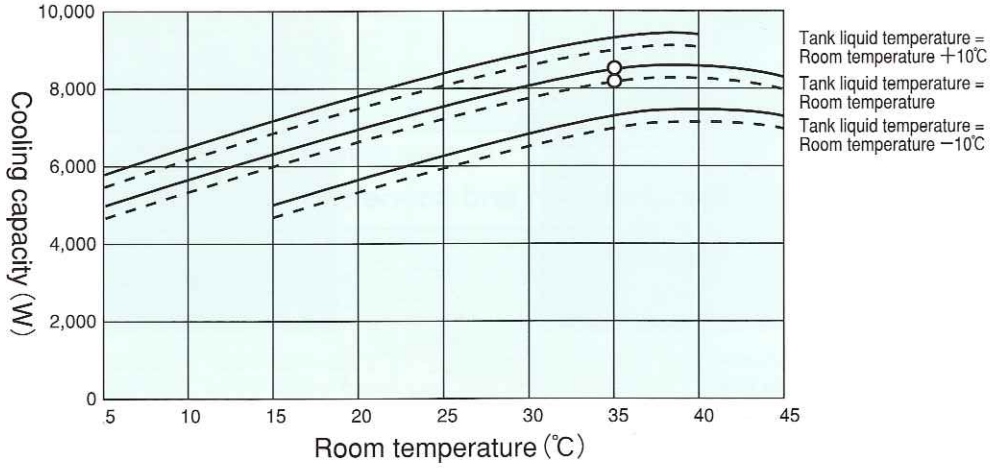
AKZJ8 SERIES

Performance curve

AKZJ568



AKZJ908



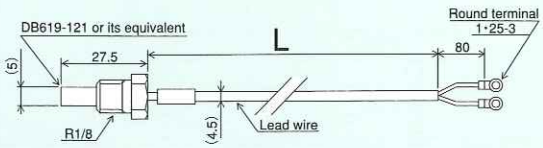
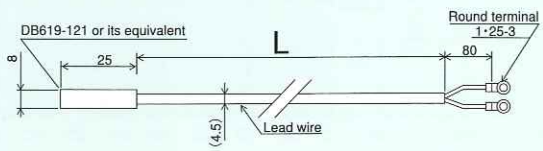
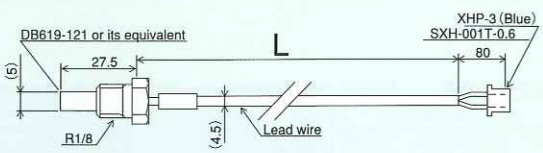
■Solid line ——: 60Hz ■Broken line - - - : 50Hz

1. Mark ○ is the standard point. (Room temperature : 35˚C/Tank liquid temperature : 35˚C /Oil used : ISO VG32)
2. Cooling capacity varies depending on conditions such as room temperature, tank liquid temperature, oil kinematic viscosity, etc.

Thermistor (for all models of 8 series Oil Cooling Unit)

■Nomenclature and application

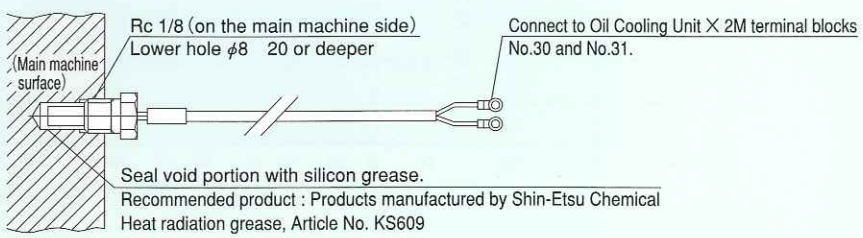
This optional thermistor installed onto the main machine oil piping can sense the temperature to control.

Name	Model	Lead wire length L (m)	Form	Application (installed by user)	Models applied
Machine tuning thermistor	AKZ 8-OP-K5	5m		For machine tuning control (Embedded in main machine body)	AKZ 8 series
	AKZ 8-OP-K10	10m			
	AKZ 8-OP-A5	5m		For machine tuning control (Attached onto main machine surface)	AKZJ 8 series
	AKZ 8-OP-A10	10m			
Oil temperature control thermistor	AKZ 8-OP-Y5	5m		For return oil temperature control (Installed to main machine oil pipinge)	AKZ 8 series
	AKZ 8-OP-Y10	10m			

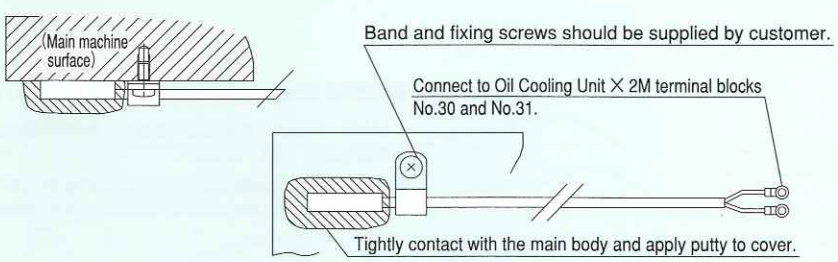
Thermistor characteristics : Resistance,R25 (25℃C resistance) =20kΩ Tolerance : ±2%

■Installation and connection

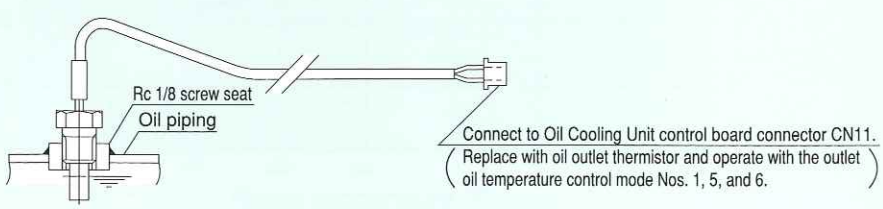
For AKZ 8-OP-K



For AKZ 8-OP-A



For AKZ 8-OP-Y



Optional parts

Main machine communication extension board

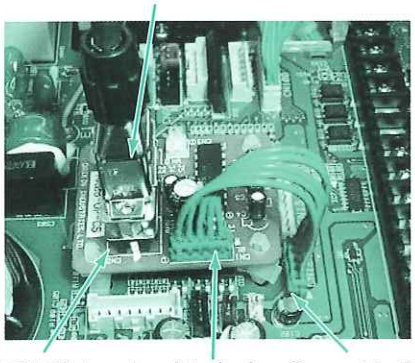
Install this optional board to Oil Cooling Unit to connect with the main machine; and
1.Operation mode and setting can be selected on the main machine side, and
2.Oil Cooling Unit alarm code and temperature data (machine surface temperature, room temperature, inlet oil temperature, outlet oil temperature, difference in temperature between inlet and outlet, inverter frequency) can be read on the main machine side.

Communication method	Model	Position	Models applicable	Specifications No.
Serial communication only	AKZ8-OP-CS	On the surface of Oil Cooling Unit control board	AKZ148、AKZ328、AKZ438、AKZJ188、AKZJ358、AKZJ458	SS08303
		Back side of the front sheet metal of Oil Cooling Unit electric component box	AKZ568、AKZ908、AKZJ568、AKZJ908	
Serial or parallel communication	AKZ8-OP-CSP	Back side of the front sheet metal of Oil Cooling Unit electric component box	AKZ568、AKZ908、AKZJ568、AKZJ908	SS08370

Note) 1. For AKZ148, AKZ328, and AKZ438 (−B and −H each) and AKZJ188, AKZJ358, and AKZJ458 (−B and −H each); AKZ8-OP-CSP is not available.
2. For AKZ148, AKZ328, and AKZ438 (Standard, −C, −E, −T each) and AKZJ188, AKZJ358, and AKZJ458 (Standard, −C, −E each), it is difficult to apply the optional AKZ8-OP-CSP. Please place an order for the non-standard with putting "-SP" at the end of the model number.
3. For communication procedures and specifications, refer to the separate specifications.

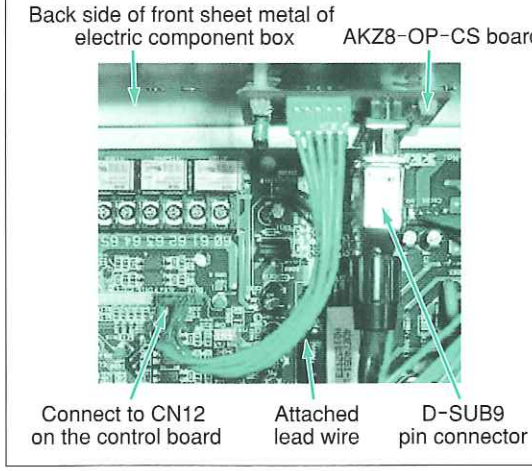
■Installation position of AKZ8-OP-CS (serial communication only)

AKZ148, 328, 438 and AKZJ188, 358, 458



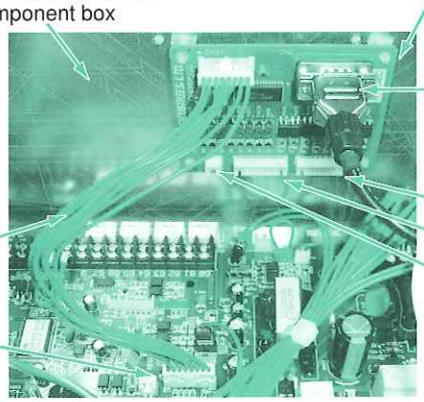
・Dimensions of communication board (W×H) : 40×50
・Fix the communication board with four locking supports.

AKZ568、908 and AKZJ568、908



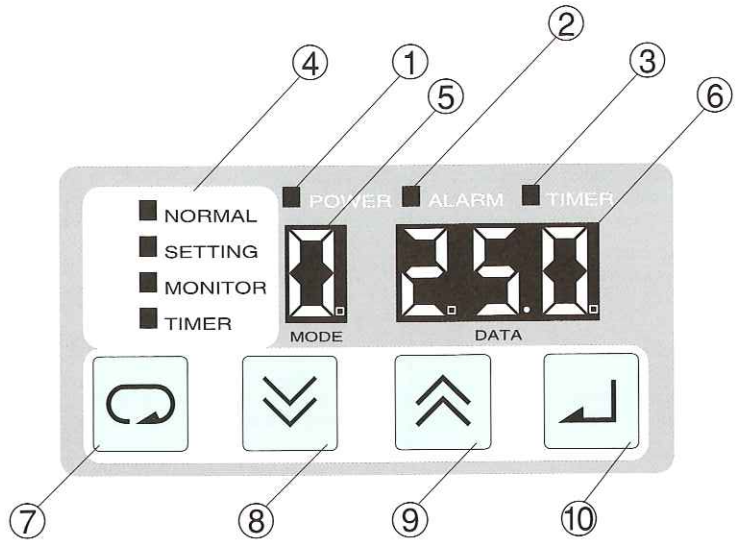
・Connect D-SUB9 pin connector to RS232C support on main machine or personal computer. (No male connectors are included as accessories.)

■Installation position of AKZ8-OP-CSP (serial/parallel communication)



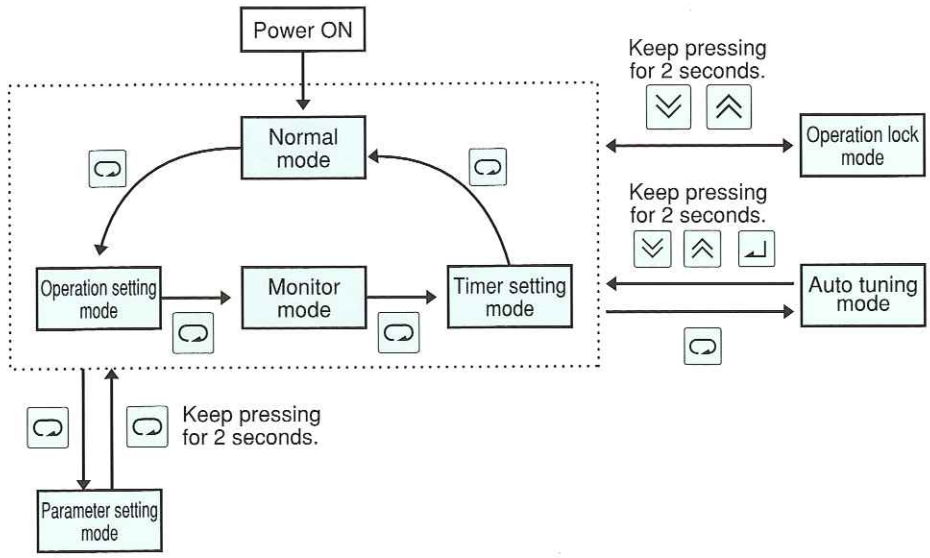
Note) No male D-SUB9 pin connectors are included as accessories.

Name, function, and operation of each part on control panel



NO.	Item	Details
①	Power lamp	The lamp is lit during the power is ON.
②	Alarm lamp	When alarm is detected, Level 1 Alarm : Flashing Level 2 Alarm : ON
③	Filter cleaning sign lamp	The lamp is flashing during the stop in timer mode.
④	Operation mode display	The control panel mode is displayed. NORMAL : Normal mode SETTING : Setting mode MONITOR : Monitor mode TIMER : Timer setting mode
⑤	Operation mode/ Select No.	The current operation mode (NORMAL, SETTING) or Data No. on the data display is shown.
⑥	Data display	Data is displayed. Data is displayed according to operation mode and Data No.
⑦	Select【SEL】key	The key selects operation mode.
⑧	【DOWN】key	The key decrements Operation mode/Data No./Data value.
⑨	【UP】key	The key increments Operation mode/Data No./Data value.
⑩	Enter【ENT】key	The key enters Operation mode/Data No./Data changed.

Shift operation to each mode



Operation mode and setting

AKZ8 series

Mode No.	Mode name	Details	Set temperature range	Optional parts required
Mode 0	Inlet oil temperature control to fix	Keeps inlet oil temperature to set value within the range as shown right	5~50℃	
Mode 1	Outlet oil temperature/ Return oil temperature control to fix	Keeps outlet oil temperature/Return oil temperature to set value within the range as shown right	5~45℃	Oil temperature control thermistor (at Return oil temperature control)
Mode 3	Room temperature tuning control of inlet oil temperature	Keeps inlet oil temperature to set value within the range as shown right	Room temperature −9.9℃~ Room temperature +9.9℃	
Mode 4	Machine surface temperature tuning control of inlet oil temperature	Keeps inlet oil temperature to set value within the range as shown right	Machine surface temperature −9.9℃~ Machine surface temperature +9.9℃	Machine tuning thermistor
Mode 5	Room temperature tuning control of outlet oil temperature/ Return oil temperature	Keeps outlet oil temperature/Return oil temperature to set value within the range as shown right	Room temperature −9.9℃~ Room temperature +9.9℃	Oil temperature control thermistor (at Return oil temperature control)
Mode 6	Machine surface temperature tuning control of outlet oil temperature/ Return oil temperature	Keeps outlet oil temperature/Return oil temperature to set value within the range as shown right	Machine surface temperature −9.9℃~ Machine surface temperature +9.9℃	Oil temperature control thermistor (at Return oil temperature control) Machine surface temperature tuning thermistor

Note) 1. Mode 2, 7,8 cannot be used. Note) 2. For particulars of optional parts, see page 37

AKZJ8 series

Mode No.	Mode name	Details	Set temperature range	Optional parts required
Mode 0	Tank liquid temperature control to fix	Keeps tank liquid temperature to set value within the range as shown right	5~50℃	
Mode 3	Room temperature tuning control of tank liquid temperature	Keeps tank liquid temperature to set value within the range as shown right	Room temperature −9.9℃~ Room temperature +9.9℃	
Mode 4	Machine surface temperature tuning control of tank liquid temperature	Keeps tank liquid temperature to set value within the range as shown right	Machine surface temperature −9.9℃~ Machine surface temperature +9.9℃	Machine tuning thermistor

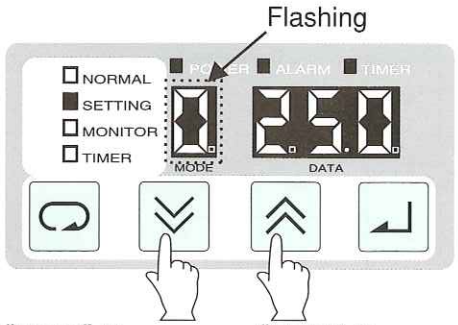
Note) 1. Mode 1, 2, 5~8 cannot be used. Note) 2. For particulars of optional parts, see page 37.

■Setting procedure: Common to AKZ and AKZJ

When the product is left factory, Mode is set to 3 and Temperature is set to 0.0 ℃.
If any other setting is required to operate, change the setting as follows:

1. Power ON・・・At the first operation, release the operation lock mode.
(Press ⩛ key and ⩓ key for 2 seconds or longer simultaneously.)
2. Select "SETTING" mode. (Press ↻ key once.)

Change mode



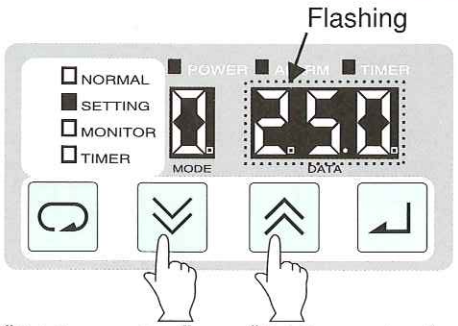
"MODE" No. decrements by −1.

"MODE" No. increments by +1.

3. Set mode. (Press ⩛ key or ⩓ key.)
4. Press ↵ to enter.

Press ↵ "ENT" key to select "MODE" ↕ "DATA"

Change set temperature

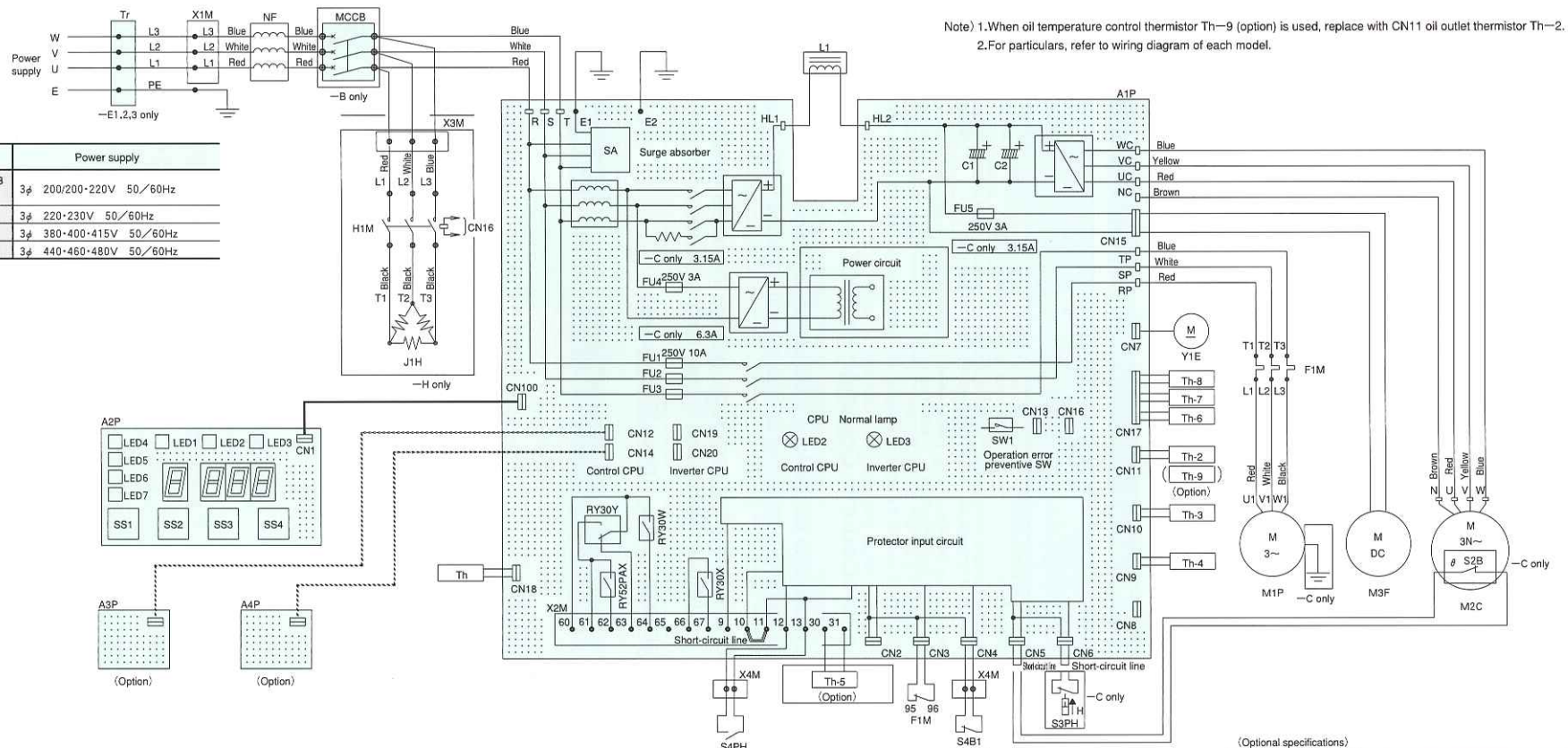


"Set Temperature" decrements by −0.1.

"Set Temperature" increments by +0.1.

5. Set temperature. (Press ⩛ key or ⩓ key.)
6. Press ↵ to enter.

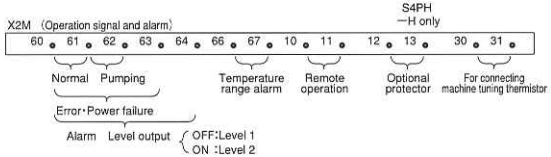
7. Return to "NORMAL" mode. (Press ↻ key three times.)



Model	Power supply
Standard,—B —C,—T,—H	3φ 200/200·220V 50/60Hz
—E1	3φ 220·230V 50/60Hz
—E2	3φ 380·400·415V 50/60Hz
—E3	3φ 440·460·480V 50/60Hz

(Standard)

A1P	Main board	NF	Noise filter
A2P	Operation panel board	Th	Thermistor (Fin)
C1,C2	Capacitor	Th-2	Thermistor (Oil outlet)
CN	Connector	Th-3	Thermistor (Room temperature)
F1M	Overcurrent relay	Th-4	Thermistor (Oil inlet)
FU1~5	Fuse	Th-6	Thermistor (EV valve outlet)
L1	Reacter	Th-7	Thermistor (Condenser)
M1P	Motor (Pump)	Th-8	Thermistor (Discharge pipe)
M2C	Motor (Compressor)	X1M~X4M	Terminal block
M3F	Motor (Fan)	Y1E	Electronic expansion valve



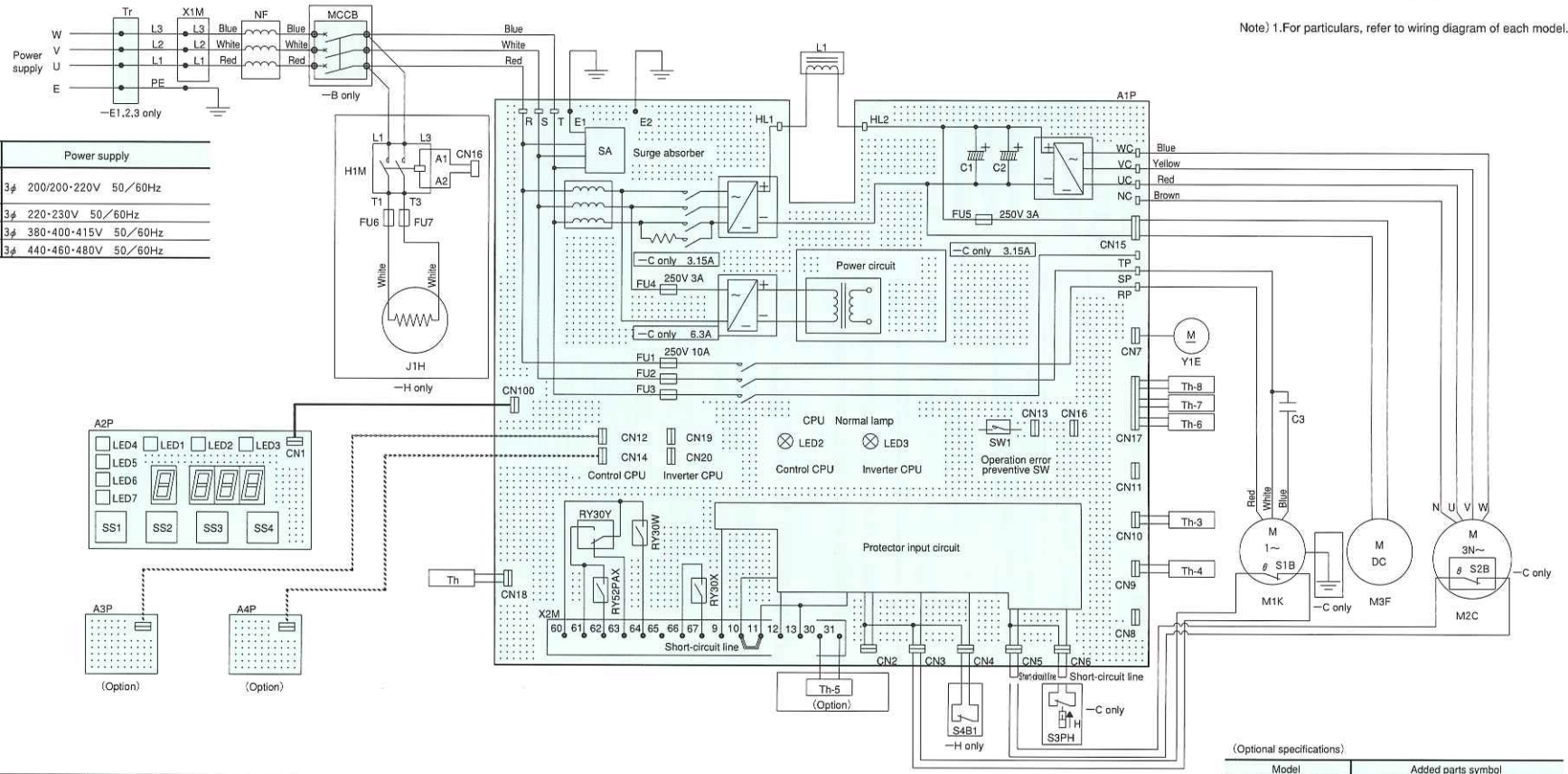
(Optional parts)

Name	Model	Parts symbol
Machine tuning thermistor	AKZ8—OP—K5	Th—5
	AKZ8—OP—K10	
	AKZ8—OP—A5	
	AKZ8—OP—A10	
Main machine communication expansion board	AKZ8—OP—CS	A3P
	AKZ8—OP—CSP	A4P

(Optional specifications)

Model	Added parts symbol	
—B (Breaker)	MCCB	No-fuse breaker
—C (CE specifications)	S2B	Compressor protection thermostat
	S3PH	High-pressure pressure switch
	——	M1P earth
—E1,E2,E3 (Different voltage specifications)	Tr	Transformer
—H (Heater)	H1M	Magnetic contactor
	J1H	Electric heater
	S4B1	Overheat protection temperature switch
	S4PH	Dry-firing prevention switch

Note) 1.For particulars, refer to wiring diagram of each model.



Model	Power supply
Standard,—B —C,—H	3φ 200/200・220V 50/60Hz
—E1	3φ 220・230V 50/60Hz
—E2	3φ 380・400・415V 50/60Hz
—E3	3φ 440・460・480V 50/60Hz

〈Standard〉

A1P	Main board	S1B	Compressor inner thermostat
A2P	Operation panel board	Th	Thermistor 〈Fin〉
C1,C2,C3	Capacitor	Th-3	Thermistor 〈Room temperature〉
CN	Connector	Th-4	Thermistor 〈Liquid temperature〉
FU1~5	Fuse	Th-6	Thermistor 〈EV valve outlet〉
L1	Reactor	Th-7	Thermistor 〈Condenser〉
M1K	Motor 〈Agitator〉	Th-8	Thermistor 〈Discharge pipe〉
M2C	Motor 〈Compressor〉	X1M,X2M	Terminal block
M3F	Motor 〈Fan〉	Y1E	Electronic expansion valve
NF	Noise filter		

X2M 〈Operation signal and alarm〉

60 61 62 63 64 66 67 10 11 12 13 30 31

Normal / Agitating — Temperature range alarm — Remote operation — Optional protector — For connecting machine tuning thermistor

Error・Power failure

Alarm Level output { OFF:Level 1 / ON :Level 2

〈Optional parts〉

Name	Model	Parts symbol
Machine tuning thermistor	AKZ8—OP—K5	Th—5
	AKZ8—OP—K10	
	AKZ8—OP—A5	
	AKZ8—OP—A10	
Main machine communication expansion board	AKZ8—OP—CS	A3P
	AKZ8—OP—CSP	A4P

〈Optional specifications〉

Model	Added parts symbol	
—B (Breaker)	MCCB	No-fuse breaker
—C (CE specifications)	S2B	Compressor protection thermostat
	S3PH	High-pressure pressure switch
	——	M1P earth
—E1,E2,E3 (Different voltage specifications)	Tr	Transformer
—H (Heater)	Hu6,7	Magnetic contactor
	H1M	Magnetic contactor
	J1H	Electric heater
	S4B1	Overheat protection temperature switch

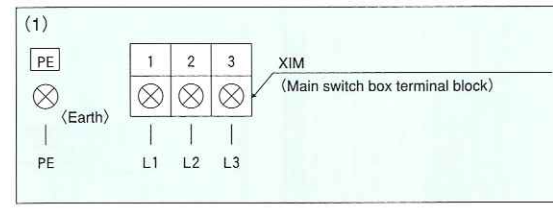
AKZ8・AKZJ8 series wiring procedure

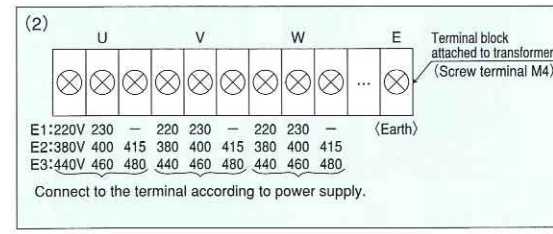
1 Power capacity・・・・Refer to Max. power consumption/Max. current consumption in the specifications of each model.

2 Connect to power terminal block (X1M, Tr)

(1) For Standard, −B, −C, −H, and −T; connect to X1M.

(2) For −E1, −E2, and −E3; connect to the terminal block attached to the transformer.





Danger

1. The main power supply must be equipped with wiring breaker (local supply) of specified capacity.
2. Connect the ground without fail. The unit is equipped with noise filter. If the unit is not grounded, electrick shock may be caused.
3. Before opening the electric component box, power off and leave it as it is for 5 minutes. After the internal high voltage is discharged completely, open the box.
4. Do not energize the unit with the electric component box opened.

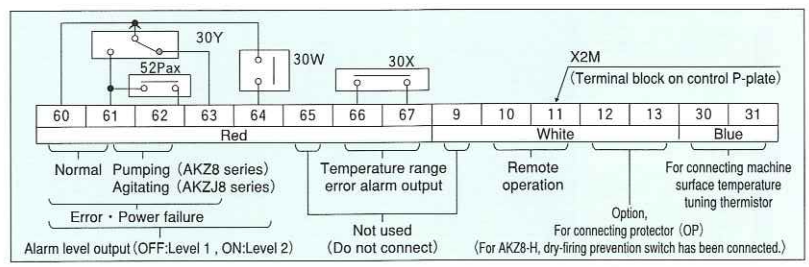
Caution

1. Use round crimp style terminal to connect. For screw terminal size and wire diameter, refer to the following table.

	Screw terminal	Wire diameter		
		JIS wire	IEC wire	UL wire
AKZ 148,328,438,568 AKZJ188,358,458,568	M4	2.0mm² or more	2.5mm² or more	AWG#14 or more
AKZ908,AKZJ908	M5	3.5mm² or more	4.0mm² or more	AWG#12 or more

2. To avoid the effect of noise, cut the wire to appropriate length before connecting so that the excess wire may not contact the control board.
3. For remote control, remove the short-circuit wire between 【10】 and 【11】 and mount the start switch (local supply).
4. The unit is set to LOCK mode when it leaves the factory. Cancel the LOCK mode on the control panel. For how to cancel the LOCK mode, refer to the instruction manual.
5. This unit is equipped with a protector switch (S1W) to reject the setting command from the operation panel. If needed, refer to the instruction manual to set.
6. CE model (−C) is classified as auxiliary machine to the main machine in the overvoltage category II. Observe the following in installing.
   - The main control panel must be equipped with the main power breaker required by EN60204−1.
   - Power must be supplied through the transformer with the basic insulation.

3 Connect to signal terminal block (X2M)



4 Signal output time chart

(1) Operation/Alarm state signal output

Signal output	State of operation		Remote control (【10】−【11】) ON: Normal	ON: Level 1 Error or Lock	ON: Level 2 Error	ON: Power failure (Power OFF)	OFF: Normal	OFF: Level 1 Error or Lock	OFF: Level 2 Error	OFF: Power failure (Power OFF)
Normal (Contact a)	60−61	ON OFF								
Error・Stop (Power OFF) (Contact b)	60−63	ON OFF								
Error level (Contact a)	60−64	ON OFF								
Pumping or agitating (Contact a)	61−62	ON OFF								

(2) Temperature range warning (oil temperature warning) output・・・・・It must be set separately.

Signal output	State of operation		Temperature range check: Within set range: Normal operation	Within set range: Level 1 Error or Lock	Within set range: Level 2 Error	Within set range: Power failure (Power OFF)	Beyond set range: Normal operation	Beyond set range: Level 1 Error or Lock	Beyond set range: Level 2 Error	Beyond set range: Power failure (Power OFF)
Temperature range normal (Contact a)	66−67	ON OFF								

Caution

1. Following wires are applicable to round crimp style (1.25-3) terminal block.
   Single wire : ϕ0.57~ϕ1.44 (AWG#22~#16)
   Stranded wire : 0.25mm²~1.25mm² (AWG#22~16)
2. 【60~64】, 【66~67】: Load applicable is as follows.
   Min. load applicable: DC10mV, 10μA or more
   Max. load applicable: DC30V, 2A (Resistance load)
3. 【10】~【13】: Prepare contact to satisfy min. load applicable of DC 12V 5 mA.
4. 【30】−【31】: When connected thermistor length is over 10m or when wiring is made in an area where noise environment is poor, shielded wire should be used.

Supplements

Precautions in external-piping

Over external pressure loss (local piping resistance) may cause abnormal pump noise (relief noise, cavitation noise), deterioration of cooling capacity, oil temperature control failure, and other problems. The external pressure loss must be within the normal operation range.

1.Suction piping
Suction vacuum pressure should be within the range of −29.7 to 0 kPa {−230 to 0 mmHg}.
Suction filter of 100 ～ 150 mesh is recommended.

2.Discharge piping
Discharge piping pressure loss should be 0.5 MPa {5kgf/cm²} or less.

3.Do not install stop valve onto either suction or discharge piping. If needed, use relief valve of 0.5 Mpa {5kgf/cm²} together with the stop valve without fail.

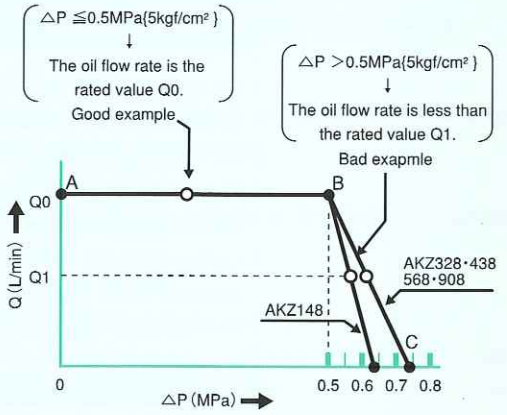
4.Calculation of piping resistance
Calculate the oil piping resistance in the following expression to determine the oil piping size.

Piping resistance $\triangle P=0.595 \times \nu \times Q \times L/D^4$
(for general hydraulic oil, lubricating oil)

△P : Piping resistance (MPa)
ν : Coefficient of kinematic viscosity (mm²/s) — Refer to Viscosity/Temperature graph.
Q : Flow rate (ℓ/min)
L : Pipe length (m)
D : Pipe inside diameter (mm)

●Relation between oil cooling unit oil flow rate and external pressure loss

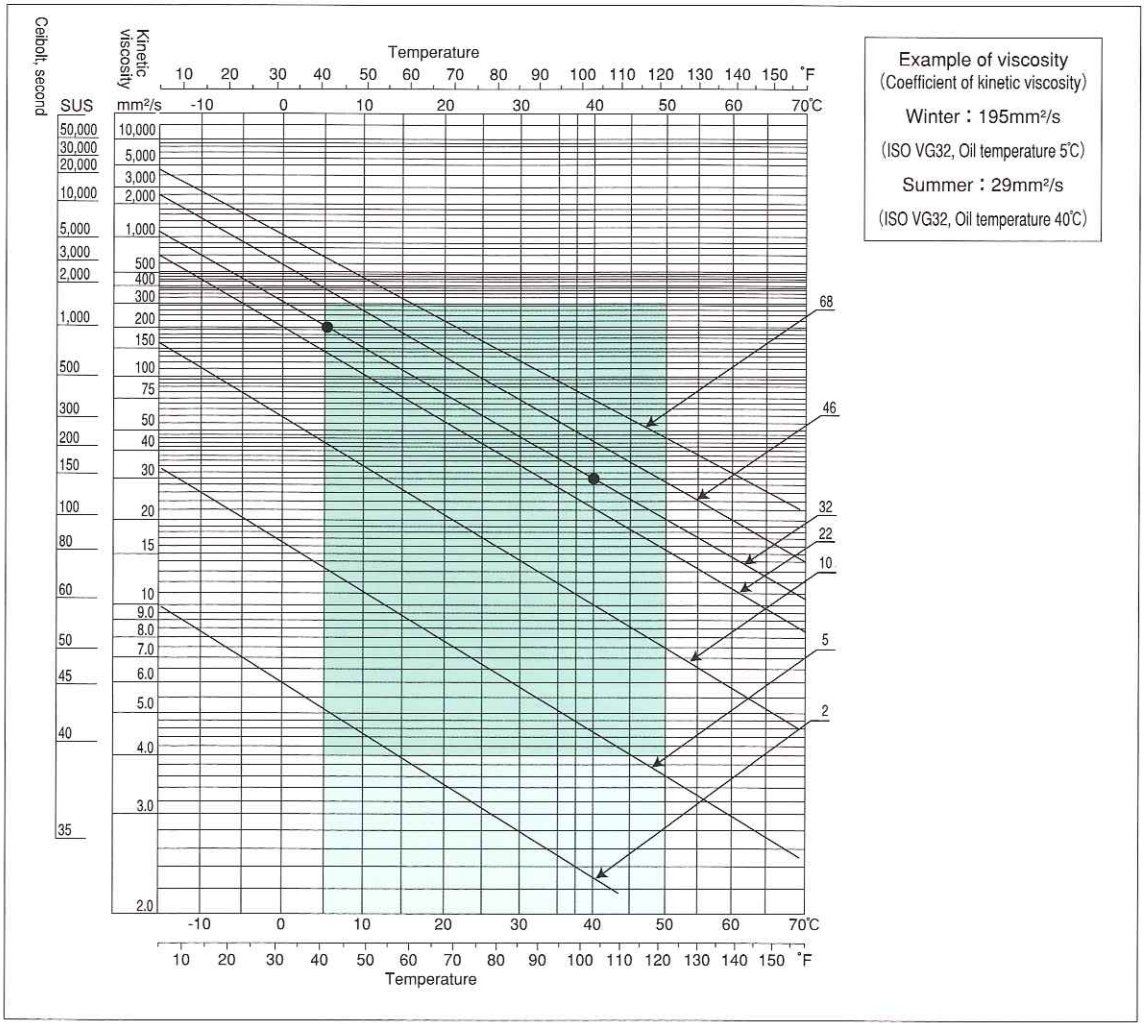
AKZ8 series type pump built-in circulating oil cooling unit Oil Cooling Unit has the following characteristics.
When the external pressure loss (△p) is 0.5 MPa {5kgf/cm²} or less, the oil flow rate is the rated value (Q0).
When the external pressure loss (△p) is over 0.5 MPa {5kgf/cm²}, the oil flow rate is less than the rated value.



Q (ℓ/min) : Oil flow rate (Q0 : Rated flow rate)
△P (MPa) : External pressure loss
A : External pressure loss is 0.
B : External pressure loss is 0.5 MPa. (Relief valve cracking pressure)
C : External pressure loss is high and oil flow rate is 0.

Note) Outlet pressure at full open on the main machine side is: AKZ148: 0.65 MPa. AKZ328, 438, 568, 908: 0.75 MPa. The local piping must be designed to have pressure resistance of the outlet pressure or higher.

■Viscosity/Temperature graph



Example of viscosity
(Coefficient of kinetic viscosity)
Winter : 195mm²/s
(ISO VG32, Oil temperature 5℃)
Summer : 29mm²/s
(ISO VG32, Oil temperature 40℃)

Precautions in handling

●Important precautions on main machine (machine tools, Industrial machinery) side

1.For bad transportation conditions including overseas transportation, refer to separate packing specifications or select appropriate transportation methods.

2.This Oil Cooling Unit is not equipped with a built-in flow switch for checking for oil supply nor a built-in temperature switch to check for oil temperature error (high or low). The machine tool should be equipped with a flow switch, temperature switch, and other protectors.

Precautions regarding operation and cooling capacity

1.Do not supply oil of 50℃ or higher to the unit. Start the oil cooling unit simultaneously with the main machine or before the oil temperature rises to 40℃.

2.Do not place anything which obstructs ventilation in the area within 500 mm from suction port and exhaust port.

3.The clogged air filter may deteriorate the cooling capacity. To prevent the air filter from being clogged, periodic cleaning (hot water, air blow) should be carried out every half month.

4.Cutting dust and chips accumulated on the cooling coil (evaporator) of AKZJ8 series may deteriorate the cooling capacity which may result in failures. Attach efficient return filter to the return side of the tank (oil inlet). In addition, periodic cleaning in the tank should be carried out to prevent dust and chips from accumulating on the cooling coil.

Precautions regarding oil/fluid applicable

1.Oil/fluid applicable to each series are as follows: (○··· Applicable, ×··· Unapplicable)

2.Oil/fluid unapplicable (marked with × in the list below) must be absolutely avoided.

	Special mention	AKZ8 series	AKZJ8 series
Lubricating oil, Mineral hydraulic fluid	No.3 Oil and No.4 Oil out of Class 4 Dangerous articles specified by the Fire Services Act, and Discoloration No.1 in Copper Corrosion Test Method for Petroleum Products (JIS K2513)	○	○
Noncombustible hydraulic fluid ●Phosphate ester ●Chlorinated hydrocarbons ●Water—glycol ●W/O·O/W emulsion (High-hydrated fluid)	——	×	×
Coolant ●Water-soluble cutting · grinding oil ●Non-water-soluble cutting · grinding oil	——	×	○
Water (Industrial water)	Water containing ingredients which may corrode cooling coil (evaporator) of SUS304 must be avoided.	×	○
Fuel and other ignitable fluid	Special ignitable materials, alcohols, No.1 petroleum, and No.2 petroleum out of Class 4 Dangerous articles specified by the Fire Services Act.	×	×
Chemicals	——	×	×
Liquid foods	Drinks, Food cooling water	×	×

Precautions in handling

*Before handling and operating this unit, you should first thoroughly read the instruction manual to understand.

●Safety precautions

(Rank of danger)

⚠DANGER・・・An urgent dangerous situation resulting in serious injury or death may be caused.
⚠WARNING・・・A dangerous situation resulting in serious injury or death may be caused.
⚠CAUTION・・・A dangerous situation resulting in slight injury or material damage only may be caused.

① General precautions

[⚠DANGER] ① Operate the unit only under the conditions defined in the catalog, drawings, specifications, instruction manual, and caution label.
[⚠DANGER] ② Never operate the unit in the atmosphere with dangers of explosions.
[⚠DANGER] ③ Do not disassemble, repair, nor modify the unit.
[⚠DANGER] ④ Observe laws and regulations and standards relating to safety (Industrial Safety and Health Act, Fire Services Act, JIS B 8361 Hydraulic System Rules).
[⚠WARNING] ⑤ If refrigerant leakage occurs,
- Ventilate the room completely. (Suffocation may be caused.)
- Refrigerant must not contact the skin directly. (Frostbite may be caused.)
- If any abnormal symptoms are observed due to inhalation, skin contact, or eye contact; consult a physician immediately.

[⚠WARNING] ⑥ When any abnormality is detected, immediately stop operating and take necessary actions after detecting the cause.
[⚠CAUTION] ⑦ Do not operate the unit under special atmospheric conditions (high temperature, high humidity, dust, dirt, powder dust, steam, and oil mist).
[⚠CAUTION] ⑧ Main machine should be equipped with flow switch and temperature switch to protect the main shaft and others.
[⚠CAUTION] ⑨ Do not get on the unit nor place matters on the unit.

② Precautions in carrying

[⚠DANGER] ① Before lifting the unit, make sure of the weight and use the included eyeplate and hagner to work.
[⚠WARNING] ② Keep away from the unit in lifting to carry.
[⚠CAUTION] ③ Ensure to prevent the unit from falling in carrying.
[⚠CAUTION] ④ Do not incline the unit at 30° or more in carrying (including storing). Compressor failures may be caused.

③ Precautions in installing

[⚠WARNING] ① Place the unit on a level and rigid place. Securely fix the unit before operating.
[⚠CAUTION] ② Do not place matters near the suction port and exhaust port.

④ Precautions in piping and wiring

[⚠DANGER] ① Piping and wiring should be executed by specialists.
[⚠DANGER] ② Power connection should be made after checking the wiring procedure in the specifications and the instruction manual.
[⚠DANGER] ③ The unit must be grounded.
[⚠WARNING] ④ Before wiring, verify the wiring diagram according to the standards.
[⚠CAUTION] ⑤ Install the wiring breaker for the main power capacity in the field.
[⚠CAUTION] ⑥ Oil piping must be executed securely after making sure of pressure proof of 1MPa or higher.

⑤ Precautions in test run

[⚠CAUTION] ① Before test run, make sure that the main machine is under the safe conditions (locked).
[⚠CAUTION] ② Before operating, make sure that oil piping and electric wiring are correctly carried out and that no connections are loose.
[⚠CAUTION] ③ Before starting the main machine, release the lock of this unit.
[⚠CAUTION] ④ Make sure that the oil piping system is filled with the required quantity of oil and that the piping is not blocked.

⑥ Precautions in operating

[⚠DANGER] ① Do not pour water and other various types of liquid.
[⚠WARNING] ② Do not put fingers and matters into any opening of the machine.
[⚠CAUTION] ③ Do not touch the exhaust port of which temperature is high.

⑦ Precautions in maintenance and inspection

[⚠DANGER] ① Work must be carried out under the open condition. In the closed area, suffocation may be caused due to refrigerant leakage.
[⚠DANGER] ② Before working, cut off the main power.
[⚠DANGER] ③ Do not work within 5 minutes after cutting off the main power.
[⚠DANGER] ④ Do not operate the unit with the cover opened.
[⚠CAUTION] ⑤ Before maintenance, inspection, and cleaning; wear gloves, safety glasses, and other protectors.
[⚠CAUTION] ⑥ Air filter must be cleaned at regular intervals (target: once every two weeks).

How to select Oil Cooling Unit

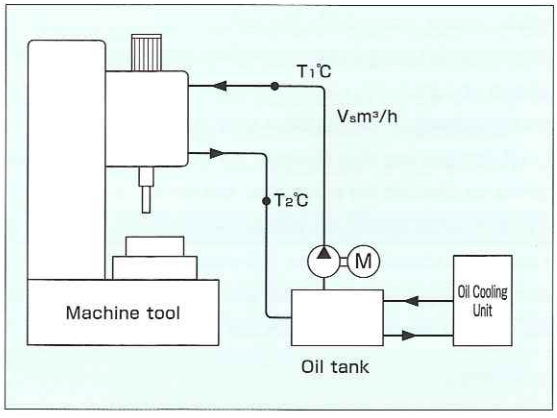
Conversion formula ●1kW=860kcal/h

1.Select the model of 20 ~ 30% larger cooling capacity than the calorific value of the machine tool.
2.The cooling capacity of Oil Cooling Unit varies depending on the fluid temperature (inlet) and the room temperature. It is necessary to know the fluid and room temperature values before selecting the appropriate model.
3.The following three methods are the guideline of the calorific value calculation.
Finally, however, it is recommended to conduct tests to determine the calorific value.

●Calorific value calculation of machine tools for the unit selection (Guideline)

(1) Cooling of machining center main shaft head

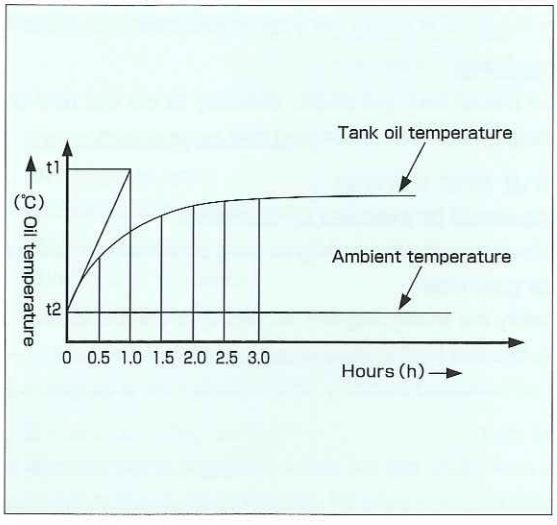
●Method 1 : Calorific value is estimated from temperature difference between supply oil and return oil.



$$Q=2.778\times10^{-7}Cp\cdot\gamma\cdot Vs\cdot\triangle T$$

Q : Calorific value (kW)
Cp : Specific heat under constant pressure (J/kg℃)…1967.4J/kg℃
γ : Specific gravity (kg/m³)・・・876kg/m³
Vs : Oil flow rate (m³/h)
△T : Temperature difference (℃)・・・T_2-T_1
Example) At △T=5℃, Vs=1.8m³/h (30ℓ/min)
$Q=\underline{2.778\times10^{-7}\times1967.4\times876}\times1.8\times5$
$=\underline{0.479}\times1.8\times5\fallingdotseq4.3$kW

●Method 2 : Calorific value is estimated from tank oil temperature increase.



Determine the maximum inclination in the oil temperature rise.
(To determine the maximum inclination, measure △t every minute for the first ten minutes.)

$$Q=2.778\times10^{-7}Cp\cdot\gamma\cdot V\cdot\triangle t/H$$

Q : Calorific value (kW)
Cp : Specific heat under constant pressure (J/kg℃)…1967.4J/kg℃
γ : Specific gravity (kg/m³)・・・876kg/m³
V : Total oil quantity (m³)
△t : Temperature difference (℃)・・・t_1-t_2
H : Hours (h)
Example) At △t=10℃, Total oil=300ℓ (0.3m³)
$Q=\underline{2.778\times10^{-7}\times1967.4\times876}\times0.3\times10$
$=\underline{0.479}\times0.3\times10\fallingdotseq1.4$kW

●Method 3 : Motor output loss is regarded as heating

$$Q=H\cdot\frac{\eta}{100}$$

Q : Calorific value (kW)
H : Motor output (kW)…For driving main shaft
η : Motor output loss (%)
Example) 7.5 kW motor output loss is 30%. Generally around 30% (Cooling main shaft head)
Q=7.5×0.3=2.3kW

How to select Oil Cooling Unit

(2) Cooling of cutting oil and grinding oil

1.Calorific value of the cutting oil/grinding oil system is roughly calculated from the following expression as the tank capacity and the pump flow rate are generally high. Next, the calorific value is determined by testing actually to select an appropriate Oil Cooling Unit.

2.Calculation (Rough)

$$Q=Q_1+Q_2+Q_3$$

Q : Heat load of the entire machining system

Q_1 : Machining heat

Q_2 : Calorific value of coolant pump motor (Heat moved to coolant)

: Q2 = Pump motor output (kW) $\times \frac{\eta}{100}$

Q_3 : Heat balance between coolant and room temperature through coolant tank

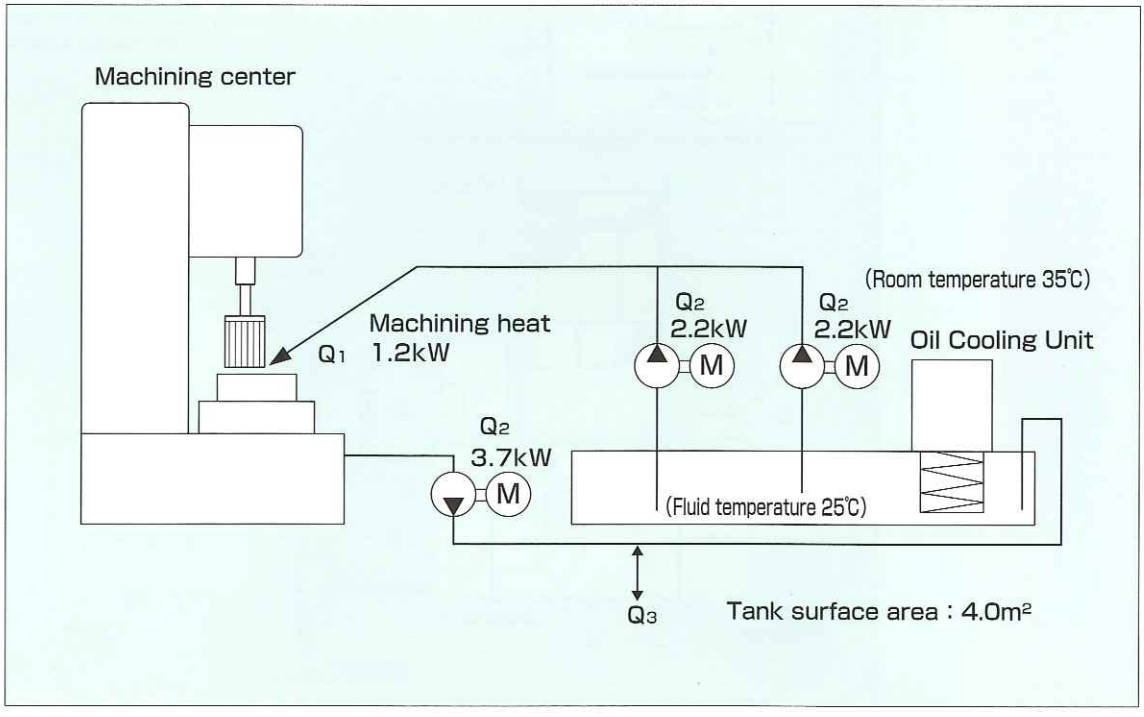
$Q_3=K \cdot A \cdot \triangle T$ K : Overall heat transfer coefficient (W /m²·℃), generally K = 11.6~23.2

A : Surface area of tank contacting with fluid (m²)

△T : Room temperature − Tank internal fluid temperature controlled (℃)

3.As for the test, determine calorific value according to Method 1 and Method 2 on Page 47.

Estimated calorific value



Example) In the above figure,

Q_1=1.2kW

$Q_2=(2.2+2.2+3.7)\times\frac{50}{100}\fallingdotseq 4.1$kW ($\eta$= 50% generally for coolant pump)

$Q_3=20\times4\times(35-25)/1000=0.9$kW

$\therefore Q=Q_1+Q_2+Q_3$

$=1.2+4.1+0.9$

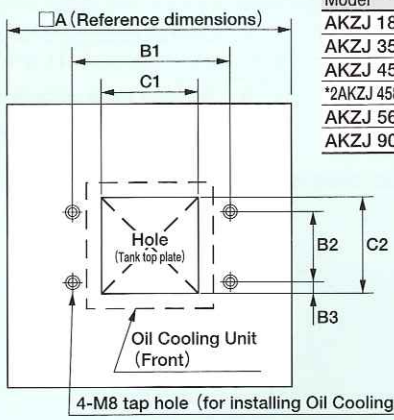
$=6.2$kW

AKZJ8 series | Basic example to install the unit to tank

●Points in manufacturing tank

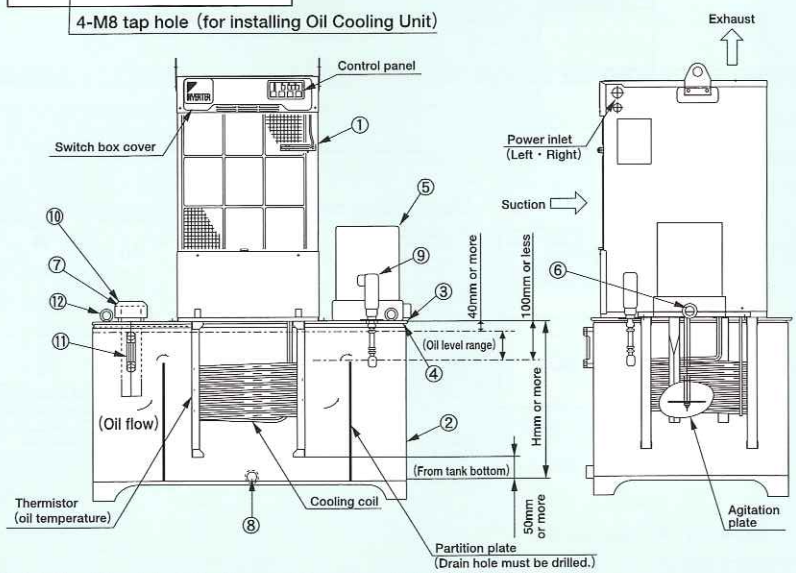
1. Divide the oil tank into three at least and adopt the overflow system.
   Prevent cut powder, cut dust, and other foreign matters from directly entering the suction line.
2. Correctly position the partition plate and piping so that the high temperature return oil from the machine and the low temperature oil cooled by the oil cooling unit may be mixed uniformly.
3. The tank should have the structure easy to be cleaned (for example, tank top plate removable).
4. Tank material ··· SUS is recommended. Select appropriate material in consideration of suitability to the oil/fluid.
   There are some examples of SS material for cutting oil tanks with coated (epoxy resin) internally.

●Tank dimensions (Top view)



Tank / Model	Size A	Depth H	Tank hole pitch B1	B2	B3	Hole C1	C2	Compatibility (○:Yes,×:No) Current model	Old model
AKZJ 188	600 or more	400 or more	390	270	15	325	325	*1 ○ AKZJ187	*1 ○ AKJ56
AKZJ 358								*1 ○ AKZJ357	*1 ○ AKJ106
AKZJ 458								–	–
*2AKZJ 458-7	700 or more		500	380	22	440	440	○ AKZJ457	–
AKZJ 568					45			○ AKZJ567	*3 × AKJ206
AKZJ 908	800 or more	500 or more	590	440	30	500	500	○ AKZJ907	*3 × AKJ306

Note) *1. The new model AKZJ188 and 358 is approx. 50 mm over the current and the old models forwardly. (It is required to check for obstacles in the forward direction.)
*2. AKZJ458-7 is a special compatible model (with attachment) with the current model of AKZJ457.
*3. The models marked with × in the compatibility column require to modify the tank in the field or to have a separate attachment. (Contact us.)

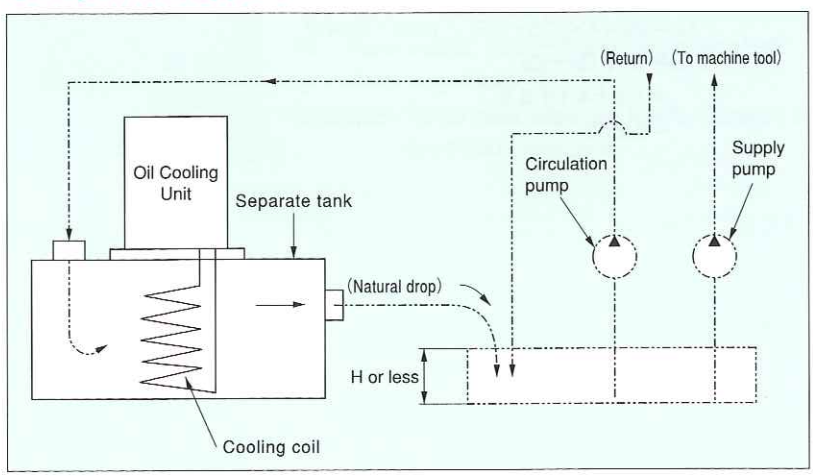


Parts No.	Name	Quantity/set
1	AKZJ 8	1
2	Tank main body	1
3	Tank top plate	1
4	Tank packing	1
5	Supply pump	1
6	Discharge port	1
7	Return port	1
8	Tank drain	1
9	Float switch	1
10	Oil inlet and air breather in common	1
11	Oil level gauge	1
12	Suspension bolt	4

Note) Parts No. 2~12 are not our products.

Note) 1: The oil level should be 40 mm ~ 100 mm from the tank top plate.
2: The cooling coil should be under the oil level.
3: The partition plate height should be the minimum oil level in the range or higher. (100 mm or less from the top)

●Separate type : Tank depth is H or less in the above table.

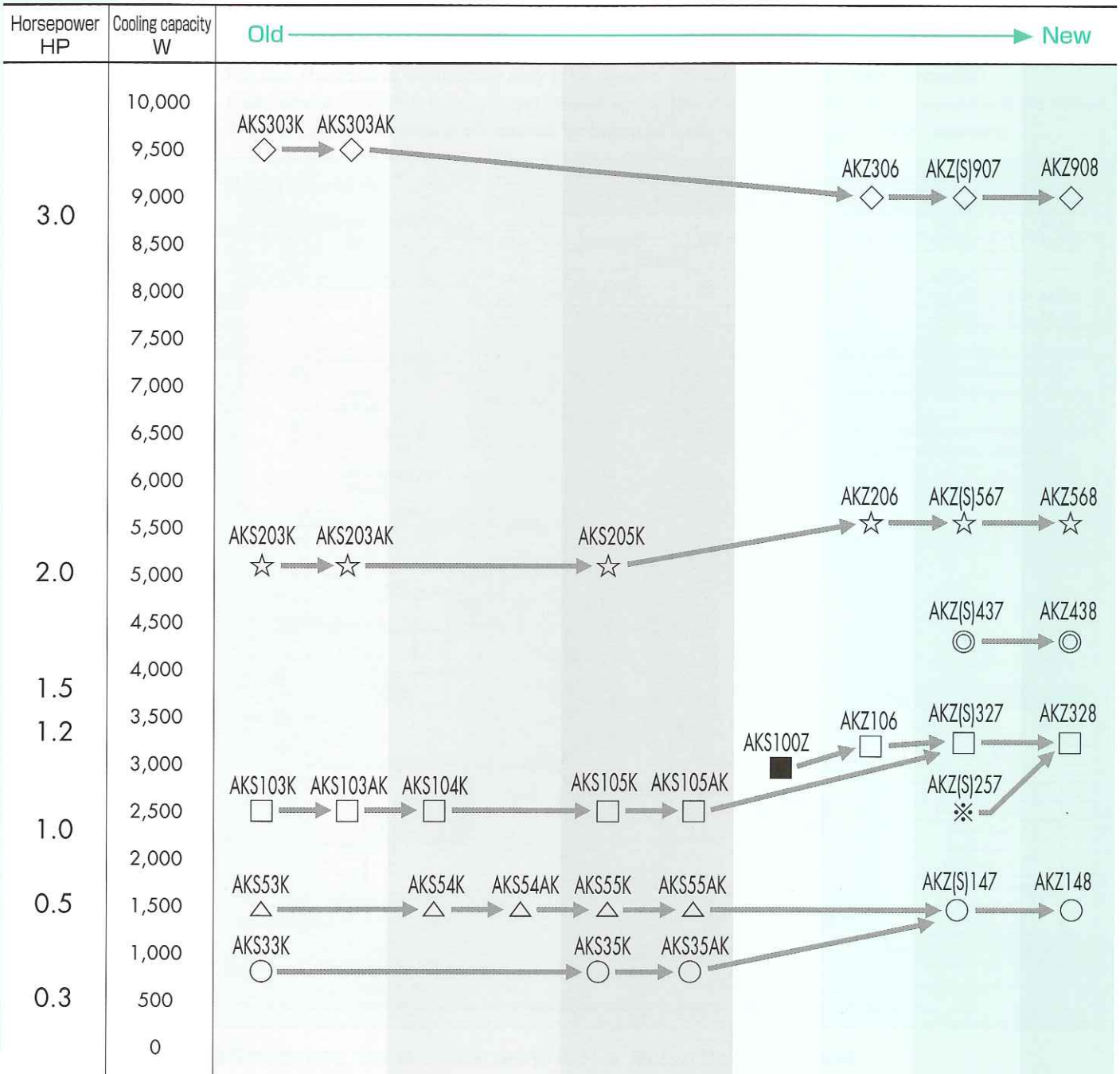


Note) 1. To prevent foreign matters including cutting dust and chips from entering, efficient filter should be installed onto the supply or return line.
Note) 2. Cutting dust and chips accumulated on the cooling coil may deteriorate the cooling capacity which may result in failures.

Memo

Equivalent history of Oil Cooling Unit for cooling main shaft (Circulation type)

AKS→AKZ



Series	AKS3 series		AKS4 series		AKS5 series		AKS-Z series	AKZ6 series	AKZ7 series	AKZ8 series
Release	—	'87.5	'86	'87	'88.1~10	'98.12	'88	'96.8~10	'01.10~'02.2	'02~'03
Abolish	'87.5	'02.3	'88	'88	'93.3	'02.3	'97.3	'02.9	Current model	New model

ON–OFF unit

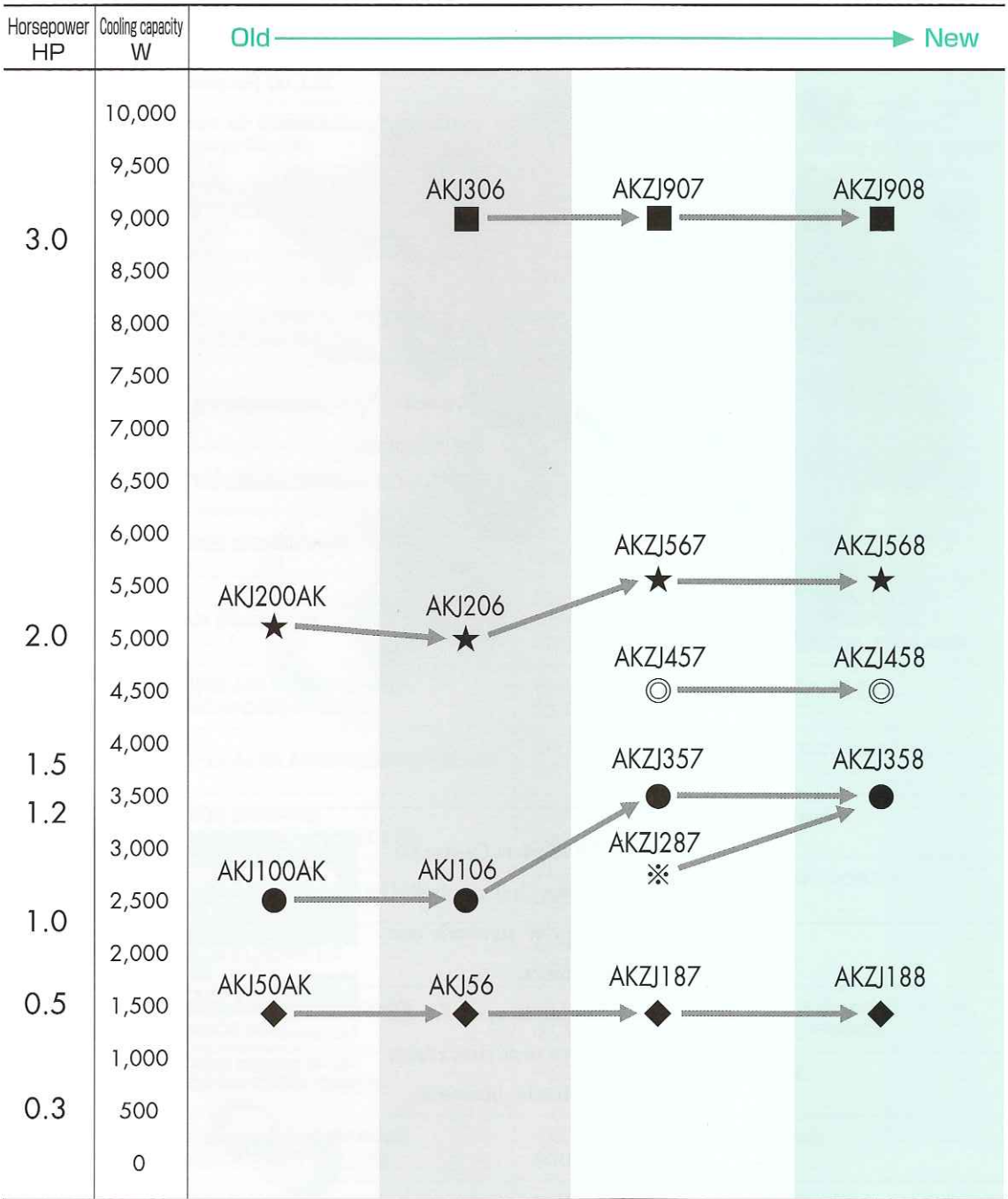
Inverter unit

Note) 1. Newer series has a higher last number in the model number. (ex. AKS35K is newer than AKS33K.)
The last alphabet of AK is newer than the last alphabet of K. (ex. AKS35AK is newer than AKS35K.)
2. Each cooling capacity means the rate at standard point and 60 Hz.
3. Dimensions of some new or old models may have been changed. Before selecting, verify the dimensions in catalogs and specifications (outline drawings). Before replacing with new models due to failures of existing ones, verify the existing state and select the model.
4. All of our models since 2002 are inverter types.
5. AKZ(S) "7" series adopts new refrigerant R407C, AKZ "8" series adopts new refrigerant R410A, and others adopt R22.
6. The conventional 1 HP models (AKS105AK, AKZ(S)257 class) are united into 1.2 HP AKZ328.

Supplements

History of Oil Cooling Unit for cutting and grinding oil (Immersion type)

AKJ→AKZJ



Series	AKJ0 series	AKJ6 series	AKZJ7 series	AKZJ8 series
Release	'87.12	'96.8～10	'01.10～'02.2	'02～'03
Abolish	'96.12	'02.9	Current model	New model
	ON−OFF unit		Inverter unit	

Note) 1. Newer series has a higher last number in the model number. (ex. AKZJ358 is newer than AKZJ357.)
2. Each cooling capacity means the rate at standard point and 60 Hz.
3. Dimensions of some new or old models may have been changed. Before selecting, verify the dimensions in catalogs and specifications (outline drawings). Before replacing with new models due to failures of existing ones, verify the existing state and select the model.
4. All of our models since 2002 are inverter types.
5. AKZJ "7" series adopts new refrigerant R407C, AKZJ "8" series adopts new refrigerant R410A, and others adopt R22.
6. The conventional 1 HP models (AKJ100AK、AKJ106、AKZJ287) are united into 1.2 HP AKZJ358.

DAIKIN Service Network

Global air conditioner manufacturer DAIKIN

can support customers rapidly and safely through
our wide service network spreading over 13 countries.

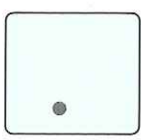
Contact DAIKIN Contact Center for domestic Oil Cooling Unit services.
Our domestic service network can support the customers.
The Contact Center is open for 24 hours and 365 days to advice, reply, and service receptionist business.

DAIKIN Contact Center
Customer service

First dial 186 for smooth call back.
0120-14-9955 ..... Common free dial
FAX contact 0120-84-1069 ..... Free dial for FAX use only
Nishi-Nihon Contact Center Koraibashi 4-5-2, Chuo-ku, Osaka-shi, Osaka-fu, Japan 541-0043

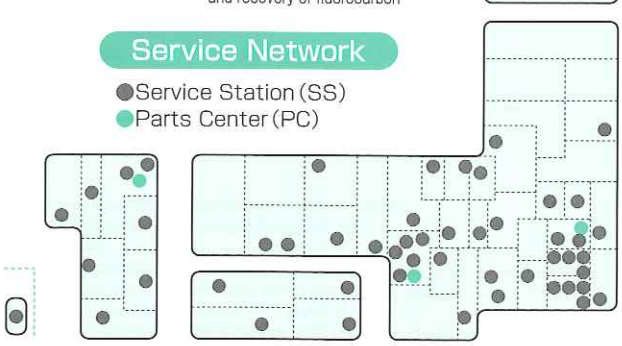
24 hours and 365 days

〈Open〉
●24 hours and 365 days
〈Work〉
●Advice and answer on hydraulic units and recovery of fluorocarbon



Service Network

●Service Station (SS)
●Parts Center (PC)



Overseas Service Bases

Contact us (Business Dept.) for Oil Cooling Unit overseas services.

We will contact the following 18 air conditioner and Oil-Hydraulics representatives in the following 13 countries and areas to support the customers.

Country · Area	Company	Address
China	**Daikin Air Conditioning Technology (Shanghai) Co.,Ltd.**	United Plaza 6F, 1468 Nan Jing Rd (W), Shanghai 200040 CHINA
	Daikin Air Conditioning Technology (Beijing) Co.,Ltd	Room1701, Grand Pacific Trade Center Phase C, 8A Guanghua Road, Chaoyang District, Beijing, 100026
	DAIKIN AIRCONDITIONING (HONG KONG) LTD.	17/F, Futura Plaza, 111-113 How Ming Street, Kwun Tong, Kowloon, Hongkong
	Daikin Air Conditioning Technology (Guangzhou) Co.,Ltd.	B 23/F, Jianhe Center, No.111 Tiyuxi Road, Tianhe Guangzhou China 510620
	◎ **DAIKIN SHANGHAI OFFICE OIL-HYDRAULICS DIV.**	RM.606, 1468 Nan Jing Rd (W), Shanghai 200040 CHINA
Korea	◎ **KD HYDRAULICS,LTD.**	1ST FLOOR, DONGIL BLDG, 242, 2-KA, YOUNGDUNGPO-DONG, YOUNGDUNGPO-KU, SEOUL KOREA
Taiwan	**HOTAI DEVELOPMENT CO., LTD.**	5-6 SECT.TAI-LIN RD., TAI-SHAN HSIANG TAIPEI HSINE, TAIWAN
	◎ **TAICIN ENTERPRISE**	NO.67 KAI AN 2 STREET AN NAN CHIU TAINAN, TAIWAN
Thailand	**SIAM DAIKIN SALES CO., LTD.**	49/9 MOO 5, SOI ONNUCH 55/1 (SIAM DAIKIN) ONNUCH RD, K.M.7.5, PRAVET SUBDISTRICT, PRAVET DISTRICT, BANGKOK 10250, THAILAND
Singapore	**DAIKIN AIR CONDITIONING (SINGAPORE) PTE.LTE.**	10 ANG MO KIO INDUSTRIAL PARK 2 SINGAPORE 2056
Philippines	**DAIKIN ALEN AIRCONDITIONING INC.**	41 LINAU ST. STA, MESA HEIGHTS QUEZON CITY 1114, PHILIPPINES
India	**DAIKIN SHRIRAM AIRCONDITIONING PVT.LTD.**	F25/2, Okhla Industrial Area, Phase II New Delhi 110020
Australia	**DAIKIN AUSTRALIA (Pty) Ltd.**	77-83 ALFRED ROAD, CHIPPING NORTON N.S.W.2170 AUSTRALIA
Europe Belgium	**DAIKIN EUROPE NV**	ZANDVOORDESTRAAT 300 B-8400 OOSTENDE, BELGUIM
Europe France	**DAIKIN AIR-CONDITIONING FRANCE SA**	LE CAPITOLE 55, AVENUE DES CHAMPS PIERRE UX 92012 HANTERRE CEDEX, FRANCE
Saudi Arabia	**ABBAR & ZAINY DAIKIN**	P.O.BOX 5700, JEDDAH 21432, SAUDI ARABIA
South Africa	**DAIKIN AIR-CONDITIONING SOUTH AFRICA PTY.LTD.**	P.O.BOX 1147 MILNERTON 7435, SOUTH AFRICA
U.S.A.	◎ **ALL WORLD MACHINERY**	1301 W.DIGGINS HARVARD IL 60033, USA

Marked with ◎ : Oil-Hydraulics representative (As of October. 31, 2003)
Others : Air conditioner representative
Note) Contact DAIKIN Contact Center for domestic services as shown on back cover.

DAIKIN

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E-mail Address: **hyd_eco@daikin.co.jp**
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