

Revision : A

- MU-A12WA- has been added.

1 TECHNICAL CHANGES

MU09TW → MU-A09WA MU12TN → MU-A12WA

- 1.Outdoor unit model has been changed.
- 2.Refrigerant has been changed. (R22 → R410A)
- 3.Compressor has been changed.

MUA12WA → MU-A12WA-

- 1.WIRING DIAGRAM has been changed.

INFORMATION FOR THE AIR CONDITIONER WITH R410A REFRIGERANT

- This room air conditioner adopts HFC refrigerant (R410A) which never destroys the ozone layer.
 - Pay particular attention to the following points, though the basic installation procedure is same as that for R22 air conditioners.
- ① As R410A has working pressure approximate 1.6 times as high as that of R22, some special tools and piping parts/materials are required. Refer to the table below.
 - ② Take sufficient care not to allow water and other contaminations to enter the R410A refrigerant during storage and installation, since it is more susceptible to contaminations than R22.
 - ③ For refrigerant piping, use clean, pressure-proof parts/materials specifically designed for R410A. (Refer to 2. Refrigerant piping.)
 - ④ Composition change may occur in R410A since it is a mixed refrigerant. When charging, charge liquid refrigerant to prevent composition change.

		New refrigerant	Previous refrigerant
Refrigerant	Refrigerant	R410A	R22
	Composition (Ratio)	HFC-32: HFC-125 (50%:50%)	R22 (100%)
	Refrigerant handling	Pseudo-azeotropic refrigerant	Single refrigerant
	Chlorine	Not included	Included
	Safety group (ASHRAE)	A1/A1	A1
	Molecular weight	72.6	86.5
	Boiling point (°F)	-60.5	-41.4
	Steam pressure [77°F](PSIG)	225.82	136.34
	Saturated steam density [77°F](lb/ft ³)	3.995	2.772
	Combustibility	Non combustible	Non combustible
	ODP *1	0	0.055
	GWP *2	1730	1700
	Refrigerant charge method	From liquid phase in cylinder	Gas phase
	Additional charge on leakage	Possible	Possible
Refrigeration oil	Kind	Incompatible oil	Compatible oil
	Color	Non	Light yellow
	Smell	Non	Non

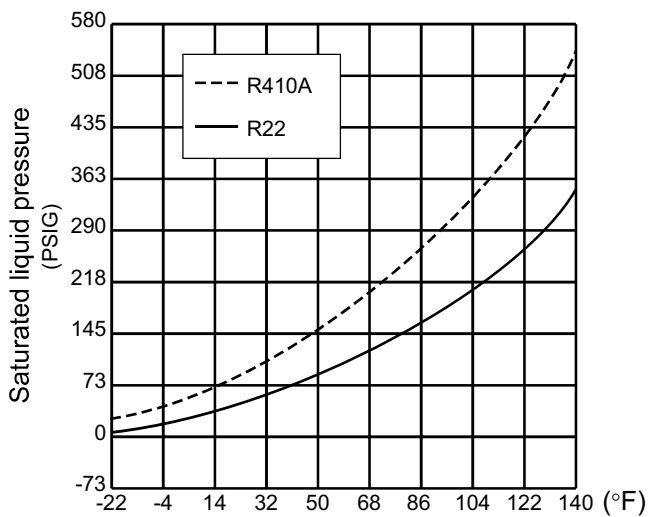
*1 :Ozone Destruction Parameter : based on CFC-11

*2 :Global Warmth Parameter : based on CO₂



	New Specification	Current Specification
Compressor	<p>The incompatible refrigeration oil easily separates from refrigerant and is in the upper layer inside the suction muffler. Raising position of the oil back hole enables to back the refrigeration oil of the upper layer to flow back to the compressor.</p>	<p>Since refrigerant and refrigeration oil are compatible each, refrigeration oil goes back to the compressor through the lower position oil back hole.</p>

Conversion chart of refrigerant temperature and pressure



1.Tools dedicated for the air conditioner with R410A refrigerant

The following tools are required for R410A refrigerant. Some R22 tools can be substituted for R410A tools.

R410A tools	Can R22 tools be used?	Description
Gauge manifold	No	R410A has high pressures beyond the measurement range of existing gauges.
Charge hose	No	Hose material have been changed to improve the pressure resistance.
Gas leak detector	No	Dedicated for HFC refrigerant.
Torque wrench	Yes	1/4in. and 3/8in.
	No	1/2in. and 5/8in.
Flare tool	Yes	Clamp bar hole has been enlarged to reinforce the spring strength in the tool.
Flare gauge	New	Provided for flaring work (to be used with R22 flare tool).
Vacuum pump adapter	New	Provided to prevent the back flow of oil. This adapter enables you to use vacuum pumps.
Electronic scale for refrigerant charging	New	It is difficult to measure R410A with a charging cylinder because the refrigerant bubbles due to high pressure and high-speed vaporization

No : Not Substitutable for R410A Yes : Substitutable for R410A

2.Refrigerant piping

① Specifications

Use the copper or copper-alloy seamless pipes for refrigerant that meet the following specifications.

Outside diameter(in)	Wall thickness (in)	Insulation material
1/4	0.0315	Heat resisting foam plastic Specific gravity 0.045 Thickness 0.315 in
3/8	0.0315	
1/2	0.0315	
5/8	0.0394	

② Flaring work and flare nut

Flaring work for R410A pipe differs from that for R22 pipe.

For details of flaring work, refer to Installation manual "FLARING WORK".

Pipe diameter	Dimension of flare nut	
	mm(in.)	
inch	R410A	R22
1/4	17 (11/16)	17 (11/16)
3/8	22 (7/8)	22 (7/8)
1/2	26 (1-1/32)	24 (15/16)
5/8	29 (1-5/32)	27 (1-1/16)

3.Refrigerant oil

Apply the special refrigeration oil (accessories: packed with indoor unit) to the flare and the union seat surfaces.

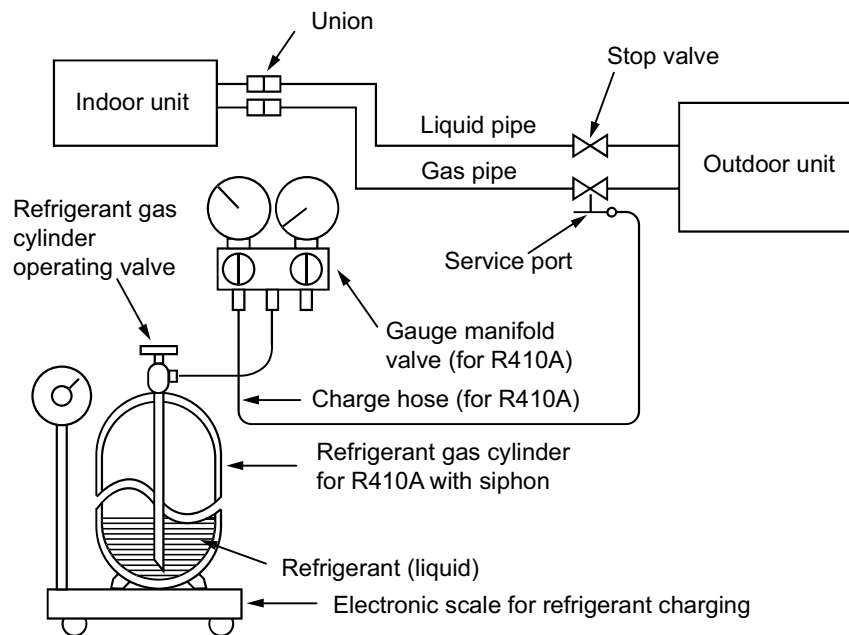
4.Air purge

- Do not discharge the refrigerant into the atmosphere.
Take care not to discharge refrigerant into the atmosphere during installation, reinstallation, or repairs to the refrigerant circuit.
- Use the vacuum pump for air purging for the purpose of environmental protection.

5.Additional charge

For additional charging, charge the refrigerant from liquid phase of the gas cylinder.

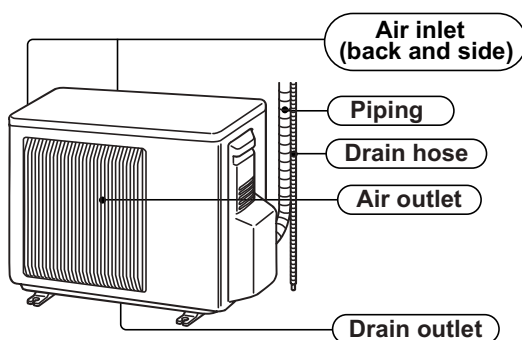
If the refrigerant is charged from the gas phase, composition change may occur in the refrigerant inside the cylinder and the outdoor unit. In this case, ability of the refrigeration cycle decreases or normal operation can be impossible. However, charging the liquid refrigerant all at once may cause the compressor to be locked. Thus, charge the refrigerant slowly.



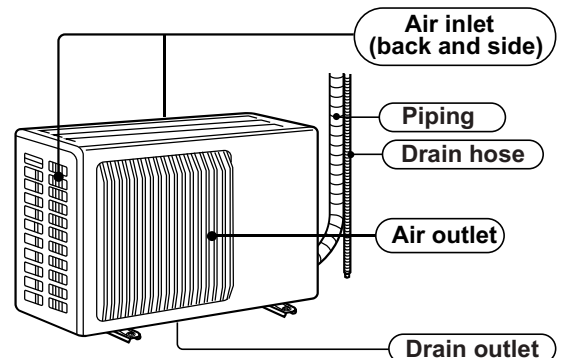
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PART NAMES AND FUNCTIONS

MU-A09WA



MU-A12WA



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SPECIFICATION

Item		Model	MS-A09WA	MS-A12WA
Capacity Rated(Minimum-Maximum)	Cooling *1	Btu/h	9,500	12,000
	Power consumption Rated(Minimum-Maximum)	W	870	1,070
EER *1 [SEER] *2	Cooling		10.9 [13.0]	11.2 [13.0]
OUTDOOR UNIT MODEL			MU-A09WA	MU-A12WA
External finish			Munsell 3Y 7.8/1.1	
Power supply		V, phase, Hz	115, 1, 60	
Max. fuse size (time delay)		A	15	20
Min. circuit ampacity		A	14	16
Fan motor		F.L.A	0.63	0.926
Compressor	Model		RN092WHDHT	
	Winding resistance (at 68°F) Ω		C-R 0.81	C-S 1.49
	R.L.A		9.30	10.82
	L.R.A		47	56
Refrigerant control			Capillary tube	
Sound level		dB(A)	47	52
Dimensions	W	in.	31-1/2	33-7/16
	D	in.	11-1/4	11-7/16
	H	in.	21-5/8	23-13/16
Weight		lb.	78	96
REMOTE CONTROLLER			Wireless type	
REFRIGERANT PIPING			Not supplied	
Refrigerant pipe size (Min. wall thickness)	Liquid	in.	1/4 (0.0315)	
	Gas	in.	3/8 (0.0315)	1/2 (0.0315)
Connection method	Indoor		Flared	
	Outdoor		Flared	
Between the indoor & outdoor units	Height difference	ft.	35	
	Piping length	ft.	65	
Refrigerant charge (R410A)			2lb.5oz.	3lb. 1oz.
Refrigerating oil (Model)		cc	350 (NE022)	

NOTE : Test conditions are based on ARI 210/240.

*1 : Rating conditions (cooling) — Indoor : 80°FDB, 67°FWB, Outdoor : 95°FDB, (75°FWB)



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(Unit : [°F])

	Mode	Test	Indoor air condition		Outdoor air condition	
			Dry bulb	Wet bulb	Dry bulb	Wet bulb
ARI	SEER (Cooling)	"A" Cooling Steady State at rated compressor Speed	80	67	95	(75)
		"B-2" Cooling Steady State at rated compressor Speed	80	67	82	(65)
		"B-1" Cooling Steady State at minimum compressor Speed	80	67	82	(65)
		Low ambient Cooling Steady State at minimum compressor Speed	80	67	67	(53.5)
		Intermediate Cooling Steady State At Intermediate compressor Speed	80	67	87	(69)

Operating Range

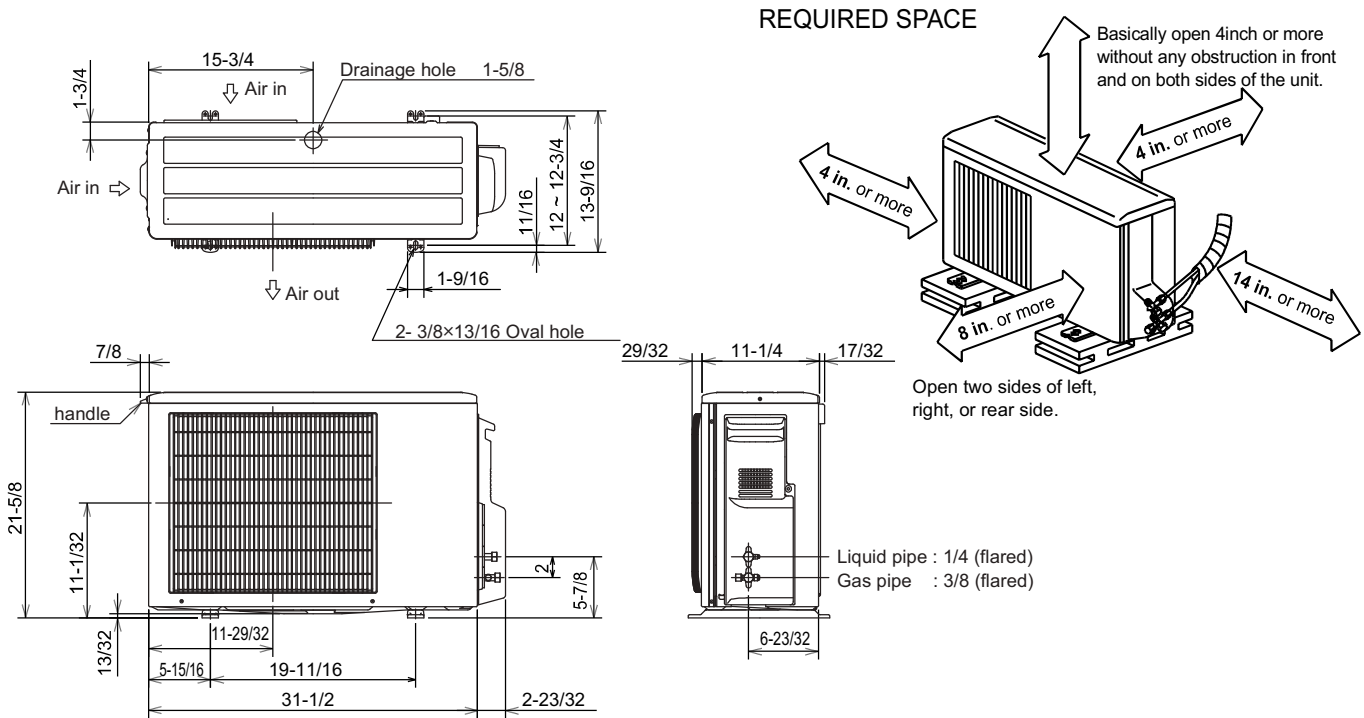
		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	67°FDB

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OUTLINES AND DIMENSIONS

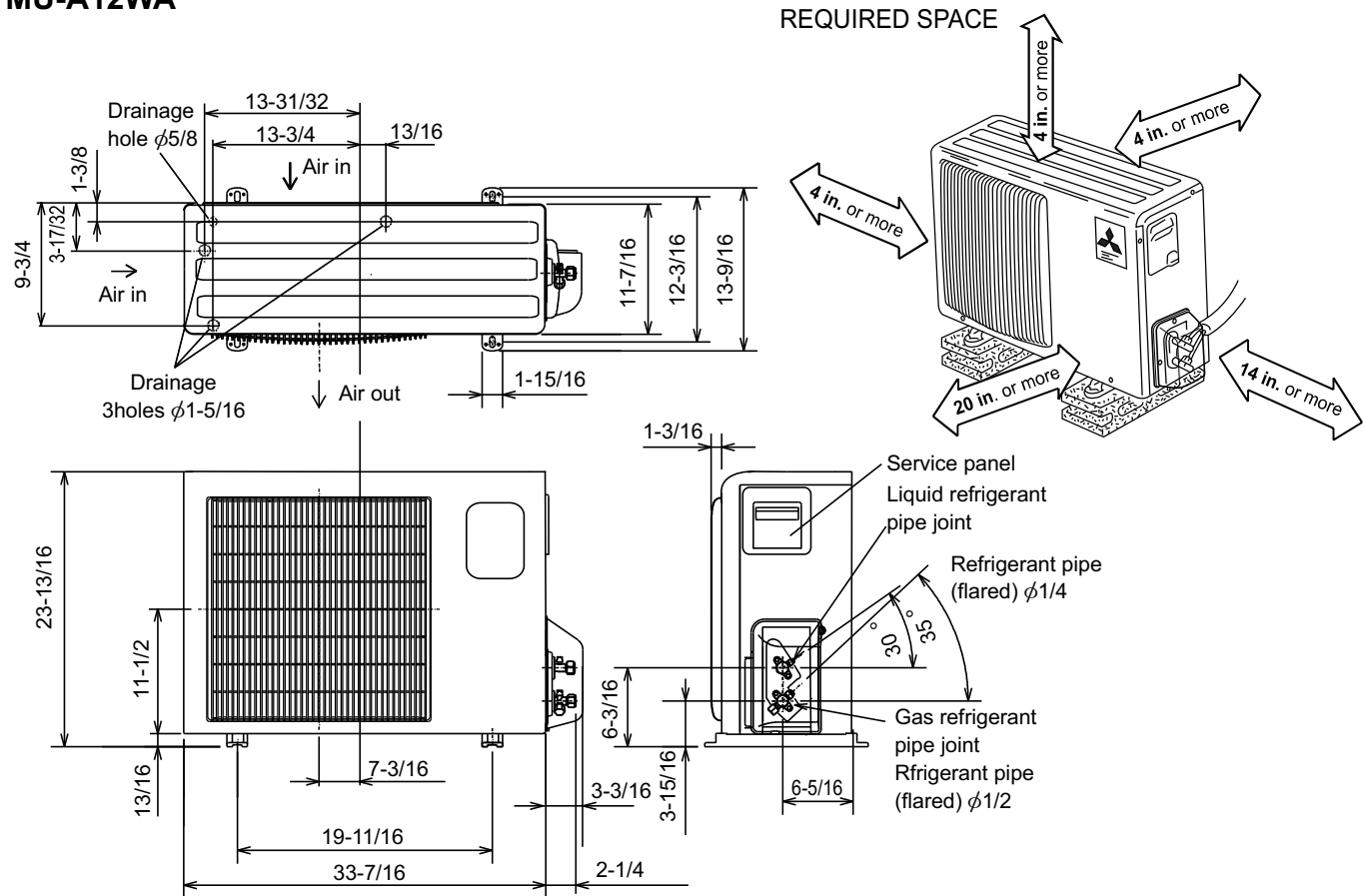
MU-A09WA

Unit : inch



MU-A12WA

REQUIRED SPACE



7 DATA

MS-A09WA MS-A12WA

7-1. PERFORMANCE DATA

1) COOLING CAPACITY

Model	Indoor air IWB (°F)	Outdoor intake air DB temperature (°F)														
		75			85			95			105			115		
		TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
MS-A09WA	71	11.6	6.4	0.77	10.9	5.9	0.85	10.2	5.6	0.91	9.5	5.2	0.96	8.7	4.8	1.00
	67	11.0	7.5	0.73	10.3	7.0	0.80	9.5	6.5	0.87	8.8	6.0	0.92	8.1	5.5	0.97
	63	10.4	8.4	0.70	9.6	7.8	0.77	8.9	7.3	0.83	8.1	6.6	0.89	7.4	6.0	0.92
MS-A12WA	71	14.7	8.3	0.95	13.7	7.8	1.04	12.9	7.3	1.12	12.0	6.8	1.18	11.0	6.3	1.23
	67	13.9	9.7	0.90	13.0	9.1	0.99	12.0	8.4	1.07	11.2	7.8	1.13	10.3	7.2	1.19
	63	13.1	10.9	0.86	12.1	10.1	0.95	11.3	9.4	1.02	10.3	8.6	1.09	9.4	7.8	1.13

Notes 1. IWB : Intake air wet-bulb temperature.
 TC : Total Capacity ($\times 10^3$ Btu/h), SHC : Sensible Heat Capacity ($\times 10^3$ Btu/h)
 TPC : Total Power Consumption (kW)
 2. SHC is based on 80°F of indoor intake air DB temperature.

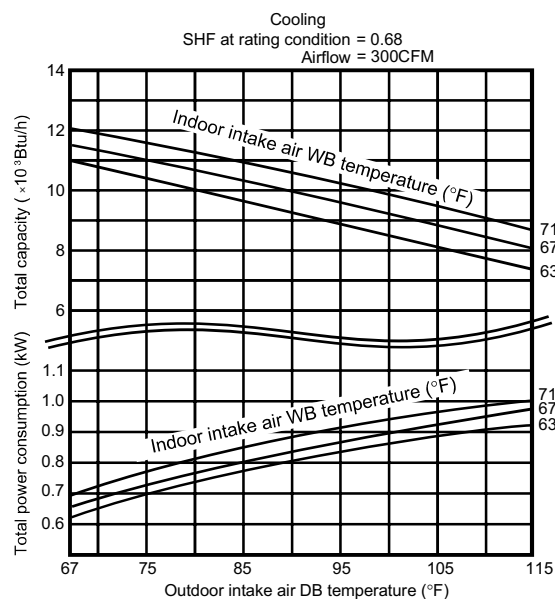
2) COOLING CAPACITY CORRECTIONS

Model	Refrigerant piping length (one way)		
	25ft (std)	40ft	65ft
MS-A09WA	1.0	0.954	0.878
MS-A12WA			

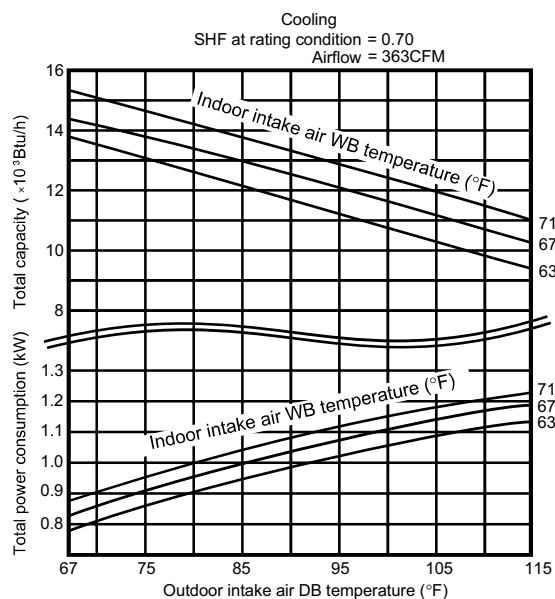
7-2. PERFORMANCE CURVE

NOTE : A point on the curve shows the reference point.

MS-A09WA



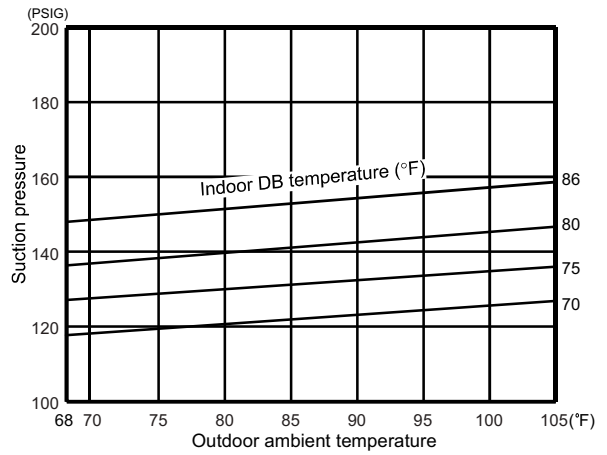
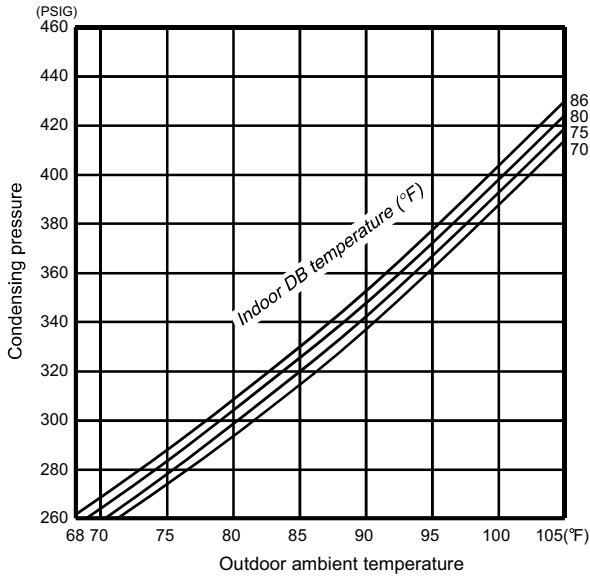
MS-A12WA



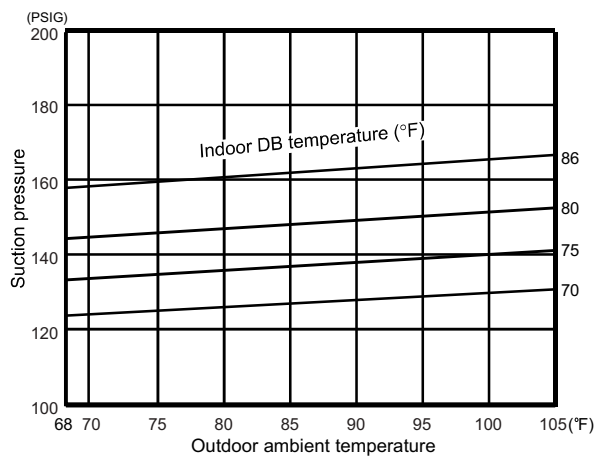
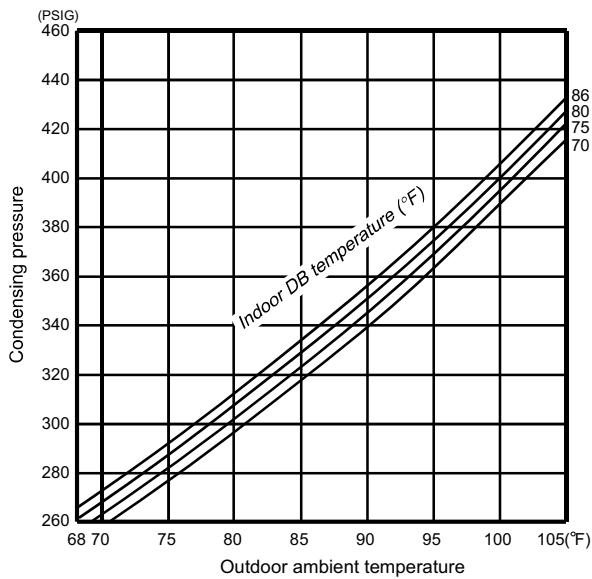
7-3. Condensing pressure

Data is based on the condition of indoor humidity 50%.
 Air flow should be set at High.
 A point on the curve shows the reference point.

MU-A09WA



MU-A12WA



7-4. STANDARD OPERATION DATA

Model			MS-A09WA	MS-A12WA	
Item		Unit	Cooling	Cooling	
Total	Capacity	Btu / h	9500	12000	
	SHF	—	0.68	0.70	
	Input	kW	0.87	1.07	
Electrical circuit	INDOOR UNIT MODEL		MS-A09WA	MS-A12WA	
	Power supply (V, phase, Hz)		115, 1, 60	115, 1, 60	
	Input	kW	0.019	0.035	
	Fan motor current	A	0.27	0.51	
	OUTDOOR UNIT MODEL		MU-A09WA	MU-A12WA	
	Power supply (V, phase, Hz)		115, 1, 60	115, 1, 60	
	Input	kW	0.851	1.035	
	Comp. current	A	6.74	7.96	
	Fan motor current	A	0.63	0.93	
Refrigerant circuit	Condensing pressure	PSIG	372	375	
	Suction pressure	PSIG	144	150	
	Discharge temperature	°F	154	149	
	Condensing temperature	°F	110	111	
	Suction temperature	°F	48	50	
	Comp. shell bottom temp	°F	146	139	
	Ref. pipe length	ft.	25	25	
	Refrigerant charge (R22)	—	2lb. 5oz.	3lb. 1oz.	
Indoor unit	Intake air temperature	DB	°F	80	80
		WB	°F	67	67
	Discharge air temperature	DB	°F	57	59
		WB	°F	56	58
	Fan speed (High)	rpm	1160	1220	
	Airflow (High)	CFM	300 (Wet)	363 (Wet)	
Outdoor unit	Intake air temperature	DB	°F	95	95
		WB	°F	—	—
	Fan speed	rpm	830	830	
	Airflow	CFM	1083	1327	

7-5. OPERATING RANGE

(1) POWER SUPPLY

	Rating	Guaranteed Voltage
Outdoor unit	115V 60Hz 1 ϕ	Min. 103V 115V Max. 127V

(2) OPERATION

Function	Intake air temperature Condition	Indoor		Outdoor	
		DB (°F)	WB (°F)	DB (°F)	WB (°F)
Cooling	Standard temperature	80	67	95	—
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	67	—
	Maximum humidity	78%		—	