

SERVICE MANUAL R410A

Outdoor unit
[Model Name]

[Service Ref.]

PUY-SP42VKA

PUY-SP42VKA.TH(-T/-D/-N)

PUY-SP48VKA

PUY-SP48VKA.TH(-T/-D/-N)

PUY-SP36YKA

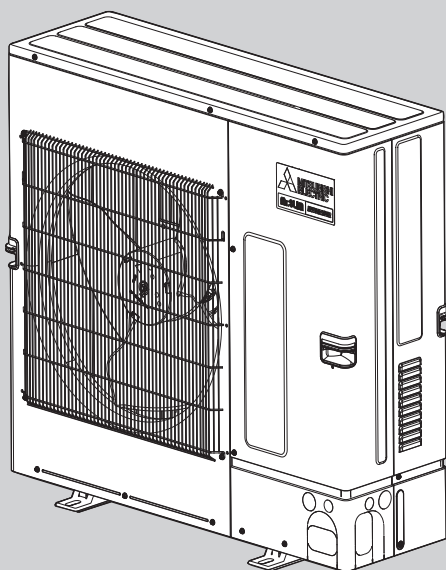
PUY-SP36YKA.TH(-T/-D/-N)

PUY-SP42YKA

PUY-SP42YKA.TH(-T/-D/-N)

PUY-SP48YKA

PUY-SP48YKA.TH(-T/-D/-N)



REFERENCE MANUAL

INDOOR UNIT SERVICE MANUAL

Model name	Service Ref.
PLY-SP36/42/48BA	PLY-SP36/42/48BA.TH(-T/-D/-N)
PCY-SP36/42/48KA	PCY-SP36/42/48KA.TH
PCY-SP36/42/48KAL	PCY-SP36/42/48KAL.TH-T
PEY-SP36/42/48JA PEY-SP36/42/48JAL	PEY-SP36/42/48JA.TH(-T/-D/-N) PEY-SP36/42/48JAL.TH-T

SAFETY PRECAUTION

ALWAYS OBSERVE FOR SAFETY

Before obtaining access to terminal, all supply circuits must be disconnected.

CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Preparation before the repair service.

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply breaker.
- Discharge the condenser before the work involving the electric parts.

Precautions during the repair service.

- Do not perform the work involving the electric parts with wet hands.
- Do not pour water into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold areas in the refrigerating cycle.
- When the repair or the inspection of the circuit needs to be done without turning off the power, exercise great caution not to touch the live parts.

Service tools

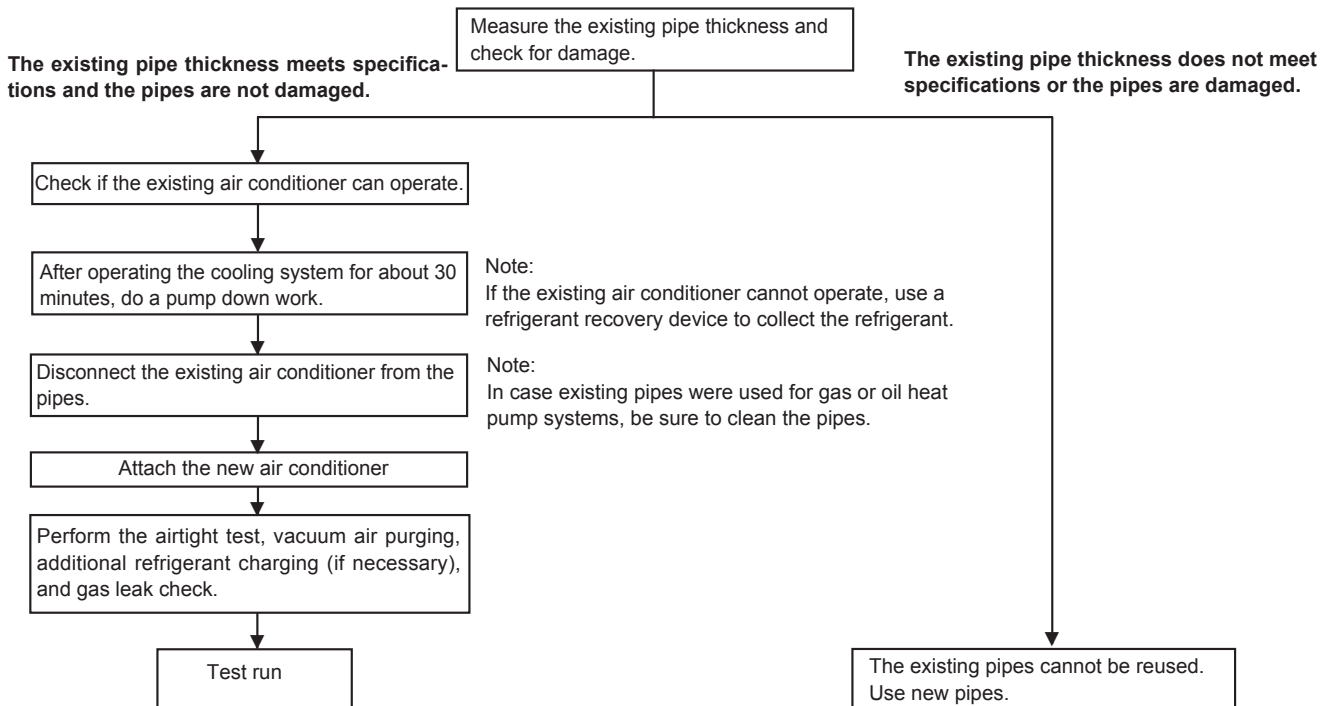
Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	<ul style="list-style-type: none"> • Only for R410A • Use the existing fitting specifications. (UNF1/2) • Use high-tension side pressure of 5.3MPa-G or over.
②	Charge hose	<ul style="list-style-type: none"> • Only for R410A • Use pressure performance of 5.09MPa-G or over.
③	Electronic scale	—
④	Gas leak detector	• Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	• Attach on vacuum pump.
⑥	Refrigerant charge base	—
⑦	Refrigerant cylinder	<ul style="list-style-type: none"> • Only for R410A · Top of cylinder (Pink) • Cylinder with syphon
⑧	Refrigerant recovery equipment	—

PRECAUTIONS WHEN REUSING EXISTING R22 REFRIGERANT PIPES

(1) Flowchart

- Refer to the flowchart below to determine if the existing pipes can be used and if it is necessary to use a filter dryer.
- If the diameter of the existing pipes is different from the specified diameter, refer to technological data materials to confirm if the pipes can be used.



Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

① Thickness of pipes

Because the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 0.7 mm or below.)

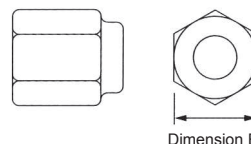
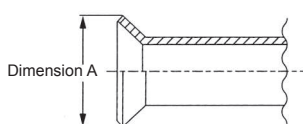
Diagram below: Piping diameter and thickness

Nominal dimensions(inch)	Outside diameter (mm)	Thickness (mm)	
		R410A	R22
1/4	6.35	0.8	0.8
3/8	9.52	0.8	0.8
1/2	12.70	0.8	0.8
5/8	15.88	1.0	1.0
3/4	19.05	—	1.0

② Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because its working pressure is higher than that of other refrigerants. Therefore, to enhance airtightness and strength, flare cutting dimension of copper pipe for R410A has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also has partly been changed to increase strength as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2 and 5/8 inch pipes, the dimension B changes.

Use torque wrench corresponding to each dimension.



Flare cutting dimensions

Nominal dimensions(inch)	Outside diameter (mm)	Dimension A ($+0.4$ / -0.4)(mm)	
		R410A	R22
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	—	23.3

Flare nut dimensions

Nominal dimensions(inch)	Outside diameter (mm)	Dimension B (mm)	
		R410A	R22
1/4	6.35	17.0	17.0
3/8	9.52	22.0	22.0
1/2	12.70	26.0	24.0
5/8	15.88	29.0 *	27.0
3/4	19.05	—	36.0

* 36.0mm for indoor unit

③ Tools for R410A (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R410A	×	×
Charge hose	Refrigerant recovery	Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil and alkylbenzene oil (minimum amount)	×	Ester oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adapter for reverse flow check	△ (Usable if equipped with adapter for reverse flow)	△ (Usable if equipped with adapter for reverse flow)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△ (Usable by adjusting flaring dimension)	△ (Usable by adjusting flaring dimension)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Refrigerant charge	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Refrigerant charge	Tool exclusive for R410A	×	—

× : Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)

△ : Tools for other refrigerants can be used under certain conditions.

○ : Tools for other refrigerants can be used.

SPECIFICATIONS

Service Ref	PUY-SP42VKA.TH(-T/-D/-N)	PUY-SP48VKA.TH(-T/-D/-N)	PUY-SP36YKA.TH(-T/-D/-N)	PUY-SP42YKA.TH(-T/-D/-N)	PUY-SP48YKA.TH(-T/-D/-N)			
Mode	Cooling							
OUTDOOR UNIT	power supply (phase,cycle,voltage)	Asia	Single phase, 50/60Hz, 220 - 240 V		3-phase, 50/60Hz, 380 - 415 V			
		Thailand	Single phase, 50 Hz, 220 V		3-phase, 50 Hz, 380 V			
	Max. current	A	29		12			
	External finish	Munsell 3Y 7.8/1.1						
	Refrigerant control	Linear Expansion Valve						
	Compressor	Hermetic						
	Motor output	kW	2.5					
	Starter type	Inverter						
	Protection devices	Discharge thermo Comp.shell thermo Over current protection Over heat protection H.P. switch						
	Fan	Fan(drive) x No.	Propeller fan x 1					
		Fan motor output	kW					
		Air volume	m³/min	75	87	75	87	
	Noise level		dB(A)	53	56	52	53	56
	Dimensions	W	mm	1,050				
		D	mm	330+25				
H		mm	981					
Weight		kg	72		73			
Refrigerant	R410A							
Charge		kg	2.8					
Oil (Model)		L	1.10					
REFRIGERANT PIPING	Pipe size O.D	Liquid	mm	9.52(3/8)				
		Gas	mm	15.88(5/8)				
	Connection method	Indoor side	Flared					
		Outdoor side	Flared					
	Between the indoor & Outdoor unit	Height difference	Maximum 30 m					
Piping length		Maximum 50 m						

DATA

REFILLING REFRIGERANT CHARGE (R410A : kg)

Service Ref.	Piping length (one way)					Initial charged
	10m	20m	30m	40m	50m	
PUY-SP36YKA.TH(-T/-D/-N)	2.8	3.1	3.4	3.7	4.0	2.8
PUY-SP42VKA.TH(-T/-D/-N)						
PUY-SP42YKA.TH(-T/-D/-N)						
PUY-SP48VKA.TH(-T/-D/-N)						
PUY-SP48YKA.TH(-T/-D/-N)						

Additional charge is required for pipes longer than 10 m.

COMPRESSOR TECHNICAL DATA

(at 20°C)

Service Ref.		PUY-SP42/48VKA.TH(-T/-D/-N) PUY-SP36/42/48YKA.TH(-T/-D/-N)
Winding Resistance (Ω)	U-V	0.88
	U-W	0.88
	W-V	0.88

STANDARD OPERATION DATA

PUY-SP42VKA.TH(-T/-D/-N)

PUY-SP48VKA.TH(-T/-D/-N)

PUY-SP36YKA.TH(-T/-D/-N)

PUY-SP42YKA.TH(-T/-D/-N)

PUY-SP48YKA.TH(-T/-D/-N)

Representative matching			PLY-SP36BA	PLY-SP42BA			PLY-SP48BA		
Mode			COOLING						
Total	Capacity	W	10.6	12.3			14.1		
	input	kW	3.34	4.37			6.07		
Electrical circuit	Indoor		PLY-SP36BA	PLY-SP42BA			PLY-SP48BA		
	Phase,Hz		1,50/60	1,50/60			1,50/60		
	Voltage		V	220-230-240/220					
	Current		A	1.07					
	Outdoor		PLY-SP36YKA	PLY-SP42VKA	PLY-SP42YKA	PLY-SP48VKA	PLY-SP48YKA		
	Phase,Hz		3,50/60	1,50/60	3,50/60	1,50/60	3,50/60		
	Voltage		V	380-400-415/380	220-230-240/220	380-400-415/380	220-230-240/220	380-400-415/380	
	Current		A	5.9-5.7-5.5/5.9	19.3-18.5-17.8/19.3	6.9-6.5-6.3/6.9	27.0-26.0-25.0/27.0	9.7-9.2-8.8/9.7	
Refrigerant circuit	Discharge Pressure		MPa	3.01	3.2			3.35	
	Suction pressure		MPa	0.91	0.84			0.72	
	Discharge temperature		°C	76.5	80.9			89.1	
	Condensing temperature		°C	50.4	53			54.8	
	Suction temperature		°C	9.6	6.5			2.6	
	Ref. pipe length		m	7.5	7.5			7.5	
Indoor side	Intake air temperature	DB	°C	27	27			27	
		WB	°C	19	19			19	
	Discharge air temperature	DB	°C	13.5	11.7			11.3	
Outdoor side	Intake air temperature	DB	°C	35	35			35	
		WB	°C	24	24			24	

**The unit of pressure has been changed to MPa based on international SI system.
The conversion factor is : 1(MPa)=10.2(kgf/cm²)**

OUTLINES AND DIMENSIONS

PUY-SP42VKA.TH(-T/-D/-N)
 PUY-SP36YKA.TH(-T/-D/-N)

PUY-SP48VKA.TH(-T/-D/-N)
 PUY-SP42YKA.TH(-T/-D/-N)

PUY-SP48YKA.TH(-T/-D/-N)

Unit: mm

1 FREE SPACE (Around the unit)

The diagram below shows a basic example. Explanation of particular details are given in the installation manuals etc.

2 SERVICE SPACE

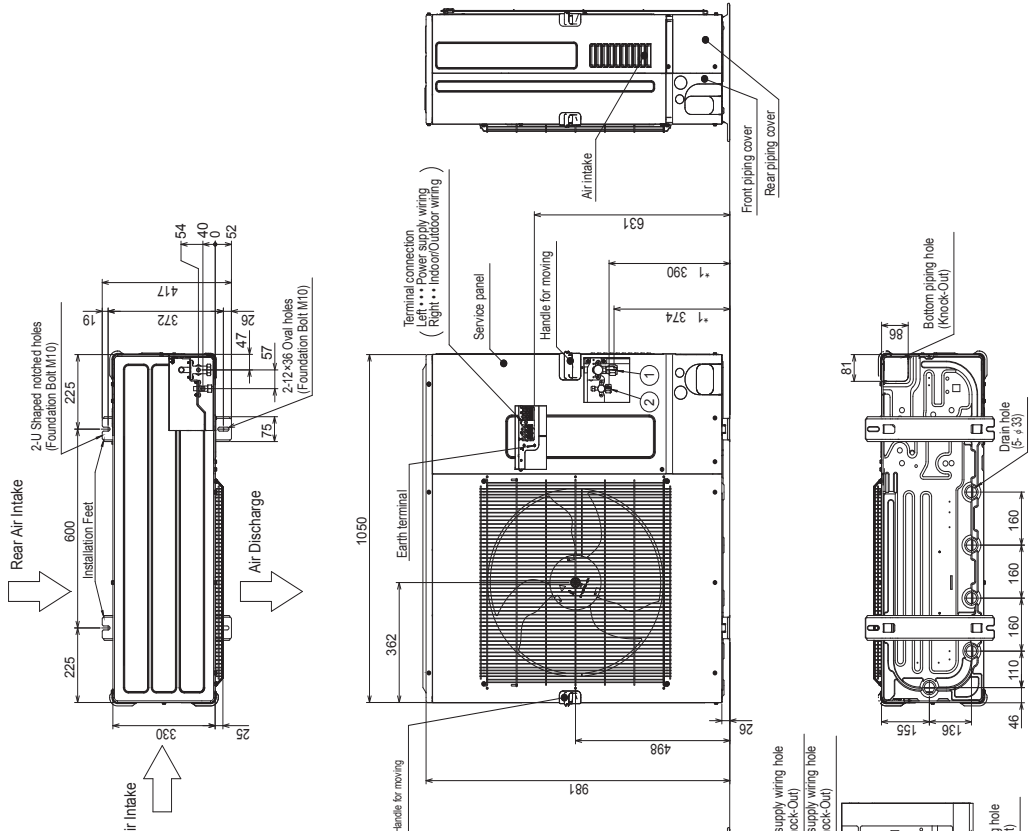
Dimensions of space needed for service access are shown in the below diagram.

3 FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10) bolts. (Bolts and washers must be purchased locally)

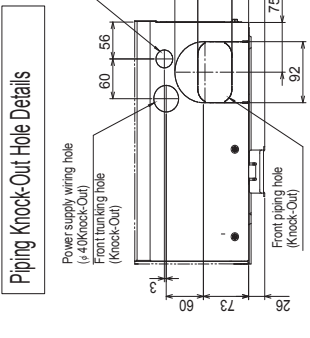
4 PIPING-WIRING DIRECTIONS

Piping and wiring connections can be made in 4 directions: Front, Right, Rear and Below.



Example Of Notes

① ... Refrigerant GAS pipe connection (FLARE) φ 16.89(5/8F)
 ② ... Refrigerant LIQUID pipe connection (FLARE) φ 9.52(3/8F)
 * ... indication of STOP VALVE connection location.

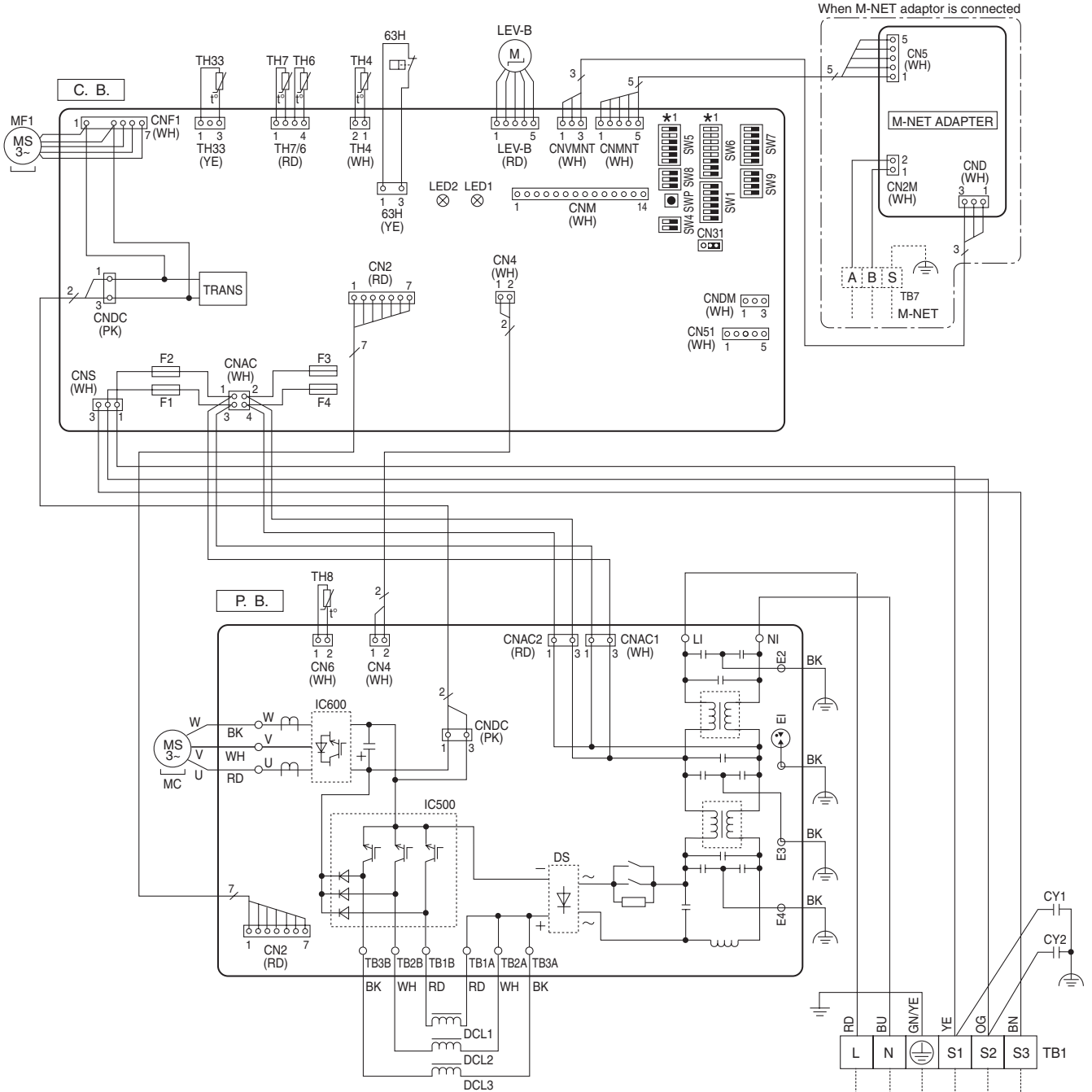


WIRING DIAGRAM

PUY-SP42VKA.TH(-T/-D/-N)

PUY-SP48VKA.TH(-T/-D/-N)

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block <Power Supply, Indoor/Outdoor>	DCL1, DCL2, DCL3	Reactor	SW7	Switch <Function Switch>
MC	Motor for Compressor	CY1, CY2	Capacitor	SW8	Switch <Function Switch>
MF1	Fan motor	P.B.	Power Circuit Board	SW9	Switch <Function Switch>
63H	High Pressure Switch	C.B.	Controller Circuit Board	SWP	Switch <Pump Down>
TH4	Thermistor <Discharge>	F1, F2, F3, F4	Fuse <T6.3AL250V>	CN31	Connector <Emergency Operation>
TH6	Thermistor <2-Phase Pipe>	SW1	Switch <Detect History Record Reset, Refrigerant Address>	CN51	Connector <Connection for Option>
TH7	Thermistor <Ambient>	SW4	Switch <Function Switch>	CNDM	Connector <Connection for Option>
TH8	Thermistor <Heat Sink>	SW5	Switch <Function Switch, Model Select>	CNM	Connector <Connection for Option>
TH33	Thermistor <Comp. Surface>	SW6	Switch <Model Select>		
LEV-B	Linear Expansion Valve				



*1. MODEL SELECT
The black square (■) indicates a switch position.

MODEL	SW6-4, 5, 6, 7, 8	SW5-5
42V	ON OFF	ON OFF
48V	ON OFF	ON OFF

M-NET ADAPTER

SYMBOL	NAME
TB7	Terminal Block <M-NET connection>
CN5	Connector <Transmission>
CND	Connector <Power Supply>
CN2M	Connector <M-NET communication>

POWER SUPPLY
~N 220-240V 50Hz
220V 60Hz

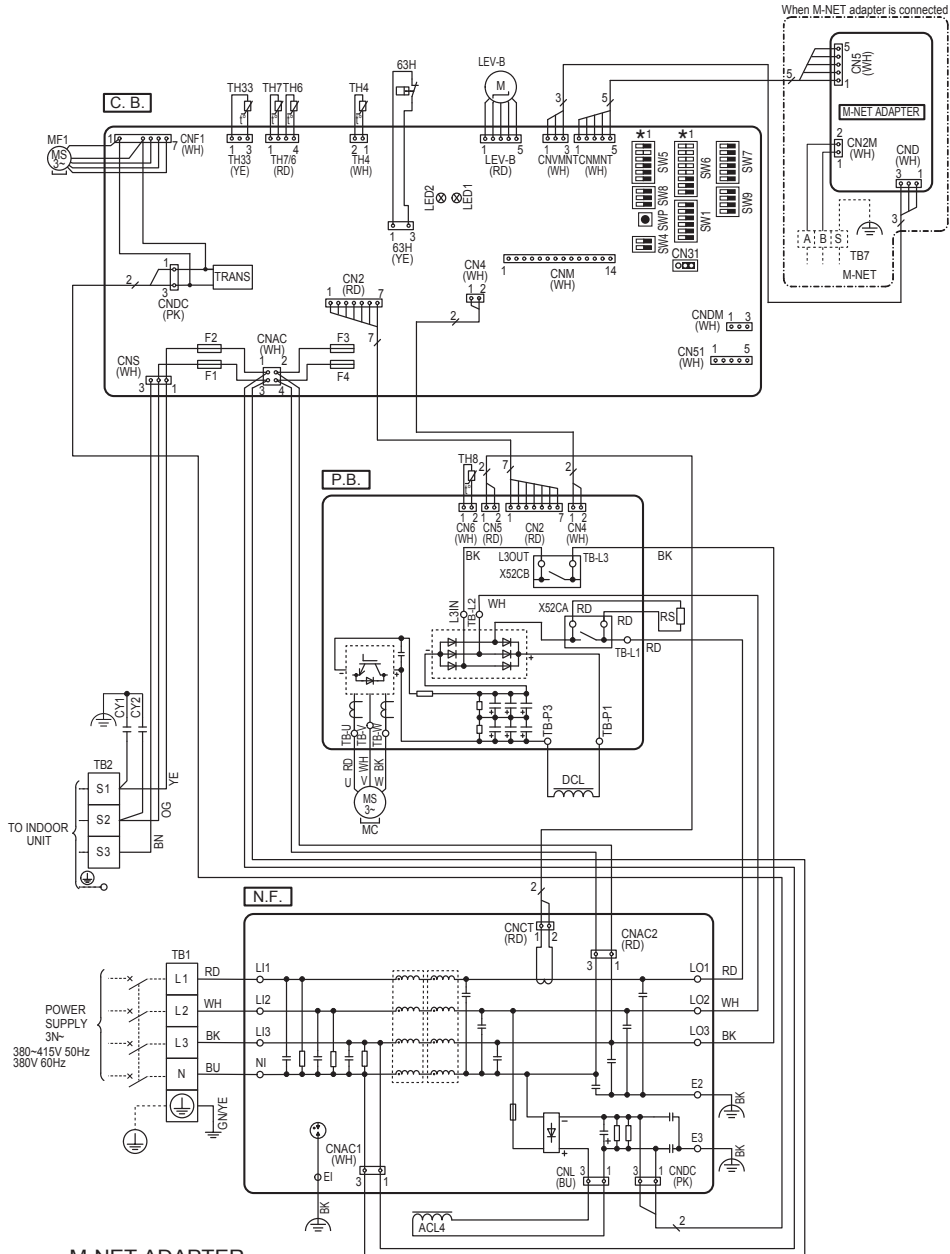
TO INDOOR UNIT

PUY-SP36YKA.TH(-T/-D/-N)

PUY-SP42YKA.TH(-T/-D/-N)

PUY-SP48YKA.TH(-T/-D/-N)

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block <Power Supply>	ACL4	Reactor	SW5	Switch <Function Switch, Model Select>
TB2	Terminal Block <Indoor/Outdoor>	DCL	Reactor	SW6	Switch <Model Select>
MC	Motor for Compressor	RS	Rush Current Protect Resistor	SW7	Switch <Function Switch>
MF1	Fan motor	CY1,CY2	Capacitor	SW8	Switch <Function Switch>
63H	High Pressure Switch	P.B.	Power Circuit Board	SW9	Switch <Function Switch>
TH4	Thermistor <Discharge>	N.F.	Noise Filter Circuit Board	SWP	Switch <Pump Down>
TH6	Thermistor <2-Phase Pipe>	C.B.	Controller Circuit Board	CN31	Connector <Emergency Operation>
TH7	Thermistor <Ambient>	F1,F2,F3,F4	Fuse <T6.3AL250V>	CN51	Connector <Connection for Option>
TH8	Thermistor <Heat sink>	SW1	Switch <Detect History Record Reset, Refrigerant Address>	CNDM	Connector <Connection for Option>
TH33	Thermistor <Comp. Surface>	SW4	Switch <Test Operation>	CNM	Connector <Connection for Option>
LEV-B	Linear Expansion Valve				



M-NET ADAPTER

SYMBOL	NAME
TB7	Terminal Block <M-NET connection>
CN5	Connector <Transmission>
CND	Connector <Power Supply>
CN2M	Connector <M-NET communication>

*1. MODEL SELECT

The black square (■) indicates a switch position.

MODEL	SW6-4, 5, 6, 7, 8	SW5-5																												
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WIRING SPECIFICATIONS

FIELD ELECTRICAL WIRING (power wiring specifications)

Outdoor unit model		SP42, 48V	SP36, 42, 48Y
Outdoor unit power supply		Asia	Single phase, 50/60Hz, 220-240 V
		Thailand	Single phase, 50 Hz, 220 V
Outdoor unit input capacity Main switch (Breaker)		*1	40 A
Wiring Wire No. x size (mm ²)	Outdoor unit power supply		3 x Min. 6
	Indoor unit-Outdoor unit	*2	3 x 1.5 (Polar)
	Indoor unit-Outdoor unit earth	*2	1 x Min. 1.5
	Remote controller-Indoor unit	*3	2 x 0.3 (Non-polar)
Circuit rating	Outdoor unit L-N (single)		220 V AC - 240 V AC
	Outdoor unit L1-N, L2-N, L3-N (3 phase)	*4	220 V AC - 240 V AC
	Indoor unit-Outdoor unit S1-S2	*4	220 V AC - 240 V AC
	Indoor unit-Outdoor unit S2-S3	*4	24 V DC
	Remote controller-Indoor unit	*4	12 V DC

*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV).

Make sure that the current leakage breaker is one compatible with higher harmonics.

Always use a current leakage breaker that is compatible with higher harmonics as this unit is equipped with an inverter.

The use of an inadequate breaker can cause the incorrect operation of inverter.

*2. Max. 45 m

If 2.5 mm² used, Max. 50 m

If 2.5 mm² used and S3 separated, Max. 80 m

• Use one cable for S1 and S2 and another for S3 as shown in the picture.

• Max. 50 m Total Max. for PEY. Wiring size 3 x 1.5 (Polar).

*3. The 10 m wire is attached in the remote controller accessory.

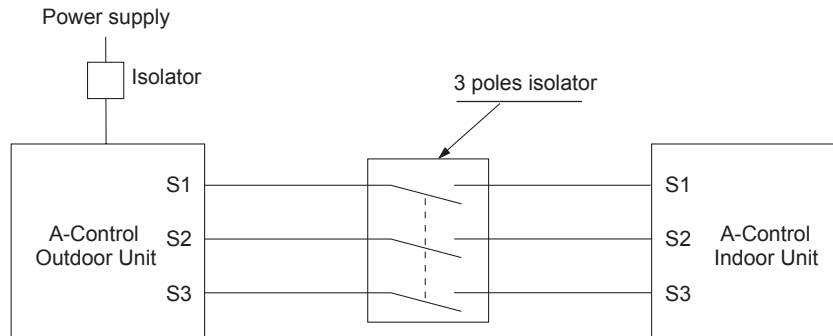
*4. The figures are NOT always against the ground.

S3 terminal has DC 24 V against S2 terminal. However between S3 and S1, these terminals are NOT electrically insulated by the transformer or other device.



⚠ Caution: Be sure to install N-Line. Without N-Line, it could cause damage to the unit.

- Notes:**
1. Wiring size must comply with the applicable local and national code.
 2. Power supply cables and Indoor/Outdoor unit connecting cables shall not be lighter than polychloroprene sheathed flexible cable. (Design 60245 IEC 57)
 3. Install an earth line longer than power cables.

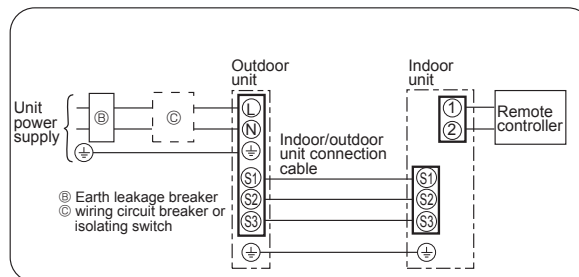


⚠ Warning:

In case of a-control wiring, there is high voltage potential on the S3 terminal caused by electrical circuit design that has no electrical insulation between power line and communication signal line. Therefore, please turn off the main power supply when servicing. And do not touch the S1, S2, S3 terminals when the power is energized. If isolator should be used between indoor unit and outdoor unit, please use 3-pole type.

Never splice the power cable or the indoor-outdoor connection cable, otherwise it may result in a smoke, a fire or communication failure.

1:1 system Electrical wiring



REFRIGERANT SYSTEM DIAGRAM

PUY-SP42VKA.TH(-T/-D/-N) PUY-SP48VKA.TH(-T/-D/-N)
PUY-SP36YKA.TH(-T/-D/-N) PUY-SP42YKA.TH(-T/-D/-N) PUY-SP48YKA.TH(-T/-D/-N)

Unit : mm (inch)

