DAIKIN

Air Conditioners

# Technical Data

VRV

## Air-cooled selection procedure


EEDEN14-202

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**General replacement procedure**

1. Replace or keep indoor units
2. Replace BS-boxes by BSVQ-P boxes in case of a Heat Recovery system.
3. Replace outdoor unit by Replacement VRV of equivalent or bigger capacity.
4. Keep refrigerant piping
5. The system will automatically clean the refrigerant piping and charge the correct amount of R-410A



## 1 - 1 Indoor unit selection

In some cases it is possible to initially keep the R-22 indoor units and replace them at a later stage.

Keep indoor units

R-22 indoor units of K series or later can be kept. R-22 indoor units from before K series and R-407C indoor units need to be replaced.

It is not possible to combine R-410A and R-22 indoor units in one system.

Install new indoor units

Select the indoor unit with a capacity at given indoor and outdoor temperature that is nearest to and higher than the given load.

All current Daikin R-410A indoor units can be used.

It is not possible to combine R-410A and R-22 indoor units in one system.

## 1 - 2 BS-boxes

In case of a Heat Recovery system BS-boxes need to be replaced by BSVQ-P boxes

## 1 - 3 Outdoor unit selection

In general, outdoor units should be selected in such a way that the sum of indoor unit capacity indexes is near to 100% connection ratio of the outdoor unit and not over 130% connection ratio.

Keep same capacity

If the indoor units are kept or are replaced by indoor units of the same capacity, replace the R-22 or R470C outdoor unit by a Replacement VRV outdoor unit of equivalent capacity.

| Replacement VRV - Heat recovery | Fixed combinations | Capacity range | Cooling capacity | Heating capacity | N° of outdoors | N° of compressors | N° of connectable indor units | Indoor unit combination ratio | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HP | kW | kW | | | | 130% | 120% | 110% | 100% | 90% | 80% | 70% | 60% | 50% |
| RQCEQ280P | RQEQ140P + RQEQ140P | 10 | 28.0 | 32.0 | 2 | 2 | 21 | 364 | 336 | 308 | 280 | 252 | 224 | 196 | 168 | 140 |
| RQCEQ360P | RQEQ180P + RQEQ180P | 13 | 36.0 | 40.0 | 2 | 2 | 28 | 468 | 432 | 396 | 360 | 324 | 288 | 252 | 216 | 180 |
| RQCEQ460P | RQEQ140P + RQEQ140P + RQEQ180P | 16 | 45.0 | 52.0 | 3 | 3 | 34 | 598 | 552 | 506 | 460 | 414 | 368 | 322 | 276 | 230 |
| RQCEQ500P | RQEQ140P + RQEQ180P + RQEQ180P | 18 | 50.0 | 56.0 | 3 | 3 | 39 | 650 | 600 | 550 | 500 | 450 | 400 | 350 | 300 | 250 |
| RQCEQ540P | RQEQ180P + RQEQ180P + RQEQ180P | 20 | 54.0 | 60.0 | 3 | 3 | 43 | 702 | 648 | 594 | 540 | 486 | 400 | 378 | 324 | 270 |
| RQCEQ636P | RQEQ212P + RQEQ212P + RQEQ212P | 22 | 63.6 | 67.2 | 3 | 3 | 47 | 827 | 763 | 699 | 636 | 572 | 508 | 445 | 381 | 318 |
| RQCEQ712P | RQEQ140P + RQEQ180P + RQEQ180P + RQEQ212P | 24 | 71.2 | 78.4 | 4 | 4 | 52 | 926 | 854 | 783 | 712 | 640 | 569 | 498 | 427 | 356 |
| RQCEQ744P | RQEQ140P + RQEQ180P + RQEQ212P + RQEQ212P | 26 | 74.4 | 80.8 | 4 | 4 | 56 | 967 | 892 | 818 | 744 | 669 | 595 | 520 | 446 | 372 |
| RQCEQ816P | RQEQ180P + RQEQ212P + RQEQ212P + RQEQ212P | 28 | 81.6 | 87.2 | 4 | 4 | 60 | 1,061 | 979 | 897 | 816 | 734 | 652 | 571 | 489 | 408 |
| RQCEQ848P | RQEQ212P + RQEQ212P + RQEQ212P + RQEQ212P | 30 | 84.8 | 89.6 | 4 | 4 | 64 | 1,102 | 1,017 | 932 | 848 | 763 | 678 | 593 | 508 | 424 |

# 1 Selection procedure Replacement VRV

| Replacement VRV - Heat pump | Fixed combinations | Capacity range | Cooling capacity | Heating capacity | N° of outdoors | N° of compressors | N° of connectable indoor units | Indoor unit combination ratio | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HP | kW | kW | | | | 130% | 120% | 110% | 100% | 90% | 80% | 70% | 60% | 50% |
| RQYQ140P | RQYQ140P | 5 | 14.0 | 16.0 | 1 | 1 | 10 | 162.5 | 150 | 137.5 | 125 | 112.5 | 100 | 87.5 | 75 | 62.5 |
| RXYQQ8T | RXYQQ8T | 8 | 22.4 | 25 | 1 | 1 | 64[1] | 260 | 240 | 220 | 200 | 180 | 160 | 140 | 120 | 100 |
| RXYQQ10T | RXYQQ10T | 10 | 28 | 31.5 | 1 | 1 | 64[1] | 325 | 300 | 275 | 250 | 225 | 200 | 175 | 150 | 125 |
| RXYQQ12T | RXYQQ12T | 12 | 33.5 | 37.5 | 1 | 1 | 64[1] | 390 | 360 | 330 | 300 | 270 | 240 | 210 | 180 | 150 |
| RXYQQ14T | RXYQQ14T | 14 | 40 | 45 | 1 | 2 | 64[1] | 455 | 420 | 385 | 350 | 315 | 280 | 245 | 210 | 175 |
| RXYQQ16T | RXYQQ16T | 16 | 45 | 50 | 1 | 2 | 64[1] | 520 | 480 | 440 | 400 | 360 | 320 | 280 | 240 | 200 |
| RXYQQ18T | RXYQQ18T | 18 | 50 | 56 | 1 | 2 | 64[1] | 585 | 540 | 495 | 450 | 405 | 360 | 315 | 270 | 225 |
| RXYQQ20T | RXYQQ20T | 20 | 56 | 63 | 1 | 2 | 64[1] | 650 | 600 | 550 | 500 | 450 | 400 | 350 | 300 | 250 |
| RXYQQ22T | RXYQQ10T + RXYQQ12T | 22 | 61.5 | 69 | 2 | 2 | 64[1] | 715 | 660 | 605 | 550 | 495 | 440 | 385 | 330 | 275 |
| RXYQQ24T | RXYQQ8T+RXYQQ16T | 24 | 67.4 | 75 | 2 | 3 | 64[1] | 780 | 720 | 660 | 600 | 540 | 480 | 420 | 360 | 300 |
| RXYQQ26T | RXYQQ12T+RXYQQ14T | 26 | 73.5 | 82.5 | 2 | 3 | 64[1] | 845 | 780 | 715 | 650 | 585 | 520 | 455 | 390 | 325 |
| RXYQQ28T | RXYQQ12T+RXYQQ16T | 28 | 78.5 | 87.5 | 2 | 3 | 64[1] | 910 | 840 | 770 | 700 | 630 | 560 | 490 | 420 | 350 |
| RXYQQ30T | RXYQQ12T+RXYQQ18T | 30 | 83.5 | 93.5 | 2 | 3 | 64[1] | 975 | 900 | 825 | 750 | 675 | 600 | 525 | 450 | 375 |
| RXYQQ32T | RXYQQ16T+RXYQQ16T | 32 | 90 | 100 | 2 | 4 | 64[1] | 1,040 | 960 | 880 | 800 | 720 | 640 | 560 | 480 | 400 |
| RXYQQ34T | RXYQQ16T+RXYQQ18T | 34 | 95 | 106 | 2 | 4 | 64[1] | 1,105 | 1,020 | 935 | 850 | 765 | 680 | 595 | 510 | 425 |
| RXYQQ36T | RXYQQ16T+RXYQQ20T | 36 | 101 | 113 | 2 | 4 | 64[1] | 1,170 | 1,080 | 990 | 900 | 810 | 720 | 630 | 540 | 450 |
| RXYQQ38T | RXYQQ8T+RXYQQ10T+RXYQQ20T | 38 | 106 | 120 | 3 | 4 | 64[1] | 1,235 | 1,140 | 1,045 | 950 | 855 | 760 | 665 | 570 | 475 |
| RXYQQ40T | RXYQQ10T+RXYQQ12T+RXYQQ18T | 40 | 112 | 125 | 3 | 4 | 64[1] | 1,300 | 1,200 | 1,100 | 1,000 | 900 | 800 | 700 | 600 | 500 |
| RXYQQ42T | RXYQQ10T+RXYQQ16T+RXYQQ16T | 42 | 118 | 132 | 3 | 5 | 64[1] | 1,365 | 1,260 | 1,155 | 1,050 | 945 | 840 | 735 | 630 | 525 |

1 Actual number of connectable indoor units depends on the indoor unit type (VRV indoor, Hydrobox, RA indoor, etc.) and the connection ratio restriction for the system (50% <= CR <= 130%)

## Heat recovery feasability chart

| Type of piping | Capacity | Piping size | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Gas | | | | | | | | Discharge gas | | | | | | | | Liquid | | | | | |
| | | Cap index | Ø12.7 | Ø15.9 | Ø19.1 | Ø22.2 | Ø25.4 | Ø28.6 | Ø34.9 | Ø41.3 | Ø9.5 | Ø12.7 | Ø15.9 | Ø19.1 | Ø22.2 | Ø25.4 | Ø28.6 | Ø34.9 | Ø6.4 | Ø9.5 | Ø12.7 | Ø15.9 | Ø19.1 | Ø22.2 |
| Between outdoors | RQEQ140P | | | S | | | | | | | | S | | | | | | | | S | | | | |
| | RQEQ180P | | | | S | | | | | | | | S | | | | | | | S | | | | |
| | RQEQ212P | | | | S | | | | | | | | S | | | | | | | S | | | | |
| Main piping | 10 HP | | | | | S | | | | | | | | S | | | | | | S | | | | |
| | 13 HP | | | | | | S | | | | | | | S | | | | | | | S | | | |
| | 16 HP | | | | | | | S | | | | | | | S | | | | | | S | | | |
| | 18 HP | | | | | | | S | | | | | | | S | | | | | | | S | | |
| | 20 HP | | | | | | | S | | | | | | | S | | | | | | | S | | |
| | 22 HP | | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 24 HP | | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 26 HP | | | | | | | | S | | | | | | | S | | | | | | | S | |
| | 28 HP | | | | | | | | S | | | | | | | | S | | | | | | S | |
| | 30 HP | | | | | | | | S | | | | | | | | S | | | | | | S | |
| From REFNET to REFNET or from REFNET to BS (1) | < 5,6kW | <50 | S | | | | | | | | S | | | | | | | | S | | | | | |
| | 5.6-11.2kW | 50≤X<100 | | S | | | | | | | | S | | | | | | | | S | | | | |
| | 11.2-16kW | 100≤X<145 | | S | | | | | | | | S | | | | | | | | S | | | | |
| | 16-18kW | 145≤X<160 | | | S | | | | | | | | S | | | | | | | S | | | | |
| | 18-22.4kW | 160≤X<200 | | | S | | | | | | | | S | | | | | | | S | | | | |
| | 22.4-33kW | 200≤X<295 | | | | S | | | | | | | | S | | | | | | S | | | | |
| | 33-37kW | 295≤X<330 | | | | | S | | | | | | | S | | | | | | | S | | | |
| | 37-47kW | 330≤X<420 | | | | | | S | | | | | | S | | | | | | | S | | | |
| | 47-53kW | 420≤X<480 | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 53-71kW | 480≤X<640 | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 71-78.4kW | 640≤X<700 | | | | | | | S | | | | | | | S | | | | | | | S | |
| | 78.4-101kW | 700≤X<900 | | | | | | | S | | | | | | | S | | | | | | | S | |
| | >101KW | >900 | | | | | | | S | | | | | | | | S | | | | | | S | |
| from BS to indoor (2) | 20-50 class | | S | | | | | | | | | | | | | | | | S | | | | | |
| | 63 class | | | S | | | | | | | | | | | | | | | | S | | | | |
| | 80 class | | | S | | | | | | | | | | | | | | | | S | | | | |
| | 100-125 class | | | S | | | | | | | | | | | | | | | | S | | | | |
| | 200 class | | | | S | | | | | | | | | | | | | | | S | | | | |
| | 250 class | | | | | S | | | | | | | | | | | | | | S | | | | |

(1) Piping between refnets depends on total capacity of indoor units connected below this refnet. It can not exceed piping size of upstream side.

(2) Piping from BS to indoor depends on the capacity of the connected indoor unit. It can not exceed piping size of upstream side.

S :Standard size of RQYQ-P series

:Possible

# 1 Selection procedure Replacement VRV

## Heat pump feasability chart

| Type of piping | Capacity | Piping Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Liquid | | | | | | Gas | | | | | | | | |
| | | Ø 6.4 | Ø 9.5 | Ø 12.7 | Ø 15.9 | Ø 19.1 | Ø 22.2 | Ø 12.7 | Ø 15.9 | Ø 19.1 | Ø 22.2 | Ø 25.4 | Ø 28.6 | Ø 34.9 | Ø 41.3 | Ø 54.1 |
| Main piping (Part A) (Part B) (Part C) | 5HP (140) | | S | | | | | | S ○ | | | | | | | |
| | 8HP | | S ○ | ● | | | | | | S ○ | | ● | ● | | | |
| | 10HP | | S ○ | ● | | | | | | | S ○ | | ● | | | |
| | 12HP | | | S ○ | ● | | | | | | | | S ○ | | | |
| | 14HP | | | S ○ | ● | | | | | | | | S ○ | ● | | |
| | 16HP | | | S ○ | ● | | | | | | | | S ○ | ● | | |
| | 18HP | | | | S ○ | ● | | | | | | | S ○ | ● | | |
| | 20HP | | | | S ○ | ● | | | | | | | S ○ | ● | | |
| | 22HP | | | | S ○ | ● | | | | | | | S ○ | ● | | |
| | 24HP | | | | S ○ | ● | | | | | | | | S ○ | ● | |
| | 26HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 28HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 30HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 32HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 34HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 36HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 40HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 42HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| From REFNET to REFNET (*1) (Part D) | < 100 | | S ○ ● | | | | | | S ○ ● | | | | | | | |
| | 100≤X<150 | | S ○ ● | | | | | | S ○ | ● | | | | | | |
| | 150≤X<160 | | S ○ ● | | | | | | | S ○ | | ● | | | | |
| | 160≤X<200 | | S ○ | ● | | | | | | S ○ | | ● | | | | |
| | 200≤X<290 | | S ○ | ● | | | | | | | S ○ | ● | | | | |
| | 290≤X<330 | | | S ○ ● | | | | | | | | ● | S ○ | | | |
| | 330≤X<420 | | | S ○ | ● | | | | | | | | S ○ | ● | | |
| | 420≤X<480 | | | S | ○ ● | | | | | | | | S ○ | ● | | |
| | 480≤X<640 | | | S | ○ | ● | | | | | | | S ○ | ● | | |
| | 640≤X<900 | | | | S | ○ ● | | | | | | | | S ○ | ● | |
| | 900≤X<920 | | | | S | ○ | ● | | | | | | | S ○ | | ● |
| | 920≤ | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| From REFNET to indoor unit (*2) (Part E) | 20-40 class | S ○ ● | | | | | | S ● | | | | | | | | |
| | 50 class | S ○ | ● | | | | | S ○ | ● | | | | | | | |
| | 63 class | | S ○ ● | | | | | ○ | S ● | | | | | | | |
| | 80 class | | S ○ ● | | | | | | S ○ ● | | | | | | | |
| | 100-125 class | | S ○ ● | | | | | | S ○ | ● | | | | | | |
| | 140 class | | S ○ | | | | | | S ○ | | | | | | | |
| | 200 class | | S ○ | ● | | | | | | S ○ | | ● | | | | |
| | 250 class | | S ○ | ● | | | | | | | S ○ | | ● | | | |

Part A : Piping between Outdoor unit and Refrigerant branch connection
Part B : Piping between Outdoor unit connection piping kits
Part C : Piping between Outdoor unit connection piping kit and Outdoor unit
Part D : Piping between Refrigerant branch kit
Part E : Piping between Refrigerant branch connection and Indoor unit
● : Piping size of conventional R-22 model
○ : Piping size of conventional R-410A model
S : Standard size of RQYQ-P series
: Possible
: can not be used for piping length of 90m equivalent or more
*1 Piping between REFNETs depends on total capacity index of indoor units connected below each REFNET and cannot exeed piping size of upstream side.
*2 Piping from REFNET to indoor unit depends on the capacity of the connected indoor unit.It cannot exeed piping size of upstream side.

Connection ratio

Ensure connection ratio is below 130%. If the connection ratio is too high the system will not be able to run.

To calculate connection ratio:

*For Replacement VRV Heat Recovery RQCEQ280-848P and RQYQ140P*

Indoor unit kW index:

| Class | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 200 | 250 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| kW index | 22 | 28 | 36 | 45 | 56 | 71 | 90 | 112 | 140 | 224 | 280 |

# 1 Selection procedure Replacement VRV

Outdoor unit kW index:

| Class | 140 | 180 | 212 |
|---|---|---|---|
| kW index | 140 | 180 | 212 |

*For Replacement VRV Heat Pump (RXYQQ8-42T)*

Indoor unit:



| Class | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 200 | 250 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| kW index | 20 | 25 | 31.25 | 45 | 50 | 62.5 | 80 | 100 | 125 | 200 | 250 |

Outdoor unit:

| Class | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|
| kW index | 200 | 250 | 300 | 350 | 400 |

## 1 - 4 Refrigerant piping

Refrigerant piping can be kept if still in good condition regardless of system history.

However if the original R-22 VRV system has suffered several compressor burnouts, there may be too much acidity in the circuit. In such case the piping should be replaced or cleaned using a 3th party cleaning device.

If Daikin guidelines were followed at the time of installation piping diameters should be suitable for Replacement VRV. If there is any doubt please check feasability chart in the previous section.

## 1 - 5 Actual performance data

The individual indoor unit capacity can be calculated as follows:

Individual indoor unit capacity = (outdoor unit capacity at given indoor and outdoor temperature and connection ratio x individual indoor unit capacity index) / total capacity index

Then, correct the indoor unit capacity according to the piping length and integrated heating capacity coefficient (if the selection is made in heating). If the corrected capacity is smaller than the load, the size of the indoor unit needs to be increased and the selection procedure needs to be repeated.

## 1 - 6 Selection example based on cooling load

Given

- Cooling: indoor 20°CWB; outdoor 33°CDB
- Indoor & outdoor unit to be replaced
- Cooling load:

| Room | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| Load [kW] | 2.9 | 2.7 | 2.5 | 4.3 | 4.0 | 4.0 | 3.9 | 4.2 |

Indoor unit selection

Select indoor type (duct, cassette, floor standing,…). In this example we choose roundflow cassette (FXFQ). Select indoor unit size using indoor capacity tables at given conditions.

| Room | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| Load [kW] | 2.9 | 2.7 | 2.5 | 4.3 | 4.0 | 4.0 | 3.9 | 4.2 |
| Unit size | 25 | 25 | 25 | 40 | 40 | 40 | 40 | 40 |
| Capacity | 3.0 | 3.0 | 3.0 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |

# 1 Selection procedure Replacement VRV



Outdoor unit selection

Indoor unit total capacity index: 3 x 28 (FXFQ25) + 5 x 45 (FXFQ40) = 309

Outdoor unit: 2 x REYQ140P = 280

Connection ratio: 309/280 = 110%.

BS-box

The old BS-boxes are replaced by new BSVQ-boxes.

Refrigerant piping

As we replace a 10 HP R-22 system with a 10 HP Replacement VRV system refrigerant piping diameters are ok.

Correction factors

Capacity should be corrected for piping length and defrost factor (only in heating). These correction factors can be found in the next chapter. For this example, we assume a correction factor of 1.

Actual performance data

Outdoor unit cooling capacity at 110%: 29.4 kW

Individual capacity FXFQ25: (28 x 29.4)/280 = 2.94 kW

Individual capacity FXFQ40: (45 x 29.4)/280 = 4.7 kW

| Room | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| Load [kW] | 3 | 2.7 | 2.5 | 4.3 | 4.0 | 4.0 | 3.9 | 4.2 |
| Unit size | 25 | 25 | 25 | 40 | 40 | 40 | 40 | 40 |
| Capacity | 2.94 | 2.94 | 2.94 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 |

In room A the delivered capacity is lower than the load, thus the indoor unit needs to be increased from 25 class to 32 class.

For the new connection ratio, the actual capacity needs to be calculated:

Indoor unit total capacity index: 2 x 28 (FXFQ25) + 1 x 36 (FXFQ32) + 5 x 45 (FXFQ40) = 317

Outdoor unit: 2 x REYQ140P = 280

Connection ratio: 317/280 = 113%.

Outdoor unit capacity at 113% can be calculated by interpolating between the capacity at 110% and 120% which are given in the capacity tables:

- RQEQ280P at 110% at design conditions: 29,4 kW
- RQEQ280P at 120% at design conditions: 29.9 kW

Interpolate:

| Connection ratio | 110% | 113% | 120% |
|---|---|---|---|
| Cooling capacity | 29.4 | ? | 29.9 |
| Index | 308 | 316 | 336 |

29.4 + (29.9 – 29.4) / (336 – 308) x (316 – 308) = 29.54 kW

Individual capacity FXFQ25: (28 x 29.54)/280 = 2.95 kW

Individual capacity FXFQ32: (36 x 29.54)/280 = 3.79 kW

Individual capacity FXFQ40: (45 x 29.54)/280 = 4.75 kW

| Room | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| Load [kW] | 3 | 2.7 | 2.5 | 4.3 | 4.0 | 4.0 | 3.9 | 4.2 |
| Unit size | 32 | 25 | 25 | 40 | 40 | 40 | 40 | 40 |
| Capacity | 3.79 | 2.95 | 2.95 | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 |

Now in all rooms the selected indoor unit delivers more than the required capacity, therefore the correct unit was selected.

# 1 Selection procedure Replacement VRV

## 1 - 7 Additional precautions when replacing a non-Daikin system

Check if the installed refrigerant piping can be re-used. Check wall thickness, diameter, refrigerant branch pipes, piping lengths, refrigerant oil and insulation according to following minimum requirements.



Minimum wall thickness

The existing piping should have a design pressure of 3,3 MPa. There should be no corrosion. Minimum wall thickness should follow below table:

| | O material | | 1/2H, H material | |
|---|---|---|---|---|
| Nominal diameter of pipe | Minimum wall thickness | Daikin indication for R-22 VRV | Minimum wall thickness | Daikin indication for R-22 VRV |
| ø 6.4 | 0.4 | 0.8 | - | - |
| ø 9.5 | 0.5 | 0.8 | (0.3) | - |
| ø 12.7 | 0.7 | 0.9 | (0.4) | - |
| ø 15.9 | 0.9 | 1.0 | (0.5) | - |
| ø 19.1 | 1.0 | 1.0 | (0.6) | - |
| ø 22.2 | 1.15 | 1.2 | 0.6 | 1.0 |
| ø 25.4 | (1.4) | - | 0.7 | 1.2 |
| ø 28.6 | (1.5) | - | 0.8 | 1.2 |
| ø 31.8 | (1.7) | - | 0.9 | 1.4 |
| ø 38.1 | (2.0) | - | 1.1 | 1.4 |
| ø 44.5 | (2.4) | - | 1.2 | 1.6 |

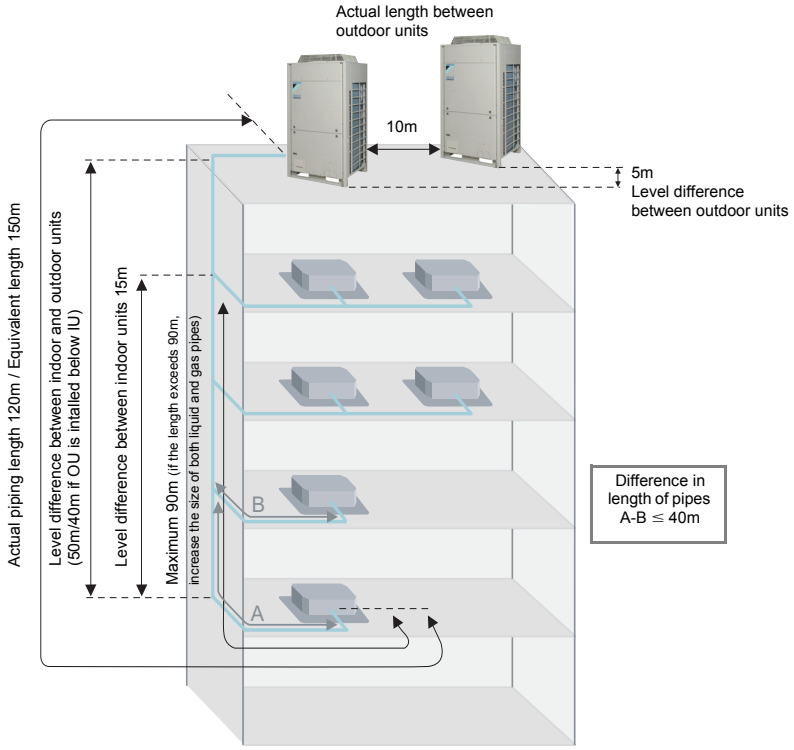
**Table:** minimum wall thickness of refrigerant piping

Refrigerant branch pipes

Refrigerant branch pipes can be re-used if they can withstand a pressure of 3.3 MPa. Y-refnets, T-refnets and headers can be re-used. Special items that implement decompression (for example: oil trap) are not allowed.

Maximum piping lengths

Check if maximum piping lengths are respected.




Total piping length: 300m

# 1 Selection procedure Replacement VRV

Piping diameters

Check if existing piping diameters are acceptable for the required capacity.

### Heat recovery feasability chart

| Type of piping | Capacity | Piping size | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Gas | | | | | | | | Discharge gas | | | | | | | | Liquid | | | | | |
| | | Cap index | Ø12.7 | Ø15.9 | Ø19.1 | Ø22.2 | Ø25.4 | Ø28.6 | Ø34.9 | Ø41.3 | Ø9.5 | Ø12.7 | Ø15.9 | Ø19.1 | Ø22.2 | Ø25.4 | Ø28.6 | Ø34.9 | Ø6.4 | Ø9.5 | Ø12.7 | Ø15.9 | Ø19.1 | Ø22.2 |
| Between outdoors | RQEQ140P | | | S | | | | | | | | S | | | | | | | | S | | | | |
| | RQEQ180P | | | | S | | | | | | | | S | | | | | | | S | | | | |
| | RQEQ212P | | | | S | | | | | | | | S | | | | | | | S | | | | |
| Main piping | 10 HP | | | | | S | | | | | | | | S | | | | | | S | | | | |
| | 13 HP | | | | | | S | | | | | | | S | | | | | | | S | | | |
| | 16 HP | | | | | | | S | | | | | | | S | | | | | | S | | | |
| | 18 HP | | | | | | | S | | | | | | | S | | | | | | | S | | |
| | 20 HP | | | | | | | S | | | | | | | S | | | | | | | S | | |
| | 22 HP | | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 24 HP | | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 26 HP | | | | | | | | S | | | | | | | S | | | | | | | S | |
| | 28 HP | | | | | | | | S | | | | | | | | S | | | | | | S | |
| | 30 HP | | | | | | | | S | | | | | | | | S | | | | | | S | |
| From REFNET to REFNET or from REFNET to BS (1) | < 5,6kW | <50 | S | | | | | | | | S | | | | | | | | S | | | | | |
| | 5.6-11.2kW | 50≤X<100 | | S | | | | | | | | S | | | | | | | | S | | | | |
| | 11.2-16kW | 100≤X<145 | | S | | | | | | | | S | | | | | | | | S | | | | |
| | 16-18kW | 145≤X<160 | | | S | | | | | | | | S | | | | | | | S | | | | |
| | 18-22.4kW | 160≤X<200 | | | S | | | | | | | | S | | | | | | | S | | | | |
| | 22.4-33kW | 200≤X<295 | | | | S | | | | | | | | S | | | | | | S | | | | |
| | 33-37kW | 295≤X<330 | | | | | S | | | | | | | S | | | | | | | S | | | |
| | 37-47kW | 330≤X<420 | | | | | | S | | | | | | S | | | | | | | S | | | |
| | 47-53kW | 420≤X<480 | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 53-71kW | 480≤X<640 | | | | | | S | | | | | | | | S | | | | | | S | | |
| | 71-78.4kW | 640≤X<700 | | | | | | | S | | | | | | | S | | | | | | | S | |
| | 78.4-101kW | 700≤X<900 | | | | | | | S | | | | | | | S | | | | | | | S | |
| | >101KW | >900 | | | | | | | S | | | | | | | | S | | | | | | S | |
| from BS to indoor (2) | 20-50 class | | S | | | | | | | | | | | | | | | | S | | | | | |
| | 63 class | | | S | | | | | | | | | | | | | | | | S | | | | |
| | 80 class | | | S | | | | | | | | | | | | | | | | S | | | | |
| | 100-125 class | | | S | | | | | | | | | | | | | | | | S | | | | |
| | 200 class | | | | S | | | | | | | | | | | | | | | S | | | | |
| | 250 class | | | | | S | | | | | | | | | | | | | | S | | | | |

(1) Piping between refnets depends on total capacity of indoor units connected below this refnet. It can not exceed piping size of upstream side.

(2) Piping from BS to indoor depends on the capacity of the connected indoor unit. It can not exceed piping size of upstream side.

S :Standard size of RQYQ-P series

: Possible

# 1 Selection procedure Replacement VRV

## Heat pump feasability chart

| Type of piping | Capacity | Piping Size | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Liquid | | | | | | Gas | | | | | | | | |
| | | Ø 6.4 | Ø 9.5 | Ø 12.7 | Ø 15.9 | Ø 19.1 | Ø 22.2 | Ø 12.7 | Ø 15.9 | Ø 19.1 | Ø 22.2 | Ø 25.4 | Ø 28.6 | Ø 34.9 | Ø 41.3 | Ø 54.1 |
| Main piping (Part A) (Part B) (Part C) | 5HP (140) | | S | | | | | | S ○ | | | | | | | |
| | 8HP | | S ○ | ● | | | | | | S ○ | | ● | ● | | | |
| | 10HP | | S ○ | ● | | | | | | | S ○ | | ● | | | |
| | 12HP | | | S ○ | ● | | | | | | | | S ○ | | | |
| | 14HP | | | S ○ | ● | | | | | | | | S ○ | ● | | |
| | 16HP | | | S ○ | ● | | | | | | | | S ○ | ● | | |
| | 18HP | | | | S ○ | ● | | | | | | | S ○ | ● | | |
| | 20HP | | | | S ○ | ● | | | | | | | S ○ | ● | | |
| | 22HP | | | | S ○ | ● | | | | | | | S ○ | ● | | |
| | 24HP | | | | S ○ | ● | | | | | | | | S ○ | ● | |
| | 26HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 28HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 30HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 32HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 34HP | | | | | S ○ | ● | | | | | | | S ○ | ● | |
| | 36HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 40HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 42HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 44HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 46HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| | 48HP | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| From REFNET to REFNET (*1) (Part D) | < 100 | | S ○ ● | | | | | | S ○ ● | | | | | | | |
| | 100≤X<150 | | S ○ ● | | | | | | S ○ | ● | | | | | | |
| | 150≤X<160 | | S ○ ● | | | | | | | S ○ | | ● | | | | |
| | 160≤X<200 | | S ○ | ● | | | | | | S ○ | | ● | | | | |
| | 200≤X<290 | | S ○ | ● | | | | | | | S ○ | ● | | | | |
| | 290≤X<330 | | | S ○ ● | | | | | | | | ● | S ○ | | | |
| | 330≤X<420 | | | S ○ | ● | | | | | | | | S ○ | ● | | |
| | 420≤X<480 | | | S | ○ ● | | | | | | | | S ○ | ● | | |
| | 480≤X<640 | | | S | ○ | ● | | | | | | | S ○ | ● | | |
| | 640≤X<900 | | | | S | ○ ● | | | | | | | | S ○ | ● | |
| | 900≤X<920 | | | | S | ○ | ● | | | | | | | S ○ | | ● |
| | 920≤ | | | | | S ○ | ● | | | | | | | | S ○ | ● |
| From REFNET to indoor unit (*2) (Part E) | 20-40 class | S ○ ● | | | | | | S ● | | | | | | | | |
| | 50 class | S ○ | ● | | | | | S ○ | ● | | | | | | | |
| | 63 class | | S ○ ● | | | | | ○ | S ● | | | | | | | |
| | 80 class | | S ○ ● | | | | | | S ○ ● | | | | | | | |
| | 100-125 class | | S ○ ● | | | | | | S ○ | ● | | | | | | |
| | 140 class | | S ○ | | | | | | S ○ | | | | | | | |
| | 200 class | | S ○ | ● | | | | | | S ○ | | ● | | | | |
| | 250 class | | S ○ | ● | | | | | | | S ○ | | ● | | | |

Part A: Piping between Outdoor unit and Refrigerant branch connection

Part B: Piping between Outdoor unit connection piping kits

Part C: Piping between Outdoor unit connection piping kit and Outdoor unit

Part D: Piping between Refrigerant branch kit

Part E: Piping between Refrigerant branch connection and Indoor unit

● : Piping size of conventional R-22 model

○ : Piping size of conventional R-410A model

S : Standard size of RQYQ-P series

: Possible

: can not be used for piping length of 90m equivalent or more

*1 Piping between REFNETs depends on total capacity index of indoor units connected below each REFNET and cannot exeed piping size of upstream side.

*2 Piping from REFNET to indoor unit depends on the capacity of the connected indoor unit.It cannot exeed piping size of upstream side.

Insulation of refrigerant piping:

Both gas and liquid piping should be insulated.

Refrigerant oil:

If one of the following oils was used the refrigerant piping can be re-used:

- Suniso
- MS
- HAB
- Barrel Freeze
- Ferreol
- Ethereal
- Ester

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