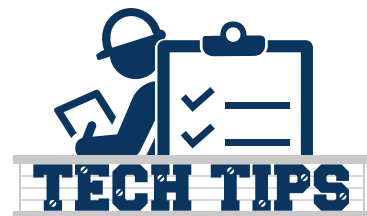


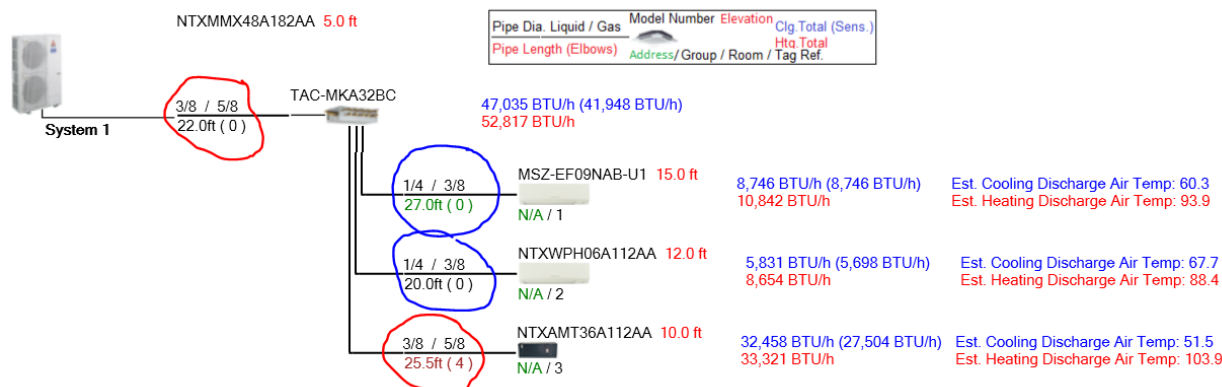
MITSUBISHI BRANCH BOX CHARGING

To charge a Mitsubishi branch box system, you will need to complete a few tasks beforehand. First, you pressure test to 600 PSI and let it sit overnight. Yes, 600 PSI. This practice helps ensure you won't have any leaks after you complete your installation. Then, conduct a triple evacuation to remove all moisture. Please note that filter driers are not installed with Mitsubishi equipment. Be sure the system is dry and leak-free to avoid component failures. Once you are confident the system is holding pressure and no moisture is present, you can start the charging process.



To start, you must know your lineset lengths – from the outdoor unit to the branch box and also from the branch box to each indoor unit. Most of the indoor products, including the branch box, will have either a 3/8" or a 1/4" liquid lineset size. Remember this, as you will need to add all similar lineset sizes together.

In the below example, there are three indoor products along with a branch box. The 6K and 9K BTU wall units utilize a 1/4" liquid lineset, while the branch box and the air handler use a 3/8" liquid line.



Now, add similar liquid line sizes. The red circle indicates the total 3/8" liquid lines have a value of 47.5 ft. The blue circle shows an entire 1/4" liquid line at 47 ft.

From there, find the charge multiplier noted in the installation book. In this case, the *TXMMX48A182AA uses .21 (oz/ft) for the 1/4" liquid line and .55 (oz/ft) for the 3/8" liquid line.

<Additional Charge>

Calculation of refrigerant charge

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Pipe size Liquid pipe ø6.35</td> <td style="text-align: center;">+</td> <td style="padding: 2px;">Pipe size Liquid pipe ø9.52</td> <td style="text-align: center;">+</td> </tr> <tr> <td style="padding: 2px;">(m) × 19.0 (g/m) (0.21 (oz/ft))</td> <td></td> <td style="padding: 2px;">(m) × 50.0 (g/m) (0.55 (oz/ft))</td> <td></td> </tr> </table>	Pipe size Liquid pipe ø6.35	+	Pipe size Liquid pipe ø9.52	+	(m) × 19.0 (g/m) (0.21 (oz/ft))		(m) × 50.0 (g/m) (0.55 (oz/ft))			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Total capacity of connected indoor units</td> <td style="padding: 2px;">Amount for the indoor units</td> </tr> <tr> <td style="padding: 2px;">– 27</td> <td style="padding: 2px;">1.5 kg (53 oz)</td> </tr> <tr> <td style="padding: 2px;">28 – 54</td> <td style="padding: 2px;">2.5 kg (88 oz)</td> </tr> <tr> <td style="padding: 2px;">55 – 62</td> <td style="padding: 2px;">3.0 kg (106 oz)</td> </tr> </table>	Total capacity of connected indoor units	Amount for the indoor units	– 27	1.5 kg (53 oz)	28 – 54	2.5 kg (88 oz)	55 – 62	3.0 kg (106 oz)
Pipe size Liquid pipe ø6.35	+	Pipe size Liquid pipe ø9.52	+															
(m) × 19.0 (g/m) (0.21 (oz/ft))		(m) × 50.0 (g/m) (0.55 (oz/ft))																
Total capacity of connected indoor units	Amount for the indoor units																	
– 27	1.5 kg (53 oz)																	
28 – 54	2.5 kg (88 oz)																	
55 – 62	3.0 kg (106 oz)																	

Now for some math:

$$47 \text{ ft. (1/4" liquid line)} \times .21 = 9.87 \text{ oz}$$

$$47.5 \text{ ft. (3/8" liquid line)} \times .55 = 26.13 \text{ ounces}$$

The total charge adder for the refrigerant lines will be $9.87 + 26.13 = \mathbf{36 \text{ ounces}}$

You are not done yet! You must add all indoor unit capacities to understand the charge adder for the coil volume. Onsite, we have a 6K, 9K and 36K BTU indoor unit, and you must add those together.

$$\mathbf{6 + 9 + 36 = 51,000 \text{ BTUs of total indoor} = 88 \text{ oz}} \text{ (See below.)}$$

Looking at the chart below, you must add 88 ounces of refrigerant to accommodate the coil volume.

<Additional Charge>
Calculation of refrigerant charge

Pipe size Liquid pipe ø6.35 (m) × 19.0 (g/m) (0.21 (oz/ft))	+	Pipe size Liquid pipe ø9.52 (m) × 50.0 (g/m) (0.55 (oz/ft))	+	<table border="1"><thead><tr><th>Total capacity of connected indoor units</th><th>Amount for the indoor units</th></tr></thead><tbody><tr><td>- 27</td><td>1.5 kg (53 oz)</td></tr><tr><td>28 – 54</td><td>2.5 kg (88 oz)</td></tr><tr><td>55 – 62</td><td>3.0 kg (106 oz)</td></tr></tbody></table>	Total capacity of connected indoor units	Amount for the indoor units	- 27	1.5 kg (53 oz)	28 – 54	2.5 kg (88 oz)	55 – 62	3.0 kg (106 oz)
Total capacity of connected indoor units	Amount for the indoor units											
- 27	1.5 kg (53 oz)											
28 – 54	2.5 kg (88 oz)											
55 – 62	3.0 kg (106 oz)											

$$\mathbf{36 \text{ (lineset charge adders)} + 88 \text{ (coil volume)} = 124 \text{ ounces of additional charge}}$$

So, what does all this mean? Well, the outdoor unit comes precharged for the outdoor unit alone!

You must add the charge for the lineset sizes, lengths and indoor coil volume. Once this charge has been added, you can open the valves and assume you have proper refrigerant charge for your newly installed or repaired Mitsubishi system. We advise that you write this additional charge value in your service notes, inside the door of the outdoor unit or in your job file for future reference.

Not done yet!

Suppose you have a leak after a few months or years of operation. You cannot just top off this unit and continue. You must remove any remaining refrigerant and see what refrigerant value was left in the system. If you trust that refrigerant, you can reuse it only if proper practices are followed.

Once you understand what you recovered from the unit, you can weigh in your proper charge. We know that the additional adder was 124 ounces, but don't forget about the amount included in the outdoor unit. This unit (*TXMMX48A182AA) shipped with 10.6 lbs. of refrigerant. This information is found on the data sticker located on the outdoor unit, service facts, submittals and in the Diamond System Builder.

Total System charge:

36 ounces (35.72/16 = 2.25 lbs.) - Lineset

88 ounces (88/16 = 5.5 lbs.) - Coil volume

10.6 lbs. - Outdoor unit pre-charge

$$\mathbf{2.25 + 5.5 + 10.6 = 18.35 \text{ lbs.}}$$

References:

Measurement conversion:

There are 16 ounces per pound so you can divide the calculated ounces by 16 to convert to pounds of refrigerant.

16 ounces = 1 lb.

144 ounces = 9 lbs. (144/16 = 9)

You will see metric sizes:

In the additional charge example above, you have noticed some funny values. That's okay, the installation and service guides have conversion charts to reference. The below tells us that Ø6.35 is 1/4".

Ø = diameter

6.35mm = 1/4"

9.52 = 3/8"

(1) Valve size for outdoor unit

For liquid	ø9.52 mm (3/8 inch)
For gas	ø15.88 mm (5/8 inch)

(2) Valve size for branch box

A UNIT	Liquid pipe	ø6.35 mm (1/4 inch)
	Gas pipe	ø9.52 mm (3/8 inch)
B UNIT	Liquid pipe	ø6.35 mm (1/4 inch)
	Gas pipe	ø9.52 mm (3/8 inch)
C UNIT	Liquid pipe	ø6.35 mm (1/4 inch)
	Gas pipe	ø9.52 mm (3/8 inch)
D UNIT	Liquid pipe	ø6.35 mm (1/4 inch)
	Gas pipe	ø9.52 mm (3/8 inch)
E UNIT	Liquid pipe	ø6.35 mm (1/4 inch)
	Gas pipe	ø12.7 mm (1/2 inch)

* 3-branch type : only A, B, C unit

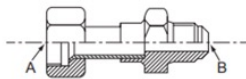


Fig. 5-3

Conversion formula

1/4 F	ø6.35 (1/4)
3/8 F	ø9.52 (3/8)
1/2 F	ø12.7 (1/2)
5/8 F	ø15.88 (5/8)
3/4 F	ø19.05 (3/4)