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Application Engineering **BULLETIN**

AE015 **May 2015**

Isolation Ball Valves for Fujitsu Airstage™ Systems

Fujitsu recommends the use of isolation ball valves for Airstage VRF systems. By isolating sections of the refrigerant circuit from the rest of the system, ball valves can aid in the service and installation of piping and equipment.

Ball valves should remain fully open during normal operation. They can be strategically placed and temporarily closed during periods of service. Always consult Fujitsu's Service Department before operating a VRF system with closed ball valves.

Ball Valve Characteristics

When installing isolation ball valves, adhere to the following guidelines:

1. The ball valve must be rated to a minimum working pressure of 700 psig, temperature range of -40°F to 300°F, and be compatible with R410A systems.
2. The ball valve must be of a full port design to avoid restriction of refrigerant flow.
3. The ball valve must be of an equal or slightly larger inner diameter (ID) of the refrigerant line it is isolating.
4. The ball valve must be insulated to avoid condensation.
5. When selecting a ball valve Fujitsu recommends installing a ball valve with a Schrader service port to allow for pressure testing, evacuating, and charging of the isolated section of piping.

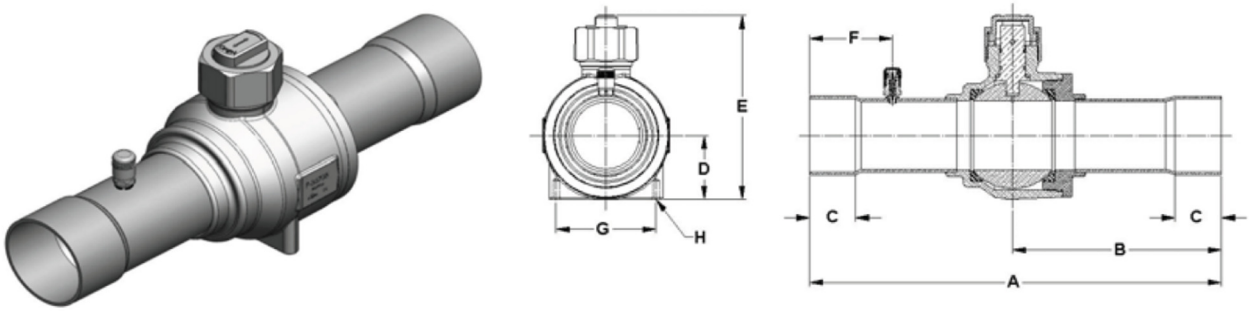

Fig. 1. Example ball valve. Note full port design and service port.

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Valve Location for Heat Recovery Systems

Ball valves for heat recovery systems are typically located on the indoor unit side of Refrigerant Branch Units (RBUs) with the Schrader service port positioned toward the indoor units. Since the RBU solenoid valves are normally closed, valves in this location can assist in the installation and troubleshooting of the piping system.

Ball valves are occasionally installed at the indoor units. This location may result in easier access and a smaller refrigerant charge that must be evacuated during servicing of the indoor unit.

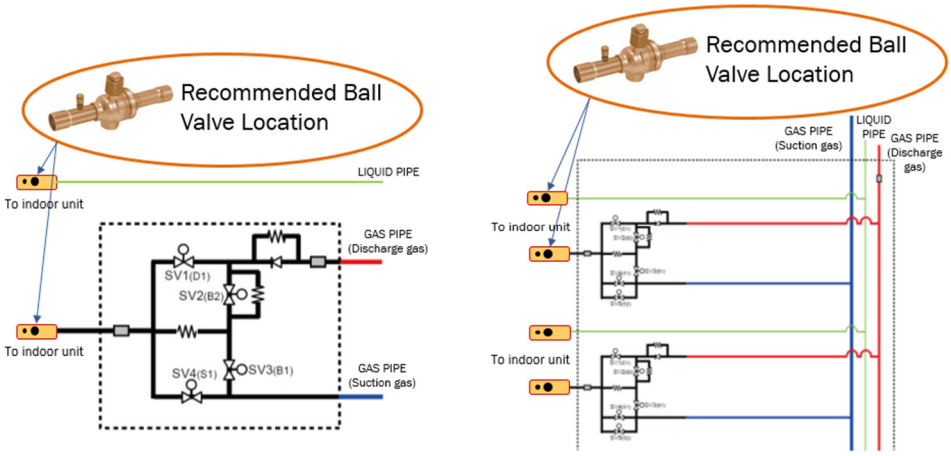

Fig. 2. Diagram of ball valves located at RBUs - Single RBU (left) and Multi RBU (right)

Valve Location for Heat Pump Systems

Separation tubes and headers have no serviceable parts and the piping components of heat pump systems are often installed in areas that are difficult to access. Therefore, ball valves are typically installed at the indoor units.

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Sizing

When ball valves are installed at the RBU, Fujitsu recommends that the valve is sized according diameter of the RBU pipe connection on the indoor unit side – see Table 1. This allows for uniform sizing of ball valves and the future addition of indoor unit capacity. In some cases, a reducer or expander will be required on the outlet of the ball valve. The fittings included with the RBU should be compatible with most ball valves.

Single RBUs do not include a liquid pipe connection and thus the liquid ball valve should be sized to match the liquid pipe size.

RBU Model Name		UTP-RU01AH	UTP-RU01BH	UTP-RU01CH	UTP-RU04BH
Outside Diameter of Indoor Unit Side	Gas Pipe	ø1/2"	ø3/4"	ø7/8"	ø3/4"
	Liquid Pipe	None			ø3/8"

Table 1. Size of RBU ports on indoor unit side

When ball valves are located at the indoor unit, the valves should be sized to the same diameter of the indoor unit pipe connections. Pipe size is determined by the capacity of the indoor unit, as shown in Table 2.

Indoor Unit Model Code	Cooling Capacity of Indoor Unit (Btu/h)	Outside Diameter	
		Liquid Pipe	Gas Pipe
7, 9, 12, 14	7,500; 9,500; 12,000; 14,000	ø1/4"	ø1/2"
18, 24, 30	18,000; 24,000; 30,000	ø3/8"	ø5/8"
36, 48, 60	36,000; 48,000; 60,000	ø3/8"	ø3/4"
72, 96	72,000; 96,000	ø1/2"	ø7/8"

Table 2. Size of refrigerant piping based on indoor unit capacity

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