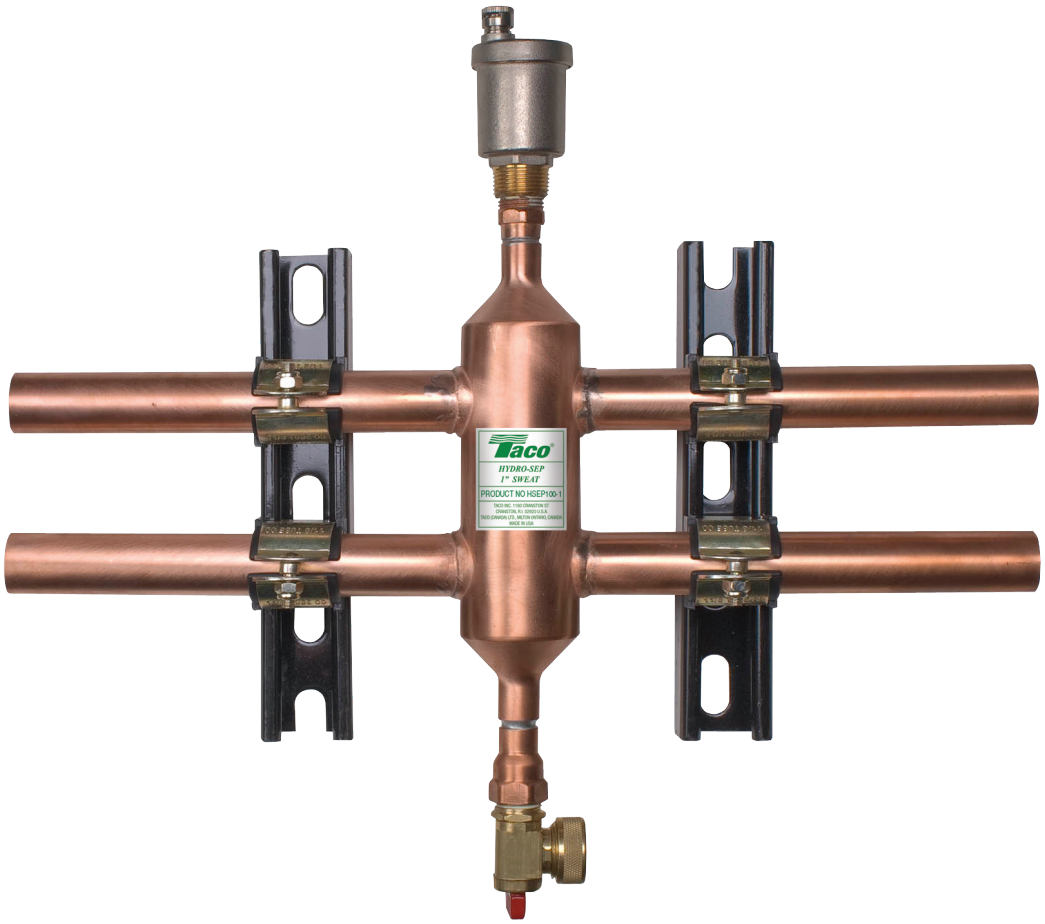
Hydraulic Separator

Taco's Hydro-Sep™ Hydraulic Separators are compact economical units that allow fast and efficient installation of primary/secondary piping for many different boilers. Installing this unique Hydraulic Separator offers the additional advantages of assisting in the removal of unwanted air and dirt particles, preventing their damaging affects on system components. It is especially suitable for today's smaller boilers that tend to have a much higher flow resistance.



Taco Comfort Solutions®
A Taco Family Company

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Printed in USA

Hydraulic Separators save

The Taco Hydro-Sep™ is the ideal piping companion for today's widespread usage of Primary Secondary piping. By installing the efficient and compact Taco Hydro-Sep piping errors can be prevented, installation time reduced and valuable mechanical room space saved. On systems using boilers with higher pressure drops the Hydraulic Separator allows for the possible use of smaller zone circulators because it is not required to overcome the additional head loss associated with the boiler. At the same time the boiler pump can maintain constant flow through the boiler.

Primary Secondary Pumping

Primary secondary pumping is used extensively in HVAC systems to hydraulically isolate different circuits in the same hydronic system.

This can be useful to save energy by shutting off or reducing the speed of pumps in areas of the system with no or low loads. This can also be useful to increase comfort by supplying areas of a system with different water temperatures or different flow rates.

To successfully accomplish these tasks the flow rates of these different circuits must be independent of each other, i.e., the flow in one circuit must not affect the flow in another circuit. This is known as decoupling or hydraulic separation.

To decouple or hydraulically separate one circuit from another, an area of very low pressure drop must be created in the common piping between the two circuits. This pipe is sometimes referred to as the decoupler or hydraulic separator. This decoupler must be as short (tee to tee) as possible to insure that the path of least resistance for the flow of water of one circuit is through the decoupler and not through the opposing connected circuit.

This decoupler or common pipe is shown in Figure 1 in red.

If this decoupler is installed correctly then the flow in one circuit does not affect the flow in the other circuit. The flow in each circuit is only a function of the pump head in its circuit. This flow is not influenced by the pumps in the opposing circuit being in series with the pumps in its circuit.

There are 3 combinations of flow and temperature possible with Taco's Hydraulic Separator depending on the relationship of the primary and secondary flow rates.

Figure 2 shows the relationship with the primary (Q primary) and secondary (Q secondary) flows equal.

In this instance the secondary circuit supply temperature is equal to the primary circuit supply temperature. For example a building secondary circuit

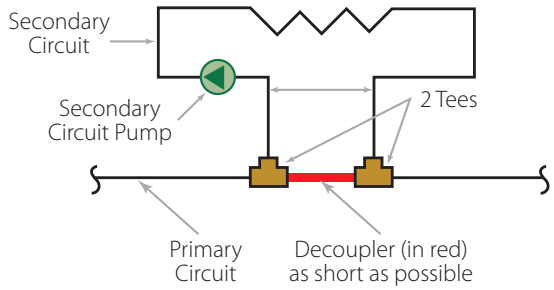
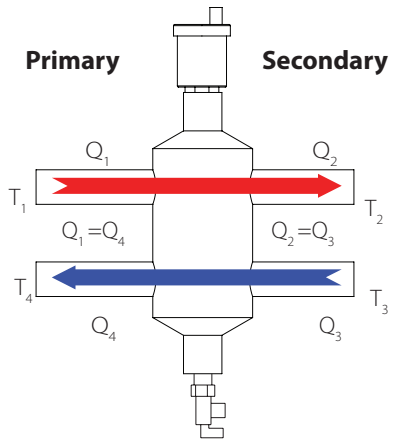


Figure 1

energy and system wear.



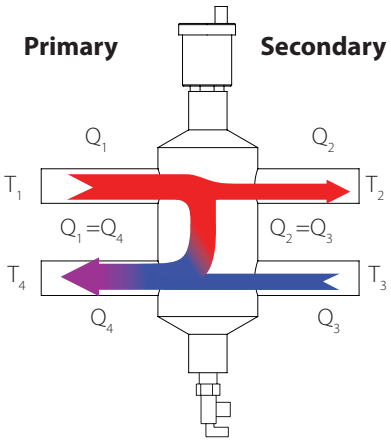
Q Primary = Q Secondary

Figure 2

supply water temperature will be the same as a boiler or chiller primary circuit supply water temperature.

Figure 3 shows the relationship if the primary flow (Q primary) is greater than the secondary flow (Q secondary).

In this instance the secondary circuit supply temperature is the same as the primary circuit temperature. For example a building secondary circuit supply water temperature will be the same as a boiler or chiller primary circuit supply water temperature.



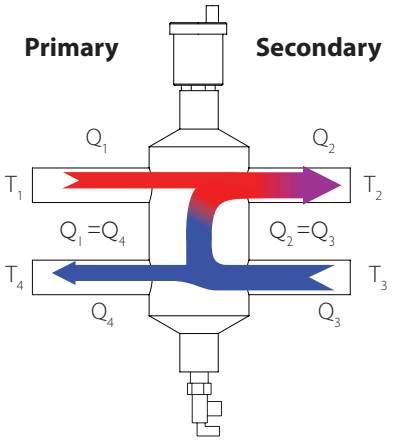
Q Primary < Q Secondary

$$T_4 = \left[\frac{(Q_1 - Q_2)T_1 + (Q_3)T_3}{Q_1} \right]$$

Figure 3

Figure 4 shows the relationship if the primary flow (Q primary) is less than the secondary flow (Q secondary).

In this instance the secondary circuit supply temperature is less than the primary circuit temperature. For example a building secondary circuit supply water temperature will be lower than a boiler and higher then the chiller primary circuit supply water temperature. This is because some of the secondary flow mixes with the primary flow and dilutes the supply water temperature to the secondary circuit.



Q Primary > Q Secondary

$$T_2 = \left[\frac{(Q_3 - Q_1)T_3 + (Q_1)T_1}{Q_3} \right]$$

Figure 4

This can cause system performance problems, especially in chilled water systems, since the building secondary supply water temperature cannot be maintained at the chiller primary supply water temperature.

This can result from staging off of multiple boiler or chillers while maintaining a constant volume building secondary circuit flow rate.

This application can also be used for low mass boilers that have flow limits below the building secondary flow rate. In this application system water is bypassed around the boiler to limit the boiler flow to manufacturer's maximum flows.

Submittal Data Information
Hydro-Sep™ Hydraulic Separator

Submittal Data # 101-137
Supersedes: 10/05/09

Effective: 10/09/20

Features

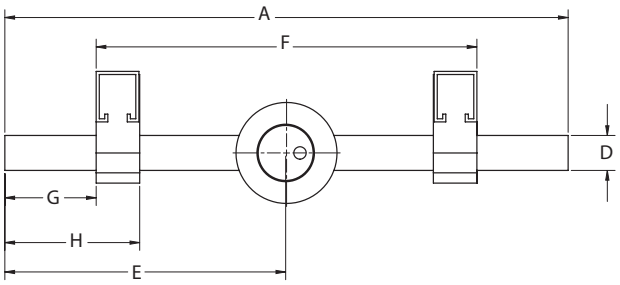
- Small space saving design
- Rugged all copper construction
- Suitable for use with oxygenated water heating systems
- Blow down port for sediment removal
- High quality, industry standard automatic Taco Hy-Vent®
- Wall mounting brackets

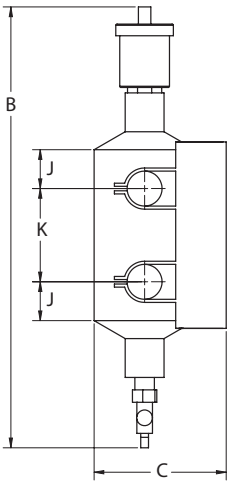
Materials of Construction

Body ..... Copper
Drain valve body..... Brass
Air vent body ..... Brass
Engineered plastics
BUNA N
Teflon®

Specifications

Connections ..... 1" and 1-1/4" Copper Sweat
Max. Flow..... 1" (11 GPM) 1-1/4" (15 GPM)
Media ..... Water or Glycol up to 50%
Max. Pressure ..... 250 PSIG
Max. Temperature..... 240˚ F

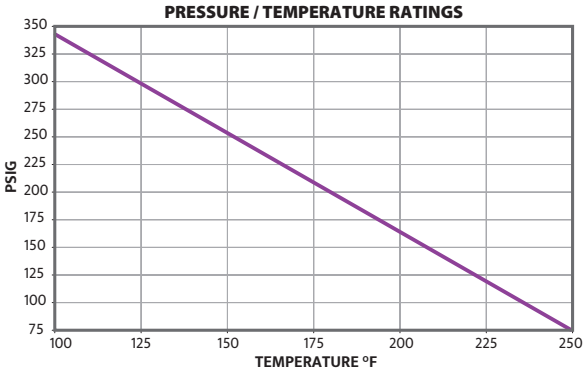




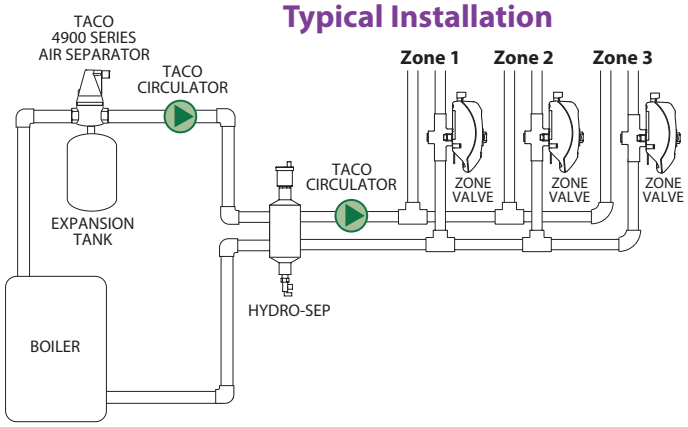
	Model Number HSEP100-1	Model Number HSEP125-1
A	18-1/8"	21-1/8"
B	15-1/2"	22-3/16"
C	3-1/2"	4"
D	1.124" - 1.127" OD x .050" Wall	1.375" - 1.377" OD x .055" Wall
E	9-1/16"	10-9/16"
F	12-1/4"	13-1/4"
G	3"	4"
H	4-1/2"	5-1/2"
J	1-1/4"	2-3/4"
K	3"	4"

Dimensions provided for reference only and are subject to change

Pressure/Temperature Chart



Typical Installation



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