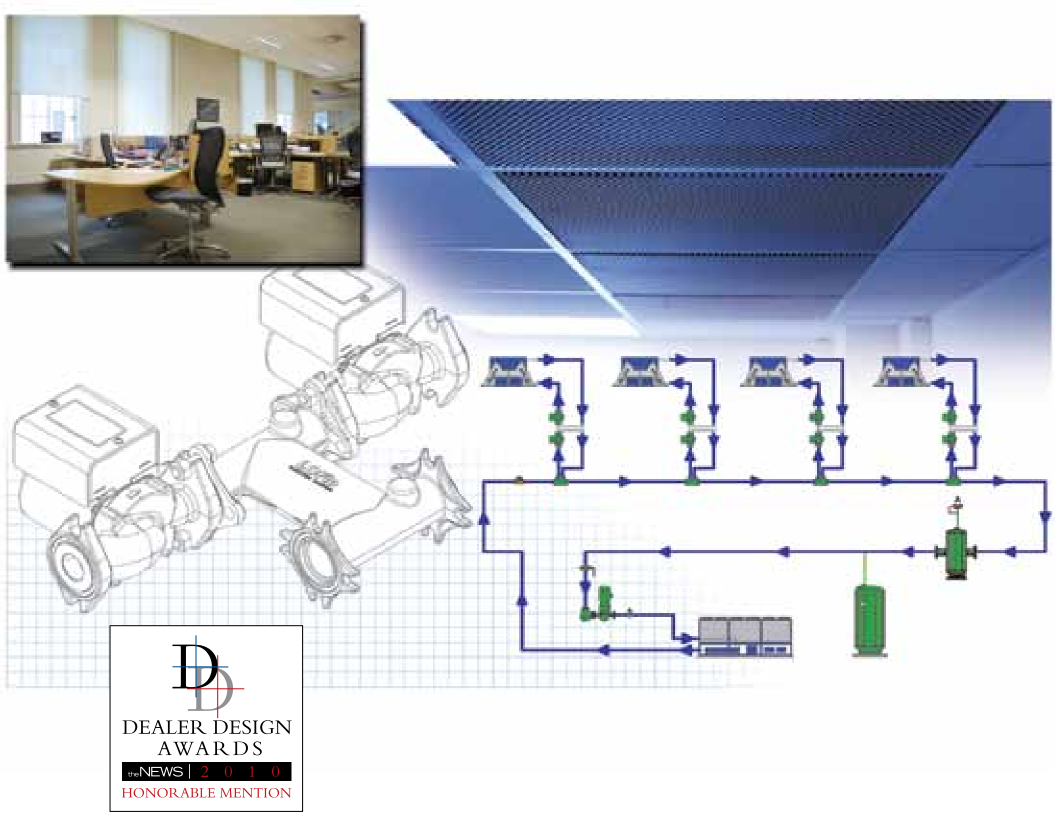
LOFlo®

injection pumping



Award Winning LOFlo®

Taco®

Do your best work.

Features & Benefits

Introduction

Designers know that the demand for super efficient comfort systems grows each day. The industry has responded with a variety of new "Green" hydronic products and system concepts that yield dramatic benefits over the traditional and conventional airside designs of the past.

The award-winning Taco LOFlo® Mixing Block (LMB) is one such product that sets a new standard for comfort, ease of design, and superior energy performance in small to large buildings. The LOFlo Mixing Block can easily be incorporated into heating and cooling systems for cost-effective results in a variety of areas. When employed in conjunction with Taco's latest system approaches, outstanding benefits accrue to designers, installers, owners, and users alike.

The LOFlo® Concept

The LMB is a complete injection mixing station contained in a simple factory-assembled package that controls each individual zone at the lowest possible flow rate by maintaining the highest possible supply water temperatures in cooling and lowest possible supply water temperatures in heating.

The LMB consists of a single cast header that functions as a hydraulic separator to which small circulators are attached – one for the primary system flow and the other an injection circulator that adjusts to precisely match the required load on a given zone.

When installed within modern radiant systems (wall, floor, or ceiling panels) or chilled beam systems (active or passive), only 2 pipes are needed. Flow rates are reduced since there are no control valves, balancing valves, or piping losses to overcome. The small, reliable circulators take the place of all of these components. The LMB automatically provides only the flow and temperature of water needed to satisfy the zone load at any given time.

Figure 1

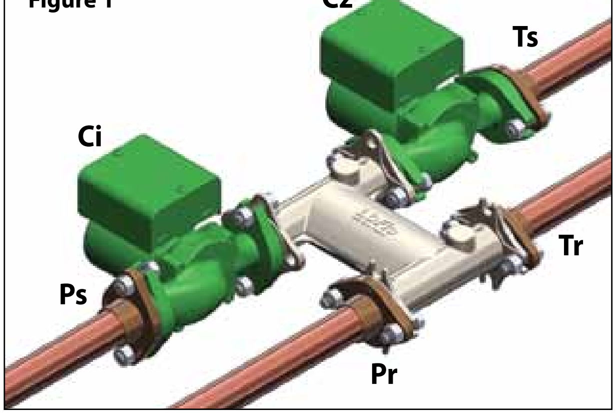


Figure 1 illustrates how the water supply from the primary circuit enters the LMB at Port **(Ps)**. The return water from the secondary terminal loop enters the LMB at terminal **(Tr)**. As the terminal unit calls for either heating or cooling, the Injection Circulator **(Ci)** varies in speed / flow to blend the two water temperatures to satisfy the

Features & Benefits

needs of the zone. This blended supply water is sent to the terminal though Port **(Ts)** and primary return water exits the LMB at Port **(Pr)**. A variety of sizes of LOFlo mixing blocks can handle flows up to 30 gpm, making them suitable for almost all installations.

The LoadMatch® Circulator

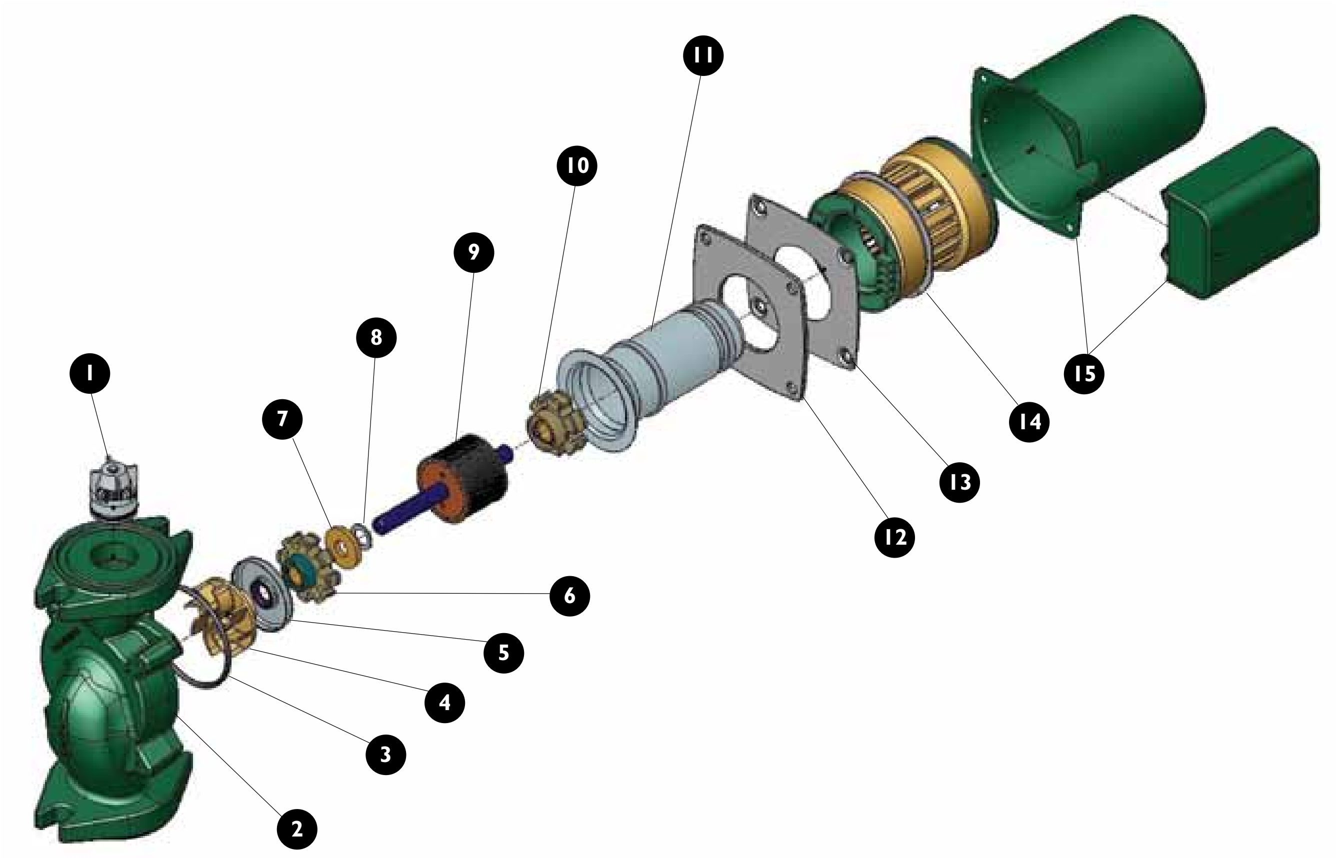
LoadMatch circulators are designed for quiet, efficient, reliable operation on the LOFlo® mixing blocks used in hydronic cooling and heating systems. This family of circulators includes a removable Integral Flow Check valve (IFC®) that prevents unwanted gravity flow and reduces installation costs. An anti-condensate baffle prevents the build up of condensate on the motor windings when the circulator is pumping chilled water. All connections to the mixing block casting are flanged to make installation a snap.

With no mechanical seals, this self-lubricating, maintenance free design provides unmatched reliability. However, in the unlikely event that a circulator repair is needed, our unique, replaceable cartridge contains all of the moving parts and is easily replaced in the field without disturbing piping connections.

All LoadMatch circulators have a design working pressure of 200 psi, making them suitable for medium and high rise construction without having to install hydraulically isolated subsystems.

They can also be used in integrated piping systems utilizing fire protection piping to meet NFPA Chapter 13 pressure ratings of 175 psi.

Features & Benefits



(#1) **Integral Flow Check** (IFC®) — prevents gravity flow.

(#2) **Casing** — Cast Iron, Bronze or Stainless Steel

(#3) **Casing O-ring** — EPDM

(#4) **Impeller** — Polypropylene 30% glass filled

(#5) **Dirt Barrier** — Keeps system dirt away from bearings.

(#6) **Front Bearing Support Assembly** — Brass with carbon bearings for smooth operation and long life.

(#7) **Thrust Washer** — Prevents noise and wear on rotor / front bearing.

(#8) **Spacer Washer**

(#9) **Rotor / Shaft** — Steel rotor, hollow ceramic impeller shaft.

(#10) **Rear Bearing Support Assembly**

(#11) **Cartridge Sleeve** — Stainless Steel.

(#12) **Cartridge Support Plate** — Seals cartridge and casing O-ring.

(#13) **Anti-Condensate Baffle** — Allows for ambient air flow, prevents build-up of condensate on motor.

(#14) **Stator** — Permanent split capacitor.

(#15) **Motor Housing/Capacitor Box Assembly**

Applications

Radiant Cooling

Radiant heating systems have been around for several thousand years. They were first used by the Romans to heat their public baths. A new member of the family recently entered our consciousness…. radiant cooling and chilled beams.

Radiant cooling and chilled beam systems have progressed in the last few decades, garnering attention as a comfortable — yet energy and material efficient option for HVAC systems.

Although these systems have been used in Europe for over 20 years, they are now starting to be examined — and installed — in the United States.

What makes this technology so interesting is its broad applicability for commercial structures. A key advantage is that a radiant cooling or chilled beam system requires very little ceiling space. This is the case because water — the main transporter of thermal energy — is much denser than air and has a higher specific heat. This permits a very high energy carrying capacity and a smaller transport system….pipes. A forced-air system is, by its very nature, greatly less efficient and requires large ducts to transport Btu's.

Figure 2 illustrates that a one inch diameter water pipe can transport the same cooling energy as an 18 inch square air duct. The use of chilled beams can thus dramatically reduce air handler and ductwork sizes, and fan horsepower enabling more efficient use of both horizontal and vertical building space.

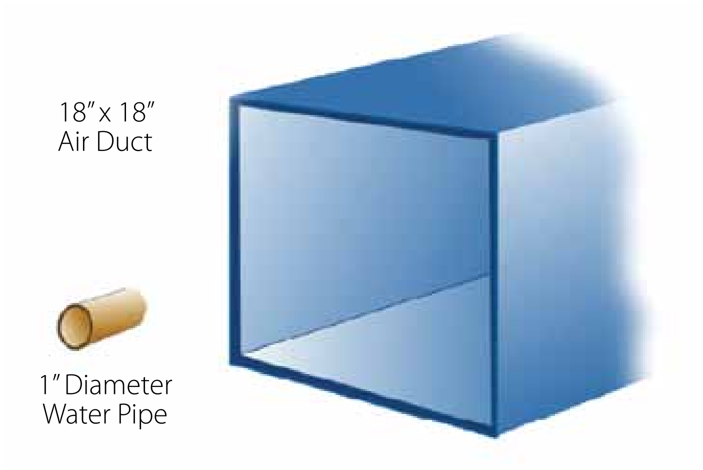


Figure 2 — Cooling Energy Transport, Economy of Water vs. Air

Applications

For a typical building this results in a lower building height (and cost) as shown in Figure 3.

Compared with air systems, radiant cooling and chilled beam hydronic systems use approximately half the horsepower to move heating and cooling energy within a building. This can reduce the overall electrical energy demand of a radiant cooling or chilled beam system by up to 25% over a typical all air VAV system as shown in Figure 4.

Air System with large ducts   Hydronic system with small pipes

Figure 3 — Building Heights

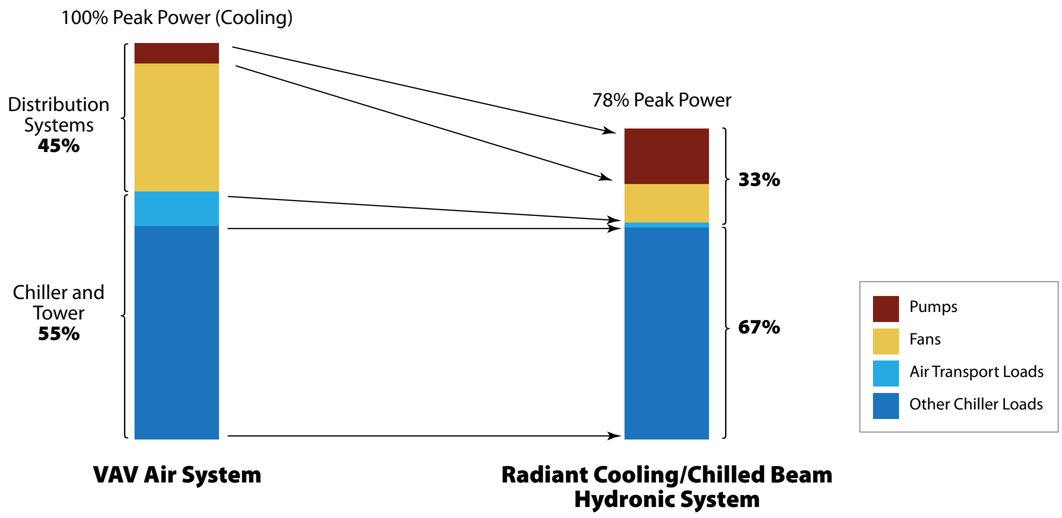


Figure 4 — Reduction in horsepower for a Radiant Cooling/Chilled Beam System

Applications

With radiant cooling systems, chilled water circulates through tubing attached or embedded in a metal ceiling panel to remove heat from a space as shown in Figure 5. This is typically referred to as a chilled ceiling system.

Approximately 50 to 60 % of the heat transfer from a radiant chilled panel is radiant, while 40 to 50% is convective. Chilled water temperature must be above the dew point—between 55°F and 60°F—to prevent condensation from forming on the bottom of the panels. Therefore, the driving force—or approach—between chilled water and a room is reduced to 15°F to 20°F. This is approximately half of a conventional chilled-water system using 40°F to 45°F chilled water, which achieves an approach of 30°F to 35°F. As a result, higher chilled-water flow rates are required to achieve reasonable capacities of the chilled ceiling panels.

Radiant cooling and chilled beams use chilled water temperature differences or delta T's of 4°F to 5°F.

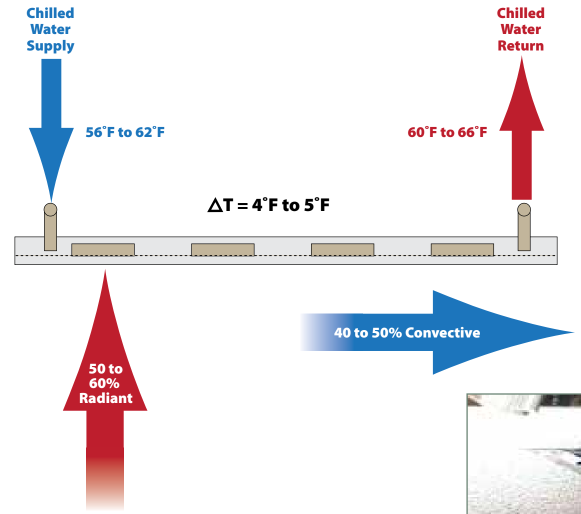


Figure 5 — Chilled Ceiling Panels

Cutaway of Chilled Ceiling Panel

Conventional chilled water systems use chilled water delta Ts of 8°F to 12°F. Chilled-water flow rates for radiant cooling and chilled beam systems are approximately double those of conventional chilled-water systems.

This means that the pumps, piping and horsepower for the pumps are also double.

Even with higher flow rates, chilled ceiling panels have relatively low capacities, ranging from 20 to 40 Btuh per square foot of panel area. While this is adequate for cooling loads of interior spaces, it may not be adequate for exterior spaces.

Exterior spaces with larger glass areas can approach 60 to 70 Btuh per square foot of floor area. For full sensible cooling in exterior spaces, the cooling load must be reduced or the chilled ceiling panels supplemented with other cooling sources.

Applications

Solar load can be reduced by using window-shading devices, such as interior blinds or exterior sun shades that close when windows are exposed to direct sunlight. Additional cooling sources include chilled walls or floor panels as shown in Figure 6.

Typical capacities of these panels:
- **Ceiling** - 20 to 40 btu/sq. ft
- **Walls** – 15 to 25 btu/sq. ft
- **Floors** – 10 to 15 btu/sq. ft

Figure 6 — Wall and Floor Radiant Panels

Chilled beam and radiant cooling systems (chilled ceiling, wall or floor panels) also provide sensible cooling only using higher temperature chilled water above the dew point.

Latent cooling or dehumidification is provided by a separate decoupled 100% Dedicated Outdoor Air System (DOAS). This is accomplished by slightly pressurizing the building with dry treated outdoor air from the DOAS unit to prevent the infiltration of warm moist outside air.

The biggest advantage to decoupling sensible and latent loads is substantial airflow reduction. A typical air-based cooling system will require 8 to 12 air changes per hour of recirculated and outside air. A radiant cooling or chilled beam system, employing a DOAS, will require 1 to 2 changes of outside air per hour only. This reduces the horsepower and materials required to move air by up to 10 times.

Passive Chilled Beams

The Europeans discovered from their experience that by lowering the chilled ceiling panel below the ceiling that the convective cooling component of the panel could be increased. This satisfied the increased cooling loads from the increased use of computers seen in the 1990s. There also was a desire to provide higher cooling capacities for exterior zones to provide better overall comfort.

By lowering the panel below the ceiling and making it an open coil, as shown in Figure 7, the capacity of the chilled panel can be increased. The industry has designated this

Applications

configuration a "passive chilled beam." It resembles a (structural) beam when mounted below the ceiling. It is passive since the convective cooling component is natural convection.

As shown in Figure 7 warm air plumes from the room rise naturally (convectively) and create a warm air pool in the upper portion of the space (or ceiling cavity). As this air contacts the coil surface, the heat is removed which causes it to drop back into the space. In this application the convective component of the cooling increases to about 85% of the total heat removal and it also increases the total capacity to 120 to 150 Btuh/sq. ft. of panel area.

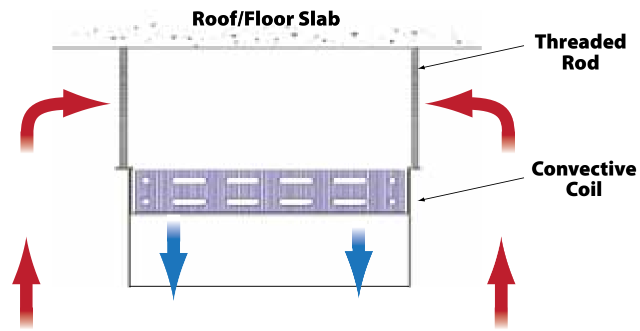
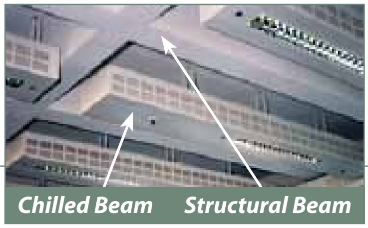


Figure 7 — Passive Chilled Beam



Active Chilled Beams

To further increase a chilled beam's cooling capacity, conditioned ventilation air from the DOAS can be used to flow air through a chilled coil, further increasing the beam's convective component by using forced convection. This configuration is referred to as an "active chilled beam" as shown in Figure 8.

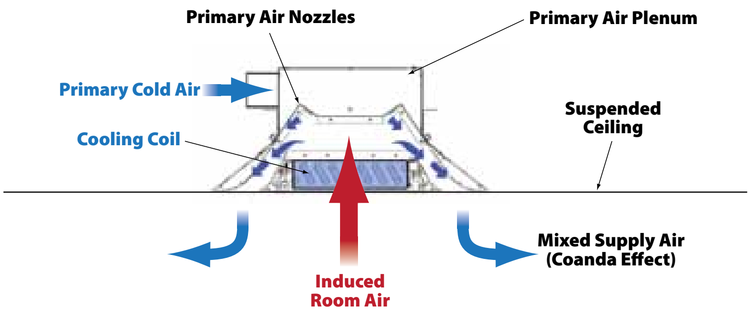
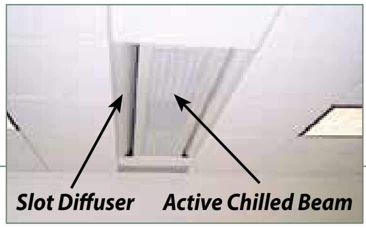


Figure 8 — Active Chilled Beam



Applications

Ventilation air from the DOAS is introduced to a chilled beam into a plenum above the coil and through a venturi, generating a higher velocity and, subsequently, a lower-pressure region inside the lower plenum in the chilled beam. This low-pressure region induces room air to flow through the chilled coil and mix with primary air from the DOAS. The airflow over the chilled coil is reversed for an active chilled beam, and the induced room air flows up through the coil.

Active chilled beams are sometimes referred to as "induction diffusers." They are really 1970's induction unit technology, only mounted in a ceiling and supplied with high temperature chilled water.

Air from an active chilled beam is introduced into a space through a slot diffuser, creating a Coanda effect. This eliminates drafts by preventing the chilled beam from "dumping" cold air. The Coanda effect is the ability of a cold air stream to hug the ceiling and not dump. This is the case because the air is discharged at higher velocity by the slot diffuser creating an upward force from the static pressure difference between the air stream and the room (Bernoulli's Principle). This forces the cold air to hug the ceiling and not dump.

Inducing warm room air to blow through a chilled coil substantially increases chilled-beam capacity. Active-chilled-beam capacities range from 400 to 600 Btuh per square foot of beam or beam-coil area. Depending on the temperature and quantity of primary supply air from a DOAS, this can add an additional 300 to 400 Btuh per square foot of beam or beam-coil area. An active chilled beam can therefore deliver from 700 to 1000 Btuh per square foot of beam or beam-coil area between the chilled coil and primary air.

LOFlo® System

If the chilled water flow rate of a radiant cooling or chilled beam system can be reduced to that of a conventional system, peak power demand can be reduced even further. Injection pumping can achieve this goal. It has been used in radiant heating systems for a number of years, lowering 180°F boiler water to the 100°F to 120°F needed for a radiant floor panel.

The same principal can be applied to a radiant cooling or chilled beam system in reverse by raising 40°F to 45°F chilled water to the 55°F to 60°F required by a chilled ceiling or chilled beam. Figure 9 shows a piping layout for an injection mixing circuit that mixes low temperature (45˚F) chilled water to the higher temperature (58˚F) required by a chilled beam.

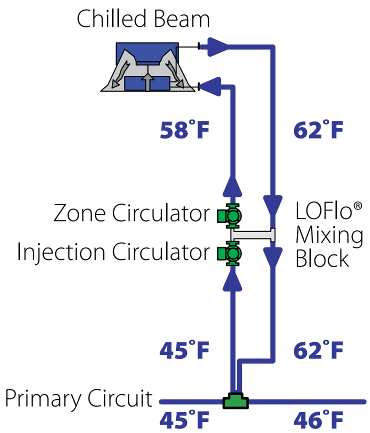


Figure 9
LOFlo® Injection Mixing Circuit

Applications

The LOFlo® Mixing Block (LMB) is not constrained by the primary supply water temperature, but rather it can supply the precise temperatures required through its unique injection feature. The LMB also eliminates the need for flo-checks since they are built-in to the circulator body.

The LMB is a packaged unit that includes an injection circulator and zone circulator. The injection circulator is controlled by variable speed to maintain the supply water setpoint (58˚F) to the chilled beam. The zone circulator is controlled by the room thermostat. It can be either constant or variable speed.

If you are already familiar with the innovative Taco LoadMatch® System, it's easy to see how the LOFlo® Mixing Block makes a simple system even better. The LOFlo® design uses a single pipe primary distribution system that is decoupled from the individual space loads. Small circulators are used for each zone (fan coil, air handler, or other type of terminal unit) to provide either on/off or variable speed flow control.

The simplicity of the LOFlo® concept allows a single pipe size for the primary distribution system. The total BTU load and delta T determines the required flow and pipe size. Once this has been done, the number of secondary loops is simply a matter of space conditioning locations. There is no need to account for added pressure drops in the secondary circuits due to piping lengths, balancing valves, check valves, etc. Thus, primary pump size is smaller, piping sizes and arrangements are simplified, and the small circulators are selected to account for secondary pump runs and accessories.

A typical LOFlo® system application is shown in Figure 10. This is a chilled beam system utilizing 4 active chilled beam terminal units in a single pipe cooling system. The diagram clearly illustrates the simplicity of this system.

The LMB allows the designer to use a 42°F supply water temperature and a delta T of 16°F vs. that required by the chilled beams of 58°F with a delta T of 4°F. The LMB will vary the flow of supply water so that each terminal is satisfied at the higher temperature and the lower delta T.

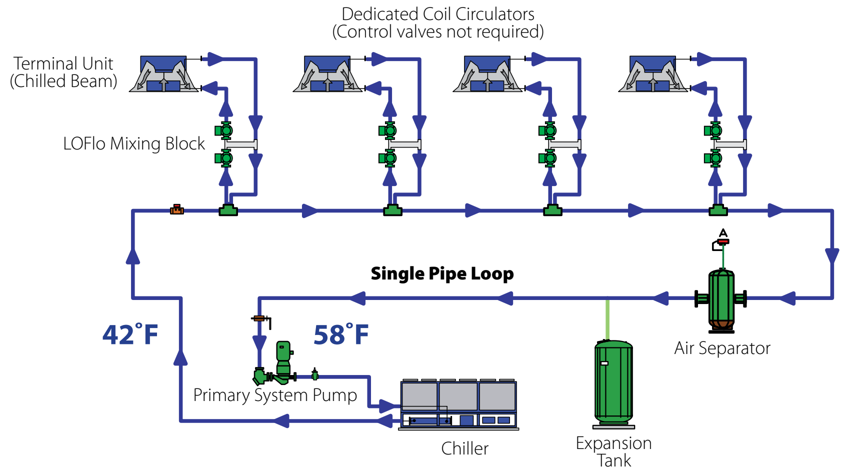


Figure 10
LOFlo® System

Applications

This change in the primary loop temperature allows a much lower flow rate and thus requires a smaller pipe diameter. In fact, the primary circuit flow is typically reduced by 75%! This is the case because a LOFlo® system uses a primary circuit delta T of 16˚F to 20˚F vs. a conventional radiant cooling or chilled beam system of 4˚F to 5˚F.

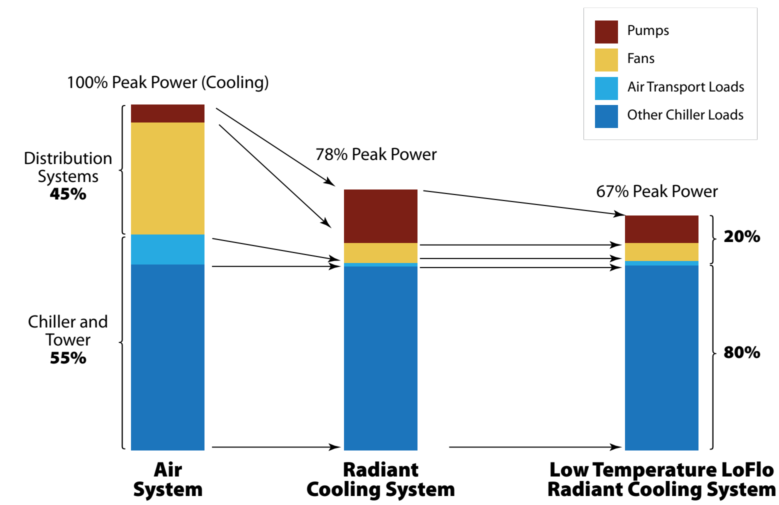


Figure 11 — Reduction in horsepower for a LOFlo® System

Figure 11 shows a comparison of peak power demand for a LOFlo® injection pumping system vs. an all air VAV system and a conventional radiant cooling/chilled beam system. The peak power demand of a low-flow injection-pumping radiant cooling system is up to 35% less than that of an all air system. The transport energy for this type of radiant cooling/chilled beam system is only 20% of the total energy of an HVAC system.

In addition to energy savings a LOFlo® system can provide better comfort. This is a result of less air delivered and therefore less evaporative cooling effects on the building occupant's skin. The system is also quieter because of the reduced air volumes.

The system can also deliver different supply water temperatures to various types of terminal units for increased versatility and comfort as shown in Figure 12. In this example the chilled beams and chilled ceilings require 60˚F supply water, the heat pumps 80˚F supply water, the DOAS unit 42˚F supply water and the fan coils less than 50˚F supply water. All of these different supply water temperatures can be supplied from a single chilled water pipe at 42˚F!

Applications

In this "green" system, each terminal unit is essentially decoupled from the primary loop. Each will operate automatically to control the load in the zone. Each terminal unit and LMB are easily connected to the primary loop through a Taco Twin-Tee®, a patented single pipe fitting designed to replace two primary circuit tees used when connecting a secondary load in a hydronic system.

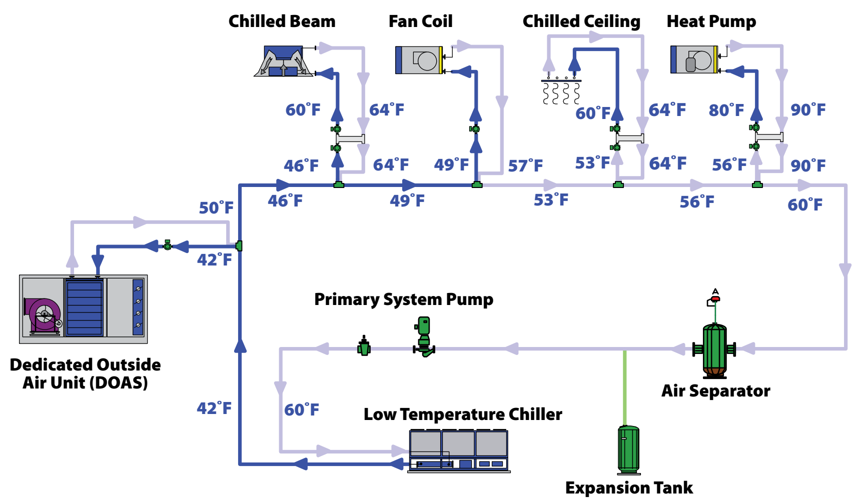
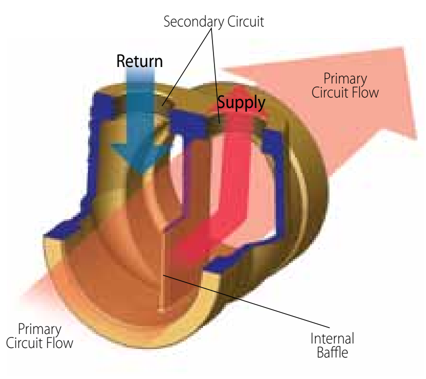


Figure 12 — Varying Supply Water Temperatures

A cutaway of the Twin-Tee® is shown in Figure 13. You can see that there is an absolute minimum distance between the supply and return connections to the secondary loop. This design ensures no pressure drop between takeoffs. The internal baffle prevents any short circuiting of secondary flow between supply and return.

Figure 13



The Twin-Tee reduces the number and costs of fittings and labor required to connect secondary loops to the primary circuit. And it is offered in a wide variety of sizes and connection types to meet any field requirement.

Applications

In a typical chilled beam system there is a requirement for two separate chilled water systems.

The first system is a low temperature (40˚F to 45˚F) chilled water system for the DOAS unit for whole building dehumidification and for fan coils at the entrances for local dehumidification, see Figure 14. The fan coils are needed at entrances when the inrush of humid outdoor air overwhelms the slight building positive pressure from the DOAS when a door is opened.

The second system is a high temperature (55˚F to 60˚F) chilled water system for the chilled beams, see Figure 15.

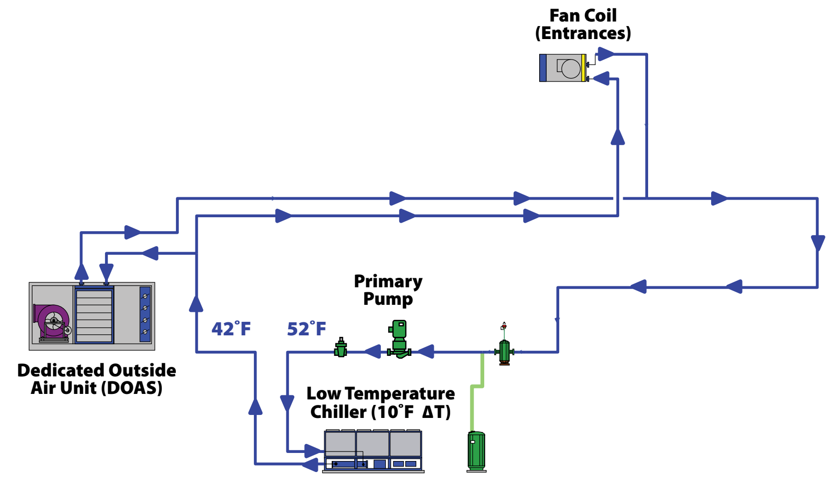


Figure 14 — Low Temperature Chilled Water System

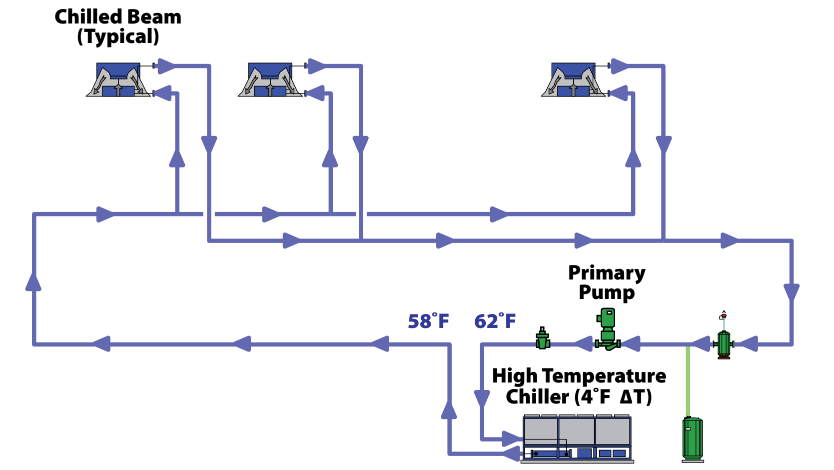


Figure 15 — High Temperature Chilled Water System

Applications

This results in a complicated system with two complete chilled water systems including chillers, pumps, air separators, expansion tanks and piping as shown in Figure 16.

A better solution is the use of a LOFlo® injection pumping system that can deliver different chilled water temperatures with a single chilled water system. The LOFlo® System utilizing the LOFlo® Mixing Block reduces the number of pipes as shown in Figure 17. The LOFlo® System also reduces the size of the pipes, pumps and pump horse-power.

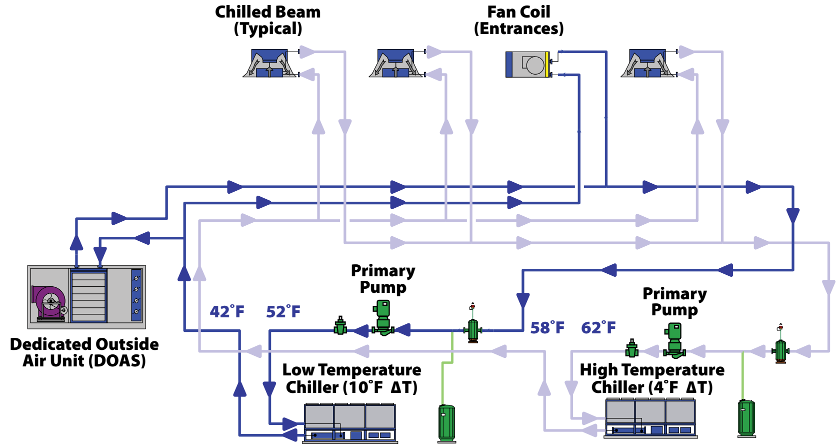


Figure 16 —Dual Temperature Chilled Water System

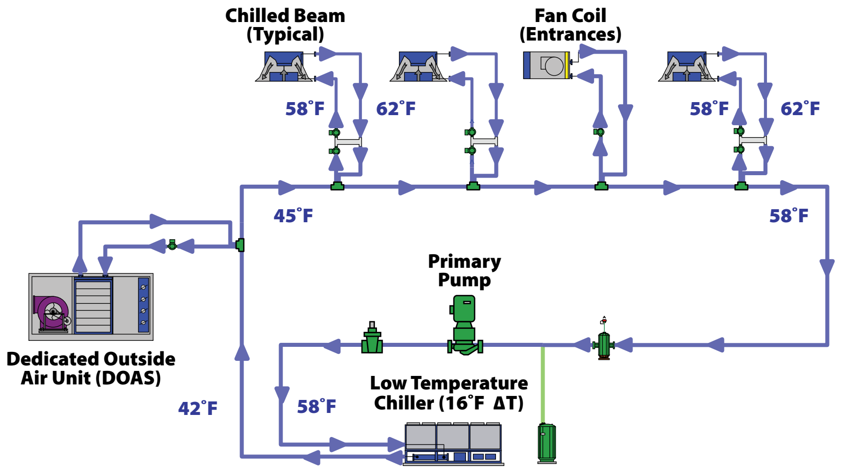


Figure 17 — LOFlo® Single Pipe Injection Mixing System

System Design Tools

System design made easy

Take the mystery out of LoadMatch®, LOFlo® and Chilled Beam system design with our free Taco Design Suite software. This useful collection of integrated computer tools allows you to design, analyze, optimize, revise and render Green Building Designs in minutes instead of hours. The Suite is easy to learn and fully supported online at our web site.

You can download all the elements of the Taco Design Suite. They are free!

Taco Load Tool®

Calculates design loads and flows

Hydronic System Solutions®

Our acclaimed HVAC system design tool

System Analysis Tool® 2.0

Evaluate System Operating and Life Cycle Costs for Alternative Systems Designs, Size Piping and Selection of Equipment

Taco Net®

Schedule All Equipment and Components

LoadMatch® Design "Wizard"

Produce AutoCAD drawings of all Systems

Generate Complete Specifications

Include BIM **Autodesk®** **Revit®** Files for All Taco Products

Taco's Advanced Hydronic Systems

Comfort technology that saves energy, time, and raw materials.

Taco's quest for systems and products that deliver innovative and effective solutions to today's cooling and heating systems has lead the company to breakthroughs that have proven themselves in hundreds of installations and thousands of evaluated designs. **LoadMatch®** is now recognized as an integral part of any Green Building design. Actual installations have proven to lower energy consumption by 25% and reduce installed costs by as much as 5 to 20%.

The **LOFlo™ Mixing Block** is another extension of the many product innovations offered by Taco. Through the use of maintenance-free, low-cost, reliable circulators assembled onto a compact casting (a hydraulic separator) and connected to a primary loop, Taco has further reduced the installed cost of piping and controls while greatly increasing the efficiency of its connected terminal unit.

Chilled Beam systems are now being added to this portfolio of Advanced Hydronic systems with similar benefits and design attributes. While LoadMatch® greatly reduces pump horsepower, chilled beam systems greatly reduce fan horsepower, control system complexity, and sound levels in conditioned spaces. We expect this concept to rapidly grow over the coming years and to achieve the same status of that of the LoadMatch® system.

Lower Operating Cost
Lower Maintenance Cost
Lower Installed Cost

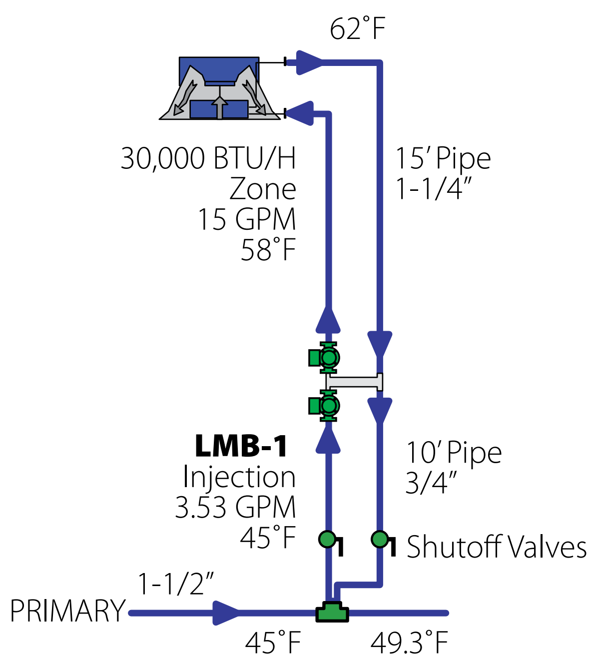
Selection Procedure

How to select the LOFlo® Mixing Block

Selection of the proper LMB for each terminal unit is quick and easy. The important point to remember is that the LMB ***decouples*** the terminal loop from the primary loop and it behaves as its own "system". In fact, the selection of the correct LMB is just a matter of selecting the two independent circulators comprising the two loops of this independent zone system.

Figure 18 shows the LMB in a cooling system with a total load of 90,000 MBH. This is the first of 3 chilled beam terminal circuits in the system that handled the load of 30,000 MBH. In order to select the proper LMB, you simply break this circuit into two loops and select each circulator for the loop they control.

Figure 18

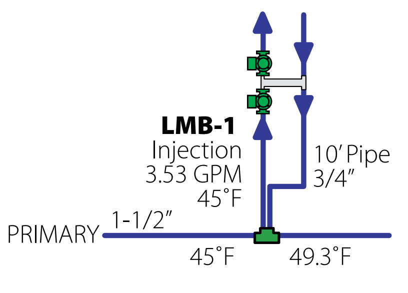


Selection Procedure — 60 Hz Example

Selecting the LOFlo® Mixing Block Injection Circulator

Figure 19 is the primary loop of the LMB. It handles the supply water off the main system loop and is

Figure 19



connected via a Twin Tee®. This circulator is the **Injection Circulator** and is selected for the loop ***flow*** of 3.53 gpm and the actual pressure drop of the circuit.

This circuit utilizes a High delta T (62˚F - 45˚F = 17˚F) and a very low flow since it takes supply water at 45˚F and injects it into the terminal loop in order to achieve an entering water temperature of 58˚F with a leaving temperature of 62˚F.

In order to make the circulator selection, you must determine the ***head*** in this circuit.

20' of 3/4" pipe = 9.3 ft.
(2) 3/4" ball valves = .28 ft.
(1) Twin Tee® = .2 ft.

Total Head 1.41 ft.

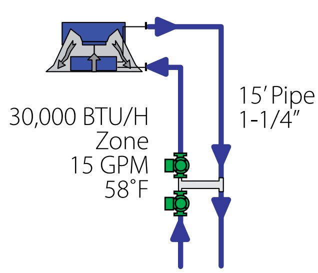
Using the pump curves shown on Page 16 , select the **Injection Circulator** for 3.53 gpm @ 1.41 ft. head.

The proper selection of the **Injection Circulator** is **model L0410.**

Selecting the LOFlo® Mixing Block Zone Circulator

The zone circulator shown in Figure 20 is selected in the same manner as the primary circulator. However,

Figure 20



this time you must remember that you are working in an entirely different loop that has a flow that is much more than that in the primary loop.

In this example, the flow is 15.0 gpm. Next you determine the head in the zone loop.

30' of 1-1/4" pipe = 1.4 ft.
Terminal Pressure Drop = 8.0 ft.

Total Head 9.4 ft.

Using the pump curves shown on Pages 24 and 25 , select the **Zone Circulator** for 15.0 gpm @ 9.4 ft. head.

The proper selection of the **Zone Circulator** is **model L1121.**

Selection Procedure

Selecting the LOFlo® Mixing Block Block Model

Choosing the proper model of the LMB is very easy. Figure 21 illustrates a detailed explanation of how to use the table found on Page 23.

Under the **Injection Circulator** column, find the **L0410D** model. Then reading across for the **L1121V Zone Circulator**, you will find the actual Taco LOFlo part numbers. Simply choose the one that is best suited for your application.

In our example, the correct part number would be: **LMB0410D-112V-Y**.

All remaining LMB's are selected in the same manner taking into account the actual entering water temperatures to the primary loop of the LOFlo mixing block.

Figure 21

INJECTION CIRCULATOR (Variable Speed)	ZONE CIRCULATOR (Variable Speed)	LOFlo® PART NUMBER
L0410D	L0410V	LMB0410D-0410V-Y
	L0609V	LMB0410D-0609V-Y
	L0710V	LMB0410D-0710V-Y
	L0515V	LMB0410D-0515V-Y
	L1111V	LMB0410D-1111V-Y
	L0435V	LMB0410D-0435V-Y
	L1121V	LMB0410D-1121V-Y
	L1130V	LMB0410D-1130V-Y

Complete table of part numbers an dimensions can be found on Page 15.

Keep in mind that the **Injection Circulator** increases in size as you move down the primary loop. This is due to the increase in entering water temperatures with each successive terminal and the resulting need for higher flows in order to achieve the same BTU's.

You should note that both 60Hz and 50Hz ratings are available on pages 24 & 25 and that you must use the appropriate pump curves for your specific application.

Technical Data

Features

- Built-In Hydraulic Separator
- Stainless Steel Casing
- Flanged Connections
- Integral Flow Check (IFC®)

  Prevents gravity flow

  Eliminates separate in-line flow check

  Reduces installed cost, easy to service

  Improved performance vs. In-line flow checks
- Exclusive ACB — Anti-Condensate Baffle - protects motor windings against condensate build-up
- Unique replaceable cartridge — Field serviceable
- Unmatched reliability-Maintenance free
- Quiet, efficient operation
- Direct drive-Low power consumption
- Self lubricating, No mechanical seal
- Standard high capacity output
- Compact design

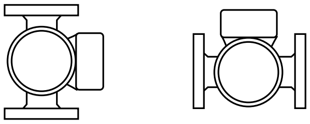
Materials of Construction

Casing (Volute): Cast Iron or Bronze

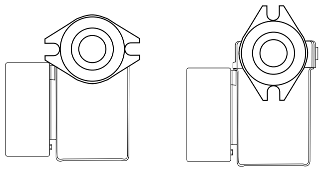
Integral Flow Check:
- Body, Plunger.............Acetal
- O-ring Seals.................EPDM
- Spring.............................Stainless Steel

Stator Housing:	Steel or Aluminum
Cartridge:	Stainless Steel
Impeller:	Non-Metallic
Shaft:	Ceramic
Bearings:	Carbon
O-Ring & Gaskets:	EPDM

Mounting Positions



Flange Orientation



Performance Data

Minimum Fluid Temperature:
32°F (0°C)

Maximum Fluid Temperature:
230°F (110°C) Cast Iron

220°F (104°C) Bronze

Maximum Working Pressure:
200 psi

Connection Sizes:
3/4", 1", 1-1/4", 1-1/2" Flanged

1/2", 3/4" Sweat

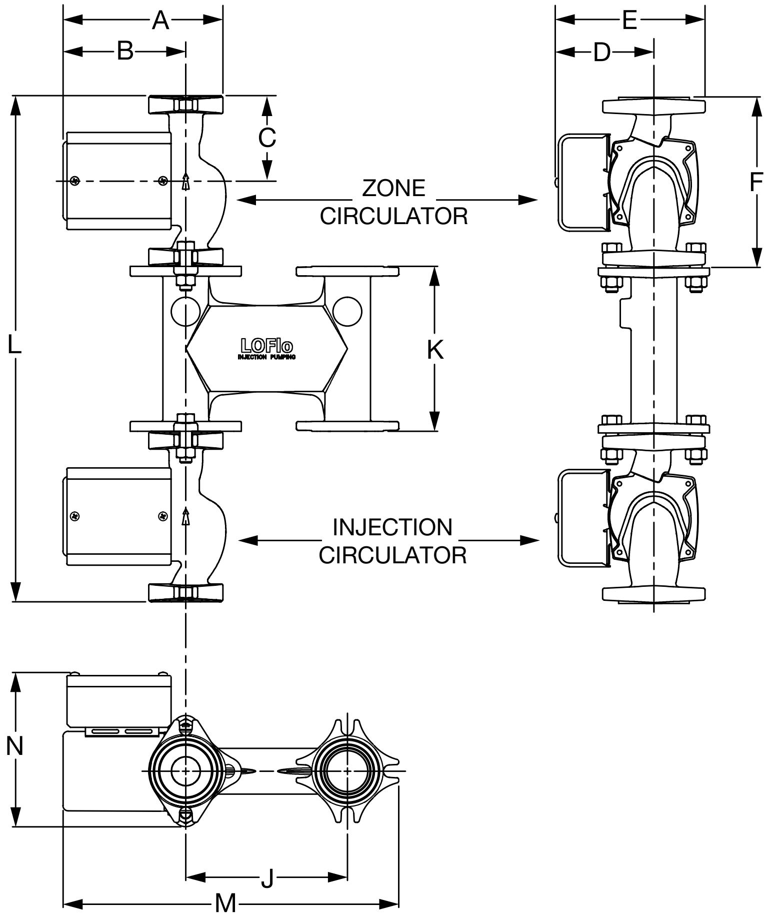
c UL us LISTED

FOR INDOOR USE ONLY

Electrical Data

		3250RPM, 60Hz Single Phase	2750RPM, 50Hz Single Phase
Model	**HP**	**115V, Amps**	**100/110V, Amps**
L0410	1/40	0.52	0.50
L0609	1/35	0.52	0.52
L0710	1/25	0.71	0.71
L0515	1/25	0.79	0.79
L0435	1/8	1.40	1.60
L1111	1/8	1.10	1.60
L1130	1/8	1.90	1.76
L1034	1/6	2.00	2.00
L1121	1/8	1.45	1.80

Dimensional Data

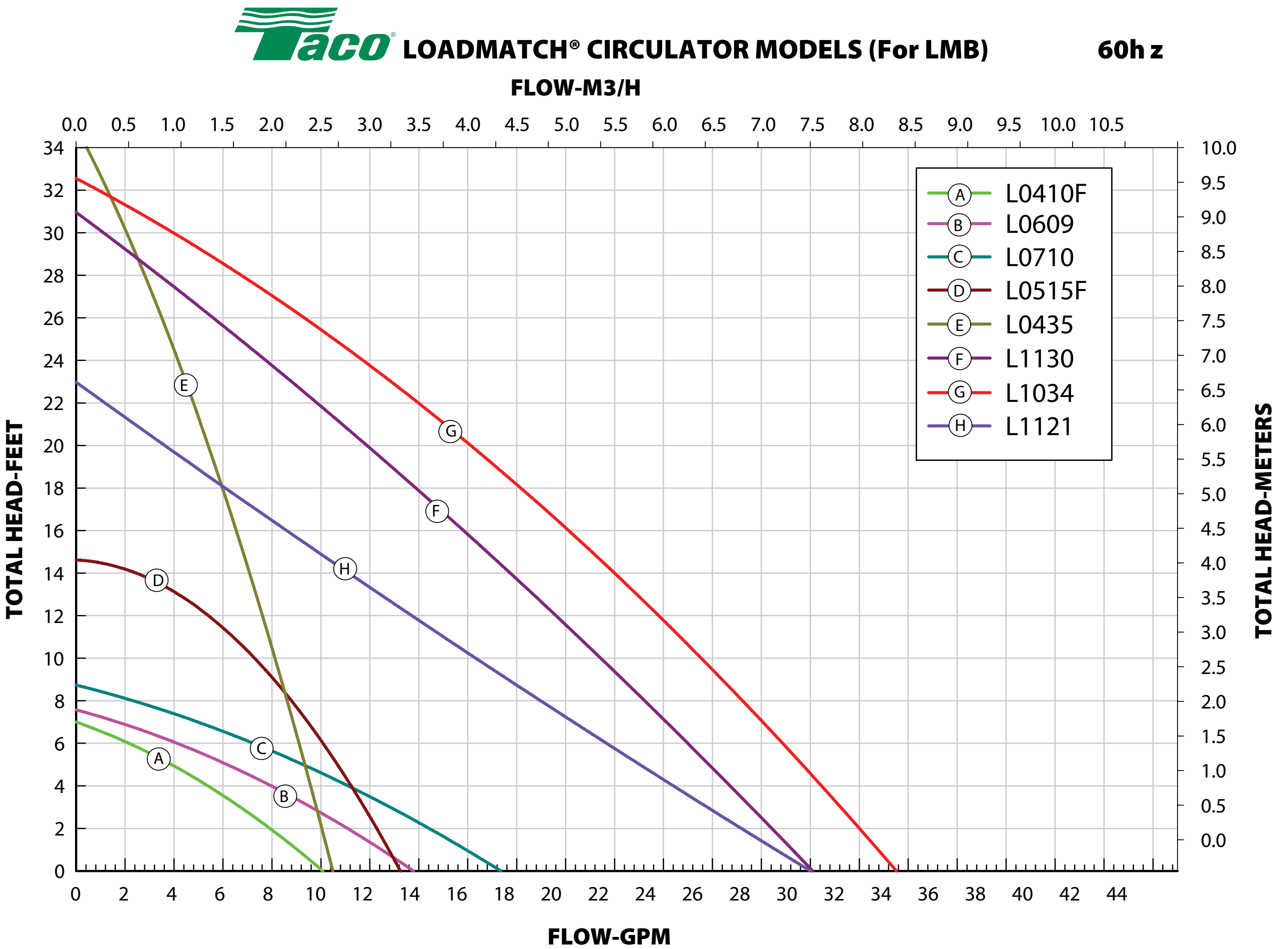


All Parts Feature Flanged Connections

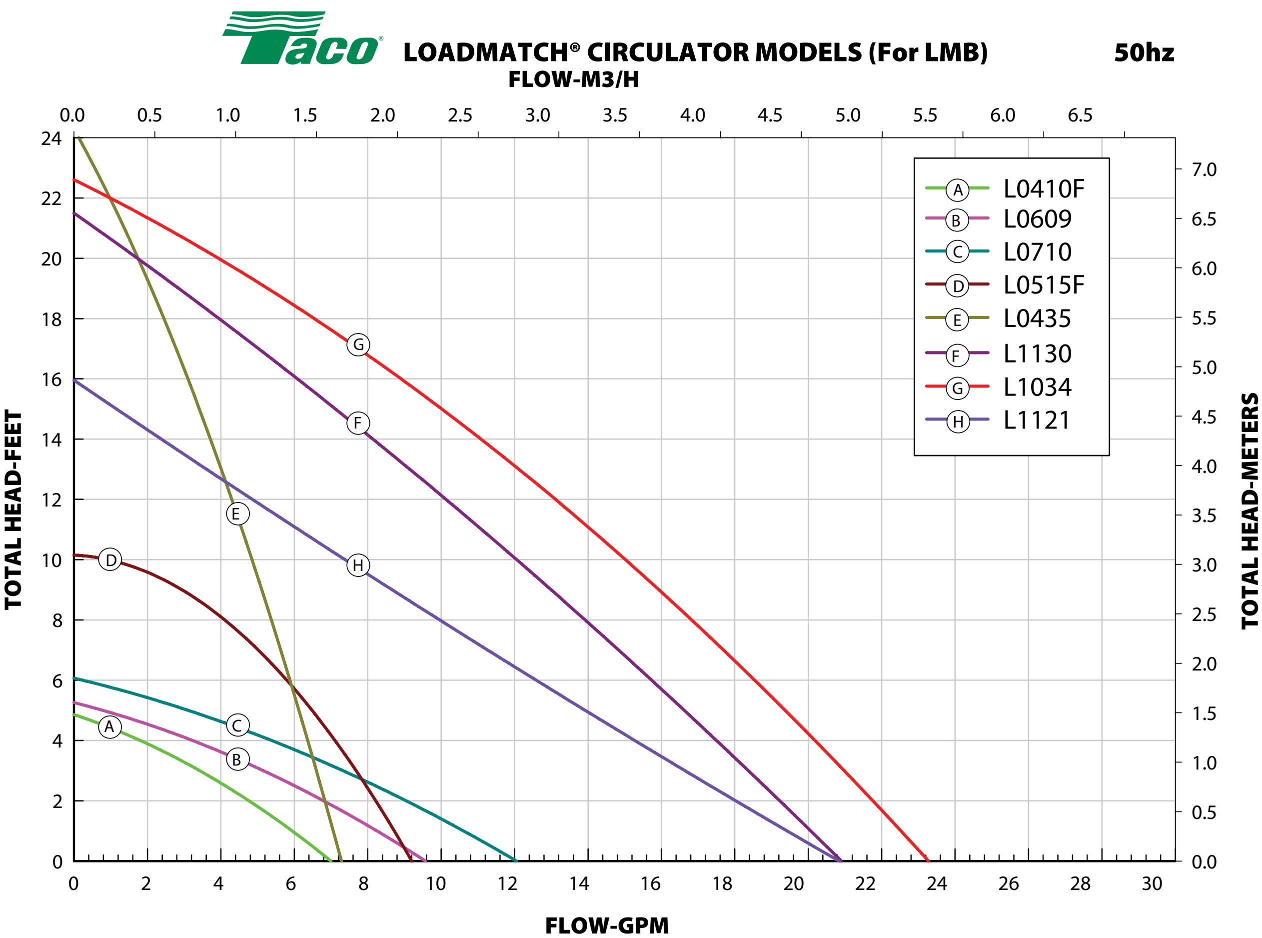
Part Numbers and Dimensional Data

INJECTION CIRCULATOR (Variable Speed)	ZONE CIRCULATOR (Variable Speed)	LOFlo™ PART NUMBER	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	F in (mm)	J in (mm)	K in (mm)	L in (mm)	M in (mm)	N in (mm)	SHIP WEIGHT lbs (Kg)
L0410D	L0410V	LMB0410D-0410V-Y	6¼ (159)	6¼ (159)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	14¼ (362)	5 (127)	19 (8.6)
	L0609V	LMB0410D-0609V-Y	5⅝ (143)	4 (102)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12 (305)	5 (127)	20 (9.1)
	L0710V	LMB0410D-0710V-Y	5⅞ (149)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	21 (9.5)
	L0515V	LMB0410D-0515V-Y	5 15/16 (151)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	21 (9.5)
	L1111V	LMB0410D-1111V-Y	7¼ (184)	5 5/16 (135)	3 3/16 (81)	3 5/16 (84)	5⅜ (137)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 5/16 (338)	5⅜ (137)	22 (10.0)
	L0435V	LMB0410D-0435V-Y	7 (178)	5 11/16 (144)	3 3/16 (81)	3⅜ (86)	5½ (140)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 11/16 (348)	5 7/16 (138)	22 (10.0)
	L1121V	LMB0410D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	13¾ (349)	5⅜ (137)	25 (11.3)
	L1130V	LMB0410D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅛ (359)	5⅜ (137)	24 (10.9)
	L1034V	LMB0410D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅜ (365)	5 15/16 (151)	25 (11.3)
L0609D	L0609V	LMB0609D-0609V-Y	5⅝ (143)	4 (102)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12 (305)	5 (127)	21 (9.5)
	L0710V	LMB0609D-0710V-Y	5⅞ (149)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	22 (10.0)
	L0515V	LMB0609D-0515V-Y	5 15/16 (151)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	22 (10.0)
	L1111V	LMB0609D-1111V-Y	7¼ (184)	5 5/16 (135)	3 3/16 (81)	3 5/16 (84)	5⅜ (137)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 5/16 (338)	5⅜ (137)	23 (10.4)
	L0435V	LMB0609D-0435V-Y	7 (178)	5 11/16 (144)	3 3/16 (81)	3⅜ (86)	5½ (140)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 11/16 (348)	5 7/16 (138)	23 (10.4)
	L1121V	LMB0609D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	13¾ (349)	5⅜ (137)	26 (11.8)
	L1130V	LMB0609D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅛ (359)	5⅜ (137)	25 (11.3)
	L1034V	LMB0609D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅜ (365)	5 15/16 (151)	26 (11.8)
L0710D	L0710V	LMB0710D-0710V-Y	5⅞ (149)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	23 (10.4)
	L0515V	LMB0710D-0515V-Y	5 15/16 (151)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	23 (10.4)
	L1111V	LMB0710D-1111V-Y	7¼ (184)	5 5/16 (135)	3 3/16 (81)	3 5/16 (84)	5⅜ (137)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 5/16 (338)	5⅜ (137)	24 (10.9)
	L0435V	LMB0710D-0435V-Y	7 (178)	5 11/16 (144)	3 3/16 (81)	3⅜ (86)	5½ (140)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 11/16 (348)	5 7/16 (138)	24 (10.9)
	L1121V	LMB0710D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	13¾ (349)	5⅜ (137)	27 (12.2)
	L1130V	LMB0710D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅛ (359)	5⅜ (137)	26 (11.8)
	L1034V	LMB0710D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅜ (365)	5 15/16 (151)	27 (12.2)
L0515D	L0515V	LMB0515D-0515V-Y	5 15/16 (151)	4½ (114)	3 3/16 (81)	2 15/16 (75)	5 (127)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	12½ (318)	5 (127)	23 (10.4)
	L1111V	LMB0515D-1111V-Y	7¼ (184)	5 5/16 (135)	3 3/16 (81)	3 5/16 (84)	5⅜ (137)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 5/16 (338)	5⅜ (137)	24 (10.9)
	L0435V	LMB0515D-0435V-Y	7 (178)	5 11/16 (144)	3 3/16 (81)	3⅜ (86)	5½ (140)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 11/16 (348)	5 7/16 (138)	24 (10.9)
	L1121V	LMB0515D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	13¾ (349)	5⅜ (137)	27 (12.2)
	L1130V	LMB0515D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅛ (359)	5⅜ (137)	26 (11.8)
	L1034V	LMB0515D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅜ (365)	5 15/16 (151)	27 (12.2)
L1111D	L1111V	LMB1111D-1111V-Y	7¼ (184)	5 5/16 (135)	3 3/16 (81)	3 5/16 (84)	5⅜ (137)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 5/16 (338)	5⅜ (137)	25 (11.3)
	L0435V	LMB1111D-0435V-Y	7 (178)	5 11/16 (144)	3 3/16 (81)	3⅜ (86)	5½ (140)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 11/16 (348)	5 7/16 (138)	25 (11.3)
	L1121V	LMB1111D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	13¾ (349)	5⅜ (137)	28 (12.7)
	L1130V	LMB1111D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅛ (359)	5⅜ (137)	27 (12.2)
	L1034V	LMB1111D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅜ (365)	5 15/16 (151)	28 (12.7)
L0435D	L0435V	LMB0435D-0435V-Y	7 (178)	5 11/16 (144)	3 3/16 (81)	3⅜ (86)	5½ (140)	6⅜ (162)	6 (152)	6⅛ (156)	18⅞ (479)	13 11/16 (348)	5 7/16 (138)	24 (10.9)
	L1121V	LMB0435D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	13¾ (349)	5⅜ (137)	28 (12.7)
	L1130V	LMB0435D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅛ (359)	5⅜ (137)	27 (12.2)
	L1034V	LMB0435D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19 (483)	14⅜ (365)	5 15/16 (151)	27 (12.2)
L1121D	L1121V	LMB1121D-1121V-Y	7¼ (184)	5¾ (146)	3¼ (83)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19⅛ (486)	13¾ (349)	5⅜ (137)	31 (14.1)
	L1130V	LMB1121D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19⅛ (486)	14⅛ (359)	5⅜ (137)	30 (13.6)
	L1034V	LMB1121D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19⅛ (486)	14⅜ (365)	5 15/16 (151)	31 (14.1)
L1130D	L1130V	LMB1130D-1130V-Y	7½ (191)	6⅛ (156)	3 (76)	3 5/16 (84)	5½ (140)	6½ (165)	6 (152)	6⅛ (156)	19⅛ (486)	14⅛ (359)	5⅜ (137)	29 (13.2)
	L1034V	LMB1130D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19⅛ (486)	14⅜ (365)	5 15/16 (151)	30 (13.6)
L1034D	L1034V	LMB1034D-1034V-Y	7½ (191)	6⅜ (162)	3 (76)	3⅞ (98)	6 (152)	6½ (165)	6 (152)	6⅛ (156)	19⅛ (486)	14⅜ (365)	5 15/16 (151)	30 (13.6)

Performance Data — 60 Hz



Performance Data — 50 Hz



Mechanical Specifications

SECTION 15182 LOFLO HYDRONIC DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED

A. This Section governs the materials and installation of closed hydronic systems associated with building heating and cooling. The following systems, where applicable, shall be installed as specified herein.

1. Hot Water Heating System
2. Chilled Water Cooling System
3. Dual Temperature Water System
4. Heat Pump Circulating System
5. Closed Circuit Cooling Tower System
6. Run-Around Heat Recovery System

1.2 EQUIPMENT SUBSTITUTION

A. All items eligible for substitution require submission of request for substitution 10 days prior to bid date. This submittal shall include specific models and capacities of equipment and not just manufacturer's literature. The prior approval request package shall also include an engineered flow schematic showing that the manufacturer has a detailed understanding of the temperature cascade. This schematic shall be sealed by a professional engineer. This schematic shall show the entering and leaving temperature, load, and flow at every terminal unit. In addition the prior approval package shall include an owner contact list for 50 single pipe distribution jobs this manufacturer has successfully installed over the last five years. A system performance guarantee shall also be provided along with manufacturer's liability policy cover page. This entire package must be received 10 days prior to bid. Only written approval issued via addendum will be notification of vendor approval. No verbal approvals will be acknowledged.

1.3 TESTING & APPROVING AGENCIES

A. Where items of equipment are required to be provided with compliance to U.L., A.G.A., or other testing and approving agencies, the contractor may submit a written certification from any nationally recognized testing agency, adequately equipped and competent to perform such services, that the item of equipment has been tested and conforms to the same method of test as the listed agency would conduct.

1.4 SUBMITTAL DATA

A. See Section 01300 for general submittal requirements.

B. Provide manufacturer's literature for all products specified in this Section, which will be installed under this project.

C. Provide performance curves for all pumps. Plot the specified operating point for each pump on its respective curve.

Mechanical Specifications

D. Provide complete literature for all components of packaged systems. These include pump performance, heat exchanger calculations, expansion tank capacity, data for all accessories and valves and complete wiring diagrams specific to the exact unit to be supplied. The wiring diagram shall indicate all required field and factory wiring.

E. The submittal package shall include the engineered flow schematic as described in the substitution section.

PART 2 - PRODUCTS

2.1 SYSTEM

1. The LOFlo distribution system shall include LOFlo Mixing Blocks with circulators, twin tees, design suite of software, and system guarantee. The manufacturer shall provide a complete system including LOFlo Mixing Block with circulators, twin tees, primary pumps, system air control, expansion components, heat exchangers, design suite of software and system guarantee. The manufacturer shall have a minimum of 50 single pipe distribution jobs installed within the last five years

B. LOFlo Mixing Block.

1. The LOFLo Mixing Block shall consist of an injection circulator and a zone circulator with an interconnecting decoupler pipe with connections to the primary and zone circuits. The interconnecting decoupler piping shall be stainless steel with flanged connections for field servicing and removal of the circulators. Circulators and interconnecting decoupler shall be factory assembled as one unit.

2. The injection circulator shall be operated at variable speed to control the supply water temperature to the terminal unit for the zone.

3. The zone circulator shall be operated either constant or variable speed to maintain the space temperature in the zone.

C. LoadMatch® Circulator.

1. Circulators shall be Taco Model LoadMatch® circulator or approved equal.

2. The circulator shall be water lubricated, direct drive, requiring no seals, couplers or bearing assembly. Ceramic shaft and carbon bearing construction shall be capable of running without fluid for 10 days without damage to shaft or bearings.

3. The circulator shall be repairable in-line without removal of the circulator from the piping using a stainless steel replaceable cartridge. Circulator shall be provided with a 3 year warranty.

4. The circulator shall incorporate a removable integral spring loaded flow check to eliminate fluid circulation when the pump is off.

Mechanical Specifications

5. The circulator shall incorporate an integral condensate baffle to eliminate condensation on the motor housing when supplying chilled water down to 20°F.

Alternative manufacturing processes that delay the effect of condensation versus preventing it shall not be allowed. Specifically extra coating on the windings is not acceptable.

6. Circulator shall be rated for 200 psi working pressure at 220°F fluid temperature

7. An integral variable speed drive (VSD) shall accept a 0-10 Vdc or 4-20 mA modulating control signal to control the speed of the circulator motor. VSD shall incorporate an exercise sequence to run the pump for 20 seconds if there has been no run signal for 72 hours.

8. Circulator shall bear UL label.

9. The manufacturer shall guarantee system operation for one full heating season and one full cooling season, to the extent that the HVAC system shall deliver the heating and cooling capacities as specified. The value of the guarantee shall be equal to the value of retrofitting the system to a two-pipe system.

D. Twin Tee

1. Tee fittings for terminal unit tie in to system distribution piping shall be Taco Twin Tee.

2. Twin Tee fittings shall be made of ductile iron or bronze and shall be rated for 200 psi.

3. The fitting shall be manufactured with two system connections and two terminal unit connections. The system connections shall be offered in three types: sweat, threaded, and grooved. Terminal unit connections shall all be threaded.

4. The fitting shall include an internal baffle that prevents short circuiting of the terminal unit fluid from inlet to outlet.

E. Design software for temperature cascade

1. Manufacturer shall provide, as part of the system, a software package that allows the construction team to design, document, and manage the temperature cascade in a single pipe distribution system. This software shall produce a flow diagram that sizes all equipment and pipe based on inputted loads and temperature differentials. The software shall document all of these design calculations in a flow schematic. The flow schematic shall show all loads, entering and leaving temperatures, and flow for each terminal unit. In the case of dual temperature systems and heat pumps, it shall document data for both heating and cooling modes.

Mechanical Specifications

F. System Guarantee

1. The manufacturer shall provide a written letter of guarantee certifying the performance of the entire system. This includes but is not limited to terminal unit performance.

PART 3 - EXECUTION

3.1 PUMPS

A. General

1. All pumps, other than circulators, shall be fitted with a multi-purpose or balancing valve or other means of providing system balance.

2. All pumps shall be fitted with instrument test port on inlet and outlet ports unless otherwise indicated.

3. All pump groups (over one pump in parallel) on a single system shall utilize a check valve on the outlet to prevent reverse flow.

B. Circulator

1. Circulator shall be mounted with motor shaft in the horizontal position.

2. Start-Up

a. The primary loop shall be purged of air with the LOFlo secondary terminal loop shutoff valves closed.

b. The primary loop shall be cleaned of debris by starting the primary pumps and continuously circulating water in the primary loop. The system shall be cleaned by frequently cleaning the start-up screens in the primary pump suction diffusers until the screens do not collect any more debris.

c. Once the suction diffuser start-up screens are clean then the shut-off valves to the LOFlo secondary terminal loops can be opened.

d. The secondary terminal loops shall be purged of air by opening the manual air vents on the terminal units.

e. When the secondary terminal unit piping is purged of air then the LOFlo Mixing Block circulators can be started.

END OF SECTION 15182

Frequently Asked Questions

What exactly is the LOFlo™ Mixing Block?

The LOFlo™ Mixing Block (LMB) is a unique Taco innovation that is comprised of a 4-connection hydraulic separator manifold incorporating two circulators that provide variable temperatures of water to a secondary loop when connected to a single-temperature primary loop. It is a complete injection mixing station in a compact, factory-assembled package.

How does it work?

One of the circulators provides a constant flow out of and back into the primary loop. The second circulator, a variable speed, acts as an injection pump to mix primary water with return water, precisely maintaining the desired temperature to terminal units. This close water temperature control results in very close space condition control.

What makes LOFlo® unique?

Small LoadMatch® circulators allow primary pumps to be smaller, lowering power consumption. In addition, the circulators contain anti-condensate baffles, making them suitable for both heating and cooling applications. All LMB components are factory assembled and utilize common, 2-bolt flanged connections for both the circulators and for connections to the primary loop. The manifold is stainless steel and acts as a hydraulic separator in order to insure proper mixing and precise temperature control. The circulators deliver the needed secondary flow without effecting flow or pressure drops in the primary loop.

What does it replace in a conventional system?

The LMB eliminates the need for mixing (balancing) valves, bypass control valves, and check valves in the secondary loop. The LMB injection system controls the loop temperature through its variable speed circulator. In addition, each circulator contains a built-in flow check to prevent "ghost" flows and, when used with the Taco Twin-Tee®, there is no need for two close-coupled T's in each secondary circuit.

Do I need to change my system piping to accommodate the LMB?

Since a single primary water temperature is used for both heating and cooling (such as in chilled beams, radiant panels, variable air volume, and air handling units), the LMB can actually reduce the number of pipes in some systems from 8 to 2!

Perhaps more importantly, the LMB allows the use of higher delta ΔT's, resulting in lower primary flows and allowing the use of smaller pipe. This can reduce flow rates by up to 75%! The elimination of balancing and control valves reduces the pressure drop and resulting pump heads and horsepower.

The use of the Taco Twin-Tee® for connection to the secondary loops will also reduce the number of Tees required simplifying the piping system and reducing installation labor and the potential for future leaks.

Frequently Asked Questions

Does it cost more than the components it replaces?
The LMB costs slightly more than the valves and accessories that it replaces in the secondary loop circuit. However, the savings in primary system piping cost, installation labor, balancing expense, and energy savings make it a highly cost effective addition to any of today's modern space conditioning systems.

Taco's Design Suite software can easily demonstrate both the material and energy cost savings when using the LOFlo™ Mixing Block in conjunction with a LoadMatch®, Radiant, or Chilled Beam commercial system.

Does it control flow accurately?
Accurate flow in the secondary (terminal) loop is assured through the selection of the LoadMatch® circulators included on the mixing block. With more than 90 possible combinations available, the LMB can be selected to meet almost any loop requirement. And since the LMB is in fact a pumping station, flow to the secondary loop is independent of conditions in the primary loop and guaranteed. In fact, this is one of the most desirable characteristics of the LOFlo® Mixing Block.

Is it considered a "Green" product?
The LOFlo® Mixing Block is a component that is used as part of a "Green" heating and air conditioning system. It can save as much as 50% of the piping costs, 50% of the pumping horsepower, reduce maintenance costs, improve system reliability, and deliver precise water temperatures for enhanced space comfort. All of these characteristics make the LMB a valuable tool in achieving the highest degree of "Green" possible in today's innovative commercial building designs.

Does it qualify for LEED points?
LEED points have been earned on projects using the LMB. The elimination of two or four pipes in primary loops has garnered 1 LEED point based on material reduction alone. In addition, the reduction in pump heads and flow rates of the primary loops can lead to pump horsepower reductions that have resulted in additional LEED points. Taco will provide the needed support and calculations to assist in obtaining LEED credits on projects using the LMB.

What is its warranty?
Each Taco circulator carries a three-year flange-to-flange warranty. Unlike most control valves, these wet-rotor circulators contain no seals to leak and require no adjustments. And should one fail in use, it is easily repaired due to its unique replaceable cartridge design. All moving parts are contained in a single assembly that does not require the circulator to be removed from the LMB in order effect a change.

How do you balance flow at the LMB?
The LMB completely eliminates the need for lengthy and expensive system balancing since it will always

Frequently Asked Questions

provide the required flow. Since the circulators are selected independently from the primary loop, and since they are sized to overcome the loop head, they will always provide the required flow and they will do so while providing the required temperature. In effect, each secondary circuit is decoupled from the primary loop.

How long has it been in the market?

Taco has been producing small wet rotor circulators for more than 50 years and has been manufacturing LoadMatch® style circulators for over 10 years. These pumps have demonstrated the highest reliability in hundreds of projects all over the world. The packaged injection mixing block LMB manifold has been available for more than 7 years and it has clearly established its reliability in many projects.

How is it controlled?

The variable speed circulators used on the LMB can be controlled in a variety of ways. They can be provided with a built-in delta ΔT controller that will maintain a set temperature drop between 5˚ and 50˚ across the terminal unit. A simple supply and return sensor connected to the piping is all that is required for precise control.

In addition, any type of controller that can supply a variable DC or Millivolt signal can be used to control the unit. Taco can also provide our LOFlo® Mixing Controller. and all circulators are UL approved, fuse-protected, and contain a snap-in PC board.

What are its maintenance requirements?

There are no maintenance requirements with the LOFlo® Mixing Block.

Do your best work.
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