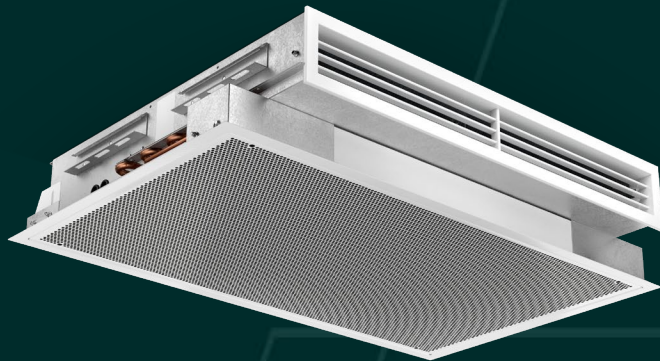




CHILLED BEAM TRAINING PART II

Chilled Beams Advanced Training Topics

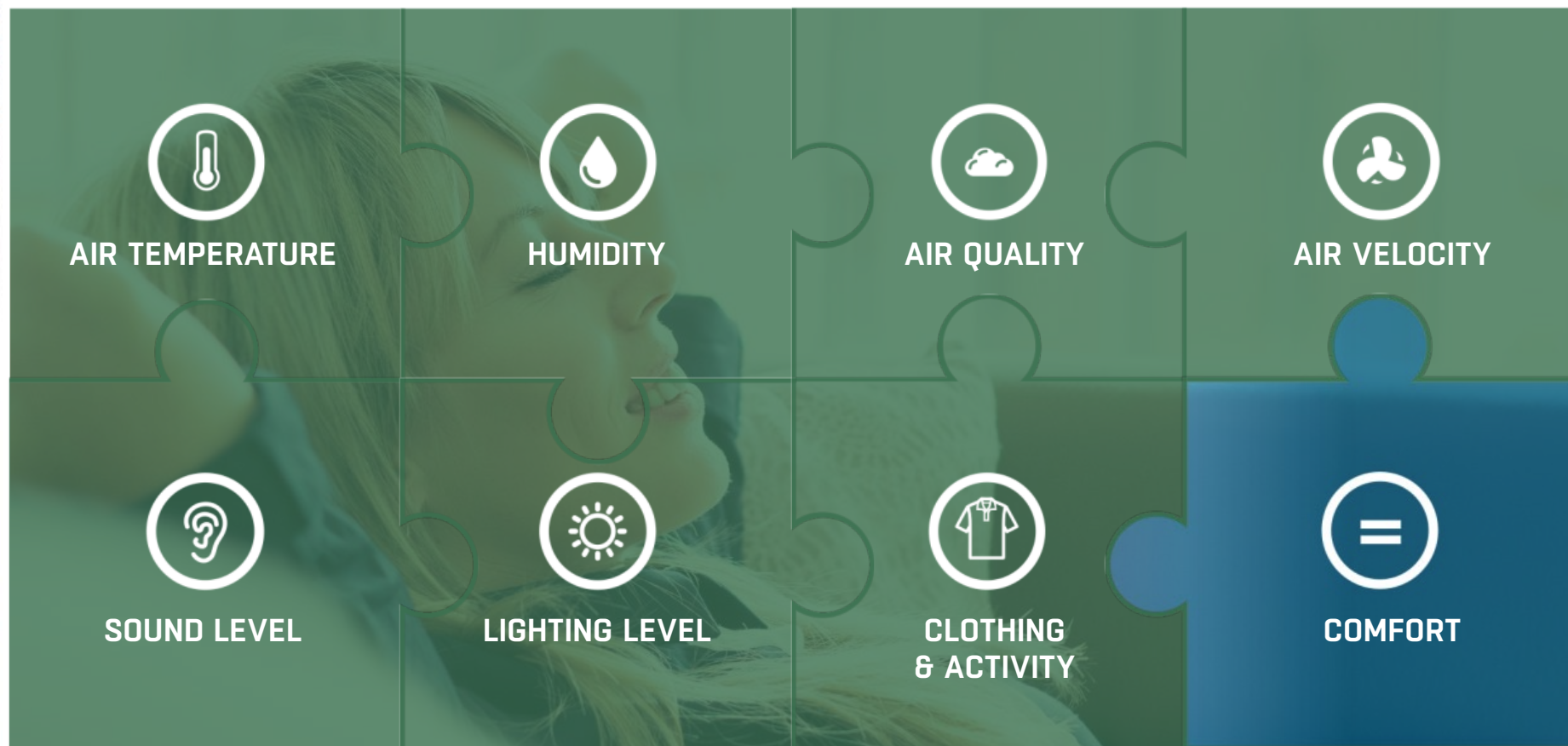
- 1) Determining zone parameters
- 2) Addressing condensation concerns
- 3) Variable airflow for chilled beam systems
- 4) Balancing and commissioning
- 5) Selecting a chilled beam with FläktGroup SELECT
- 6) Unique selling points toolkit





DETERMINING ZONE PARAMETERS

What Makes an Indoor Environment Comfortable?





Comfort



Increased Productivity

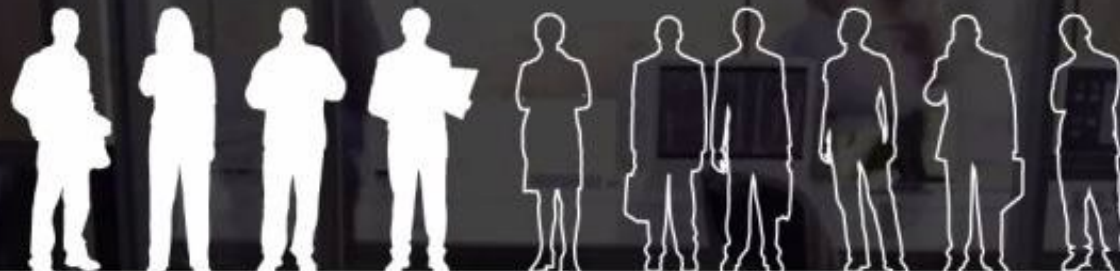


Better Health

Offices are normally ventilated for:



But, typically, occupancy averages only:



ASHRAE 55 specifies the combinations of environmental and personal factors that will produce thermal environmental conditions that are acceptable to most healthy adult occupants at an altitude up to 10,000 ft. within an indoor space designed for human occupancy for periods of 15 minutes or more.

ASHRAE 55 addresses 6 factors:

- Metabolic rate — occupant based
- Clothing insulation — occupant based
- Air temperature – thermal environment based
- Radiant temperature — thermal environment based
- Air speed — thermal environment based
- Humidity — thermal environment based



Analytical determination and interpretation of thermal comfort using calculation of the predicted mean vote (PMV) and the predicted percentage dissatisfied (PPD) indices and local thermal comfort criteria.

CATEGORIES OF THERMAL ENVIRONMENT

CATEGORY	THERMAL STATE OF BODY		LOCAL DISCOMFORT			
	PPD% (PREDICTED PERCENTAGE DISSATISFIED)	PMV (PREDICTED MEAN VOTE)	DR% (DRAFT RATE)	PD% (Percentage Dissatisfied)		
				VERTICAL AIR TEMP DIFFERENCE	CAUSED BY WARM OR COOL FLOOR	RADIANT ASYMMETRY
A	<6	$-0.2 < PMV < + 0.2$	<10	<3	<10	<5
B	<10	$-0.5 < PMV < + 0.5$	<20	<5	<10	<5
C	<15	$-0.7 < PMV < + 0.7$	<30	<10	<15	<10

INDEX TERMS

PMV: Predicted Mean Vote

PPD: Predicted Percentage Dissatisfied

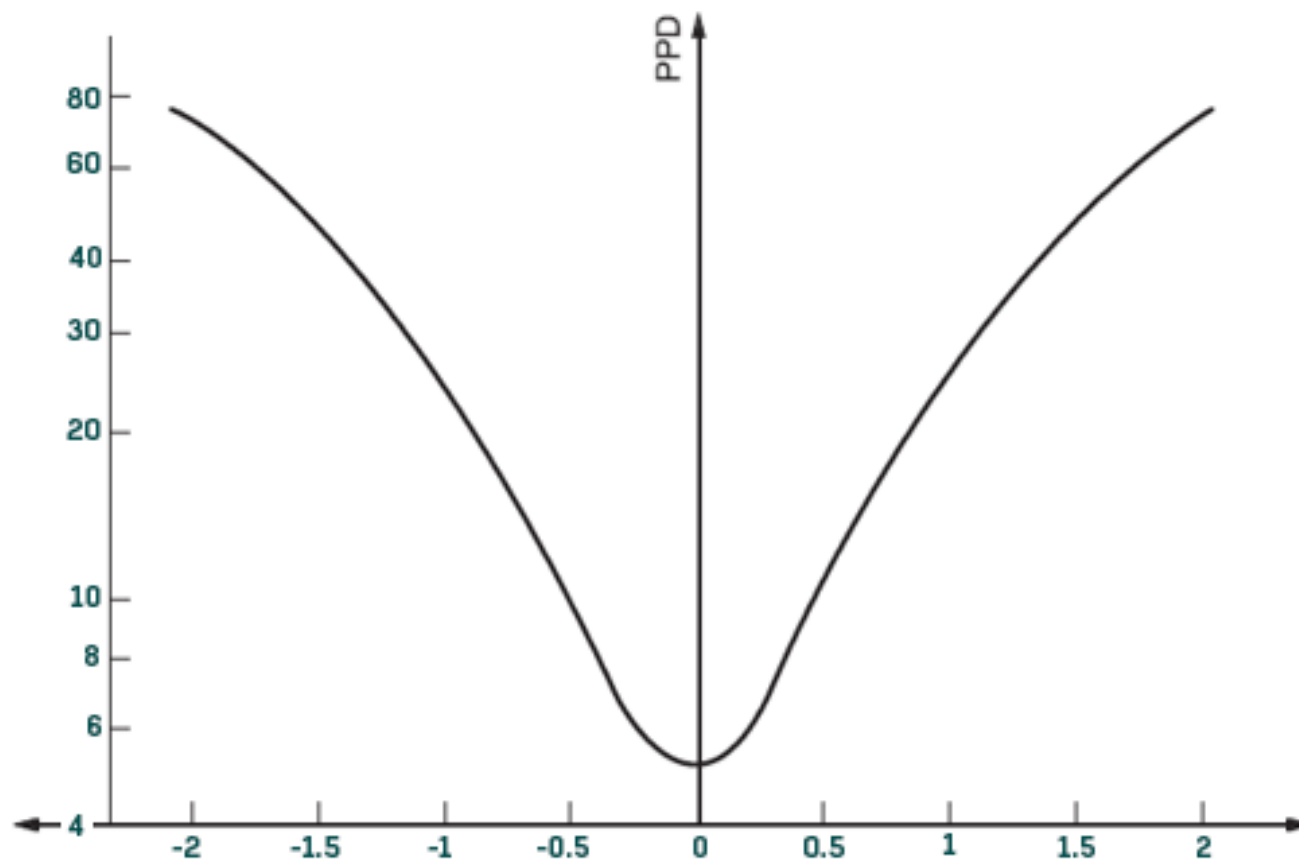
DR: Draft Rate

PD: Percentage Dissatisfied

SEVEN POINT THERMAL SENSATION SCALE

+3	HOT
+2	WARM
+1	SLIGHTLY WARM
0	NEUTRAL
-1	SLIGHTLY COOL
-2	COOL
-3	COLD

The Results



+3	Hot
+2	Warm
+1	Slightly Warm
0	Neutral
-1	Slightly Cool
-2	Cool
-3	Cold

A minimum of 5% of occupants will be dissatisfied by the air treatment system

Ideal Office Conditions



Noise

- Typically 25 – 35 dB(A)

Room Air Velocity

- $V < 0.7$ ft/s in cooling
- $V < 0.5$ ft/s in heating

Temperature

- Summer: $75^{\circ}\text{F} \pm 4^{\circ}\text{F}$
- Winter: $70^{\circ}\text{F} \pm 2^{\circ}\text{F}$
- Vertical temperature difference:
 - $< 2^{\circ}\text{F}$ in summer
 - $< 3.6^{\circ}\text{F}$ in winter

Relative Humidity

- 50% $\pm 10\%$ (check dew point with highest air room temperature and relative humidity)
- Positive pressure inside the building
- Infiltration through building structures
- Good structure, no filtration
- Control: system to control inlet water temperature

1. Selection of thermal environment:

- Room air temperature in winter
- Room air temperature in summer

2. Selection of the indoor air quality level and flow rate:

- Fresh air requirement per person and/or per ft²
- Select relative humidity for the space
- Primary air temperature
 - For a temperate climate: 57.2°F - 59°F and air moisture ~ 19.8 lb
 - Hot and humid climate: 55.4°F - 59°F and air moisture ~ 15.43 lb.

3. Calculation of required cooling and heating capacity:

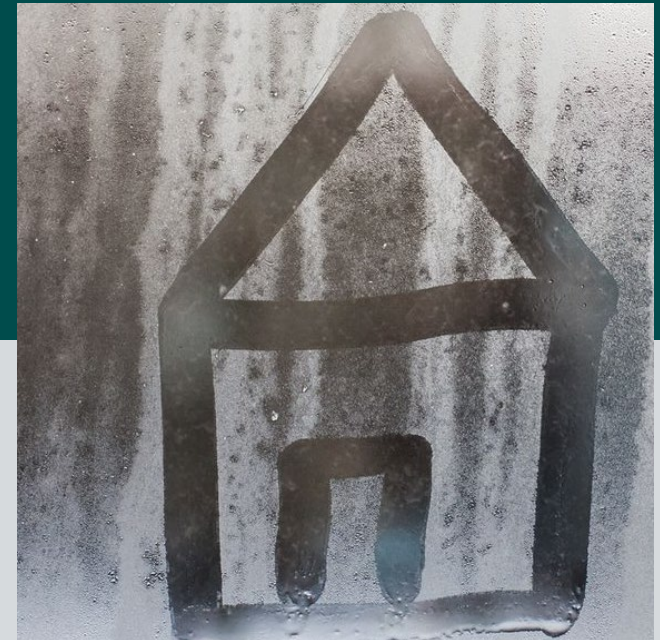
- Heat loads (summer), sensible only
- Heat losses (winter)



CONDENSATION CONCERNS

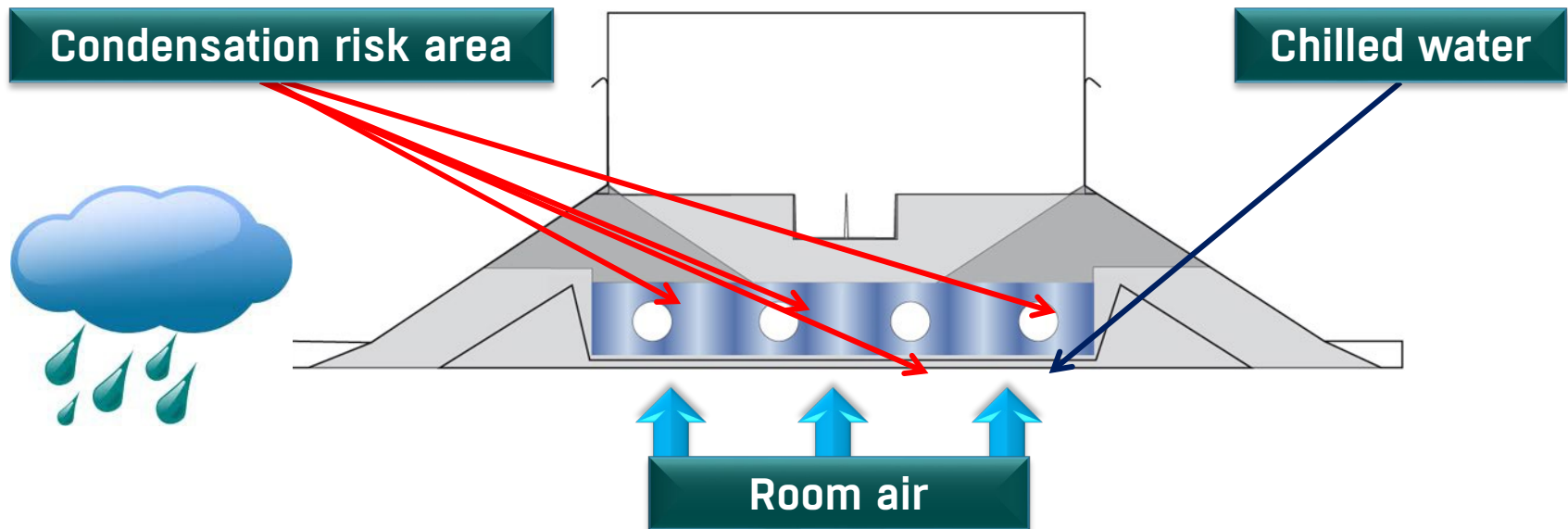
- Chilled beams can be used for sensible cooling only, not dehumidification.
- Latent loads will need to be treated by an energy recovery system.
- In humid and hot climates, the internal latent loads **MUST** be estimated accurately in a chilled beam system.
- The latent load analysis must consider, people, building infiltration, door openings and building permeance.
- The latent load must still be resolved with supply air. The drier the air the less of it is required to remove moisture resulting in lower all-around energy use.

CONDENSATION is a CRITICAL Parameter to CONTROL in a chilled beam system.

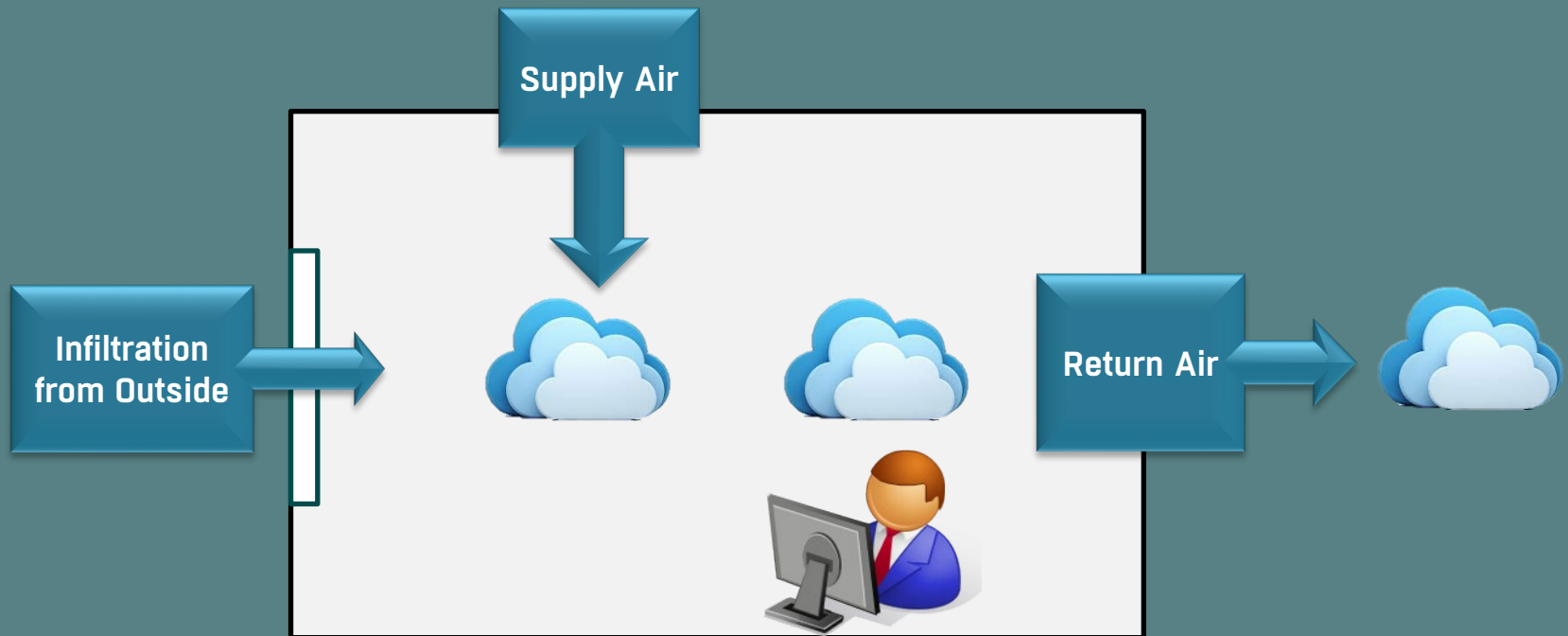


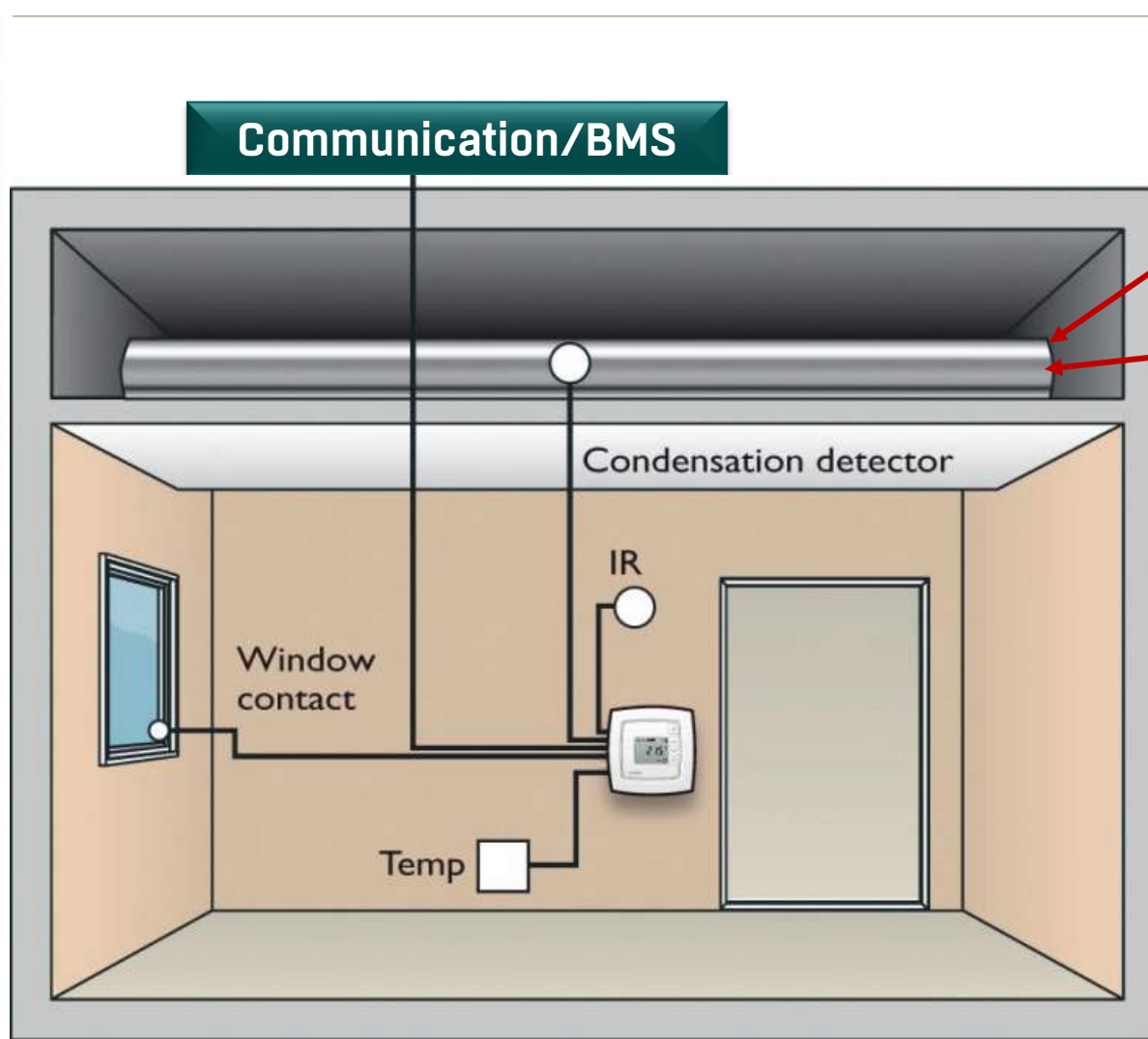
The Condensation Principle

- Condensation occurs when room air encounters a chilled beam's water coil, and the surface of the water coil has a temperature lower than the room's dew point.
- The dew point depends on the hygrometry and the temperature in the room.
- Condensation is a concern when using chilled beams.



Condensation Avoidance





Inputs:

- Condensation sensor or humidity sensor
- Window sensor
- Room or exhaust temperature

Outputs:

- Signal ON/OFF for the 2 way valve
- Signal 0-10V for the variable air volume (NOVA II chilled beams)

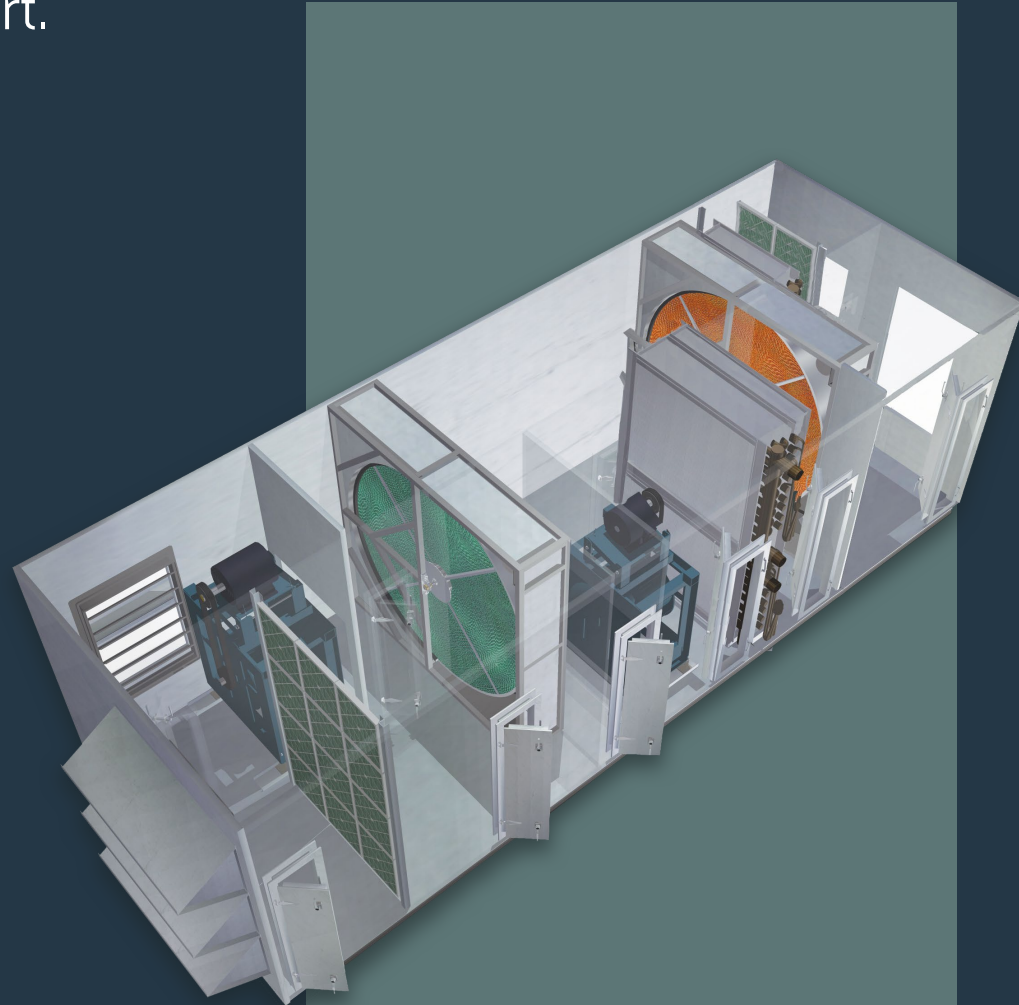
NEUTON®: Avoiding Condensation

- The NEUTON® pump module is an active condensation control system.
- Equipped with smart sensors and controls to respond to occupied, unoccupied and low load conditions by varying water flow and/or temperature as needed to accommodate changes in load conditions.
- The NEUTON® the hot and cold-water control valves to only release enough water of each temperature to maintain the desired beam temperature and avoid condensation.



Combining an Energy Recovery Unit and a Chilled Beam System

- Add a Pinnacle® or ElitePro to maximize indoor air comfort.
- The energy recovery wheels in these units, will help dehumidify the air, eliminate contaminants, save money, and energy.
- The outdoor air, conditioned by the energy recovery unit, will be supplied to rooms through chilled beams.

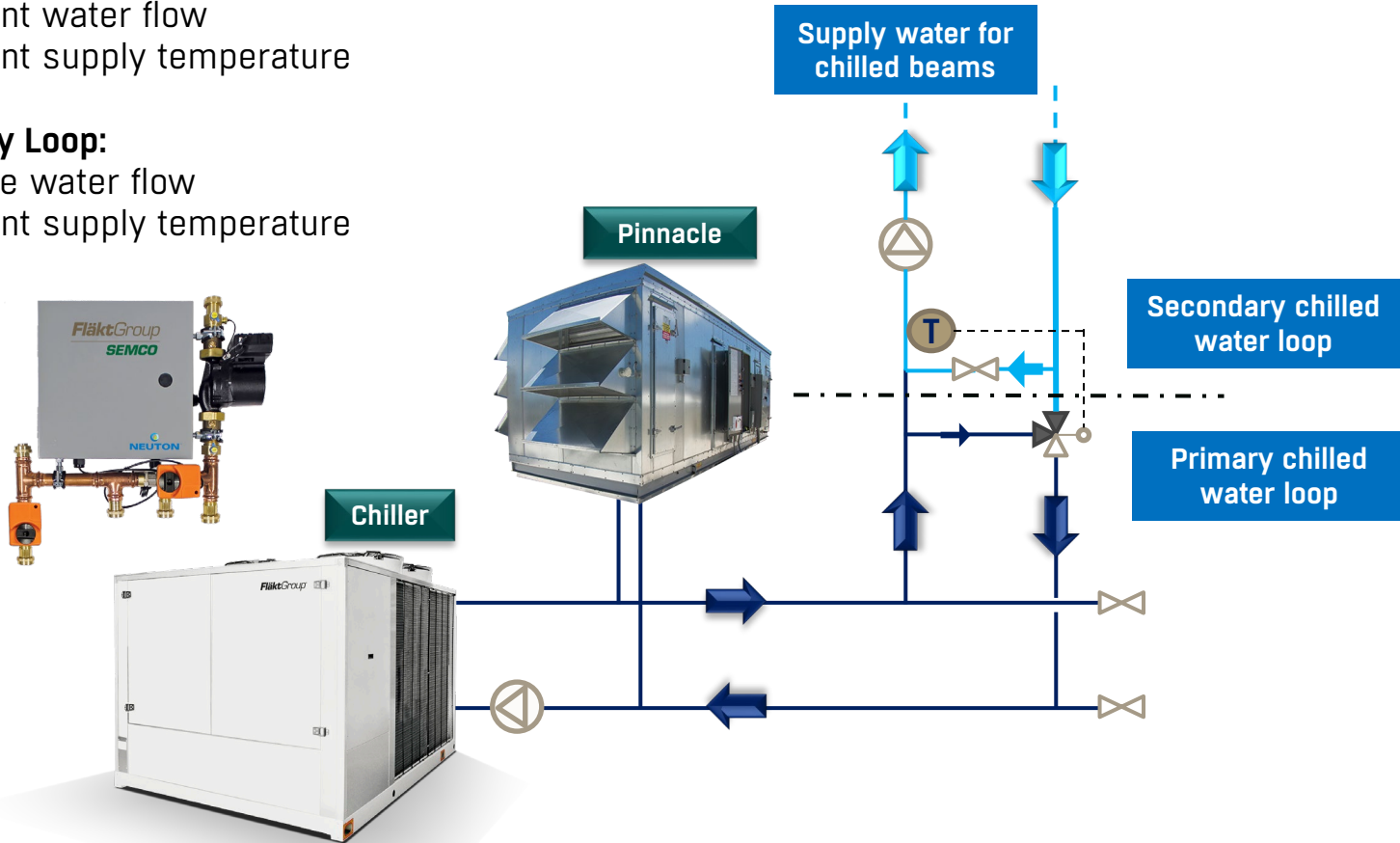


Primary Loop:

- Constant water flow
- Constant supply temperature

Secondary Loop:

- Variable water flow
- Constant supply temperature

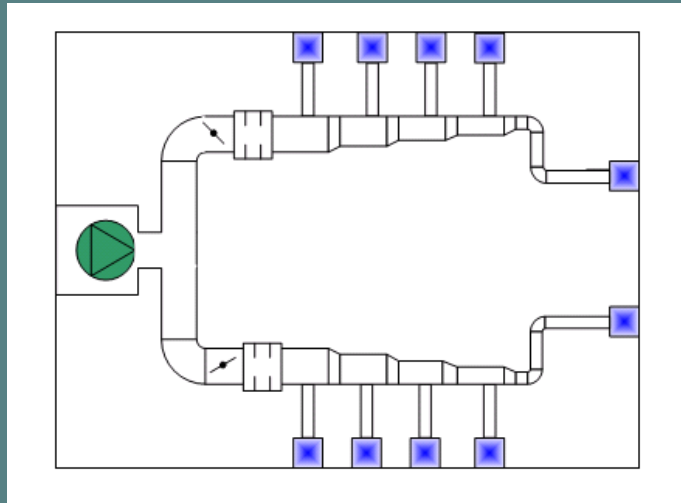


Only one chiller is necessary for both chilled beams and an energy recovery unit.



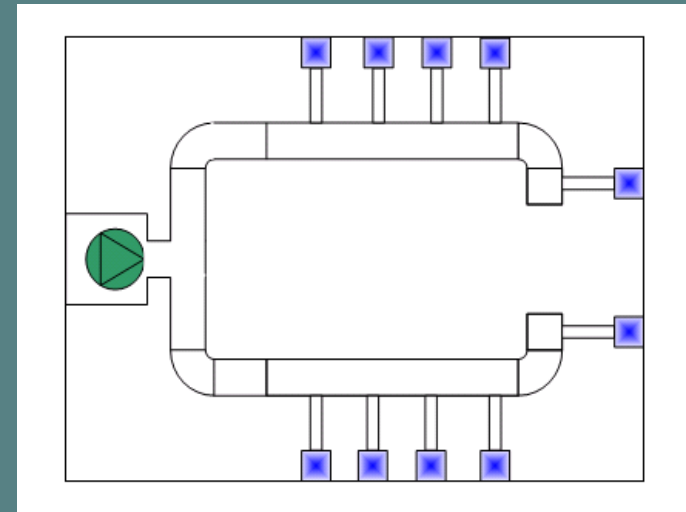
VARIABLE AIRFLOW FOR CHILLED BEAM SYSTEMS

TRADITIONAL VENTILATION DUCTWORK



- CAV system only commissioning is required.
- A damper must also be located before each terminal unit for balancing.

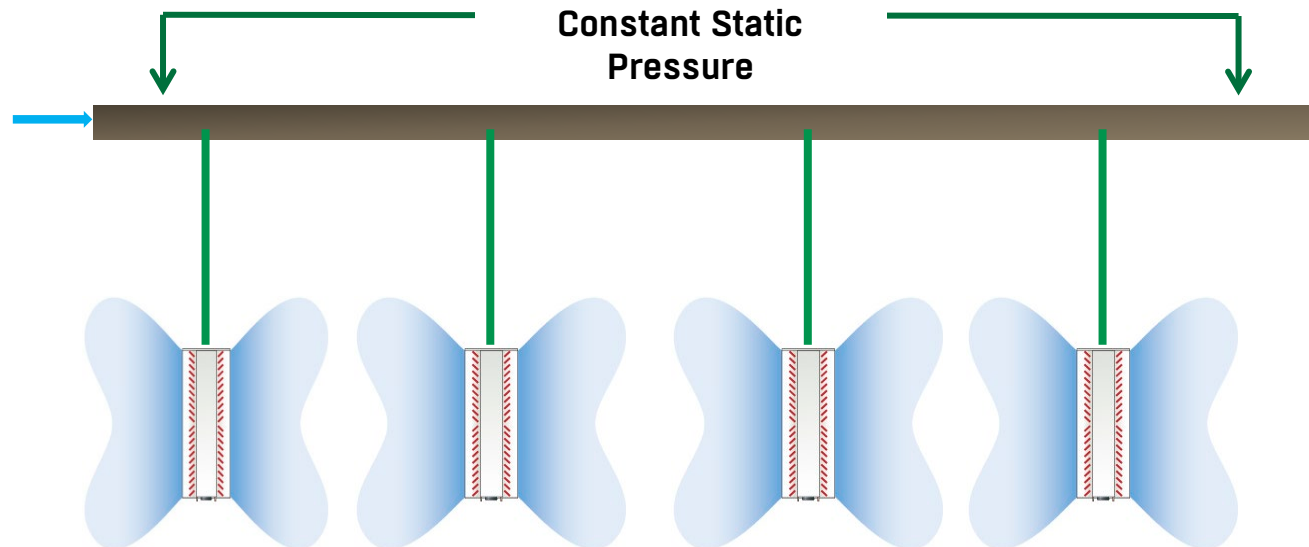
STATIC PRESSURE REGAIN DUCTWORK



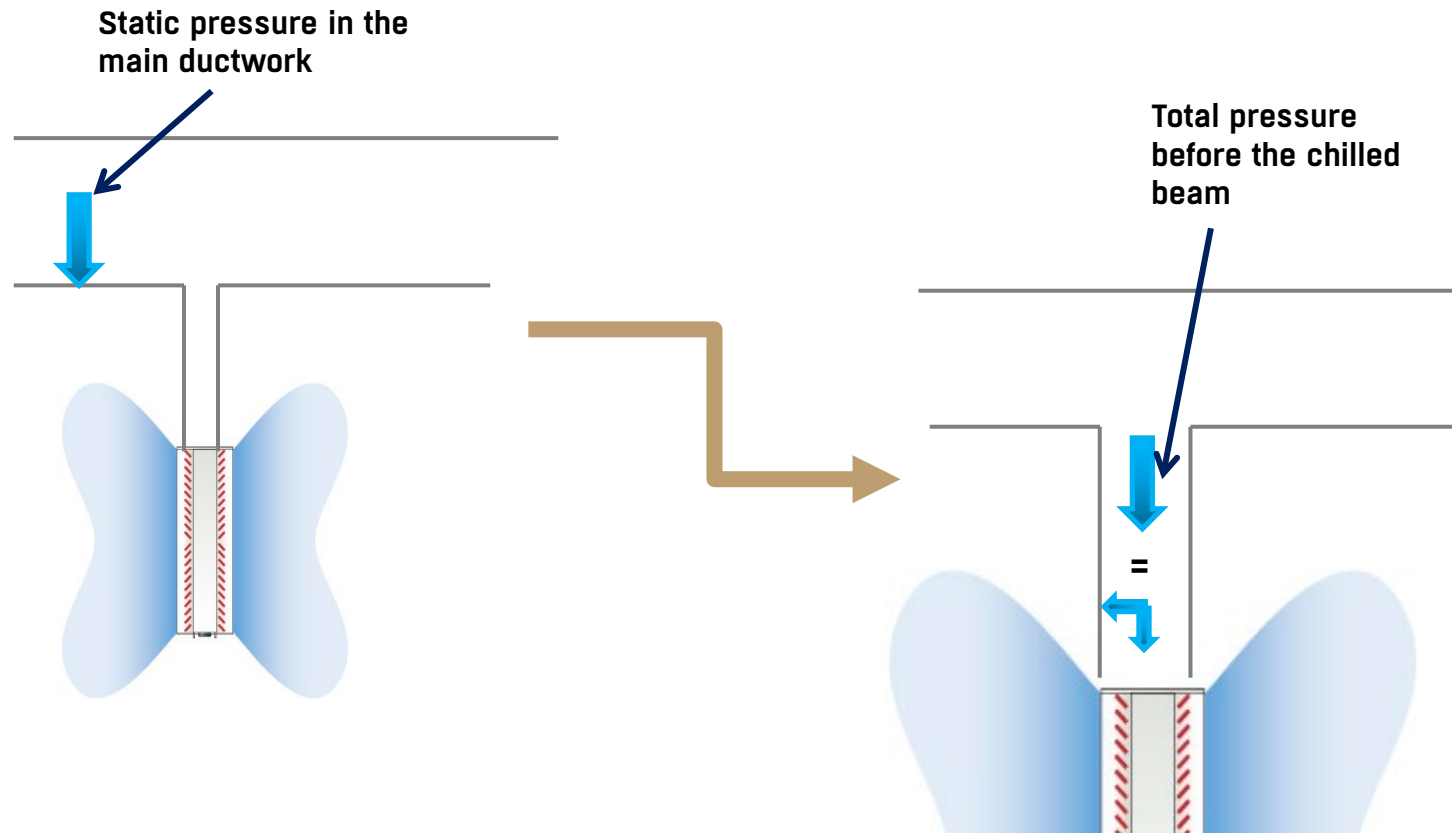
- CAV or VAV system
- Self-balancing system
- Less commissioning to do
- Energy savings

Pressure Dependent Chilled Beams:

- Ductwork will need to be designed to allow for a constant static pressure, if beams will be used.
- The airflow is dependent on the static pressure of the ductwork.
- If the pressure changes, the airflow is modified.
- The static pressure must be constant throughout the ductwork.

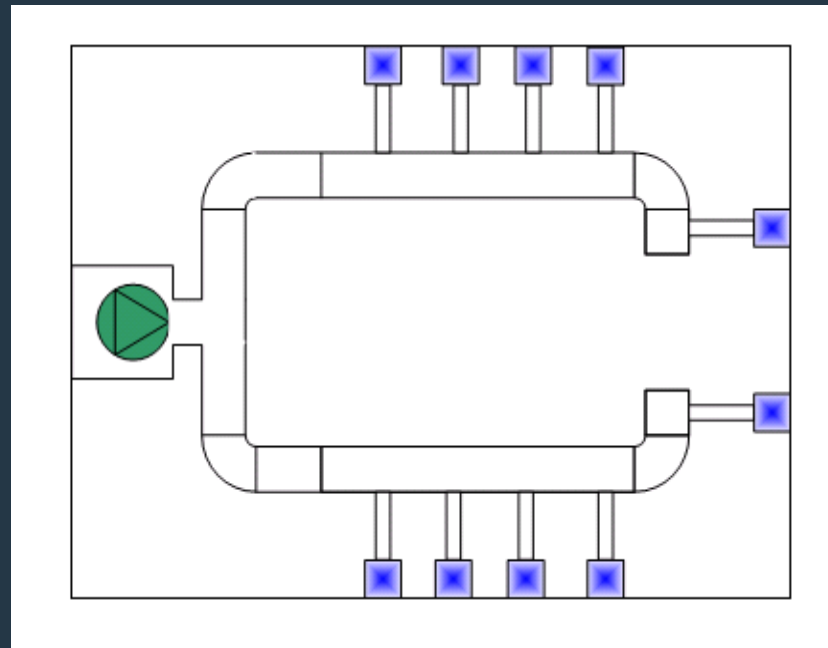


Pressure Drop



Static Pressure Regain Ductwork

- Same static pressure at the beginning and at the end of the branch.
- Ductwork is the same diameter along the entire branch.

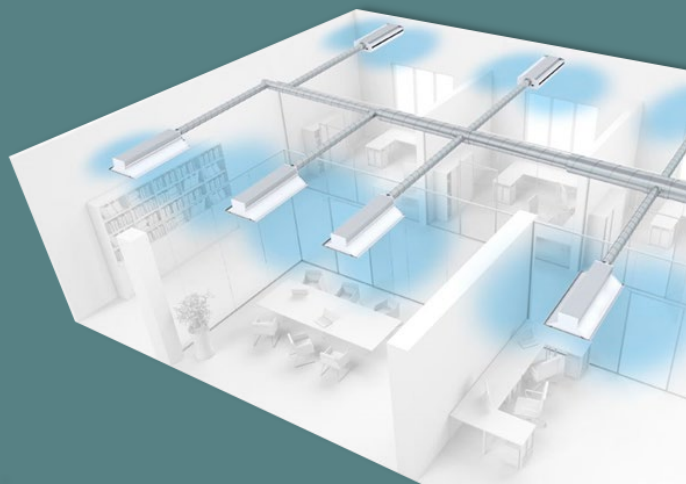


Selection of Ductwork:

FläktGroup SEMCO has built the curves to enable a quick selection of ductwork sizes depending on the length of the branch, the air velocity before the branch and the airflow in the branch

Designing a Zone

- By floorplan
- By heat loads values per square feet
- By use/purpose: closed offices, cubicles, open space, and conference rooms



- Optional flow control device for the LYRA II IQCC, NOVA II IQFI and the Orion II IQHA.
- It adjusts ventilation in response to changes in demand, upstream pressure, occupancy levels and evolving zone conditions. Ensuring that conditions always meet occupant needs.
- It allows the beam to be pressure independent and work with any duct system regardless of pressure. Increasing beam flexibility.
- Equipped with a CO₂ sensor, temperature sensor and occupancy sensor.
- Has three operating modes: unoccupied, standard occupancy and high occupancy.
- Can easily be moved to other beams.





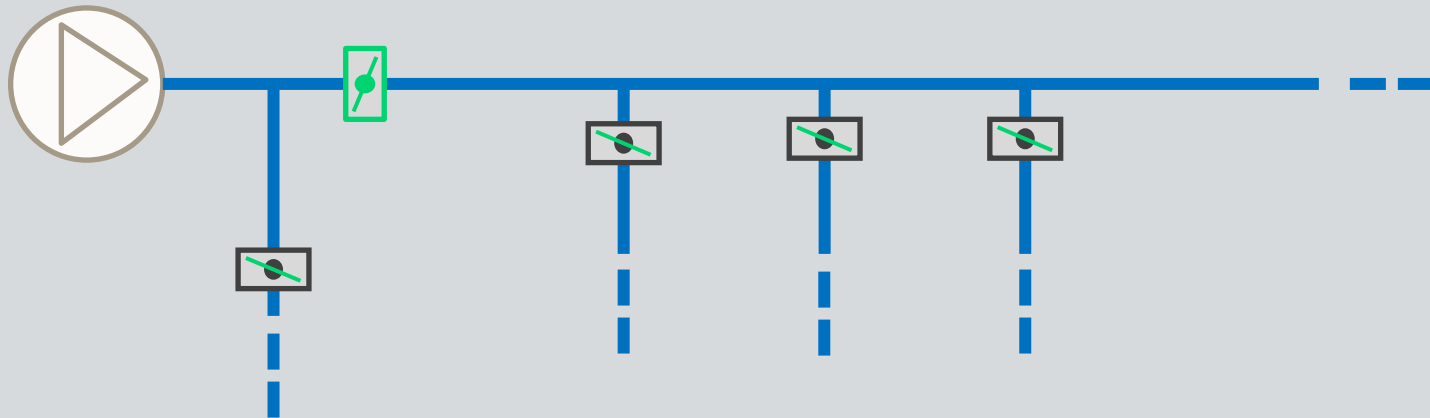
BALANCING & COMMISSIONING

Why Balance Ductwork?

tandard sizes and uncertain local friction resistance factors, airflows tend to be not exactly as designed, so dampers are needed to balance the ductwork.

Problems caused by unbalanced ductwork:

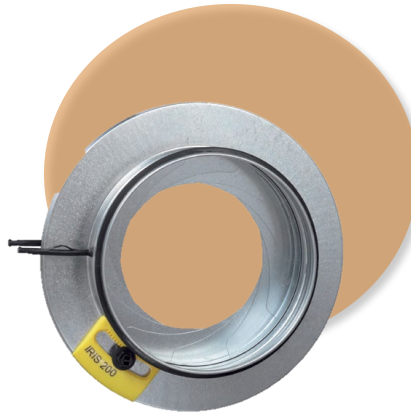
- Some rooms have too much or not enough airflow.
- Some rooms get too cold or too warm.
- The rooms with too much airflow are noisy.





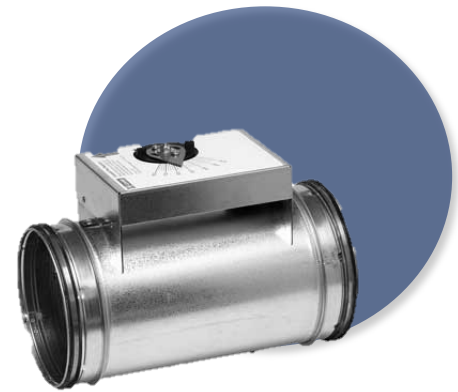
Blade Damper:

- Used for branches and Terminal Units



Iris Damper:

- Used for terminal units
- Low noise



Constant Volume Damper:

- Used for terminal units
- No commissioning is required



- Help to set the operating times and set-points.
- Ensure that a proper installation is done.
- Adjustment so that an even regulation is obtained.
- Possible problem solving
- The airflow and the water flow are adjusted during the commissioning.

Parameters impact:

- The pressure drop of the ductwork will impact any energy recovery units.
- The static pressure will impact induction, so the air flows through the chilled beams.
- The induction will impact the cooling capacity.
- The water flowing into the coil will impact cooling capacity

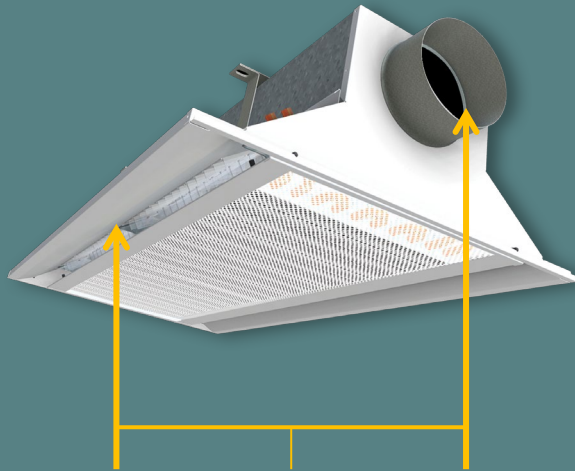


Flushing the System

- To clean the piping, close the shut-off valves of each chilled beam to clean the main piping first.

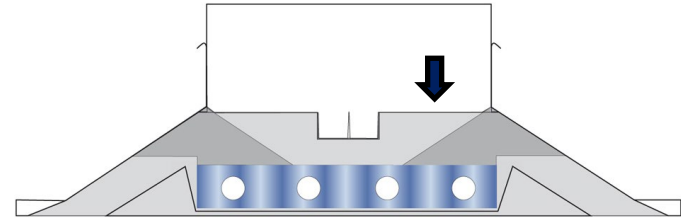
Filling up and Venting the System

- The main pipes must be installed at a higher level than the chilled beams.
- Remove air bubbles from piping.



Total Air Pressure Drop:

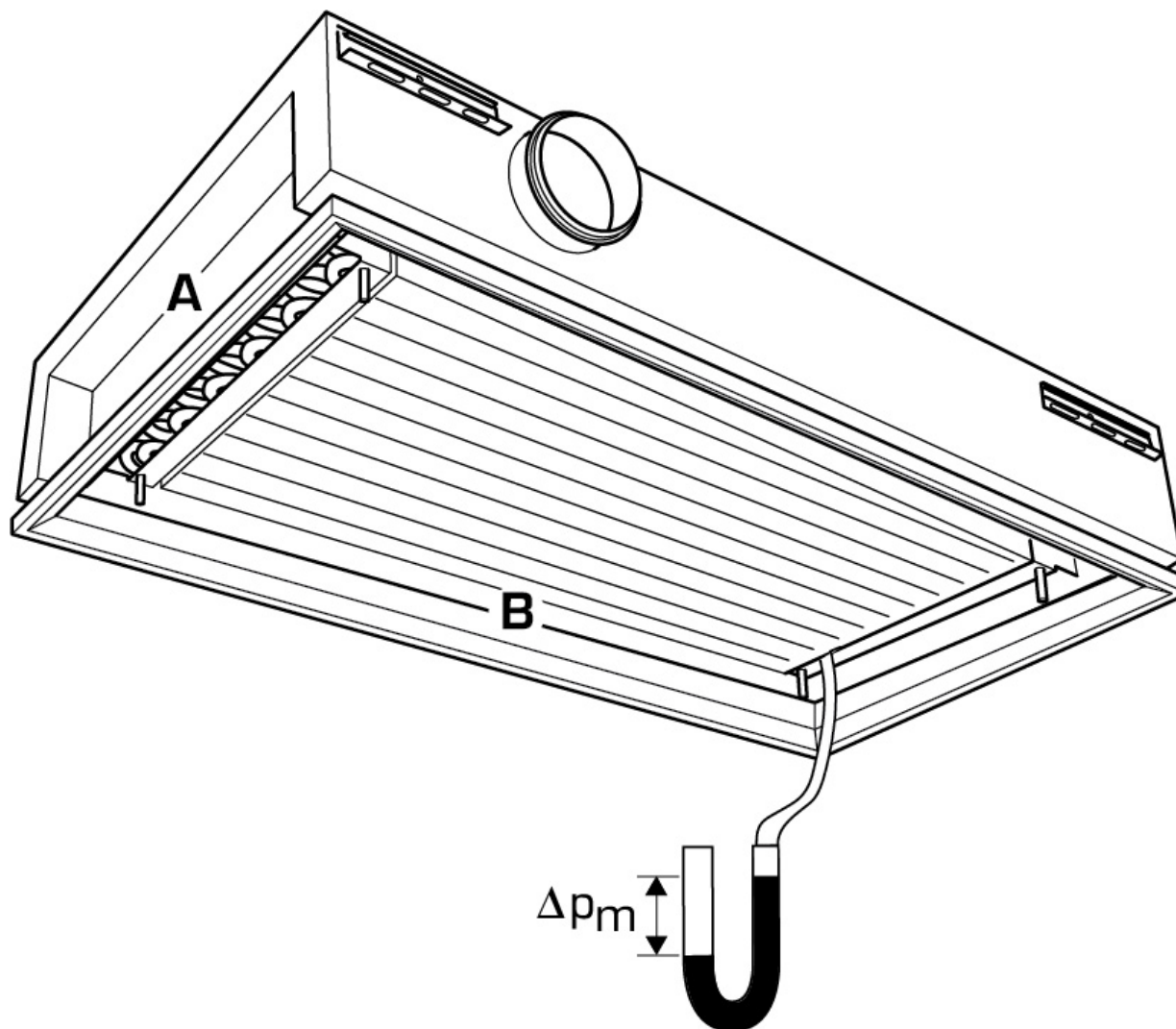
- Pressure used to design the ductwork and given by the selection tool **SELECT**
- Difference of total pressure before the beam and after the outlets of the beam.



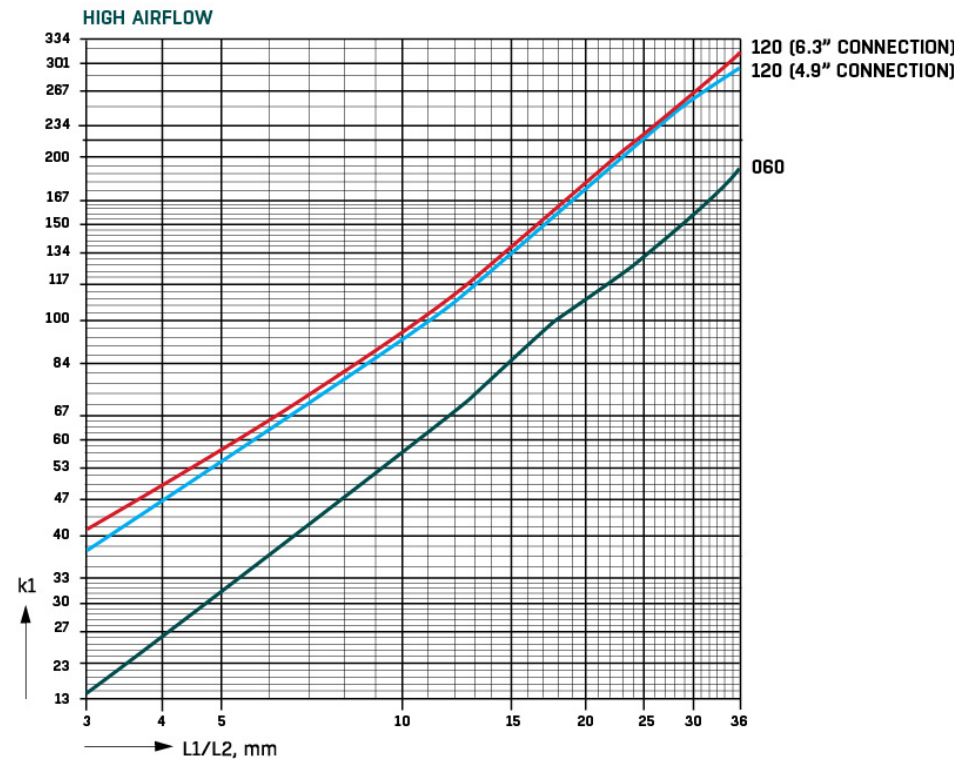
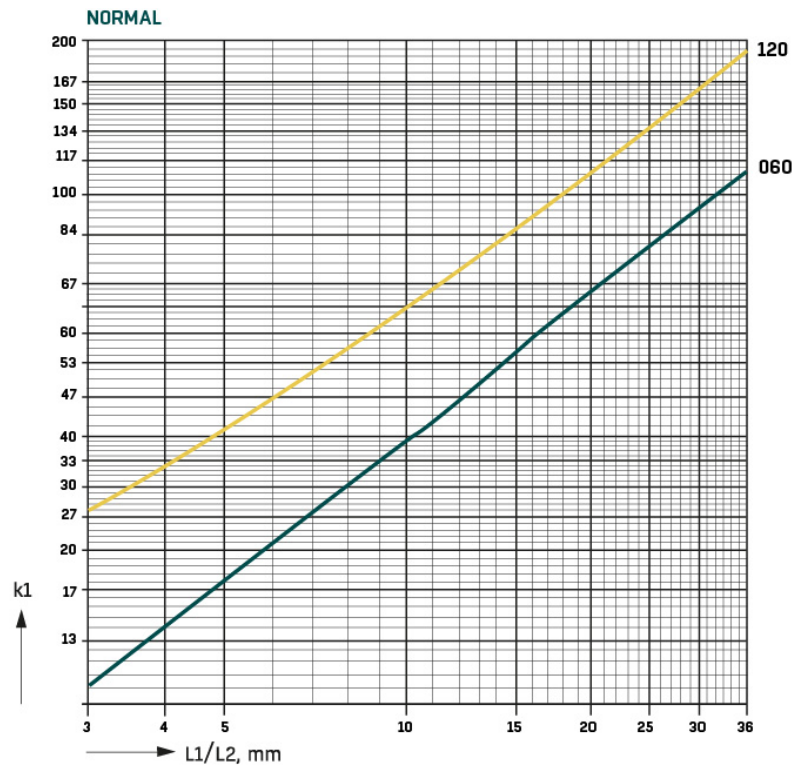
Static Pressure in the plenum chamber:

- Pressure used to do commissioning and measure the airflow through the chilled beam.
- Slightly different from the static pressure before the beam.
- More accurate than others (ex. Pitot tube) methods

Checking Air Pressure



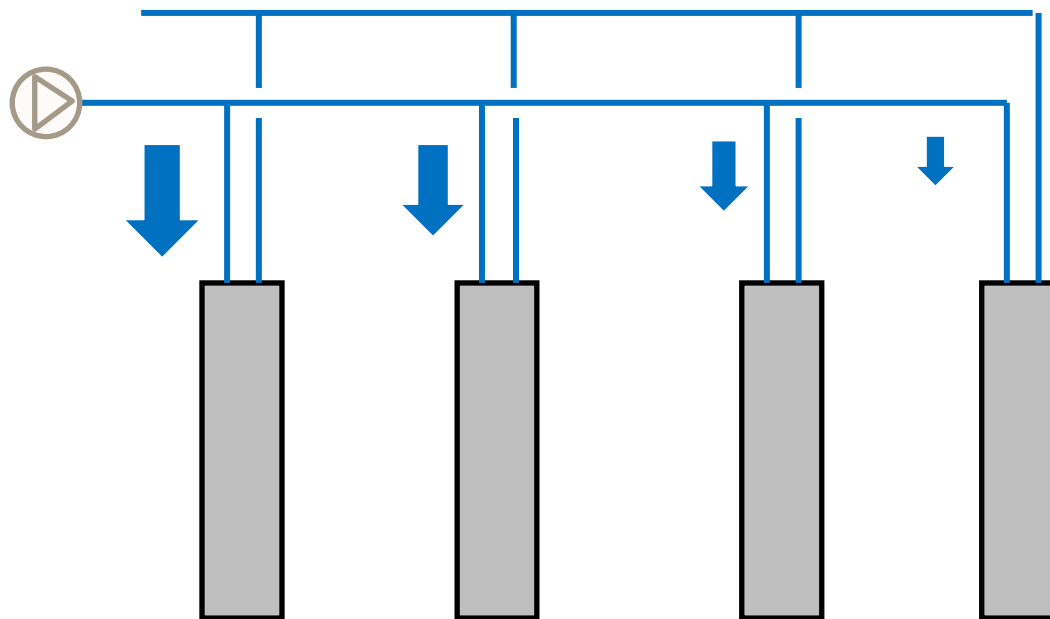
LYRA II IQCC: Airflow Commissioning



$$q = k \sqrt{\Delta p_m} \quad \begin{matrix} (\text{l/s}) & (\text{Pa}) \end{matrix}$$

$$q = 3.6k \sqrt{\Delta p} \quad \begin{matrix} (\text{m}^3/\text{h}) & (\text{Pa}) \end{matrix}$$

Why Balance Piping?

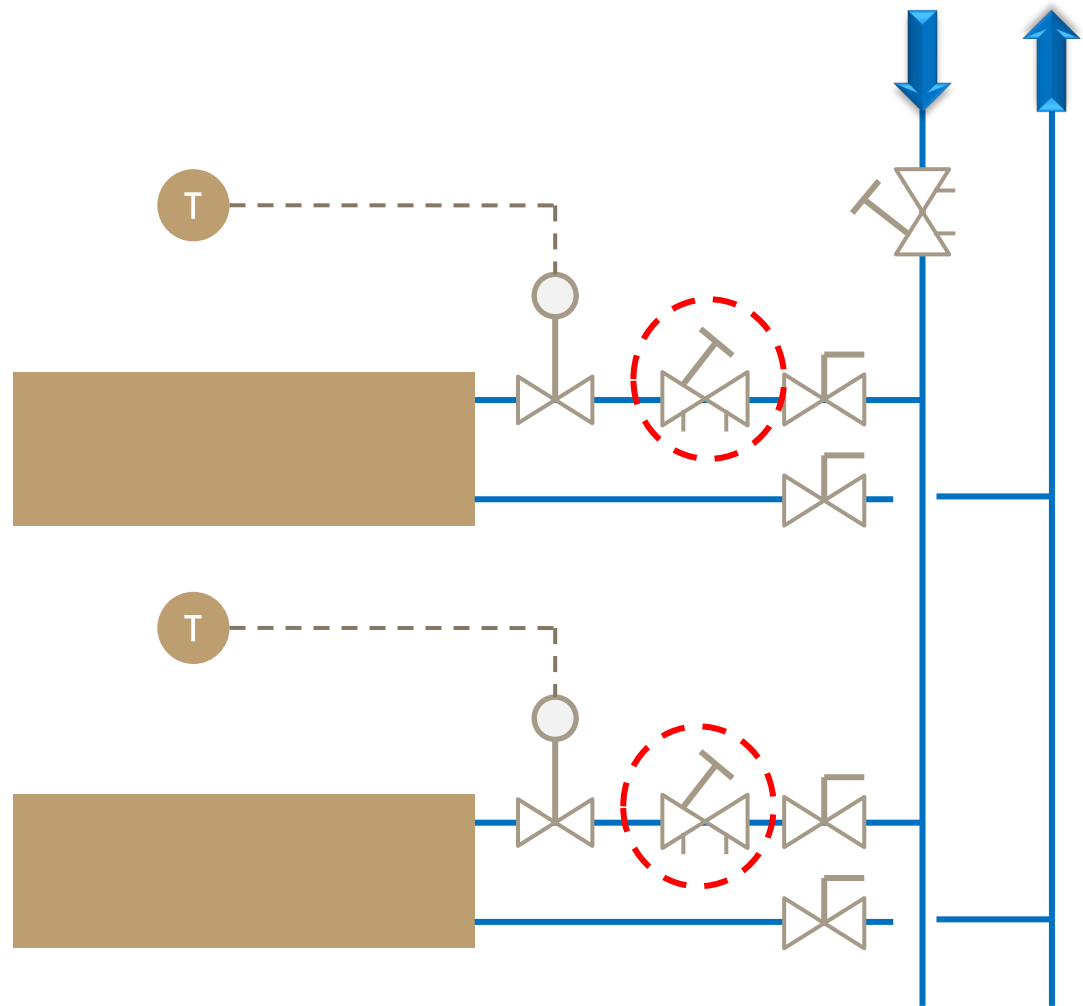


To compensate, the furthest unit of the system should be over supplied with water:

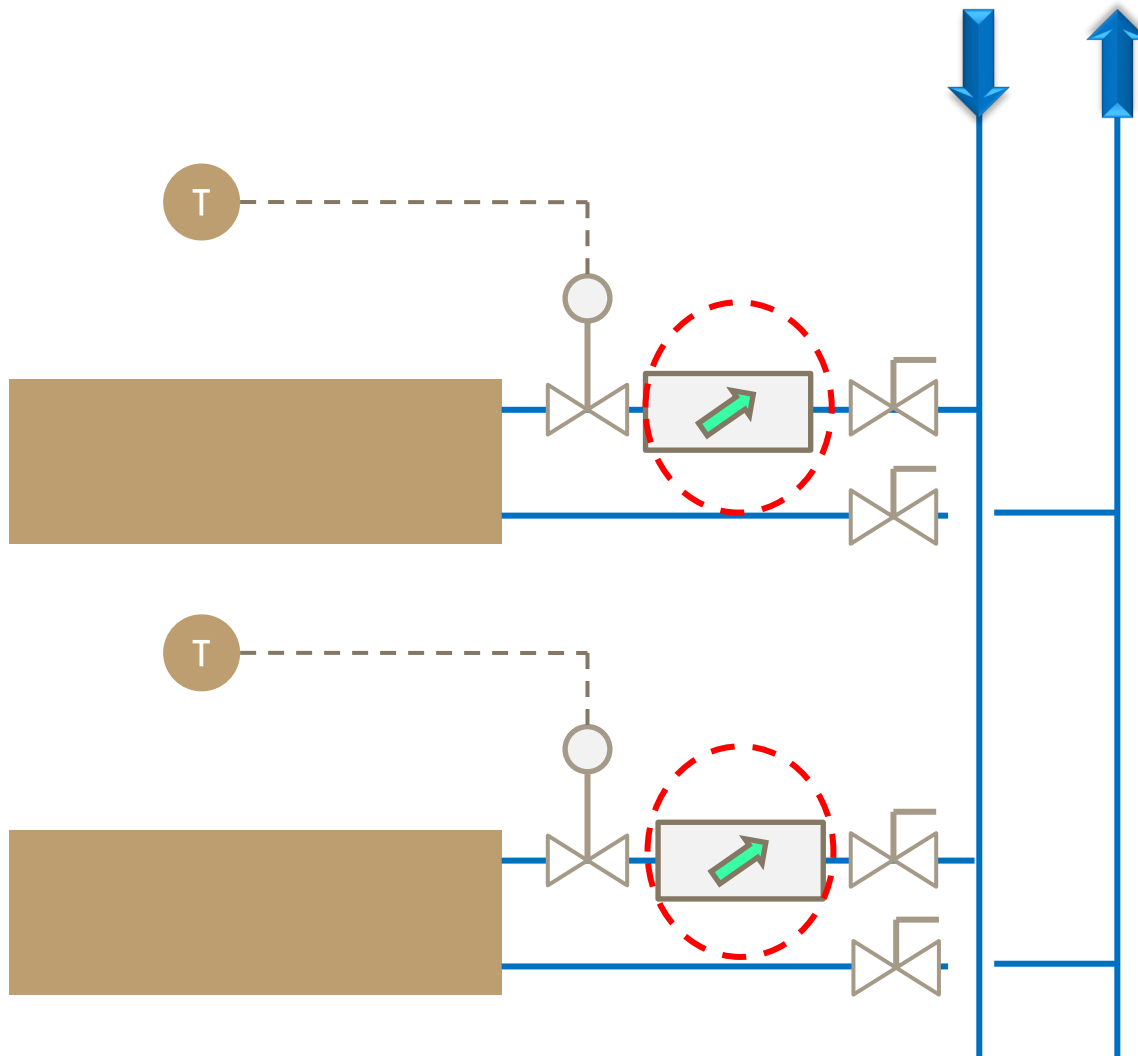
- Unnecessary energy is wasted chilling or heating
- Pumping excess flow through the units closest to the plant room

Water Balancing Static

- Commissioning is required
- This is **NOT** the best solution for chilled beams since it's a variable water flow system

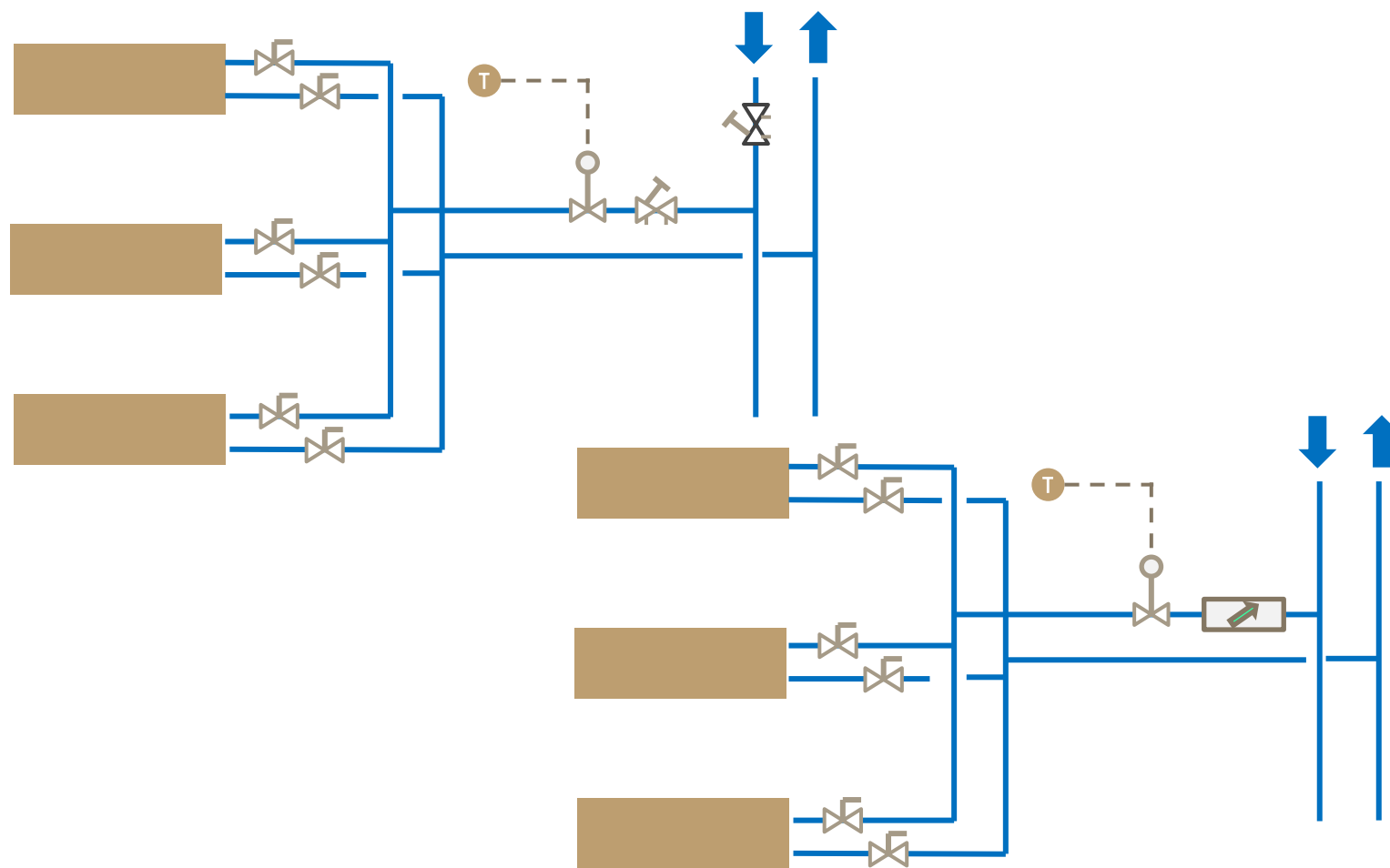


Water Balancing Dynamic



- Pre-set in the factory.
- Commissioning isn't required.
- The dynamic balancing valve is pressure independent.
- Fewer valves than static balancing system.
- Most efficient solution for chilled beams with variable water flow.

Common Water Balancing





SELECTING A BEAM WITH SELECT

Things to Consider When Selecting a Chilled Beam

Chilled Beam Type:

- Active Chilled Beam — exposed or flush mounted

Selection of Inlet Water Temperature to Avoid Condensation:

- $\Delta t = 14.4^{\circ}\text{F}$ between room temperature and mean water temperature.
- $\Delta t = 14.4^{\circ}\text{F}$ between room temperature and supply air temperature.

Selection of Water Temperature Difference and/or Water Flow Rate:

- 0.8 gpm per circuit

Chilled Beam Model

Total and Active Length of Chilled Beam

Accessories



1. select.flaktgroup.com

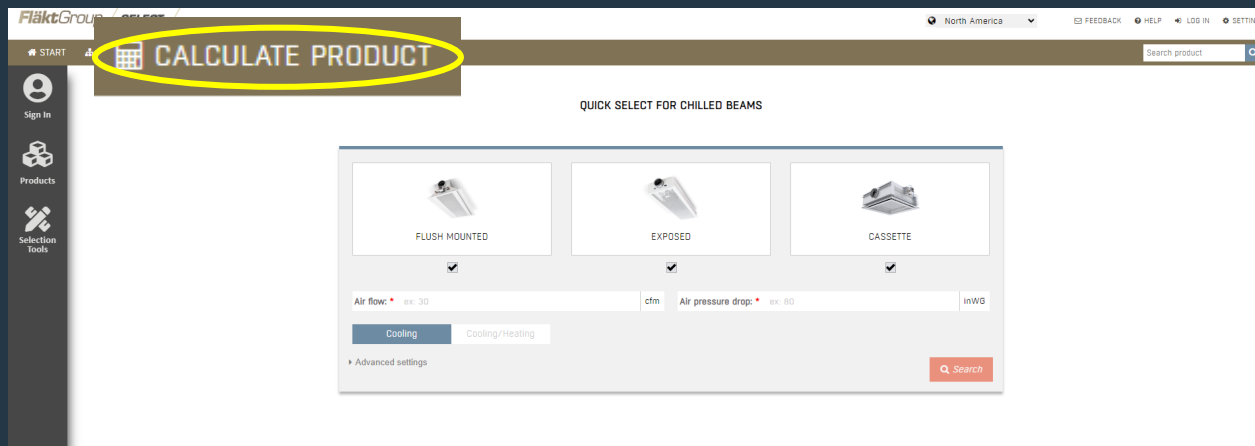
The screenshot shows the website **FläktGroup / SELECT**. The navigation bar includes a dropdown menu for **North America**, which is circled in yellow. The sidebar on the left contains links for **Sign In**, **Products**, and **Selection Tools**. The main content area has a header with the text **WELCOME TO SELECT - YOUR RESOURCE FOR OPTIMAL INDOOR AIR CLIMATE** and a sub-header **PLEASE TAKE A MINUTE TO REGISTER**. Below this, there are three main sections: **Quick Select**, **Calculate**, and **Project**. The **Quick Select** section is highlighted with a yellow circle around the **Chilled Beams** option. The **Calculate** section has a sub-header **Configure your product for optimal performance:** and a list of options: **Chilled Beams**, **Diffusers/Valves**, **VAVs**, and **Silencer**. The **Project** section has a sub-header **Manage, save and share your work. Create unique room designs and simulate the indoor air climate with the Room Designer.** and a button **Projects >>**.

2. Make sure North America is selected

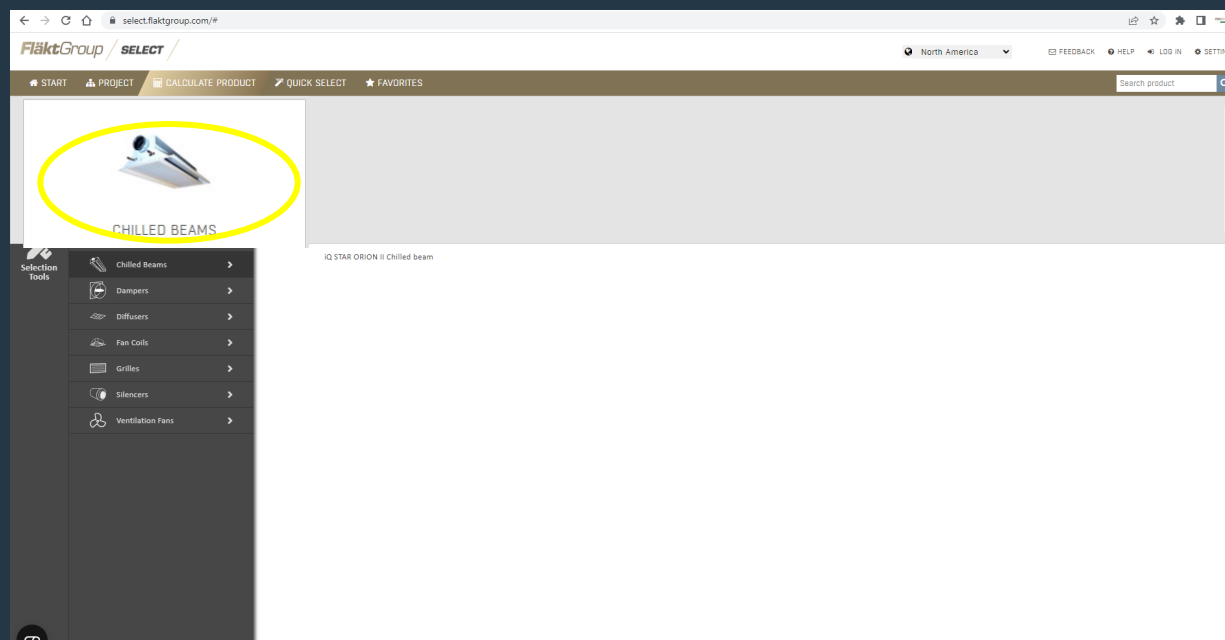
3. Go to “Quick Select” and select Chilled “Beams”

Using SELECT

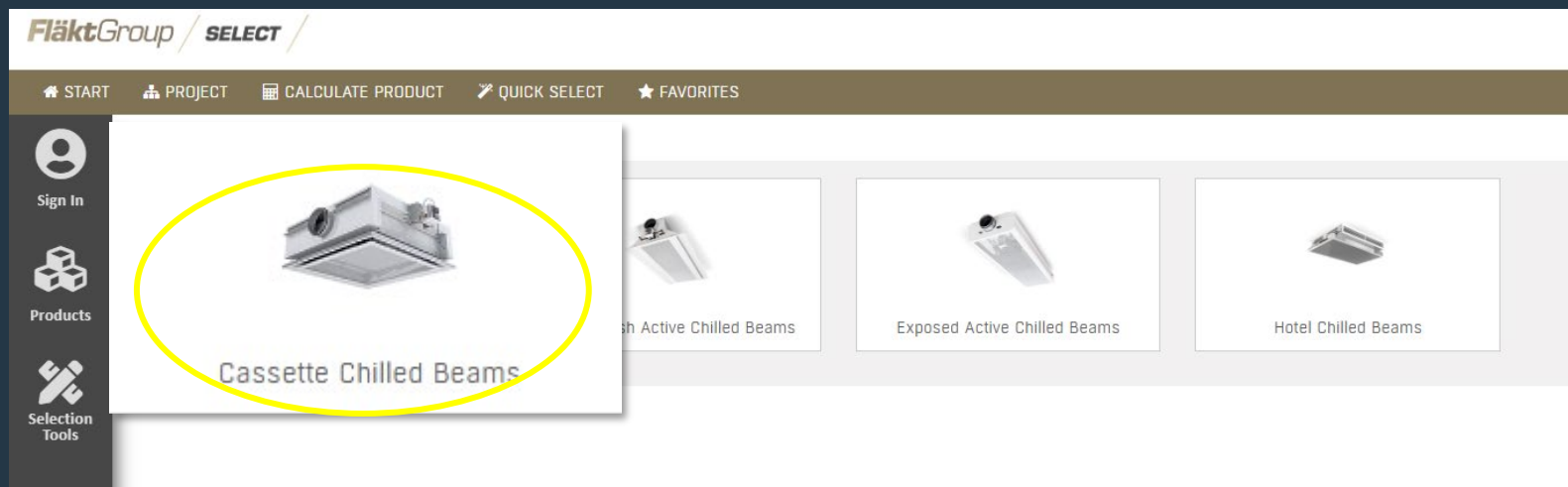
4.



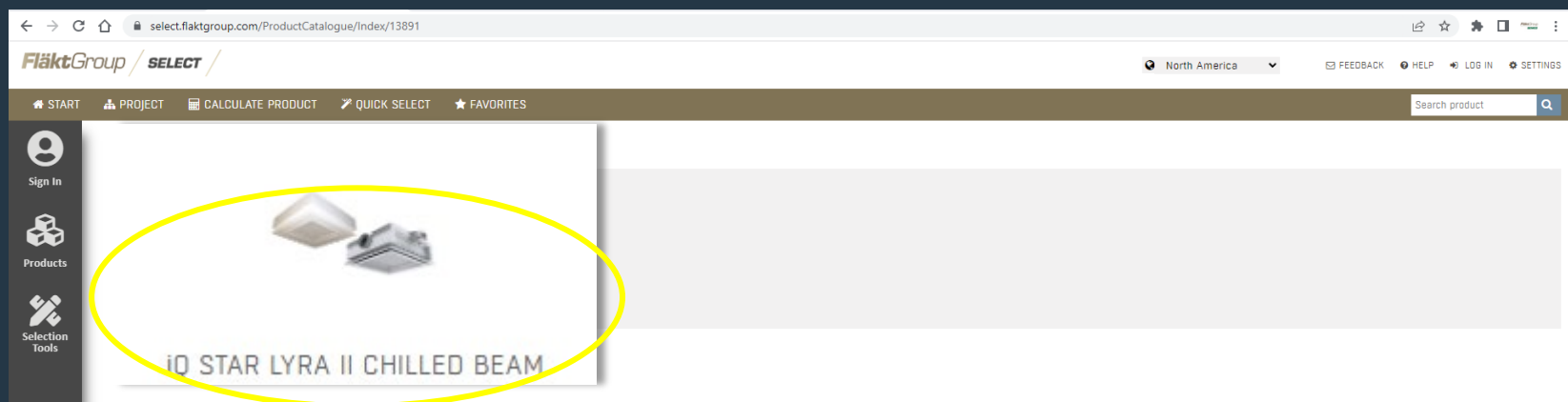
5.



5.



6.



Selecting a Beam

Properties

Length: 2 feet - US Market
Coil function: Cooling & Heating
PI Function: With

ADVANCED PRODUCT PROPERTIES

Capacity setup: High
Variant: High airflow level
FPC angle: None
Air connection: R & L-R open
Freely suspended: No
Purging nipple: No
Coil connection type: 15mm plain tail

Parameters

Number of units: 1
Air pressure drop: 0.24 inWG

V0

Vmin

Vmax

Air flow: 9.3 48.7 83.1 cfm
Air flow (all units): 9.3 48.7 83.1 cfm
Air temp: 68 68 68 °F

Inlet water temp: 57.2 °F
Inlet water flow: 0.66 gpm
Ceiling temp: 76.1 °F
Room temp: 75.2 °F
Relative humidity: 50 %

RESULT

VISUALIZATION

DESCRIPTION

DOCUMENTS

ACCESSORIES (2)

	*	*	*	
	561	1886	2283	btu/h
	480	1462	1561	btu/h
Supply air power	81	424	722	btu/h
Power (all units)	561	1886	2283	btu/h
Sound Lp10A dBA	< 20	< 20	27	dB(A)
Air flow	9.3	48.7	83.1	cfm
Air flow (all units)	9.3	48.7	83.1	cfm
Total air pressure drop	0.24	0.24	0.24	inWG
Outlet water temp	58.4	60.9	61.1	°F
Throw length L02	1.5	5.7	9.6	ft
Water pressure drop	1.74	1.74	1.74	ftWG

ADDITIONAL RESULT

V0

Vmin

Vmax

EXCELLENCE IN SOLUTIONS

Properties		
Length:	2 feet - US Market	▼
Coil function:	Cooling	▼
Connection diameter:	125	▼
PI Function:	With	▼
▼ ADVANCED PRODUCT PROPERTIES		
Capacity setup:	High	▼
Variant:	Normal airflow	▼
▼ FPC angle	None	▼
FPC angle left front:	0	▼
FPC angle left back:	None	▼
FPC angle right front:	0	▼
FPC angle right back:	None	▼
FPC angle back right:	0	▼
FPC angle front left:	0	▼
Air connection:	R & L-R open	▼
Freely suspended:	No	▼
Purging nipple:	No	▼
Coil connection type:	15mm plain tail	▼

Properties

Length:	2 feet - US Market	▼
Coil function:	Cooling	▼
Connection diameter:	125	▼
PI Function:	With	▼

▼ ADVANCED PRODUCT PROPERTIES

Capacity setup:	High	▼
Variant:	Normal airflow	▼

▼ FPC angle	None	▼
FPC angle left front:	15	▼
FPC angle left back:	None	▼
FPC angle right front:	-30	▼
FPC angle right back:	None	▼
FPC angle back right:	-45	▼
FPC angle front left:	0	▼

Air connection:	R & L-R open	▼
Freely suspended:	No	▼
Purging nipple:	No	▼
Coil connection type:	15mm plain tail	▼

Properties

Length:	2 feet - US Market	▼
Coil function:	Cooling	▼
Connection diameter:	125	▼
PI Function:	With	▼

▼ **ADVANCED PRODUCT PROPERTIES**

Capacity setup:	High	▼
Variant:	High airflow level	▼
▼ FPC angle	None	▼

FPC angle left front:	0	▼
FPC angle left back:	None	▼
FPC angle right front:	0	▼
FPC angle right back:	None	▼
FPC angle back right:	0	▼
FPC angle front left:	0	▼

Air connection:	Right	▼
Freely suspended:	No	▼
Purging nipple:	No	▼
Coil connection type:	15mm plain tail	▼

Parameters

Number of units ⓘ

4

Air pressure drop

0.28 inWG

V0

Vmin

Vmax

6.4

33.3

56.6

cfm

Air flow

25.6

133.2

226.4

cfm

Air flow (all units)

72

72

72

°F

Air temp ❄️ ⓘ

57.2

°F

Inlet water temp ⓘ

0.66

gpm

Inlet water flow ⓘ

76.1

°F

Ceiling temp ⓘ

75.2

°F

Room temp ⓘ

50

%

Relative humidity ⓘ

Beam Selection Results

 Calculate  Export  Print					
RESULT	VISUALIZATION	DESCRIPTION			ACCESSORIES (2)
					
Power		561	1886	2283	btu/h
Coil power		480	1462	1561	btu/h
Supply air power		81	424	722	btu/h
Sound Lp10A dBA		< 20	< 20	27	dB(A)
Air flow		9.3	48.7	83.1	cfm
Total air pressure drop		0.24	0.24	0.24	inWG
Outlet water temp		58.4	60.9	61.1	°F
Throw length L02		1.5	5.7	9.6	ft
Water pressure drop		1.74	1.74	1.74	ftWG
▼ ADDITIONAL RESULT					
NC value		10	10	20	
NR value		10	10	25	
Outlet air temp		66.6	64.3	66	°F
K-factor		20.4	104.9	192	#
Dew point		55.3	55.3	55.3	°F
Delta water temp		33.2	35.7	35.9	°F
Inductionfactor		4.9	2.06	1.53	
Mean water-room		50.3	49.1	48.9	°F
Nozzle setting		3	19	36	
					
		V0	Vmin	Vmax	

Beam Selection Results: Simulation

RESULT **VISUALIZATION** DESCRIPTION DOCUMENTS ACCESSORIES (2)

+ 🔍 - Vmin ▾

▶ Simulate Auto place products 📷

9.84 ft

20 ft

9.84 ft

20 ft

Measurement tools

- Grid size: 3.28 ft
- Show grid: ☒
- Show dimensions: ☒
- Show throw lengths: ☒

Occupied zone

- Enable: ☒
- Height: 5.91 ft
- Floor Gap: 0.66 ft
- Wall Gap: 1.64 ft
- Isovel: 0.66 ▾ fps

Room

- Length: 20.00 ft
- Width: 9.84 ft
- Height: 9.84 ft

Product placement

- Length: 0 ft
- Width: 0 ft
- Height: 0 ft

START

PROJECT

CALCULATE PRODUCT

QUICK SELECT

FAVORITES

Sign In

Products

Selection Tools

Calculate

Export

Print

RESULT

VISUALIZATION

DESCRIPTION

DOCUMENTS

ACCESSORIES (2)

Compact, flexible and silent cassette chilled beam.

- A compact chilled beam for flush mounting or exposed installation
- Ensures comfort with low temperature gradient and no draught
- Gives flexibility to the diffusion enabling lay out modification
- Has in option a Demand Controlled Ventilation function, available as retrofit and pressure independent
- Includes fastening brackets for rapid and simple installation
- Available in two sizes: 600×600 mm and 600×1200 mm (Ceiling flushed)
- Available in two sizes: 725×725 mm and 725×1325 mm (Exposed)
- Integrated control for plug and play installation

The LYRA II cassette is an active chilled beam for ventilation, cooling and heating. This diffusion system offers high flexibility thanks to the combination of Flow Pattern Control, Coanda Safety Control & adjustable induction for the best comfort. It can be used as a traditional CAV chilled beam or equipped with Pi a very flexible VAV-chilled beam. With the introduction of the Pi advanced function it gives the LYRA II even more flexibility making it pressure independent and adding a Demand Controlled Ventilation function allowing the air diffusion to follow the building occupancy making the HVAC system highly efficient. It can also be supplied with integrated control to offer a plug and play solution.

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IQ STAR LYRA II CHILLED BEAM
IQCC-060-16-1-04-4_R

Properties

Length:	2 feet - US Market
Coil function:	Cooling
Connection diameter:	125
PI Function:	With

ADVANCED PRODUCT PROPERTIES

Parameters

Number of units	1
Air pressure drop	0.24 inWG
	VO Vmin Vmax
Air flow	9.3 48.7 83.1 cfm
Air temp	68 68 68 °F
Inlet water temp	57.2 °F
Inlet water flow	0.66 gpm
Ceiling temp	76.1 °F
Room temp	75.2 °F
Relative humidity	50 %

version:15

Calculate

Export

Print

RESULT

VISUALIZATION

DESCRIPTION

DOCUMENTS

ACCESSORIES (2)

- Chilled Beams Flyer creating the perfect fit
- Declaration of conformity WEGA-NOVA-LYRA-STELLA
- Design Guide Pi function (IQAZ-35)
- LYRA II IQCC Installation, Maintenance and Commissioning
- LYRA II IQCC Technical Catalogue
- Pi function - Wega II - Nova II - Lyra II - Orion II Flyer
- Pi Function Modbus Communication (IQAZ-35)
- Application brochure Water-based Air Conditioning
- Chilled Beam Master Sales Brochure - North America
- Lyra II IQCC Installation & Owner's Manual - North America
- Lyra II IQCC Technical Guide - North America

Beam Selection Results: Accessories

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Available Accessories

	STRZ-70 Valve + valve actuator STRZ-70-01-01-0-1 Not Allowed IQCC: Sales Area (North America)	
	Valve DN15 (kvs 0.25-1.9) female 1/2" valve inlet	
	Valve actuator 24 V NC cable 1 m	
	QFAZ-12 Suspension rods QFAZ-12	+
	STRZ-18 CO2 sensor STRZ-18-1-1	+
	Execution For wall mounting	
	STRZ-09 Occupancy detector STRZ-09-1	+
	Type Wall mounted	
	STRZ-16 Condensation sensor STRZ-16-1-05	+
	Installation Installed on chilled beam	
	STRZ-24 STRZ-24-1	+
	STRZ-76 Integrated Control STRZ-76-00-07-1	+
	Placement of controller Without room controller (slave)	
	Sensors and valve kit Cooling and heating valve kit, PIR	
	QFAZ-23 Suspension System with Wire QFAZ-23-01-01	+
	IQAZ-33 Casing Free hanging IQAZ-33-000 Not Allowed IQCC: Freely suspended (No)	
	Duct enclosure Without	

EXCELLENCE IN SOLUTIONS

Beam Selection Results: Configuration Strings

FläktGroup / SELECT

North America

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QUICK SELECT

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Selection Tools

IQCC-060-16-1-04-4_R

Calculate

Export

Print

Properties

Length: 2 feet - US Market

Coil function: Cooling

Connection diameter: 125

PI Function: With

ADVANCED PRODUCT PROPERTIES

Parameters

Number of units: 1

Air pressure drop: 0.24 inWG

Air flow: 9.3 48.7

Air temp: 68 68

Inlet water temp: 57.2

Inlet water flow: 0.66

Ceiling temp: 76.1

Room temp: 75.2

Relative humidity: 50

RESULT

VISUALIZATION

DESCRIPTION

DOCUMENTS

ACCESSORIES (4)

Selected Accessories

IQAZ-35 PI FUNCTION ACTUATOR

IQAZ-35-03-1-1-1

Installation: Installed on chilled beam

QUANTITY

1

B13

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✓

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	A	B	C	D	E
1	AlphaCode	Name	OrderingCode	Quantity	
2	IQCC	iQ STAR LYRA II CHILLED BEAM	IQCC-060-16-1-04-4_R	1	
3	IQAZ-35	IQAZ-35 PI FUNCTION ACTUATOR	IQAZ-35-03-1-1-1	1	
4	QFAZ-18	QFAZ-18 Fastening brackets	QFAZ-18-7-1	1	

Valve

DN15 (kvs 0.25-1.5) female 1/2" valve inlet

Valve actuator

24 V NC cable 1 m

QFAZ-12 Suspension rods

QFAZ-12

STRZ-18 CO2 sensor

STRZ-18-1-1

Execution

For wall mounting

STRZ-09 Occupancy detector



UNIQUE SELLING POINTS TOOLKIT

General Chilled Beam Unique Selling Points:

- **Time saving** - easy to select and specify in FläktGroup SELECT
- **Energy savings** - reduced chiller consumption load and electrical consumption, use of free-cooling
- **Ease of layout design** - with high cooling capacity, adjustable induction and air diffusion
- **High indoor air climate comfort** – silent units and low air velocity in the room
- **Simple commissioning** – no tools required for adjusting air diffusion and induction.
- **Low maintenance** – no moving parts, no condensation tray and drop-down front plate allows easy cleaning
- **Low Life Cycle Cost** – reduced energy consumption and maintenance costs



JUNO IQHC:

- **Cooling capacity** – highest in the industry
- **FläktGroup SELECT** – quick and easy selection
- **Universal beam** – flexible air and water connections

AURORA IQSA:

- **Ease of layout design** – narrow beam
- **High indoor air climate comfort** – adjustable energy control
- **Customizable** – custom paint option

NOVA II IQFI:

- **Energy savings** – demand control ventilation with Pi actuator option
- **Flexible** – broad application area
- **FläktGroup SELECT** – quick and easy selection



Unique Selling Points

LYRA II IQCC:

- **Ease of layout design** - compact cassette beam
- **High indoor air climate comfort** – silent unit
- **PLUS**, all the benefits of the **NOVA II**

ORION II IQHA:

- **Bulkhead mount** – perfect for hotel and hospital rooms
- **Flexible** – Pi actuator option
- **Quiet** – very low noise levels



Thank you for your attention!

