

# HYZER X



## General

Controller designed to manage different units, devices and components that make up a hydronic system. Different system configurations: combined management of multi-machine variable flow systems

## Strengths

- ▶ Variable flow control on primary circuit for systems with primary/secondary circuit or with one single primary circuit
- ▶ Wide range of configurations available: 2-tube systems, 4-tube systems with centralised or onboard pumps
- ▶ Algorithms for efficiency maximization: adaptive optimization logic
- ▶ Dry cooler, well pump and boiler management
- ▶ Real-time reading of energy consumption and system performances
- ▶ System reliability: automatic/manual selector switches
- ▶ Options supplied with system: shut-off valve and inverter for pump



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# INTRODUCTION TO MULTI-MACHINE SYSTEMS

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# INTRODUCTION TO MULTI-MACHINE SYSTEMS

## SYSTEM APPROACH

The latest developments of the applicable directives and regulations (e.g. ERP, F-gas and carbon tax) have induced manufacturers to tackle new challenges in terms of efficiency and sustainability.

Hence, cooling/heating system technologies capable of making the difference must offer efficient products under different working conditions, as well as solutions that are fit to integrate each unit in one system.

The new range of HYZER system controllers offers plug & play solutions which can be adapted to each and every required integration and management level.

Our experience in system engineering has enabled us to develop 3 different solutions to timely respond to the market needs. These include:

- HYZER E : Function integrated inside the advanced controller of Bluebox machines HYZER E controls variable flow and multi-machine systems together. For additional information, please refer to the reference options in the machine technical catalogues.
- HYZER X : External controller for more advanced system management The wide range of available configurations makes it possible to work on all three system levels: source, production, distribution. This solution offers a configurator which can help customers select the right system for their needs.
- HYZER C : Custom solution to control systems that are not included in the solutions managed by HYZER X

This document is intended to illustrate in detail the various options and configurations available with HYZER X in order to help and assist customers and dealers in selecting the right system(s) for their needs. This product is also the base on which more sophisticated projects pertaining to the HYZER C solution may be developed.



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# **HYZER X**

Controller designed to manage different units, devices and components that make up a hydronic system  
Different system configurations: combined management of multi-machine variable flow systems

## **ELECTRICAL CONTROL PANEL**

HYZER consists of an electric cabinet with forced ventilation and protection level IP54. It is a two-door cabinet featuring an external door and a glass panel.

The electrical control panel of the basic unit comprises:

- power switch for door locking
- automatic/manual switch
- automatic/manual switch in each pump in the system
- fuses for protecting the fans and auxiliary circuits
- phase monitor
- potential-free general alarm contacts
- single potential free operating contacts for fans and pumps (if fitted)
- industrial PLC (programmable logic controller) with I/O modules
- temperature probes
- 7" touch screen display
- 24VDC power supply
- Modbus and SNMP protocol

All the electrical cables inside the panel are numbered and the terminal board dedicated to the customer's connections is coloured orange so that it can be quickly identified in the panel.

In addition to the electric cabinet, the product is supplied with 2 temperature probes (4-20 mA) for each user-side circuit that are to be placed on the delivery and return manifold of the system (installation and wiring by the customer).

## **CONTROL BLUETHINK**

The standard PLC featuring I/O modules consists of:

- a RS485 serial interface;
- analog and digital inputs for pump, alarm and auxiliary device control;
- an Ethernet port with Modbus protocol; an integrated web server and a preloaded web page;
- an SNMP protocol.

For further details on available functions and on displayed information, you can refer to the specific documentation of the control.

By default, the serial connections present as standard are enabled only for reading from BMS. Enabling of writing from BMS is to be requested when ordering.

## **Main controller functions**

The base controller is designed for the following functions:

- system thermoregulation;
- distribution of load demanded by the system according to a preset unit activation logic;
- monitoring of operating variables and alarms in each unit;
- management of backup unit rotation, if any;
- equalization of the hours of operation of the units;
- recording of the log of all machine inputs, outputs and states
- automatic rotation of compressor starting sequence
- recording of the alarm log

## **Human-Machine Interface;**

The control has a graphic display that allows the following information to be displayed:

- system water input and output temperature;
- set temperature and differential set points
- description of alarms
- hour meter and number of start-ups of the units, compressors and pumps.
- external air temperature

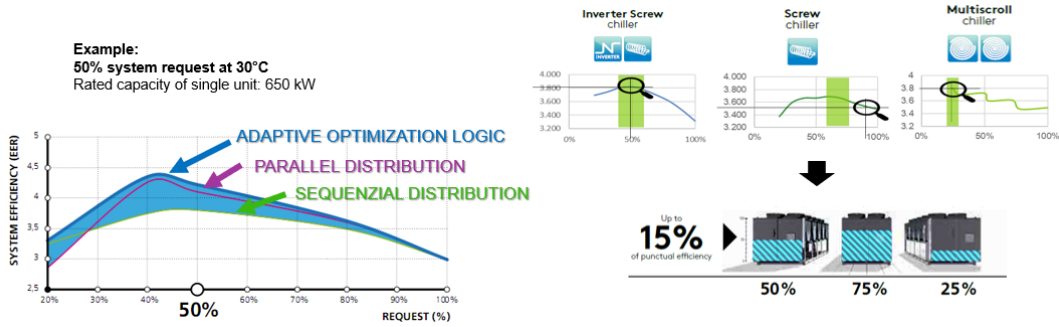
## SYSTEM THERMOREGULATION: ADAPTIVE OPTIMIZATION LOGIC

HYZER X integrates state-of-the-art algorithms which can define the best activation sequence of the units and source devices, such as boilers or dry coolers, in a dynamic manner.

The adaptive optimization logic is designed to calculate and determine optimized system operation under all conditions. If compared to conventional capacity distribution logic, the logic of this controller takes into account the outside weather conditions, the type of machines (size, efficiency, compressor curves) involved in thermoregulation, and the type of system for enhanced total system efficiency.

The example below shows 3 different units in hydraulic parallel. As the graph shows, efficiency can be increased by up to 15%.

For further details, please refer to the specific controller manual.

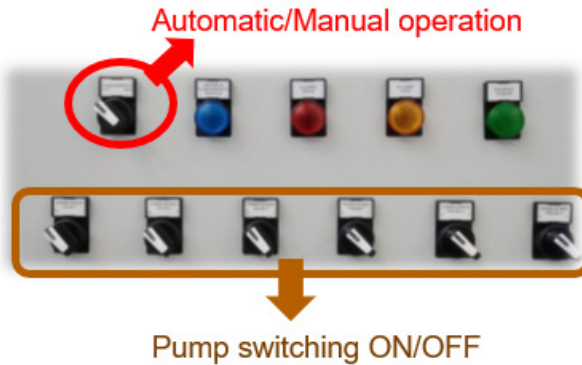


## NETWORKING

The HYZER X system controller requires connection to each unit and device in the system using an Ethernet TCP-IP cable in order to acquire the main operating variables.

## SYSTEM REDUNDANCY

All units are supplied with dedicated automatic/manual selector switches to control the system in stand-alone mode, thus ensuring utmost reliability.



## SYSTEM CONFIGURATION

The controller is best configured if the user is aware of which system type needs to be managed. A configurator is available for HYZER X to help customers select the right system for their needs.

The configurator can be used for three different types of system:

2-tube air/water system;

2-tube water/water system;

4-tube system.

HYZER X is designed to control max. 4 units in hydraulic parallel. Products by Swegon include:

CH: chillers;

FC: freecooling chillers;

HP: reversible heat pumps;

OH: heat pumps;

MT: multifunctional unit.

In 2-tube systems it is not possible to combine water/water and air/water units. Contact our sales network for this type of configuration.

### System types

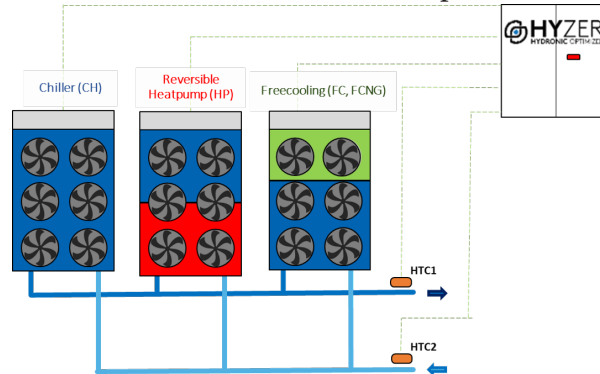
The hydraulic diagrams in this document are for exemplification purposes only and their main function is to help the reader understand the type of machines and devices the controller can manage.

For a more technical evaluation of the system, please refer to the dedicated manual.

#### 2-tube air/water system;

The phrase “air/water systems” means all hydronic systems consisting of air-condensed units for the generation of heating and/or cooling.

Units CH, HP and FC can be combined to a max. of three units in parallel, as shown in the figure.

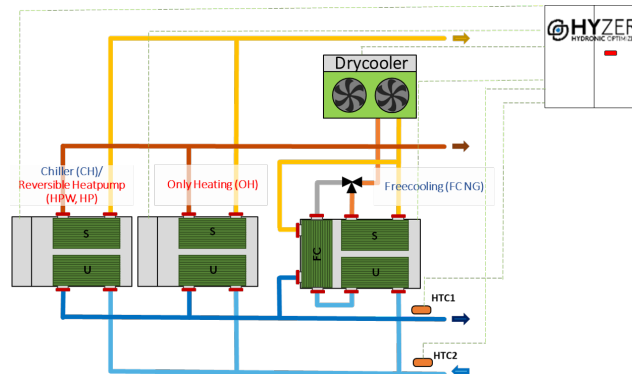


The acronyms in the HTC1 and HTC2 diagrams refer to the temperature probes supplied with the unit (2 in each user-side circuit - installation and wiring by the customer).

#### 2-tube water/water system;

The phrase “water/water systems” means all hydronic systems consisting of water-condensed units for the generation of heating and/or cooling.

Units CH, HP, HPW, OH and FC can be combined to a max. of three units in parallel, as shown in the figure.

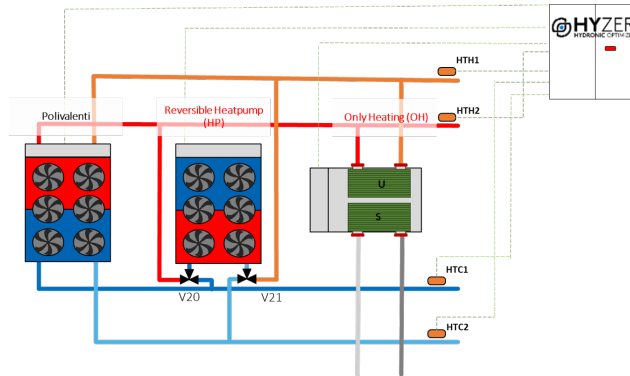


The acronyms in the HTC1 and HTC2 diagrams refer to the temperature probes supplied with the unit (2 in each user-side circuit - installation and wiring by the customer).



## 4-tube system

The phrase "four-tube systems" means all hydronic systems consisting of at least one multifunctional unit for the generation of heating and/or cooling.



The acronyms in the HTC1, HTC2, HTH1 and HTH2 diagrams refer to the temperature probes supplied with the unit (2 in each user-side circuit - installation and wiring by the customer).

Multifunctional units can be combined with air/water CH or HP units or with water/water CH, HP, HPW or OH units up to a max. of three units in parallel.

If an HP unit is fitted in the system, the heat/cold operating mode is controlled using a video display or a digital input. The customer is in charge of installing and providing for the hydraulic valves required for heat/cold switching.

If a water/water unit is fitted in the system, the source side is controlled by each individual unit and not at system level.

## PUMPS

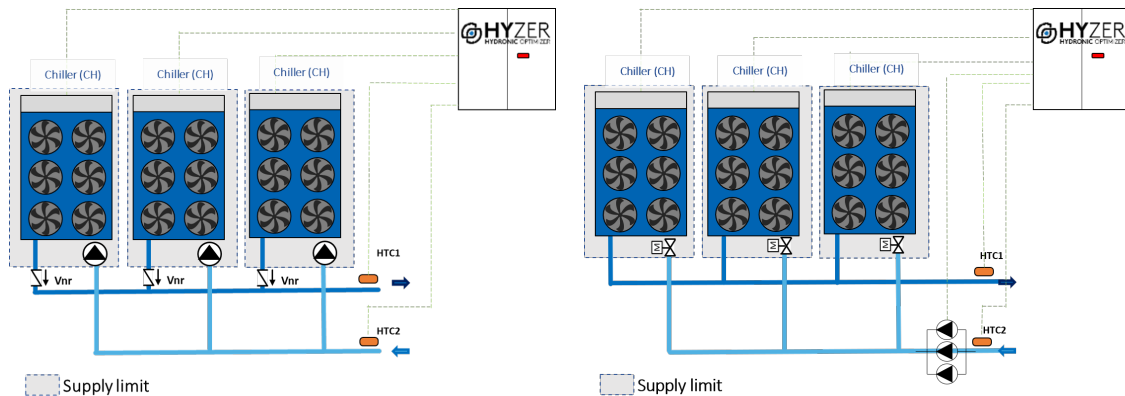
System pumps may be:

- onboard - refer to the specific unit price list for your selection;
- centralized - the customer is in charge of installation and provision.

The product does not include the supply of additional pumps. Contact our sales force if pumps are required.

**System with pumps onboard the machine**

**System with centralized pumps**



Please find below an explanation of the acronyms in the diagrams.

- M: shut-off valves
- HTC1: sensor located on system inlet
- HTC2: sensor located on system outlet

Shut-off valves can be supplied together with the unit. Refer to the dedicated option to file a request for such valves. Check valves must be installed at the outlet of each unit (installation and provision by customer) in order to prevent any backflow when the flow reverses its direction.

Up to 4 centralized pumps can be controlled.

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**Pump type**

Both onboard and centralized pumps can fit an inverter for variable flow management.

The configurator suggests the use of ON/OFF pumps as opposed to inverter pumps, depending on the system type to be managed (either constant or variable flow system).

Customers can order an inverter together with the centralized pumps. Refer to the dedicated option for this opportunity.

**TESTING**

All units are tested at the factory, based on the configuration required in the order.

## Hydraulic circuit accessories

### xPB Pump set in backup mode

If the system consists of centralized pumps, it is possible to set one or two pumps in Backup and manage their rotation, equating in this way the number of operating hours.

In function of the circuits where they are installed, the options are divided into:

- xPBU: Pump sets in back-up on user side
- xPBS: Pump sets in back-up on source side (for water to water systems)
- xPBC: Pump sets in back-up on hot loop (for 4-pipe systems)
- xPBF: Pump sets in back-up on cold loop (for 4-pipe systems)

### xIx Inverter for centralized pump

This option includes the supply of an inverter for each pump and the related protections in the electric cabinet. This option is selectable for all pumps in the system:

- xIxU: Inverter for pump sets centralized on user side
- xIxS: Inverter for pump sets centralized on source side (for water to water systems)
- xIxC: Inverter for pump sets centralized on hot loop (for 4-pipe systems)
- xIxF: Inverter for pump sets centralized on cold loop (for 4-pipe systems)

The specified price is based on the dimensions of the control panel (according to inverters' number) and on additional power switch. It is so mandatory to select the inverter in function of the pump rated power (refer to the configurator).

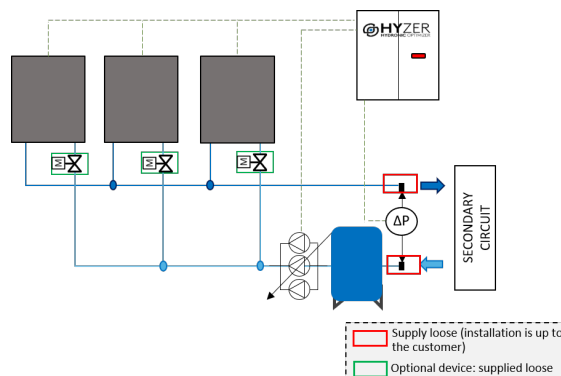
The inverter is supplied together with the unit, but the customer is responsible for its installation in the electric cabinet.

## INVERTER

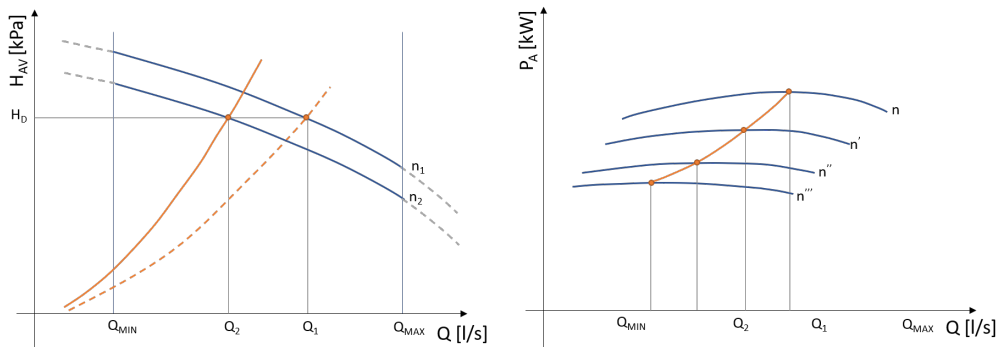
	Nominal pump capacity
	kW
INV1	0,75
INV2	1,1
INV3	1,5
INV4	2,2
INV5	3
INV6	4
INV7	5,5
INV8	7,5
INV9	9,2
INV10	11
INV11	15
INV12	18
INV13	22
INV14	30
INV15	37
INV16	45

### PVD FLOWZER VD - Transducer for automatic adjustment

Flowzer VD is supplied as standard with two pressure transducers which have to be installed on the delivery and return branches of the system (installation by customer). Through these transducers, the inverter can gauge the actual pressure at the ends of the system and automatically adapt the pump speed to achieve the available discharge head setpoint value. This accessory therefore allows a constant pressure system to be achieved.



With Flowzer VD, the customer can set, directly on the inverter, the available discharge head value  $H_d$  that the system must keep. As can be seen from the graph as the user request decreases, the resistant curve of the plant moves to the left, consequently the inverter reduces the speed of the pump in order to maintain the useful head necessary for the unit. With this system a significant reduction in electrical power is achieved. The customer will have to check that, in minimum flow rate conditions (i.e. with the maximum number of user points closed), the discharge head is always higher than or equal to the minimum flow rate allowed by the units.



This accessory is useful when the total head losses of the circuit are slightly variable or when they change depending on the seasons (for example, some user points are active only during summer operation and not during winter operation).

The use of this accessory also allows the pump speed to be adapted to possible fouling of the filter on the hydraulic circuit.

The VD flowzer options are distinguished by the type of circuit:

- PVDU: FLOWZER VDS- Transducer for automatic water flow control on user side
- PVDC: FLOWZER VDS - Transducer for automatic water flow control on hot loop (for 4-pipe systems)
- PVDF: FLOWZER VDS - Transducer for automatic water flow control on cold loop (for 4-pipe systems)

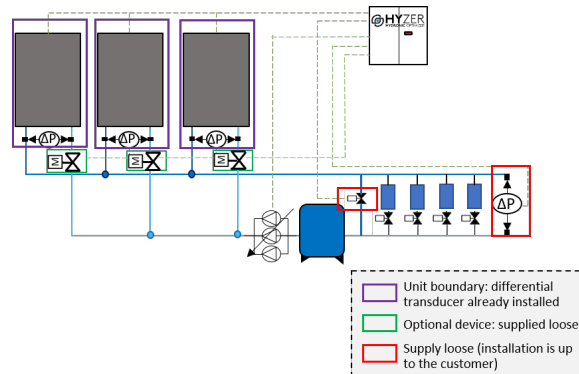
## PVF **FLOWZER VFPP – Kit for variable flow rate primary circuit pump with bypass valve included**

Function built in HYZER X controller for variable flow management

Flowzer VFPP has been conceived for either new or fully reconditioned systems consisting of one primary loop.

The option includes:

- two system pressure transducers ( $\Delta p$ ) supplied separately (installation by the customer);
- a modulating bypass valve with servo-motor supplied with the system (installation by customer).



All system units must include the option "VPS and VFPP setup for HYZER X".

The option offers a complete default package to guarantee simple selection, purchasing and commissioning.

Flowzer VFPP has the advantage of:

- simplifying the system layout and implementing an innovative design as an alternative to the classic system, based on fixed flow-rate primary circuit plus secondary circuit;
- being ideal for new or entirely redesigned systems, especially for comfort applications
- managing the variable flow rate with the max. energy saving possible.
- limiting the capex of the system

The Flowzer VFPP system controller uses an advanced algorithm that enables prevention of unnecessary waste of energy and hunting by the inverter and the bypass valve.

The capex of the system is also reduced thanks to:

- single inverter + pumping module, integrated in the unit
- small internal footprint, due to the simplified layout

The operating principle can be summarized as follows:

- Flowzer VFPP carries out constant control of the discharge head
- the controller modulates the pump speed according to the signal detected by the system transducers  $\Delta p_p$
- as the demand from the system goes down, the pump speed will be reduced.
- the pump speed can be reduced until it reaches the minimum allowed flow rate on the heat exchanger of the unit
- this flow rate is indirectly monitored through the losses detected by the differential pressure transducer  $\Delta p_e$
- When the minimum allowed flow rate threshold is exceeded (load demand very low or down to min. value), the control system opens the bypass valve  $V_{bp}$  to recirculate the flow rate that is not required by the system, but is necessary to guarantee the minimum flow rate between the heat exchangers in the units.

Provision must be made for a tank to be installed between the unit and the separator or a bypass pipe in order to ensure the min. necessary volume ( $V_{min}$ ).

Bypass valve  $V_{bp}$  is controlled by a 0-10 V signal. Refer to the dedicated manual for the max. recommended length of the cables. Extend the cables appropriately, where necessary.

The pressure transducers of the system  $\Delta p_p$  provide a 4-20 mA signal and require two 1/4" female fittings. These transducers must be installed within 200 m of the unit, near the system terminal that is affected by the highest line head losses or in any case in a position where it is possible to measure an adequate pressure value.

Further details can be found in the relevant manual.

The VFPP flowzer options are distinguished by the type of circuit:

- PVFU: FLOWZER VFPP - Kit for variable flow pump in primary circuit with bypass valve included on user side
- PVFC: FLOWZER VFPP - Kit for variable flow pump in primary circuit with bypass valve included on hot loop (for 4-pipe systems)
- PVFF: FLOWZER VFPP - Kit for variable flow pump in primary circuit with bypass valve included on cold loop (for 4-pipe systems)

### SUx / SCx / SFx Selection of by-pass valve according to the system power

The option is used to select the bypass valve (supplied with system) according to the system capacity. The option requires that control type VFPP is selected.

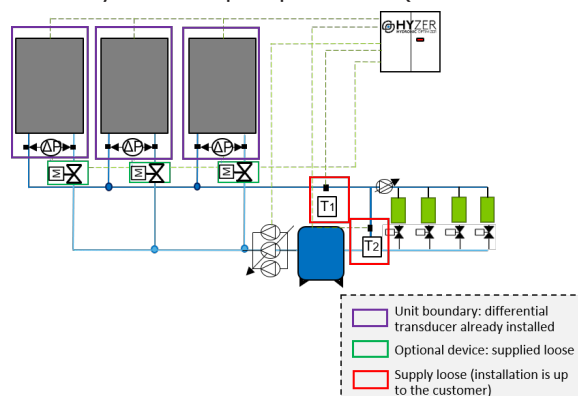
For system capacities above 1250 kW the number of valves supplied with the system is two.

	System capacity range**	Quantity	Diameter	Qmax**
	kW	-	in	m <sup>3</sup> /h
S_A	<240	1	2 1/2"	41.3
S_B	240÷335	1	3"	57.6
S_C	335÷570	1	4"	98
S_D	570÷850	1	5"	146.2
S_E	850÷1250	1	6"	215
S_F	1250÷1700	2	2 x 5"	2 x 146.2
S_G	1700÷2500	2	2 x 6"	2 x 215

### PVP FLOWZER VPS – Kit for variable flow rate pump with temperature sensors

Function built in HYZER X controller for variable flow management

Flowzer VPS is designed for traditional systems (either new or existing ones), consisting of a primary and a secondary circuit, in which a secondary inverter pump is fitted (not controlled by HYZER X controller).



The option includes:

- 1 system temperature sensor (T) - supplied separately; installation by the customer

All system units must include the option "VPS and VFPP setup for HYZER X".

The option offers a complete default package to guarantee simple selection, purchasing and commissioning.

Flowzer VPS has the advantage of:

- being ideal for renovations of existing systems, especially for comfort applications
- managing the variable flow rate with the max. energy saving possible.
- implementing a flexible design, e.g. for scalable or multi-zone systems

The controller in the Flowzer VPS system uses an advanced algorithm which prevents hunting by the inverter and balances the pump speed and the recirculation flow rate to a minimum.

With refurbishments, the system's capex is limited to the unit and its commissioning.

The dimensions of the inverter in the unit and pump module can be resized thanks to the low design discharge head of the primary circuit.

The operating principle can be summarized as follows:

- Flowzer VPS performs a smart check of the flow rate in the primary circuit and balances it with the flow rate in the secondary circuit.
  - the system controller modulates the pump speed according to the condition detected by the system sensors T
  - as the required thermal load decreases, the flow rate of the secondary circuit will decrease; the direction of flow is detected indirectly, as the difference in the temperature values, by the system sensors through the bypass pipe.
  - The check thus contributes to reducing the speed of the primary pump until the min. flow threshold that is admissible between the heat exchangers in the system units is exceeded.
  - this flow rate is indirectly monitored through the losses detected by the differential pressure transducer  $\Delta p_e$
- Provision must be made for a tank to be installed between the unit and the bypass pipe in order to ensure the min. necessary volume ( $V_{min}$ ).

The temperature sensors of the system T provide a 4-20 mA signal and require 1/2" female fittings.

Further details can be found in the relevant manual.

The VPS flowzer options are distinguished by the type of circuit:

- PVPU: FLOWZER VPS – Kit for variable flow pump with temperature sensors on user side
- PVPC: FLOWZER VPS – Kit for variable flow pump with temperature sensors on hot loop (for 4-pipe systems)
- PVPF: FLOWZER VPS – Kit for variable flow pump with temperature sensors on cold loop (for 4-pipe systems)

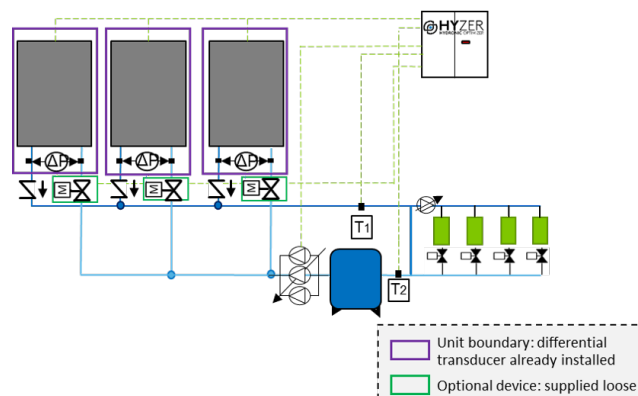
## **PVTU FLOWZER VPS with TD-based control - automatic management of the variable flow rate, including control with constant temperature difference (TD) in the heat exchanger on the user side in systems featuring both the primary and secondary circuits.**

Function built in HYZER X controller for variable flow management

The Flowzer VPS with TD based control is suitable for systems featuring a primary and a secondary circuit physically divided by a heat exchanger or a tank with multiple connections.

The option includes:

- the management of the variable flow through two sensors already supplied and to be installed in the delivery and return pipes



All system units must include the option "Variable flow unit arrangement for HYZER X"

The option offers a complete default package to guarantee simple selection, purchasing and commissioning. The dimensions of the inverter of the unit and of the pump module can be favoured by the low design discharge head of the primary circuit.

The operating principle can be summarized as follows:

- flowzer vps with TD-based control performs smart monitoring of the flow rate in the primary circuit, keeping the T difference constant in the heat exchanger;
- the system controller modulates the pump speed according to the condition detected by the temperature sensors (T) in the system, which are installed at the inlet and outlet of the heat exchanger on the user side;
- the difference in the water temperature (T) and flow rate are inversely proportional, which is why if the T difference is reduced at the same performance level, the water flow exceeds the flow required by the system and the pump speed is reduced in order to save energy;

on the other hand, when the load increases, the T difference increases in the system and the pump speed is increased accordingly.

- The check contributes to reducing/increasing the speed of the pump in the primary circuit until the min./max. flow threshold admitted in the heat exchanger of the unit is exceeded.

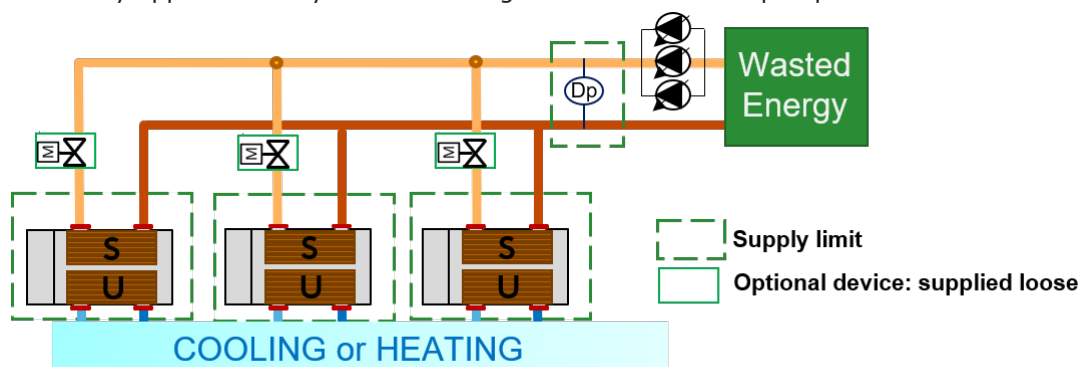
- this flow rate is indirectly monitored through the losses detected by the differential pressure transducer  $\Delta p_e$
- The flowzer vps with TD-based control options are distinguished by the type of circuit:

- PVTU: flowzer vps with TD-based control - automatic management of variable flow rate, including control with constant TD (difference between input and output temperature in the heat exchanger on the user side) in systems featuring both the primary and secondary circuits. User circuit.
- PVTTC: flowzer vps with TD-based control - automatic management of variable flow rate, including control with constant TD (difference between input and output temperature in the heat exchanger on the user side) in systems featuring both the primary and secondary circuits. Hot loop.
- PVTFC: flowzer vps with TD-based control - automatic management of variable flow rate, including control with constant TD (difference between input and output temperature in the heat exchanger on the user side) in systems featuring both the primary and secondary circuits. Cold loop.

#### PVDS FLOWZER VDS - Pressure transducers for automatic flow rate setup on source side

Flowzer VDS requires two pressure transducers to be installed in the system. Through these transducers, the inverter can gauge the actual pressure on the unit side and it can automatically adapt the pump speed to obtain the required flow rate value. The two transducers are supplied together with the unit as standard, but they have to be installed by the customer.

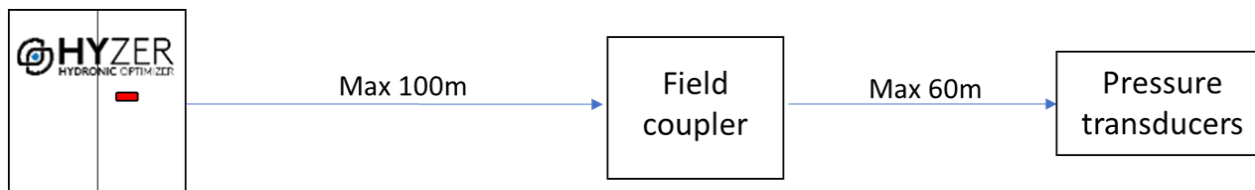
Solution only applicable to systems featuring a set of centralized pumps on source side



Flowzer VDS is used to automatically adjust the pump speed. This solution always ensures a constant water flow rate on the user-side heat exchangers, as required by the design conditions.

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**PVA Field coupler for the management of additional pressure transducers for VFPP systems**  
For VFPP systems, the accessory includes the supply of a field coupler capable of measuring a second working point up to a distance of 160m from the Hyzer  
The Hyzer X control must be connected to the field coupler device via Ethernet TCP-IP cable.  
The option includes also the supply of the two pressure transducers.



The PVA options are distinguished by the type of circuit:

- PVAU: Field coupler for the management of additional pressure transducers for VFPP systems
- PVAC: Field coupler for the management of additional pressure transducers for VFPP systems
- PVAF: Field coupler for the management of additional pressure transducers for VFPP systems

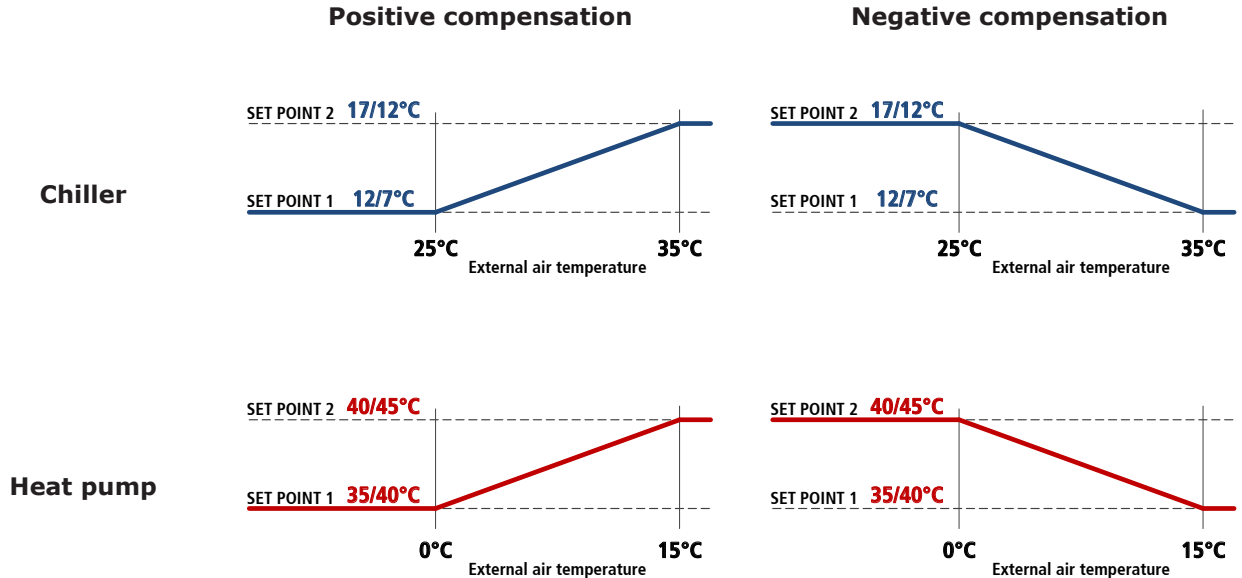


## Electrical accessories

### CSP Set point compensation depending on external air temperature

The system setpoint is set so that it can vary between two values - max. and min. values -, depending on the outside air temperature. The compensation ramp and the maximum and minimum values of the set point can be changed by the user.

Unless otherwise specified in the order, the controller will be set to implement a positive compensation logic according to the temperatures shown in the following diagrams:



### SETD Double set point from digital input

The accessory allows you to preset two different operating set points and manage the change from one to the other through a digital signal.

The set point temperatures must be specified when ordering. For unit optimization, reference must be made to the lowest setpoint in chiller mode and the highest setpoint in heat pump mode.

Unless otherwise specified in the order, the controller will be set at the factory with the following temperatures:

- in chiller mode, set point 1 to 7°C and set point 2 to 12°C
- in heat pump mode (only for HP units) set point 1 to 45°C and set point 2 to 40°C

For 4-pipe systems the accessory is divided into:

- SEDC: Dual set point from digital input on hot loop
- SEDF: Dual set point from digital input on cold loop

### SDBM Dynamic setpoint from BMS

The option is used to preset the operating setpoint of the system from the BMS.

In any case, the setpoint value will be within the minimum and maximum limits of the relevant operating modes.

For 4-pipe systems the accessory is divided into:

- SDBC: Dynamic setpoint from BMS on hot loop
- SDBF: Dynamic setpoint from BMS on cold loop

### ENxM Energy meter reading

This option enables reading of the main electrical values (including voltage, current, power) on the three phases. The measured values are then made available on the unit display or via BMS and they refer to the data of each machine in the system.

This option requires selection of the ENM (Energy Meter) option in the dedicated unit price list.

### FLxM Flowmeter reading

This option enables reading of values such as the water flow rate and the heating and cooling capacity output by each individual unit. The measured values are then made available on the unit display or via BMS and they refer to the data of each machine in the system.

This option requires selection of the "Flowmeter for HYZER X" option in the dedicated unit price list.

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## Network accessories

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### PBA BACnet protocol over IP (Ethernet)

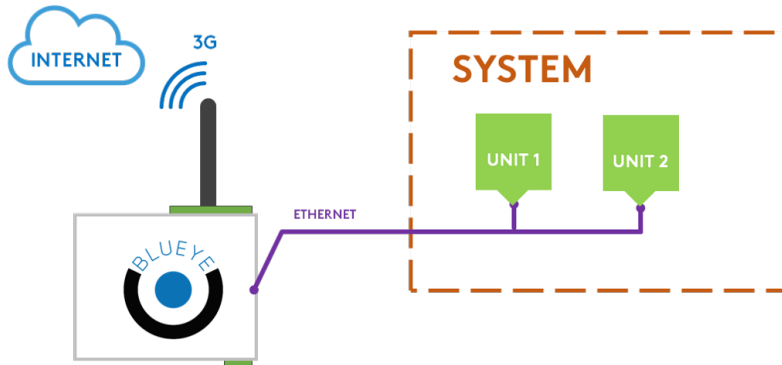
The controller is set for use, in read and write mode, of the BACnet port on IP protocol.

By default, the programming gives read-only access to the control of the unit. Enabling of read/write access should be requested when ordering.

### PBMS Bacnet serial interface

RS485 serial card for connection of the unit to an external supervisor via BACnet MS/TP protocol

### BEET Blueye® via Ethernet



**Blueye®** is a supervision platform for remote monitoring of the HYZER X system using a network featuring a Modbus protocol.

This option features the Blueye device, as already installed and wired in the electric cabinet.

The critical variables to be monitored over time are identified for each connected device. These variables are sampled and saved to the cloud so that they are accessible at all times through a web portal or a mobile APP (available for Android and iOS).

The following options can be selected for connection to the internet:

- a LAN (Ethernet) connection - available in the system;
- a connection to a mobile network - at least 3G. The data SIM card is not included.

Three different types of contracts can be signed.

#### **Blueye® Cloud Basic:**

- to monitor a max. of 20 variables in total over max. 5 units/peripherals;
- to set a min. sampling frequency of 60 seconds.

#### **Blueye® Cloud Advanced:**

- to monitor a max. of 200 variables in total over max. 10 units/peripherals;
- to set a min. sampling frequency of 5 seconds.

#### **Blueye® Connect:**

- To monitor up to 10 units/peripherals.

Subscribing to any of the **Blueye® Cloud** enables:

- viewing the history of the monitored variables, in the form of both numerical values and graphs;
- downloading the history of variables in CSV format;
- the creation of automatic reports;
- setting notifications (via APP or mail) with settable thresholds for each variable;
- switching the unit ON/OFF remotely;;
- changing the set point remotely;
- selection of SUMMER/WINTER mode remotely (for reversible units only).

The subscription to the **Blueye® Connect** service offers the advantages below:

- a safe connection (tunnelling) between the user and the remote unit through the Blueye® portal;
- full access to the remote controller;
- real time monitoring;
- software upgrading.

The services listed are not part of the option and they have to be purchased separately based on the number of units/devices to be connected and the number of variables to be monitored. In order to connect multiple units to **Blueye® device, the network switch is required (this accessory is sold separately).**

**For further details, refer to the specific Blueye® documentation.**

## External devices

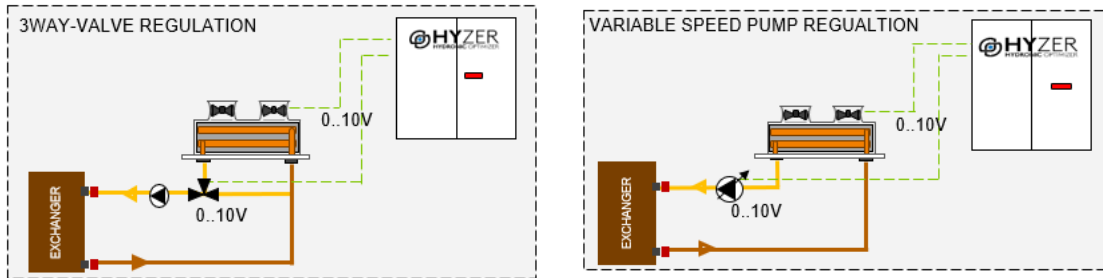
### DRYC Dry cooler management

This option requires that control of an external dry cooler unit is enabled. The controller enables/disables the set of dry coolers fitted in the system and it enables optimisation of modulation in parallel, based on the actual demand.

The option includes:

- a 0-10V signal for condensation control;
- a 0-10V signal for fan control;
- an OK signal to authorise system run.

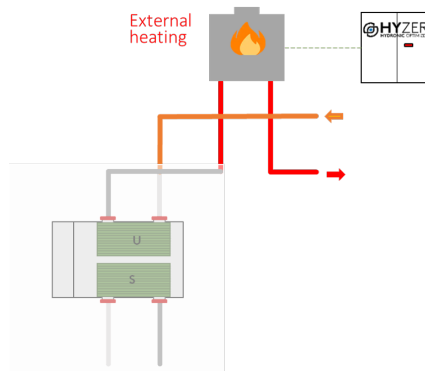
Condensation can be controlled using a 3-way modulating valve or an inverter pump.



### CORA OK signal for auxiliary heating

This option enables the OK signal to the auxiliary heating system. It includes:

- a digital input for the alarm;
- a digital output for the OK signal.



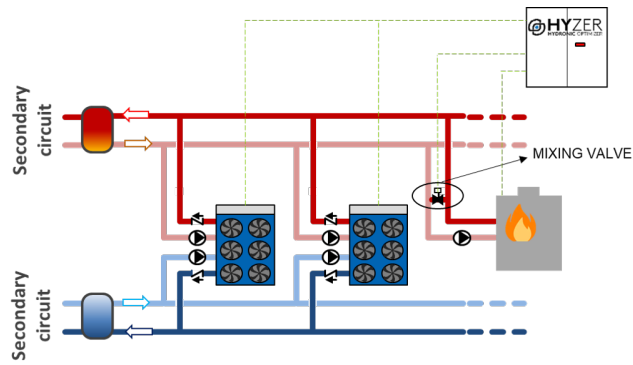
### CONC OK signal to boiler

This option requires that control of an auxiliary boiler is enabled.

Based on the specific needs of the system, it can work as an integration or a replacement for the refrigeration units.

The option includes:

- a 0-10V signal for 3-way valve control;
- an OK signal for the boiler;
- 3 temperature sensors (IN/OUT/REF)
- a digital input for the alarm;

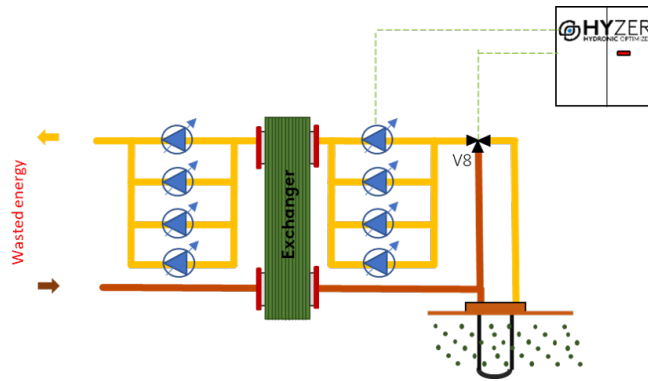


**PPx Well water pumps**

The option includes an OK signal to manage up to 4 well pumps.

The control of well water includes:

- a 0-10V signal for 3-way valve control;
- a 0-10V signal for pump control;
- an OK signal to authorise system run.
- a digital input for the alarm;



**XPBP Well pump set in backup mode**

Either one or two well pumps can be set up in backup mode and their rotation managed by equalizing the number of hours of operation.

## HYZER X

			STANDARD UNIT**
<b>Dimensions and weights**</b>			
Length		mm	590
Depth		mm	360
Height		mm	855
Weights		kg	40
<b>General electrical specifications</b>			
Power supply		V/ph/Hz	230-24/1~/50
Auxiliary circuit voltage		V	24
Suggested line section	(5)	mm <sup>2</sup>	3G1,5 FG16OR16
Suggested line protection	(6)		CH10gG 10A

\*\*Basic unit without options included

- (5) These values are calculated for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct system for line protection must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

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