INTELLICON 1000 SERIES

Multiple Pump Multiple Zone Controller For HVAC Systems

INTELLICON 1000

MULTIPLE PUMP MULTIPLE ZONE CONTROLLER FOR HVAC SYSTEMS

INTRODUCTION

The Lubi **Intellicon 1000** is a fully integrated variable speed controller that lets you monitor and control upto six identical pumps of hydronic or chilled water HVAC system connected in parallel.

The variable speed technique offers a huge opportunity in energy savings and so is a must for Sustainable Green Energy Modern Buildings.

The Intellicon 1000 is a pre-engineered solution for your HVAC system. It comes as a complete package of all hardware controls including high technology Variable Speed Drive for each pump as well as application optimized software with flexibility to configure the HVAC system according to the site requirements to achieve maximum energy savings as well as occupant comfort.

The Intellicon 1000 offers BMS connectivity using industry standard protocols like BACnet™ MS/TP or IP, ModBus RTU, LonWorks®.

APPLICATIONS

- ❒ Heating systems
- ❒ Air-conditioning systems

FEATURES AND BENEFITS

- ❒ Variable speed energy saving optimized solution designed especially for HVAC systems.
- ❒ Available with Parallel Sensorless Technology (optional)
- ❒ Enhanced control capabilities and performance by optimized staging of pumps as per field demand.
- ❒ Multiple Pump, Multiple Zone Control made easy by inbuilt PLC based control.
- ❒ User friendly field configurable controller through operator interface touch screen color HMI.
- ❒ Can be integrated with existing or new HVAC system.
- ❒ Standalone or BMS Operation using industry standard serial communication protocols.
- ❒ Reliable solution for long term performance and monitoring accuracy
- ❒ Easy installation as the controller comes variable speed drives prewired and tested at factory.
- ❒ Easy selection from our pre-engineered models available in the catalog.

TECHNICAL SPECIFICATIONS

Types of controllers	Design for control up to 6 identical variable speed pumps working in parallel, staged, sequenced or standby configuration Intellicon 1000 - for 2 pumps & 1 zone Intellicon 1001 - for 3 pumps & 2 zones Intellicon 1002 - for 4 pumps & 5 zones Intellicon 1003 - for 6 pumps & 12 zones
Designed to control Lubi pumps	LCR, LCRI, LCRN, LES, LBS, LVI, LVS, LHC
Frequency	50/60 Hz
Motor sizes	Up to 185 kW
Ambient temp.	0°C to +50°C
Electrical ratings	380-415V 50 Hz, 230/460V 60 Hz, 380V 60 Hz
Communication protocols	BACnet™ MS/TP or IP, ModBus RTU, LonWorks®
Mounting	Wall or floor mounting

INTELLICON 1000 SERIES OF CONTROLLER HAVE BEEN DESIGNED TO OFFER ADJUSTMENTS OF THE FOLLOWING CONTROL PARAMETER FOR FIELD ADJUSTMENT
Up to 12 Analog Inputs (AI) for zone DP, temperature signals (4-20 mA)
1 AI for DP transmitter or flow sensor for pump run-out protection
Up to 6 Digital Inputs (DI), one per pump, DP switch (optional if VFD used)
1 DI for remote connection for start/stop
1 DI for alarm of standby pump (DOL)
1 DI for alarm silencer
1 DI for emergency stop
1 DI for Auto / Manual selection
Up to 6 Analog Outputs (AO), one per VFD for speed signal
Up to 6 Analog Output (AO), one per VFD to give feedback signal
Up to 6 Digital Outputs (DO), one per pump/VFD for ON/OFF signal
1 DO for stand by Pump/VFD ON/OFF signal
Up to 3 DI per VFD for : (a) Pump running (b) Communication failure alarm (c) VFD fault
Up to 3 DO for alarms: (a) Pump/Motor/VFD alarm (b) DP transmitter alarm (c) General system alarm
1 DO per VFD for automatic bypass activation

ENCLOSURE

The Intellicon series controller cabinet is rated NEMA 1 and is provided with a lockable key.

OPERATOR INTERFACE

The Intellicon 1000 series controller includes a 4.3” 65536 color touch-screen HMI for all necessary user interface functions. Larger HMI are available at extra cost. The Intellicon series controllers are programmed to perform Online Self Diagnostic Tests of CPU, RAM and flash memory. Data stored within the controller will be protected during power supply interruptions.

Two level password security is standard on the Intellicon series controllers. One level will enable the user to change field adjustable parameters. The other level will enable factory/commissioning person to adjust parameters which do not require adjustment in the field.

BAS

Intellicon 1000 controller shall be capable of communication with the BAS with any of the following protocols:
ModBus RTU, BACnet™ MS/TP or IP, BACnet Ethernet and LonWorks®.

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OPERATION LOGIC

- ❒ The Intellicon series controllers are programmed to operate so that it logically determines the most efficient combination of operating pumps, and pump operating speed based on the zone DP/FLOW or TEMP transmitter signals.
- ❒ The controller responds to the most dissatisfied zone by increasing either, the number of operating pumps, or the pump speed. In the case where all zones are satisfied then pump logic controller responds by decreasing either, the number of operating pumps (or) the pump speed so as to optimize the energy efficiency of the pumping operation while meeting system demand.
- ❒ The Intellicon controller will continuously monitor all zone signals to determine an Active Control Zone. To prevent unnecessary changes to the operating pump speed, to become the Active Control Zone, the candidate zone must have a greater error from its set-point than the current active control zone for greater than 1 minute.
- ❒ The Intellicon controller is capable of sequencing the pumps based on a field adjustable interval of operating hours with a “bump-less” Pump transfer algorithm. The controller incorporates embedded logic to prevent hunting, pump flow surge, and motor overloading. The controller logic also provides an adjustable PID control loop.
- ❒ The Intellicon controller is designed with Hand-Off-Automatic (H-O-A) control and provides the option for a remote On/Off signal from a Single dry type relay or via BMS communication signal.
- ❒ The Intellicon controller provides a data-logging feature including alarms, and events (adjustment to system parameters) & recording of history data with a date & time stamp. The alarm history is displayed on its graphical HMI.
- ❒ The Intellicon controller is capable of handling multiple variable speed sensorless pumping operation without any DPT sensor in the building (optional).
- ❒ The Intellicon controller automatically disable any zone DP signals that are not within limits and alert the operator of a possible transmitter failure. If system found all DPT sensors failure in the building the pump speed will default to a pre- defined percent of full speed (factory default is loaded as 90% of full speed).

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OPERATION LOGIC (CONT....)

- ❒ The operator interface shall have following screens options:
  - Zone setups (including calibration of DP/Flow/ Temperature sensor range)
  - Pump configuration
  - Design set-point and End Of Curve data
  - Alarm history and event review
  - Display of zone status, pump status and system status
  - Factory default / commissioning setup data.
- ❒ Automatic by-pass feature at extra cost is available as an option. In this feature on an event of VFD failure, an appropriate alarm signal is activated. In the place of the failed VFD/Pump assembly, a standby VFD/Pump unit will be operated in variable speed mode. If the system demand is too great with the standby VFD/Pump Unit the Intellicon controller sends an automatic VFD by-pass signal to each VFD/by-pass assembly to operate in by-pass mode.

ALARMS

- ❒ System fault alarms
- ❒ General alarm
- ❒ Pumps run feedback alarms
- ❒ Pump alarms
- ❒ Drive fault alarm
- ❒ Zone/sensor alarm
- ❒ Drive communication alarm
- ❒ Potential free contact is provided with a hooter/ buzzer for general alarm, pump alarm and general sensor alarm.

SAFETY FEATURES

- ❒ Auto omission of pump in case of pump failure (optional)
- ❒ Auto omission of zone/sensor in case of any zone sensor (optional)
- ❒ System End Of Curve protection with DP is standard and flow sensor is optional
- ❒ Remote stop for emergency shutdown.

APPLICATION RANGE

CONTROLLER TYPE	CONTROLLER CONFIGURATION	MAXIMUM EQUIPMENT QUANTITY		SENSOR CONTROL			
		PUMPS	ZONES	DP ZONE SENSOR	RETURN TEMP SENSOR	EOC* BY DP	EOC* BY FLOW
Intellicon 1000	Variable secondary pumping control**	2	1	■	■	■	Optional
Intellicon 1001	Variable secondary pumping control**	3	2	■	■	■	Optional
Intellicon 1002	Variable secondary pumping control**	4	5	■	■	■	Optional
Intellicon 1003	Variable secondary pumping control**	6	12	■	■	■	Optional

Note: ■ Supply as standard

* End Of Curve protection.

** A zone sensor signal can be reconfigured to control a valve command output.

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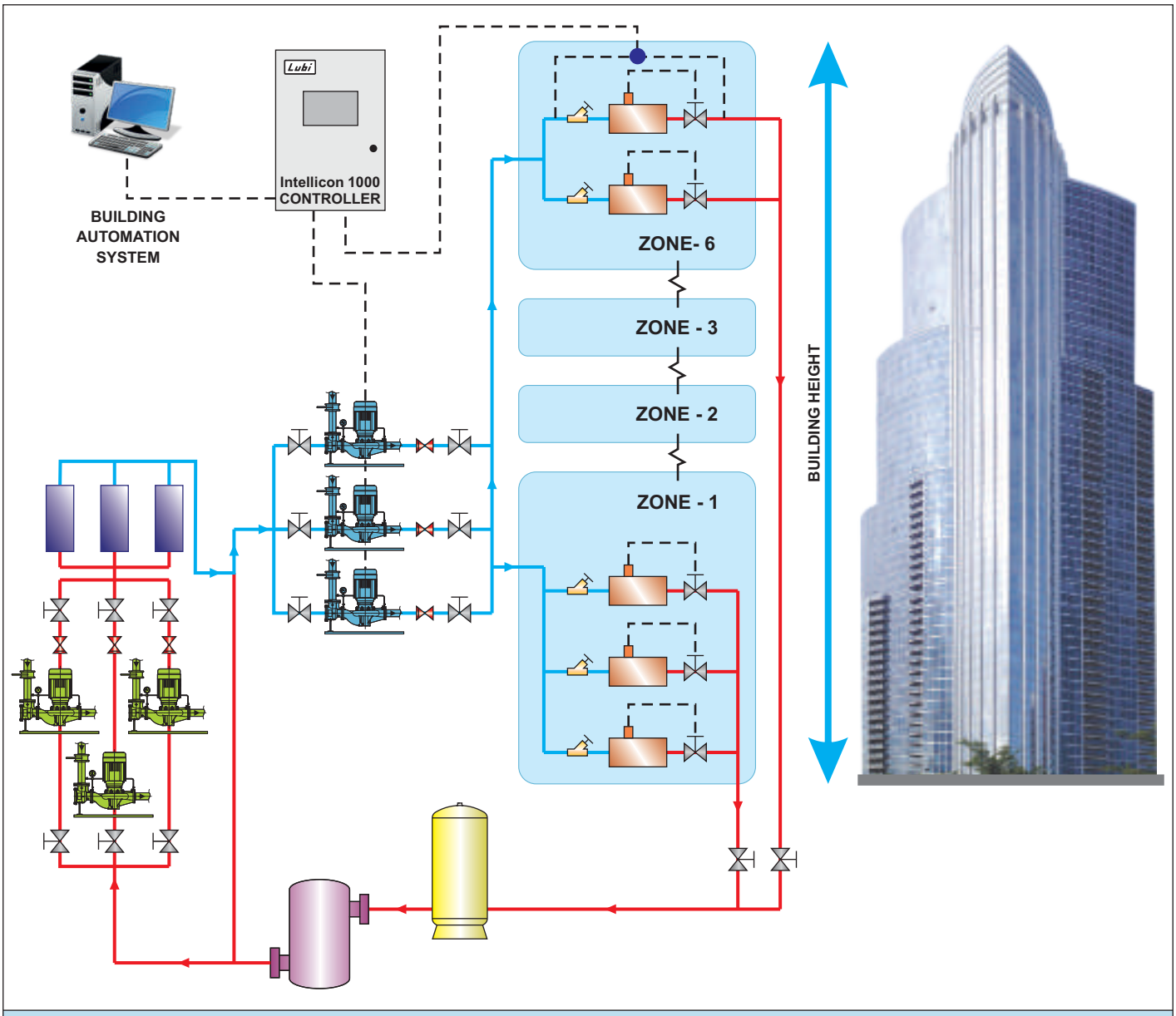
TYPICAL LAYOUT FOR ZONE SENSOR CONTROL HVAC SYSTEM



LEGEND KEYS

- PRIMARY PUMPS
- SECONDARY PUMPS
- BALANCING VALVE
- TEMPERATURE CONTROL SENSOR
- 2 WAY VALVE
- CHILLER
- AIR HANDLING UNIT (LOAD)
- DPT
- EXPANSION TANK
- AIR SEPARATOR
- NON-RETURN VALVE

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