ARMSTRONG 🏭

IPC 9521 | SUBMITTAL

Job: _____

_____

Engineer: _____

Contractor: _____

Representative: _____

Ordered by: _____ Date: _____

Submitted by: _____ Date: _____

Approved by: _____ Date: _____

CONFIGURATION

SYSTEM		COOLING TOWERS** QUANTITY
Quantity of water cooled chillers	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
	☐ 3	☐ 2 ☐ 3 ☐ 4 ☐ 5
	☐ 4	☐ 3 ☐ 4 ☐ 5
	☐ 5	☐ 4 ☐ 5
Capacity per chiller*		Tons
Number of zones		(Specify 1 to 5)

PRIMARY PUMP SPEED CONTROL	FOR ZONE(S)
☐ Sensorless ☐ Local Plant dP sensor	1
☐ Zone differential pressure sensor(s) ☐ Zone return temperature sensor(s)	1 to 5

* All chillers, pumps on each set & cooling towers have to be of identical capacity

** Only headered cooling towers are allowed. 1 speed signal/VFD is considered per tower

SYSTEM LAYOUT	CONFIGURATION		OPERATION	QUANTITY OF CHW PRIMARY PUMPS	
Primary CHW pumps	☐ Single	☐ Headered	☐ Parallel	☐ Duty pumps = number of chillers	(1 to 5) Duty + 0 Standby
			☐ Standby	☐ Duty pumps = number of chillers* + 1 Standby pump	(1 to 4) Duty + 1 Standby
		☐ Dedicated	☐ Parallel	☐ Duty pumps = number of chillers	(1 to 5) Duty + 0 Standby
			☐ Standby	☐ Duty pumps = number of chillers + Standby pumps = number of chillers	(1 to 5) Duty + (1 to 5) Standby**
	☐ DualArm ☐ Twin	☐ Dedicated	☐ Parallel	☐ Duty pumps = number of chillers	(1 to 5)***

* Up to 4 chillers systems

** Equal number of duty and standby pumps

*** 1 DualArm = 2 rotating assembly (considered Duty/Duty)

  1 Twin = 2 rotating assembly (considered Duty/Standby)

SYSTEM LAYOUT	CONFIGURATION		OPERATION		QUANTITY OF CHW PRIMARY PUMPS	
Condenser cw pumps	☐ Single	☐ Headered	☐ Parallel	☐ Duty pumps = number of chillers	(1 to 5) Duty + 0 Standby	
			☐ Standby	☐ Duty pumps = number of chillers* + 1 Standby pump	(1 to 4) Duty + 1 Standby	
		☐ Dedicated	☐ Parallel	☐ Duty pumps = number of chillers	(1 to 5) Duty + 0 Standby	
			☐ Standby	☐ Duty pumps = number of chillers + Standby pumps = number of chillers	(1 to 5) Duty + (1 to 5) Standby**	
	☐ DualArm ☐ Twin	☐ Dedicated	☐ Parallel	☐ Duty pumps = number of chillers	(1 to 5) Duty + 0 Standby	

* Up to 4 chillers systems

** Equal number of duty and standby pumps

STANDARD FUNCTIONALITY AND CONSTRUCTION

The Armstrong IPC 9521 is a pre-programmed control system, designed for the automation of a water cooled variable primary chiller plant. It includes:

- 2 panels mounted on a wall rack
- The master panel has a large-sized (10.4") touch-screen operator interface (not to be directly exposed to sunlight)
- On-screen menu driven operator interface manual or automatic system control (H-O-A selection)
- Multi-color schematic active display of mechanical room hydraulic circuit indicating operating status
- Remote or local start/stop mode of operation
- Three field and two factory levels password security
- Secure front cabinet door with lock and key
- Alarm and event logging of 2000 events
- Data trending available on a csv file
- Internal circuit breaker protection
- Automatic or manual pump alternation
- **Alarms:** ① controller communication alarm, ② sensor alarm, ③ general system alarm, ④ Individual equipment (chiller, pumps, tower fans, valves, auxiliary equipment) alarm
- Standard Modbus RTU communication between IPC controller and VFD's (pumps and towers)
- Logic outputs for chiller 2-way automatic ON/OFF isolation valves
- Logic output for chiller 2-way automatic modulating bypass valve
- Digital inputs for pump differential pressure switches on all variable speed primary pumps

- Output for remote alarm/horn signal
- Input for silencing of remote alarm/horn
- Automatic sequencing of chillers
- Sequencing, isolation valve, and modulating control for chillers in a variable primary flow application
- Pump speed, cooling valves and bypass valve PID control loop, adjustable
- Parallel Sensorless™ primary pumps control mode with best efficiency point staging.
- Cooling valves control mode (ASHRAE 90.1)
- Separate operating status display of primary and secondary pump status, pump speed(s) and drive status
- Separate operating status display of chiller status, demand limit, power, temperatures
- Separate operating status display of tower fan, tower fan speed(s) and drive status
- Separate operating status display of isolation and bypass valves
- Separate input screens for; set points, differential pressure sensors, flow and kW monitors
- Separate status display screens for; pump status, zone status, system status, plant status
- **Power supply:** 100V-240V AC/1 phase/50-60 Hz
- Ambient air Temperature for operation range : (0 to 45°C)
- Ambient air temperature for storage range : (0 to 60°C)
- Relative humidity : (10...85 %) Non Condensing
- Operating altitude 2000 m

OPTIONAL FEATURES AND DIMENSIONS

CHILLER COMMUNICATION		DIMENSIONS AND WEIGHTS				
		LENGTH	HEIGHT	DEPTH	WEIGHT	ENCLOSURE
Interface OR Hardwired (Output 0-10V)	☐ Modbus RTU ☐ BACnet™ MS/TP ☐ BACnet™ IP ☐ LonWorks® ☐	2100 (82.70)	1100 (43.30)	321 (12.60)	70 (154)	☐ IP54
		2541 (100.00)	1078 (42.40)	395 (15.60)	80 (176)	☐ IP55*
Hardwired (Output 4-20 mA)	☐	2100 (82.70)	1200 (47.20)	321 (12.60)	75 (165)	☐ IP54
	☐	2541 (100.00)	1228 (48.30)	395 (15.60)	90 (198)	☐ IP55*

Notes:
- Dimensions in mm (inches) Weights in kg (lbs)
- Weights are approximate

*Recommended for outdoor application.
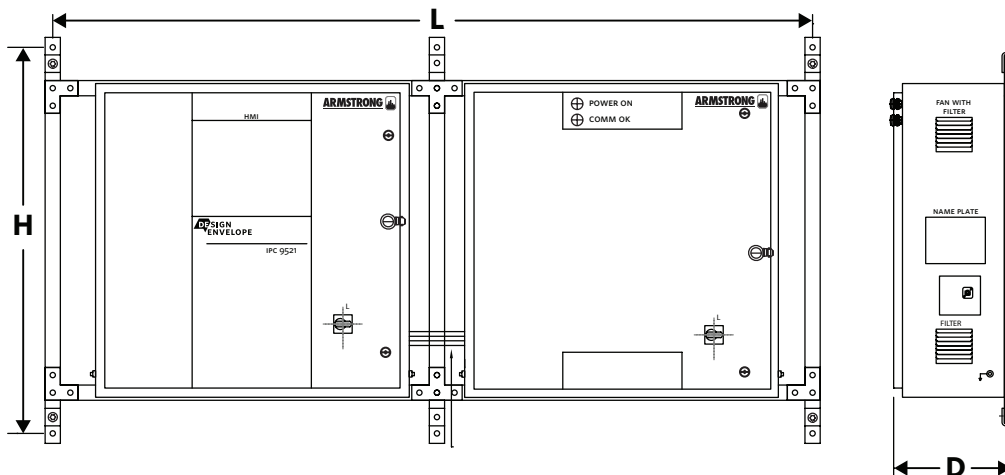
OPTIONS

☐ ECO*PULSE embedded intelligence (diagnostic service available on a subscription basis)

☐ Export crating

☐ On-site start up by 1 trained Armstrong service provider.

BAS COMMUNICATION

☐ Not required

☐ Modbus RTU

☐ Modbus TCP

☐ BACnet™ MS/TP

☐ BACnet™ IP

☐ LonWorks®

INSTRUMENTATION (FOR THE PUMP CONTROL)	TOTAL QUANTITY	FOR PRIMARY PUMP SPEED CONTROL			
		SENSORLESS	LOCAL PLANT DP	ZONE DP	ZONE RETURN TEMP
☐ Zone dP sensors		N/A	N/A	= qty of zones	N/A
☐ Zone return temperature sensors		N/A	N/A	N/A	= qty of zones
☐ Pump head dP sensor		N/A	1*	N/A	N/A
☐ Plant dP sensor with package		N/A	1	N/A	N/A

* Not required with Design Envelope pumps

INSTRUMENTATION (FOR THE SYSTEM)	TOTAL QUANTITY	
☐ Primary flow sensor		1
☐ Primary supply and return temperature sensors		2
☐ Chiller kW sensors*		= qty of chillers
☐ Condenser temperature sensors		2
☐ Condenser flow sensor		1
☐ Outside air temperature & humidity sensor		1

* Optional if each chiller already has an integrated kW reading