
CONTRACTOR COST COMPARISON *Case Study*

Factory Built Pumping Package or Field Erected pumping system? There is generally little question which type of installation yields a better quality system. A factory built system allows for more up front engineering, better working conditions and factory mounted controls. The overall finished system is certified in the factory, so is more efficient, more accessible

The question always comes up which way is more expensive. On a recent project in Norfolk, Virginia, the mechanical contractor was asked to justify his decision between a field erected system and the specified packaged pumping system. The owner wanted to know how much of a “premium” he was paying for the packaged system specified by the engineer.

The contractor’s analysis for a field erected system was as follows:

Mechanical Equipment/Materials:	\$ 63,676.00
Sales Tax (4.5%):	\$ 2,865.42
Labor (646.9 HRS x \$18.00):	\$ 11,644.00
Labor S.I.T. (32%):	\$ 3,726.08
Subcontractors:	
Electrical:	\$ 3,500.00
Controls:	\$ 9,880.00
Sub-Total:	\$ 95,291.50
Overhead (8%):	\$ 7,623.32
Totals:	\$102,914.82

Note: In the contractor’s cost estimate, he had three pages of spreadsheet costs to calculate every component and installation labor. This estimate did not include any installation drawings for his field personnel. This estimate took the contractor approximately one day to figure, whereas the estimate using the package took less than an hour.

The contractor was given the following proposal for the packaged pumping system:

Two pumps (P-3, P-4) each rated 291 GPM at 83 foot TDH with 15 HP, ODP, 1750 RPM, 208/3/60, premium efficiency motors, for VCW.

Two pumps (P-5, P-6) each rated 211 GPM at 82 foot TDH with 15 HP, ODP, 1750 RPM, 208/3/60, premium efficiency motors, for HW.

Two pumps (P-1, P-2) each rated 363 GPM at 61 foot TDH with 10 HP, ODP, 1750 RPM, 208/3/60, premium efficiency motors, for CDW.

Manual isolation butterfly valve to be provided at suction and discharge of each pump. Check valve to be provided at discharge of each pump. Pressure gauges mounted on a gauge panel to be provided for suction header and individual pump discharge pressure indication. Suction diffuser to be provided at suction of each pump.

2-Way, 3", electric actuated, modulating control valve to be provided for chilled water bypass connection. To be packaged mounted.

3-Way, 4", electric actuated, mixing control valve to be provided for Heat Exchanger. To be packaged mounted.

Single point power supply connection to be 208 Volt, 3 PH, 60 Hz. Control enclosure to be provided shall be UL listed, NEMA 1, multiple compartment. Separate compartments provided for power distribution, variable frequency drives for each VCW, HW & CDW pumps, and sequencing controls.

Two variable frequency drives to be provided for the VCW 15 HP pumps, two variable frequency drives to be provided for the HW 15 HP pumps, and two variable frequency drives to be provided for the CDW 10 HP pumps.

Three S1151DPS Differential pressure transmitter(s) provided for zone PID control, to be field installed by others, one S1151DPS Differential pressure transmitter(s) provided for VariPrime control, to be field installed by others.

Factory non-witnessed flow test to be provided for the system, with Certified Report generated.

The total cost for this equipment (F.O.B. Factory, full freight allowed to jobsite), is: \$ 97,860.00 R/N. This price includes Systecon's standard parts warranty, and factory start-up service.

For the pumping package that was quoted, the contractor only had to figure in rigging and installation of one component. He estimated those costs as follows:

Equipment Cost:	\$94,260.00
Sales Tax:	\$ 4,270.50
Rigging:	\$ 2,400.00
Start-Up:	\$ 3,600.00
Total:	\$104,530.50

The final overall cost of the two systems was basically the same. However, the packaged pumping system included many benefits that are not available in a field erected system. They are:

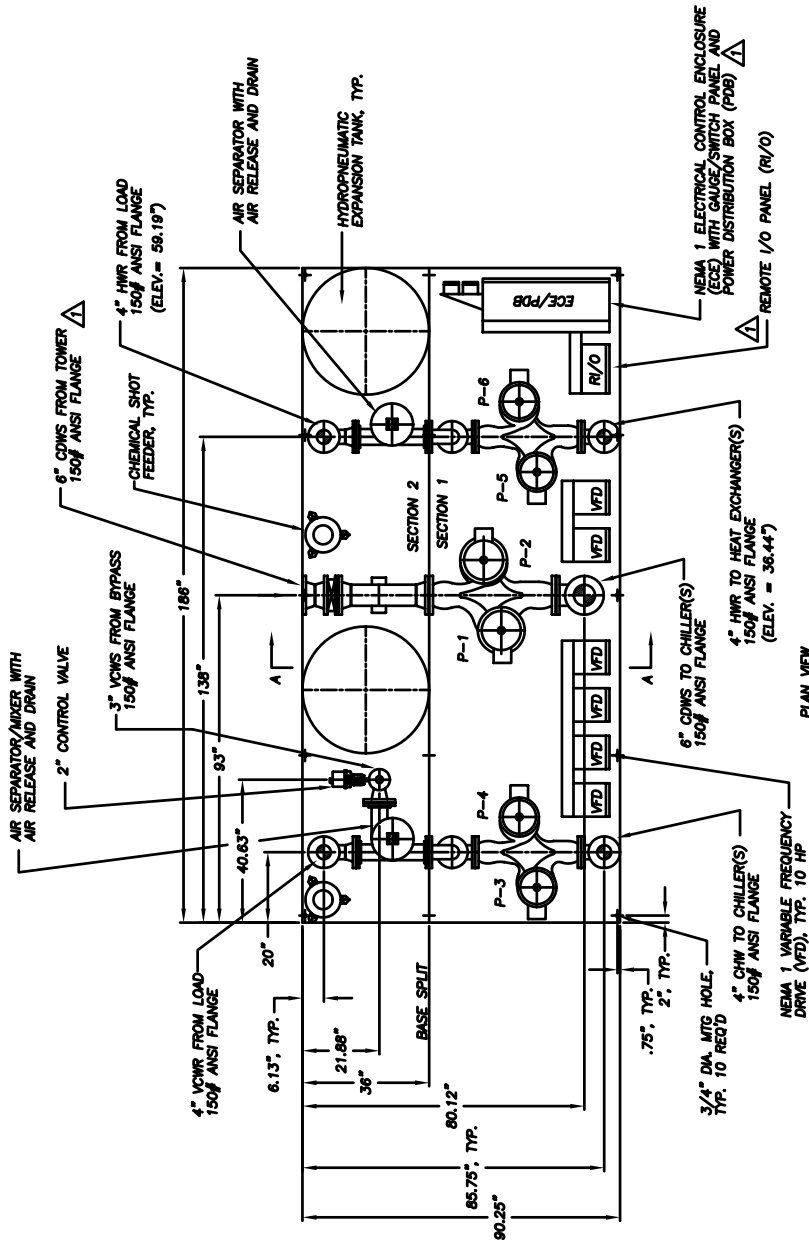
- 1) The packaged pumping system had all controls factory mounted, including the interface to the Building Automation System (BAS). The field erected system would have required the BAS contractor to begin work after most of the equipment was installed. This would have pushed back completion several months.
- 2) The packaged pumping system was completely tested for all control sequences. This test included an efficiency test that would be impossible to duplicate in the field. The results of the efficiency test will provide the owner with additional operational savings not available in the field erected system.
- 3) The factory start-up provided includes start-up of the pumps, VFD's, and system controls by one person. This start-up will essentially commission the entire chilled water pumping system at one time, savings additional costs.
- 4) The factory testing of the pumping will reduce the balancing contractors time and cost. Also, most parts of a variable volume system require less test and balance than constant volume systems. This is especially true of Systecon VariPrime™ systems, which eliminate constant volume evaporator pumps and additional components that must be balanced.
- 5) This packaged pumping system employs new technology available only with the Systecon VariPrime™ system. The VariPrime™ system is more cost effective than the traditional primary/secondary system. If an evaluation was made between the Systecon package and a field erected primary/secondary system, the cost savings for the VariPrime™ package would have been dramatic.

IMPORTANT

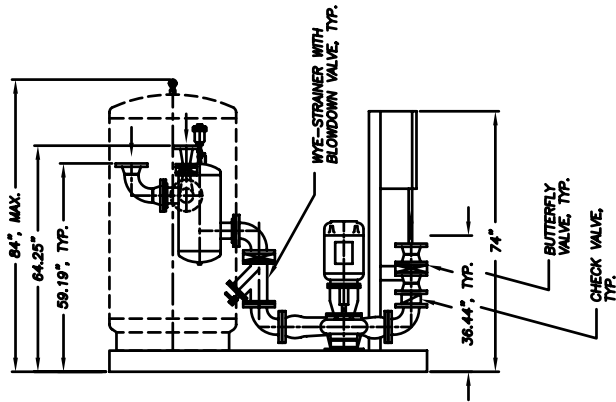
1. NOTICE: PIPING DIMENSIONS ARE APPROXIMATE. FINAL DIMENSIONS AND TOLERANCES DO NOT COMPLETE FIELD PIPING UNTIL SYSTEM IS PROPERLY INSTALLED. SYSTEMCON ACCEPTS NO LIABILITY DUE TO DIMENSION VARIANCES.
2. DO NOT RIG FROM SYSTEM PIPING. LEVEL AND SHIM BASE BEFORE ANCHORING.
3. BASE MUST BE GROUDED.
4. DO NOT BIND SYSTEM CONNECTIONS.
5. FIELD PIPING MUST BE SUPPORTED.
6. INDEPENDENT OF SYSTEM CONNECTIONS. ALLOW 48" CLEARANCE IN FRONT OF ELECTRICAL ENCLOSURES.
7. INTERNAL PIPE SIZE IS 6" FOR P-1, 2.
8. INTERNAL PIPE SIZE IS 4" FOR P-3, 4, 5, 6.

THIS DRAWING SHOWS THE SYSTEM CONFIGURATION AS OF THE DATE OF CONSTRUCTION.

125 PSIG MAXIMUM SUCTION DESIGN. 125 PSIG MAXIMUM DISCHARGE DESIGN. RULING SYSTEM IS 1/2" BORE SCHEDULE 40. SYSTEM FLOW: 281/211/283 GPM. USE: CHILLED/WOT/CONDENSER WATER. PUMP MODEL FLOW HEAD HP P-1 4302-4X4X10 563 61 10 P-2 4302-4X4X10 291 63 10 P-3 4302-4X4X10 291 63 10 P-4 4302-4X4X10 291 63 10 P-5 4302-4X4X10 211 62 10 P-6 4302-4X4X10 211 62 10 POWER: 460 V 3 PH 60 HZ. SYSTEM WEIGHT: SECTION 1 WL = 4,700 LB. SECTION 2 WL = 3,100 LB. FILL WL = 6,100 LB. WATER WL = 5,500 LB. OPERATIONAL WL = 21,200 LB.



PLAN VIEW



LEFT SIDE VIEW

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