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Booster Check Report

Grundfos Reference #:	xxxxxxx
Facility Name	Atlanta Condo Building
Energy Saving potential	105,335 kWh
Sales company	**Grundfos CBS (GPU)**
Author	Grundfos CBS
Date	May 22, 2020

Contents

1. Summary

Existing System	
Number of Pumps	**3**
System Condition(s)	**Inefficient, Oversized (regardless VFDs)**
	Costly Repairs Imminent (due to oversizing)
Design Water Flow Capacity (Name Plate)	**500 GPM**
Estimated Building Flow Demand*	**80-120 GPM**
Design Pressure Boost (Name Plate)	**370 FT**
Gauge Pressure (based on walkthrough, See Appendix C)	**347 FT**

*Based on comparable Audited Buildings or Annual Water Bills

Energy Saving Summary			
	EXISTING	**PROPOSED**	**SAVINGS**
Energy Consumption (kWh)	137,234	31,899	105,335
Energy Cost	$13,723	$3,190	$10,533
Savings			77%
Cost per kWh	**$0.10**		
Operating Cost Comparison			
Estimated Maintenance (per yr.)	$2,000	$100	$1,900
Maintenance + Energy (1 yr)	$15,723	$3,290	$12,433
Maintenance + Energy (10 yrs)	$157,234	$32,899	$124,335

The assumptions made in this calculation are:

- One of the existing pumps is running continuously throughout the year, the second pump is turns on during peak hours (6 hours/day). The third pump is a dedicated standby.

2. Booster Assessment Results

The Booster Check Service begins with a walkthrough evaluation (in line with ASHRAE Level 1 Audit) to capture system and pump nameplate data as well as building characteristics.
Utility and system operation information is provided by end user and local system operator. In general, we are looking for Booster Systems with the following conditions, where energy savings opportunities are greatest;

1. **Energy Inefficient (Constant speed operation)**
2. **Over-sized**
3. **Undersized (Insufficient building pressure)**
4. **High ongoing maintenance costs (Continuous system repair costs)**
5. **End-of-Life (over 15 years where system breakdown is imminent and parts may no longer be available)**

The energy savings are estimated based on the following assumptions:

1. Pump run hours and maintenance cost based on operator and end user comments
2. Existing booster system is feeding only the domestic cold water applications unless otherwise specified (Refer Appendix C. Qualifying Form)

Based on the assessment, the following observations were made of the existing booster system:

- Existing system is in constant speed operation with pressure reducing valves being used as pressure regulating device. (meets condition #1)
- Existing system design water flow capacity is **500 GPM**. Estimated building flow demand based on similar audited buildings is **80-120 GPM** (meets condition #2).
- Water Bills from last **17 months** were provided. The estimated maximum monthly consumption is **33 GPM**
- As per end users and operators, booster meets condition #4.

Table 1 below shows similar audited buildings characteristics and energy savings.

Building	Age	# of Units	# of Floors	# of Pumps	HP			Existing kWh	Energy Savings	Existing System Efficiency
					P1	P2	P3		%	
Building #1	18	320	39	3	10	25	15	109,869	79%	6.6 - 14%
Building #2		248	35	2	20	30		112,957	88%	3.7-27.2%
Atlanta Condo Building	18	286	36	2	20	25	25			
Building #3	11	297	33	3	25	40	40	129,681	84%	2.9-12.4%

Table 1 Comparison Table

In the light of the aforementioned, we would like to propose the following:

Selection	Energy Savings	Maintenance Savings
Hydro MPC-E (CUE) 3CR20-8 20HP 3x460V	$10,533	$1,900

Yours truly,

Grundfos CBS
Energy Optimization Analyst
Phone: (+1) 905 491 6672

3. Grundfos Energy Optimization

Grundfos is proud to be leading the market in pump-specific audits. We are currently the only pump manufacturer offering audits. While other energy auditors do exist, they have minimal experience auditing pump systems. At Grundfos, we know pumps and pumping systems; it's been our primary focus for over 60 years. After performing over 450 audits we have collected enough data to enable us to size the right booster for your application with the optimum energy consumption.

In recent years, more and more regulations and standards have been established focusing on reducing energy consumption. Commercial buildings are no exception. The ASHRAE 90.1-2010 Chapter 10, Section 10.4 outlines changes to commercial building water pressure booster system requirements as follows:

a) *One or more pressure sensors shall be used to vary pump speed and/or start and stop pumps. The sensor(s) shall either be located near the critical fixture(s) that determine the pressure required, or logic shall be employed that adjusts the set point to simulate operation of remote sensor(s).*

b) *No device(s) shall be installed for the purpose of reducing the pressure of all of the water supplied by any booster system, except for safety devices.*

c) *No booster system pumps shall operate when there is no service water flow.*

Governments have been known to adopt ASHRAE standards into their building code. This will mean that a new standard for commercial water pressure boosting may be adopted in the near future and Grundfos can help you to stay ahead of the game.

The electrical grid is particularly challenged with ever increasing demand. To solve this problem, many provincial and federal authorities have started incentive programs. One of the incentive programs is the Georgia Power Energy Efficiency Program.

https://www.georgiapower.com/content/dam/georgia-power/pdfs/business-pdfs/Custom%20Savings%20Final_03.09.2020.pdf

The Program offers incentives to help offset the cost of an investment in high-efficiency products. Upgrading to a Grundfos BoosterpaQ is an eligible measure under this scheme.

Estimated Incentive:	$10,533

The customer is responsible for the rebate application and should ensure the eligibility criteria are met as described on the link above to get the full rebate. The estimated Incentive is calculated based on rebate figures from the website and estimated total project cost. The estimated incentive figure is subjected to changes from Georgia Power Energy Efficiency Program and policies.

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Appendix A: Existing System

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Appendix B: Picture of Proposed Grundfos System

Actual Installation from the Grundfos Energy Optimization Program

I. Pump Curve

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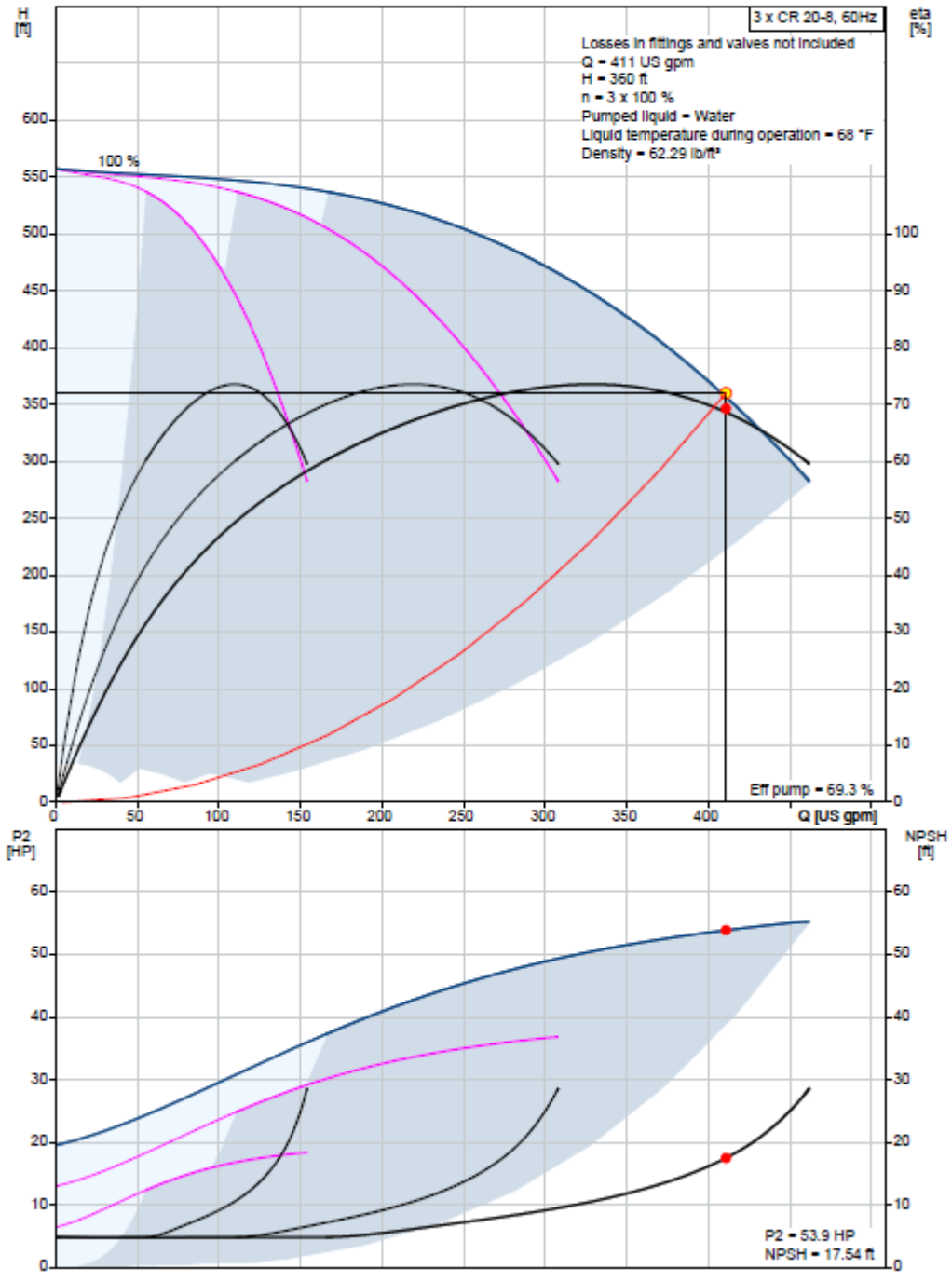
Company name:
Created by:
Phone:

Date: 5/22/2020

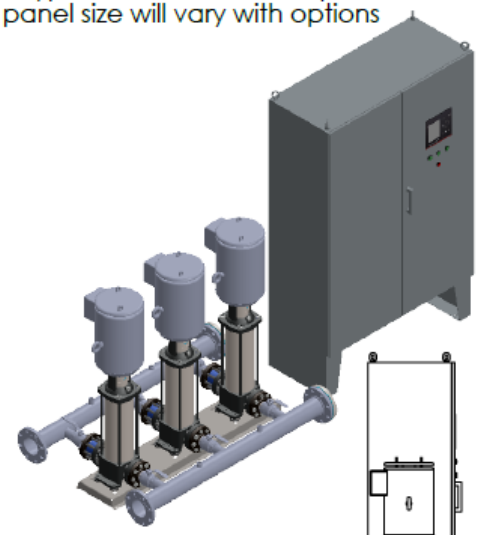
On request CR 20-8 A-GJ-A-E-HQQE 60 Hz

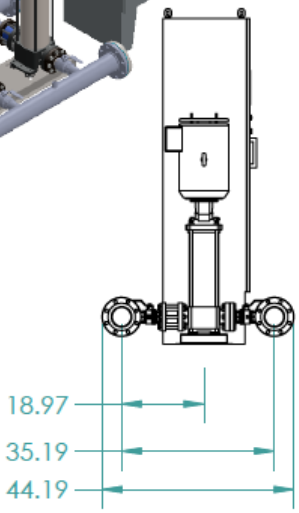


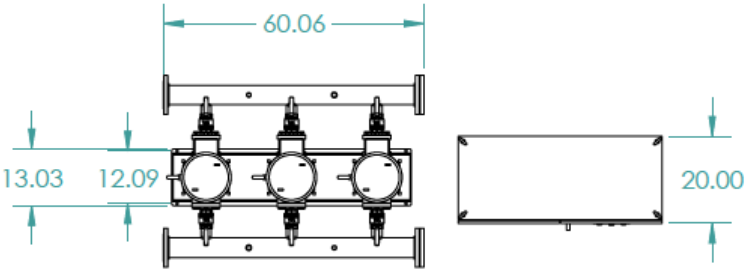
II. Dimensional Drawings

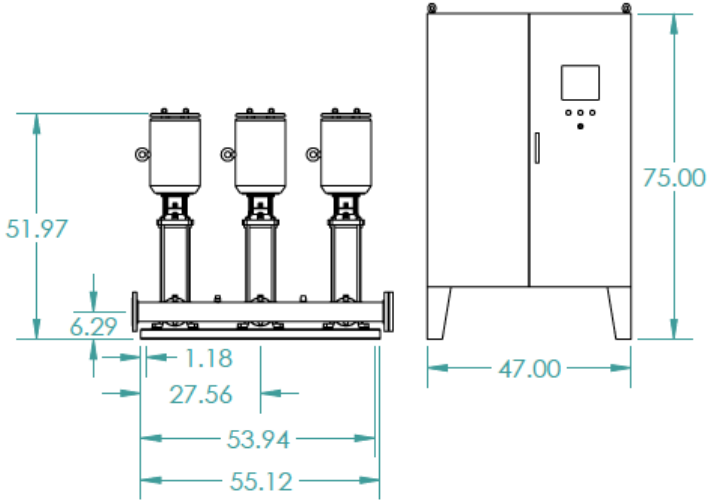
1. Manifolds 4" ANSI Class 150 AISI 316SS Schedule 10s ASTM A312 or ∅114.3mm x2mm
2. Base/Frame AISI 304SS
3. Standard system layout : panel right facing suction
4. Full port ball valve ASTM
5. UL Type 12 rated electrical panel

Note: panel size will vary with options









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FRESNO, CALIFORNIA 93727 USA

Note:
All dimensions are ±0.5"
Not for Construction
All dimensions subject to changewithout notice.

BoosterpaQ Model:	HYDRO MPC E 3CR20-8				
Power:	3x460	60HZ	3x20HP		
Job:				Scale:	1:35
Dwg No:	Rev: 0	Date: 2/14/2018	Drawer 71999	Page:	1 of 1

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Appendix C: Qualifying Form

Booster Check

Domestic Pressure Boosting Qualification Form (Rev 16)

(MINIMUM INFO IN RED)	General						
Bldg. Type	Drop-down			Other			
Facility	Nam[redacted]			Year Built	2002		
Address	3[redacted]		Atlanta	Street	GA	ST	30326 Zip
Ownership/Mgmt							
Point of Contact	Mr. Ramon Manganares						
Title	Drop-down						
Phone / Email	6[redacted]						
	Bldg. Characteristics						
Fixture Count	No. of Floors	36	Units (Rms)		Fixtures/Unit		
Bldg. Occupancy	Current	Drop-down		Average	Drop-down		
Height (FT)	to Roof	450 feet		per Floor			
Static Pressure (PSI)	@ Roof	40 PSI		@ Critical Location			
Backflow Preventer	Installed	Drop-down		Location	Drop-down		
Pressure Boosting System	No. of Systems	One		Location(s)	1st Floor		
Riser Design	Gravity-fed	Drop-down	Storage tank	Drop-down	Break-tank	Drop-down	
Low Riser	Floors Served	Yes	Fed by	Drop-down	Sub-metered	Drop-down	
Irrigation Branch		Drop-down	Fed by	Drop-down	Sub-metered	Drop-down	
Cooling Tower Make-up		Drop-down	Fed by	Drop-down	Sub-metered	Drop-down	
Main Water Meter	Volume /min.			Time of day			
	Request						
Drawings/Riser Diagram	Drop-down						
Annual Water Consumption (1-yr)	Drop-down	See attached water bills for reference					
Deliverable expected/Deadline	Drop-down						
Opportunity to present results to Mgmt.	Drop-down						
Interest in utility incentive	Drop-down	Georgia Power Company					
	Electric Utility						
Provider	Georgia Power Company						
EE Program Participant	Drop-down						
Avg. Bundled Energy Rate ($/kWh)	$0.10 / kWh		Use EIA.gov Statistic	Drop-down			
Rate Increase (%/yr)	Drop-down						
	Existing System						
Installation year	2002						
Manufacturer	System	Syncroflo	Pumps	3			
Pump Design	Quantity	3 Canned VT	Style	Drop-down	Jockey	Drop-down	
System Layout	Headers (in.)	6"	Iso. Valves	Drop-down	Diapghram Tank	Drop-down	
Power Supply	Phase	Drop-down	Voltage	Drop-down			
Nameplate Total Flow	500	Units	GPM				
Nameplate Head	370	Units	PSI				
Design Pressures	System	FT	Suction Min	PSI	Suction Max	PSI	
	Actual Pressures						
Suction	85-95	Units	PSI				
Discharge	235	Units	PSI				
Working Pressure/Boost	140	Units	PSI				

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Pumps							
Tag	Rated HP	Flow	Head (TDH)	On	Switch Position	Observed % Speed / Hz	Annual Run-hrs (Estimated)
P1	20	120	370	✓	Drop-do		8760
P-2	25	190	370	✓	Drop-do		???
P-3	5	190	370		Drop-do		???
					Drop-do		

Controls					
Pressure Control	Drop-down				
Actual Setpoints (units)	System	235 PSI	Suction Alarm	Yes	System Alarm Yes
Pump Sequencing	Drop-down				
Sequencing Variable	Lead-Lag Drop-down		Duty-Standby Drop-down		

System Modifications (pump, motor, drive etc.)	
Annual Maintenance Estimate	
Reported Problems (poor system pressure, alarms, valves won't hold)	
Feeding Special Application (multiple cooling tower cells, feeding adjacent bldgs)	Make up water to cooling tower
Additional Notes (Typical & max # of pumps online, ease of instrumenting system, preferred contractor, permissable down-time)	

Auditor	One
Signature	
Date	1st Floor