

HYDRO MPC BOOSTERPAQ®

OPTIMIZED WATER SOLUTIONS



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GRUNDFOS 

HYDRO MPC BOOSTERPAQ®

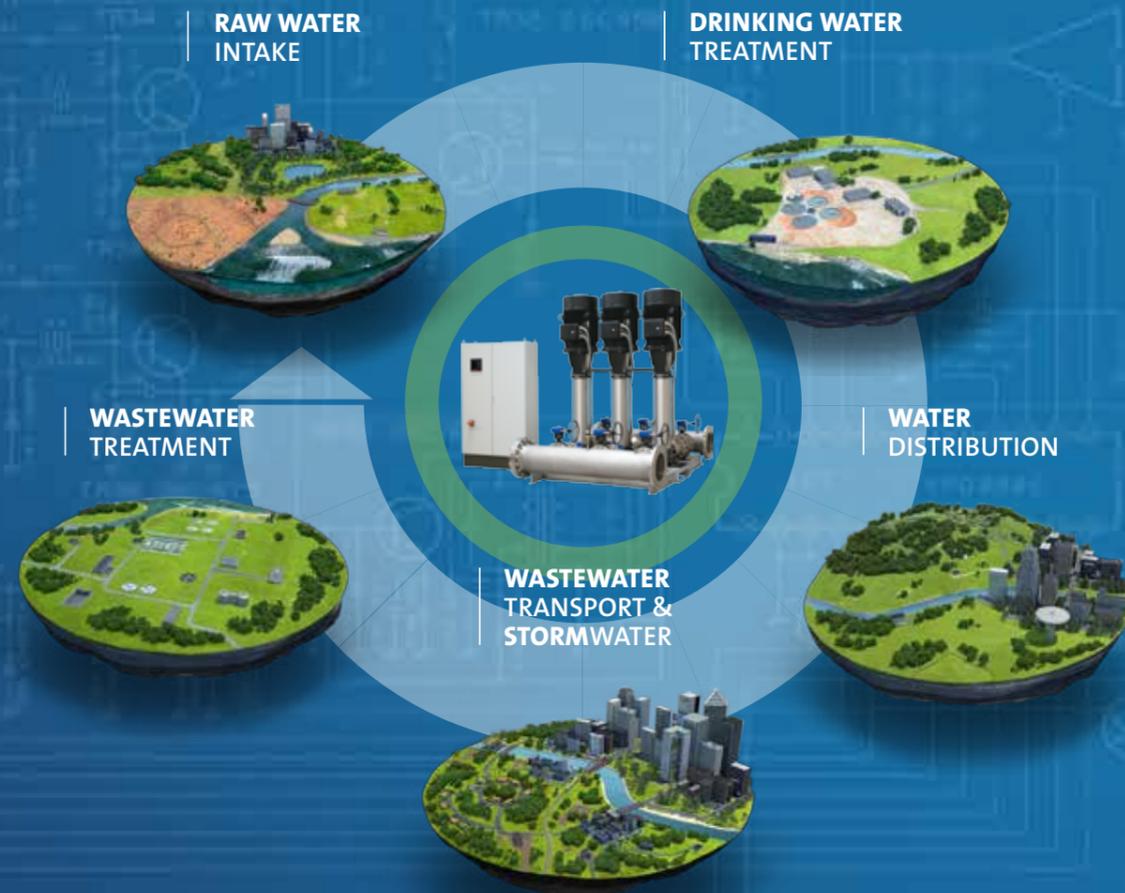
OPTIMIZED WATER SOLUTIONS

Grundfos pressure boosting solutions are the optimal choice for water supply applications. The Grundfos Hydro MPC BoosterpaQ® is UL-listed, NSF61/NSF372 certified, and provides consistent, reliable and efficient control; whether pressure, flow, or remote measurement.

Grundfos Hydro MPC BoosterpaQ® ensures that your water supply and wastewater facilities perform at their best. Water flows can vary significantly throughout the day and place extraordinary demands on pumping equipment in your installations.

Whether your system is a large scale water utility or a small water system you need a booster system to move the water through the distributing pipes and to the consumer. In areas with elevation changes, several booster units can be placed strategically in the distribution network to meet system consumption and load profiles.

The engineered packaged pump system features all relevant functions for a perfect choice in pumping applications and fits in many applications throughout the water cycle.



HYDRO MPC BOOSTERPAQ®

TAKE YOUR BOOSTER SOLUTION TO NEW HEIGHTS

BENEFITS OF THE HYDRO MPC BOOSTERPAQ

- Saves Energy Costs: Most efficient cascade control, application optimized software and pumps in the industry
- Single Source Responsibility: One manufacturer for pumps, motors, drives & controls
- Plug-and-Pump: Easy to install and commission
- Easy to Operate: Large, clear, user friendly & advanced controls interface
- Reduce floor space: Space-saving complete solution
- Communication Capable: Ethernet and BUS communication options
- Drinking Water Approvals: NSF61/372, Hygienic designed 316 SS manifolds

SYSTEM CONTROL AT YOUR FINGERTIPS

The CU 352 MPC controller boasts many customized functions such as numerous BUS communication options, pump curve data loaded in for proportional pressure, built-in logging capability, and many more.



MLE MOTOR

Grundfos has eliminated the complexity in matching motor, drive and control logic components by providing a simple and effective out-of-the-box MLE motor solution to meet your variable speed application needs.

CR PUMP

As standard, the Hydro MPC BoosterpaQ features the world's number one multi-stage centrifugal pumps, the CR and CRE, which are known for their reliability, efficiency and adaptability.

MANIFOLDS

Grundfos manifolds use high precision production technologies that provide hydraulic optimization, reduced pressure loss and noise, as well as the best conditions to meet hygienic standards.



MAINTAINING HIGH EFFICIENCY OVER A BROAD FLOW RANGE

The consumption profile, in municipal water systems can experience peaks and valleys throughout the day. Although sufficient flow could be supplied by a single large pump, multiple pumps have proven to be more economical. This as higher efficiency is achieved at realistic flow rates that are encountered compared to designed flow. Pumping systems achieve higher efficiency throughout the entire flow range, even at lower flow rates which can be the greatest percentage of time.

THE "BRAIN" BEHIND THE SYSTEM

Optimizing your energy savings lies with the use of highly advanced controls. The Grundfos CU352 control unit is the "brain" behind Hydro MPC systems. Specially designed for control of parallel connected pumps, the CU352 is easy to operate and monitor.

NUMBER OF PUMPS RUNNING

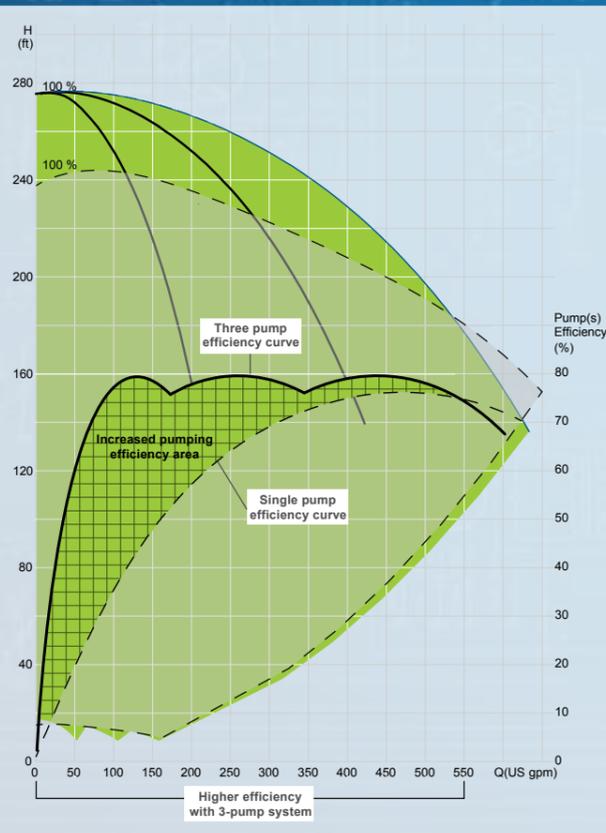
The method of evaluating the number of pumps that should be running is unique in the Hydro MPC. The pump curve data loaded into the controller ensures the pump system can determine an estimated measurement of flow rate very precisely. Together with curve data, flow rate, pressures and power the CU352 calculates the optimal start speed of the pumps and number of pumps in operation to maintain the most efficient operation.

PROPORTIONAL PRESSURE

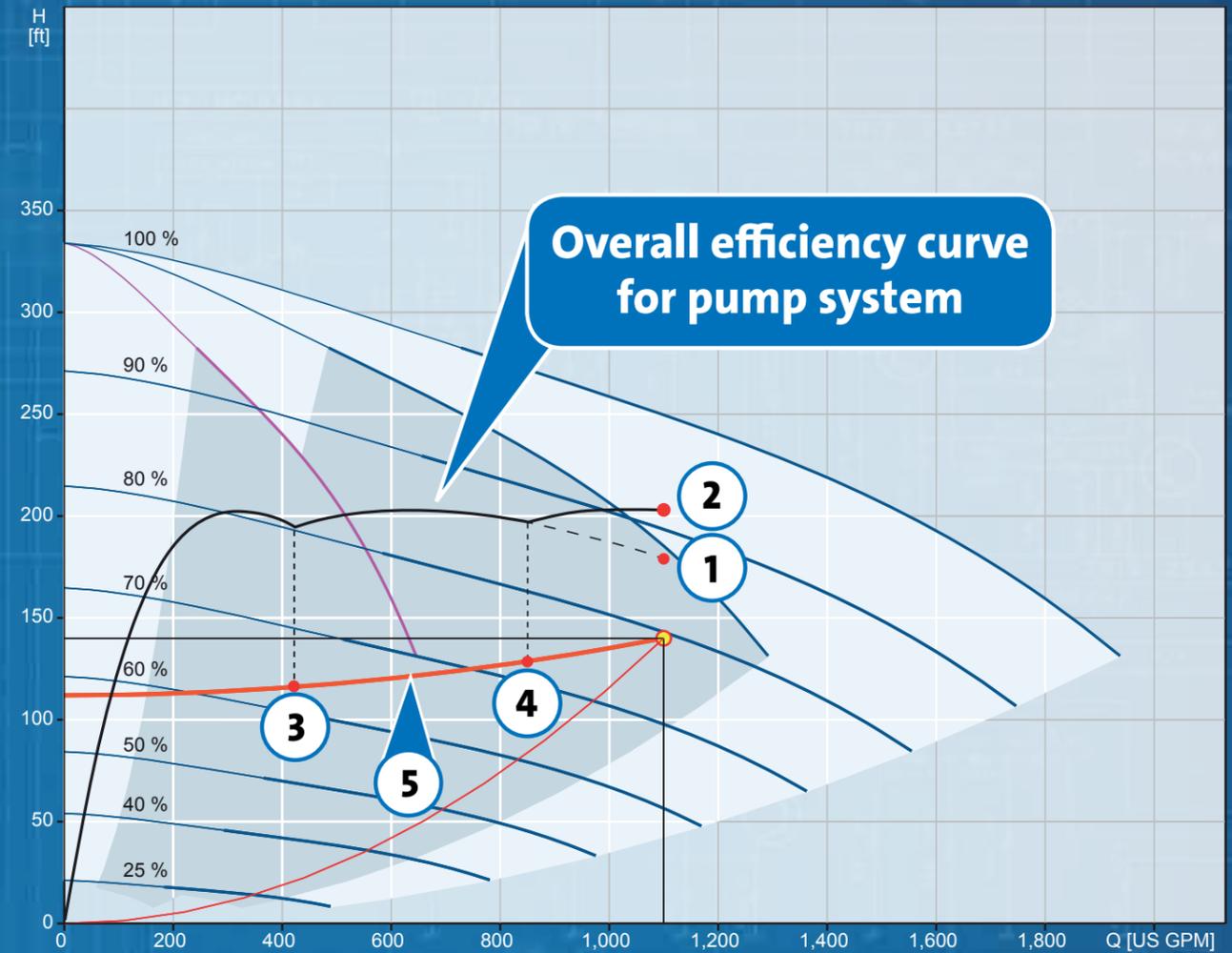
Municipal water systems tend to have a substantial amount of requirement dedicated to pipe friction loss. Combine VFD pump control and proportional pressure control (pipe friction loss compensation) and large savings can be realized.

NON-REVENUE WATER

The amount of non-revenue water (in network piping leakage) can be drastically reduced through proportional pressure control. The amount of non revenue water varies from 10% in very efficient systems to 40-50% in older systems. By lowering the pressure in periods of low consumption, the leaking and wearing of pipes is reduced, thus also reducing costs of both energy and maintenance.



*Typically, the maximum designed flow is only required for a small percentage of time. High efficiency in part-load conditions is key to saving energy cost.



Typical methods pump controllers use today to stage pumps on and off are based on capacity and do not consider operating efficiency. Operating costs can be optimized by running the most efficient combination of pumps. The figure above, shows how three pumps in operation can reduce the energy at a particular operating point by 12% over two pumps in operation even when two pumps could meet the requirement based on capacity alone.

DESCRIPTION OF POINTS ON SYSTEM CURVE

1. Efficiency curve for two pumps in operation, each at 94% speed, pump efficiency at 68.9%, brake horsepower at 56.4 HP.

2. Efficiency curve for three pumps in operation, each at 81% speed, pump efficiency at 78.2%, brake horsepower at 49.7 HP. This option provides an additional savings of 12%.

3. Conditions on "control curve" where two pumps in operation are more efficient than a single pump.

4. Point on "control curve" where three pumps are more efficient than two pumps in operation.

5. Proportional pressure "control curve" displays pressure boosting requirement as it varies with flow rate.

USER BENEFITS -CU352

FLOW ESTIMATION

Using pump curve data, suction and discharge pressure, number of pumps in operation, speed of pumps in operation and power consumption, the CU352 controller calculates estimated flow and displays it on the default Status screen. The controller uses the flow rate calculation for functionalities such as cascade control at best hydraulic efficiency, pumps outside duty range protection and proportional pressure control.

CASCADE CONTROL BASED ON EFFICIENCY

The CU352 controller uses best operating hydraulic efficiency to perform cascade control. Using pump curve data, suction pressure and discharge pressure, the controller determines where pumps are operating on their curves and stages on additional pumps when doing so would maximize efficiency.

PUMPS OUTSIDE OF DUTY RANGE

Related to cascade control based on efficiency, where pumps outside of duty range provides protection to prevent pumps from running off their curve and alarm of situation that allows pumps running off their curve.

The benefit of cascade control using best overall efficiency is it is more efficient to stage on an additional pump and allow additional pumps to run on their overall curve compared to fewer pumps operating off their curves.

PROPORTIONAL PRESSURE CONTROL

Use flow rate as a controlling measurement to change pressure setpoint as flow rate changes, i.e. friction loss compensation. This is possible because of continuous estimation of the flow rate. The proportional pressure control curve can be adjusted to allow full pressure anywhere in the performance range (gpm capacity) of the system.

REDUCED OPERATION

Ability to limit the number of pumps in operation when a digital input is activated. Can be activated via a digital input, allows setting of maximum input power (KW) or the pump system or reduced number of pumps available to operation. Designed for generator backup when full power is not always available.

STOP FUNCTION

Built in Stop Function that does not require additional ancillary equipment such as a flow switch, flow meter or temperature measuring device. The CU352 controller detect conditions of low or no flow condition and charge a diaphragm tank with additional pressure before shutting off. The low flow detection is adjustable to allow this to happen at flow rates ranging from 1% to 15% of nominal flow from one pump in operation.

Ability to also incorporate a flow switch or flow meter to activate the Stop Function. This provides the flexibility to activate the Stop Function at an exact flow rate determined by the operator.

EMERGENCY RUN FUNCTION

Special set-point that ignores all alarms and will maintain an emergency set-point.

SOFT PRESSURE BUILD-UP

Avoid water hammering and unnecessary pipe stress. When activated, Soft Pressure build-up ensures smooth pressure build-up upon power up, and from changing from Stop to Normal Operation.

BUILT IN LOGGING CAPABILITY

Predefined parameters can be logged in the memory, seen on screen or exported as a CSV-file through the Ethernet port.

SERVICE CONTACT INFORMATION

Customer can input service contact information into controller allowing for easy contact information to Grundfos service partners thereby reducing down-time.

COMMUNICATION

The Hydro MPC can easily communicate with existing SCADA systems or Grundfos GRM system; a secure, internet-based system where you can monitor and manage pump installations on your computer and receive possible alarms directly to your mobile phone.

FEATURES, FUNCTIONS & PERFORMANCE RANGE

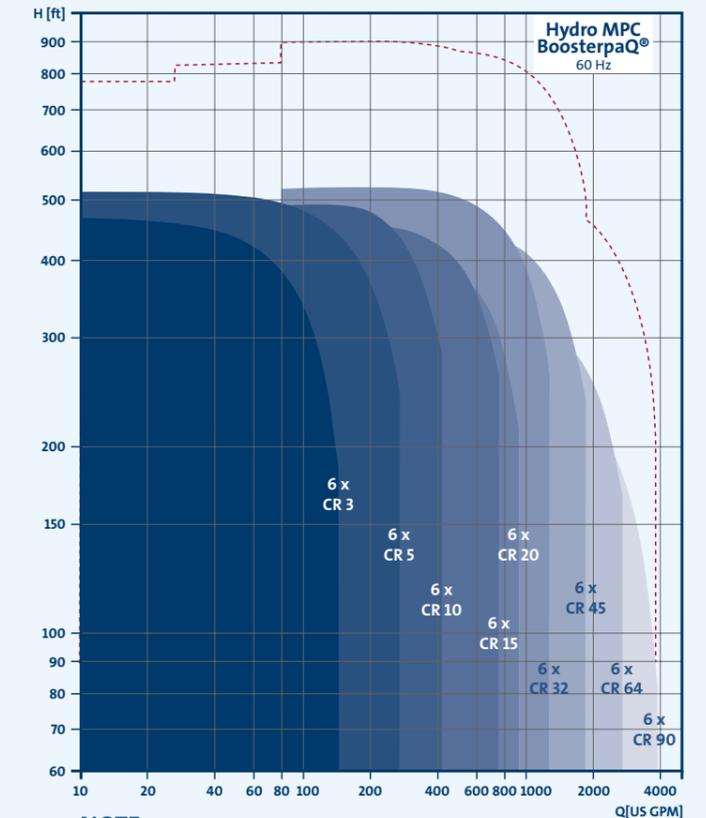


CU352
CONTROL INTERFACE



HYDRO MPC BOOSTERPAQ®

FEATURES / FUNCTIONS	
UL-listed Package Pumping System	X
System NSF 61 / NSF 372 Certified	X
Constant-pressure control	X
Stop function (no flow shutdown)	X
Dry-run protection via digital input	Capable
Dry-run protection via analog input	Standard
SCADA communication capability	X
Automatic cascade control	X
Forced pump changeover	X
Password protection	X
High-system pressure shutdown	X
Low-system pressure shutdown	X
Pump curve data loaded into controller	X
Proportional pressure control	X
Pumps outside of duty range protection	X
End of curve protection	X
Flowrate estimation (viewable on controller)	X
Advanced control interface	X
Alternative set-points	X
Pump test run	X
Clock program	X
Pilot pump	X
Soft pressure build-up	X
Emergency run (via digital input)	X
Built-in logging capability	X
Battery back-up capability (controller)	X
Reduced Operation (via digital input)	X
Ethernet connection (built-in web server)	X



NOTE:
The area within the dotted line applies to Hydro MPC booster sets available on request. The performance range is based on the standard range of the CR and CRI pumps.

MUNICIPALITY CONSOLIDATES AND UPGRADES WATER SUPPLY PUMPING SYSTEM

PROBLEM: The existing water delivery systems serving Cottonwood, Arizona were aging and managed through a patchwork of four separate and privately-owned water systems, each controlling individual, and sometimes overlapping, service areas.

SOLUTION: The city integrated the separate water systems and replaced the old, inefficient pumps with the Grundfos Hydro MPC, an integrated pressure boosting system that offers up to six vertical multi-stage CR pumps in parallel operation designed to optimize pumping efficiency over a range of flow rates.

RESULT: The city reduced pipe fatigue and related leaks by 30% or roughly \$38,000 in capital repairs, as well as earned a \$24,000 utility rebate. Residents no longer worry about rolling water outages, and the community is drawing less water from the aquifer today than during 2009. Moreover, the level of “unaccounted water” — which refers to the difference in the amount of water extracted versus the amount of water billed to customers — has dropped to 11% from 40%, helping to bridge the water crisis facing the southwest.



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