# Intelligent Pump Controller


iQPUMP®

**HP Range:**
5 - 150 HP @ 208/240 VAC
5 - 500 HP @ 480 VAC

iQpump is UL approved for single-phase and three-phase AC input

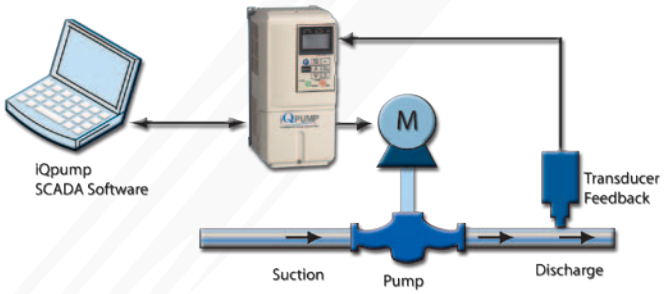
# iQpump Concept . . . Your Total Pump Solution

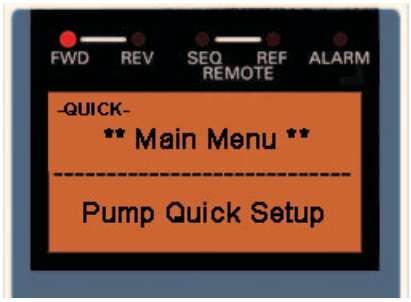
The iQpump controller was designed with the pump service operators and pump system owners in mind. iQpump offers ease of setup and comprehensive pump and motor protection features. The integrated pump specific software and set up parameters allow the operator to program control values for a wide range of applications. The iQpump controller will automatically adjust pump operating conditions, as the process variables change while still maintaining optimum pump performance and protection. iQpump can also replace phase converters when converting from a single-phase to a three-phase pump motor.

## Simplex System Overview

Easy Installation and Set up

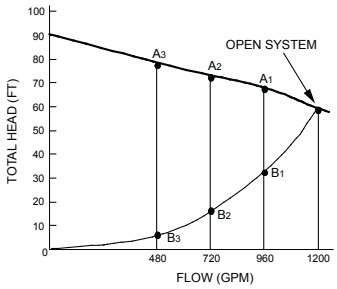
1. Wire iQpump Controller
2. Connect pipe to pump
3. Set System Pressure (PSI) Setpoint
4. Calibrate Feedback Transducer Level (PSI)
5. Start iQpump controller



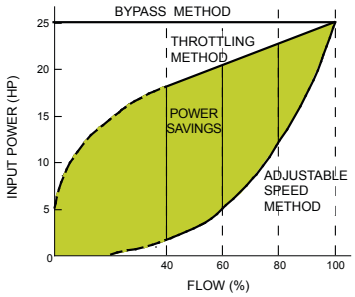




iQpump has an onboard "Pump Quick Setup" menu, and with just a few simple answered questions, a Simplex system can be running in minutes.

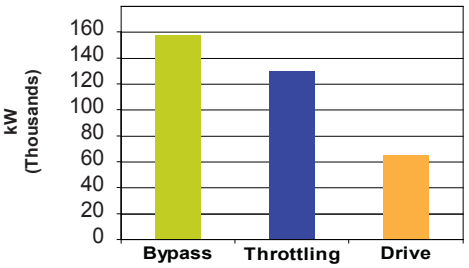
## Typical Pump Energy Consumption and Savings




Comparison of Operating Points for Throttling (A) and Adjustable Speed (B) Flow Control




Above chart shows the typical power requirements and savings for throttling and bypass methods to adjustable speed method.




100,000 sq. ft. building operated 4000 hrs/year. (One 50 HP booster pump) Based on Energy Savings Predictor Software.

# System Benefits

## Improved Process Control

By matching pump output flow or pressure directly to the process requirements, small variations in the process can be corrected more rapidly by iQpump than by other control forms.

## Improved System Reliability

Any reduction in speed achieved by using iQpump has major benefits in reducing pump wear, particularly in bearings and seals.

## Reduce Total System Cost

iQpump lowers system cost by eliminating sensors, jockey pumps, restriction valves as well as reducing pressure tank sizing.

## Energy Savings

Depending on application, iQpump will reduce the demand for energy by 20 to 50% by adjusting pump speed to match a lower flow/pressure.

## Ease of Installation and Set Up

iQpump uses pump terminology on all setup parameters and monitors. Also included is a “Pump Quick Setup” menu.

## Eliminate Complex Control Panels

By installing iQpump, many of the electromechanical controls can be eliminated. This will reduce the maintenance that these panels require.

## Reduce Mechanical Stress and Damage to Pumps

iQpump has soft-start and soft-stop capabilities. Pressure surges and water hammer are eliminated.

## Cooler Running Pump Motor

Soft start eliminates inrush current, dramatically increasing winding insulation life.

# Typical Applications

- Commercial and Residential Irrigation, Fluid Storage Tanks
- Settling Ponds, Sewage Lift Stations
- Booster Pump Stations (Municipal, High-rises, Condos, Apartment Complexes, Residential Developments)


The iQpump Controller was designed with the pump service operators and pump system owners in mind. iQpump offers ease of setup and comprehensive pump and motor protection features.

The integrated pump specific software and setup parameters, allow the operator to set up specific control values for a wide range of applications. iQpump will automatically adjust pump operating conditions, as the process variables change while still maintaining optimum pump performance and protection.

Most existing systems, which require constant pressure or flow control, are using bypass lines, pressure release values, throttling valves or impeller trim adjustments. The most efficient method is pump speed control. Pump speed control will reduce energy consumption, while maintaining system optimization.

The iQpump Controller can be configured for Simplex, Duplex, Triplex or up to an eight-pump system. One iQpump Controller can be used as a master, which can also control one or two secondary pump motors. The secondary pump motors can be connected using mechanical motor starters, reduced voltage soft starters, or additional iQpump drives. The software is structured in such a way that it only has a few basic pump parameters to be setup to run this application.

The iQpump controller from Yaskawa is available from 5 to 500 horsepower. In addition to Irrigation Pumps in Commercial and Residential applications, the iQpump controller is suitable for a variety of other pumping applications such as Pressure Booster Pumps, Submersible Deep Well Pumps, Storage Tank Level Control and Metering Pumps.

**Drive Performance Features**

- Ratings: 5-150 HP, 208 VAC 5-150 HP, 230 / 240 VAC 5-500 HP, 480 VAC
- Overload capacity: nominal 110% for 60 sec. (150% peak)
- Starting torque: 100% at 3 Hz
- Motor preheat function
- Adjustable accel/decel: 0.1 to 6000 sec.
- Controlled speed range: 40:1
- Critical frequency rejection: 3 selectable, adjustable bands
- Torque-limiting: 30-180%
- Energy Saving control
- Torque boost: full range, auto
- Power loss ride-thru: 2 sec.
- Auto restart after power loss or fault reset, selectable, programmable
- Feedback signal loss detection
- Serial communications loss detection
- "Up/Down" floating point control capability (PI)
- Stationary motor auto-tuning
- Pump Sleep function
- Run-permissive input

**Pump Control Features**

- Operator Keypad with intuitive pump language
- Hand-Off-Auto
- Programmable Pump Process Set Point
- Pump Start Level & Start Time
- Sleep Protection
- Simplex, Duplex, & Triplex Control
- Automatic System Restart
- No Flow Detection
- Low and High Feedback set points
- Pre-Charge Low Level Control
- Thrust Bearing Control
- Automatic System Stabilization
- Motor Condensation Pre-Heat Function

**Protective Features**

- Current-limited stall prevention
- Heat sink over-temperature, speed fold-back
- Bi-directional start into rotating motor
- Current-limiting DC bus fuse
- Optically-isolated controls
- Short circuit protection: Phase-phase and phase-neutral
- Ground fault protection
- Short circuit withstand rating: 100K RMS
- Electronic motor overload: UL
- Current limit
- Fault display: last 10 faults
- Fault circuit: OC, OV, OT
- Over torque and under torque protection

**Pump Protective Features**

- Dry Well
- Air in System
- Blocked Impeller
- Pump over Cycling
- No Flow Protection
- Loss of Prime
- Transducer Loss
- Over Torque

**Pump Alarms and Messages**

- Low Feedback
- High Feedback
- Low Level
- Low Water
- Pump Over Cycling
- No Flow Detection
- Loss of Prime
- Pump Fault
- Motor Thermostat
- Pre-Charge Mode
- Thrust Bearing Active
- Start Mode Active
- Sleep Mode Active

**Service Conditions**

- Ambient Temperature:
- -10°C to 40°C (14° F to 104° F) NEMA 1, -10°C to 45°C (14° F to 113° F) protected chassis
- Humidity: 95% RH, non-condensing
- Altitude: 3300 ft; higher by derate
- Input voltage: +10%/-15%
- Input frequency: 50/60 Hz ± 5%
- 3-phase, 3-wire, phase sequence insensitive

**Design Features**

- LCD keypad display, 5 lines x 16 characters, backlit, 6 languages, copy function
- Multi-step speed settings: 5 available
- Setpoint (PI) control
- 32-bit microprocessor logic
- Non-volatile memory, program retention
- Displacement power factor: 0.98
- Output frequency: 0.1 to 120 Hz
- Frequency resolution: 0.06 Hz
- Frequency regulation: 0.1%
- Control Terminal Board: Quick disconnect
- Carrier frequency: selectable to 15 kHz
- 3% DC bus reactor: 30-150 HP, 208 VAC; 30-150 HP, 240 VAC; 40-500 HP, 480 VAC; optional on lower ratings
- 24 VDC control logic, PNP / NPN selectable
- Transmitter/Option power supply
- Input/output terminal status
- Timer function: Elapsed time, Delay on start, Delay on stop
- RS-422/485 port: Modbus protocol
- Volts/hertz ratio: Preset and programmable V/Hz patterns
- Meter Functions: Volt, amp, kilowatt, elapsed run time, speed command
- NEMA 1 or protected chassis
- UL, cUL listed and CE marked; IEC 146;
- MTBF: exceeds 28 years