

Go With The Flow...

Modbus
Capable
To BAS

...the new wave
in energy management

Flow Intelligent™ controls:

- advanced control logic
- advanced platform flexibility
- advanced green technology



**THERMODYNAMIC PROCESS
CONTROL**

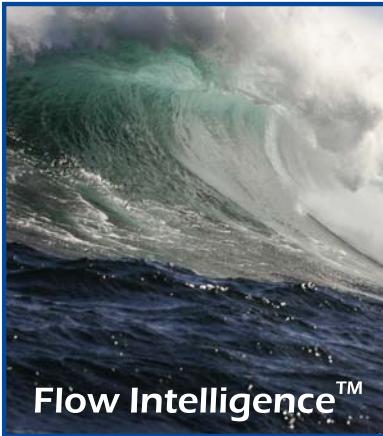
Flow Intelligent™ Design

Patented Flow Intelligent™ mechanical room controls from TPC are getting noticed by more customers every day – customers who are doing more work and banking greater margins on that work.

This is possible because Thermodynamic Process Control's Flow Intelligent™ (TPC-FI) mechanical room control makes hydronic projects more affordable, easier to install, quicker to pay back, and virtually effortless to sell. **Flow Intelligence™ measures exactly the energy a hydronic system is using, then modulates boilers to replace only that energy.** Never waste a cycle, never waste a therm, never waste a BTU.

Flow Intelligence™ means the end of short-cycling, the end of expensive custom control solutions, and the assurance of extended equipment life.

The TPC-FI control delivers these advances on the TPC-FI-FDP™ (Flexible Distributed Platform). Flow Intelligence™ is the new gold standard of control, and the FDP offers more flexibility for your jobs.



Flow Intelligence™

While other controls guess at the building load, patented Flow Intelligence™ knows exactly what it is and responds appropriately. TPC-FI measures outdoor air, system ΔT and gpm flow through the system.

With this data, the TPC-FI control will only replace the energy being used in the system – meaning boilers

will never over-fire and waste fuel, cycles, and cause excess emissions.

Controls that don't have Flow Intelligence™ are just making uneducated guesses, and **what they don't know is costing you!**

Flow Intelligence™: Only replace the energy you use



Total System Control

With the ability to modulate boilers and pumps as well as control dampers, mechanical draft devices and automatic isolation valves, the TPC-FI is really a system administrator.

The TPC-FI-FDP™ brings control of virtually all equipment in the mechanical room into one easy to

understand network. No need to piece a system together and pay someone to make it work.

The hallmark of the FDP is flexibility. TPC can provide new device definitions and custom sequences to create the control solutions you need.

TPC-FI-FDP™ – Flexible platform with the strength of TPC



Easy CAN Installation

One of the hassles of installing HVAC control systems is chasing down all the control wiring. With the FDP, that worry is a thing of the past!

Simply “daisy chain” the network together and it is up and running. Also, because this is a distributed network, you can mix and match the control solutions you need.

Boilers, pumps, dampers, and a host of mechanical devices can be controlled on one network with logic that populates when those devices are present.

Buy only the control solution you need while working in a self-defined network – what could be easier?

CAN network makes integration easy!

Ground-Breaking Advantages

How often does a piece of equipment find ways to save money? With the TPC-FI-FDP™, you will find new ways all the time. Here are just three:

1. **Patented Hybrid Boiler Control™** | The U.S. Patent Office has approved TPC's claim to hybrid boiler control. With two independent reset loops of control, you can easily mix and match condensing and non-condensing boilers to save all the fuel possible while making the job affordable.
2. **Intelligent Load Sharing™** | If you can't afford to replace or just don't want to get rid of all your existing equipment, you can add a summer/jockey boiler with the confidence that the TPC-FI control will choose the appropriate boilers for current conditions. You will realize significant fuel savings, thanks to Intelligent Load Sharing™ and TPC.
3. **Faster Payback** | Flow Intelligence™ programming with the FDP platform allows you to design projects that pay back in months, not years!



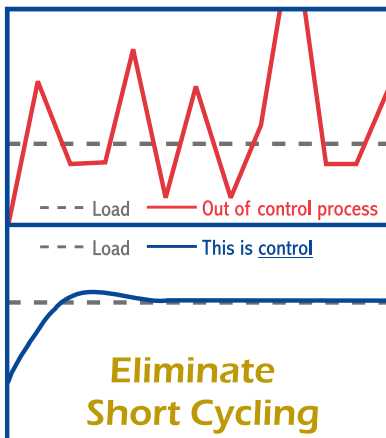
Energy costs are at the top of everyone's minds, and when you bring them TPC's energy solutions, you will be too!

Elimination of short-cycling saves fuel, cuts emissions and extends equipment life. All of these benefits protect critical natural resources.

Not only will Flow Intelligence™ cut your fuel consumption (up to a documented 72%), it will also eliminate short-cycling.

Environmental leadership is in demand. Wasted money, wasted energy, wasted resources and wasted labor are out of fashion. TPC puts you out in front.

Up to 72% reduction in fuel consumption



Short-cycling of boilers is the biggest thief of energy dollars in a hydronic mechanical room. Those starts and stops can cost up to 50% of your fuel bill, and add to maintenance costs by wearing out equipment prematurely.

TPC eliminates short-cycling.

“The controls have done exactly what TPC said they would do. They have helped reduce cycles, wear, and energy purchased.”

– Mike R.

*Performance Contracting Engineer
Indianapolis, IN*

Short-cycling is nothing more than poor system control.

Cycles always measure in hours



Every TPC-FI-FDP™ system keeps an hour-by-hour record of the last 365 days of use. Easily download one year of data to document real-time loads, as well as the run hours, faults and modulations of every boiler, pump, and piece of equipment in the network. TPC can even show you the real-time efficiency of your boiler plant!

Use this powerful information to plan energy strategies and develop PM schedules. You've never had information like this before, and it proves that you made the right call!

Just like every TPC device, the FDP is never obsolete! Programming updates and new functionality are simple to add and easy to use.

The control documents system performance, proving its value in black and white

Features, Ratings & Specs

TPC Standard Features

- **Network Size: 64 controlled devices**
- Outdoor reset
- 4 reset slopes -- 2 winter, 1 summer, 1 DHWP *
- Condensing and non-condensing priority set-point *
- Optimum stop setback, optimum start boost
- Post-cycle pump purge based on run time percent with max limit (boost to 100%)
- Acceleration boiler, boiler pump, and system pump modulation outputs
- Sequential/parallel/optimized modulation
- Low fire hold with respect to load and occupied space temperatures
- DHW priority, DHW supply set-point, DHW priority override
- Event scheduling for occupancy used for start and stop
- External system enable contact, external system reset analog input
- Calculates real-time load, displays real-time load calculation, and modulates based on real-time load (not supply temperature) *
- Knows boiler max and min BTU outputs and selects/utilizes accordingly
- Intelligent load selection -- chooses boilers based on their relationship to the load for operation *
- Intelligent shutdown uses load, size, type, priority, hours of operation for shutdown of boilers
- Chooses boilers based on priority for condensing or non-condensing (hybrid) *
- Intelligent load sharing *
- Measures supply return and system flow to determine real-time load *
- Condensing protection program insures non-condensing boilers see minimum water temperatures $> 130^{\circ}\text{F}$ *
- System pump rotation lead/lag
- 6" LCD full-color touchscreen Graphical User Interface
- Real English language on screen prompts
- 3-way valve control
- All points alarm
- User selectable modulation signals 0-10Vdc, 4-20mA
- Optional gas flow meter to determine real-time boiler plant efficiency
- Internal load predictions based on outdoor air, redundancy factor and history
- USB port for graphical and code-based updates
- Hardwire network backup
- Uses boiler manufacturer's unique product data in Acceleration Control Algorithm for modulation tuning
- Minimum stage delay at any percentage of boiler output
- **Standard Equipment: 1 system administrator, 1-64 field devices, 1 flow meter with hot tap, 2 thermistors with wells, 1 outdoor air thermistor with shield**



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★ The TPC-FI-FDP™ System embodies Flow Intelligence™, Intelligent Load Sharing™ and Hybrid Boiler Control™ as described and protected by U.S. Patent No. 7,658,335 B2.

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