

# P-K MACH<sup>®</sup> HIGH EFFICIENCY, COMMERCIAL BOILERS



AHRI  
Certified  
up to  
**95%**  
efficiency



**HARSCO**  
INDUSTRIAL  
Patterson-Kelley



# Harsco Industrial Patterson-Kelley delivers premium quality boilers that consistently produce the ROI customers demand.

## The Harsco Industrial Patterson-Kelley difference.

Access to best-in-class technology, the strength of our people, and the reliability of our products are reasons alone to partner with Harsco Industrial Patterson-Kelley. But ultimately, customers rely on us for our commitment to provide the **right** solution with the lowest total cost of ownership in the industry.

### Our Approach

- > Customized solutions through in-depth discovery; focused on customer needs
- > Deployed through experienced Harsco Industrial Patterson-Kelley employees and our authorized resellers

We use a consultative approach. First, we understand your needs, then apply and integrate the boiler solution to best address the heating demand. We ensure that our customers consistently receive the highest level of technical and application support by utilizing over 135 years of experience. Our dedicated employees and factory trained service technicians are always available to deploy these solutions.

## ROI from the start.

Saving you money in more ways than one.

The **P-K MACH** is an ideal choice for a wide variety of commercial and industrial building applications, including new construction as well as retrofit projects. It offers unmatched fuel savings with up to a 95% efficiency rating. It's "fit through the door" design eliminates any up-front construction costs. While, the NURO™ touch-screen control system allows for a quicker money-saving installation process, and no future hardware purchases for upgrades. That's what we call the P-K PAYBACK.

P-K MACH® condensing boilers feature fully independent cast aluminum heat exchangers. Aluminum is easier to cast than other metals. The result is increased heat transfer surface for higher efficiency. The aluminum heat engine easily sheds condensate thanks to an aluminum oxide barrier that forms during use for extreme corrosion resistance.

## A world of savings.

Save money by choosing a high efficiency condensing boiler over an 85% efficient non-condensing boiler. Save even more when you replace outdated equipment operating at only 75% efficiency with P-K MACH® condensing boilers.

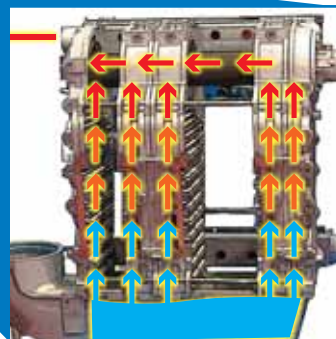
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CITY	UPGRADE FROM A 85% EFFICIENT SYSTEM TO A 95% EFFICIENT PK MACH	UPGRADE FROM A 75% EFFICIENT SYSTEM TO A 95% EFFICIENT PK MACH
	FUEL SAVINGS	FUEL SAVINGS
Atlanta, GA	\$2,870	\$6,510
Boston, MA	\$5,225	\$11,915
Chicago, IL	\$4,250	\$9,635
Dallas, TX	\$2,410	\$5,460
Boulder, CO	\$4,180	\$9,475
Detroit, MI	\$4,650	\$10,540
Los Angeles, CA	\$2,155	\$4,885
Miami, FL	\$1,120	\$2,535
Minneapolis, MN	\$4,485	\$10,165
New York, NY	\$3,985	\$9,030
Philadelphia, PA	\$4,680	\$10,610
Phoenix, AZ	\$1,130	\$2,570
San Francisco, CA	\$4,805	\$10,890
Seattle, WA	\$5,860	\$13,280
Washington, DC	\$3,985	\$9,035

Source: BIN Data from InterEnergy Software / Gas Technology Institute

Note: Fuel savings calculated based on natural gas at \$1/therm



- LOW MAINTENANCE ALUMINUM
- MULTIPLE VENTING SOLUTIONS
- EVEN HEAT DISTRIBUTION
- CONSISTENT TEMPERATURE
- INDEPENDENT SECTIONS
- INDEPENDENT SECTIONS
- TURBULENT FLOW – heat transfer surface increases the farther the water moves away from the burner.



## Sized to get in and fit in.

Installation time and construction costs are reduced.

There's no rigging required to put your P-K MACH® condensing boiler in any room of your building, whether it's the basement or the penthouse. All P-K MACH® condensing boilers fit through a standard 36 inch doorway or a standard elevator.

Our largest models (1,500,000 BTU/hr and larger) are equipped with wheels which means they can be moved by two people without a forklift. The narrow design of all P-K MACH® condensing boilers allows them to navigate corners and hallways with ease.

P-K MACH® condensing boilers are perfect for new installation and retrofit projects, requiring only 4 hook ups – gas, water, electric and venting.



### Smaller.



COMPETITORS  
4,000,000 BTU  
BOILERS  
AVERAGE  
40.5" – 66" W

**P-K MACH® C4000**  
4,000,000 BTU  
BOILER IS ONLY  
31.75" W

### Lighter.



**P-K MACH® C4000**  
4,000,000  
BTU BOILER  
WEIGHS JUST  
1900 lbs

COMPETITORS  
4,000,000 BTU  
BOILERS  
AVERAGE  
3,700 lbs

*And even if rigging is required,  
lower weight means lower costs*



P-K MACH® condensing boiler models C1500, C2000, C2500, C3000, C4000 include wheels and dollies for easy movement through hallways and doors and around corners.

# Maximize efficiency with NURO™ touch-screen control system.

Get long-term ROI with this simple to set-up, and easy-to-maintain boiler control system.



The NURO™ touch-screen control system provides the most intuitive interface in the industry. Designed to maximize efficiency, NURO™ monitors and modulates the combustion and ignition of the boiler to maintain the desired outlet temperature. The lead/lag setup and boiler start rotation ensures run times are equally distributed across each unit in the system, extending the life of the boilers.

**EASY TO USE:** *Touch-screen interface provides simple step-by-step navigation for set-up, maintenance, custom configurations, efficiency, help and more.*

**EASY TO SET-UP:** *Whether installing a single boiler or cascading, with a simple touch, select from a variety of pre-configured settings for optimal system efficiency.*

**EASY TO MAINTAIN:** *Software upgrades provide long-term upgradability, which eliminates hardware replacement and costly service calls.*



The NURO control easily interfaces with building management systems (BMS) via the integrated MODBUS® RS-485 protocol or a 0-10 vdc analog control signal. BACnet, LONWORKS®, and METASYS® N2 are also available by adding a protocol converter for even greater application flexibility.

MODBUS® is a registered trademark of Schneider Automation Inc. LONWORKS® is a registered trademark of Echelon Corporation. METASYS® is a registered trademark of Johnson Controls, Inc.



## Set yourself up for even more savings.

Reduce needed components with a primary only pump capability.

**Primary only pump system** – Streamline installation by eliminating multiple boiler circulation pumps. This reduces peripheral equipment costs, pipe fittings, motor starter disconnects, etc. Secondary pumps are replaced by control valves. If all boilers in the system are not required for the current load, the control valves will close off the idle boilers ensuring equal flow through the remaining boilers.

Arranging P-K MACH® condensing boilers in a primary only configuration allows a single pump to be used with VFD (variable frequency drive) to reduce the flow rate. This reduces the operating cost of the primary pump significantly by reducing the electrical consumption, increasing your energy savings.



BOILER RATINGS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
EFFICIENCY	93.5%	93%	92%	94%	94%	94%	94%	95%	94%	92%	94%
MAX BTU/HR INPUT	300,000	399,000	500,000	750,000	900,000	1,050,000	1,500,000	2,000,000	2,500,000	3,000,000	4,000,000
MAX KW INPUT	88	117	147	220	264	308	440	586	733	879	1,172
MAX BTU/HR OUTPUT	279,000	367,000	460,000	712,500	846,000	987,000	1,440,000	1,920,000	2,375,000	2,850,000	3,800,000
MAX KW OUTPUT	82	108	135	209	248	289	422	563	696	835	1,114
MIN FLOW @ IGNITION(GPM)	7	9	11.5	27	32	37	50	66	84	100	123
MIN FLOW @ IGNITION(LITRES/SEC)	.4	.6	.7	2	2	2	3	4	5	6	8
MINBTU/HR INPUT	60,000	79,800	100,000	150,000	180,000	210,000	300,000	400,000	500,000	600,000	800,000
MIN KW INPUT	18	23	29	44	53	62	88	117	147	176	234
MIN BTU/HR OUTPUT	55,800	73,400	52,000	142,500	169,200	197,400	288,000	384,000	475,000	570,000	760,000
MIN KWOUTPUT	16	22	27	42	50	58	84	113	139	167	223
OUTDOOR	-	-	-	☀️*	☀️*	☀️*	☀️*	-	-	-	-
NURO TOUCH-SCREEN CONTROL SYSTEM	JULY 2015	JULY 2015	JULY 2015	JUNE 2015	JUNE 2015	JUNE 2015	✓	✓	✓	✓	✓
FUEL NG=NATURAL GAS, LP=PROPANE, DF=DUAL FUEL	NG, LP	NG, LP	NG, LP	NG, LP, DF	NG, LP, DF	NG, LP, DF	NG, LP, DF*	NG, LP, DF*	NG, LP, DF*	NG, LP, DF*	NG, LP, DF*
NOX	-	-	-	<10 ppm	<10 ppm	<10 ppm	<15 ppm	<15 ppm	<10 ppm	<10 ppm	<10 ppm
DIMENSIONS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
DEPTH (IN / MM)	21.75 / 552	21.75 / 552	21.75 / 552	42.625 / 1083	42.625 / 1083	42.625 / 1083	66.25 / 1756	72.5 / 1920	58.325 / 1483	58.325 / 1483	62.5 / 1587.5
WIDTH (IN / MM)	36.5 / 927	36.5 / 927	36.5 / 927	28.125 / 713	28.125 / 713	28.125 / 713	30.25 / 769	30.25 / 769	31.75 / 806	31.75 / 806	31.75 / 806
HEIGHT (IN / MM)	34 / 862	34 / 862	34 / 862	54.625 / 1387	54.625 / 1387	54.625 / 1387	56 / 1423	56 / 1423	78.75 / 2000	78.75 / 2000	78.75 / 2000
OPERATING PARAMETERS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
BOILER HP	8.3	11	13.7	21	25	30	43	57	72	85	114
MAX INLET GAS PRESSURE (INCHES WC)	14	14	14	14	14	14	14	14	14	14	14
MIN INLET GAS PRESSURE (INCHES WC)	3.5	3.5	6 (3.5 option)	3.5	3.5	3.5	3	3	4	4.5	4.5
ELECTRIAL REQUIREMENTS	120V 1ph, 60hz, <8amps	120V 1ph, 60hz, <8amps	120V 1ph, 60hz, <8amps	120V 1ph,60hz, <5 amps	120V 1ph,60hz, <5 amps	120V 1ph,60hz, <5 amps	120V 1ph,60hz, <15 amps	120V 1ph,60hz, <15 amps	120V 1ph,60hz, <17 amps	204/240V 3ph 60hz 480 3ph 60hz <20 amps	204/240V 3ph 60hz 480 3 ph 60hz <20 amps
OPERATING WEIGHT (LBS / KILOS)	290 / 132	313 / 142	313 / 142	695/315	735/222	780/254	1350/612	1600/726	1550/703	1600/726	1900/862
MAXIMUM PRESSURE (PSIG / PA)	80 / 5.62	80 / 5.62	80 / 5.62	80 / 5.62	80 / 5.62	80 / 5.62	125 / 8.79	125 / 8.79	125 / 8.79	125 / 8.79	125 / 8.79
FLOW RATE 20°F AT GPM (LT / SEC)	28 / 1.8	37 / 2.3	46 / 2.9	72 / 4.5	86 / 5.4	100 / 6.3	144 / 9.1	192 / 12.2	238 / 15.0	259 / 16.3	345 / 21.7
FLOW RATE 40°F AT GPM (LT / SEC)	14 / .9	18 / 1.1	23 / 1.5	36 / 2.3	43 / 2.7	50 / 3.2	72 / 4.5	91 / 5.7	119 / 7.5	143 / 9.0	190 / 12.0
ACCEPTABLE VENT MATERIALS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
AL29-4C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
316L SS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PVC	-	-	-	-	-	-	-	-	-	-	-
CPVC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
POLYPROPYLENE* NEW	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
CAT II				✓	✓	✓	✓	✓	✓	✓	-
CAT IV				✓	✓	✓	✓	✓	✓	✓	✓

Common venting arrangements include sealed combustion.

+ (CANADA) When this material is used for venting, it must be listed to ULC-S636  
(US) When this material is used for venting, it must be listed to UL-1738

\* Available with Envi control only

# HARSCO

INDUSTRIAL  
Patterson-Kelley

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PROUDLY  
DESIGNED & ASSEMBLED  
IN THE U.S.A.



## Certifications

GE GAP (IRI) GAP.4.1.0  
AND GAP.4.1.3

FM Global 6-4/12-69

