

Boiler Selection Guide

Condensing and Non-Condensing
Hydronic Boilers



Patterson-Kelley

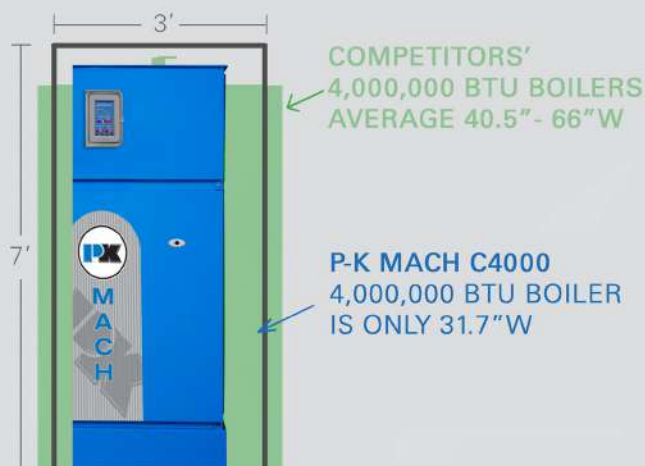
MACH[®]

Condensing Boilers



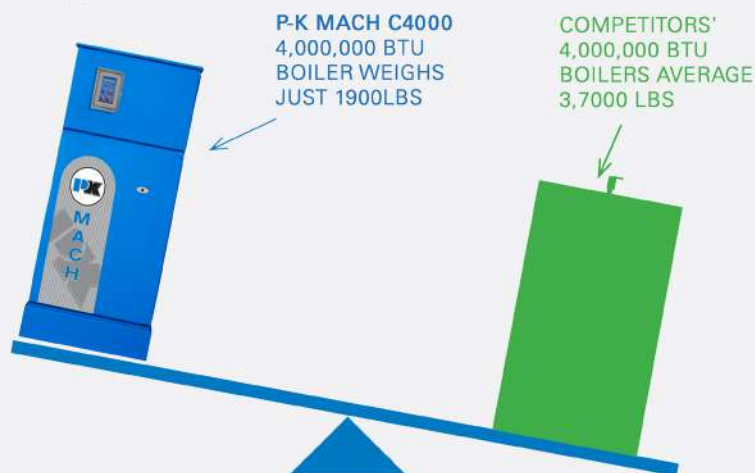
BOILER RATINGS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
EFFICIENCY	93.0%	93.1%	91.2%	93.9%	93.9%	93.9%	94.3%	95.1%	94.4%	91.1%	94.1%
MAX BTU/HR INPUT	300,000	399,000	500,000	750,000	900,000	1,050,000	1,500,000	2,000,000	2,500,000	3,000,000	4,000,000
MAX KW INPUT	88	116.9	146.5	219.8	263.8	307.7	439.6	586.1	732.7	879.2	1172.3
MAX BTU/HR OUTPUT	279,000	371,469	456,000	704,250	845,100	985,950	1,414,500	1,902,000	2,360,000	2,733,000	3,764,000
MAX KW OUTPUT	82	108.9	133.6	206.4	247.7	289.0	414.5	557.4	691.6	801.0	1103.1
MIN FLOW @ IGNITION (GPM)	7.0	9.0	11.5	27.0	32.0	37.0	50.0	66.0	84.0	100.0	123.0
MIN FLOW @ IGNITION (L/SEC)	0.4	0.6	0.7	1.7	2.0	2.3	3.2	4.2	5.3	6.3	7.8
MIN BTU/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	17.6	23.4	29.3	44.0	52.8	61.5	87.9	117.2	146.5	175.8	234.5
MIN BTU/HR OUTPUT	55,800	74,294	91,200	140,850	169,020	197,190	282,900	380,400	472,000	546,600	752,800
MIN KW OUTPUT	16.4	21.8	26.7	41.3	49.5	57.8	82.9	111.5	138.3	160.2	220.6
INDOOR/OUTDOOR	INDOOR	INDOOR	INDOOR	INDOOR / OUTDOOR	INDOOR / OUTDOOR	INDOOR / OUTDOOR	INDOOR	INDOOR	INDOOR	INDOOR	INDOOR
TURNDOWN	5:1	5:1	5:1	5:1	5:1	5:1	5:1	5:1	5:1	5:1	5:1
FUEL NG=NATURAL GAS, LP=PROPANE, DF=DUALFUEL	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
DIMENSIONS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
DEPTH (IN / MM)	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	62.5 / 1587.5
WIDTH (IN / MM)	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	31.75 / 806
HEIGHT (IN / MM)	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	78.75 / 2000

Smaller.



ALL P-K MACH BOILERS FIT THROUGH A STANDARD 36" DOORWAY.

Lighter.



MACH®

ALUMINUM TECHNOLOGY



OPERATING PARAMETERS	CM300	CM399	CM500	C750	C900	C1050	C1500	C2000	C2500	C3000	C4000
BOILER HP	8.3	11.0	13.7	21.0	25.0	30.0	43.0	57.0	72.0	85.0	114.0
MAX INLET GAS PRESSURE NG/LP (INCHES / WC)	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14
MIN INLET GAS PRESSURE NG/LP (INCHES / WC)	3.5 / 7	3.5 / 7	6 -or- 3.5 / 7	3.5 / 7	3.5 / 7	3.5 / 7	3.5 / 7	3.5 / 3	3 / 7	4.5 / 7	3 / 7
MAX OPERATING PRESSURE (psig / kPa)	80 / 552	80 / 552	80 / 552	80 / 552	80 / 552	80 / 552	125 / 862	125 / 862	125 / 862	125 / 862	125 / 862
SHIPPING WEIGHT (LBS / KILOS)	420 / 191	445 / 202	445 / 202	735 / 333	790 / 358	820 / 372	1330 / 603	1630 / 740	1550 / 703	1600 / 726	2100 / 953
ELECTRICAL REQUIRMENTS	120V 1ph 60hz <8 amps	120V 1ph 60hz <8 amps	120V 1ph 60hz <8 amps	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 480V 3ph 60hz <20 amps	204/240V 3ph 60hz 480V 3ph 60hz <20 amps
OPERATING WEIGHT (LBS / KILOS)	290 / 132	313 / 142	313 / 142	695 / 315	735 / 222	780 / 254	1200* / 612 *add 100 lbs for DF models	1600 / 726	1550 / 703	1600 / 726	1900 / 862
FLOW RATE 20°F ΔT GPM (L/SEC)	28 / 1.8	37 / 2.3	46 / 2.9	70 / 4.4	85 / 5.4	99 / 6.3	141 / 8.9	190 / 12.0	236 / 14.9	273 / 17.3	376 / 23.8
INLET VENT DIAMETER (IN / MM)	5 / 127	5 / 127	5 / 127	6 / 152.4	8 / 203.2	8 / 203.2	10 / 254	10 / 254	10 / 254	10 / 254	10 / 254
EXHAUST VENT DIAMETER (IN / MM)	4 / 101.6	4 / 101.6	4 / 101.6	6 / 152.4	8 / 203.2	8 / 203.2	10 / 254	10 / 254	10 / 254	10 / 254	10 / 254
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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Patterson-Kelley understands the importance of water quality. We have teamed up with expert chemists to provide Water Quality Standards for Peak Efficiency.


Check out aluminumboilers.com for more information.




Certifications

GE GAP (R) GAP4.1.D
AND GAP4.1.3
FM G. cbaf 6-4/12-69

 ASME Code Section IV
Applies to Heating Boilers

 ANSI Z21.13
CSA 4.9

 Canada (Gas Appliances)
U.S. Code Appliance

 U.S. Green Building Council Member

Insurance Evolved 



Connect from anywhere, anytime using the NURO® Connect App.

SONIC®

STAINLESS STEEL TECHNOLOGY



OPERATING PARAMETERS	SC-650 SCD-650	SC-750 SCD-750	SC-850 SCD-850	SC-1000 SCD-1000	SC-1500	SC-2000	SC-3000	SC-4000
BOILER HP	18	21	24	28	43	57	86	115
MAX INLET GAS PRESSURE NG/LP (INCHES / WC)	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14	14 / 14
MIN INLET GAS PRESSURE NG/LP (INCHES / WC)	3.5 / 7	3.5 / 7	3.5 / 7	3.5 / 7	4 / 7	4 / 7	4 / 7	4 / 7
MAX OPERATING PRESSURE (psig / kPa)	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103
SHIPPING WEIGHT (LBS / KILOS)	780 / 354	780 / 354	800 / 363	810 / 367	1400 / 635	1400 / 365	1900 / 862	1900 / 862
ELECTRICAL REQUIRMENTS	120V 1ph 60hz 10 amps	120V 1ph 60hz 10 amps	120V 1ph 60hz 10 amps	120V 1ph 60hz 10 amps	208/240V 1ph 60hz 15 amps	208/240V 1ph 60hz 15 amps	208/240V 3ph 440/480V 3ph 60hz 20 amps	208/240V 3ph 440/480V 3ph 60hz 20 amps
OPERATING WEIGHT (LBS / KILOS)	780 / 354	780 / 354	800 / 363	810 / 367	1650 / 748	1650 / 748	2141 / 971	2191 / 994
FLOW RATE 20°F ΔT GPM (L/SEC)	61 / 3.9	71 / 4.5	80 / 5.0	92 / 5.9	146 / 9.2	193 / 12.2	291 / 18.4	384 / 24.3
INLET VENT DIAMETER (IN / MM)	6 / 152.4	6 / 152.4	6 / 152.4	6 / 152.4	12 / 304.8	12 / 304.8	12 / 304.8	12 / 304.8
EXHAUST VENT DIAMETER (IN / MM)	6 / 152.4	6 / 152.4	6 / 152.4	6 / 152.4	10 / 254	10 / 254	10 / 254	10 / 254
ACCEPTABLE VENT MATERIALS	SC-650 SCD-650	SC-750 SCD-750	SC-850 SCD-850	SC-1000 SCD-1000	SC-1500	SC-2000	SC-3000	SC-4000
AL29-4C	✓	✓	✓	✓	✓	✓	✓	✓
316L SS	✓	✓	✓	✓	✓	✓	✓	✓
PVC	--	--	--	--	--	--	--	--
CPVC	✓	✓	✓	✓	✓	✓	✓	✓
POLYPROPYLENE ^{NEW}	* / **	* / **	* / **	* / **	✓	✓	✓	✓
CAT II	✓	✓	✓	✓	✓	✓	✓	✓
CAT IV	✓	✓	✓	✓	✓	✓	✓	✓

*Canada: when this material is used for venting, it must be listed ULC-26236

**USA: when this material is used for venting, it must be listed UL-1738



Certifications

GE GAP (R) GAP4.1.0

AND GAP4.1.3

FM Global 4-712-68

ASME Code Section IV
Applies to Heating Boilers

ANSI Z21.13
CSA 4.8

Canada (See Approvals)
U.S. (See Approvals)

U.S. Green Building Council Member

Insurance Evolved **FM** Global



State of the art
NURO® Control System

SONIC®

Condensing Boilers



BOILER RATINGS	SC-650 SCD-650	SC-750 SCD-750	SC-850 SCD-850	SC-1000 SCD-1000	SC-1500	SC-2000	SC-3000	SC-4000
EFFICIENCY	94.1%	94.1%	94.1%	92.3%	97.1%	96.4%	96.9%	96.0%
MAX BTU/HR INPUT	650,000	750,000	850,000	1,000,000	1,500,000	2,000,000	3,000,000	4,000,000
MAX KW INPUT	190.5	219.8	249.1	293.1	439.6	586.1	879.2	1172.3
MAX BTU/HR OUTPUT	611,650	705,750	799,850	923,000	1,456,500	1,928,000	2,907,000	3,840,000
MAX KW OUTPUT	179.3	206.8	234.4	270.5	426.9	565.0	852.0	1125.4
MIN FLOW @ IGNITION	25	25	30	30	48	48	72	96
MIN FLOW @ IGNITION (L/SEC)	1.6	1.6	1.9	1.9	3.0	3.0	4.6	6.1
MIN BTU/HR INPUT	125,000	125,000	141,000	143,000	300,000	400,000	600,000	800,000
MIN KW INPUT	36.6	36.6	41.3	41.9	87.9	117.2	175.8	234.5
MIN BTU/HR OUTPUT	122,300	117,600	131,850	133,300	288,000	384,000	576,000	768,000
MIN KW OUTPUT	35.8	34.5	38.6	39.1	84.4	112.5	168.8	225.1
INDOOR/OUTDOOR	INDOOR	INDOOR	INDOOR	INDOOR	INDOOR	INDOOR	INDOOR	INDOOR
TURNDOWN	5:1	6:1	6:1	7:1	5:1	5:1	5:1	5:1
FUEL NG=NATURAL GAS, LP=PROPANE, DF=DUALFUEL	NG LP DF	NG LP DF	NG LP DF	NG LP DF	NG LP DF	NG LP DF	NG LP DF	NG LP DF
DIMENSIONS	SC-650 SCD-650	SC-750 SCD-750	SC-850 SCD-850	SC-1000 SCD-1000	SC-1500	SC-2000	SC-3000	SC-4000
DEPTH (IN / MM)	54 / 1372	54 / 1372	54 / 1372	54 / 1372	65 / 1651	65 / 1651	66 / 1674	66 / 1674
WIDTH (IN / MM)	25 / 641	25 / 641	25 / 641	25 / 641	31 / 787	31 / 787	32 / 808	32 / 808
HEIGHT (IN / MM)	51 / 1295	51 / 1295	51 / 1295	51 / 1295	69 / 1743	69 / 1743	69 / 1743	69 / 1743

BIG OUTPUT. SMALL DESIGN.

Easily fits through a standard 36-inch doorway and navigates corners and hallways with ease.

COMPETITION SIZE



A design that fits

60%

*SMALLER THAN THE LEADING COMPETITION

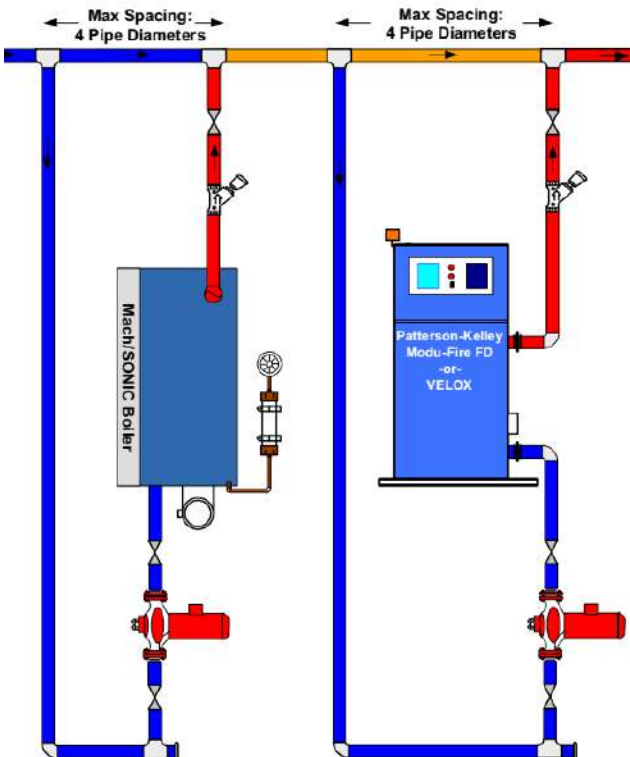
*Calculation based on competitor boiler size of 40.5"Wx109"Dx80"H

THERMIFIC VELOX™ & MFD™

Non-Condensing Boilers



BOILER RATINGS	750-MFD	1000-MFD	1500-MFD	2000-MFD	2500-MFD	3000-MFD	750-VX	1000-VX	1500-VX	1700-VX	2000-VX
EFFICIENCY	85.0%	85.0%	85.0%	85.0%	84.9%	84.9%	85.0%	85.0%	85.0%	85.0%	85.0%
MAX BTU/HR INPUT	750,000	1,000,000	1,500,000	2,000,000	2,500,000	3,000,000	750,000	1,000,000	1,500,000	1,700,000	2,000,000
MAX KW INPUT	219.8	293.1	439.6	586.1	732.7	879.2	219.8	293.1	439.6	498.2	586.1
MAX BTU/HR OUTPUT	637,500	850,000	1,275,000	1,700,000	2,122,500	2,547,000	637,500	850,000	1,275,000	1,445,000	1,700,000
MAX KW OUTPUT	186.8	249.1	373.7	498.2	622.0	746.5	186.8	249.1	373.7	423.5	498.2
MIN FLOW @ IGNITION (GPM)	60	80	90	170	165	165	60	80	90	100	120
MIN FLOW @ IGNITION (L/SEC)	3.8	5.1	5.7	10.8	10.5	10.5	3.8	5.1	5.7	6.3	7.6
MIN BTU/HR INPUT	150,000	166,000	250,000	335,000	500,000	500,000	604,000	610,000	1,005,000	1,050,000	1,100,000
MIN KW INPUT	44.0	48.6	73.3	98.2	146.5	146.5	177.0	178.8	294.5	307.7	322.4
MIN BTU/HR OUTPUT	127,500	141,100	212,500	284,750	424,500	424,500	513,400	518,500	854,250	892,500	935,000
MIN KW OUTPUT	37.4	41.4	62.3	83.5	124.4	124.4	150.5	152.0	250.4	261.6	274.0
INDOOR/OUTDOOR	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL	YES/OPTIONAL
TURNDOWN	5:1	6:1	6:1	6:1	5:1	6:1	1.2:1	1.6:1	1.5:1	1.6:1	1.8:1
FUEL NG=NATURAL GAS, LP=PROPANE, DF=DUALFUEL	NG LP	NG LP	NG LP	NG LP	NG LP	NG LP	NG LP	NG LP	NG LP	NG LP	NG LP
DIMENSIONS	750-MFD	1000-MFD	1500-MFD	2000-MFD	2500-MFD	3000-MFD	750-VX	1000-VX	1500-VX	1700-VX	2000-VX
DEPTH (IN / MM)	34 / 864	34 / 864	34 / 864	34 / 864	54 / 1372	54 / 1372	34 / 864	34 / 864	34 / 864	34 / 864	34 / 864
WIDTH (IN / MM)	27 / 679	27 / 679	27 / 679	27 / 679	32 / 813	32 / 813	27 / 679	27 / 679	27 / 679	27 / 679	27 / 679
HEIGHT (IN / MM)	47 / 1,181	47 / 1,181	62 / 1,476	62 / 1,476	68 / 1,727	68 / 1,727	47 / 1,181	47 / 1,181	62 / 1,476	62 / 1,476	62 / 1,476



Hybrid designs provide efficiency and flexibility.

Take advantage of NURO® to improve performance and create a diverse system setup.

✓ LOCALIZED BMS

For those applications which require system control but are not wanting to add an additional layer of control complexity.

✓ VALVE CONTROL

The ability to control valves for primary only installations as well as for ASHRAE 90.1 requirements.

✓ HYBRID SYSTEM

Utilize both condensing and non-condensing boilers for more effective system operation during design heating days as well as shoulder seasons.

THERMIFIC VELOX™ & MFD™

COPPER TECHNOLOGY



OPERATING PARAMETERS	750-MFD	1000-MFD	1500-MFD	2000-MFD	2500-MFD	3000-MFD	750-VX	1000-VX	1500-VX	1700-VX	2000-VX
BOILER HP	19	25.4	38	50.8	63.4	76.1	19	25.4	38	43.2	50.8
MAX INLET GAS PRESSURE NG/LP (INCHES / WC)	14	14	14	14	14	14	14	14	14	14	14
MIN INLET GAS PRESSURE NG/LP (INCHES / WC)	3.5 / 7	3.5 / 7	4 / 7	3.5 / 7	4 / NA	4 / NA	3.5 / 7	3.5 / 7	4 / 7	3.5 / 7	3.5 / 7
MAX OPERATING PRSSURE (psig / kPA)	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103	160 / 1103
SHIPPING WEIGHT (LBS / KILOS)	750 / 340	750 / 340	920 / 417	935 / 424	1200 / 544	1200 / 544	750 / 340	750 / 340	920 / 417	935 / 424	935 / 424
ELECTRICAL REQUIRMENTS	208-240V or 120V 1ph 60hz 10 amps	208-240V or 120V 1ph 60hz 10 amps	208-240V or 120V 1ph 60hz 15 amps	208-240V or 120V 1ph 60hz 15 amps	208-240V or 120V 1ph 60hz 20 amps	208-240V or 120V 1ph 60hz 20 amps	208-240V or 120V 1ph 60hz 10 amps	208-240V or 120V 1ph 60hz 10 amps	208-240V or 120V 1ph 60hz 15 amps	208-240V or 120V 1ph 60hz 15 amps	208-240V or 120V 1ph 60hz 15 amps
OPERATING WEIGHT (LBS / KILOS)	800 / 363	800 / 363	985 / 447	985 / 447	1,217 / 552	1,217 / 552	800 / 36	800 / 362	985 / 447	985 / 447	985 / 447
FLOW RATE 20°F ΔT GPM (L/SEC)	65 / 4.1	85 / 5.4	130 / 8.2	170 / 10.7	220 / 13.9	265 / 16.7	65 / 4.1	85 / 5.4	130 / 8.2	145 / 9.2	170 / 10.7
INLET VENT DIAMETER (IN / MM)	8 / 203.2	8 / 203.2	8 / 203.2	8 / 203.2	10 / 254	10 / 254	8 / 203.2	8 / 203.2	8 / 203.2	8 / 203.2	8 / 203.2
EXHAUST VENT DIAMETER (IN / MM)	5 / 127	5 / 127	6 / 152.4	6 / 152.4	10 / 254	8 / 203.2	5 / 127	5 / 127	6 / 152.4	6 / 152.4	6 / 152.4
ACCEPTABLE VENT MATERIALS	750-MFD	1000-MFD	1500-MFD	2000-MFD	2500-MFD	3000-MFD	750-VX	1000-VX	1500-VX	1700-VX	2000-VX
AL29-4C	✓	✓	✓	✓	✓	✓	Note 1	Note 1	Note 1	Note 1	Note 1
316L SS	✓	✓	✓	✓	✓	✓	Note 1	Note 1	Note 1	Note 1	Note 1
PVC	--	--	--	--	--	--	--	--	--	--	--
CPVC	--	--	--	--	--	--	--	--	--	--	--
POLYPROPYLENE ^{NEW}	--	--	--	--	--	--	--	--	--	--	--
CAT I	--	--	--	--	--	--	✓	✓	✓	✓	✓
CAT II	✓	✓	✓	✓	✓	✓	--	--	--	--	--
CAT IV	✓	✓	✓	✓	✓	✓	--	--	--	--	--

Note 1: Ensure flue material is suitable for Category 1 applications.

All P-K Thermific VELOX® and MFD™ boilers come standard with Harsco Industrial Patterson-Kelley's NURO® control system. Advanced features such as cascade sequencing and building management system integration via MODBUS® protocol makes it easy to set up and manage boilers, even when used in a hybrid system design with P-K MACH® condensing boilers.

MODBUS® is a registered trademark owned by Schneider Automation Inc.




Certifications

GE GAP (IR) GAP4.1.0
AND GAP4.1.3

FM Global 6-4/12-68

 ASME Code Section IV
Applies to Heating Boilers

 ANSI Z39.13
CSA 4.9
Controlled Temperature
MFK (per Application)

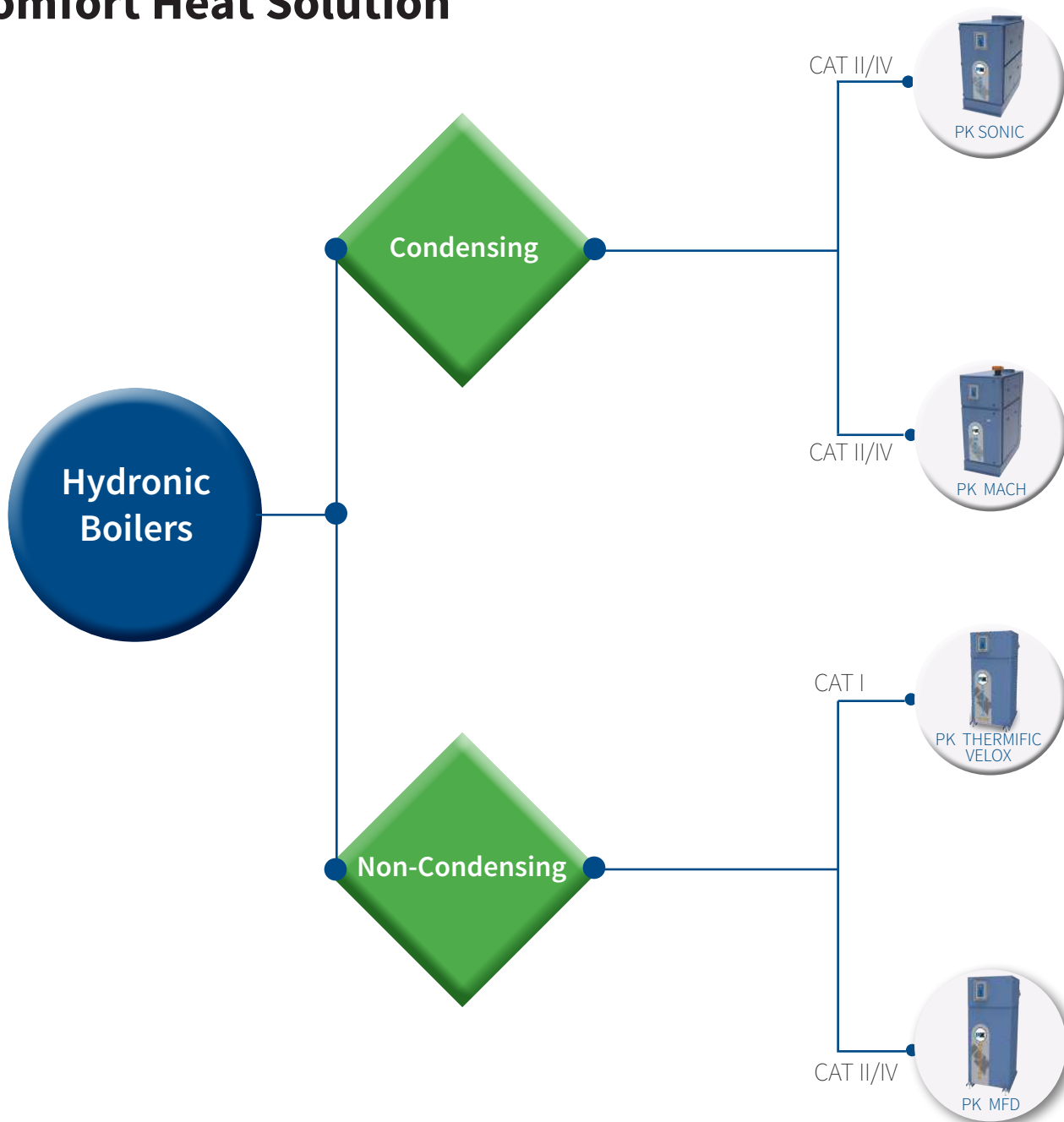
 U.S. Green Building Council Member

Insurance Evolved 



State of the art
NURO® Control System

Find your P-K Comfort Heat Solution



THE PATTERSON-KELLEY EXPERIENCE

Patterson-Kelley, a division of the Harsco Industrial Groups (HSC), is the leading provider and producer of commercial hot water heating solutions. With over 135 years of experience and an innovative R&D pipeline, we provide a full line of condensing and non-condensing boilers, semi-instantaneous water heaters, and an array of commercial boiler and water heating products including gas fired, dual fuel and outdoor boilers.

Because we are continuously evolving our products, descriptions and technical data are subject to change without notice. Contact your local Harsco Industrial Patterson-Kelley representative for the most up-to-date information and product application support.

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