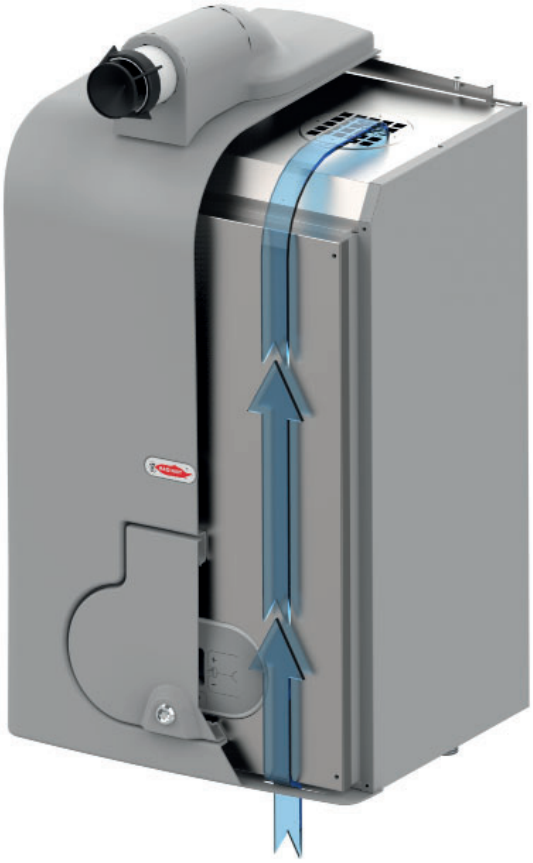
1. GENERAL FEATURES

The Combi-Tech® R2K series, is Radiant's high-end range of wall-hung instantaneous boilers equipped with patented condensing exchanger produced in Radiant, that offers high reliability and performances, thanks to a coil made from a single large-section tube, Ø 28 mm, made of stainless steel.
This large section reduces the possibility of clogging and facilitates ordinary and extraordinary maintenance. The heat exchanger can be descaled quickly and efficiently when clogging occurs, thanks to the threaded connections fitted therein.
An additional bain-marie steel coil is inserted inside the primary coil, for instantaneous D.H.W. production. The exchanger is therefore integrated and with high inertia on the primary circuit for greater sanitary comfort.
During the D.H.W. production, the circulating pump is activated and the diverter valve switches to internal recirculation, these devices allow a reduced and stable water temperature of the primary exchanger, significantly lower fluctuations and high comfort.
The inlet of the cold domestic water is inside the condensing chamber, so that the exhausts temperature falls below the dew point condensing also in the sanitary mode.
The burner components, totally designed in our assemblies and tailor-made for our products, guarantee an excellent modulation range of as much as 1/9.
This lead the units to run at very low minimum powers, to meet the lowest power requirements of the new low-temperature installations, as for heating, and very low sanitary draws during the summer period.
This avoids the frequent ons and offs that many cheap boilers on the market suffer from, while at the same time ensuring greater comfort and energy savings.
The boiler is equipped with an 8 l. expansion vessel, a high-pressure circulating pump of no less than 7.5 m/H20 and the hydraulic circuit is made almost entirely of copper steel and brass.
Available in Natural Gas, L.P.G., Air Propaned, tested and adjusted in-house to facilitate the initial start-up.

2. OUTDOOR UNITS - RAIN AND BOX

R2K 24-28-34 RAIN

Self-cooling function



The RAIN unit is made with a ABS casing, which protects the product from ultraviolet rays and it is designed for being installed directly outdoor.

The RAIN boiler is protected against weatherings and it can be installed even in an unprotected location.

Between the room of the RAIN shield and the boiler casing, there is an air chamber that thermally protects the main board and all other electronic parts from the high summer heat.

The burner suction is diverted into this air room, so the inner temperature stays as cooler as possible.

R2K 24-28 BOX

The BOX version has a depth of only 26,5 cm so that it can be actually installed inside a box.

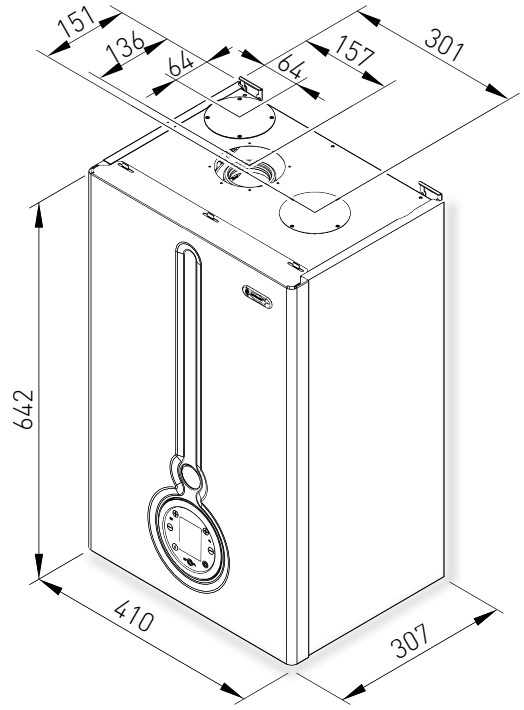
For the exhausts outlet, it is possible to use a flue with a diameter of 80, 60, and even 50 mm.

UNIVERSAL BOX PANEL

If it is supplied as a replacement, it is possible to purchase an universal steel casing that can be adapted to existing boxes of other brands to protect the housing of this product.

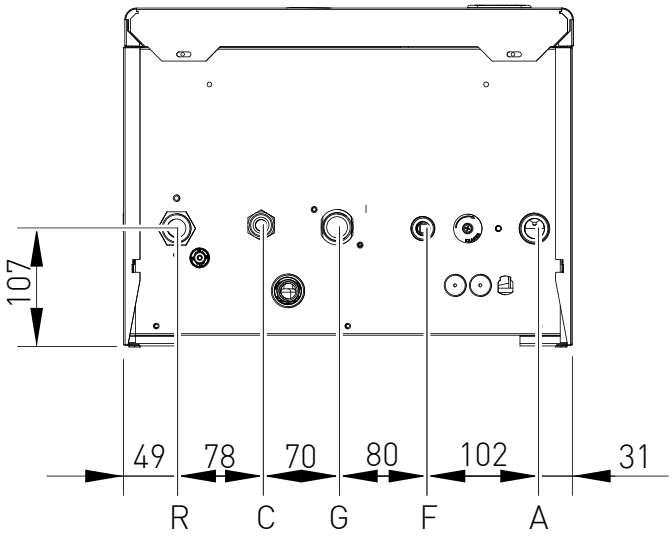
3. OVERALL DIMENSIONS AND CONNECTIONS

R2K 24 - R2K 28

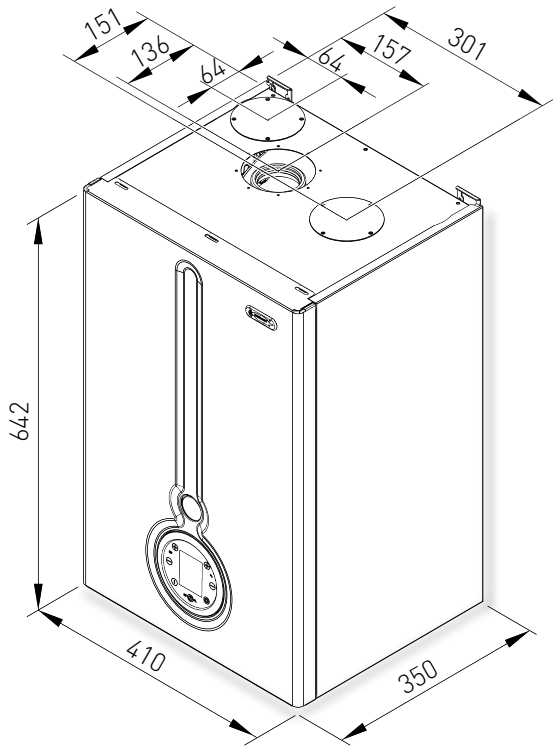


LEGENDA		
AI	HEATING FLOW	Ø3/4"
RI	HEATING RETURN	Ø3/4"
G	GAS	Ø3/4"
F	COLD	Ø1/2"
C	HOT	Ø1/2"
Sc	CONDENSATE OUTLET	Ø25
A	AIR INTAKE	Ø80
S	FUME EXHAUST	Ø80

FLUE VENTINGS	
Distance between the higher edge of the casing and the bend axe	
HORIZONTAL COAXIAL DIA. 60/100 MM.	100
HORIZONTAL COAXIAL DIA. 80/125 MM.	117
HORIZONTAL SEPARATE FLUES DIA 80/80 MM.	129
HORIZONTAL SEPARATE FLUES DIA. 60/60 MM.	192



R2K 34



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FLUE VENTINGS	
Distance between the higher edge of the casing and the bend axe	
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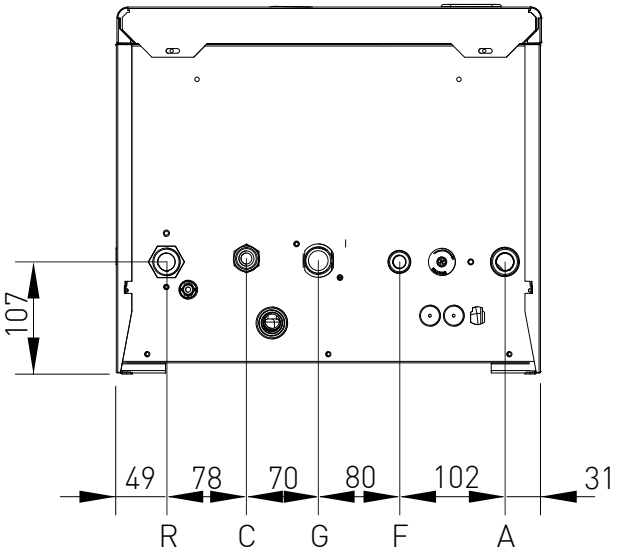
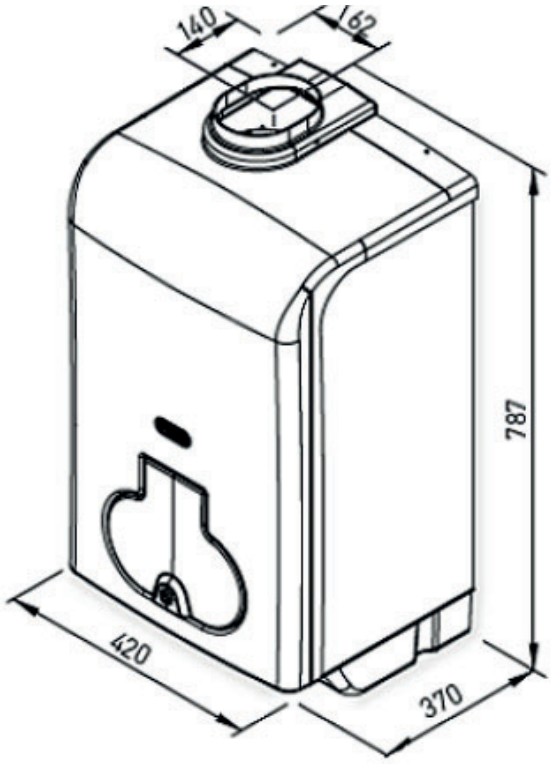
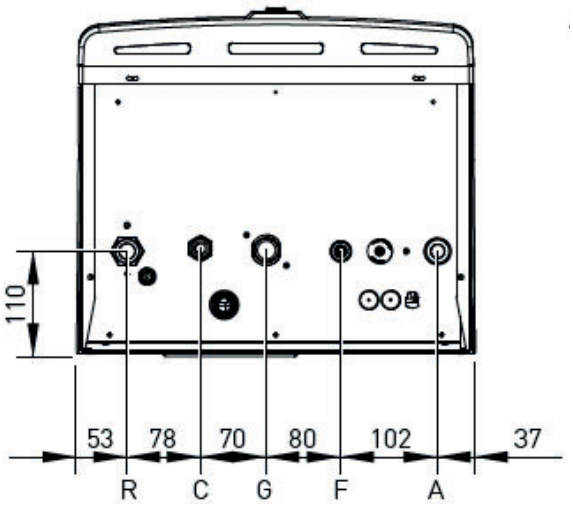


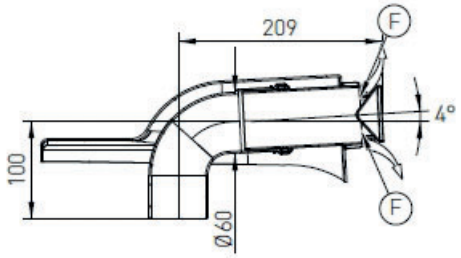
R2K 24-28-34 RAIN



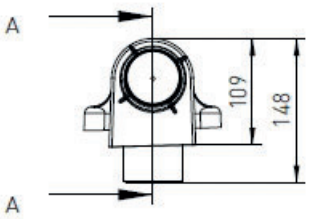


KEYS		
R	RETURN	Ø3/4"
C	DHW OUTLET	Ø1/2"
G	GAS	Ø3/4"
F	COLD WATER INLET	Ø1/2"
A	INFEED	Ø3/4"

OPTIONAL FRONT FLUE EXHAUST



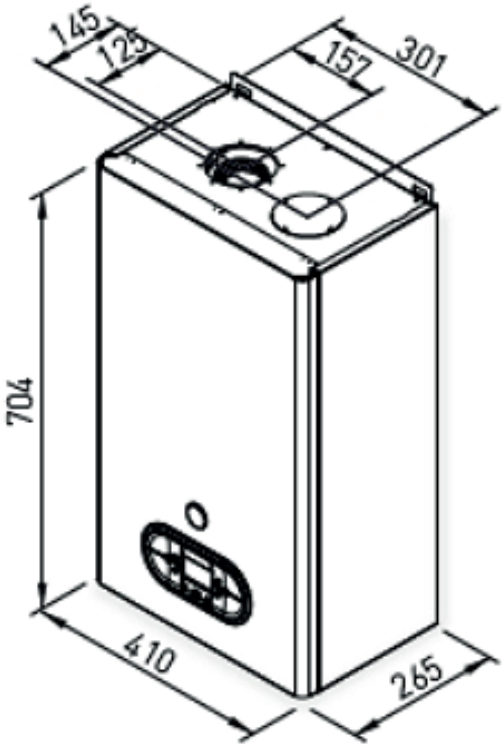
SECTION A-A

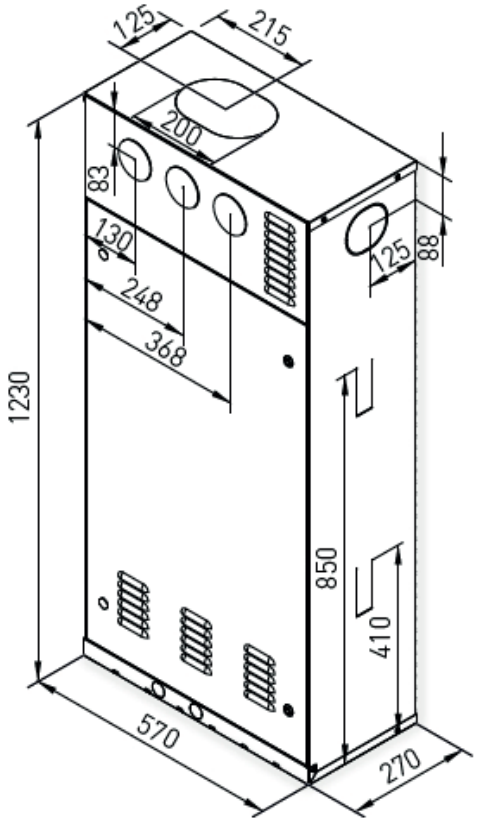


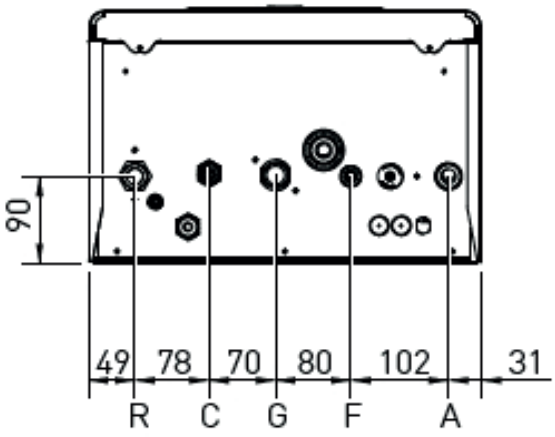
Ø 60 POLYPROPYLENE HORIZONTAL FRONT OUTLET FOR OUTDOOR INSTALLATION, WITHOUT CHIMNEY.

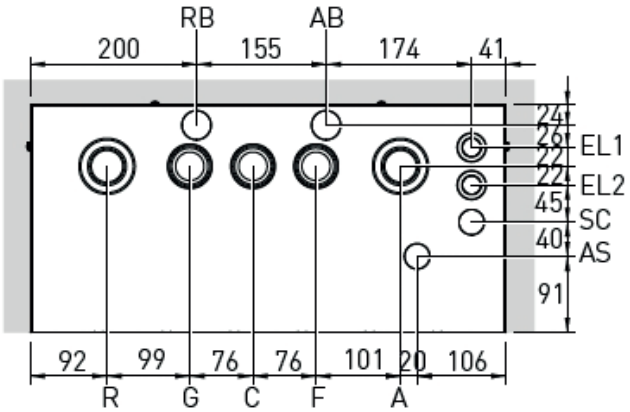
It enables the combustion exhausts to be discharged directly outside by means of a polypropylene duct, and to suction air irectly from the hole located above the head of the sealed chamber, protected by a metal mesh.

R2K 24-28 BOX







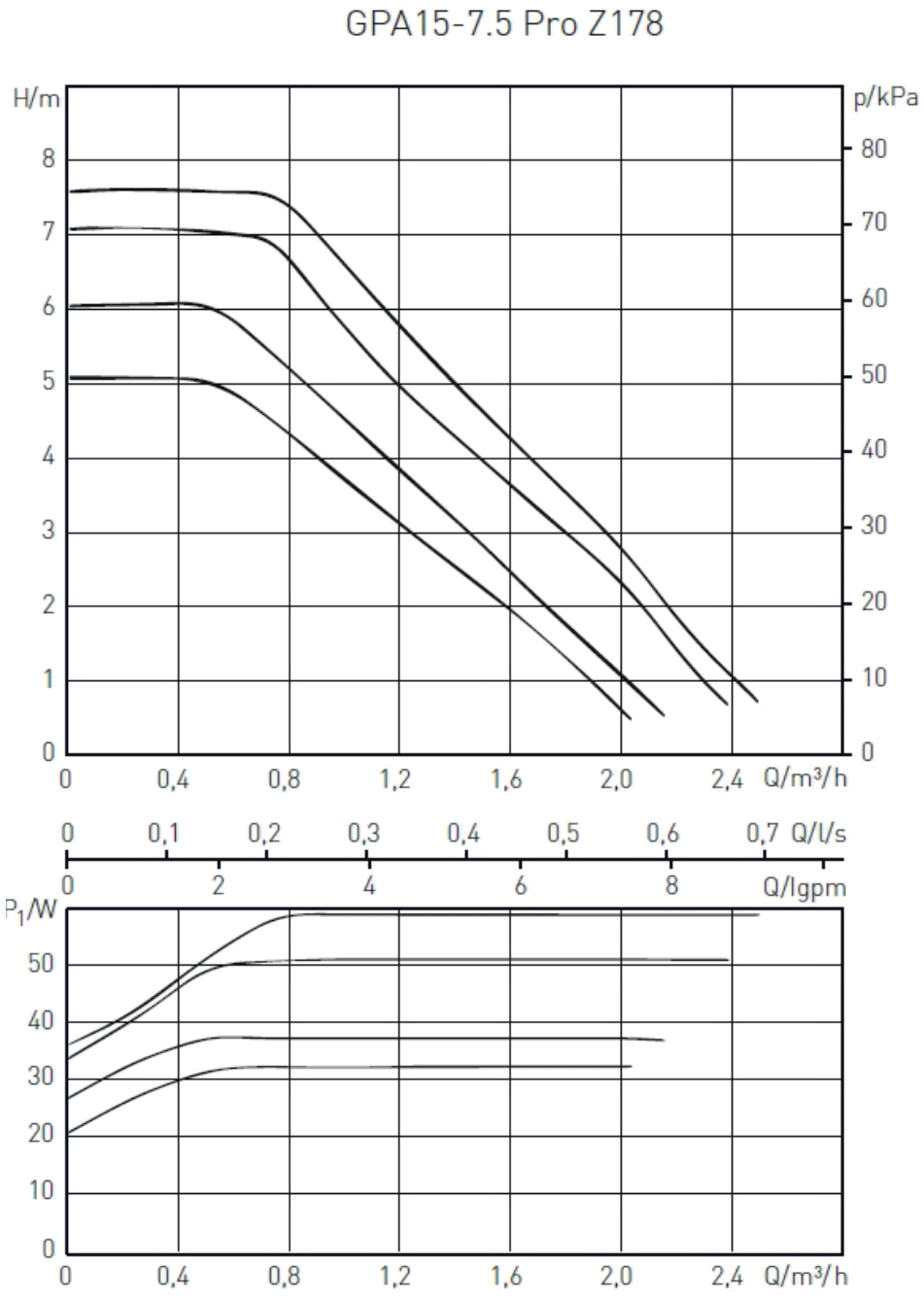


KEYS		
R	RETURN	Ø3/4"
C	DHW OUTLET	Ø1/2"
G	GAS	Ø3/4"
F	COLD WATER INLET	Ø1/2"
A	INFEED	Ø3/4"

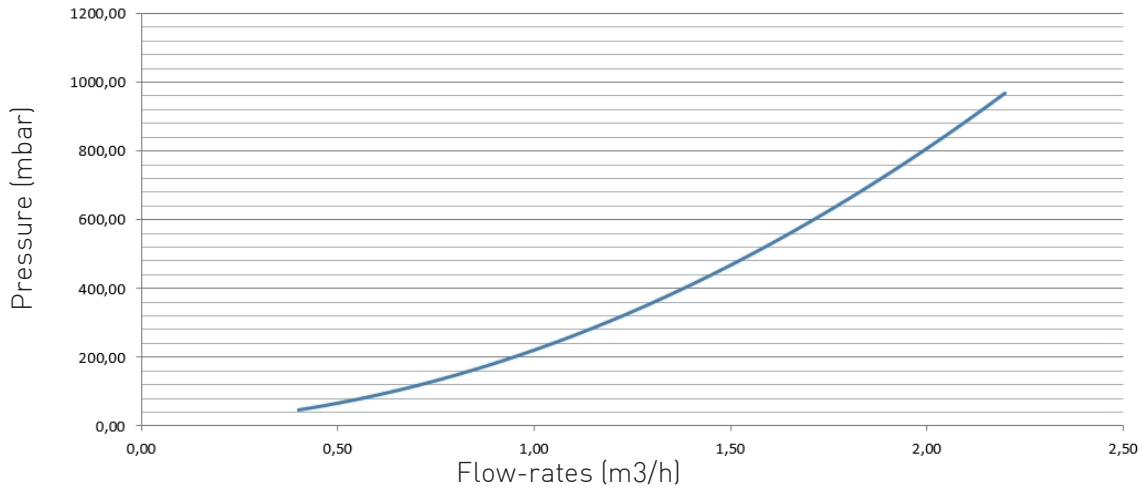
KEYS	
R	RETURN
C	DHW OUTLET
G	GAS
F	COLD WATER INLET
A	INFEED
SC	CONDENSATE OUTLET
EL1	ELECTRICAL FEEDING ROOM
EL2	REMOTE CONTROLLER CABLE ROOM

4. CARACTHERISTICS CURVES

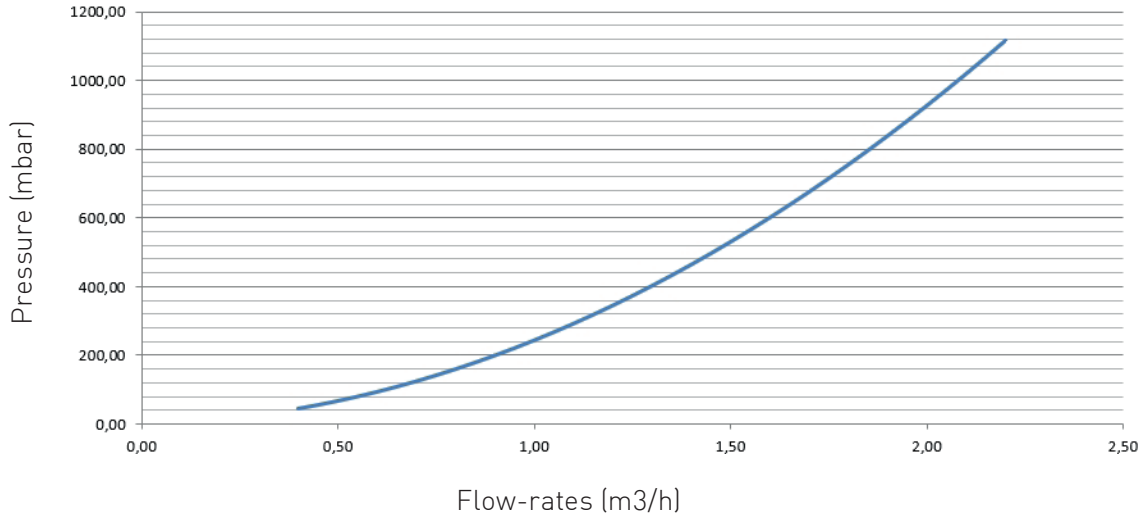
PUMP HEAD / FLOW DIAGRAM



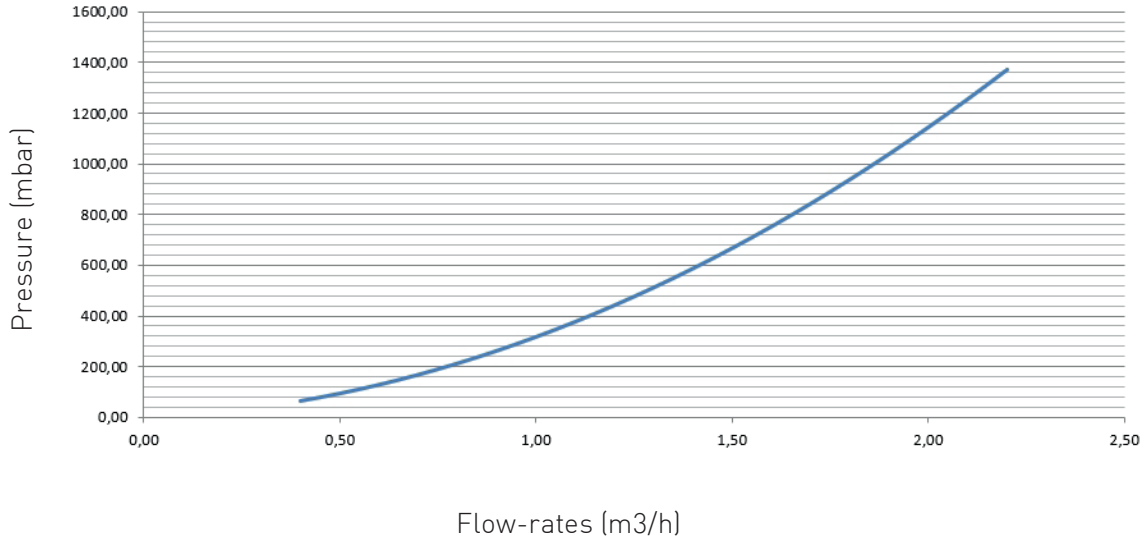
Appliance head losses for R2K 24



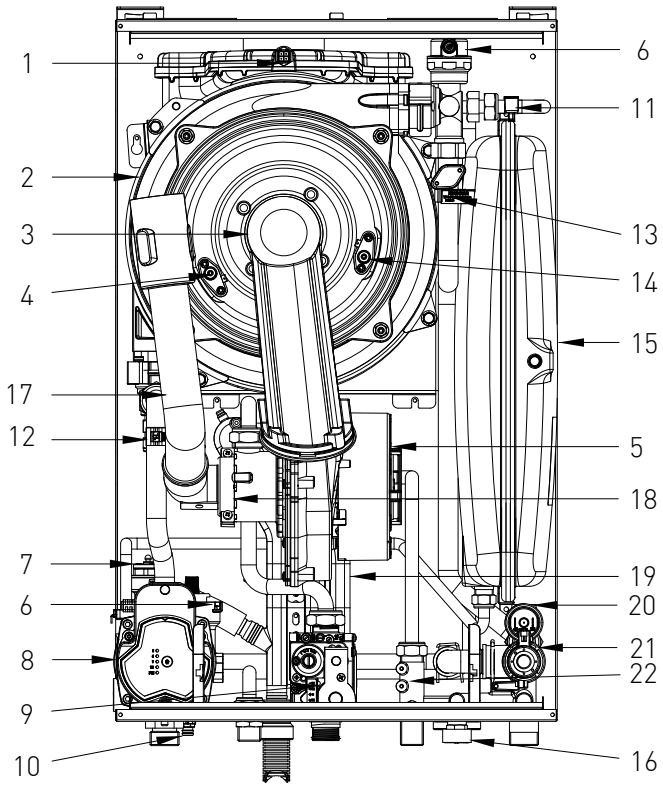
Appliance head losses for R2K 28



Appliance head losses for R2K 34



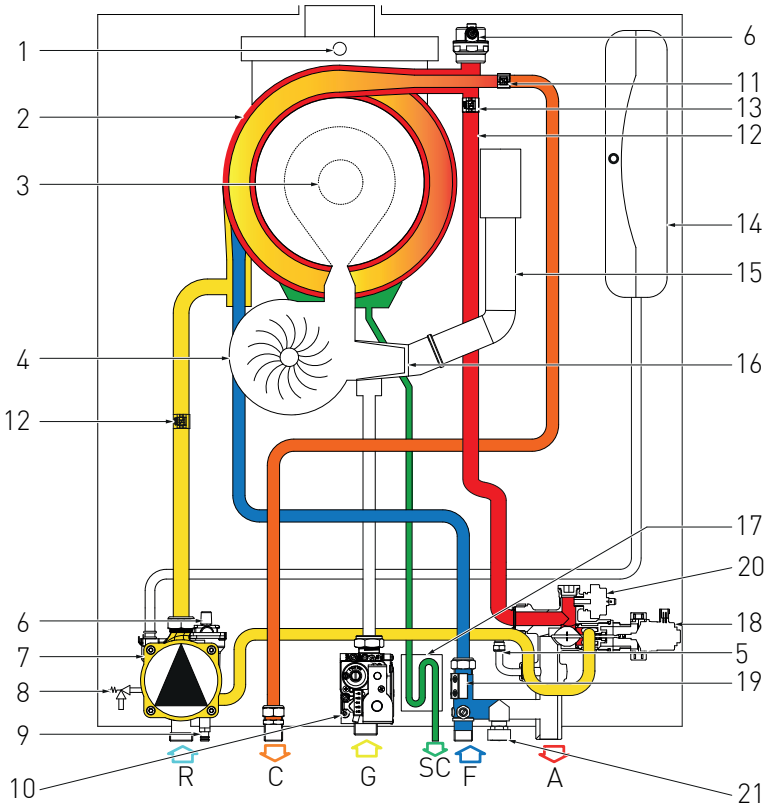
5. INTERNAL VIEW



KEY

1. FUMES SAFETY THERMOFUSE
2. INTEGRATED HEAT EXCHANGER
3. BURNER UNIT
4. DETECTION ELECTRODE
5. ELECTRIC FAN
6. AIR RELIEF VALVE
7. SAFETY VALVE 3 BAR
8. PUMP
9. GAS VALVE
10. SYSTEM DRAINING TAP
11. DOMESTIC CIRCUIT PROBE
12. SAFETY THERMOSTAT
13. HEATING PROBE
14. LIGHT UP ELECTRODE
15. EXPANSION TANK
16. START-UP TRANSFORMER
17. AIR SUCTION TUBE
18. PROPORTIONAL VENTURI
19. WATER PRESSURE SWITCH
20. CONDENSATE COLLECTION SIPHON
21. DIVERTER VALVE
22. FLOW SWITCH
23. SYSTEM FILLING TAP

6. HYDRAULIC SCHEME

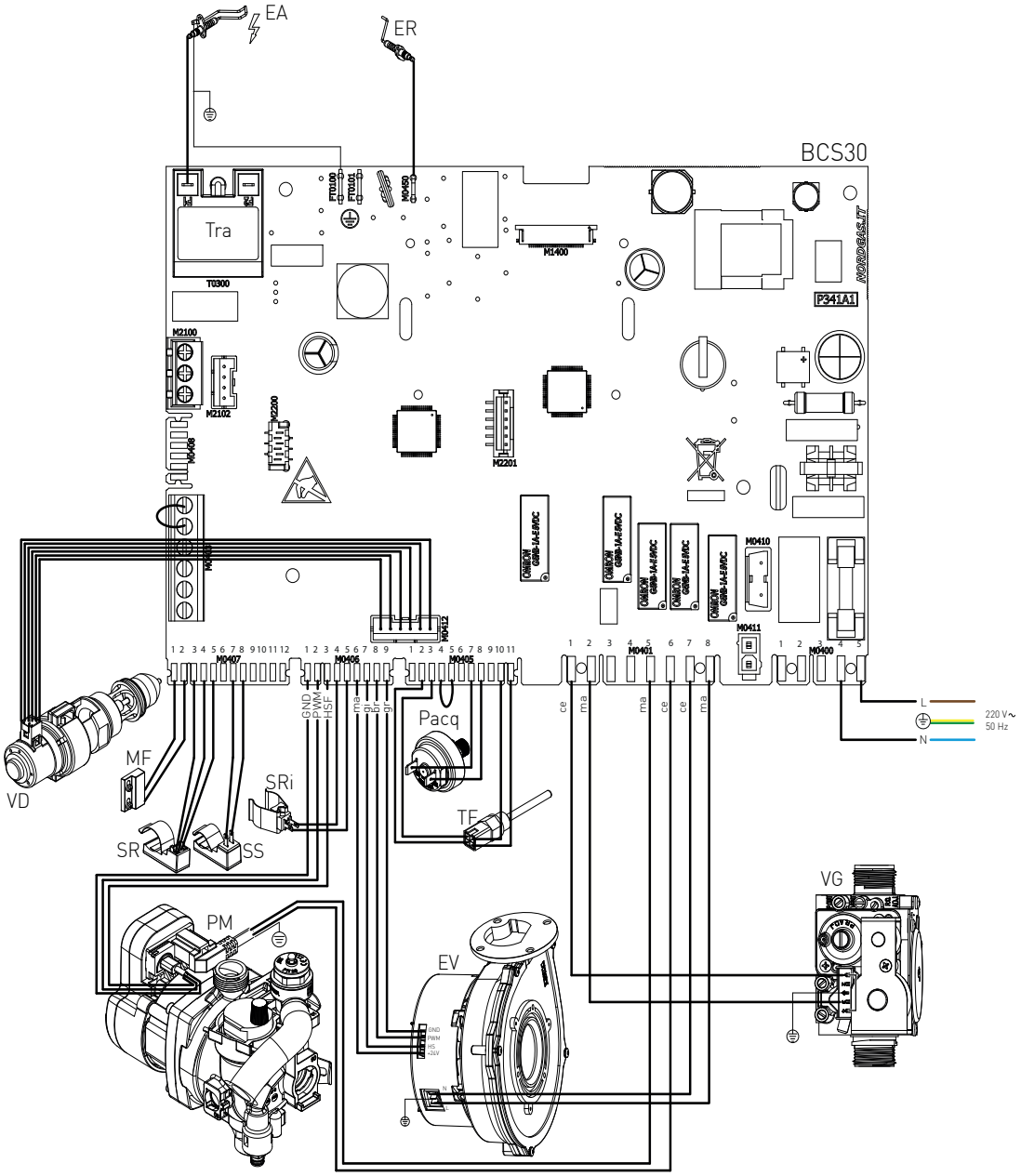


KEY

R. HEATING RETURN
C. DOMESTIC HOT WATER OUTLET
G. GAS INLET
SC. CONDENSATE DRAIN
F. COLD WATER INLET
A. HEATING FORWARD

1. FUMES SAFETY THERMOFUSE
2. INTEGRATED HEAT EXCHANGER
3. BURNER UNIT
4. ELECTRIC FAN
5. BY-PASS
6. AIR RELIEF VALVE
7. CIRCULATOR
8. SAFETY VALVE 3 BAR
9. SYSTEM DRAINING TAP
10. GAS VALVE
11. DOMESTIC CIRCUIT PROBE
12. SAFETY THERMOSTAT
13. HEATING PROBE
14. EXPANSION TANK
15. AIR SUCTION TUBE
16. PROPORTIONAL VENTURI
17. CONDENSATE COLLECTION SIPHON
18. DIVERTER VALVE
19. FLOW SWITCH
20. WATER PRESSURE SWITCH
21. SYSTEM FILLING TAP

7. ELECTRICAL SCHEME



ER: DETECTION ELECTRODE
EA: START-UP ELECTRODE
C: CIRCULATOR
VG: GAS VALVE
TRA:START-UP TRANSFORMER
TF: FUMES THERMOFUSE (102°C)
VD: DIVERTER VALVE

TS: SAFETY THERMOSTAT
PACQ:WATER PRESSURE SWITCH
MF: MICRO-FLOW SWITCH
SR: HEATING PROBE
SS: DOMESTIC CIRCUIT PROBE
EV: ELECTRIC FAN

MP: PANEL TERMINAL
SE: EXTERNAL PROBE
TA: ENVIRONMENT THERMOSTAT
L: LINE
N: NEUTRAL
NE: BLACK

CE: BLUE
MA: BROWN
AR: ORANGE
GI: YELLOW
BI: WHITE
GR. GREY

8. DATA

Model		R2K 24 R2K 24 RAIN R2K 24 BOX	R2K 28 R2K 28 RAIN R2K 28 BOX	R2K 34 R2K 34 RAIN
EEC Certification	n°	0476CQ0134	0476CQ0134	0476CQ0134
Gas cathegory		II2HM3P	II2HM3P	II2H3P
Flue venting type	tipo	B23- B23p-B33-B53-C13-C33-C43-C53-C63-C83-C93		
Energy efficiency 92/42/CEE	n° stelle	4	4	4
Heat Input max	kW	23.5	28.0	34.0
Heat Input min	kW	2.90	3.70	4.10
Heat Output max. - 60/80°C	kW	22.94	27.30	33.35
Heat Output min. - 60/80°C	kW	2.75	3.52	3.94
Heat Output max. - 50/30°C	kW	24.79	29.40	36.19
Heat Output min. - 50/30°C	kW	3.02	3.83	4.34
Potenza termica utile 30% Pm - 50/30°C	kW	4.26	5.12	6.21
Efficiency at 100% Heat Input - 60/80°C	%	97.60	97.50	98.08
Heat Input average efficiency - 60/80°C	%	97.20	96.80	98.02
Efficiency Heat Output min - 80/60°C	%	94.70	95.00	96.06
Efficiency at 100% Heat Input - 50/30°C	%	105.50	105.00	106.43
Efficiency Heat Output min - 50/30°C	%	104.20	103.60	105.91
Efficiency at 30% Heat Input average - return 30°C	%	107.70	107.70	108.60
Combustion characteristics				
Maximum combustion efficiency	%	97.80	97.70	97.60
Minimum combustion efficiency	%	98.10	98.20	97.90
Flue efficiency losses with burner on (Heat Input max.)	%	2.20	2.30	2.40
Flue efficiency losses with burner on (Heat Input min.)	%	1.90	1.80	2.10
Chimney losses - Burner OFF	%	0.015	0.010	0.010
Casing efficiency losses (Heat Input max.)	%	0.20	0.20	-0.48
Casing efficiency losses (Heat Input min.)	%	-	3.20	1.84
Casing losses - Burner OFF	%	-	0.04	0.035
Fumes temperature - Heat Input max.	°C	64.30	68.17	69.40
Fumes temperature - Heat Input min.	°C	58.50	60.70	61.30
Fumes mass - Heat Input max.	g/s	10.38	12.37	14.96
Fumes mass - Heat Input min.	g/s	1.26	1.78	1.88
CO2 - Heat Input max. - G20	%	9.3-9.1	9.3-9.1	9.45-9.25
CO2 - Heat Input min. - G20	%	9-8.8	9-8.8	9.05-8.85
CO2 - Heat Input max. - G30	%	11.4-11.2	11.5-11.3	11.4-11.2
CO2 - Heat Input min. - G30	%	10.9-10.7	10.75-10.65	10.75-10.55
CO2 - Heat Input max. - G31	%	10.5-10.3	10.4-10.2	10.55-10.35
CO2 - Heat Input min. - G31	%	10.2-10	9.95-9.85	9.9-9.7
CO - Heat Input max.	ppm	67	60	75
CO - Heat Input min.	ppm	1	1	2
Weighted CO (0% O2)	ppm	5	5	7
Weighted NOx (0% O2) ppm	ppm	20	21	31

Model		R2K 24 R2K 24 RAIN R2K 24 BOX	R2K 28 R2K 28 RAIN R2K 28 BOX	R2K 34 R2K 34 RAIN
Weighted NOx (0% O2) on GCV mg/kWh	mg/kWh	32	36	49
NOx class	classe	VI	VI	VI
.Central heating circuit				
Temperature setting - Central heating	°C	30-80/25-45	30-80/25-45	30-80/25-45
Max. operating temperature - Central heating	°C	80	80	80
Max. operating pressure - Central heating	bar	3	3	3
Min. operating pressure - Central heating	bar	0.3	0.3	0.3
Expansion vessel capacity (C.H.)	litri	8	8	8
Expansion vessel pre-charge pressure	bar	1	1	1
Boiler water content	litri	4.34	4.73	5.99
.Domestic Hot Water (D.H.W.) circuit				
Temperature setting - D.H.W.	°C	35-60	35-60	35-60
Max. operating pressure - D.H.W.	bar	6	6	6
Min. operating pressure - D.H.W.	bar	0.5	0.5	0.5
D.H.W. flow rate - continuous flow - Δt 30°C	litri/min	11.1	13.4	16
D.H.W. flow rate - continuous flow - Δt 35°C	litri/min	9.86	11.5	13.7
.Dimensions				
Width	mm	410	410	410
Depth	mm	307	307	350
Height	mm	642	642	642
Gross weight	kg	35	37	44
.Hydraulic Connections				
C.H. Flow	Ø	3/4"	3/4"	3/4"
Cold water inlet	Ø	1/2"	1/2"	1/2"
D.H.W. outlet	Ø	1/2"	1/2"	1/2"
Gas	Ø	3/4"	3/4"	3/4"
C.H. Return	Ø	3/4"	3/4"	3/4"
.Flue systems				
Fan - Max. available pressure	Pa	100	76	91
Fan - Min. available pressure	Pa	21	4	5.8
Max. Flue length Ø60/100 - Horiz. Conc.	m	10	6	2
Flue bend 45°/90° MF Ø60/100 - Pressure loss	m	0.6 / 1	0.6 / 1	0.6 / 1
Max. Flue length Ø80/125 - Horiz. Conc.	m	12	8	10
Flue bend 45°/90° MF Ø80/125 - Pressure loss	m	0.5 / 0.8	0.5 / 0.8	0.5 / 0.8
Max. Flue length Ø50/50 - Horiz. Twin	m	10	12	3
Flue bend 45° /90° - Pressure loss	m	0.8 / 1.5	0.8 / 1.5	0.8 / 1.5
Max. Flue length Ø60/60 - Horiz. Twin	m	32	20	18
Flue bend 45° /90° - Pressure loss	m	0.8 / 1.5	0.8 / 1.5	0.8 / 1.5
Max Flue length Ø80/80 - Horiz. Twin	m	60	60	60
Flue bend 45° /90° - Pressure loss	m	0.8 / 1.5	0.8 / 1.5	0.8 / 1.5
Max. Flue length Ø50 - Horiz. Pipe	m	8	10	3
Flue bend 45° /90° - Pressure loss	m	0.8 / 1.5	0.8 / 1.5	0.8 / 1.5
Max. Flue length Ø60 - Horiz. Pipe	m	30	18	14
Flue bend 45° /90° - Pressure loss	m	0.8 / 1.5	0.8 / 1.5	0.8 / 1.5

Model		R2K 24 R2K 24 RAIN R2K 24 BOX	R2K 28 R2K 28 RAIN R2K 28 BOX	R2K 34 R2K 34 RAIN
Max. Flue length Ø80 - Horiz. Pipe	m	35	35	35
Flue bend 45° /90° - Pressure loss	m	0.8 / 1.5	0.8 / 1.5	0.8 / 1.5
.Electrical specifications				
Voltage-frequency	V/Hz	230/50	230/50	220-230/50
Nominal power consumption	A	0.72	0.75	0.75
Max Power consumption	W	78	78	78
Max Power consumption - fan	W	34	34	34
Max Power consumption - boiler pump (100%)	W	40	40	40
Max Power consumption - boiler pump (55%)	W	25	25	25
Electric power with boiler OFF	W	3.5	3.5	3.5
Protection rating	IP	X5D	X5D	X5D
.Gas supply				
Supply pressure - G20	mbar	20	20	20
Supply pressure max. - G20	mbar	25	25	25
Supply pressure min. - G20	mbar	17	17	17
Fan revolutions Max HEATING output - G20	Hz	190	192	203
Fan revolutions Max D.H.W. output - G20	Hz	190	192	203
Fan revolutions Min HEATING output - G20	Hz	50	50	53
Fan revolutions Min D.H.W. output - G20	Hz	50	50	53
Gas consumption - G20	m^3/h	2,49	2.96	3.60
Supply pressure - G30	mbar	30	30	28-30
Supply pressure min. - G30	mbar	35	35	35
Supply pressure max. - G30	mbar	20	20	20
Fan revolutions Max HEATING output - G30	Hz	177	180	195
Fan revolutions Max D.H.W. output - G30	Hz	177	180	195
Fan revolutions Min HEATING output - G30	Hz	50	50	55
Fan revolutions Min D.H.W. output - G30	Hz	50	50	55
Gas consumption - G30	kg/h	1,85	2.21	2.68
Supply pressure - G31	mbar	37	37	37
Supply pressure min. - G31	mbar	45	45	45
Supply pressure max. - G31	mbar	25	25	25
Fan revolutions Max HEATING output - G31	Hz	190	190	203
Fan revolutions Max D.H.W. output - G31	Hz	190	190	203
Fan revolutions Min HEATING output - G31	Hz	50	50	55
Fan revolutions Min D.H.W. output - G31	Hz	50	50	55
Gas consumption - G31	kg/h	1,83	2.17	2.64

PRODUCT SHEET - ERP regulations				
.Technical parameters for boiler space heaters, boiler combination heaters and cogeneration space heaters				
Model		R2K 24 R2K 24 RAIN R2K 24 BOX	R2K 28 R2K 28 RAIN R2K 28 BOX	R2K 34 R2K 34 RAIN
Condensing boiler	[Yes/No]	Yes	Yes	Yes
Low-temperature (**) boiler:	[Yes/No]	No	No	No
B11 boiler	[Yes/No]	No	No	No
Cogeneration space heater	[Yes/No]	No	No	No
If yes, equipped with a supplementary heater	[Yes/No]	No	No	No
Combination heater	[Yes/No]	Yes	Yes	Yes
.Rated heat output Prated	kW	23	27	33
.For boiler space heaters and boiler combination heaters: Useful heat output				
At rated heat output and high-temperature regime (*) P4	kW	22,9	27,3	33,3
At 30 % of rated heat output and low-temperature regime (**) P1	kW	7,6	9,1	11,0
.Auxiliary electricity consumption				
At full load elmax	kW	0,038	0,038	0,038
At part load elmin	kW	0,016	0,016	0,016
In standby mode PSB	kW	0,004	0,004	0,004
Seasonal space heating energy efficiency ns	%	94	94	94
Seasonal space heating energy efficiency class		A	A	A
For boiler space heaters and boiler combination heaters: Useful efficiency				
At rated heat output and high-temperature regime (*) n4	%	87,5	87,2	88,3
At 30 % of rated heat output and low-temperature regime (**) n1	%	97,0	97,0	97,8
.Other items				
Standby heat loss $_{Pstby}$	kW	0,059	0,059	0,059
Ignition burner power consumption $_{Pign}$	kW	0,000	0,000	0,000
Annual energy consumption $_{QHE}$	kWh/GJ	20513 / 73,85	24422 / 87,92	29444 / 106
Sound power level, indoors $_{LWA}$	dB	52	52	52
.For combination heaters:				
D.H.W. energy efficiency class		A	A	A
.Declared load profile		XL	XL	XL
Daily electricity consumption $_{Qelec}$	kWh	0,146	0.154	0,160
Annual electricity consumption AEC	kWh	53	56	59
.Water heating energy efficiency $_{nwh}$	%	86	87	87
Daily fuel consumption $_{Qfuel}$	kWh	23,929	23,660	26,821
Annual fuel consumption AFC	GJ	18	18	18
Contact details	Tel. +39 0721 9079.1 - fax. +39 0721 9079299 - e-mail: info@radiant.it - http://www.radiant.it			
Name and address of the supplier	RADIANT BRUCIATORI S.p.A. Via Pantanelli, 164/166 - 61025 - Montelabbate (PU)			
(*) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.				
(**) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).				
(***) The boiler can be connected to an external tank for DHW production.				

9. ACCESSORIES

Model	Part Number	R2K 24 R2K 24 RAIN R2K 24 BOX	R2K 28 R2K 28 RAIN R2K 28 BOX	R2K 34 R2K 34 RAIN
CLOUDWARM WIRELESS APPLICATION Free installation N.B. In case you do not have a wifi network, you can anyway access thru a GSM modem that can be purchased separately - for heating only	40-00638	√	√	√
EASY REMOTE - BOILER REMOTE CONTROLLER THAT RUNS THE DUAL FUNCTION OF THE CHRONOTHERMOSTAT AND REMOTE CONTROLLER - FOR HEATING ONLY	40-00017	√	√	√
DIGITAL WEEK DAY - Weekly chronothermostat that acts as a weekly chronothermostat and allows control on two temperature levels: day-night.	86047LA	√	√	√
WI-TIME - Weekly digital wifi thermostat compatible with Alexa and Google Home thanks to the (free) downloadable application. It acts as a chronothermostat from smartphone for heating and cooling on two levels, comfort and eco in accordance with the set time programme.	40-00611	√	√	√
OUTDOOR PROBE - The unit constantly adjusts its firing rate	73518LA	√	√	√
POLYPHOSPHATES DISPENSER	25-00804	√	√	√
MAGNETIC DIRT SEPARATOR	65-00913	√	√	√
CONDENSATE OUTLET PUMP	82156LA	√	√	√
ANTI-FREEZE KIT (ALL MODELS)	82259LP	√	√	√
CONNECTIONS COVER (NO BOX UNITS)	65-00527	√	√	
CONNECTIONS COVER XL (NO BOX UNITS)	65-00380	√	√	
VERTICAL VENTING UNION KIT DIA. 80 MM. (NO RAIN PRODUCTS)	27079LA	√	√	√
KIT K - HORIZONTAL COAXIAL DIA. 60/100 MM.	82087LA	√	√	√
KIT V - VERTICAL COAXIAL DIA. 60/100 MM.	82091LA	√	√	√
KIT AK 50 - HORIZONTAL COAXIAL DIA. 80/125 MM.	82109LP	√	√	√
KIT CK 50 - VERTICAL COAXIAL DIA. 80/125 MM.	82112LP	√	√	√
KIT H - HORIZONTAL SEPARATE FLUES DIA. 80/80 MM.	82086LA	√	√	√
KIT M - HORIZONTAL SEPARATE FLUES DIA. 60/60 MM.	50-00162	√	√	√
KIT L - VERTICAL VENTING DIA. 80 MM. (FOR RAIN PRODUCTS)	82246LP	√	√	√
KIT RAIN - HORIZONTAL DIA. 80 MM.	82244LP	√	√	√
FRONT VENTING - FOR RAIN PRODUCTS	50-00172	√	√	√
VERTICAL FLUE UNION KIT DIA. 80 MM. (FOR RAIN PRODUCTS)	52614LP	√	√	√
CONTAINER ASSEMBLY (FOR BOX PRODUCTS)	51038LP	√	√	√
HORIZONTAL FLUE KIT BOX 2 DIA. 80 MM. (FOR BOX PRODUCTS ONLY)	82099LP	√	√	√