

**schuster®**



**WKV**

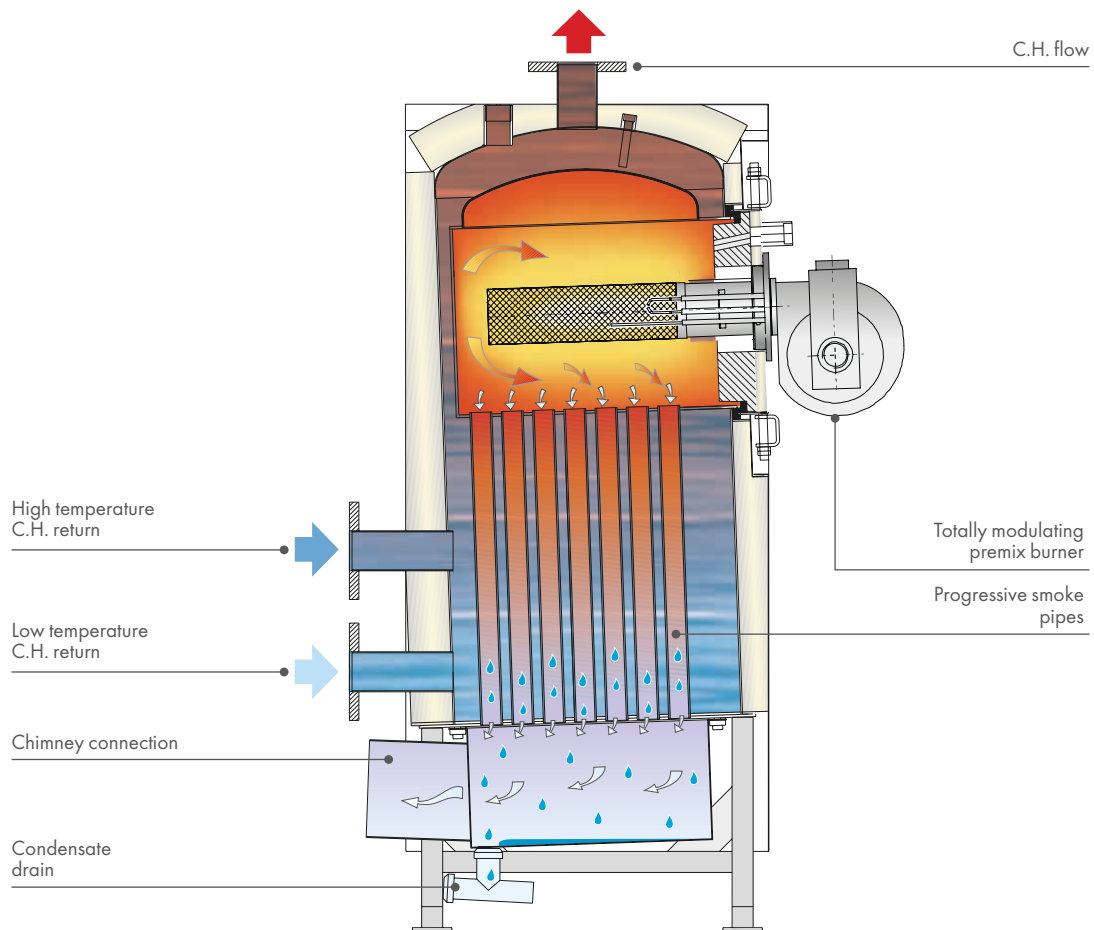
CONDENSING UNIT IN STAINLESS STEEL  
FROM 150 kW TO 350 kW



# Features

Condensing units, entirely in stainless steel, complete with total premix modulating gas burner.

- 4 natural gas fired models, from 150 to 350 kW
- Certified efficiency up to 109% at part load
- Made of high quality materials and very high resistance to the acidic condensate: completely in stainless steel AISI 316L and AISI 304, treated with the most recent cutting and welding technologies
- Endowed with electronic panel boards with HSCP and BCM controllers, in order to make cascades up to 8 boilers
- Modulation ratio 1:6
- Silent and with low pressure losses, thanks to the optimization of the smoke way
- Vertically developed, they occupy little spaces and can be easily introduced through narrow doors



WKV	Nominal input (kW)	Nominal output in COND. (kW)	Number of special pipes	Efficiency at full load in COND. %	Efficiency at part load in COND. %	Max condensate production (l/h)	Dimensions (mm - W x D x H)
150	140	150	37	107.1	109	22.54	890x1147x1650
230	214	230	61	107.4	109	34.45	1020x1277x1765
300	280	300	71	107.4	109	45.08	1070x1329x1920
348	324	348	91	107.4	109	52.16	1150x1429x1950

# Details

## High quality of materials

Boiler completely manufactured in stainless steel: combustion chamber in AISI 316L, other parts in AISI 304.

Very high efficiency vertical patented pipes, progressive and armoured with the external pipe in AISI 316L and, inside, aluminium multi-radial fins.



**Two return connections** high/low temperature for the maximum energy recovery during condensation.



## Very low heat losses

80 mm thick layer of mineral wool for thermal and acoustic insulation. Carbon steel door with thermal isolation resistant at 1400°C.



## Self cleaning of the tube bundle

thanks to the natural washout that condensates produce for gravity.



## Premix burner

with high modulation ratio (1:6), preassembled and pre-adjusted.

## Electronic control panel

Equipped with:

- electronic controller HSCP
- modulating burner manager
- multifunction SHC PCBs



## Prearrangement for cascade

up to 8 WKV through BCM (Boiler Cascade Manager).



## Simplified installation

- No hydraulic interface is needed.

## Progressive smoke pipes

Circular section pipes in stainless steel AISI 316L, containing, in all their length, a series of multi-radial aluminium fins that assure a very high heat exchange, withstanding the condensate.

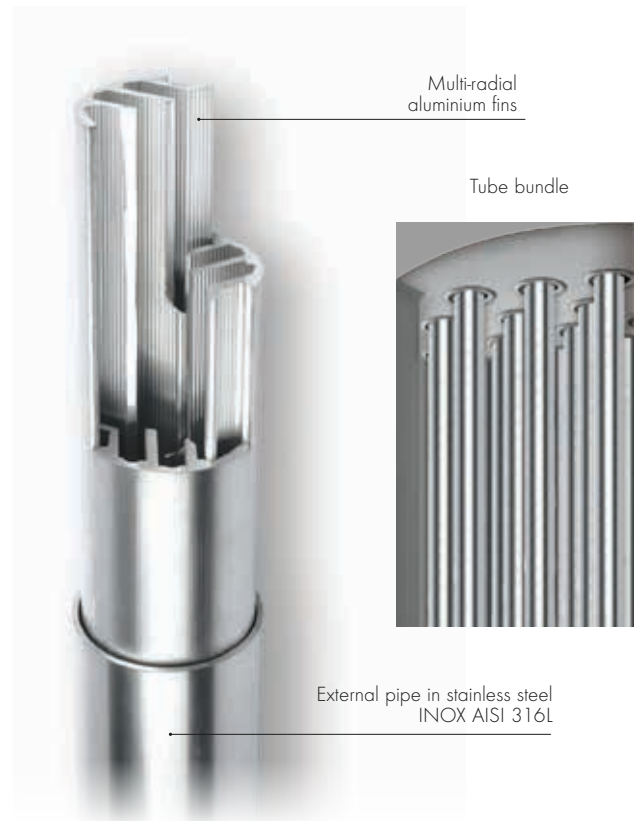
The two elements are armoured and assembled in just one piece.

To favour the cold starts, the initial portion of the pipes has a "progressive density" of the aluminium fins.

The smoke temperatures are meaningful of the exchange quality of the tube bundle: in fact, at the pipe entrance a smoke temperature of  $750\div 850^{\circ}\text{C}$  is recorded, but, after only 50 cm, the temperature goes down to  $60^{\circ}\text{C}$ .

The smoke pipes, placed in a vertical tube bundle, favour:

- exceptional thermal exchange
- functional outflow of the condensates
- absence of wet acidic deposits
- cleaning for gravity of the smooth exchange surfaces
- longer lasting.



## Pre-mixing

In the totally premixed burners, the gas and the combusive air are "mixed" before entering the boiler combustion chamber.

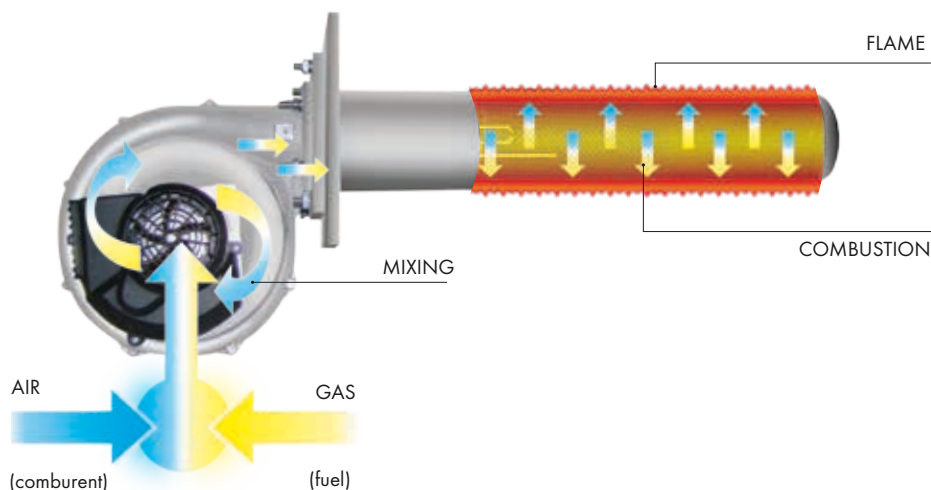
The mixture results, therefore, more homogeneous and, the combustion, more efficient, particularly in modulation, than both in the pressure jet burners and in the traditional atmospheric ones, in which air and gas come into contact in the combustion chamber.

The electronics allows to modulate with a nearly constant ratio, both the air and the gas, thanks to the adoption of modulating fans and gas valves with related pneumatic opening. The smoke condensation temperature (dew point) remain constant at any boiler output operation.

The produced flame is particularly compact and thus avoids contacts with the combustion chamber, that produce overheating phenomena and emissions worsening.

The combination of the boiler with such pre-mixed burner, pre-adjusted in the factory, sensitively reduces the dimensions of the combustion chamber and, therefore, the total volumes of the boiler.

- **Wide modulation range, over 1:6**  
gotten through the variation of the rotation speed of the fan motor that regulates the combustion air flow rate.
- **Reduced ventilation noise more than 30%** if compared to a correspondent pressure jet burner.
- **Compact flame.**
- **Increase of radiation thermal exchange** particularly at the minimum output and in deep modulation.
- **Low sound emissions** to the chimney.
- **Low  $\text{NO}_x$  emissions:**  $<70 \text{ mg} / \text{kWh}$ .
- **Particularly compact dimensions.**



# Control panels

## HSCP (Heating System Control Panel)

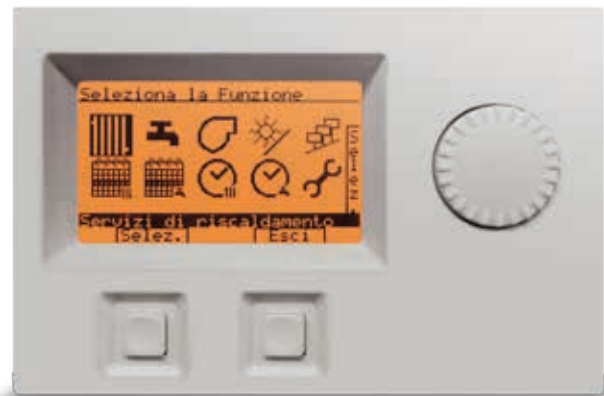
Detects and connects among them, through eBus, more devices in different points of the installation. This allows the amplification of the system through the connection of special multifunctional cards SHC (Slave Heating Controller) for the management of the passive loads and/or further active energetic resources. In this way it is possible to perform several functions.

Thanks to the SHC it is possible to use, and then to buy, only the optional necessary cards, of which one is supplied as standard, and, through the variation of a simple specialized parameter, to set its functions.

Every SHC controls up to 3 installation circuits, and has 3 inlets for NTC temperature sensors and 2 inlets for PT1000 sensors for solar circuits.

It is possible to connect up to 4 SHC cards and then to control up to 12 heating circuits.

A low tension feeder is available in case of installation on main panel board in the boiler house



HSCP Panel  
(always supplied with outer temperature sensor and flow temperature sensor)

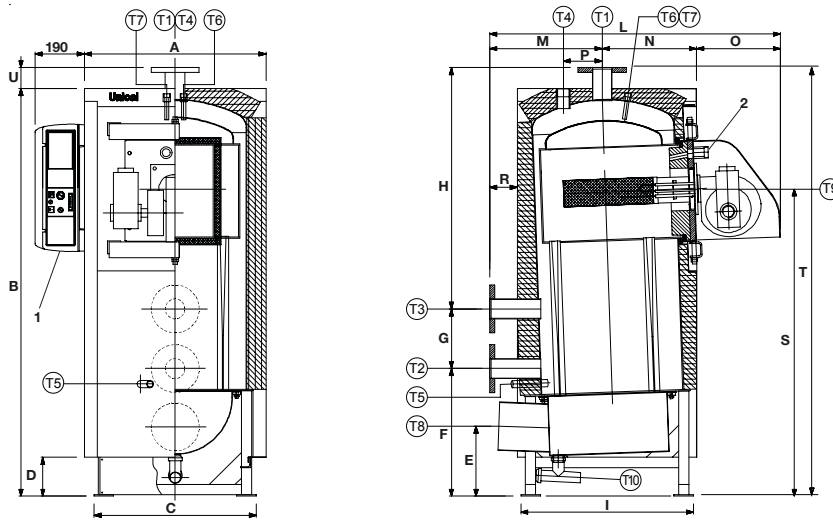
## BCM (Boiler Cascade Manager)

Powerful electronic optional module that allows:

- To manage the cascade of up to 8 boilers of any power
- To supply double operational safety, in case of breakdown of the HSCP through the activation of demand of programmable power
- To manage the modulating pump (Analogical outlet 0-10 V) with significant efficiency increase at part loads
- To integrate in the Building Automation Systems of the boilerhouse through Modbus
- To control the heat request: temperature set point and modulation level (E BUS)
- To monitor the operation state of the temperatures (E BUS)
- To set the parameters (E BUS)
- To manage and to reset the alarms
- To remote the alarm signals through relay.



# Dimensions and technical data



Key:

- 1 - Panel board
- 2 - Flame sight glass
- T1 - Central heating (C.H.) flow
- T2 - Low temperature C.H. return
- T3 - High temperature C.H. return
- T4 - Expansion vessel connection
- T5 - Boiler drain connection
- T6 - Bulb holder
- T7 - Bulb holder
- T8 - Chimney connection
- T9 - Burner connection
- T10 - Condensate drain

Model	A mm	B mm	C(*) mm	D mm	E mm	F mm	G mm	H mm	I mm	L mm	M mm	N mm	O mm	P mm	R mm	S mm	T(*) mm	U mm
WKV 150	700	1570	625	150	270	491	230	929	685	1147	433	364	350	150	107	1183	1650	80
WKV 230	830	1670	755	150	270	491	230	1044	815	1277	503	454	320	170	107	1209	1765	95
WKV 300	880	1830	795	150	305	556	250	1024	855	1329	526	483	320	170	109	1300	1920	90
WKV 348	960	1860	875	150	332	586	250	1114	965	1429	576	533	320	170	109	1333	1950	90

\* Minimum dimension of the boiler house access door.

WKV		150	230	300	348	
<b>Outputs</b>						
NOMINAL INPUT max. - min.	kW	140 - 35	214 - 50	280 - 70	324 - 70	
NOMINAL OUTPUT in condensing mode (50°C/30°C) max. - min.	kW	150 - 38.1	230 - 54.5	300 - 76.1	348 - 76.1	
NOMINAL OUTPUT in condensing mode (80°C/60°C) max. - min.	kW	136.5 - 34.3	209.2 - 49	273.6 - 68.4	317.7 - 68.5	
<b>Efficiency</b>						
EFFICIENCY CATEGORY (directive 92/42/CE)		★★★★	★★★★	★★★★	★★★★	
EFFICIENCY at full load, in condensation	%	107.1	107.4	107.4	107.4	
EFFICIENCY at part load, in condensation	%	109	109	109	109	
EFFICIENCY at full load, in standard mode	%	97.5	97.7	97.9	98	
<b>Combustion and Hydraulic Performances</b>						
CO <sub>2</sub> max-min	%	9.1	9.1	9.1	9.1	
MAX. CONDENSATE PRODUCTION (at 15°C)	kg/h	22.54	34.45	45.08	52.16	
SMOKE SIDE PRESSURE LOSSES	mm c.a.	35	40	45	50	
WATER SIDE PRESSURE LOSSES with Δt 15 K m	m c.a.	0.27	0.32	0.55	0.60	
SMOKE MASSIVE FLOW RATE (max.)	kg/h	228.8	346.5	457.6	529.5	
MAX. NET SMOKE TEMPERATURE (ff-ta) ** (Tboiler 80/60°C)	°C	50	50	50	50	
MAX. NET SMOKE TEMPERATURE (ff-ta) ** (Tboiler 50/30°C)	°C	30	30	30	30	
MIN. GAS PRESSURE at gas train inlet (G20) mbar	mbar	20	20	20	20	
MAX. AVAILABLE PRESSURE AT CHIMNEY BASE WITH BURNER ON	Pa	100	100	100	100	
MAX. WORKING PRESSURE	bar	5	5	5	5	
BOILER WATER CONTENT	l	151	257	317	389	
<b>Dimensions - Connections and Weight</b>						
FLOW/ RETURN connections	T1/T2/T3	UNI 2278 PN16	65	65	80	80
EXPANSION VESSEL CONNECTIONS	T4	ISO 7/1	1	1	2	2
BOILER DRAIN	T5	ISO 7/1	3/4	3/4	3/4	3/4
BULB HOLDER	T6/T7	Øi mm	163	163	163	163
CHIMNEY CONNECTION	T8	Øi mm	180	180	200	200
BURNER CONNECTION	T9	Øi mm	163	163	163	163
CONDENSATE DRAIN	T10	Øe mm	40	40	40	40
NET WEIGHT	kg	310	447	540	661	

\*\* Room temperature ta = 20°C.

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