

MODAL

(The product can be sold only outside the UE)



BREVETTO
Unical
PATENT

smoke pipes

PRESSURIZED STEEL BOILER WITH REVERSED FLAME

OUTPUT RANGE

from 64 to 291 kW

WORKING TEMPERATURE

minimum return temperature higher than 50°C

OPERATION WITH

gas or oil fired pressure jet burners

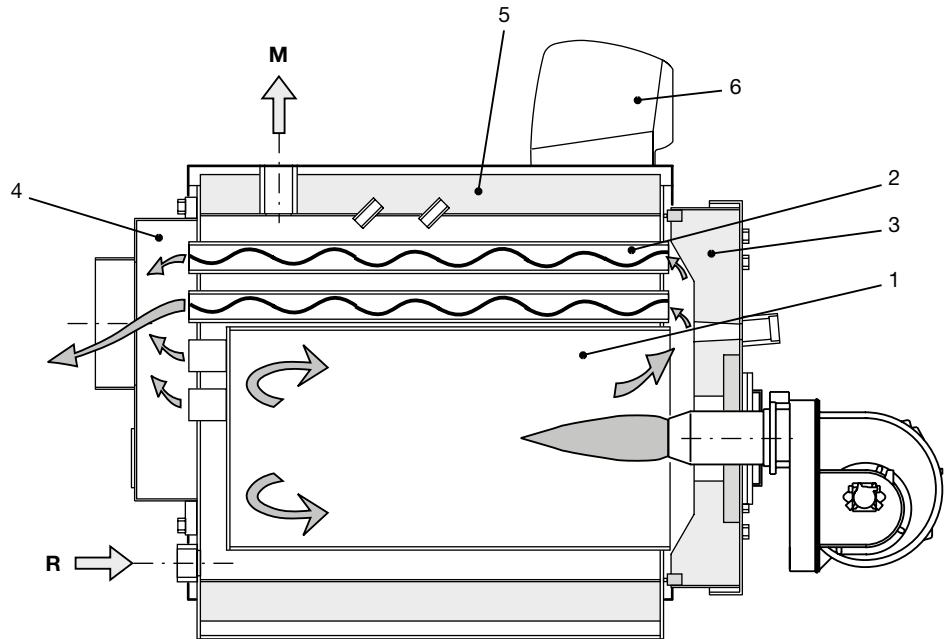
MODELS

| | | | | |
|-----|-----|-----|-----|-----|
| 64 | 76 | 93 | 105 | 116 |
| 140 | 163 | 186 | 233 | 291 |

Decentralization of tube bundle for high resistance to the condensate

MAIN COMPONENTS

1. Furnace
2. Smoke pipes with smoke diverters
3. Door with flame control warning light
4. Smoke chamber
5. Body insulation
6. Panel board



TECHNICAL DATA

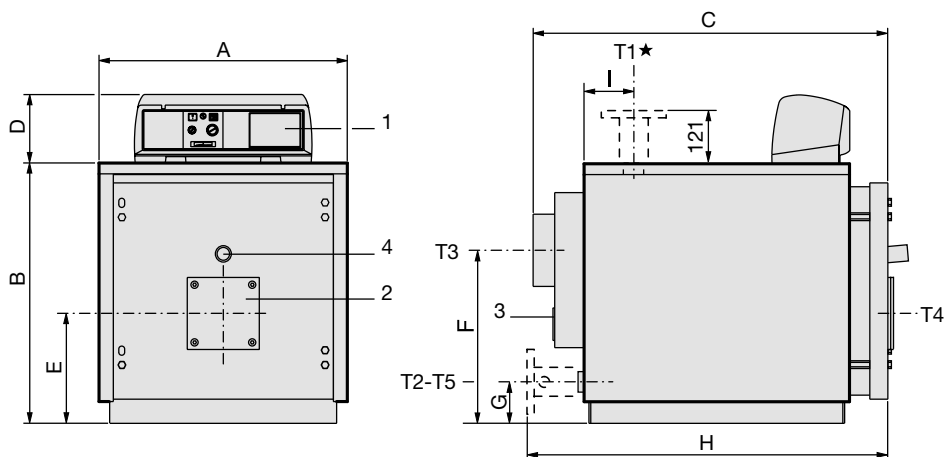
| MODAL | | 64 | 76 | 93 | 105 | 116 | 140 | 163 | 186 | 233 | 291 |
|-----------------------------------|---------|------|------|------|------|------|------|------|------|------|------|
| NOMINAL OUTPUT | kW | 64 | 76 | 93 | 105 | 116 | 140 | 163 | 186 | 233 | 291 |
| NOMINAL INPUT | kW | 71 | 84 | 102 | 115 | 128 | 155 | 180 | 206 | 258 | 322 |
| WATER EFFICIENCY AT NOMINAL LOAD | % | 90.1 | 90.4 | 91.1 | 91.3 | 90.6 | 90.3 | 90.5 | 90.3 | 90.3 | 90.4 |
| BOILER CAPACITY | l | 86 | 86 | 86 | 126 | 126 | 126 | 151 | 151 | 203 | 247 |
| WATER PRESSURE DROPS* | m w.c. | 0.10 | 0.13 | 0.16 | 0.10 | 0.10 | 0.14 | 0.20 | 0.25 | 0.22 | 0.30 |
| FLUE GAS PRESSURE DROP | mm w.c. | 1.5 | 1.8 | 2.5 | 3 | 3 | 5 | 8 | 14 | 18 | 22 |
| MAXIMUM BOILER WORKING PRESSURE** | bar | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| WEIGHT | kg | 195 | 195 | 195 | 280 | 280 | 280 | 318 | 318 | 420 | 480 |

*Pressure drops corresponding to a thermal variation of 15K. **On request, available up to 10 bar.

PRODUCT PLUS VALUES

- **COMPACT DIMENSIONS**
simplifies the transport and the positioning in boiler house
- **THERMAL EXCHANGE OPTIMISATION**
by driven water passage into the boiler
- **TUBE BUNDLE POSITIONING**
decentralized upwards, above the furnace, with drastic reduction of the possible condensation
- **SMOKE PIPES OF HIGH THICKNESS**
with anti-condensing effect
- **TURBULATORS**
for the thermal exchange optimisation into the smoke pipes
- **BOTTOM OF THE FURNACE**
reinforced with U profiles for greater mechanical resistance
- **INTERNAL DOOR INSULATION**
in light refractory concrete
- **FRONT DOOR**
with self-centering locking
- **EXTERNAL CASING**
inclusive of 60 mm rock wool insulation
- **PANEL BOARD**
suitable for electronic control

DIMENSIONS



- 1 Board panel
- 2 Burner connection plate
- 3 Cleaning door
- 4 Sight glass
- T1 C.H. flow
- T2 C.H. return
- T3 Flue connection
- T4 Burner axis
- T5 Boiler drain

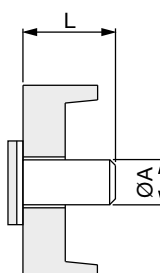
| MODAL | Nominal output kW | Nominal input kW | Boiler capacity l | Water pressure drops(**) m w.c. | Flue gas pressure drop mm w.c. | Maximum boiler working pressure bar | Weight kg | CONNECTIONS | | | |
|-------|----------------------|---------------------|----------------------|------------------------------------|-----------------------------------|--|--------------|------------------------------------|----------------|----------------|---------------------|
| | | | | | | | | T1 - T2 ISO 7/1 UNI2278 PN16 | T3 Øe mm | T4 Øi mm | T5 Øi ISO 7/1 |
| 64 | 64 | 71 | 86 | 0.10 | 1.5 | 6 | 212 | Rp 1½ | 200 | 130 | Rp ¾ |
| 76 | 76 | 84 | 86 | 0.13 | 1.8 | 6 | 212 | Rp 1½ | 200 | 130 | Rp ¾ |
| 93 | 93 | 102 | 86 | 0.16 | 2.5 | 6 | 212 | Rp 1½ | 200 | 130 | Rp ¾ |
| 105 | 105 | 115 | 126 | 0.10 | 3 | 6 | 309 | Rp 2 | 200 | 180 | Rp ¾ |
| 116 | 116 | 128 | 126 | 0.10 | 3 | 6 | 309 | Rp 2 | 200 | 180 | Rp ¾ |
| 140 | 140 | 155 | 126 | 0.14 | 5 | 6 | 309 | Rp 2 | 200 | 180 | Rp ¾ |
| 163 | 163 | 180 | 151 | 0.20 | 8 | 6 | 349 | Rp 2 | 200 | 180 | Rp ¾ |
| 186 | 186 | 206 | 151 | 0.25 | 14 | 6 | 349 | Rp 2 | 200 | 180 | Rp ¾ |
| 233 | 233 | 258 | 203 | 0.22 | 18 | 6 | 485 | DN 65* | 250 | 180 | Rp ¾ |
| 291 | 291 | 322 | 247 | 0.30 | 22 | 6 | 555 | DN 65* | 250 | 180 | Rp ¾ |

| MODAL | A mm | B mm | C mm | D mm | E mm | F mm | G mm | H mm | I mm |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 64 | 690 | 722 | 990 | 190 | 305 | 480 | 115 | -- | 147 |
| 76 | 690 | 722 | 990 | 190 | 305 | 480 | 115 | -- | 147 |
| 93 | 690 | 722 | 990 | 190 | 305 | 480 | 115 | -- | 147 |
| 105 | 760 | 812 | 1205 | 190 | 350 | 500 | 130 | -- | 157 |
| 116 | 760 | 812 | 1205 | 190 | 350 | 500 | 130 | -- | 157 |
| 140 | 760 | 812 | 1205 | 190 | 350 | 500 | 130 | -- | 157 |
| 163 | 760 | 812 | 1385 | 190 | 350 | 500 | 130 | -- | 157 |
| 186 | 760 | 812 | 1385 | 190 | 350 | 500 | 130 | -- | 258 |
| 233 | 860 | 937 | 1437 | 190 | 421 | 580 | 165 | 1482 | 258 |
| 291 | 860 | 937 | 1687 | 190 | 421 | 580 | 165 | 1732 | 258 |

(*) In the MODAL 233 and MODAL 291 models, connections T1 and T2 are flanged.
 (**) Pressure drops corresponding to a thermal variation of 15K.

BURNER BLAST TUBE DIMENSIONS

| BOILER TYPE | ØA mm | L mm |
|---------------|----------|---------|
| MODAL 64÷93 | 130 | 150 |
| MODAL 105÷140 | 180 | 170 |
| MODAL 163÷186 | 180 | 170 |
| MODAL 233÷291 | 180 | 170 |



TECHNICAL DATA

ELECTRICAL, HYDRAULIC, INSTALLATION DIAGRAMS AND CONTROLLERS can be unloaded from the web site www.unical.eu at the page of the product

| Gas fired | | MODAL 64 | MODAL 76 | MODAL 93 | MODAL 105 | MODAL 116 |
|--|------|----------|----------|----------|-----------|-----------|
| Nominal output | kW | 64.0 | 76.0 | 93.0 | 105.0 | 116.0 |
| Nominal input | kW | 71.0 | 84.0 | 102.0 | 115.0 | 128.0 |
| Water efficiency at full load (100%) | % | 90.1 | 90.4 | 91.1 | 91.3 | 90.6 |
| Water efficiency at part load (30%) | % | 85.4 | 85.6 | 85.9 | 86 | 86.1 |
| Efficiency class (ex dir. 92/42 CEE) | | 1 | 1 | 1 | 1 | 1 |
| Combustion efficiency at nominal load (100%) | % | 90.6 | 91 | 91.6 | 91.8 | 91.1 |
| Casing heat losses (80°-60°C) | % | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 |
| Chimney losses with burner on | % | 9.3 | 8.9 | 8.3 | 8.1 | 8.9 |
| Chimney losses with burner off | % | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Net flue gas temperature tf-ta | °C | 187.0 | 180.4 | 169.2 | 167.3 | 182.3 |
| CO ₂ content | % | 9.5 | 9.6 | 9.7 | 9.8 | 9.8 |
| Flue gas mass flow rate | kg/h | 109.0 | 128.5 | 154.7 | 172.9 | 192.4 |

| Gas fired | | MODAL 140 | MODAL 163 | MODAL 186 | MODAL 233 | MODAL 291 |
|--|------|-----------|-----------|-----------|-----------|-----------|
| Nominal output | kW | 140.0 | 163.0 | 186.0 | 233.0 | 291.0 |
| Nominal input | kW | 155.0 | 180.0 | 206.0 | 258.0 | 322.0 |
| Water efficiency at full load (100%) | % | 90.3 | 90.5 | 90.2 | 90.3 | 90.3 |
| Water efficiency at part load (30%) | % | 86.4 | 86.6 | 86.8 | 87.1 | 87.3 |
| Efficiency class (ex dir. 92/42 CEE) | | 1 | 1 | 1 | 1 | 1 |
| Combustion efficiency at nominal load (100%) | % | 90.8 | 91.2 | 91 | 91 | 90.8 |
| Casing heat losses (80°-60°C) | % | 0.5 | 0.6 | 0.7 | 0.7 | 0.5 |
| Chimney losses with burner on | % | 9.1 | 8.7 | 8.9 | 8.9 | 9.1 |
| Chimney losses with burner off | % | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Net flue gas temperature tf-ta | °C | 187.9 | 179.5 | 184.2 | 183.2 | 187.0 |
| CO ₂ content | % | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 |
| Flue gas mass flow rate | kg/h | 233.0 | 270.6 | 309.6 | 387.8 | 484.0 |

| Oil fire | | MODAL 64 | MODAL 76 | MODAL 93 | MODAL 105 | MODAL 116 |
|--|------|----------|----------|----------|-----------|-----------|
| Nominal output | kW | 64.0 | 76.0 | 93.0 | 105.0 | 116.0 |
| Nominal input | kW | 71.0 | 84.0 | 102.0 | 115.0 | 128.0 |
| Water efficiency at full load (100%) | % | 90.1 | 90.4 | 91.1 | 91.3 | 90.6 |
| Water efficiency at part load (30%) | % | 85.4 | 85.6 | 85.9 | 86 | 86.1 |
| Efficiency class (ex dir. 92/42 CEE) | | 1 | 1 | 1 | 1 | 1 |
| Combustion efficiency at nominal load (100%) | % | 90.6 | 91 | 91.6 | 91.7 | 91.1 |
| Casing heat losses (80°-60°C) | % | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 |
| Chimney losses with burner on | % | 9.3 | 8.9 | 8.3 | 8.2 | 8.9 |
| Chimney losses with burner off | % | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Net flue gas temperature tf-ta | °C | 200.0 | 193.0 | 181.0 | 179.0 | 195.0 |
| CO ₂ content | % | 12.4 | 12.5 | 12.6 | 12.7 | 12.8 |
| Flue gas mass flow rate | kg/h | 111.4 | 131.6 | 158.6 | 177.4 | 196 |

| Oil fire | | MODAL 140 | MODAL 163 | MODAL 186 | MODAL 233 | MODAL 291 |
|--|------|-----------|-----------|-----------|-----------|-----------|
| Nominal output | kW | 140.0 | 163.0 | 186.0 | 233.0 | 291.0 |
| Nominal input | kW | 155.0 | 180.0 | 206.0 | 258.0 | 322.0 |
| Water efficiency at full load (100%) | % | 90.3 | 90.5 | 90.2 | 90.3 | 90.3 |
| Water efficiency at part load (30%) | % | 86.4 | 86.6 | 86.8 | 87.1 | 87.3 |
| Efficiency class (ex dir. 92/42 CEE) | | 1 | 1 | 1 | 1 | 1 |
| Combustion efficiency at nominal load (100%) | % | 90.8 | 91.2 | 91 | 91 | 90.8 |
| Casing heat losses (80°-60°C) | % | 0.5 | 0.6 | 0.7 | 0.7 | 0.5 |
| Chimney losses with burner on | % | 9.1 | 8.7 | 8.9 | 8.9 | 9.1 |
| Chimney losses with burner off | % | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Net flue gas temperature tf-ta | °C | 201.0 | 192.0 | 197.0 | 196.0 | 200.0 |
| CO ₂ content | % | 12.8 | 12.8 | 12.8 | 12.8 | 12.8 |
| Flue gas mass flow rate | kg/h | 237.4 | 275.6 | 315.4 | 395.1 | 493.1 |