



AVIO kW Export

Wall-mounted with storage tank



Compact wall-mounted open chamber boiler with conventional flue and 45 litre stainless steel storage tank and nominal heat output of 23.7 kW (20,382 kcal/h).

AVIO kW is an excellent solution in all installations which require the use of several services at the same time and is purposely designed to satisfy the requirements of the modern building industry.

The appliance is characterised by electronic flame modulation which optimises the operation of the generator both on the heating and domestic hot water circuits.

It also stands out thanks to its new hydraulic unit which guarantees excellent performance and is equipped with an adjustable system by-pass as standard.

In combination with optionals such as the Comando Amico Remoto remote control, Super Comando Remoto remote control and external probe, it is extremely simple to manage, control and program the boiler from a distance, optimising operation using climatic thermoregulation.

The IPX4D level of electrical protection guarantees correct operation even when there are sprays of water or high humidity levels.

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FEATURES

Wall-hung open chamber boiler with conventional flue for heating and domestic hot water production with 45-litre storage. Nominal heat output of 23.7 kW (20,382 kcal/h)

Type B_{11BS} appliance classification.

The model is composed of

- main multigas 11 ramp air intake burner in stainless steel, complete with ignition electrode and detection electrode;
- electric double shutter gas valve with incorporated modulation coil;
- high performance main copper gas/water exchanger, composed of four pipes connected in series inserted into a lamellar battery protected by an anticorrosive alloy;
- steel plate combustion chamber insulated internally with ceramic panels;
- steel plate flue hood complete with draught breaker/wind protection and flue exhaust control device;
- stainless steel 45 litre storage tank insulated with self-extinguishing polystyrene, equipped with lower inspection flange. It is equipped with a stainless steel water-water exchanger wound in double concentric coil and is equipped with draining valve;
- hydraulic group composed of an electric 3 way valve, an adjustable speed circulation pump with incorporated air separating device, a system draining device and an adjustable by-pass;
- ball valve for system filling;
- 10 litre (actual 7.7) membrane system expansion vessel (with 1.0 bar preload, primary circuit 3 bar safety valve, 8 bar storage tank safety valve, heating system manometer);
- overheating safety thermostat, heating system temperature regulation selector, storage tank hot water temperature regulation selector, function selector (off, summer, winter);
- setting of boiler operation parameters is carried out using knobs with status and operation mode visualisation using

LEDs;

- self-diagnosis system with operational status and anomaly visualisation using LEDs;
- control panel with viewable controls, equipped with micro-processor P.C.B. with 2 sensor continual flame modulation (domestic hot water and heating) with P.I.D. control;
- AVIO kW range of modulation from 23.7 to 9.5 kW (from 20,382 to 8,170 kcal/h),
- ignition delay in heating phase, anti-freeze protection system (up to -5°C), pump antiblocking function and 3 way valve, domestic hot water and heating post-circulation function, chimney sweep function, circulator operating mode selection, dynamic flow temperature variation to the storage tank water-water exchanger on the basis of the regulation of the domestic hot water selector, ready for connection to room thermostat, Chronothermostat, Comando Amico Remoto remote control, digital remote control, electronic control unit for zone-based systems and external probe;
- electronic ignition with ionisation control;
- IP X4D electrical protection level.

Supplied as standard with lower protective casing, connection group with depth-adjustable fittings and gas and cold domestic water shut-off valves.

Category II_{2H3+} appliance, works with methane gas and L.P.G. power supply. CE mark.

The following model is available:

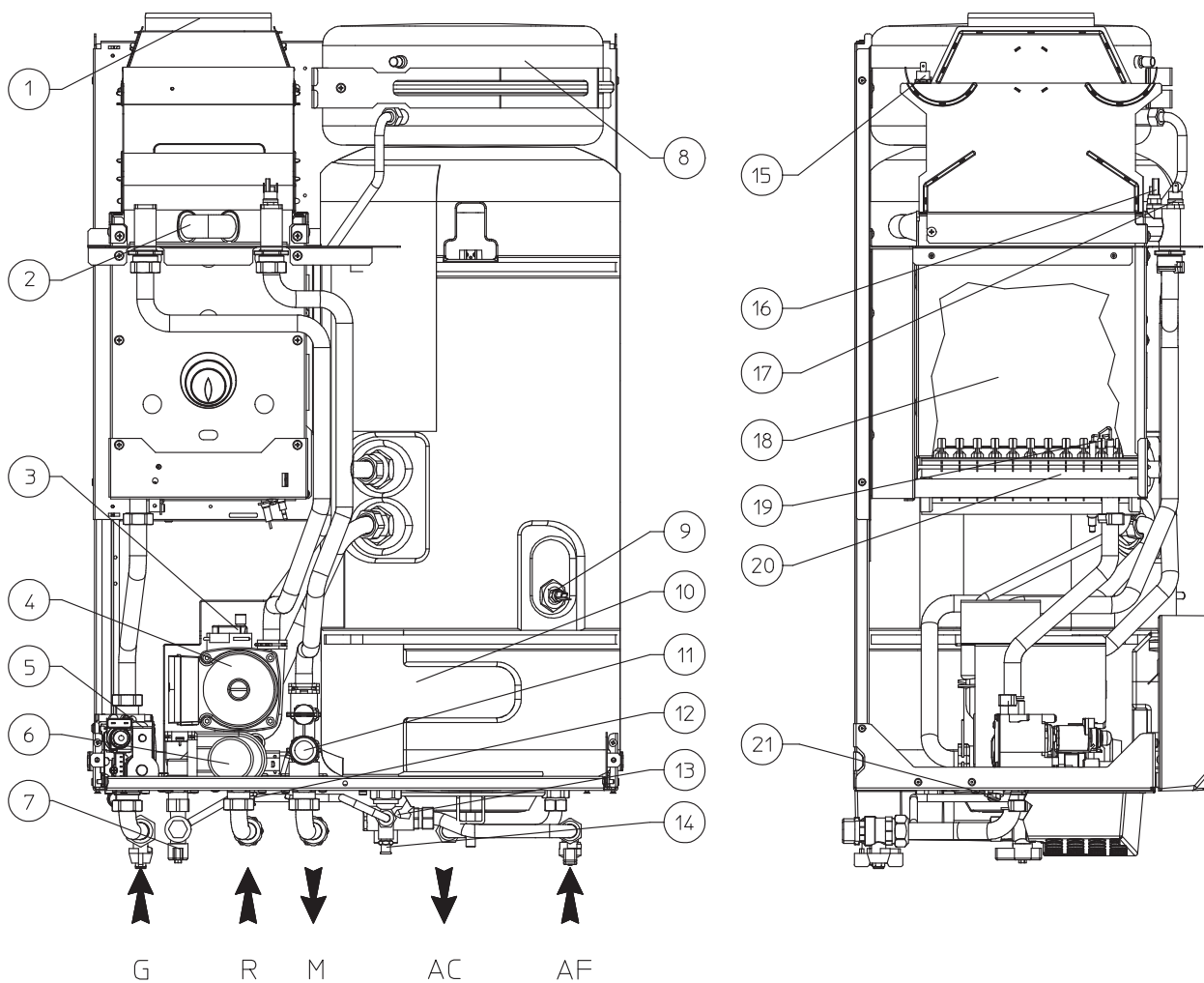
- **AVIO 24 kW Export code 3.018505**



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MAIN COMPONENTS



KEY:

- | | |
|---------------------------------|--|
| 1 - Flue hood | 13 - 8 bar safety valve |
| 2 - Primary heat exchanger | 14 - Storage tank draining valve |
| 3 - Automatic vent valve | 15 - Flue safety thermostat |
| 4 - Boiler pump | 16 - Flow probe |
| 5 - Gas valve | 17 - Safety thermostat |
| 6 - Three-way valve (motorised) | 18 - Combustion chamber |
| 7 - System filling valve | 19 - Ignition and detection electrodes |
| 8 - System expansion vessel | 20 - Burner |
| 9 - Domestic hot water probe | 21 - Adjustable by-pass |
| 10 - Stainless steel probe | |
| 11 - 3 bar safety valve | |
| 12 - System draining valve | |

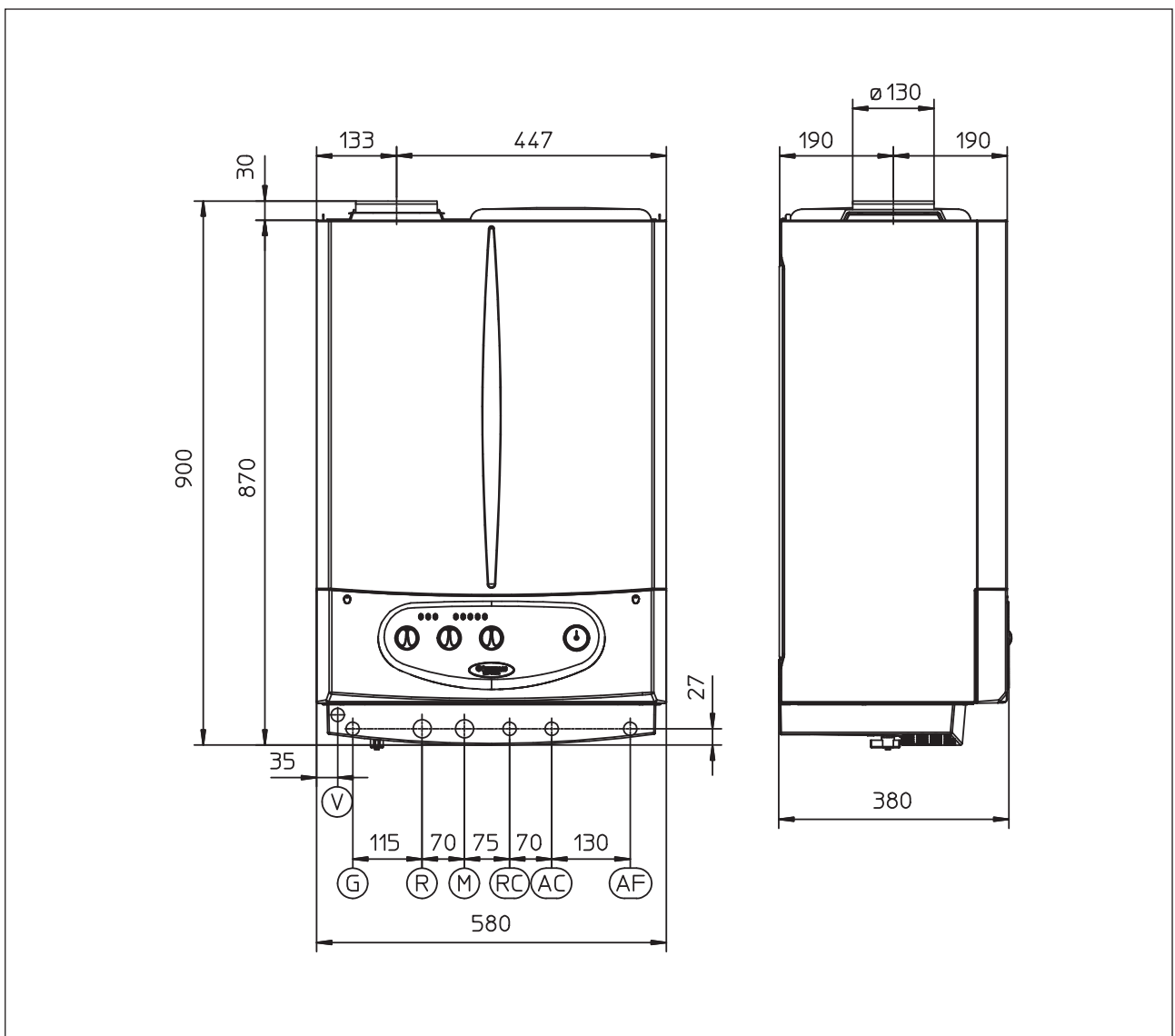


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3 MAIN DIMENSIONS

Model	Height mm	Width mm	Depth mm	Ø flue mm
AVIO 24 kW	870	580	380	130

3.1 CONNECTIONS



Model	Delivery M	Return R	Hot outlet AC	Cold inlet AF	Gas G	Recirculation RC (optional)	Expansion vessel capacity (litres)
AVIO 24 kW	3/4"	3/4"	1/2"	1/2"	1/2"	1/2"	10 (actual 7.7)



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PUMP HEAD FLOW RATE GRAPH

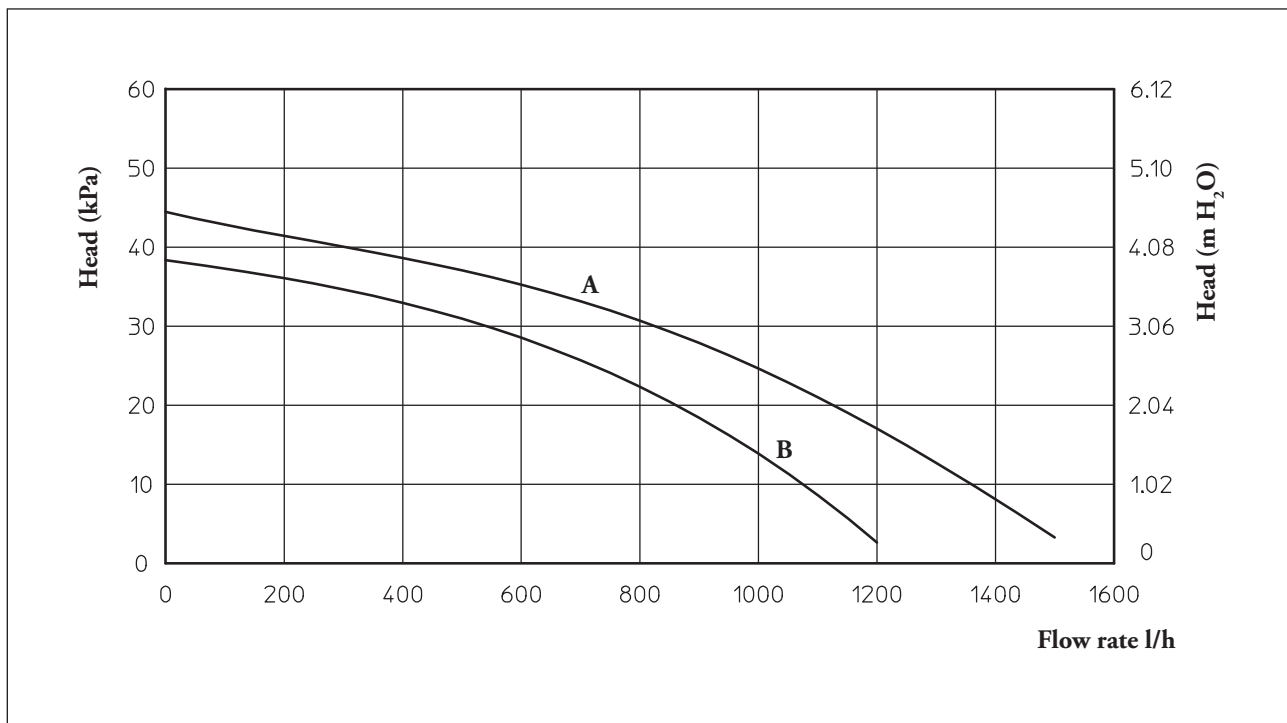
The “AVIO kW” series of boilers is supplied with a three-speed electric regulator. The pump is already equipped with a condenser.

“AVIO kW” series boilers are equipped with an adjustable by-pass. By-pass regulation is calibrated in the factory according to curve **A**. The regulation can be modified using the screw located on the by-pass group.

4.1

AVIO 24 kW PUMP

GRUNDFOS UPS 15-50 AO HB



A: Head available to the system at third speed (screw tightened 1.5 revolutions compared to the adjusting screw completely loose).

B: Head available to the system at second speed (screw tightened 1.5 revolutions compared to the adjusting screw completely loose).



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WIRING DIAGRAM

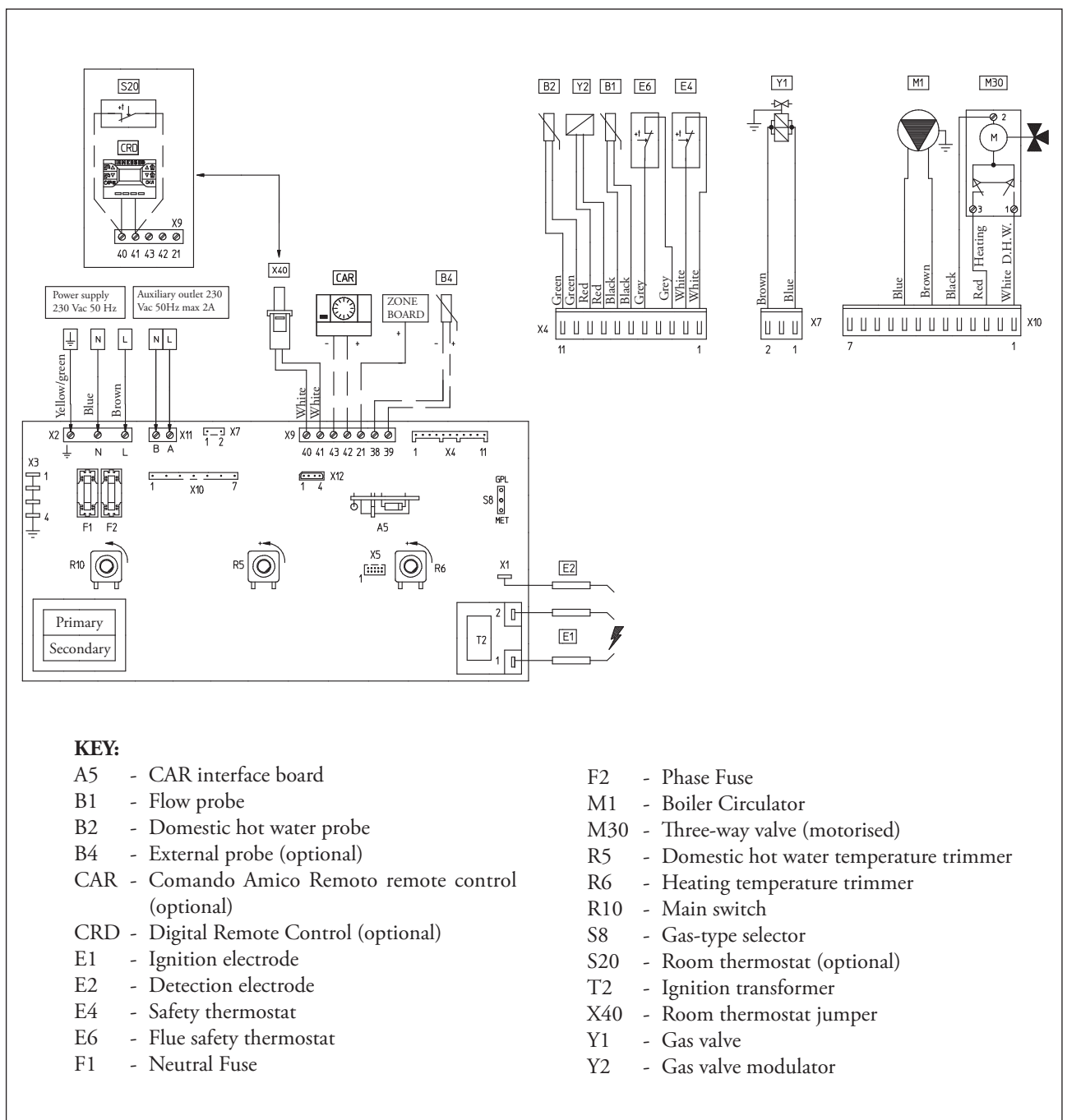
ROOM THERMOSTAT OR REMOTE CONTROL

The boiler is ready for the application of the Comando Amico Remoto (CAR) remote control, which must be connected to terminals 42 and 43 on connector X9 on the integrated P.C.B., respecting the polarity and removing bridge X40, or alternatively, the boiler is ready for the application of the digital remote control (CRD) which must be connected to terminals 40 and 41 on connector X9 on the integrated P.C.B., respecting the

polarity and removing bridge X40.

The boiler is ready for the application of the Room Thermostat (S20) which must be connected to terminals 40 and 41 on connector X9 on the integrated P.C.B., respecting the polarity and removing bridge X40.

The external probe (B4) must be connected to terminals 38 and 39 of connector X9 on the integrated P.C.B.

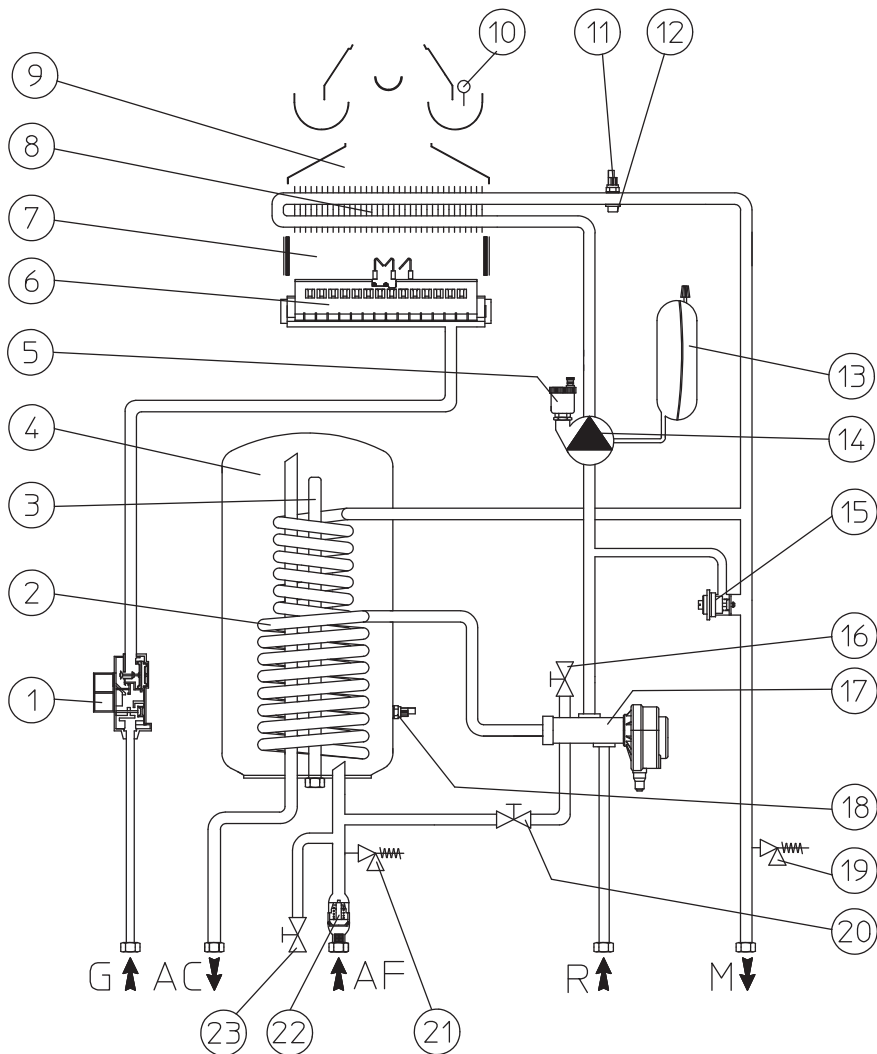




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HYDRAULIC DIAGRAM



KEY:

- | | |
|---|-------------------------------------|
| 1 - Gas valve | 13 - System expansion vessel |
| 2 - Stainless steel coil for storage tank | 14 - Boiler pump |
| 3 - Magnesium anode | 15 - Adjustable by-pass |
| 4 - Stainless steel storage tank | 16 - System draining valve |
| 5 - Automatic vent valve | 17 - Three-way valve (motorised) |
| 6 - Burner | 18 - Domestic hot water probe |
| 7 - Combustion chamber | 19 - 3 bar safety valve |
| 8 - Primary heat exchanger | 20 - System filling valve |
| 9 - Flue hood | 21 - 8 bar safety valve |
| 10 - Flue safety thermostat | 22 - One-way cold water inlet valve |
| 11 - Flow probe | 23 - Storage tank draining valve |
| 12 - Safety thermostat | |



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AVIO kW TECHNICAL DATA

			AVIO 24
Maximum nominal heat input		kW (kcal/h)	26.2 (22,546)
Maximum useful heat output		kW (kcal/h)	23.7 (20,382)
Minimum nominal heat input		kW (kcal/h)	11.0 (9,500)
Minimum useful heat output		kW (kcal/h)	9.5 (8,170)
Efficiency at 100% heat output		%	90.4
Efficiency at 30% heat output load		%	88.0
Central heating circuit			
Adjustable central heating temperature		°C	35 - 85
Max system operating temperature		°C	90
Max system operating pressure		bar	3
Nominal (actual) capacity of system expansion vessel		litres	10 / (7.7)
Preload pressure of system expansion vessel		bar	1.0
Available head with 1000 l/h flow rate		kPa (m H ₂ O)	24.7 (2.52)
Domestic hot water circuit			
Useful heat output for domestic hot water production		kW (kcal/h)	23.7 (20,382)
Domestic hot water temperature adjustable range		°C	20 - 60
Domestic hot water service max. working pressure		bar	8
Flow rate in continuous service (Δt 30°C)		litres/min	11.5
Flow rate in 10 minutes (Δt 30°C)		litres/min	13.5
Storage tank losses		kW	0.155
Gas supply			
METHANE (G20)	MIN - MAX	mbar	2.50 - 13.30
	nozzles	n° - ø mm	11 x 1.30
LPG (G30)	MIN - MAX	mbar	5.50 - 27.80
	nozzles	n° - ø mm	11 x 0.79
LPG (G31)	MIN - MAX	mbar	6.93 - 35.80
	nozzles	n° - ø mm	11 x 0.79
Supply voltage		V/Hz	230 - 50
Nominal power absorption		A	0.43
Installed electric power		W	93.5
Power absorbed by pump		W	80
Electric insulation degree	IP		X4D
Boiler water content		litres	3.6
Stainless steel storage tank capacity		litres	45
Empty boiler weight		kg	50



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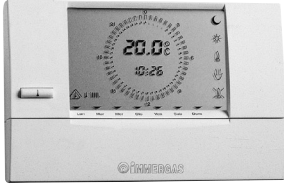
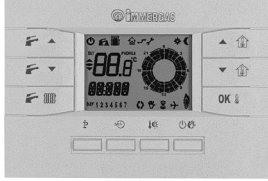
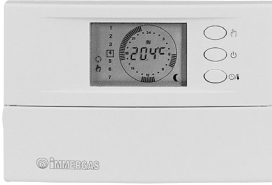







8 AVIO 24 kW COMBUSTION CHARACTERISTICS

		Methane (G20)	LPG (G30)	LPG (G31)
Combustion efficiency at 100% nominal heat output	%	92.8	92.8	92.8
Combustion efficiency min. heat output	%	89.8	89.8	89.8
Flue losses with burner on (100% nom. heat output)	%	7.2	7.2	7.2
Flue losses with burner on (min. heat output)	%	10.2	10.2	10.2
Flue losses with burner off	%	0.43	0.43	0.43
Casing losses with burner off	%	0.57	0.57	0.57
Casing losses with burner on (100% nom. heat output)	%	2.4	2.4	2.4
Casing losses with burner on (min. heat output)	%	3.8	3.8	3.8
Flue temperature Maximum Heat Input	°C	101	106	104
Flue temperature Minimum Heat Input	°C	76	79	77
Flue flow rate at Maximum Heat Input	kg/h	73	70	72
Flue flow rate at Minimum Heat Input	kg/h	63	60	62
CO ₂ at Maximum Heat Input	%	5.00	6.10	5.90
CO ₂ at Minimum Heat Input	%	2.37	2.88	2.75
CO at Maximum Heat Input	mg/kWh	59	113	62
CO at Minimum Heat Input	mg/kWh	48	61	53
NO _x at Maximum Heat Input	mg/kWh	312	500	427
NO _x at Minimum Heat Input	mg/kWh	143	206	192
Weighted CO	mg/kWh	49	-	-
Weighted NO _x	mg/kWh	146	-	-
NO _x class	-	3	3	3
Boiler flue circuit resistance	Pa	1.5	1.5	1.5
Net area of draught controlling device	m ²	0.0292	0.0292	0.0292
Draught controlling device localised loss coefficient		--	--	--

The gas flow rates refer to the net heating value at the temperature of 15°C and at the pressure of 1013 mbar.
The flue gas temperature values refer to the air intake temperature of 15°C.



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9	OPTIONALS	
<p>Comando Amico Remoto remote control code 3.011236</p> 	<p>Digital Remote Control code 3.016362</p> 	
<p>Weekly digital chrono-thermostat code 3.014438</p> 	<p>Radio-chrono-thermostat (wireless) code 3.014439</p> 	
<p>External probe code 3.014083</p> 	<p>Remote control code 3.013305</p> 	
<p>Control unit kit for zone-based systems code 3.011668</p> 	<p>Domestic hot water system expansion vessel code 3.017744</p> 	
<p>Domestic hot water recirculation kit (including pump) code 3.015380</p> 	<p>Polyphosphate dispenser kit code 3.013061</p> 	
<p>Domestic hot water recirculation probe kit code 3.012944</p>	<p>Additional system expansion vessel kit code 3.018433</p>	
<p>GSM remote control kit code 3.017182</p>	<p>Stub pipe kit Ø 130 with sump code 3.014102</p>	
<p>Shut-off valve kit with filter code 3.015854</p>	<p>Universal connection kit code 3.011667</p>	

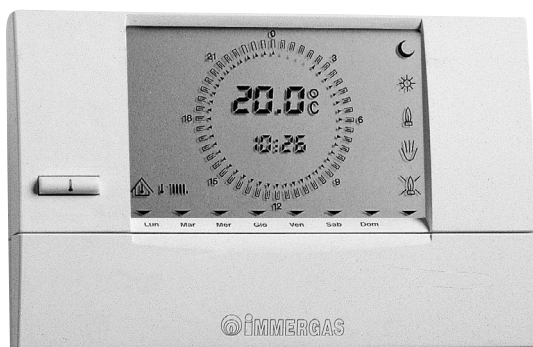
The boiler is ready for DIM (multi-system distribution manifold) connection, available in 5 built-in kits.



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APPENDIX

10 COMANDO AMICO REMOTO REMOTE CONTROL (OPTIONAL)



The Comando Amico Remoto remote control allows the user to manage, control and program boiler operation from a distance.

It has been designed to guarantee ideal temperature conditions at any moment of the day and night for each individual day of the week. The main characteristics which make the Immergas Comando Amico Remoto remote control stand out are the simplicity and clarity of the controls and the ease of connection to the boiler control panel. Using only two cables, it receives electrical power and sends regulation and control commands.

10.1 FEATURES

Connection to the boiler takes place with 2 cables (min. section 0.50 mm² and max. 2.5 mm²) with maximum length of 50 metres.

The Comando Amico Remoto remote control is divided into two completely independent sectors:

- **TEMPERATURE REGULATION AND BOILER OPERATIONAL MODE SECTOR.**

Possibility of operation in anti-freeze position: with the selector in the 0 position, the remote control controls the ignition of the boiler only when the room temperature goes under +5°C. The display shows OFF, if the room probe has not been disabled.

Summer position: the regulator enables the domestic hot water function. The hot water temperature regulation is carried out using the appropriate knob. The display shows the value during regulation.

Winter position: the regulator enables the operation of both the domestic hot water circuit and the heating circuit. The specific knobs allow the user to select the required temperatures. The display shows the value during regulation.

- **TIME PERIOD AND ROOM TEMPERATURE PROGRAMMING SECTOR.**

Manual operation: operating range between 5°C and 30°C.

Automatic operation: 2 different levels of room temperature (comfort and reduced) managed within the day and the week.

Automatic operation with pre-set program: the Comando Amico Remoto remote control contains a "standard" weekly

programmer which is already memorised.

Diagnostics: the Comando Amico Remoto remote control continuously controls the boiler operational status and highlights any anomalies, showing the corresponding error code on the display.

On the display, it is possible to visualise: the flow temperature, the set room temperature and the external temperature (if the external probe is connected).

Additional functions: the Comando Amico Remoto remote control is capable of excluding the internal room temperature probe.

The Comando Amico Remoto remote control can operate with **ON-OFF or Modulating regulation**. The appliance is supplied with the modulating operation setting which can be excluded by switching to ON-OFF mode.

Boiler with external probe: the boiler P.C.B. is capable of supporting an external probe.

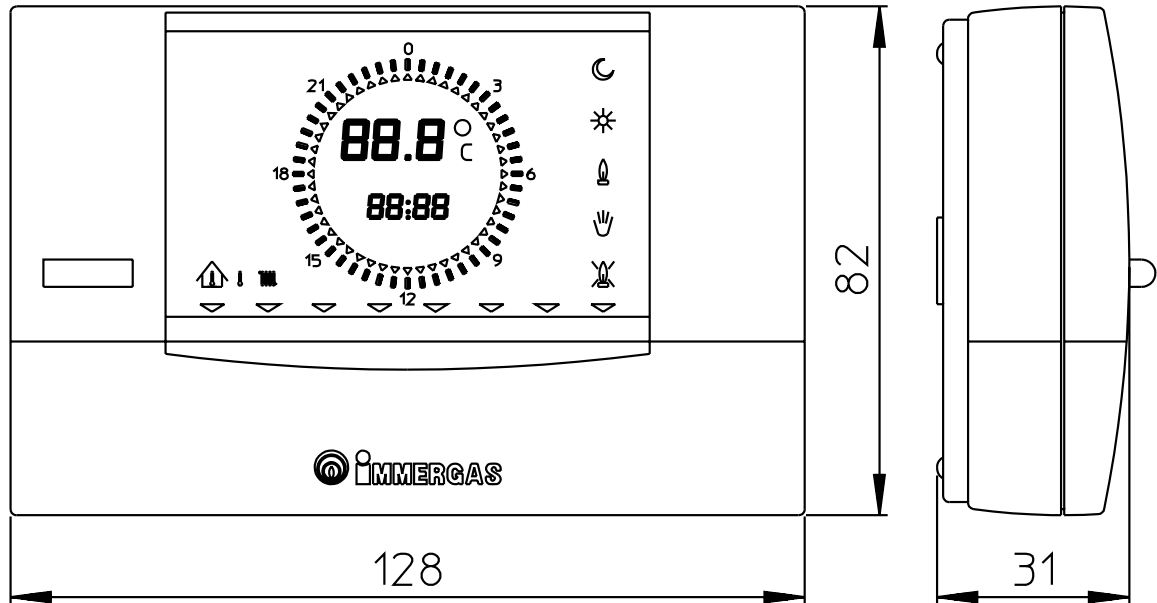
Rotating the heating adjustment selector, it is possible to set the relationship between the external temperature and the temperature of the heating water according to 9 pre-set curves.

The display shows a number between 0 and 9 relative to the curve selected.



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11 COMANDO AMICO REMOTO REMOTE CONTROL - DIMENSIONS



11.1 TECHNICAL DATA

- Connection to the boiler via two-wire cable (to be connected following polarity sequence)
- Remote control unit connection available as standard
- Graphic display :..... LCD
- Dimensions (mm) :..... 128 x 82 x 31
- Correct operational range for room probe:..... +0 / +40°C
- Reduced temperature adjustment range :..... +5°C / +25°C
- Comfort temperature adjustment range :..... +5°C / +30°C
- Room anti-freeze intervention temperature :..... +5°C
- Room anti-freeze intervention end temperature :..... +5.6°C
- Boiler temperature thermostat intervention temperature ON (modulating) :..... set point
- Boiler temperature thermostat intervention temperature OFF (modulating) :..... set point +0.6°C
- Boiler temperature thermostat intervention temperature ON (On - Off) :..... set point
- Boiler temperature thermostat intervention temperature OFF (On - Off) :..... set point +0.3°C
- Resolution visualised :..... 0.1 °C
- Clock programmer charge reserve time :..... 8 hours
- Timer programming resolution :..... 30 minutes
- Maximum number of ignitions and switch-offs per day :..... 48
- Number of standard programs inserted :..... 1



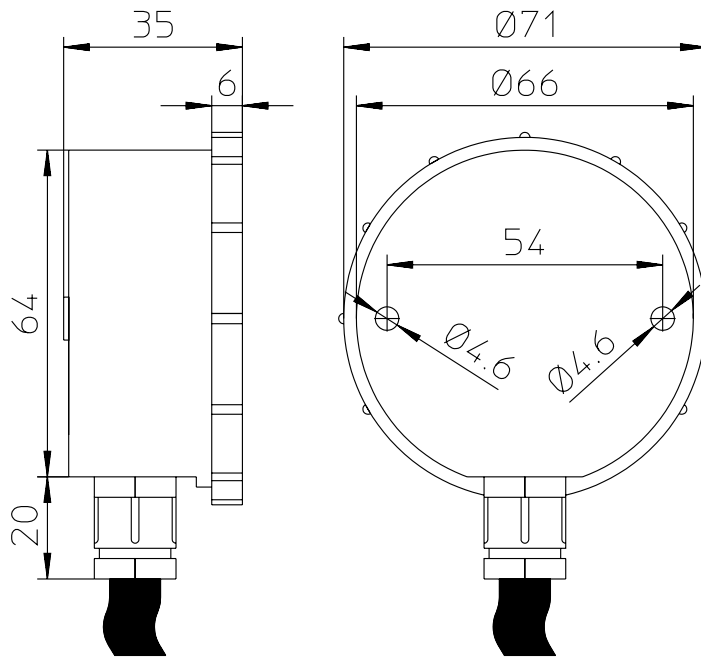
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EXTERNAL PROBE (OPTIONAL)

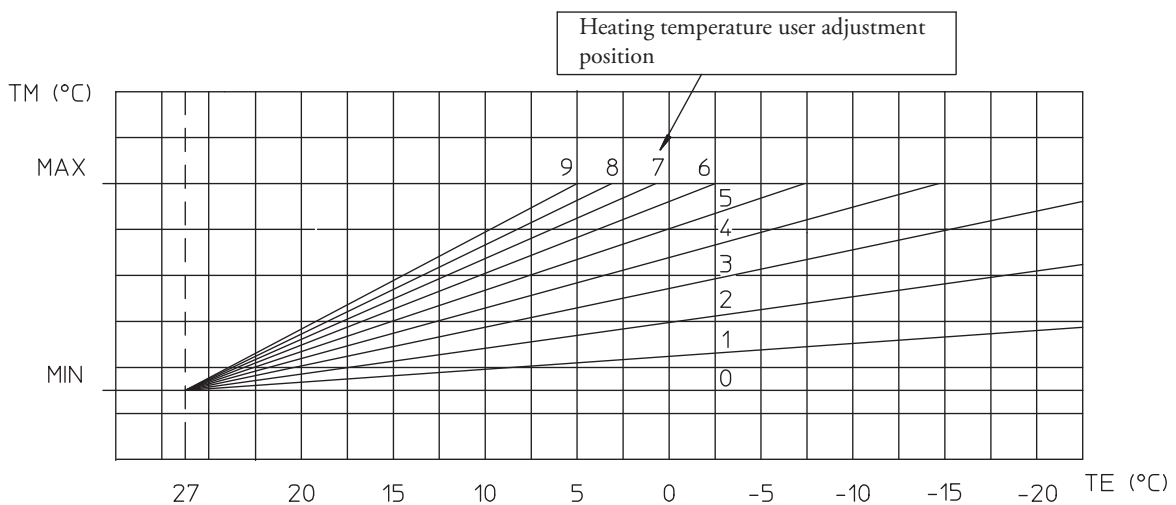
The electrical connection of the EXTERNAL PROBE must take place at terminals 38-39 on the boiler P.C.B.

Attention: The external probe **CANNOT** be combined with the Digital Remote Control.



12.1

EXTERNAL PROBE ADJUSTMENT FUNCTIONS



TM-MAX/MIN = Flow temp. range selected.

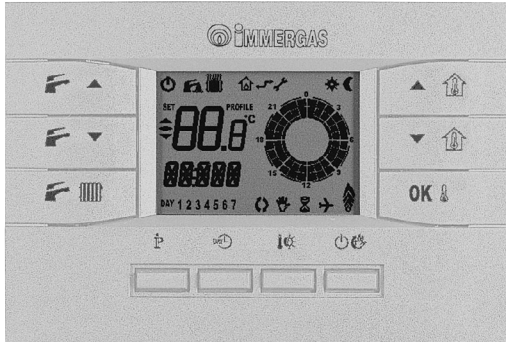
Te = External temperature.



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DIGITAL REMOTE CONTROL (OPTIONAL)



The Digital Remote Control allows the user to manage, control and program boiler operation from a distance.

It has been designed to guarantee ideal temperature conditions at any moment of the day and night for each individual day of the week. The main characteristics which make the Immergas Digital Remote Control stand out are the simplicity and clarity of the controls and the ease of connection to the boiler control panel. Using only two cables, it receives electrical power and sends regulational and control commands.

13.1

FEATURES

Connection to the boiler takes place with 2 cables (min. section 0.50 mm² and max. 2.5 mm²) with maximum length of 50 metres even without the need to respect polarity.

The Digital Remote Control allows the user to regulate the temperature in the domestic hot water and heating phases and to select the boiler operation modes.

Operation in anti-freeze position: with the selector in the Stand-by position, the remote control controls the ignition of the boiler only when the room temperature goes under +5°C.

Summer position: the regulator enables the domestic hot water function. The hot water temperature regulation is carried out using the appropriate keys. The display shows the value during regulation.

Winter position: the regulator enables the operation of both the domestic hot water circuit and the heating circuit. The regulation of the relative temperatures (domestic hot water and heating) is carried out using the appropriate keys. The display shows the value during regulation.

Manual operation: operates in range of between 5°C and 30°C.

Automatic operation: 2 different levels of room temperature (comfort and reduced) managed over the day and the week.

Automatic operation with pre-set program: the Digital Remote Control contains a "standard" weekly programmer which is already memorised.

Diagnostics: the Digital Remote Control continuously controls the boiler operational status and highlights any anomalies, showing the corresponding error code on the display.

Display messages: on the Digital Remote Control display, it is possible to visualise: the flow temperature, the set room temperature. In addition, using the appropriate key, it is possible to access further information regarding the boiler operational status.

Additional functions: The Digital Remote Control has a special menu reserved for the technician inside which it is possible to set various parameters, the main ones including:

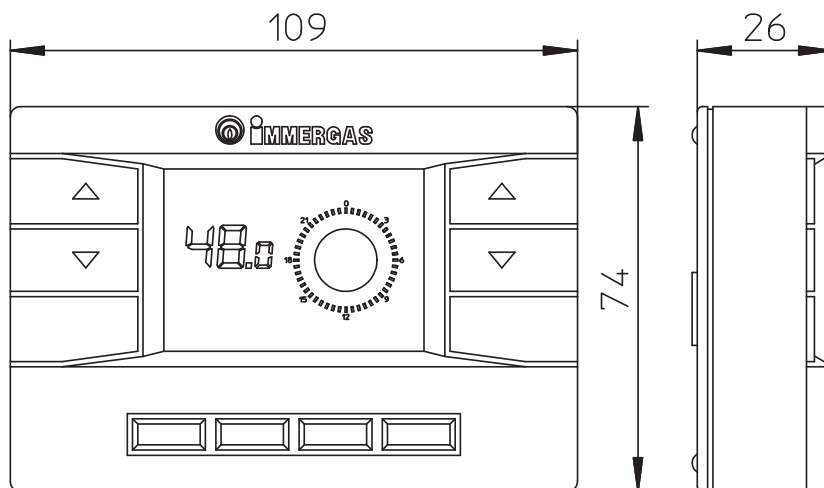
- possibility to exclude the **internal room temperature probe**.
- possibility to operate with **ON-OFF or Modulating regulation**. The appliance is supplied with the setting for modulating operation which can be excluded by switching to ON-OFF mode.
- possibility to operate with a **self-learning system** which allows the user to reduce oscillation in room temperature (in time) to a minimum.
- possibility to operate with a system which takes in to account the dimensions and inactivity of the heating system in order to optimise the speed at which the system arrives at the correct temperature.



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DIGITAL REMOTE CONTROL - DIMENSIONS



14.1

TECHNICAL DATA

- Power supply..... Using communication bus
- Absorbed power: 200 mW
- Room temperature: 0 - 40°C
- Warehouse temperature: -10 - +65°C
- Protection class according to EN 60730:..... II
- Protection class according to EN 60529:..... IP 20
- Casing dimensions (LxHxD):..... 110 x 73 x 25
- Connection technique:..... 2 non-polarised wires
- Charge reserve time:..... 24 hours (with at least 2 charging hours)
- Max. length of connection cable: 50 m (with cable 2x0.75mm²)
- Room temperature indication precision: +/- 1°C to 25°C
- NTC room temperature sensor: 50 k to 25°C
- Clock indication deviation +/- 15 minutes / year

14.2

FACTORY SETTINGS

- On ignition: Stand-by
- Domestic hot water set: 50°C
- Winter status: Manual
- Comfort room temperature 20°C
- Reduced room temperature 16°C
- RISL 85.0°C
- ANTIG 5.0°C
- AMBCR 0.0°C
- AMBON 1
- MODUL 1
- ITALN 1
- K REG 3.0
- DIMEN 5.0
- AUTOA 1