

Engineering and installation

DHW Domestic hot water

October 2014

STIEBEL ELTRON

Engineering and installation

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STIEBEL ELTRON GmbH & Co. KG, 37603 Holzminden

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Specification

Dimensions in the diagrams are in millimetres unless stated otherwise. Pressure figures may be stated in pascals (MPa, hPa, kPa) or in bars (bar, mbar). The details of threaded connections are given in accordance with ISO 228. Fuse/MCB types and ratings comply with the VDE regulations that apply in Germany. Output details apply to new appliances with clean heat exchangers.

INTRODUCTION	6	PRODUCTS	70
DHW appliances made in Germany	6	Instantaneous water heaters	71
Electricity: energy source for the future	8	Equipment and operation	72
ENGINEERING	8	Installation and installation benefits	77
System selection	9	Hydraulic connection	82
Types of supply	9	Power supply	83
Appliance selection	12	Comfort instantaneous water heaters	85
Statutory framework conditions	30	Full electronic closed loop control comfort instantaneous water heaters	86
Energy Savings Ordinance EnEV [Germany]	30	DHE SLi	86
Drinking Water Ordinance [Germany]	37	Electronically controlled comfort instantaneous water heaters	89
DVGW Code of Practice W551	38	DEL SLi	89
Sizing and configuration	40	DHB-E SLi	92
DHW demand	40	Electronically controlled comfort instantaneous water heaters	95
Losses from DHW heating systems	42	DHB STi	95
Bases of calculations	44	HDB-E Si	98
Economic feasibility study	49	Remote controls	101
DHW installation	53	Special taps	103
Underlying standards and regulations	53	Accessories	105
Cold water connection	54	Compact instantaneous water heater	106
Measures to prevent excessively high pressure; pressure control	54	Electronic closed loop control compact instantaneous water heaters	107
DHW distribution and hygiene requirements	55	DCE	107
Sound insulation for instantaneous water heaters and taps	56	DHC-E	110
Water quality and materials	57	Hydraulically controlled (open loop) compact instantaneous water heaters	113
Corrosion protection	58	DHF C	113
Power supply	60	DHC	116
General design information	60	DHA	120
Primary power supply and main lines	60	Taps/valves	123
Apartment complexes	62	Accessories	127
Selecting overcurrent protective devices	65	Mini instantaneous water heater	128
Terminology	66	Mini instantaneous water heaters, open (vented)/sealed (unvented)	129
Test and quality symbols	69	DEM	129
		Mini instantaneous water heaters, open (non-pressurised)	132
		DNM	132
		Mini instantaneous water heaters, sealed (pressure-tested)	135
		DHM	135
		Taps/valves	138
		Tempra instantaneous water heaters	142
		Full electronic closed loop control Tempra instantaneous water heaters	143
		Tempra Plus	143
		Electronic closed loop control Tempra instantaneous water heaters	146
		Tempra B	146

Water boilers	150	Floorstanding cylinder	243
Equipment and operation	151	Equipment	244
Installation and installation benefits	152	Installation and installation benefits	245
Hydraulic connection	153	Hydraulic connection	245
Power supply	153	Power supply	246
Water boilers, 5 litres	154	Floorstanding DHW cylinder 200 to 1000 litres	247
EBK 5 G	154	SHW S	247
EBK 5 GA	156	SHW ACE	253
EBK 5 K	158	SHO AC	258
KBA 5 KA	160	Floorstanding combi cylinder 300 to 1000 litres	263
Automatic water boilers, 5 l	162	SB S	263
SNU HOT+HOT 3in1 cr	162	SB AC	265
Accessories	165	Flanged immersion heaters	268
Wall mounted water heater	166	Indirect coils	273
Equipment and operation	167	Safety assemblies	274
Installation and installation benefits	169	Accessories	276
Hydraulic connection	171	Hand dryers	278
Power supply	172	Appliance selection	279
Wall mounted cylinders 30 to 150 litres	173	Economic efficiency	281
SHZ LCD	173	Hygiene	281
SH S	179	Installation	281
PSH Universal EL	183	Highspeed hand driers	282
PSH EL	188	Ultronic	282
PSH Si	193	HTT hand dryers	283
Wall mounted cylinders 30 to 200 litres	196	HTT 4	283
PSH Trend	196	HTT 5	284
Instantaneous water cylinder	200	HTE hand dryer	286
SHD S	200	HTE	286
Safety assemblies	204		
Taps/valves	206		
Small water heater	210		
Equipment and operation	211		
Installation	212		
Hydraulic connection	213		
Power supply	215		
Small water heater, 5 to 15 litres, open vented (non-pressurised)	216		
SNU SLi	216		
Small water heater, 5 to 15 litres, open vented (non-pressurised)	220		
SN SLi	220		
Taps, undersink	223		
Taps, oversink	228		
Small water heater, 5 to 15 litres, sealed unvented (pressure-tested)	232		
SHU SLi	232		
SH SLi	235		
Small water heater, 15 litres, sealed unvented (pressure-tested)	238		
PSH MINI ID	238		
Safety assemblies	240		

Products

B 21 B 28	272	Replacement anode 3/4	276
BGC	271	SB AC	265
DCE	107	SB S	263
DEL SLi	89	SHD S	200
DEM	129	SHO AC	258
DHA	120	SH S	179
DHB-E SLi	92	SH SLi	235
DHB STi	95	SHU SLi	232
DHC	116	SHW ACE	253
DHC-E	110	SHW S	247
DHE SLi	86	SHZ LCD	173
DHF C	113	SN SLi	220
DHM	135	SNU HOT+HOT 3in1 cr	162
DMV / ZH 1	274	SNU SLi	216
DNM	132	SRT 2	205
EBK 5 G	154	SRT 2	242
EBK 5 GA	156	SV	275
EBK 5 K	158	SV EX	204
FB 1 SL	102	SVMT	240
FCR 18	268	Tees	240
FCR 21	268	Tempra B	146
FCR 28	269	Tempra Plus	143
FCR 28 Si	270	Ultronic	282
FFB 1	102	WDV 611 WDV 1011	276
FFB 1 SL	101	WDV 612 WDV 1012	276
FFB 2	102	WDV 650	276
FFB 2 SL	101	WEH	125
FKB Filter Starter-Kit Basis	165	WEH	141
FKC Filter Starter-Kit Comfort	165	WEN	126
FK filter cartridges	165	WEN	139
GF 18 GF 28	272	WEN	227
HDB-E Si	98	WKM WDM	228
HTE	286	WKM WDM WBM	206
HTT 4	283	WST WUT	223
HTT 5	284	WTFS	273
KBA 5 KA	160	WTW	273
KV	204	ZH 1	274
KV	241	ZTA 3/4	105
LR-1-A	105		
LR-1-A	127		
MAE	140		
MAW	138		
MAZ	140		
MEBD	104		
MEBD	124		
MEKD	103		
MEKD	123		
MEK MED	230		
MEK MED MEB	208		
MEW MEWC MES	225		
PSH EL	188		
PSH MINI ID	238		
PSH Si	193		
PSH Trend	196		
PSH Universal EL	183		
Replacement anode 1 1/4	276		

INTRODUCTION

STIEBEL ELTRON offers convenient and energy efficient solutions for renewables, domestic hot water, air conditioning and room heating. The Holzminden site is the head office of the STIEBEL ELTRON Group – and is also its largest production facility. Not only is it home to the worldwide administration and sales organisation, it's also the production site of many millions of electrical DHW and heating appliances as well as plants and systems that use renewables.

Traditionally the company has been oriented towards wholesalers and contractors. This focus remains the company's philosophy today. STIEBEL ELTRON values the active support of its partners and provides training plus sales and service support. The retail trade, contractors and engineers/designers have access to the training academy in Holzminden for product support. Last year alone, more than 20,000 participants took advantage of the wide range on offer. The whole product range is showcased in six sales centres in Germany, including permanent exhibitions – mostly with 'live' systems.

An ambitious research, development and investment program has been designed to equip STIEBEL ELTRON for the years ahead. During 2013, the Group investments in its production sites in Germany climbed above the €10 million barrier once again. Investments were targeted at the development of new products, the installation of new production lines and the expansion of the logistics centre. In 2014 too, major investments are being made. A new training centre is being built.

STIEBEL ELTRON is a group of companies with a decidedly international outlook, and can rightly claim to be a market leading supplier of technology worldwide for building services and equipment for the utilisation of renewable energy. Since 1924, the company's policies have been based on its level of technical competence, high quality standards, innovation, reliability and customer-oriented service.

Five national and international production facilities, 24 subsidiaries around the world plus sales organisations and representations in 120 countries translate into a truly global presence for STIEBEL ELTRON. For best possible quality, strategic priority is placed on the two German plants in Holzminden and Eschwege.

For instance, over the last ten years, the company has invested large amounts in the production of instantaneous water heaters. More than €20 million were spent just on the development of new products and installation of new production lines.

Furthermore: All the electronics for the appliances are developed and constructed in Holzminden. The STIEBEL ELTRON centre of excellence in Eschwege contributes all the plastic components for all instantaneous water heater models.

Production at STIEBEL ELTRON boasts a high degree of vertical integration in general. Nearly all parts are manufactured within the company itself – including the plastic granules, the cables and heating wire, and sheet metal. That permits great flexibility in production while guaranteeing consistently high "Made in Germany" quality.



Holzminden plant: this is where STIEBEL ELTRON makes instantaneous water heaters for markets all over the world.

It all began in 1927 with the production of the first small instantaneous water heater. The business started out with small production runs, but developed over the course of eight decades into a real success story. Today, several thousand appliances are made every day at the company's main site near the River Weser in Germany.

DHW appliances made in Germany

Celebrating a production milestone for STIEBEL ELTRON at Holzminden, Lower Saxony: In the middle of 2012 the number of instantaneous water heaters produced passed the 20 million mark. This location houses both the company's head office and its largest production facility, where electronic instantaneous water heaters are built on a total of 15 final assembly lines.



STIEBEL ELTRON has been the world market leader for instantaneous water heaters for years. One of the reasons for this is that in 1987, the company launched the market's first fully electronic instantaneous water heater. Today, 34 different types of instantaneous water heater are produced, in 180 versions. Just counting the electronic models alone, more than four million appliances have been made in Holzminden since their introduction 25 years ago.

INTRODUCTION

Electronic instantaneous water heaters are highly regarded among users and installers. The same goes for small water heaters. Millions of STIEBEL ELTRON appliances are installed worldwide in homes and offices – with well over half a million new appliances adding to that number every year.

Small water heaters remain an efficient alternative to instantaneous water heaters. STIEBEL ELTRON continually invests sums in the high millions in the development of new devices and in the optimisation of production processes.



Outstanding quality has made STIEBEL ELTRON the leading supplier of building services and system designers. To consolidate and continuously expand this success, the production facilities in Holzminden and Eschwege are certified to the quality assurance standard DIN EN ISO 9001. This commitment to quality is our guarantee of success in the future.

Quality, safety and endurance tests are carried out in specialised laboratories at STIEBEL ELTRON, and are tailored to the various requirements of the specific product groups. For instance, the accelerated life test is based on an operating time of 15 years at high use or 20 years of normal use. To meet the high acoustic quality requirements of the appliances, there is a sound laboratory at Holzminden equipped with the latest technology.

With core competencies in domestic hot water, central heating, air conditioning, ventilation, solar and heat pumps, STIEBEL ELTRON is shaping the future of building services and system designers. In all of those product areas and for many years now, STIEBEL ELTRON has continued to set new standards for performance, economy, environmental responsibility, ease of use and design.



In the Eschwege plant, the small water heaters are manufactured on the world's most advanced production system.

Electricity: energy source for the future

Steadily increasing requirements for building envelopes, such as those imposed by the expanded Energy Saving Ordinance in Germany, are reducing the annual heat demand of buildings, for both new build and modernisation of buildings. As a result, the economic, environmental and energy significance of domestic hot water heating is rising considerably.

In existing residential buildings in Germany, DHW heating accounts for approx. 10 - 15 % of the total final energy consumption in the household. High grade new buildings require at least 50 % of their annual heat demand for DHW heating.

Efficient, low-loss and hygienic heating of domestic hot water is therefore a key factor in achieving policy objectives for energy and climate action in the building sector.

Thanks to its versatility, electrical energy is one of the most important energy sources in the world and is therefore also used for heating domestic hot water, for example with electric instantaneous water heaters, cylinders with direct electric heating, or DHW heat pumps.

In Germany today, however, the supply of electricity is responsible for about 40 % of total German CO₂ emissions (German Federal Environment Agency 2010). That makes it a key area for Germany's energy and climate policy, but it also offers comparatively cost effective opportunities for reaching the set reduction targets.

Sustainable, climate-friendly electricity supply can be assured in the long term only by utilising renewable energy. At the same time, the use of electrical energy in whatever form must be economical, efficient and targeted.

What that means in practical terms for DHW heating, for example with a decentralised electric instantaneous water heater, is that the DHW outlet temperature must be continuously adapted electronically to match user requirements. At the same time, hygienic concerns are not the only reason for avoiding long, high-loss pipelines to the point of consumption.

Renewable energy sources are intended to cover 35 % of electricity consumption by 2020, reducing CO₂ emissions. Their share was already approx. 24 % in 2013 (see diagram).

The use of electrically operated heat generators brings many advantages.

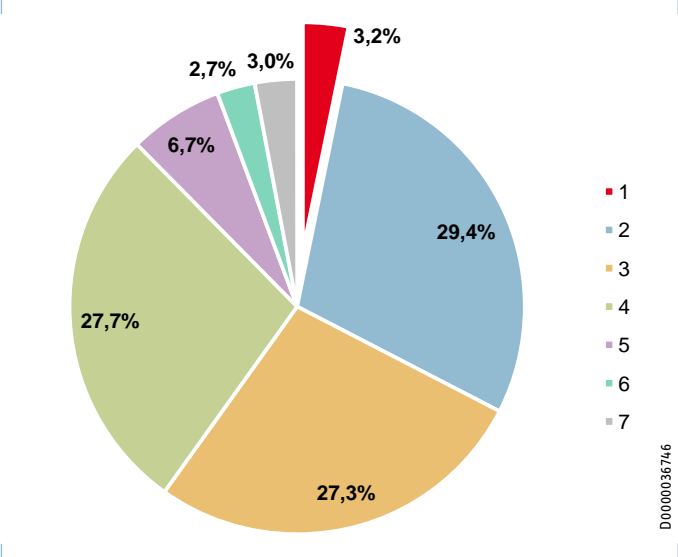
From an environmental perspective, these devices are attractive because the primary energy demand or primary energy factor for electricity generation will fall steadily up until 2020 and well beyond.

On the other hand, for buildings with their own electricity generation, e.g. photovoltaics, they offer the opportunity to utilise that locally generated electricity for domestic hot water heating. A combination of different renewable energy sources is also economically feasible.

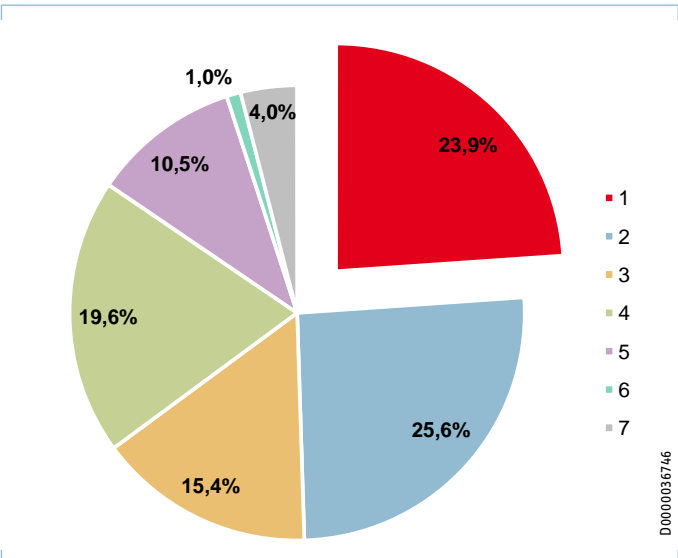
Thanks to its versatility, electricity will remain one of the most important energy sources. Consequently the efforts of the coming years will lead to the primary energy expenditure required for power generation falling drastically, and with it CO₂ emissions.

Users of electrically operated DHW heaters are choosing a hygienic, low-loss, efficient and environmentally sustainable form of domestic hot water heating.

This guide gives you a reference work for designing and installing domestic hot water heaters from STIEBEL ELTRON.



Sources of electricity in Germany, 1991



Sources of electricity in Germany, 2013

Sources: German Federal Statistical Office, Federal Ministry for Economic Affairs and Energy, BDEW German Association of Energy and Water Industries, Statistik der Kohlenwirtschaft e. V., AG Energiebilanzen e. V.

- 1 Renewables
- 2 Lignite
- 3 Nuclear energy
- 4 Anthracite
- 5 Natural gas
- 6 Mineral oil
- 7 Miscellaneous

System selection

Types of supply

As for any technical building services, it is possible to formulate generally applicable requirements for domestic hot water heating systems. DHW heaters should:

- › Provide the amount of DHW needed when it is needed
- › Always maintain the required water temperature
- › Meet hygienic requirements
- › Supply the heated water to the draw-off point with no losses if possible
- › Keep the necessary consumption of final and primary energy as low as possible
- › Be durable, reliable and safe
- › Be easy to operate and adjust

To fulfil these requirements, it is important not only to select the right appliances, but also to examine the different types of supply and select one which suits the requirements profile of the application. The following types of supply should be considered:

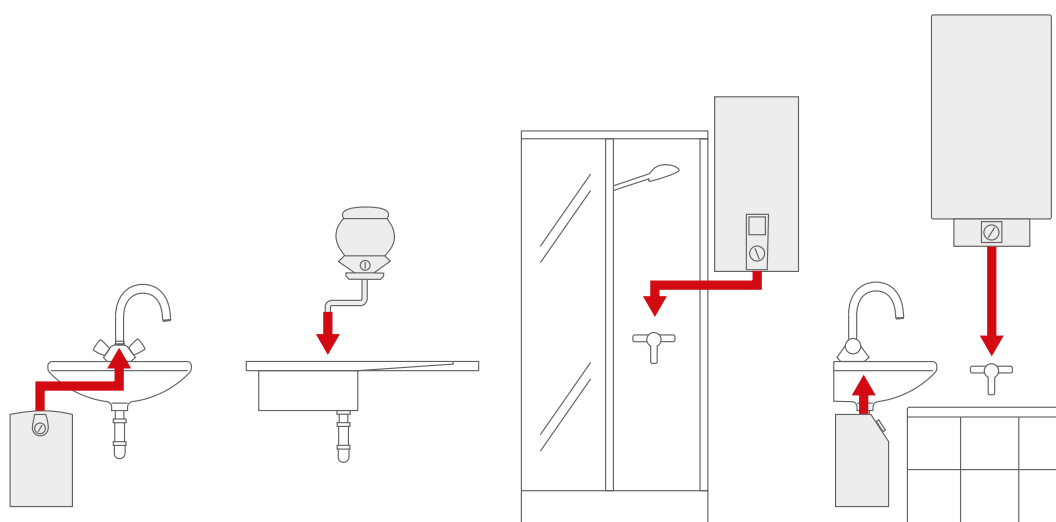
Decentralised DHW heating

The water is heated directly at or near the draw-off point. The best decentralised appliance is selected for each draw-off point / consumer. Decentralised DHW heating systems can be usefully divided further into the following categories:

Individual supply, individual draw-off point

Individual draw-off points are supplied independently of one another, each by a suitable appliance. Examples:

Appliance type	Possible areas of application
Open vented / sealed unvented small water heater	Washbasin, kitchen sink, hand basin
Comfort instantaneous water heaters	Washbasin, kitchen sink, hand basin, shower, bath tub
Wall mounted cylinder or instantaneous water cylinder	Washbasin, kitchen sink, hand basin, shower, bath tub
Water boiler	Kitchenette, kitchen sink
Compact instantaneous water heater	Sink, washbasin, hand basin
Mini instantaneous water heater	Basin
Tempra instantaneous water heaters	Washbasin, kitchen sink, shower, bath tub



Examples of decentralised supply with individual supply

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Group supply / centralised apartment supply, multiple draw-off points

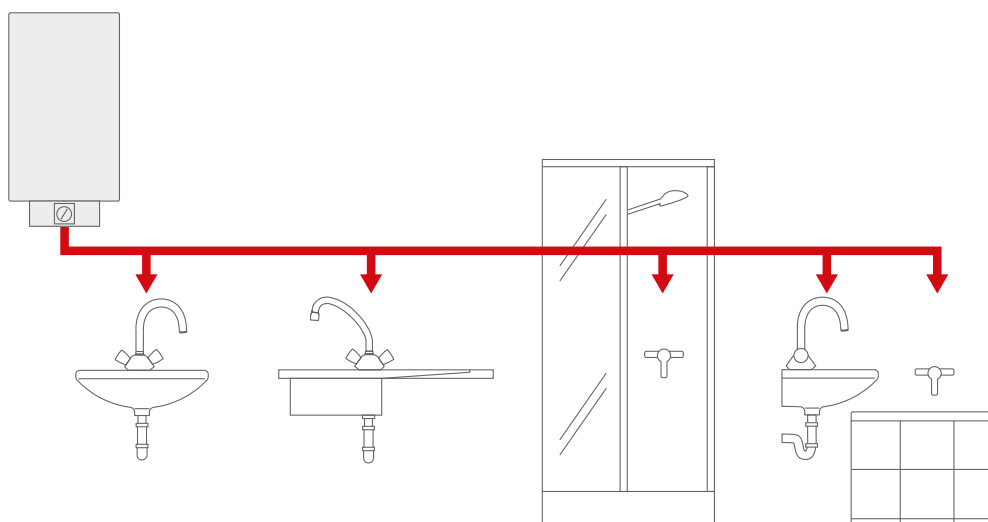
An appliance in the immediate vicinity, e.g. in the same room or on the same plumbing wall, supplies multiple draw-off points. Examples:

Appliance type	Possible areas of application
Instantaneous water heaters	Bathroom with washbasin, shower and/or bath tub in one room
Wall mounted cylinder or instantaneous water cylinder	Bathroom, kitchen, toilet in one apartment / on a shared plumbing wall
Freshwater station	Bathroom, kitchen, toilet in one apartment / on a shared plumbing wall

Efficient and convenient operation of decentralised appliances or appliances for centralised apartment supply requires short pipe runs and electricity as an available energy source at the specific location. With a product range designed for a range of different requirements, there is a solution available for virtually any dimension or output.

Investors, design engineers and users of a decentralised appliance or system benefit from the following advantages:

- › DHW heating close to the point of use, short pipe runs
- › Capacity of DHW pipeline < 3 l
- › Low losses, very little standby energy consumption, no DHW circulation
- › Low, needs-based water requirement, hot water available immediately
- › Simple calculation of energy costs per apartment
- › Ideal for modernisation, connection to existing cold water connections
- › Low capital investment, easy installation
- › Minimum space requirement
- › Can be used regardless of the type of central heating
- › Silent water heating
- › Accurate temperature delivery, possible limiting of temperature for safety reasons



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Examples of decentralised supply with group supply

Central DHW heating

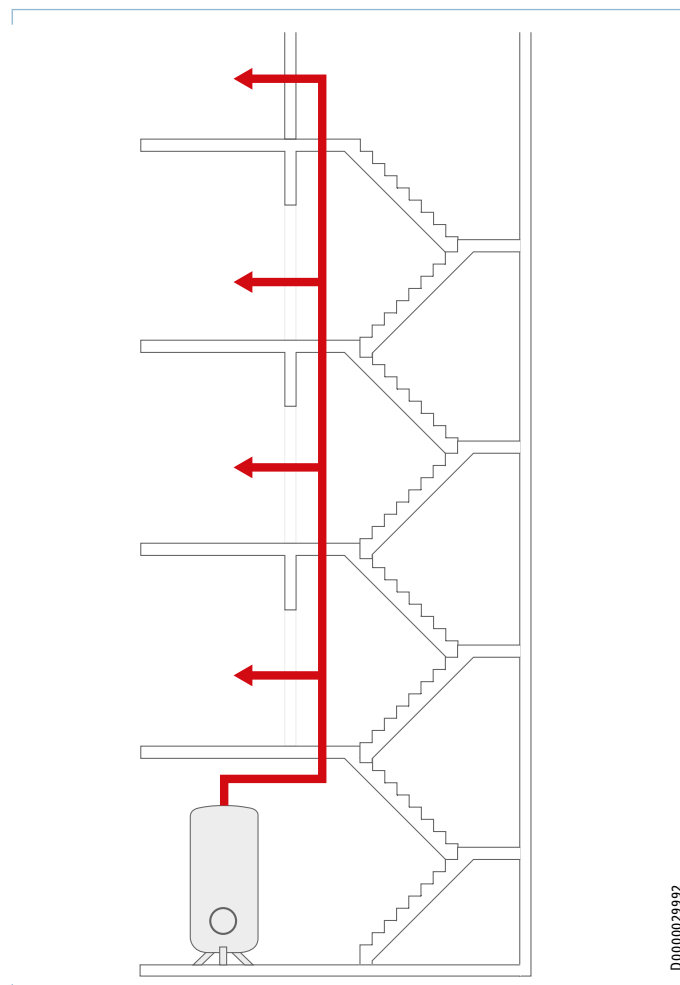
If a central DHW heat source supplies multiple apartments in one building, for example from a DHW cylinder set up at basement level, the system is described as a centralised system. The heated water is conveyed through DHW pipes to multiple draw-off points. The distribution network is pressure-tested and usually has a DHW circulation line to ensure a constant, uniform DHW outlet temperature. Examples:

Appliance type	Possible areas of application
Sealed unvented DHW cylinders, wall mounted or floorstanding cylinders	Detached house, apartment building, sports facility, commercial kitchen
Floorstanding combi cylinders, instantaneous water cylinders	Detached house / two-family house
Sealed unvented DHW cylinders, floor-standing cylinders	Hotels, hostels and other residential facilities, barracks

Before centralised DHW heaters can be planned and the right sizes selected, it is necessary to know the expected consumption profile and the level of demand that may occur at any one time. It is essential to match the capacities of the DHW cylinder and the heat source to one another and to the demand and consumption profile.

Design engineers / installers of centralised systems must also account for losses during storage and distribution, in addition to the actual DHW demand. These may be considerable and may increase the total energy consumption. For instance, system temperatures greater than 60 °C are needed in order to meet hygiene requirements. Nonetheless, centralised systems offer the following advantages:

- › Provision / storage of large volumes of water
- › High DHW convenience
- › Low connected loads for heat sources
- › Option of combining different energy sources
- › Use of special tariffs, electricity generated on site
- › Centralised heat source, e.g. for central heating as well
- › Modernisation of an existing centralised hot water boiler
- › No decentralised appliances, e.g. in apartments







Example of centralised supply

D0000029992

Appliance selection

There is a wide range of products available for DHW heating, so it is advisable to select a product group as a basic first step. Before taking that step, the type of supply should be known and other basic parameters of the project should be established. The draw-off points to be supplied, the space available at the site and the available power supply are often factors affecting the selection of appliances. Use the following pages to gain a general idea of the range of appliances available and their potential applications. For the exact selection of appliances, this technical guide contains further chapters for each product group.

	Comfort instantaneous water heaters	Compact instantaneous water heaters	Mini instantaneous water heaters	Tempra instantaneous water heaters
	 PIC00002156	 PIC00003456	 PIC00002180	 PIC00002097
Individual supply	•	•	•	•
group supply	•			•
Centralised supply				
Basin	•	•	•	•
Washbasin	•	•		•
Bidet	•	•		•
Kitchen sink	•	•		•
Utility sink	•	•		•
Shower	•	• *	• *	•
Luxury shower	•			•
Bath tub	•			•
Permanent electrical connection	•	•	•	•
Plug-in electrical connection			•	
Rated output	11 - 27 kW	11-13.5 kW	3 - 6 kW	12-36 kW
Nominal capacity				
Power supply	380 - 415 V	380-415 V	220 - 240 V	208 -240V

* The appliance may also be able to be used for showers depending on the cold water temperature.

	Water boilers	Automatic water boilers	Wall mounted water heaters	Small water heaters	Floorstanding cylinders
	 PIC00002259	 PIC00003314	 PIC00002180	 PIC00002055	 PIC00001963
Individual supply	•	•	•	•	
group supply			•	•	
Centralised supply					•
Basin				•	
Washbasin			•	•	•
Bidet			•	•	•
Kitchen sink	•	•	•	•	•
Utility sink	•		•	•	•
Shower			•	•	•
Luxury shower			•		•
Bath tub			•		•
Permanent electrical connection			•		•
Plug-in electrical connection	•	•		•	
Rated output	2 kW	2 kW	1 - 6 kW	1 - 3.3 kW	2 - 18 kW
Nominal capacity	5 l	5 l	30 - 150 l	5 - 15 l	200 - 1000 l
Power supply	230 V	230 V	230 V / 400 V	220 - 240 V	230 V / 400 V

Instantaneous water heaters

Instantaneous water heaters are sealed unvented appliances with a pressure-tested internal tank for centralised or decentralised supply. Any number of draw-off points can be connected.

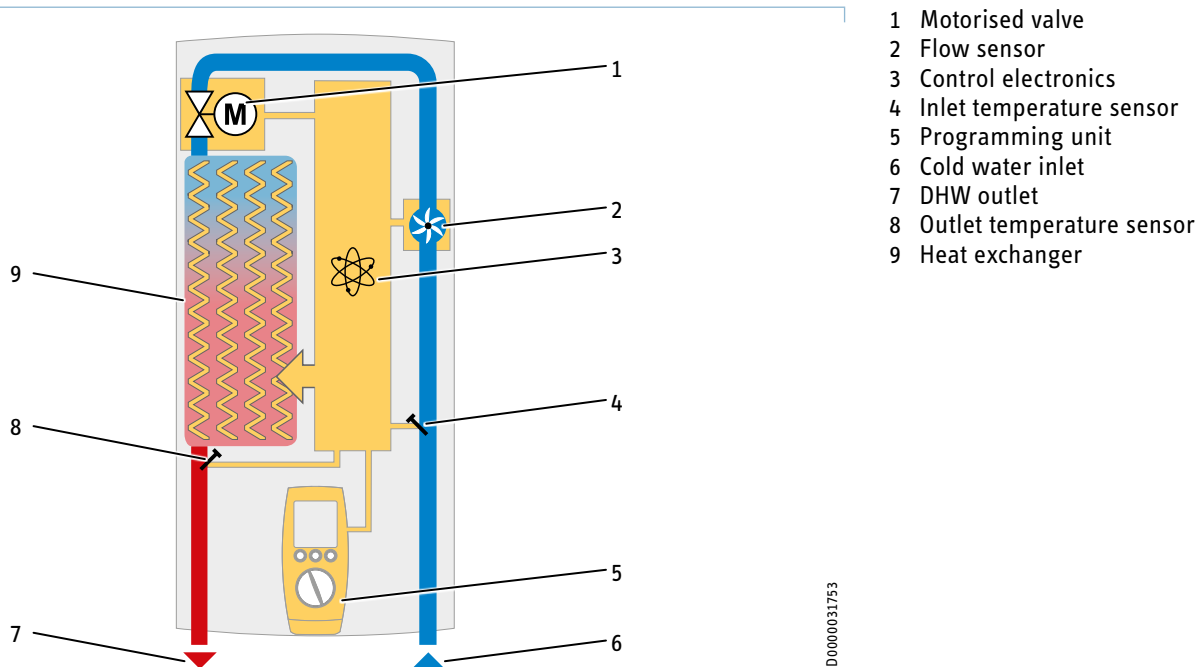
Despite their high heating output, instantaneous water heaters are extremely compact and therefore suitable for space saving installation in bathrooms, shower rooms, toilets or kitchens, for example. Possible consumers include bath tubs, showers, wash-basins or kitchen sinks.

Their method of operation makes instantaneous water heaters virtually loss free. The water is heated to the set temperature only on demand, which is to say during draw-off. This saves power and water.

The available volume of DHW is affected by the following factors:

- › Flow rate [l/min]
- › Cold water inlet temperature [°C]
- › Appliance heating output [kW]
- › Required DHW temperature [°C]

The general method of operation is the same for all appliances and is shown below. Nonetheless, some types of appliance have more features than others. The significant difference is the extent to which the appliances can respond to various influences such as fluctuating cold water inlet temperature, and the degree of convenience of operation.



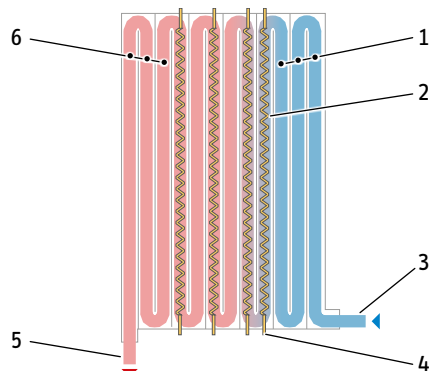
Function diagram for instantaneous water heaters

Different heating elements are used to heat the water, according to the appliance type.

Bare wire heating element

Most of the appliances heat the water using bare wire heating elements. The live heating conductors are located directly in the water being heated. The bare wire heater spirals are set into an insulating block that is encased by a pressure-tested cylinder. Pipes in the insulating block house the heater spirals. The insulation resistance is assured by pre- and post-ballasts. The insulation resistance depends in part on the properties of the water flowing through. To ensure safe operation, the electrical resistance or conductivity of the water at the place of installation must be taken into consideration.

Bare wire heating elements are also especially suitable for use in hard water. The very small amount of water inside the appliance and the low-mass heating system mean there is hardly any post-heating after the appliance has been switched off – a major reason for the reduction in scale build-up.



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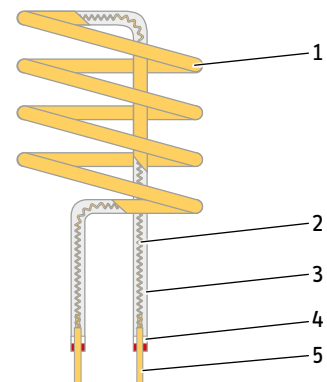
Function diagram for bare wire heating elements

- 1 Pre-ballast
- 2 Bare wire heater spiral
- 3 Cold water inlet
- 4 Connection
- 5 DHW outlet
- 6 Post-ballast

Tubular heater

Tubular heaters are just as powerful and compact. Heat transfer takes place on the surface of the copper tubing. The heater spiral is located inside the tube and is surrounded by a filler material for electrical insulation.

Tubular heaters are not affected by air in the water and are suitable for soft water.



D0000031754

Function diagram for tubular heaters

- 1 Copper-clad steel tube
- 2 Indirect coil
- 3 Filler
- 4 Silicone seal
- 5 Connection

Control (open loop | closed loop)

The potential DHW convenience of an instantaneous water heater depends on more than just the available heating output. Another decisive factor is whether the appliance can react to and compensate for changes in:

- › The cold water inlet temperature ΔT
- › The cold water pressure Δp
- › The supply voltage ΔU
- › The set temperature

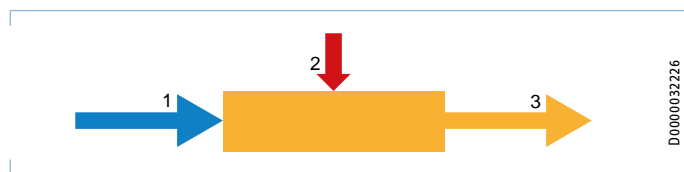
So DHW convenience, or constant and accurate temperature setting and draw-off at the required outlet temperature, is therefore linked to the following capabilities / types of open and closed loop control of the appliance.

		Hydraulic open loop control	Electronic open loop control	Electronic control unit	Fully electronic closed loop control
Compensation of pressure fluctuations	Δp	○	+	+	+
Reaction to changes in cold water temperature	ΔT	-	+	+	+
Compensation of voltage fluctuations	ΔU	-	○	+	+
Control of the water flow rate	ΔV	-	-	-	+
Variable output matching	ΔP	-	+	+	+
DHW convenience		+	++	+++	++++

- Not possible
- Somewhat possible
- +

Hydraulic open loop control

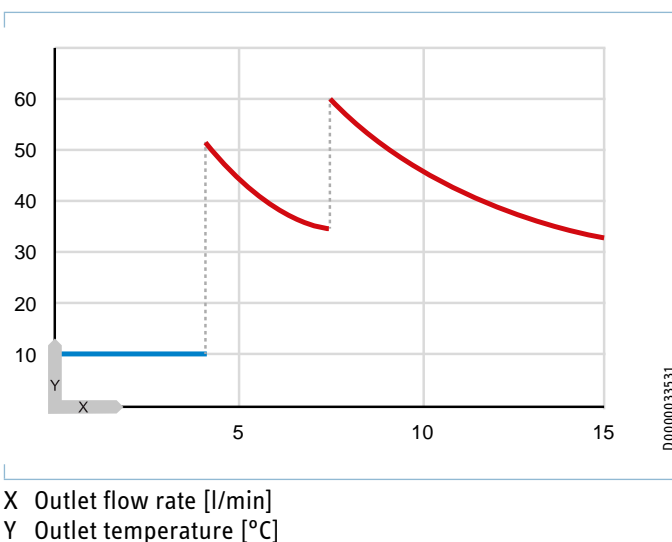
The basic difference in control types is between open loop control and closed loop control. Appliances with open loop control are not able to constantly check and regulate a control variable or a set value, such as the DHW temperature. This means that they cannot adjust the heating output or water flow rate according to that variable or value.



Open loop control

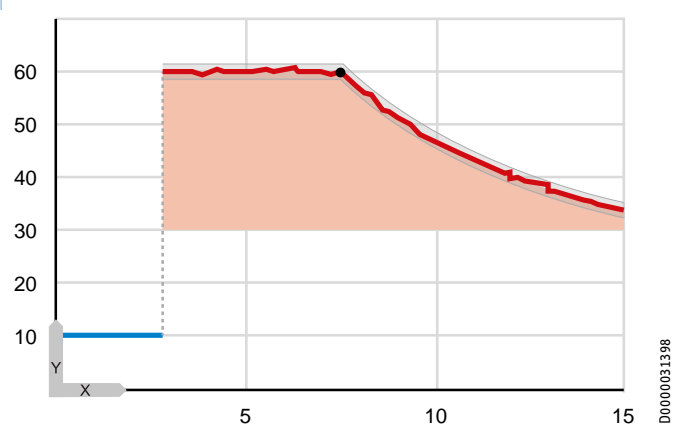
- 1 Set value
- 2 Disturbance variables (pressure, inlet temperature, voltage, output limit)
- 3 Actual value

Appliances with hydraulic control (open loop) do not have any electronics. They activate the available heating output in stages according to the draw-off flow rate. The maximum temperature increase is determined by the heating output. The set value is normally specified in stages and is not accurate to a degree of temperature. Deviations from the set value are corrected at the draw-off tap.



Electronic open loop control with 2i technology

Unlike hydraulically controlled instantaneous water heaters, the appliances with electronic open loop control are equipped with our 2i technology, comprising an inlet temperature sensor and a flow sensor. The heating output is calculated according to the selected temperature stage. There is, however, no direct matching of the actual DHW temperature to the set temperature. The control's capacity to react to changes/external disturbances is therefore limited. The electronic control varies the heating output based on the cold water temperature and the current flow rate. This allows pressure fluctuations and changes in inlet temperature to be largely compensated up to the output limit of the appliance. The DHW temperature is specified in three stages.



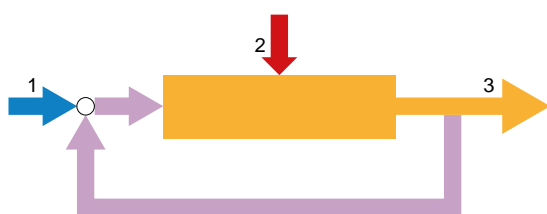
X Outlet flow rate [l/min]
Y Outlet temperature [°C]

Electronic closed loop control with 3i technology

The appliances with electronic closed loop control feature 3i technology. This comprises an inlet temperature sensor, an outlet temperature sensor and a flow sensor. The last of these also forms part of the electronic air detection and safety system.

The user sets the required DHW temperature on a programming unit, which may have a multifunction display and special functions.

The electronics can thus react to different influencing factors and adapt the output. There is direct matching of the set DHW temperature and the actual DHW temperature.

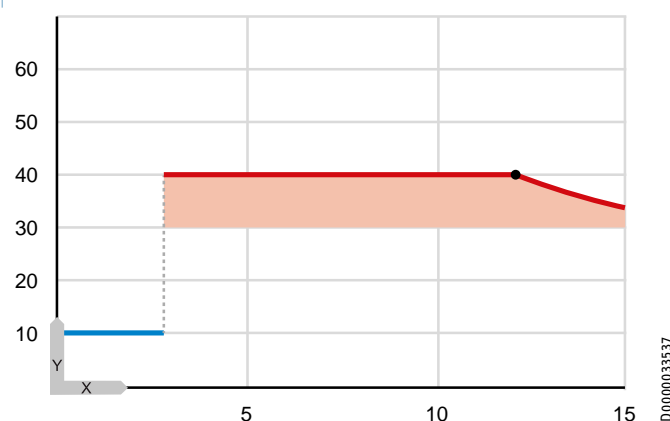


Closed loop control

- 1 Set value
- 2 Disturbance variables (pressure, inlet temperature, voltage, output limit)
- 3 Actual value

Appliances with electronic closed loop control keep the outlet temperature constant up to the output limit. This allows pressure fluctuations, changes in inlet temperature and voltage fluctuations to be compensated up to the output limit. The outlet temperature remains constant until the heating output of the appliance is no longer sufficient.

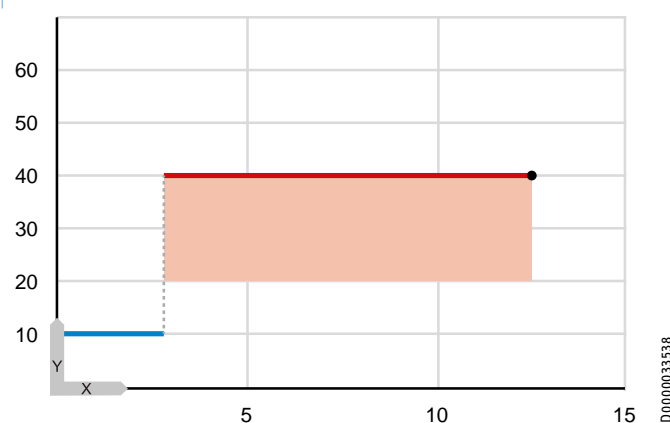
In the example shown below, the set temperature of 40 °C can be kept constantly available up to a draw-off flow rate of approx. 12 l/min. Pressure fluctuations, such as those caused by opening another draw-off point, are compensated. Larger draw-off flow rates are made available with lower outlet temperatures, due to the appliance output.



X Outlet flow rate [l/min]
Y Outlet temperature [°C]

Fully electronic closed loop control with 4i technology

The appliances with fully electronic closed loop control feature 4i technology. This combines three sensors (inlet temperature, outlet temperature, flow rate) with a motorised valve. The instantaneous water heater is thus able to actively control the flow rate. If the output limit is reached, constantly accurate temperature delivery can be assured, for example by reducing the flow rate. This allows pressure fluctuations, changes in inlet temperature and voltage fluctuations to be fully compensated up to the output limit. These appliances offer the highest level of DHW convenience, which is particularly pleasant when showering.



X Outlet flow rate [l/min]
Y Outlet temperature [°C]


Comfort instantaneous water heaters

The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	DHE SLi	DEL SLi	DHB-E SLi	DHB STi	HDB-E Si
					
			PIC00002162	PIC00003330	PIC00002164
					PIC00002905
Control concept:					
4i technology Fully electronic control	•				
3i technology Electronic control		•	•		
2i technology Electronic switching				•	•
Dynamic regulation of flow rate Motorised valve	•				
18 21 24 27 kW	•	•		•	
11 18 21 24 kW					•
11 13 18 21 24 27 kW			•		
DHW convenience:					
Always accurate delivery of the required temperature	•				
Accurate temperature delivery up to the maximum appliance output		•	•		
Constant temperature delivery up to the maximum appliance output				•	•
Temperature selection:					
Variable, 20-60 °C	•				
Variable, 30-60 °C		•	•		
Three stages, approx. 35, 45, 55 °C				•	
Multifunction display, illuminated	•	•			
Wireless mini remote control	•				
Version with selectable rated output 18/21/24 kW	•	•	•		
ECO function	•				
Memory for temperature settings	•	•			
Child safety protection	•	•			
43 °C anti-scalding protection	•	•	•		
Wellness shower programs	•				
Solar operation	•	•	•		
Air detection for operational reliability	•	•	•	•	•
Profi Rapid® installation system	•	•	•	•	•
Undersink operator convenience	•	•	•	•	
Bare wire heating element	•	•	•	•	

Compact instantaneous water heater

The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	DCE	DHC-E	DHF C	DHC DHA
	 PIC00003456	 PIC00002100	 PIC00002264	 PIC00002247
11 13 kW	•			
3 4 6 8 10 kW				•
8 10 12 kW		•		
13 15 18 21 24 kW			•	
Bare wire heating element	•			
Tubular heater		•	•	•
Hydraulic open loop control			•	•
Electronic closed loop control	•	•		
Variable output matching	•	•		
Air detection system	•			
Anti-scalding protection	•			
LCD indicator	•			
Optional wireless remote control	•			

Mini instantaneous water heater

Instantaneous water heaters with heating output up to 7 kW are also known mainly as mini instantaneous water heaters and are designed especially for the supply of a single draw-off point.

Mini instantaneous water heaters are especially suitable for supplying a hand washbasin. International: Also suitable for showers if inlet temperatures are in the high range.

Mini instantaneous water heaters are an alternative to DHW cylinders, such as small water heaters. They do not have any standby losses, but may supply lower outlet temperatures and draw-off flow rates, depending on the inlet temperature.

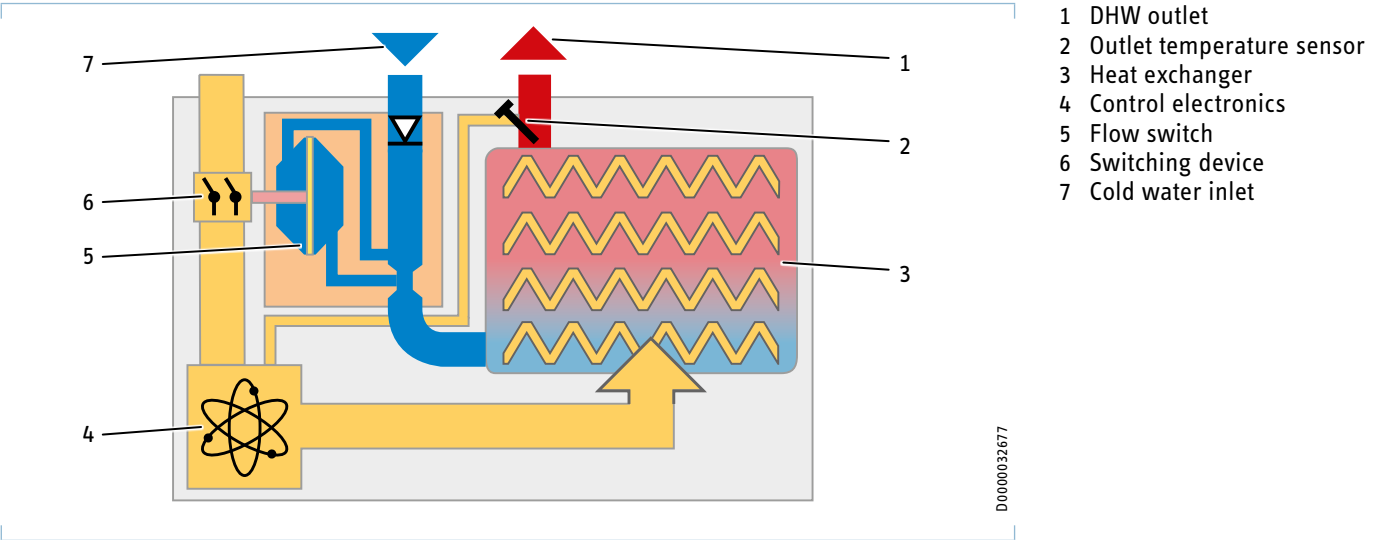
The method of operation of the mini instantaneous water heater is similar to the comfort instantaneous water heater for showers and baths.

The water is heated in a bare wire heating element. The appliance is therefore suitable for both hard and soft water areas. The con-




trol is either hydraulic or electronic, depending on the appliance type. The heating output is activated by a flow switch immediately when water is drawn off, and is controlled according to the required temperature. Appliances with electronic closed loop control keep the outlet temperature constant up to the appliance's output limit, irrespective of the inlet temperature. Appliances with hydraulic open loop control do not have control electronics and cannot completely compensate external influences such as changes in the cold water temperature.

Their method of operation makes instantaneous water heaters virtually loss free. The water is heated to the set temperature only on demand, which is to say during draw-off. This saves power and water.

The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.



Function diagram for mini instantaneous water heaters

	DEM				DNM				DHM			
												
	PIC00002180				PIC00001969				PIC00001985			
	3	4	6	7	3	4	6		3	4	6	7
Heating output 3.5 kW	•				•				•			
Heating output 4.4 kW		•				•				•		
Heating output 5.7 kW			•				•				•	
Heating output 7.0 kW				•								•
Open vented (non-pressurised)	•	•	•	•	•	•	•					•
Sealed unvented (pressure-tested)		•	•	•				•		•	•	•
Oversink installation	•	•	•	•	•	•	•					•
Undersink installation	•	•	•	•	•	•	•	•	•	•	•	•
Electronically controlled	•	•	•	•								
Hydraulically controlled					•	•	•		•	•	•	•

Tempra instantaneous water heaters

The Tempra instantaneous water heaters were developed to meet the requirements of centralised DHW heating using the instantaneous water heating principle. The output available for this task can be up to 36 kW if required, depending on the DHW volume, the number of draw-off points and the inlet temperature.

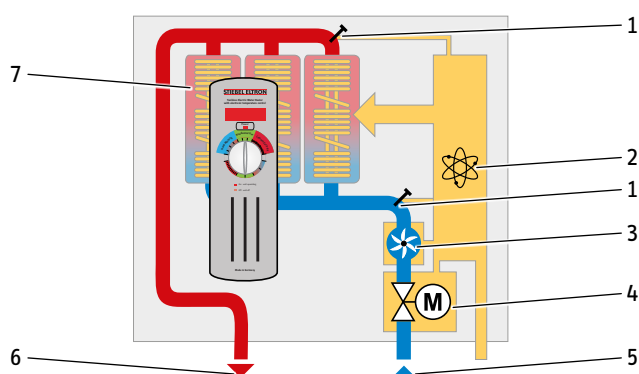
Due to their high output, these appliances supply up to 18 l/min of warm water (38 °C) for showering. This makes the Tempra instantaneous water heaters suitable for centralised group supply of multiple draw-off points e.g. several baths, showers, washbasins, kitchen sinks etc.

Tempra instantaneous water heaters are therefore an alternative to centralised DHW cylinders, with advantages including space saving dimensions, quick and cost effective installation, immediate and unlimited hot water, efficiency benefits by eliminating DHW circulation lines, with no energy lost via pipework or cylinders. Moreover, the Tempra instantaneous water heaters offer constant outlet temperatures regardless of external disturbances such as fluctuations in voltage, pressure or cold water temperature.

They operate according to the same principle as any instantaneous water heater. The water is heated by up to three tubular heater cartridges connected in parallel. The appliance is thus particularly suitable for soft water. Control is either fully electronic or electronic closed loop control, depending on the appliance type. Three sensors measure the inlet temperature, outlet temperature and flow rate. Continuous target-actual comparison ensures accurate temperature delivery. If the appliance were at its maximum output, greater DHW consumption would force a drop in temperature. To ensure that the required temperature is still maintained even in this case, the motorised valve in the Tempra Plus automatically regulates the water volume. This means no more unpleasant temperature fluctuations when showering.

Their method of operation makes instantaneous water heaters virtually loss free. The water is heated solely as needed, with only the energy actually required being used. Consequently, correspondingly high efficiency levels can be attained. This saves both energy and water.



The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.



D0000040794

Function diagram for Tempra Plus

- 1 Temperature sensor
- 2 Control electronics
- 3 Flow sensor
- 4 Motorised valve
- 5 Cold water inlet
- 6 DHW outlet
- 7 Tubular heater cartridge

	Tempra Plus	Tempra
		
	PIC00002097	PIC00002093
Heating output 12 15 20 24 29 36 kW	•	•
Tubular heater	•	•
LED indicator	•	•
Variable temperature selection	•	•
Sealed unvented (pressure-tested)	•	•
Oversink installation	•	•
Fully electronic closed loop control	•	•
Electronically controlled	•	•
Motorised valve for dynamic flow rate control	•	•

Water boilers

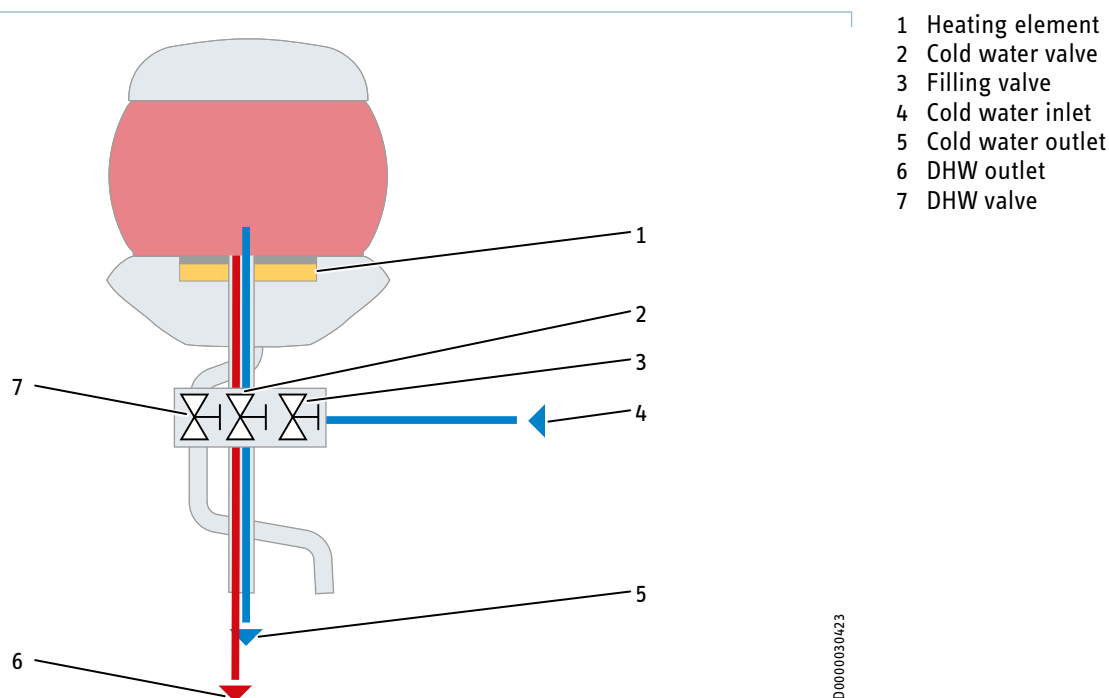
A water boiler is suitable anywhere where boiling water needs to be drawn off regularly and safely. These appliances are permanently installed and have a capacity of up to 5 l. They are able to heat water to boiling point and permit safe draw-off with their integral tap. These appliances are often used in places such as:

- › Kitchenettes in office buildings
- › Kitchens in private homes

Permanently installed water boilers have the following advantages over portable electric kettles:

- › Permanent cold water connection for convenient filling
- › Direct draw-off of cold and boiling water at the appliance
- › Larger capacity
- › Greater flow rate of boiling water
- › Automatic or manual reheating to boiling point
- › Low risk of accidents, cannot be tipped over or torn down
- › Permanently installed overflow, no splashing

The appliances are normally fitted directly above or below the sink and are permanently connected to the cold water pipeline. The specially designed tap can be used to fill the appliance and to draw off cold, hot or boiling water. With their high heating output of 2 kW, the appliances permit quick reheating.








Function diagram for water boilers

ENGINEERING

System selection

The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	EBK 5 G	EBK 5 GA	EBK 5 K
	 PIC00002259	 PIC00002260	 PIC00002261
Max. capacity 5 litres	•	•	•
Glass water container	•	•	
Plastic water container			•
Tap with lever and 2 handles	•		•
3-handle tap		•	
Stainless steel heating element	•	•	•
	KBA 5 KA		
	 PIC00002262		
Max. capacity 5 litres	•		
Glass water container			
Plastic water container	•		
Tap with lever and 2 handles			
3-handle tap	•		
Stainless steel heating element	•		
	SNU HOT		
	 PIC00003792		
5 litre capacity	•		
Plastic water container	•		
3in1 tap	•		
Child safety protection	•		
Copper heating element	•		

Wall mounted water heater

A widespread approach to decentralised DHW heating is the use of electrically heated wall mounted cylinders for individual or group supply of one or more draw-off points, such as an entire home.

Wall mounted cylinders require a much smaller connected electrical load than instantaneous water heaters. The required amount of heat is stored in the water and used when needed.

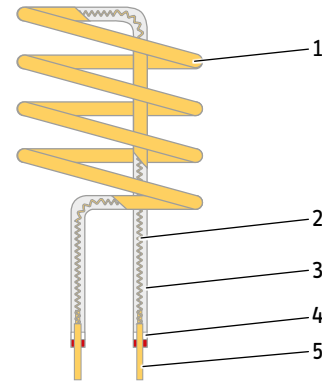
Wall mounted cylinders also have the advantage of being able to make use of special tariff structures offered by the power supply utility. That makes it possible, for example, to generate an entire day's DHW requirement for an apartment during the night at low-cost tariffs and then to use it the next day without reheating. Some wall mounted cylinders come already equipped with special control technology for that purpose. Wall mounted cylinders also offer the following general benefits:

- › Space saving wall mounted storage of the day's DHW requirement
- › Low connected electrical load
- › Possibility of high DHW flow rates
- › Option of using low-cost tariffs
- › Decentralised, needs-based storage of DHW
- › For either open vented or sealed unvented systems
- › Decentralised calculation of power costs

All wall mounted cylinders, or at least their internal tanks, are made of steel with an internal enamel coating for corrosion protection. To keep standby losses low, all cylinders have directly applied, high grade thermal insulation and an external casing.

The electric heating element is usually located at the bottom of the cylinder so that the entire contents of the cylinder can be heated.

The tubular heaters have different forms and outputs depending on the appliance type, but always have all the necessary safety equipment and are always structured as follows:

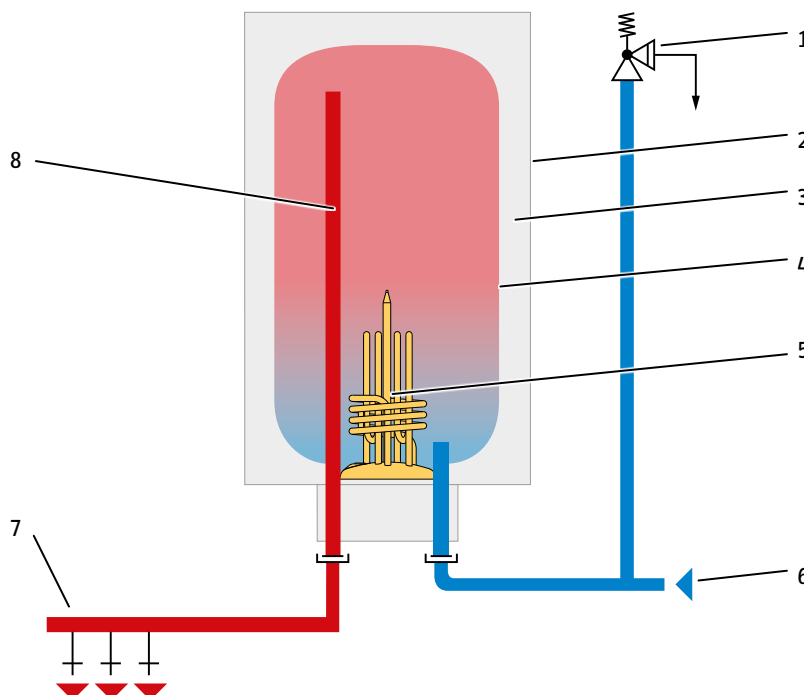


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Function diagram for tubular heaters

- 1 Copper pipe
- 2 Indirect coil
- 3 Filler
- 4 Silicone seal
- 5 Connection

Due to the physical properties of water, the cold water is always fed in at the bottom, with as little mixing with the heated water as possible. All cylinders feature a patented cold water inlet for that purpose. The heated water, on the other hand, is drawn off in the upper section of the cylinder:



D0000031758







Function diagram for wall mounted cylinders

- 1 Safety fittings to DIN 1988
- 2 External casing
- 3 Thermal insulation
- 4 Internal cylinder
- 5 Heating element
- 6 Cold water inlet
- 7 Draw-off point
- 8 Overflow pipe

ENGINEERING

System selection

Various different appliance sizes, types and versions are available for individual or group supply to the DHW system. The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	SHZ LCD	SH S	PSH Universal EL PSH EL
	 PIC00002180	 PIC00002240	 PIC00002184
Capacities 30 - 150 litres	•	•	•
Capacities 30 - 200 litres			
Capacities 30 and 100 litres			
Open vented (non-pressurised)	•	•	
Sealed unvented (pressure-tested)	•	•	•
Electric single circuit operation	•	•	•
Electric dual circuit operation	•		•
Electric operation as instantaneous water cylinder			
LCD screen and ECO functions	•		•
	PSH Si	PSH Trend	SHD S
	 PIC00002277	 PIC00004068	 PIC00002241
Capacities 30 - 150 litres	•		
Capacities 30 - 200 litres		•	
Capacities 30 and 100 litres	•		•
Open vented (non-pressurised)			
Sealed unvented (pressure-tested)	•	•	•
Electric single circuit operation	•	•	•
Electric dual circuit operation			•
Electric operation as instantaneous water cylinder			•
LCD screen and ECO functions			

Small water heater

A very attractive and widespread form of decentralised electric DHW heating is the use of open vented small water heaters at single draw-off points, or pressure-tested small water heaters for the supply of small groups, such as a number of washbasins.

Offering compact design, versatile mounting options and comparatively low requirements for installation infrastructure, yet with high DHW convenience, these water heaters are suitable for supply of facilities such as:

- › Basin
- › Washbasin
- › Kitchen sink
- › Guest toilets
- › Visitor toilets in non-residential buildings

In addition to the general advantages of decentralised electric DHW heating, the users, design engineers and installers of the system also benefit from:

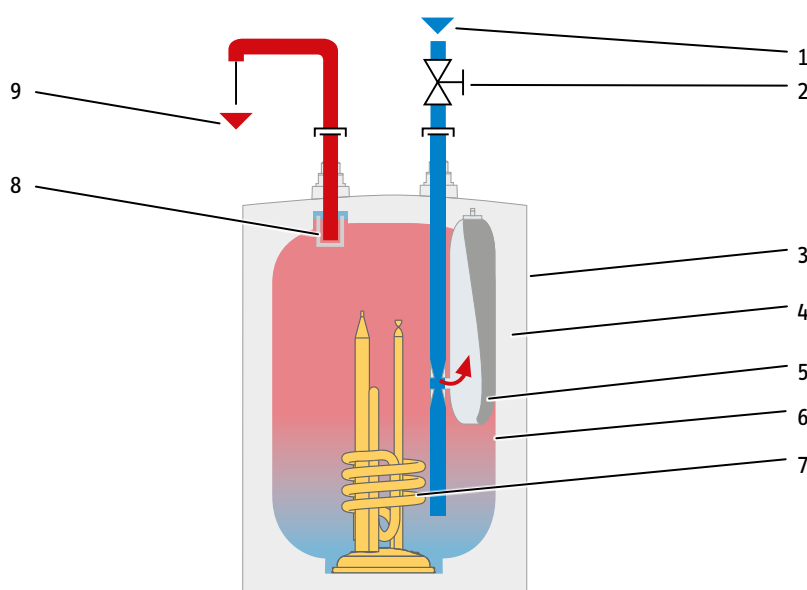
- › Low connected electrical loads of 1.0 kW-3.3 kW depending on appliance type
- › Electrical connection with a standard plug
- › High mixed water volume at the single draw-off point of 10 l up to 30 l (40 °C) depending on type and cylinder water temperature
- › Compact dimensions for space saving installation
- › Oversink or undersink installation e.g. in undersink cupboard
- › Easy combination and use with special taps
- › Operation without safety equipment in the water connection for open vented appliances
- › Extremely low standby energy consumption

The internal cylinders of the appliances are made of different materials depending on the appliance type and version. Open vented small water heaters are fitted with an internal cylinder made of polypropylene and high grade rigid foam thermal insulation.

During draw-off, cold water flows without turbulence into the lower section of the cylinder and is drawn off at the highest point.

For even greater efficiency and convenience, some appliances have additional components and functions such as:

- › Anti-drip function: The tap is prevented from dripping during heat-up, which saves water and prevents limescale build-up. The expansion water enters a special reservoir, pressing the expansion diaphragm together. The reservoir is drained during the next draw-off procedure.
- › thermostop function: Prevents standby losses through the draw-off tap: the mixer tap will not heat up unnecessarily during standby.







- 1 Cold water inlet
- 2 Angle valve, cold water
- 3 External casing
- 4 Thermal insulation
- 5 Anti-drip function
- 6 Internal cylinder
- 7 Heating element
- 8 thermostop
- 9 Draw-off point


Function diagram for open vented small water heaters

ENGINEERING

System selection

The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	SNU SLi	SN SL	SHU SLi	SH SLi
				
	PIC00002057	PIC00002055	PIC00001986	PIC00002055
Nominal capacity 5 litres	•	•	•	
Nominal capacity 10 litres	•	•	•	•
Nominal capacity 15 litres		•		•
Open vented (non-pressurised)	•	•		
Sealed unvented (pressure-tested)			•	•
Oversink installation		•		•
Undersink installation	•		•	
Anti-drip function (5 litres)	•			
thermostop function	•			

	PSH MINI ID
	
	PIC00002172
Nominal capacity 5 litres	
Nominal capacity 10 litres	
Nominal capacity 15 litres	•
Open vented (non-pressurised)	
Sealed unvented (pressure-tested)	•
Oversink installation	•
Undersink installation	
Anti-drip function (5 litres)	
thermostop function	

Floorstanding cylinder

Power supply utilities in many places offer special tariffs if electricity is used in off-peak periods, such as during the night. This is especially appealing for users who have chosen to use electricity as their energy source now and in the future. As with wall mounted cylinders, floorstanding cylinders offer the possibility of storing required amounts of heat for a long period of time. This will also be a very attractive feature in years to come, in order to utilise excess capacity from electricity sources such as wind power. Many users, for example in detached and two-family houses, also wish to make use of electricity they generate themselves, e.g. from a photovoltaic system.

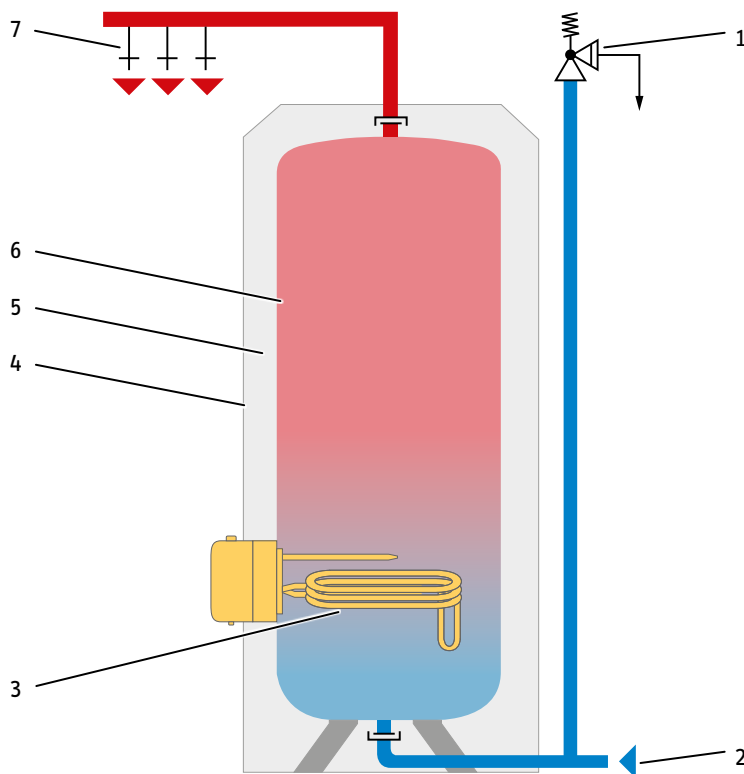
Floorstanding cylinders are generally used for centralised supply of DHW to a building. The range of potential applications is extremely wide, including residential buildings, businesses, sports facilities and barracks. The available storage volumes enable high peak demand levels and draw-off rates. Centralised systems provide high DHW convenience.

Furthermore, floorstanding cylinders can be combined in a system together with other heat sources, including renewable energy sources. Depending on their range of available features, floorstanding cylinders can be fitted with various equipment for this purpose.

All floorstanding cylinders, or at least their internal tanks, are made of steel with an internal enamel coating for corrosion protection. To keep standby losses low, directly applied, high grade thermal insulation and an external casing are available for all cylinders. The electric heating element is usually located in the lower section of the cylinder so that the entire contents of the cylinder can be heated.

Due to the physical properties of water, the cold water is always fed in at the bottom, with as little mixing with the heated water as possible. All cylinders feature a patented cold water inlet for that purpose. The heated water, on the other hand, is drawn off in the upper section of the cylinder.

For the water connection, there is an extensive range of accessories available, such as safety assemblies.



- 1 Safety fittings to DIN 1988
- 2 Cold water inlet
- 3 Heating element
- 4 External casing
- 5 Thermal insulation
- 6 Internal cylinder
- 7 Draw-off point






Function diagram for floorstanding cylinders

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ENGINEERING

System selection

Various different appliance sizes, types and versions are available for centralised supply to the DHW system. The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	SHW S	SHW ACE	SHO AC
	 PIC00001963	 PIC00001758	 PIC00001593
Capacities 200 - 400 litres	•	•	
Capacities 600 - 1000 litres			•
Electric flanged immersion heater	•	•	•
Unoccupied flanged apertures			
	SB S	SB AC	
	 PIC00001967	 PIC00001782	
Capacities 200 - 400 litres	•		
Capacities 600 - 1000 litres		•	
Electric flanged immersion heater			
Unoccupied flanged apertures	•	•	

Statutory framework conditions

Energy Savings Ordinance EnEV [Germany]

European regulations governing the energy performance of buildings oblige the member states of the European Union to implement measures to save energy and reduce CO₂ emissions. This was implemented in German law by the Energieeinsparverordnung (Energy Saving Ordinance, EnEV) in 2002. This superseded previous regulations for thermal insulation and heating systems and for the first time took a holistic approach to the structural and heating requirements for buildings. Following a revision in 2007, the building energy performance certificate for residential and non-residential buildings was introduced as well. A further amendment was made on 1 October 2009, which tightened the requirements for primary energy demand and the quality of components (by an average of 30 %). In accordance with strategic policy objectives, the next amendment is scheduled for 2014.

The new EnEV came into force on 1 May 2014, but brought only marginal changes to the requirements for the energy performance of buildings. For the 1 May 2014 deadline, the reference building described in the EnEV still represents the necessary technical standard for compliance with energy performance requirements. For new buildings from 1 January 2016 onwards, significantly tougher specifications will apply.

Reference building

The EnEV of 2009 introduced the reference building procedure for assessing residential buildings. This involves defining a building for comparison purposes, which matches the planned building in terms of geometric shape, net floor space and facing direction. The energy quality of the building envelope of the reference building is defined precisely in the EnEV, along with its system technology. Specifications are made for central heating, DHW heating, ventilation and cooling. Isolated exceptions to the described system technology are possible. To meet the requirements of the EnEV of 2014, the annual primary energy demand of the planned building must not exceed the value calculated for the reference building.

On 1 January 2016, the requirements for the permissible maximum annual primary energy demand will be tightened by a further 25 %. As the required standards described by the ordinance for the building envelope and system technology in the reference building are not being updated to reflect this new requirement, builders will need to plan their building in a more specific way.

There are two calculation methods available for demonstrating compliance. Either of these methods can be chosen, but the chosen method must be applied to both the planned residential building and the reference building.

Primary energy demand:

$$Q_{P \text{ planned building}} \leq Q_{P \text{ reference building}}$$

Physics of the reference building

External wall	Heat transfer coefficient	U=0.28 W/(m²K)
Floor plate / cellar ceiling	Heat transfer coefficient	U=0.35 W/(m²K)
Cellar wall	Heat transfer coefficient	U=0.35 W/(m²K)
Roof / top-storey ceiling	Heat transfer coefficient	U=0.20 W/(m²K)
Window	Heat transfer coefficient	U=1.30 W/(m²K)
Window	Light transmission efficiency of glazing	g = 0.6
Attic window	Heat transfer coefficient	U=1.40 W/(m²K)
Attic window	Light transmission efficiency of glazing	g = 0.6
External doors	Heat transfer coefficient	U=1.80 W/(m²K)
Building envelope	Thermal bridge correction factor	ΔUWB = 0.05 W/(m².K)
Tightness test	Rated value n50	DIN 4108-6: with tightness test
Tightness test	Rated value n50	DIN 18599-2: as per category I

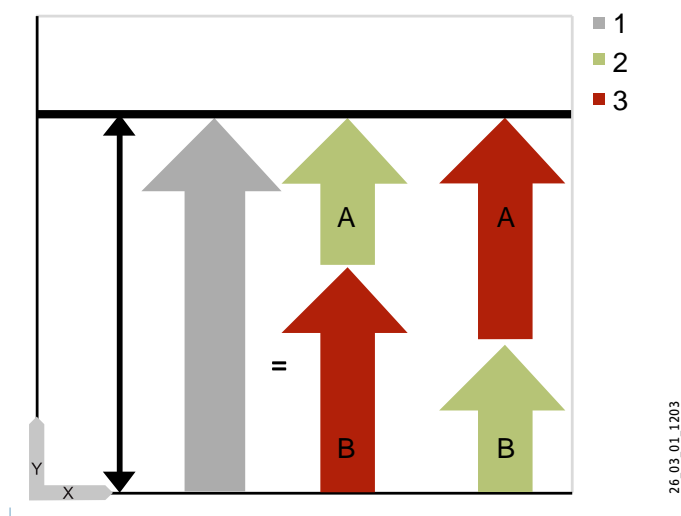
System technology of the reference building

Central heating	Oil condensing boiler, improved
	Installed within the thermal envelope (with more than 2 residential units outside the thermal envelope)
	Radiator heating system, system temperature 55 °C/45 °C
	Thermostatic valves, proportional band 1 K
Centralised DHW heating	Circulation pump with closed loop control (constant Δp)
	Internal distribution, hydraulically balanced pipe-work
	Oil condensing boiler (combined DHW and central heating)
	Solar thermal system (combination system with flat-plate collector)
	Indirectly heated cylinder (dual mode solar cylinder)
	Installed within the thermal envelope (with more than 2 residential units outside the thermal envelope)
Decentralised electric DHW heating*	Internal distribution; shared plumbing wall
	Circulation pump with closed loop control (constant Δp)
	With DHW circulation
	Centralised apartment supply
Ventilation	Without cylinder
	Line length in accordance with DIN 4701-10, Table 5.1 -3
	Centralised extract air system
Cooling	DC fan with closed loop control, demand-dependent
	No building cooling

* If decentralised electric DHW heating is used, the maximum annual primary energy demand must be reduced by 10.0 kWh/(m²/p.a.). This does not apply if measures to save energy are implemented in accordance with para. 7 no. 2 in conjunction with no. VI.1 of the Annex of the German Renewable Energies Heat Act (improved building envelope).

Compensation options

Despite setting higher requirements for the building envelope and defining a minimum insulation standard, the EnEV of 2014 also offers opportunities for compensation. The more effective the system technology, the lower the requirements are for an even better building envelope in order to receive special subsidies and financing options. The greatest benefits here are offered by systems which use environmental energy, and systems which achieve a high level of heat recovery. Their primary energy results are better in comparison to the reference system technology and the requirements of the EnEV can be met easily with a building envelope of appropriate quality.



- Y Permissible annual primary energy demand relative to floor space Q_p $Q_{p, \max}$ [kWh/(m²a)]
- 1 Total energy demand
- 2 Energy efficient version
- 3 Energy inefficient version
- A System
- B Building(s)

EnEV for residential properties

The EnEV of 2014 defines maximum values for the annual primary energy demand and the specific transmission heat losses (mean U-value of the building envelope) for residential buildings. One method of calculation for residential buildings without cooling is to determine the annual heat demand Q_h to DIN 4108-6 and the system expenditure of energy value e_p to DIN 4701-10. The system expenditure of energy value, which is non-dimensional and refers to the primary energy used for heating, ventilation and DHW, enables the assessment of the entire system technology.

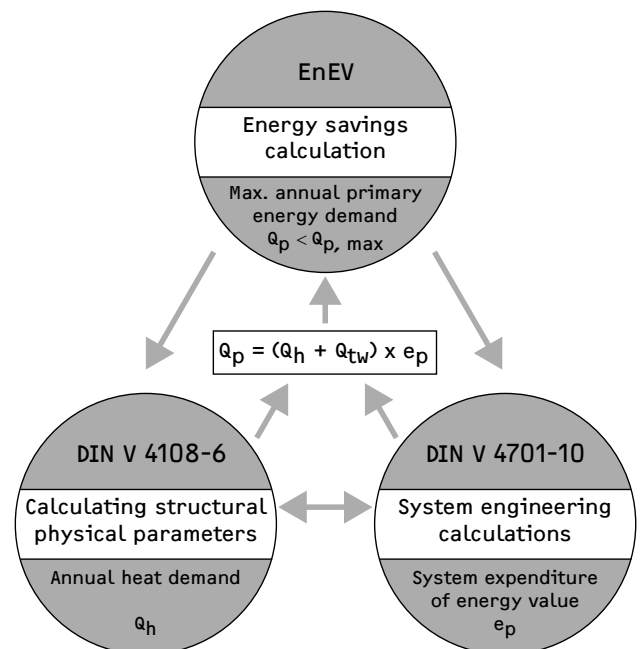
A second method is the calculation to DIN 18599 (energy assessment of buildings), which is now also permitted for calculations for residential buildings.

Maximum specific transmission heat losses $H_{T'}$ for residential buildings

Freestanding residential building < 350 m²	$H_{T'} = 0.40 \text{ W/(m}^2 \text{ K)}$
Freestanding residential building > 350 m²	$H_{T'} = 0.50 \text{ W/(m}^2 \text{ K)}$
Residential building with neighbouring building on one side	$H_{T'} = 0.45 \text{ W/(m}^2 \text{ K)}$
Other residential buildings	$H_{T'} = 0.65 \text{ W/(m}^2 \text{ K)}$
Extension and expansion of residential buildings	$H_{T'} = 0.65 \text{ W/(m}^2 \text{ K)}$

From 1 January 2016, the specific transmission heat loss of a new residential building relative to the heat-transferring outside surface area must not exceed the value for the relevant reference building.

Effects of standards



$$Q_p = (Q_h + Q_{tw}) \cdot e_p$$

- Q_p Primary energy demand
- Q_h Heating energy
- Q_{tw} DHW demand
- Q_{tw} is set by the EnEV at 12.5 kWh/m²/p.a.
- e_p System expenditure of energy value

EnEV for non-residential buildings

For non-residential buildings, the EnEV for 2014 specifies that calculations should follow the comprehensive rules in DIN V 18599. The reference building procedure is used to define the maximum permissible annual primary energy demand. For the building envelope, maximum U-values are specified for opaque and transparent surfaces. In addition to heating, DHW heating and ventilation, calculations must also be made for cooling, lighting and internal loads. The DIN V 18599 divides the overall building into various zones, since non-residential buildings usually have different areas used for different purposes and these require different conditioning. A zone includes those rooms within a building that demand similar parameters on account of their use (temperature, ventilation, illumination, internal loads, daylight provision, technical equipment) with similar framework conditions. Each zone is assigned to one of 33 specified utilisation profiles (e.g. office, hotel room, kitchen, toilet, transit area). The energy demand for heating and cooling must be considered separately for each conditioned zone. To simplify the calculation, it is permissible to determine the annual primary energy demand in accordance with a single zone model for some types of building if certain conditions are met (e.g. central heating system, no cooling, lighting as per reference specification). These types of building are: schools, kindergartens, office buildings, hotels, restaurants, pubs and commercial premises.

Outline DIN V 18599

Part 1	General statement procedure, terminology, zoning and assessing the fuel type
Part 2	Demand for available energy for heating and cooling building zones
Part 3	Demand for usable energy for energetic air treatment
Part 4	Usable and final energy demand for lighting
Part 5	Final energy demand of heating systems
Part 6	Final energy demand of domestic ventilation systems and air heating systems for residential buildings
Part 7	Final energy demand for air handling and air conditioning systems for non-residential buildings
Part 8	Usable and final energy demand for DHW heating systems
Part 9	Final and primary energy demand of CHP systems
Part 10	Utilisation framework conditions, climate data
Supplement 1	Examples

Primary energy demand for non-residential buildings

$$Q_Q = Q_{P,h} + Q_{P,c} + Q_{P,m} + Q_{P,w} + Q_{P,l} + Q_{P,aux}$$

Q_P	Primary energy demand
$Q_{P,h}$	Central heating
$Q_{P,c}$	Cooling
$Q_{P,m}$	Steam
$Q_{P,w}$	DHW
$Q_{P,l}$	Light
$Q_{P,aux}$	Auxiliary energy

Maximum values for mean heat transfer coefficients for non-residential buildings

Components	Internal temperature $\geq 19^\circ\text{C}$	Internal temperature $< 19^\circ\text{C}$
Opaque external building parts	$U_{\text{mean}} = 0.35 \text{ W}/(\text{m}^2\cdot\text{K})$	$U_{\text{mean}} = 0.50 \text{ W}/(\text{m}^2\cdot\text{K})$
Transparent external building parts	$U_{\text{mean}} = 1.90 \text{ W}/(\text{m}^2\cdot\text{K})$	$U_{\text{mean}} = 2.80 \text{ W}/(\text{m}^2\cdot\text{K})$

DHW pipelines

For DHW pipelines, the following requirements in the EnEV apply, as well as DIN 1988-200.

Thermal insulation of heat distribution lines and DHW lines, cooling distribution lines, cold water lines and valves and taps:

Type of line / valves / taps	Minimum thickness of the insulating layer, for thermal conductivity of $0.035 \text{ W}/(\text{m}\cdot\text{K})$
Internal diameter up to 22 mm	20 mm
Internal diameter over 22 mm up to 35 mm	30 mm
Internal diameter over 35 mm up to 100 mm	Same as internal diameter
Internal diameter over 100 mm	100 mm
Lines and valves/taps from rows 1 to 4 in wall and ceiling openings, in areas where lines cross, at line connection points, in central network distributors	1/2 of the requirements in rows 1 to 4
Central heating lines from rows 1 to 4 which were installed after 31 January 2002 in building parts between heated rooms of different users	1/2 of the requirements in rows 1 to 4
Lines from row 6 installed in the floor structure	6 mm

Energy performance certificates

One major requirement of the EnEV 2014 is the issuance of certificates documenting the energy performance of new buildings, as well as existing buildings in the event of certain structural modifications, required modernisation, rental or sale. The energy performance certificate is intended to clearly state the energy quality of the building and make suggestions for improvement.

An important point to note is that the energy quality of the building will need to be stated in real estate advertisements in commercial media. At the same time, an energy efficiency class is being introduced for the energy performance certificate, based on an assessment of final energy.

In future, buildings will therefore receive an efficiency classification with a letter (A+ to H), which must also appear in the real estate advertisements mentioned above, at least for residential buildings. Consequently, in the light of the new classification, anyone planning to build a building today should think twice before dismissing the option of a better letter simply because the EnEV of 2014 does not currently require it.

The energy performance certificate is a valuable instrument designed to create transparency and clarity. The energy performance certificate details the energy quality of a building. This involves assessing the properties of the building envelope and heating system. The energy performance certificate is intended to clearly state the energy quality of the building and also make suggestions for improvement. In future all energy performance certificates will receive a registration number and all issuers of energy performance certificates must register themselves as well. This registration is intended to enable random checks of energy performance certificates in Germany. The energy performance certificate form also displays details regarding the use of alternative energy systems and the requirements of the German Renewable Energies Heat Act (EEWärmeG).

Eng. support

The calculations according to DIN V 18599 are extensive and can, because of the interactions that occur, only be resolved by iterative means, and with computer-aided support. STIEBEL ELTRON offers essential software solutions for this calculation.

This enables complex calculations to be carried out and also includes manufacturer's data. In this connection, our specialist department offers support in all areas concerning the Energy Saving Ordinance.

ENERGIEAUSWEIS für Wohngebäude

gemäß den §§ 16 ff. der Energieeinsparverordnung (EnEV) vom 1.1.2002

Berechneter Energiebedarf des Gebäudes

Energiebedarf

CO₂-Emissionen ¹ kg/(m²·a)

Endenergiebedarf dieses Gebäudes
kWh/(m²·a)

A	B	C	D	E	F	G	H
0	25	50	75	100	125	150	175
							200
							225
							>250

kWh/(m²·a)

Primärenergiebedarf dieses Gebäudes

Registriernummer ²
aus: Registernummer der Baugenehmigung

Abkürzungen gemäß EN 826-2 *

<p>Primärenergiebedarf je Wert kWh/(m²·a) Anfordersgrenze kWh/(m²·a)</p> <p>Energieeffizienzklasse des Gebäudes (A-H) je Wert Wert (K) Anforderungsgrenze Wert (K)</p> <p>Gemessener Wärmeabfluss (bei Freilegen) > angegeben</p>	<p>Für Energiebedarfsberechnungen verwendete Verfahren:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verfahren nach DIN V 4108-6 und DIN V 4701-10 <input type="checkbox"/> Verfahren nach DIN V 4708-6 <input type="checkbox"/> Regelung nach § 8 Absatz 2 EN 12975 <input type="checkbox"/> Vereinfachungen nach § 8 Absatz 2 EN 12975
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Endenergiebedarf dieses Gebäudes
(Primärenergiebedarf in Umrechnungsfaktor)

kWh/(m²·a)

Example calculations for an apartment building

A primarily electrical, decentralised DHW heating system is very suitable for complying with the specifications of the currently valid Energy Saving Ordinance EnEV and the Renewable Energies Heat Act EEWärmeG.

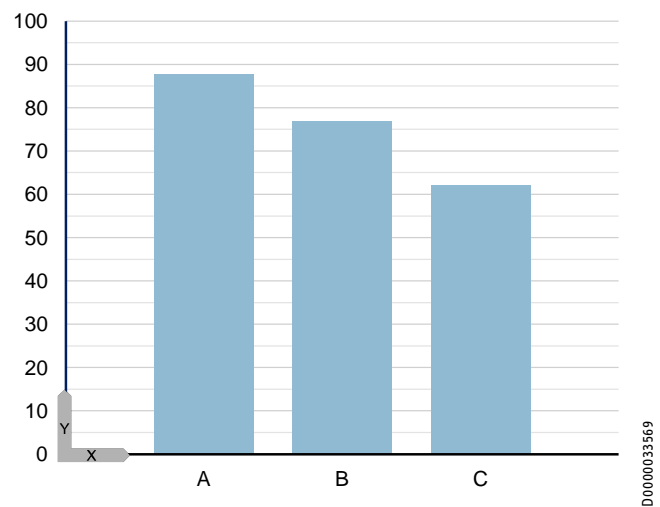
The following options, with any prerequisites required for them, are explained for the construction of a new apartment building. The given characteristics of the construction of this new apartment building are as follows:

Data for the example building

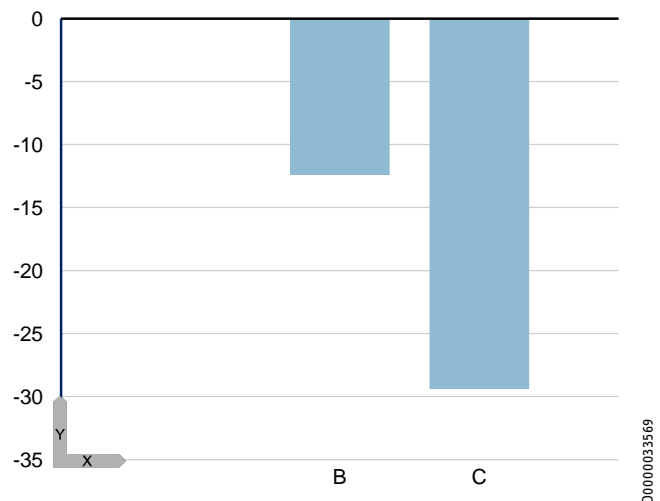
Year of construction	2014
Type	Apartment building
Residential units	9
Floors	3
Type of building	Heavy
Envelope area [A]	1345 m ²
Volume of the structure [Ve]	2740 m ³
Available floor space [An]	877 m ²
Reference location for climate	Germany

Reference building

The basis of comparison for the planned system solution is the relevant reference building, structured in accordance with EnEV. The following illustration compares the annual primary energy demand of the reference building with and without decentralised electrical DHW heating. In the case of a planned decentralised electrical DHW heating system, instead of the centralised system, the calculation can be made with centralised apartment supply, without a storage cylinder, on a shared plumbing wall. The resulting maximum annual primary energy demand for the reference building with electrical DHW heating must be reduced by 10.0 kWh/(m²/p.a.) unless energy saving measures have been implemented in accordance with para. 7 no. 2 of the Renewable Energies Heat Act.



Y Primary energy demand [kWh/m²/p.a.]



- Y Deviation [%]
- A EnEV reference, decentralised electrical DHW supply, with energy saving in accordance with para. 7 no. 2 of the Renewable Energies Heat Act (EEWärmeG)
- B EnEV reference, decentralised electrical DHW supply, with deficit of 10.0 kWh/(m²p.a.).
- C EnEV reference, centralised DHW provision, oil condensing and solar thermal system

Version I

Construction of the apartment building without the use of renewable energy sources; compliance with the EEWärmeG via a substitute measure (improvement of the building envelope – energy saving).

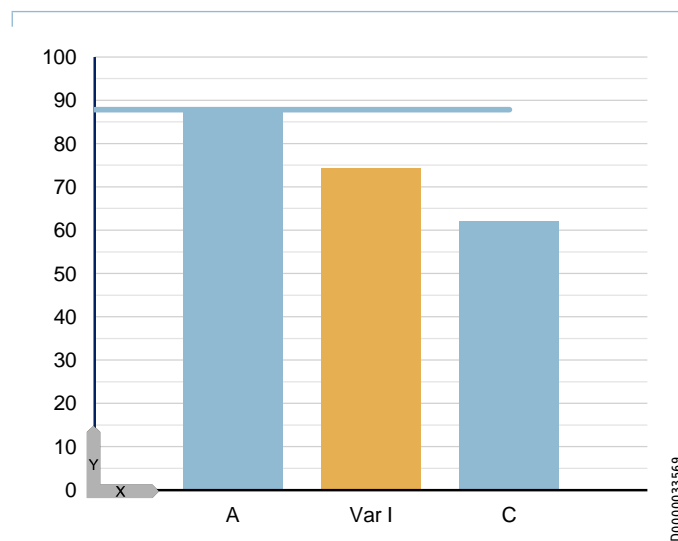
Energy saving measures qualify as substitute measures for private buildings only if the building then falls at least 15 % below the applicable maximum annual primary energy demand and the applicable requirements for thermal insulation of the building envelope according to the Energy Saving Ordinance. The following requirements must therefore be met:

- › Annual primary energy demand of the planned building < (version A – 15 %)
- › Transmission heat loss HT of the planned building < (permissible maximum – 15 %)

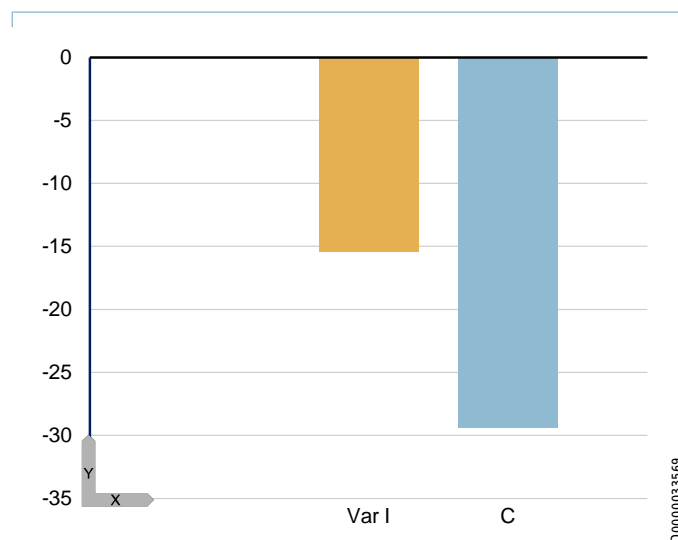
The building envelope must be of higher quality than that of the reference building. The following adjustments have been made for the example building:

	Envelope area [m²]	Reference	Change	Deviation [%]
U-value, windows	120	1.300 W/m²K	0.900 W/m²K	-31
U-value, external wall	558	0.280 W/m²K	0.160 W/m²K	-43
U-value, floor plate / cellar ceiling	313	0.350 W/m²K	0.250 W/m²K	-29
U-value, roof	354	0.200 W/m²K	0.180 W/m²K	-10
Thermal bridge correction factor	-	0.050 W/m²K	0.035 W/m²K	-30
Transmission heat loss HT		0.500 W/m²K	0.260 W/m²K	-48
Annual heat demand Qh		- 41.7 kWh/m²/yr	29.1 kWh/m²/yr	-30

As well as the the distribution and circulation losses of a centralised DHW distribution system, the annual heat demand is also significantly reduced, by 30 %. That reduces the initial consumption of final and primary energy and results in compliance with the requirements of the EnEV and EEWärmeG at the same time.



Y Primary energy demand [kWh/m²/p.a.]



Y Deviation [%]

- A EnEV reference, decentralised electrical DHW supply, with energy saving in accordance with para. 7 no. 2 of EEWärmeG
- Var I Version I: planned building, substitute measure in accordance with EEWärmeG and decentralised electrical DHW supply
- C EnEV reference, centralised DHW provision, oil condensing and solar thermal system

Conclusion

The use of decentralised electrical DHW heating is possible in the new building. For this system configuration, the EnEV allows for a modified reference building until 31/12/2015. Compliance with the Renewable Energies Heat Act is possible without the use of renewable energy sources, via the “energy saving” substitute measure.

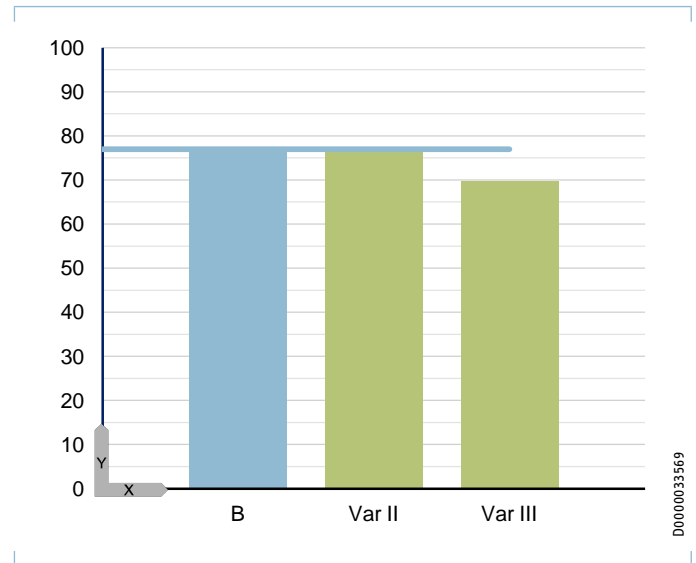
Version II / III

Heating of the apartment building with an air | water heat pump (version II) or brine | water heat pump (version III) via an underfloor heating system, DHW supply decentralised via electric instantaneous water heaters / small water heaters.

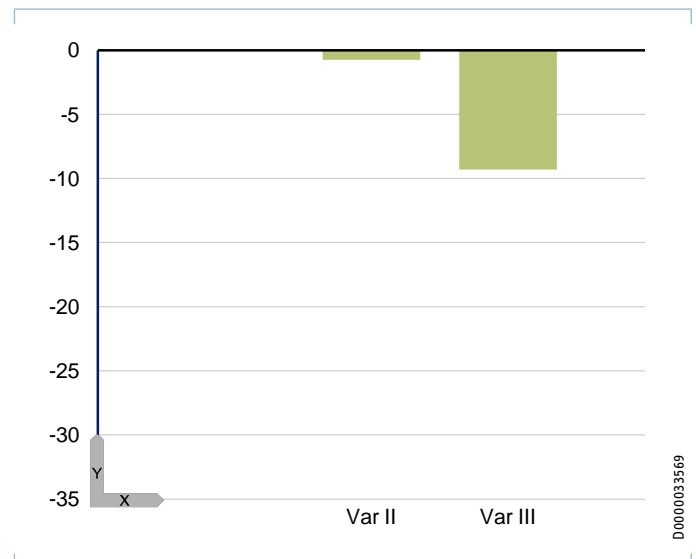
In this example, compliance with the Renewable Energies Heat Act is provided by the use of the heat pump. It covers 50 % of the heating energy demand and fulfils all the other specifications from EEWärmeG, such as the required seasonal performance factor and the quality label.

To meet the requirements of the EnEV, the building must fall below the maximum permissible limit:

- Annual primary energy demand of the planned building < annual primary energy demand of the reference building (electrical DHW heating)
- The resulting maximum annual primary energy demand for the reference building with electrical DHW heating must be reduced by 10.0 kWh/(m²p.a.) because energy saving measures in accordance with para. 7 no. 2 of the Renewable Energies Heat Act are not being used to comply with the Act.



Y Primary energy demand [kWh/m²p.a.]



Y Deviation [%]

B EnEV reference, decentralised electrical DHW supply, with deficit of 10.0 kWh/(m²p.a.).

Ver II Version II: planned building, air | water heat pump with underfloor heating system and decentralised electrical DHW supply

Ver III Version III: planned building, brine | water heat pump with underfloor heating system and decentralised electrical DHW supply

Conclusion

The combination of heat pump for central heating and decentralised electrical DHW heating in the new building is possible without improving the reference building envelope. For this system configuration, the EnEV allows for a modified reference building until 31/12/2015.

Drinking Water Ordinance [Germany]

Drinking water is one of the most important forms of sustenance, if not the most important. In accordance with accepted engineering standards, the following rules apply:

- › Drinking water must be free of pathogens.
- › Drinking water must not have any properties that are harmful to health.
- › Drinking water should be colourless, clear, cool, odourless and neutral in taste.
- › Drinking water should always be available in adequate quantities and at adequate pressure.
- › Drinking water and the materials in contact with it should be compatible in such a way that no corrosion damage is caused.

In addition to engineering standards, statutory specifications must be observed, such as the Drinking Water Ordinance [Germany].

The German Drinking Water Ordinance (TrinkwV) has the purpose of protecting human health from detrimental effects such as those that might result from contamination of drinking water.

The first TrinkwV came into force in 1976. In the years that followed, the ordinance was amended several times and expanded by European law. The currently valid 2nd ordinance amending the Drinking Water Ordinance of 14 December 2012 is based on EU directive 98/83, the Prevention of Infection Act [Germany] (IfSG) and the Foodstuffs and Commodities Act [Germany] (LMBG).

The Drinking Water Ordinance [Germany] governs the following:

- › Action to be taken if permissible limits are breached
- › Possible means of distribution and disinfection
- › Obligations of the operators of a water supply facility
- › The extent of monitoring
- › Information to be made known to consumers

The last amendment of the Drinking Water Ordinance [Germany] to come into force brought major changes.

It now also requires that the operators of large scale, centralised DHW heating systems, which is to say private landlords, apartment owners' associations or housing corporations, must have their systems inspected for Legionella every three years. These parties are also obliged to notify the health authorities of any inspection results over the threshold for action.

Previously this inspection obligation applied only to installations supplying water to the public, such as in schools, nursery schools, hospitals, pubs and restaurants.

Legionella bacteria

In Germany Legionnaires' disease is one of the most significant diseases that can be transmitted through water. It is caused by Legionella, a kind of bacteria which grows in warm water, such as in domestic hot water and air conditioning systems or dry cooling systems. If Legionella bacteria are inhaled, they can cause serious pneumonia and Pontiac fever.

Every year at least 20,000 – 32,000 people in Germany fall ill with community-acquired pneumonia caused by Legionella. To that figure must be added 10 to 100 times that number of cases of Pontiac fever, which is milder in its effects and is also caused by Legionella (German Federal Environment Agency // Statement; "Legionellen:Aktuelle Fragen zum Vollzug der geänderten Trinkwasserverordnung TrinkwV" [Legionella: current questions regarding the implementation of the Drinking Water Ordinance] [Germany]).

The pathogen is found throughout the world and occurs in all freshwater in concentrations which are not harmful to people. It is a natural component of our drinking water.

A precondition for infection / illness is an increased concentration of the pathogen in the air / in steam, which is then breathed in, for example when showering. Drinking the water poses no known risk.

The risk of an increased concentration of pathogens in drinking water is especially high when water stagnates for days, in other words for a relatively long period of time, at temperatures between 25 and 55 °C. This is frequently the case if terminal lines which are rarely or never used are still connected to the network, or other technical flaws exist (German Federal Environment Agency // Statement; "Legionellen:Aktuelle Fragen zum Vollzug der geänderten Trinkwasserverordnung TrinkwV" [Legionella: current questions regarding the implementation of the Drinking Water Ordinance] [Germany]).

Risk prevention measures are described by accepted engineering standards, such as DVGW Code of Practice W551 or DIN 1988-200. The possibility of DHW stagnating can be minimised early, in the design stage, by measures such as the following:

- › The use of decentralised DHW heaters, such as instantaneous water heaters
- › Keeping DHW distribution lines as short as possible
- › Ensuring that DHW cylinders and pipeline networks are not oversized
- › The use of a DHW circulation line and pump, and operating them according to engineering standards
- › Avoiding dead legs
- › Maintaining required DHW temperatures

Inspection obligations according to TrinkwV

Obligations for rented residential buildings with large scale DHW heating systems include the following:

- › Obligation to inform the tenants, and
- › Obligation to carry out inspections for Legionella according to para. 14 (Annex 3, Part II)

The following are not affected:

- › Systems in detached houses and two-family houses, no matter whether owner-occupied or rented
- › Decentralised systems – such as the use of instantaneous water heaters or wall mounted small water heaters within the home or apartment itself

Definition of large scale system

All systems with DHW cylinders with capacity > 400 l, or pipeline capacity > 3 l in at least one pipeline from the outlet of the DHW cylinder to the most distant draw-off point. Any DHW circulation lines are not counted.

Systems in detached houses or two-family houses are not counted as large scale systems for DHW heating.

Examples of pipeline cross-sections and up to 3 litre capacity

- Ø 15 mm = 20 m line length
- Ø 18 mm = 15 m line length
- Ø 22 mm = 9 m line length

DVGW Code of Practice W551

DVGW Code of Practice W 551 “Drinking water heating and drinking water piping systems; Technical measures to reduce Legionella growth; ..” (version: April 2004) is an accepted engineering standard which also describes essential requirements for hygiene and for the operation of relevant systems. The Code of Practice also distinguishes between large and small systems, and describes the following additional specifications.

Requirements for the operation of a large system

The water at the outlet of the DHW heater must always be at a temperature greater than or equal to 60 °C.

The entire contents of the cylinder, including all preheating stages, must be heated at least once a day to 60 °C or more.

Branch lines with a capacity greater than 3 l must be fitted with DHW circulation.

The temperature drop in the DHW circulation line must be no more than 5 K.

Definition of small system

All systems with DHW cylinders or centralised instantaneous DHW heaters in detached or two-family houses, regardless of the capacity of the DHW cylinder/heater or the pipework capacity.

All systems with 400 litres capacity or less and 3 l or less in each pipeline from the outlet of the DHW heater to the most distant draw-off point, not counting DHW circulation lines.

Requirements for installing a small system and recommendations for its operation

Requirements:

A centralised DHW cylinder or centralised instantaneous water heater must be able to maintain an outlet temperature of 60 °C. This is not intended to suggest recommended operating temperatures, but to provide specifications for designing and installing the systems. Branch lines with a capacity greater than 3 l must be fitted with DHW circulation. The temperature drop in the DHW circulation line must be no more than 5 K.

Recommendations:

It is recommended to set a thermostat temperature of 60 °C. Operating temperatures less than 50 °C should be avoided. The user must be informed about the possible health risk when commissioning the system and instructing the user in its use.

Requirements for decentralised instantaneous DHW heaters, regardless of type of building

No requirements if the capacity of every pipeline from the DHW heater to the most distant draw-off point is less than or equal to 3 l.

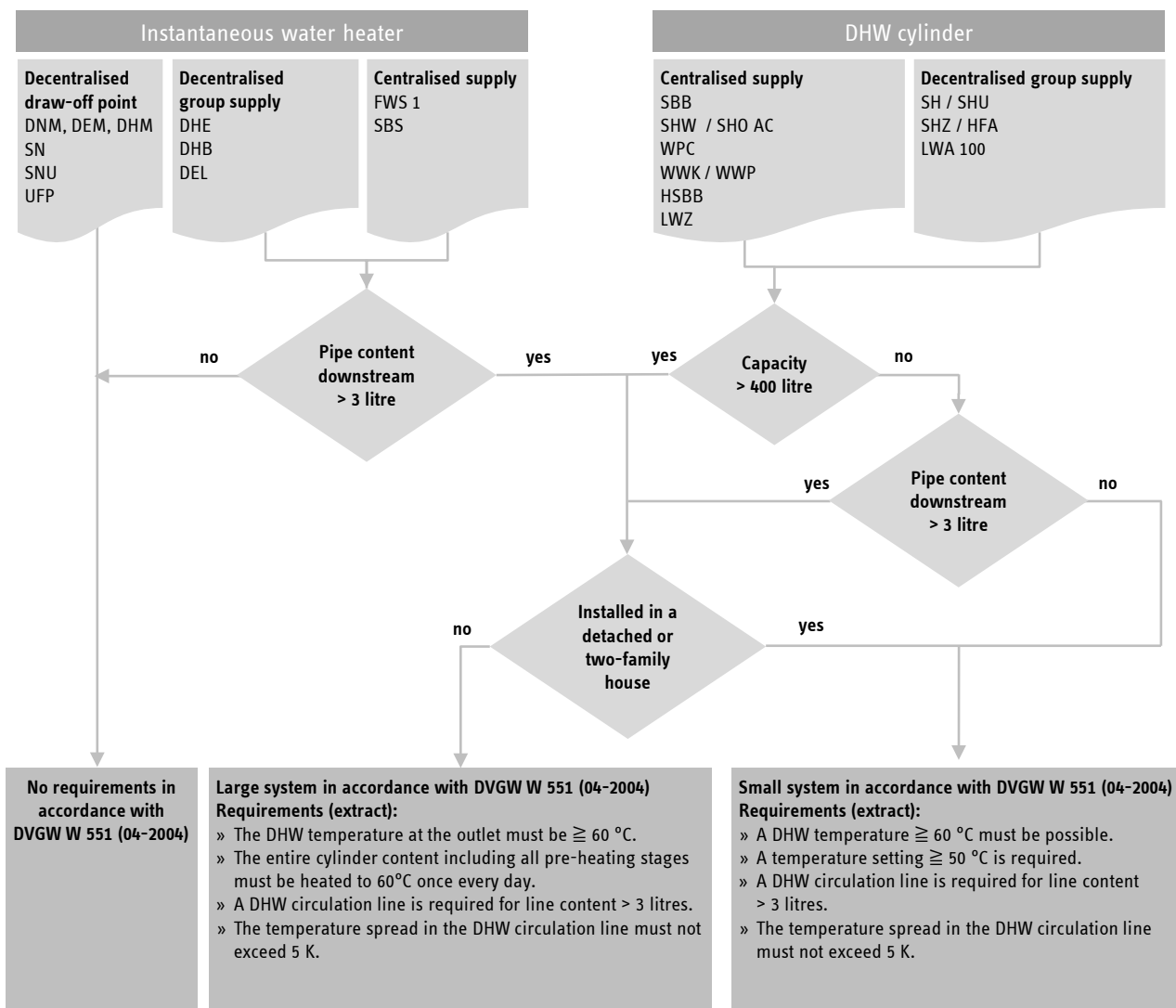
If that is the case, there are no costs incurred for taking samples or testing by accredited laboratories.

There is no need to check every riser. Moreover, it would often be necessary to install suitable sample collection points in such risers first.

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Statutory framework conditions

The following provides an overview of the requirements to DVGW W 551 (2004-04).



D0000024048

Sizing and configuration

DHW demand

The selection of a suitable appliance for DHW heating requires knowledge of the requirements of the respective draw-off point or the area to be supplied. The following data is usually relevant:

- › The flow rate of the draw-off tap \dot{V}
- › The duration of draw-off Δt
- › The available temperature ϑ_N at the draw-off tap
- › The time between draw-offs, or usage frequency per day f
- › The available DHW requirement per draw-off or day v_N , v_N, d
- › Draw-off profile of the centralised supply

The following tables contain data for different draw-off points and types of supply. These are standard values which can be applied if no exact details are available for the building. The selection for the residential building sector is based on VDI 2067, Part 12.

These details describe the useful energy demand at the draw-off point. In addition to that there is energy consumed in distribution, generation and storage of the domestic hot water.

Residential buildings

Supply type: individual supply

Draw-off point	Flow rate \dot{V} [l/min]	Duration of draw-off Δt [min]	Available temperature t_N [°C]	Available DHW requirement per draw-off v_N [l]
Shower, low flow shower head	6	2 - 6	40	12 - 36
Shower, normal shower head	8	2 - 6	40	16 - 48
Shower, luxury shower head	10	2 - 6	40	20 - 60
Bath tub, standard	8 - 10	10 - 13	40	80 - 130
Bath tub, large	10 - 12	13 - 15	40	130 - 180
Washbasin	4	1 - 2	40	4 - 8
Bidet	6	1 - 2	40	6 - 12
Sink	4	2 - 3	50	8 - 12

Supply type: group supply

Draw-off points, group	Usage frequency				Total available DHW requirement for t_N			total energy demand				
	Shower	Bath	Washbasin	Sink	per person per day		per person per year	per person per day		per person per year		
	f [1/d]	f [1/d]	f [1/d]	f [1/d]	v_N, tot, d [l/d]	Average value	v_N, tot, a [m³/p.a.]	Average value	q_N, tot, d [kWh/d]	Average value	q_N, tot, a [kWh/p.a.]	Average value
Shower (normal), washbasin, dishwasher + sink	0.5	-	2	0.13	15 - 47	31.0	5.2 - 16.2	10.7	0.5 - 1.6	1.1	190 - 570	380
Shower (normal), washbasin, sink	0.5	-	2	0.60	19 - 51	35.0	6.5 - 17.5	12.0	0.7 - 1.8	1.3	250 - 630	440
Bath tub (normal), washbasin, dishwasher + sink	-	0.3	2	0.13	33 - 56	44.0	11.7 - 19.3	15.7	1.1 - 1.9	1.5	400 - 680	540
Bath tub (normal), washbasin, sink	-	0.3	2	0.60	37 - 60	48.5	13.0 - 20.6	16.8	1.3 - 2.1	1.7	460 - 720	590
Bath tub (large), washbasin, dishwasher + sink	-	0.3	2	0.13	48 - 71	59.0	16.6 - 24.5	20.7	1.7 - 2.5	2.1	580 - 860	720
Bath tub (large), washbasin, sink	-	0.3	2	0.60	52 - 75	63.5	17.9 - 25.8	21.9	1.9 - 2.7	2.5	640 - 920	780
Bath tub (normal), shower (normal), washbasin, dishwasher + sink	0.4	0.1	2	0.13	22 - 54	38.0	7.5 - 18.6	12.7	0.7 - 1.9	1.3	270 - 650	460

Statistical number of occupants in residences

If the number of persons in the residential unit or building is not known, the following reference values can be used.

Number of rooms in res. unit	Number of occupants nP
1	1.2
2	1.6
3	2.3
4	2.8
5	3.1
6	3.4
7 or more	3.8

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Sizing and configuration

Non-residential / commercial buildings

Application	Specific demand per day at 60 °C DHW temperature [L]	Per
Bakers		
Dough preparation, cleaning of machines and appliances	50	1 m ² baking area
Cleaning the workplace	0.5	1 m ² operating area
Personal hygiene (showers and washing of hands)	40	Employee
Butchers		
Cleaning machines and appliances	80	1 pig/week
Cleaning the workplace	1	1 m ² operating area
Personal hygiene (showers and washing of hands)	40	Employee
Hairdressers		
Barber, position with basin	40 - 60	Position with basin
Ladies' hairdresser		
Up to 8 positions with basin	100 - 120	Position with basin
9 to 14 positions with basin	80 - 100	Position with basin
More than 14 positions with basins	60 - 80	Position with basin
Cleaning the workplace	0.5 - 1	Position with basin
Kindergartens		
Washbasins in kindergartens	2.5	Child
Pubs		
Washbasin	15	Guest
Full-size bath tub	90	Guest
Shower	50	Guest
Room cleaning, kitchen	5	Room
Without dishwashing (preparation without cleaning)	5	Essen
Hotels		
Room with shower and bath	120 - 180	Guest
Room with bath	95 - 140	Guest
Room with shower	50 - 100	Guest
Other hotels, B&Bs, residential homes	25 - 50	Guest
Bath and shower facilities		
Indoor swimming pools:		
Public	40	User
Private	20	User
Saunas:		
Public	100	User
Private	50	User
Communal washrooms:		
Schools, sport centres	40	User
Residential homes	60	User
Hospitals	60 - 120	User
Industrial applications	30	User
Hospitals and residential homes		
Hospitals	200	Bed
Residential homes e.g. retirement homes, residential home for young people, children's homes	40 - 80	Bed
Agriculture		
Calf fattening and rearing:		
Preparation of drinking trough	8	Calf
Cleaning of feeders	50 - 100	
Disinfection of stalls	10 - 20	
Milking parlour and milk preparation centre:		
Udder shower	3	Cow
Cleaning the milking installation	1 - 2	1 m line
Cleaning the milk collecting tank	5 - 10	100 l capacity
Cleaning the milk room	1	1 m ² floor area
Basin	10	

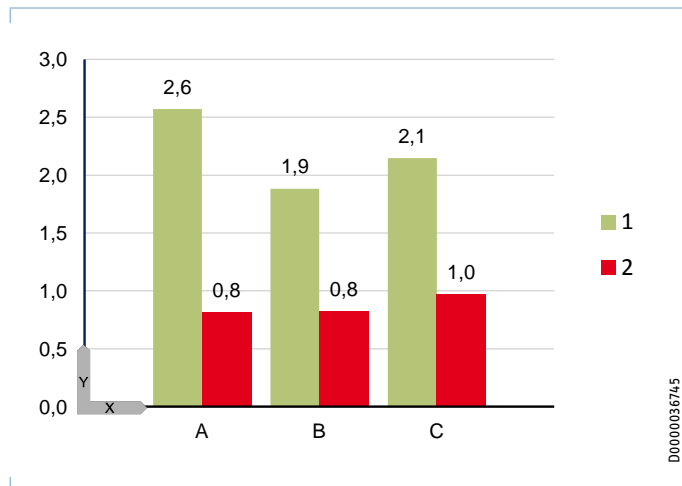
Losses from DHW heating systems

In addition to the actual DHW demand or useful energy demand, additional energy consumption for distribution, generation and storage of the domestic hot water must be considered, especially when assessing the cost effectiveness of different systems and supply types.

The magnitude of the losses in each case will vary depending on the planned building and its features, such as insulation of the distribution network. The following types of losses can be applied as a rough guide, subject to the type of building and hot water boiler in question. All details are taken from the study "Reduzierung von Energieverbrauch und CO₂-Emissionen durch dezentrale elektrische Warmwasserversorgung" [Reduction of energy consumption and CO₂ emissions through decentralised DHW supply], July 2011, from "FfE Forschungsgesellschaft für Energiewirtschaft mbH".

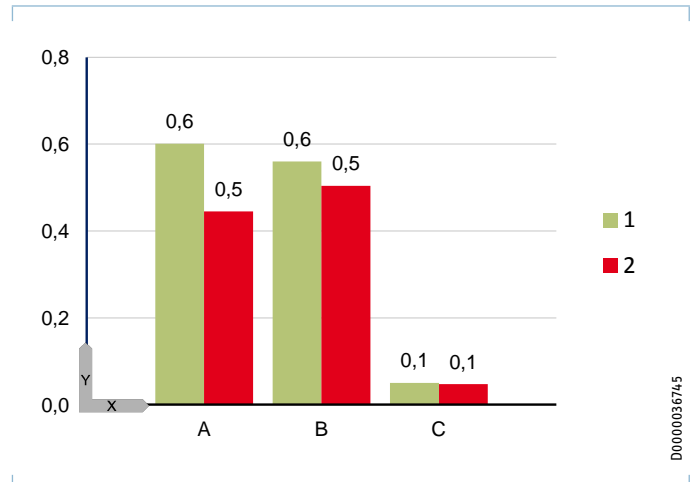
Start-up losses

Start-up losses will vary depending on the positioning of the draw-off points in/on the pipework and/or the distance from a draw-off point to the DHW circulation line. Generally speaking, cooled water lying in the DHW pipeline must be pushed out before the water with the required temperature becomes available at the outlet. Likewise, the pipe material, having cooled, must be heated up as well.



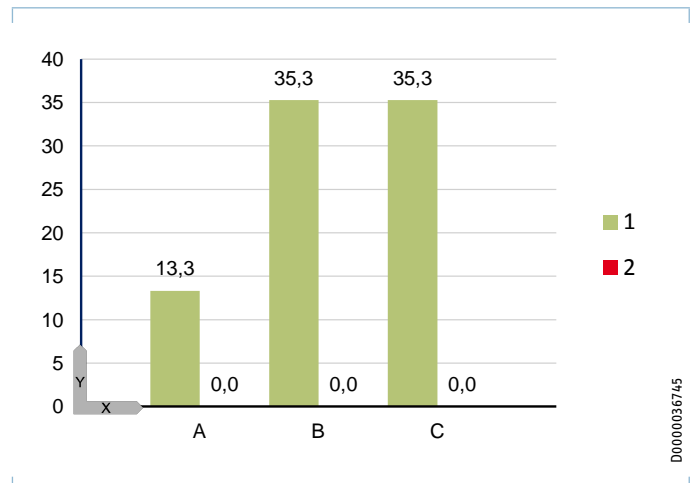
Distribution losses

Distribution losses are dependent on the installed branch lines, their size, material and insulation. Distribution losses arise when DHW is drawn off through branch lines, e.g. from the DHW circulation branch to the tap.



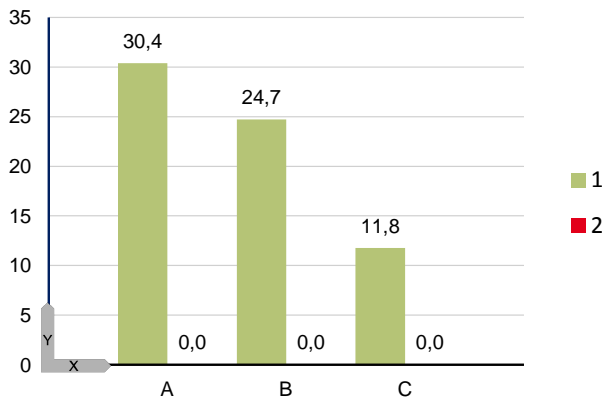
DHW circulation losses

Centralised supply systems usually have a DHW circulation line to meet hygiene requirements and also to prevent high start-up losses and to maximise convenience. While the DHW circulation pump is operating, heat is given off into the surrounding environment. After interruptions, pipeline heating losses must be taken into account as well. All these losses are dependent on the water temperature, the standard of insulation, the operating times and the control of the circulation pump, as well as the pipe material and the distribution network.



Cylinder losses / standby heat loss

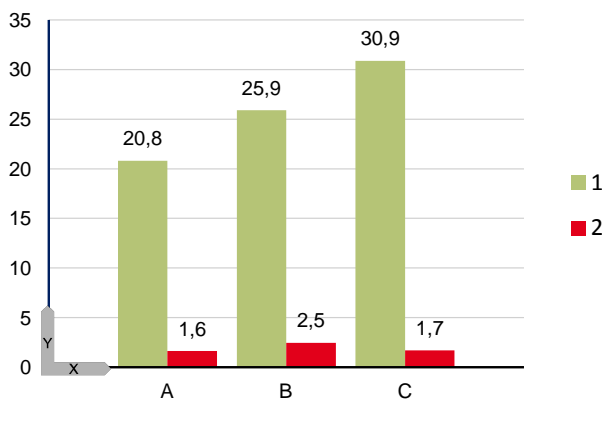
Both the DHW cylinder and the installed pipework constantly give off energy to the surrounding environment, e.g. the utility area in the basement. These losses, also called the standby heat loss, are usually stated in kWh/24h.



- Y % of the useful energy demand
 A Detached house
 B 3 apartment building
 C 12 apartment building
 1 Centralised supply with oil / gas heating
 2 Decentralised electric instantaneous water heaters

Generation and technical system losses

For every heat generator or boiler, efficiency, energy used for control and auxiliary energy must be considered.



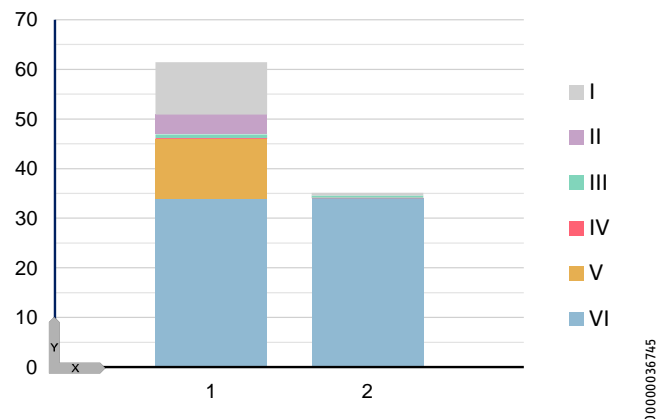
- Y % of the useful energy demand
 A Detached house
 B 3 apartment building
 C 12 apartment building
 1 Centralised supply with oil / gas heating
 2 Decentralised electric instantaneous water heaters

Summary

When all types of loss are considered, the example of the “12 apartment building” clearly indicates that the economical operation of a centralised supply system depends to a great extent on the planning, design, quality and operation of the installed distribution system.

Decentralised DHW heating is an attractive option because its final energy demand is considerably lower.

The appliances can be installed in close proximity to the respective draw-off points. That results in short pipe runs, which in turn reduce start-up, standby and distribution losses to a minimum.



- Y Total energy demand [kWh/d]
 1 Centralised supply with oil / gas heating
 2 Decentralised electric instantaneous water heaters
 I Generation and system losses
 II Cylinder losses
 III Start-up losses
 IV Distribution losses
 V DHW circulation losses
 VI Useful energy demand

Bases of calculations

Instantaneous water heaters

With the requirements of the draw-off point and the planned conditions of use now established, system and appliance selection can begin. The following formulas and bases of calculation are essential when sizing electronic instantaneous water heaters.

Flow rate \dot{m}_D [kg/min]

$$\dot{m}_D = \frac{P}{c \cdot \Delta\vartheta} \cdot \frac{1h}{60min}$$

\dot{m}_D	Flow rate [kg/min]
P	Output [W]
c	Specific thermal capacity (water: 1.163 Wh/(kg·K))
$\Delta\vartheta$	Temperature differential ($\vartheta_2 - \vartheta_1$) [K]

Example: Instantaneous water heater DHE 21, rated output 21,000 W

What is the flow rate \dot{m}_D , if the DHW temperature is $\vartheta_2 = 38^\circ\text{C}$ and the cold water temperature is $\vartheta_1 = 10^\circ\text{C}$?

$$\dot{m}_D = 21,000 \text{ W} / (1.163 \text{ Wh}/(\text{kg}\cdot\text{K}) \cdot 28 \text{ K}) \cdot 1/60 \text{ h/min}$$

$$\dot{m}_D = 10.7 \text{ kg/min} \triangleq 10.7 \text{ l/min}$$

Rules of thumb for temperature increase $\Delta\vartheta$ [K]

$\Delta\vartheta = 28 \text{ K}$ (from 10°C to 38°C)

$$\dot{m}_D \approx P/2$$

$$\dot{m}_D \approx 21/2 \text{ l/min} = 10.5 \text{ l/min}$$

$\Delta\vartheta = 43 \text{ K}$ (from 10°C to 53°C)

$$\dot{m}_D \approx P/3$$

$$\dot{m}_D \approx 21/3 \text{ l/min} = 7.0 \text{ l/min}$$

DHW temperature ϑ_2 [°C]

$$\vartheta_2 = \frac{P}{c \cdot \dot{m}_D} \cdot \frac{1h}{60min} + \vartheta_1$$

ϑ_2	DHW temperature [°C]
P	Output [W]
c	Specific thermal capacity (water: 1.163 Wh/(kg·K))
\dot{m}_D	Flow rate [kg/min]
ϑ_1	Cold water temperature [°C]

Example: Instantaneous water heater DHE 21, rated output 21,000 W

What is the DHW temperature ϑ_2 if the flow rate is $\dot{m}_D = 10.7 \text{ kg/min}$ and the cold water temperature is $\vartheta_1 = 10^\circ\text{C}$?

$$\vartheta_2 = 21,000 \text{ W} / (1.163 \text{ Wh}/(\text{kg}\cdot\text{K}) \cdot 10.7 \text{ kg/min}) \cdot 1/60 \text{ h/min} + 10^\circ\text{C}$$

$$\vartheta_2 = 28 \text{ K} + 10^\circ\text{C} \triangleq 38^\circ\text{C}$$

Rule of thumb for DHW temperature

$$\vartheta_2 \approx 14 \cdot P / (\dot{m}_D) + \vartheta_1$$

Factor 14 = $1000 / (60 \cdot 1.163)$

$$\vartheta_2 \approx 14 \cdot 21 \text{ kW} / 10.7 \text{ kg/min} + 10^\circ\text{C}$$

$$\vartheta_2 \approx 37.5^\circ\text{C}$$

Rule of thumb for connected load P [kW]

$$P \approx 0.073 \cdot \dot{m}_D \cdot \Delta\vartheta$$

Example

What is the connected load in kW required to increase a flow rate of 10 l/min from 10°C to 38°C ?

$$P \approx 0.073 \cdot 10 \text{ kg/min} \cdot (38^\circ\text{C} - 10^\circ\text{C})$$

$$P \approx 20.4 \text{ kW}$$

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Sizing and configuration

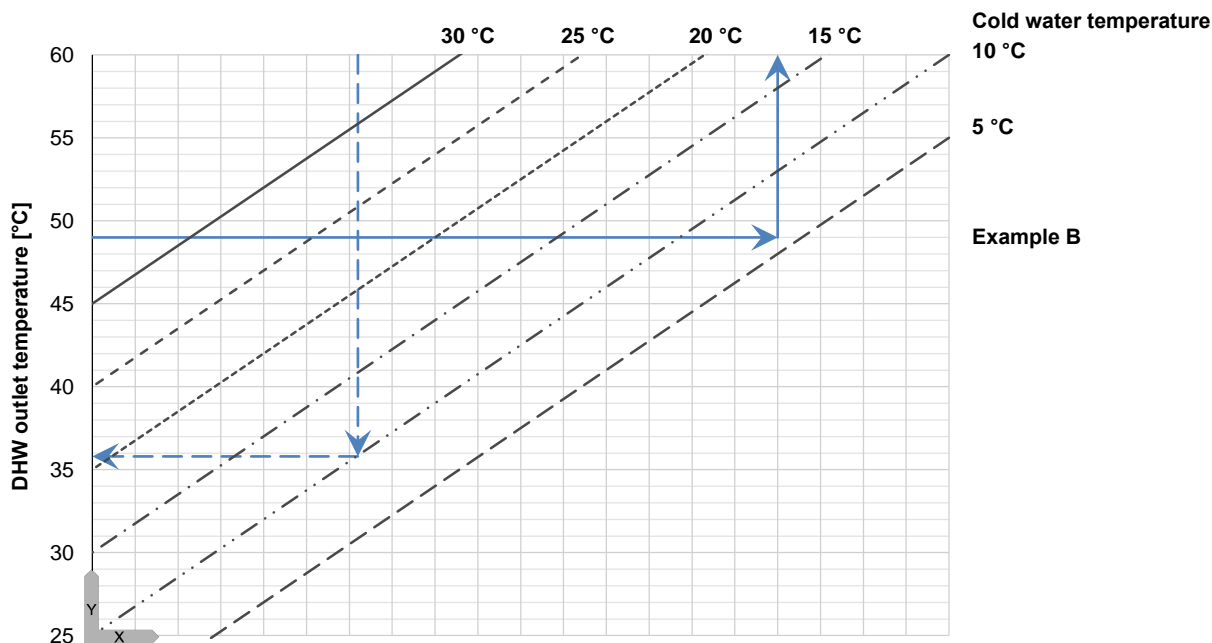
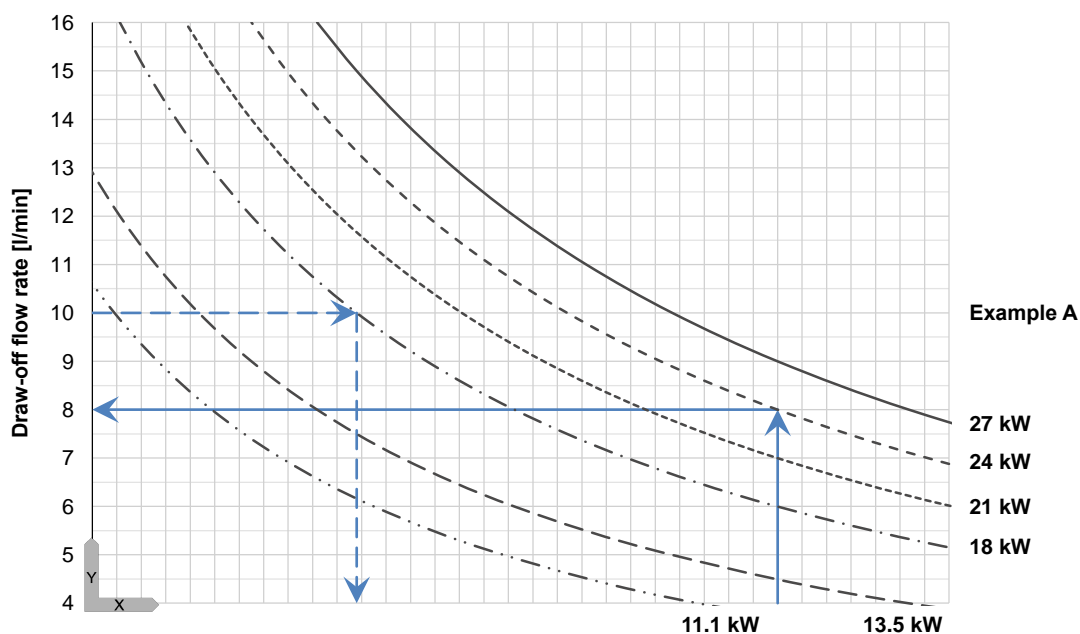
The following charts can also be used when sizing instantaneous water heaters.

Example A

Given: Flow rate 10 l/min
To be determined: Outlet temperature, with cold water temperature of 10 °C and output of 18 kW, e.g. DHE 18 SL
Solution: 35.8 °C

Example B

Given: Outlet temperature 49 °C with cold water temperature of 6 °C;
To be determined: Maximum draw-off flow rate with a 24 kW device, e.g. DHE 24 SL
Solution: 8 l/min



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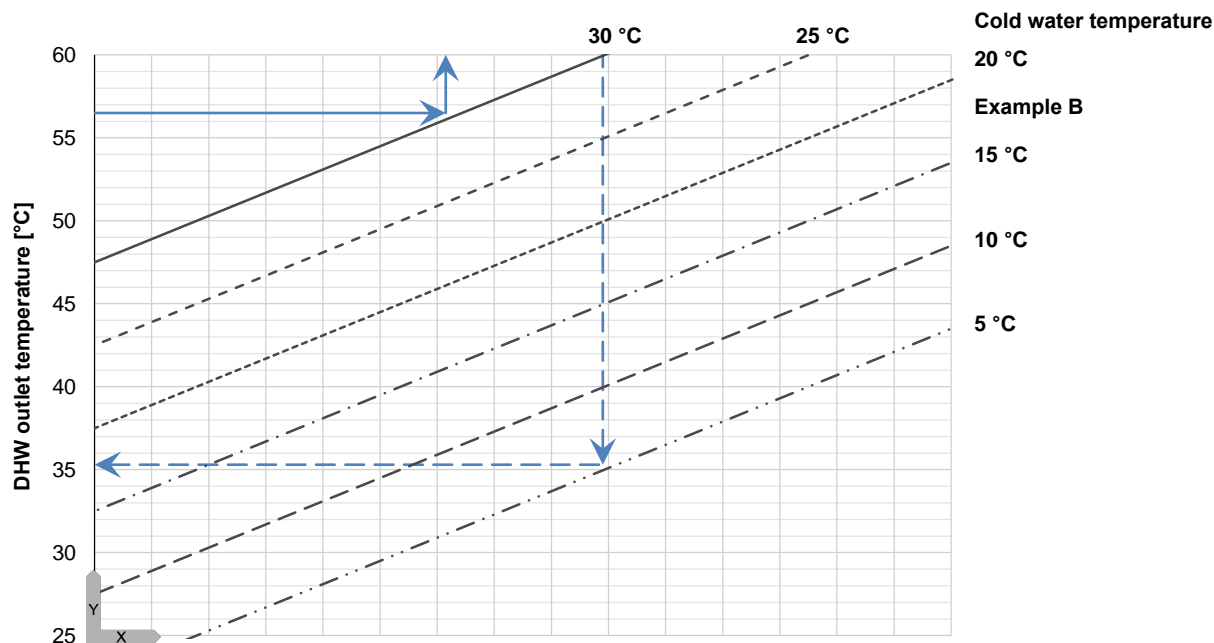
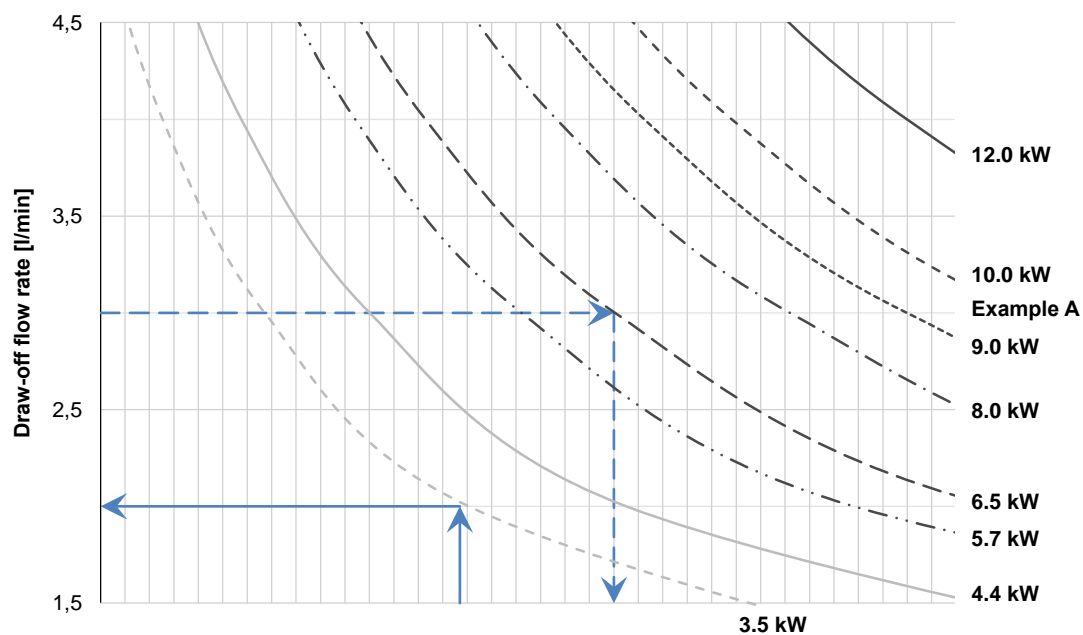
Sizing and configuration

Example A

Given: Flow rate 3.0 l/min
 To be determined: Outlet temperature, with cold water temperature of 5 °C and output of 6.5 kW
 Solution: 31 °C

Example B

Given: Outlet temperature 56 °C with cold water temperature of 30 °C
 To be determined: Maximum draw-off flow rate with a 3.5 kW appliance
 Solution: 1.9 l/min



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Cylinders

The sizing of electrically heated cylinders for group or centralised supply depends on the type of building, the number of units to be supplied in the building, and the facilities in those units. The connected electrical load of the cylinder is not usually based on the peak DHW demand. Instead, the peak demand for DHW must be stored in the cylinder. It therefore makes sense to size the cylinder based on the required amounts of heat/DHW. To do that, one must first determine the longest continuous period of use, such as filling a bath tub, and the associated pattern of consumption. Alternatively the reference values listed above can be used.

The heat amount for a period of use can be calculated as follows:

$$Q_{ges} = N_{WE} \cdot Q_{ges,WE}$$

Q_{tot}	Heat amount for a period of use [kWh]
N_{WE}	Number of residential units with the same profile
$Q_{tot,WE}$	Heat amount for a residential unit for a period of use [kWh]

The heat amount can then be used as the basis for calculating the required amount of DHW at the temperature level of the intended use. Alternatively, the DHW amount can be taken directly from the reference values above.

$$V_{TWW} = \frac{Q_{ges,WE}}{c \cdot (t_{soll} - t_{KW})}$$

V_{TWW}	Required DHW amount for a period of use [l]
c	Specific thermal capacity (water: 1,163 Wh/(kg·K))
t_{set}	Temperature level of use, e.g. 40 °C for a bath tub
t_{KW}	Cold water temperature

The calculation of the required minimum cylinder size must factor in the standby losses, the cylinder efficiency and any losses from DHW circulation lines. DHW circulation losses are only to be included for centralised DHW systems. Group and individual supply systems are usually designed without circulation lines, due to the shorter pipe runs and lower water capacity.

A further decisive factor for sizing is the maximum possible or required cylinder temperature.

$$V_{Sp} = \frac{V_{TWW} \cdot (t_{soll} - t_{KW})}{(t_{Sp} - t_{KW})}$$

V_{cyl}	Required cylinder volume
V_{TWW}	Required DHW amount for a period of use [l]
t_{set}	Temperature level of use, e.g. 40 °C for a bath tub
t_{KW}	Cold water temperature
t_{cyl}	Required cylinder temperature

15–20 % of the cylinder capacity can be assumed to be a supplement compensating for the cylinder volume that cannot be used.

$$t_{Sp} = V_{Sp} \cdot 1,15$$

V_{cyl}	Required cylinder volume
t_{cyl}	Required cylinder temperature

Example: calculating cylinder volume in single circuit operation

A DHW cylinder is required for supply of a group of draw-off points. The required DHW amount is determined by the standard bath tub draw-off point. The maximum cylinder temperature is 60 °C; the cold water temperature is 10 °C; electrical connection: Single circuit

$$t_{cyl} = (110 \text{ l} \cdot (40 \text{ °C} - 10 \text{ °C})) / (60 \text{ °C} - 10 \text{ °C})$$

$$t_{cyl} = 66.3 \text{ l} \cdot 1.15 = 76 \text{ l}$$

Recommendation: wall mounted cylinder with nominal capacity of 80 l

The required connected load for the cylinder is based on the time available between individual periods of use and the off-peak enable times.

$$P_{EL} = \frac{V_{Sp} \cdot c \cdot (t_{Sp} - t_{KW})}{T_{Hz}}$$

P_{EL}	Required connected electrical load [W]
V_{cyl}	Cylinder volume [l]
c	Specific thermal capacity (water: 1,163 Wh/(kg·K))
t_{cyl}	Set cylinder temperature
t_{KW}	Cold water temperature
T_{Hz}	Time between periods of use [h] Recommendation: for single circuit operation $\triangleq 2 \text{ h}$ Enable time in off-peak for dual circuit operation $\triangleq 8 \text{ h}$

Example: calculating the connected electrical load for single circuit operation

The calculation must determine the minimum connected load for the wall mounted cylinder selected earlier, with single circuit operation

$$P_{EL} = (80 \text{ l} \cdot 1.163 \text{ Wh/(kg·K)} \cdot (60 \text{ °C} - 10 \text{ °C})) / T_{Hz}$$

$$P_{EL} = 4650 \text{ Wh} / 2 \text{ h} = 2325 \text{ W}$$

Recommendation: connected electrical load $\geq 3 \text{ kW}$

Example: calculating the cylinder volume and connected electrical load for dual circuit operation

The calculation must determine the cylinder size and the minimum connected load with dual circuit operation if a bath tub is expected to be filled twice in one day (outside the off-peak enable time).

$$V_{cyl} = 2 \cdot 110 \text{ l} / ((60 \text{ °C} - 10 \text{ °C})) / ((40 \text{ °C} - 10 \text{ °C}))$$

$$V_{cyl} = 2 \cdot 66.3 \text{ l} \cdot 1.15 = 152.9 \text{ l}$$

Recommendation: wall mounted cylinder with nominal capacity of 150 l

$$P_{EL} = (150 \text{ l} \cdot 1.163 \text{ Wh/(kg·K)} \cdot (60 \text{ °C} - 10 \text{ °C})) / T_{Hz} =$$

$$P_{EL} = 8722 \text{ Wh} / 8 \text{ h} = 1090 \text{ W}$$

Recommendation: connected electrical load $\geq 2 \text{ kW}$

General

The following additional bases of calculation and formulas can be used generally for design, checking and sizing.

Required heat amount Q [Wh]

$$Q = m \cdot c \cdot \Delta\vartheta$$

Q	Heat amount [Wh]
m	Water volume [kg] (1 kg $\hat{=}$ 1 l)
c	Specific thermal capacity (water: 1,163 Wh/(kg·K))
$\Delta\vartheta$	Temperature differential ($\vartheta_2 - \vartheta_1$) [K]

Example

How many Wh are required to heat 80 kg of water from $\vartheta_1 = 10^\circ\text{C}$ to $\vartheta_2 = 55^\circ\text{C}$?

$$Q = 80 \text{ kg} \cdot 1.163 \text{ Wh}/(\text{kg}\cdot\text{K}) \cdot 45 \text{ K}$$

$$Q = 4187 \text{ Wh} \hat{=} 4.2 \text{ kWh}$$

Required energy demand (work) W [Wh]

$$W = \frac{m \cdot c \cdot \Delta\vartheta}{\eta}$$

W	Energy demand [Wh]
m	Water volume [kg] (1 kg $\hat{=}$ 1 l)
c	Specific thermal capacity (water: 1,163 Wh/(kg·K))
$\Delta\vartheta$	Temperature differential ($\vartheta_2 - \vartheta_1$) [K]
η	Efficiency

Example

How much energy is required to heat 80 kg of water from $\vartheta_1 = 10^\circ\text{C}$ to $\vartheta_2 = 55^\circ\text{C}$?

$$W = 80 \text{ kg} \cdot 1.163 \text{ Wh}/(\text{kg}\cdot\text{K}) \cdot 45 \text{ K} / 0.98$$

$$W = 4272 \text{ Wh} \hat{=} 4.3 \text{ kWh}$$

Required output P [W]

$$P = \frac{m \cdot c \cdot \Delta\vartheta}{t \cdot \eta}$$

P	Output [W]
m	Water volume [kg] (1 kg $\hat{=}$ 1 l)
c	Specific thermal capacity (water: 1,163 Wh/(kg·K))
$\Delta\vartheta$	Temperature differential ($\vartheta_2 - \vartheta_1$) [K]
t	Heat-up time [h]
η	Efficiency

Example

80 kg of water are to be heated from $\vartheta_1 = 10^\circ\text{C}$ to $\vartheta_2 = 55^\circ\text{C}$ in 8 hours.

$$P = (80 \text{ kg} \cdot 1.163 \text{ Wh}/(\text{kg}\cdot\text{K}) \cdot 45 \text{ K}) / (8 \text{ h} \cdot 0.98)$$

$$P = 534 \text{ W}$$

Heat-up time t [h]

$$t = \frac{m \cdot c \cdot \Delta\vartheta}{P \cdot \eta}$$

m	Water volume [kg] (1 kg $\hat{=}$ 1 l)
c	Specific thermal capacity (water: 1,163 Wh/(kg·K))
$\Delta\vartheta$	Temperature differential ($\vartheta_2 - \vartheta_1$) [K]
P	Output [W]
η	Efficiency

Example

Required heat-up time for 80 kg of water heated from $\vartheta_1 = 10^\circ\text{C}$ to $\vartheta_2 = 55^\circ\text{C}$ with connected load of 2000 W

$$t = (80 \text{ kg} \cdot 1.163 \text{ Wh}/(\text{kg}\cdot\text{K}) \cdot 45 \text{ K}) / (2000 \text{ W} \cdot 0.98)$$

$$t = 2.1 \text{ h}$$

Mixed water temperature ϑ_M [°C]

$$\vartheta_M = \frac{m_1 \cdot \vartheta_1 + m_2 \cdot \vartheta_2}{m_1 + m_2}$$

ϑ_M	Mixed water temperature [°C]
m_1	Amount of cold water [kg]
ϑ_1	Cold water temperature [°C]
m_2	Amount of DHW [kg]
ϑ_2	DHW temperature [°C]

Example

When 80 kg of water (m_2) at $\vartheta_2 = 55^\circ\text{C}$ is mixed with 40 kg of water (m_1) at $\vartheta_1 = 10^\circ\text{C}$

$$\vartheta_M = (40 \text{ kg} \cdot 10^\circ\text{C} + 80 \text{ kg} \cdot 55^\circ\text{C}) / (40 \text{ kg} + 80 \text{ kg})$$

$$\vartheta_M = 40^\circ\text{C}$$

Mixed water volume m_M [kg] or [l]

$$m_M = \frac{m_2 \cdot (\vartheta_2 - \vartheta_1)}{\vartheta_M - \vartheta_1}$$

m_M	Mixed water volume [kg]
m_2	Amount of DHW [kg]
ϑ_2	DHW temperature [°C]
ϑ_1	Cold water temperature [°C]
ϑ_M	Mixed water temperature [°C]

Example

How much mixed water at a temperature of $\vartheta_M = 40^\circ\text{C}$ do you get by mixing cold water at $\vartheta_1 = 10^\circ\text{C}$ into 80 kg of DHW at $\vartheta_2 = 55^\circ\text{C}$?

$$m_M = (80 \text{ kg} \cdot (55^\circ\text{C} - 10^\circ\text{C})) / (40^\circ\text{C} - 10^\circ\text{C})$$

$$m_M = 120 \text{ kg} \approx 120 \text{ l}$$

Economic feasibility study

Economic feasibility studies are used to compare different system concepts, and form the basis for objective decision making. For this, all possible costs should be included and split over the respective cost categories. It is possible to examine the influence of the different types of costs separately.

Cost calculation to VDI 2067

The VDI 2067 guideline concerns the viability calculation of technical services for buildings; it uses the annuity method. It is structured as follows:

Group 1 (Parts 10 to 14)

Energy demand of heated and air-conditioned buildings.

Group 2 (Parts 20 to 27)

Energy expenditure for benefit transfer, for example for DHW heating

Group 3 (Part 30)

Distribution energy expenditure.

Group 4 (Parts 40 to 46)

Energy expenditure for generation

This calculation takes into account the dynamic development of costs, interest and prices for a period in the future. The guideline details the required interest and annuity factors which are applied, over the period under consideration, to the investment amounts which remain the same each year. Costs are split over the following categories for this calculation:

Capital costs

These include interest and repayment of the invested capital for the respective system.

Costs of consumption

This include above all the energy costs, but can also include costs for auxiliary energy or fuels and other operating fluids.

Operational costs

This cost category includes primarily the costs of maintenance, monitoring, meter reading and cleaning.

Example: Apartment building with 7 residential units

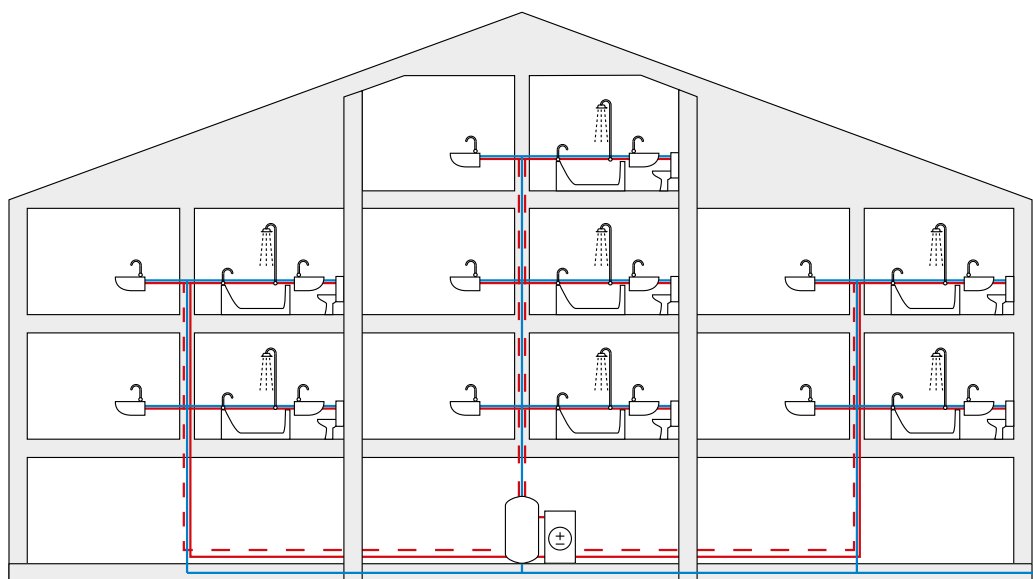
The following example of a cost calculation is based on the terms and definitions explained here as well as the annuity method from VDI 2067. Payback periods are also determined and displayed, based on the present value method.

The example compares the following two system concepts for DHW heating in the same building. Based on an apartment building with 7 residential units.

Centralised DHW supply, fossil fuel heat source (gas)

The DHW is heated centrally, in an unheated basement. The pipework is laid out for comparison purposes in accordance with EnEV / DIN4701-10 and is structured as follows:

Section	Length [m]	Heat losses [kWh/year]
Pipelines between DHW generator and risers	44.1	2230
Main lines in the heated area, including DHW circulation	67.9	2735
Branch lines, connection between main line and draw-off point including DHW circulation	45.3	912



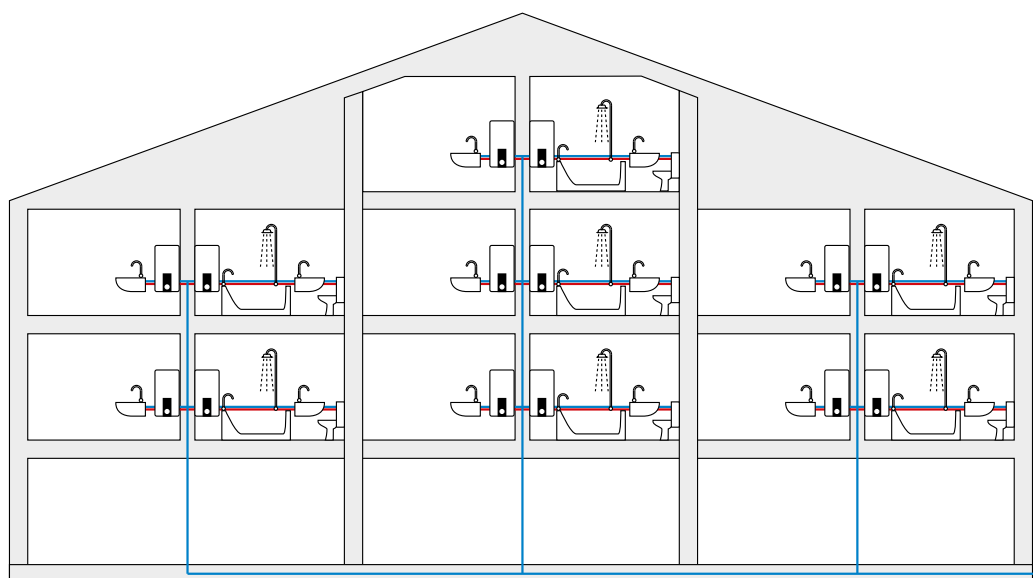
Centralised DHW supply, fossil fuel heat source (gas)

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Decentralised DHW supply, electronic instantaneous water heater (electricity)

The DHW heating is decentralised in each apartment, set up as group supply using instantaneous water heaters with electronic closed loop control. The DHW pipework is laid out for comparison purposes in accordance with EnEV / DIN4701-10 and is restricted to:

Section	Length [m]	Heat losses [kWh/year]
Branch lines between DHW generator and draw-off point	11.3	228



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Decentralised DHW supply, electronic instantaneous water heater (electricity)

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Sizing and configuration

System comparison	New installation of decentralised DHW heating, electronic instantaneous water heaters		New installation of centralised DHW heating, gas condensing, central heating	
DHW demand				
Annual heat demand (DHW)	kWh/a	11,312		11,312
Annual heat demand (DHW) including losses	kWh/a	12,322		20,107
Annual energy demand for auxiliary energy / generator losses	kWh/a	0		360
Final energy demand for DHW	kWh/a	12,322		20,107
Final energy demand relative to the decentralised electric system	%	100		163
Investment				
Heat generator, cylinder, instantaneous water heaters including installation	€	5,600		4,500
Hydraulic distribution system including installation and meters	€	4,500		18,500
Total investment outlay	€	10,100		23,000
Investment costs relative to the decentralised electric system	%	100		228
Average service life	years	20		20
Average annuity		0.0736		0.0736
Capital costs	€/a	743		1,693
Energy and operating costs				
Energy costs for DHW	€/a	2,957		1,508
Energy costs for household / auxiliary energy	€/a	0		86
Maintenance / repairs	€/a	152		345
Inspections according to TrinkwV	€/a	0		155
Expenses for annual meter reading and billing	€/a	0		220
Total energy and operation-related costs	€/a	3109		2,314
Total costs				
Total costs	€/a	3,852		4,007
Total costs	€/m²/p.a.	4.26		4.43
Total costs relative to the decentralised electric system	%	100		104
Payback period				
Capital difference	€	-		12,900
	Energy / operating costs [€]	Cash value factor	Energy / operating costs [€]	Cumulative return
Year 1	3,109	0.971	2,314	12,129
Year 2	3,227	0.943	2,394	11,344
Year 3	3,350	0.915	2,478	10,545
Year 4	3,478	0.888	2,566	9,735
Year 5	3,611	0.863	2,658	8,913
Year 6	3,749	0.837	2,755	8,080
Year 7	3,893	0.813	2,857	7,237
Year 8	4,043	0.789	2,964	6,385
Year 9	4,199	0.766	3,076	5,524
Year 10	4,361	0.744	3,193	4,655
Year 11	4,529	0.722	3,317	3,780
Year 12	4,704	0.701	3,447	2,898
Year 13	4,886	0.681	3,583	2,011
Year 14	5,076	0.661	3,727	1,119
Year 15	5,273	0.642	3,877	223
Year 16	5,477	0.623	4,035	-676
Year 17	5,690	0.605	4,200	-1,577
Year 18	5,912	0.587	4,374	-2,480
Year 19	6,142	0.570	4,557	-3,384
Year 20	6,382	0.554	4,749	-4,288

The calculations for energy consumption and CO₂ emissions were performed using Hottgenroth-Energieberater Plus 7.1.0. The total costs were determined with reference to VDI 2067. Savings over the period of 20 years were determined using the present value method, incorporating rates of inflation for various energy sources. All costs include the applicable value added tax at the rate of 19 %.

Every care has been taken in arriving at these costs, but deviations from the calculations shown are nevertheless possible. This may be due to differences in energy prices or fluctuations in the investment costs.

The calculation is based on the following conditions: electricity price: €0.26/kWh; gas price: €0.075/kWh; interest rate: 3 %; inflation for gas: 5 %/p.a.; inflation for electricity: 4 %/p.a.

DHW installation

Underlying standards and regulations

Fundamental technical rules for hydraulic connections and DHW installations were revised in 2012. The DIN 1988:2012-05 series of standards constituted important regulations specifically designed for national standardisation in Germany. The standard currently consists of the following parts (technical rules for drinking water installations – Part 200: Installation Type A (closed system) – Planning, components, apparatus, materials; DVGW code of practice):

- › Part 100: Protection of drinking water, maintaining the drinking water quality – Technical rules of the DVGW
- › Part 200: Installation Type A (closed system) – Planning, components, apparatus, materials; DVGW code of practice
- › Part 300: Calculating pipe diameters; technical rules of the DVGW
- › Part 500: Pressure raising systems with variable speed pumps; technical rules of the DVGW
- › Part 600: Drinking water installations in conjunction with fire fighting and fire safety systems; technical rules of the DVGW

Part 200 replaces not only DIN 1988-2:1988-12, but also DIN 1988-5:1988-12 (technical rules for drinking water installations Part 5: Pressure boosting and reduction) and DIN 1988-7:1988-12 (technical rules for drinking water installations Part 7: prevention of corrosion and scaling).

Provisions contained therein and not already contained in European standard DIN EN 806-2:2005-06 were added to the current series of standards and updated to reflect the latest technological developments.

The DIN 1988:2012-05 series of standards applies together with European standard DIN EN 806-2:2005-06 for the engineering of drinking water installations. It complements DIN EN 806-2 and makes additional determinations reflecting national laws and regulations (technical rules for drinking water installations – Part 200: Installation Type A (closed system) – Planning, components, apparatus, materials; DVGW code of practice).

The following section lists important requirements for the connection of DHW heating systems from DIN 1988-200:2012-05 (technical rules for drinking water installations – Part 200: Installation type A (closed system) – Planning, components, apparatus, materials; technical rules of the DVGW) and DIN EN 806-2.

This list is not exhaustive. Accepted engineering standards must always be observed.

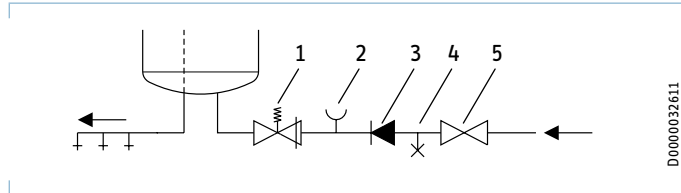
This standard divides DHW heaters according to their operating mode into systems or appliances for:

- › Decentralised supply, and specifically:
 - Individual supply or
 - Group supply
- › Centralised supply

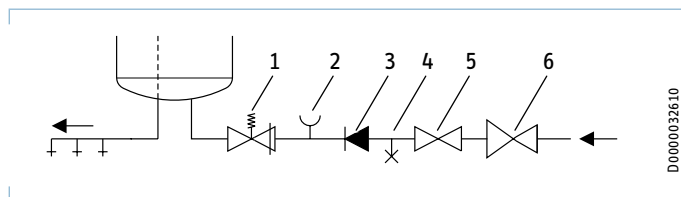
Different requirements also apply based on function (instantaneous DHW heaters, DHW cylinders), structural design (open vented or sealed unvented DHW heaters) and the type of heating (direct or indirect).

Cold water connection

For the cold water connection, the requirements of DIN EN 12897 must also be followed in addition to DIN 1988 Part 200. The connection can be established like those in the following diagrams.



Cold water connection



Cold water connection with additional pressure reducing valve

- 1 Safety valve
- 2 Pressure gauge test connector
- 3 Non-return valve
- 4 Inspection valve
- 5 Straight-through shut-off valve (butterfly)
- 6 Pressure reducing valve

- › Regardless of the type of heating used by the DHW heater, a non-return valve must be installed in the cold water line.
- › For inspection and replacement of the non-return valve, shut-off valves must be installed before and after it. The second, downstream shut-off valve can be dispensed with if the nominal capacity is 200 l or less.
- › A test facility must be installed between the shut-off fitting and the non-return valve to allow the functioning of the non-return valve to be checked.
- › A connection point for a pressure gauge must be provided as a minimum.

Measures to prevent excessively high pressure; pressure control

For reasons of stability, all parts of DHW systems must be designed for permissible operating pressure of 1 MPa, unless allowance must be made for higher permissible operating pressures or temperatures.

If any DHW heaters are designed only for operating pressures less than 1 MPa, appropriate safety valves must be used and approved.

Open vented DHW heaters

These appliances are constantly open to, and cannot be shut off from, the atmosphere. For example, decentralised small water heaters are thus not subject to pressure. A pressure of 100 kPa must not be exceeded during operation.

Appliances with a permanently open outlet and an open vented DHW cylinder do not require any safety equipment in the cold water inlet line.

Sealed unvented DHW heaters

These appliances are permanently under pressure from the cold water mains line.

All sealed unvented DHW cylinders must be fitted with at least one diaphragm safety valve. The safety valve must have a TÜV type approval code in accordance with TRD 721.

Nominal diameter of safety valves for sealed unvented DHW cylinders:

Min. valve size * [DN]	Nominal capacity [l]	Max. heating output [kW]
15 (Rp ½)	≤ 200	75
20 (Rp ¾)	≥ 200 ≤ 1000	150
25 (Rp 1)	≥ 1000 ≤ 5000	250

* The size of the inlet connection is used as the valve size.

The following applies to the installation of diaphragm safety valves:

- › Install these safety valves in the cold water line. No shut-off valves, restrictions or strainers must be installed between the DHW cylinder and the safety valve connection.
- › The safety valves should be close to the DHW cylinder and must be easily accessible. The supply line to the safety valve must be at least of the same nominal diameter as that of the safety valve and must have a length < 10xDN.
- › Install the safety valve high enough to enable the connected discharge pipe to be installed with a downward slope. We recommend that the safety valve is fitted above the DHW cylinder, enabling it to be replaced without having to drain the cylinder.

The following details apply to the setting pressure (response pressure) of safety valves:

The safety valves supplied by the manufacturer have a fixed setting. The response pressure of the safety valve must be less than or equal to the permissible operating pressure of the DHW heater. The maximum pressure in the cold water line must be at least 20 % below the response pressure of the safety valve. If the maximum pressure in the cold water line is higher, a pressure reducing valve must be installed.

Max. permissible pressure of the DHW heater [MPa]	Response pressure of the safety valve [MPa]	Max. pressure in the cold water line [MPa]
0.6	0.6	≤ 0.48
0.7	0.7	≤ 0.56
1.0	1.0	≤ 0.8

Sealed unvented instantaneous DHW heaters

These appliances are permanently under pressure from the cold water mains line. The water is heated during draw-off.

Appliances with nominal volume ≤ 3 l can be installed without a safety valve.

DHW distribution and hygiene requirements

DIN 1988-200 states that the DHW temperature at the draw-off point must be 55 °C, 30 s after the draw-off point is fully opened. All decentralised devices and DHW heaters with high rates of water exchange are exempt from this rule.

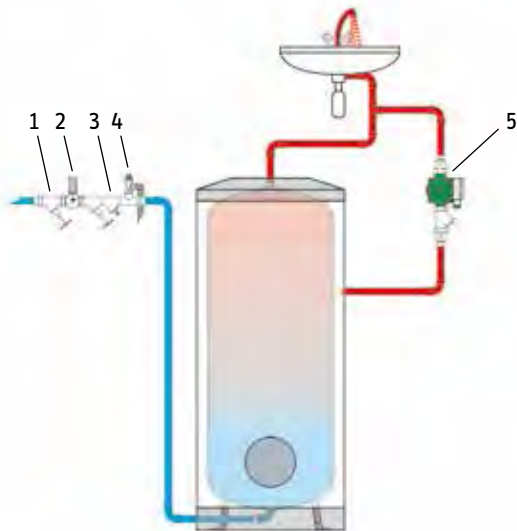
- › Decentralised appliances with a draw-off tap for individual supply, such as small water heaters or mini instantaneous water heaters can be operated without additional hygiene requirements.
- › Decentralised DHW heaters, .e.g. instantaneous water heaters, can be operated without additional hygiene requirements if the downstream pipeline volume from heater to draw-off point is less than 3 l.
- › Decentralised cylinders for supply of a group, e.g. in a bathroom, must supply a temperature ≥ 50 °C at the outlet of the cylinder.
- › Centralised DHW heaters, e.g. cylinders, must be designed and constructed so that the temperature at the outlet of the cylinder is always ≥ 60 °C. Brief deviations in the minute range, e.g. during or after peak draw-off, are permitted.
- › When planning and constructing centralised DHW heaters, e.g. cylinders in detached and 2-family houses or instantaneous water heaters with downstream pipeline volume < 3 l, it is important to ensure that a temperature of ≥ 60 °C is possible at the outlet of the DHW heater and a temperature of 55 °C is possible at the inlet of a DHW circulation line. The required cylinder temperature can be set to ≥ 50 °C if the water in the cylinder and pipeline is guaranteed to be exchanged within 3 days of operation and the user is informed during commissioning about the possible health risk (growth of Legionella). Otherwise the set temperature should be 60 °C. Operating temperatures < 50 °C should be avoided.

As a basic rule when installing pipes in systems for group and centralised supply, one should ensure that the pipes are in straight lines, parallel and with pipe runs and distances kept as short as possible.

If the pipeline between the cylinder outlet and the most distant draw-off point has capacity > 3 l, a DHW circulation line should be installed. The temperature in the DHW circulation system must not exceed the water temperature at the cylinder outlet by more than 5 K.

The connecting circuitry for centralised or decentralised cylinders can vary. A few examples are shown below.

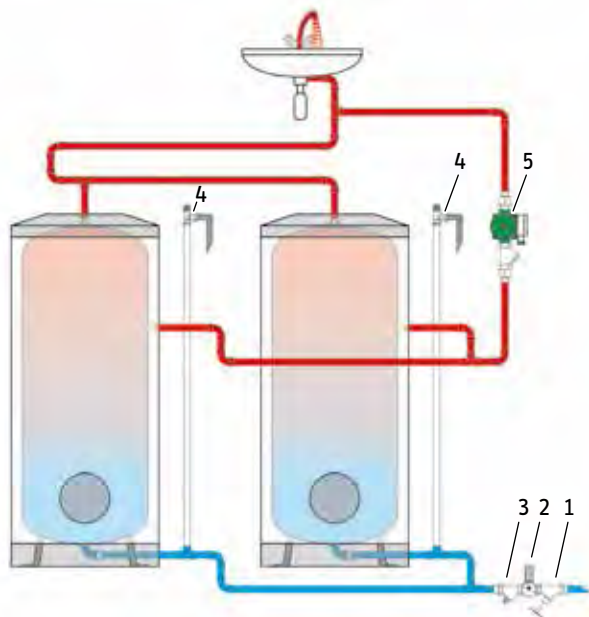
Connection of a floorstanding or wall mounted cylinder, with or without DHW circulation line



5%20SHW%20SG

Parallel connection of one or more floorstanding cylinders

Suitable for achieving high peak draw-off flow rates, e.g. in the case of high simultaneous use of the consumers, with simultaneously high availability of reheating, e.g. electrical single circuit operation

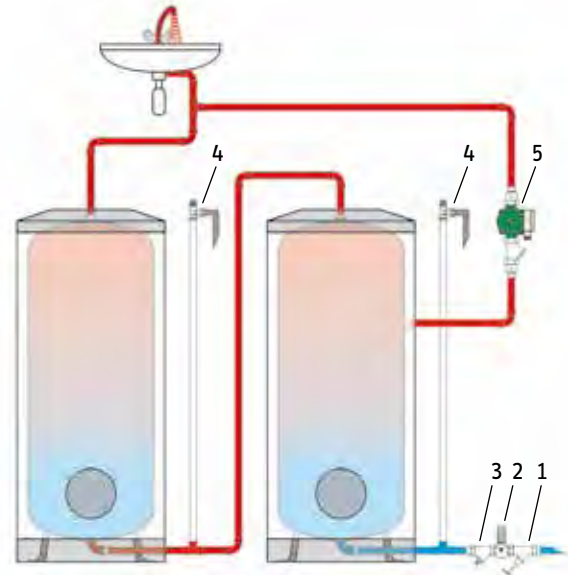


5%20SHW%20%20

- 1 Shut-off valve
- 2 Pressure reducing valve
- 3 Non-return valve
- 4 Safety valve
- 5 DHW circulation pump

Series connection of one or more floorstanding cylinders

Suitable for achieving high DHW delivery capacity at low draw-off flow rates and with restricted availability of reheating, e.g. electrical dual circuit operation.



5%20SHW%20%20

Sound insulation for instantaneous water heaters and taps

Sound insulation requirements are subject to e.g. the DIN 4109 series of standards. Those standards define e.g. values for permissible sound pressure levels in rooms and requirements for appliances and taps.

The general Building Regulation test certificate [Germany] verifies the suitability of the product listed in the certificate in accordance with the State Building Order with regard to noise emissions.

Valves/taps and instantaneous water heaters (not cylinders) must be designated beginning with Ü (conformity symbol) based on the "General Building Regulation test certificate" and with "P" to verify their suitability regarding noise emissions. To prevent confusion in the market, the current format of the P-IX test symbol has been retained and therefore forms part of the Ü designation.

Meaning



Conformity symbol for building products in accordance with the State Building Orders [Germany]. The manufacturer certifies conformity for fittings/taps and instantaneous water heaters based on their noise characteristics. A general test certificate is issued by the building supervisory authority.
Example: The test certificate number for the instantaneous water heater type DHE is PA-IX.

Water quality and materials

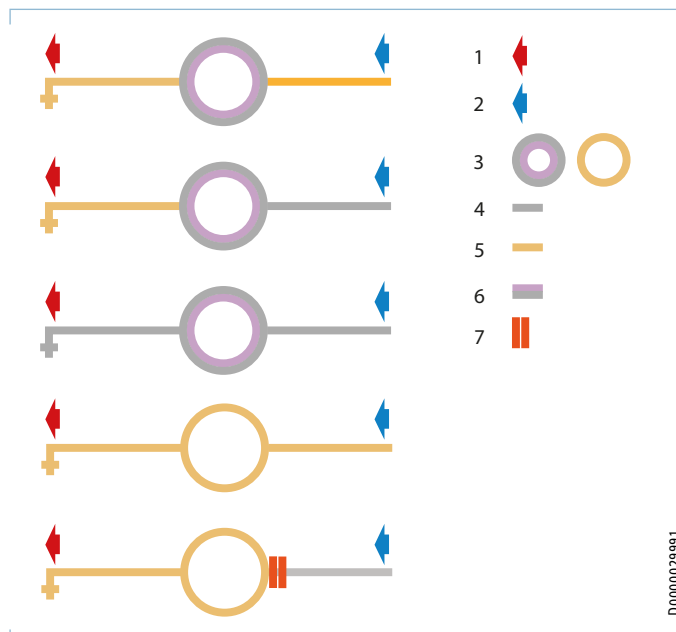
Combining appliances, internal cylinders and pipes of different materials may affect the likelihood of corrosion of particular components.

The functioning and durability of DHW appliances is therefore highly dependent on selecting the right materials for internal cylinders and pipes.

In addition to the operating conditions and the installation design, the corrosion characteristics of a material are strongly influenced by the chemical composition of the water.

The following table and diagram show possible suitability and possible installation options for the DHW heater.

Cylinder material	Suitability
Copper	For any kind of water
Polypropylene	For any kind of water
Steel with anticor® enamel coating directly applied internally	For any kind of water



- 1 DHW outlet line
- 2 Cold water inlet line
- 3 Appliance
- 4 Galvanised steel
- 5 Copper
- 6 Steel with internal enamel coating
- 7 Intermediate piece made of gunmetal

It is thus possible to combine copper pipes with pipes made from galvanised steel, for example. In such cases, the products made of galvanised steel must be installed before the copper in the direction of flow.

The water will then flow from the galvanised steel material to the components made of copper. Direct contact between the two materials must be prevented, e.g. by using an intermediate piece made of gunmetal. It is therefore not possible to use both materials in a DHW circulation system.

The use of taps made from copper alloys is not critical in this context, because the surface area of the taps is relatively small.

Likewise, the corrosion risk from the use of instantaneous water heaters with galvanised pipes is quite low because only a relatively small copper surface is exposed to the water by such appliances. The number of copper ions leaching into the water is minimal. However, this requires a sound water quality at the installation location plus adequate flushing of the lines to prevent the formation of corrosion nuclei. The relevant decision has to be made in situ by a qualified contractor.

With respect to the water quality, it is recommended to make use of practical experience of the water at the site, or to consult the local water supply utility in order to make an assessment using a water analysis or to find out about any expected changes in the water quality.

The EN 12502 series of standards lists the values required in the water analysis and the procedure for an assessment.

For instance, an assessment of the electrical conductivity of the water is important for the use of instantaneous water heaters with a bare wire heating system.

Application ranges for instantaneous water heaters with bare wire heating systems, relative to the water's specific electrical conductivity / resistance

		Stand- ard spec. at 15 °C	20 °C	25 °C	30 °C	45 °C	55 °C	60 °C
Resistance	Ω cm	≥900	≥800	≥735	≥670	≥550	≥490	≥470
Conduct- ance	μS/cm	≤1110	≤1250	≤1360	≤1490	≤1820	≤2040	≤2130
Resistance	Ω cm	≥1000	≥890	≥815	≥739	≥600	≥540	≥515
Conduct- ance	μS/cm	≤1000	≤1120	≤1230	≤1350	≤1670	≤1850	≤1940
Resistance	Ω cm	≥1100	≥970	≥895	≥810	≥660	≥590	≥565
Conduct- ance	μS/cm	≤910	≤1030	≤1120	≤1240	≤1520	≤1700	≤1770
Resistance	Ω cm	≥1200	≥1070	≥985	≥900	≥720	≥650	≥615
Conduct- ance	μS/cm	≤830	≤940	≤1020	≤1110	≤1390	≤1540	≤1630
Resistance	Ω cm	≥1300	≥1175	≥1075	≥970	≥780	≥700	≥670
Conduct- ance	μS/cm	≤770	≤850	≤930	≤1030	≤1280	≤1430	≤1490

Conversion factor: 10 μS/cm = 1 mS/m

The following applies for bare wire water heaters: according to DIN EN 60335-2-1-13.2, the maximum leakage current is 5 mA

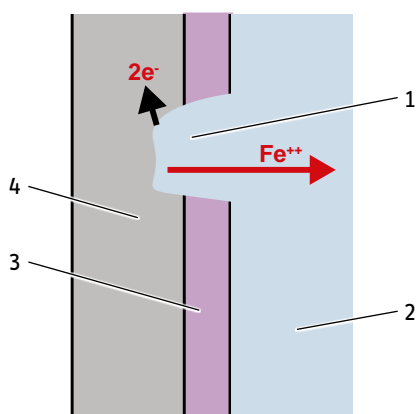
According to DIN EN 60335-35-7.1, the specific resistance of the water at 15 °C must not exceed 1300 Ω cm.

Corrosion protection

- Iron ions (Fe^{++}) go into solution, giving off electrons (2e^-).
- An oxide is formed with the oxygen contained in the water; iron oxide = "rust"

Corrosion is defined as a measurable change in a material as a result of reactions with its environment. In most cases these reactions are of an electrochemical nature.

The driving force in these is a difference in potential between the corroding metal (the anode) and a counter electrode (the cathode). Reactions involving electrons occur on both electrodes, with the actual corrosion process liberating electrons from the less noble electrode. The impulse current between anode and cathode is assured by the movement of ions through electrolytes (the corrosive medium) and is a measure of the speed of the corrosion process. The electrochemical series enables only a rough estimate of the corrosion behaviour of the metals, since the individual potentials of the anode and cathode are substantially dependent on the physical-chemical parameters of the composition of the corrosive medium and the corrosion products.



- 1 Flaw
- 2 Water
- 3 Email
- 4 Cylinder

Corrosion can be largely prevented if certain fundamental rules are observed when selecting and installing cylinder and pipework materials. The internal cylinders of water heaters are made either from corrosion-resistant materials, such as copper or polypropylene, or the inside of a steel cylinder is protected from corrosion by an enamel coating.

Corrosion-resistant materials

For open vented (non-pressurised) small water heaters (5-15 l), corrosion-resistant materials such as temperature-resistant polypropylene used in cylinders have proven very successful for many years now.

Sealed unvented (pressure-tested) small water heaters are fitted with an internal cylinder made from copper or an enamelled steel cylinder.

Wall mounted cylinders 30-150 l and floorstanding cylinders 200-1000 l have a steel cylinder with a special internal enamel coating.

Corrosion-protected materials

Adequate corrosion protection is also provided by corrosion-protected materials such as steel cylinders with internal enamel coating. Sealed unvented cylinders with internal enamel coating are available in capacities of 30 - 1000 l. The protective enamel layer with its 0.4 mm overall thickness is highly resistant to abrasion. Enamel is a special type of glass with a particular chemical composition and special physical properties. Enamel is the ideal surface protection for metal. Enamelling creates a composite material comprising metal and glass that combines the positive properties of both materials in an optimum fashion.

This composite material is hard, resistant to abrasion, corrosion, weather and heat, non-flammable, resistant to chemical attack, colour-fast, hygienically safe and non-toxic. In spite of every conceivable care being taken, irregularities can occur during the enamelling process (flaws or wear spots) that may initially not be apparent. Additional cathodic protection is provided to ensure lasting corrosion protection.

Active corrosion protection

Cathodic corrosion protection

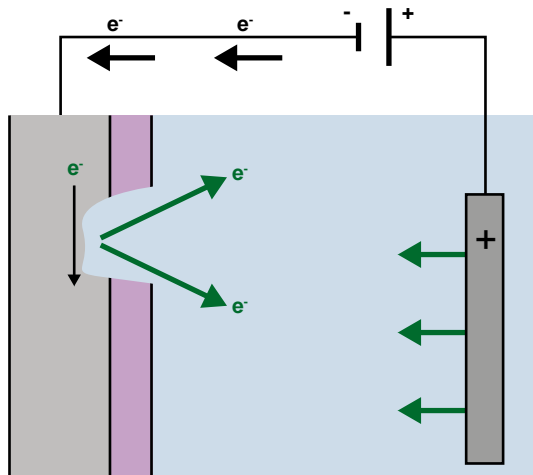
- A superimposed, opposing protective current prevents "rusting" through an excess of electrons (e^-) at the site of the flaw.

The tendency of the iron to go into solution at the site of any flaws or wear on the enamel is suppressed by superimposing an opposing current (the protective current). The resulting excess of electrons (cathodic polarisation) at the flaw shifts the difference in potential between the anode and the cathode (the cylinder) until corrosion stops.

To prevent concentration of the anodic current on objects built into the cylinder, such as immersion heaters and indirect coils, such objects are fitted with appropriate insulation.

The cathodic corrosion protection is achieved using an impressed current anode or a protective magnesium anode:

Impressed current anode



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- › Small flow of current (the protective current) from external voltage source, producing excess of electrons
- › Free of maintenance and wear
- › Current intensity is regulated according to the flaw (size, severity)

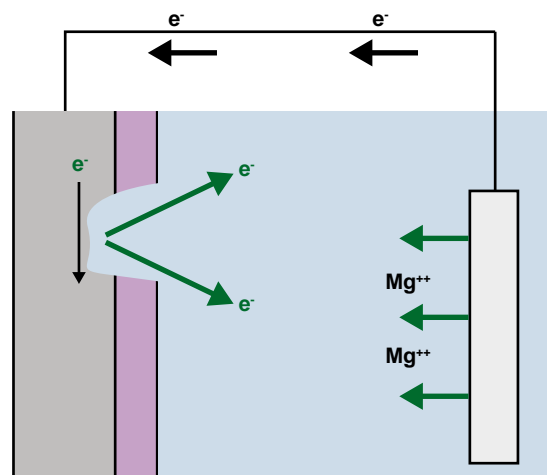
Unlike the protective magnesium anode, the protective current here is impressed by an external power source. The DC current required for corrosion protection is fed in and regulated from outside with electronic closed loop control (SHZ LCD).

The titanium anode rod coated with inert metal oxide functions as the infeed and test electrode.

The power feed is periodically interrupted for a short time. Then the difference in potential is checked. That difference is then compared by the electronics with the set potential. Constantly matching the actual potential to the set potential regulates the intensity of the protective current accurately to the actually required value. The required current intensity is determined primarily by the presence and severity of any flaws in the enamel.

The titanium rod is not subject to metal dissolution when the current is given off (inert material). Impressed current anodes are free from wear and require no maintenance.

Protective magnesium anode



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- › Magnesium is less noble than iron and goes into solution more easily.
- › Excess of electrons from liberation of magnesium ions (Mg^{++})
- › Replacement required when used up

The magnesium anode is conductively joined to the internal steel cylinder. A current flows from the anode to any flaws, in accordance with the electrochemical series. This anodic current created by the dissolution of the less noble material prevents corrosion at the damaged spot.

The protective anode integrated into the cylinder is largely made from magnesium and should first be checked after two years.

This is required as there are situations (due to water quality) that can lead to a reduced service life. That first assessment can be used to come to a more accurate conclusion regarding further maintenance intervals.

Power supply

General design information

When designing a system for DHW heating, the design engineer must also deal with the electrical power supply to the system. Important aspects of this include the following:

- › Determining the output demand
- › Selecting simultaneity factors
- › Applying general and engineering standards
- › The use of protective devices
- › Determining safety measures and zones of use

The standards and regulations to be observed when designing the electrical connection include the following.

Neither this list of standards and regulations nor the excerpts of them that follow are intended to be exhaustive. All accepted engineering standards must always be followed in their currently applicable versions.

- › DIN 18015-1:2007-09
- › Electrical installations in residential buildings,
Part 1: Planning principles
- › DIN VDE 0100-430 (VDE 0100-430)
- › Low-voltage electrical installations,
Part 4-43: Protection for safety; Protection of cables and leads against overcurrent
- › DIN VDE 0100-520 (VDE 0100-410)
- › Low-voltage electrical installations,
Part 520: Wiring systems
- › Supplement 2: Protection against overload, Selection of overcurrent protective devices
- › DIN EN 60269-1, VDE 0636-1
- › Low-voltage fuses
- › Part 1: General requirements
- › DIN EN 60898-1, VDE 0641-11
- › Electrical accessories - Circuit breakers for overcurrent protection for household and similar installations
- › Part 1: Circuit-breakers for AC operation

In the preliminary design / planning / engineering phases, the electricity network operator or local power supply utility must be consulted regarding the connection requirements for the building project. The requirements of the locally applicable building laws must also be observed.

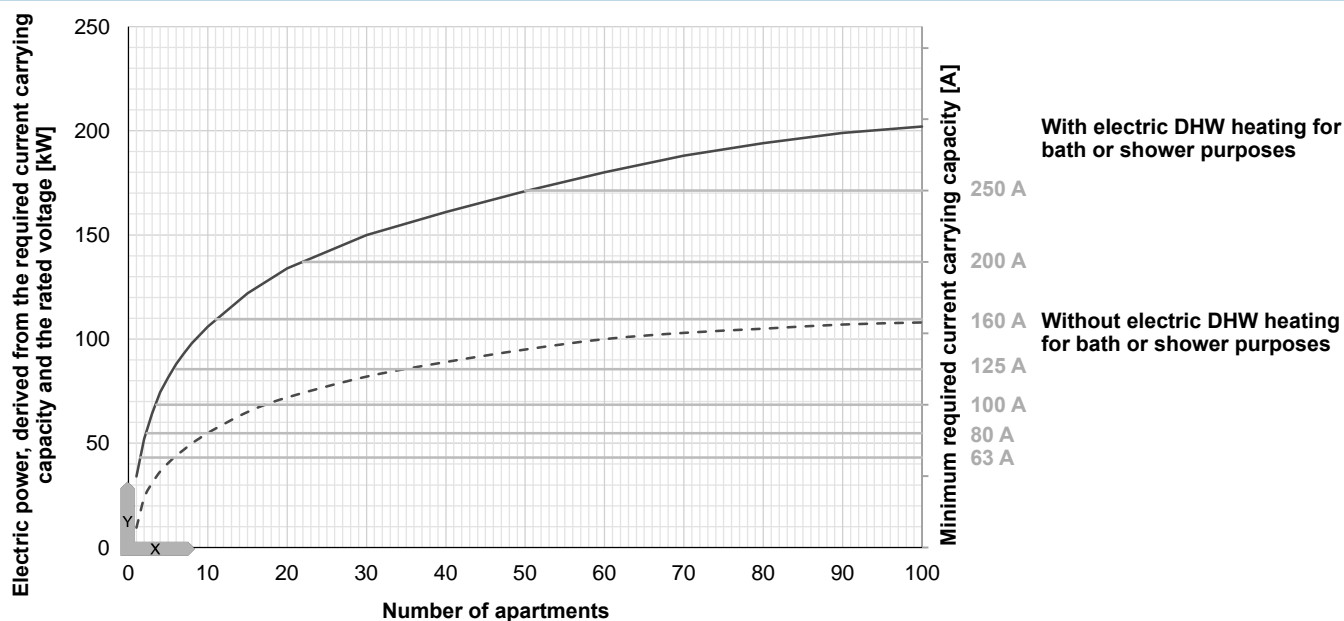
Primary power supply and main lines

The design engineer must determine the cross-section, type and number of main lines based on the number and type of the appliances to be connected. Simultaneity during operation must also be considered. Main lines must always be designed as AC lines.

DIN 18015-1:2007-09 defines the basis for sizing main lines in residential buildings without electric central heating. Based on that, the following information can be used for the sizing of main lines in conjunction with the use of decentralised electric instantaneous water heaters. The final, detailed planning and design must be checked with reference to the above standard.

Rated current for overcurrent protective devices in residential buildings, main line [A]	Maximum number of apartments *
63	1
80	2
100	3
125	6
160	11
200	22
250	50

* Based on DIN 18015-1:2007-09, with electric DHW heating for bath or shower purposes, without electric central heating



Both the curves shown on the graph represent a basis for sizing main lines in apartments without electric central heating. The curve “With electric DHW heating for bath or shower purposes” is applied if the bath and shower water is sourced from instantaneous water heaters, DHW cylinders or instantaneous water cylinders.

Example: The connected load for 10 residential units is either 55 kW (without DHW heating) or 105 kW (with DHW heating). For the 10 installed instantaneous water heaters, it is therefore not the total installed output of e.g. 10 x 27 kW which is applied but simultaneity in operation that is considered. The overcurrent protective device / the building connection would need to be designed with 160 A for this example.

If in addition to a centralised supply, appliances with connected loads < 6 kW are used, such as small water heaters or mini instantaneous water heaters, the curve “without electric DHW heating” would apply. However, in that case, the connected load of the centralised heat source for DHW heating would need to be added to the value determined.

Apartment complexes

A power distribution board for the required overcurrent and residual current devices must be provided in each apartment. The appliances for DHW heating must be taken into account when selecting the power distribution board capacity.

The line from the meter panel to the power distribution board must be an AC line designed with a carrying capacity of at least 63 A.

An AC line with permissible current carrying capacity of at least 35 A must be provided for the connection of electric DHW heating with instantaneous water heaters for bath and/or shower purposes in the apartment.

If rooms/bathrooms/toilet are fitted with a bath tub or shower, special requirements must be considered, e.g. regarding the separation of protection zones according to DIN VDE 0100-701 or additional protective devices.

Departments

The defined zones and rooms with bath tub or shower can be separated by walls with or without windows and doors, horizontal or inclined ceilings, floors and/or permanently installed partitions. If the dimensions of the permanently installed partitions are smaller than the dimensions of the respective zones, the minimum clearance must be maintained horizontally and vertically. This applies, for example, in the case of partitions with a height less than 225 cm. The minimum clearance may also be called the reach-round radius, overreach radius, or safety distance.

Description of zone 0

Zone 0 (zero) is the inside of the bath tub or shower tray. Zone 0 does not apply to showers without tray.

Only electrical equipment with IPX7 protection may be installed in this zone.

Electrical consumers in this zone must meet the following conditions:

- › The appliance must be suitable for use and installation in this zone, according to the manufacturer's details.
- › The appliance must be permanently installed in a fixed position and permanently connected to the power source.
- › The appliance must be protected by SELV with a rated voltage not in excess of 12 V AC or 30 V DC.

Description of zone 1: Zones in rooms with a bath tub or shower tray

Horizontal limits of zone 1

- › Surface of the finished floor and
- › Whichever of the following horizontal planes is higher:
 - at the height of the highest fixed shower head or highest fixed water outlet
 - at the height of 225 cm over the surface of the finished floor

Vertical limits of zone 1

- › Outer edges of the bath tub or shower tray, or
- › For showers without tray: at a distance of 120 cm from the centre of the fixed shower head or fixed water outlet on the wall or ceiling

Zone 1 is not included in zone 0. Zone 1 includes the area below bath tubs and shower trays down to the surface of the finished floor.

Description of zone 2

Horizontal limits of zone 2

- › Surface of the finished floor and
- › Whichever of the following horizontal planes is higher:
 - at the height of the highest fixed shower head or highest fixed water outlet
 - at the height of 225 cm over the surface of the finished floor

Vertical limits of zone 2

- › Vertical planes at the limit of zone 1 and the vertical planes parallel to them at a distance of 60 cm from the limit of zone 1

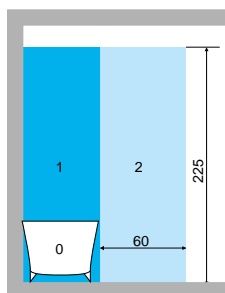
There is no zone 2 in the case of showers without tray. In such cases, zone 1 is enlarged to 120 cm in its horizontal dimension (see description for zone 1).

Water heaters can be installed in zones 1 and 2 as long as they are permanently installed in a fixed position and permanently connected to their power source. The protection rating required for zones 1 and 2 is at least IPX4.

If electrical equipment is exposed to water jets or hose water, e.g. for cleaning purposes, IPX5 protection must be adhered to in zones 1 and 2.

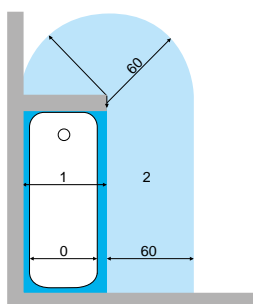
There are no requirements laid down for protection ratings for areas beyond zones 0 to 2.

Dimensions of zones 0, 1 and 2 in rooms with bathtub or shower tray



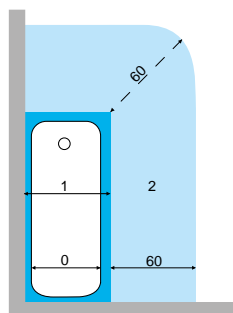
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Side view



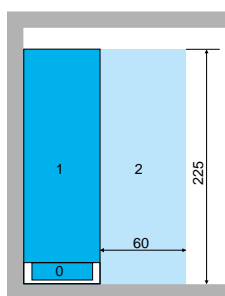
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Plan view with permanently fitted partition and minimum clearance radius for reach-round



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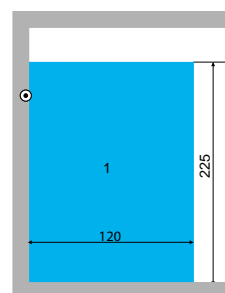
Plan view



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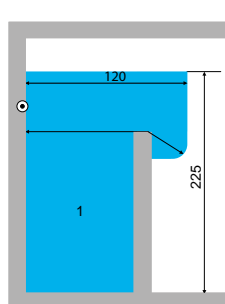
Side view, shower

Dimensions of zone 1 in rooms with shower but without bathtub



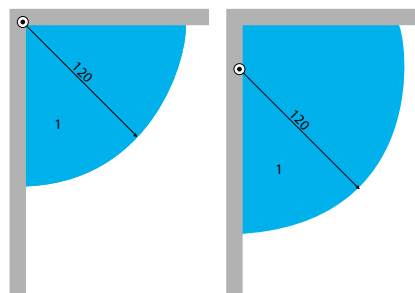
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Side view



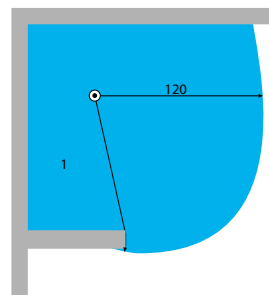
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Side view with permanently fitted partition and clearance for overreach



D0000032252

Plan view with alternate water outlet points



D0000032253

Plan view with permanently fitted partition and clearance for reach-round

All dimensions in cm

⊙ Permanently installed water outlet

IP rating of enclosures to EN 60529

All STIEBEL ELTRON electric DHW appliances meet IP rating requirements.

The IP rating is specified on the type plates of STIEBEL ELTRON DHW appliances.

Examples:

Type	Section	IP rating
DHE	1 and 2	IP25
DEL	1 and 2	IP25
DHB-E	1 and 2	IP25
DHB ST	1 and 2	IP25
HDB	1 and 2	IP25
DHF	1 and 2	IP24
DEM	1 and 2	IP25
DNM	1 and 2	IP25
DHM	1 and 2	IP25
SHZ LCD	1 and 2	IP25
SH S	1 and 2	IP25
PSH	1 and 2	IP25 (vertical), IP24 (horizontal)
SHD	1 and 2	IP25

Explanations of the IP code (International Protection) and the protection ratings for equipment and people:

Component	Numerals or letters	Meaning for protection of the equipment	Meaning for protection of people
Code letters	IP	-	-
First digit	2	Prevents ingress of solid foreign bodies ≥ 12.5 mm diameter	Prevents access to dangerous parts with fingers
Second digit	3	Protected against sprayed water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect
	4	Protected against splashing of water	Water splashed against the enclosure from any direction shall have no harmful effect
	5	Protected against water jets	Water projected as a jet against the enclosure from any direction shall have no harmful effect
Additional letter (optional)	D	-	Prevents access to dangerous parts with wire

If a digit in the code is not specified, it is replaced by an "X".
Example: IPX4

Additional protection through residual current devices (RCD)

For power circuits in rooms with a bath tub or shower, one or more residual current devices (RCDs) with a rated residual current of $I_{\Delta N} \leq 30$ mA are required. In the following cases, the additional protection of residual current devices (RCDs) is not required:

- › Power circuits which are exclusively intended for the supply of permanently connected DHW heaters
- › Power circuits with the protective measure "Protection by safety separation" and which supply an individual consumer
- › Power circuits with the protective measure "Protection by low voltage:

Supplementary equipotential bonding

In buildings with protective equipotential bonding of the entire installation with the main earthing bar, supplementary protective equipotential bonding is not required.

If that is not the case, the following extraneous conductive parts leading into rooms with a bath tub or shower must be integrated into a supplementary bonding arrangement (see also DIN VDE 0100-701:2008-10 for configuration of protective equipotential bonding):

- › Parts of water mains and drain networks
- › Parts of heating and air conditioning systems
- › Parts of gas supply systems

Protection of cable and wiring systems

- › Cable and wiring systems supplying electrical equipment, such as DHW heaters in rooms with a bath tub or shower, and which are installed in those rooms or in walls of those rooms, must be fitted with an earth conductor which has continuity with the earth conductor of the electrical system.
- › If the appliance is permanently fitted over the bath tub or shower tray, or over the cubicle floor in the case of showers without tray:
 - Cables and leads supplying the appliance in zone 1 must be laid vertically from above or horizontally through the adjoining wall to the back of the appliance.
- › If the appliance is permanently fitted under the bath tub or shower tray:
 - Cables and leads supplying the appliance in zone 1 must be laid vertically from below or horizontally through the adjoining wall to the back of the appliance.
- › All other cables and leads and their accessories must be laid at a depth of at least 6 cm from the surface of the wall.
- › When compliance with the latter requirement is not possible, DIN VDE 0100-701 describes exceptions.
- › Flat webbed house wire to DIN VDE 0250-201 (VDE 0250 part 201) must not be laid up to a depth of 6 cm from the wall surface inside walls, ceilings, sloping roofs or fixed partitions, in rooms containing a bath tub or shower.

Selecting overcurrent protective devices

Cable and wiring systems must be installed according to DIN VDE 0100-520. The choice of overcurrent protective device and the cable cross-section depends on factors such as the routing method, the cable length and the cable design.

The guidelines shown here must always be compared and checked with reference to the local conditions, the requirements of the power supply utility, and accepted engineering standards.

Once the design engineer has identified a cable and wiring design suitable for the purpose, the next step is to select the cable or conductor cross-section based on the expected operating current and the routing method. Then the device for protection against overload is selected.

The following table contains reference values for various connected loads and routing methods.

Connected load [kW]	Voltage [V]	Operating current [A]	Routing method B2, routing in electrical conduits on or in walls		Routing method C, direct installation on or in walls	
			Nominal conductor cross-section [mm ²]	Maximum permissible rated current for overcurrent protective device [A]	Nominal conductor cross-section [mm ²]	Maximum permissible rated current for overcurrent protective device [A]
3.5	230	15.2	1.5	16	1.5	16
4.4	230	19.1	2.5	20	2.5	20
5.7	230	24.3	4	32	2.5	25
6.0	220	27.3	4.0	32	2.5	25
6.5	400	9.4	2.5	2x16	2.5	2x16
8.0	230	34.8	4.0	35	4.0	32
9.6	230	41.8	6.0	50	6.0	50
11.0	400	15.9	2.5	3x16	2.5	3x16
12.0	230	52.2	6.0	63	6.0	63
12.0	400	17.3	2.5	3x20	2.5	3x20
13.5	400	19.5	2.5	3x20	2.5	3x20
15.0	400	21.7	4	3x25	2.5	3x20
18.0	400	26.0	6	3x35	4	3x35
21.0	400	30.3	6	3x35	4	3x35
24.0	400	34.6	6	3x35	6	3x40
27.0	400	39.0	10	3x40	6	3x40

Terminology

Protective magnesium anode

Protection against corrosion for enamelled DHW cylinders. The anodic current created by the dissolution of the protective magnesium anode prevents corrosion at sites of damage.

Anti-drip function

Energy and water saving function for decentralised, electric, open vented small water heaters. A plastic diaphragm in a specially shaped part of the cylinder accommodates the expansion water created during heat-up. A vacuum pump drains the reservoir again when water is drawn off next. This stops the tap from dripping during heat-up.

Standby energy loss [kWh/24h]

The total heat losses of a DHW cylinder in standby mode at 65 °C over a period of 24 h without additional water being drawn off.

Operating pressure

Water pressure, stated as positive pressure relative to atmospheric pressure in the particular system section or system component. Used for matching with permissible operating pressures and adjustment with required safety equipment.

Bare wire heating element

Heating element used in e.g. instantaneous water heaters, consisting of pre- and post-ballasts and bare wire indirect coils in the water. The low mass heating coils assure rapid heat transfer. This method of heating has low susceptibility to scale build-up.

Pressure

In physics, pressure is stated as the following quotient:

Pressure = force / area

$p = F [N] / A [m^2]$.

SI unit = Pa (Pascal)

1 Pa = 1 N/m²

100000 Pa \triangleq 1 bar \triangleq 1000 mbar

1000 hPa \triangleq 1 bar \triangleq 1000 mbar

1 MPa \triangleq 10 bar

Pressure differential

Differential between two pressures inside a potable water system.

Pressure drop

Calculated or measured pressure differential before/after a component or section of a system

Flow limiter

A facility integrated into the cold water inlet to limit the flow rate. With the tap fully opened, the flow limiter largely maintains the throughput to a specified maximum, independent of pressure fluctuations.

Flow limit valve

Component of fully electronic instantaneous water heaters which actively controls the flow rate using closed loop control. An electronic flow limit valve is integrated into the cold water inlet. If the set temperature is not achieved when the draw-off tap is fully opened, then the flow rate is automatically limited for accurate temperature delivery.

Flow rate setting (open vented DHW appliances)

To prevent backpressure damage in open vented DHW appliances, the flow rate must be set subject to the mains water pressure and the respective appliance size.

Throughput, flow rate, volume flow

The volume of water that moves through a cross-section, e.g. a pipe cross-section, within a certain unit of time.

Electrical conductivity of the water

Sum parameter to which all ions in the water contribute, subject to their mobility in an electrical field. Due to the dependence on temperature of this mobility, the electrical conductivity is measured at a reference temperature or is converted to a value corresponding to that. Contractors and design engineers must take the values supplied by the water supply utility into account when designing and installing a bare wire instantaneous water heater.

Electrical resistance of the water

The specific electrical resistance of the water specified by STIEBEL ELTRON for bare wire instantaneous water heaters. The mathematical inverse quantity of the specific electrical conductivity of the water.

Single circuit operation

Form of electrical connection used for electrically heated DHW cylinders. The power supply is usually available 24 h. Any reheating required occurs immediately and at maximum heating output.

Remote control

Accessory for e.g. instantaneous water heater, for convenient operation at a distance from the appliance. Either via cable or wireless, depending on preference and the equipment features of the appliance.

Dual circuit remote control

Activation of the base heating stage in dual circuit cylinders by the power supply utility via an audio frequency ripple control receiver or via a time switch.

Flow pressure

Static positive pressure at a test point in the DHW consumer system when water is drawn off.

Impressed current anode

Maintenance free corrosion protection for enamelled DHW cylinders.

Frost protection setting

Automatic reheating of the water if below 5 °C, without user input.

Minimum flow pressure

Required static positive pressure at the connection point of a tap or an instantaneous water heater at a specific flow rate.

Minimum supply pressure

Minimum static positive pressure at the connection point of the water mains to the supply line as stated by the local water supply utility.

Mixed water volume at 40 °C

Mixed water volume with a temperature level of 40 °C having the same heat content as the nominal capacity of the DHW cylinder at a water temperature of 65 °C. The cold water temperature for reference purposes is 15 °C.

Off-peak tariff

An electricity tariff which is less expensive than the standard tariff, which the power supply utility makes available during certain enable times each day. Ideal for cost effective DHW heating, e.g. at night.

PU foam thermal insulation

Special thermal insulation made from rigid polyurethane foam, which is applied directly to the cylinder or which takes the form of two semi-shells that are placed around the cylinder to reduce heat loss to a minimum.

Heating system with tubular heater

Type of heating for instantaneous water heaters, DHW cylinders and water boilers. The heating element comprises a metal pipe into which the heating spiral has been concentrically pressed, with magnesium oxide acting as insulation.

Static pressure

Static positive pressure at a test point in the potable water system when no water is flowing.

Non-return valve

Safety valve which automatically prevents water flowing back from a cylinder or other system parts into the potable water system.

Safety valve

Valve which protects system components against excessive pressure or temperature.

Safety pressure limiter

Safety switch which isolates all poles of the appliance from the power supply in the event of excessive pressure and which is not accessible to the user. The appliance must only be restarted by a heating contractor after the cause of the fault is eliminated. Safety pressure limiters are used in conjunction with bare wire heating systems, for example.

High limit safety cut-out

Safety switch which isolates all poles of the appliance from the power supply in the event of excessive temperatures.

The appliance must only be restarted by a heating contractor after the cause of the fault is eliminated.

Safety valve

A valve which opens automatically to prevent the operating pressure exceeding a preset limit and which closes again automatically once the pressure has dropped.

Signal anode

Protective magnesium anode with indicator

Special enamel coating

Corrosion protection for the internal cylinders in sealed unvented DHW cylinders by means of a special enamel. Enamels are special types of silica based glass with a particular chemical composition and special physical properties. An enamel coating is created by melting a thin sealed layer onto a metallic substrate. It is hard, impact-resistant, temperature-resistant, physiologically harmless and is neutral to all pipework material.

Special “anticor” direct enamel coating

Enamelling process that far exceeds the requirements of national and international regulations.

Backpressure

The water flowing into an open vented DHW cylinder and out of its outlet creates backpressure inside the cylinder. The level of this backpressure depends on the flow rate, the pipe cross-section and the length of the pipes downstream of the appliance.

The maximum backpressure for open vented water heaters with the draw-off tap fully open must not exceed 0.1 MPa.

Temperature controller

Controller that switches the heating output ON and OFF automatically subject to the temperature measured by the temperature sensor. The DHW temperature can, for example, be variably adjusted from approx. 35-85 °C.

High limit safety cut-out

Controller that switches the heating output OFF at a certain temperature, but does not automatically switch it ON again. For a restart, users need to press the pushbutton again.

Mixer tap

Monobloc mixer tap for open vented water heaters, equipped with not only the draw-off valve but also with a mixer handle with regulating component. Some of the water flow is routed through the cylinder, the remainder flows directly to the outlet.

The temperature of the drawn water is adjusted only via the mixing handle.

thermostop function

Energy saving function for decentralised, electric, open vented small water heaters. A trap shaped like an inverse U-bend collects air released from the water during heating, interrupting and/or preventing gravity circulation. Gravity circulation in conventional cylinders heats up mixer taps resulting in unintended energy losses.

Thermostatic valve

For central premixing of the water temperature in sealed unvented DHW cylinders. The thermostatic valve is fitted into the water outlet of the cylinder and enables constant outlet temperatures by admixing cold water via a bypass line. These are infinitely variable from 40-60 °C.

Triac

A triac is an electronic switching element without contacts, for AC power.

DHW

Water suitable for human consumption with quality characteristics in accordance with currently accepted engineering standards.

Potable water system in buildings

All pipework and/or appliance systems which are, for example, intended for the conveyance, storage, treatment and consumption of potable water and which are connected to a centralised water supply and/or to an individual or dedicated water supply are deemed to comprise the potable water system.

Universal connection (electrical)

Universal power connection for water heaters/DHW cylinders. A connection system that can be changed to different output ratings and voltages by simple jumpering and a separating terminal, i.e. without ingress into the internal wiring.

Negative pressure

Negative pressure is created, for example, when the inlet to open vented DHW appliances is suddenly closed. This is caused by the kinetic energy of the water column in the overflow pipe and in the downstream pipes. The level of negative pressure depends on the flow velocity and the magnitude of the water column as well as the counteracting pressure drop in the pipework.

Efficiency

The efficiency of an appliance or process is the ratio between the energy that is delivered and that which is consumed. Subject to the type of appliance, the efficiency for electric water heaters lies between 0.9 and 1.0.





















DHW circulation line

For centralised DHW supply systems, DHW circulation lines provide greater convenience and are designed to provide DHW with almost constant temperature at the draw-off points. Accepted engineering standards require the installation of DHW circulation lines in large scale systems if the contents of a pipeline between a draw-off point and the outlet on the DHW cylinder is greater than or equal to three litres.

Dual circuit operation

A form of electrical connection used for electrically heated DHW cylinders. Appliances with this design permit the use of special tariff conditions, e.g. during the off-peak tariff period. Changeover to single circuit operation is usually possible.

Test and quality symbols

	<p>Meaning</p> <p>Test symbol of the Verband Deutscher Elektrotechniker e.V. [Association of Electrical Engineers (Germany)]</p> <p>The VDE mark and VDE / GS mark certify that the appliance complies with all requirements of the Appliance Safety Act [Germany].</p>		<p>Meaning</p> <p>The International Electrotechnical Commission (IEC) is an international standards organisation in the field of electrotechnical engineering and electronics. Some standards are developed together with ISO.</p> <p>The IEC uses the name IECCE for the IEC System for Conformity Testing and Certification of Electrotechnical Equipment and Components, better known as the CB system.</p>
	<p>The CE mark is an administrative symbol that is exclusively intended for governmental supervisory authorities.</p> <p>With the CE mark, the manufacturer certifies that the appliances comply with the applicable requirements of the European directives.</p>		<p>The WQA seal represents a testing and assessment procedure in the USA. Products with the WQA seal have a high standard of quality. The Water Quality Association (WQA) represents the highest quality standards in the entire water industry.</p>
	<p>The VDE EMC mark certifies that all the requirements of the standards for electromagnetic compatibility (EMC) have been met.</p>		<p>Underwriters Laboratories Inc. (UL) is the certification organisation for product safety in the USA. Testing for electrical safety is voluntary. For reasons of product liability, electrical safety testing is undertaken in many cases.</p>
	<p>Conformity symbol for building products in accordance with the State Building Orders [Germany]. The manufacturer certifies conformity for fittings/taps and instantaneous water heaters based on their noise characteristics. A general test certificate is issued by the building supervisory authority.</p> <p>Example: The test certificate number for the instantaneous water heater type DHE is PA-IX.</p>		<p>Products with this test symbol comply with the relevant safety standards. The Canadian Standards Association (CSA) is an independent non-profit organisation dedicated to safety, the public interest, and sustainability.</p>
	<p>Test symbol:</p> <p>Österreichischer Verband für Elektrotechnik [Austrian Association of Electrical Engineers].</p> <p>National conformity symbol for Austria.</p>		<p>The China Compulsory Certification (CCC) test symbol is a mandatory marking in the field of safety and quality and is intended for products sold on the Chinese market.</p>
	<p>Eidgenössisches Starkstrominspektorat ESTI [Federal Inspectorate for Heavy Current Installations, Switzerland] Market surveillance / approval safety symbol</p>		<p>The test symbol Gosudarstvennyy Standart (GOST) for electromagnetic compatibility and electrical safety in Russia.</p>
	<p>Safety and quality designations: French association for electrical engineering;</p> <p>Laboratoire Central Des Industries Electriques.</p> <p>National conformity symbol for France</p>		<p>The independent testing institution TÜV Rheinland acts on behalf of manufacturers to check that their products are safe and comply with EC directives. In addition to electrical safety, the products are always also checked for electromagnetic compatibility.</p>
	<p>Quality symbol of the Schweizerischer Verein des Gas- und Wasserfaches SVGW [Swiss Association for Gas and Water]. The SVGW symbol certifies compliance with the inspection regulations for water heaters and DHW cylinders.</p>		<p>The test symbol is a required Saudi Arabian quality test symbol, adopted by the Saudi Arabian Standards Organisation (SASO) to certify a product's conformity with the relevant standards.</p>
	<p>Quality symbol of the German institute for standardisation (DIN) for the low-noise construction of electric water heaters in accordance with DIN 44899, part 6.</p>		<p>WaterMark is a certification from Standards Australia Limited, an independent Australian limited liability company. In Australia, every pipework system for potable water and industrial water must have the WaterMark approval.</p>
	<p>Quality symbol of the European Enamel Authority (EEA) for best enamel quality. The EEA quality symbol applies to all enamelled DHW cylinders made by STIEBEL ELTRON.</p>		<p>The RCM test symbol (Regulatory Compliance Mark) indicates that electronic devices, radio systems and telecommunications equipment are in compliance with the applicable legal standards and requirements in Australia.</p>
			<p>COC stands for "Certificate of Conformity" or "Certificate of Compliance". The document is a statement of the extent to which certain goods comply with recognised standards and is intended to facilitate the approval of the goods on international markets.</p>

Notes

PRODUCTS

Instantaneous water heaters

Instantaneous water heaters

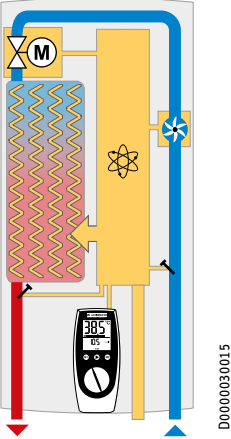
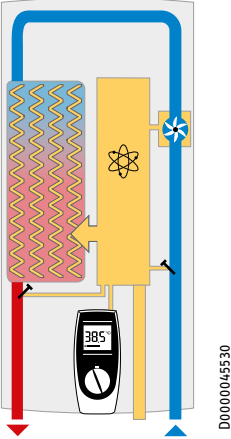


PRODUCTS

Instantaneous water heaters

Equipment and operation

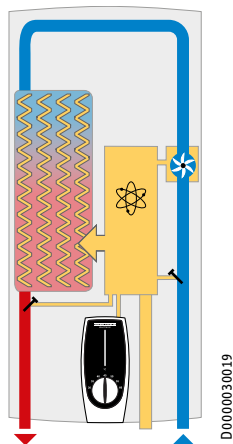
Comfort instantaneous water heaters

DHE SLi	DEL SLi
	
Function Fully electronically controlled (closed loop) instantaneous water heater with 4i technology, inlet and outlet temperature sensors, flow rate sensor for automatic variable output matching and motorised valve to regulate the water flow rate Bare wire heating system	Electronically controlled (closed loop) instantaneous water heater with 3i technology, inlet and outlet temperature sensors, flow rate sensor for automatic variable output matching Bare wire heating system
Benefits	
DHW convenience Always the precise temperature through fully electronically regulated heating output and water volume	Precise temperature control through electronically controlled heating output (closed loop control)
Disturbance compensation Full compensation of pressure fluctuations, inlet temperature changes and voltage fluctuations, automatic flow rate matching to the output limit	Full compensation of pressure fluctuations, inlet temperature changes and voltage fluctuations up to the output limit
High flow rate convenience	
Automatic output matching	Automatic output matching
Saving water and energy	Saving water and energy
Operating convenience	
Variable digital temperature selection 20 - 60 °C	Variable digital temperature selection 30 - 60 °C
Temperature selection with 0.5 °C resolution	Temperature selection with 1 °C resolution
Quick temperature selection with a memory key	
Backlit multifunction display	
Wireless mini remote control with 4 keys for temperature selection	
Efficiency indication by LCD colour change: yellow / green	
The economy monitor displays cost savings and CO ₂ reductions	
Additional functions	
Undersink operator convenience	Undersink operator convenience
High operational reliability through air detection	High operational reliability through air detection
Anti-scalding protection, electronically adjustable	43 °C anti-scalding protection
ECO function, wellness showers, automatic water volume control, energy meter, clock	
Child safety protection	
Hardwired comfort remote control as accessory	
Wireless comfort remote control as accessory	
Profi Rapid® installation system	
Profi-Rapid® installation technology for quick assembly	Profi-Rapid® installation technology for quick assembly
DHE 18 21 24 SL, adjustable rated output	DEL 18 21 24 SL, adjustable rated output
DHE 18 SL 25A, for systems with 25 A fuse protection	DEL 18 SL 25A, for systems with 25 A fuse protection

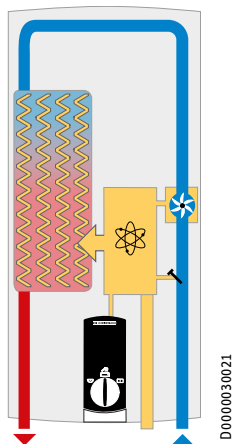
PRODUCTS

Instantaneous water heaters

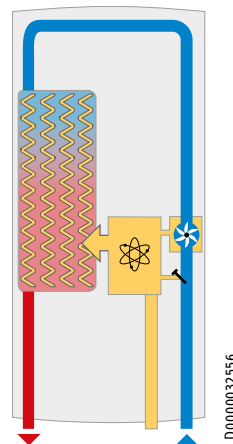
DHB-E SLi



DHB STi



HDB-E Si



Function

Electronically controlled (closed loop) instantaneous water heater with 3i technology, inlet and outlet temperature sensors, flow rate sensor for automatic variable output matching
Bare wire heating system

Electronically controlled (open loop) instantaneous water heater with 2i technology, inlet temperature sensor and flow sensor with automatic output matching.
Bare wire heating system

Electronically controlled (open loop) instantaneous water heater with 2i technology, inlet temperature sensor and flow sensor with automatic output matching.
Bare wire heating system

Benefits

DHW convenience

Accurate temperature delivery through electronically controlled heating output (closed loop control)

Disturbance compensation

Full compensation of pressure fluctuations, inlet temperature changes and voltage fluctuations up to the output limit

High flow rate convenience

Automatic output matching

Saving water and energy

Operating convenience

Variable temperature selection
30-60 °C

Temperature scale 30 - 60 °C

Accurate temperature delivery through electronically controlled heating output (open loop control)

Compensation of pressure fluctuations and inlet temperature changes up to the output limit

Automatic output matching

Saving water and energy

Temperature selection in three levels, approx. 35, 45, 55 °C

Fixed temperature approx. 55 °C through electronically controlled heating output (open loop control)

Compensation of pressure fluctuations and inlet temperature changes up to the output limit

Automatic output matching

Energy saving

Fixed temperature approx. 55 °C and manual mixing with cold water at the tap

Additional functions

Undersink operator convenience

High operational reliability through air detection

43 °C anti-scalding protection

Undersink operator convenience

High operational reliability through air detection

High operational reliability through air detection

Profi Rapid® installation system

Profi-Rapid® installation technology for quick assembly

DHB-E 18|21|24 SL, adjustable rated output

DHB-E 18 SL 25A, for systems with 25 A fuse protection

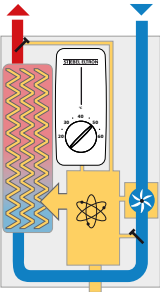
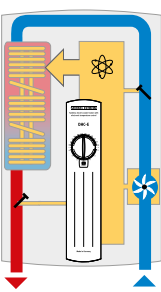
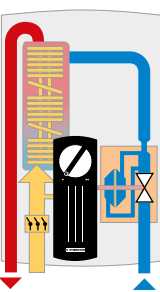
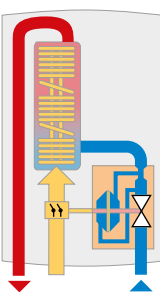
Profi-Rapid® installation technology for quick assembly

Profi-Rapid® installation technology for quick assembly

PRODUCTS

Instantaneous water heaters

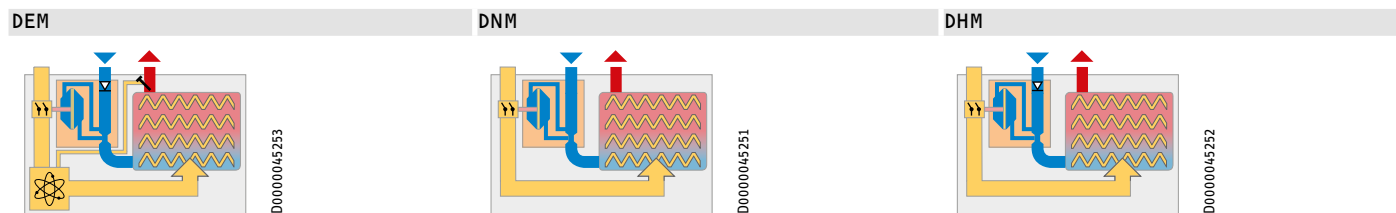
Compact instantaneous water heater

DCE	DHC-E	DHF C	DHC DHA
			
D0000030041	D0000041397	D0000030023	D0000041398
Function			
Electronically controlled (closed loop) instantaneous water heater with 3i technology. Inlet and outlet temperature sensors, flow rate sensor for automatic variable output matching with bare wire heating system	Electronically controlled (closed loop) instantaneous water heater with 3i technology. Inlet and outlet temperature sensors, flow rate sensor for automatic variable output matching with tubular heater heating system	Hydraulically controlled (open loop) instantaneous water heater with automatic two-stage control and control valve to compensate pressure fluctuations, with tubular heater heating system	Heating output controlled in 2 stages. Hydraulically controlled (open loop) instantaneous water heater with tubular heater heating system
Benefits			
DHW convenience			
Precise temperature control through electronically controlled heating output (closed loop control)	Precise temperature control through electronically controlled heating output (closed loop control)	Heating output controlled in 2 stages	Hydraulically controlled (open loop) heating output
Disturbance compensation			
Full compensation of pressure fluctuations, inlet temperature changes and voltage fluctuations up to the output limit	Full compensation of pressure fluctuations, inlet temperature changes and voltage fluctuations up to the output limit	Partial compensation of pressure fluctuations	Partial compensation of pressure fluctuations
High flow rate convenience			
Automatic output matching	Automatic output matching	Manual adjustment	Manual adjustment
Saving water and energy	Saving water and energy		
Rapid heat-up with bare wire heating system			
Operating convenience			
Variable temperature selection 30-60 °C	Variable temperature selection 30-60 °C	Temperature selection in 2 stages and manual mixing with cold water at the tap	Manual mixing with cold water at the tap
Temperature selection with rotary selector	Temperature selection with rotary selector		
Temperature scale 30 - 60 °C			
Additional functions			
Suitable for preheated water up to 70 °C			
Anti-scalding protection	Anti-scalding protection		
High operational reliability through air detection			
Profi Rapid® installation system			
Profi-Rapid® installation technology for quick assembly	Profi-Rapid® installation technology for quick assembly	Profi-Rapid® installation technology for quick assembly	Profi-Rapid® installation technology for quick assembly

PRODUCTS

Instantaneous water heaters

Mini instantaneous water heater



Function

Electronically controlled (closed loop) mini instantaneous water heater with electronic controller, flow switch, outlet temperature sensor and bare wire heating system

Open vented (non-pressurised), hydraulically controlled (open loop) mini instantaneous water heater with flow switch and bare wire heating system

Sealed unvented (pressure-tested), hydraulically controlled (open loop) mini instantaneous water heater with flow switch and bare wire heating system

Benefits

DHW convenience

Electronically controlled heating output for accurate, constant temperature delivery up to maximum output

Near constant, accurate temperature delivery up to maximum output. Heating output controlled hydraulically in one stage. Accurate temperature delivery by mixing at the tap.

Near constant temperatures up to maximum output. Heating output controlled hydraulically in one stage. Accurate temperature delivery by mixing at the tap.

Constant, accurate temperature delivery when there are fluctuations in the inlet temperature

When there are fluctuations in the inlet temperature, accurate temperature is delivered by manual mixing at the tap.

When there are fluctuations in the inlet temperature, accurate temperature is delivered by manual mixing at the tap.

Rapid heat-up with bare wire heating system

Rapid heat-up with bare wire heating system

Rapid heat-up with bare wire heating system

Equipment

Profi Rapid® installation system

Profi Rapid® installation system

Profi Rapid® installation system

Type (open vented | sealed unvented)

Type (open | -)

Type (open vented | sealed unvented)

Installation (oversink | undersink)

Installation (oversink | undersink)

Installation (- | undersink)

3.5 KW version with standard plug

3.5 KW version with standard plug

3.5 KW version with standard plug

Internal temperature adjustment from 30 to 50 °C

Anti-scalding protection at high inlet temperatures

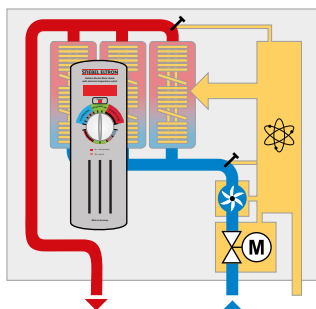
Suitable for preheated water up to 60 °C

PRODUCTS

Instantaneous water heaters

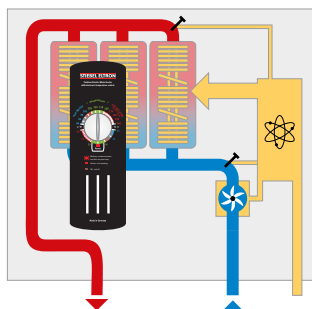
Tempra instantaneous water heaters

Tempra Plus



D0000040794

Tempra



D0000040793

Function

Fully electronically controlled (closed loop) instantaneous water heater with cold water and flow sensor, DHW sensor for automatic variable output matching, and motorised valve to dynamically regulate the water flow rate. Tubular heater system.

Electronically controlled (closed loop) instantaneous water heater with cold water, flow rate and DHW sensor for automatic variable output matching. Tubular heater system.

Benefits

DHW convenience

Always the precise temperature through fully electronically regulated heating output and water volume

Electronically controlled heating output for accurate temperature delivery up to maximum output

Motorised valve to dynamically regulate the water flow rate at maximum output and high DHW demand

Disturbance compensation

Full compensation of fluctuations in pressure, inlet temperature and voltage, automatic regulation of water flow rate at maximum output and high DHW demand.

Full compensation of fluctuations in pressure, inlet temperature and voltage up to the output limit.

Operating convenience

Variable digital temperature selection
30 - 60 °C

Variable temperature selection
30-60 °C

Temperature selection with rotary selector

Temperature selection with rotary selector

LED indicator

Temperature scale 30 - 60 °C

Temperature selection accurate to 0.5 K

Additional functions

Anti-scalding protection

Anti-scalding protection

Temperature scale can be selected in °F or °C for LED indicator

Temperature scale can be read in °F or °C on control fascia

PRODUCTS

Instantaneous water heaters

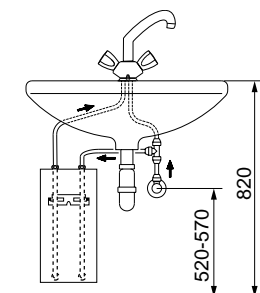
Installation and installation benefits

Install the instantaneous water heaters in a room that is free from the risk of frost and near the draw-off points. Observe VDE 0100, part 701 [or local regulations for protection zones].

The following installation dimensions are recommended. Always check the dimensions of the site and compare.

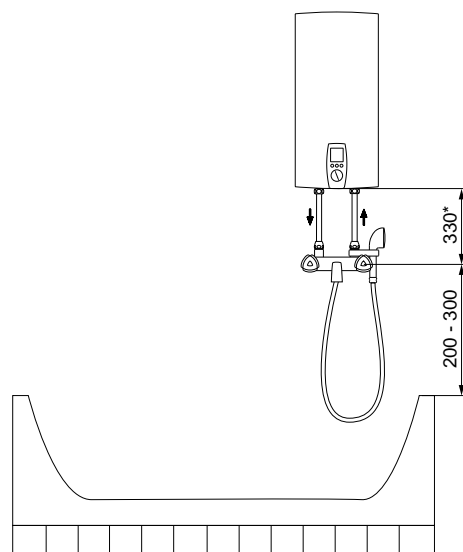
Installation examples

Comfort instantaneous water heaters



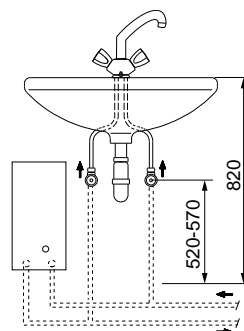
D0000031722

Washbasin, undersink, on finished walls



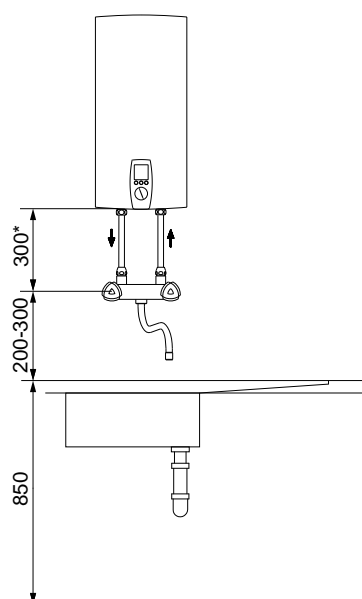
D0000031721

Bath tub, oversink, on finished walls



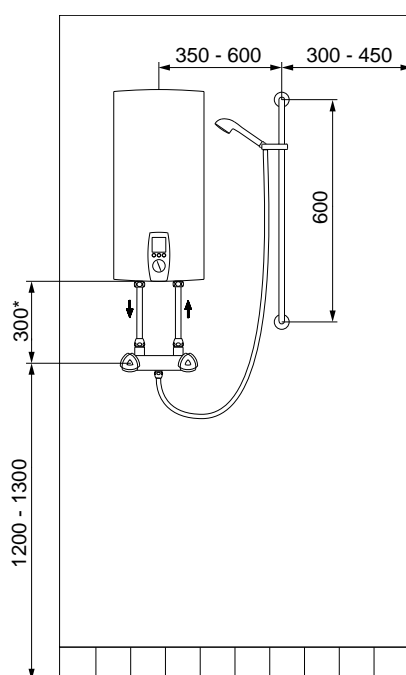
D0000031723

Washbasin, undersink, on unfinished walls



D0000031719

Sink, oversink, on finished walls



D0000031720

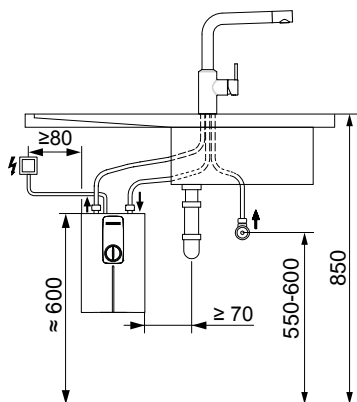
Shower, on finished walls

* Longer pipes are available as accessories.

PRODUCTS

Instantaneous water heaters

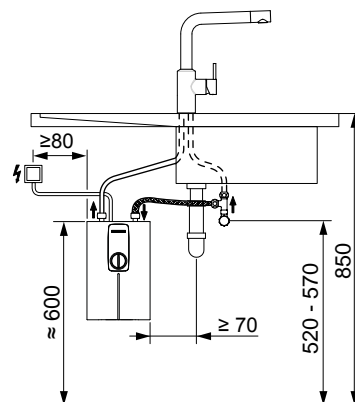
Compact instantaneous water heater DCE, open vented (non-pressurised)



D0000039998

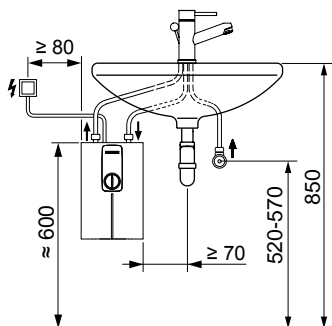
Kitchen sink, undersink, on finished walls

Compact instantaneous water heater DCE, sealed unvented (pressure-tested)



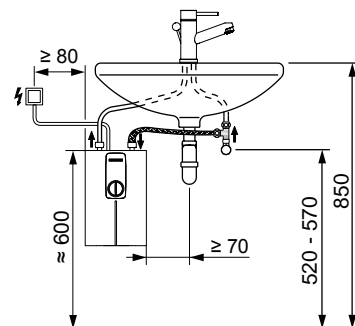
D0000039997

Kitchen sink, undersink, on finished walls



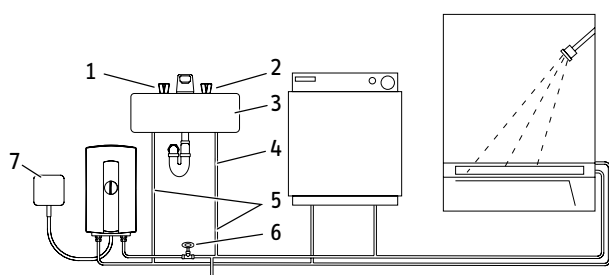
D0000040000

Washbasin, undersink, on finished walls



D0000039999

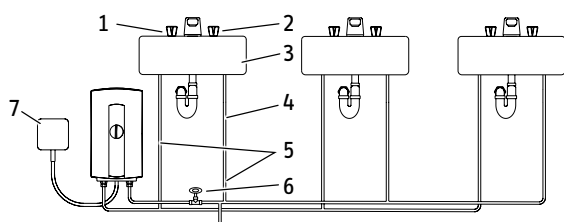
Compact instantaneous water heater DHC-E | DHC, sealed unvented (pressure-tested)



26_02_02_1081

Installation in household

- 1 DHW valve (left)
- 2 Cold water valve (right)
- 3 Washbasin
- 4 Cold water supply
- 5 Water line for installation of the water tap
- 6 Shut-off valve
- 7 Power connection



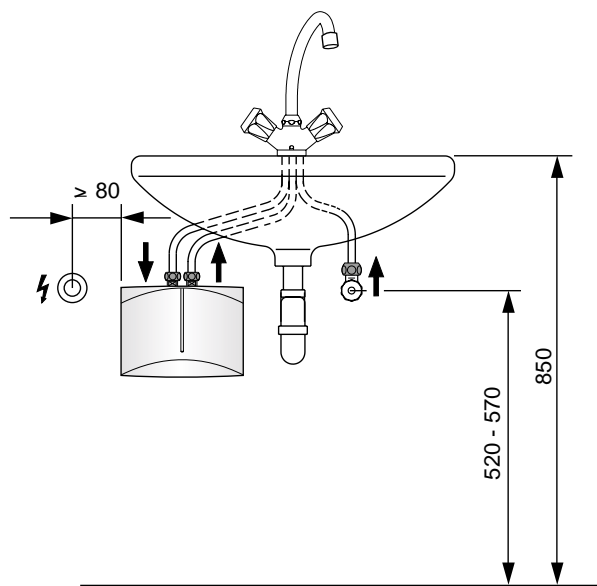
26_02_02_1082

Installation on commercial premises

PRODUCTS

Instantaneous water heaters

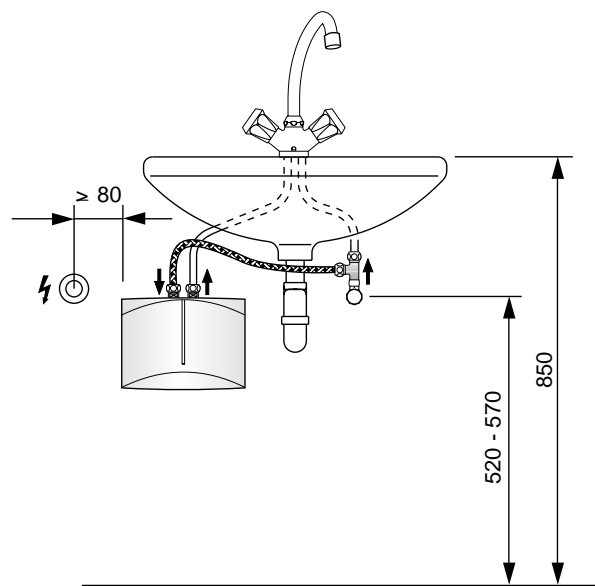
Mini instantaneous water heaters, open vented (non-pressurised)



26_02_05_0095

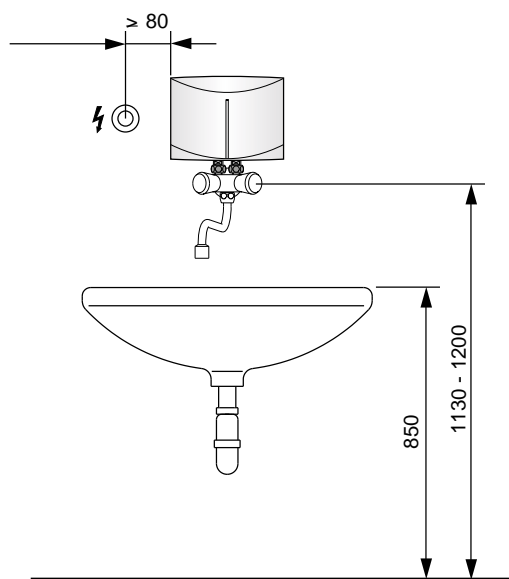
Washbasin, undersink

Mini instantaneous water heaters, sealed (pressure-tested)



26_02_05_0058

Washbasin, undersink



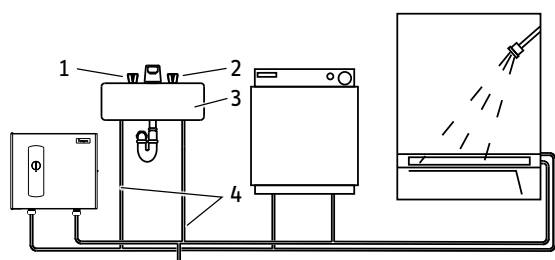
26_02_05_0096

Washbasin, oversink

PRODUCTS

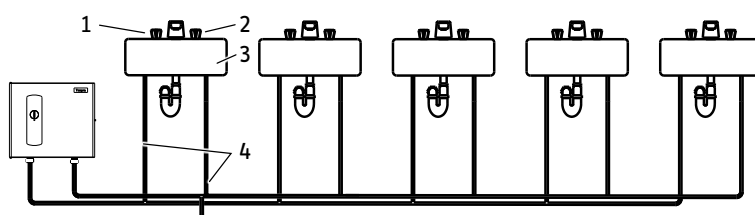
Instantaneous water heaters

Tempra instantaneous water heater DHC-E | DHC, sealed unvented (pressure-tested)



D0000044736

Installation in household



D0000044737

Installation on commercial premises

PRODUCTS

Instantaneous water heaters

The STIEBEL ELTRON Profi-Rapid installation system offers many practical details to enable professional and rapid installation

- › Universal mounting rail with central tile compensation
- › Freely accessible installation area for the water connections (on finished or unfinished walls)
- › Central fixing screw for service
- › Optional installation inside the water jet area in a shower cubicle
- › Installation in self-supporting frames
- › Universal water connection with twin connector technology fits all instantaneous water heaters from STIEBEL ELTRON
- › Cold water shut-off valve for shutting off in finished or unfinished wall installations
- › Operating convenience for undersink installation and pivoting cover as addition for DHE, DEL, DHB-E and DHB ST
- › Suitable for use with plastic pipes
- › Freely accessible power connection at the top or bottom
- › Special kits for extreme installation requirements

Wall mounting

The universal mounting bracket fits without new holes needing to be drilled when replacing appliances. Existing rawl plug fixing holes, even from third party manufacturers, can be used. Tile offsets up to 20 mm can be compensated.



D0000032637

Easily accessible installation area

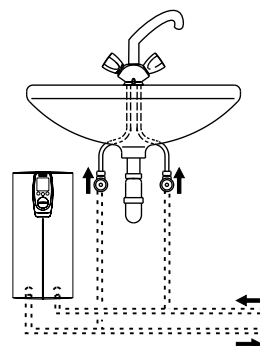
Back of appliance can be removed without tools for convenient access to the water connection.



D0000032638

Pivoting cover

On instantaneous water heaters DHE, DEL, DHB-E and DHB ST, the cover can be turned for greater ease of use, for example with undersink installation. Fixing from the front is a must for all instantaneous water heaters.



D0000046365

Central fixing for optimum service convenience

The complete appliance can easily be undone and removed with the central fixing.



D0000032639

Hoseproof to IP25

The external casing is designed to be hoseproof. Installation inside the shower or above the bath tub (protection zone 1) is permissible.

PRODUCTS

Instantaneous water heaters

Self-supporting installation

The slimline design of the DHE, DEL, DHB-E, DHB ST and HDB-E series makes them an ideal choice for integration into self-supporting systems in conjunction with a recessed enclosure. In particular the electronic instantaneous water heaters with remote control are an excellent choice for self-supporting installations.



Safety

The test designations (e.g. type-testing symbol, VDE/GS symbol, CE symbol, FNN listing [FNN = network technology/network operation forum in the VDE]) issued by renowned institutes reassure engineers, installers and users that STIEBEL ELTRON appliances are of high grade, that they are state of the art and comply with relevant building regulations.

Hydraulic connection

Observe the details regarding water quality and materials, EN 806/ DIN 1988, and the regulations specified by your local water supply utility. Instantaneous water heaters feature a pressure drop which varies according to the flow rate (see specification) and which must be taken into consideration during engineering and when selecting the installation location. Operation with preheated water (up to approx. 60 °C) is an option for electronically controlled many instantaneous water heaters. See the specifications for more information.

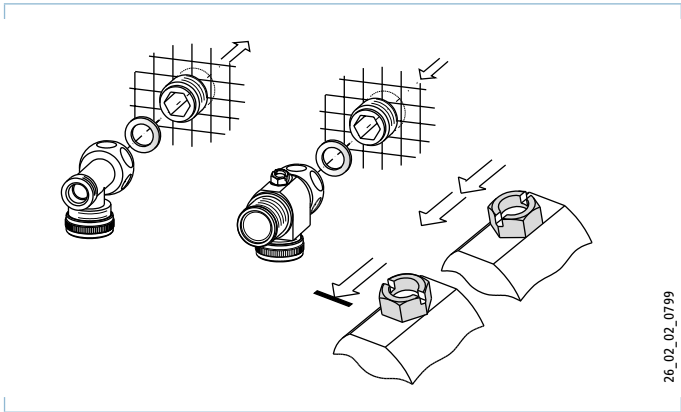
The standard water connection system for all STIEBEL ELTRON instantaneous water heaters ensures quick and smooth connection of the cold and hot water lines, in both new and replacement installations.

Twin connector technology

The twin connector method has proven to be very useful in practice over several decades. The interface to the water installation remains detachable, even in very old pipework systems.

Three-way shut-off with ball valve

The universal three-way ball valve is set onto the twin connector. The shut-off is effective for water connections on finished and unfinished walls. In case of replacement, the existing three-way ball valve can remain installed on the cold water piping (no water shut-off in the branch or main line). For an installation on an unfinished wall, a surface-mounted tap, or a surface mounted tap with additional draw-off point. The dirt strainer downstream of the shut-off valve is easy to clean.



Flow limiter

Different flow limiters are included with our appliances. They are colour coded.

Material number	Colour	L/min
279933	Pink	4.0
149862	Blue	7.5
149863	Green	8.5
128368	Brown	12.0

PRODUCTS

Instantaneous water heaters

Suitable for use with plastic pipes

Observe the manufacturer's details for the plastic pipe systems, and the specifications of the DHW appliances.

	DHE SL	DEL SL	DHB-E SL	DHB ST	HDB-E	DCE	DHC-E	DHF *	DHC, DHA	DEM, DNM, DHM
Suitable for plastic pipes for cold water and DHW connection	•	•	•	•	•	•				
Suitable for plastic pipes for cold water connection only							•	•	•	•

* Install a metal pipe of approx. 1 m length at the appliance's cold water connection.

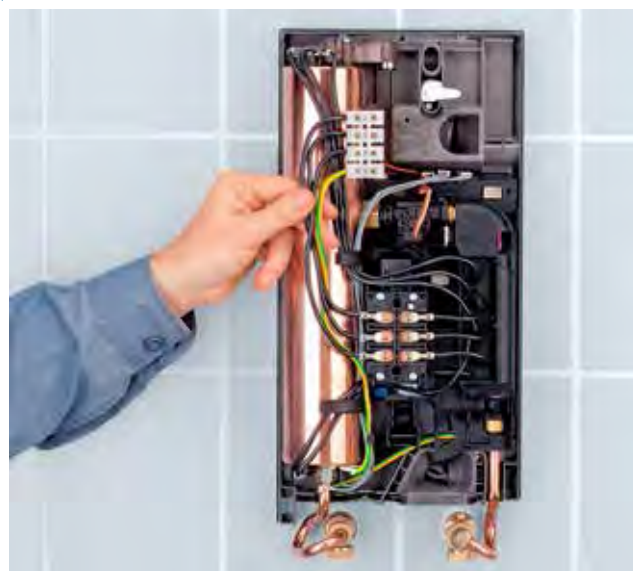
Power supply

As standard, the power connection is made in the lower section of the appliance.



D0000032640

When replacing third party appliances, the power supply is frequently connected in the upper part of the appliance. By relocating the terminal block, the power connection can be easily moved to provide the connection at the top.



D0000032641

The cable grommet is designed to prevent the ingress of water and to provide a hoseproof seal.



D0000032890

With the electronic instantaneous water heaters 18/21/24, the maximum connected load can be reduced with a coding plug from 24 kW to 21 kW or 18 kW. This enables the output of the instantaneous water heater to be adjusted at the installation location to suit the available cable cross-sections and fuse ratings.

PRODUCTS

Instantaneous water heaters

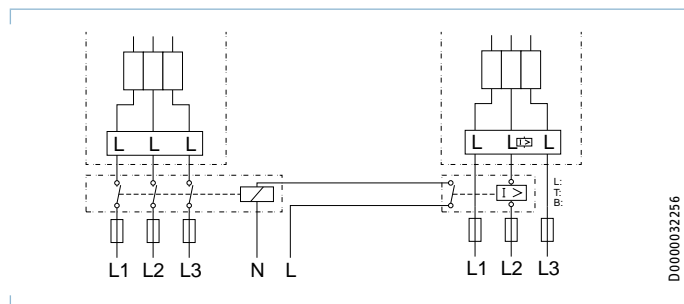
Priority control for combination with other appliances, e.g.

- › Electric cylinder heaters
- › Instantaneous water heaters

A load shedding relay is required for operation with priority control, e.g. LR-1-A.

Load shedding relay as priority control for electronic instantaneous water heaters

The load shedding relay LR-1-A is used when the cable cross-sections are too small to allow two large electrical loads to be operated at the same time. This is often the case in residences where an instantaneous water heater is to be installed for DHW heating in addition to DHW cylinders, for example. If an LR-1-A is used, the power connection does not need to be able to handle simultaneous operation of both of the large loads. When the appliance which operates for short periods (e.g. instantaneous water heater) is switched on, the load shedding relay switches off the load which operates long-term (e.g. cylinder heating).



The load shedding relay and the contactor must be installed in the control panel.

Fuses/MCBs and cable cross-sections

The table shows an overview of the minimum cable cross-sections and the required fuse ratings.

Detailed information about the method of cable routing and the overcurrent protective devices can be found in the following standards:

- › DIN VDE 01000 part 430 / October 2010
- › DIN VDE 0298-4 / 2003
- › DIN EN 60269-1, VDE 0636-1
- › DIN EN 60898-1, VDE 0641-11

Output [kW]	Voltage [V]	Minimum cable cross-section [mm ²] Routing method: C Ambient temperature: 25 °C	Fuse rating [A]
3.5	230	1.5	16
4.4	230	2.5	20
5.7	230	4	25
6.5	400	1.5	2 x 16
11	400	2.5	3 x 16
12	230	6.0	63
12	400	2.5	3 x 20
13.5	400	2.5	3 x 20
15	400	2.5	3 x 20
18	400	4	3 x 35
21	400	4	3 x 35
24	400	6	3 x 40
27	400	6	3 x 40

The technical connection conditions of the relevant power supply utility are mandatory for the installation.

In Germany, for example, refer to Technische Anschlussbedingungen TAB 2007, 2011 edition from BDEW Bundesverband der Energie- und Wasserwirtschaft e.V.

Comfort instantaneous water heaters



Full electronic closed loop control comfort instantaneous water heaters DHE SLi



PIC00002156

Full electronic closed loop control comfort instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature can be variably preselected. The electronic control with motorised valve effects automatic matching of the electrical output and water volume for constantly accurate temperature delivery. Temperature can also be adjusted via the standard 4-key wireless mini remote control. The bare wire heating system inside the pressure-tested copper cylinder is suitable for soft or hard water areas (for application range, see specification). Electronically regulated flow limiter valve. Installation with pressure fittings. Threaded water fittings for installation on unfinished or finished walls, 3-way ball shut-off valve, connection option for direct draw-off taps on finished walls.

DHE SLi

- › DHE 18/21/24 SL, adjustable rated output
- › DHE 18 SL 25 A, for systems with 25 A fuse protection
- › Fully electronic closed loop control with motorised valve for permanently accurate temperature delivery
- › User interface with backlit multifunction LCD
- › Display of temperature, flow rate, energy consumption or time
- › Comfort functions: ECO button, four wellness shower programs, automatic water volume control
- › Memory key for accurate temperature delivery
- › Appliance cover rotates to bring user interface to top
- › Safety functions: Childproofing; anti-scalding protection
- › Wireless comfort remote control or hardwired comfort remote control as accessories
- › For preheated water, e.g. for reheating with a solar thermal system
- › Electronic safety concept and air detection with differential analysis system
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Saves up to 30 % water and energy compared with hydraulic instantaneous water heaters
- › An economy monitor displays cost savings and CO₂ reductions

Accessories

- › 222419 FFB 1 SL
- › 232613 MEKD
- › 232614 MEBD
- › 223340 FFB 2 SL
- › 221333 FB 1 SL
- › 073864 ZTA 3/4
- › 001786 LR-1-A
- › 230957 WEH

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

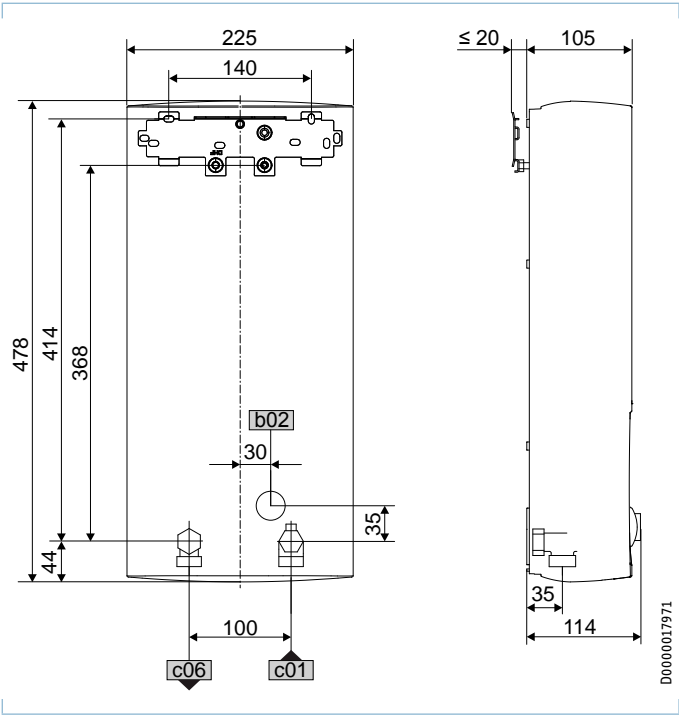
An alphabetical product index can be found at the start of this technical guide.

Full electronic closed loop control comfort instantaneous water heaters DHE SLi

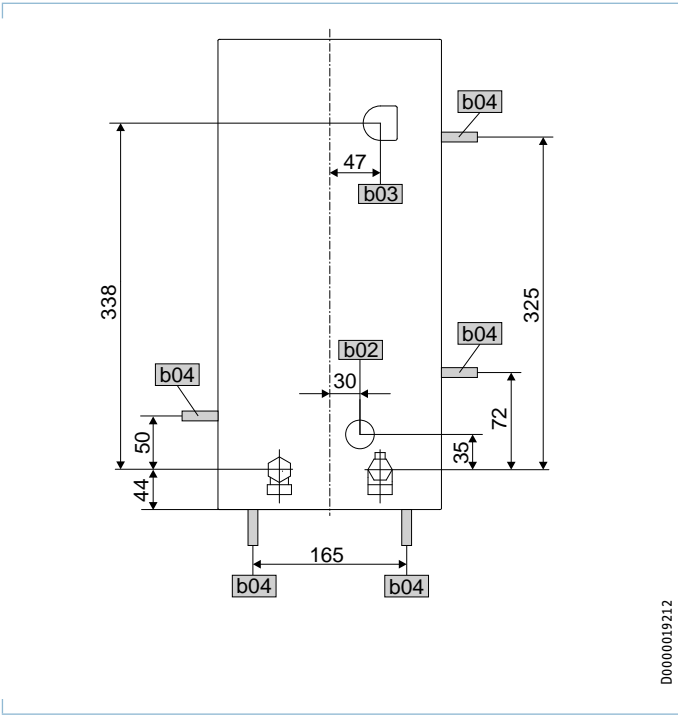
		DHE 18 SLi 25 A			DHE 18/21/24 SLi			DHE 27 SLi		
		227492			227493			227494		
Electrical data										
Rated voltage	V	380	400	415	380	400	415	380	400	415
Rated output	kW	16.2	18	19.4	16.2/19/21.7	18/21/24	19.4/22.6/25.8	24.4	27	29.1
Rated current	A	24.7	26	27	27.6/31.4/33.3	29/33/35	30.1/34.3/36.3	37.1	39	40.5
Fuse/MCB rating	A	25	25	32	32/32/35	32/32/35	32/35/40	40	40	40
Phases		3/PE			3/PE			3/PE		
Frequency	Hz	50/60	50/60	50/-	50/60	50/60	50/-	50/-	50/-	50/-
Max. mains impedance at 50 Hz	Ω	0.3	0.28	0.27	0.33	0.31	0.3	0.2	0.19	0.18
Max. mains impedance at 60Hz	Ω	0.36	0.34		0.4	0.38				
Specific resistance ρ ₁₅ ≥ (at θ _{cold} ≤25 °C)	Ω cm	900			900			900		
Specific conductivity σ ₁₅ ≤ (at θ _{cold} ≤25 °C)	μS/cm	1111			1111			1111		
Specific resistance ρ ₁₅ ≥ (at θ _{cold} ≤55°C)	Ω cm	900	900	900	900	900	900	900	900	900
Specific conductivity σ ₁₅ ≤ (at θ _{cold} ≤55 °C)	μS/cm	1111	1111	1111	1111	1111	1111	1111	1111	1111
Connections										
Water connection		G 1/2 A			G 1/2 A			G 1/2 A		
Application limits										
Max. permissible pressure	MPa	1			1			1		
Max. inlet temperature for reheating	°C	55			55			55		
Values										
Max. permissible inlet temperature	°C	65			65			65		
On	l/min	> 2.5			> 2.5			> 2.5		
Flow rate for pressure drop	l/min	5.2			5.2/6.0/6.9			7.7		
Pressure drop at flow rate	MPa	0.04			0.04/0.06/0.08			0.1		
DHW delivery	l/min	9.2			9.2 / 10.7 / 12.3			13.8		
Δθ on delivery	K	28			28			28		
Hydraulic data										
Nominal capacity	l	0.4			0.4			0.4		
Versions										
Connected load, selectable		-			X			-		
Temperature setting range	°C	20-60			20-60			20-60		
Safety category		1			1			1		
Insulating block		Plastic			Plastic			Plastic		
Heating system		Bare wire			Bare wire			Bare wire		
Cap and back panel		Plastic			Plastic			Plastic		
Colour		white			white			white		
IP rating		IP25			IP25			IP25		
Dimensions										
Height/Width/Depth	mm	478	225	105	478	225	105	478	225	105
Weights										
Weight	kg	4.5			4.5			4.5		

Full electronic closed loop control comfort instantaneous water heaters DHE SLi

Dimensions and connections



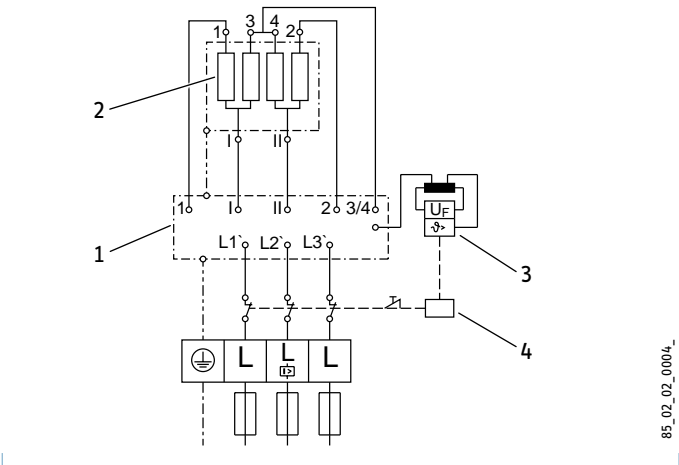
Alternative connection options



		DHE 18 SLi 25 A	DHE 18/21/24 SLi	DHE 27 SLi
b02	Entry electrical cables I			
b03	Entry electrical cables II			
b04	Entry electrical cables III			
c01	Cold water inlet	Male thread	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A	G 1/2 A

Wiring diagram

3/PE ~ 380-415 V



Electronically controlled comfort instantaneous water heaters DEL SLi



PIC00002162

Electronically controlled comfort instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature can be variably preselected. The electronic control unit automatically adjusts the electrical output to ensure accurate temperature delivery up to the output limit. The bare wire heating system inside the pressure-tested copper cylinder is suitable for soft or hard water areas (for application range, see specification). Installation with pressure fittings. Threaded water fittings for unfinished or finished walls, 3-way ball shut-off valve, connection option for direct draw-off taps on finished walls.

DEL SLi

- › DEL 18/21/24 SL, adjustable rated output
- › DEL 18 SL 25 A, for systems with 25 A fuse protection
- › Electronic closed loop control for accurate temperature delivery up to the output limit
- › LCD temperature indicator
- › Wireless remote control FFB 1 or FFB 2 as accessories
- › Appliance cover rotates to bring user interface to top
- › Temperature can be limited to 43 °C
- › For preheated water, e.g. for reheating with a solar thermal system
- › Electronic safety concept and air detection with differential analysis system
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Power supply connection at the top or bottom of the appliance
- › Saves up to 30 % water and energy compared with hydraulic instantaneous water heaters

Accessories

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

- › 169478 FFB 1
- › 232613 MEKD
- › 232614 MEBD
- › 169482 FFB 2
- › 073864 ZTA 3/4
- › 001786 LR-1-A
- › 230957 WEH

An alphabetical product index can be found at the start of this technical guide.

Electronically controlled comfort instantaneous water heaters

DEL SLi

		DEL 18 SLi 25 A			DEL 18/21/24 SLi			DEL 27 SLi		
		227498			227499			227500		
Electrical data										
Rated voltage	V	SBBE 380	400	415	380	400	415	380	400	415
Rated output	kW	16.2	18	19.4	16.2/19/21.7	18/21/24	19.4/22.6/25.8	24.4	27	29.1
Rated current	A	24.7	26	27	27.6/31.4/33.3	29/33/35	30.1/34.3/36.3	37.1	39	40.5
Fuse/MCB rating	A	25	25	32	32/32/35	32/32/35	35/35/40	40	40	40
Phases		3/PE			3/PE			3/PE		
Frequency	Hz	50/60	50/60	50/-	50/60	50/60	50/-	50/-	50/-	50/-
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 25\text{ }^{\circ}\text{C}$)	$\Omega\text{ cm}$	900	900	900	900	900	900	900	900	900
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 25\text{ }^{\circ}\text{C}$)	$\mu\text{S/cm}$	1111	1111	1111	1111	1111	1111	1111	1111	1111
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 55\text{ }^{\circ}\text{C}$)	$\Omega\text{ cm}$	900	900	900	900	900	900	900	900	900
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 55\text{ }^{\circ}\text{C}$)	$\mu\text{S/cm}$	1111	1111	1111	1111	1111	1111	1111	1111	1111
Max. mains impedance at 50 Hz	Ω	0.3	0.28	0.27	0.33	0.31	0.3	0.2	0.19	0.18
Max. mains impedance at 60Hz	Ω	0.36	0.34		0.4	0.38				
Connections										
Water connection		G 1/2 A			G 1/2 A			G 1/2 A		
Application limits										
Max. permissible pressure	MPa	1			1			1		
Max. inlet temperature for reheating	$^{\circ}\text{C}$	55			55			55		
Values										
Max. permissible inlet temperature	$^{\circ}\text{C}$	65			65			65		
On	l/min	> 2.5			> 2.5			> 2.5		
Flow rate for pressure drop	l/min	5.2			6.9			7.7		
Pressure drop at flow rate	MPa	0.075 (0.05 without flow limiter)			0.125 (0.085 without flow limiter)			0.155 (0.105 without flow limiter)		
Flow rate limit at	l/min	12 (7.5)			12 (7.5)			12 (7.5)		
DHW delivery	l/min	9.2			9.2/10.7/12.3			13.8		
$\Delta\vartheta$ on delivery	K	28			28			28		
Hydraulic data										
Nominal capacity	l	0.4			0.4			0.4		
Versions										
Connected load, selectable		-			X			-		
Temperature setting range	$^{\circ}\text{C}$	30-60			30-60			30-60		
Safety category		1			1			1		
Insulating block		Plastic			Plastic			Plastic		
Heating system		Bare wire			Bare wire			Bare wire		
Cap and back panel		Plastic			Plastic			Plastic		
Colour		white			white			white		
IP rating		IP25			IP25			IP25		
Dimensions										
Height	mm	478			478			478		
Width	mm	225			225			225		
Depth	mm	105			105			105		
Weights										
Weight	kg	4.3			4.3			4.3		

Electronically controlled comfort instantaneous water heaters DHB-E SLi



PIC00003330

Electronically controlled comfort instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature can be variably preselected. The electronic control unit automatically adjusts the electrical output to ensure accurate temperature delivery up to the output limit. The bare wire heating system is suitable for hard and soft water areas (for application range, see specification). Installation with pressure fittings. Threaded water fittings for unfinished or finished walls, 3-way ball shut-off valve, connection option for direct draw-off taps on finished walls.

DHB-E SLi

- › DHB-E 18/21/24 SL, adjustable rated output
- › DHB-E 18 SL 25 A, for systems with 25 A fuse protection
- › Electronic closed loop control for accurate temperature delivery up to the output limit
- › Appliance cover rotates to bring user interface to top
- › Temperature can be limited to 43 °C
- › For preheated water, e.g. for reheating with a solar thermal system
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Saves up to 30 % water and energy compared with hydraulic instantaneous water heaters

Accessories

- › 073864 ZTA 3/4
- › 001786 LR-1-A
- › 230957 WEH
- › 232613 MEKD
- › 232614 MEBD

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Electronically controlled comfort instantaneous water heaters

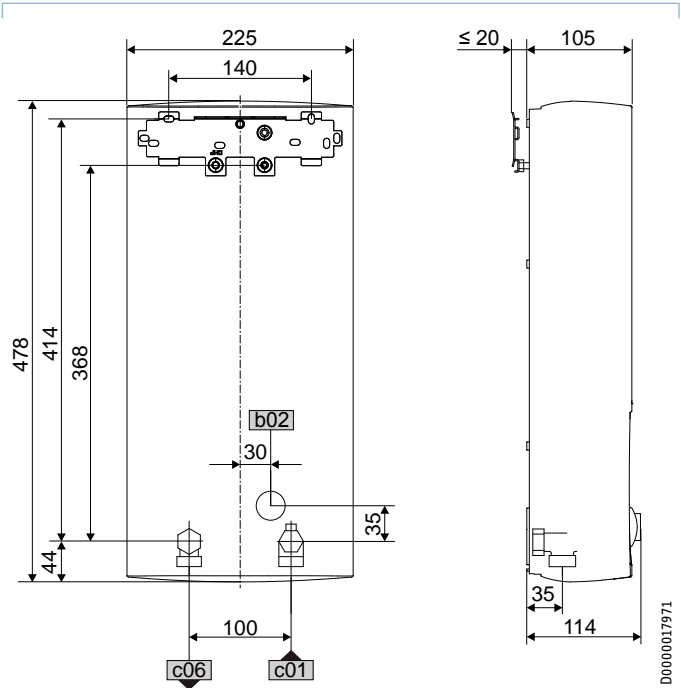
DHB-E SLi

		DHB-E 11 SLi			DHB-E 13 SLi			DHB-E 13 AU			DHB-E 18 SLi 25 A			DHB-E 18/21/24 SLi			DHB-E 27 SLi		
		232013			232014			232360			232015			232016			232017		
Electrical data																			
Rated voltage	V	380	400	415	380	400	415	380	400	415	380	400	415	380	400	415	380	400	415
Rated output	kW	10.1	11		12.2	13.5	14.5	12.2	13.5	14.5	16.2	18	19.4	16.2/19/21.7	18/21/24	19.4/22.6/25.8	24.4	27	
Rated current	A	15.4	16		18.5	19.5	20.2	18.5	19.5	20.2	24.7	26	27	27.6/29.5/33.3	29/31/35	30.1/32.2/36.3	37.1	39	
Fuse/MCB rating	A	16	16		20	20	20	20	20	20	25	25	32	32/32/35	32/32/35	32/32/40	40	40	
Phases		3/PE			3/PE			3/PE			3/PE			3/PE			3/PE		
Frequency	Hz	50/60	50/60		50/60	50/60	50/-	50/60	50/60	50/-	50/60	50/60	50/-	50/60	50/60	50/-	50/-	50/-	
Specific conductivity σ_{15} ≤ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	μS/cm	1111			1111			1111			1111			1111			1111		
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	Ω cm	900			900			900			900			900			900		
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	Ω cm	900	900	1000	900	900	1000	900	900	1000	900	900	1000	900	900	1000	900	900	1000
Specific conductivity σ_{15} ≤ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	μS/cm	1111	1111	1000	1111	1111	1000	1111	1111	1000	1111	1111	1000	1111	1111	1000	1111	1111	1000
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 45^\circ\text{C}$)	Ω cm	1200	1200	1300	1200	1200	1300	1200	1200	1300	1200	1200	1300	1200	1200	1300	1200	1200	1300
Specific conductivity σ_{15} ≤ (at $\vartheta_{\text{cold}} \leq 45^\circ\text{C}$)	μS/cm	833	833	770	833	833	770	833	833	770	833	833	770	833	833	770	833	833	770
Max. mains impedance at 50 Hz	Ω										0.474	0.450	0.433	0.356	0.338	0.326	0.316	0.300	
Max. mains impedance at 60Hz	Ω										0.392	0.372		0.294	0.279				
Connections																			
Water connection		G 1/2 A			G 1/2 A			G 1/2 A			G 1/2 A			G 1/2 A			G 1/2 A		
Application limits																			
Max. permissible pres- sure	MPa	1			1			1			1			1			1		
Max. inlet temperature for reheating	°C	45			45			45			45			45			45		
Values																			
Max. permissible inlet temperature	°C	60			60			60			60			60			60		
On	l/min	>3.0			>3.0			>3.0			>3.0			>3.0			>3.0		
Flow rate for pressure drop	l/min	3.1			3.9			5.2			5.2			5.2/6.0/6.9			7.7		
Pressure drop at flow rate	MPa	0.07 (0.02 without flow limiter)			0.11 (0.03 without flow limiter)			0.08 (0.06 without flow limiter)			0.08 (0.06 without flow limiter)			0.08/0.10/0.13 (0.06/0.08/0.10 without flow limiter)			0.16 (0.12 with- out flow limiter)		
Flow rate limit at	l/min	4.0			4.0			7.5			7.5			7.5/7.5/8.5			8.5		
DHW delivery	l/min	5.6			6.9			6.9			9.2			9.2/10.7/12.3			13.8		
$\Delta\vartheta$ on delivery	K	28			28			28			28			28			28		
Hydraulic data																			
Nominal capacity	l	0.4			0.4			0.4			0.4			0.4			0.4		
Versions																			
Connected load, se- lectable		-			-			-			-			X			-		
Temperature setting range	°C	30 - 60			30 - 60			30-50			30 - 60			30 - 60			30 - 60		
Safety category		1			1			1			1			1			1		
Insulating block		Plastic			Plastic			Plastic			Plastic			Plastic			Plastic		
Heating system		Bare wire			Bare wire			Bare wire			Bare wire			Bare wire			Bare wire		
Cap and back panel		Plastic			Plastic			Plastic			Plastic			Plastic			Plastic		
Colour		white			white			white			white			white			white		
IP rating		IP25			IP25			IP25			IP25			IP25			IP25		
Dimensions																			
Height/Width/Depth	mm	478	225	105	478	225	105	478	225	105	478	225	105	478	225	105	478	225	105
Weights																			
Weight	kg	3.6			3.6			3.6			3.6			3.6			3.6		

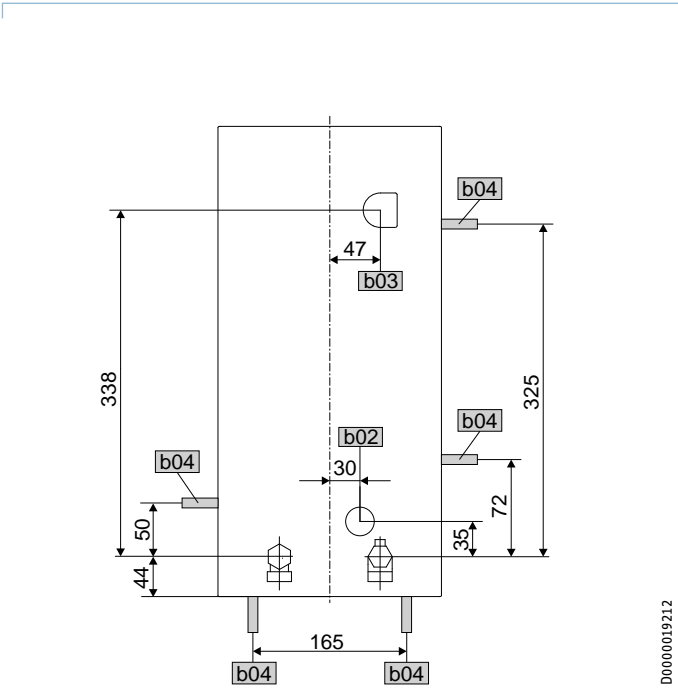
Electronically controlled comfort instantaneous water heaters

DHB-E SLi

Dimensions and connections



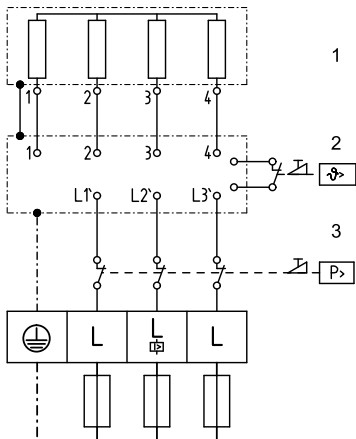
Alternative connection options



		DHB-E 11 SLi	DHB-E 13 SLi	DHB-E 13 AU	DHB-E 18 SLi 25 A	DHB-E 18/21/24 SLi	DHB-E 27 SLi
b02	Entry electrical cables I						
b03	Entry electrical cables II						
b04	Entry electrical cables III						
c01	Cold water inlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A

Wiring diagram

3/PE ~ 380-415 V



Electronically controlled comfort instantaneous water heaters DHB STi



PIC00002164

Electronically controlled comfort instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature can be selected in three detented stages. The electronic controller automatically adjusts the electric output accordingly. The bare wire heating system is suitable for hard and soft water areas (for application range, see specification). Installation with pressure fittings. Threaded water fittings for unfinished or finished walls, 3-way ball shut-off valve, connection option for direct draw-off taps on finished walls.

DHB STi

- › Electronic open loop control for accurate temperature delivery up to the output limit
- › Electronic air detection system
- › Appliance cover rotates to bring user interface to top
- › Power supply connection at the top or bottom of the appliance
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Three-stage temperature selection, approx. 35, 45, 55 °C

Accessories

- › 232613 MEKD
- › 232614 MEBD
- › 001786 LR-1-A
- › 230957 WEH

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

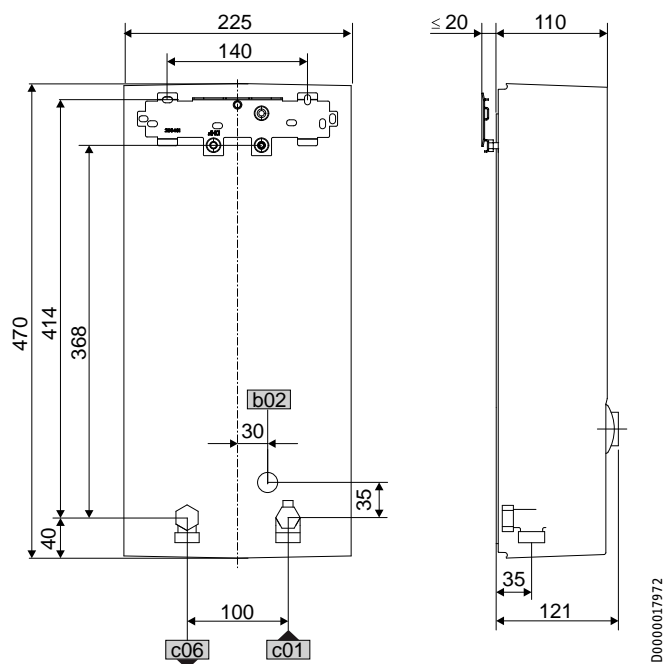
Electronically controlled comfort instantaneous water heaters

DHB STi

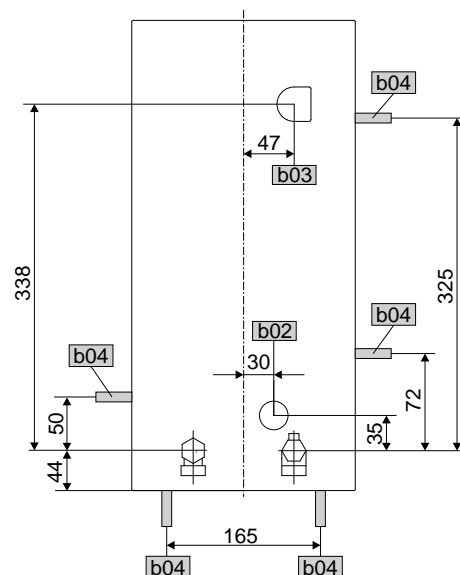
		DHB 18 STi			DHB 21 STi			DHB 24 STi			DHB 27 STi		
		227612			227613			227614			227615		
Electrical data													
Rated voltage	V	380	400	415	380	400	415	380	400	415	380	400	415
Rated output	kW	16.2	18	19.4	19	21	22.6	21.7	24	25.8	23.5	26	28
Rated current	A	24.7	26	27	29.5	31	32.2	33.3	35	36.3	35.6	37.7	38.9
Fuse/MCB rating	A	25	25	32	32	32	32	35	35	40	35	40	40
Phases		3/PE			3/PE			3/PE			3/PE		
Frequency	Hz	50/60	50/60	50/-	50/60	50/60	50/-	50/60	50/60	50/-	50/-	50/-	50/-
Max. mains impedance at 50 Hz	Ω	0.474	0.450	0.433	0.406	0.386	0.372	0.356	0.338	0.326	0.316	0.300	0.289
Max. mains impedance at 60Hz	Ω	0.392	0.372		0.336	0.319		0.294	0.279				
Specific resistance ρ ₁₅ ≥ (at θ _{cold} ≤35°C)	Ω cm	≥1100	≥1100	≥ 1200	≥1100	≥1100	≥ 1200	≥1100	≥1100	≥ 1200	≥1100	≥1100	≥ 1200
Specific conductivity σ ₁₅ ≤ (at θ _{cold} ≤35°C)	μS/cm	≤910	≤910	≤830	≤910	≤910	≤830	≤910	≤910	≤830	≤910	≤910	≤830
Connections													
Water connection		G 1/2 A			G 1/2 A			G 1/2 A			G 1/2 A		
Application limits													
Max. permissible pressure	MPa	1			1			1			1		
Values													
Max. permissible inlet temperature	°C	35			35			35			35		
On	l/min	> 3.0			> 3.0			> 3.0			> 3.0		
Flow rate for pressure drop	l/min	5.2			6.0			6.9			7.7		
Pressure drop at flow rate	MPa	0.08 (0.06 without flow limiter)			0.1 (0.08 without flow limiter)			0.13 (0.1 without flow limiter)			0.16 (0.12 without flow limiter)		
Flow rate limit at	l/min	7.5			7.5			8.5			8.5		
DHW delivery	l/min	9.2			10.7			12.3			13.8		
Δθ on delivery	K	28			28			28			28		
Hydraulic data													
Nominal capacity	l	0.4			0.4			0.4			0.4		
Versions													
Temperature setting range	°C	Approx. 35, 45, 55			Approx. 35, 45, 55			Approx. 35, 45, 55			Approx. 35, 45, 55		
Safety category		1			1			1			1		
Insulating block		Plastic			Plastic			Plastic			Plastic		
Heating system		Bare wire			Bare wire			Bare wire			Bare wire		
Cap and back panel		Plastic			Plastic			Plastic			Plastic		
Colour		white			white			white			white		
IP rating		IP25			IP25			IP25			IP25		
Dimensions													
Height/Width/Depth	mm	470	225	110	470	225	110	470	225	110	470	225	110
Weights													
Weight	kg	3.6			3.6			3.6			3.6		

Electronically controlled comfort instantaneous water heaters DHB STi

Dimensions and connections



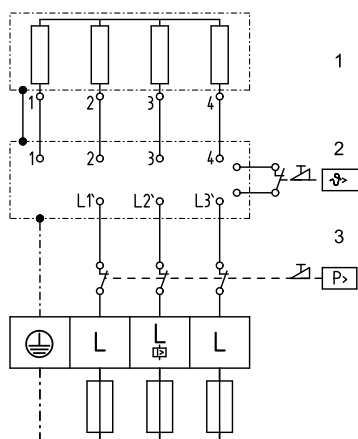
Alternative connection options



			DHB 18 STi	DHB 21 STi	DHB 24 STi	DHB 27 STi
b02	Entry electrical cables I					
b03	Entry electrical cables II					
b04	Entry electrical cables III					
c01	Cold water inlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A

Wiring diagram

3/PE ~ 380-415 V



- 1 Heater
- 2 High limit safety cut-out
- 3 Safety pressure limiter

Electronically controlled comfort instantaneous water heaters HDB-E Si



PLC00002905

Electronically controlled comfort instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature is permanently set in the appliance to 55 °C and is maintained up to the output limit. The electronic controller automatically matches the electric output [to the prevailing demand]. The bare wire heating system is suitable for hard and soft water areas (for application range, see specification). Installation with pressure fittings. Threaded water connections for installation on finished or unfinished walls. Ideal replacement appliance; matches the installation interfaces of STIEBEL ELTRON instantaneous water heaters.

HDB-E Si

- › Temperature set permanently to 55 °C
- › Electronic air detection system
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Power supply connection at the top or bottom of the appliance
- › Ideal replacement appliance for hydraulic instantaneous water heaters

Accessories

- › 232613 MEKD
- › 232614 MEBD
- › 230957 WEH

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Electronically controlled comfort instantaneous water heaters

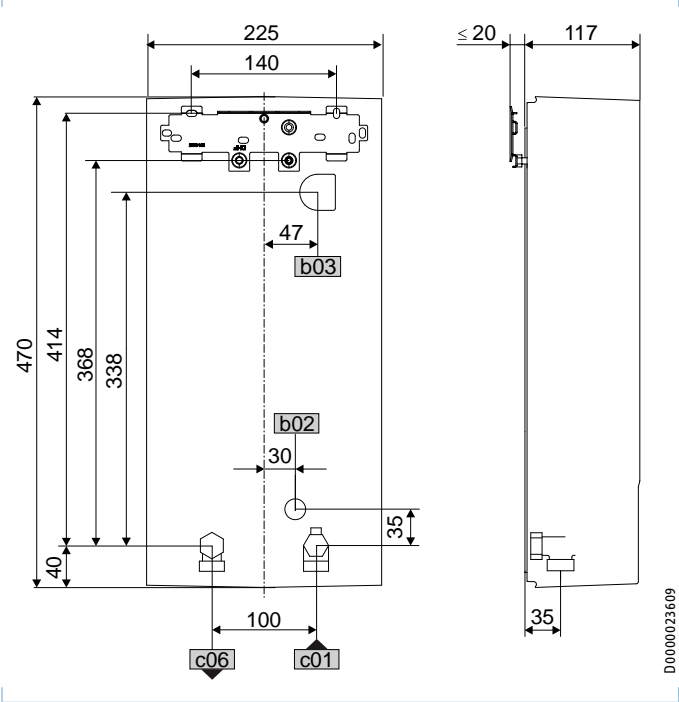
HDB-E Si

		HDB-E 12 Si			HDB-E 18 Si			HDB-E 21 Si			HDB-E 24 Si		
		232003			232004			232005			232006		
Electrical data													
Rated voltage	V	380	400	415	380	400	415	380	400	415	380	400	415
Rated output	kW	9.7	10.7	11.5	16.2	18	19.4	19	21	22.6	21.7	24	25.8
Rated current	A	14.4	15.5	16	24.7	26	27	29.5	31	32.2	33.3	35	36.3
Fuse/MCB rating	A	16	16	16	25	25	32	32	32	32	35	35	40
Phases		3/PE			3/PE			3/PE			3/PE		
Frequency	Hz	50/60	50/60	50/-	50/60	50/60	50/-	50/60	50/60	50/-	50/60	50/60	50/-
Max. mains impedance at 50 Hz	Ω				0.47	0.45	0.43	0.41	0.39	0.37	0.36	0.34	0.33
Max. mains impedance at 60Hz	Ω				0.39	0.37		0.34	0.32		0.29	0.28	
Specific resistance ρ ₁₅ ≥ (at θ _{cold} ≤35°C)	Ω cm	≥1100	≥1100	≥ 1200	≥1100	≥1100	≥ 1200	≥1100	≥1100	≥ 1200	≥1100	≥1100	≥ 1200
Specific conductivity σ ₁₅ ≤ (at θ _{cold} ≤35°C)	μS/cm	≤910	≤910	≤830	≤910	≤910	≤830	≤910	≤910	≤830	≤910	≤910	≤830
Connections													
Water connection		G 1/2 A			G 1/2 A			G 1/2 A			G 1/2 A		
Application limits													
Max. permissible pressure	MPa	1			1			1			1		
Values													
Max. permissible inlet temperature	°C	35			35			35			35		
On	l/min	>2.3			>2.3			>2.3			>2.3		
Flow rate for pressure drop	l/min	3.1			5.2			6.0			6.9		
Pressure drop at flow rate	MPa	0.07 (0.02 without flow limiter)			0.08 (0.06 without flow limiter)			0.10 (0.08 without flow limiter)			0.13 (0.1 without flow limiter)		
Flow rate limit at	l/min	4			7.5			7.5			8.5		
DHW delivery	l/min	5.5			9.0			10.5			12		
Δθ on delivery	K	28			28			28			28		
Hydraulic data													
Nominal capacity	l	0.4			0.4			0.4			0.4		
Versions													
Temperature setting range	°C	55			55			55			55		
Safety category		1			1			1			1		
Insulating block		Plastic			Plastic			Plastic			Plastic		
Heating system		Bare wire			Bare wire			Bare wire			Bare wire		
Cap and back panel		Plastic			Plastic			Plastic			Plastic		
Colour		white			white			white			white		
IP rating		IP25			IP25			IP25			IP25		
Dimensions													
Height/Width/Depth	mm	470	225	117	470	225	117	470	225	117	470	225	117
Weights													
Weight	kg	3.6			3.6			3.6			3.6		

Electronically controlled comfort instantaneous water heaters

HDB-E Si

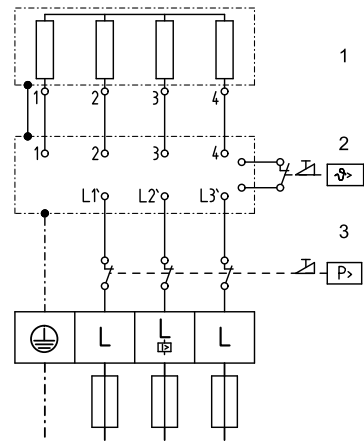
Dimensions and connections



			HDB-E 12 Si	HDB-E 18 Si	HDB-E 21 Si	HDB-E 24 Si
b02	Entry electrical cables I					
b03	Entry electrical cables II					
c01	Cold water inlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A

Wiring diagram

3/PE ~ 380-415 V



- 1 Bare wire heating system
- 2 High limit safety cut-out
- 3 Safety pressure limiter

Comfort instantaneous water heaters

Remote controls

Comfort instantaneous water heaters

Remote controls

FFB 1 SL



PIC00002067

- › Variable temperature selection from 20 °C to 60 °C
- › Exclusive soft-line design
- › User interface with backlit multifunction LCD
- › Display of temperature, flow rate, energy consumption or time
- › Two memory keys for accurate temperature delivery
- › Comfort functions: ECO button, four wellness shower programs, automatic water volume control
- › Safety functions: Childproofing; anti-scalding protection
- › Transmission frequency 868.3 MHz, bidirectional, range approx. 25 m

FFB 2 SL



PIC00002088

- › Variable temperature selection from 20 °C to 60 °C
- › Exclusive soft-line design
- › User interface with backlit multifunction LCD
- › Display of temperature, flow rate, energy consumption or time
- › Two memory keys for accurate temperature delivery
- › Comfort functions: ECO button, four wellness shower programs, automatic water volume control
- › Safety functions: Childproofing; anti-scalding protection
- › Transmission frequency 868.3 MHz, bidirectional, range approx. 25 m

The bi-directional wireless remote control FFB 1 SL enables operation of the DHE both at the appliance and via the wireless remote control. The receiver module is installed in the instantaneous water heater. The wireless user interface can be fitted into a wall mounting bracket anywhere convenient. Standard delivery: Receiver module, wireless user interface, wall mounting bracket. Retrofit option for all DHE SL from 04/2005.

The bi-directional wireless remote control FFB 2 SL enables extension of the system up to six wireless user interfaces. The wireless user interfaces can be fitted into wall mounted retainers anywhere convenient. Standard delivery: Wireless user interface, wall mounting bracket. Retrofit option for all DHE SL from 04/2005.

Comfort instantaneous water heaters

Remote controls

FFB 1



PIC00001958

The wireless remote control FFB 1 enables the operation of the DEL only via the wireless remote control. The programming unit on the instantaneous water heater indicates the temperature selected via the wireless remote control, and no adjustment may be made. The receiver module is installed into the instantaneous water heater. The wireless user interface can be fitted into a wall mounting bracket anywhere convenient. Standard delivery: Receiver module, wireless user interface, wall mounting bracket.

- › Temperature adjustment with plus/minus keys and two memory keys
- › Display of the accurate temperature
- › Retrofit option for all DEL from May 2005
- › Immersion resistant IPX7

FFB 2



PIC00001959

The wireless remote control FFB 2 enables extension of the system up to six wireless user interfaces. The wireless user interfaces can be fitted into wall mounted retainers anywhere convenient. Standard delivery: Wireless user interface, wall mounting bracket

- › Temperature adjustment with plus/minus keys and two memory keys
- › Display of the accurate temperature
- › Retrofit option for all DEL from May 2005
- › Immersion resistant IPX7

		FFB 1 SL	FFB 2 SL	FFB 1	FFB 2
		222419	223340	169478	169482
Temperature setting range	°C	20-60	20-60	30-60	30-60
Wireless frequency EU	MHz	868.3	868.3	433	433
Frequency band	MHz	868.0 - 868.6	868.0 - 868.6	433.05-434.79	433.05-434.79
Wireless range inside the building approx.	m	25	25	25	25
Height	mm	152	152	130	130
Width	mm	85	85	63	63
Depth	mm	23	23	18.5	18.5
Weight	kg	0.19	0.19	0.12	0.12

FB 1 SL



PIC00001990

The hardwired remote control FB 1 SL enables the operation exclusively at the remote control. The programming unit of the DHE is fitted into the wall mounting bracket. A fascia panel is fitted into the appliance. The FB 1 SL is connected via a permanent control cable (J-YY2 x 2 x 0.6). Standard delivery: Connection assembly, fascia, wall mounting bracket.

		FB 1 SL
		221333
Temperature setting range	°C	20-60
IP rating		IP25
Height	mm	190
Width	mm	88
Depth	mm	43

- › Retrofit option for all DHE from May 2005
- › Hoseproof to IP25
- › Safety low voltage

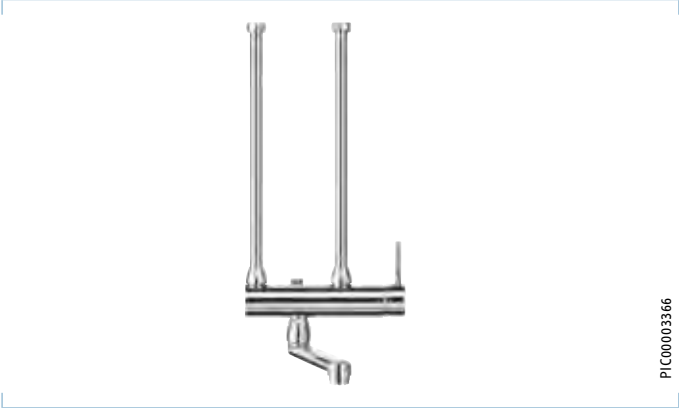
Comfort instantaneous water heaters

Special taps

Comfort instantaneous water heaters

Special taps

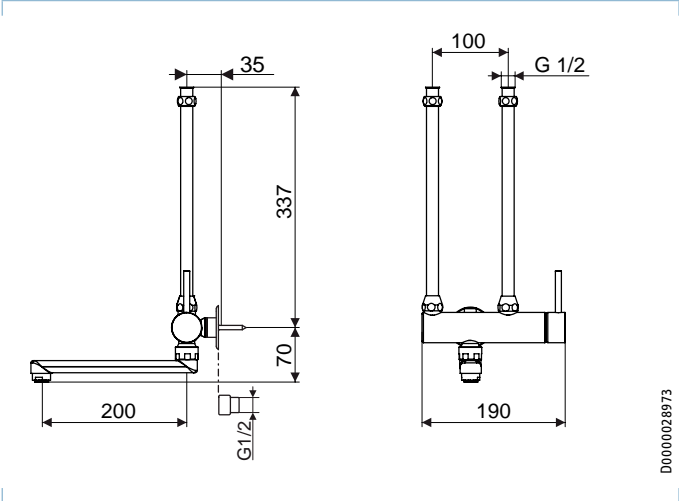
MEKD



- > Mono lever mixer tap (pressure-tested)
- > Can be used with DHE, DEL, DHB-E, DHB-ST, HDB-E, DHF-C
- > MEKD equipped with pivoting spout

		MEKD
		232613
Application		Kitchen
Type		Sealed unvented
Type of installation		Wall mounted mixer
Finish		Chrome-plated
Max. flow rate	l/min	13
Max. permissible pressure	MPa	1
Reach	mm	185
Water connection		G 1/2

Mono lever wall mounted tap (pressure-tested), chrome-plated metal lever, brass body, chrome finish. Cold water supply either via instantaneous water heater or tap connection.



Comfort instantaneous water heaters

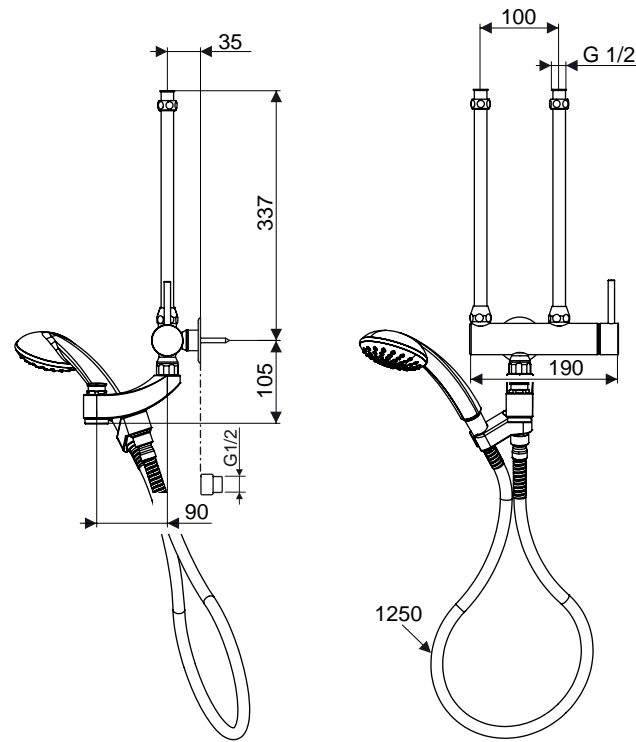
Special taps

MEBD



PI/C00003368

Mono lever wall mounted tap (pressure-tested), chrome-plated metal lever, brass body, chrome finish. Cold water supply either via instantaneous water heater or tap connection.



D0000028976

- › Mono lever mixer tap (pressure-tested)
- › Can be used with DHE, DEL, DHB-E, DHB-ST, DHH, HDB, DHF-C
- › Equipment level MEBD with rinsing hose and hand-held spray

		MEBD
		232614
Application		Bath/shower
Type		Sealed unvented
Max. permissible pressure	MPa	1
Max. flow rate	l/min	13
Type of installation		Wall mounted mixer
Finish		Chrome-plated
Water connection		G 1/2
Reach	mm	87

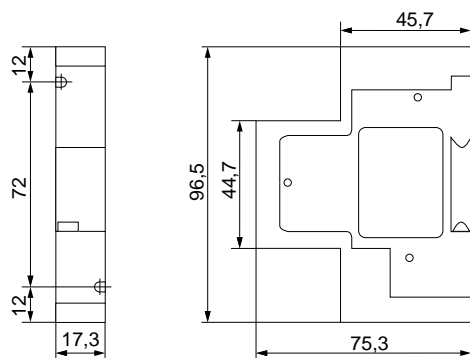
Comfort instantaneous water heaters

Accessories

Comfort instantaneous water heaters

Accessories

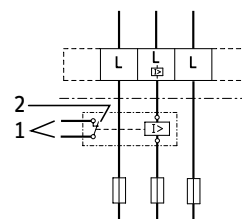
LR-1-A



D0000031718

› Installed dimension = one horizontal pitch as defined by DIN 43880

LR-1-A for instantaneous water heaters up to 27 kW. Automatic load shedding relay for priority control, e.g. in conjunction with electric storage heaters or to interlock two instantaneous water heaters against each other.



85_02_02_0003_

- 1 Control cable to the contactor of the 2nd appliance (e.g. electric storage heater).
- 2 Control contact opens when switching the instantaneous water heater on.

LR-1-A

001786

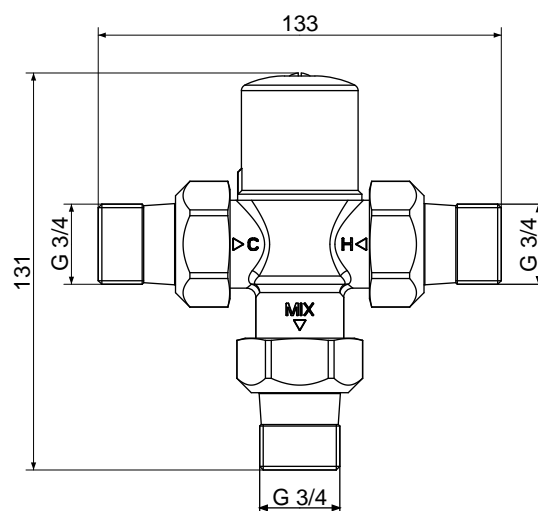
ZTA 3/4



PLC00002249

		ZTA 3/4
		073864
Temperature setting range	°C	35-65
Max. permissible pressure	MPa	1
Water connection		G 3/4 A

Thermostatic valve for central premixing, e.g. in conjunction with DHE (required in the case of cylinder temperatures >60 °C).



D0000028807

PRODUCTS

Compact instantaneous water heater

Compact instantaneous water heater



Electronic closed loop control compact instantaneous water heaters

DCE



PIC00003456

PIC00004230

Electronic closed loop control compact instantaneous water heaters

APPLICATION: Space saving, compact instantaneous water heater, especially suitable for kitchen sinks or for medium DHW convenience at washbasins or hand basins. In commercial settings, in utility rooms or for multiple hand washbasins in public washrooms. International: Also suitable for showers with inlet temperatures greater than 20 °C. Exceptionally flat, with installed depth of less than 10 cm.

EQUIPMENT / CONVENIENCE: Electronically controlled for accurate temperature delivery within the output range. Very rapid DHW heating and high temperature stability due to bare wire heating system. Selectable connected load 11 kW or 13.5 kW. With power cable as standard. Accurate temperature selection via the controls, for DHW heating from 20 - 60 °C. Rotary temperature selector on appliance with DCE 11/13 compact. Wireless remote control with memory function for 2 accurately delivered, preprogrammed temperatures, plus practical wall mounting bracket for DCE 11/13 compact RC.

EFFICIENCY: DHW is heated in close proximity to the draw-off point, no thermal losses in cylinder or pipework. Electronic output control with 3 sensors for high efficiency and consistently accurate temperature delivery. Accurate temperature delivery without unnecessary addition of cold water at the tap. Suitable for water preheated up to 70 °C; water preheated up to 55 °C can be additionally heated with the instantaneous water heater.

PROFI-RAPID INSTALLATION: Easy and secure wall mounting: Direct fitting through the appliance back panel enables easy compensation of any unevenness in the wall and drill hole discrepancies. Existing fixing points for common small water heaters can still be used. Appliance cover easy to open due to locking hooks. Quick, universal and external water connection: G 3/8 water connections at the top for direct installation with a pressure-tested or non-pressurised tap. Can be installed with plastic pipe systems. Easy electrical connection: Power cable prepared for permanent connection as standard, upward cable routing avoids cabling in visible lower areas. Adjustable output, can be set internally to 11 or 13.5 kW. IP25 rating.

SERVICE: Fault analysis via LED diagnostic display. Internal assembly can be completely removed from the back panel without tools.

SAFETY: Bare wire heating system suitable for hard and soft water. Anti-scalding protection can be activated internally to limit the water temperature to 43 °C. Multi stage electronic safety system, comprising high limit safety cut-out, sensor controlled monitoring of heating element temperature, and air detection system.

DCE

- › Exceptionally flat, compact design
- › Particularly convenient and energy efficient due to electronic output control
- › Quick PROFI-RAPID installation
- › Multi stage electronic safety concept
- › With power cable as standard
- › Wireless remote control as standard, with two temperature memory buttons (DCE 11/13 RC)
- › Selectable connected load 11 kW or 13.5 kW

Accessories

- › 233048 LRH 11/13.1
- › 230957 WEH
- › 230956 WEN

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

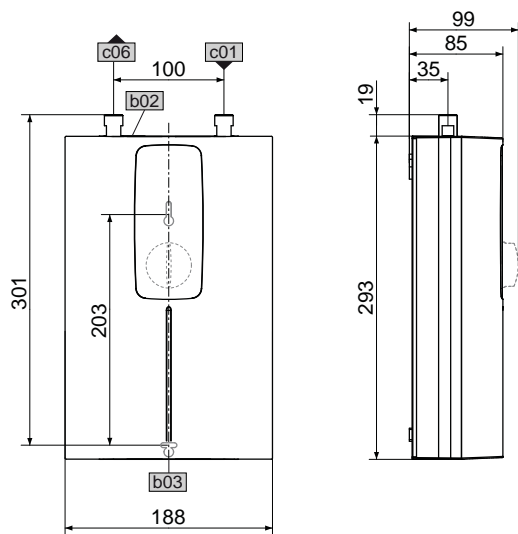
Electronic closed loop control compact instantaneous water heaters

DCE

		DCE 11/13			DCE 11/13 RC		
		230770			230771		
Electrical data							
Rated voltage	V	380	400	415	380	400	415
Rated output	kW	10/12.1	11/13.5	11.8/14.5	10/12.1	11/13.5	16.8/20.2
Rated current	A	15.4/18.5	16.2/19.5	16.8/20.2	15.4/18.5	16.2/19.5	16.4/20.1
Fuse/MCB rating	A	16/20	16/20	16/20	16/20	16/20	16/20
Phases		3/PE			3/PE		
Frequency	Hz	50/60	50/60	50/-	50/60	50/60	50/-
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	$\Omega \text{ cm}$	900	900	900	900	900	900
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	$\mu\text{S/cm}$	1111	1111	1111	1111	1111	1111
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 55^\circ\text{C}$)	$\Omega \text{ cm}$	1100	1100	1100	1100	1100	1100
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 55^\circ\text{C}$)	$\mu\text{S/cm}$	909	909	909	909	909	909
Max. mains impedance at 380V / 50Hz	Ω	0.28			0.28		
Max. mains impedance at 400V / 50Hz	Ω	0.26			0.26		
Max. mains impedance at 415V / 50Hz	Ω	0.24			0.24		
Connections							
Water connection		G 3/8			G 3/8		
Application limits							
Max. permissible pressure	MPa	1			1		
Max. inlet temperature for reheating	$^\circ\text{C}$	55			55		
Values							
Max. permissible inlet temperature	$^\circ\text{C}$	70			70		
On	l/min	>2.5			>2.5		
Flow rate for pressure drop	l/min	4 (8)			4 (8)		
Pressure drop at flow rate	MPa	0.06 (0.15 without flow limiter)			0.06 (0.15 without flow limiter)		
Flow rate limit at	l/min	5			5		
DHW delivery	l/min	3.7/4.5			3.7/4.5		
$\Delta\vartheta$ on delivery	K	43			43		
Hydraulic data							
Nominal capacity	l	0.2			0.2		
Versions							
Connected load, selectable		X			X		
Temperature setting range	$^\circ\text{C}$	20-60			20-60		
Safety category		1			1		
Insulating block		Plastic			Plastic		
Heating system		Bare wire			Bare wire		
Cap and back panel		Plastic			Plastic		
Colour		white			white		
IP rating		IP24			IP24		
Dimensions							
Height	mm	293			293		
Width	mm	188			188		
Depth	mm	99			85		
Weights							
Weight	kg	2.5			2.5		

Electronic closed loop control compact instantaneous water heaters DCE

Dimensions and connections

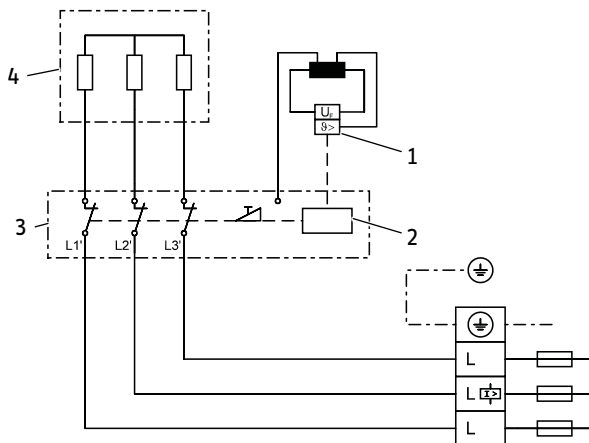


D0000039746

		DCE 11/13	DCE 11/13 RC
b02	Entry electrical cables I		
b03	Entry electrical cables II		
c01	Cold water inlet	Male thread	G 3/8 A
c06	DHW outlet	Male thread	G 3/8 A

Wiring diagram

3/PE ~ 380-415 V



D0000040233

- 1 High limit safety cut-out
- 2 Electronic safety switch
- 3 Power PCB
- 4 Heater

Electronic closed loop control compact instantaneous water heaters DHC-E



PLC00002100

Electronic closed loop control compact instantaneous water heaters

Sealed (pressure-tested), electronically controlled (open loop) instantaneous water heater for supplying multiple draw-off points. Tubular heater system in pressure-tested cylinder. The electronic open loop control system selects the output automatically, subject to the inlet temperature and the selected water temperature. After opening the tap/valve, the appliance switches on the power. With control lamp for heating mode. Operates even with low water pressure.

DHC-E

- › Simple and secure operation
- › Quick and easy installation
- › Works even with low water pressure
- › Use as a pressure appliance for multiple draw-off points or a shower
- › ETL compliant
- › IP 24: splashproof

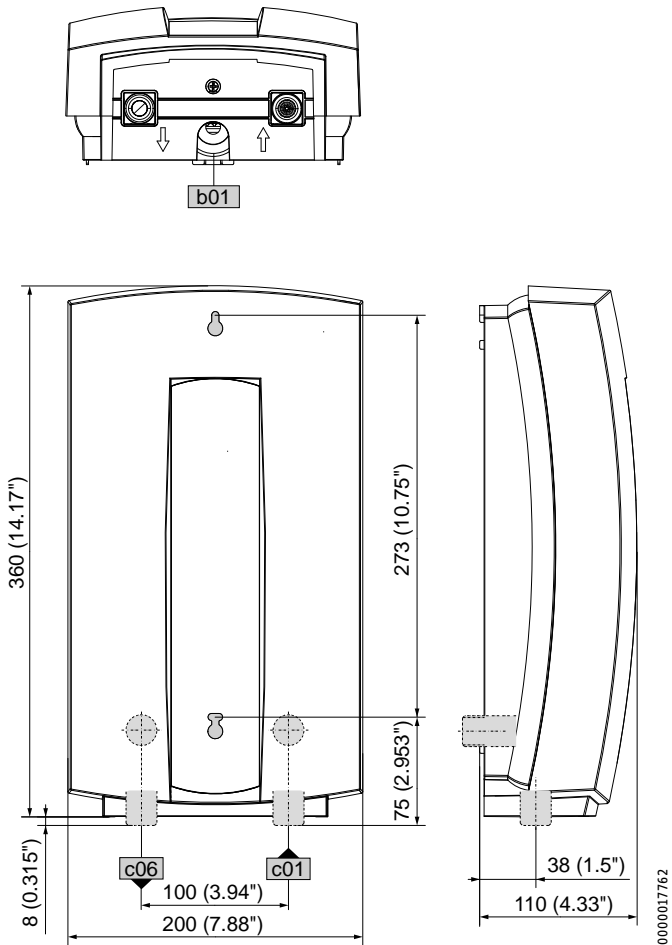
Electronic closed loop control compact instantaneous water heaters

DHC-E

		DHC-E 8/10				DHC-E 12			
		224201				230628			
Electrical data									
Rated voltage	V	208	220	230	240	208	220	230	240
Rated output	kW	5.4/7.2	6.0/8.1	6.6/8.8	7.2/9.6	9	10	11	12
Rated current	A	28/35	30/50	31/39	32/40	44	46	48	50
Fuse/MCB rating	A	30/50	40/50	40/50	40/50	60	60	60	60
Frequency	Hz	50/60				50/60			
Power connection		2/GRD				2/GRD			
Phases		1/N/PE ~220-240 V				1/N/PE ~220-240 V			
Values									
On	l/min	1.4				1.4			
Max. permissible inlet temperature	°C	55				55			
DHW delivery	l/min	3.0-5.2				4.9-6.5			
$\Delta\theta$ on delivery	K	25				25			
Flow rate for pressure drop	l/min	1.4				1.4			
Connections									
Water connection		1/2" NPT				1/2" NPT			
Application limits									
Max. permissible pressure	MPa	1				1			
Hydraulic data									
Nominal capacity	l	0.5				0.5			
Versions									
Temperature display		Analogue				Analogue			
Temperature setting range	°C	30-60				30-60			
Heating system		Tubular heater				Tubular heater			
Cap and back panel		Plastic				Plastic			
Colour		white				white			
IP rating		IP24				IP24			
Dimensions									
Height	mm	360				360			
Width	mm	200				200			
Depth	mm	110				110			
Weights									
Weight	kg	2.7				2.7			

Electronic closed loop control compact instantaneous water heaters DHC-E

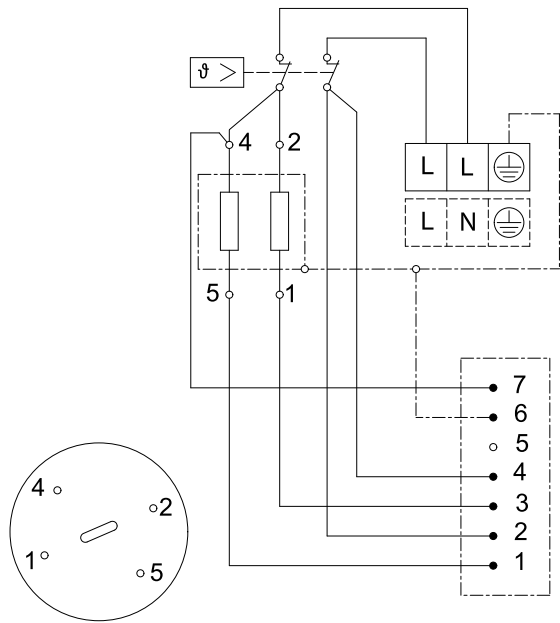
Dimensions and connections



		DHC-E 8/10	DHC-E 12
b01	Entry electrical cables		
c01	Cold water inlet	Male thread	1/2" NPT
c06	DHW outlet	Male thread	1/2" NPT

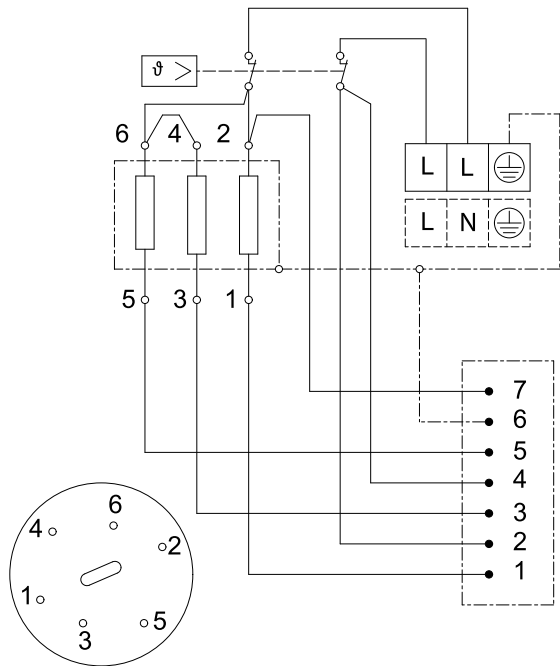
Wiring diagrams DHC-E 8/10

- 2/GRD ~ 208 / 240 V
- 1/N/PE ~ 220 / 230 / 240 V



DHC-E 12

- 2/GRD ~ 208 / 240 V
- 1/N/PE ~ 220 / 230 / 240 V



Hydraulically controlled (open loop) compact instantaneous water heaters DHF C



PIC0000264

Hydraulically controlled (open loop) compact instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The hydraulic control system regulates the electrical output automatically in two output stages, subject to the flow rate. When the start-up volume is exceeded, first the lower output stage is started (for smaller flow rates) then the higher stage (for higher flow rates). The tubular heater system inside the pressure-tested copper cylinder can be used in soft water areas. Installation with pressure taps. Threaded water connections for finished/unfinished walls, 3-way ball shut-off valve, connections for WKMD and WBMD surface mounted taps.

DHF C

- › Hydraulically controlled
- › Output selector for locking out the higher output stage
- › The control valve largely compensates for pressure fluctuations
- › Tubular heating system

Accessories

- › 232613 MEKD
- › 232614 MEBD
- › 001786 LR-1-A
- › 230957 WEH

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

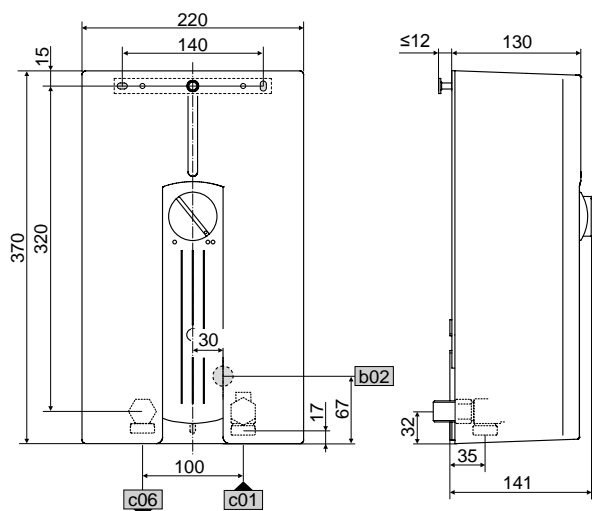
Hydraulically controlled (open loop) compact instantaneous water heaters

DHF C

		DHF 13 C	DHF 15 C	DHF 18 C	DHF 21 C	DHF 24 C	DHF 12 C1		DHF 13 C3		
		074301	074302	074303	074304	074305	182137		185708		
Electrical data											
Rated voltage	V	400	400	400	400	400	230	230	220	230	230
Rated output stage I max.	kW	6.6	7.5	9	10.5	12	8.8	8			6.6
Rated output stage II min.	kW	6.6	7.5	9	10.5	12	8.8	8			6.6
Rated output stage II max.	kW	13.2	15	18	21	24	13.2	12			13.2
Rated current	A	19.5	21.7	26	30.4	34.2	57.3	54.5			33
Fuse/MCB rating	A	20	25	32	32	35	60	60			35
Phases		3/PE	3/PE	3/PE	3/PE	3/PE	1/N/PE				3/PE
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60				50/60
Max. mains impedance Zmax to DIN EN 61000-3-11	Ω					0.44	0.15				0.45
Connections											
Water connection		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A				G 1/2 A
Total alkaline earths	mol/m³	2.5	2.5	2.5	2.5	2.5	2.5				2.5
Total hardness (H2O)	Degree d	14	14	14	14	14	14				14
Hardness range		2 (medium hardness)	2 (medium hardness)	2 (medium hardness)	2 (medium hardness)	2 (medium hardness)	2 (medium hardness)				2 (medium hardness)
Application limits											
Max. permissible pressure	MPa	1	1	1	1	1	1				1
Values											
Max. permissible inlet temperature	°C	20	20	20	20	20	20				20
ON 1st stage	l/min	>2.5	>3.0	>3.9	>4.4	>4.9	>2.5				>2.5
ON 2nd stage	l/min	>3.7	>4.5	>5.9	>6.4	>7.6	>3.7				>3.7
Pressure drop at flow rate	MPa	0.05	0.055	0.06	0.06	0.07	0.05				0.05
Flow rate for pressure drop	l/min	3.7	4.5	5.9	6.4	7.6	3.7				3.7
DHW delivery	l/min	6.7	7.4	9.2	10.7	12.3	6.2				6.7
Δθ on delivery	K	28	28	28	28	28	28				28
Hydraulic data											
Nominal capacity	l	0.6	0.6	0.6	0.6	0.6	0.6				0.6
Versions											
Safety category		1	1	1	1	1	1				1
Pressure vessel material		Copper	Copper	Copper	Copper	Copper	Copper				Copper
Heating system		Tubular heater	Tubular heater	Tubular heater	Tubular heater	Tubular heater	Tubular heater				Tubular heater
Cap and back panel		Plastic	Plastic	Plastic	Plastic	Plastic	Plastic				Plastic
Colour		white	white	white	white	white	white				white
IP rating		IP24	IP24	IP24	IP24	IP24	IP24				IP24
Dimensions											
Height	mm	370	370	370	370	370	370				370
Width	mm	220	220	220	220	220	220				220
Depth	mm	130	130	130	130	130	130				130
Weights											
Weight	kg	4.1	4.1	4.1	4.1	4.1	4.1				4.1

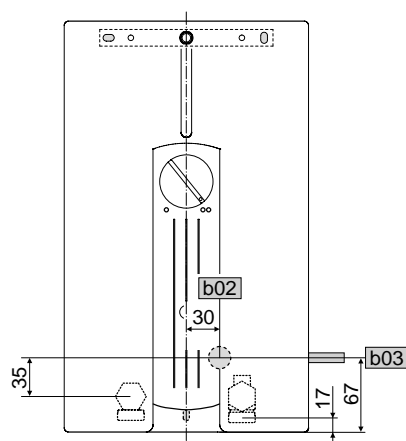
Hydraulically controlled (open loop) compact instantaneous water heaters DHF C

Dimensions and connections



D0000017978

Alternative connection options



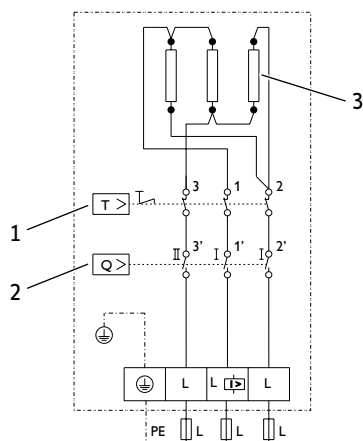
D0000025571

		DHF 13 C	DHF 15 C	DHF 18 C	DHF 21 C	DHF 24 C	DHF 12 C1	DHF 13 C3
b02	Entry electrical cables I							
b03	Entry electrical cables II							
c01	Cold water inlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A

Wiring diagrams

Appliance types other than DHF 12 C1

Appliance types other than DHF 13 C3: 3/PE ~ 400 V
DHF 12 C3: 3/PE ~ 230 V

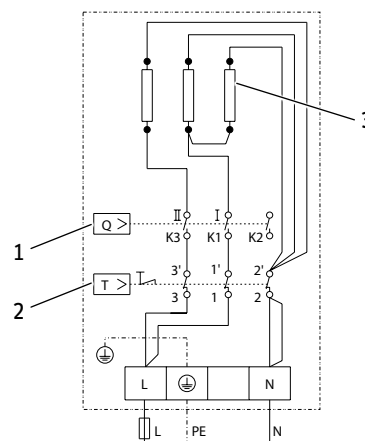


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- 1 High limit safety cut-out
- 2 Differential pressure switch
Stage I for low flow rate
Stage II for high flow rate
- 3 Tubular heater system

DHF 12 C1

1/N/PE ~ 220/230 V



85_02_02_0008

- 1 Differential pressure switch
Stage I for low flow rate
Stage II for high flow rate
- 2 High limit safety cut-out
- 3 Tubular heater system

Hydraulically controlled (open loop) compact instantaneous water heaters DHC



PLC00002247

Hydraulically controlled (open loop) compact instantaneous water heaters

Sealed unvented (pressure-tested), hydraulically switched instantaneous water heater for supplying several draw-off points that are close to each other. Tubular heater element inside a pressure-tested copper cylinder. Works even with low water pressure.

DHC

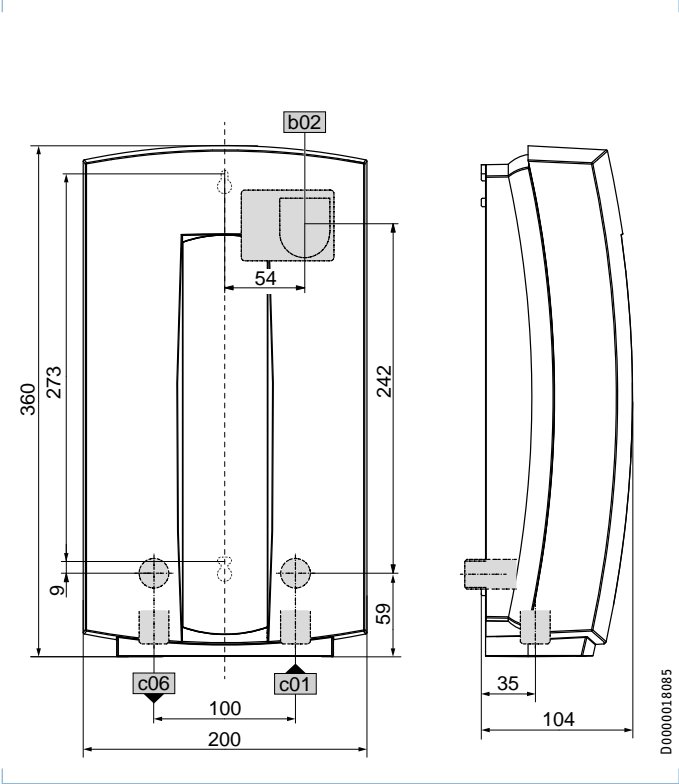
- › Hydraulically controlled
- › Metal water connections
- › Power cable with standard plug (DNM 3)
- › Tubular heating system

Hydraulically controlled (open loop) compact instantaneous water heaters DHC

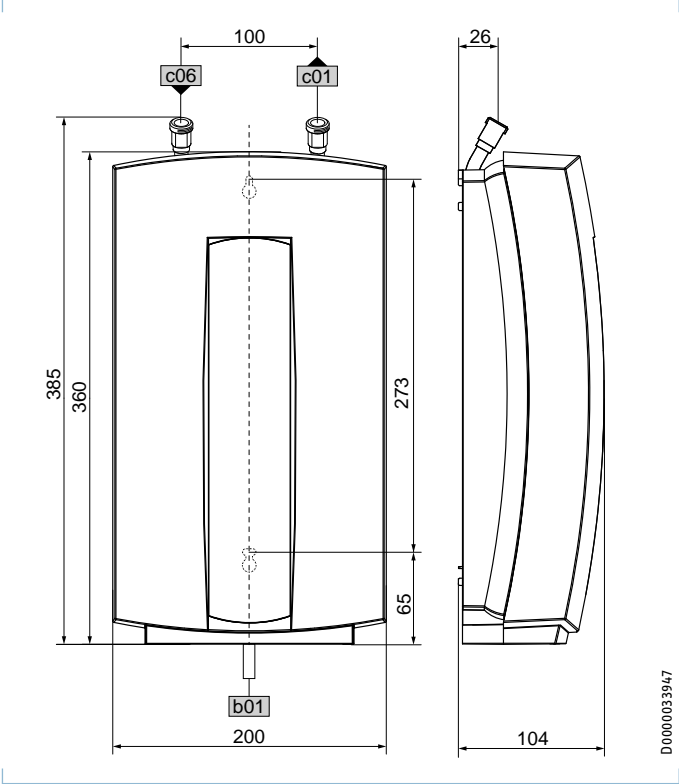
		DHC 3			DHC 4			DHC 6			DHC 8			DHC 6 U		
		073478			073715			073480			073481			073479		
Electrical data																
Rated voltage	V	220	230	240	220	230	240	220	230	240	220	230	240	220	230	240
Rated output	kW	2.7	3.0	3.3	4.0	4.4	4.8	6.0	6.6	7.2	8.0	8.8	9.6	6.0	6.6	7.2
Rated current	A	12.2	13.0	13.4	18.1	19.1	20.8	27.2	28.6	30.0	36.3	38.2	40.0	27.2	28.6	30.0
Fuse/MCB rating	A	16	16	16	20	20	20	30	30	30	40	40	40	30	30	30
Cable cross-section	mm ²						2.5			4			6			4
Phases		1/N/PE			1/N/PE			1/N/PE			1/N/PE			1/N/PE		
Frequency	Hz	50/60			50/60			50/60			50/60			50/60		
Max. mains impedance Zmax to DIN EN 61000-3-11	Ω	0.47			0.47			0.32			0.24			0.32		
Connections																
Water connection		G 1/2 A			G 1/2 A			G 1/2 A			G 1/2 A			G 3/8 A		
Total alkaline earths	mol/m ³	2.5			2.5			2.5			2.5			2.6		
Total hardness (H ₂ O)	Degree d	14			14			14			14			14		
Hardness range		2 (medium hardness)			2 (medium hardness)			2 (medium hardness)			2 (medium hardness)			2 (medium hardness)		
Application limits																
Max. permissible pressure	MPa	1			1			1			1			1		
Test pressure	MPa	1.1			1.1			1.1			1.1			1.1		
Values																
Max. permissible inlet temperature	°C	30			20			30			25			30		
On	l/min	> 1.6			> 1.6			> 2.6			> 3.0			> 2.6		
Pressure drop at flow rate	MPa	0.025			0.025			0.025			0.03			0.025		
Flow rate for pressure drop	l/min	1.6			1.6			2.6			3.0			2.6		
DHW delivery	l/min	1.7			2.5			3.7			5.0			3.7		
Δθ on delivery	K	25			25			25			25			25		
Hydraulic data																
Nominal capacity	l	0.5			0.5			0.5			0.5			0.5		
Versions																
Sealed unvented type		X			X			X			X			X		
Oversink installation		X			X			X			X					
Undersink installation														X		
IP rating		IP24			IP24			IP24			IP24			IP24		
Safety category		1			1			1			1			1		
Pressure vessel material		Copper			Copper			Copper			Copper			Copper		
Heating system		Tubular heater			Tubular heater			Tubular heater			Tubular heater			Tubular heater		
Cap and back panel		Plastic			Plastic			Plastic			Plastic			Plastic		
Colour		white			white			white			white			white		
Dimensions																
Height/Width/Depth	mm	360	200	104	360	200	104	360	200	104	360	200	104	360	200	104
Weights																
Weight	kg	2			2.1			2.4			2.4			2.4		

Hydraulically controlled (open loop) compact instantaneous water heaters DHC

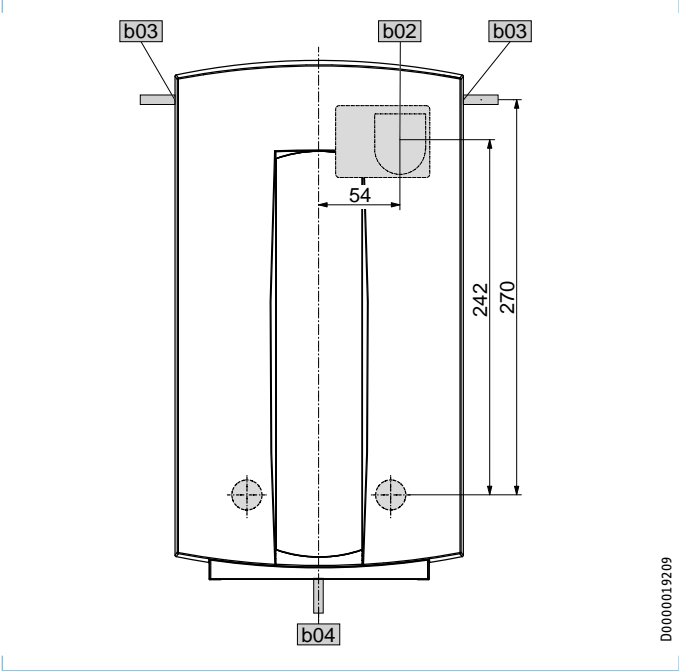
Dimensions and connections Appliance types other than DHC 6 U



DHC 6 U



Alternative connection options



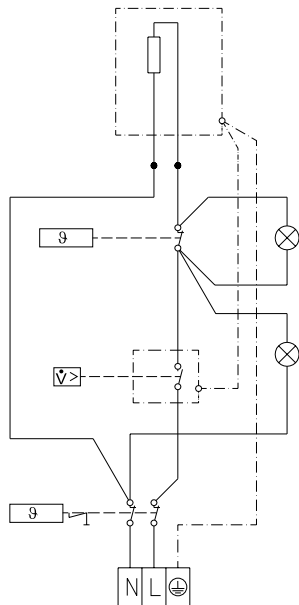
		DHC 6 U	DHC 6	DHC 8	DHC 4
b02	Entry electrical cables I				
b03	Entry electrical cables II				
b04	Entry electrical cables III				
c01	Cold water inlet	Male thread	G 3/8 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 3/8 A	G 1/2 A	G 1/2 A

Hydraulically controlled (open loop) compact instantaneous water heaters DHC

Wiring diagrams

DHC 4

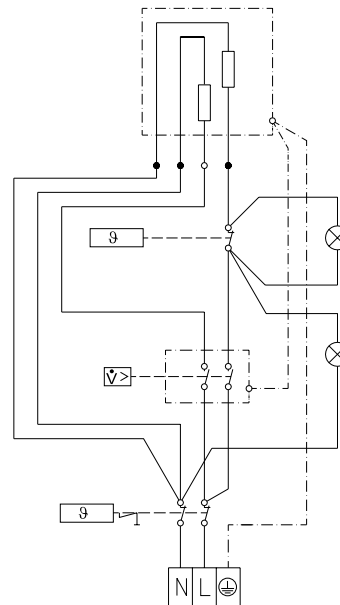
1/N/PE ~ 220-240 V



85_03_03_0006

DHC 6, DHC 8, DHC 6 U

1/N/PE ~ 220-240 V



85_02_03_0007

Hydraulically controlled (open loop) compact instantaneous water heaters DHA



PLC00002247

Hydraulically controlled (open loop) compact instantaneous water heaters

Attractively designed, hydraulically controlled compact instantaneous water heater (pressure-tested), with bare wire heating system for rapid heat-up, equipped with power cable for permanent connection, and tee and pressure hose as connection accessories. With aerator for adaptation to commercially available pressure taps. Metal water connections G 3/8.

DHA

- › Hydraulically controlled
- › Metal water connections
- › Power cable with standard plug (DNM 3)
- › Tubular heating system

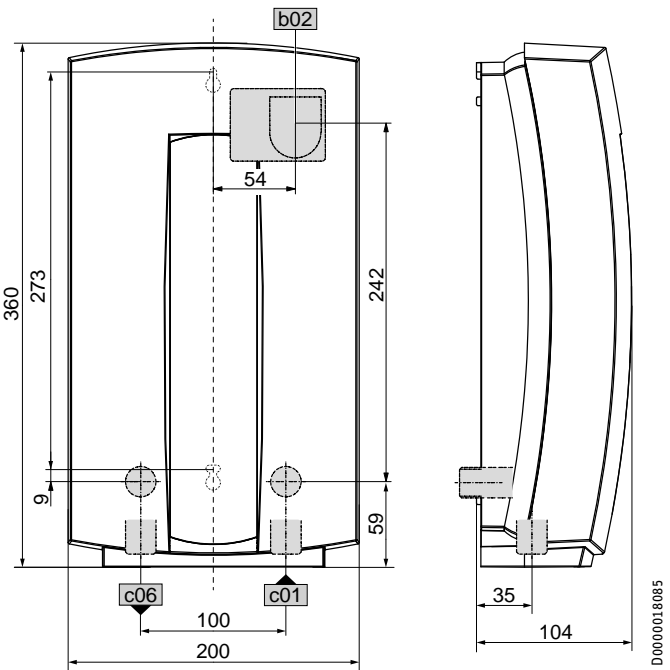
Hydraulically controlled (open loop) compact instantaneous water heaters

DHA

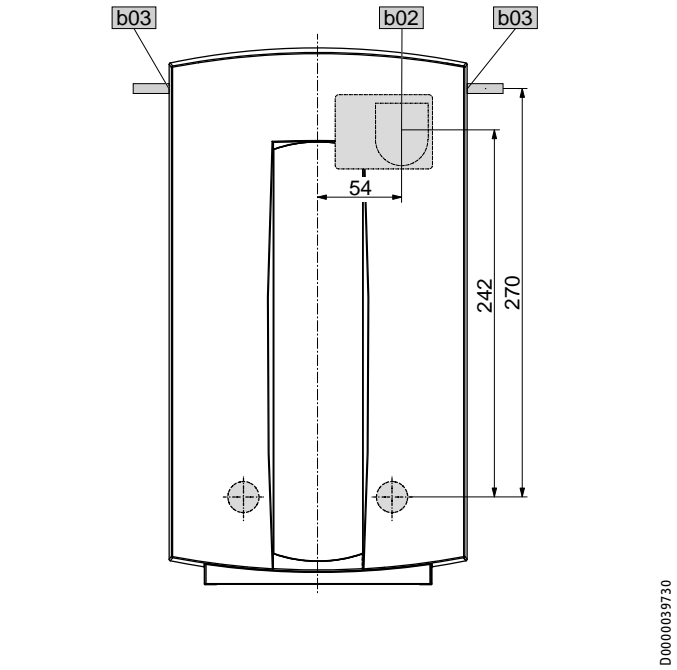
DHA 4/8 L				
073716				
Electrical data				
Rated voltage	V	220	230	240
Rated output	kW	8.0	8.8	9.6
Rated current	A	36.3	38.2	40
Fuse/MCB rating	A	40	40	40
Cable cross-section	mm ²			6
Phases				1/N/PE
Frequency	Hz			50/60
Max. mains impedance Z _{max} to DIN EN 61000-3-11	Ω			0.24
Connections				
Water connection				G 1/2
Total alkaline earths	mol/m ³			2.5
Total hardness (H ₂ O)	Degree d			14
Hardness range				2 (medium hardness)
Application limits				
Max. permissible pressure	MPa			1
Test pressure	MPa			1.1
Values				
Max. permissible inlet temperature	°C			25
On	l/min			> 3.0
DHW delivery	l/min			4.6
Δθ on delivery	K			25
Hydraulic data				
Nominal capacity	l			0.6
Versions				
Sealed unvented type				X
Oversink installation				X
IP rating				IP24
Safety category				1
Pressure vessel material				Copper
Heating system				Tubular heater
Cap and back panel				Plastic
Colour				white
Dimensions				
Height	mm			362
Width	mm			200
Depth	mm			105
Weights				
Weight	kg			2.6

Hydraulically controlled (open loop) compact instantaneous water heaters DHA

Dimensions and connections



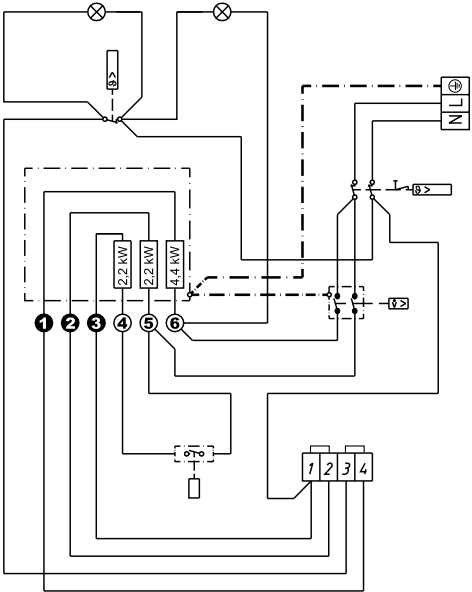
Alternative connection options



DHA 4/8 L		
b02	Entry electrical cables I	
b03	Entry electrical cables II	
c01	Cold water inlet	Male thread G 1/2 A
c06	DHW outlet	Male thread G 1/2 A

Wiring diagram

- 8.8 kW 1/N/PE ~ 220-240 V
- 6.6 kW 1/N/PE ~ 220-240 V
- 4.4 kW 1/N/PE ~ 220-240 V



Compact instantaneous water heater

Taps/valves

Compact instantaneous water heater

Taps/valves

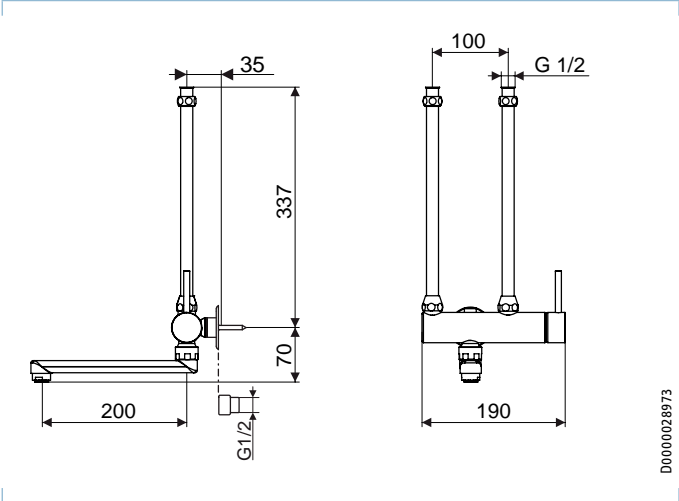
MEKD



- › Mono lever mixer tap (pressure-tested)
- › Can be used with DHE, DEL, DHB-E, DHB-ST, DHH, HDB, DHF-C
- › MEKD equipped with pivoting spout

		MEKD
		232613
Application		Kitchen
Type		Sealed unvented
Type of installation		Wall mounted mixer
Finish		Chrome-plated
Max. flow rate	l/min	13
Max. permissible pressure	MPa	1
Reach	mm	185
Water connection		G 1/2

Mono lever wall mounted tap (pressure-tested), chrome-plated metal lever, brass body, chrome finish. Cold water supply either via instantaneous water heater or tap connection.



Compact instantaneous water heater

Taps/valves

MEBD

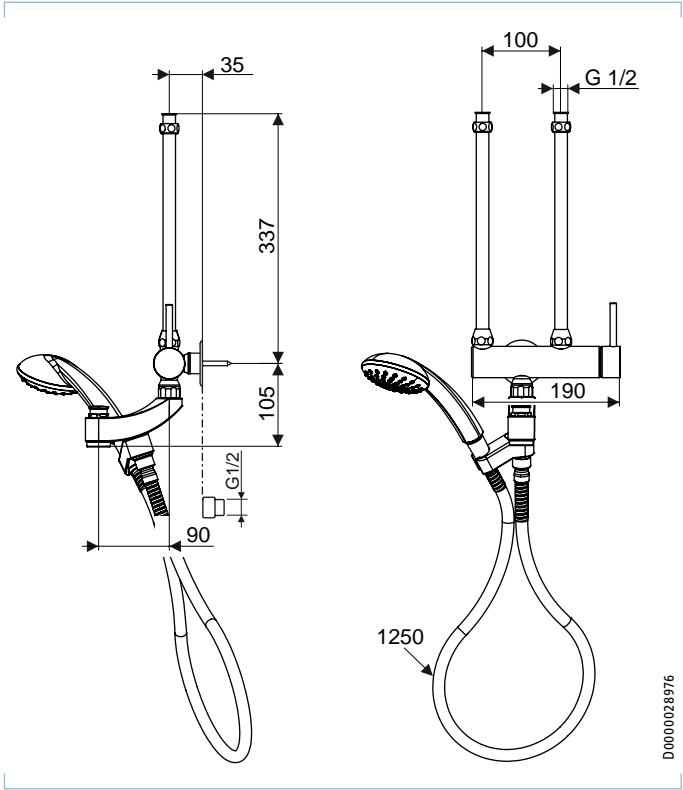


PI/C00003368

Mono lever wall mounted tap (pressure-tested), chrome-plated metal lever, brass body, chrome finish. Cold water supply either via instantaneous water heater or tap connection.

- › Mono lever mixer tap (pressure-tested)
- › Can be used with DHE, DEL, DHB-E, DHB-ST, DHH, HDB, DHF-C
- › Equipment level MEBD with rinsing hose and hand-held spray

		MEBD
		232614
Application		Bath/shower
Type		Sealed unvented
Max. permissible pressure	MPa	1
Max. flow rate	l/min	13
Type of installation		Wall mounted mixer
Finish		Chrome-plated
Water connection		G 1/2
Reach	mm	87



D0000028976

Compact instantaneous water heater

Taps/valves

WEH

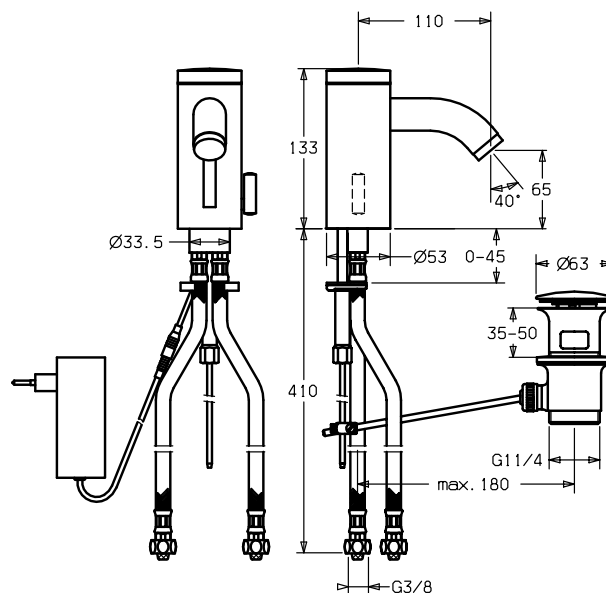


PIC00002179

- › Sensor tap (pressure-tested) for DHM and DEM
- › Stable and robust version for commercial use
- › Operationally reliable thanks to dirt trap in the inlet
- › Easy-care chrome finish
- › Easy selection of accurate temperature delivery
- › No maintenance thanks to plug-in power supply unit (no need to change batteries)

		WEH
		230957
Application		Washbasin
Sealed unvented type		X
Type of installation		Monobloc mixer tap
Finish		Chrome-plated
Connection		Connecting hoses
Max. flow rate	l/min	6
Minimum supply pressure	MPa	0.1
Max. DHW temperature	°C	80
Rated voltage	V	230
Power connection		1/N/PE
Standby power consumption	W	0.6
Outlet height	mm	65
Reach	mm	110
Weight	kg	2.2

Sensor tap for washbasins. For pressurised operation. Chrome-plated finish, quick-acting fitting. 230 V plug-in power supply unit.



D0000017728

Compact instantaneous water heater

Taps/valves

WEN

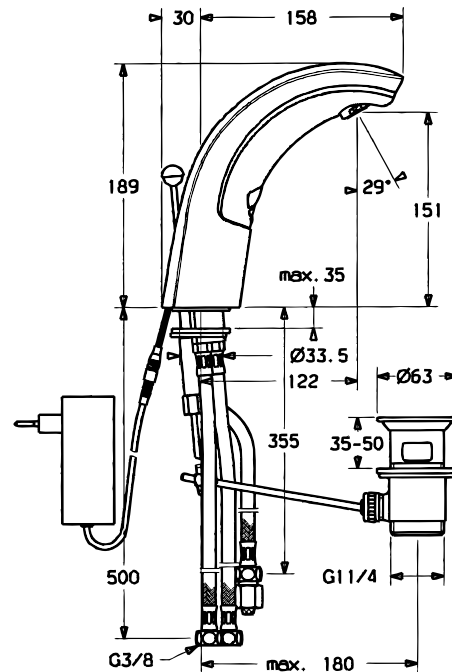


PIC00002178

- › Open sensor tap for mini instantaneous water heaters (DEM, DNM) and pressurised / non-pressurised cylinders (SNU 5/10, SHU 5/10)
- › Stable and robust version for commercial use
- › Operationally reliable thanks to dirt trap in the inlet
- › Easy-care chrome finish
- › Easy selection of accurate temperature delivery
- › No maintenance thanks to plug-in power supply unit (no need to change batteries)

		WEN
		230956
Application		Washbasin
Open vented type		X
Type of installation		Monobloc mixer tap
Finish		Chrome-plated
Connection		Connecting hoses
Max. flow rate	l/min	5
Minimum supply pressure	MPa	0.1
Max. DHW temperature	°C	80
Rated voltage	V	230
Power connection		1/N/PE
Max. current load, power supply unit	A	16
Standby power consumption	W	0.6
Outlet height	mm	151
Reach	mm	122
Weight	kg	3.14

Sensor tap for washbasins. Open type of operation (non-pressurised). Chrome-plated finish, quick-acting fitting. 230 V plug-in power supply unit with integrated socket for a standard plug.

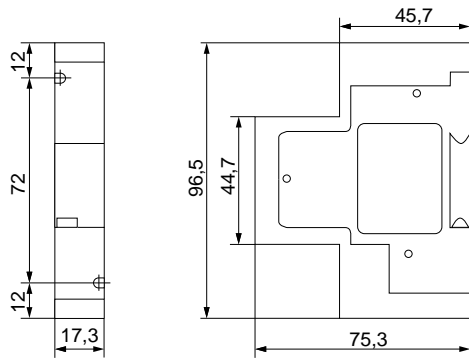


D0000017729

Compact instantaneous water heater Accessories

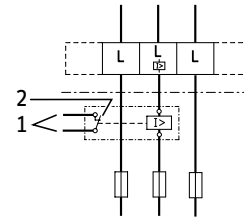
Compact instantaneous water heater Accessories

LR-1-A



› Installed dimension = one horizontal pitch as defined by DIN 43880

LR-1-A for instantaneous water heaters up to 27 kW. Automatic load shedding relay for priority control, e.g. in conjunction with electric storage heaters or to interlock two instantaneous water heaters against each other.



- 1 Control cable to the contactor of the 2nd appliance (e.g. electric storage heater).
- 2 Control contact opens when switching the instantaneous water heater on.

LR-1-A
001786

PRODUCTS

Mini instantaneous water heater

Mini instantaneous water heater



Mini instantaneous water heaters, open (vented)/sealed (unvented) DEM



PIC00002180

Mini instantaneous water heaters, open (vented)/sealed (unvented)

Right up to their output limit, the mini electronic instantaneous water heaters maintain a constant outlet temperature, irrespective of the inlet temperature. The bare wire heating system ensures quick and efficient DHW availability. The temperature can be set internally from approx. 30 °C to 50 °C. The flow rate can be set so it still functions reliably when the water pressure is low. The mini electronic instantaneous water heaters heat the water directly at the draw-off point only when required. Particularly suitable for basins where a constant outlet temperature is required. International: Also suitable for showers if inlet temperatures are in the high range. Energy and water losses due to long pipe runs, as occur in central systems, are avoided. Also suitable for preheated water up to 60 °C. Reheating up to 45 °C.

DEM

- › Efficient DHW supply especially to hand basins
- › International: Also suitable for showers if inlet temperatures are in the high range
- › Electronically controlled mini instantaneous water heater
- › Constant outlet temperature up to the output limit thanks to electronics
- › Temperature can be set internally from approx. 30 - 50 °C
- › Flow rate can be selected internally
- › Effective bare wire heating system
- › DHW output DEM 7: 3.7 l/min with 15 °C to 40 °C (Δt 25 K)

Accessories

- › 185474 MAW
- › 185475 MAZ
- › 185476 MAE
- › 230957 WEH
- › 230956 WEN

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

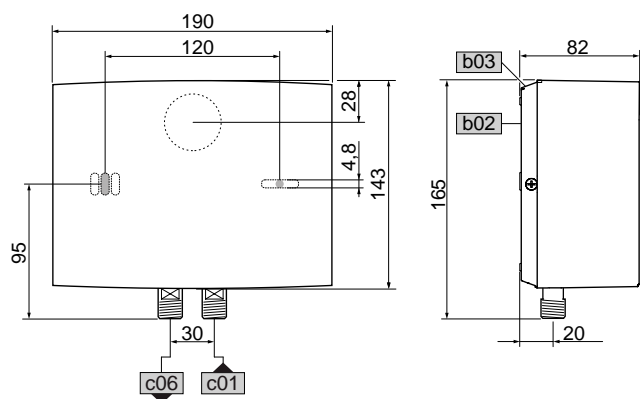
Mini instantaneous water heaters, open (vented)/sealed (unvented)

DEM

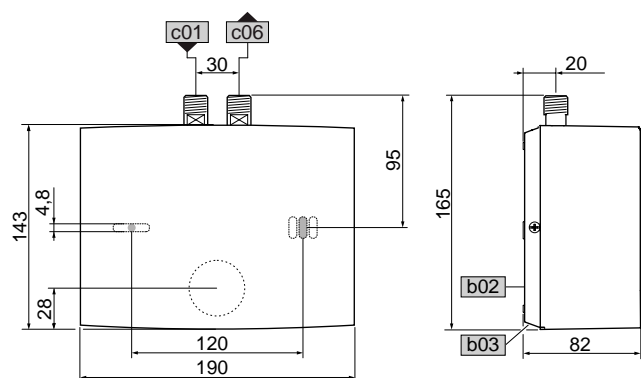
		DEM 3				DEM 4				DEM 6				DEM 7	
		231001				231002				231215				232769	
Electrical data															
Rated voltage	V	200	220	230	240	200	220	230	240	200	220	230	240	380	400
Rated output	kW	2.7	3.2	3.5	3.8	3.3	4.0	4.4	4.8	4.3	5.2	5.7	6.2	5.9	6.5
Rated current	A	13.3	14.5	15.2	15.8	16.7	18.2	19.1	20.0	21.6	23.6	24.7	25.8	15.5	16.3
Fuse/MCB rating	A	16	16	16	16	20	20	20	20	25	25	25	32	16	20
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/-	50/-
Phases		1/N/PE				1/N/PE				1/N/PE				2/PE	
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	$\Omega\text{ cm}$	1000				1000				1000				1000	
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	$\mu\text{S/cm}$	1000				1000				1000				1000	
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 50^\circ\text{C}$)	$\Omega\text{ cm}$	1300				1300				1300				1300	
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 50^\circ\text{C}$)	$\mu\text{S/cm}$	770				770				770				770	
Max. mains impedance at 50 Hz	Ω	0.182	0.166	0.158	0.152	0.137	0.125	0.119	0.114	0.091	0.083	0.079	0.076		
Max. mains impedance at 60Hz	Ω	0.278	0.254	0.242	0.232	0.209	0.191	0.182	0.174	0.139	0.127	0.121	0.116		
Max. mains impedance at 380V / 50Hz	Ω													0.236	
Max. mains impedance at 400V / 50Hz	Ω													0.225	
Connections															
Water connection		G 3/8 A				G 3/8 A				G 3/8 A				G 3/8 A	
Application limits															
Max. permissible pressure	MPa	1				1				1				1	
Max. inlet temperature for reheating	$^\circ\text{C}$	50				50				50				50	
Values															
Max. permissible inlet temperature	$^\circ\text{C}$	60				60				60				60	
Temperature setting range, DHW	$^\circ\text{C}$	30-50				30-50				30-50				30-50	
On	l/min	>1.5				>1.8				>2.2				>2.2	
Pressure drop at flow rate	MPa	0.05				0.06				0.07				0.07	
Flow rate for pressure drop	l/min	1.5				1.8				2.2				2.2	
Flow rate limit at	l/min	2.3				2.8				3.2				3.2	
DHW delivery	l/min	2.0				2.5				3.2				3.7	
$\Delta\vartheta$ on delivery	K	25				25				25				25	
Hydraulic data															
Nominal capacity	l	0.1				0.1				0.1				0.1	
Versions															
Oversink installation		X				X				X				X	
Undersink installation		X				X				X				X	
Open vented type		X				X				X				X	
Sealed unvented type		X				X				X				X	
IP rating		IP25				IP25				IP25				IP25	
Safety category		1				1				1				1	
Insulating block		Plastic				Plastic				Plastic				Plastic	
Heating system		Bare wire				Bare wire				Bare wire				Bare wire	
Cap and back panel		Plastic				Plastic				Plastic				Plastic	
Colour		white				white				white				white	
Dimensions															
Height	mm	143				143				143				143	
Width	mm	190				190				190				190	
Depth	mm	82				82				82				82	
Weights															
Weight	kg	1.5				1.5				1.5				1.5	

Mini instantaneous water heaters, open (vented)/sealed (unvented) DEM

Dimensions and connections



D0000018342



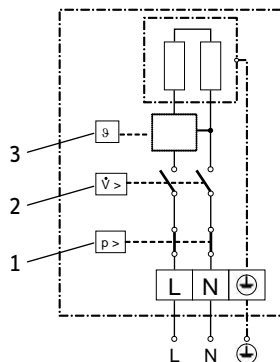
D0000018336

			DEM 3	DEM 4	DEM 6	DEM 7
b02	Entry electrical cables I					
b03	Entry electrical cables II					
c01	Cold water inlet	Male thread	G 3/8 A	G 3/8 A	G 3/8 A	G 3/8 A
c06	DHW outlet	Male thread	G 3/8 A	G 3/8 A	G 3/8 A	G 3/8 A

Wiring diagrams

DEM 3

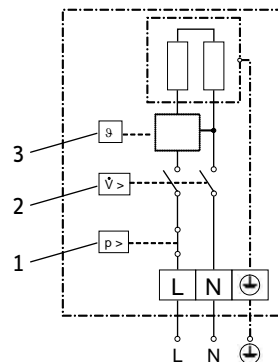
1/N/PE ~ 200-240 V



D0000035308

DEM 4 | DEM 6

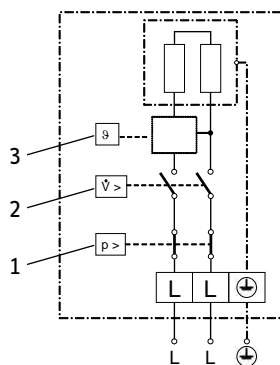
1/N/PE ~ 200-240 V



85_02_05_0001

DEM 7

2/PE ~ 380-415 V



D0000035309

- 1 Safety pressure limiter
- 2 Pressure differential switch
- 3 PCB with outlet temperature sensor

Mini instantaneous water heaters, open (non-pressurised) DNM



PIC00001968



PIC00001969

Mini instantaneous water heaters, open (non-pressurised)

Open (non-pressurised) for the supply of individual draw-off points. The hydraulic control system regulates the electrical output automatically, subject to the flow rate. The bare wire heating system is suitable for hard and soft water areas. With automatic flow rate control for almost constant temperature (for application range, see specification). Installation with open (non-pressurised) taps. G 3/8 threaded water connection, finished walls.

DNM

- › Efficient DHW supply especially to hand basins
- › International: Also suitable for showers if inlet temperatures are in the high range
- › Rapid heat-up time
- › Universal installation undersink or oversink
- › Power cable with standard plug (DNM 3)
- › Device complete with the wall retainer integrated into the back panel
- › Metal water connections
- › Special aerator with flow limiter for IG M 22 and AG M 24
- › DHW output DNM 3: 2 l/min
with 15 °C to 40 °C (Δt 25 K)
- › DHW output DNM 4: 2.5 l/min
with 15 °C to 40 °C (Δt 25 K)
- › DHW output DNM 6: 3.3 l/min
with 15 °C to 40 °C (Δt 25 K)

Accessories

- › 185474 MAW
- › 185475 MAZ
- › 185476 MAE
- › 230956 WEN

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Mini instantaneous water heaters, open (non-pressurised)

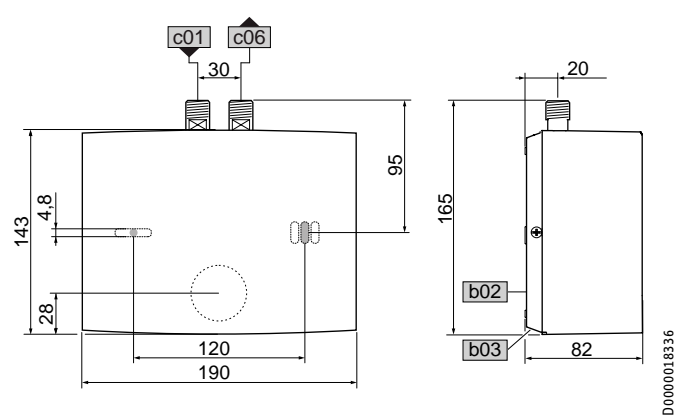
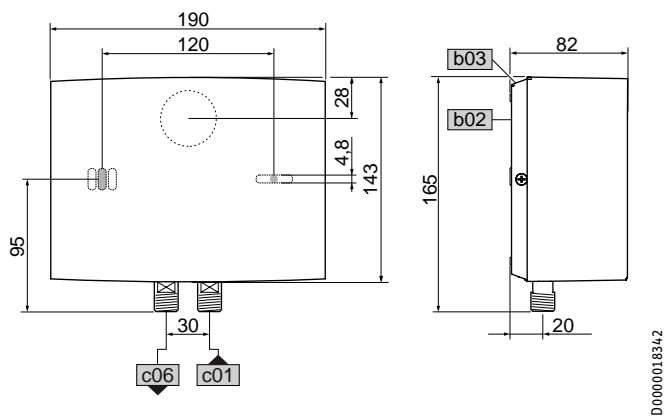
DNM

		DNM 3				DNM 4				DNM 6			
		185411				185415				185418			
Electrical data													
Rated voltage	V	200	220	230	240	200	220	230	240	200	220	230	240
Rated output	kW	2.7	3.2	3.5	3.8	3.3	4.0	4.4	4.8	4.3	5.2	5.7	6.2
Rated current	A	13.3	14.5	15.2	15.8	16.7	18.2	19.1	20	21.6	23.6	24.7	25.8
Fuse/MCB rating	A	16	16	16	16	20	20	20	20	25	25	25	32
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Phases		1/N/PE				1/N/PE				1/N/PE			
Max. mains impedance at 50 Hz	Ω									0.434	0.394	0.377	0.361
Max. mains impedance at 60Hz	Ω									0.424	0.386	0.369	0.354
Specific resistance ρ ₁₅ ≥ (at θ _{cold} ≤25 °C)	Ω cm	1100				1100				1100			
Specific conductivity σ ₁₅ ≤ (at θ _{cold} ≤25 °C)	μS/cm	909				909				909			
Connections													
Water connection		G 3/8 A				G 3/8 A				G 3/8 A			
Application limits													
Max. permissible pressure	MPa	0				0				0			
Values													
Max. permissible inlet temperature	°C	35				35				35			
On	l/min	> 1.6				> 2.0				> 2.6			
Pressure drop at flow rate	MPa	0.05				0.06				0.08			
Flow rate for pressure drop	l/min	1.6				2.0				2.6			
Flow rate limit at	l/min	2.2				2.8				4.3			
DHW delivery	l/min	2.0				2.5				3.2			
Δθ on delivery	K	25				25				25			
Hydraulic data													
Nominal capacity	l	0.1				0.1				0.1			
Versions													
Oversink installation		X				X				X			
Undersink installation		X				X				X			
Open vented type		X				X				X			
IP rating		IP25				IP25				IP25			
Safety category		1				1				1			
Insulating block		Plastic				Plastic				Plastic			
Heating system		Bare wire				Bare wire				Bare wire			
Cap and back panel		Plastic				Plastic				Plastic			
Colour		white				white				white			
Dimensions													
Height	mm	143				143				143			
Width	mm	190				190				190			
Depth	mm	82				82				82			
Weights													
Weight	kg	1.4				1.4				1.4			

Mini instantaneous water heaters, open (non-pressurised)

DNM

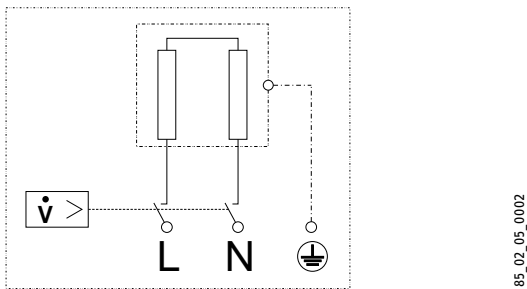
Dimensions and connections



			DNM 3	DNM 4	DNM 6
b02	Entry electrical cables I				
b03	Entry electrical cables II				
c01	Cold water inlet	Male thread	G 3/8 A	G 3/8 A	G 3/8 A
c06	DHW outlet	Male thread	G 3/8 A	G 3/8 A	G 3/8 A

Wiring diagram

1/N/PE ~ 200-240 V



Mini instantaneous water heaters, sealed (pressure-tested) DHM



PIC0001985

Mini instantaneous water heaters, sealed (pressure-tested)

Sealed (pressure-tested) for supplying individual draw-off points. The hydraulic control system regulates the electrical output automatically, subject to the flow rate. The bare wire heating system is suitable for hard and soft water areas. Automatic flow rate control for almost constant temperature rise (for application range, see specification). Installation with pressure taps. G 3/8 threaded water connection, finished walls.

DHM

- › Efficient DHW supply especially to hand basins
- › International: Also suitable for showers if inlet temperatures are in the high range
- › Rapid heat-up
- › Undersink installation
- › Power cable for a permanent connection
- › Device complete with the wall retainer integrated into the back panel
- › Metal water connections
- › Special aerator with flow limiter for IG M 22 and AG M 24
- › Water output DHM 3: 2 l/min with 15 °C to 40 °C (Δt 25 K)
- › Water output DHM 4: 2.5 l/min with 15 °C to 40 °C (Δt 25 K)
- › Water output DHM 6: 3.3 l/min with 15 °C to 40 °C (Δt 25 K)
- › Water output DHM 7: 3.7 l/min with 15 °C to 40 °C (Δt 25 K)

Accessories

- › 230957 WEH

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

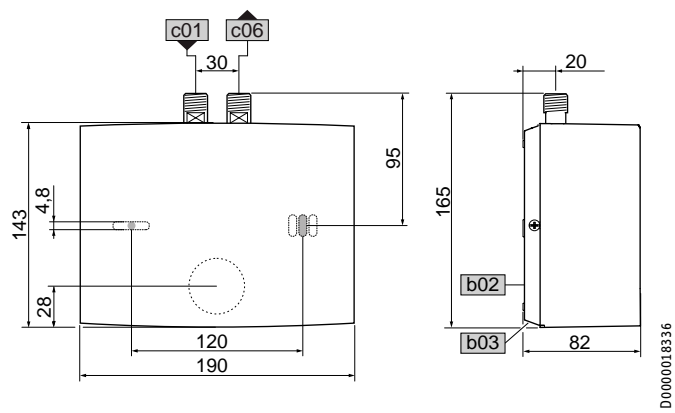
Mini instantaneous water heaters, sealed (pressure-tested)

DHM

		DHM 3				DHM 4				DHM 6 220	DHM 6				DHM 7			
		220813				220814				220815	185473				232789			
Electrical data																		
Rated voltage	V	200	220	230	240	200	220	230	240		220	200	220	230	240	380	400	415
Rated output	kW	2.7	3.2	3.5	3.8	3.3	4.0	4.4	4.8		6	4.3	5.2	5.7	6.2	5.9	6.5	7.0
Rated current	A	13.3	14.5	15.2	15.8	16.7	18.2	19.1	20		27.3	21.6	23.6	24.7	25.8	15.5	16.3	16.9
Fuse/MCB rating	A	16	16	16	16	20	20	20	20		32	25	25	25	32	16	20	20
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60		50	50/60	50/60	50/60	50/60	50/60	50/60	50
Phases		1/N/PE				1/N/PE				1/N/PE	1/N/PE				2/PE			
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	$\Omega\text{ cm}$	1100				1100				1100	1100				1100			
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} \leq 25^\circ\text{C}$)	$\mu\text{S/cm}$	909				909				909	909				909			
Specific resistance $\rho_{15} \geq$ (at $\vartheta_{\text{cold}} > 25^\circ\text{C}$)	$\Omega\text{ cm}$	1100				1100				1100	1100				1100			
Specific conductivity $\sigma_{15} \leq$ (at $\vartheta_{\text{cold}} > 25^\circ\text{C}$)	$\mu\text{S/cm}$	909				909				909	909				909			
Max. mains impedance at 50 Hz	Ω									0.358	0.434	0.394	0.377	0.361				
Max. mains impedance at 60Hz	Ω										0.424	0.386	0.369	0.354				
Connections																		
Water connection		G 3/8 A				G 3/8 A				G 3/8 A	G 3/8 A				G 3/8 A			
Application limits																		
Max. permissible pressure	MPa	1				1					1				1			
Values																		
Max. permissible inlet temperature	$^\circ\text{C}$	35				35				35	35				35			
On	l/min	> 1.6				> 2.0				> 2.6	> 2.6				> 2.6			
Pressure drop at flow rate	MPa	0.05				0.06				0.09	0.08				0.08			
Flow rate for pressure drop	l/min	1.6				2.0				2.6	2.6				2.6			
Flow rate limit at	l/min	2.2				2.8					4.3				4.3			
DHW delivery	l/min	2.0				2.5				3.4	3.2				3.7			
$\Delta\vartheta$ on delivery	K	25				25				25	25				25			
Hydraulic data																		
Nominal capacity	l	0.1				0.1				0.1	0.1				0.1			
Versions																		
Oversink installation										X								
Undersink installation		X				X				X	X				X			
Open vented type		X				X				X	X				X			
Sealed unvented type		X				X				X	X				X			
IP rating		IP25				IP25				IP25	IP25				IP25			
Safety category		1				1				1	1				1			
Insulating block		Plastic				Plastic				Plastic	Plastic				Plastic			
Heating system		Bare wire				Bare wire				Bare wire	Bare wire				Bare wire			
Cap and back panel		Plastic				Plastic				Plastic	Plastic				Plastic			
Colour		white				white				white	white				white			
Dimensions																		
Height	mm	143				143				143	143				143			
Width	mm	190				190				190	190				190			
Depth	mm	82				82				82	82				82			
Weights																		
Weight	kg	1.4				1.4				1.4	1.4				1.4			

Mini instantaneous water heaters, sealed (pressure-tested) DHM

Dimensions and connections

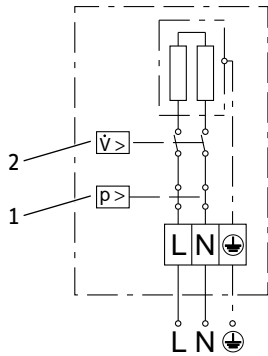


			DHM 3	DHM 4	DHM 6	DHM 7
b02	Entry electrical cables I					
b03	Entry electrical cables II					
c01	Cold water inlet	Male thread	G 3/8 A	G 3/8 A	G 3/8 A	G 3/8 A
c06	DHW outlet	Male thread	G 3/8 A	G 3/8 A	G 3/8 A	G 3/8 A

Wiring diagrams

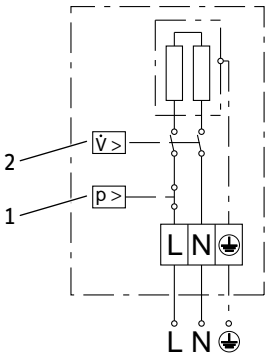
DHM 3

1/N/PE ~ 200 - 240 V



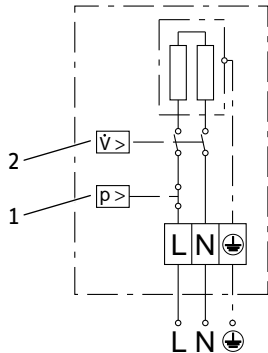
DHM 6 220

1/N/PE ~ 220 V



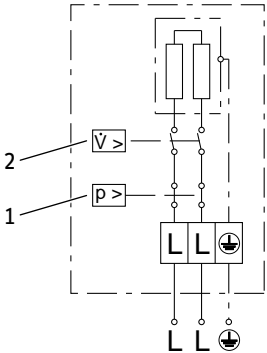
DHM 4 | DHM 6

1/N/PE ~ 200 - 240 V



DHM 7

2/PE ~ 380 - 415 V







- 1 Safety pressure limiter
- 2 Pressure differential switch


Mini instantaneous water heater

Taps/valves

Mini instantaneous water heater

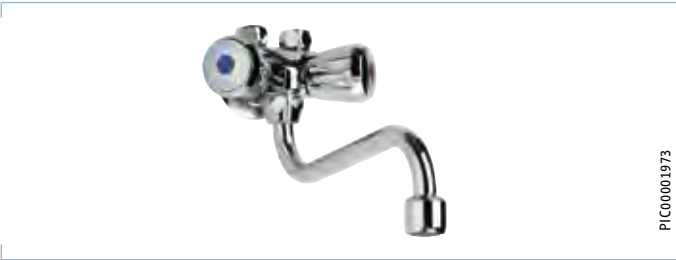
Taps/valves

WASHBASIN	MAW	WEN	MAZ	MAE
				
	PlCo0001973	PlCo0002178	PlCo0003790	PlCo0003791
DEM		•	•	•
DNM	•	•	•	•
DHM		•		

WASHBASIN	WEH
	
	PlCo0002179
DEM	•
DNM	
DHM	•

Taps, open (non-pressurised)

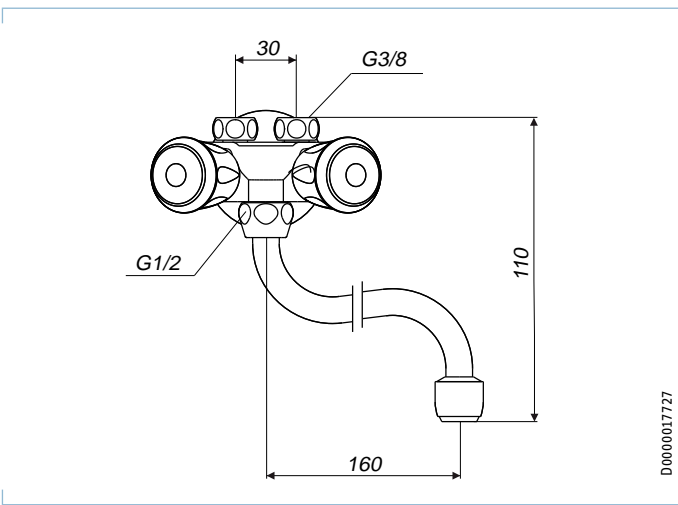
MAW



> Wall mounted tap MAW (non-pressurised) for mini instantaneous water heaters DNM and DEM (oversink)

		MAW
		185474
Application		Washbasin
Type		Open
Type of installation		Wall mounted mixer
Connection		Connecting hoses
Reach	mm	160
Test pressure	MPa	1.6
Flow rate	l/min	3.5
Max. operating temperature	°C	90

Twin-handle taps for mini instantaneous water heaters DEM and DNM.



Mini instantaneous water heater Taps/valves

WEN

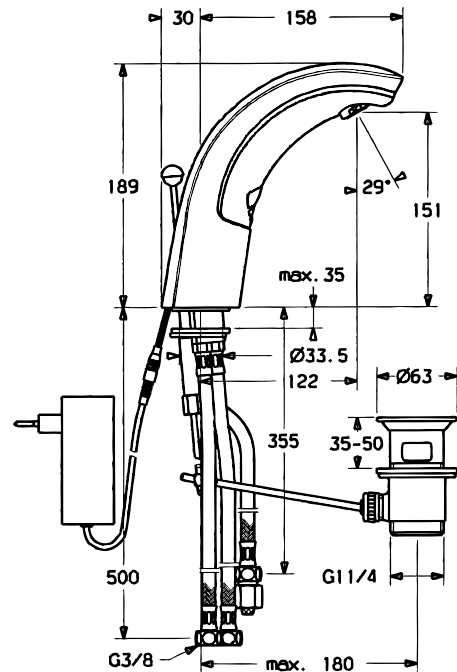


PIC00002178

- › Open sensor tap for mini instantaneous water heaters (DEM, DNM) and pressurised / non-pressurised cylinders (SNU 5/10, SHU 5/10)
- › Stable and robust version for commercial use
- › Operationally reliable thanks to dirt trap in the inlet
- › Easy-care chrome finish
- › Easy selection of accurate temperature delivery
- › No maintenance thanks to plug-in power supply unit (no need to change batteries)
- › Programmable 12 or 24 h hygiene flushing

		WEN
		230956
Application		Washbasin
Open vented type		X
Type of installation		Monobloc mixer tap
Finish		Chrome-plated
Connection		Connecting hoses
Max. flow rate	l/min	5
Minimum supply pressure	MPa	0.1
Max. DHW temperature	°C	80
Rated voltage	V	230
Power connection		1/N/PE
Max. current load, power supply unit	A	16
Standby power consumption	W	0.6
Outlet height	mm	151
Reach	mm	122
Weight	kg	3.14

Sensor tap for washbasins. Open type of operation (non-pressurised). Chrome-plated finish, quick-acting fitting. 230 V plug-in power supply unit with integrated socket for a standard plug.



D0000017729

Mini instantaneous water heater Taps/valves

MAZ



PIC00003790

> Twin-handle basin tap MAZ (non-pressurised) for mini instantaneous water heater DNM and DEM

		MAZ
		185475
Application		Washbasin
Type		Open
Type of installation		Monobloc mixer tap
Connection		Connecting hoses
Outlet height	mm	170
Reach	mm	150
Test pressure	MPa	1.6
Flow rate	l/min	3.5
Max. operating temperature	°C	90

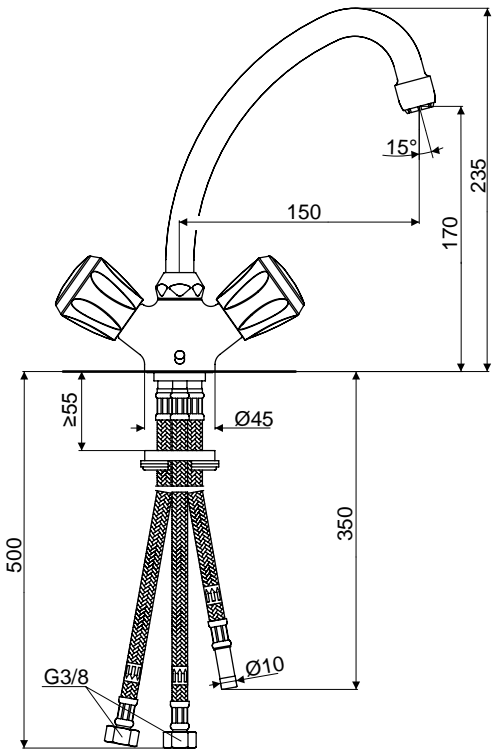
MAE



PIC00003791

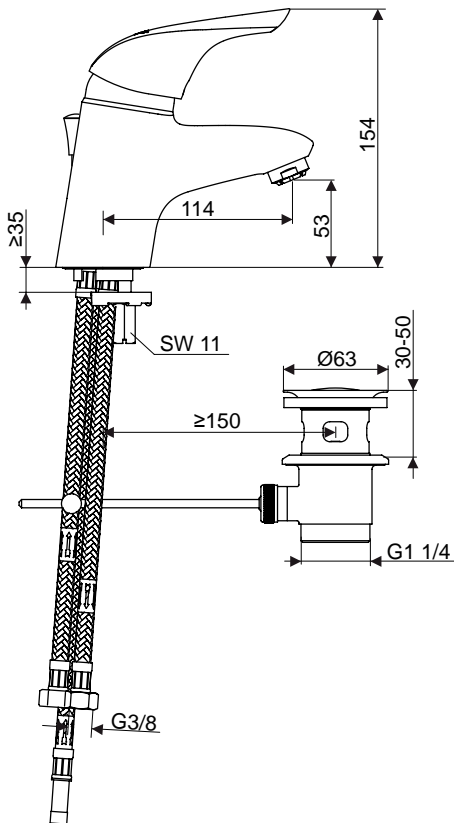
		MAE
		185476
Application		Washbasin
Type		Open
Type of installation		Monobloc mixer tap
Connection		Connecting hoses
Outlet height	mm	43
Reach	mm	113
Test pressure	MPa	1.6
Flow rate	l/min	3.5
Max. operating temperature	°C	90

Twin-handle taps for mini instantaneous water heaters DEM and DNM.



D0000024796

Mono lever mixer, non-pressurised, with pull rod drain set for mini instantaneous water heaters DNM and DEM, for mono hole installation.



D0000017726

Mini instantaneous water heater

Taps/valves

Taps, sealed (pressure-tested)

WEH

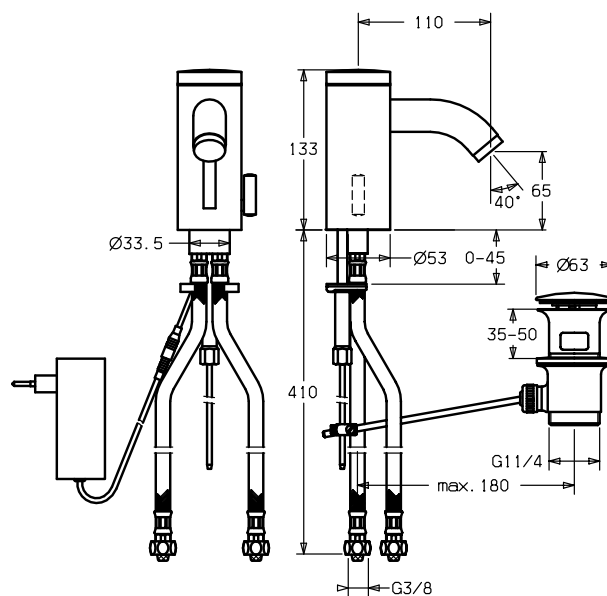


P/C00002179

- › Sensor tap (pressure-tested) for DHM and DEM
- › Stable and robust version for commercial use
- › Operationally reliable thanks to dirt trap in the inlet
- › Easy-care chrome finish
- › Easy selection of accurate temperature delivery
- › No maintenance thanks to plug-in power supply unit (no need to change batteries)

		WEH
		230957
Application		Washbasin
Sealed unvented type		X
Type of installation		Monobloc mixer tap
Finish		Chrome-plated
Connection		Connecting hoses
Max. flow rate	l/min	6
Minimum supply pressure	MPa	0.1
Max. DHW temperature	°C	80
Rated voltage	V	230
Power connection		1/N/PE
Standby power consumption	W	0.6
Outlet height	mm	65
Reach	mm	110
Weight	kg	2.2

Sensor tap for washbasins. For pressurised operation. Chrome-plated finish, quick-acting fitting. 230 V plug-in power supply unit.

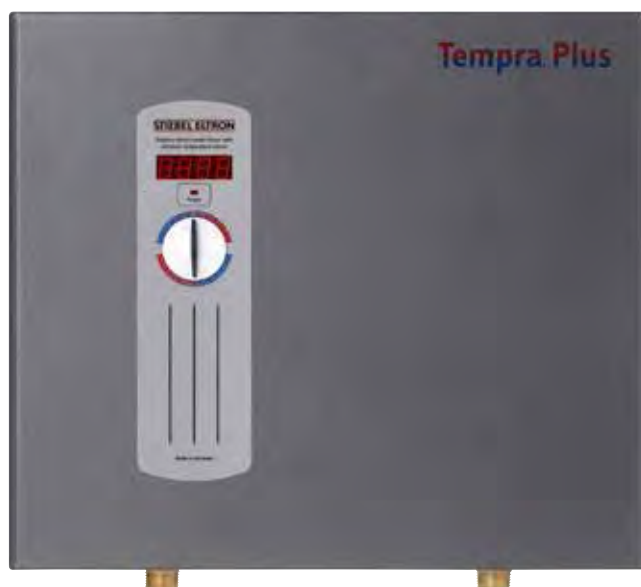


D0000017728

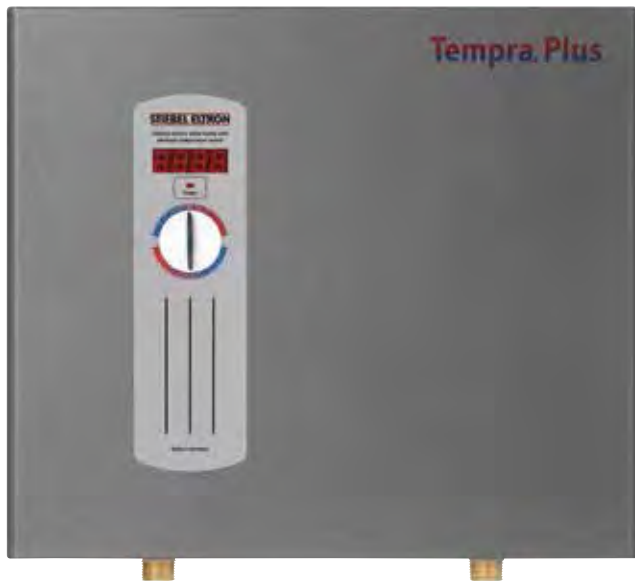
PRODUCTS

Tempra instantaneous water heaters

Tempra instantaneous water heaters



Full electronic closed loop control Tempra instantaneous water heaters Tempra Plus



Full electronic closed loop control Tempra instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature can be variably preselected. Automatic adjustment of the electrical output for temperature delivery accurate to the degree up to the output limit. The tubular heating system inside the pressure-tested copper cylinder is suitable for soft water areas (for application range, see specification). Flow limit. Installation with pressure taps. Threaded water connections.

Tempra Plus

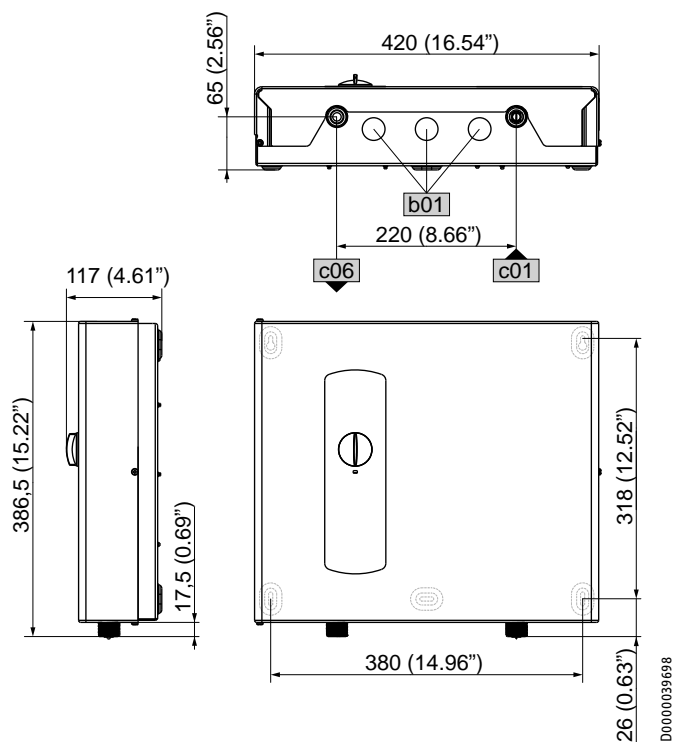
- › Works even with low water pressure
- › Quick and easy installation
- › Simple and secure operation
- › Temperature can be limited to 43 °C
- › Temperature setting 30 °C - 60 °C
- › Temperature selection to the exact degree with easy to read LCD
- › Fully electronic closed loop control with motorised valve for permanently accurate temperature delivery

Full electronic closed loop control Tempra instantaneous water heaters

Tempra Plus

		Tempra 12 Plus		Tempra 15 Plus		Tempra 20 Plus		Tempra 24 Plus		Tempra 29 Plus		Tempra 36 Plus	
		224196		224197		224198		224199		223425		223426	
Electrical data													
Rated voltage	V	208	240	208	240	208	240	208	240	208	240	208	240
Rated output	kW	9	12	10.8	14.4	14.4	19.2	18	24	21.6	28.8	27	36
Rated current	A	44	50	2 x 26	2 x 30	2 x 35	2 x 40	2 x 44	2 x 50	3 x 35	3 x 40	3 x 44	3 x 50
Fuse/MCB rating	A	60	60	2 x 40	2 x40	2 x 50	2 x 50	2 x 60	2 x 60	3 x 50	3 x 50	3 x 60	3 x 60
Frequency	Hz	50/60		50/60		50/60		50/60		50/60		50/60	
Power connection		1/GRD		2/GRD		2/GRD		2/GRD		3/GRD		3/GRD	
Connections													
Water connection		3/4" NPT		3/4" NPT		3/4" NPT		3/4" NPT		3/4" NPT		3/4" NPT	
Hydraulic data													
Nominal capacity	l	0.5		1.0		1.0		1.0		1.5		1.5	
Values													
On	l/min	1.4		1.9		1.9		1.9		2.9		2.9	
Max. permissible inlet temperature	°C	55		55		55		55		55		55	
Application limits													
Max. permissible pressure	MPa	1.0		1.0		1.0		1.0		1.0		1.0	
Test pressure	MPa	2.0		2.0		2.0		2.0		2.0		2.0	
Temperature setting range	°C	30-60		30-60		30-60		30-60		30-60		30-60	
Versions													
Temperature display		Digital		Digital		Digital		Digital		Digital		Digital	
Cap and back panel		Sheet steel		Sheet steel		Sheet steel		Sheet steel		Sheet steel		Sheet steel	
Colour		Grey		Grey		Grey		Grey		Grey		Grey	
Dimensions													
Height	mm	369		369		369		369		369		369	
Width	mm	420		420		420		420		420		420	
Depth	mm	117		117		117		117		117		117	
Weights													
Weight	kg	6.1		7.3		7.3		7.3		8.6		8.6	

Dimensions and connections



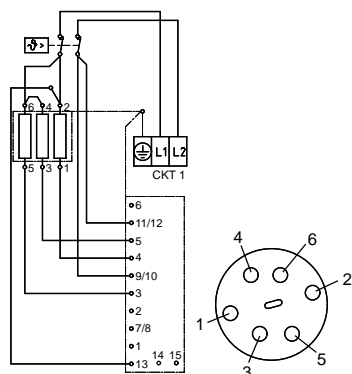
			Tempra 12 Plus	Tempra 15 Plus	Tempra 20 Plus	Tempra 24 Plus	Tempra 29 Plus	Tempra 36 Plus
b01	Entry electrical cables							
c01	Cold water inlet	Male thread	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT
c06	DHW outlet	Male thread	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT

Full electronic closed loop control Tempra instantaneous water heaters Tempra Plus

Wiring diagrams

Tempra 12 Plus

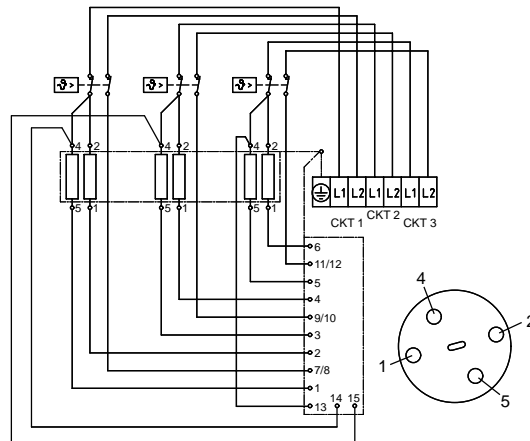
1/N/PE ~ 208-240 V



D0000039679

Tempra 29 Plus

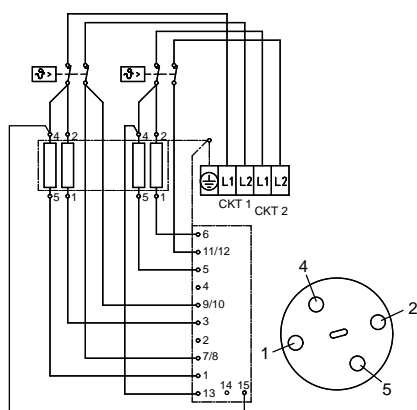
1/N/PE ~ 208-240 V



D0000039676

Tempra 15 Plus | Tempra 20 Plus

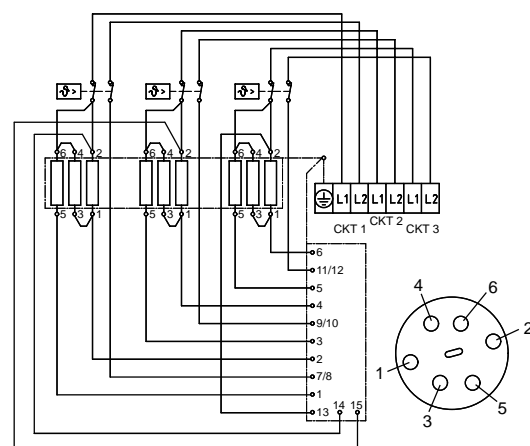
1/N/PE ~ 208-240 V



D0000039678

Tempra 36 Plus

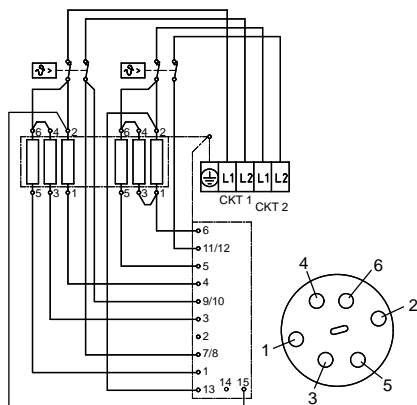
1/N/PE ~ 208-240 V



D0000039675

Tempra 24 Plus

1/N/PE ~ 208-240 V



D0000039677

Electronic closed loop control Tempra instantaneous water heaters Tempra B



PLC00002093

Electronic closed loop control Tempra instantaneous water heaters

Sealed unvented (pressure-tested) for supplying several draw-off points. The DHW temperature can be variably preselected. Automatic adjustment of the electrical output for temperature delivery accurate to the degree up to the output limit. The tubular heating system inside the pressure-tested copper cylinder is suitable for soft water areas (for application range, see specification). Flow limit. Installation with pressure taps. Threaded water connections.

Tempra B

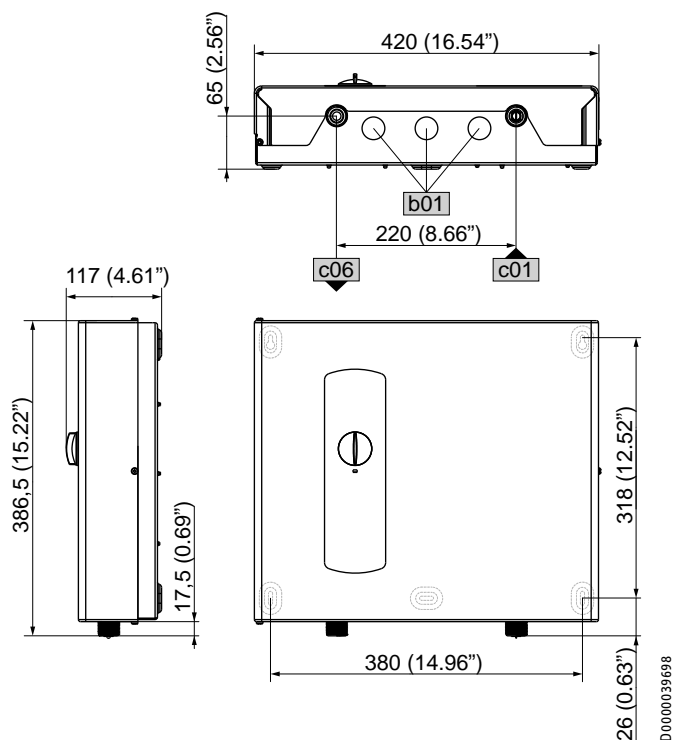
- › Electronic temperature control
- › Temperature setting 30 °C - 60 °C
- › Simple and secure operation
- › Quick and easy installation
- › Works even with low water pressure

Electronic closed loop control Tempra instantaneous water heaters

Tempra B

		Tempra 12 B		Tempra 15 B		Tempra 20 B		Tempra 24 B		Tempra 29 B		Tempra 36 B	
		223420		223421		223422		223424		232885		232886	
Electrical data													
Rated voltage	V	208	240	208	240	208	240	208	240	208	240	208	240
Rated output	kW	9	12	10.8	14.4	14.4	19.2	18	24	21.6	28.8	27	36
Rated current	A	44	50	2 x 26	2 x 30	2 x 35	2 x 40	2 x 44	2 x 50	3 x 35	3 x 40	3 x 44	3 x 50
Fuse/MCB rating	A	60	60	2 x 40	2 x 40	2 x 50	2 x 50	2 x 60	2 x 60	3 x 50	3 x 50	3 x 60	3 x 60
Frequency	Hz	50/60		50/60		50/60		50/60		50/60		50/60	
Power connection		1/GRD		2/GRD		2/GRD		2/GRD		3/GRD		3/GRD	
Connections													
Water connection		3/4" NPT		3/4" NPT		3/4" NPT		3/4" NPT		3/4" NPT		3/4" NPT	
Hydraulic data													
Nominal capacity	l	0.5		1.0		1.0		1.0		1.5		1.5	
Values													
On	l/min	1.4		1.9		1.9		1.9		2.9		2.9	
Max. permissible inlet temperature	°C	55		55		55		55		55		55	
Application limits													
Max. permissible pressure	MPa	1.0		1.0		1.0		1.0		1.0		1.0	
Test pressure	MPa	2.0		2.0		2.0		2.0		2.0		2.0	
Temperature setting range	°C	30-60		30-60		30-60		30-60		30-60		30-60	
Versions													
Temperature display		Digital		Digital		Digital		Digital		Digital		Digital	
Cap and back panel		Sheet steel		Sheet steel		Sheet steel		Sheet steel		Sheet steel		Sheet steel	
Colour		Grey		Grey		Grey		Grey		Grey		Grey	
Dimensions													
Height	mm	369		369		369		369		369		369	
Width	mm	420		420		420		420		420		420	
Depth	mm	117		117		117		117		117		117	
Weights													
Weight	kg	6.1		7.3		7.3		7.3		8.6		8.6	

Dimensions and connections



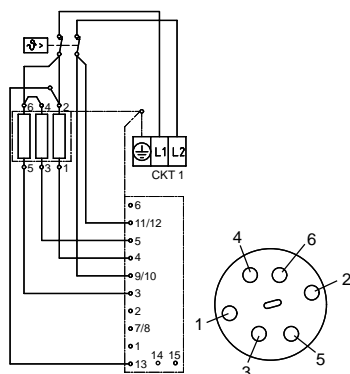
		Tempra 12 B	Tempra 15 B	Tempra 20 B	Tempra 24 B	Tempra 29 B	Tempra 36 B
b01	Entry electrical cables						
c01	Cold water inlet	Male thread	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT
c06	DHW outlet	Male thread	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT

Electronic closed loop control Tempra instantaneous water heaters Tempra B

Wiring diagrams

Tempra 12 B

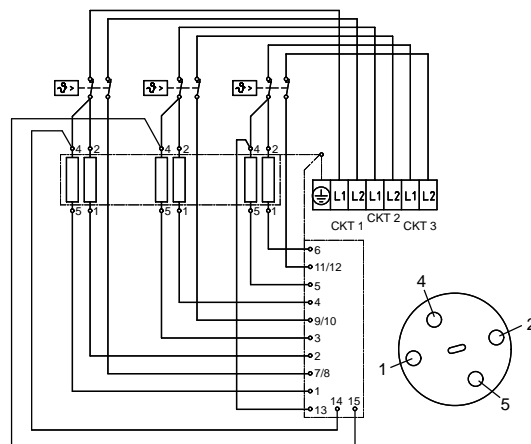
1/N/PE ~ 208-240 V



D0000039679

Tempra 29 B

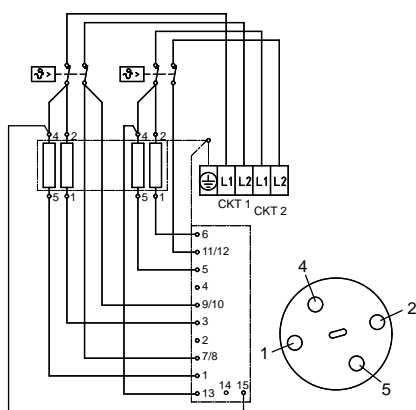
1/N/PE ~ 208-240 V



D0000039676

Tempra 15 B | Tempra 20 B

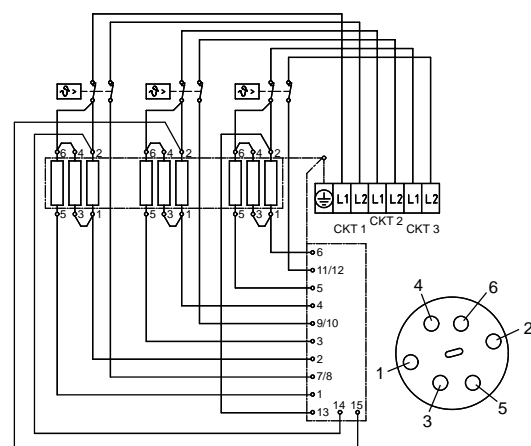
1/N/PE ~ 208-240 V



D0000039678

Tempra 36 B

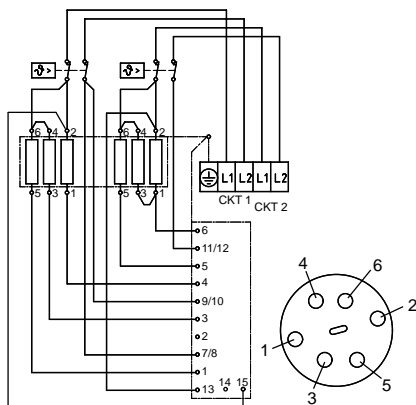
1/N/PE ~ 208-240 V



D0000039675

Tempra 24 B

1/N/PE ~ 208-240 V



D0000039677

Notes

Water boilers



Equipment and operation

All water boilers are non-pressurised in operation and are designed to supply a draw-off point with boiling, hot, warm or cold water. The product range can be divided as follows, based on equipment configuration and appliance design.

- › Water boilers with fill & drain tap
- › Automatic water boilers

Water boilers with fill & drain tap:

All water boilers for permanent wall installation are equipped with a fill & drain tap, making them suitable for installation directly over the kitchen sink, for example. The following is a general summary of the equipment features of this product group:

Fill & drain tap

The tap can be used to fill cold water into the container, draw off cold water directly, draw off boiling water, or mix hot and cold water as required.

Programming unit

The set temperature can be adjusted variably on the programming unit, up to the boiling point. An indicator lamp lights up when heating is in progress.

Overflow pipe

The overflow pipe drains off condensate or water vapour formed when boiling. At the same time, it handles any accidental overfilling of the container. The overflow pipe is fastened to the appliance in a way that allows it to be pointed in various directions.

Level indicator

The level of the water is indicated by the markings on the various DHW containers.

Cleaning/descaling aperture

Cleaning or descaling of the appliance is possible either directly via a sufficiently large opening on the container or by adding a descaling agent through a service aperture.

Equipment features of the water boilers with fill & drain tap

	EBK 5 G	EBK 5 GA	EBK 5 K	KBA 5 KA
Max. capacity 5 litres	•	•	•	•
Glass water container	•	•		
Plastic water container			•	•
White plastic casing			•	
Grey plastic casing				•
Tap with lever and 2 handles	•		•	
3-handle tap		•		•
Stainless steel heating element	•	•	•	•
Automatic boiling point detection with automatic shutdown	•	•	•	•

Automatic water boilers:

The SNU HOT automatic water boiler is non-pressurised in operation and is designed to supply a draw-off point with near-boiling hot water close to 100 °C. The temperature can be selected from 65 °C to 97 °C. With open vented appliances, the actual temperature may vary slightly due to differences in air pressure.

3 in 1 tap

The 3 in 1 tap is a combination of a non-pressurised tap for hot water and a pressure-tested tap for cold water and DHW.

Hot water, non-pressurised:

The handle for drawing the hot water is equipped with a push and turn mechanism for childproofing. The special aerator allows the near 100 °C boiling hot water to be drawn off without vapour or splashing. When the tap is closed, the remaining water runs back into the container, so that hot water is immediately available when the tap is next opened.

Additional safety feature: The hot water is conveyed separately inside the tap, keeping the surface cool.

Cold water and DHW, pressure-tested:

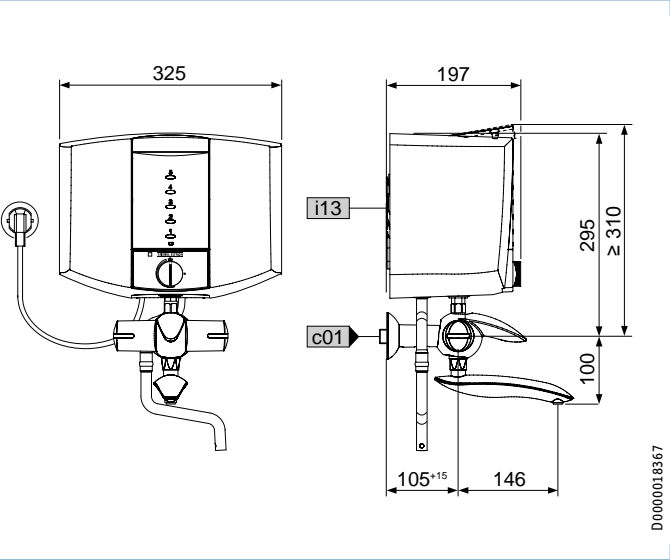
The cold water and DHW are supplied from the central network on site and operated with a mono lever mixer.

Installation and installation benefits

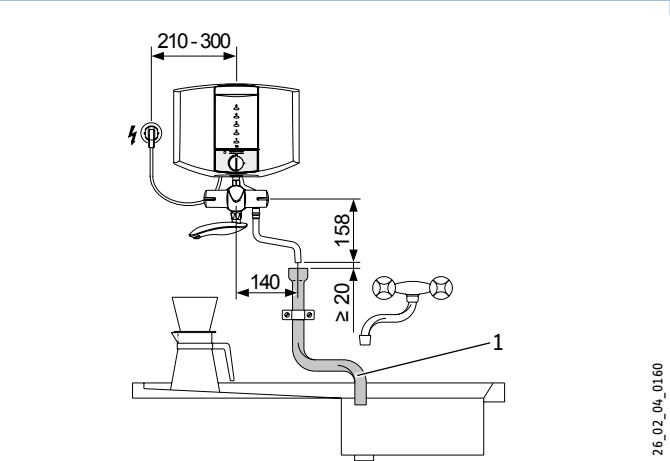
Water boilers with fill & drain tap:

Installation examples

The following installation dimensions are recommended. Always check the dimensions of the site and compare.

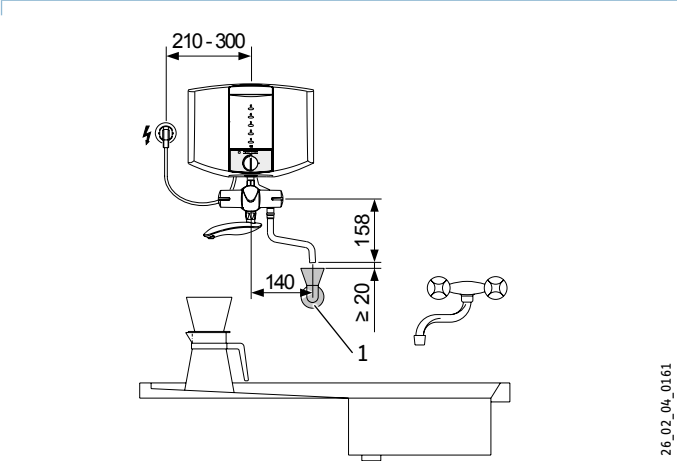


		EBK 5 K
c01	Cold water inlet	Male thread G 1/2 A
i13	Wall mounting bracket	



Attaching the overflow/steam pipe to finished walls

- 1 Outlet pipe to the sink



Attaching the overflow/steam pipe to unfinished walls

- 1 Drain outlet with stench trap

Equipment features

The following equipment features ensure that the appliances are easy to install and service:

Fill & drain tap

The tap can be connected to the cold water line either on unfinished or finished walls or in conjunction with a water connection valve.

Wall mounting bracket

The wall mounting bracket is used for tile compensation or to adapt to the existing cold water connection. This allows the appliance seat to be adjusted either variably or via a number of predefined positions.

Throttle facility in the tap

This allows the flow rate to be adjusted for the prevailing pressure conditions in the water supply network, in accordance with the manufacturer's specifications.

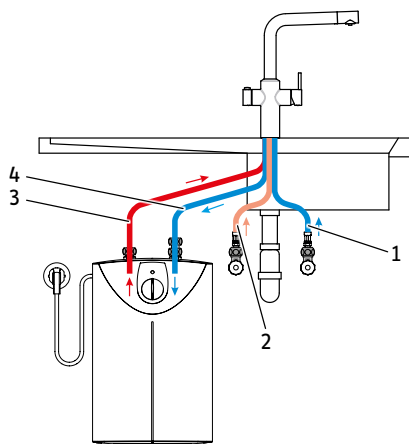
Hydraulic connection

Water boilers with fill & drain tap and automatic water boilers:

Water boilers are designed to supply water to a single draw-off point. The water connection of the appliance is non-pressurised (open vented).

Always observe accepted engineering standards, such as EN 806 and DIN 1988, and the regulations specified by your local water supply utility. Never exceed the maximum permissible pressure specified on the type plate.

Installation is particularly easy because, being a non-pressurised system, there is no need to install a safety assembly or a drain.

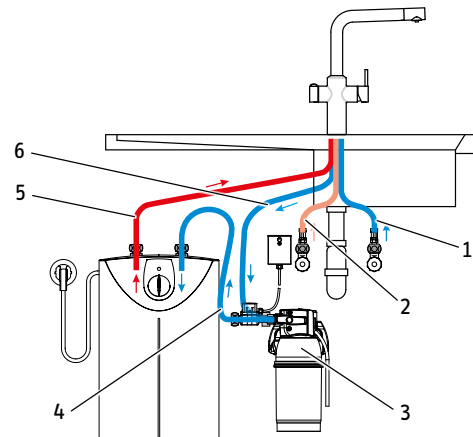


D0000033774

- 1 Cold water supply to the tap
- 2 Hot water supply to the tap
- 3 Hot water outlet
- 4 Cold water supply to the appliance

Hydraulic installation with water filter

For even higher potable water quality in food and beverage preparation areas, an upstream water filter is recommended. This filter is installed in the cold water supply line between the tap and SNU Hot.



D0000033775

- 1 Cold water supply to the tap
- 2 Hot water supply to the tap
- 3 Water filter
- 4 Cold water supply to the appliance
- 5 Hot water outlet
- 6 Cold water supply to the filter

Power supply

Water boilers with fill & drain tap and automatic water boilers:

Observe the VDE 0100 [or local equivalent] and the regulations specified by your local power supply utility as well as the type plate.

Compare the voltage, select an adequate cable cross-section and the correct fuse/MCB. The water boiler is supplied with a 3-core power cable and standard plug.

Water boilers, 5 litres EBK 5 G



PIC00002259

EBK 5 G

- › Exclusive design
- › High-grade glass container
- › Wide container aperture for easy descaling
- › Lever and twin-handles fill & drain tap in brass with white casing

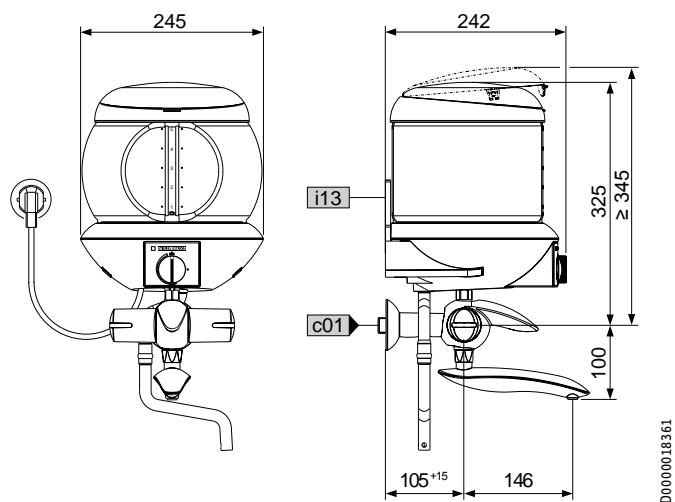
Water boilers, 5 litres

Water boilers for the preparation of hot and boiling water in domestic or similar applications. With boiling point detection and automatic shutdown; optional immediate re-boiling. High limit safety cut-out, variably adjustable from approx. 35 °C to boiling point; heat-up indicator lamp. Integral high limit safety cut-out. Tap with throttle facility, installation on finished walls or connection via water connection valve. Standard delivery includes fill & drain tap and power cable with standard plug. IP24D protection rating (splashproof).

		EBK 5 G
		074286
Hydraulic data		
Nominal capacity	l	5
Electrical data		
Connected load ~ 230 V	kW	2
Rated voltage	V	230
Phases		1/N/PE
Frequency	Hz	50
Application limits		
Temperature setting range	°C	35 - 100
Max. permissible pressure	MPa	0
Max. flow rate	l/min	10
Versions		
IP rating		IP24
Open vented type		X
Container material		Glass
Material, tap body		Brass
Colour, outer tap body		white
Dimensions		
Height from the centre of the water connection	cm	325
Width	mm	245
Depth	mm	242
Length of connecting cable	mm	650
Weights		
Weight, empty	kg	3.5
Weight, full	kg	8.5

Water boilers, 5 litres EBK 5 G

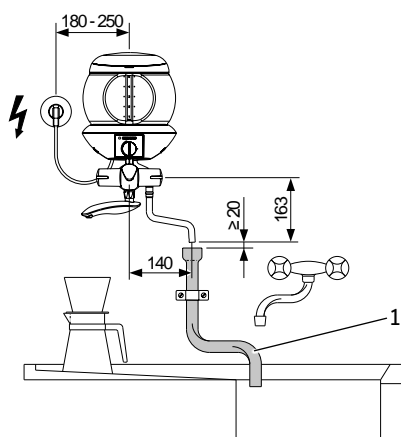
Dimensions and connections



		EBK 5 G
c01	Cold water inlet	Male thread G 1/2 A
i13	Wall mounting bracket	

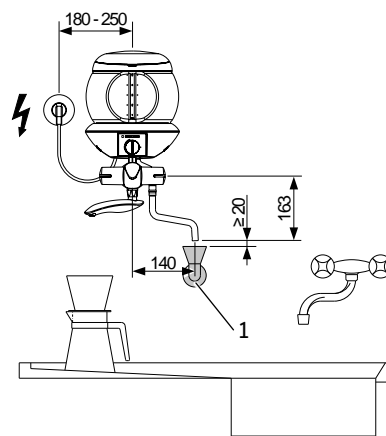
Alternative installation options

Attaching the overflow/steam pipe to finished walls



1 Outlet pipe to the sink

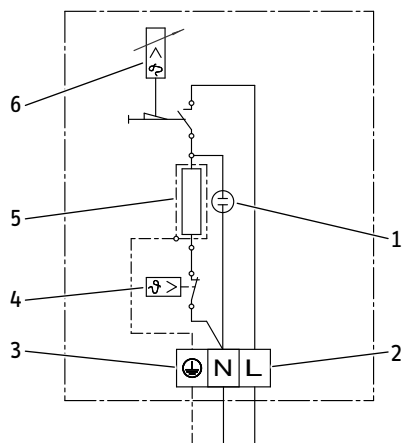
Attaching the overflow/steam pipe to unfinished walls



1 Drain outlet with stretch trap

Wiring diagram

1/N/PE ~ 230 V



- 1 ON/OFF indicator
- 2 Mains terminal
- 3 Earth conductor
- 4 Safety temperature controller
- 5 Heating element
- 6 Temperature limiter

Water boilers, 5 litres EBK 5 GA



PLC00002260

EBK 5 GA

- › Exclusive design
- › High-grade glass container
- › Wide container aperture for easy descaling
- › Triple-handle fill & drain tap, chrome-plated brass

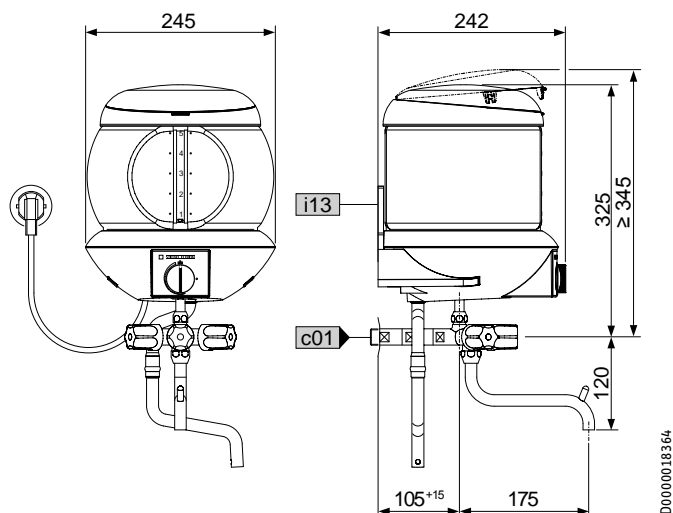
Water boilers, 5 litres

Water boilers for the preparation of hot and boiling water in domestic or similar applications. With boiling point detection and automatic shutdown; optional immediate re-boiling. High limit safety cut-out, variably adjustable from approx. 35 °C to boiling point; heat-up indicator lamp. Integral high limit safety cut-out. Tap with throttle facility, installation on finished walls or connection via water connection valve. Standard delivery includes fill & drain tap and power cable with standard plug. IP24D protection rating (splashproof).

		EBK 5 GA
		074287
Hydraulic data		
Nominal capacity	l	5
Electrical data		
Connected load ~ 230 V	kW	2
Rated voltage	V	230
Phases		1/N/PE
Frequency	Hz	50
Application limits		
Temperature setting range	°C	35 - 100
Max. permissible pressure	MPa	0
Max. flow rate	l/min	10
Versions		
IP rating		IP24
Open vented type		X
Container material		Glass
Material, tap body		Brass
Colour, outer tap body		Chrome-plated
Dimensions		
Height from the centre of the water connection	cm	325
Width	mm	245
Depth	mm	242
Length of connecting cable	mm	650
Weights		
Weight, empty	kg	3.5
Weight, full	kg	8.5

Water boilers, 5 litres EBK 5 GA

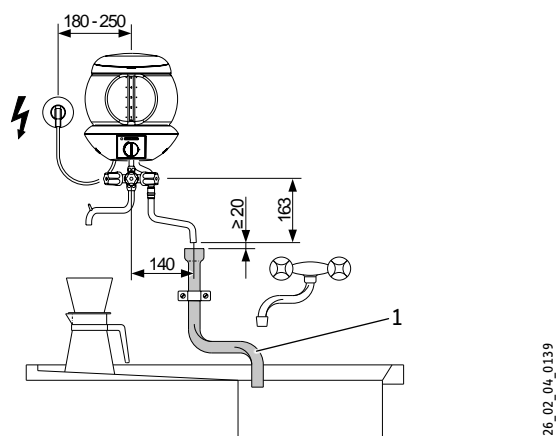
Dimensions and connections



		EBK 5 GA
c01	Cold water inlet	Male thread G 1/2 A
i13	Wall mounting bracket	

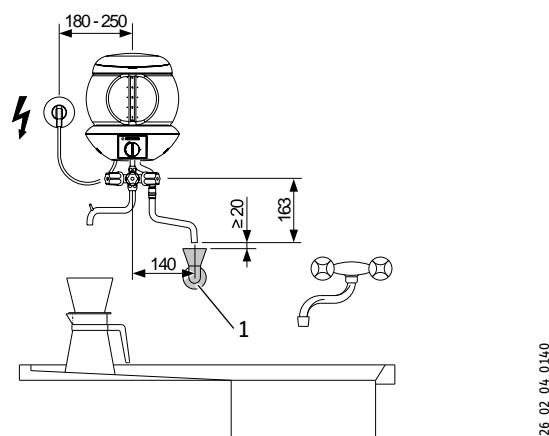
Alternative installation options

Attaching the overflow/steam pipe to finished walls



1 Outlet pipe to the sink

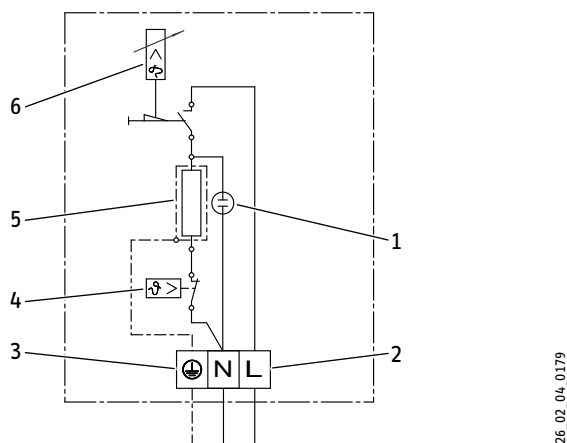
Attaching the overflow/steam pipe to unfinished walls



1 Drain outlet with stench trap

Wiring diagram

1/N/PE ~ 230 V



- 1 ON/OFF indicator
- 2 Mains terminal
- 3 Earth conductor
- 4 Safety temperature controller
- 5 Heating element
- 6 Temperature limiter

Water boilers, 5 litres EBK 5 K



PLC00002261

EBK 5 K

- › Plastic container with white casing
- › Lever and twin-handles fill & drain tap in brass with white casing
- › Descaling aperture with closure

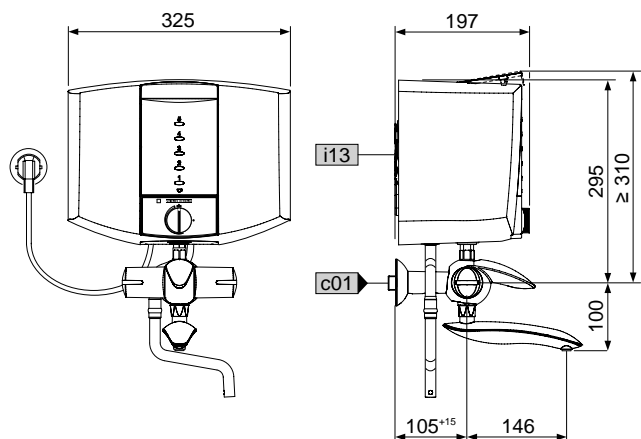
Water boilers, 5 litres

Water boilers for the preparation of hot and boiling water in domestic or similar applications. With boiling point detection and automatic shutdown; optional immediate re-boiling. High limit safety cut-out, variably adjustable from approx. 35 °C to boiling point; heat-up indicator lamp. Integral high limit safety cut-out. Tap with throttle facility, installation on finished walls or connection via water connection valve. Standard delivery includes fill & drain tap and power cable with standard plug. IP24D protection rating (splashproof).

		EBK 5 K
		074288
Hydraulic data		
Nominal capacity	l	5
Electrical data		
Connected load ~ 230 V	kW	2
Rated voltage	V	230
Phases		1/N/PE
Frequency	Hz	50
Application limits		
Temperature setting range	°C	35 - 100
Max. permissible pressure	MPa	0
Max. flow rate	l/min	10
Versions		
IP rating		IP24
Open vented type		X
Container material		Plastic
Material, tap body		Brass
Colour, outer tap body		white
Dimensions		
Width	mm	325
Depth	mm	197
Length of connecting cable	mm	650
Weights		
Weight, empty	kg	2.7
Weight, full	kg	7.7

Water boilers, 5 litres EBK 5 K

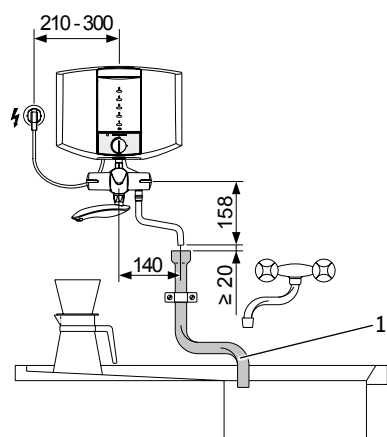
Dimensions and connections



		EBK 5 K
c01	Cold water inlet	Male thread G 1/2 A
i13	Wall mounting bracket	

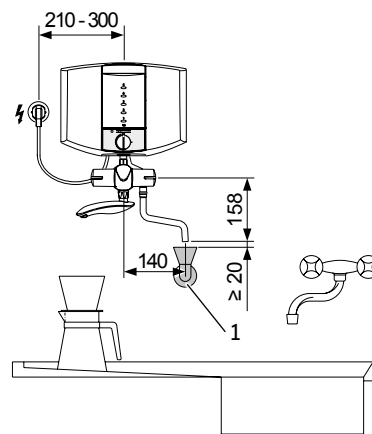
Alternative installation options

Attaching the overflow/steam pipe to finished walls



1 Outlet pipe to the sink

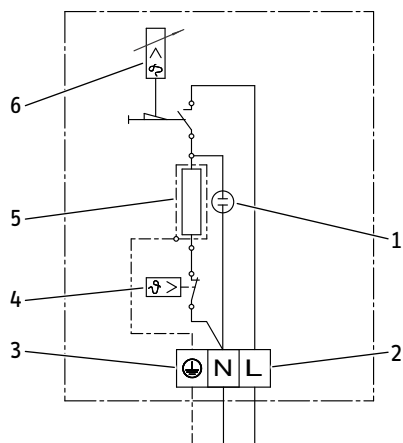
Attaching the overflow/steam pipe to unfinished walls



1 Drain outlet with stench trap

Wiring diagram

1/N/PE ~ 230 V



- 1 ON/OFF indicator
- 2 Mains terminal
- 3 Earth conductor
- 4 Safety temperature controller
- 5 Heating element
- 6 Temperature limiter

Water boilers, 5 litres KBA 5 KA



PLC00002262

KBA 5 KA

- › Plastic container with grey casing
- › Triple-handle fill & drain tap, chrome-plated brass
- › Descaling aperture with closure

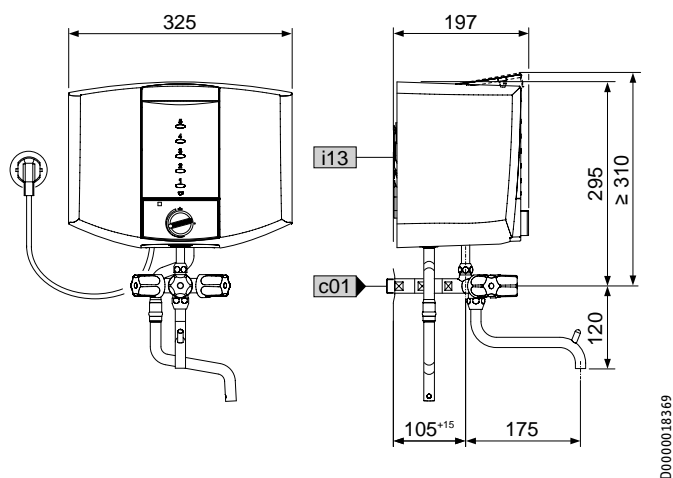
Water boilers, 5 litres

Water boilers for the preparation of hot and boiling water in domestic or similar applications. With boiling point detection and automatic shutdown; optional immediate re-boiling. High limit safety cut-out, variably adjustable from approx. 35 °C to boiling point; heat-up indicator lamp. Integral high limit safety cut-out. Tap with throttle facility, installation on finished walls or connection via water connection valve. Standard delivery includes fill & drain tap and power cable with standard plug. IP24D protection rating (splashproof).

		KBA 5 KA
		074289
Hydraulic data		
Nominal capacity	l	5
Electrical data		
Connected load ~ 230 V	kW	2
Rated voltage	V	230
Phases		1/N/PE
Frequency	Hz	50
Application limits		
Temperature setting range	°C	35 - 100
Max. permissible pressure	MPa	0
Max. flow rate	l/min	10
Versions		
IP rating		IP24
Open vented type		X
Container material		Plastic
Material, tap body		Brass
Colour, outer tap body		Chrome-plated
Dimensions		
Height from the centre of the water connection	cm	295
Width	mm	325
Depth	mm	197
Length of connecting cable	mm	650
Weights		
Weight, empty	kg	2.7
Weight, full	kg	7.7

Water boilers, 5 litres KBA 5 KA

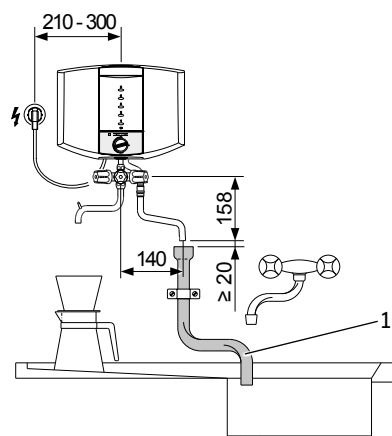
Dimensions and connections



		KBA 5 KA
c01	Cold water inlet	Male thread G 1/2 A
i13	Wall mounting bracket	

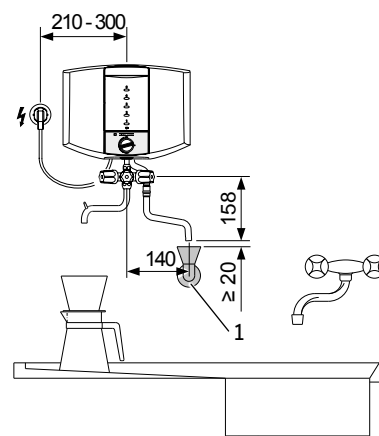
Alternative installation options

Attaching the overflow/steam pipe to finished walls



1 Outlet pipe to the sink

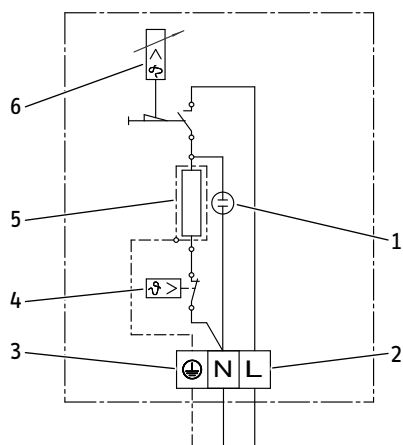
Attaching the overflow/steam pipe to unfinished walls



1 Drain outlet with stretch trap

Wiring diagram

1/N/PE ~ 230 V



- 1 ON/OFF indicator
- 2 Mains terminal
- 3 Earth conductor
- 4 Safety temperature controller
- 5 Heating element
- 6 Temperature limiter

Automatic water boilers, 5 l SNU HOT+HOT 3in1 cr



PLC00003792

SNU HOT+HOT 3in1 cr

- › Hot water at almost 100 °C at any time without delay
- › Instant hot water every time the tap is turned on. No residual water in the tap
- › No steam hammer during drawing
- › Temperature selection from 65 °C to approx. 97 °C
- › Complete with special tap HOT 3in1 as standard
- › Plastic hot water cylinder
- › Highly effective thermal insulation with low heat losses
- › For combining a central supply with the SNU HOT automatic water boiler
- › Surface optionally either with chrome-plated or stainless steel finish.
- › Hot water is drawn via a separate rotating handle with locking knob for anti-scalding protection
- › Connection by means of flexible connection hoses
- › Cast drain outlet, 180° pivoting end stop
- › Hot water draw-off with non-splash flow
- › Easy and reliable installation

Automatic water boilers, 5 l

Automatic water boiler for immediate use of water at almost 100 °C without delay. Suitable for the quick preparation of hot drinks and food as well as for cleaning very dirty dishes - for households and commercial enterprises, small offices and doctors' practices. The SNU HOT is a space-saving system comprising an open vented (non-pressurised) 5 l undersink cylinder and a special HOT 3in1 kitchen tap. This tap features one handle for drawing hot water from the cylinder and a mixing lever for cold and hot water from the central DHW system. As a safety feature, the tap handle for hot water has a push and turn mechanism. The hot water is routed separately inside the tap so that the tap surface can be touched without risk. As a result of the open vented construction, drawing hot water creates little steam or splashing. No steam escapes from the tap whilst water is being heated. After hot water has been drawn, the hot water remaining inside the tap is fed back to the cylinder, leaving freshly heated hot water available for the next draw-off. The cylinder features polystyrene rigid foam thermal insulation for low heat losses. The electronic temperature control with automatic boiling point capture regulates the electric heater and maintains a constant water temperature of up to 97 °C (subject to boiling temperature). Automatic boil-dry detection and additional high limit safety cut-out. Electric connection via cable with standard plug (supplied).

Accessories

- › 233230 FK filter cartridges
- › 233231 FKB Filter Starter-Kit Basis
- › 233232 FKC Filter Starter-Kit Comfort

An alphabetical product index can be found at the start of this technical guide.

Automatic water boilers, 5 l SNU HOT+HOT 3in1 cr

		SNU HOT+HOT 3in1 cr			
		232252			
Rated voltage	V	200	220	230	240
Rated output	kW	1.5	1.8	2	2.2
Rated current	A	7.6	8.3	8.7	9.1
Fuse/MCB rating	A	10	10	10	10
Phases		1/N/PE			
Frequency	Hz	50/60			
Versions					
Type of installation		Undersink			
Version		With special HOT 3in1 cr tap			
Internal cylinder material		Plastic			
Casing material		Plastic			
Thermal insulation material		Polystyrene			
Colour		white			
IP rating		IP24			
Type		Open vented/sealed unvented			
Hydraulic data					
Nominal capacity	l	5			
Max. flow rate, hot water	l/min	2.3			
Energy data					
Standby energy consumption/24 h at 97 °C	kWh	0.47			
Connections					
Hardness range		1			
Total hardness	mmol/l	1.5			
Total hardness	°dH	<8.4			
Power supply		Standard plug type F			
Application limits					
Temperature setting range	°C	Approx. 65 - 97			
Max. permissible pressure	MPa	0			
Values					
Max. permissible inlet temperature	°C	35			
Dimensions					
Height	mm	421			
Width	mm	263			
Depth	mm	230			
Weights					
Weight	kg	3			

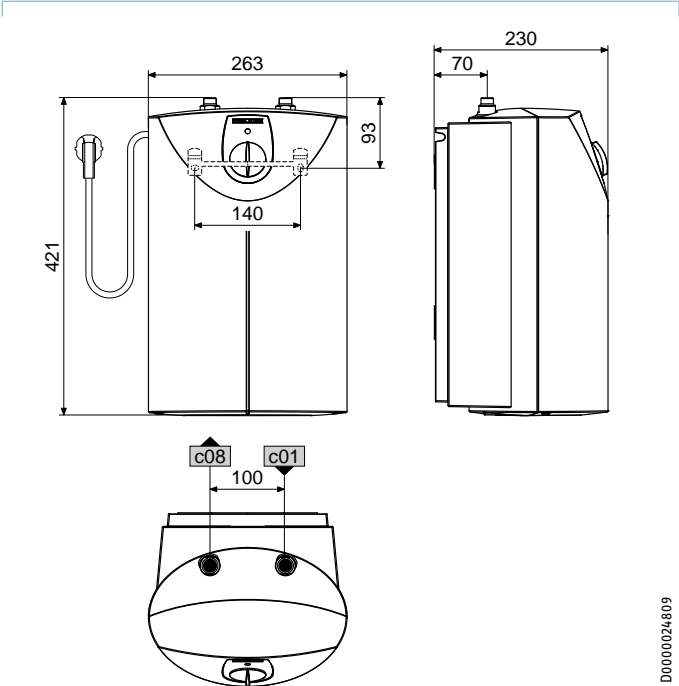
		HOT 3in1 cr
		297876
Versions		
Type of installation		Monobloc mixer tap
Application		Sink
Type		Open vented/sealed unvented
Finish		Chrome
Hydraulic data		
Max. flow rate, hot water	l/min	2.1
Max. flow rate, cold water/DHW	l/min	12
Application limits		
Max. permissible pressure, hot water	MPa	0
Maximum permissible operating pressure, cold water/DHW	MPa	1
Max. permissible hot water temperature	°C	97
Max. permissible temperature, DHW	°C	70
Weights		
Weight	kg	2.8
Dimensions		
Outlet height	mm	287
Reach	mm	210

Automatic water boilers, 5 l

SNU HOT+HOT 3in1 cr

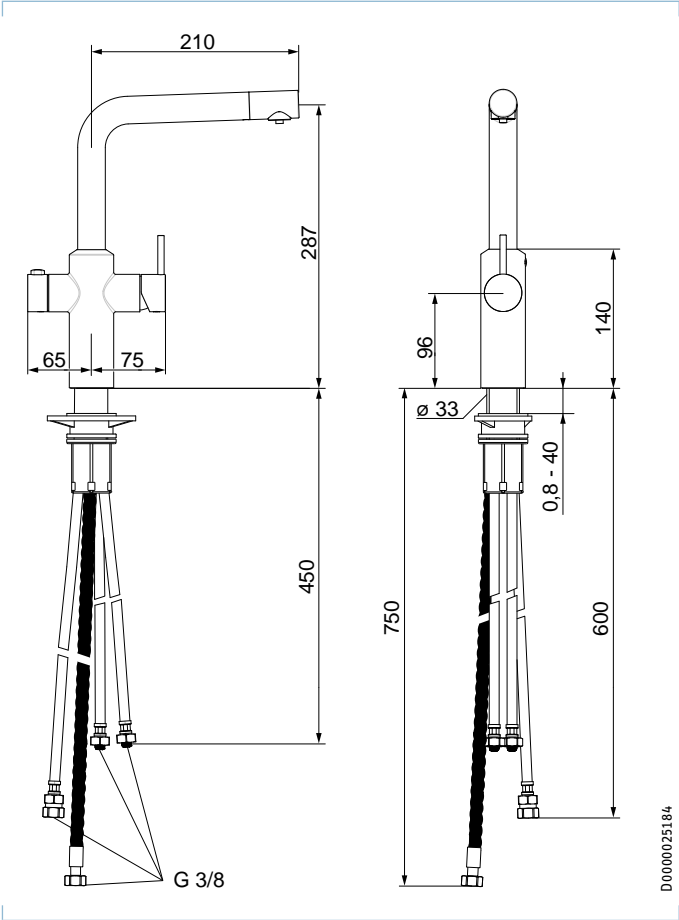
Dimensions and connections

SNU HOT



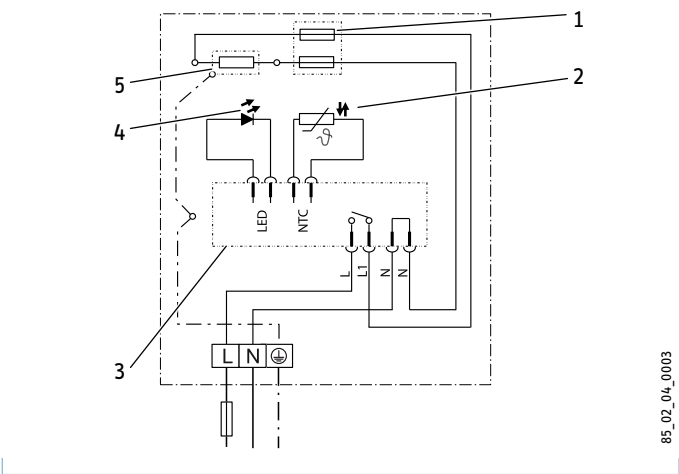
SNU HOT+HOT 3in1 cr			
c01	Cold water inlet	Male thread	G 3/8 A
c08	Hot water outlet	Male thread	G 3/8 A

HOT 3in1 cr



Wiring diagram

1/N/PE ~ 200-240 V



Automatic water boilers, 5 l Accessories

Automatic water boilers, 5 l Accessories

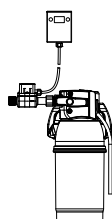
FKB Filter Starter-Kit Basis



D0000034532

- › Descaling filter, recommended for fault-free operation
- › Descaling filter recommended even in the case of water hardness <8.4°dH (hardness range 1)
- › Descaling filter is required in the case of water hardness >8.4°dH (hardness range 2)
- › FKB Filter Starter-Kit Basis. Does not include flow rate measuring device for filter monitoring

FKC Filter Starter-Kit Comfort



D0000034532

- › Descaling filter, recommended for fault-free operation
- › Descaling filter recommended even in the case of water hardness <8.4°dH (hardness range 1)
- › Descaling filter is required in the case of water hardness >8.4°dH (hardness range 2)
- › FKC Filter Starter-Kit Comfort. Includes flow rate measuring device for filter monitoring

FK filter cartridges

STIEBEL ELTRON water filter FKB Filter Starter-Kit Basis. Technical description: Water filter for combination with the SNU HOT automatic water boilers. The use of the filter is recommended in all cases for fault-free operation. It protects the SNU HOT from scale build-up and thereby extends the service life of the automatic water boiler. Set comprises filter with wall mounting bracket and connection hose. For installation on the cold water inlet of the hot water cylinder. Specification: Application range: from hardness range 1, pressure drop: 0.02 MPa at 1 l/min. Capacity subject to water hardness: 500 - 1000 litres.

FKB Filter Starter-Kit Basis		
233231		
Type of installation		Undersink
Max. permissible pressure	MPa	0.86
Casing material		Plastic
Height	mm	265
Width	mm	137
Depth	mm	130

STIEBEL ELTRON water filter FKC Filter Starter-Kit Comfort technical description: Water filter for combination with the SNU HOT automatic water boilers. The use of the filter is recommended in all cases for fault-free operation. It protects the SNU HOT from scale build-up and thereby extends the service life of the automatic water boiler. Set comprises filter with wall mounting bracket, connection hose and flow sensor with indicator for monitoring of filter capacity. For installation on the cold water inlet of the hot water cylinder. Specification: Application range: from hardness range 1, pressure drop: 0.02 MPa at 1 l/min. Capacity subject to water hardness: 500-1000 litres.

FKC Filter Starter-Kit Comfort		
233232		
Type of installation		Undersink
Max. permissible pressure	MPa	0.86
Casing material		Plastic
Height	mm	265
Width	mm	137
Depth	mm	130

Replacement filter cartridges for STIEBEL ELTRON FKB water filter, comprising a set with three filter cartridges. Specification: Application range: 8.5 - 17 °dH, pressure drop: 0.02 MPa at 1 l/min. Capacity subject to water hardness: 500 - 1000 litres.

FK filter cartridges		
233230		
Max. permissible pressure	MPa	0.86
Height	mm	259
Width	mm	108
Depth	mm	108

PRODUCTS

Wall mounted water heater

Wall mounted water heater



PRODUCTS

Wall mounted water heater

Equipment and operation

Programming unit

All wall mounted cylinders have their own programming unit for setting values and for adjustment/information.

The following different programming units are possible, depending on the equipment configuration of the wall mounted cylinder.

Programming unit with LCD



PIC00002953

The backlit display with multi function indications ensures a clear overview and very easy operation.

The buttons can be used for direct setting of the required temperature and for rapid heating. The menu can also be accessed by pressing a single button. Variable temperature selection and optional temperature limitation can be accessed easily via the user interface menu.

The LCD informs you automatically about the available mixed water volume, the operating state and the temperature limit. You can view the DHW temperature or the energy consumption for DHW heating.

Programming unit with heat content indication



PIC00000956

Examples for SH 100 S:

- 5 red LED fields = 1 full bathtub or 4 showers
- 2 red LED fields = 1 shower

Depending on the appliance type, the programming unit may have heat content indication, a quick heat-up button, a heat-up indicator and/or a service indicator for the protective magnesium anode.

The heat content is indicated by seven LED fields on the user interface. This information indicates the available heat content as "mixed water volume 40 °C" when the average DHW temperature is between 40 °C and 82 °C.

The number of illuminated LED fields informs the user of the available mixed water volume for the respective cylinder size.

ECO functions

Three ECO functions can be activated using the programming unit with LCD. This allows the appliance to adapt to the user's usage pattern. The potential savings are as follows:

3 automatic ECO functions can be selected

- ECO Comfort: automatic temperature setback to 60 °C
- ECO Plus: optional setback to 60 °C and 60 % charging level
- ECO Dynamic: automatic dynamic matching to the individual draw-off pattern

PRODUCTS

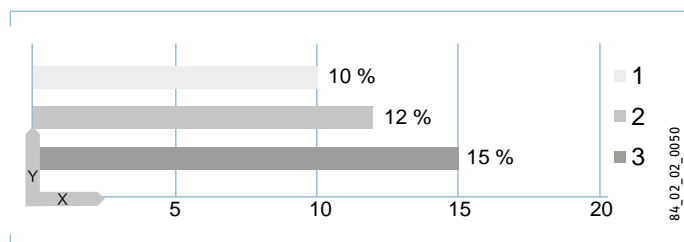
Wall mounted water heater

ECO Comfort

Automatic temperature reduction from 85 °C to 60 °C, one week after commissioning the appliance.

ECO Plus

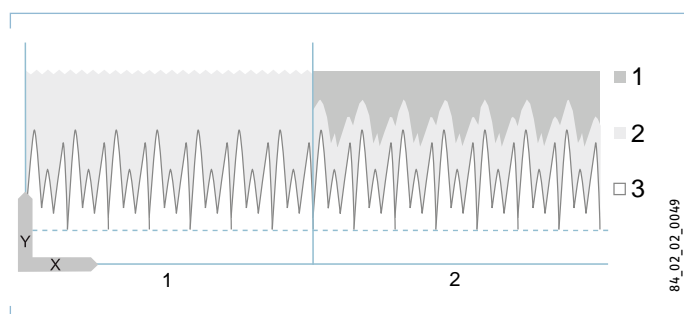
Additional energy savings by delaying switch-on until approx. 40 % of the DHW volume provided has been drawn off.



- X Potential savings [%]
Y ECO function
1 ECO Comfort
2 ECO Plus
3 ECO Dynamic

ECO Dynamic functionality

Activation of an intelligent learning curve: constant matching of the available DHW volume to the actual DHW demand by capturing user patterns; however, not less than 60 °C and 40 % heating



- X Heating level
Y 1st week without ECO Dynamic
2nd week with ECO Dynamic
1 Volume of DHW saved
2 Volume of DHW stored
3 Volume of DHW used

Summary of functions

	SHZ LCD	SH S	PSH Uni- versal EL	PSH EL	PSH Si	PSH Trend	SHD S
Programming unit with LCD	•		•	•			
Backlighting	•						
Programming unit with rotary selector, nominal capacity ≤ 50 l		•			•	•	•
Programming unit with rotary selector, nominal capacity ≤ 80 l		•				•	•
Heat content display		•					
ECO functions available	•		•	•			
Reverse control	•		•	•			
Automatic scale indicator	•						
Impressed current anode	•						
Protective magnesium anode with signal indicator		•					•
Protective magnesium anode			•	•	•	•	•
Quick heat-up	•		•	•			•
Temperature limit	•	•	•	•			

Reverse control

With the programming unit with LCD, the appliance will adapt automatically to the off-peak tariff periods set by the local power supply utility. The charging level of the appliance will thus only be guaranteed to be 100 % at the end of the off-peak tariff period. That results in a considerable reduction in standby energy consumption.

Scale build-up indication

The SHZ LCD electronic comfort from STIEBEL ELTRON is the world's first wall mounted DHW cylinder to be equipped with this innovative scale build-up indicator: a genuine early warning system that automatically detects scale build-up on the flanged immersion heater and reliably announces when the next service is required. This prevents possible damage or appliance failure, and extends its service life. Together with the maintenance-free impressed current anode, it's a powerful service pack.

- › Automatic immersion heater monitoring
- › Signals in good time when the system needs to be descaled
- › The Ca symbol appears automatically
- › Prevents appliance failure and triggering of the safety element
- › Independent of potable water quality and user habits
- › Automatic reset by self-test after descaling
- › Ensures safe, reliable operation and a long service life

Impressed current anode

If the appliance has an impressed current anode, the intensity of the protective current required will vary depending on the presence of any flaws. The impressed current anode is regulated electronically and is used only in conjunction with the LCD programming unit. Unlike the protective magnesium anode, replacement after consumption of the material is not required.

Signal anode

The integral protective magnesium anode is equipped with a signalling facility. The service indicator on the user interface illuminates as soon as the anode has been consumed.

Temperature limit

The maximum outlet temperature may be able to be limited variably or in 3 stages (as anti-scalding protection, for example), depending on the programming unit type.

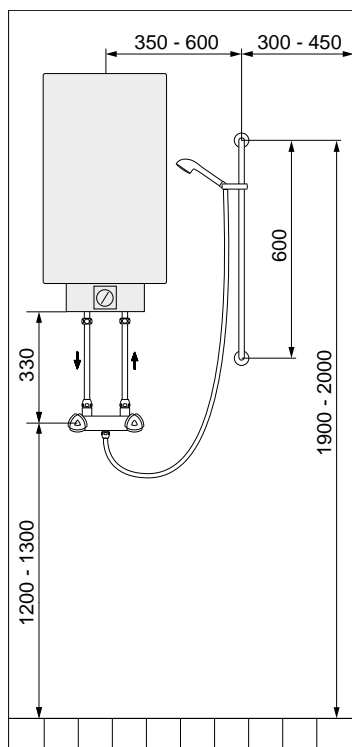
PRODUCTS

Wall mounted water heater

Installation and installation benefits

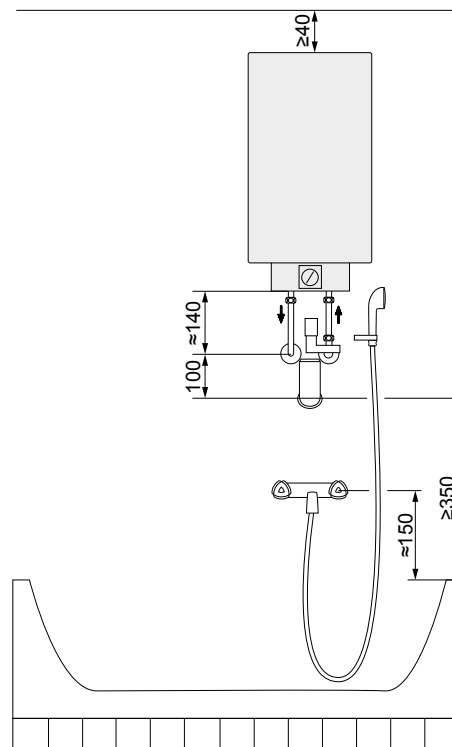
Installation examples

The following installation dimensions are recommended. Always check the dimensions of the site and compare.



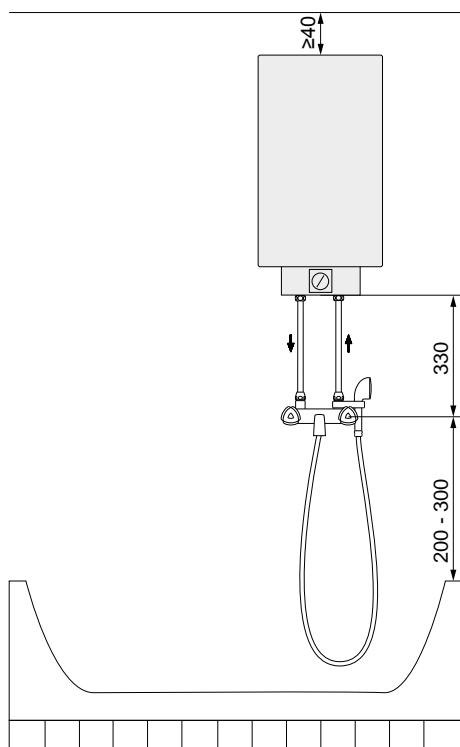
D0000032117

Shower, on finished walls, open vented cylinder



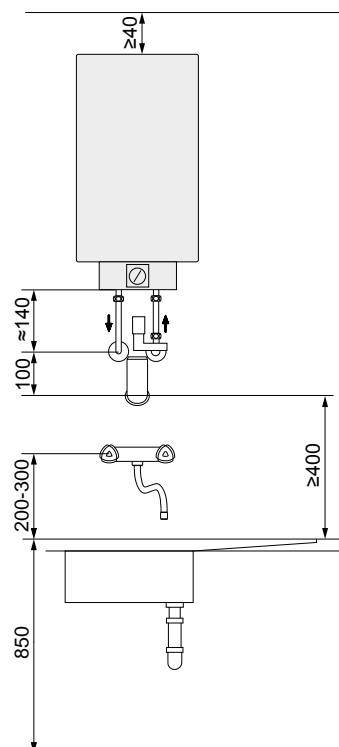
D0000032119

Bath tub, on unfinished walls, sealed unvented cylinder



D0000032118

Bath tub, on finished walls, open vented cylinder



D0000032120

Sink, on unfinished walls, sealed unvented cylinder

PRODUCTS

Wall mounted water heater

Equipment features

The following equipment features make the appliances easier to install and service:

Mounting brackets

All appliances are mounted using one or two mounting brackets, depending on appliance size. Precisely sized spacers are provided to permit tile compensation. Some models also have side caps.

Drain

All appliances have a drain connector for easy draining of the cylinders. Some models have a drain valve allowing metered draining. Both the drain connector and the drain valve are fitted with a hose connection. Draining is necessary when service work is required on elements such as the flanged immersion heater.

Enamelled cylinders

All cylinders are made of steel with an internal enamel coating for corrosion protection. STIEBEL ELTRON was the first manufacturer to obtain the EEA (European Enamel Authority) quality certificate for its DHW cylinder enamel coating.

Immersion heater plug

Following service work on the electric flanged immersion heater, the electrical contacts can be connected without risk of errors. The specially designed plug allows safe, quick and reliable working.

Suitable for use with plastic pipes

The following wall mounted cylinders are equipped as standard with a safety concept that permits the appliance to be connected to plastic pipework systems:

- › SHZ LCD
- › SH S
- › PSH Universal EL
- › PSH EL
- › PSH Trend

These cylinders enable operating temperatures up to 85 °C (SHZ LCD) or 82 °C to be selected. Limitation to lower temperatures, e.g. 60 / 65 °C, may be possible according to type.

Should faults develop, temperatures up to 95 °C (max. 0.6 MPa) can occur. Any plastic pipework used must be suitable for these conditions. These operating conditions must be checked against the manufacturer's details regarding the application limits of the plastic pipes.

Non-pressurised 2/3 draw-off

With this equipment, 2 draw-off points can be supplied or operated even with non-pressurised wall mounted cylinders. However, only 1/3 of the volume can be drawn off via the second draw-off point.

LICENCE CERTIFICATE

AUTHORISATION TO USE THE QUALITY SIGN



This is to certify that

Stiebel Eltron GmbH & Co. KG

Licence number: 201

Is authorized to use the quality sign which is shown above according to the regulations for the use of the European Enamel Authority quality sign for enamel coating on the application area (7.12 hot water tanks / boilers) as described in chapter 7 of the EEA Quality Requirements.

Date of issue of this licence: 06.10.2012

Period of validity of this licence: 05.10.2015

Hagen, 06.10.2012


Dr. Leo Gypen
EEA-President


Werner Weisenhaus
EEA-Technical Committee

D00000032152

Quality certificate from the EEA (European Enamel Authority)

Equipment features of the wall mounted cylinders

	SHZ LCD	SH S	PSH Universal EL	PSH EL	PSH Si	PSH Trend	SHD S
Caps for mounting brackets	•	•					•
Drain valve	•	•					•
Drain connector							
Enamelled cylinders	•	•	•	•	•	•	•
Immersion heater plug	•	•	•	•			•
Suitable for use with plastic pipes	•	•	•	•		•	
Copper flanged immersion heater	•	•			•		•
Stainless steel immersion heater				•		•	
Protected top heater			•				

Hydraulic connection

The wall mounted cylinders can be operated in various ways, with supply of one or more draw-off points, depending on the type and model of the cylinder. The water connection of the cylinder will vary according to how it is operated.

Hydraulic connection and required safety valve

	SHZ LCD	SH S	PSH Universal EL	PSH EL	PSH Si	PSH Trend	SHD S
Open vented operating mode	•	•	•	•			
Non-pressurised tap	•	•	•	•			
Sealed unvented operation	•	•	•	•	•	•	•
At supply pressure ≤ 0.6 MPa safety valve KV 30	•	•	•	•	•	•	•
At supply pressure > 0.6 MPa ≤ 1.0 MPa safety valve KV 40	•	•	•	•	•	•	•

Open vented operating mode

Open vented (non-pressurised) water heaters supply only a single draw-off point. These cylinders must not be subjected to pressure and must be identified by the manufacturer as non-pressurised DHW cylinders.

When the DHW stopcock is opened in the mixer tap, cold water flows into the bottom section of the DHW cylinder. The hot water in the cylinder is pushed upwards out of the cylinder, through the permanently open spout of the mixer tap. For this reason, the outlet connector and pivoting tap spout must never be shut off and the aerator must never be fitted with a hose.

Always observe accepted engineering standards, such as EN 806 and DIN 1988, and the regulations specified by your local water supply utility.

Matching connection accessories are available for every cylinder. Use in combination is recommended because all safety equipment is already built in. This also ensures that the flow rate specified on the type plate, and thus the DIN standard limits for appliance and tap noise, will not be exceeded even during surges in water pressure. In addition there will be a minor mixing effect and consequently a more efficient utilisation of the stored hot water.

The DHW connector can be extended with the use of suitable accessories. However, if the maximum permissible length of 1 m needs to be exceeded, an air vent valve should be installed in the DHW line.

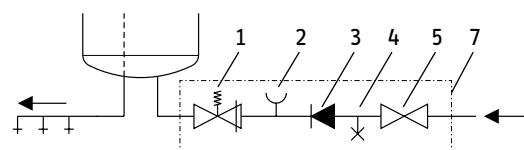
Sealed unvented operating mode

Sealed unvented (pressure-tested) water heaters, i.e. those under full mains pressure, can supply multiple draw-off points. For safety reasons, water will visibly drip from the safety valve of the safety assembly during heating up.

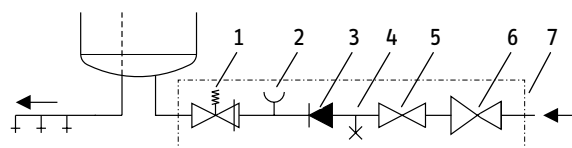
Always observe accepted engineering standards, such as EN 806 and DIN 1988, and the regulations specified by your local water supply utility. Never exceed the maximum permissible pressure specified on the type plate.

For safety reasons, standards such as DIN 1988 require an individually tested safety assembly to be installed directly on the water heater in the cold water line.

The critical factor when selecting a safety assembly is the maximum permissible pressure of the water heater.



Hydraulic connection at supply pressure ≤ 0.48 MPa with safety valve KV 30



Hydraulic connection at supply pressure > 0.48 MPa with safety valve KV 40

- 1 Safety valve
- 2 Pressure gauge test connector
- 3 Non-return valve
- 4 Inspection valve
- 5 Straight-through shut-off valve (butterfly)
- 6 Pressure reducing valve
- 7 Safety valve KV 40

Power supply

The wall mounted DHW cylinders can be connected electrically for different operating modes depending on cylinder type. Factors to consider include the DHW consumption of the end users, the power supply utility's connection model, and the possible operating mode of the DHW cylinders.

Always observe accepted engineering standards, such as VDE 0100 in Germany, and the regulations of your local power supply utility.

Connect the DHW cylinder permanently to an AC power supply. The cable cross-section must be selected according to the appliance specification and safeguarded with a fuse/MCB.

In addition, the DHW cylinder must be able to be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. For this, install circuit breakers, fuses, etc.

Single circuit operation

Single circuit appliances include all electric water heaters that operate at full connected electric heating output each time the control thermostat switches ON. The preselected DHW temperature is maintained continuously.

Manual rapid heat-up operation

This type of connection means that when the appliance is switched on, it heats up the water content once to the set temperature using the full connected electrical heating output and then switches off. If there is additional DHW demand, the appliance must be switched on again manually.

Possible connection versions

	SHZ LCD	SH S	PSH Universal EL	PSH EL	PSH Si	PSH Trend	SHD S
Single circuit operation	•	•	•	•	•	•	•
Manual rapid heat-up operation	•	•	•	•			
Dual circuit operation	•	•	•	•			•
Instantaneous water cylinder connection							•

Dual circuit connection

The cylinder content is heated with the base heating stage during off-peak tariff periods. The enable times for this are provided by the local power supply utility. During off-peak tariff periods, a lower connected electrical load is usually used to heat the entire cylinder content to the set temperature. With this type of connection, the cylinder size is selected based on the volume of DHW stored until the next enable time.

In the event of additional demand for DHW, the pushbutton can be pressed during the normal tariff period to switch on quick heat-up for one-off heating with a (usually) greater connected electrical load. When the selected temperature is reached, the rapid heat-up function switches off and does not switch on again.

Instantaneous water cylinder connection

In this operating mode, the appliance works with normal heating output when drawing off small amounts of water. With a high temperature setting and after large volumes of water or the entire cylinder contents are drawn off, the appliance will switch automatically to rapid heating with high heating output.

The appliance then operates as an instantaneous water heater with rapid heating.

Following a long power failure, the zero volt relay prevents the rapid heat-up function from being switched on straight away. Once the voltage returns, the appliance initially works with normal heating output until the temperature controller reacts for the first time. Subsequently, rapid heating is automatically ready for operation again.

Wall mounted cylinders 30 to 150 litres

SHZ LCD



PLC00002180

Wall mounted cylinders 30 to 150 litres

Sealed unvented (pressure-tested) or open vented (non-pressurised) for the supply of one or more draw-off points. Installation possible in connection with plastic pipework (observe manufacturer's details and application limits). Electronic DHW temperature control. The water content is maintained by the controller, subject to the selected operating mode, at the selected temperature. Highest efficiency with 3 selectable automatic ECO functions: ECO-Comfort, ECO-Plus and ECO-Dynamik and optional reverse control in dual circuit operation. Programming unit with function keys and LCD. Menu selection and display supported by backlighting: Precision temperature selection and display, precise temperature limit, heat content indication in litres of available mixed water, optional energy consumption indication, automatic scaling level indicator, service and fault display, heating active indication. Internal steel cylinder with special, directly applied "anticor" enamel coating. Thermal insulation with the lowest heat loss. Output setting, operating mode selection (dual circuit, single circuit, manual rapid heat-up) and activation of reverse control via DIP switch.

SHZ LCD

- › Universal flanged immersion heater for dual circuit operation, optional single circuit operation/manual rapid heat-up operation
- › Electronic control unit and programming unit with LCD
- › Menu selection and display, e.g. variable temperature selection from 20 °C to 85 °C
- › 3 automatic ECO functions can be selected: ECO Comfort, ECO Plus, ECO Dynamic
- › Optional reverse control in dual circuit operation
- › Backlit display
- › Rapid heating up and heat-up display
- › Automatic scale indicator
- › Maintenance free impressed current anode
- › DIP switches for selection of operating mode and output switching
- › Quick and easy installation (even in corners) using mounting bracket
- › Thermal insulation with extremely low heat losses
- › Drainage valve with hose connection

Accessories

- › 233480 KV 30
- › 233481 KV 40
- › 230764 SRT 2
- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

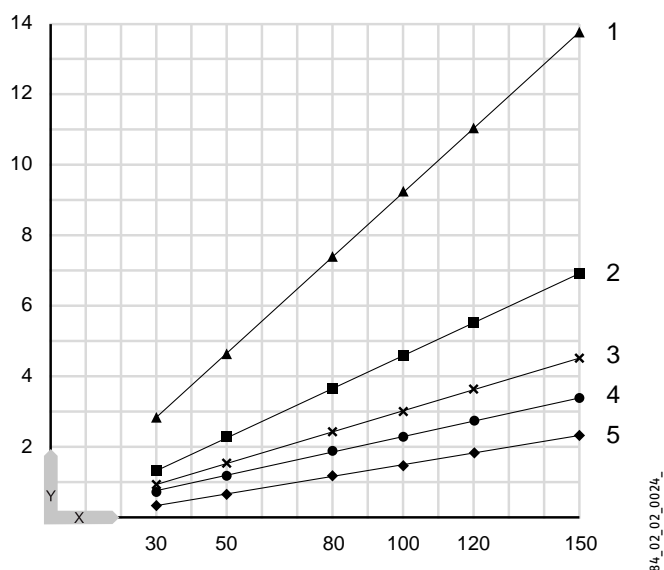
Wall mounted cylinders 30 to 150 litres

SHZ LCD

		SHZ 30 LCD	SHZ 50 LCD	SHZ 80 LCD	SHZ 100 LCD	SHZ 120 LCD	SHZ 150 LCD
		231251	231252	231253	231254	231255	231256
Hydraulic data							
Nominal capacity	l	30	50	80	100	120	150
Mixed water volume 40 °C (15 °C/65 °C)	l	59	97	159	198	235	292
Electrical data							
Connected load ~ 230 V	kW	1-4	1-4	1-4	1-4	1-4	1-4
Connected load ~ 400 V	kW	1-6	1-6	1-6	1-6	1-6	1-6
Phases		1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE
Rated voltage	V	230/400	230/400	230/400	230/400	230/400	230/400
Frequency	Hz	50/-	50/-	50/-	50/-	50/-	50/-
Single circuit operating mode		X	X	X	X	X	X
Dual circuit operating mode		X	X	X	X	X	X
Manual rapid heat-up mode		X	X	X	X	X	X
Application limits							
Temperature setting range	°C	20-85	20-85	20-85	20-85	20-85	20-85
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6
Test pressure	MPa	0.78	0.78	0.78	0.78	0.78	0.78
Max. permissible temperature	°C	95	95	95	95	95	95
Max. flow rate	l/min	18	18	18	18	18	18
Energy data							
Standby energy consumption/24 h at 65 °C	kWh	0.45	0.52	0.66	0.77	0.92	1.05
Versions							
IP rating		IP25	IP25	IP25	IP25	IP25	IP25
Sealed unvented type		X	X	X	X	X	X
Open vented type		X	X	X	X	X	X
Colour		white	white	white	white	white	white
Dimensions							
Height	mm	770	740	1050	1050	1210	1445
Width	mm	410	510	510	510	510	510
Depth	mm	420	510	510	510	510	510
Weights							
Weight, full	kg	53	78	118	140	165	203
Weight, empty	kg	22.9	27.6	37.6	39.5	42.4	52

Heat-up diagram

Set temperature 85 °C



X Nominal capacity [l]

Y Duration [h]

1 1 kW

2 2 kW

3 3 kW

4 4 kW

5 6 kW

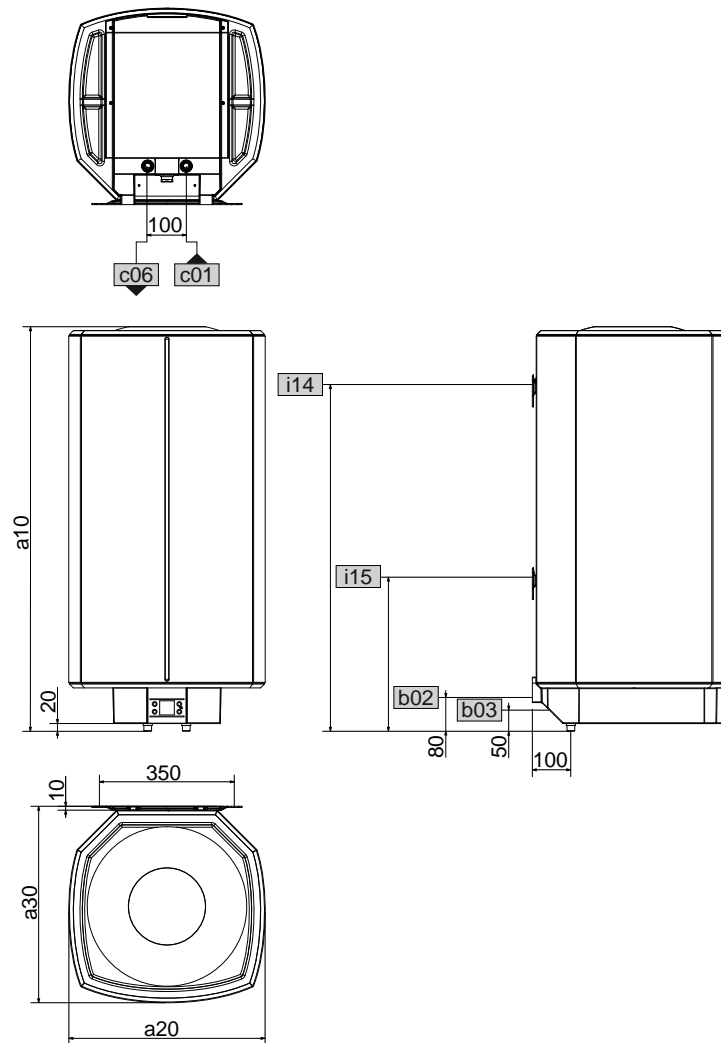
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 15 °C cold water temperature

Wall mounted cylinders 30 to 150 litres

SHZ LCD

Dimensions and connections



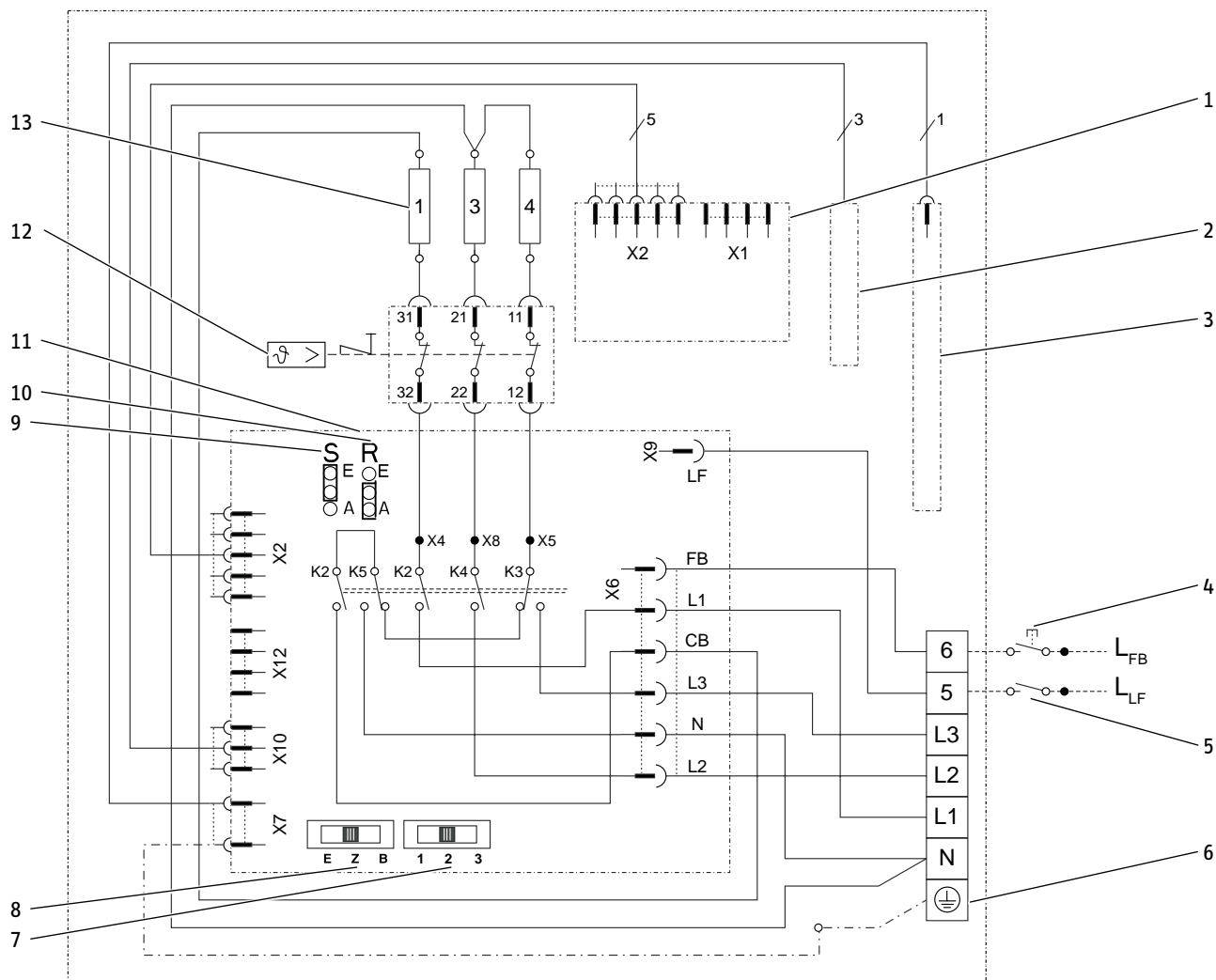
D0000021508

				SHZ 30 LCD	SHZ 50 LCD	SHZ 80 LCD	SHZ 100 LCD	SHZ 120 LCD	SHZ 150 LCD
a10	Appliance	Height	mm	770	740	1050	1050	1210	1445
a20	Appliance	Width	mm	410	510	510	510	510	510
a30	Appliance	Depth	mm	420	510	510	510	510	510
b02	Entry electrical cables I								
b03	Entry electrical cables II								
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
i14	Wall mounting bracket I	Height	mm	700	600	900	900	900	1100
		Max. Ø fixing screw	mm	12	12	12	12	12	12
i15	Wall mounting bracket II	Height	mm					300	300
		Max. Ø fixing screw	mm					12	12

Wall mounted cylinders 30 to 150 litres

SHZ LCD

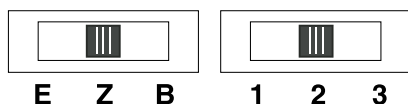
Wiring diagrams and terminals



- 1 Electronic assembly for operation
- 2 Temperature sensors
- 3 Impressed current anode
- 4 Remote control for rapid heating (any phase can be connected, no output transfer)
- 5 Power-OFF contact (any phase can be connected, no output transfer)
- 6 Mains terminal

- 7 Output switch
- 8 Operating mode switch
- 9 ECO jumper (energy saving mode)
- 10 Reverse control jumper
- 11 Electronic control unit assembly
- 12 High limit safety cut-out
- 13 Heating element, 2 kW ~ 230 V each

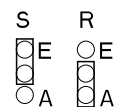
Switches for operating mode and output



- E Single circuit operation
Z Dual circuit operation
B Manual rapid heat-up operation
1 Output 1
2 Output 2
3 Output 3

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ECO jumper (energy saving mode) and reverse control



- S ECO jumper (energy saving mode)
E ECO on (factory setting)
A ECO off (commercial mode)
R Reverse control jumper
E Reverse control on
A Reverse control off (factory setting)

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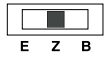
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Wall mounted cylinders 30 to 150 litres

SHZ LCD

Dual circuit operation

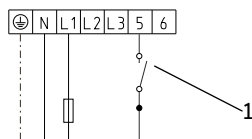
Single meter measurement with power-OFF contact



1/2 kW 1/N/PE ~ 230 V



2/2 kW 1/N/PE ~ 230 V



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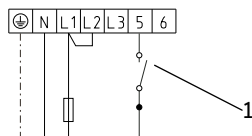
1/4 kW 1/N/PE ~ 230 V



2/4 kW 1/N/PE ~ 230 V



3/4 kW 1/N/PE ~ 230 V



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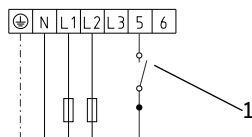
1/4 kW 2/N/PE ~ 400 V



2/4 kW 2/N/PE ~ 400 V



3/4 kW 2/N/PE ~ 400 V



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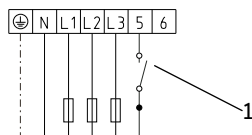
1/6 kW 3/N/PE ~ 400 V



2/6 kW 3/N/PE ~ 400 V



3/6 kW 3/N/PE ~ 400 V



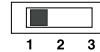
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1 Power-OFF contact

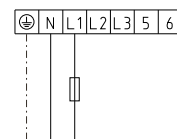
Single circuit and manual rapid heat-up operation



1 kW 1/N/PE ~ 230 V

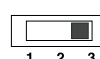


2 kW 1/N/PE ~ 230 V

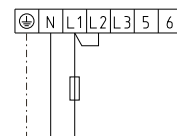
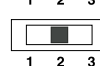


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3 kW 1/N/PE ~ 230 V



4 kW 1/N/PE ~ 230 V

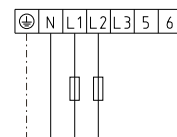
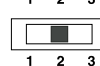


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3 kW 2/N/PE ~ 400 V



4 kW 2/N/PE ~ 400 V

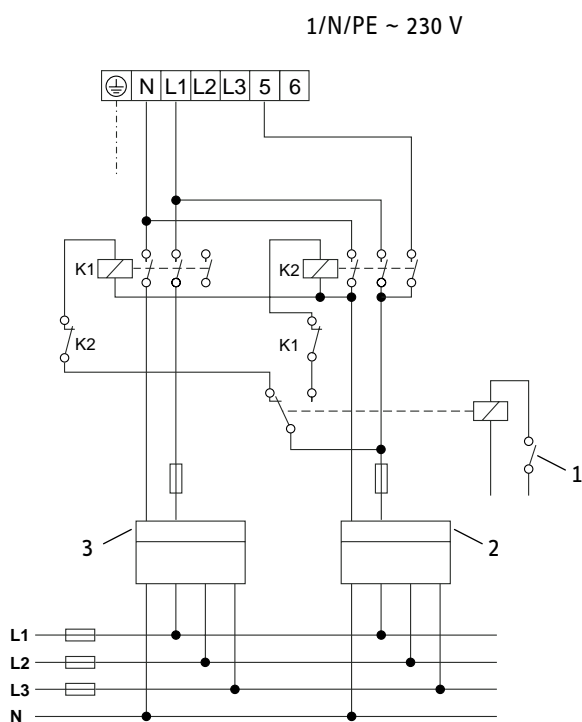


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Wall mounted cylinders 30 to 150 litres SHZ LCD

Dual circuit operation

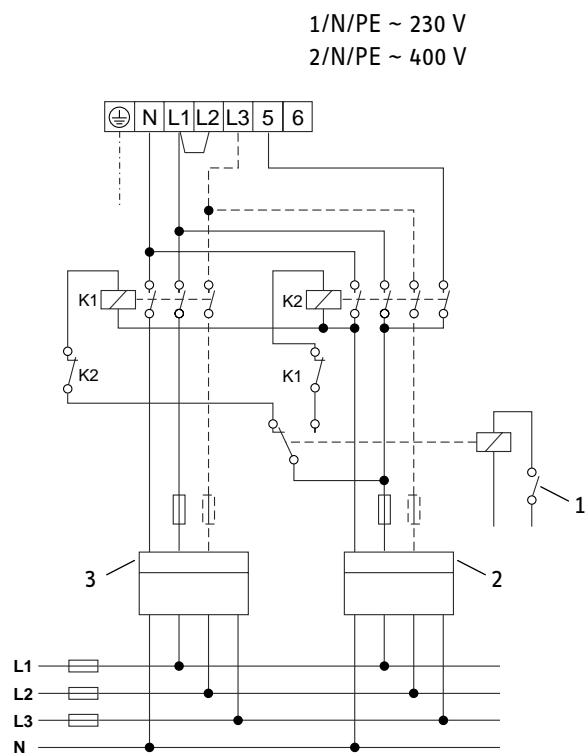
Dual meter measurement with power-OFF contact, single phase



- K1 Contactor 1
- K2 Contactor 2
- 1 Power-OFF contact
- 2 Off-peak tariff meter
- 3 Peak tariff meter

Dual circuit operation

Dual meter measurement with power-OFF contact, multiple phases



Wall mounted cylinders 30 to 150 litres

SH S



PLC0000240

Wall mounted cylinders 30 to 150 litres

Sealed unvented (pressure-tested) for supplying several draw-off points. Open vented (non-pressurised) as an option for the supply of one draw-off point. Variable temperature selection. The controller maintains the water content (subject to connection) at the selected temperature. Automatic frost protection. Internal steel cylinder with special, directly applied anticor® enamel coating. White painted sheet steel outer jacket and optimum thermal insulation.

SH S

- › Universal immersion heater for single circuit operation
- › Electronic heat content indication via LED in the user interface
- › Signal anode with indicator lamp in the user interface; can be replaced without removing the flange (50 - 150 l)
- › Variable temperature selection from approx. 35 °C to approx. 82 °C
- › Optional temperature limit at 45 °C, 55 °C or 65 °C
- › Heating element connections through complete flanged plug
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Thermal insulation with extremely low heat losses
- › Quick and easy installation (even in corners) using mounting bracket
- › Drainage valve with hose connection

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB
- › 230764 SRT 2
- › 233480 KV 30
- › 233481 KV 40

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

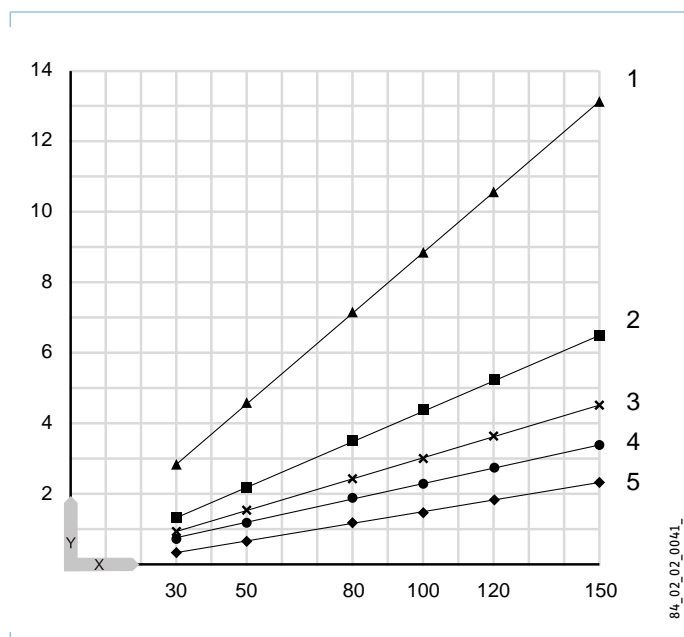
Wall mounted cylinders 30 to 150 litres

SH S

		SH 30 S	SH 50 S	SH 80 S	SH 100 S	SH 120 S	SH 150 S
		073047	073048	073049	073050	073051	073052
Hydraulic data							
Nominal capacity	l	30	50	80	100	120	150
Mixed water volume 40 °C (15 °C/65 °C)	l	59	97	159	198	235	292
Electrical data							
Connected load ~ 230 V	kW	1-4	1-4	1-4	1-4	1-4	1-4
Connected load ~ 400 V	kW	3-6	3-6	3-6	3-6	3-6	3-6
Phases		1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE	1/N/PE, 2/N/PE, 3/N/PE
Rated voltage	V	230/400	230/400	230/400	230/400	230/400	230/400
Frequency	Hz	50/-	50/-	50/-	50/-	50/-	50/-
Single circuit operating mode		X	X	X	X	X	X
Application limits							
Temperature setting range	°C	35-82	35-82	35-82	35-82	35-82	35-82
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6
Test pressure	MPa	0.78	0.78	0.78	0.78	0.78	0.78
Max. permissible temperature	°C	95	95	95	95	95	95
Max. flow rate	l/min	18	18	18	18	18	18
Min. water inlet pressure	MPa	0.1	0.1	0.1	0.1	0.1	0.1
Max. water inlet pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6
Energy data							
Standby energy consumption/24 h at 65 °C	kWh	0.45	0.52	0.66	0.77	0.92	1.05
Versions							
IP rating		IP25	IP25	IP25	IP25	IP25	IP25
Sealed unvented type		X	X	X	X	X	X
Open vented type		X	X	X	X	X	X
Colour		white	white	white	white	white	white
Dimensions							
Height	mm	770	740	1050	1050	1210	1445
Width	mm	410	510	510	510	510	510
Depth	mm	420	510	510	510	510	510
Weights							
Weight, full	kg	53	78	118	140	165	203
Weight, empty	kg	23.1	28	38	40.8	45.5	53.3

Heat-up diagram

Set temperature 82 °C



X Nominal capacity [l]

Y Duration [h]

1 1 kW

2 2 kW

3 3 kW

4 4 kW

5 6 kW

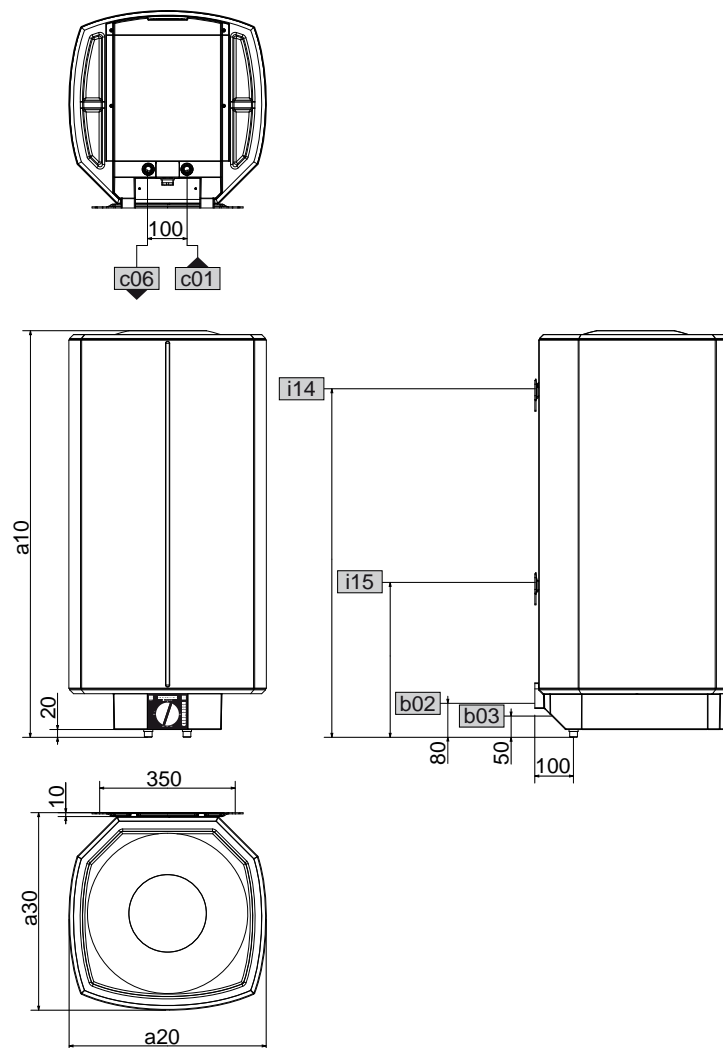
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 15 °C cold water temperature

Wall mounted cylinders 30 to 150 litres

SH S

Dimensions and connections

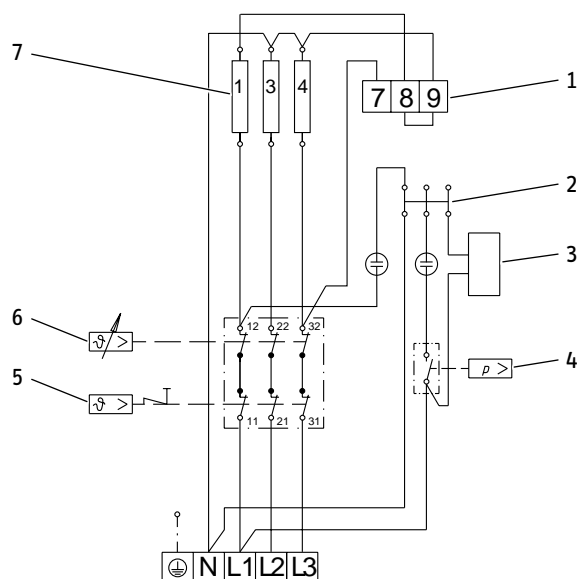


D0000024799

			SH 30 S	SH 50 S	SH 80 S	SH 100 S	SH 120 S	SH 150 S	
a10	Appliance	Height	mm	770	740	1050	1050	1210	1445
a20	Appliance	Width	mm	410	510	510	510	510	510
a30	Appliance	Depth	mm	420	510	510	510	510	510
b02	Entry electrical cables I								
b03	Entry electrical cables II								
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
i14	Wall mounting bracket I	Height	mm	700	600	900	900	900	1100
		Max. Ø fixing screw	mm	12	12	12	12	12	12
i15	Wall mounting bracket II	Height	mm					300	300
		Max. Ø fixing screw	mm					12	12

Wall mounted cylinders 30 to 150 litres SH S

Wiring diagram and connections

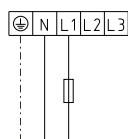


85_02_07_0025

- 1 Terminal for output changeover
- 2 Plug-in distributor for N conductor
- 3 Heat content display
- 4 Pressure switch for signal anode
- 5 High limit safety cut-out
- 6 Temperature controller
- 7 Heating element, 2 kW ~ 230 V each

1 kW 7 8 9 1/N/PE ~ 230 V

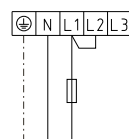
2 kW 7 8 9 1/N/PE ~ 230 V



85_02_07_0036

3 kW 7 8 9 1/N/PE ~ 230 V

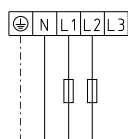
4 kW 7 8 9 1/N/PE ~ 230 V



85_02_07_0037

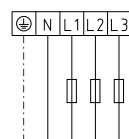
3 kW 7 8 9 2/N/PE ~ 400 V

4 kW 7 8 9 2/N/PE ~ 400 V



85_02_07_0038

6 kW 7 8 9 3/N/PE ~ 400 V



85_02_07_0039

Wall mounted cylinders 30 to 150 litres

PSH Universal EL



PIC0002184

Wall mounted cylinders 30 to 150 litres

Angular wall mounted sealed unvented DHW cylinder with directly applied foam insulation and enamelled internal steel cylinder. Flanged immersion heater with protective anode. The appliance is electronically operated. The integral PCB has 3 ECO economy programs. The display shows the set temperature. Functions such as frost protection, temperature limit and rapid heat-up (manual) are part of the standard features. The ceramic heating element is located inside an enamelled protective pipe and does not come into contact with the DHW. This enables dry replacement of the heating elements. The PCB facilitates variable temperature selection. The temperature can be set to between 7 °C and 85 °C. These cylinders can be installed vertically or horizontally.

PSH Universal EL

- › ECO Comfort function (temperature setback from 85 °C to 60 °C)
- › ECO Plus function (60 °C set temperature and 60 % heating level)
- › ECO Dynamic function (intelligent dynamic matching to the draw-off pattern)
- › Intelligent self-learning electronics
- › Selection of operating modes (single circuit, dual circuit or manual rapid heat-up) via DIP switch on the PCB
- › Vertical and horizontal mounting
- › Modern design with intuitive user interface
- › Protected ceramic heating element (replaceable without draining)
- › Additional function for limiting temperature to 40 °C - 60 °C
- › Enamelled steel cylinder
- › Protective anode
- › Temperature curve display
- › Integral key lock

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

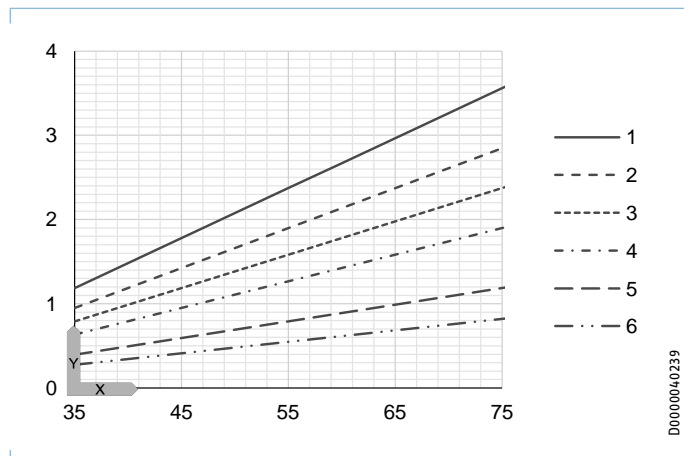
Wall mounted cylinders 30 to 150 litres

PSH Universal EL

		PSH 30 Univer- sal EL	PSH 50 Univer- sal EL	PSH 80 Univer- sal EL	PSH 100 Uni- versal EL	PSH 120 Univer- sal EL	PSH 150 Univer- sal EL
		231150	231151	231152	231153	231649	231154
Hydraulic data							
Nominal capacity	l	30	50	80	100	120	150
Mixed water volume 40 °C (15 °C/60 °C), vertical	l	53	92	136	183	217	273
Mixed water volume 40 °C (15 °C/60 °C), horizontal	l	42	76	111	153	173	194
Electrical data							
Connected load ~ 230 V	kW	2.6	3	3	3	3	3
Rated voltage	V	230	230	230	230	230	230
Phases		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Frequency	Hz	50	50	50	50	50	50
Single circuit operating mode		X	X	X	X	X	X
Dual circuit operating mode		X	X	X	X	X	X
Manual rapid heat-up mode		X	X	X	X	X	X
Heat-up time 2.6 kW (15 °C/60 °C)	h	0.61					
Heat-up time 3.0 kW (15 °C/60 °C)	h		0.88	1.42	1.77	2.13	2.66
Application limits							
Temperature setting range	°C	7-85	7-85	7-85	7-85	7-85	7-85
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6
Max. flow rate	l/min	23.5	23.5	23.5	23.5	23.5	23.5
Energy data							
Standby energy consumption/24 h at 65 °C, vertical	kWh	0.57	0.78	0.88	1.05	1.19	1.29
Standby energy consumption/24 h at 65 °C, horizontal	kWh	0.83	0.94	1	1.26	1.43	1.57
Versions							
IP rating horizontal		IP24	IP24	IP24	IP24	IP24	IP24
IP rating vertical		IP25	IP25	IP25	IP25	IP25	IP25
Sealed unvented type		X	X	X	X	X	X
Power cable		X	X	X	X	X	X
Power cable length approx.	mm	1000	1000	1000	1000	1000	1000
Colour		white	white	white	white	white	white
Dimensions							
Height	mm	696	951	893	1045	1200	1435
Width	mm	380	380	475	475	475	475
Depth	mm	392	392	492	492	492	492
Weights							
Weight, full	kg	52	78	114	138	163	202
Weight, empty	kg	22	28	34	38	43	52

Heat-up diagram

Mixed water temperature 40 °C



X Temperature setting [°C]

Y Heat-up time [h]

1 150 l

2 120 l

3 100 l

4 80 l

5 50 l

6 30 l

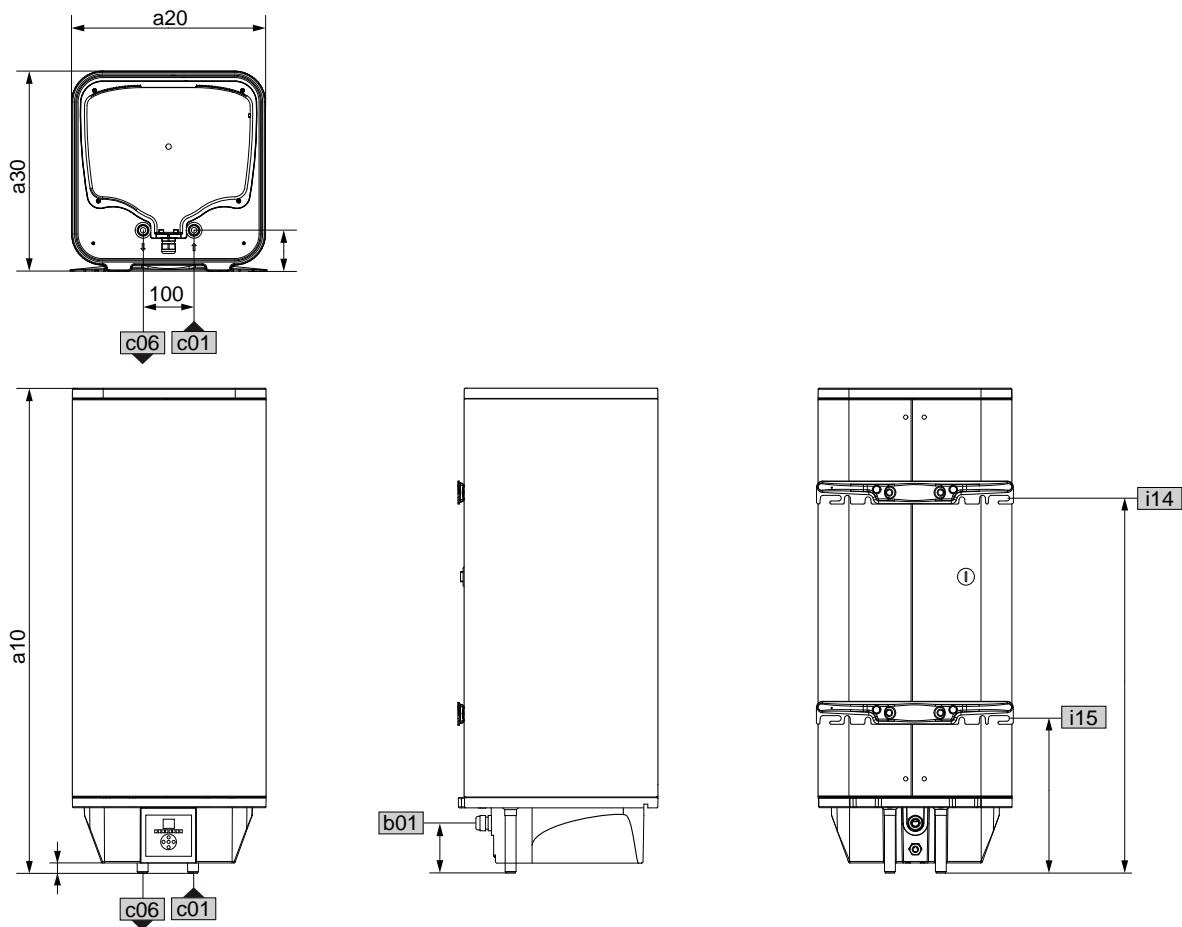
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 15 °C cold water temperature

Wall mounted cylinders 30 to 150 litres

PSH Universal EL

Dimensions and connections



D0000018705

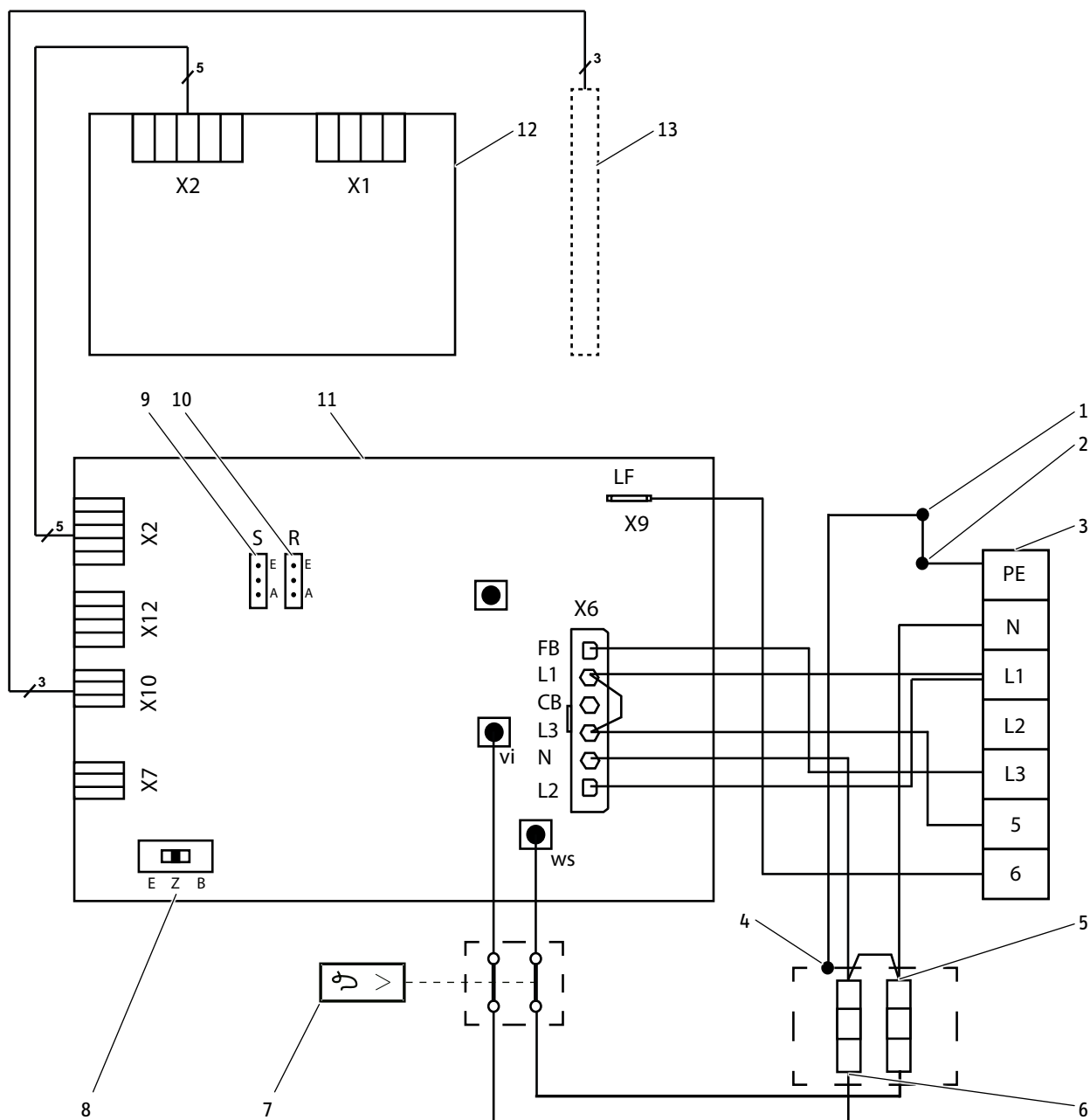
			PSH 30 Uni- versal EL	PSH 50 Uni- versal EL	PSH 80 Uni- versal EL	PSH 100 Uni- versal EL	PSH 120 Uni- versal EL	PSH 150 Uni- versal EL	
a10	Appliance	Height	mm	696	931	893	1045	1200	1435
a20	Appliance	Width	mm	380	380	475	475	475	475
a30	Appliance	Depth	mm	392	392	492	492	492	492
b01	Entry electrical cables	Height	mm	98.5	98.5	78.5	78.5	78.5	78.5
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
		Top clearance	mm	20	20	0	0	0	0
		Rear clearance	mm	80	80	85	85	85	85
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
		Top clearance	mm	20	20	0	0	0	0
		Rear clearance	mm	80	80	85	85	85	85
i14	Wall mounting bracket I	Height	mm	445	705	592	735	870	1090
i15	Wall mounting bracket II	Height	mm	210	270	270	300	300	300

Wall mounted cylinders 30 to 150 litres

PSH Universal EL

Wiring diagram and connections

1/N/PE ~ 230 V



- | | |
|--|--------------------------------------|
| 1 Anode | 7 High limit safety cut-out |
| 2 Cylinders | 8 Operating mode switch |
| 3 Mains terminal | 9 ECO jumper |
| 4 Ceramic heating element in enamelled protective pipe | 10 Reverse control jumper |
| 5 Heating output | 11 Electronic control unit assembly |
| PSH 30 Universal EL: 1.6 kW ~ 230 V | 12 Electronic assembly for operation |
| PSH 50-150 Universal EL: 2 kW ~ 230 V | 13 Temperature sensors |
| 6 Additional heating output, 1 kW ~ 230 V | |

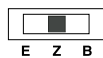
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Wall mounted cylinders 30 to 150 litres

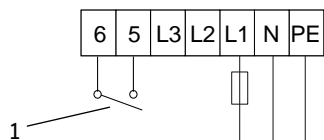
PSH Universal EL

Dual circuit operation

Single meter measurement with power-OFF contact

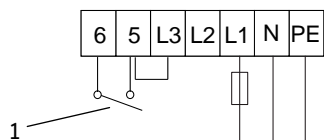


PSH 30 Universal EL PSH 50-150 Universal EL
kW 1.6 / 2.6 2 / 3



85_02_07_0020

PSH 30 Universal EL PSH 50-150 Universal EL
kW 2.6 / 2.6 3 / 3



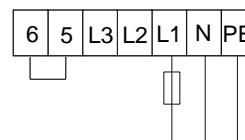
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1 Power-OFF contact

Single circuit operation

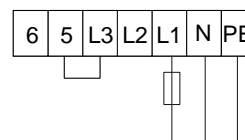


PSH 30 Universal EL PSH 50-150 Universal EL
kW 1.6 / 2.6 2 / 3



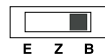
85_02_07_0018

PSH 30 Universal EL PSH 50-150 Universal EL
kW 2.6 / 2.6 3 / 3

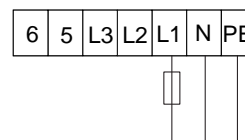


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Manual rapid heat-up operation



PSH 30 Universal EL PSH 50-150 Universal EL
kW 2.6 3



85_02_07_0024

Wall mounted cylinders 30 to 150 litres

PSH EL



PIC00002184

Wall mounted cylinders 30 to 150 litres

Angular wall mounted sealed unvented DHW cylinder with directly applied foam insulation and enamelled internal steel cylinder. Flanged immersion heater with protective anode. The appliance is electronically operated. The integral PCB holds 3 ECO economy programs. The display indicates the set temperature. Functions such as frost protection, temperature limit and rapid heat-up (manual) are part of the standard features. The PCB facilitates variable temperature adjustment. The temperature can be set to between 7 °C and 85 °C. These cylinders can be installed vertically.

PSH EL

- › Protected heating element
- › Additional function for limiting temperature to 40 °C - 60 °C
- › Enamelled steel cylinder
- › Temperature curve display
- › Integral key lock
- › Vertical installation
- › ECO Comfort function (temperature setback from 85 °C to 60 °C)
- › ECO Plus function (60 °C set temperature and 60 % heating level)
- › ECO Dynamic function (intelligent dynamic matching to the draw-off pattern)
- › Intelligent self-learning electronics
- › Modern design with intuitive user interface
- › The impressed current anode is fitted into the floor-standing cylinder in place of the installed anode
- › Protective anode
- › Selection of operating modes (single circuit, dual circuit or manual rapid heat-up) via DIP switch on the PCB
- › Frost protection function at 7 °C
- › Additional function for limiting temperature to 40 °C - 60 °C
- › CoPro special enamel coating

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

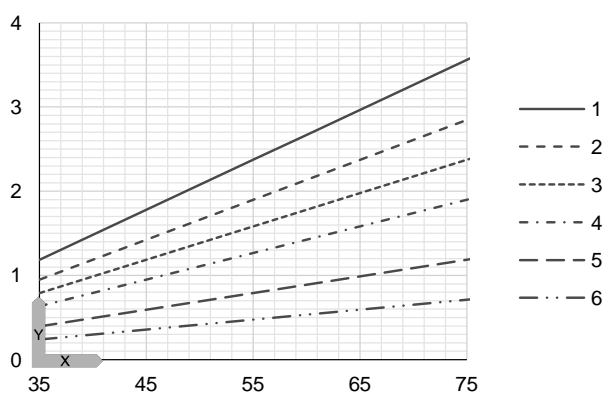
Wall mounted cylinders 30 to 150 litres

PSH EL

		PSH 30 EL	PSH 50 EL	PSH 80 EL	PSH 100 EL	PSH 120 EL	PSH 150 EL
		231155	231156	231157	231158	231648	231159
Hydraulic data							
Nominal capacity	l	30	50	80	100	120	150
Mixed water volume 40 °C (15 °C/60 °C)	l	53	100	141	187	223	288
Electrical data							
Connected load ~ 230 V	kW	3	3	3	3	3	3
Rated voltage	V	230	230	230	230	230	230
Phases		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Frequency	Hz	50	50	50	50	50	50
Single circuit operating mode		X	X	X	X	X	X
Dual circuit operating mode		X	X	X	X	X	X
Manual rapid heat-up mode		X	X	X	X	X	X
Heat-up time 3.0 kW (15°C/60°C)	h	0.53	0.88	1.42	1.77	2.13	2.66
Application limits							
Temperature setting range	°C	7-85	7-85	7-85	7-85	7-85	7-85
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6
Max. flow rate	l/min	23.5	23.5	23.5	23.5	23.5	23.5
Energy data							
Standby energy consumption/24 h at 65 °C	kWh	0.52	0.69	0.72	0.84	0.91	1.21
Versions							
IP rating		IP25	IP25	IP25	IP25	IP25	IP25
Sealed unvented type		X	X	X	X	X	X
Power cable		X	X	X	X	X	X
Power cable length approx.	mm	1000	1000	1000	1000	1000	1000
Colour		white	white	white	white	white	white
Dimensions							
Height	mm	696	951	893	1045	1200	1435
Width	mm	380	380	475	475	475	475
Depth	mm	392	392	492	492	492	492
Weights							
Weight, full	kg	49	75	111	135	161	199
Weight, empty	kg	19	25	31	35	41	49

Heat-up diagram

Mixed water temperature 40 °C



X Temperature setting [°C]

Y Heat-up time [h]

1 150 l

2 120 l

3 100 l

4 80 l

5 50 l

6 30 l

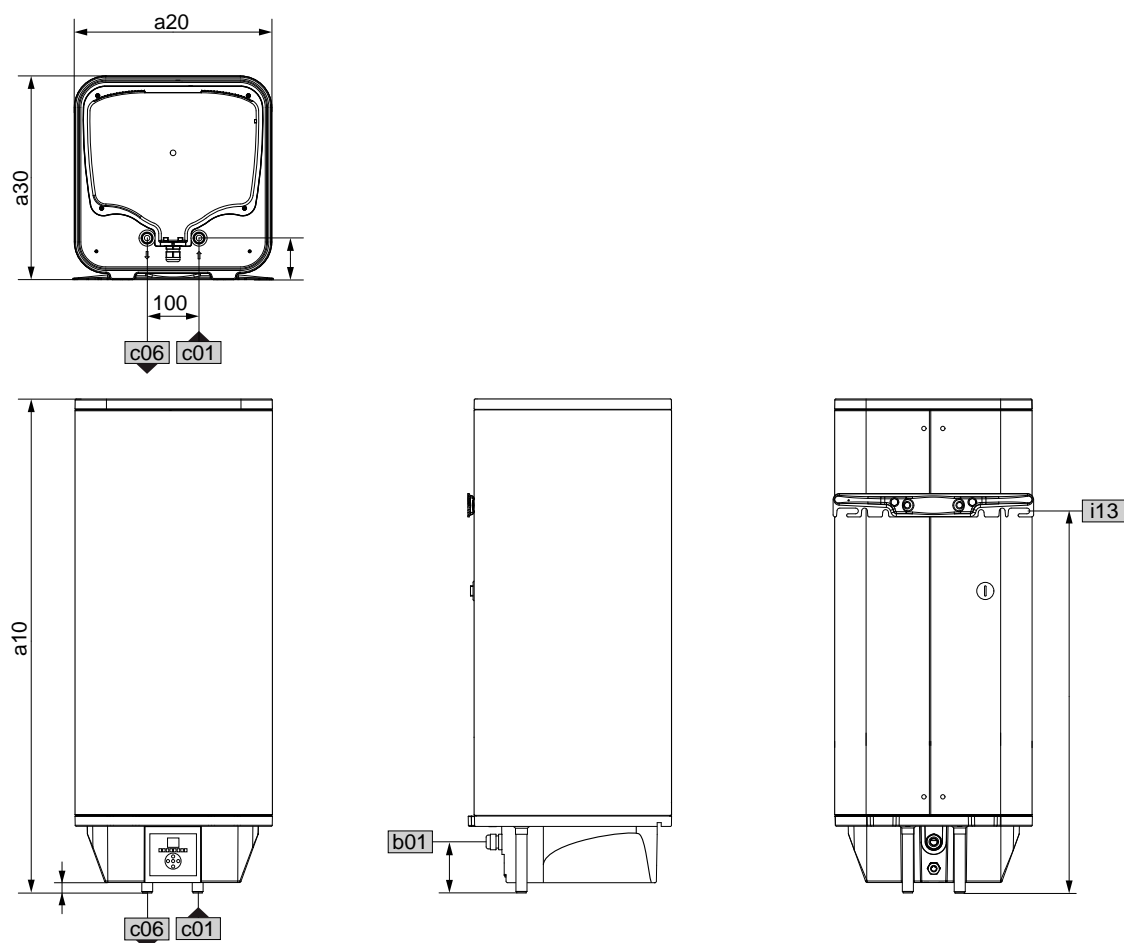
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 15 °C cold water temperature

Wall mounted cylinders 30 to 150 litres

PSH EL

Dimensions and connections



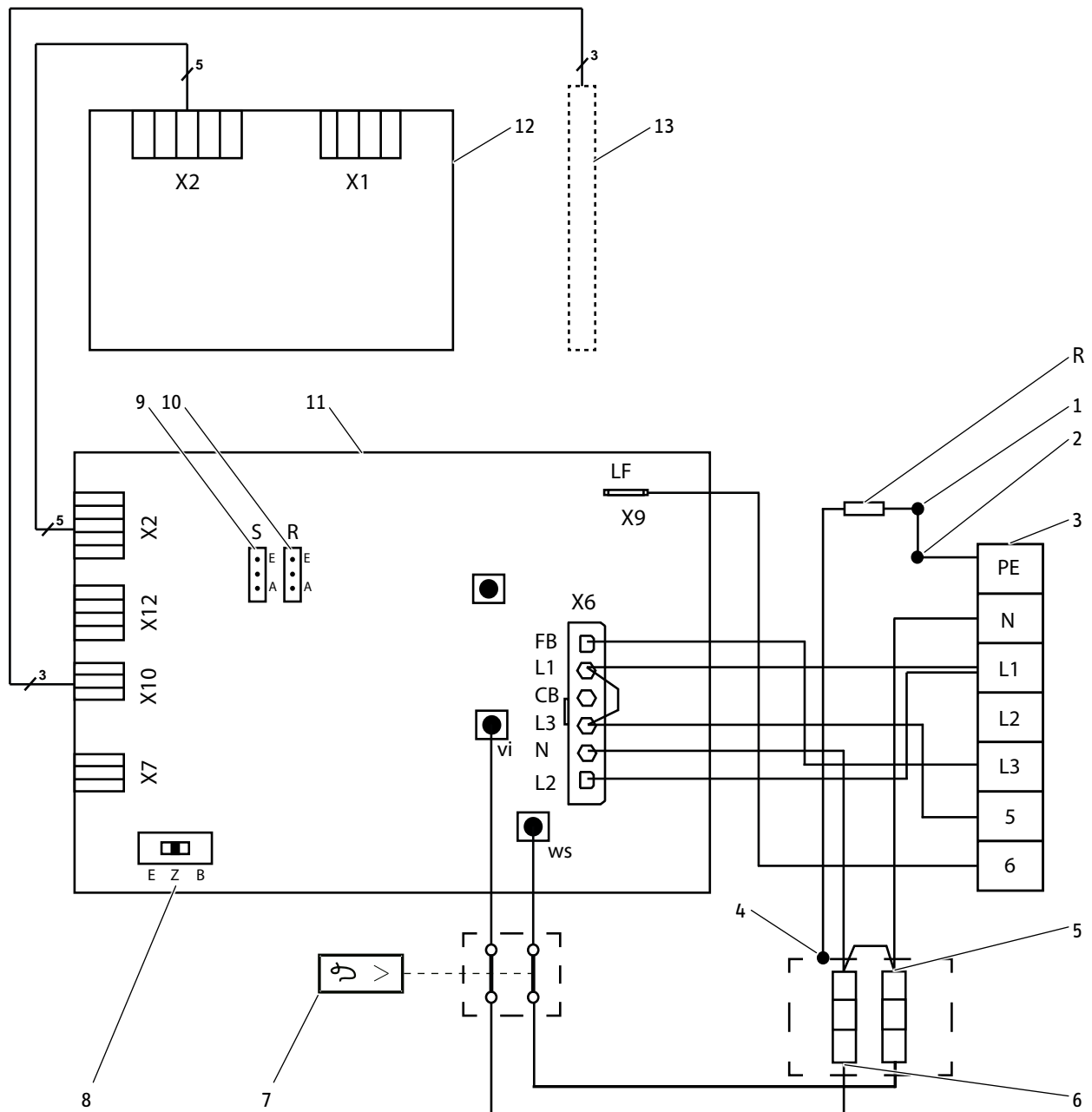
D0000019029

				PSH 30 EL	PSH 50 EL	PSH 80 EL	PSH 100 EL	PSH 120 EL	PSH 150 EL
a10	Appliance	Height	mm	696	951	893	1045	1200	1435
a20	Appliance	Width	mm	380	380	475	475	475	475
a30	Appliance	Depth	mm	392	392	492	492	492	492
b01	Entry electrical cables	Height	mm	98.5	98.5	78.5	78.5	78.5	78.5
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
		Top clearance	mm	20	20	0	0	0	0
		Rear clearance	mm	80	80	85	85	85	85
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
		Top clearance	mm	20	20	0	0	0	0
		Rear clearance	mm	80	80	85	85	85	85
i13	Wall mounting bracket	Height	mm	445	705	592	735	870	1090

Wall mounted cylinders 30 to 150 litres PSH EL

Wiring diagram and connections

1/N/PE ~ 230 V



R Resistance 560 Ω

1 Anode

2 Cylinders

3 Mains terminal

4 Stainless steel heating element

5 Heating element, 2 kW ~ 230 V

6 Additional heating element, 1 kW ~ 230 V

7 High limit safety cut-out

8 Operating mode switch

9 ECO jumper

10 Reverse control jumper

11 Electronic control unit assembly

12 Electronic assembly for operation

13 Temperature sensors

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Wall mounted cylinders 30 to 150 litres

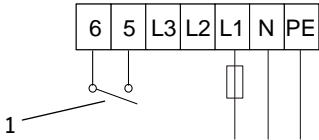
PSH EL

Dual circuit operation

Single meter measurement with power-OFF contact

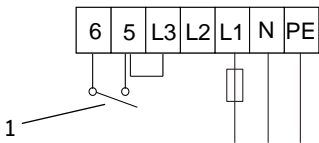


2/3 kW, 1/N/PE ~ 230 V



85_02_07_0020

3/3 kW, 1/N/PE ~ 230 V



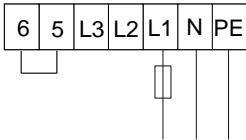
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1 Power-OFF contact

Single circuit operation

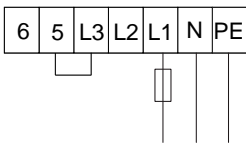


2/3 kW, 1/N/PE ~ 230 V



85_02_07_0018

3/3 kW, 1/N/PE ~ 230 V

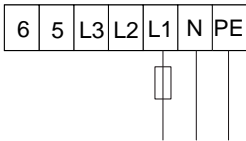


85_02_07_0019

Manual rapid heat-up operation



3 kW, 1/N/PE ~ 230 V



85_02_07_0024

Wall mounted cylinders 30 to 150 litres

PSH Si



PIC00002277

Wall mounted cylinders 30 to 150 litres

Sealed unvented (pressure-tested) electric water heater for supplying one or several draw-off points. Variable temperature selection 30 to 50 litres from 5 °C to 65 °C; 80 to 150 litres from 5 °C to 62 °C as well as automatic reheating when the set temperature is undershot and frost protection is selected. Internal steel cylinder with special enamel coating and protective anode for a particularly long service life. Only suitable for operation as a pressure appliance with appropriate safety assembly. Easy installation.

PSH Si

- › Single circuit operation
- › Protective anode
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Variable external temperature adjustment (PSH 30-50 Si)
- › Variable internal temperature adjustment (PSH 80-150 Si)
- › Replaceable copper immersion heater
- › Rigid polyurethane foam thermal insulation
- › Power cable for fixed power supply, approx. 1 m for 30 - 50 l; without cable for 80 - 150 l

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Wall mounted cylinders 30 to 150 litres

PSH Si

		PSH 30 Si	PSH 50 Si	PSH 80 Si	PSH 100 Si	PSH 120 Si	PSH 150 Si
		074478	074479	074480	074481	074482	074483
Hydraulic data							
Nominal capacity	l	30	50	80	100	120	150
Electrical data							
Connected load ~ 230 V	kW	2	2	2.2	2.2	2.2	2.2
Rated voltage	V	230	230	230	230	230	230
Phases		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Frequency	Hz	50/-	50/-	50/-	50/-	50/-	50/-
Single circuit operating mode		X	X	X	X	X	X
Application limits							
Temperature setting range	°C	5-65	5-65	5-62	5-62	5-62	5-62
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6
Energy data							
Standby energy consumption/24 h at 65 °C	kWh	0.76	1.13	1.05	1.25	1.35	1.65
Versions							
Sealed unvented type		X	X	X	X	X	X
IP rating		IP25	IP25	IP25	IP25	IP25	IP25
Colour		White/grey	White/grey	White/grey	White/grey	White/grey	White/grey
Dimensions							
Width	mm	338	338	505	505	505	505
Height	mm	623	918	737	908	1046	1241
Depth	mm	345	345	520	520	520	520
Diameter	mm	338	338	505	505	505	505
Weights							
Weight, full	kg	44	67	106	131	154	190
Weight, empty	kg	14	17	26	31	34	40

Wall mounted cylinders 30 to 200 litres

PSH Trend



PLC00004068

Wall mounted cylinders 30 to 200 litres

Sealed unvented (pressure-tested) electric water heater in a new design, for supplying one or more draw-off points. Variable temperature selection from 35 °C to 75 °C plus frost protection setting for automatic reheating when the water falls below the set temperature. Internal steel cylinder with CoPro special enamel coating and protective anode for a particularly long service life. Only suitable for operation as a pressure appliance with appropriate safety assembly. Easy installation thanks to universal wall mounting bracket.

PSH Trend

- › New ergonomic design
- › Variable temperature selection from 35 °C to 75 °C
- › Vertical installation
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Replaceable stainless steel heating elements
- › Single circuit operation

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

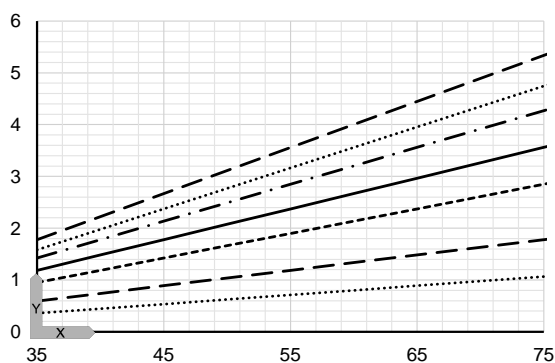
Wall mounted cylinders 30 to 200 litres

PSH Trend

		PSH 30 Trend	PSH 50 Trend	PSH 80 Trend	PSH 100 Trend	PSH 120 Trend	PSH 150 Trend	PSH 200 Trend
		232080	232081	232082	232083	232084	232085	232086
Hydraulic data								
Nominal capacity	l	30	50	80	100	120	150	200
Mixed water volume 40 °C (15 °C/65 °C)	l	52	99	142	186	224	288	376
Electrical data								
Connected load ~ 230 V	kW	2	2	2	2	2	2	3
Rated voltage	V	220-240	220-240	220-240	220-240	220-240	220-240	220-240
Phases		1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE	1/N/PE
Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Single circuit operating mode		X	X	X	X	X	X	X
Heat-up time 2.0 kW (15°C/60°C)	h	0.80	1.33	2.13	2.66	3.20	4.00	
Heat-up time 3.0 kW (15°C/60°C)	h							3.55
Application limits								
Temperature setting range	°C	7-75	7-75	7-75	7-75	7-75	7-75	7-75
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Test pressure	MPa	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Max. permissible temperature	°C	95	95	95	95	95	95	95
Max. flow rate	l/min	23.5	23.5	23.5	23.5	23.5	23.5	23.5
Min. water inlet pressure	MPa	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Max. water inlet pressure	MPa	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Energy data								
Standby energy consumption/24 h at 65 °C	kWh	0.53	0.72	0.79	0.97	1.14	1.32	1.61
Versions								
Sealed unvented type		X	X	X	X	X	X	X
IP rating		IP25	IP25	IP25	IP25	IP25	IP25	IP25
Power cable		X	X	X	X	X	X	X
Power cable length approx.	mm	1000	1000	1000	1000	1000	1000	1000
Colour		white	white	white	white	white	white	white
Dimensions								
Height	mm	642	897	871	1025	1178	1410	1715
Depth	mm	410	410	520	520	520	520	520
Diameter	mm	405	405	510	510	510	510	510
Weights								
Weight, full	kg	46.4	71.4	108.2	133.6	159.1	196.2	256.3
Weight, empty	kg	16.4	21.4	28.2	33.6	39.1	46.2	56.3

Heat-up diagram

Mixed water temperature 40 °C



X Temperature setting [°C]

Y Heat-up time [h]

1 150 l

2 200 l

3 120 l

4 100 l

5 80 l

6 50 l

7 30 l

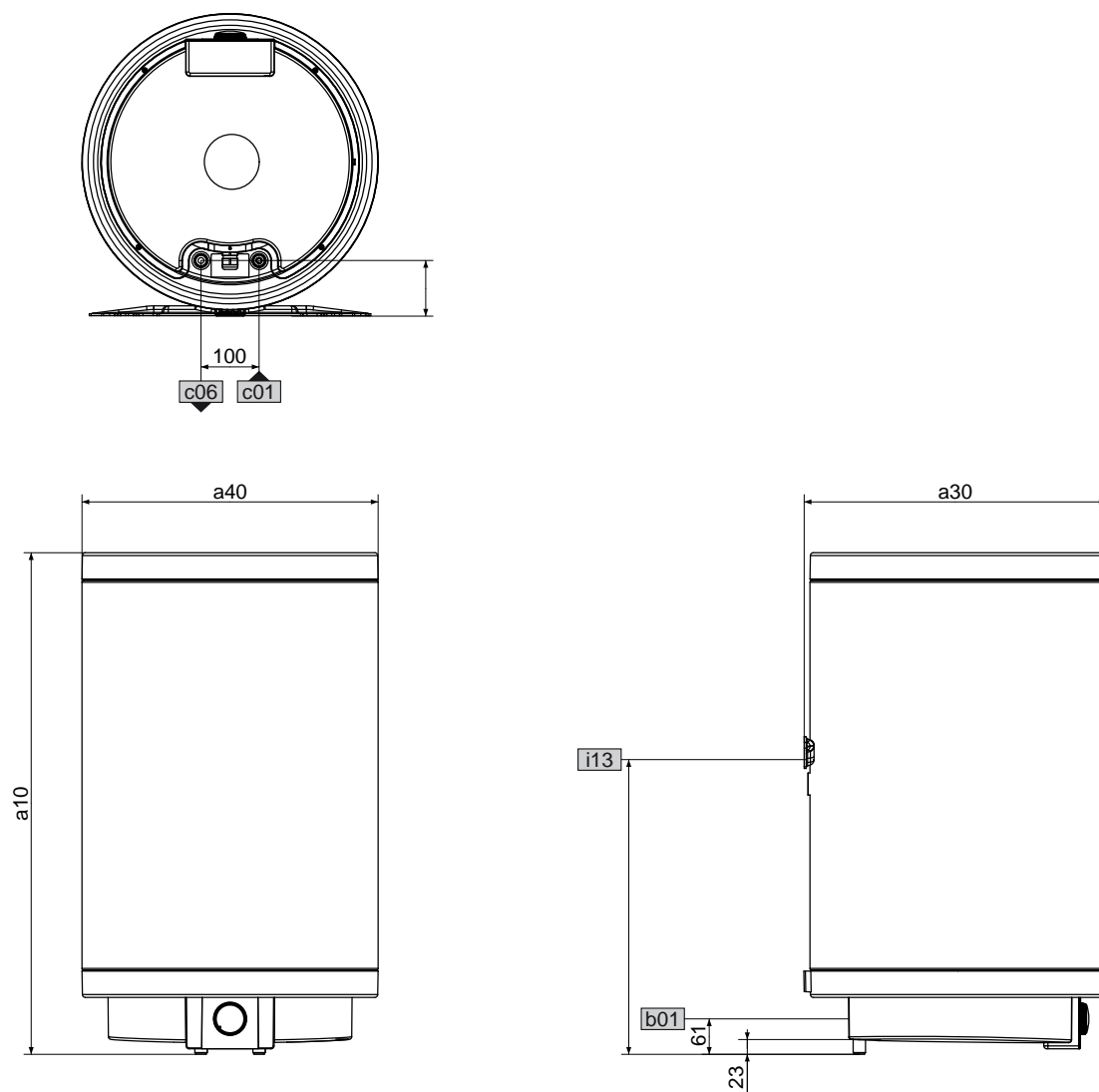
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 15 °C cold water temperature

Wall mounted cylinders 30 to 200 litres

PSH Trend

Dimensions and connections



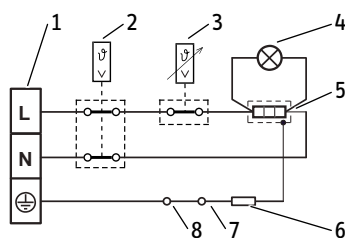
D0000037135

			PSH 30 Trend	PSH 50 Trend	PSH 80 Trend	PSH 100 Trend	PSH 120 Trend	PSH 150 Trend	PSH 200 Trend	
a10	Appliance	Height	mm	642	897	871	1025	1178	1410	1715
a30	Appliance	Depth	mm	410	410	520	520	520	520	520
a40	Appliance	Diameter	mm	405	405	510	510	510	510	510
b01	Entry electrical cables	Fitting		PG 16	PG 16	PG 16	PG 16	PG 16	PG 16	PG 16
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
		Rear clearance	mm	85.5	85.5	95	95	95	95	95
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A	G 1/2 A
		Rear clearance	mm	85.5	85.5	95	95	95	95	95
i13	Wall mounting bracket	Height	mm	530	590	585	735	890	1125	1425

Wall mounted cylinders 30 to 200 litres PSH Trend

Wiring diagram

1/N/PE ~ 220-240 V



D0000037038

- 1 Terminal
- 2 High limit safety cut-out
- 3 Temperature controller
- 4 ON/OFF indicator
- 5 Heating element
- 6 Electrical resistance 560 ohm
- 7 Anode
- 8 Cylinder

Instantaneous water cylinder SHD S



PLC0000241

SHD S

- › Instantaneous water cylinder mode: 3.5 kW standard heating and 21 kW automatic for a larger draw-off volume
- › Optional single circuit operation: 21 kW
- › Optional dual circuit operation: 3.5 kW / 21 kW
- › Key for quick heat-up (21 kW) for dual circuit operation
- › Variable temperature selection from approx. 35 °C to approx. 82 °C
- › Heat-up display (for high output) in the user interface
- › Signal anode with indicator lamp in the user interface; can be replaced without removing the flange
- › Heating element connections through complete flanged plug
- › Drain valve with G 3/4 hose connection

Instantaneous water cylinder

Sealed unvented (pressure-tested) for supplying several draw-off points. Variable temperature selection. The controller maintains the water content (subject to connection) at the selected temperature. Optional connection: Instantaneous water cylinder, single circuit cylinder and dual circuit cylinder. Automatic frost protection, internal steel cylinder with special, directly applied anticor® enamel coating, white painted sheet steel outer jacket and optimum thermal insulation.

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232607 WBM
- › 232608 MEK
- › 232609 MED
- › 232610 MEB
- › 233480 KV 30
- › 233481 KV 40
- › 230764 SRT 2

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

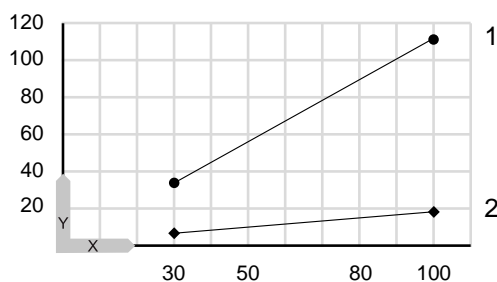
Instantaneous water cylinder

SHD S

		SHD 30 S	SHD 100 S
		073059	073060
Hydraulic data			
Nominal capacity	l	30	100
Mixed water volume 40 °C (15 °C/65 °C)	l	59	195
Electrical data			
Connected load ~ 400 V	kW	3.5/21	3.5/21
Phases		3/PE	3/PE
Rated voltage	V	400	400
Frequency	Hz	50	50
Single circuit operating mode		X	X
Dual circuit operating mode		X	X
Application limits			
Temperature setting range	°C	35-85	35-85
Max. permissible pressure	MPa	0.6	0.6
Test pressure	MPa	0.78	0.78
Max. permissible temperature	°C	110	110
Max. flow rate	l/min	18	18
Energy data			
Standby energy consumption/24 h at 65 °C	kWh	0.45	0.77
Versions			
IP rating		IP25	IP25
Sealed unvented type		X	X
Open vented type			
Colour		white	white
Dimensions			
Height	mm	770	1050
Width	mm	410	510
Depth	mm	420	510
Weights			
Weight, full	kg	54.3	140.1
Weight, empty	kg	24.3	40.1

Heat-up diagram

Set temperature 65 °C



- X Nominal capacity [l]
Y Duration [min]
1 3.5 kW
2 21 kW

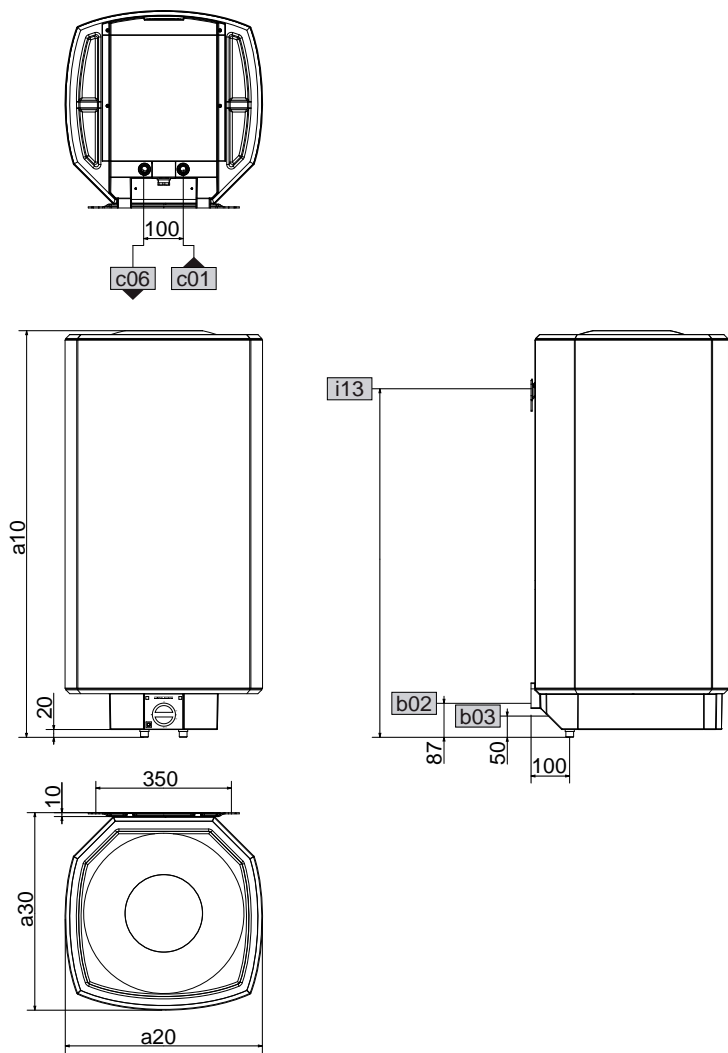
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 15 °C cold water temperature

Instantaneous water cylinder

SHD S

Dimensions and connections

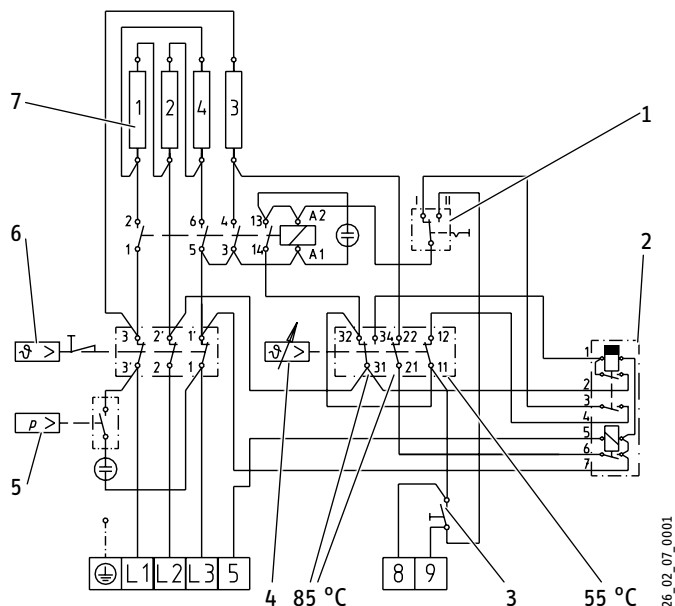


D0000024812

			SHD 30 S	SHD 100 S	
a10	Appliance	Height	mm	770	1050
a20	Appliance	Width	mm	410	510
a30	Appliance	Depth	mm	420	510
b02	Entry electrical cables I				
b03	Entry electrical cables II				
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A
i13	Wall mounting bracket	Height	mm	700	900
		Max. Ø fixing screw	mm	12	12

Instantaneous water cylinder SHD S

Wiring diagrams and terminals



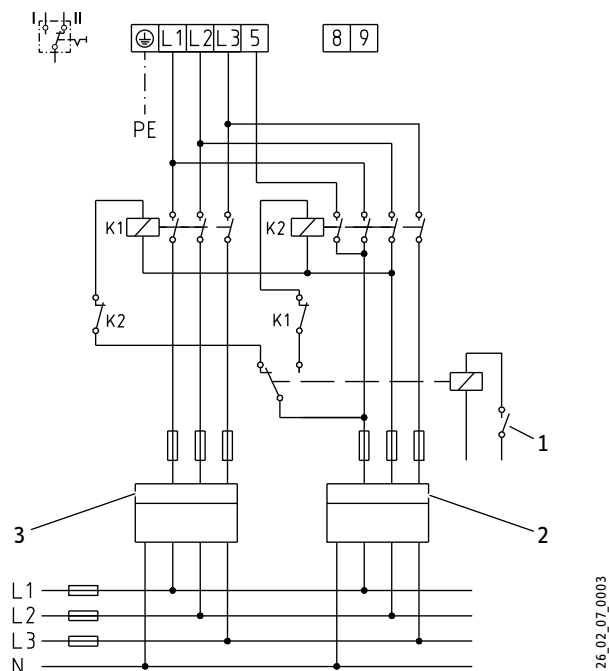
- 1 Operating mode switch
- 2 Electronic assembly with zero volt and switching relay
- 3 Rapid heating pushbutton
- 4 Temperature controller
- 5 Pressure switch for signal anode
- 6 High limit safety cut-out
- 7 Heating element ~ 400 V

Heating element	1	2	3	4
kW	7.0	7.0	3.5	3.5

Dual circuit operation

Dual meter measurement with power-OFF contact

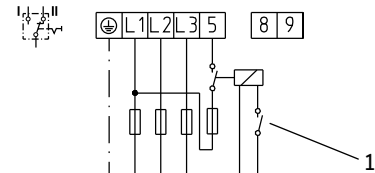
3.5/21 kW, 3/PE ~ 400 V



Dual circuit operation

Single meter measurement with power supply utility contact

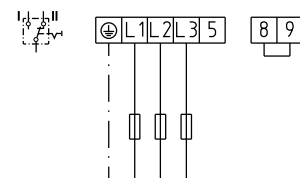
3.5/21 kW, 3/PE ~ 400 V



- 1 Power-OFF contact

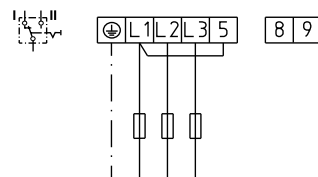
Single circuit operation

21 kW, 3/PE ~ 400 V



Instantaneous operation

3.5/21 kW, 3/PE ~ 400 V



K1 Contactor 1

K2 Contactor 2

1 Power-OFF contact

2 Off-peak tariff meter

3 Peak tariff meter

Wall mounted water heater Safety assemblies

Wall mounted water heater Safety assemblies



KV 30

Safety assembly to DIN 1988 for sealed unvented wall mounted cylinders up to 200 l capacity. Shut-off valve, pressure gauge connection G 1/4 without pressure reducing valve, plastic drain outlet G 1, brass casing, chrome finish.

- › Safety valve 0.6 MPa (6 bar)
- › Twin connector system for easy installation
- › Rotating safety valve for drip water outlet on the right or left
- › Drain outlet with adjustable drip water inlet
- › DVGW test symbol
- › Test symbol PA-IX..../..

KV 40

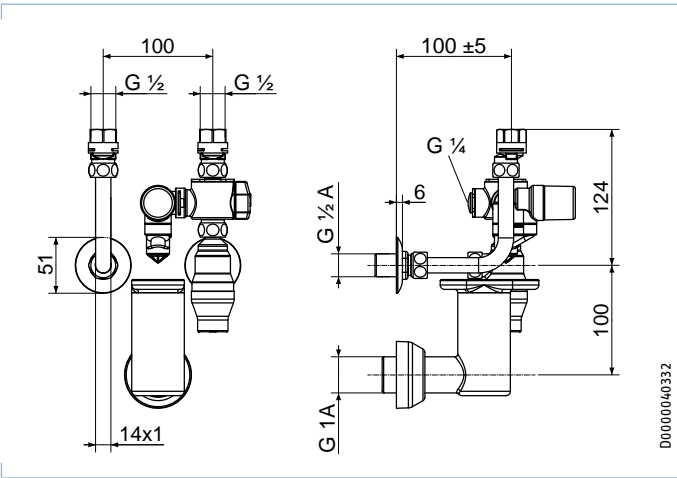
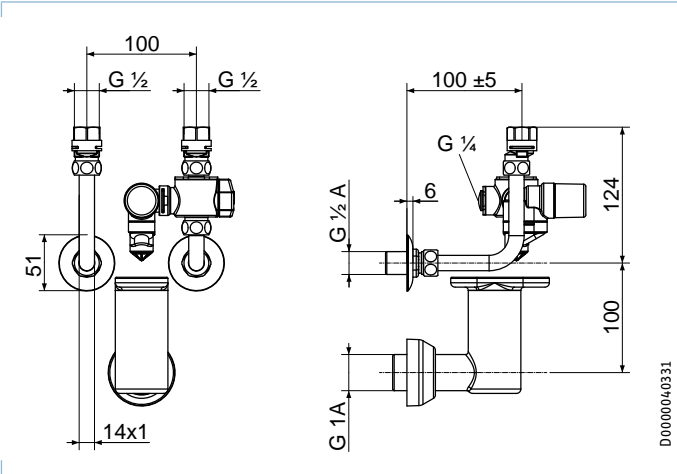
Safety assembly to DIN 1988 for sealed unvented wall mounted cylinders up to 200 l capacity. Shut-off valve, pressure gauge connection G 1/4 with pressure reducing valve, plastic drain outlet G 1, brass body, chrome finish.

- › Safety valve 0.6 MPa (6 bar)
- › Pressure reducing valve, adjustable 0.15 - 0.5 MPa
- › Twin connector system for easy installation
- › Rotating safety valve for drip water outlet on the right or left
- › Drain outlet with adjustable drip water inlet
- › DVGW test symbol
- › Test symbol PA-IX..../..

SV EX

Safety valve for wall mounted cylinders

		KV 30	KV 40
		233480	233481
Max. permissible pressure	MPa	0.48	1.6
Safety valve	MPa	0.6	0.6
Pressure reducing valve		-	X
Pressure reducing valve, nominal pressure			PN 16
Pressure reducing valve setting range	MPa		0.15 - 0.5
Drip water connection		X	X
Type of installation		Unfinished walls	Unfinished walls
Water connection		G 1/2 A	G 1/2 A
Drain outlet		G 1 A	G 1 A



		SV EX 1/2	SV EX 3/4
		073945	073946
Connection		1/2 Zoll	3/4 inch
Max. permissible pressure	MPa	0.6	0.6

Wall mounted water heater Safety assemblies

SRT 2

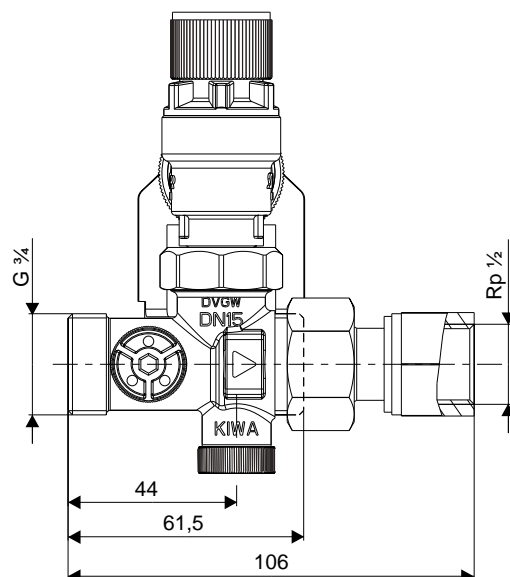
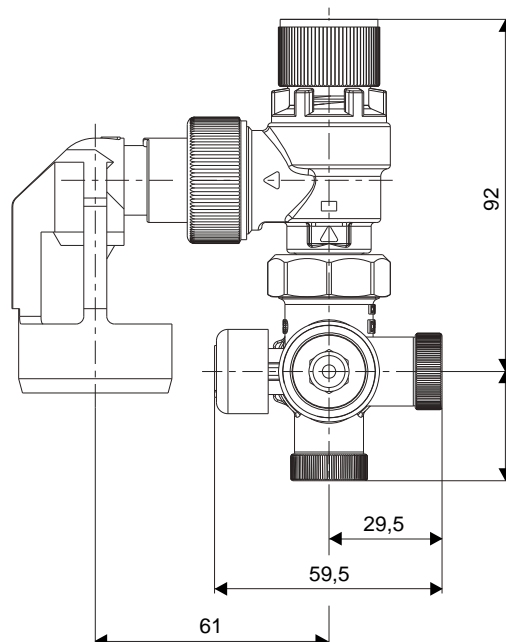


PIC00002177

- › Applicable for SH 30-150 S, SHZ 30-150 LCD, SHD 30/100 S, HFA-Z 30-150, SH 30-150 F
- › Can be used with SH 10 SL(i), SH 15 SL(i)
- › Safety valve 0.6 MPa (6 bar)
- › Suitable for vertical or horizontal installation.

		SRT 2
		230764
Application		Pressurised cylinders
Max. permissible pressure	MPa	0.6
Pressure reducing valve		-
Finish		Brass
Drip water connection		X
Type of installation		Finished walls

Safety assembly for installation on finished walls, for sealed un-vented wall mounted cylinders. Safety valve 0.6 MPa. Ball shut-off valve, cylinder connection G 1/2, pressure gauge connection G 1/4 without pressure reducing valve, plastic drip water connection G 1, brass casing. For horizontal or vertical installation.



D0000017725

Wall mounted water heater Taps/valves

Wall mounted water heater Taps/valves

WKM | WDM | WBM

- › Twin-handle mixer tap
- › Can be used with SN 5-15 SL, EB 15 SL, UFP 5 h
- › In case of non-pressurised operation: also with SH/SHZ, HFA-Z, HFA/EB 80 Z
- › WDM and WBM equipped with metal shower hose and hand shower attachment for low pressure operation

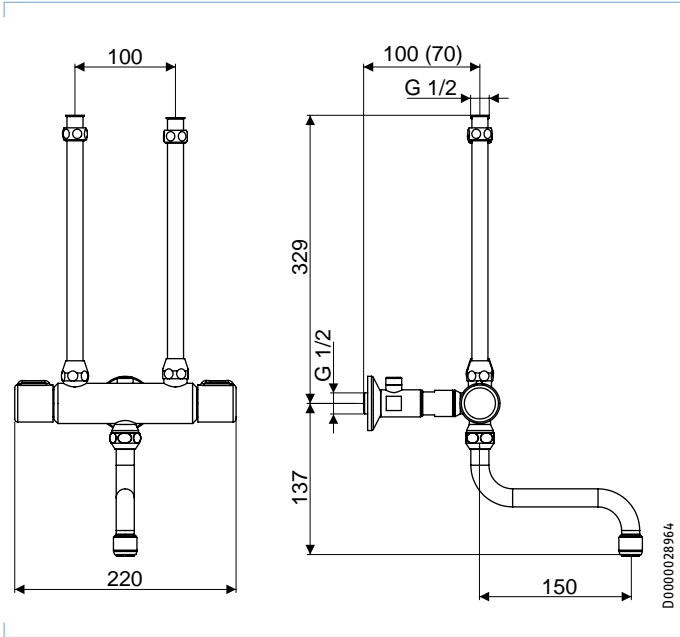
Twin-handle wall taps, chrome-plated metal handles, chrome finish. Non-return valve and butterfly valve in the cold water connection. Complete range in a uniform design for all applications in bath and kitchen.

		WKM	WDM	WBM
		232605	232606	232607
Application		Kitchen	Shower	Bath/shower
Type		Open	Open	Open
Type of installation		Wall mounted mixer	Wall mounted mixer	Wall mounted mixer
Finish		Chrome-plated	Chrome-plated	Chrome-plated
Max. flow rate	l/min	18	18	18
Max. permissible pressure	MPa	1	1	1
Reach	mm	160		86

WKM



PIC00003363

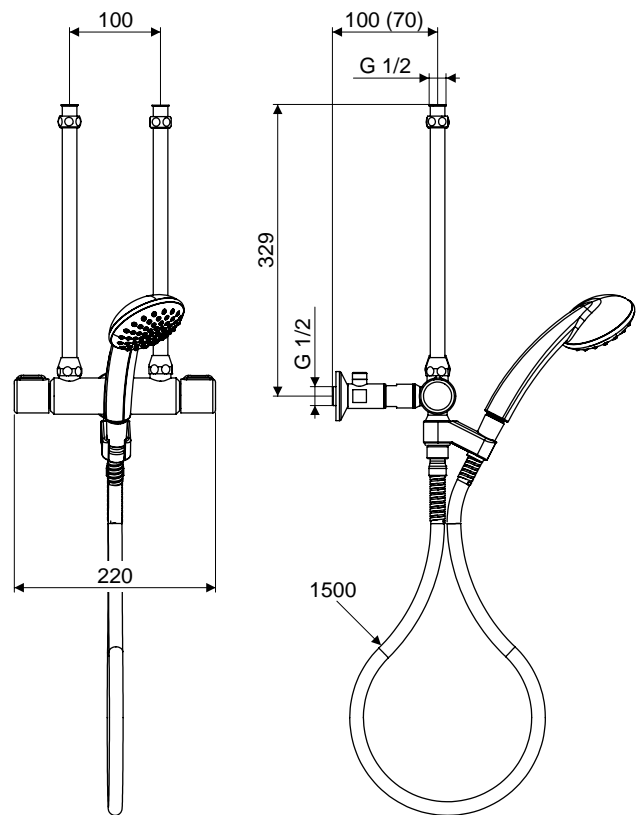


Wall mounted water heater Taps/valves

WDM



PIC00003834

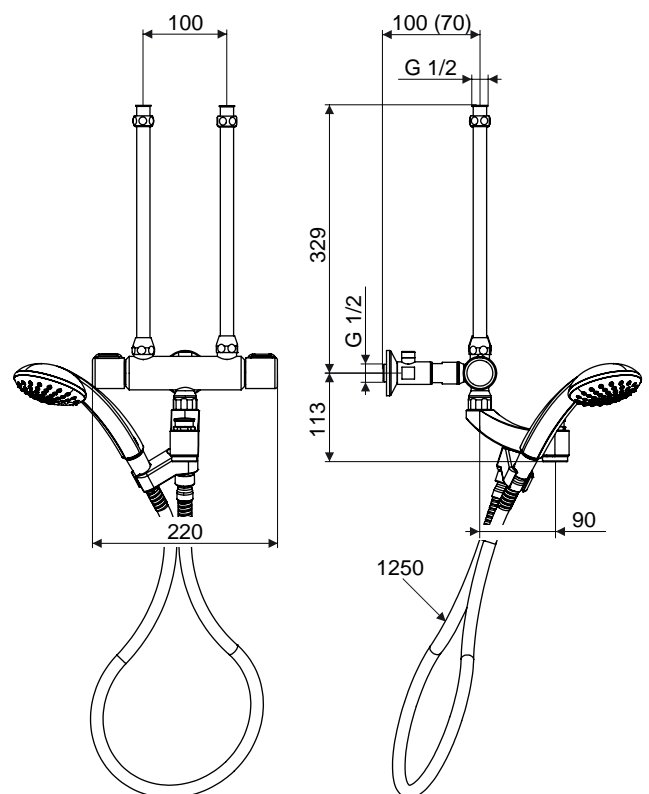


D0000028970

WBM



PIC00003365



D0000028972

Wall mounted water heater Taps/valves

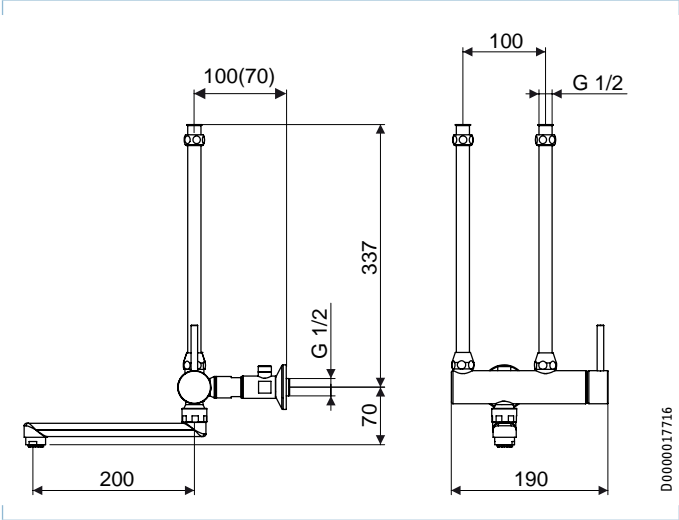
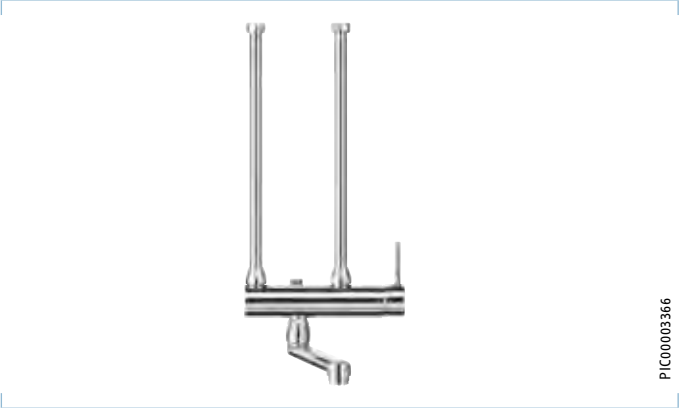
MEK | MED | MEB

- › Mono lever mixer tap
- › Can be used with SN 5-15 SL, EB 15 SL, UFP 5 h
- › In case of non-pressurised operation: also with SH/SHZ, HFA-Z, HFA/EB 80 Z
- › MED and MEB equipped with metal shower hose and hand shower attachment for low pressure operation

Mono lever wall tap for use inside a shower, on the bath or above the kitchen sink. Ceramic control cartridge; solid and robust brass tap construction.

		MEK	MED	MEB
		232608	232609	232610
Application		Kitchen	Shower	Bath/shower
Type		Open	Open	Open
Type of installation		Wall mounted mixer	Wall mounted mixer	Wall mounted mixer
Finish		Chrome-plated	Chrome-plated	Chrome-plated
Max. flow rate	l/min	18	18	18
Max. permissible pressure	MPa	1	1	1
Reach	mm	185		87

MEK

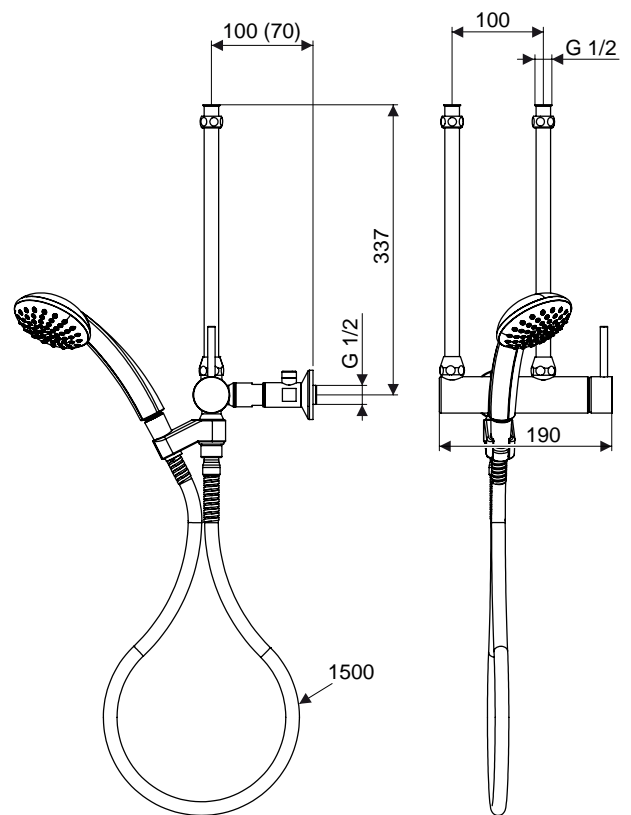


Wall mounted water heater Taps/valves

MED



PIC00003794

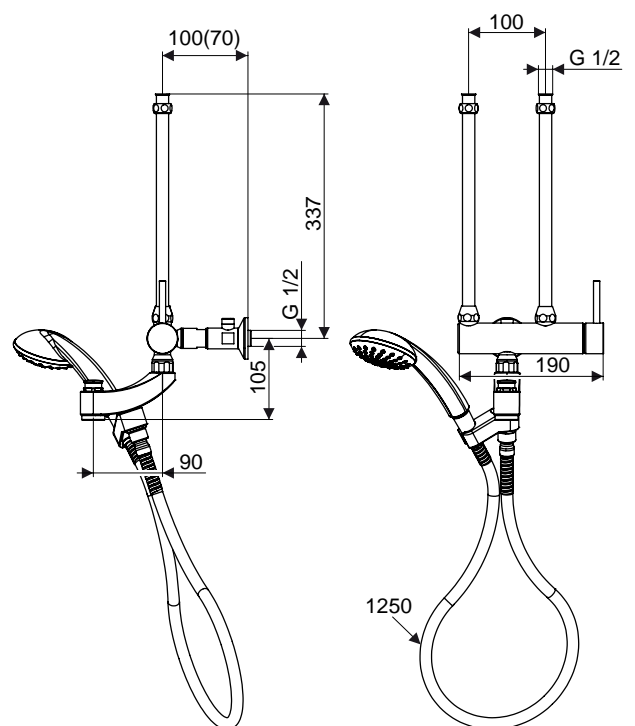


D0000028574

MEB



PIC00003795



D0000017719

Small water heater



Equipment and operation

The following series of small water heaters are characterised by their economy, environmental compatibility and a high degree of user convenience. These appliances with their 5 to 15 l capacity combine many useful features with the most frugal energy consumption, and are equipped with high grade, recyclable thermal insulation.

These small water heaters are environmentally responsible not only because of their low energy consumption but also because they are manufactured using top quality, recyclable materials. All the parts of the appliance are marked with recycling symbols, allowing proper sorting of the raw materials for re-use.

Many useful features

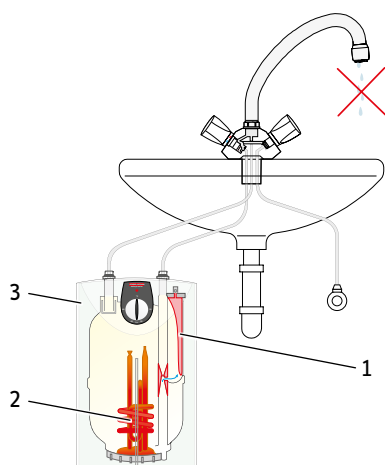
Due to their design, the materials used, the components and control functions, these small water heaters offer a host of useful features. These include:

- › Low standby power consumption
- › Large mixed water volume
- › Optimum overflow curve
- › Option of energy saving mode / temperature limiting
- › Easy operation
- › Anti-drip function for the SNU 5 SL. The new anti-drip module for highest convenience and hygiene prevents the tap from dripping during heat-up.
- › thermostop function

Anti-drip function

This function saves water and reduces limescale build-up on taps and the sink/basin.

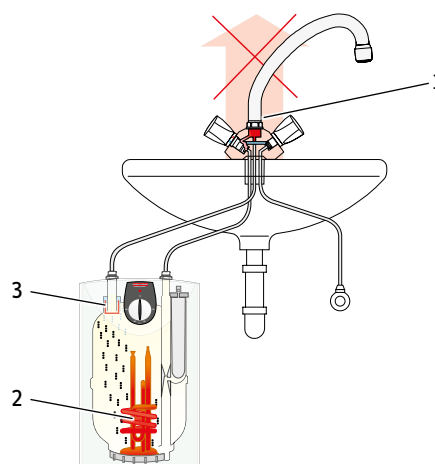
During heat-up, the expansion water enters a special reservoir, pressing the expansion diaphragm together. When water is next drawn-off, the reservoir drains via a venturi nozzle and is ready for the next heat-up process.



- 1 Anti-drip reservoir
- 2 Heating element
- 3 Cylinder

thermostop function

The thermostop function saves energy by preventing undesirable heating of mixer taps. In standby mode, heat radiation loses up to 0.4 kWh/d via the mixer tap. Air bubbles are released during heat-up; air collects in the siphon and stops thermal circulation.



- 1 Mixer tap
- 2 Heating element
- 3 thermostop

Temperature selection

The temperature selector allows the required water temperature to be set to approx. 82 °C or 85 °C. The setting range can be limited by your contractor to a lower temperature.

Energy saving

Lower water temperatures mean lower heat losses and less scale build-up. It is therefore possible to set an economy range "E" (approx. 35 °C to approx. 65 °C). The mixed water volume actually required should be worked out by reducing the cylinder water temperature step by step. Then the setting should be adjusted accordingly. Occasional periods of higher demand, such as when guests are visiting, can be covered with small water heaters and single circuit cylinders by using the temperature selector to temporarily increase the cylinder temperature.

PRODUCTS

Small water heater

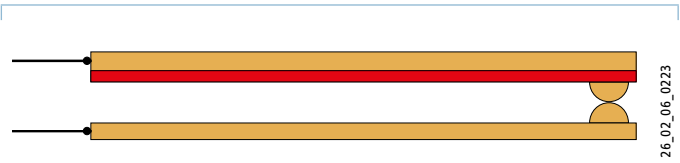
High limit safety cut-out with reset function for greater safety

All open vented small water heaters are equipped with a high limit safety cut-out with reset function. It prevents undesirable consequences of commissioning errors, such as starting the appliance when not yet filled, for example.

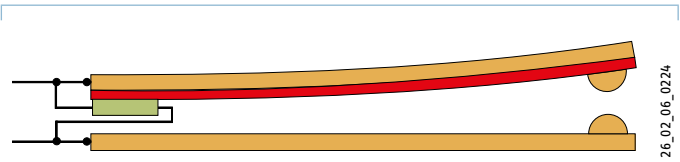
The high limit safety cut-out with reset function is reactivated in one quick hand movement.



Standard for all open vented small water heaters with 2 kW heating output: High limit safety cut-out with reset function



Bimetal high limit safety cut-out closed

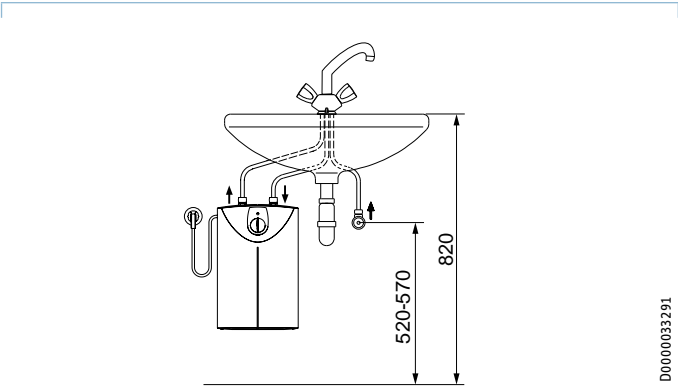


Bimetal high limit safety cut-out open

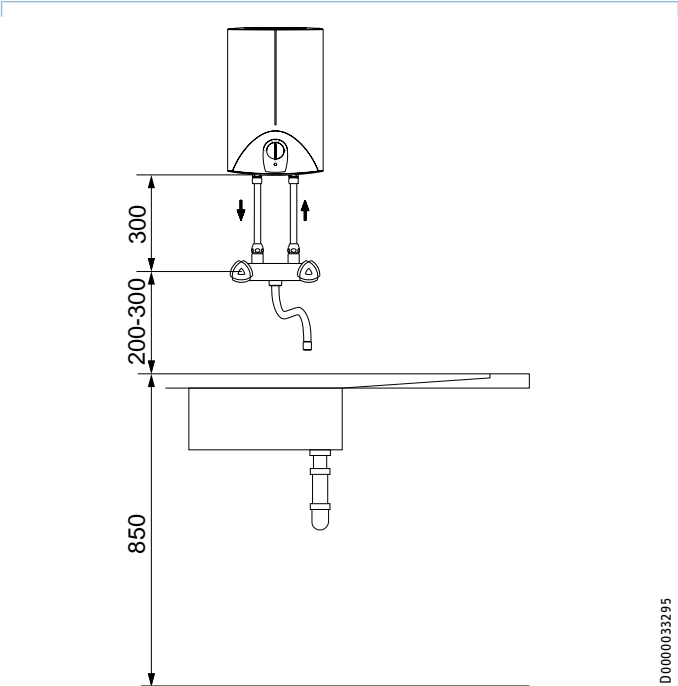
Installation

Examples

The following installation dimensions are recommended. Always check the dimensions of the site and compare.



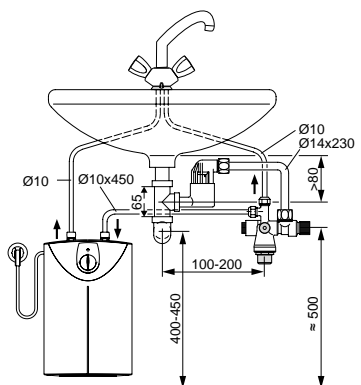
Washbasin, undersink, non-pressurised



Sink, oversink, non-pressurised

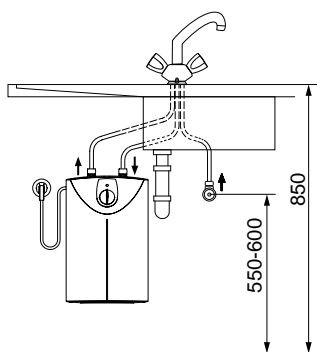
PRODUCTS

Small water heater



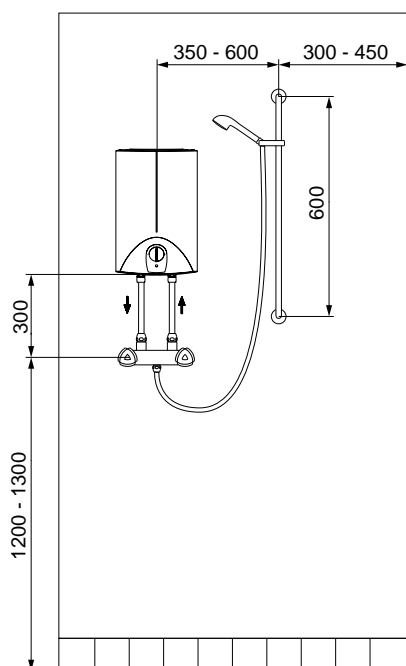
D0000033493

Washbasin system with SVMT, pressure-tested



D0000033294

Sink, undersink, non-pressurised



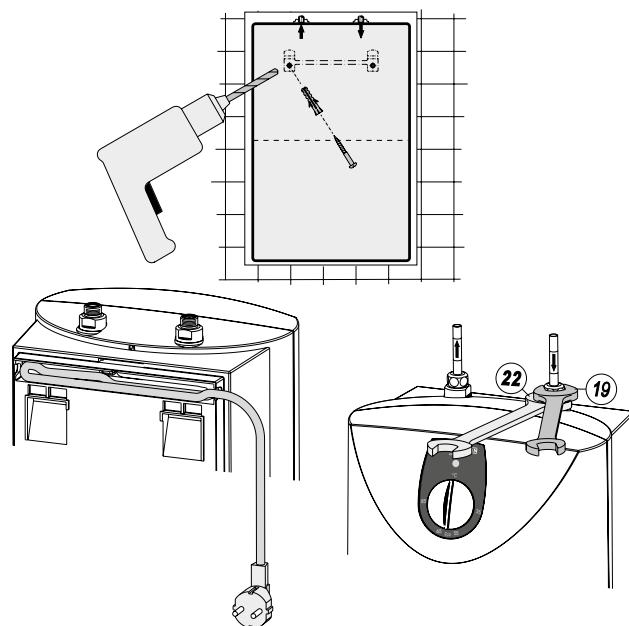
D0000033297

Shower, oversink, non-pressurised

Installation system

The Profi-Rapid® installation system is unique. No matter what meets you at the installation location – new build or modernisation – you can handle any situation with Profi-Rapid®. Details matched to practical needs and easy access to all connections deliver convincing benefits.

Profi-Rapid® – nothing could be simpler.



26_02_06_0006

Practical cable compartment in the back panel of the appliance allows easy storage of the power cable. It can be inserted into the compartment provided, with a choice of feeding the cable through the left or right hand side of the appliance. As a result the appliance will always fit in perfectly, wherever it is.

Hydraulic connection

Open vented small water heaters

Open vented (non-pressurised) water heaters supply only a single draw-off point. They must not be subjected to pressure and are therefore not suitable for operation with standard pressure taps. The outlet connector and pivoting tap spout must never be shut off.

The flow rate specified on the type plate must also be observed. Suitable aerators should be used to prevent excessive flow rates even during temporary increases in water pressure.

The following taps are suitable for operation with open vented small water heaters:

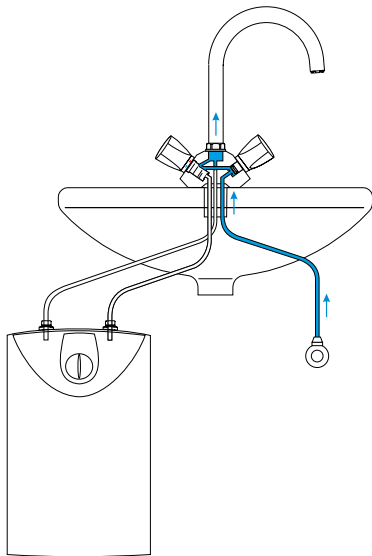
PRODUCTS

Small water heater

Open, non-pressurised taps

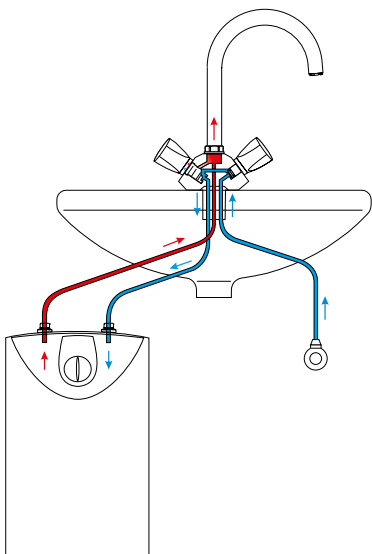
Mixer tap as single hole version for non-pressurised undersink water heaters

The required outlet temperature (from cold to hot) is selected at the temperature selection valve. Water is drawn at the valve. Cold water flows into the small water heater and pushes the hot water through the outlet pipe to the tap. Only that much cold water must flow into the cylinder as DHW can flow out of the tap. To prevent excess pressure inside the cylinder, the cold water inlet flow must be limited. For undersink appliances, the cold water supply is equipped with a flow limiter. The water volume increases during heat-up. The expansion water drips from the tap. This is a physical necessity and does not mean that the tap is faulty. The SNU 5 SL anti-drip comfort is an exception. In this case the expansion water is retained inside the small water heater.



26_02_10_0344

Drawing cold water



26_02_10_0345

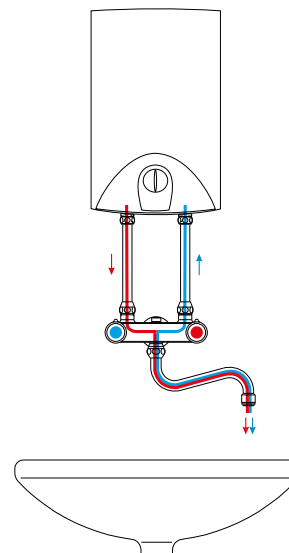
Drawing hot water

Mixer tap for wall mounting and non-pressurised oversink water heaters

The internal cylinder of the small water heater is constantly filled with water, but is not under mains water pressure. The open tap connects the appliance permanently with the ambient atmosphere. The operating pressure is 0 Pa. In open vented water heaters, the internal cylinder is made from plastic (5 - 10 l capacity).

When hot water is drawn, cold water flows into the small water heater via the DHW valve and pushes the hot water through the outlet pipe to the tap. Only that much cold water must flow into the cylinder as DHW can flow out of the tap. To prevent excess pressure inside the cylinder, the cold water inlet flow must be limited. For oversink appliances, the cold water inlet of the tap contains the throttle screw, which limits the flow rate.

The water temperature in the heater cylinder is variably adjusted via the temperature selector to a value from approx. 35 °C to 85 °C. The water volume increases during heat-up. The expansion water drips from the tap. This is a physical necessity and does not mean that the tap is faulty.



26_02_10_0346

Drawing off mixed water

PRODUCTS

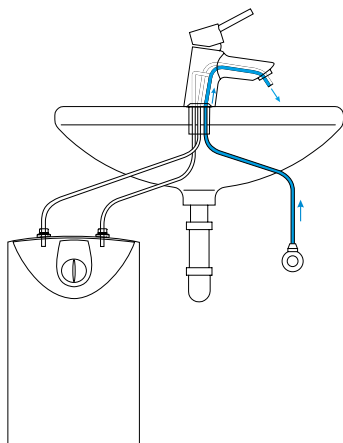
Small water heater

Non-pressurised mono lever mixer tap as single hole version for non-pressurised undersink water heaters

The tap is opened and closed by lifting or lowering the lever. The temperature is adjusted by moving the lever to the right or left.

Drawing cold water:

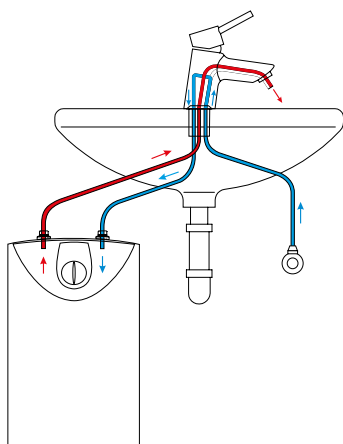
Lift the tap lever and turn it to the right. This shifts the ceramic sealing discs inside the control cartridge horizontally and vertically. The incoming cold water from the mains is directed immediately to the tap outlet.



Drawing cold water

Drawing hot water:

Lift the tap lever and turn it to the left. This shifts the ceramic sealing discs horizontally and vertically. The cold water from the mains is diverted inside the control cartridge of the tap and is routed to the undersink water heater. The hot water is routed to the tap via the heater's DHW connection. The tap outlet is permanently open towards the cylinder and thereby connects the small water heater with the atmosphere.

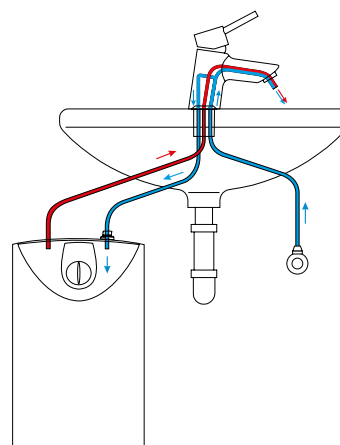


Drawing hot water

Drawing off mixed water:

Lift the tap lever in its centre position. Some of the incoming cold water is directed immediately to the tap outlet. Another part is routed into the water heater via its cold water connection, pushing hot water out of the water heater to the tap.

The hot and cold water are mixed in the control cartridge. The mixed water temperature can be changed by moving the lever to the right or left.



Drawing off mixed water

Sealed unvented systems

Sealed unvented water heaters, i.e. those under full mains pressure, can supply multiple draw-off points. Observe EN 806 and DIN 1988 and the regulations specified by your local water supply utility.

Never exceed the maximum permissible pressure specified on the type plate.

For safety reasons, standards such as DIN 1988 require an individually tested safety assembly to be installed directly on the water heater in the cold water line.

The critical factor when selecting a safety assembly is the maximum permissible pressure of the water heater. Make sure the safety valve and the associated drain facility are installed correctly. No shut-off valves should be installed between the safety valve and the water heater.

See also "Hydraulic connection" for wall mounted and floorstanding cylinders.

Power supply

Observe the VDE 0100 [or local equivalent] and the regulations specified by your local power supply utility as well as the type plate.

Compare the voltage, select an adequate cable cross-section and the correct fuse/MCB. The small water heater is supplied with a 3-core power cable and standard plug.

Prior to switching on your appliance, fill it by opening the DHW valve.

Small water heater, 5 to 15 litres, open vented (non-pressurised) SNU SLi

SNU 5 SLi + WST-W



Small water heater, 5 to 15 litres, open vented (non-pressurised)

Open vented (non-pressurised) for the supply of one draw-off point. As undersink and oversink version. The 5 litre undersink version (SNU 5) with anti-drip and thermostop function. With internal polypropylene cylinder and thermal insulation. The water content is maintained at the required temperature by a controller. Variable temperature selection from approx. 35 °C to 85 °C with automatic frost protection setting when the appliance is off. As standard with mounting rail, metal water connections, connecting cable and standard plug. Installation only with taps for open appliances.

SNU 5 SLi + MAE-K



SNU 5 SLi + MAE-W



SNU SLi

- › Exclusive soft-line design
- › Anti-drip function for the highest comfort and hygiene (SNU 5 SL)
- › thermostop function for the prevention of energy losses with mixer taps (SNU 5 SL, SNU 10 SL)
- › SNU..SL appliances for undersink installation
- › Resettable high limit safety cut-out (for all 1 and 2 kW units)
- › High-grade thermal insulation with extremely low energy losses
- › Temperature limit at 38 °C, 45 °C, 55 °C or 65 °C
- › Practical cable storage in the back panel of the appliance to house any excess power cable

Accessories

- › 232604 WUT
- › 232611 MES
- › 232612 MEW
- › 232620 WST
- › 232741 MEWC
- › 230956 WEN

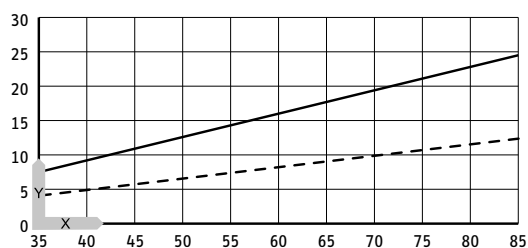
Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Small water heater, 5 to 15 litres, open vented (non-pressurised) SNU SLi

		SNU 5 SLi			SNU 5 SLi + WST-W			SNU 5 SL + MAE-K			SNU 5 SL + MAE-W			SNU 10 SLi		
		221121			221122			222173			222172			222199		
Hydraulic data																
Nominal capacity	l	5			5			5			5			10		
Mixed water volume 40 °C	l	10			10			10			10			19		
Electrical data																
Rated voltage	V	220	230	240	220	230	240	220	230	240	220	230	240	220	230	240
Rated output	kW	1.8	2.0	2.2	1.8	2.0	2.2	1.8	2.0	2.2	1.8	2.0	2.2	1.8	2.0	2.2
Rated current	A	8.3	8.7	9.1	8.3	8.7	9.1	8.3	8.7	9.1	8.3	8.7	9.1	8.3	8.7	9.1
Fuse/MCB rating	A	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Phases		1/N/PE			1/N/PE			1/N/PE			1/N/PE			1/N/PE		
Frequency	Hz	50/60			50/60			50/60			50/60			50/60		
Application limits																
Temperature setting range	°C	35 - 85			35 - 85			35 - 85			35 - 85			35 - 85		
Max. permissible pressure	MPa	0			0			0			0			0		
Max. flow rate	l/min	5			5			5			5			10		
Energy data																
Standby power consumption over 24h at 38 °C	kWh	0.09			0.09			0.09			0.09					
Standby energy consumption/24 h at 65 °C	kWh	0.2			0.2			0.2			0.2			0.31		
Versions																
IP rating		IP24			IP24			IP24			IP24			IP24		
Type		Open			Open			Open			Open			Open		
Type of installation		Undersink			Undersink			Undersink			Undersink			Undersink		
Internal cylinder material		PP			PP			PP			PP			PP		
Thermal insulation material		Polystyrene			Polystyrene			Polystyrene			Polystyrene			Polystyrene		
Casing material		PS			PS			PS			PS			PS		
Colour		white			white			white			white			white		
Connections																
Water connection		G 3/8			G 3/8			G 3/8			G 3/8			G 3/8		
Dimensions																
Depth	mm	230			230			230			230			275		
Height	mm	421			421			421			421			503		
Width	mm	263			263			263			263			295		
Weights																
Weight	kg	3.0			3.0			3.0			3.0			4.6		

Heat-up diagram



X Temperature setting [°C]

Y Duration [min]

1 5 l / 1 kW, 10 l / 2 kW

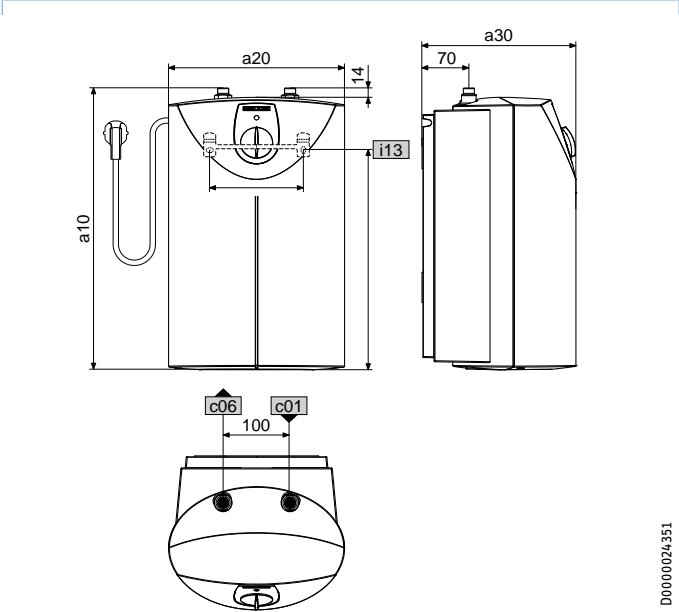
2 5 l / 2 kW

The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

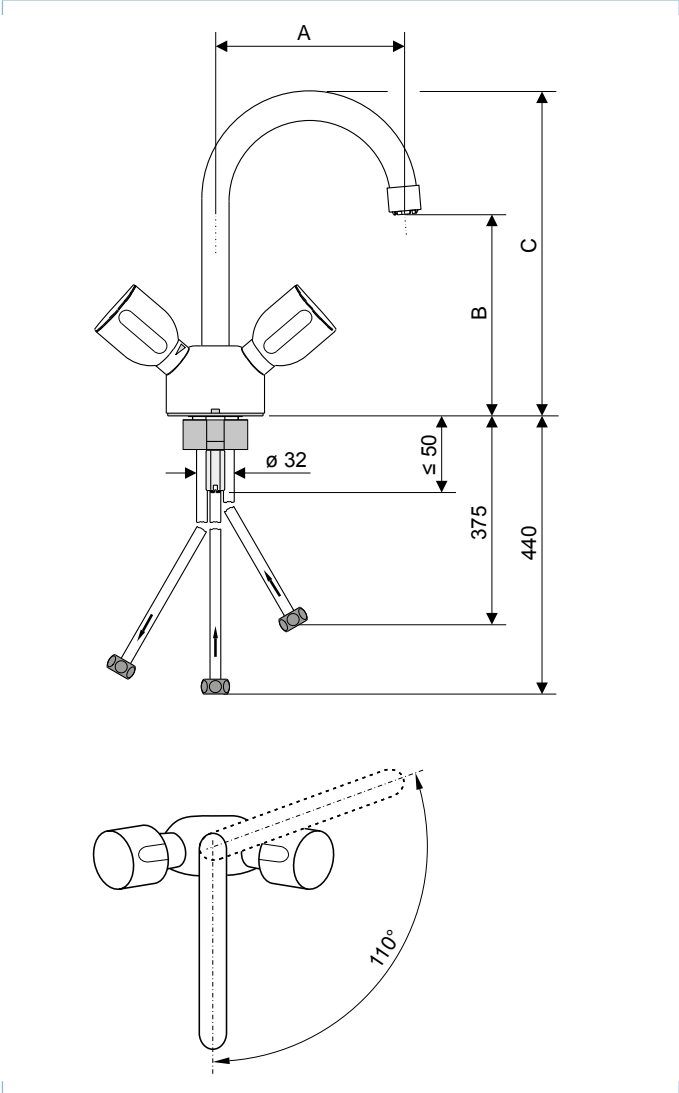
Small water heater, 5 to 15 litres, open vented (non-pressurised) SNU SLi

Dimensions and connections SNU 5 SLi



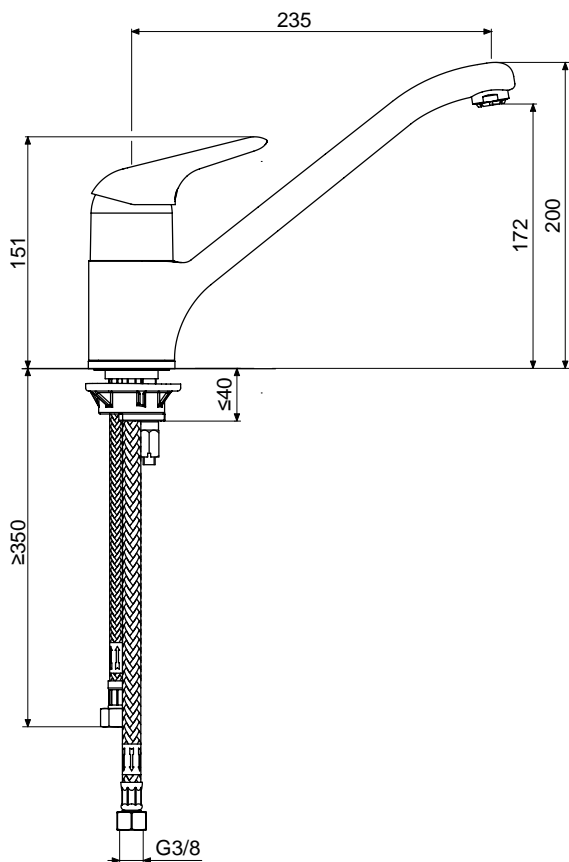
				SNU 5 SLi	SNU 10 SLi
a10	Appliance	Height	mm	421	503
a20	Appliance	Width	mm	263	295
a30	Appliance	Depth	mm	230	275
c01	Cold water inlet	Male thread		G 3/8 A	G 3/8 A
c06	DHW outlet	Male thread		G 3/8 A	G 3/8 A
i13	Wall mounting bracket	Height	mm	328	363
		Horizontal hole spacing	mm	140	200

WST-W



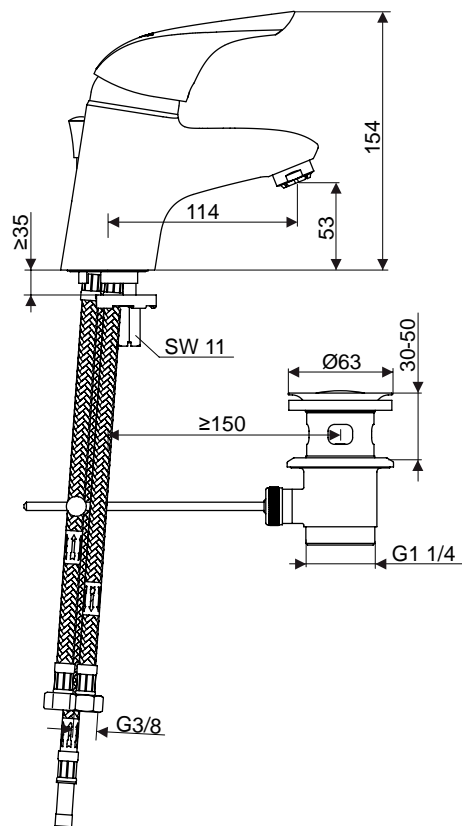
Small water heater, 5 to 15 litres, open vented (non-pressurised) SNU SLi

MAE-K



D0000039734

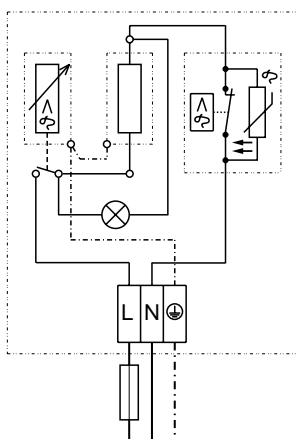
MAE-W



D0000017726

Wiring diagram

1/N/PE ~ 220-240 V



85_02_06_0001

Small water heater, 5 to 15 litres, open vented (non-pressurised) SN SLi



PIC00002055

Small water heater, 5 to 15 litres, open vented (non-pressurised)

Open vented (non-pressurised) for the supply of one draw-off point. As undersink and oversink version. With internal polypropylene cylinder and thermal insulation. The water content is maintained at the required temperature by a controller. Variable temperature selection from approx. 35 °C to 85 °C with automatic frost protection setting when the appliance is off. As standard with mounting rail, metal water connections, connecting cable and standard plug. Installation only with taps for open appliances.

SN SLi

- › Exclusive soft-line design
- › SN..SL appliances for oversink installation
- › Resettable high limit safety cut-out (for all 1 and 2 kW units)
- › High-grade thermal insulation with extremely low energy losses
- › Temperature limit at 38 °C, 45 °C, 55 °C or 65 °C
- › Practical cable storage in the back panel of the appliance to house any excess power cable

Accessories

- › 232605 WKM
- › 232606 WDM
- › 232608 MEK
- › 232609 MED

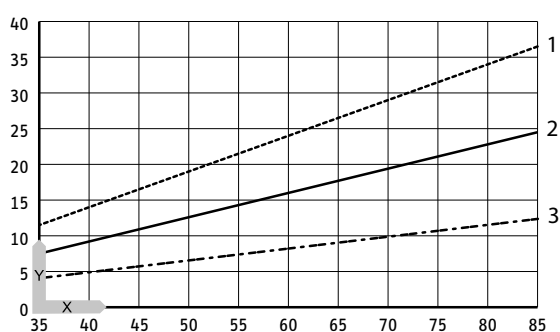
Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Small water heater, 5 to 15 litres, open vented (non-pressurised) SN SLi

		SN 5 SLi			SN 10 SLi			SN 15 SLi		
		221127			222193			222204		
Hydraulic data										
Nominal capacity	l	5			10			15		
Mixed water volume 40 °C	l	10			19			28		
Electrical data										
Rated voltage	V	220	230	240	220	230	240	220	230	240
Rated output	kW	1.8	2.0	2.2	1.8	2.0	2.2	1.8	2.0	2.2
Rated current	A	8.3	8.7	9.1	8.3	8.7	9.1	8.3	8.7	9.1
Fuse/MCB rating	A	10	10	10	10	10	10	10	10	10
Phases		1/N/PE			1/N/PE			1/N/PE		
Frequency	Hz	50/60			50/60			50/60		
Application limits										
Temperature setting range	°C	approx. 35–85			approx. 35–85			approx. 35–85		
Max. permissible pressure	MPa	0			0			0		
Max. flow rate	l/min	5			10			12		
Energy data										
Standby energy consumption/24 h at 65 °C	kWh	0.2			0.31			0.37		
Versions										
IP rating		IP24			IP24			IP24		
Type		Open			Open			Open		
Type of installation		Oversink			Oversink			Oversink		
Internal cylinder material		PP			PP			PP		
Thermal insulation material		Polystyrene			Polystyrene			Polystyrene		
Casing material		PS			PS			PS		
Colour		white			white			white		
Connections										
Water connection		G 1/2			G 1/2			G 1/2		
Dimensions										
Depth	mm	230			275			295		
Height	mm	421			503			601		
Width	mm	263			295			316		
Weights										
Weight	kg	3.0			4.6			6.7		

Heat-up diagram



D0000046779

X Temperature setting [°C]

Y Duration [min]

1 15 l / 2 kW

2 10 l / 2 kW

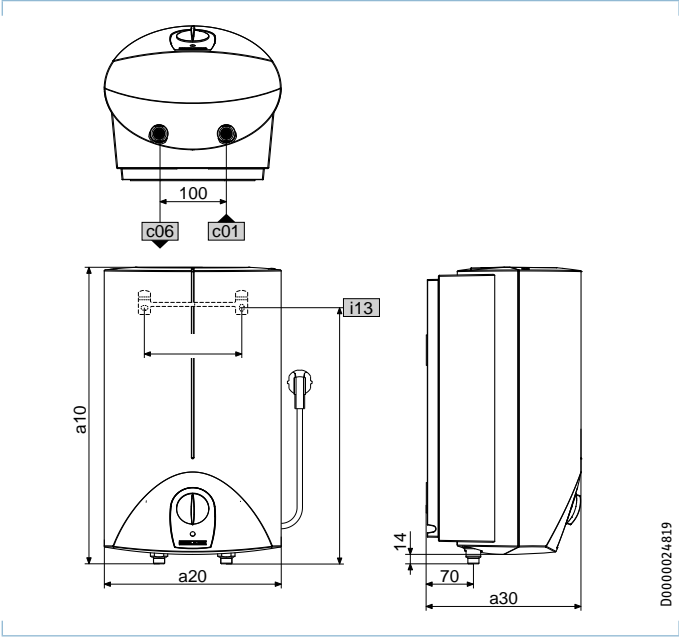
3 5 l / 2 kW

The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

Small water heater, 5 to 15 litres, open vented (non-pressurised) SN SLi

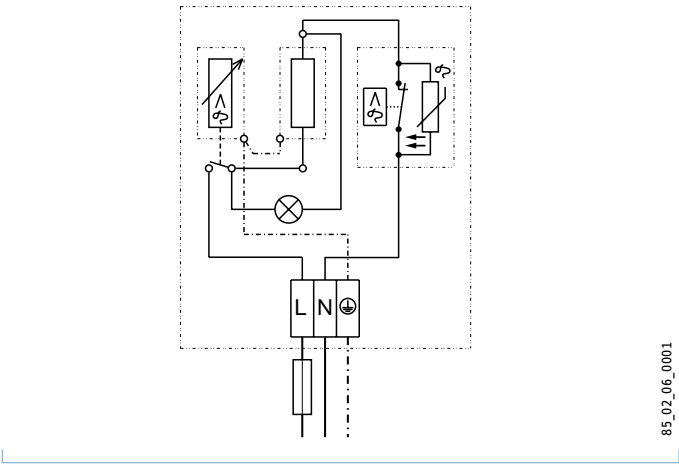
Dimensions and connections



			SN 5 SLi	SN 10 SLi	SN 15 SLi
a10	Appliance	Height	mm	421	503
a20	Appliance	Width	mm	263	316
a30	Appliance	Depth	mm	230	275
c01	Cold water inlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A	G 1/2 A	G 1/2 A
i13	Wall mounting bracket	Height	mm	303	387
		Horizontal hole spacing	mm	140	200

Wiring diagram

1/N/PE ~ 220-240 V



Small water heater, 5 to 15 litres, open vented (non-pressurised)
Taps, undersink

Small water heaters, open vented (non-pressurised)
Taps, undersink

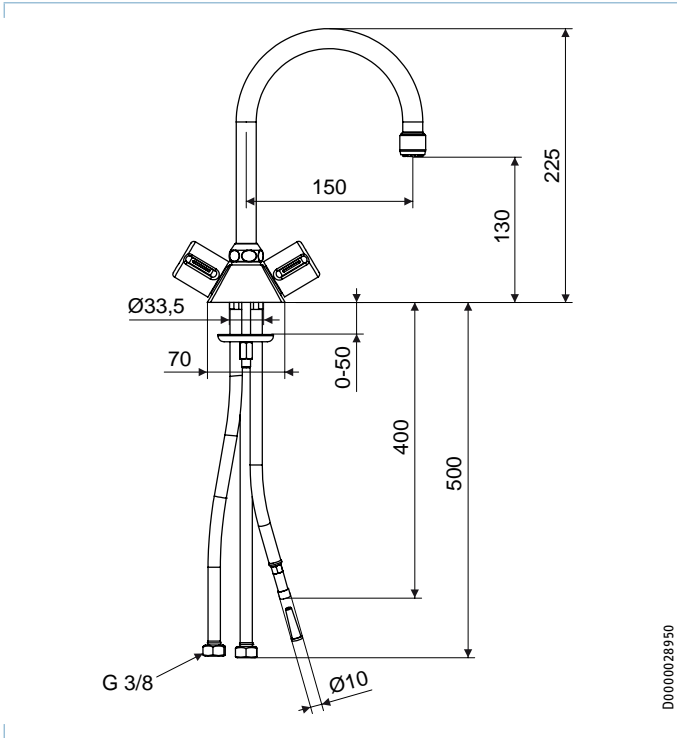
WST | WUT

- › Mixer tap
- › Can be used with SNU 5 SL(i), SNU 10 SL(i), UFP 5 t, DNM

Mixer tap for washbasin or kitchen sink. Chrome-plated metal handles, chrome finish. Chain retaining eyelet, quick-acting fitting. Complete range in a uniform design for all applications in bath and kitchen.

		WST	WUT
		232620	232604
Application		Washbasin	Sink
Type		Open	Open
Type of installation		Monobloc mixer tap	Monobloc mixer tap
Finish		Chrome-plated	Chrome-plated
Connection		Connecting hoses	Connecting hoses
Max. flow rate	l/min	5/10	5/10
Max. permissible pressure	MPa	1	1
Outlet height	mm	130	200
Reach	mm	150	200

WST

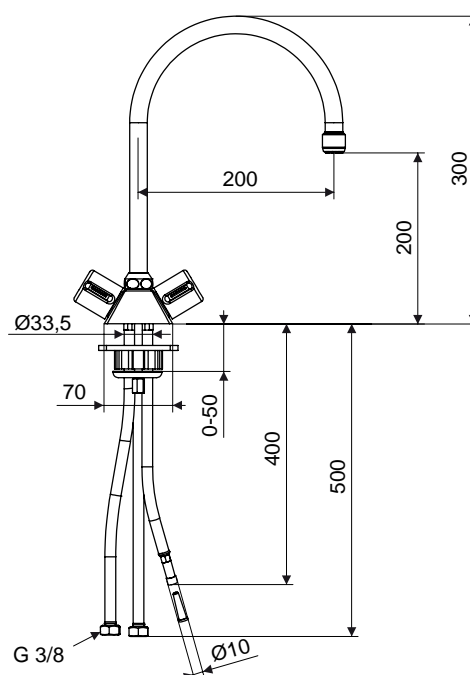


Small water heater, 5 to 15 litres, open vented (non-pressurised) Taps, undersink

WUT



PIC00003793



D0000028963

Small water heater, 5 to 15 litres, open vented (non-pressurised) Taps, undersink

MEW | MEWC | MES

- › Mono lever mixer tap
- › Can be used with SNU 5 SL(i), SNU 10 SL(i), UFP 5 t, DNM
- › MEW with pull rod drain set
- › MEWC with pivoting spout
- › MES with pivoting spout

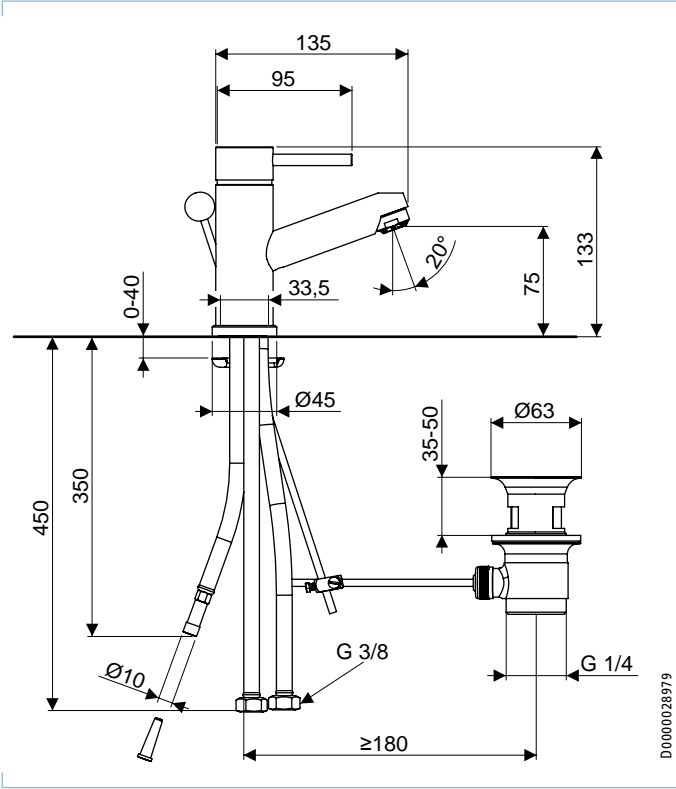
Mono lever mixer for washbasins or for use on a kitchen sink.
Ceramic control cartridge; solid and robust brass tap construction.

		MEW	MEWC	MES
		232612	232741	232611
Application		Washbasin	Washbasin	Sink
Type		Open	Open	Open
Type of installation		Monobloc mixer tap	Monobloc mixer tap	Monobloc mixer tap
Finish		Chrome-plated	Chrome-plated	Chrome-plated
Connection		Connecting hoses	Connecting hoses	Connecting hoses
Max. flow rate	l/min	5/10	5/10	5/10
Max. permissible pressure	MPa	1	1	1
Outlet height	mm	50	140	190
Reach	mm	110	140	190

MEW



PIC00003797

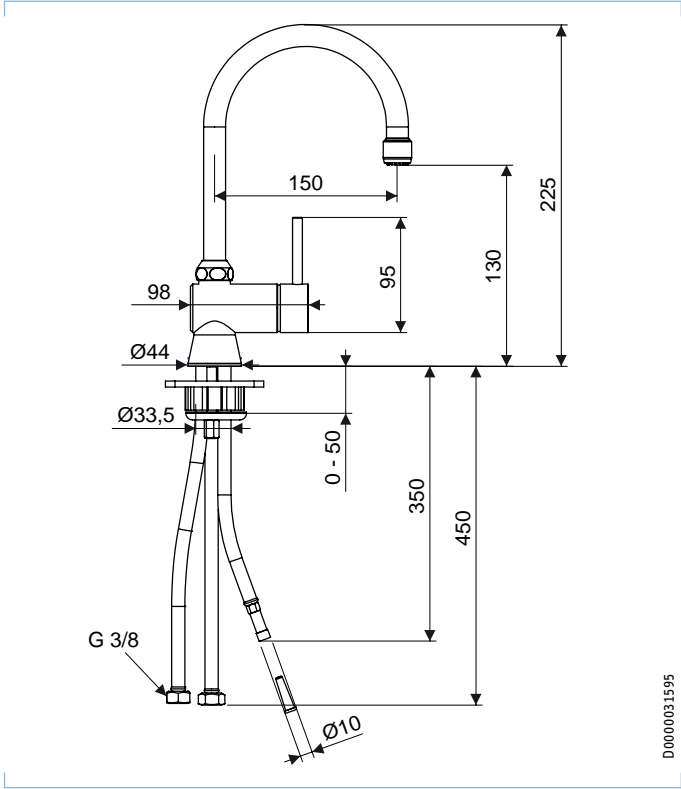


Small water heater, 5 to 15 litres, open vented (non-pressurised)
Taps, undersink

MEWC



PIC00003799

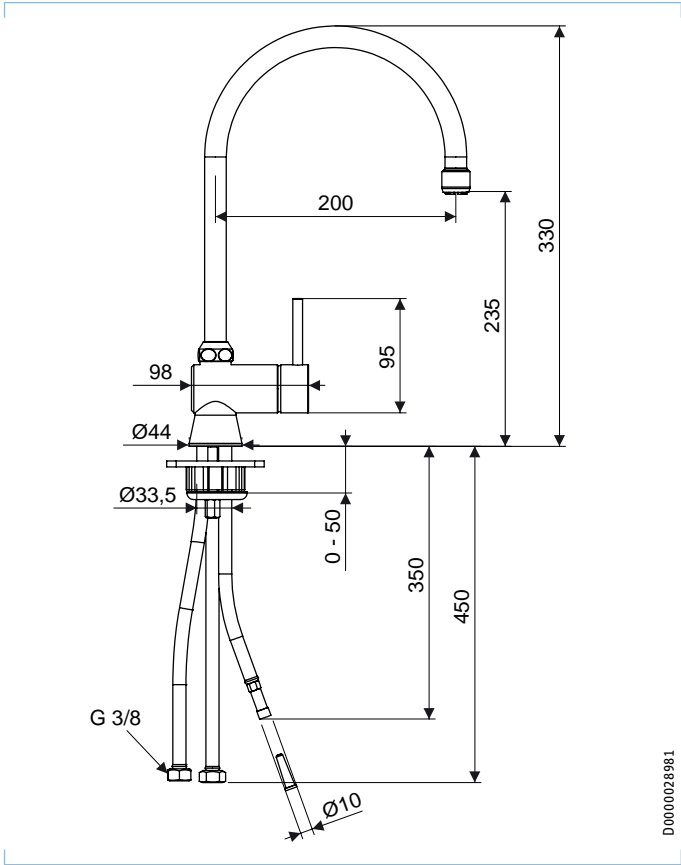


D0000031595

MES



PIC00003796



D0000029981

Small water heater, 5 to 15 litres, open vented (non-pressurised) Taps, undersink

WEN

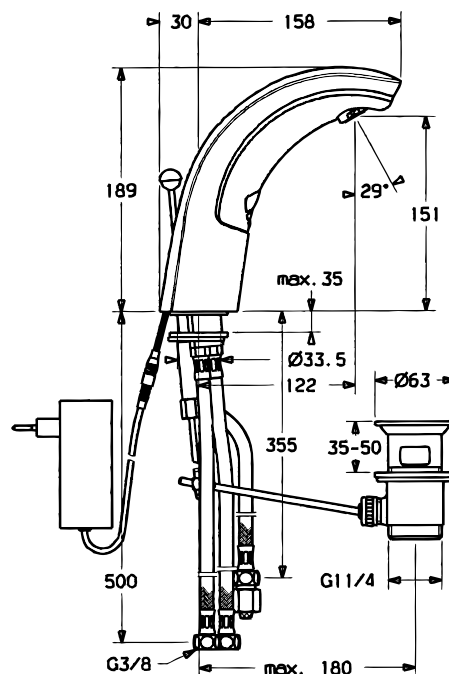


PIC00002178

- › Open sensor tap for mini instantaneous water heaters (DEM, DNM) and pressurised / non-pressurised cylinders (SNU 5/10, SHU 5/10)
- › Stable and robust version for commercial use
- › Operationally reliable thanks to dirt trap in the inlet
- › Easy-care chrome finish
- › Easy selection of accurate temperature delivery
- › No maintenance thanks to plug-in power supply unit (no need to change batteries)

		WEN
		230956
Application		Washbasin
Open vented type		X
Type of installation		Monobloc mixer tap
Finish		Chrome-plated
Connection		Connecting hoses
Max. flow rate	l/min	5
Minimum supply pressure	MPa	0.1
Max. DHW temperature	°C	80
Rated voltage	V	230
Power connection		1/N/PE
Max. current load, power supply unit	A	16
Standby power consumption	W	0.6
Outlet height	mm	151
Reach	mm	122
Weight	kg	3.14

Sensor tap for washbasins. Open type of operation (non-pressurised). Chrome-plated finish, quick-acting fitting. 230 V plug-in power supply unit with integrated socket for a standard plug.



D0000017729

Small water heater, 5 to 15 litres, open vented (non-pressurised) Taps, oversink

Open vented small water heaters Taps, oversink

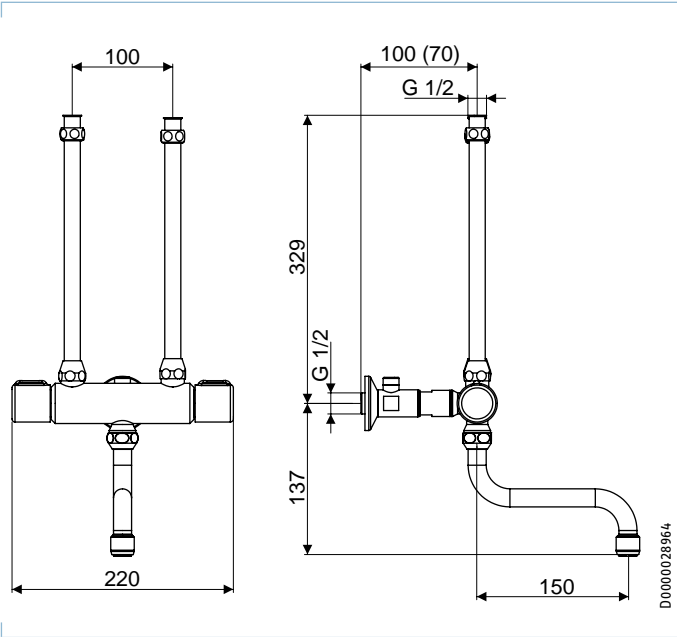
WKM | WDM

- › Twin-handle mixer tap
- › Can be used with SN 5-15 SL, EB 15 SL, UFP 5 h
- › In case of non-pressurised operation: also with SH/SHZ, HFA-Z, HFA/EB 80 Z
- › WKM equipment with pivoting spout with special jet controller

Twin-handle wall taps, chrome-plated metal handles, chrome finish. Non-return valve and butterfly valve in the cold water connection. Complete range in a uniform design for all applications in bath and kitchen.

		WKM	WDM
		232605	232606
Application		Kitchen	Shower
Type		Open	Open
Type of installation		Wall mounted mixer	Wall mounted mixer
Finish		Chrome-plated	Chrome-plated
Max. flow rate	l/min	18	18
Max. permissible pressure	MPa	1	1
Reach	mm	160	

WKM

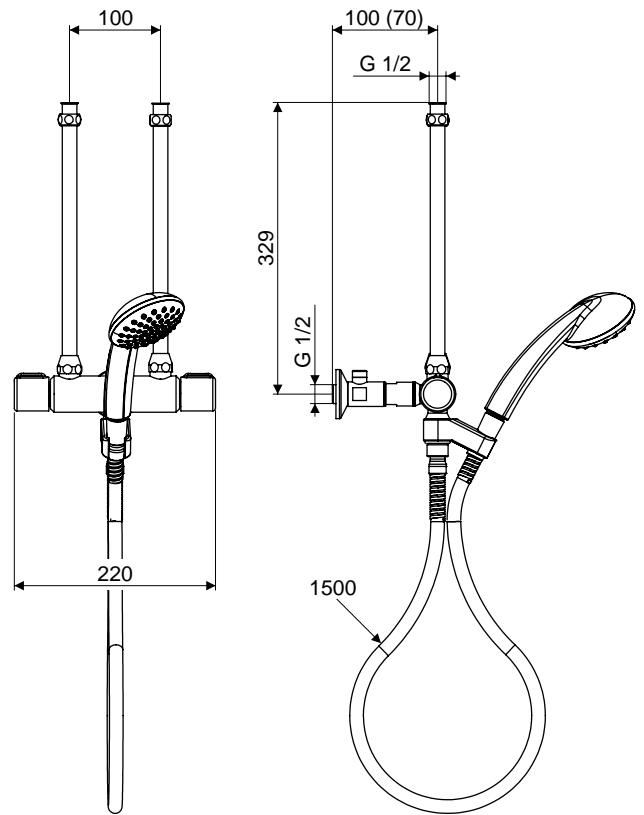


Small water heater, 5 to 15 litres, open vented (non-pressurised)
Taps, oversink

WDM



PIC00003834



D0000028970

Small water heater, 5 to 15 litres, open vented (non-pressurised) Taps, oversink

MEK | MED

- › Mono lever mixer tap
- › Can be used with SN 5-15 SL, EB 15 SL, UFP 5 h
- › In case of non-pressurised operation: also with SH/SHZ, HFA-Z, HFA/EB 80 Z
- › MED and MEB equipped with metal shower hose and hand shower attachment for low pressure operation

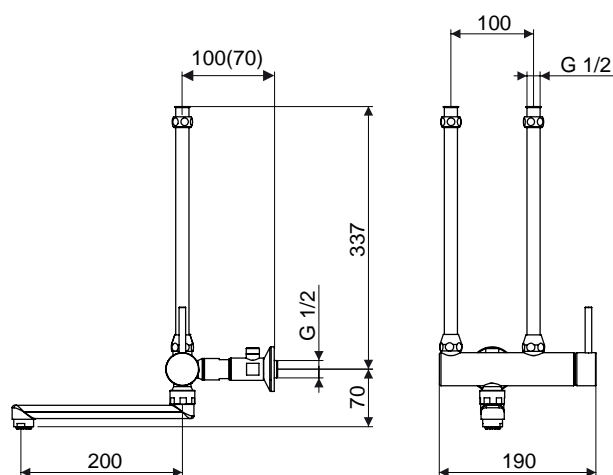
Mono lever wall tap for use inside a shower, on the bath or above the kitchen sink. Ceramic control cartridge; solid and robust brass tap construction.

		MEK	MED
		232608	232609
Application		Kitchen	Shower
Type		Open	Open
Type of installation		Wall mounted mixer	Wall mounted mixer
Finish		Chrome-plated	Chrome-plated
Max. flow rate	l/min	18	18
Max. permissible pressure	MPa	1	1
Reach	mm	185	

MEK



PIC00003366



D0000017716

Small water heater, 5 to 15 litres, open vented (non-pressurised) Taps, oversink

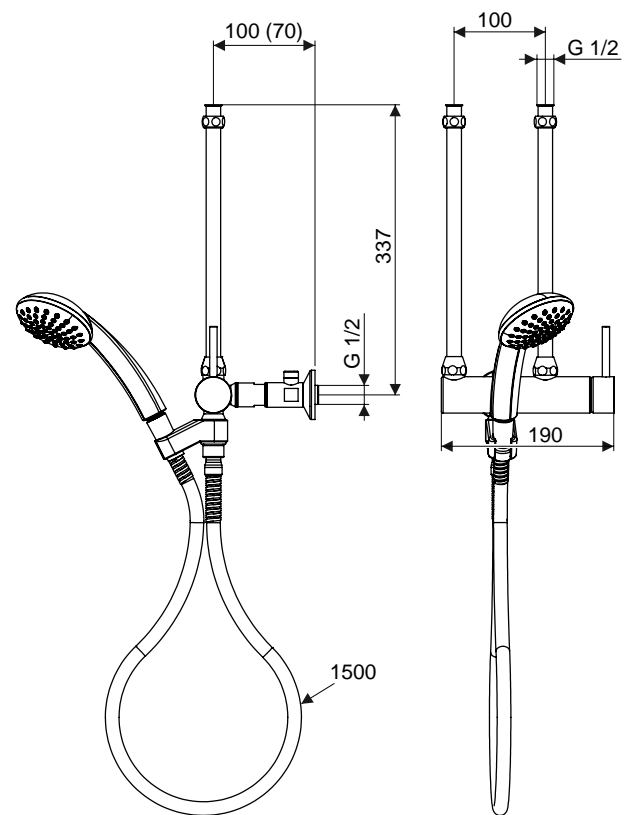
MED



PIC00003794

Accessories

- › 006629 Connection pipe 500 mm
- › 068523 Shower hose / 1250
- › 068520 Shower hose / 1500
- › 068524 Shower hose / 2000
- › 000734 U / heavy



D0000028574

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested) SHU SLi



PLC00001986

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested)

Sealed unvented (pressure-tested) for supplying several draw-off points. As under and oversink version. With pressure-tested internal container for 0.7 MPa permissible operating pressure and thermal insulation. The water content is maintained at the required temperature by a controller. Variable temperature selection from approx. 35 °C to 82 °C with automatic frost protection setting when the appliance is off. As standard with mounting rail, connecting cable and earthed plug. Installation only with the matching safety assembly.

SHU SLi

- › Exclusive soft-line design
- › SHU SL/SLi appliances for undersink installation
- › Pressure-tested copper internal cylinder in SHU 5 SL(i)
- › High-grade thermal insulation
- › Temperature limit at 38 °C, 45 °C, 55 °C or 65 °C
- › Practical cable storage in the back panel of the appliance to house any excess power cable
- › Matching safety assemblies as accessories

Accessories

- › 073499 SVMT
- › 070558 Tees
- › 230957 WEH

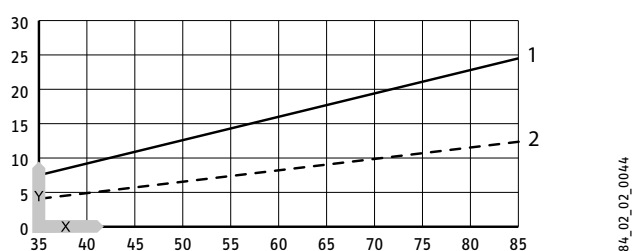
Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested) SHU SLi

		SHU 5 SLi			SHU 10 SLi		
		222151			229473		
Hydraulic data							
Nominal capacity	l	5			10		
Mixed water volume 40 °C	l	10			19		
Electrical data							
Rated voltage	V	220	230	240	220	230	240
Rated output	kW	1.8	2.0	2.2	1.8	2.0	2.2
Rated current	A	8.3	8.7	9.1	8.3	8.7	9.1
Fuse/MCB rating	A	10	10	10	10	10	10
Phases		1/N/PE			1/N/PE		
Frequency	Hz	50/60			50/60		
Application limits							
Temperature setting range	°C	Approx. 35 - 82			Approx. 35 - 82		
Max. permissible pressure	MPa	0.7			0.7		
Max. flow rate	l/min	5			10		
Energy data							
Standby energy consumption/24 h at 65 °C	kWh	0.29			0.36		
Versions							
IP rating		IP24			IP24		
Type		Sealed unvented			Sealed unvented		
Type of installation		Undersink			Undersink		
Internal cylinder material		Copper			Steel, enamelled		
Thermal insulation material		Polystyrene			Polystyrene		
Casing material		PS			PS		
Colour		white			white		
Connections							
Water connection		G 3/8			G 3/8		
Height/Width/Depth	mm	421	263	230	503	295	275
Weights							
Weight	kg	5.2			7.6		

Heat-up diagram



X Temperature setting [°C]

Y Duration [min]

1 10 l / 2 kW

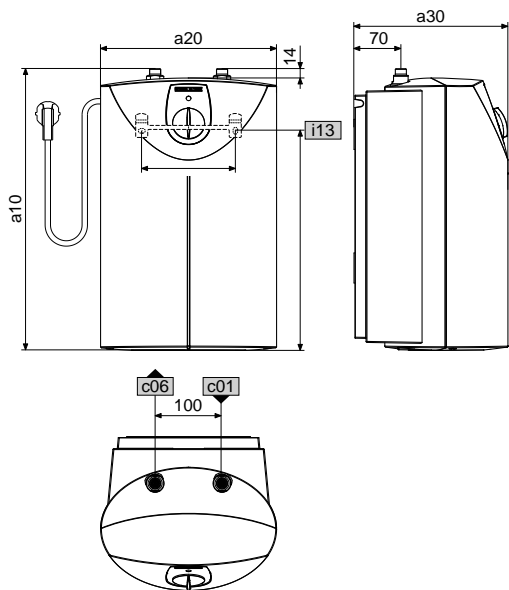
2 5 l / 2 kW

The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested) SHU SLi

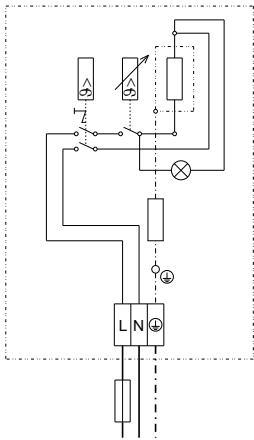
Dimensions and connections



			SHU 5 SLi	SHU 10 SLi
a10	Appliance	Height	mm	421
a20	Appliance	Width	mm	263
a30	Appliance	Depth	mm	230
c01	Cold water inlet	Male thread	G 3/8 A	G 3/8 A
c06	DHW outlet	Male thread	G 3/8 A	G 3/8 A
i13	Wall mounting bracket	Height	mm	328
		Horizontal hole spacing	mm	140
				200

Wiring diagram

1/N/PE ~ 220-240 V



Small water heater, 5 to 15 litres, sealed unvented (pressure-tested) SH SLi



PIC00002053

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested)

Sealed unvented (pressure-tested) for supplying several draw-off points. As oversink version with pressure-tested, enamelled steel internal cylinder, and thermal insulation. Variable temperature selection from approx. 35 °C to 80 °C with automatic frost protection setting when the appliance is off. With connecting cable (0.7 m) as standard.

SH SLi

- › Exclusive soft-line design
- › SH...SL/SLi appliances for oversink installation
- › Internal steel container, enamelled
- › High-grade thermal insulation
- › Temperature limit at 38 °C, 45 °C, 55 °C or 65 °C
- › Practical cable storage in the back panel of the appliance to house any excess power cable
- › Matching safety assemblies as accessories

Accessories

- › 233482 KV 307
- › 233481 KV 40
- › 230764 SRT 2

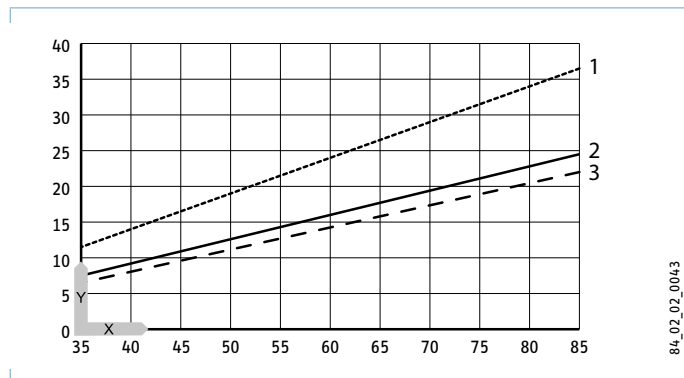
Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested) SH SLi

		SH 10 SLi			SH 15 SLi			SH 15 SL 3.3 kW		
		229476			229478			229479		
Hydraulic data										
Nominal capacity	l	10			15			15		
Mixed water volume 40 °C	l	19			28			28		
Electrical data										
Rated voltage	V	220	230	240	220	230	240	220	230	240
Rated output	kW	1.8	2.0	2.2	1.8	2.0	2.2	3.0	3.3	3.6
Rated current	A	8.3	8.7	9.1	8.3	8.7	9.1	13.7	14.3	15.0
Fuse/MCB rating	A	10	10	10	10	10	10	16	16	16
Phases		1/N/PE			1/N/PE			1/N/PE		
Frequency	Hz	50/60			50/60			50/60		
Application limits										
Temperature setting range	°C	Approx. 35 - 82			Approx. 35 - 82			Approx. 35 - 82		
Max. permissible pressure	MPa	0.7			0.7			0.7		
Max. flow rate	l/min	10			12			12		
Energy data										
Standby energy consumption/24 h at 65 °C	kWh	0.34			0.4			0.4		
Versions										
IP rating		IP24			IP24			IP24		
Type		Sealed unvented			Sealed unvented			Sealed unvented		
Type of installation		Oversink			Oversink			Oversink		
Internal cylinder material		Steel, enamelled			Steel, enamelled			Steel, enamelled		
Thermal insulation material		Polystyrene			Polystyrene			Polystyrene		
Casing material		PS			PS			PS		
Colour		white			white			white		
Connections										
Water connection		G 1/2			G 1/2			G 1/2		
Dimensions										
Depth	mm	275			295			295		
Height	mm	503			601			601		
Width	mm	295			316			316		
Weights										
Weight	kg	8.0			10.5			11.0		

Heat-up diagram



X Temperature setting [°C]

Y Duration [min]

1 15 l / 2 kW

2 10 l / 2 kW

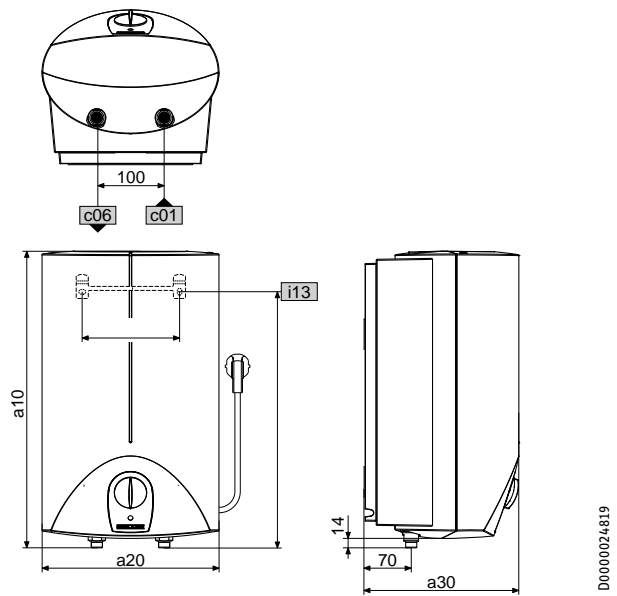
3 15 l / 3.3 kW

The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

Small water heater, 5 to 15 litres, sealed unvented (pressure-tested) SH SLi

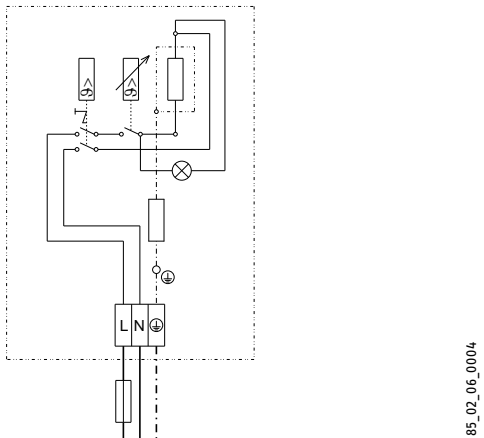
Dimensions and connections



			SH 10 SLi	SH 15 SLi	SH 15 SL 3.3 kW
a10	Appliance	Height	mm	503	601
a20	Appliance	Width	mm	295	316
a30	Appliance	Depth	mm	275	295
c01	Cold water inlet	Male thread		G 1/2 A	G 1/2 A
c06	DHW outlet	Male thread		G 1/2 A	G 1/2 A
i13	Wall mounting bracket	Height	mm	387	495
		Horizontal hole spacing	mm	200	200

Wiring diagram

1/N/PE ~ 220-240 V



Small water heater, 15 litres, sealed unvented (pressure-tested) PSH MINI ID



PLC00002172

Small water heater, 15 litres, sealed unvented (pressure-tested)

Sealed unvented (pressure-tested) for supplying several draw-off points. As oversink version with pressure-tested, enamelled steel internal cylinder, and thermal insulation. Variable temperature selection from approx. 35 °C to 80 °C with automatic frost protection setting when the appliance is off. With connecting cable (0.7 m) as standard.

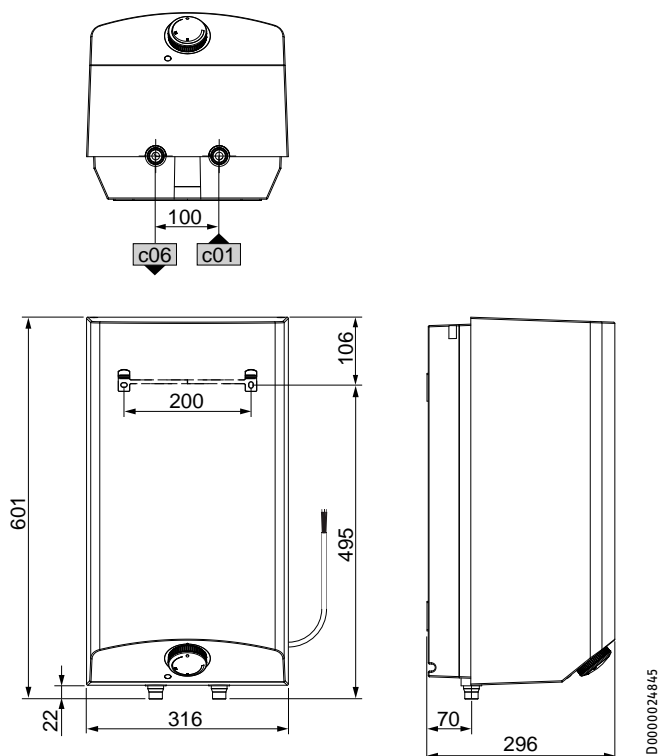
PSH MINI ID

- › Pressure-tested internal steel cylinder for 0.6 MPa permissible operating pressure
- › High-grade thermal insulation
- › Power cable approx. 0.7 m prefitted
- › Temperature limit at 7 to 80 °C

		PSH 15 Mini ID	
		229501	
Hydraulic data			
Nominal capacity	l	15	
Mixed water volume 40 °C	l	34.8	
Electrical data			
Rated voltage	V	220	230
Rated output	kW	0.3	0.33
Rated current	A	1.4	1.5
Fuse/MCB rating	A	10	10
Frequency	Hz	50	
Power connection		1/N/PE ~ 220/230 V	
Standby power consumption over 24h at 65 °C	kWh	0.7	
Application limits			
Temperature setting range	°C	35-82	
Max. permissible pressure	MPa	0.6	
Max. flow rate	l/min	12	
Versions			
IP rating		IP24	
Type		Sealed unvented	
Type of installation		Oversink	
Internal cylinder material		Steel, enamelled	
Thermal insulation material		Polystyrene	
Casing material		PS	
Colour		white	
Connections			
Water connection		G 1/2 A	
Dimensions			
Depth	mm	302	
Height	mm	480	
Width	mm	302	

Small water heater, 15 litres, sealed unvented (pressure-tested) PSH MINI ID

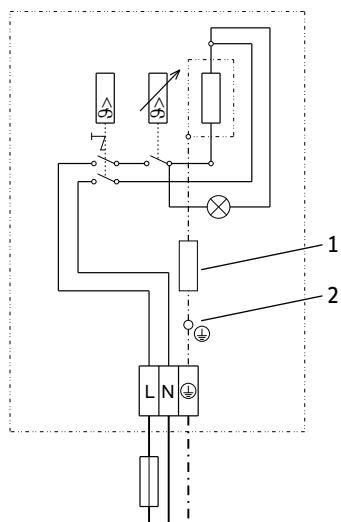
Dimensions and connections



PSH 15 Mini ID			
c01	Cold water inlet	Male thread	G 1/2 A
c06	DHW outlet	Male thread	G 1/2 A

Wiring diagram

1/N/PE ~ 220-230 V



- 1 Resistance 560 Ω
- 2 Protective anode

Small water heater, 15 litres, sealed unvented (pressure-tested)
Safety assemblies

Small water heater, sealed (pressurised)
Safety assemblies

SVMT



		SVMT
		073499
Max. permissible pressure	MPa	1
Permiss. Operating pressure	bar	5.6
Pressure reducing valve		X
Drip water connection		X
Type of installation		Finished walls
Connection		G 1/2 A

Accessories

> 070558 Tees

Tees



		Tees
		070558

Small water heater, 15 litres, sealed unvented (pressure-tested) Safety assemblies

KV



PIC00004297

KV 307

Safety assembly KV 307 for sealed unvented small oversink water heaters with 10 or 15 litres capacity. Shut-off valve with pressure gauge connection G $\frac{1}{4}$ without pressure reducing valve, plastic drain outlet G 1, brass casing, chrome finish.

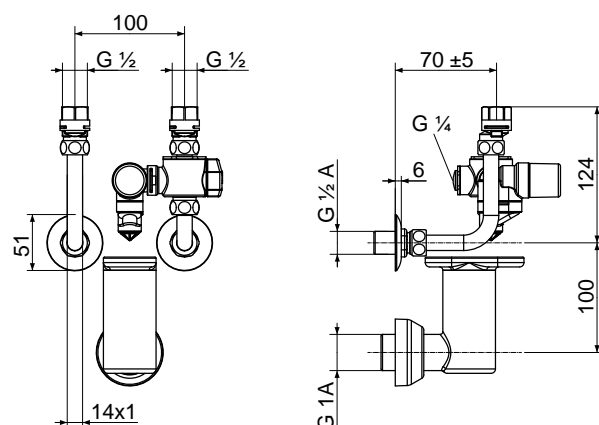
- › Safety valve 0.7 MPa (7 bar)
- › Twin connector system for easy installation
- › Rotating safety valve for drip water outlet on the right or left
- › Drain outlet with adjustable drip water inlet
- › DVGW test symbol
- › Test symbol PA-IX...../..

KV 40

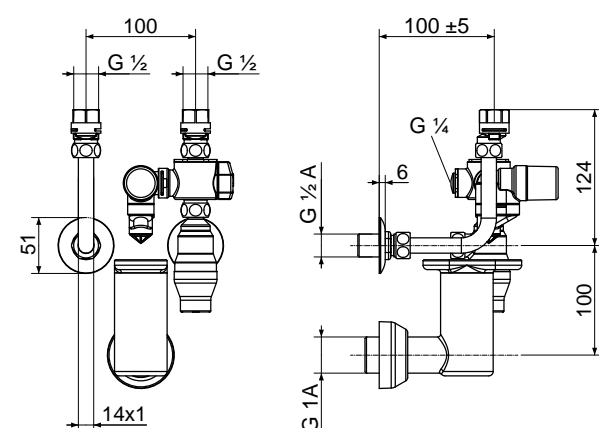
Safety assembly to DIN 1988 for sealed unvented wall mounted cylinders up to 200 l capacity. Shut-off valve, pressure gauge connection G $\frac{1}{4}$ with pressure reducing valve, plastic drain outlet G 1, brass body, chrome finish.

- › Safety valve 0.6 MPa (6 bar)
- › Pressure reducing valve, adjustable 0.15 - 0.5 MPa
- › Twin connector system for easy installation
- › Rotating safety valve for drip water outlet on the right or left
- › Drain outlet with adjustable drip water inlet
- › DVGW test symbol
- › Test symbol PA-IX...../..

		KV 307	KV 40
		233482	233481
Max. permissible pressure	MPa	0.56	1.6
Safety valve	MPa	0.7	0.6
Pressure reducing valve		-	X
Pressure reducing valve, nominal pressure			PN 16
Pressure reducing valve setting range	MPa		0.15 - 0.5
Drip water connection		X	X
Type of installation		Unfinished walls	Unfinished walls
Water connection		G 1/2 A	G 1/2 A
Drain outlet		G 1 A	G 1 A



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D0000040332

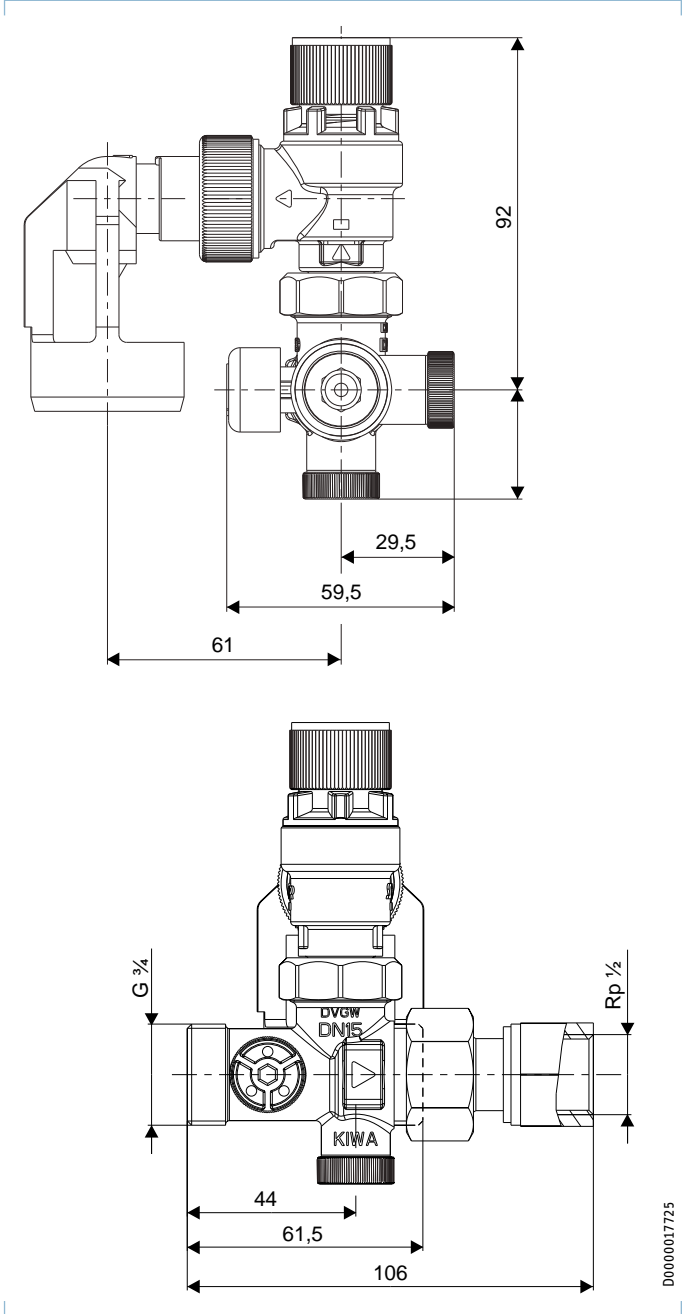
Small water heater, 15 litres, sealed unvented (pressure-tested) Safety assemblies

SRT 2



PlC00002177

Safety assembly for finished walls, for sealed unvented wall mounted cylinders and pressurised small water heaters. Safety valve 0.6 MPa. Ball shut-off valve, cylinder connection G 1/2, pressure gauge connection G 1/4 without pressure reducing valve, plastic drip water connection G 1, brass casing. For horizontal or vertical installation.



D0000017725

		SRT 2
		230764
Application		Pressurised cylinders
Max. permissible pressure	MPa	0.6
Pressure reducing valve		-
Finish		Brass
Drip water connection		X
Type of installation		Finished walls

Floorstanding cylinder



PRODUCTS

Floorstanding cylinder

Equipment

All floorstanding cylinders are internally enamelled, pressure-tested DHW cylinders suitable for supplying multiple draw-off points. The product range can be divided into the following categories, each with specific equipment features, based on equipment configuration and usage options.

Electric floorstanding cylinders

A flanged immersion heater is built into every electric floorstanding cylinder. The heating element is always located in the lower part of the cylinder so that the entire contents of the cylinder can be heated. The set DHW temperature is adjusted manually on the heating element. The water is heated to that set temperature, subject to connection of electricity and, if applicable, enable times. All floorstanding cylinders have generously sized connections for cold water, DHW and DHW circulation.

Electric floorstanding cylinders with integral indirect coil

These appliances are additionally equipped with an integral, enamelled, smooth tube indirect coil. This coil is located above the electric flanged immersion heater and can be used to connect an additional heat source. This allows ideal combination of multiple heat sources. For instance, the electric flanged immersion heater can be used in off-peak tariff periods, while the alternative heat source is put into operation in peak tariff periods.

Floorstanding combi cylinder

Floorstanding combi cylinders are internally enamelled cylinders which are not equipped at the factory with immersion heaters or indirect coils. The flanged apertures on these cylinders allow them to be equipped individually with electric flanged immersion heaters or indirect coils. That permits options such as installation of high heating outputs, combination of multiple heat sources, or preparation for later applications.

Additional equipment features

Floorstanding cylinders may have the following additional equipment features, depending on cylinder type:

Thermal insulation, directly applied

These cylinders have foam insulation applied directly to the wall. With insulation matched to the shape of the tank and an outer casing over that, standby losses are reduced to a minimum.

Thermal insulation as a separate component

If the dimensions of cylinders with directly applied insulation would exceed door and transport dimensions, separate insulation elements matched to the cylinder are used instead. Due to the properties of the insulating material and the fixing system, this separate insulation likewise fits very closely to the shape of the tank and ensures excellent insulation.

Anode / signal anode

All floorstanding cylinders have a protective magnesium anode for additional corrosion protection. In the signal anode, the magnesium element is fitted with a signalling facility. The display element illuminates as soon as the anode has been consumed.

Temperature display

Depending on type, the appliances may be equipped with analogue thermometers fitted to the outside.

Enamel

All cylinders are made of steel with an internal enamel coating for corrosion protection. STIEBEL ELTRON was the first manufacturer to obtain the EEA (European Enamel Authority) quality certificate for its DHW cylinder enamel coating.

LICENCE CERTIFICATE

AUTHORISATION TO USE THE QUALITY SIGN



This is to certify that

Stiebel Eltron GmbH & Co. KG

Licence number: 201

Is authorized to use the quality sign which is shown above according to the regulations for the use of the European Enamel Authority quality sign for enamel coating on the application area (7.12 hot water tanks / boilers) as described in chapter 7 of the EEA Quality Requirements.

Date of issue of this licence: 06.10.2012

Period of validity of this licence: 05.10.2015

Hagen, 06.10.2012

Dr. Leo Gypen
EEA-President

Werner Weissenhaus
EEA-Technical Committee

D0000032152

Quality certificate from the EEA (European Enamel Authority)

Equipment features of the floorstanding cylinders

	SHW S	SHW ACE	SHO AC	SB
Electric flanged immersion heater	•	•	•	
Unoccupied flanged apertures				•
Thermal insulation, direct	•	•		•
Thermal insulation, separate			•	•
Signal anode	•	•	•	•
Thermometer	•	•	•	•

Installation and installation benefits

The design of all the floorstanding cylinders makes them very easy to install and very reliable for planning purposes. The following notes and features are important when planning a system:

Siting

All floorstanding cylinders are suitable only for indoor installation in a room free from the risk of frost.

For height and diameter, see the specification. All cylinders have height-adjustable feet for levelling the cylinder.

Cold water inlet pipe

Some cylinder types have a connection pipe routed through the side for connection to the cold water main on any side and for easy draining with flat-gasket fitting.

Removable cylinder casing

The casing of the cylinder can be removed for transport and installation.

Standard flange dimensions and standard hole circle

Flanged aperture as cleaning and maintenance aperture

DHW circulation connection

For connection of a DHW circulation circuit

Suitable for use with plastic pipes

The following floorstanding cylinders are equipped as standard with a safety concept that permits the appliance to be connected to plastic pipework systems:

- › SHW
- › SHW ACE

These cylinders enable operating temperatures up to 82 °C to be selected. Limitation to lower temperatures, e.g. 60 / 65 °C, may be possible according to type.

Should faults develop, temperatures up to 95 °C (max. 0.6 MPa) can occur. Any plastic pipework used must be suitable for these conditions. These operating conditions must be checked against the manufacturer's details regarding the application limits of the plastic pipes.

Hydraulic connection

Floorstanding cylinders are designed to supply water to multiple draw-off points. The water connection of the cylinder is pressure-tested (sealed unvented).

Always observe accepted engineering standards, such as EN 806 and DIN 1988, and the regulations specified by your local water supply utility.

Never exceed the maximum permissible pressure specified on the type plate.

For safety reasons, standards such as DIN 1988 require an individually tested safety assembly to be installed directly on the water heater in the cold water line.

The critical factor when selecting a safety assembly is the maximum permissible pressure of the water heater. Make sure the safety valve and the associated drain facility are installed correctly. No shut-off valves should be installed between the safety valve and the water heater. Matching connection accessories are available for every cylinder. Use in combination is recommended because all safety equipment is already built in.

Hydraulic connection and required safety valve

	SHW S	SHW ACE	SHO AC	SB
Sealed unvented operation	•	•	•	•
At supply pressure ≤ 0.6 MPa safety valve ZH 1 (0.6 MPa)	•	•	•	
At supply pressure ≤ 1.0 MPa safety valve ZH 1 (1 MPa)				•
At supply pressure ≤ 1.0 MPa safety valve DMV / ZH 1 (0.6 MPa)	•	•	•	
At supply pressure > 0.6 MPa safety valve SV ¾-6	•	•	•	
At supply pressure ≤ 1.0 MPa safety valve SV ¾-100				•

Power supply

The electric floorstanding cylinders can be connected electrically for different operating modes depending on cylinder type. Factors to consider include the DHW consumption of the end users, the power supply utility's connection model, and the possible operating modes of the DHW cylinders.

Always observe accepted engineering standards, such as VDE 0100 in Germany, and the regulations of your local power supply utility.

Connect the DHW cylinder permanently to an AC power supply. The cable cross-section must be selected according to the appliance specification and safeguarded with a fuse/MCB.

In addition, the DHW cylinder must be able to be separated from the power supply by an isolator that disconnects all poles with at least 3 mm contact separation. For this, install circuit breakers, fuses, etc.

Single circuit operation

Single circuit appliances include all electric water heaters that operate at full connected electric heating output each time the control thermostat switches ON. The preselected DHW temperature is maintained continuously.

Dual circuit operation

The cylinder content is heated with the base heating stage during off-peak tariff periods. The enable times for this are provided by the local power supply utility. During off-peak tariff periods, a lower connected electrical load is usually used to heat the entire cylinder content to the set temperature. With this type of connection, the cylinder size is selected based on the volume of DHW stored until the next enable time.

In the event of additional demand for DHW, the pushbutton can be pressed during the normal tariff period to switch on quick heat-up for one-off heating with a (usually) greater connected electrical load. When the selected temperature is reached, the rapid heat-up function switches off and does not switch on again.

Possible connection versions

	SHW S	SHW ACE	SHO AC
Single circuit operation	•	•	•
Dual circuit operation	•		•

Floorstanding DHW cylinder 200 to 1000 litres SHW S



PLC0001963

Floorstanding DHW cylinder 200 to 1000 litres

Sealed unvented (pressure-tested) for supplying several draw-off points. Variable temperature selection. The controller maintains the water content (subject to connection) at the selected temperature. Automatic frost protection. Internal steel cylinder with special enamel coating and protective anode, DHW circulation connection and thermal insulation. Flanged immersion heater with copper heating elements. Controller-limiter combination with separation of all poles. Switch for output selection.

SHW S

- › Universal flanged immersion heater for dual and single circuit operation
- › Complete cylinder casing with plastic jacket, cover and fascia
- › The cold water inlet pipe is included in the standard delivery; can be connected on any side
- › Thermometer and signal anode with display element
- › Variable temperature selection from approx. 35 °C to approx. 82 °C
- › Optional temperature limit at 45 °C or 60 °C
- › Quick heat-up pushbutton
- › Installation also in connection with plastic pipework systems (observe manufacturer's details)
- › Permissible operating pressure 0.6 MPa (6 bar)
- › High grade thermal insulation (directly applied foam)

Accessories

- › 074371 DMV / ZH 1
- › 143498 Replacement anode 3/4
- › 074370 ZH 1

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

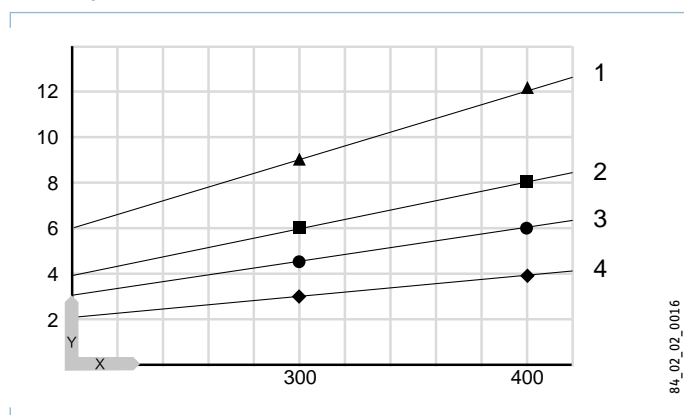
Floorstanding DHW cylinder 200 to 1000 litres

SHW S

		SHW 200 S	SHW 300 S	SHW 400 S
		182120	182121	182122
Hydraulic data				
Nominal capacity	l	200	300	400
Mixed water volume 40 °C (15 °C/65 °C)	l	392.4	581.6	767.7
Electrical data				
Connected load ~ 230 V	kW	2-4	2-4	2-4
Connected load ~ 400 V	kW	2-6	2-6	2-6
Rated voltage	V	230/400	230/400	230/400
Phases		1/N/PE, 3/N/PE	1/N/PE, 3/N/PE	1/N/PE, 3/N/PE
Frequency	Hz	50/60	50/60	50/60
Single circuit operating mode		X	X	X
Dual circuit operating mode		X	X	X
Application limits				
Temperature setting range	°C	35-82	35-82	35-82
Max. permissible pressure	MPa	0.6	0.6	0.6
Test pressure	MPa	0.78	0.78	0.78
Max. permissible temperature	°C	95	95	95
Max. flow rate	l/min	30	38	45
Energy data				
Standby energy consumption/24 h at 65 °C	kWh	1.5	1.9	2.25
Versions				
IP rating		IP24	IP24	IP24
Sealed unvented type		X	X	X
Colour		Pure white/basalt grey	Pure white/basalt grey	Pure white/basalt grey
Dimensions				
Height	mm	1578	1593	1763
Width	mm	630	700	750
Depth	mm	730	815	865
Weights				
Weight, full	kg	265	377	490
Weight, empty	kg	65	77	90

Heat-up diagram

Set temperature 60 °C



X Nominal capacity [l]

Y Duration [h]

1 2 kW

2 3 kW

3 4 kW

4 6 kW

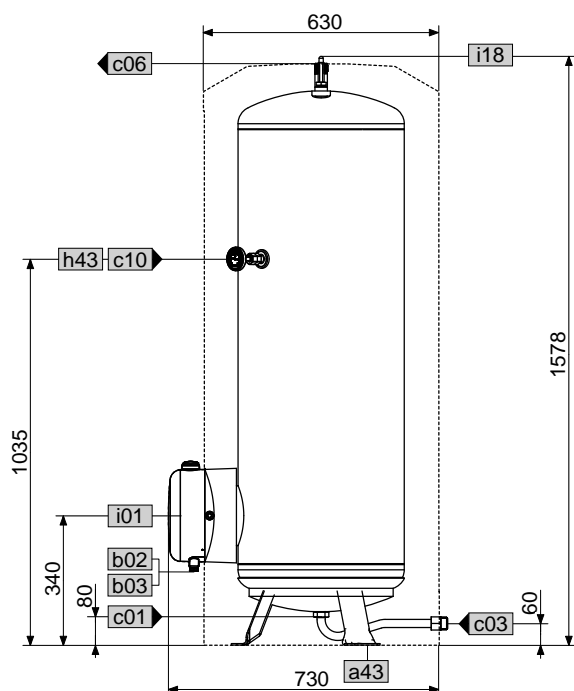
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

Floorstanding DHW cylinder 200 to 1000 litres SHW S

Dimensions and connections

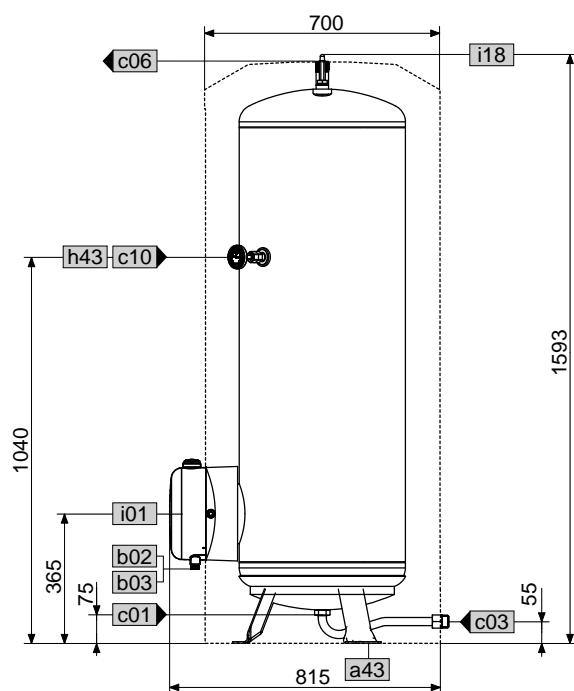
SHW 200 S



D0000025459

SHW 200 S				
a43	Appliance	Pitch circle diameter of feet	mm	430
a45	Feet fixing hole	Diameter	mm	19
b02	Entry electrical cables I	Diameter	mm	PG 16
b03	Entry electrical cables II	Diameter	mm	PG 13.5
c01	Cold water inlet	Male thread		G 1 A
c03	Cold water inlet pipe	Male thread		G 1 A
		Torque	Nm	100
c06	DHW outlet	Male thread		G 1 A
c10	DHW circulation	Male thread		G 1/2 A
h43	Thermometer	Diameter	mm	14.5
i01	Flange	Diameter	mm	210
		Pitch circle diameter	mm	180
		Screws		M 12
		Torque	Nm	55
i18	Protective anode	Female thread		G 1 1/4

SHW 300 S



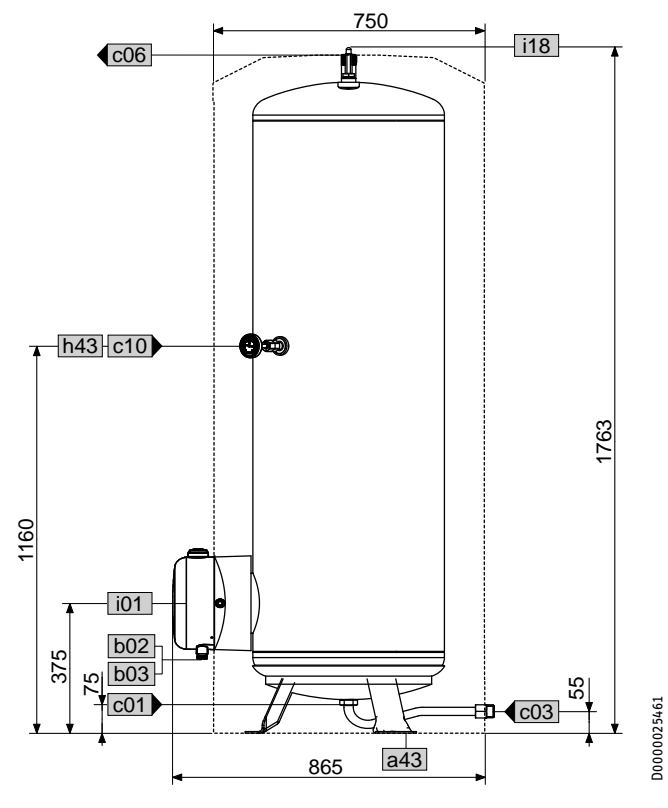
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SHW 300 S				
a43	Appliance	Pitch circle diameter of feet	mm	490
a45	Feet fixing hole	Diameter	mm	19
b02	Entry electrical cables I	Diameter	mm	PG 16
b03	Entry electrical cables II	Diameter	mm	PG 13.5
c01	Cold water inlet	Male thread		G 1 A
c03	Cold water inlet pipe	Male thread		G 1 A
		Torque	Nm	100
c06	DHW outlet	Male thread		G 1 A
c10	DHW circulation	Male thread		G 1/2 A
h43	Thermometer	Diameter	mm	14.5
i01	Flange	Diameter	mm	210
		Pitch circle diameter	mm	180
		Screws		M 12
		Torque	Nm	55
i18	Protective anode	Female thread		G 1 1/4

Floorstanding DHW cylinder 200 to 1000 litres

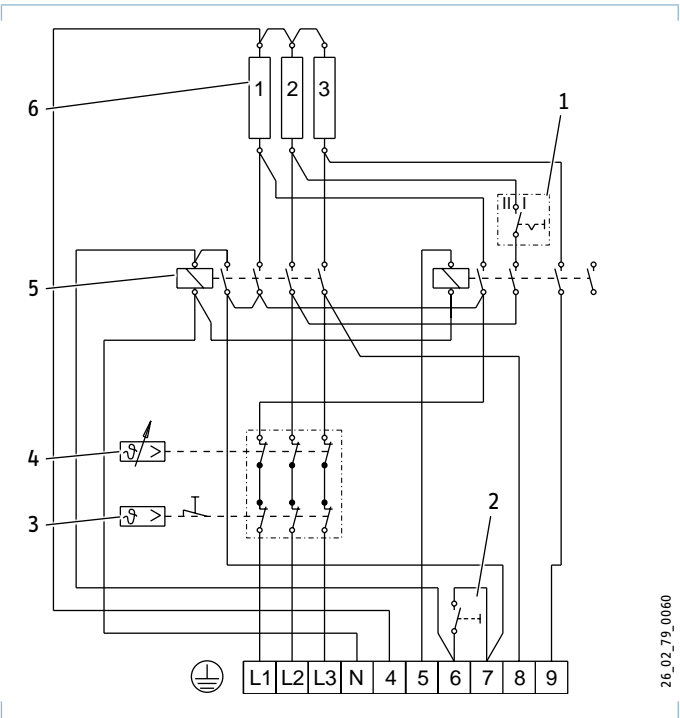
SHW S

SHW 400 S



			SHW 400 S
a43	Appliance	Pitch circle diameter of feet	mm 540
a45	Feet fixing hole	Diameter	mm 19
b02	Entry electrical cables I	Diameter	mm PG 16
b03	Entry electrical cables II	Diameter	mm PG 13.5
c01	Cold water inlet	Male thread	G 1 A
c03	Cold water inlet pipe	Male thread	G 1 A
		Torque	Nm 100
c06	DHW outlet	Male thread	G 1 A
c10	DHW circulation	Male thread	G 1/2 A
h43	Thermometer	Diameter	mm 14.5
i01	Flange	Diameter	mm 210
		Pitch circle diameter	mm 180
		Screws	M 12
		Torque	Nm 55
i18	Protective anode	Female thread	G 1 1/4

Wiring diagrams and terminals



- 1 Circuit breaker in control panel interior
- 2 Rapid heating pushbutton
- 3 High limit safety cut-out
- 4 Temperature controller
- 5 Contactor
- 6 Heating element, 2 kW ~ 230 V each

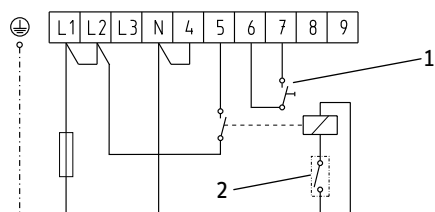
Floorstanding DHW cylinder 200 to 1000 litres

SHW S

Dual circuit operation

Single meter measurement with power-OFF contact

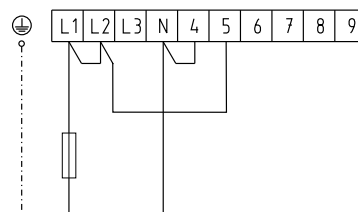
2/4 kW Switch position I 1/N/PE ~ 230 V
4/4 kW Switch position II 1/N/PE ~ 230 V



26_02_79_0061

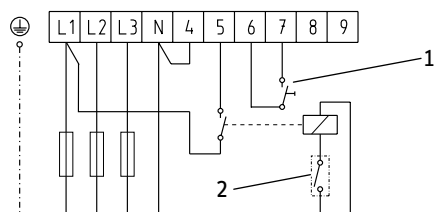
Single circuit operation

2(4) kW Switch position I 1/N/PE ~ 230 V
4(4) kW Switch position II 1/N/PE ~ 230 V



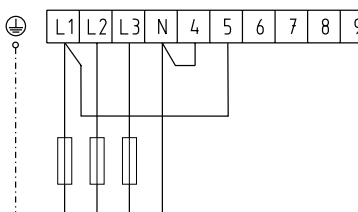
26_02_79_0065

2/6 kW Switch position I 3/N/PE ~ 400 V



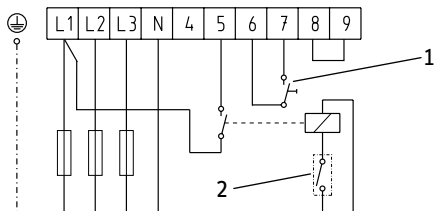
26_03_79_0062

2(6) kW Switch position I 3/N/PE ~ 400 V



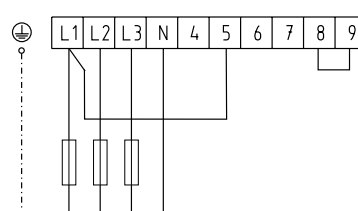
26_02_79_0066

3/6 kW Switch position I 3/N/PE ~ 400 V



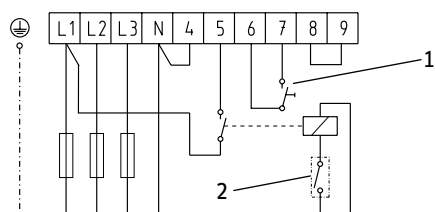
26_03_79_0063

3(6) kW Switch position I 3/N/PE ~ 400 V



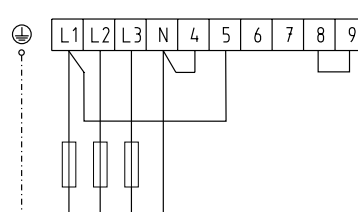
26_02_79_0067

4/6 kW Switch position I 3/N/PE ~ 400 V
6/6 kW Switch position II 3/N/PE ~ 400 V



26_02_79_0064

4(6) kW Switch position I 3/N/PE ~ 400 V
6(6) kW Switch position II 3/N/PE ~ 400 V



26_02_79_0068

- 1 Rapid heating pushbutton
- 2 Power-OFF contact

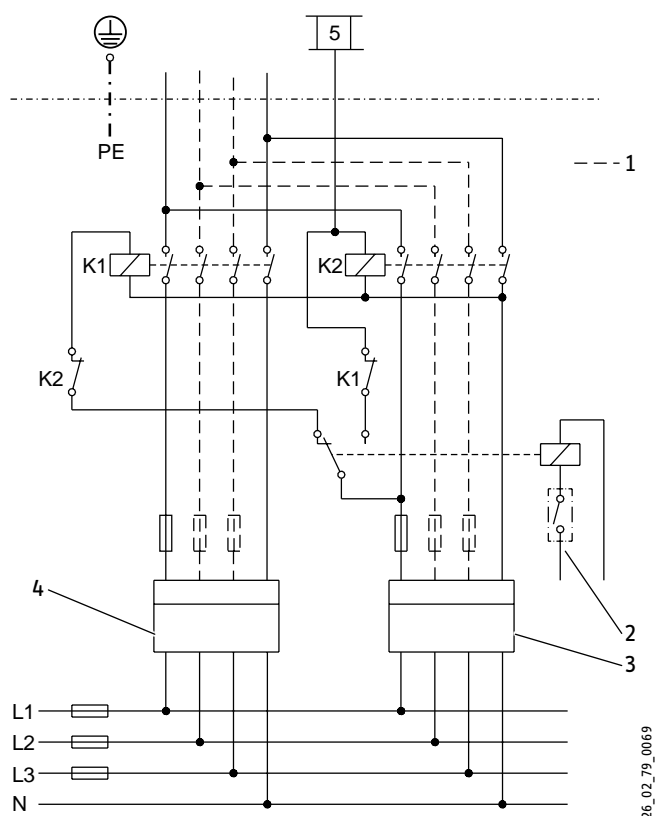
Floorstanding DHW cylinder 200 to 1000 litres SHW S

Dual circuit operation

Dual meter measurement with power-OFF contact

1/N/PE ~ 230 V

3/N/PE ~ 400 V



K1 Contactor 1

K2 Contactor 2

1 Connections also required for 3/N/PE ~ 400 V

2 Power-OFF contact

3 Off-peak tariff meter

4 Peak tariff meter

Floorstanding DHW cylinder 200 to 1000 litres

SHW ACE



PIC0001758

Floorstanding DHW cylinder 200 to 1000 litres

Sealed unvented DHW cylinder (pressure-tested) made from steel with special internal enamel coating plus anti-corrosion rod. For supplying DHW to several draw-off points in domestic, commercial and agricultural applications, also in conjunction with plastic pipework (observe manufacturer's details and application limits). Thermal insulation with low heat losses; plastic sleeve. Flanged immersion heater for single circuit operation with low-set heating element. The water is maintained by the controller (subject to connected load) at the selected temperature. Variable temperature selection from approx. 35 °C to approx. 82 °C. Controller-limiter combination with separation of all poles.

SHW ACE

- › Universal immersion heater for single circuit operation
- › Permissible operating pressure 0.6 MPa (6 bar)
- › Signal anode with visible display element
- › Pearl-white plastic jacket

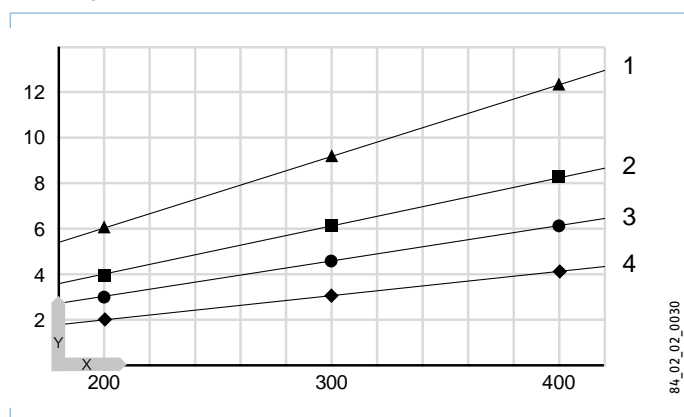
Floorstanding DHW cylinder 200 to 1000 litres

SHW ACE

		SHW 200 ACE 070074	SHW 300 ACE 070075	SHW 400 ACE 070076
Hydraulic data				
Nominal capacity	l	200	300	400
Mixed water volume 40 °C (15 °C/65 °C)	l	392.4	581.6	767.7
Electrical data				
Connected load ~ 230 V	kW	2-6	2-6	2-6
Connected load ~ 400 V	kW	4-6	4-6	4-6
Rated voltage	V	230/400	230/400	230/400
Phases		1/N/PE, 2/N/PE, 3/PE	1/N/PE, 2/N/PE, 3/PE	1/N/PE, 2/N/PE, 3/PE
Frequency	Hz	50/60	50/60	50/60
Single circuit operating mode		X	X	X
Application limits				
Temperature setting range	°C	35-82	35-82	35-82
Max. permissible pressure	MPa	0.6	0.6	0.6
Test pressure	MPa	0.78	0.78	0.78
Max. permissible temperature	°C	95	95	95
Max. flow rate	l/min	30	38	45
Energy data				
Standby energy consumption/24 h at 65 °C	kWh	1.9	2.2	2.7
Versions				
IP rating		IP25	IP25	IP25
Sealed unvented type		X	X	X
Colour		white	white	white
Dimensions				
Height	mm	1578	1593	1763
Width	mm	550	650	700
Depth	mm	690	790	840
Weights				
Weight, full	kg	254	367	454
Weight, empty	kg	54	67	85

Heat-up diagram

Set temperature "E"



X Nominal capacity [l]

Y Duration [h]

1 2 kW

2 3 kW

3 4 kW

4 6 kW

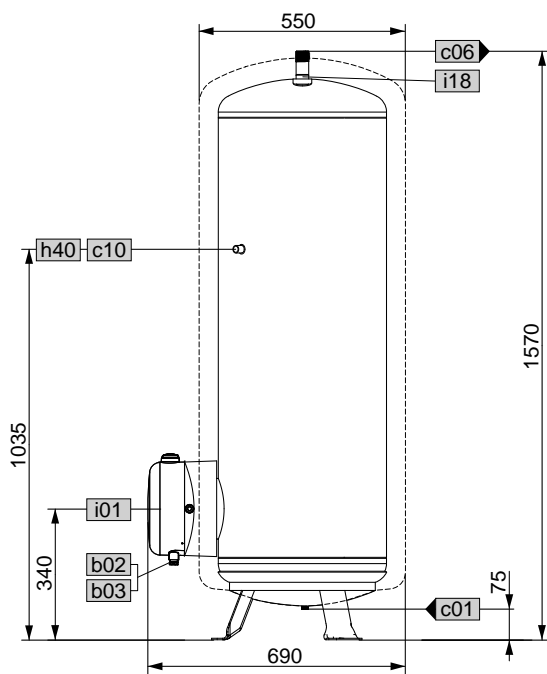
The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

Floorstanding DHW cylinder 200 to 1000 litres SHW ACE

Dimensions and connections

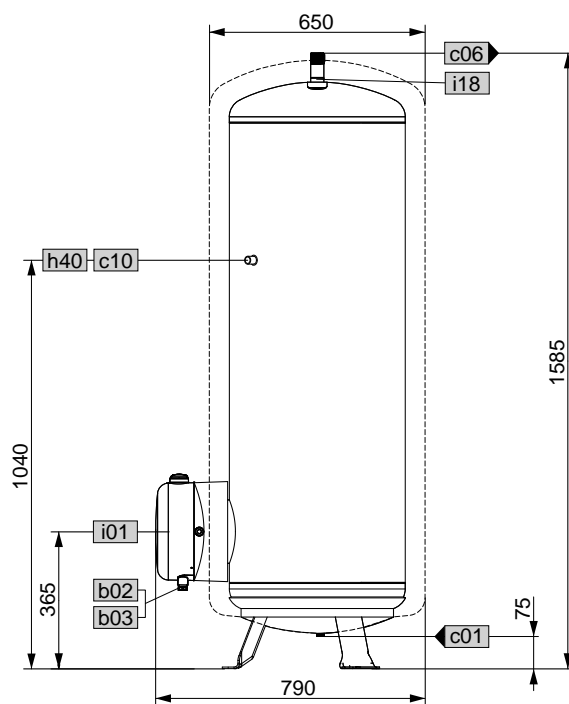
SHW 200 ACE



D0000025464

				SHW 200 ACE
a43	Appliance	Pitch circle diameter of feet	mm	430
a45	Feet fixing hole	Diameter	mm	19
b02	Entry electrical cables I	Fitting		PG 16
b03	Entry electrical cables II	Fitting		PG 13.5
c01	Cold water inlet	Male thread		G 1 A
c06	DHW outlet	Male thread		G 1 A
c10	DHW circulation	Male thread		G 1/2 A
h43	Thermometer	Diameter	mm	14.5
i01	Flange	Diameter	mm	210
		Pitch circle diameter	mm	180
		Screws		M 12
		Torque	Nm	55
i18	Protective anode	Female thread		G 1 1/4

SHW 300 ACE



D0000025465

				SHW 300 ACE
a43	Appliance	Pitch circle diameter of feet	mm	490
a45	Feet fixing hole	Diameter	mm	19
b02	Entry electrical cables I	Fitting		PG 16
b03	Entry electrical cables II	Fitting		PG 13.5
c01	Cold water inlet	Male thread		G 1 A
c06	DHW outlet	Male thread		G 1 A
c10	DHW circulation	Male thread		G 1/2 A
h43	Thermometer	Diameter	mm	14.5
i01	Flange	Diameter	mm	210
		Pitch circle diameter	mm	180
		Screws		M 12
		Torque	Nm	55
i18	Protective anode	Female thread		G 1 1/4

Floorstanding DHW cylinder 200 to 1000 litres
SHW ACE

[illegible]

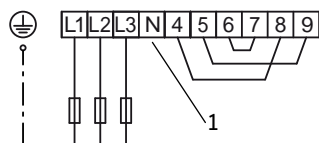
			SHW 400 ACE
a43	Appliance	Pitch circle diameter of feet	mm 540
a45	Feet fixing hole	Diameter	mm 19
b02	Entry electrical cables I	Fitting	PG 16
b03	Entry electrical cables II	Fitting	PG 13.5
c01	Cold water inlet	Male thread	G 1 A
c06	DHW outlet	Male thread	G 1 A
c10	DHW circulation	Male thread	G 1/2 A
h43	Thermometer	Diameter	mm 14.5
i01	Flange	Diameter	mm 210
		Pitch circle diameter	mm 180
		Screws	M 12
		Torque	Nm 55
i18	Protective anode	Female thread	G 1 1/4

The diagram illustrates a 3-phase 4-wire system with a star-delta switch. The input lines are labeled L1, L2, L3, and N. The switch mechanism (1) can connect the load (2) in either a star configuration (for 230V) or a delta configuration (for 400V). The star configuration uses the neutral line, while the delta configuration does not. The load is represented by three resistors (R) in a triangular arrangement.

-

Floorstanding DHW cylinder 200 to 1000 litres SHW ACE

6 kW, 3/PE ~ 230 V

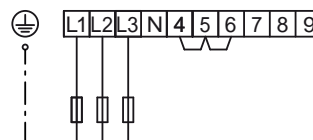


26.02.09_0024

1 Never connect N.

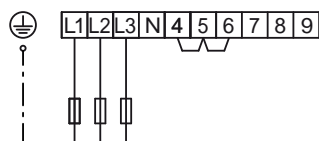
In Austria, only the following connections with separation of all poles are permissible:

2 kW, 1/N/PE ~ 230 V



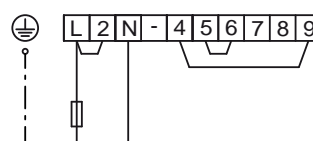
26.02.09_0025

6 kW, 3/PE ~ 400 V



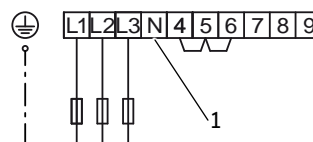
26.02.09_0025

3 kW, 1/N/PE ~ 230 V



26.02.09_0027

6 kW, 3/PE ~ 400 V



26.02.09_0028

1 Never connect N.

Floorstanding DHW cylinder 200 to 1000 litres

SHO AC



PIC00001593

Floorstanding DHW cylinder 200 to 1000 litres

Sealed unvented (pressure-tested) for supplying several draw-off points. Variable temperature selection. The controller maintains the water content (subject to connection) at the selected temperature. Automatic frost protection. Internal steel cylinder with special enamel coating and protective anode, DHW circulation connection and thermal insulation. Flanged immersion heater with copper heating elements. Controller-limiter combination with separation of all poles. Switch for output selection.

SHO AC

- › Flanged immersion heater for single circuit operation or dual circuit/single circuit operation, depending on cylinder type
- › Copper immersion heater elements can be replaced individually
- › Thermometer and signal anode with display element
- › Variable temperature selection from approx. 35 °C to approx. 82 °C
- › Optional temperature limit 60 °C
- › Thermal insulation as accessory
- › Permissible operating pressure 0.6 MPa (6 bar)

Accessories

- › 074370 ZH 1
- › 074371 DMV / ZH 1
- › 232875 WDV 611
- › 232876 WDV 1011
- › 143499 Replacement anode 1 1/4

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

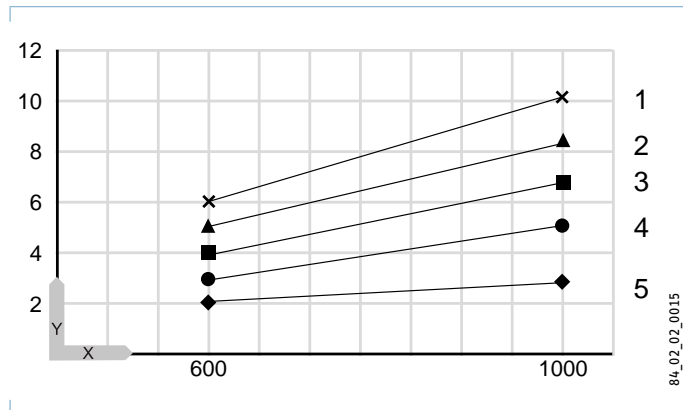
Floorstanding DHW cylinder 200 to 1000 litres

SHO AC

		SHO AC 600 7.5	SHO AC 600 6/12	SHO AC 1000 12	SHO AC 1000 9/18
		001414	003352	001415	003353
Hydraulic data					
Nominal capacity	l	600	600	1000	1000
Mixed water volume 40 °C (15 °C/65 °C)	l	1133.5	1133.5	1828.9	1828.9
Electrical data					
Connected load ~ 400 V	kW	7.5	6-12	12	9/18
Rated voltage	V	400	400	400	400
Phases		3/PE	3/N/PE	3/PE	3/N/PE
Frequency	Hz	50/60	50	50	50
Single circuit operating mode		X	X	X	X
Dual circuit operating mode			X		X
Application limits					
Temperature setting range	°C	35-85	35-85	35-85	35-85
Max. permissible temperature	°C	110	110	110	110
Max. permissible pressure	MPa	0.6	0.6	0.6	0.6
Test pressure	MPa	0.78	0.78	0.78	0.78
Max. flow rate	l/min	50	50	70	70
Energy data					
Standby energy consumption/24 h at 65 °C	kWh	2.3	2.3	3.2	3.2
Versions					
IP rating		IP24	IP24	IP24	IP24
Sealed unvented type		X	X	X	X
Dimensions					
Height	mm	1685	1685	2525	2525
Width	mm	750	750	750	750
Depth	mm	1030	1030	1030	1030
Weights					
Weight, full	kg	760	761	1230	1232
Weight, empty	kg	160	161	230	232

Heat-up diagram

Set temperature 60 °C



X Nominal capacity [l]

Y Duration [h]

- 1 6 kW
- 2 7.5 kW
- 3 9 kW
- 4 12 kW
- 5 18 kW

The heat-up time depends on the cylinder capacity, cold water inlet temperature and heating output.

Graph assumes 10 °C cold water temperature

Floorstanding DHW cylinder 200 to 1000 litres

SHO AC

Wiring diagrams and terminals

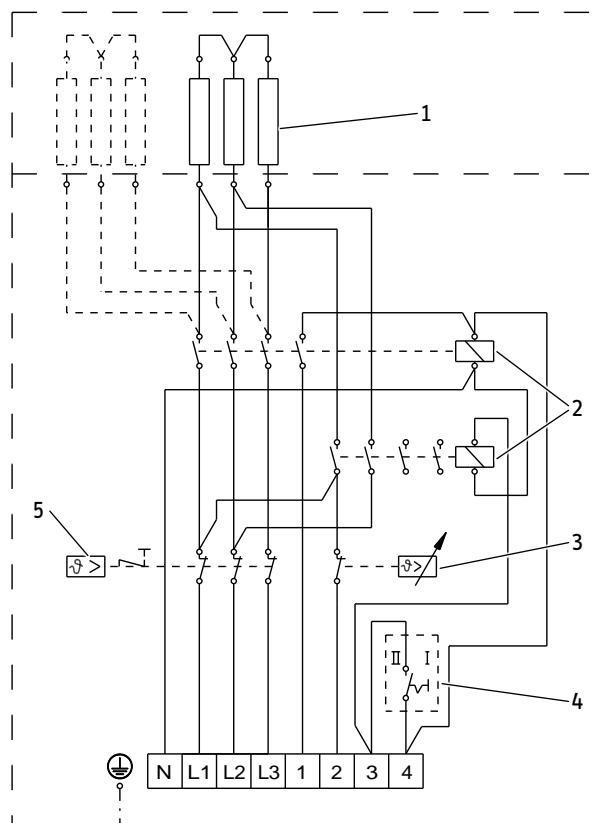
Dual circuit operation

6/12 kW 3/N/PE ~ 400 V

12/12 kW 3/N/PE ~ 400 V

9/18 kW 3/N/PE ~ 400 V

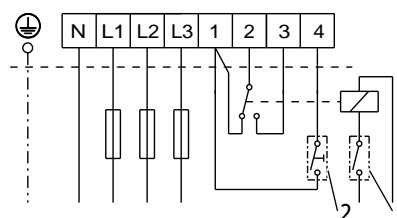
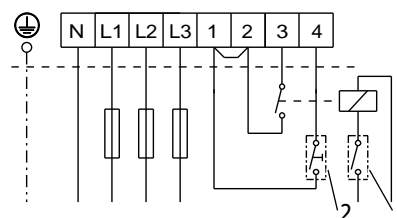
18/18 kW 3/N/PE ~ 400 V



- 1 Heating element ~ 400 V
- 2 Contactor
- 3 Temperature controller
- 4 Circuit breaker I / II
- 5 High limit safety cut-out

Dual circuit operation

Single meter measurement with power-OFF contact



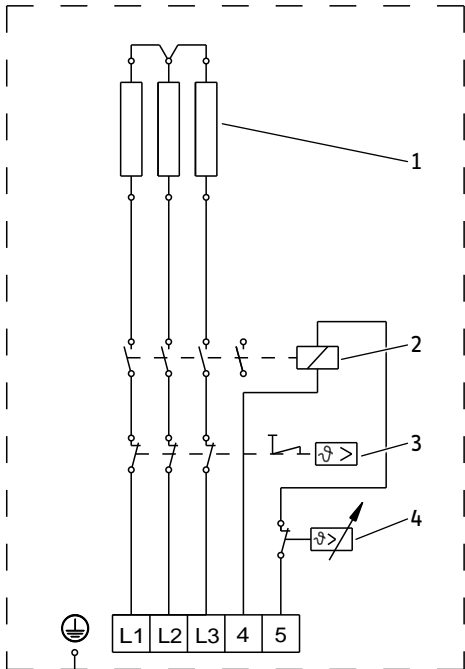
Rapid heating in off-peak tariff period only with position II of the circuit breaker

- 1 Power-OFF contact
- 2 Pushbutton for remote control of rapid heating

Floorstanding DHW cylinder 200 to 1000 litres SHO AC

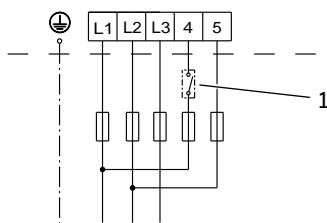
Single circuit operation

7.5 kW 3/PE ~ 400 V
12 kW 3/PE ~ 400 V



- 1 Heating element ~ 400 V
- 2 Contactor
- 3 High limit safety cut-out
- 4 Temperature controller

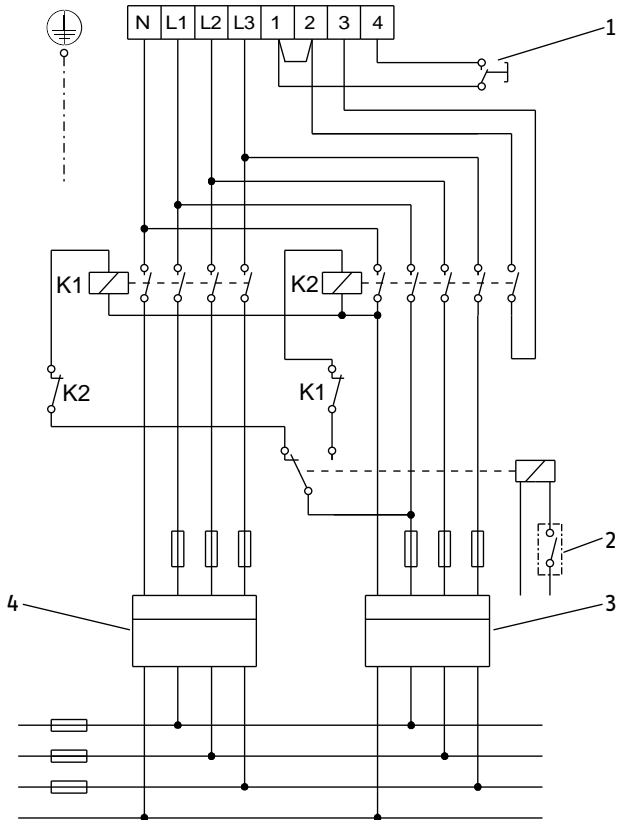
Connection example for single circuit operation with power-OFF contact



- 1 Power-OFF contact

Dual circuit operation Dual meter measurement with power-OFF contact

1/N/PE ~ 230 V
3/N/PE ~ 400 V



- K1 Contactor 1
- K2 Contactor 2
- 1 Pushbutton for remote control of rapid heating
- 2 Power-OFF contact
- 3 Off-peak tariff meter
- 4 Peak tariff meter

Floorstanding combi cylinder 300 to 1000 litres

SB S



PLC0001967

Floorstanding combi cylinder 300 to 1000 litres

Sealed (pressure-tested) for supplying several draw-off points in commercial, industrial and domestic situations. Existing connectors for: cold water and DHW, and in the upper area (except SB 650/3 AC) for thermometer, DHW circulation and threaded immersion heater (BGC). Internal steel cylinder with special enamel coating and protective anode. The flanged apertures (delivered with fitted protective caps) are equipped on site according to requirements, i.e. either with immersion heaters (FCR), indirect coils (WTW, WTFS) or blank flanges (B).

SB S

- › Number of flanged apertures: two
- › Complete cylinder casing with plastic jacket, cover and fascia
- › The cold water inlet pipe is included in the standard delivery; can be connected on any side
- › Thermometer and signal anode with display element
- › Permissible operating pressure 1.0 MPa (10 bar)
- › High grade thermal insulation (directly applied foam)

Accessories

- › 074371 DMV / ZH 1
- › 232030 BGC 2/60
- › 143498 Replacement anode 3/4
- › 075115 BGC/45
- › 076062 WTW 21/13
- › 072119 WTFS 21/13
- › 074370 ZH 1
- › 076102 B 21
- › 071330 FCR 21/60
- › 071331 FCR 21/120

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

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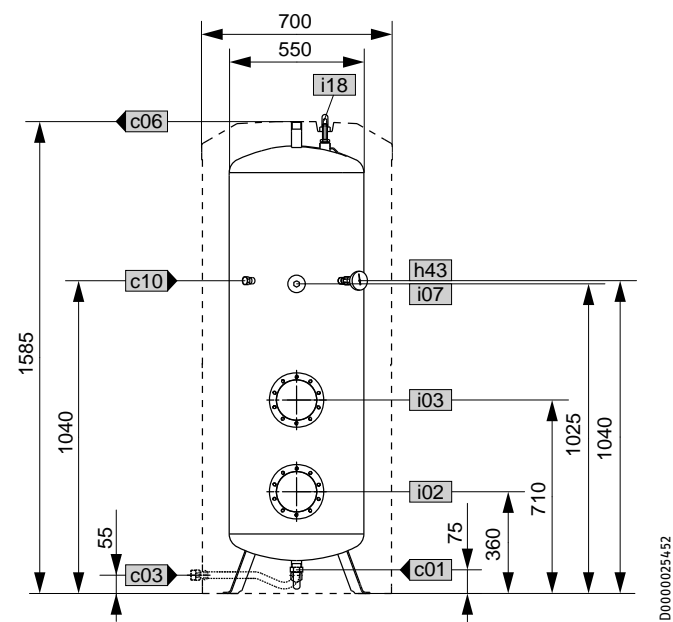
		SB 302 S	SB 402 S
		185354	185355
Hydraulic data			
Nominal capacity	l	300	400
Application limits			
Max. permissible temperature	°C	110	110
Max. permissible pressure	MPa	1.0	1.0
Test pressure	MPa	1.5	1.5
Max. flow rate	l/min	38	45
Dimensions			
Height	mm	1585	1755
Width	mm	700	750
Depth	mm	700	750
Weights			
Weight, full	kg	401	519
Weight, empty	kg	101	119

Floorstanding combi cylinder 300 to 1000 litres

SB S

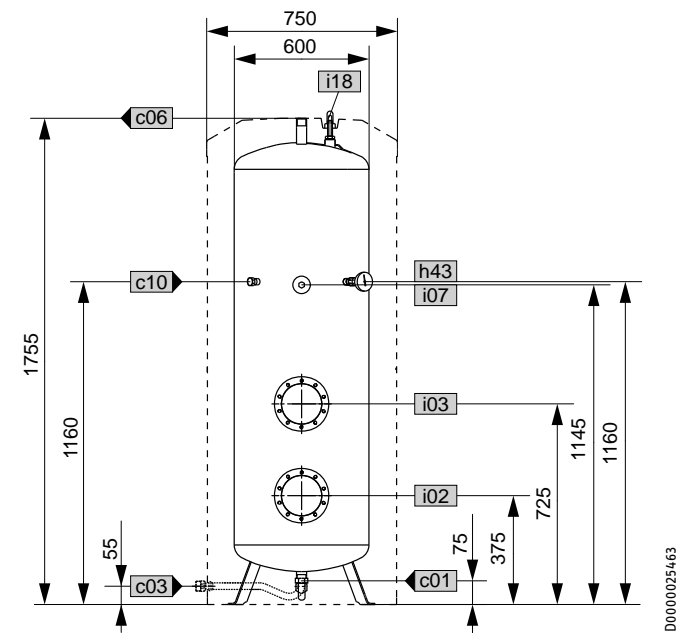
Dimensions and connections

SB 302 S



SB 302 S			
c01	Cold water inlet	Male thread	G 1 A
c03	Cold water inlet pipe	Male thread	G 1 A
		Torque	Nm 100
c06	DHW outlet	Male thread	G 1 A
c10	DHW circulation	Male thread	G 1/2 A
h43	Thermometer	Male thread	G 1/2 A
i02	Flange I	Diameter	mm 210
		Pitch circle diameter	mm 180
		Screws	M 12
		Torque	Nm 55
i03	Flange II	Diameter	mm 210
		Pitch circle diameter	mm 180
		Screws	M 12
		Torque	Nm 55
i07	Electric emergency/booster heater	Male thread	G 1 1/2 A
i18	Protective anode		

SB 402 S



SB 402 S			
c01	Cold water inlet	Male thread	G 1 A
c03	Cold water inlet pipe	Male thread	G 1 A
		Torque	Nm 100
c06	DHW outlet	Male thread	G 1 A
c10	DHW circulation	Male thread	G 1/2 A
h43	Thermometer	Male thread	G 1/2 A
i02	Flange I	Diameter	mm 210
		Pitch circle diameter	mm 180
		Screws	M 12
		Torque	Nm 55
i03	Flange II	Diameter	mm 210
		Pitch circle diameter	mm 180
		Screws	M 12
		Torque	Nm 55
i07	Electric emergency/booster heater	Male thread	G 1 1/2 A
i18	Protective anode		

Floorstanding combi cylinder 300 to 1000 litres

SB AC



PLC0001782

Floorstanding combi cylinder 300 to 1000 litres

Sealed (pressure-tested) for supplying several draw-off points in commercial, industrial and domestic situations. Existing connectors for: cold water and DHW, and in the upper area (except SB 650/3 AC) for thermometer, DHW circulation and threaded immersion heater (BGC). Internal steel cylinder with special enamel coating and protective anode. The flanged apertures (delivered with fitted protective caps) are equipped on site according to requirements, i.e. either with immersion heaters (FCR), indirect coils (WTW, WTFS) or blank flanges (B).

SB AC

- › Number of flanged apertures: two or three (SB 650/3 AC)
- › Thermal insulation as accessory
- › Thermometer and signal anode with display element
- › Permissible operating pressure 1.0 MPa (10 bar)

Accessories

- › 074371 DMV / ZH 1
- › 232030 BGC 2/60
- › 075124 FCR 28/360 Si
- › 075131 FCR 28/180 Si
- › 075140 FCR 28/120 Si
- › 075141 FCR 28/270 Si
- › 232877 WDV 612
- › 143499 Replacement anode 1 1/4
- › 000694 FCR 28/120
- › 000695 FCR 28/180
- › 000696 FCR 28/270
- › 001502 FCR 28/360
- › 071332 FCR 28/120
- › 071333 FCR 28/180
- › 075115 BGC/45
- › 076098 WTW 28/18
- › 076099 WTW 28/23
- › 072118 WTFS 28/23
- › 074370 ZH 1
- › 076103 B 28
- › 232878 WDV 1012
- › 232879 WDV 650

Detailed descriptions of the accessories available for this product group can be found at the end of this chapter.

An alphabetical product index can be found at the start of this technical guide.

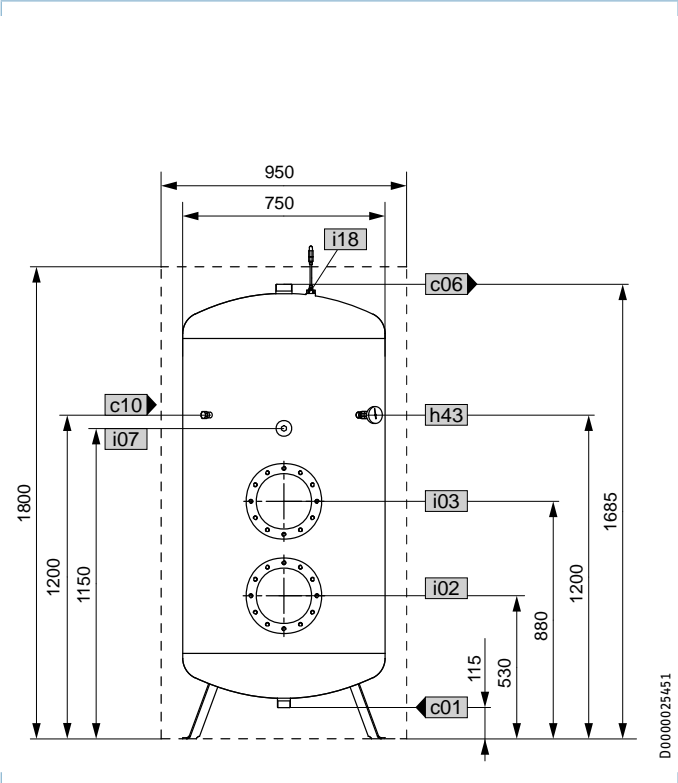
Floorstanding combi cylinder 300 to 1000 litres

SB AC

		SB 602 AC	SB 1002 AC	SB 650/3 AC
		071554	071282	003039
Hydraulic data				
Nominal capacity	l	600	1000	650
Application limits				
Max. permissible temperature	°C	110	110	110
Max. permissible pressure	MPa	1.0	1.0	1.0
Test pressure	MPa	1.5	1.5	1.5
Max. flow rate	l/min	50	70	50
Dimensions				
Height	mm	1685	2525	1725
Width	mm	750	750	750
Depth	mm	800	800	830
Weights				
Weight, full	kg	754	1212	840
Weight, empty	kg	154	212	190

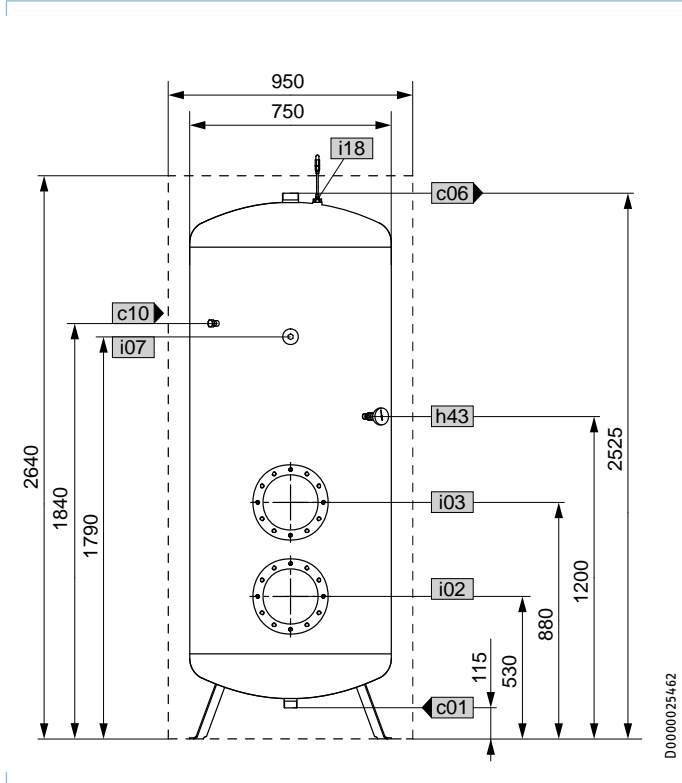
Dimensions and connections

SB 602 AC



			SB 602 AC
c01	Cold water inlet	Male thread	G 1 1/2 A
c06	DHW outlet	Male thread	G 2 A
c10	DHW circulation	Male thread	G 1/2
h43	Thermometer	Male thread	G 1/2 A
i02	Flange I	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 85
i03	Flange II	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 85
i07	Electric emergency/booster heater	Female thread	G 1 1/2
i18	Protective anode		

SB 1002 AC

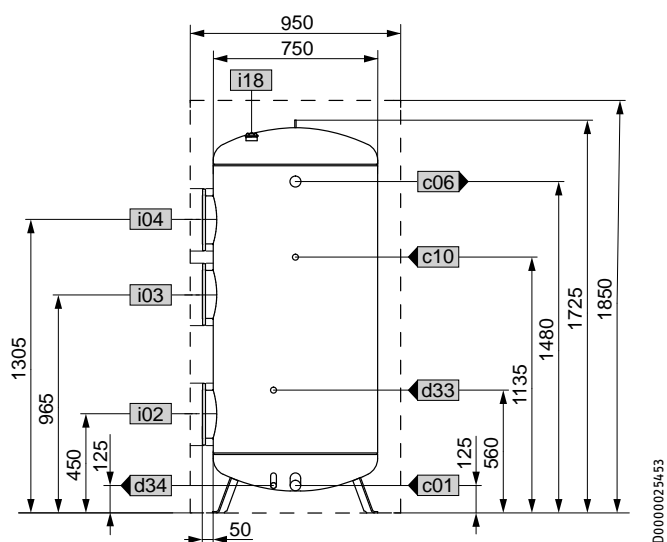


			SB 1002 AC
c01	Cold water inlet	Male thread	G 1 1/2 A
c06	DHW outlet	Male thread	G 2 A
c10	DHW circulation	Male thread	G 1/2
h43	Thermometer	Male thread	G 1/2 A
i02	Flange I	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 85
i03	Flange II	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 85
i07	Electric emergency/booster heater	Female thread	G 1 1/2
i18	Protective anode		

Floorstanding combi cylinder 300 to 1000 litres

SB AC

SB 650/3 AC



SB 650/3 AC			
c01	Cold water inlet	Male thread	G 1 1/2 A
c06	DHW outlet	Male thread	G 2 A
c10	DHW circulation	Male thread	G 1/2
d33	Heat source flow	Male thread	G 3/4 A
d34	Heat source return	Male thread	G 3/4 A
h43	Thermometer	Male thread	G 1/2 A
i02	Flange I	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 55
i03	Flange II	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 85
i04	Flange III	Diameter	mm 280
		Pitch circle diameter	mm 245
		Screws	M 14
		Torque	Nm 85
i07	Electric emergency/booster heater	Female thread	G 1 1/2
i18	Protective anode		

Floorstanding cylinder Flanged immersion heaters

Floorstanding cylinder Flanged immersion heaters

FCR 18

- › Variable temperature selection from 35 °C to 85 °C (in control panel interior)
- › Replaceable copper heating element
- › Permissible operating pressure 1.0 MPa (10 bar)



FCR 21

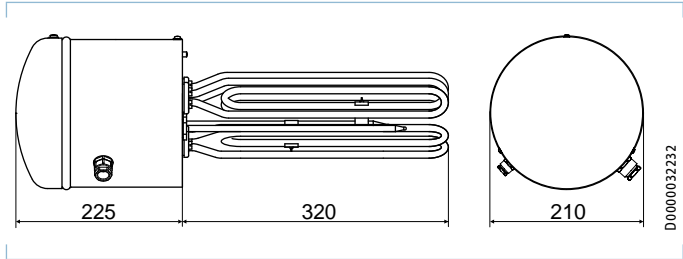
- › Variable temperature selection from approx. 35 °C to approx. 82 °C
- › Replaceable copper heating element
- › Permissible operating pressure 1.0 MPa (10 bar)



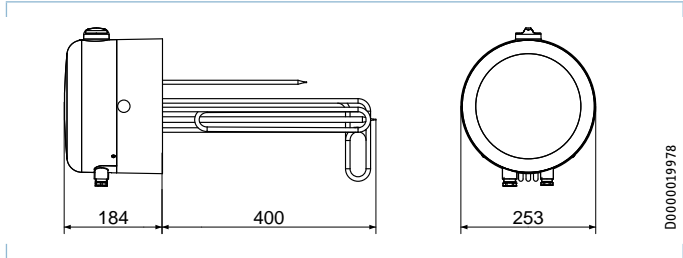
Flanged immersion heaters for horizontal installation in sealed unvented DHW cylinders with flange connector to DIN 4805, e.g. mating flange GF 18. Observe the details supplied by the cylinder manufacturer and DIN 4753 or 4751. Standard delivery: Temperature controller with frost protection setting, high limit safety cut-out, flange gasket, protective cover with two cable inlets.

Accessories

- › 001663 GF 18



Flanged immersion heaters for horizontal installation in sealed DHW cylinders with flange connector to DIN 4805. Observe the details supplied by the cylinder manufacturer and DIN 4753 or 4751. Standard delivery: Temperature controller with frost protection setting (external), optional temperature limit, integral push button for quick heat-up, high limit safety cut-out, flange gasket, protective cover with two cable inlets.



		FCR 18/60	FCR 18/90	FCR 21/60	FCR 21/60 CrNi	FCR 21/120
		000691	000692	071330	231932	071331
Connected load ~ 230 V	kW			2-4		4
Connected load ~ 400 V	kW	6	9	2-6	2-6	8/12
Connected load ~ 380 V	kW			1.8-5.4		7.2/10.8
Rated voltage	V	400	400	230/400	400	230/400
Phases		3/PE	3/PE	1/N/PE, 3/N/PE	3/PE	1/N/PE, 2/PE, 3/PE
Frequency	Hz	50/60	50	50/60	50/60	50/60
Single circuit operating mode		X	X	X	X	X
Dual circuit operating mode				X		
Temperature setting range	°C	35-85	35-85	35-82	35-82	35-82
Max. permissible pressure	MPa	1.0	1.0	1.0	1.0	1.0
Minimum cylinder diameter	mm	450	450	450	450	450
Minimum cylinder volume	l	200	200	200	200	200
IP rating		IP24	IP24	IP24	IP24	IP24
External flange diameter	mm	180	180	210	210	210
Immersion depth	mm	325	325	400	422	400
Torque	Nm	55	55	55	55	55
Weight	kg	13.5	15.5	6	5.5	5.8

Floorstanding cylinder Flanged immersion heaters

FCR 28

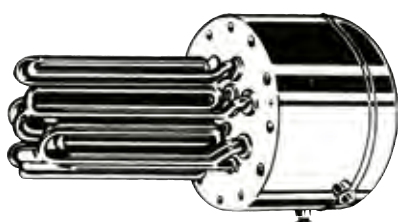
- › Variable temperature selection from approx. 35 °C to approx. 85 °C
- › FCR (single circuit) temperature selection in control panel interior
- › FCR (dual circuit/single circuit) external control for temperature selection
- › Replaceable copper heating element
- › Permissible operating pressure 1.0 MPa (10 bar)

Flanged immersion heaters for horizontal installation in sealed unvented DHW cylinders with flange connector to DIN 4805, e.g. mating flange GF 28. Observe the details supplied by the cylinder manufacturer and DIN 4753 or 4751. Standard delivery: Temperature controller with frost protection setting, high limit safety cut-out, flange gasket, protective cover with two cable inlets.

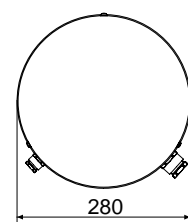
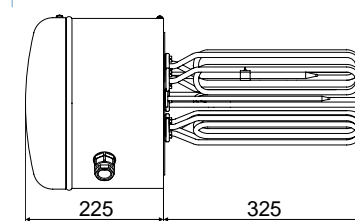
Accessories

- › 001664 GF 28

FCR 28/120

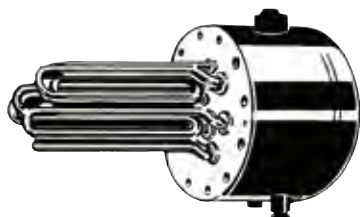


P/C00001589

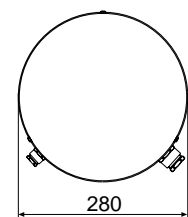
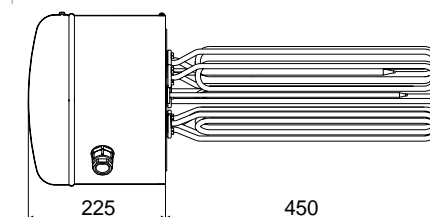


D0000020344

FCR 28/360



P/C00001780



D0000020345

		FCR 28/120	FCR 28/120	FCR 28/180	FCR 28/180	FCR 28/270	FCR 28/360
		000694	071332	071333	000695	000696	001502
Connected load ~ 400 V	kW	12	6/12	9/18	18	27	36
Rated voltage	V	400	400	400	400	400	400
Phases		3/PE	3/N/PE	3/N/PE	3/PE	3/PE	3/PE
Frequency	Hz	50	50	50	50	50	50/60
Single circuit operating mode		X			X	X	X
Dual circuit operating mode			X	X			
Temperature setting range	°C	35-85	35-85	35-85	35-85	35-85	35-85
Max. permissible pressure	MPa	1.0	1.0	1.0	1.0	1.0	1.0
Minimum cylinder diameter	mm	450	550	550	450	450	550
Minimum cylinder volume	l	200	300	300	200	200	300
IP rating		IP24	IP24	IP24	IP24	IP24	IP24
External flange diameter	mm	280	280	280	280	280	280
Immersion depth	mm	325	450	450	325	325	450
Torque	Nm	80	80	80	80	80	80
Weight	kg	13	13	13	13	13	17

Floorstanding cylinder

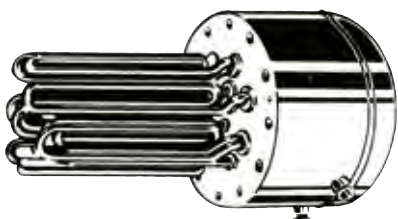
Flanged immersion heaters

FCR 28 Si

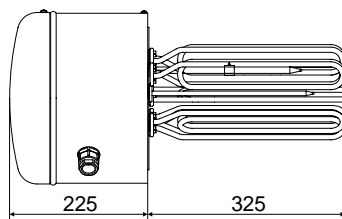
- › Variable temperature selection from 30 °C to 85 °C
- › FCR (single circuit) temperature selection in control panel interior
- › Replaceable copper heating element
- › Permissible operating pressure 1.0 MPa (10 bar)

Flanged immersion heater for horizontal installation in sealed unvented floorstanding cylinders. Flanged immersion heater for single circuit operation. DHW temperature can be variably adjusted on the controller in control panel interior from approx. 30 to approx. 85 °C, factory-set to 60 °C (detent position). The water inside the cylinder is held by the controller at the selected temperature; automatic frost protection; high limit safety cut-out; excluding fitted switching protection; individually replaceable copper heating element; fitted flange gasket; flange fixing screws supplied separately. IP24 (splashproof).

FCR 28/120 Si | FCR 28/180 Si | FCR 28/270 Si

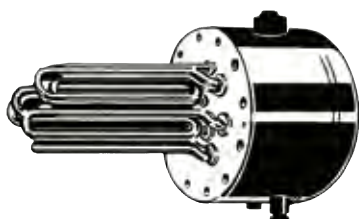


PIC00001589

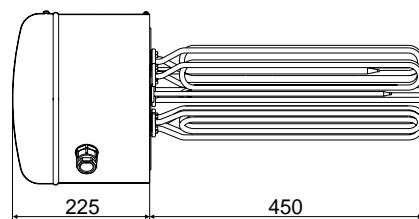


D0000020344

FCR 28/360 Si



PIC00001780



D0000020345

		FCR 28/120 Si	FCR 28/180 Si	FCR 28/270 Si	FCR 28/360 Si
		075140	075131	075141	075124
Connected load ~ 400 V	kW	12	18	27	36
Connected load ~ 380 V	kW	10.8	16.4	24.4	32.6
Rated voltage	V	400	400	400	400
Phases		3/PE	3/PE	3/PE	3/PE
Frequency	Hz	50/60	50/60	50/60	50/60
Single circuit operating mode		X	X	X	X
Temperature setting range	°C	35-85	35-85	35-85	35-85
Max. permissible pressure	MPa	1	1	1	1
Minimum cylinder diameter	mm	450	450	450	550
Minimum cylinder volume	l	200	200	200	300
IP rating		IP24	IP24	IP24	IP24
External flange diameter	mm	280	280	280	280
Immersion depth	mm	325	325	325	450
Torque	Nm	80	80	80	80
Weight	kg	13	13	14.8	17.7

Floorstanding cylinder Flanged immersion heaters

BGC



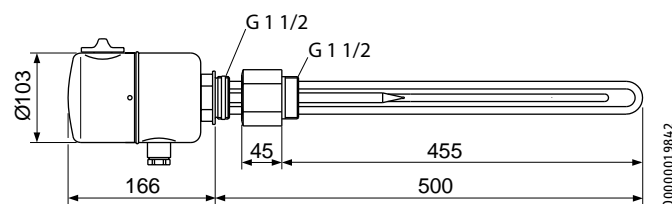
PIC00001598

Threaded immersion heater for sealed heating and DHW heating systems. Variable temperature selection from approx. 10 °C to 80 °C. The temperature may be limited to 45/60/80 °C. Integral temperature controller with high limit safety cut-out. Heating element and protective pipe material: Copper; threaded connection: Brass, thread G 1 1/2 with PTFE gasket.

		BGC/45	BGC	BGC 2/60	BGC 2
		075115	003769	232030	232029
Connected load ~ 230 V	kW	2-5.7	2-5.7	2-5.7	2-5.7
Connected load ~ 400 V	kW	6	6	6	6
Rated voltage	V	230/400	230/400	230/400	230/400
Phases		1/N/PE, 2/PE, 3/PE	1/N/PE, 2/PE, 3/PE	1/N/PE, 2/PE, 3/PE	1/N/PE, 2/PE, 3/PE
Frequency	Hz	50/60	50/60	50/60	50/60
Single circuit operating mode		X	X	X	X
Temperature setting range	°C	10-80	10-80	10-80	10-80
Max. permissible pressure	MPa	1	1	1	1
IP rating		IP44	IP44	IP44	IP44
Immersion depth	mm	455	500	480	540
Weight	kg	2.5	2	2.8	2.2

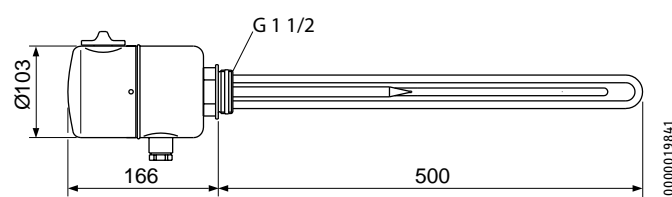
BGC/45

- › Complete connection nipple G 1 1/2 for optional threading through the thermal insulation
- › Suitable for use with DHW cylinders SBB (WP) basic and Trend
- › Suitable for use with SB, SBB and SBP cylinders up to 500 l with directly applied foam insulation



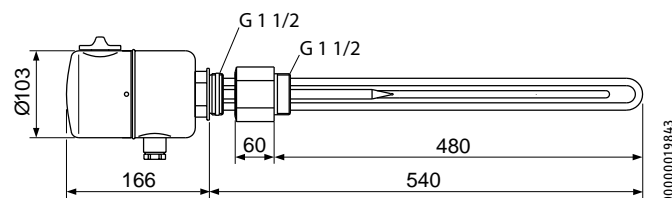
BGC

- › For use in WPRB pipe assembly for electric reheating



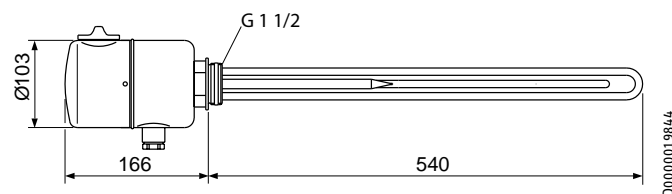
BGC 2/60

- › Complete with connection nipple 60 mm G 1 1/2 to enable threaded fitting through the thermal insulation
- › Suitable for use with SBB, SBS and SBP system cylinders in conjunction with WD and WDH thermal insulation
- › Suitable for use with buffer cylinders SBP 700 E/E SOL and solar cylinders SBB 600 plus
- › Suitable for use with SB, SBB and SBP cylinders up to 500 litres, with directly applied foam insulation (exception SBB (WP) basic and Trend)



BGC 2

- › Special applications in system/tank construction



Floorstanding cylinder

Flanged immersion heaters

B 21 | B 28

Blank flanges for the optional sealing of flanged apertures, enamel coated on the inside. The gaskets, screws with insulation sleeves and cap with thermal insulation are part of the standard delivery.

		B 21	B 28
		076102	076103

GF 18 | GF 28

Mating flanges for special cylinder models. The mating flanges are welded into the cylinder constructed on site and enable the installation of flanged immersion heater FCR 18 or FCR 28.

		GF 18	GF 28
		001663	001664

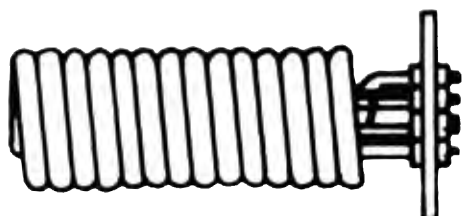
Floorstanding cylinder

Indirect coils

Floorstanding cylinder

Indirect coils

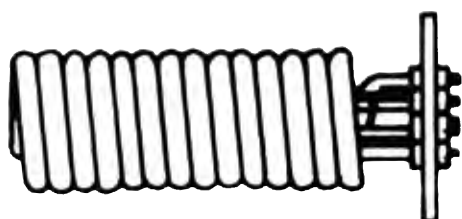
WTW



- › WTW 21/13 for installation in SB 302-402 S
- › WTW 28/18 for installation in SB 602-1002 AC, SB 650/3 AC
- › WTW 28/23 for installation in SB 602-1002 AC, SB 650/3 AC

		WTW 21/13	WTW 28/18	WTW 28/23
		076062	076098	076099
Flange diameter	mm	210	280	280
Material		Copper	Copper	Copper
Immersion depth	mm	410	440	540
Connection		G1	G1	G1
Area	m ²	1.3	1.8	2.3
Flow rate	m ³ /h	0.7	1.0	1.4
Permiss. Operating pressure	bar	15	15	15
Weight	kg	10	10	10
Contents	l	0.7	1.4	1.7

WTFS



- › WTFS 21/13 for installation in SB 302-402 S
- › WTFS 28/23 for installation in SB 602-1002 AC, SB 650/3 AC

		WTFS 21/13	WTFS 28/23
		072119	072118
Flange diameter	mm	210	280
Material		Copper	Copper
Immersion depth	mm	410	540
Connection		12 mm (internal)	14.3 mm (internal)
Area	m ²	1.25	2.32
Permiss. Operating pressure	bar	25	28

Finned tube indirect coil for DHW heating in conjunction with boiler operation. The indirect coil and thermostat protective pipe are fitted to the flange plate with a gasket and are suitable for installation in floorstanding combi cylinders. Screws, insulation sleeves, thermostat with protective pipe (6.5 mm internal dia.) for the heating circuit pump controller and the cap with thermal insulation are part of the standard delivery.

Finned tube safety indirect coil for DHW heating in conjunction with refrigerant. The indirect coil is fitted to the flange plate with a gasket and is suitable for installation into floorstanding combi cylinders. Twin wall copper pipe with leak indicator and inert gas filling. The screws and the cap with thermal insulation are part of the standard delivery.

Floorstanding cylinder

Safety assemblies

Floorstanding cylinder

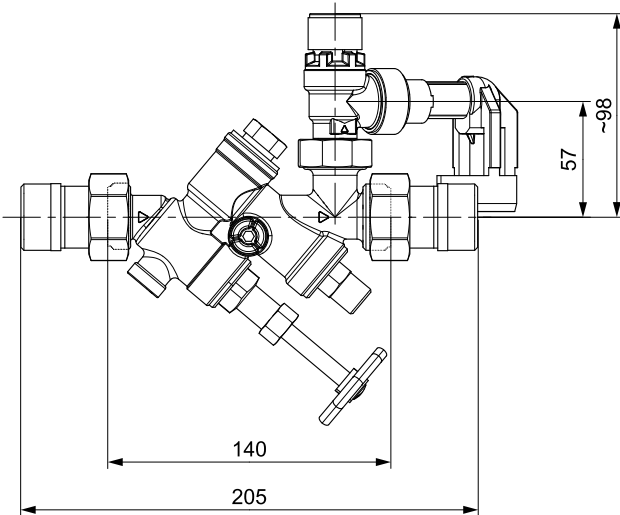
Safety assemblies

ZH 1



PI(C00002267

Safety assembly ZH 1 for sealed floorstanding electric cylinders and combi cylinders up to 1000 litres. Pressure reducing valve DMV/ZH1 may be retrofitted. Brass casing, threaded fittings.



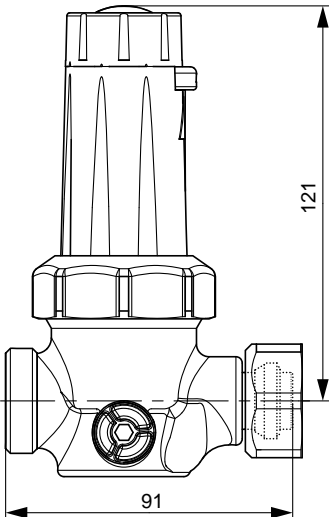
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DMV / ZH 1



PI(C00002268

Special pressure reducing valve G 1 as supplement to ZH 1, if the static pressure at the installation location exceeds 0.48 MPa (4.8 bar).



D0000017702

		ZH 1	DMV / ZH 1
		074370	074371
Safety valve response pressure	MPa	0.6	
Pressure reducing valve		-	X
Drip water connection		X	
Connection		G 3/4 A	3/4 inch
Type of installation		Finished walls	Finished walls
Water connection			G 3/4

Floorstanding cylinder

Safety assemblies

SV

Safety valve for sealed unvented, pressurised cylinders with up to 0.6 MPa (6 bar) permissible operating pressure.



- SV 1/2-6**
- › Diaphragm safety valve with brass casing, response pressure 0.6 MPa or 1.0 MPa (6 or 10 bar) for DHW cylinders.

- SV 3/4-6**
- › Diaphragm safety valve with brass casing, response pressure 0.6 MPa or 1.0 MPa (6 or 10 bar) for DHW cylinders.

- SV 3/4-10**
- › Safety valve G 3/4, response pressure 1.0 MPa (10 bar), for DHW cylinders up to 1000 l and 1.0 MPa (10 bar) max. operating pressure

		SV 1/2-6	SV 3/4-6	SV 3/4-10
		074373	074374	074375
Safety valve response pressure	MPa	0.6	0.6	1
Water connection		G 1/2	G 3/4	G 3/4

Floorstanding cylinder Accessories

Floorstanding cylinder Accessories

WDV 611 | WDV 1011



High grade fleece thermal insulation with insulation cover and floor disc for floorstanding cylinders SHO AC. Graphite inserts in the fleece ensure low heat losses. Plastic jacket in white; cover in black. Thermal insulation secured with a quick-release hook strip.

- › Thermal insulation WDV 611 for floorstanding cylinders SHO AC 600 or SHO AC 1000

WDV 612 | WDV 1012



High grade fleece thermal insulation with insulation cover and floor disc for floorstanding combi cylinders SB AC. Graphite inserts in the fleece ensure low heat losses. Plastic jacket in white; cover in black. Thermal insulation secured with a quick-release hook strip.

- › Thermal insulation WDV 612 for floorstanding combi cylinders SB 602 AC or SB 1002 AC

WDV 650

- › Thermal insulation WDV 650 for floorstanding combi cylinder SB 650 AC

High grade fleece thermal insulation with insulation cover and floor disc for floorstanding combi cylinders SB/650/3 AC. Graphite inserts in the fleece ensure low heat losses. Plastic jacket in white; cover in black. Thermal insulation secured with a quick-release hook strip.

		WDV 611	WDV 1011	WDV 612	WDV 1012	WDV 650
		232875	232876	232877	232878	232879
Insulation for		SHO AC 600	SHO AC 1000	SB 602 AC	SB 1002 AC	SB 650/3 AC
Height	mm	1850	2690	1850	2690	1920
Thickness	mm	100	100	100	100	100
Standby energy consumption/24 h at 65 °C	kWh	2.3	3.2	2.6	3.5	3.3

Replacement anode 3/4

- › For floorstanding cylinder SHW 200-400 S, HSTP 200-400 or floorstanding combi cylinder SB 302-402 S

Segmented signal anode for floorstanding cylinders, may also be installed in rooms with low ceiling height. For optional use in conjunction with floorstanding cylinders or combi cylinders.

	Replacement anode 3/4
	143498

Replacement anode 1 1/4

- › For floorstanding cylinder SHO AC 600-1000 or floorstanding combi cylinder SB 602-1002 AC

Segmented signal anode for floorstanding cylinders, may also be installed in rooms with low ceiling height. For optional use in conjunction with floorstanding cylinders or combi cylinders.

	Replacement anode 1 1/4
	143499

Notes

Hand dryers



Appliance selection

Electric hand dryers have been developed especially for use in sanitary facilities of public buildings, restaurants, pubs, hotels and industrial companies. Their use guarantees economy, hygiene and environmental responsibility.

The use of hand dryers eliminates the need for replacement and disposal/cleaning of paper or fabric towels. This reduces labour and storage costs and paper waste.

Operating costs are also lower as a result. The one-off investment is followed by minimal operating costs.

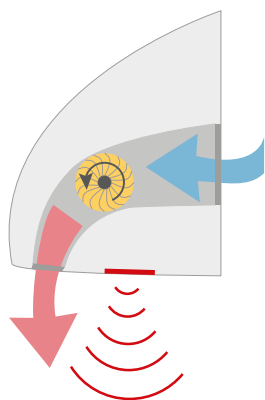
The methods of operation and consequently the product range can be divided into two general types of hand dryers:

High speed hand dryers

High speed hand dryers which blow the moisture away with a rapid, concentrated blast of air. With a drying time of less than 15 s and operating noise of 82 dB(A), this type of hand dryer is suitable above all for use in sanitary facilities with high traffic.

Hot air hand dryers

Hot air hand dryers, on the other hand, operate by evaporation, using heated air to dry the moisture directly on the skin. These hand dryers achieve a drying time of approx. 25 s with operating noise of 68 dB(A). They are therefore ideal for use in sanitary facilities where comfort is considered more important than speed.



D0000032123




Function diagram for hand dryers

All appliances have infrared proximity switches for non-contact, hygienic drying on demand. A high level of operational safety is ensured by a high limit safety cut-out for overheating protection, plus electronic components which prevent the device being left on continuously.

PRODUCTS

Hand dryers

The summary below shows the equipment features of the various appliance types. Additional versions and details regarding configuration and assembly can be found in the relevant planning and product sections of this technical guide.

	Ultronic	HTT	HTE
	 <p>PIC00002971</p>	 <p>PIC0000274</p>	 <p>PIC0000238</p>
High speed hand dryers	•		
Hot air hand dryers		•	•
Infrared electronics for non-contact operation	•	•	•
Made in Germany	•	•	•
Connected load: 0.91 kW	•		
Connected load: 1.80 kW			•
Connected load: 2.60 kW		•	
IP rating: IP23		•	•
IP rating: IP24	•		
Safety category I	•		
Safety category II		•	•
Operating noise 54 dB(A)			•
Operating noise 68 dB(A)		•	
Operating noise 82 dB(A)	•		

PRODUCTS

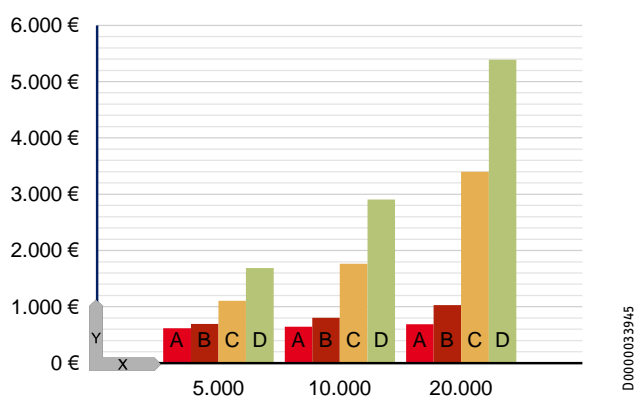
Hand dryers

Economic efficiency

Research by the ipi-Institut für Produktforschung und Information GmbH, Esslingen, verified the outstanding economy of electronically controlled hand dryers. Hand dryers are by far the most economical system for sanitary areas in administrative buildings, industrial companies, hotels, pubs, restaurants, swimming pools, sports centres etc.

For cost comparisons, a cost of €0.003 per drying can be assumed. It takes only around 14 dryings per day for hand dryers to work out as the most cost effective solution when compared with paper and cloth towel systems. They cut costs by up to 80 %.

Cost comparison between electric hand dryers and alternative systems



Based on: Study of the economy of hand drying by the ipi-Institut Esslingen. Total costs are calculated from base costs (acquisition and installation of the appliance and accessories) plus operating costs (based on: price offered by the manufacturer, electricity price €0.25 per kWh).

X Number of drying procedures per year

Y Total costs after 5 years [€]

A Ultronic

B HTT turbotronic

C Single-sheet paper systems

D Cloth roll towel systems

Hygiene

Current legislation does not restrict the use of electric hand dryers in buildings and facilities. The German UBA [Environmental Protection Agency] certifies that electric hand dryers meet hygiene requirements and are on a comparable level to paper towels.

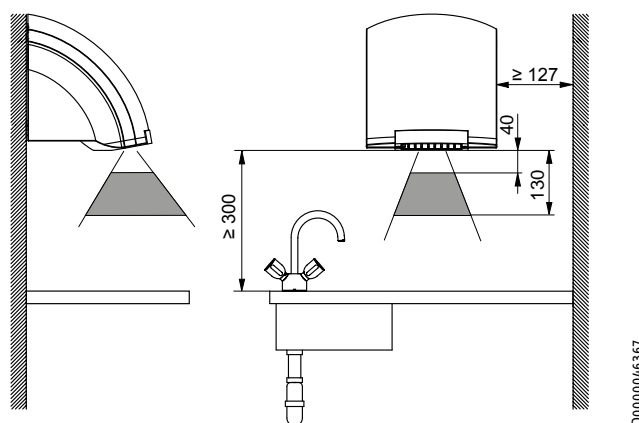
In Germany, the use of drying equipment in workplaces is subject to the Workplace Directives of the Federal Ministry of Labour (BMA), where hand dryers are explicitly confirmed as suitable, hygienic facilities for drying hands.

In a further study, the Institut Fresenius and the ipi-Institut investigated whether hot air hand dryers increase or decrease the bacteria count in the air discharged from them. The results demonstrated that the total number of bacteria in the discharge air was significantly lower than in the intake air, meaning that hot air hand dryers reduce airborne bacteria.




Furthermore, the design and shape of the external housing prevents objects from being placed on it.

Installation

The following clearance dimensions and recommended heights can be used as a guide for the installation of an electric hand dryer. As the dryers are electrical devices, the requirements for protection zones and installation areas must be checked and complied with regardless of these dimensions. Furthermore, the permanent electrical connection at the installation location must be provided with the appropriate cross-section and the necessary fuse/MCB protection.



Clearances

	Age	Height [mm]
	Adult man	1350
	Adult woman	1250
	Nursery school	4 - 7 810
	Primary school	7 - 10 910
	High school	10 - 13 1120
	High school	13 - 16 1250

Guidelines for installation height

The devices themselves are installed using four screws on a vertical wall. The casing cover is secured with screws as well.

Thus, rapid and easy installation and protection against vandalism are assured.

Highspeed hand driers

Ultronic

Ultronic S



PIC00002971

Ultronic W



PIC00002972

Ultronic

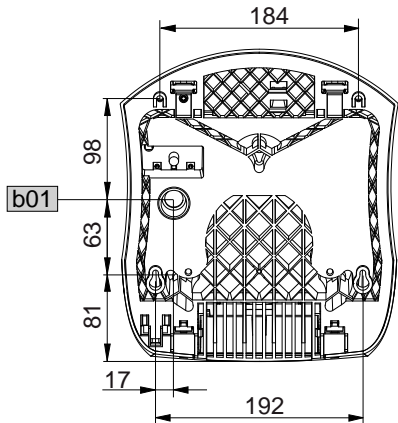
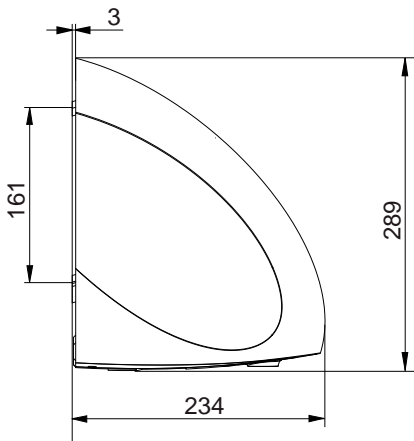
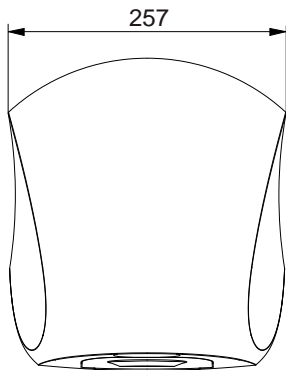
- › Extremely short drying time of < 15 s
- › Dries with an air speed of in excess of 300 km/h
- › Reverse compatible wall fixing; matches existing holes from HTE and HTT models
- › Designed in a stainless steel look
- › Energy efficient and environmentally responsible
- › Hygienic as hand drying requires no contact with the appliance
- › Made in Germany

Highspeed hand driers

The Ultronic hand dryer is the latest development in the high speed hand dryer segment. The new Ultronic is distinguished by its powerful, highly concentrated, fast air stream in excess of 300 km/h that dries hands in less than 15 seconds. This high speed air stream “wipes” moisture from the surface of your hands in the shortest time. The low connected load and short drying times make the new Ultronic the most viable hand drying system for commercial, public and hotel/restaurant bathrooms and wash-rooms. The advanced and prize-winning diecast aluminium casing is available in a white finish. A brushed stainless steel version is available for upmarket applications.

		Ultronic S	Ultronic W
		231582	231583
Versions			
Colour		Stainless steel	Signal white, RAL 9003
Casing material		Diecast aluminium	Diecast aluminium
IP rating		IP24	IP24
Safety category		I	I
Electrical data			
Power connection		1/N/PE ~ 220-240 V	1/N/PE ~ 220-240 V
Frequency	Hz	50/60	50/60
Rated voltage	V	230	230
Rated current	A	4.0	4.0
Rated output	W	910	910
Max. mains impedance Z _{max} to DIN EN 61000-3-11	Ω	257	257
Values			
Operating noise	dB(A)	82	82
Air velocity	m/s	94	94
Air flow rate	m ³ /h	200	200
Drying time	s	15	15
Dimensions			
Height	mm	289	289
Width	mm	257	257
Depth	mm	234	234
Weights			
Weight	kg	4.4	4.4

Dimensions and connections



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Ultronic S Ultronic W

HTT hand dryers

HTT 4

HTT 4 WS



PIC00002274

HTT 4

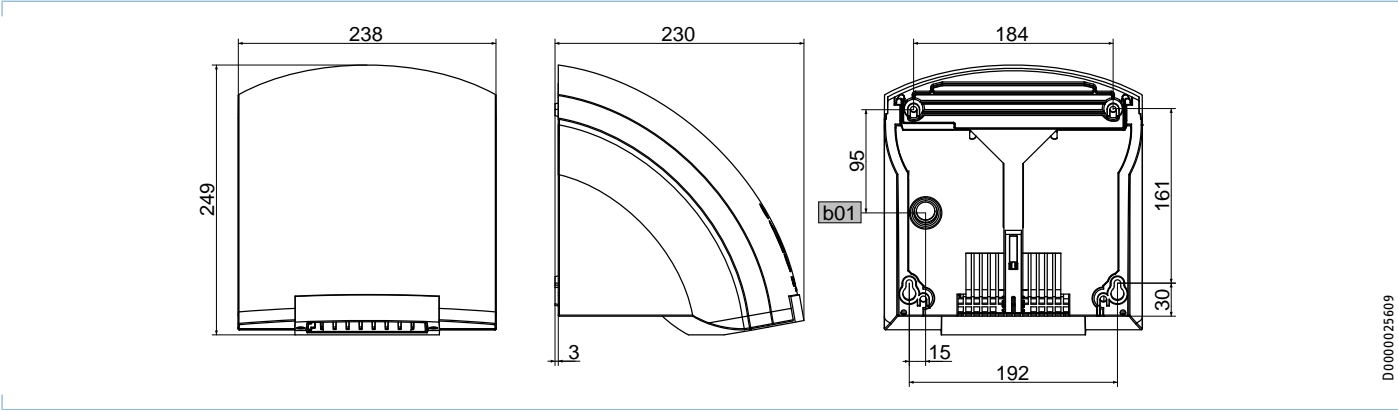
- › Particularly short drying times
- › Hygienic and energy efficient through IR proximity electronics
- › Minimum operating costs
- › Maintenance free, reliable operation
- › Electronically commutated DC motor
- › Easy installation
- › Operating noise 68 dB(A)
- › HTE 4 in an impact and UV resistant plastic casing
- › HTE 5 in a particularly robust diecast aluminium casing

HTT hand dryers

These powerful hand dryers were designed specifically for the high demands made on washroom facilities in catering, commerce and in public buildings. The high air flow rate results in very short drying times. The HTT turbotronik is an economical and hygienic hand drying system for bathrooms and washrooms in commercial, public and catering environments.

		HTT 4 WS
		074464
Versions		
Colour		Alpine white
Casing material		Plastic
IP rating		IP23
Safety category		II
Electrical data		
Power connection		1/N ~ 220-240 V
Frequency	Hz	50/60
Rated voltage	V	~230 V
Rated current	A	11.3
Rated output	W	2600
Connected load, heating element	W	2500
Connected load, fan	W	100
Values		
Operating noise	dB(A)	68
Air velocity	m/s	28
Air flow rate	m³/h	250
Drying time	s	20
Dimensions		
Height	mm	250
Width	mm	238
Depth	mm	230
Weights		
Weight	kg	2.7

Dimensions and connections



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HTT hand dryers

HTT 5

HTT 5 WS



PIC000002275

HTT 5 SM



PIC000001962

HTT hand dryers

These powerful hand dryers were designed specifically for the high demands made on washroom facilities in catering, commerce and in public buildings. The high air flow rate results in very short drying times. The HTT turbotronik is an economical and hygienic hand drying system for bathrooms and washrooms in commercial, public and catering environments.

HTT 5 AM



PIC000001961

HTT 5

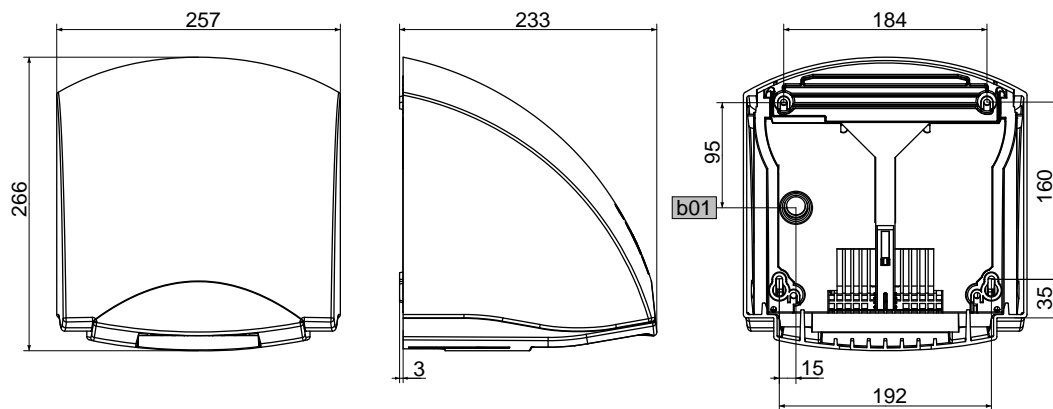
- › Particularly short drying times
- › Hygienic and energy efficient through IR proximity electronics
- › Minimum operating costs
- › Maintenance free, reliable operation
- › Electronically commutated DC motor
- › Operating noise 68 dB(A)
- › Easy installation
- › HTE 4 in an impact and UV resistant plastic casing
- › HTE 5 in a particularly robust diecast aluminium casing

HTT hand dryers

HTT 5

		HTT 5 WS	HTT 5 SM	HTT 5 AM
		074465	182053	182052
Versions				
Colour		Signal white, RAL 9003	Silver metallic	Anthracite metallic
Casing material		Diecast aluminium	Diecast aluminium	Diecast aluminium
IP rating		IP23	IP23	IP23
Safety category		II	II	II
Electrical data				
Power connection		1/N ~ 220-240 V	1/N ~ 220-240 V	1/N ~ 220-240 V
Frequency	Hz	50/60	50/60	50/60
Rated voltage	V	~230	~230	~230
Rated current	A	11.3	11.3	11.3
Rated output	W	2600	2600	2600
Connected load, heating element	W	2500	2500	2500
Connected load, fan	W	100	100	100
Values				
Operating noise	dB(A)	68	68	68
Air velocity	m/s	28	28	28
Air flow rate	m³/h	250	250	250
Drying time	s	20	20	20
Dimensions				
Height	mm	266	266	266
Width	mm	257	257	257
Depth	mm	230	230	230
Weights				
Weight	kg	4.2	4.2	4.2

Dimensions and connections



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	HTT 5 WS	HTT 5 SM	HTT 5 AM
b01 Durchführung elektr. Leitungen			

HTE hand dryer

HTE

HTE 4



PIC00002274

HTE 5



PIC00002238

HTE

- › Hygienic and energy efficient through IR proximity electronics
- › Minimum operating costs
- › Maintenance free, reliable operation
- › Easy installation
- › HTE 4 in an impact and UV resistant plastic casing
- › HTE 5 in a particularly robust diecast aluminium casing

HTE hand dryer

Hand dryer for hygienic and economical operation through IR proximity electronics. It regulates the touch-free demand-dependent starting and stopping of the hand dryer. The HTE electronic dries your hands very quietly and effectively. With their innovative design, these appliances bring a new point of focus to the washroom.

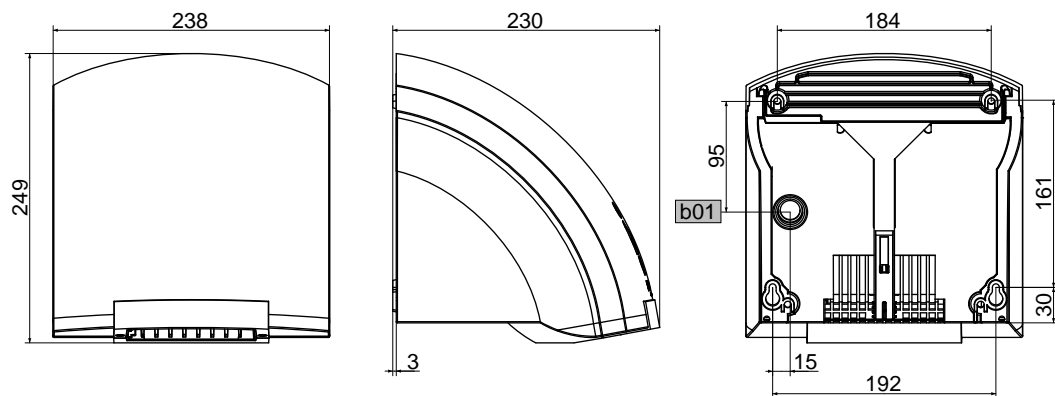
		HTE 4	HTE 5
		073007	073008
Versions			
Colour		alpine white	Signal white, RAL 9003
Casing material		Plastic	Diecast aluminium
IP rating		IP23	IP23
Safety category		II	II
Electrical data			
Power connection		1/N ~ 220-240 V	1/N ~ 220-240 V
Frequency	Hz	50/-	50/-
Rated voltage	V	230	~230
Rated current	A	7.8	7.8
Rated output	W	1800	1800
Connected load, heating element	W	1740	1740
Connected load, fan	W	60	60
Values			
Operating noise	dB(A)	54	54
Air velocity	m/s	12	12
Air flow rate	m³/h	146	146
Drying time	s	36	36
Dimensions			
Height	mm	250	266
Width	mm	238	257
Depth	mm	230	230
Weights			
Weight	kg	2.5	4

HTE hand dryer

HTE

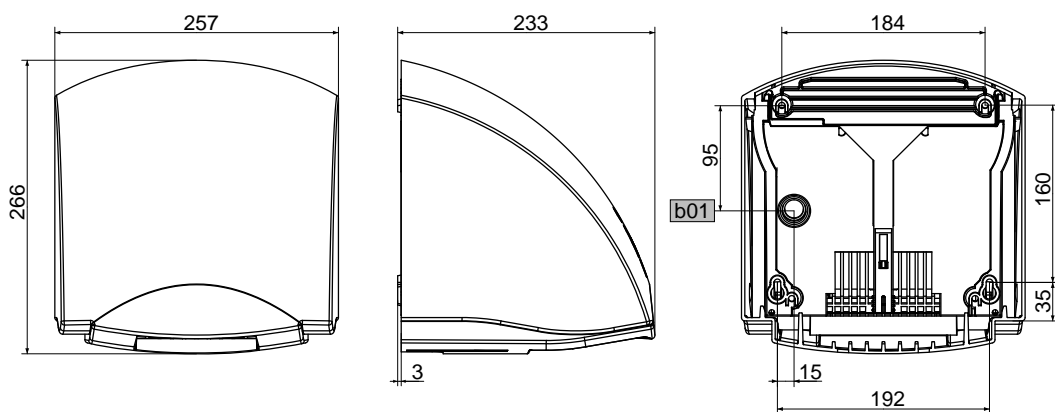
Dimensions and connections

HTE 4



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HTE 5



D0000025610

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HTE 4

HTE 5

Notes

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