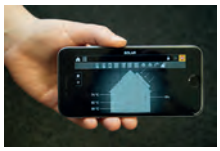
Overview
HDG regulation and control technology

	HDG H20-30 HDG F20-50 HDG Euro	HDG FK Hybrid	HDG Compact 40-80	HDG Compact 100-200	HDG K10-60	Page
 **HDG Control hardware** • Display, central module, drive module • The extension modules, EM4, EM8, EM8+4 • Overview of inputs and outputs • Overview of bus design • Bus star distributor						**110**
 **HDG Control stand-alone** • As an extension to the HDG Control • As a stand-alone heating and system controller						**116**
 **HDG Control functions – overview of the hydraulic functions** • Accumulator management • Refilling management • External heat source • Weather-compensated heating circuit • Room control unit, room sensors • Network pump • Domestic hot water management • Control of the solar heating system • Cascade management						**118**
 **myHDG WebControl** • HDG WebControl • Free platform with worldwide access • Expert access via the HDG ExpertNet						**121**

HDG Control – the new heating and system controllers for the complete heating system

The HDG Control is an intelligent boiler and heating system controller and
is the control platform and cockpit for the log wood boilers (HDG Euro, HDG H, HDG F), the wood chip boilers HDG Compact 40-80 and the pellet boilers HDG K10-60. The HDG Control controls all electronic processes that are required for heat generation, heat distribution and optimum combustion. It controls fuel feeding, output and combustion control as well as coordinating ignition, automatic cleaning and ash removal, accumulator management and all components of the connected heating system.

Illustration shows HDG Compact 50 with HDG Control Touch XL

Overview of the components

HDG Control Touch – the display

The HDG Control is operated via a touch display module. The standard 4.3" display is highly durable and can also be operated while wearing gloves. A simple menu interface allows the operator to make the necessary settings in the shortest time. The operating module is connected with the other components via BUS communication.

Equipment features and scope of delivery:
- Resistant 4.3" touch display with 480 x 272 pixels (colour display)
- SD card interface, incl. SD card for data recording (4 GB)
- Mounted in a sturdy plastic housing
- Individually packaged including fastening material to be mounted on the boiler by the customer
- Included in the scope of delivery with the HDG Euro, HDG H, HDG F, HDG K10-60 and HDG Compact 40-80

HDG Control Touch XL – the display with expanded access

On request, instead of the 4.3" display, a larger 7" display is available. The HDG Control Touch XL provides integrated data logging and web visualisation in addition to a larger display with 800 x 480 pixels. The "myHDG" web communication portal has a very high level of data securing and allows the values of the complete connected system to be conveniently called up. This enables access to the controller via tablet, computer or smartphone

Technical data (addition equipment for the 4.3" display):
- Resistant 7" touch display with 800x480 pixels
- Ethernet interface with RJ45 socket

HDG central module

HDG Compact 25 - 80 function

The central module takes over the control of the components and sensors relevant for combustion. In order to attain constantly optimum combustion, the HDG Control determines the optimum material and air quantity for the fuel in use on the basis of the data provided by the combustion chamber temperature sensor and lambda sensor. The primary and secondary air is supplied for the combustion by an actuator with an air quantity controller. If the system is not in operation, the actuators close automatically so that the boiler does not cool down via the chimney in an unnecessary manner. The measured combustion chamber temperature is not only an important variable for progressive combustion control. It is also an indicator as to whether the system was ignited independently using residual embers or detects if it must be relit using the automatic ignition fan. This avoids unnecessary ignition times. The combustion chamber temperature sensor also monitors possible temperature excesses. The **"combustion chamber temperature stop"** displayed prevents further fuel from being fed in. The filling level on the combustion grate is permanently monitored by a mechanical level indicator. The controller also detects if the system can be ignited in the case of a restart. The **"Material Stop"** display indicates this process on the display. The lambda sensor measures the oxygen in the flue gas and is used, amongst other things, as a reference variable for the optimal secondary air quantity. The secondary air is introduced to the combustion gasses in the hot combustion chamber via a separate nozzle channel. This means that in each case the best firing efficiency can be achieved for the fuel available, even with variable fuel quality. The control automatically prevents the fuel feeding if a minimal oxygen value is not achieved using the additional **"lambda stop"** function which can be set as required.

HDG Euro, HDG F, HDG H function

The central module also takes over the control of the components and sensors relevant for combustion for HDG log wood boilers. In order to attain constantly optimum combustion, the HDG Control determines the optimum material and air quantity for the fuel in use on the basis of the data provided by the flue gas temperature sensor and lambda sensor. The primary and secondary air is supplied for the combustion by an actuator with an air quantity controller. If the system is not in operation, the actuators close automatically so that the boiler does not cool down via the chimney in an unnecessary manner. The lambda sensor measures the oxygen in the flue gas and is used, amongst other things, as a reference variable for the optimal secondary air quantity. The secondary air is introduced to the combustion gasses in the hot combustion chamber via a separate nozzle channel. This means that in each case the best firing efficiency can be achieved for the fuel available, even with variable fuel quality. The central module controls the optional HDG automatic ignition and cleaning systems.

Hydraulic functions

In addition it also has an integrated heating and system controller with connection possibilities for 8 sensor inputs and three mixing valves (or switching valves) and for three circulation pumps. This means that up to 3 weather-compensated heating circuits can be connected. The connections can be used according to system requirements and can be expanded with the HDG Control extension modules. The HDG central module and any extension modules that may be installed are operated by the installed HDG Control touch display.

The HDG central module is pre-mounted and ready for connection on the boiler and included in the scope of delivery of the HDG Compact 40-80, the HDG Euro, the HDG F and the HDG H.

HDG drive module

The HDG drive module is an extension for the HDG central module. It controls all of the drives required for combustion supply. The HDG drive module monitors the motor currents of the connected units and thereby protects the components. Automatic reversal is triggered automatically for drives, such as the rotary wheel when a set current value is reached. The module is directly connected to the central module via a bus. The HDG drive module is operated by the installed HDG Control touch display. The HDG drive module is pre-mounted and ready for connection on the boiler and included in the scope of delivery of the HDG Compact 40-80.

HDG automatic burner

The automatic burner is used with the HDG K10-60. It also controls all of the components relevant for combustion. All necessary parameters are determined using the combustion chamber temperature sensor and flue gas temperature sensor. The control of the complete delivery technology such as the HDG pellet suction system and HDG pellet tube converter is also performed by this control component.

The connection to heating components is performed by the integration of HDG extension modules. The HDG central module for pellets and any extension modules that may be installed are operated by the installed HDG Control touch display. The HDG central modules for pellets is pre-mounted and ready for connection on the boiler and included in the scope of delivery of the HDG Compact K10-60.

HDG extension modules for the HDG Control

The HDG extension modules expand the scope of control of the integrated HDG Control heating and system controller. The assignment of the inputs and outputs of the modules connected by bus is determined in the HDG hydraulic plan and can be used differently according to requirements. The modules are operated via an installed HDG Control touch display in an connected boiler or stand-alone controller. In combination with the HDG K10-60 the extension modules control all of the hydraulic components. **The HDG extension modules do not include sensor equipment as standard.** The necessary sensor packages must be ordered according to requirements.

The HDG extension modules are supplied with fastening materials and the corresponding mating plug set. The HDG extension module is available in the following versions:

HDG EM4 boiler extension module

The EM4 has 4 sensor inputs and a connection option for a mixing valve (or switching valve) as well as two circulation pumps. This means it can be connected to 1 weather-compensated heating circuit and 1 domestic hot water tank. This module is intended for direct installation in the boiler.

HDG EM8 boiler extension module

The EM8 boiler has 8 sensor inputs and a connection option for two mixing valves (or switching valves) as well as three circulation pumps. This means it can be connected to 2 weather-compensated heating circuit and 1 domestic hot water tank. This module is only intended for direct installation in the HDG K10-33 V2.

HDG EM8 extension module

The EM8 has 8 sensor inputs and a connection option for two mixing valves (or switching valves) as well as three circulation pumps. This means it can be connected to 2 weather-compensated heating circuit and 1 domestic hot water tank. This module is pre.mounted as an external extension module in a wall housing. The EM8 can also be retrofitted with an EM4 circuit board to become an EM8+4.

HDG EM8+4 extension module

The EM8+4 is a combination of an EM8 and an EM4. It has 12sensor inputs and a connection option for three mixing valves (or switching valves) as well as five circulation pumps. This means it can be connected to 3 weather-compensated heating circuit and 2 domestic hot water tanks. This module is pre.mounted as an external extension module in a wall housing.

The HDG extension modules do **not** include sensor equipment. These must be ordered according to requirements.

E
Regulation and *control technology

Overview of HDG Control Inputs and Outputs

Inputs	Touch display	Central module	Expansion modules EM4	EM8	EM8+4	for use with	Description
Sensor inputs	1 (reserved for pellet boiler and SAL for outside temp.)	12	4	8	12	Temperature sensor	The sensor inputs (each PT1000) are used for the individual hydraulic functions. The individual assignment is determined according to the terminal and hydraulic plan. Sensor inputs for functions such as combustion chamber temperatures are permanently assigned and are not taken into account here.
Analogue inputs (0-10 V In)	0	1	1	1	2	External boiler requirement	The boiler can be activated externally via a 0-10 V signal HDG Compact 40-80: the output of the boiler can be determined via the signal HDG K10-60: the flow temperature of the boiler can be determined via the signal, the output is automatically adjusted to the decrease. Stand-alone/log wood: no function **The function is only available on request and after prior inspection!**
Digital inputs	0	0	1	1	2	External warning	A fault or warning output of an external device can be connected to this device. If there is a fault or a warning, this is displayed on the HDG Control display. This can be used for an external heat source, for example. **The function is only available on request and with extension modules.**
						External fault	
		2				External boiler requirement	The boiler can be activated by an external digital source. Stand-alone/log wood: no function

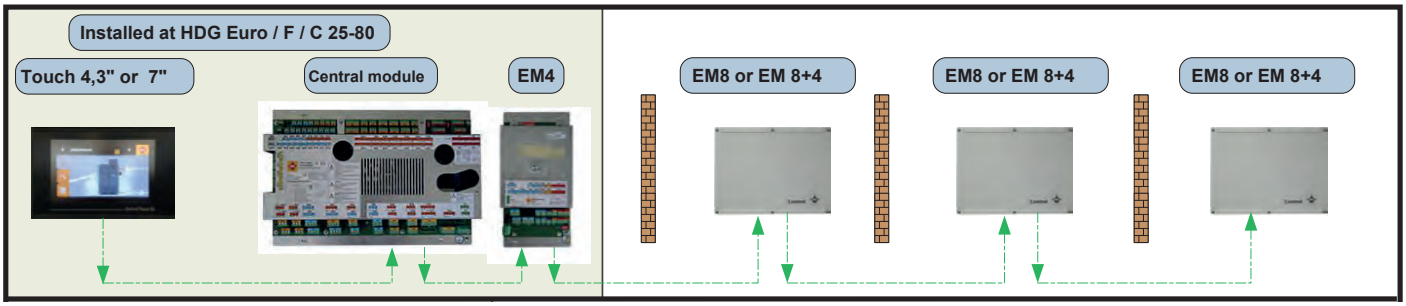
Outputs	Touch display	Central module	EM4	EM8	EM8+4	for use with	Description
Mixing valve	0	3	1	2	3	Mixing valve / switching valve	Connection option for mixing valve or switching valve. The individual assignment is determined according to the terminal and hydraulic plan.
Pumps	0	3	2	3	5	Pumps	Connection possibility for circulation pumps. The individual assignment is determined according to the terminal and hydraulic plan.
Analogue output (0-10V out)	0	2	2	2	4	Boiler demand	Output of an analogue signal if a boiler is required. Can be used with the SAL master for example, to forward the demand arising from the hydraulics to any boiler with a corresponding analogue input. (0-10V corresponding to 0-100°C). **The function is only available on request and with prior inspection.**
As PWM output		No	Yes	Yes	Yes	Solar pump	Speed regulation of the solar pump. Control can be performed with a PWM and 0-10 V signal with extension modules. Only 0-10 V for the central module.
Potential-free digital output	0	4	0	1	1	Collective fault	Potential-free output of operating signals
						Collective warning	
						Collective fault/ warning	
						Operating message	
						Boiler sequential circuit	Digital request of an external heat source. The individual assignment is determined according to the terminal and hydraulic plan.
						Refuel signal	Potential-free output of the refuel signal for log wood boilers

Interfaces (internal interfaces not specified)							
RS 485 interface	1	0	0	0	0	ModBus	ModBus interface for higher-level controllers/control rooms. **The function is only available on request and with prior inspection.**
SD card	1	0	0	0	0	SD card	Slot for SD card Is used for updates and data recording
RJ45 network	Only for 7"	0	0	0	0	Network	Network interface for connection to an Ethernet network. Only in combination with HDG Control Touch XL

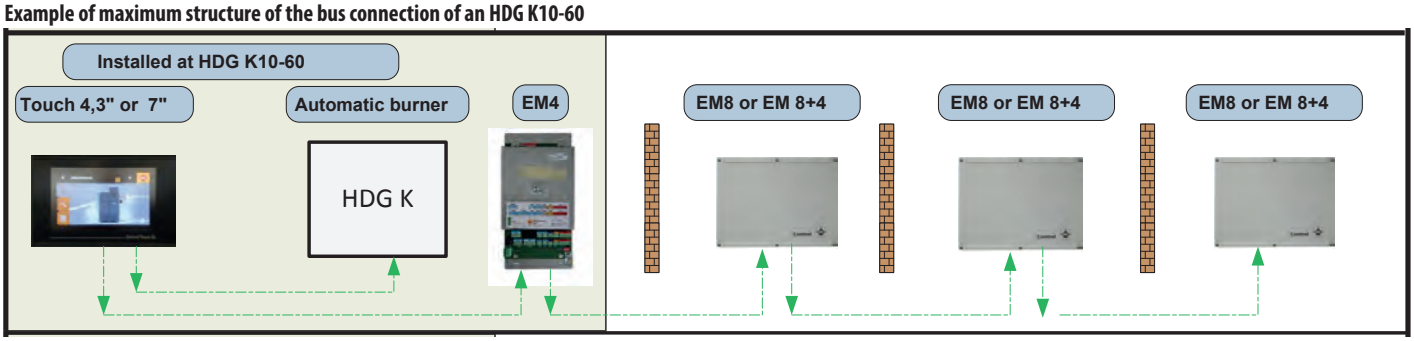
The drive module is used for delivery systems for the HDG Compact 40-80 and is therefore not included here.

Overview of bus communication structure

Example of maximum structure of the bus connection of an HDG Compact 40-80, HDG Euro, HDG H, HDG F



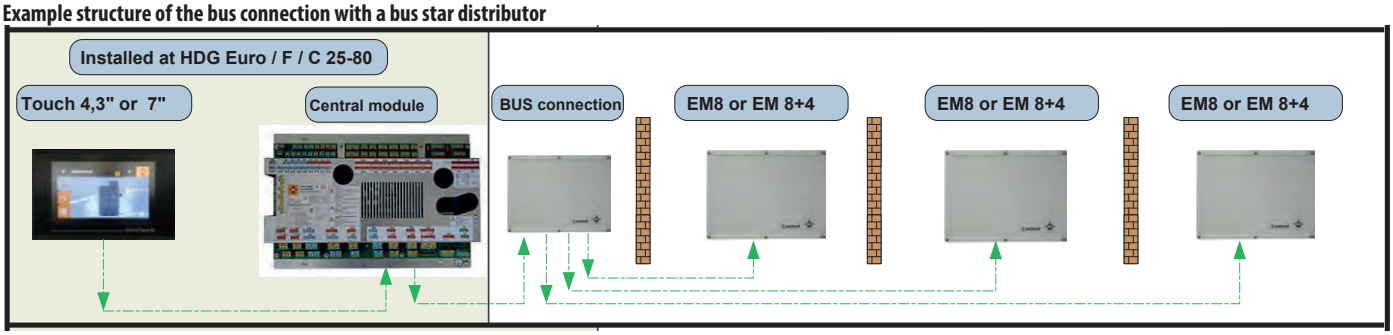
Example of maximum structure of the bus connection of an HDG K10-60



HDG bus star distributor

The HDG bus star distributor is an RS-485 hub, that is enables a star-shaped bus connection between HDG Control touch displays or room control units. Up to 7 further bus participants can be connected to the distributor. The start distributor cannot be used between extension modules. The bus has to be structured in series here.

Example structure of the bus connection with a bus star distributor



Description	Suitable for	Item no.	EURO	PG
HDG Control 4.3" touch display	HDG Euro, HDG F, HDG H, HDG Compact 40-80 HDG K10-60, SAL	Included in boiler price		**5**
HDG Control 7" XL touch display Control unit with 7" touch display and integrated web visualisation Surcharge with regard to the 4.3" touch display included as standard	HDG Euro, HDG F, HDG H, HDG Compact 40-80, SAL	16005011		**7**
	HDG K10-60	16005010		**7**
HDG central module	HDG Euro, HDG F, HDG H, HDG Compact 40-80	Included in boiler price		
HDG drive module	HDG Compact 40-80	Included in boiler price		
HDG pellet central module (automatic burner)	HDG K10-60	Included in boiler price		
HDG EM4 boiler, extension module for installation in the boiler	HDG Euro, HDG F, HDG H, HDG Compact 40-80 HDG K10-60	16005021		**7**
HDG EM8 boiler, extension module for installation in the boiler	HDG K10-33 V2	16005036		**7**
HDG EM8, external extension module in wall housing	HDG Euro, HDG F, HDG H, HDG Compact 40-80 HDG K10-60, SAL	16005023		**7**
HDG EM4, extension module for subsequent upgrade of an EM8 to an EM8+4	SAL	16005022		**7**
HDG EM8+4, external extension module in wall housing	HDG Euro, HDG F, HDG H, HDG Compact 40-80 HDG K10-60, SAL	16005025		**7**
HDG bus star distributor	HDG Euro, HDG F, HDG H, HDG Compact 40-80 HDG K10-60, SAL	16005029		**7**

HDG Control stand-alone extension module EM8 SAL or EM8+4 SAL

The HDG Control EM8 and EM8+4 extension modules can be equipped with their own touch display operating module. This stand-alone (SAL) function allows the operator to be operated independently or alternatively to further expand the scope of control of the HDG Control. The respective demand and the temperatures necessary for control are forwarded to the connected master)main controller) via a bus connection. Faults reported at the master (main controller) are also shown in the display of the slave (subordinate controllers). The maximum expansion included 1 master display and 10 slave controllers with a maximum bus route of 1,000 m. An SAL can be expanded with a maximum of 2 EM8 or EM8+4 units.
If an SAL is installed without a HDG heating system but with HDG Control (e.g. for consumer regulation of an HDG Compact 100-200), this has the full master functionality. An outside temperature sensor must be integrated for outside temperature control in this case.

The controller can be equipped with the standard (4.3") as well as the 7" touch display with integrated web visualisation.

Type	Available inputs and outputs				Item no.	EURO	PG
	Sensor	Pump	Mixing valve				
HDG Control Touch SAL EM8	8	3	2		16005024		7
HDG Control Touch SAL XL EM8	8	3	2		16005034		7
HDG Control Touch SAL EM8+4	12	5	3		16005026		7
HDG Control Touch SAL XL EM8+4	12	5	3		16005035		7

The HDG Control Touch extension modules can also control various hydraulic functions. If the maximum number of the particular functions is exceeded, additional HDG Control touch-screen displays can be integrated in the system.

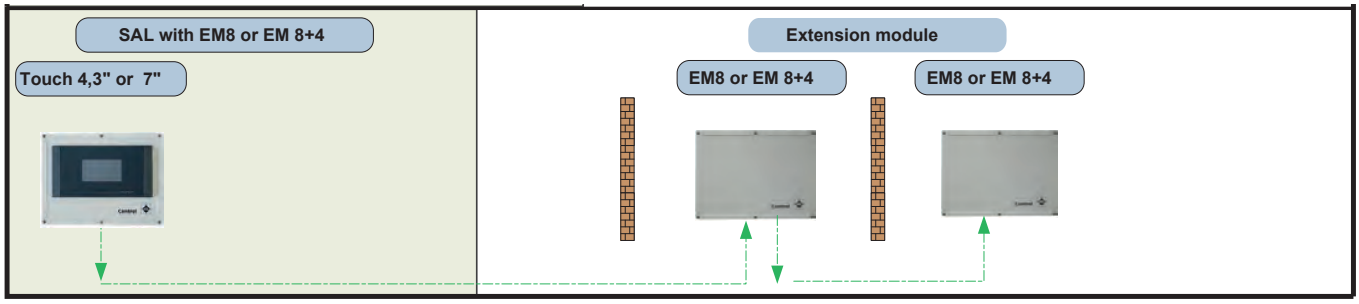
Control of the various plumbing system functions requires the appropriate inputs and outputs, e.g. for sensors, pumps and mixer valves. The requirements must be compared with the available inputs and outputs and expansion modules added if necessary.

HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Item no.	EURO	PG
	Sensor	Pump	Mixing valve				
Accumulator management (1st accumulator) 3 immersion sensors for top, middle and bottom	3			1	16005050		7
Accumulator management (2 accumulators) 3 immersion sensors for top, middle and bottom	3			1	16005052		7
External heat source (e.g. oil/gas boiler) 1 immersion sensor	1[1]	1[1]	1[1]	1	16005055		7
Weather-compensated heating circuit, 1 heating circuit contact sensor	2[2]	1	1	6	16005005		7
Network pump (for local heating network) 1 contact sensor	1[1]	1	1[1]	2	16005056		7
Domestic hot water management, 1 immersion sensor	1	1		2	16005006		7
Solar charge on buffer tank, 1 collector sensor	1	1	0-2[2]	1	16005008		7
Solar charge on water and possibly buffer, 1 collector sensor, 1 immersion sensor	1	1	0-2[2]		16005015		7
Outside temperature sensor(only necessary if there is no boiler in the system)	Already reserved			1	16005009		7

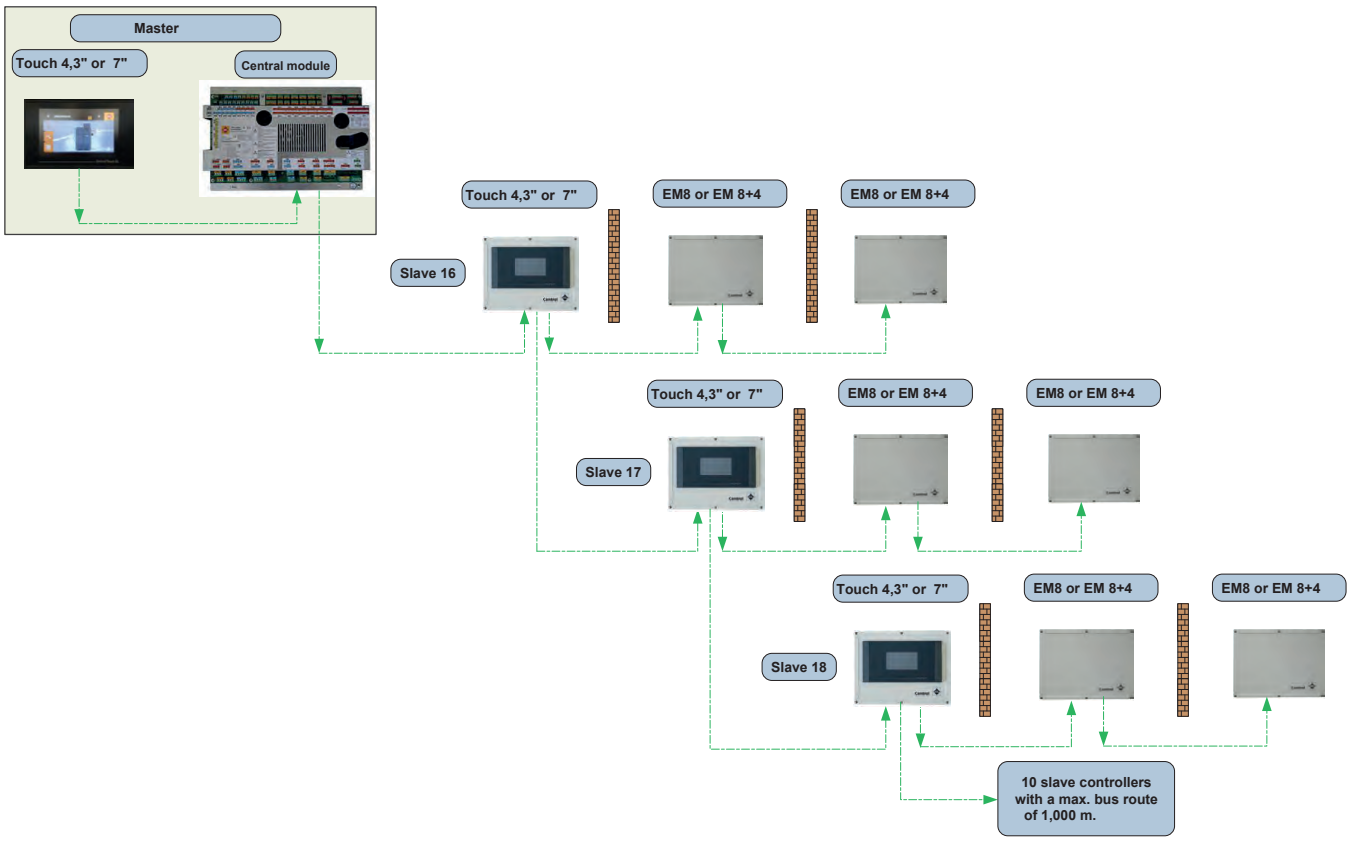
Control hardware expansion:	Available inputs and outputs				Item no.	EURO	PG
	Sensor	Pump	Mixing valve				
HDG EM8, external extension module in wall housing	8	3	2	2	16005023		7
HDG EM8+4, external extension module in wall housing	12	5	3		16005025		7

[1] Depending on hydraulic connection.
[2] Sensor input is reserved for room control unit light/room control sensor.
Function guaranteed only if installed according to HDG plumbing configuration diagrams and using HDG system components and correctly installed and commissioned by HDG-trained staff.

Example of the maximum expansion of the bus connection of the HDG Control as a stand-alone unit with two EM8 or EM8+4



Example of the structure of the bus connection of the HDG Control as a stand-alone unit. A boiler or a stand-alone unit can act as the master.



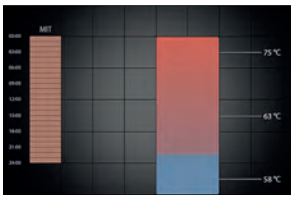
E
Regulation and control technology

HDG Control, heating and system controllers for log wood boilers, HDG K10-60, HDG Compact 40-80

HDG Control functions – overview of the hydraulic functions

The HDG Control is a multi-functional heating and system controller. The individual functions can be used as required. HDG plans the suitable hydraulic system for you and supports you with its implementation. Control of the respective hydraulic functions requires the appropriate inputs and outputs, e.g. for sensors, pumps and mixing valves. The required inputs/outputs must be synchronised with the existing ones (e.g. on the central module) and possibly expanded with extension modules. The designations of the respective parameter groups can be adjusted to improve operating clarity.

HDG accumulator management



The HDG Control can control two connected accumulators per installed display unit. 3 accumulators are connected for this in the standard version. The current condition of the accumulator can be read in the display and in the HDG WebControl.

The accumulator can be controlled with various heating programs.

- **Standard accumulator heating:** Within the set enable time, the accumulator heats at standard demand.
- **Minimum accumulator heating:** Within the set enable time, the accumulator heats at minimal demand. This means that the accumulator is heated to a low temperature level or charging degree. This allows the solar energy system that supports heating to be better utilised, for example.
- **Forced accumulator heating:** Forced accumulator heating takes place within the set enable time regardless of whether there is demand from a heating component. Load peaks, e.g. for domestic hot water preparation in hotels can be compensated like this.
- **Off:** Accumulator heating is deactivated by the heating system, e.g. pure solar power operation.

Different start and stop temperatures can be determined in the individual charging programs. In addition the individual temperature sensors can be used flexibly for charging. You can create different programs for the accumulator using the week program. There are a maximum of 8 different individually adjustable enabling times available. If domestic hot water preparation is integrated in the accumulator or if an external fresh water station is in operation, the combination accumulator operating mode must be selected. The accumulator is always kept at a temperature that guarantees hot water preparation.

Refilling management

Depending on the wood type in use, the outside temperature, consumption behaviour and any solar power that may be fed into the system as well as the accumulator temperature, the optimum refilling quantity and the next (latest possible) heating point are calculated and shown in the display or via HDG WebControl for the HDG log wood boilers. This intelligent calculation yield a definite comfort benefit as reheating is reduced to the minimum necessary amount. The optimum refilling quantity minimises fuel consumption as overheating is avoided and the wood is used to an optimum degree.

The 3 sensors used for accumulator management are used as the reference variable for the calculation for refilling management.

HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Restriction	Item no.	EURO	PG
	Sensor	Pump	Mixing valve					
Accumulator management (1 accumulator), for log wood boilers incl. refilling management, 3 immersion sensors for top, middle and bottom of accumulator	3			1	for HDG Compact 40-80, HDG log wood boiler, stand-alone	16005050		**7**
Accumulator management1 (1 accumulator) incl. return temperature control, 3 immersion sensors for top, middle and bottom of accumulator, 1 contact sensor for return temperature control	4	1	1	1	Only for HDG K10-60	16005051		**7**
Accumulator management (2 accumulators) 3 immersion sensors for top, middle and bottom of accumulator	3			1	-	16005052		**7**
Accumulator management (2 accumulators) with charge transfer system, 3 immersion sensors for top, middle and bottom of accumulator	3	1	1		Only for HDG log wood boiler	16005053		**7**

External heat source

The HDG Control makes it possible to control an external heating source (e.g. oil(gas boiler, electric heating rod, etc.) in addition to the HDG central heating boiler. The external heating source can be operated together with the HDG central heating boiler and are activated by this as required. The external heating source can be individually parameterised with enabling temperatures, off times and a week program.

Basic function:

In the basic function only one heating source is in operation, the HDG central heating boiler always has priority. The external heating source either supplies the energy directly to the accumulator (base load) or to the consumers (emergency operation) via a switching valve (sensor in heating source required). The external heating source is only enabled if the accumulator temperature drops too far and a consumer has a heating requirement.

Peak load function:

The peak load function is only possible at the accumulator. The external heating source can be enabled in addition to the HDG central heating boiler in this case. There are two variants:
1.Digital enabling (e.g. heating value device with integrated circulation pump) at the accumulator
2.Digital enabling + circulation pump (e.g. low temperature boiler) at the accumulator

HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Restriction	Item no.	EURO	PG
	Sensor	Pump	Mixing v.					
External heat source (e.g. oil/gas boiler) 1 immersion sensor	1*	1*	1*	1	-	16005055		**7**

* Depending on hydraulic connection.

Weather-compensated heating circuit

The HDG Control has an integrated weather-compensated heating control. 6 different heating circuits can be managed per display. The designation of the individual heating circuits can be adjusted individually to improve clarity.
The calculation of the heating circuit flow temperature is performed using the settable gradient of the heat curve and the outside temperature. Other factors which influence heating curve correction (parallel shift)) and the day or night indoor target temperature.

Operating modes:
Each heating circuit can be assigned to individual operating modes. In addition, the operating modes for all heating circuits can be set for multiple systems.

You can choose between the following operating modes:

- **Normal**
  This mode is selected for automatic operation. Depending on the requirements, the weather-compensated heating control is put into operation and controls itself independently according to the heating / reduce temperature or off period set in the week programme.

- **Day mode**
  This operating mode deactivates the original preset reduced temperature periods. The weather-compensated heating control works continuously in day operation (heating operation).

- **Night mode**
  This operating mode deactivates the original preset heating times. The weather-compensated heating control works continuously in night operation (reduced operation).

- **Party mode**
  This operating mode activates day operation (heating operation) independently of the current operating mode. The next night operation (reduced operation) is omitted. The weather-compensated heating control will function in party mode until a normal change is made from Reduced temperature to Heating in the week programme. The operating mode then switches back to normal mode.

- **Holiday mode**
  In holiday operation, a period is defined in which the heating circuit will be switched off automatically and will be switched on again after the time has expired.

- **Summer mode**
  The selected heating circuit is also set to Off in summer mode. The mixing valve is closed and the heat circuit pumps are switched off. Summer mode will remain until it is deactivated.

The following systems can be selected as possible heating systems:

- **Radiators**
- **Underfloor heating:** With this heating system you have the option of activating a screed drying program.
- **Constant:** Controlled independent of the outside temperature to the same adjustable flow temperature e.g. controlling swimming pool heating; indoor thermostat unit is not possible here
- **Not controlled:** Start according to enabling temperature and week program; without heating circuit mixing circuit; in combination with the indoor thermostat unit, the pump switches off after reaching the desired room temperature (thermostat function).

HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Restriction	Item no.	EURO	PG
	Sensor	Pump	Mixing v.					
Weather-compensated heating circuit, 1 heating circuit contact sensor	2*	1	1	6	-	16005005		**7**

* Sensor input is reserved for room programmer light/indoor thermostat unit

HDG room control unit/room control sensor

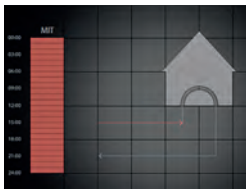
The HDG room control units and room sensors are extension modules for the weather-compensated heating control of the HDG Control. Depending on their functional scope, these extension modules can calculate actual room temperature values and influence it. Plastic housing with 4-hole fastening, dimensions 98x106x32 mm, colour pure white, similar to RAL 9010, IP30

HDG room control unit LIGHT:
Room control unit without room sensor with the option for setting the operating mode of the heating circuit (off, auto). Dial for adjusting the flow temperature. Connection via sensor line.

HDG room control unit bus:
Room control unit with integrated room sensor, fault and refuelling LED, dial for setting heating circuit operating modes (e.g. heating mode, reduced, auto, off). Dial for adjusting the flow temperature. Connection via bus.

HDG room control sensor:
Room control sensor with integrated PT1000 measuring element. Comparison of room target and actual temperature with subsequent adjustment on the flow temperature.

Type/output/version	Item no.	EURO	PG
HDG room control unit BUS	16005027		**7**
HDG room control unit LIGHT	16005028		**7**
HDG room control sensor	16005033		**7**

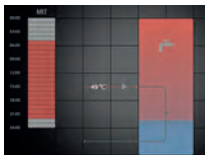


Network pump
A network pump can be used to supply a local heating network with energy. The HDG Control controls a maximum of two network pumps per display. The respective enabling temperatures can be individually parameterised. The network pump can supply consumers such as an accumulator, heating circuit or domestic hot water (DHW) with heat. If this consumer has a heat requirement, the network pump supplied the required energy.

In total 12 variants for controlling the network pump are available.

HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Restriction	Item no.	EURO	PG
	Sensor	Pump	Mixing v.					
Network pump (for local heating network), 1 contact sensor	1*	1	1*	2	-	16005056		**7**

* Depending on hydraulic connection.



Domestic hot water management
The HDG Control can regulate two external domestic hot water tanks. A week programme can be selected for the domestic hot water supply. Only during this time can hot water heating occur, taking into account the enable temperature for the hot water pump. You can specify the temperature of the hot water supply. If the temperature falls below the preset domestic hot water (DHW) temperature, then the hot water heating pump will start up.

Activate protection
If protection from Legionnaire's disease is activated, the hot water will be heated up once weekly to this specified temperature.
At the same time the domestic hot water priority is activated to reach the Legionnaire's disease protection temperature.

Hot water priority
With priority switching, if hot water heating is "on", the flow temperature to the heating circuits is reduced. The duration of the priority is also configurable.

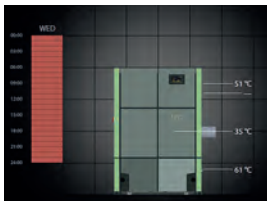
HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Restriction	Item no.	EURO	PG
	Sensor	Pump	Mixing v.					
Domestic hot water management, 1 immersion sensor	1	1		2	-	16005006		**7**

Control of the solar heating system
The HDG Control can regulate a thermal plate collector system (with antifreeze) and max. three charging zones.
1 zone charging: Collector at domestic hot water tank or accumulator bottom
2 zone charging: Collector at domestic hot water tank and accumulator bottom
3 zone charging: Collector at domestic hot water tank and accumulator (PS2R) top and bottom.

The HDG Control can regulate 20 different solar energy systems.
The speed of the solar pump is controlled depending on the collector temperature, the reference temperature of the selected zone and the target temperature difference.

HDG Control sensor packages for controlling the following hydraulic functions	Inputs and outputs required			Max. per display	Restriction	Item no.	EURO	PG
	Sensor	Pump	Mixing v.					
Solar charge on buffer tank, 1 collector sensor				1	-	16005008		**7**
Solar charge on water and possibly buffer, 1 collector sensor, 1 immersion sensor					-	16005015		**7**

*For speed control of solar operation using a PWM signal, an EM4, EM8 or EM8+4 is required in the system network.
** Depending on hydraulic connection.



Cascade management
HDG heating systems can be combined with each other to cover a greater power range.

The advantages of a cascade solution:
- Higher power range
- Optimum operational reliability
- Heat supplied as required in particular with a fluctuating energy demand
- Especially economic operation
- Boiler maintenance without interrupting heating
- Can be installed where space is at a premium

Innovative HDG Control cascade regulation
The HDG Control has a very innovative cascade control. The installed accumulator as a central hydraulic module is used to check the required output on the basis of the charging level. The boiler is switched on and off depending on requirements. The boilers are deployed in turn to attain an even accumulation of operating hours. 5 boilers can be used in the system. They can have the same output or different outputs. External heat sources such as oil or gas boilers can also be integrated.

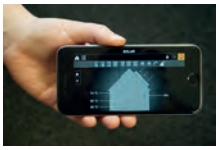
The HDG Control cascade management will be available from around autumn 2016.

HDG Control Touch XL – the display with expanded access

On request, instead of the 4.3" display, a larger 7" display is available. This HDG Control Touch XL provides integrated data logging and web visualisation in addition to a larger display with 800 x 480 pixels. The myHDG web communication portal has a very high level of data securing and allows the values of the complete connected system to be conveniently called up. This enables access to the controller via tablet, computer or smartphone.

HDG WebControl

HDG WebControl the web access for every HDG Control Touch XL. This means that heating system control moves from the cellar to your coat pocket. The user interface of the HDG WebControl has a clear structure and adjusts automatically to the end device such as PC, laptops or smartphones. Operation itself is completely user friendly and heavily orientated to the operation of the boiler. Depending on the access rights group, all parameters that can be set on the boiler can be changed by HDG WebControl. This makes operation completely user friendly.



Fault and warnings can be forwarded by e-mail.

The HDG WebControl was developed with the highest possible security criteria in mind in order to keep unauthorised users out of the home or company network - all data is therefore encrypted for transmission.

Individual access – HDG Control offers three ways of reaching the controller.

An Internet or network connection is required to reach the HDG WebControl. The HDG Control Touch XL is connected to the Ethernet network with an RJ45 network socket. Depending on requirements, the HDG WebControl can now be accessed in three different ways:

myHDG allows several heating systems with HDG Control to be managed via one access point.

Internal access in the company or home network

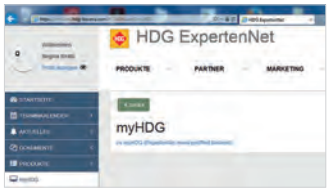
Due to the system design, it is possible to operate and control the HDG WebControl completely self-sufficiently in the company or home network. It can be directly addressed in the network. The HDG WebControl does not require Internet access and can still be completely operated.

This direct access can also be used for external access, e.g. using DynDNS. The implementation of this must be performed by the customer.

myHDG – the free platform for worldwide access to the HDG WebControl

With myHDG, HDG provides the customer with an optional, free platform with which remote access to the heating system with HDG WebControl can be set up without specialist knowledge, e.g. via a fixed IP address, DynDNS, etc. You only need a valid e-mail address, an Internet-capable end device and an HDG Control Touch XL.

The HDG WebControl acts solely as an exchange, the customer data is solely on the heating system. This ensures the highest level of data security.



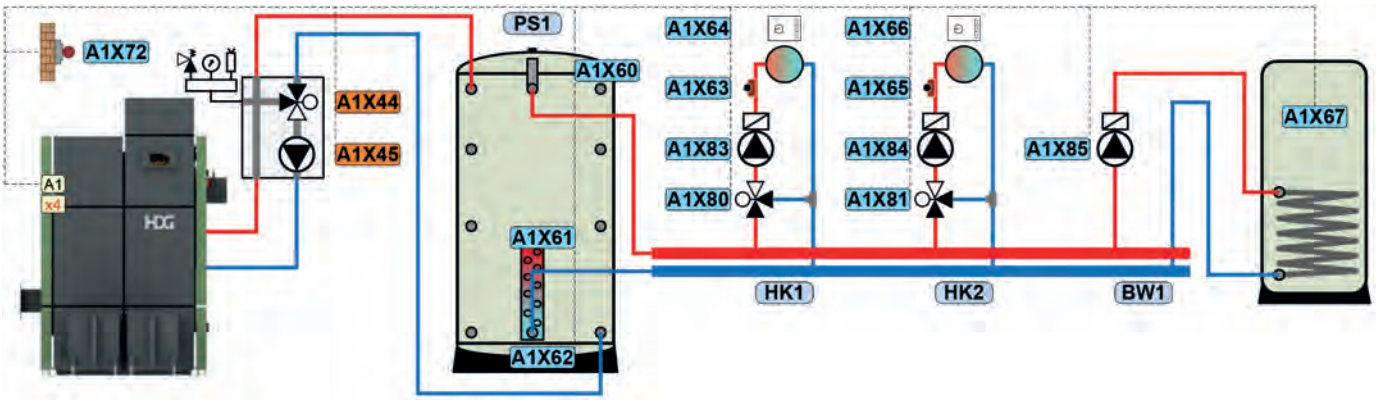
Expert access via the HDG ExpertNet

If the customer and heating system construction company reach an agreement, it is also possible that the heating system constructor also has access to HDG WebControl. The specialist company can then simply access the system with their existing access on the customer portal HDG ExpertNet (only for heating system constructors). No additional access is necessary.

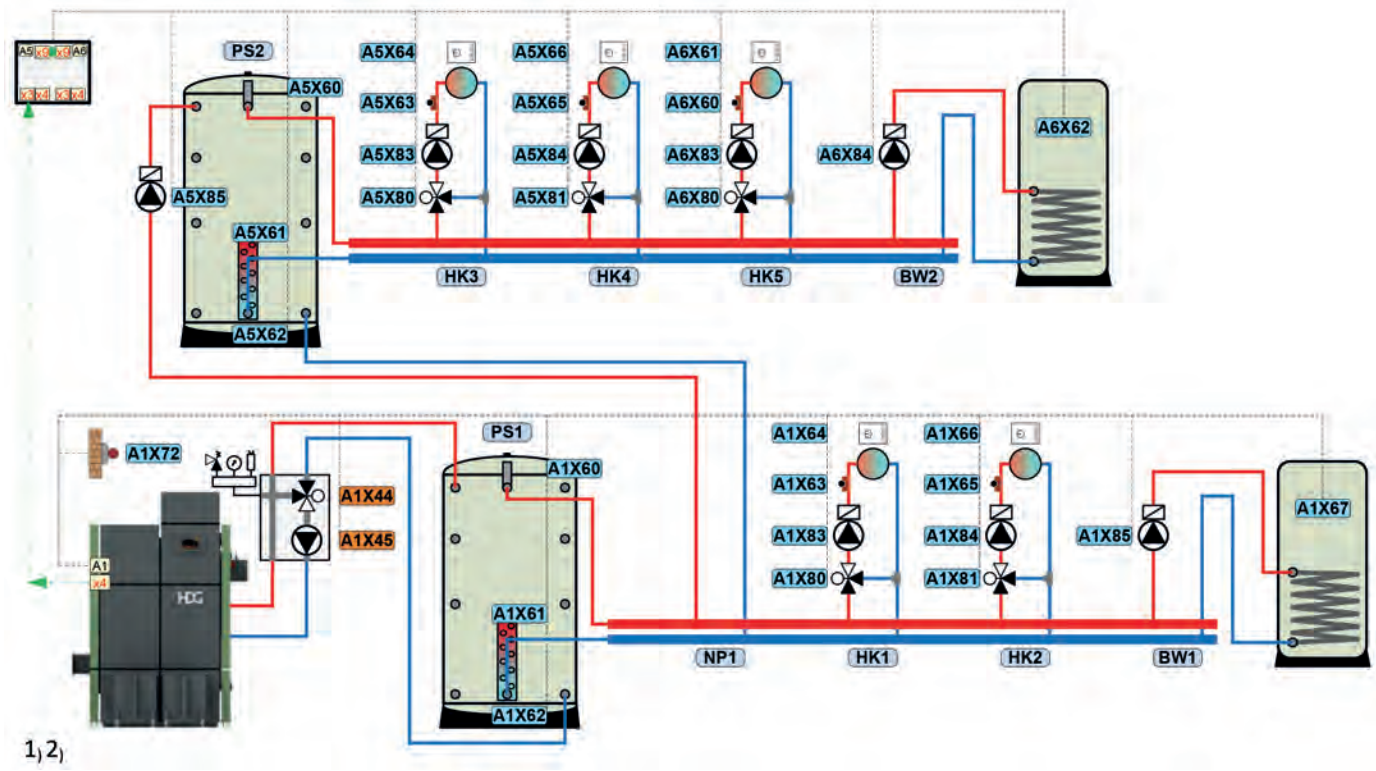
Description	Suitable for	Item no.	EURO	PG
HDG Control 4.3" touch display	HDG Euro, HDG F, HDG H, HDG Compact 40-80, HDG K10-60, SAL,	Included in boiler price		
HDG Control 7" XL touch display Control unit with 7" touch display and integrated web visualisation Surcharge with regard to the 4.3" touch display included as standard	HDG Euro, HDG F, HDG H, HDG Compact 40-80, SAL,	16005011		7
	HDG K10-60	16005010		7
Using myHDG – the exchange portal for access to HDG WebControl	HDG Control Touch XL	Free		
Using HDG ExpertNet – access to HDG WebControl for specialists	HDG Control Touch XL	Free		
E-mail notification for faults and warnings	HDG Control Touch XL	Free – available from autumn 2016		

HDG Control hydraulic plan principle with HDG Compact 40-80 (examples)

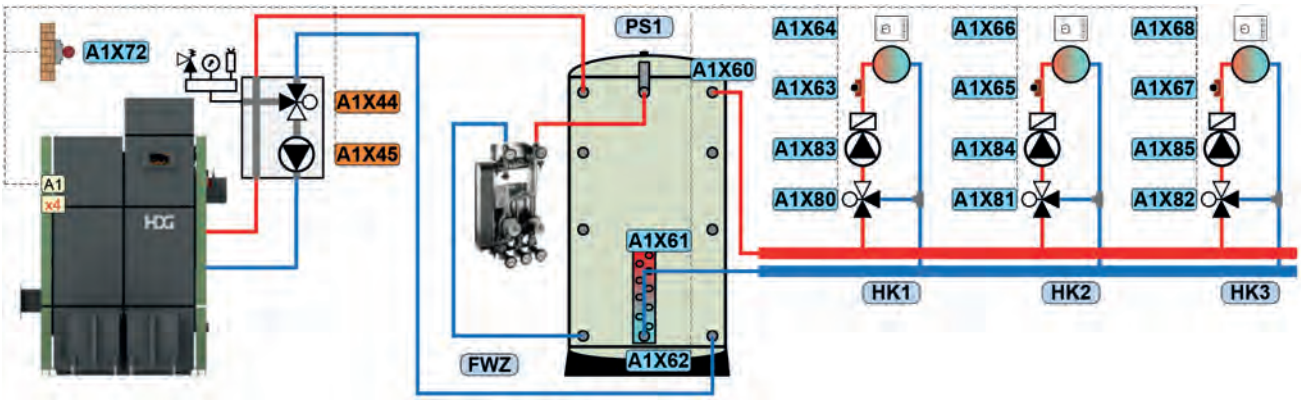
Example 1: For one house with two mixed heating circuits and domestic hot water (DHW) and accumulator



Example 2: For two houses, two accumulators with a network pump, a total of 5 mixed heating circuits, two domestic hot water (DHW) circuits



Example 3: For one house with three heating circuits with accumulator and external fresh water station



E
Regulation and *control technology