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AUTOMATIC PUMP CONTROLLED
EXPANSION SYSTEM



911 KPG AUTOMATIC PUMP CONTROLLED EXPANSION SYSTEM

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Automatic Pump Controlled Expansion System is a technological devices developed to absorb the volume changes that may occur at the heating and cooling systems and stabilize the installment pressure.

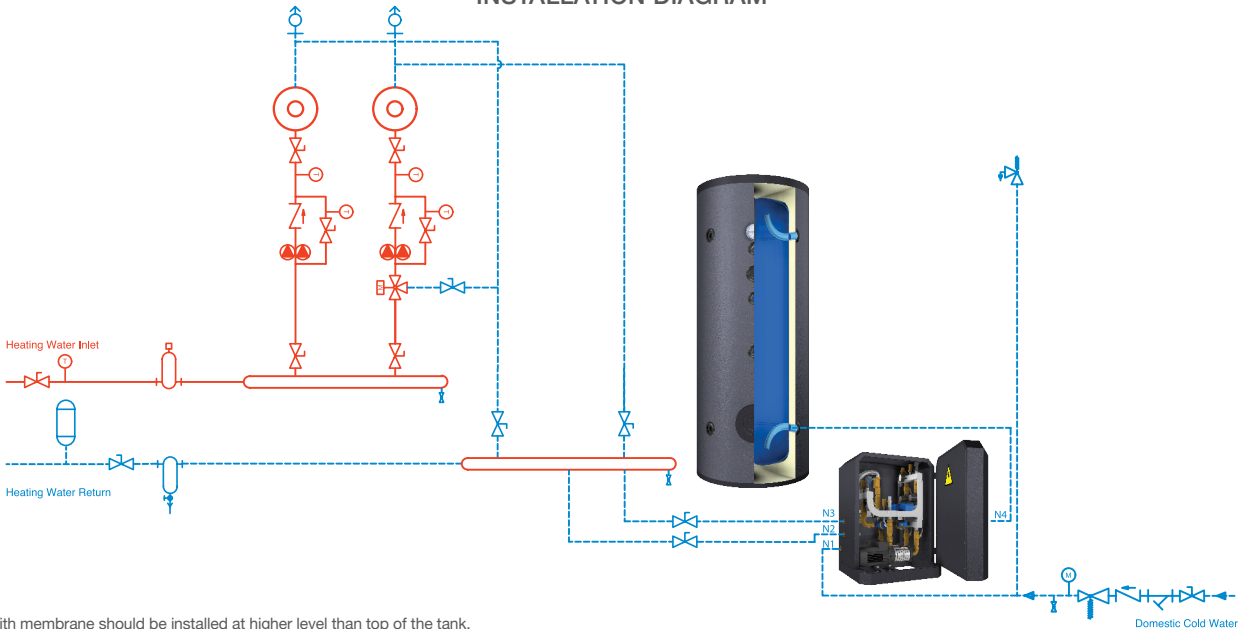
Considering the expansion and contraction of water due to the temperature variation, the amount of water changes in the system. The device keeps the pressure in the installment in balance with 0,1 bar precision by transmitting the water among the tank and installment through the proportioning valves and pumps.

- Volume**
Min. 500L
- Tank**
51.11 Enameled Accumulation Tank
- Pump**
Grundfos CM Serie
- Control System**
7" Touch Panel
- Maximum Operating Temperature**
95°C
- Maximum Operating Pressure**
6 bar / 10 bar / 16 bar
- Control Circuit Voltage**
230 V AC
- Automatic Filling System**
Available



Manufactured in accordance with 2014/68/EU Pressure Equipment Directive, TS EN 13445-3, TS736 and TS EN 12897 standards.

INSTALLATION DIAGRAM



Relief valves with membrane should be installed at higher level than top of the tank. Thus it is protected against high temperature and calcification and it is not necessary to discharge the tank when working on the relief valve. The installaion diagram shown above is just an example. The installion must be done according to updated standards and instructions.

		500L	800L-1000L	1500L-2000L	2500L-3000L	4000L-5000L
INSULATION	TANK	PU- 42kg/m³ HCFC-free polyurethane in accordance with the 814/2013 EU ErP Comission Regulations and TS EN 12897 Standards	STD/50 mm	x	x	x
		Soft PU- 15 kg/m³ soft polyurethane	x	STD/80 mm	STD/80 mm	STD/80 mm
		Soft PU- 26 kg/m³ flame retardant soft polyurethane	x	OPS/80 mm	STD/80 mm	STD/80 mm
		Izomax- 50kg/m³ insulation with d0 fire class as well as with BL-S3 compatible with the ErP regulations following the 814/2013 EU Comission Regulations and TS EN 12897 Standards	x	OPS/80 mm	OPS/80 mm OPS/100 mm*	OPS/80 mm
COATING	TANK	Blueshell- Recyclable polyethylene cover that provides heat-saving	STD	x	x	x
		Vinleks- Artificial Leather	x	STD	STD	STD
		Izoqua- Waterproof PVC unit which is suitable for exterior usage. (Optional only with the izomax insulation application)	x	OPS	OPS	OPS
	UNIT	Sheet Metal- Electrostatic Powder Painted Sheet	STD	STD	STD	STD
EQUIPMENT	TANK	Thermometer (0°C- 120°C)	STD/Ø63	STD/Ø100	STD/Ø100	STD/Ø100
		Steel Sensor Tube	OPS/Ø9 mm 2 pieces	OPS/Ø9 mm 2 pieces	OPS/Ø9 mm 2 pieces	OPS/Ø9 mm 2 pieces
		Cleaning & Control Flange	STD/4"	STD/5" OPS/16"	STD/5" OPS/16"	STD/5" OPS/16"
	UNIT	Pump	STD	STD	STD	STD
		Automatic Filling System	STD	STD	STD	STD
CARRIER ELEMENT	TANK	Steel leg system mounted on a palette from 3 different locations	STD	STD	STD-x	x
		Circle steel leg system that provides circular floor contact	x	x	x-STD	STD
	UNIT	Rubber leg system mounted on a cell from 4 locations	STD	STD	STD	STD

STD: Abbreviation for spare parts and equipments which belong to the standard products.
OPS: Abbreviation for the optional spare parts and equipments for non-standard products.

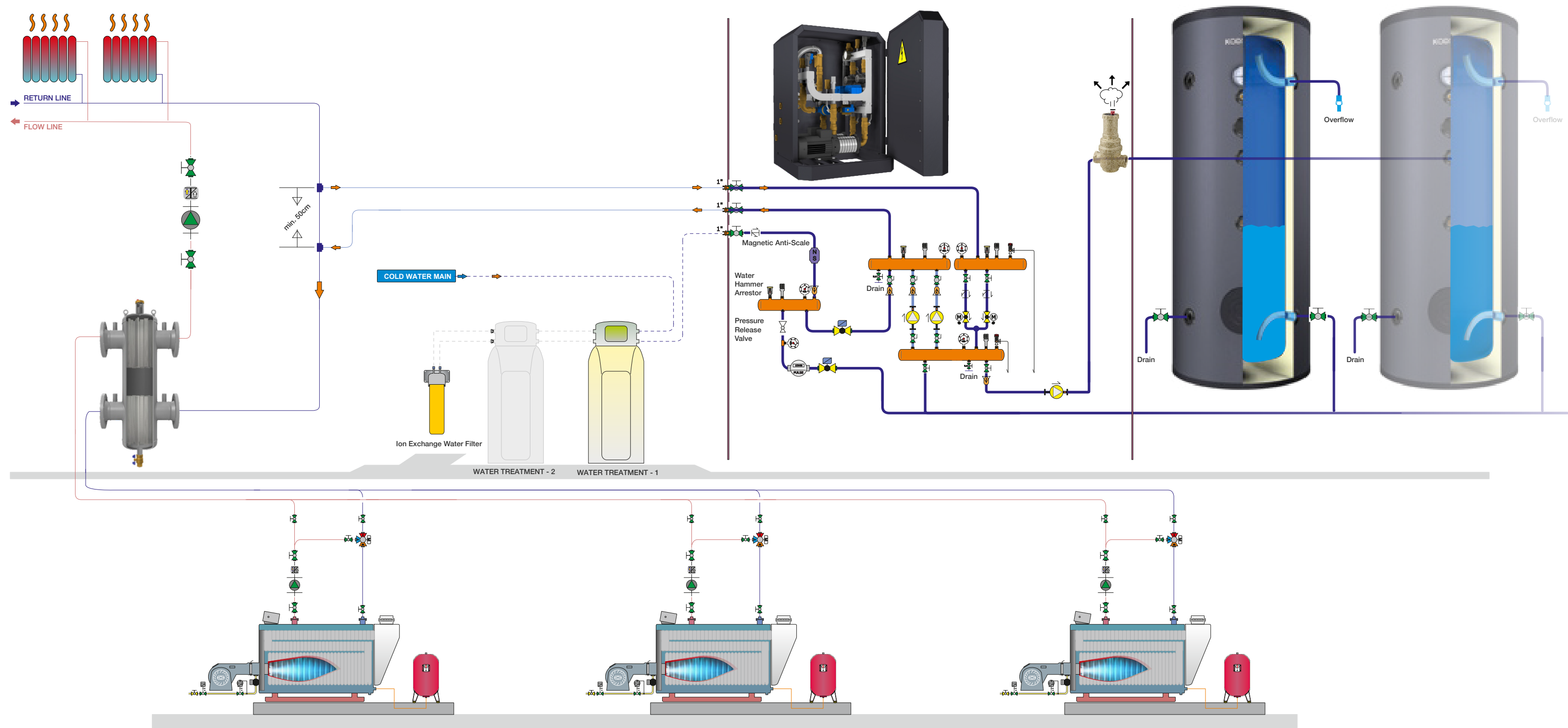
	Code	Unit	911.06	911.10	911.16
Capacity	V	lt	min 500L	min 500L	min 500L
Maximum Allowable Working Pressure	P	bar	6	10	16
Width	D1	mm	650	650	650
Depth	D2	mm	650	650	650
Height	H	mm	960	960	960
Domestic Cold Water Inlet Connection	N1	inch	1"	1"	1"
Expansion Line Inlet Connection	N2	icnh	1"	1"	1"
Pressurization Line Outlet Connection	N3	inch	1"	1"	1"
Storage Tank Connection	N4	inch	1¼"	1¼"	1¼"
Maximum Flow Rate	Q	m³/h	6	1	3,2
Power	P _{power}	kW	1,8	2,7	4,9
Gross Weight	G	kg	135	142	160
Tilt Height	R	mm	1100	1100	1100

The table shown above is prepared based on spare parts and equipments which belong to the standard products; all products have flanged connection.

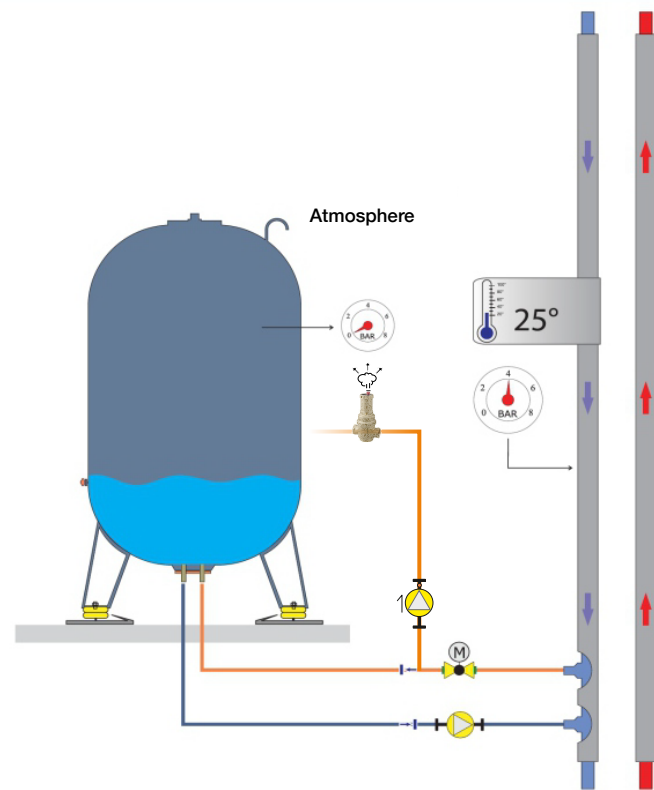
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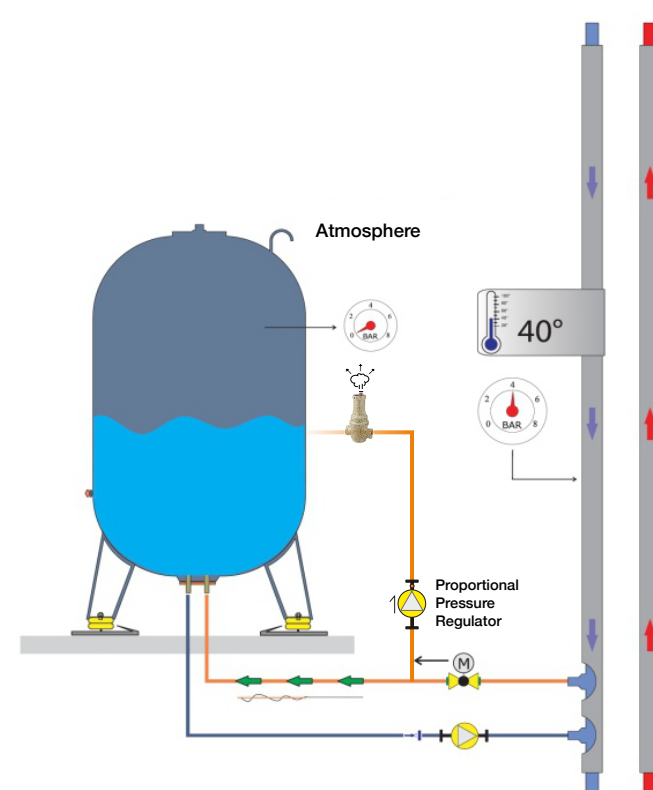


1. LOW TEMPERATURE



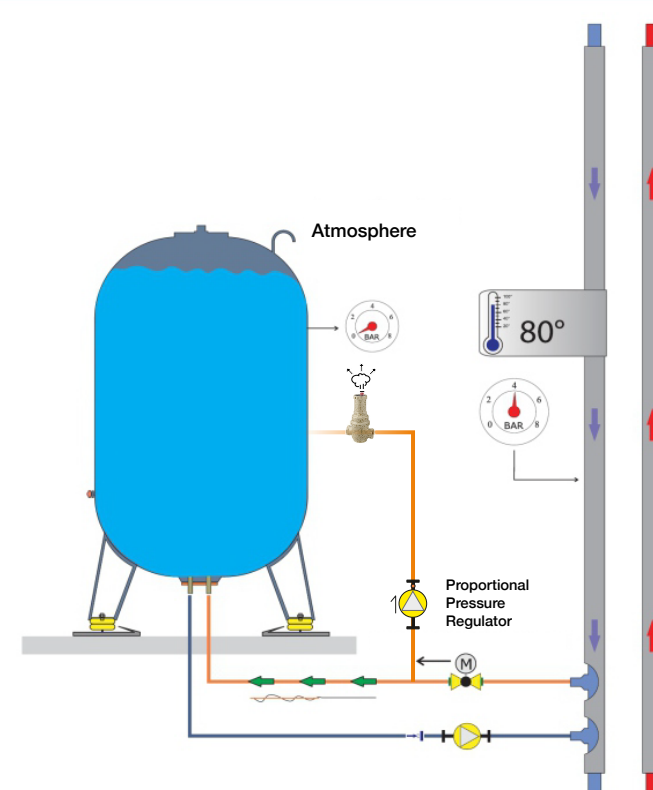
There is a certain amount of water in the tank. The system is in standby.

2. TEMPERATURE RISE



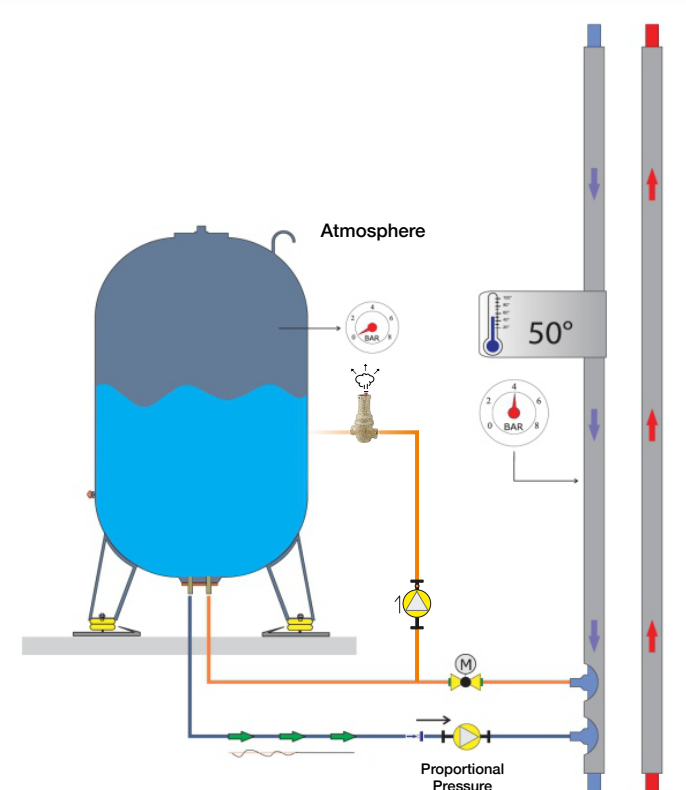
When the system is heated, the water volume and the installation pressure increase.
The automation control unit enables the solenoid and motorized valves and accumulates the amount of expanded water into the tank.
The air in the tank and the decomposed oxygens in the water throughout the expansion process are drained by the upper discharge device.

3. MAXIMUM EXPANSION



The rising installation pressure is kept constant by accumulating the amount of expanded water into the tank. When the system reaches its maximum operating temperature, the amount of water in the tank also reaches its maximum level.

4. REFILLING OF SYSTEM



When the temperature decreases, the system compensates the installment by sending back the amount of water that shrinks during the cooling of the water to the installation via pumps in the device and prevents the pressure drop in the installment.

BENEFITS

The system has capability of pressure balancing in high precision compared to the conventional membrane expansion vessels. Considering the thermal expansion and contraction of water due to the temperature variation, the amount of water changes in the system. The device keeps the pressure in the installment in balance with 0,1 bar precision by transmitting the water among the tank and installment.

Thanks to the measurement sensors which the device equipped with, the water level and pressure of the system is consistently kept under control. In this way, the accumulation of air caused by change in pressure and water level and the associated heating problems are prevented.

Automatic Pump Controlled Expansion system has a tank which 99% of the volume is utilizable; thus the space saving is ensured by meeting the need with an average of 65% smaller tank capacity compared to conventional type membrane expansion vessels. This ratio is even higher in plants where operating pressure is higher.

Because there is no membrane in new generation expansion system; the pressurized nitrogen gas (pressurized air) is not needed in the tank; atmospheric air pressure is sufficient. Since the expansion tank is pump controlled, the tank used in the system does not operate under pressure.

Since there is no membrane and pressurized nitrogen gas in the Pump Controlled Expansion System; against the risk of membrane rupture, there is no membrane replacement and annual maintenance obligation at least every three years, which is a requirement in conventional systems.

The device has a user-friendly automation system with a color & touch screen, a functional menu and an internet module. The internet module offers remote monitoring and has the capability of sending fault alarm to the defined phone and e-mail addresses. A possibility of an explosion, flood or major damage to device (potential for large systems) are prevented in this way. The automation system keeps track of the last 20 faults in addition to the 15-day data logs.

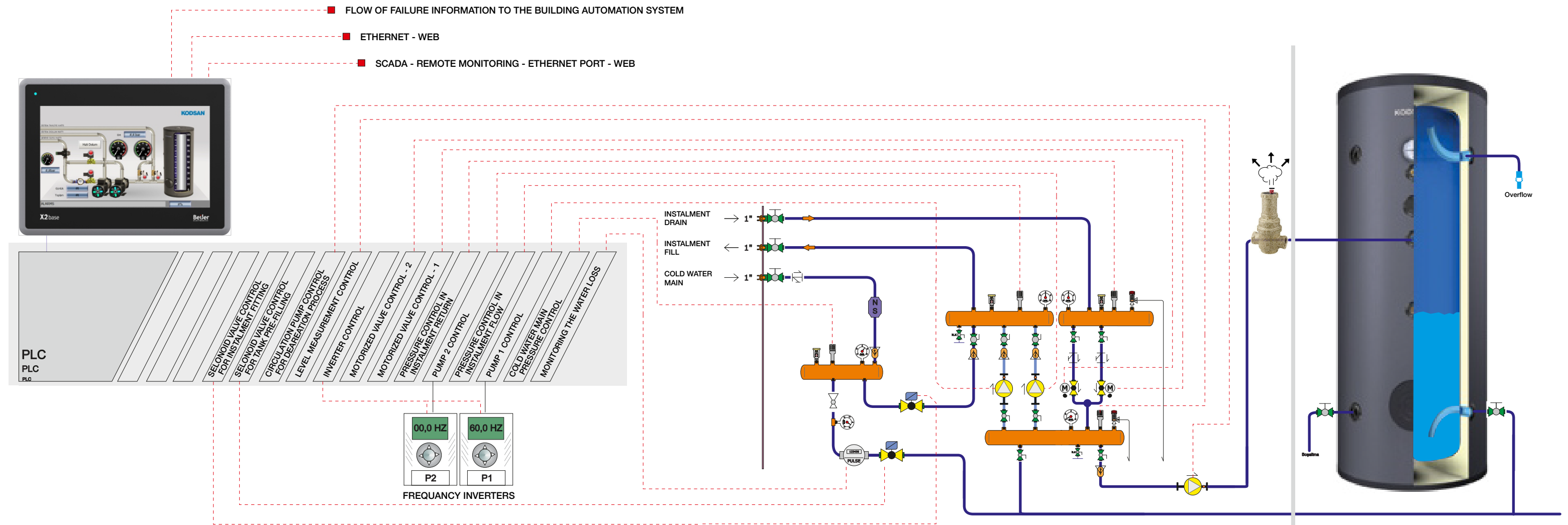
The automation system enables to monitor the amount of water collected from the main with pulse-out water meter, the amount of water reduced due to evaporation and leak is measured and water is supplied from the main line to the installation. It is also capable of detecting the static level of the leakage points in the installation, shutdown the system when dangerous limits are approached, and give visual and audible warnings.

While the Pump Controlled Expansion System is commissioned, the automatic filling invention provided by the automation system functions. With this feature, which hedge the pumps against overloading and shortening their life, the water in the main is transmitted directly to the installation in a controlled manner and automatic filling is possible.

The pumps in the device are individually controlled by frequency inverters, which ensure vibration-free pressurization. Thanks to this control provided by automation, while the pumps work with a soft start-stop system, they offer long-lasting use with the adjustable co-aging technique used in other pressure balancing equipment.

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rbm
Passion for innovation

GRUNDFOS

Schneider
Electric

Beijer
ELECTRONICS

SIEMENS

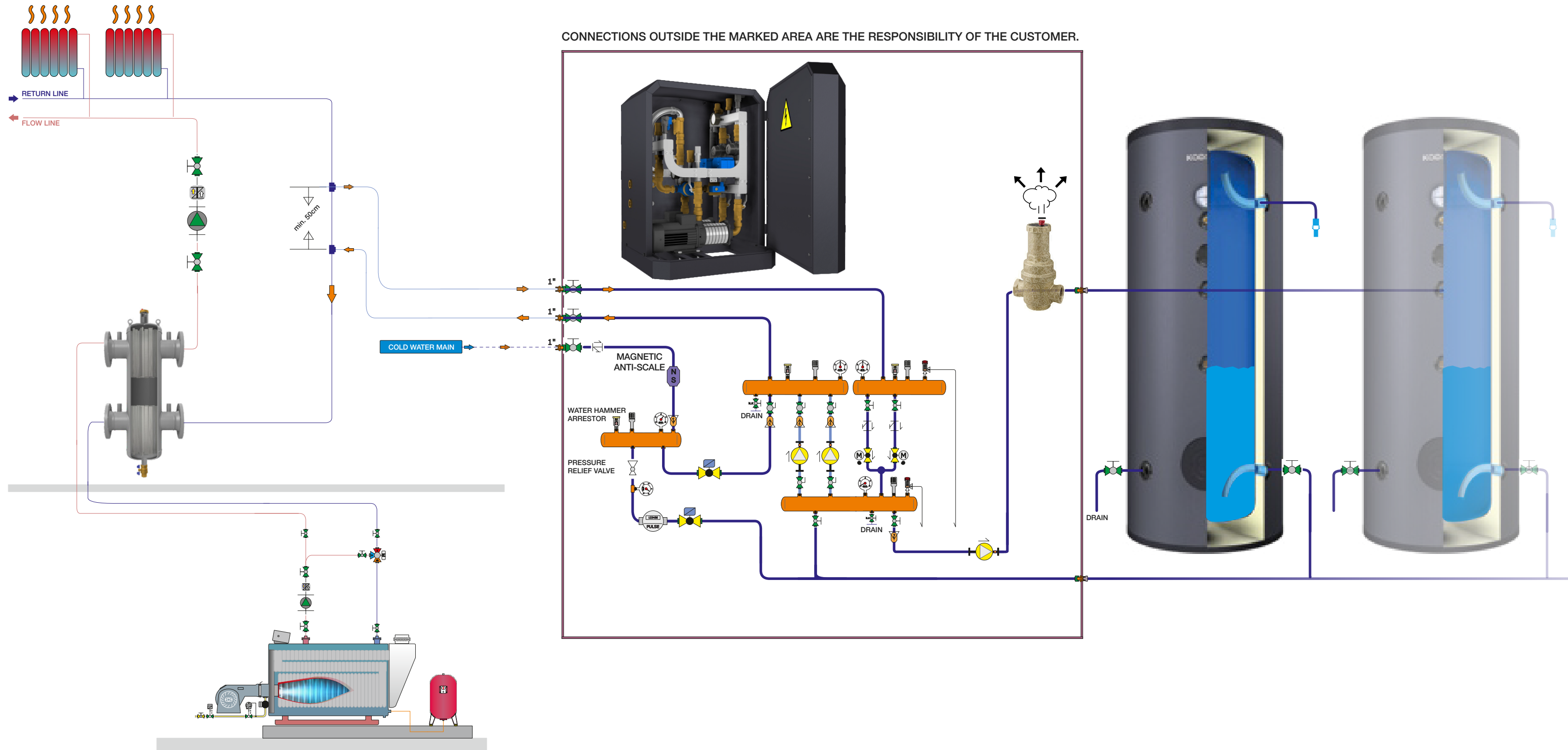
Danfoss

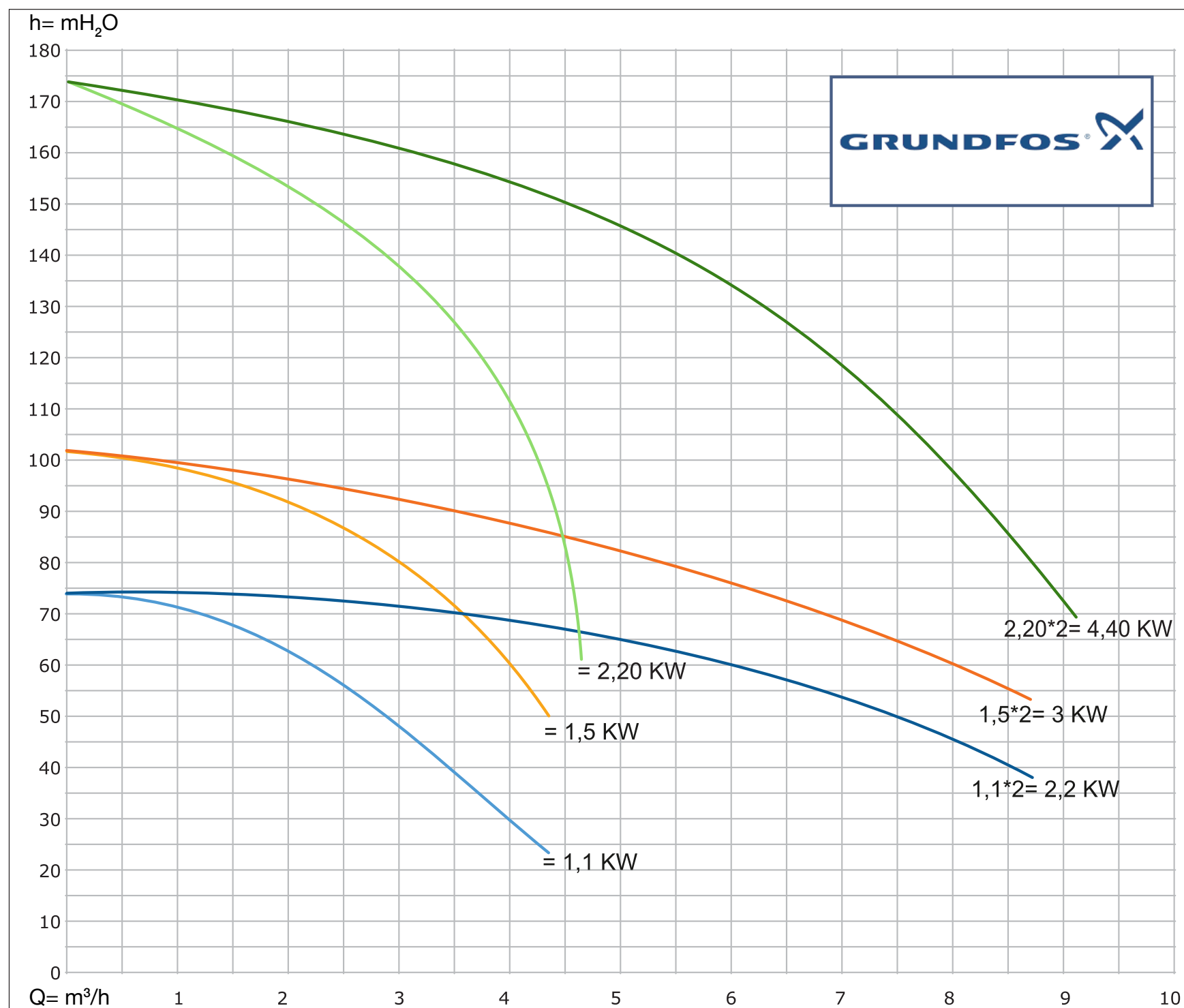


- ➔ Pressure balancing with 0,1 bar precision
- ➔ Monitoring the water loss via meter with pulse output
- ➔ Deaeration system
- ➔ Water level measurement
- ➔ Frequency inverter control on pumps
- ➔ Data log record
- ➔ Failure log record
- ➔ Rotational operation in pumps

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