Accessories guide DHP-R Eco

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Expansion Module HPC EM, Water Charge System Function

Manufacturer: Abelko
Part number: 086U3395

Area of use
The expansion module in WCS function mode manages hot water charging for the hot water heaters. The WCS function is achieved by moving the switch according to the figure to the side.

System overview

Accompanying accessories
Submersible sensor return VVX, Thermokon-Danelko AKF1004140, part no. 086U3364
One of the following modular cables:
- Modular cable 0.3 m, part no. 086U4227
- Modular cable 1.1 m, part no. 086U4228
- Modular cable 10.0 m, part no. 086U4229

Electrical connection WCS
- Temperature input, T1: Submersible sensor, return VVX
- Temperature input, T2: -
- Analogue output 0-10V, AO1: Signal to control valve
- Relay, DO1: Signal to circulation pump, (potential free connection, max 6A)

Other accessories
Control valve VVL (2-way), heat exchanger (tap water exchanger), circulation pump.
Expansion Module HPC EM, Tap Water Control Function

Manufacturer: Abelko
Part number: 086U3395

Area of use
The expansion module in TWC function mode ensures that outgoing tap water and hot water circulation maintain sufficiently high temperatures to prevent legionella bacteria.
The TWC function is achieved by moving the switch according to the figure to the side.

System overview

Accompanying accessories
2 x PT1000 strap on sensors with 2 m cable, part no. 086U3365 (regards 1 x sensor)
One of the following modular cables:
Modular cable 0.3 m, part no. 086U4227
Modular cable 1.1 m, part no. 086U4228
Modular cable 10.0 m, part no. 086U4229

Electrical connection TWC
Temperature input, T1: Sensor, HW heater
Temperature input, T2: Sensor, HW return
Analogue output 0-10V, AO1: -
Relay, DO1: Signal to immersion heater, hot water (potential free connection, max 6A)

Other accessories
-
Expansion module HPC EM, Shunt Function

Manufacturer: Abelko

Part number: 086U3395

Area of use
The expansion module in the Shunt function mode maintains the desired temperature for another heating circuit. The Shunt function is achieved by moving the switch according to the figure to the side.

System overview

Accompanying accessories
1 x PT1000 strap on sensor part no. 086U3365
One of the following modular cables:
- Modular cable 0.3 m, part no. 086U4227
- Modular cable 1.1 m, part no. 086U4228
- Modular cable 10.0 m, part no. 086U4229

Electrical connection Shunt function
Temperature input, T1: Sensor, shunt temperature
Temperature input, T2: -
Analogue output 0-10V, AO1: Signal to shunt valve
Relay, DO1: Signal to circulation pump, (potential free connection, max 6A)

Other accessories
Shunt valve, circulation pump.
Cooling module HPC CM

Manufacturer: Abelko

Part number: 086U3394

Area of use
Passive cooling means that coolant circulates through the bore hole and the coolant tank without any heat pump starting. Only circulation pumps for heat transfer fluid are used. The heat from the coolant tank is transported down into the rock. A condition for passive cooling to work is that the coolant is colder than the coolant tank.

Active cooling means that a heat pump starts which then lowers the temperature of the coolant before it enters the coolant tank. If the integral continues to rise, more heat pumps start. The valve for active cooling shifts position and disconnects the borehole. The coolant therefore only circulates through the cooling tank and heat pump so that all produced cooling can be used.

An extra function that can be activated in the cooling module is dew point control. This function is not necessary, but if it is to be activated more information can be found under the accessory Dew point sensor.
Cooling module cont’d.

System overview

Accompanying accessories
4 x PT1000 strap on sensors with 2 m cable, part no. 086U3365 (regards 1 x sensor)
One of the following modular cables:
- Modular cable 0.3 m, part no. 086U4227
- Modular cable 1.1 m, part no. 086U4228
- Modular cable 10.0 m, part no. 086U4229
Dew point sensor for wall mounting, part no. 086U3396 (if the dew point function is to be used)

Electrical connection
- Temperature input, T1: Sensor, cooling tank
- Temperature input, T2: Sensor, coolant cooler
- Temperature input, T3: Sensor, output cooling tank
- Temperature input, T4: Sensor, cooling circuit
- Analogue input 0-10V, AI1: Signal from dew point sensor, room temperature 0 - 50°C
- Analogue input 0-10V, AI2: Signal from dew point sensors, rel. Humidity 0 - 100%
- Analogue output 0-10V, AO1: Signal to control valve cooling circuit
- Analogue output 0-10V, AO2: Signal to cooling fans
- Relay 24VAC, DO1: Signal to exchange valve, cooling tank (passive cooling)
- Relay 24VAC, DO2: Signal to exchange valve, coolant return (active cooling)
- Relay 24VAC, DO3: Signal to circulation pump coolant cooler
- Relay 24VAC, DO4: Signal to exchange valve, coolant cooler
- Relay 24VAC, DO5: Signal to circulation pump, cooling circuit

Other accessories
Control valve, exchange valves, circulation pumps.
Strap on Sensor with Connection Box PT1000

Manufacturer: Thermokon-Danelko

Part number: 086U3356

Area of use
Strap on sensor used in several places in the system to read the temperature. The sensor lies against the pipe and senses temperatures in the range 0-160°.

System overview

Technical data
Resistance table:

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Ohm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40</td>
<td>842.7</td>
</tr>
<tr>
<td>-35</td>
<td>862.5</td>
</tr>
<tr>
<td>-30</td>
<td>882.2</td>
</tr>
<tr>
<td>-25</td>
<td>901.9</td>
</tr>
<tr>
<td>-20</td>
<td>921.6</td>
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<tr>
<td>-15</td>
<td>941.2</td>
</tr>
<tr>
<td>-10</td>
<td>960.8</td>
</tr>
<tr>
<td>-5</td>
<td>980.4</td>
</tr>
<tr>
<td>0</td>
<td>1000.0</td>
</tr>
<tr>
<td>5</td>
<td>1019.5</td>
</tr>
<tr>
<td>10</td>
<td>1039.0</td>
</tr>
<tr>
<td>15</td>
<td>1058.5</td>
</tr>
<tr>
<td>20</td>
<td>1077.9</td>
</tr>
<tr>
<td>25</td>
<td>1097.3</td>
</tr>
<tr>
<td>30</td>
<td>1116.7</td>
</tr>
<tr>
<td>35</td>
<td>1136.1</td>
</tr>
<tr>
<td>40</td>
<td>1155.4</td>
</tr>
<tr>
<td>45</td>
<td>1174.7</td>
</tr>
<tr>
<td>50</td>
<td>1194.0</td>
</tr>
<tr>
<td>55</td>
<td>1213.2</td>
</tr>
<tr>
<td>60</td>
<td>1232.4</td>
</tr>
<tr>
<td>65</td>
<td>1251.6</td>
</tr>
<tr>
<td>70</td>
<td>1270.7</td>
</tr>
<tr>
<td>75</td>
<td>1289.9</td>
</tr>
<tr>
<td>80</td>
<td>1309.0</td>
</tr>
<tr>
<td>85</td>
<td>1328.0</td>
</tr>
<tr>
<td>90</td>
<td>1347.1</td>
</tr>
<tr>
<td>95</td>
<td>1366.1</td>
</tr>
<tr>
<td>100</td>
<td>1385.1</td>
</tr>
</tbody>
</table>
Strap on Sensor with Connection Box PT1000 cont’d

Accompanying accessories
-

Installation
Tighten the sensor around the pipe using cable tie. Then apply insulation tape/insulation on the outside, depending on the type of pipe.

Electrical connection
15-24VDC/24VAC supply voltage.
The strap on sensor is connected to WM HPC, Temperature input T1 or T2 and GND.

Other accessories
-
Submersible sensor PT1000

Manufacturer: Thermokon-Danelko

Part number: 086U3364

Area of use
Submersible sensor used to read the temperature in the return line from the heat exchanger, see the system image below. The sensor is installed inside the pipe and senses temperatures in the range 0-160°.

System overview

![Diagram of system overview](image-url)
Submersible sensor PT1000 cont’d

Technical data
Resistance table for submersible sensor:

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Ohm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40</td>
<td>842.7</td>
</tr>
<tr>
<td>-35</td>
<td>862.5</td>
</tr>
<tr>
<td>-30</td>
<td>882.2</td>
</tr>
<tr>
<td>-25</td>
<td>901.9</td>
</tr>
<tr>
<td>-20</td>
<td>921.6</td>
</tr>
<tr>
<td>-15</td>
<td>941.2</td>
</tr>
<tr>
<td>-10</td>
<td>960.8</td>
</tr>
<tr>
<td>-5</td>
<td>980.4</td>
</tr>
<tr>
<td>0</td>
<td>1000.0</td>
</tr>
<tr>
<td>5</td>
<td>1019.5</td>
</tr>
<tr>
<td>10</td>
<td>1039.0</td>
</tr>
<tr>
<td>15</td>
<td>1058.5</td>
</tr>
<tr>
<td>20</td>
<td>1077.9</td>
</tr>
<tr>
<td>25</td>
<td>1097.3</td>
</tr>
<tr>
<td>30</td>
<td>1116.7</td>
</tr>
<tr>
<td>35</td>
<td>1136.1</td>
</tr>
<tr>
<td>40</td>
<td>1155.4</td>
</tr>
<tr>
<td>45</td>
<td>1174.7</td>
</tr>
<tr>
<td>50</td>
<td>1194.0</td>
</tr>
<tr>
<td>55</td>
<td>1213.2</td>
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<tr>
<td>60</td>
<td>1232.4</td>
</tr>
<tr>
<td>65</td>
<td>1251.6</td>
</tr>
<tr>
<td>70</td>
<td>1270.7</td>
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<tr>
<td>75</td>
<td>1289.9</td>
</tr>
<tr>
<td>80</td>
<td>1309.0</td>
</tr>
<tr>
<td>85</td>
<td>1328.0</td>
</tr>
<tr>
<td>90</td>
<td>1347.1</td>
</tr>
<tr>
<td>95</td>
<td>1366.1</td>
</tr>
<tr>
<td>100</td>
<td>1385.1</td>
</tr>
</tbody>
</table>

Accompanying accessories

- Electrical connection
The submersible sensor is connected to the heat exchanger return line as close to the heat exchanger as possible. Connected to EM HPC, temperature input T1 and GND.

Other accessories

-
Modular cables

Manufacturer: Abelko

Part number:  
- Modular cable 0.3 m: 086U4227
- Modular cable 1.1 m: 086U4228
- Modular cable 10.0 m: 086U4229
- Conductor joint: 086U4230

Area of use
The modular cable is a cable that joins the various units. Connections can be made between several heat pumps or between different accessory modules internally in the heat pump. Conductor joint to connect and extend two or more modular cables.

System overview
- 

Accompanying accessories
- 

Electrical connection
The modular cable is connected to one of the connections Exp.in or Exp.out.

Other accessories
-
Flow Guard Kit

Manufacturer: IFM

Part number: 086U3368

Area of use
The flow guard is an electronic guard that does not contain any moving parts. It is used for ground water or lake water systems and ensures that there is a sufficiently large flow through the heat exchanger.

System overview
See accompanying figure.

Supplied accessories
Flow guard IFM SI5001, part no. 086U3345
Weld nipple IFM E40113, part no. 086U3367
Connection cable IFM EVC005, part no. 086U3366

Electrical connection
The flow guard is connected using the connection cable to the heat pump’s control computer. The three-core connection cable is connected as follows:
Brown cable, positive terminal (+), connected to terminal block 147
Blue cable, negative terminal (-), connected to terminal block 148
Black cable, signal in, connected to terminal block 124

Other accessories
Heat exchanger
Switching Valve for Hot Water, DHP-R Eco

Manufacturer: NordiCold
Part number: 086U2471

Area of use
The exchange valve is of the ball exchange valve type. It is used to control the flow of hot water to either the heating system or hot water heaters depending on the heating demands.

System overview
See accompanying figure.

Supplied accessories

Electrical connection
The exchange valve’s motor connects to HPC RM, digital output 24 VAC, DO4.

Other accessories

Technical data

<table>
<thead>
<tr>
<th>Exchange valve DN 32 internal thread</th>
<th>Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve body</td>
<td>Brass</td>
</tr>
<tr>
<td>Ball</td>
<td>Chromed brass</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>0°C to 100°C</td>
</tr>
<tr>
<td>Max. Differential pressure</td>
<td>6 bar</td>
</tr>
<tr>
<td>Seal valve housing</td>
<td>PTFE</td>
</tr>
<tr>
<td>O-rings</td>
<td>EPDM</td>
</tr>
</tbody>
</table>
Hot Gas Circuit Circulation Pump Kit

Manufacturer: Wilo
Part number: 086L3004

Area of use
The hot gas pump is a circulation pump for the hot gas circuit.

System overview
See accompanying figure.

The kit contains the following accessories:
1 x circulation pump Wilo Yonos Para GT 15/6 RKC FS 130 12, art.nr. 086L2856
2 x union joints with shut-off, Ø 28 clamp ring RSK 5805928, part no. 086U4232 (refers to 2 x connections)

Electrical connection
Hot gas pump connected to terminal block DHP-R Eco according to electrical instruction.

Other accessories
Flexible hoses, strainer, valve for adjusting flow.
Room Sensor

Manufacturer: Thermokon-Danelko

Part number: 086U3354

Area of use
The room sensor is an active sensor for room temperature. The sensor is wall-mounted.

System overview

Supplied accessories

Electrical connection
24VAC supply voltage.
The room sensor is connected to WM HPC, analogue input 0-10V, AI1.
Measurement range: Temperature: 0 - 50°C.

Other accessories
**Dew Point Sensor**

**Manufacturer:** Thermokon-Danelko

**Part number:** 086U3396

**Area of use**
Dew point control is an extra function that ensures that condensation precipitation cannot occur on the cooling circuit. If the temperature and humidity reaches the dew point, the supply set point is adjusted upwards. The sensor is wall-mounted.

**System overview**
- 

**Accompanying accessories**
- 

**Electrical connection**
24VAC supply voltage.
The dew point sensor is connected to HPC CM (cooling module) to the inputs AI1 (temperature) and AI2 (humidity).
Measurement range: Rel. humidity: 5 - 95%. Temperature: 0 - 50°C.

**Other accessories**
-
**Web Access**

**Manufacturer:** Abelko

**Part number:**
- 086U3392 (HP1)
- 086U3393 (HP2-8)

**Area of use**
Used to monitor the heat pump using a web interface. Alarm notification can occur via SMS or e-mail. The accessory consists of a code that can access the heat pump via the Internet.

Web access HP 1 refers to unlocking heat pump #1 in a system, i.e. master heat pump. This enables full access to heat pump 1 and other connected units in the heat pump, for example expansion modules. Alarm management and statuses for the entire system can be obtained, for example, for slave heat pumps.

Web access HP 2-8 refers to unlocking heat pumps #2 to #8 in a system, i.e. slave heat pumps. This means that the temperatures of all heat pumps can be viewed via the web interface.

Web access can only be used if there is a network connection in the installation area.

**System overview**
- 

**Accompanying accessories**
- 

**Electrical connection**
- 

**Other accessories**
-
Router for Web Access

Manufacturer: D-Link
Part number: 086U4840

Area of use
Used to connect to the heat pump via the Internet. The router directs the network traffic between the local network where the heat pump is and the Internet. It also limits the amount of incoming traffic from the Internet. The router is pre-configured and ports out 10.0.48.94 and 10.0.48.101 to 10.0.48.109, which means that no settings need to be made at connection.

System overview

Supplied accessories
10 + 2 metre network cable supplied with router.

Connection
The router has a WAN port which is connected to a broadband modem or a broadband socket, see images below. It also has four network sockets for a local network, to which you can connect your heat pumps. If four sockets are not enough, use a switch. The network cable must be connected from the Ethernet socket on WM HPC in the heat pump and to a spare port in the router.

Other accessories
Soft Start

Manufacturer: Carlo Gavazzi
Part number: 086L1516

Area of use
Used to limit the current when the heat pump is started. Soft start distributes the current consumption for a few seconds and enables the heat pump to start slower, to prevent current peaks in the electrical network.

System overview

Technical data
The table below shows the current consumption when BFN-P Eco is started with and without soft start.

<table>
<thead>
<tr>
<th>Heat pump, BFN-P Eco</th>
<th>22</th>
<th>26</th>
<th>33</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting without soft start (A)</td>
<td>80</td>
<td>102</td>
<td>110</td>
<td>112</td>
</tr>
<tr>
<td>Starting with soft start (A)</td>
<td>46</td>
<td>50</td>
<td>89</td>
<td>76</td>
</tr>
<tr>
<td>Starting current (A)</td>
<td>20</td>
<td>25</td>
<td>33</td>
<td>33</td>
</tr>
</tbody>
</table>

Supplied accessories
Panel, screws as well as wiring and cable tie for installation.

Installation
The soft starter is installed between the unit cabinet and compressor, according to the overview image to the right. Detailed installation instructions are supplied with the soft starter.

Electrical connection
See wiring diagram and installation instructions included with the product.

Other accessories
-
**Electronic Valve Actuator SQS 65.5**
For WCS function (hot water charging)

**Manufacturer:** Siemens

**Part number:** 086U4837

**Area of use**
The valve actuator controls the valve that opens the flow through the heat exchanger for hot water heating. The motor has a 35 second set-up time, DC 0-10 V control signal, AC 24 V supply voltage and mode indication. Manual setting is possible.

**System overview**

![Diagram of heating and control circuit with control valve](image)

**Accompanying accessories**
Control valve VVG 44.25-10 (2-way). For charge output up to 110 kW.
Part number 086U3730

or

control valve VVG 44.32-16 (2-way). For charge output 110-180 kW.
Part number 086U3731
Electronic Valve Actuator SQS 65.5 cont’d

Installation
Screw the actuator directly onto the valve in the vertical to horizontal position. No adjustments necessary.

Electrical connection
Analogue output 0-10V, AO1: Signal to control valve
Digital output 24 VAC 2.1, DO1.1: Signal to charge pump
Digital output 24 VAC 2.2, DO1.2: Signal to charge pump

Other accessories
Valve Actuator ESBE

Manufacturer: ESBE

Part number: 086U5272

Area of use
Valve actuator that is used to control ESBE shunt valves. Proportional or 3 or 2 step control signal. Manual control also possible.

System overview

Supplied accessories
The actuator is supplied with an adapter for connection to the shunt valve, as well as a 1.5 m connection cable.

Technical data

Motor

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24V AC/DC, 50/60 Hz</td>
</tr>
<tr>
<td>Output</td>
<td>5 VA</td>
</tr>
<tr>
<td>Rotation time</td>
<td>45/120 seconds</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP41</td>
</tr>
</tbody>
</table>

Installation
The actuator is installed on the valve using an adapter. Installation instructions supplied with the valve on delivery.
Valve Actuator ESBE cont’d

Electrical connection
Analogue output 0-10V, AO1: Signal to control valve
Electrical connection of shunt valve which is used for auxiliary heat:

Electrical connection of shunt valve which is used for sub-shunt group:

Other accessories
Shunt valves ESBE

Manufacturer: ESBE

Part number: 086U5265 3-way shunt valve VRG131 DN20-KVS 6.3
086U5266 3-way shunt valve VRG131 DN25-KVS 10
086U5267 3-way shunt valve VRG131 DN32-KVS 16
086U5268 3-way shunt valve VRG131 DN40-KVS 25

Area of use
ESBE shunt valves are used partly as exchange or distribution valves to control the water flow when using external heat sources, for example, oil-fired boilers (shunt valve in the system image on the previous page). They are also used to control the flow to the sub-shunt groups, i.e. additions to the heating system, and regulate heating or cooling in the radiator and floor heating systems or other similar applications (shunt valve 2 in the system image on the previous page).

System overview
See previous section, Valve Actuator ESBE.

Technical data

<table>
<thead>
<tr>
<th>Shunt valve</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve body</td>
<td>Dezincification-resistant brass</td>
</tr>
<tr>
<td>Control</td>
<td>PPS composite</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>-10°C to 130°C</td>
</tr>
<tr>
<td>Max. Differential pressure</td>
<td>1 bar (mixture) 2 bar (distribution)</td>
</tr>
<tr>
<td>O-rings</td>
<td>EPDM</td>
</tr>
</tbody>
</table>
Shunt valves ESBE cont’d

The valve that is to be selected is determined partly by the Kvs value, i.e. the capacity value in m³/hours at a pressure drop of 1 bar, and partly by the system that the valve is to serve. For radiator systems, normally select Δt = 20°C and for floor heating Δt = 5°C. Suitable pressure drop is 3-15 kPa. To select the correct valve dimension use the diagram below. Start from the output requirement (e.g. = 25 kW) and go vertically to t (e.g. = 15°C). Continue horizontally to the shaded area (pressure drop = 3–10 kPa) and select the smaller option (e.g. Kvs = 6.3).

Dimensioning the shunt valve for boiler installations
Shunt valves ESBE cont’d

For control valves, the Kvs value is always given in one (heat conducting) direction.

Pressure drop chart
Flow Adjustment Valve for hot gas circuit

Manufacturer: Nordicold
Part number: 086U3757 2-16 l/min

Area of use
The flow adjustment valve is used to adjust the water flow through the hot gas circuit to a suitable low level to optimise the heat pump's efficiency. The valve that is to be selected is calculated by max 20% of the nominal condenser flow on the heat pump. This valve is selected for the following flows:

- DHP-R Eco 22 = 6 l/min
- DHP-R Eco 26 = 7.2 l/min
- DHP-R Eco 33 = 9.6 l/min
- DHP-R Eco 42 = 12 l/min

System overview
Flow Adjustment Valves for hot gas circuit cont’d

Technical data

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing and insert</td>
<td>Brass</td>
</tr>
<tr>
<td>Flow gauge</td>
<td>shockproof and temperature resistant plastic</td>
</tr>
<tr>
<td>Spring</td>
<td>stainless steel</td>
</tr>
<tr>
<td>O-ring</td>
<td>EPDM</td>
</tr>
<tr>
<td>Maximum operating temperature</td>
<td>See pressure/temperature diagram</td>
</tr>
<tr>
<td>Min operating temperature</td>
<td>-20°C</td>
</tr>
<tr>
<td>Max operating temperature</td>
<td>see pressure drop chart</td>
</tr>
<tr>
<td>Flow accuracy</td>
<td>±10% over the actual reading</td>
</tr>
</tbody>
</table>

Pressure/temperature diagram

![Image of pressure/temperature diagram]
Flow Adjustment Valves for hot gas circuit cont’d

Pressure drop chart

Accompanying accessories

Installation
The valves can be supplied with pipe connections with external thread, soldered connections or clamp ring connections. The group valve can be installed in all positions. To achieve the exact flow a straight pipe piece is recommended (the same length as the valve body) on the supply side. Installation instructions supplied with the valve on delivery.

Electrical connection

Other accessories
RS-232 to RS-422/485 converter

Manufacturer: Moxa

Part number: 086U9011

Area of use
The converter is used if you need an RS-422/485 connection instead of RS-232.
The converter can be mounted on a DIN-rail

Supplied accessories
Moxa TCC-100
DB9 angled connector to be connected to RS-232 connection on WM-HPC

Electrical installation
RS-232 connects to RS-232 on WM-HPC.
If the unit is mounted inside the electrical cabinet, 24 V power supply (24 VDC) is available on plinth 147 (V+) and 148 (V-). RS-422/485 is connected as instructed in the manual for Moxa TCC-100.