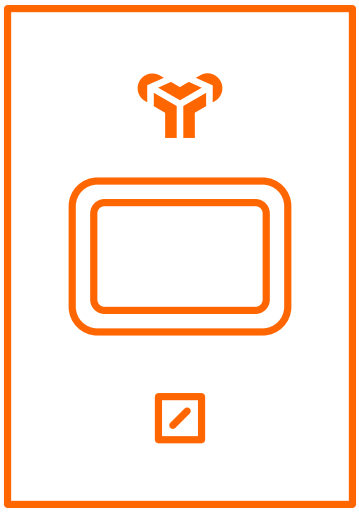
kraftwerk
cogeneration



direktor
control

Manual

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1. THE DIREKTOR CONTROL

1.1 Product information

The Kraftwerk Direktor control is used to control multivalent generation systems in modern energy plants and provides combined and coordinated heat and electricity generation in buildings and neighbourhoods.

The operation mode of various controllable energy generators, such as CHP units, heat pumps and boiler systems, can be parametrised with the control, based on various environmental conditions. This approach means that the CHP unit and the air-to-water heat pump can be prioritized differently, depending on the current outside temperature and the supply line temperature or the current PV yield and the electricity consumption in the building. This can optimize the efficiency of each generator as well as the cost-effectiveness of the entire system during operation.

The Direktor control also offers numerous control options for the consumer side. This makes it possible to control multiple heating circuits, each with its own heating curve. The control can also be used to regulate the load in a buffer tank used to heat water – whether as a central fresh water station or a domestic hot water tank.

All settings can be made on the Direktor controlDirektor control user interface, even if the user has no knowledge of programming. An appropriate hydraulic system and a suitable electrical measurement concept are chosen from a template catalogue for the control configuration. These then serve as the basis for configuring the relevant generators, pumps, valves, sensors and meters.

Current operating data such as CHP power generation, PV yield and power consumption, buffer tank temperatures or operating and fault messages from the generators can be viewed instantly thanks to visualisation of the measuring concept and hydraulic systems. Furthermore, the integrated data recording function allows the user to display historical data relating to all measured values and operating data in diagrams.

In this manual, we describe the functions that Direktor provides, how you can adjust parameters and where you can find detailed information on operating the components in your energy plant.

1.2 Logic structure: Operating strategy and control logics

The Direktor control is basically designed to ensure that energy supply is as efficient as possible at all times. To ensure this is the case, there must be the option to adjust the prioritisation and operation of individual generators based on external factors.

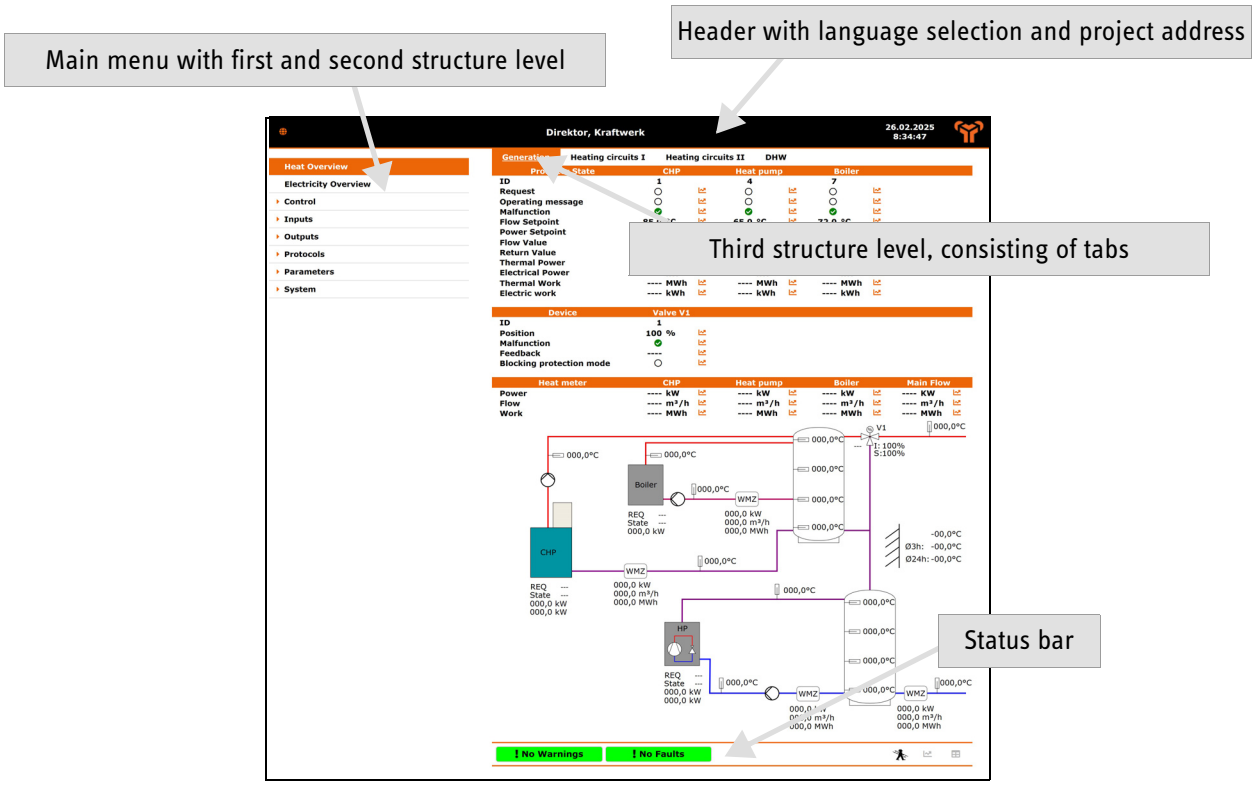
To configure this adaptive control system, the Direktor control makes a distinction between the operating strategy and individual control logics. The operating strategy contains up to five scenarios that determine which control logic is applied at specified times or under specified conditions. The specific control parameters for the generator side (activation and deactivation, modulation behaviour, setpoint temperatures and valve control) can be configured in the individual control logics (up to 5).

In brief: the operating strategy defines the active control logic; the active control logic regulates the generators.

1.3 Operating controls

You can operate the Direktor control on the integrated touch display or remotely using our proprietary web portals Webgate and Webcontrol.

You can see the user interface structure below.



1.4 Icons

	This icon indicates an adjustable parameter. Parameter changes are documented in the change log.
	These icons are used to display a diagram or download it as a CSV file.
	Click on this icon in the status bar to switch all consumers to chimney sweep mode.

1.5 Diagram function

You can access the diagram function to evaluate the stored operating data.

Click on the button next to a value to select one or more measured values. You can select the measured values as a group from any menu.

You can discard your selection, display it as a diagram or download it as a CSV file when accessing it via Webgate by clicking on the corresponding button in the status bar. The selected recording period will then open up. Select a pre-set period using the quick selection function or set the period manually on the calendar.

If you select a section of the diagram, it will be enlarged for display.

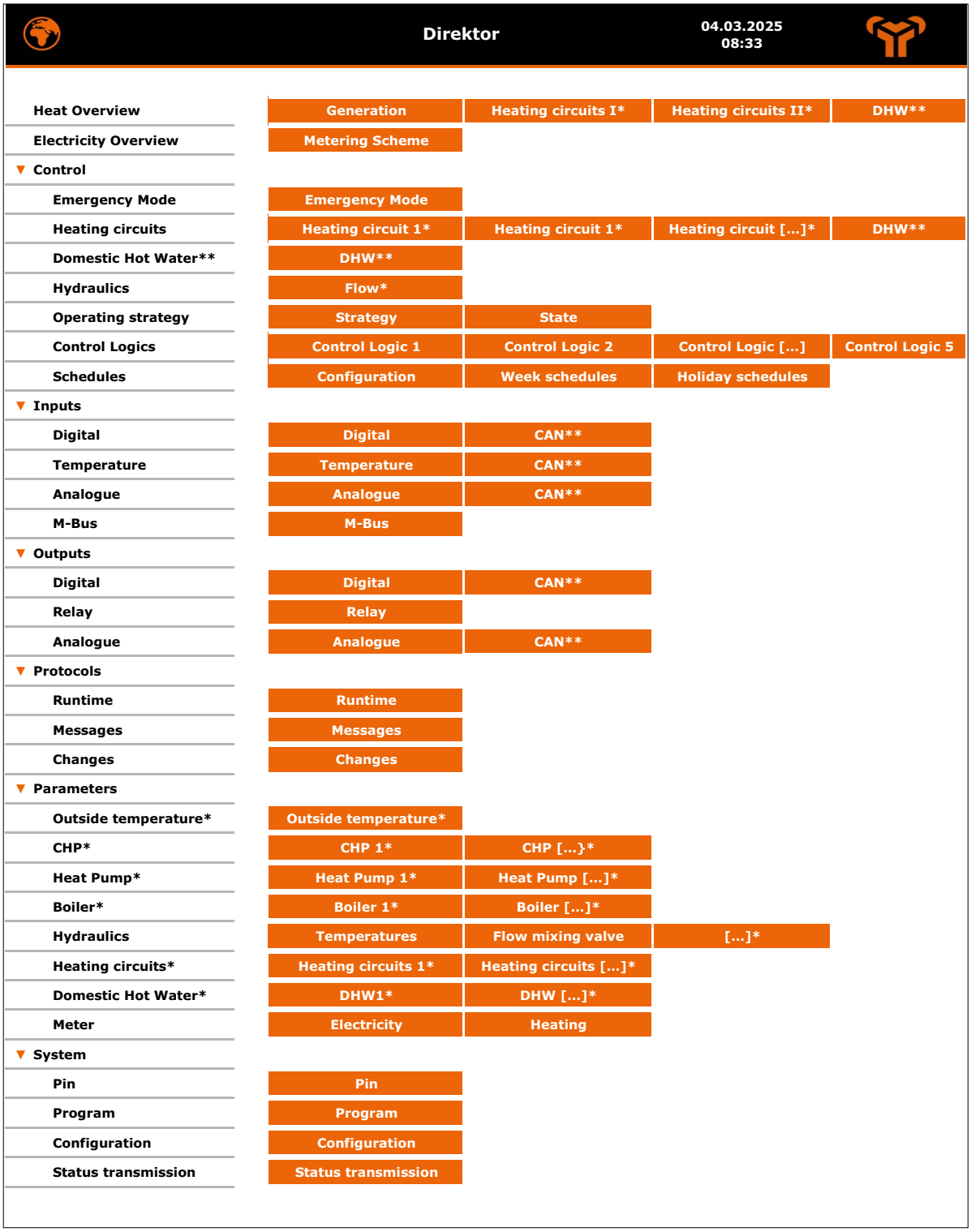
You can hide or unhide individual measured values using the legend. The diagram scaling then automatically adjusts to the selected measured values.

1.6 Webgate and Webcontrol

Webgate is a browser-based tool included in the scope of delivery that can be used to monitor operation of all Direktor controls and Mephisto CHP units. This is where you can view, download and analyse all important information. You can also using Webgate to access the web interface on the control
– the web control – and thus operate all Direktor controls and Mephisto CHP units remotely.

2. THE MENUS

Below you will find an overview of the Direktor control menu items (main menu, left) and the associated sub-pages (orange tabs, right). The following menu screenshots are shown as examples and may vary depending on the hydraulic systems and connected generators or consumers.



* Whether the menu is visible or not depends on the basic configuration of the Direktor control

** Menu is part of an extension module (available as an option)

*** Interface extension possible via CAN I/O modules (available as an option)

2.1 Heat overview

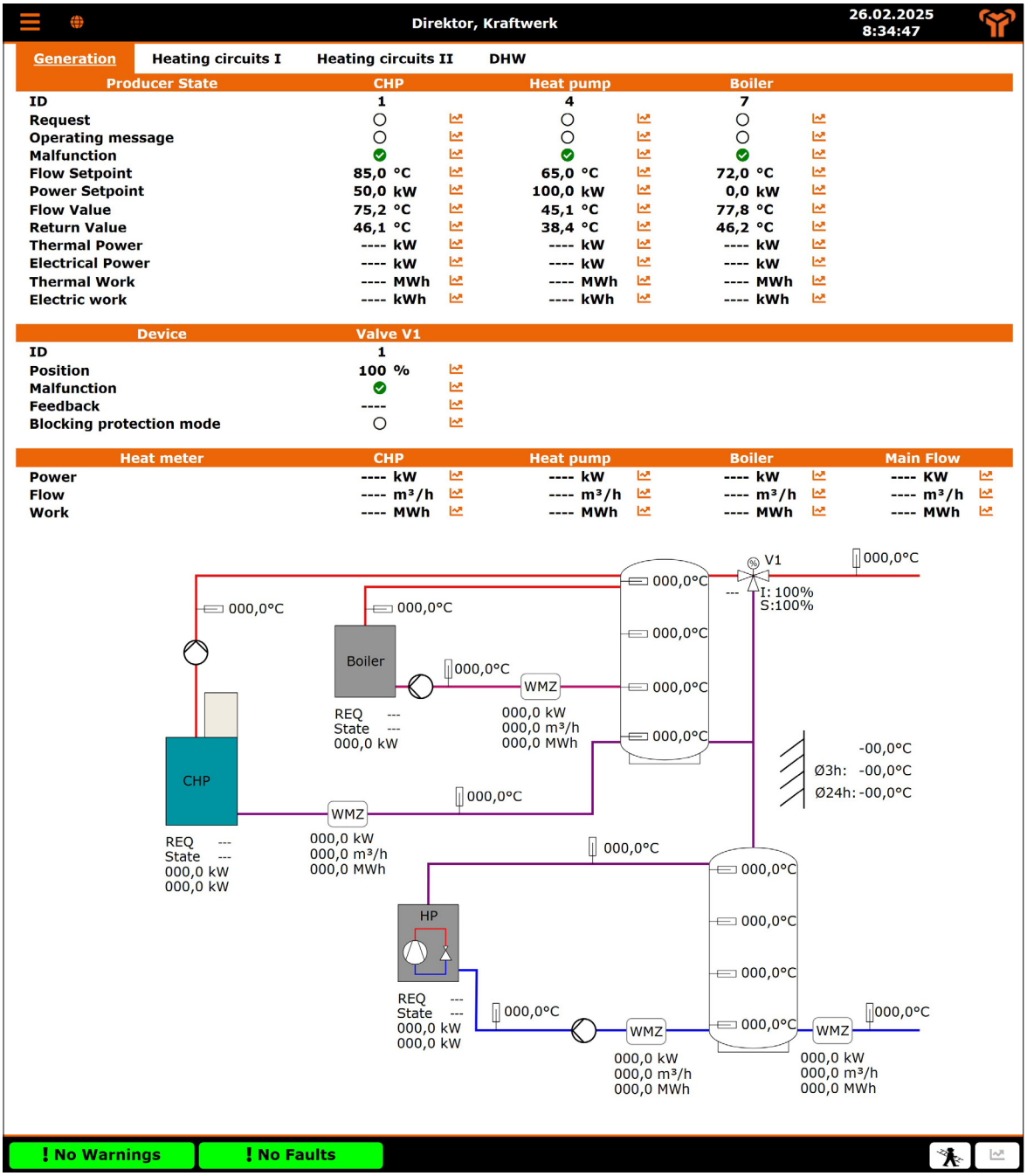
This menu item displays the heat-side generator and consumer data all together. Depending on the Direktor control configuration and features, you will find the visualisations of:

- Heat generation and hydraulic systems
- Heating circuits
- Domestic hot water (DHW)

2.1.1 Heat overview >Generation

The generators are visualised here:

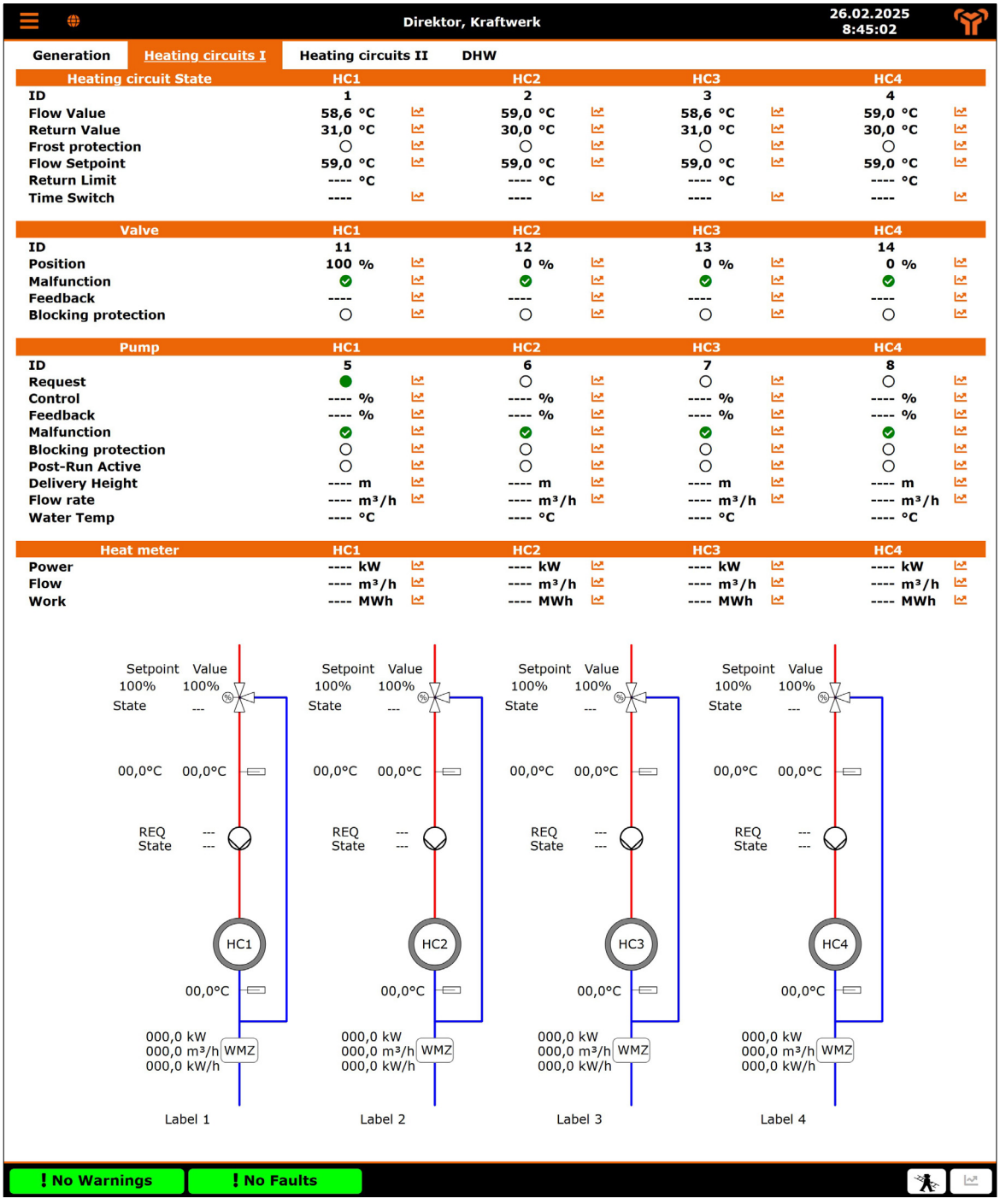
- Activation (on/off)
- Status: OK (green), fault (red), warning (yellow)
- Instantaneous thermal output (HP/CHP unit/boiler)
- Instantaneous electrical power (CHP unit)



2.1.2 Heat overview >Heating circuits

Up to four heating circuits are displayed on the first overview page. Up to four additional heating circuits can be optionally configured, which are then displayed on a further overview page.

All monitored, controlled and regulated elements are displayed (temperatures, mixing valves, pumps, any heat meters)

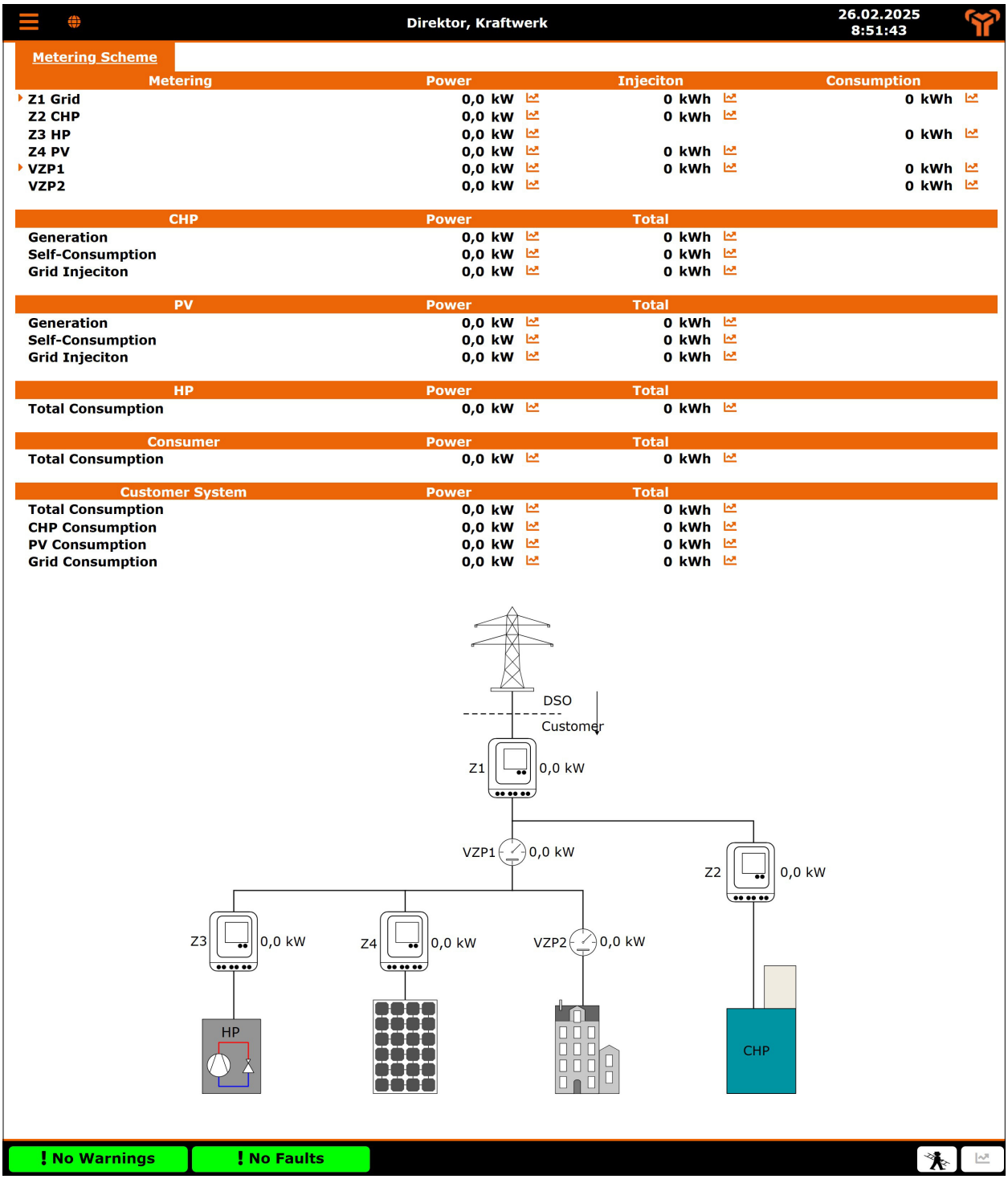


2.1.3 Heat overview >DHW (domestic hot water)

If an optional domestic hot water system is installed, this menu displays the output, volume flow and the energy from the generators.

2.2 Electricity overview

This overview shows the meter readings and operating data of all connected electrical consumers and electrical generators.



2.3 Control

All parameters relevant to the generator and consumer control can be set and adjusted on this menu item's subpages.

Please note that you must complete basic configuration of the Direktor control previously (selection of hydraulic systems and measuring concept as well as interface assignment for the associated components during initial operation).

2.3.1 Emergency mode

This menu item can be used to configure the behaviour of the generators and valves in emergency mode.

Activation, the setpoint temperature and setpoint power output in emergency mode can be parametrised for each generator individually. You can also set the required position of the valves in the generator hydraulic systems.

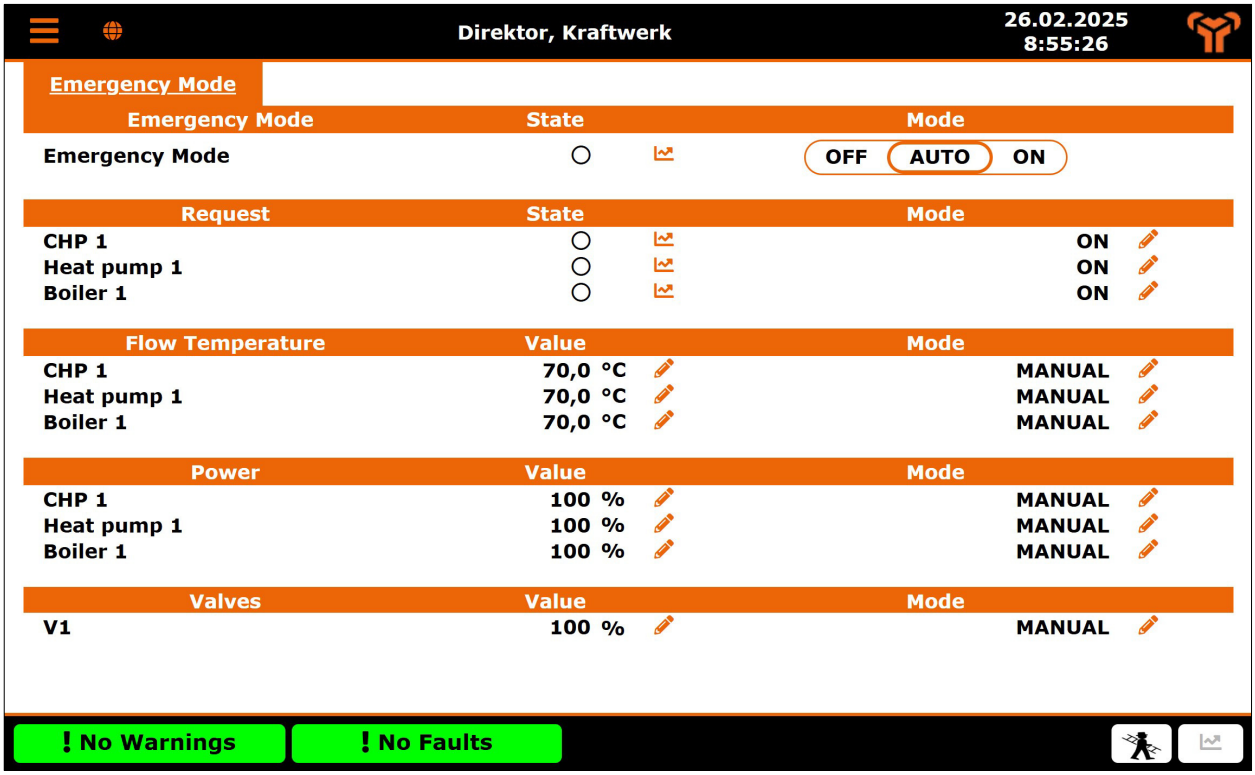
Emergency mode can be activated directly on site using the manual switch on the control housing. In this way, the generators can be activated easily as required if there is insufficient heat supply due to a fault.

The first **Emergency mode** menu item can be used to override the switch position manually in order to switch emergency mode on or off remotely, regardless of the switch's physical position.
The following settings are possible:

OFF: Emergency mode is deactivated even if the manual switch is switched on.

AUTO: Emergency mode is activated or deactivated depending on the position of the manual switch

ON: Emergency mode is activated even if the manual switch is turned off.



2.3.2 Control >Heating circuits

This is where you can configure the heating circuits.

You can configure each heating circuit individually:

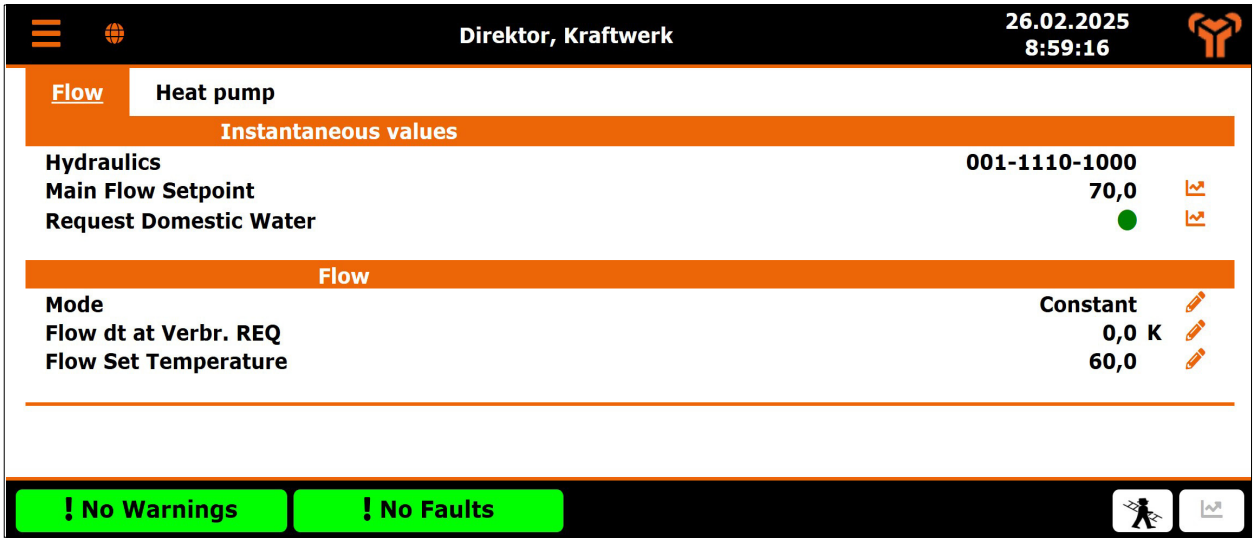
- Supply line temperature/heating curve/control parameters
- Return limiter
- Reduction with timer
- Limit values for frost protection
- Switch-off when a specific outside temperature is exceeded



2.3.3 Control >Hydraulics

This sub-men is used to configure and display the system temperatures relevant for control. These vary depending on the underlying project-specific hydraulic systems.

In the example shown, the highest heating circuit temperature is used as the setpoint supply line temperature for the generator side (supply line mode = max. heating circuit).



2.3.4 Control >Operating strategy

Up to five scenarios can be configured in the operating strategy, which define which specific control logic is activated under specific conditions. Several triggering and deactivation conditions can be logically linked to each other for activating/deactivating the stored control logic.

The Direktor control checks the triggering conditions one after the other, starting with Scenario 1. As soon as an triggering condition is true, the scenario concerned and the assigned rule logic are activated. The triggering conditions are only checked again when the scenario is deactivated due to its deactivation condition. If no deactivation condition is specified for the scenario concerned, the negated triggering condition is used as the deactivation criterion (deactivation condition is true if triggering condition is false).

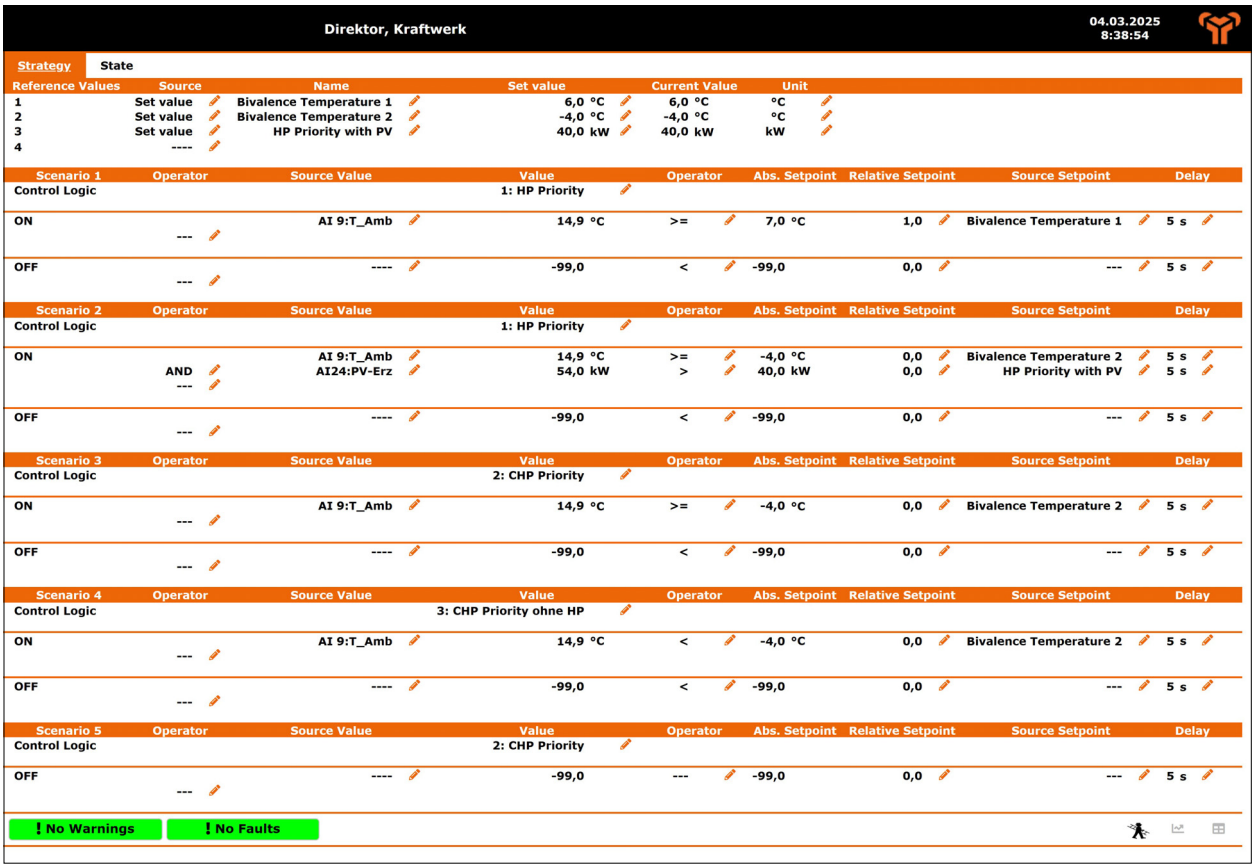
Scenario 5 has no triggering condition and therefore serves as a fall-back scenario that is always activated if none of the previously specified triggering conditions are true.

Reference values for operating strategies

The reference values required for switching strategies are defined in the upper rows.

These include:

- Fixed values, e.g. limit temperature
- Values from inputs



Example parametrisation of the operating strategy

The figure above shows an example of operating strategy parametrisation. Three fixed values have been specified as reference values, including two temperature thresholds (referred to as balance point 1 and 2) and a power specification. The reference values are used to specify the respective triggering conditions for the scenarios.

The example shows the following strategy:

- If the outside temperature is above balance point 1, the heat pump should take priority over all other generators. The control logic for heat pump priority (HP priority) is stored in Scenario 1. The measured value from the outdoor temperature sensor ("OT") on sensor input "AI 9" is compared with balance point 1 as the triggering condition for this scenario. If the measured temperature is higher than the reference value plus a relative deviation of +1 K, Scenario 1 is activated. This is the case in the example.
- If the triggering condition for Scenario 1 is no longer met, the algorithm checks the triggering conditions for the other scenarios in order.
- If the temperature is below balance point 1 but above balance point 2, the heat pump only takes priority if there is a correspondingly high level of electricity generation from the PV system (Scenario 2). Several triggering conditions have been linked together for this purpose.
- If the PV yield is below 40 kW, Scenario 3 would become active and the CHP unit would be prioritised. The heat pump can still assist in this scenario.
- If the temperature falls below balance point 2, a control logic is activated in Scenario 4, where the heat pump is switched off permanently.
- If an operational status commences that is not covered by the aforementioned triggering conditions, Scenario 5 becomes active and with it Control Logic 2 (CHP priority).

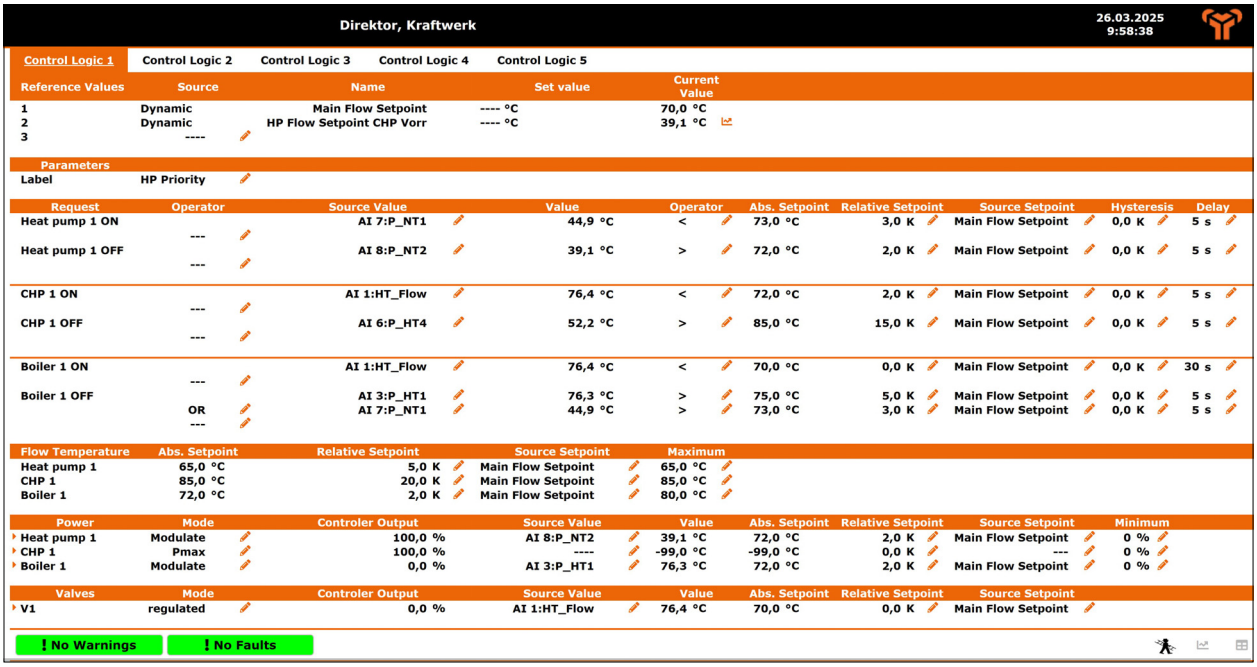
The transition of a condition from FALSE to TRUE can be delayed ("Delay" column) to avoid changing scenarios too frequently when triggering and deactivation criteria are close together.

2.3.5 Regulation >Control logics

You can define up to five control logics that contain the switch-on and switch-off conditions, setpoint temperatures and power modulations for the individual generators. Several switch-on and switch-off criteria can be stored and logically linked for each generator.

Reference values for control logic

You can specify temperature reference values such as fixed values and values from analogue inputs. The specified temperature reference values apply to all control logics.



Example parametrisation of control logic

The figure above shows an example parametrisation of the control logic where the heat pump has priority over the combined heat and power unit. The peak load boiler is activated last.

You achieve the required prioritisation by selecting the appropriate switch-on and switch-off conditions for the generators concerned:

- The heat pump switches on as soon as the heat pump buffer tank falls below the currently required main supply line temperature plus the pre-set safety margin (rel. setpoint) of 3 K at the upper temperature sensor (P_NT_1). The value of the main supply line temperature is stored as a reference value and can change dynamically, for example, depending on the heating curves stored for the consumers.
  The heat pump switches off as soon as the buffer tank is filled completely (lower buffer sensor P_NT2 above setpoint temperature).
- The CHP unit is not activated until the measured main supply line temperature (HT_Flow) falls below the setpoint temperature plus 2 K.
  The CHP unit is deactivated when its buffer tank is filled completely (lower buffer sensor P_HT4 above setpoint temperature plus 15 K). In this case, the CHP unit's high-temperature buffer tank is filled at a fairly high temperature and with a wide spread to utilise the buffer volume to optimum effect.
- The boiler is activated when the temperature falls below the required supply line temperature.
  The boiler is deactivated as soon as the HT buffer tank has a higher temperature (5 K above the setpoint) at the upper sensor (P_HT1) than the boiler's supply line temperature or the temperature is sufficient (3 K above the setpoint) in the heat pump's LT buffer tank to supply directly to the supply line.

As with the operating strategy, time delays ("Delay" column) can be set for the switch-on and switch-off conditions to change from FALSE to TRUE.

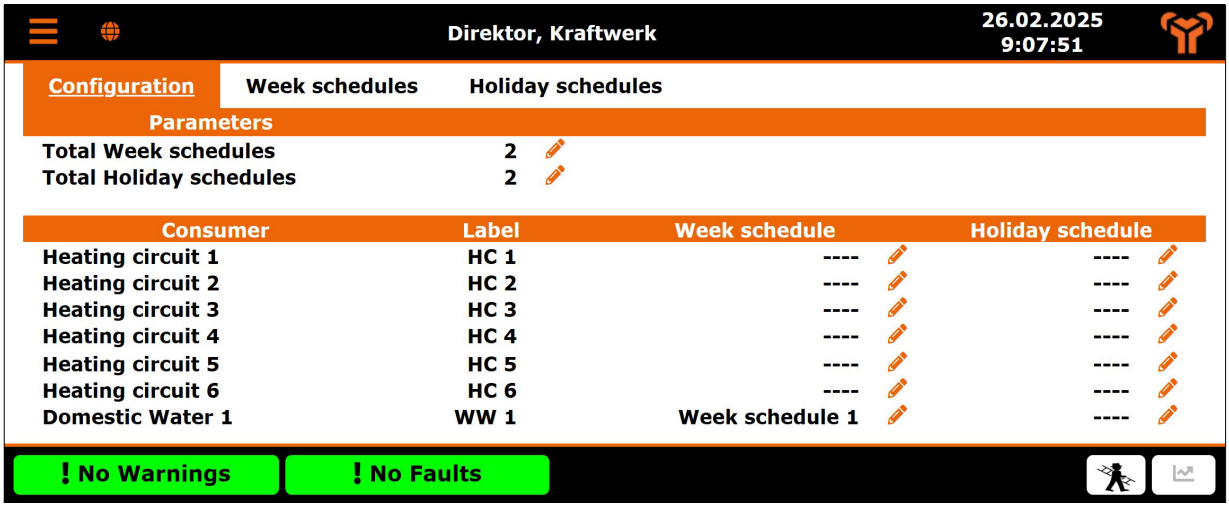
A hysteresis can also be configured that has an influence on the changeover from TRUE to FALSE. Depending on the operator, a true condition is only evaluated as false again if the source temperature ("Source actual") exceeds (<) or falls below (>) the setpoint temperature ("Abs. Setpoint") by the value of the hysteresis.

The specifications for the supply line temperature and output from the individual generators can be seen in the lower section of the screenshot. In the example, all generators are activated with a specific increase in the main supply line temperature. The CHP unit always runs at maximum output. The output from the heat pump and boiler is modulated based on the reading from a buffer tank sensor.

The three-way mixing valve V1 regulates the heat transfer added from the HT tank as soon as the temperature from the LT tank is no longer sufficient to achieve the required main circuit supply line temperature.

2.3.6 Control >Schedules

You can store up to five weekday and holiday schedules. The stored schedules can be assigned to each consumer circuit on an individual basis.



2.4 Inputs

2.4.1 Inputs >Digital

There are 14 digital inputs available to you as standard. These can be supplemented with optional extension modules as needed. All inputs can be named individually (applies to all inputs and outputs).

There are three switch options:

OFF The digital input is set to "OFF" manually.

AUTO The digital input transmits the present signal (ON/OFF) to the control unit (normal case).

ON The digital input is set to "ON" manually.

2.4.2 Inputs >Temperature

24 inputs for PT1000 temperature sensors are available to you as standard. These can be supplemented with optional extension modules as needed.

2.4.3 Inputs >Analogue

There are 8 universal analogue inputs for 0-10 V or 4-20 mA available to you as standard. These can be supplemented with optional extension modules as needed.

2.4.4 Inputs >MBus

This menu item can be used to search for, name and read MBus meters.

2.5 Outputs

2.5.1 Outputs >Digital

There are 8 digital outputs available to you as standard. These can be supplemented with optional extension modules as needed. All outputs can be named individually (applies to all inputs and outputs).

The current switching status of the digital outputs are displayed here.

There are three switch options:

OFF The digital output is permanently switched off.

AUTO The control program switches the digital output automatically (normal case).

ON The digital output is permanently switched on.

2.5.2 Outputs >Relay

There are 8 relays available to you as standard. These can be supplemented with optional extension modules as needed. All outputs can be named individually (applies to all inputs and outputs).

This is where the digital outputs' current switching statuses are displayed.

There are three switch options:

OFF The relay is permanently switched off.

AUTO The relay switches the digital output automatically (normal case).

OFF The relay is permanently switched on.

2.5.3 Outputs >Analogue

There are 8 analogue outputs available to you as standard. These can be supplemented with optional extension modules as needed. All outputs can be named individually (applies to all inputs and outputs).

2.6 Protocols

2.6.1 Protocols >Runtime

This is where the times when the generators were activated or deactivated are listed. Any change in the control logic is also listed here.

The entry is made in the top row of the runtime log, with older entries being shifted down by one row each.

2.6.2 Protocols >Messages

This is where the warnings and faults are displayed for the connected generators, pumps and valves. The ID of the device that triggered the fault is shown in brackets in the relevant message log entry.

Warnings provide notification of deviations from normal values and do not require immediate action. Faults can cause the connected device to switch off and require intervention.

2.6.3 Protocols >Changes

This is where any changes to the parameters are listed and saved.

2.7 Parameters

This is where the required settings are made for the control's initial operation.

We will gladly assist you with this task:

Email: mail@kwk.info

Tel.: +49 511 2629970

2.8 System

This menu is where the basic settings are configured. This is carried out in the factory.

3. TECHNICAL DATA FOR DIREKTOR

Higher-level control system with 10" touch display for wall installation in the energy station with preconfigured bus interface included in the scope of delivery, used to communicate with Mephisto CHP units and the heat pumps supplied by Kraftwerk.

Physical data

Dimensions	500 x 700 x 250 mm (W x H x D)
Protection rating	IP66
Installation	Mounting on wall
Door	Hinged on right
Weight	35 kg

Environment data

Ambient temperature (operation)	0 to 50 °C
Ambient temperature (storage)	-20 to 65 °C
Rel. humidity	max. 95%, non-condensing

Electrical data

Mains connection	1 phase, 230 V, 50 Hz
Fuse protection	B 16 A

Interfaces, available as standard

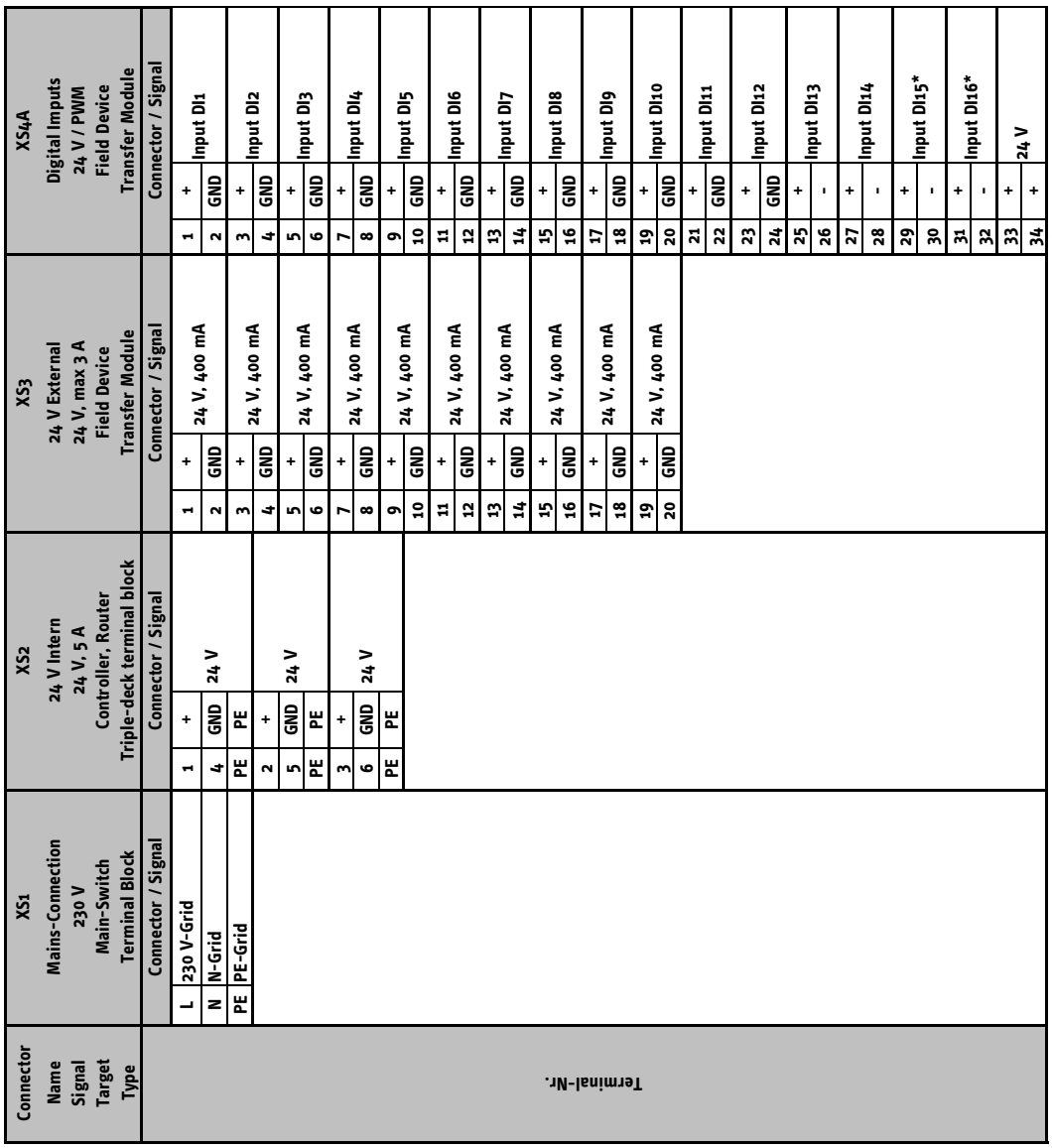
- 24 sensor inputs (PT1000)
- 8 analogue inputs (0(2)-10 V/0(4)-20 mA)
- 8 analogue outputs (0(2)-10 V/0(4)-20 mA)
- 14 digital inputs (24 V)
- 8 digital outputs (24 V/0.4 A)
- 8 relay outputs (potential-free, max. 230 V/5 A)
- Bus interfaces:
  Modbus RTU/Modbus TCP
  MBus
  Grundfos GENIbus (RS485)
- Telemetry:
  VPN router with integrated switch
  - 3x LAN
  - 1x WAN
  - Mobile communication (4G)

3.1 Terminal assignment

Danger to life
Due to electrical voltage

A high voltage runs through the electrical enclosure's electrical cables and contacts. If you come into contact with this voltage, it can be fatal.

- Do not touch any exposed or uncovered patches on the cables. Do not touch any electrical contacts.
- Only have a qualified electrician carry out maintenance work on the electrical enclosure.
- Only open the electrical enclosure for maintenance purposes.
- Before working on electrical equipment, always follow these instructions:
  - Switch off the system
  - Secure against being switched on again
  - Check that the system is de-energised.
  - **It is essential to bear in mind that external power sources (e.g. boiler lockout) cannot be ruled out.**



Connector Name Signal Target Type	XS4B (optional) Digital Imputs 24 V / PWM Field Device Transfer Module			XS5 Analogue Inputs Pt1000 Temperature Sensors Transfer Module			XS6 Analogue Inputs Pt1000 Temperature Sensors / Field Devices Transfer Module			XS7 230 V External 230 V, B-10 A Field Devices Triple-deck terminal block		
Terminal-Nr.	Connector / Signal			Connector / Signal			Connector / Signal			Connector / Signal		
	1	+	Input DI17	1	+	Pt1000 AI01	1	+	Pt1000 AI17	1	L	230 V
	2	-		2	-		2	-		7	N	N
	3	+	Input DI18	3	+	Pt1000 AI02	3	+	Pt1000 AI18	PE	PE	PE
	4	-		4	-		4	-		2	L	230 V
	5	+	Input DI19	5	+	Pt1000 AI03	5	+	Pt1000 AI19	8	N	N
	6	-		6	-		6	-		PE	PE	PE
	7	+	Input DI20	7	+	Pt1000 AI04	7	+	Pt1000 AI20	3	L	230 V
	8	-		8	-		8	-		9	N	N
	9	+	Input DI21	9	+	Pt1000 AI05	9	+	Pt1000 AI21	PE	PE	PE
	10	-		10	-		10	-		4	L	230 V
	11	+	Input DI22	11	+	Pt1000 AI06	11	+	Pt1000 AI22	10	N	N
	12	-		12	-		12	-		PE	PE	PE
	13	+	Input DI23	13	+	Pt1000 AI07	13	+	Pt1000 AI23	5	L	230 V
	14	-		14	-		14	-		11	N	N
	15	+	Input DI24	15	+	Pt1000 AI08	15	+	Pt1000 AI24	PE	PE	PE
	16	-		16	-		16	-		6	L	230 V
	17	+	Input DI25	17	+	Pt1000 AI09	17	+	Analogue Input AI25*	12	N	N
	18	-		18	-		18	-		PE	PE	PE
	19	+	Input DI26	19	+	Pt1000 AI10	19	+	Analogue Input AI26*			
	20	-		20	-		20	-				
	21	+	Input DI27	21	+	Pt1000 AI11	21	+	Analogue Input AI27*			
	22	-		22	-		22	-				
	23	+	Input DI28	23	+	Pt1000 AI12	23	+	Analogue Input AI28*			
	24	-		24	-		24	-				
	25	+	Input DI29	25	+	Pt1000 AI13	25	+	Analogue Input AI29*			
	26	-		26	-		26	-				
	27	+	Input DI30	27	+	Pt1000 AI14	27	+	Analogue Input AI30*			
	28	-		28	-		28	-				
	29	+	Input DI31	29	+	Pt1000 AI15	29	+	Analogue Input AI31*			
	30	-		30	-		30	-				
	31	+	Input DI32	31	+	Pt1000 AI16	31	+	Analogue Input AI32*			
	32	-		32	-		32	-				
	33	+	24 V				33	+	+24 V			
	34	+					..	+				

* 0..20mA: Jumper closed
0-10 V: Jumper open

Connector Name Signal Target Type	XS8A Relais Outputs pot.-frei (230 V / 3,15 A) Field Devices PCB-Connector			XS8B (optional) Relais Outputs pot.-frei (230 V / 3,15 A) Field Devices PCB-Connector			XS9A Digital Outputs 24 V, 400 mA / PWM Field Devices Transfer Module			XS9B (optional) Digital Outputs 24 V, 400 mA / PWM Field Devices Transfer Module		
	Connector / Signal			Connector / Signal			Connector / Signal			Connector / Signal		
Terminal-Nr.	1	NO	Relais 1, Normally Opened	1	NO	Relais 9, Normally Opened	1	+	Digital Output DO17*	1	+	Digital Output DO25*
	2	C	Relais 1	2	C	Relais 9	2	-		2	-	
	3	NC	Relais 1, Normally Closed	3	NC	Relais 9, Normally Closed	3	+	Digital Output DO18*	3	+	Digital Output DO26*
	4	NO	Relais 2, Normally Opened	4	NO	Relais 10, Normally Opened	4	-		4	-	
	5	C	Relais 2	5	C	Relais 10	5	+	Digital Output DO19*	5	+	Digital Output DO27*
	6	NC	Relais 2, Normally Closed	6	NC	Relais 10, Normally Closed	6	-		6	-	
	7	NO	Relais 3, Normally Opened	7	NO	Relais 11, Normally Opened	7	+	Digital Output DO20*	7	+	Digital Output DO28*
	8	C	Relais 3	8	C	Relais 11	8	-		8	-	
	9	NC	Relais 3, Normally Closed	9	NC	Relais 11, Normally Closed	9	+	Digital Output DO21*	9	+	Digital Output DO29*
	10	NO	Relais 4, Normally Opened	10	NO	Relais 12, Normally Opened	10	-		10	-	
	11	C	Relais 4	11	C	Relais 12	11	+	Digital Output DO22*	11	+	Digital Output DO30*
	12	NC	Relais 4, Normally Closed	12	NC	Relais 12, Normally Closed	12	-		12	-	
	13	NO	Relais 6, Normally Opened	13	NO	Relais 13, Normally Opened	13	+	Digital Output DO23*	13	+	Digital Output DO31*
	14	C	Relais 5	14	C	Relais 13	14	-		14	-	
	15	NC	Relais 5, Normally Closed	15	NC	Relais 13, Normally Closed	15	+	Digital Output DO24*	15	+	Digital Output DO32*
	16	NO	Relais 6, Normally Opened	16	NO	Relais 14, Normally Opened	16	-		16	-	
	17	C	Relais 6	17	C	Relais 14						
	18	NC	Relais 6, Normally Closed	18	NC	Relais 14, Normally Closed						
	19	NO	Relais 7, Normally Opened	19	NO	Relais 15, Normally Opened						
	20	C	Relais 7	20	C	Relais 15						
	21	NC	Relais 7, Normally Closed	21	NC	Relais 15, Normally Closed						
	22	NO	Relais 8, Normally Opened	22	NO	Relais 16, Normally Opened						
	23	C	Relais 8	23	C	Relais 16						
	24	NC	Relais 8, Normally Closed	24	NC	Relais 16, Normally Closed						

* max. 400 mA
Sum max. 3 A

* max. 400 mA
Sum max. 3 A

Connector Name Signal Target Type	XS10 Analogue Outputs 0(2)..10 V, 0(4)..20 mA Field Devices Transfer Module			XS11 Fieldbus Communication CAN, Genibus, Modbus Field Devices Transfer Module			XS12 M-Bus Meters Transfer Module			Router VPN-Router Ethernet / Mobile Remote Monitoring Module RJ45	
Terminal-Nr.	Connector / Signal			Connector / Signal			Connector / Signal			Connector / Signal	
	1	+	Analogue Output AO1*	1	+	CAN-L	1	+	M-Bus	LAN1	Netzwork Connector
	2	-		2	+	CAN-H	2	-			
	3	+	Analogue Output AO2*	13	-	CAN-GND	PE	PE	Shield	LAN2	Netzwork Connector
	4	-		3	+	CAN-L	3	+	M-Bus		
	5	+	Analogue Output AO3*	4	+	CAN-H	4	-		LAN3	Netzwork Connector
	6	-		14	-	CAN-GND	PE	PE	Shield		
	7	+	Analogue Output AO4*	5	+	GENIBUS-B	5	+	M-Bus	WAN	Internet Modbus-TCP
	8	-		6	+	GENIBUS-A	6	-			
	9	+	Analogue Output AO5*	15	-	GENIBUS-Y	PE	PE	Shield	Ant. Main	Mobile Antenna
	10	-		7	+	GENIBUS-B	7	+	M-Bus		
	11	+	Analogue Output AO6*	8	+	GENIBUS-A	8	-		Ant. Aux	Additional Antenna
	12	-		16	-	GENIBUS-Y	PE	PE	Shield		
	13	+	Analogue Output AO7*	9	+	RS485-B (Modbus-B)	9	+	M-Bus	24 V	Power Supply
	14	-		10	+	RS485-A (Modbus-A)	10	-			
	15	+	Analogue Output AO8*	16	-	RS485-GND (Modbus-GND)	PE	PE	Shield	WiFi	W-LAN Antenna
	16	-		11	+	RS485-B (Modbus-B)	11	+	M-Bus		
				12	+	RS485-A (Modbus-A)	12	-		RS232	Serial Interface
				17	-	RS485-GND (Modbus-GND)	PE	PE	Shield		
										RS485	Serial Interface

* 0..20mA: J1..J8: open
0..10 V: J1..J8: closed

3.2 Declaration of conformity

EU declaration of conformity
(According to MRL 2006/42/EC Annex II 1.A)

The manufacturer

Kraftwerk Kraft-Wärme-Kopplung GmbH
Am Lindener Hafen 30
DE 30453 Hannover
Tel.: 0049 511 262 997 0

hereby declares under its sole responsibility that controls of the type

DIREKTOR

are compliant with the following EC/EU directives:

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU
- Eco-Design Directive 2009/125/EC

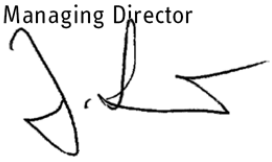
The following harmonized standards were applied:

- DIN EN 60730-1:2021-06 Automatic electrical controls and controllers, Part 1
- DIN EN IEC 61000-6-2:2019-11 Electromagnetic compatibility (EMC), Part 6-2: Immunity for industrial environments
- DIN EN IEC 61000-6-4:2020-09 Electromagnetic compatibility (EMC), Part 6-4: Generic standards - Emission standard for industrial environments
- DIN EN 61131-2:2015-06 Programmable logic controllers, Part 2 and Part 3
- DIN EN IEC 63000 VDE 0042-12:2019-05 Technical documentation for the assessment of electrical and electronic equipment with respect to the restriction of hazardous substances

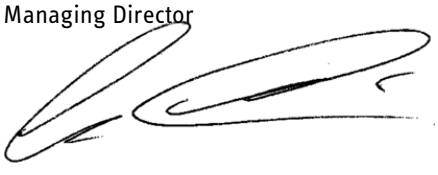
This declaration is issued on behalf of the manufacturer by:

Hannover, 01. October 2024

Dipl.-Ing. Jörn Laue
Managing Director



Dipl.-Ing. Gunther Duensing
Managing Director



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