Orca - System

Instruction Manual

orca

Copyright

Contents

Contents of the EC Declaration of conformity

according to the DIN EN ISO/IEC 17050-1

Object of the declaration:	Orca flow meter
Function:	Measuring the flow rate and the temperature of fluids
Type:	Flow meter
Name of the issuer:	enesty GmbH
Address of the issuer:	Fröndenberger Str. 15 04746 Hartha

The subject of the declaration described above, as delivered, is in conformity with the following documents.

Number	**Title**
EN 60204-1:2020	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 60529:1991+A1:2000+A2:2013	Degrees of protection provided by enclosures (IP code)
EN 61000-6-2:2019	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
EN 61000-6-4:2019	Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments
EN 61326-1:2013	electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements
EN 82079-1:2019	Safety of machinery — Instruction handbook — General drafting principles

1 General

1.1 Handling of the instruction manual

This instruction manual is interpreted in particular for the safe operation of the system and does not claim to be exhaustive.

The present instruction manual describes the system in its function and is intended to inform the operator about the required safety notes, to point out residual risks and to explain the essential operations.

The present instruction manual is only applicable for the described system and is not subject to the updating of the manufacturer. The included sketches and drawings are not to scale. The technical description does not claim to be exhaustive.

- Keep the instructions for use in such a way that all employees assigned to work on the system have access to them if necessary.
- Keep the instructions for use in a clean, complete and legible condition throughout the entire lifetime of the system.
- Read the instructions for use before working with the system for the first time and consult them if any uncertainties or doubts arise when using the system.
- If you have noticed any discrepancies while reading these instructions for use or if any uncertainties persist after reading, please contact the manufacturer.

1.2 Information about the system

Designation of the product:	Orca flow meter
Function:	Measuring the flow rate and the temperature of fluids
Type:	Flow meter
Year of construction:	2022

1.3 Address data

Manufacturer:	enesty GmbH Fröndenberger Str. 15 04746 Hartha
Phone:	+49 (0) 34328 60 70 90
Fax:	+49 (0) 34328 60 70 91
E-Mail:	info@enesty.org
Web:	www.orca-system.com www.enesty.org www.jurke-engineering.de

1.4 Representations used

Steps to be executed are represented in a numbered list. Do not change the sequence of the steps.

1. Operational step 1
2. Operational step 2

   → Effect of an operational step

   Steps without an obligatory sequence are represented with bullet points.

- Item 1
- Item 2

2 Safety information

2.1 Representation of safety instructions and warnings

The safety instructions and warnings call the attention to any residual dangers when operating the Orca system, which cannot be avoided by construction. It is essential that you observe the measures mentioned to avoid these hazards.

General structure of safety instructions and warnings

SIGNAL WORD

Type and source of the danger

Description of the hazard

- Measures to prevent the hazard

In these instructions for use, the safety and warning messages are differentiated according to the severity and probability of occurrence of the hazards. The hazard levels are indicated by the signal word and the signal color.

⚠DANGER

DANGER indicates a hazardous situation with an imminent danger to the life and health of persons. If not avoided, the hazardous situation will result in death or serious injury.

⚠WARNING

This message warns of a potentially dangerous situation for the health of persons. If not avoided, the hazardous situation could result in death or serious injury.

⚠CAUTION

This message warns of a potentially dangerous situation for the health of persons. If not avoided, the hazardous situation could result in minor or moderate injury.

Some safety instructions and warnings do not refer to certain dangers. They shall call the attention to other safety Information and promote their use.

Supplementary note that does not refer to a specific hazard.

2.2 Intended use

The Orca system is solely designed for the monitoring of liquid media in pipelines from ¼“ (13.8 mm) to 2“ (60.5mm). The system is intended for the flow monitoring as a component of an injection moulding machine or of a machine of comparable use.

The Orca system is designed for the use with water. Tests with water and a glycol content of up to 50 % have shown no or only minor deviations in the flow rate display.[1] If necessary, the parameters stored in the measuring system can be adjusted after consultation with our service department.

All notes of this instruction manual need to be complied with and the maintenance plan needs to be followed. The use of the system is solely permitted in the commercial sector.

The lifetime of the Orca System is not predetermined.

Any deviation from the intended use may cause hazards and is strictly not permitted.

2.3 Inadmissible use

Any other use of the system that does not comply with the intended use may cause hazards and is not permitted.

Especially the following use is inadmissible:

- Use of liquids other than those specified in the intended use
- Use of the system on pipelines with diameters that are not as specified in the intended use
- Using the system with open electrical enclosures
- Using the system without prior consultation of the instructions for use
- Using the system in a potentially explosive atmosphere
- Using the system without legible warning and information signs
- Using the system in a deficient condition

[1] The following products have been tested: Castrol Radicool NF, AXTI® Temp E Ethylene glycol 100% (as at 02.03.2020)

2.4 Consequences of conversions and changes

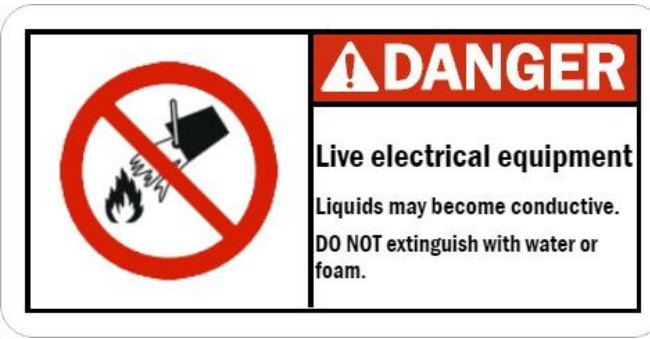
Modifications, additions, (partial) dismantling or alterations must be agreed with the manufacturer prior to execution. Failure to comply will result in the loss of warranty claims.

If the Orca system is modified after the declaration of conformity has been issued, the manufacturer is not liable for the consequences of accidents and for damage that can be traced back to these changes unless these modifications have been authorized by the manufacturer or have been carried out by itself.

For changes to safety-relevant aspects of the system, the converting party must subsequently provide proof of safety. The converting party thus declares itself the manufacturer of the product.

For repair work, the use of spare and wear parts from third-party manufacturers can lead to risks. Only original parts or parts approved by the manufacturer may be used. The manufacturer is not liable for damage caused by the use of unapproved spare and wear parts or auxiliary materials.

2.5 Safety sign

Sign	Meaning	Location
	warning of electricity	electrical compartment
	do not extinguish with water.	electrical compartment

	warning of hot surface	near valves and pipelines for hot water
	warning of hot water	near valves and hoses for hot water

2.6 Residual risks

⚠ WARNING

Danger of burns on hot surfaces

Valves, pipelines, and hoses through which hot water (up to 120 °C / 248 °F) flows may have highly heated surfaces. Burns may occur in case of body contact.

- Allow valves, pipelines, and hoses to cool sufficiently before handling them. Use protective gloves if necessary.

⚠ WARNING

Danger of scalding from hot water

Hot water (up to 120 °C / 248 °F) can escape as a result of improper installation of pipelines and hoses or defects. Serious scalding may occur in case of body contact.

- Switch off the Orca system if you notice leaking water.

⚠ CAUTION

Loud switching noise of the valves

Loud noises occur briefly when the valves of the Orca system are actuated.

- Do not stand next to the valves during the switching operation.

2.7 Behaviour in case of a malfunction

If the operator determines a malfunction or disturbance on the system, the following steps need to be complied with:

1. Immediately disconnect the power plug at the control cabinet of the Orca system.
2. Close the valve at the inflow of the respective media line.
3. Inform your supervisor.
4. If applicable contact the after sales service of the manufacturer

Do not release the system for operation until the fault has been properly rectified and the condition specified in the intended use of the system has been restored by a skilled person.

2.8 Requirements for the users

The staff to operate, setting up and maintaining the system must have the necessary qualification for the commissioned tasks. A corresponding description is attached in the annex (see chapter 9.1).

Each employee has to be instructed on the system before using it for the first time in order to ensure a safe operation and should be aware of the existing remaining hazards. The instruction needs to be repeated at least once per year.

All persons who are commissioned with tasks on the Orca system

- must have been instructed with the safety instructions in this manual before using the system for the first time,
- must be able to recognize any residual risks based on the warning messages,
- must be informed about warning devices and escape routes,
- must always observe the basic regulations on occupational safety and accident prevention,
- must shut down the system when malfunctions occur and inform the supervisor of the malfunction.

2.9 Responsibility of the operating company

2.9.1 Personnel selection and instruction

The locally applicable regulations on occupational health and safety must be complied with. The area of responsibility, authority and supervision of personnel must be clearly regulated.

The operating company may only assign work on the system to suitable persons who are familiar with the basic regulations on work safety and accident prevention and who have been informed about and understand these instructions for use.

It must ensure that each individual employee has the necessary knowledge of the procedure before starting work on the system.

Unauthorized persons (e.g., visitors) must not enter the working area of the system without supervision by a skilled person.

The employees must be instructed regularly and verifiably about:

- the correct handling of the system,
- all existing residual risks,
- the required protective measures,
- the occupational safety behavior,
- the correct use of the provided tools,
- the safety and health markings.

The instruction must be repeated at regular intervals but at least once a year.

If questions or problems arise which the operating company is unable to solve, the manufacturer can provide further training and other support on request. See contact information in chapter 1.3.

2.9.2 Making the necessary personal protective equipment available

No personal protective equipment is required when using the Orca system. The obligations of the operator to make personal protective equipment available result from the working environment in which the Orca system is being used.

2.9.3 Provision of information and tools

Suitable aids and safety equipment must be provided and used for carrying out necessary work.

In addition to these instructions for use, the applicable documents containing further information on the system must also be available to the maintenance personnel. These documents must always be accessible to authorized employees.

Keep safety labels and other markings in a complete and legible condition throughout the service life of the Orca system.

Means for fire-fighting in case of possible incipient fires are to be provided sufficiently by the operating company.

2.9.4 Workplace lighting

Work may only be carried out with adequate workplace lighting.

EN 12464-1 gives the following guide values:

Work area	Minimum value of illuminance
corridors and traffic areas	100 lx
die casting foundry	300 lx

3 Technical data

3.1 Measures and weights

Weight of the circle of 4:	About 12 kg
Dimensions of the circle of 4 (LxWxH):	306 mm x 385 mm x 217 mm
Weight of the circle of 6:	About 15 kg
Dimensions of the circle of 6 (LxWxH):	406 mm x 385 mm x 217 mm

3.2 Connected values and parameters

Rated current:	10 A
Grid connection:	230 V
Control voltage:	24 V
Protection class switchgear combination:	IP 65
Double ultrasonic sensor:	Measuring range from 0.1 to 100 l/min maintenance-free
Operating temperature range:	From +10 °C to 120 °C on the machines
Humidity:	From 10 to 90 %, not condensing
Installation position:	Any

3.3 Labelling

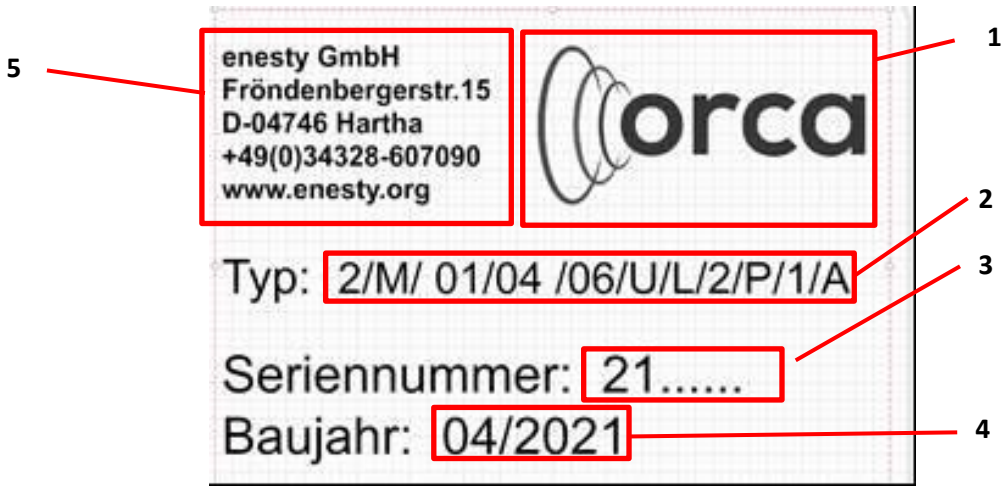


Illustration 1 Labelling

Pos.	Description
1	Logo of the system
2	Distributor configuration information (see Illustration 2 configuration)
3	Serial Number
4	Month / Year of delivering

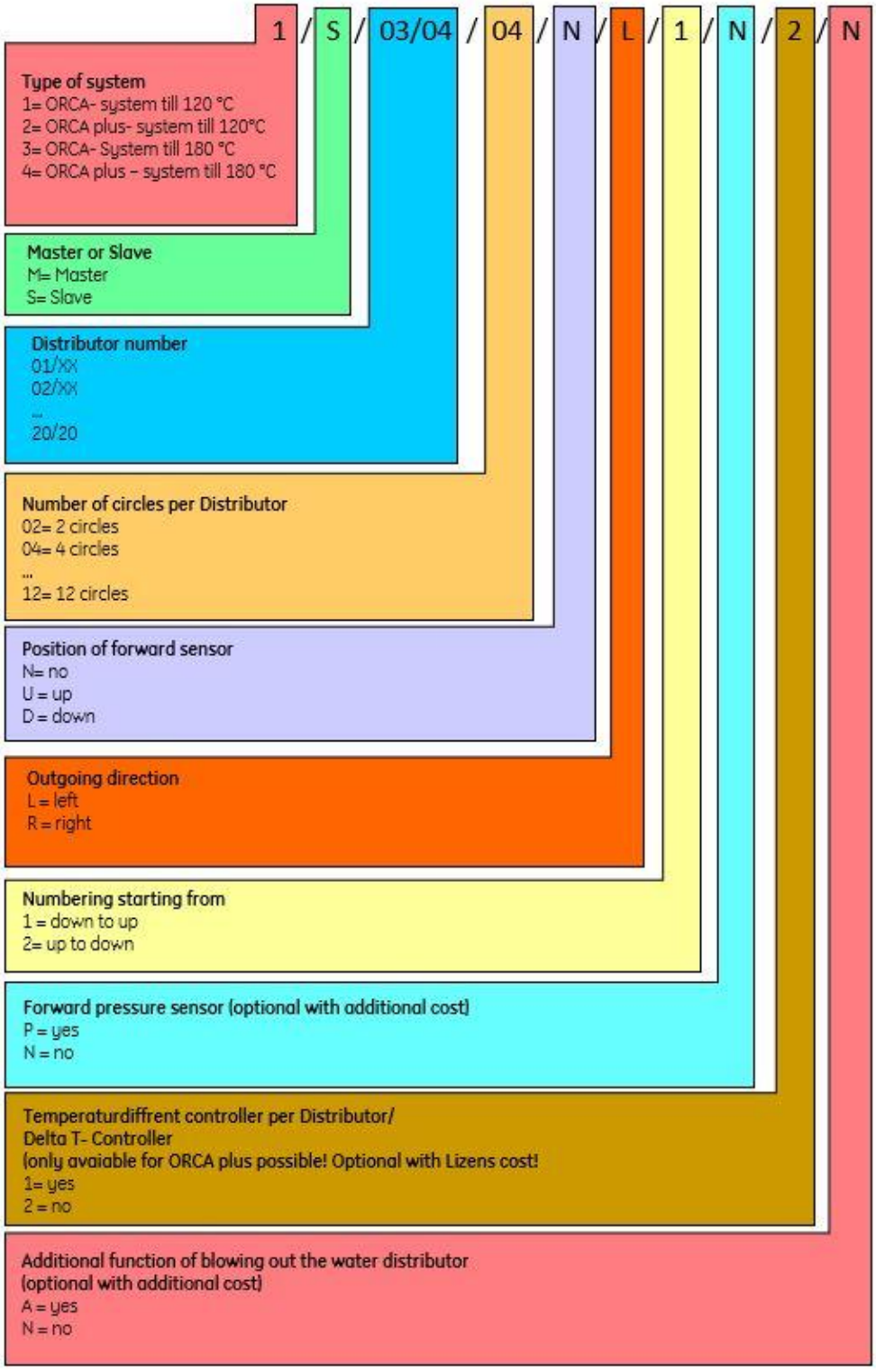


Illustration 2 configuration specification

4 Technical description

4.1 Structure

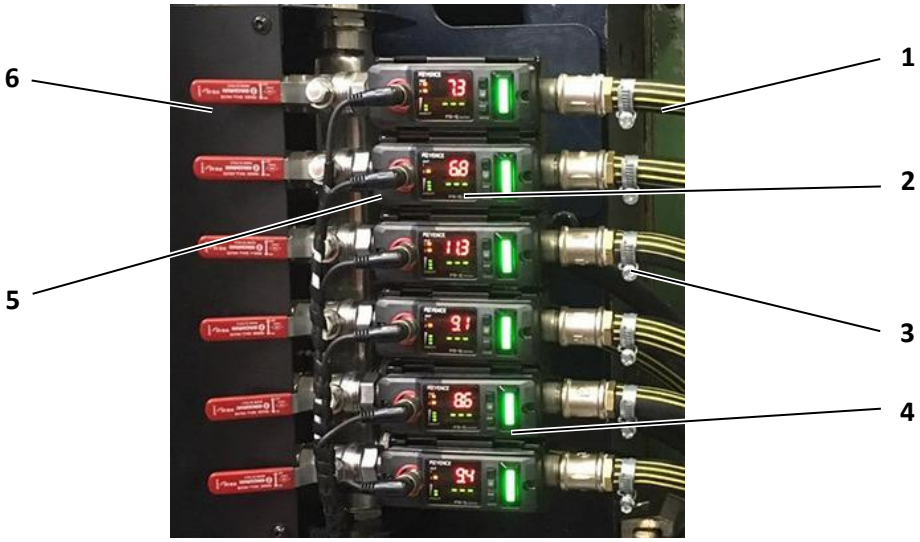


Illustration 3: Flow sensors (circle of 6 represented)

Pos.	Description
1	Hose line (interface)
2	Double ultrasonic sensor
3	Clamp to fix the media hose
4	Status display
5	Connection of the double ultrasonic sensor
6	Ball valve

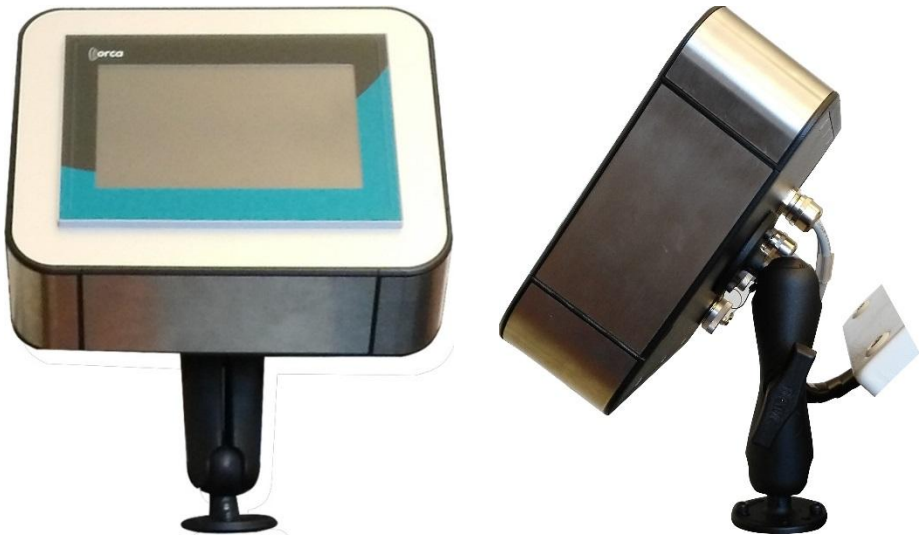


Illustration 4: Display unit with bracket

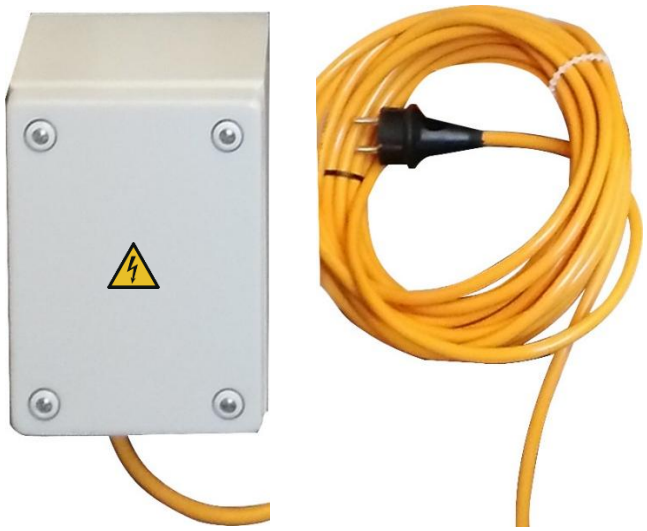


Illustration 5: Power cable with Schuko plug

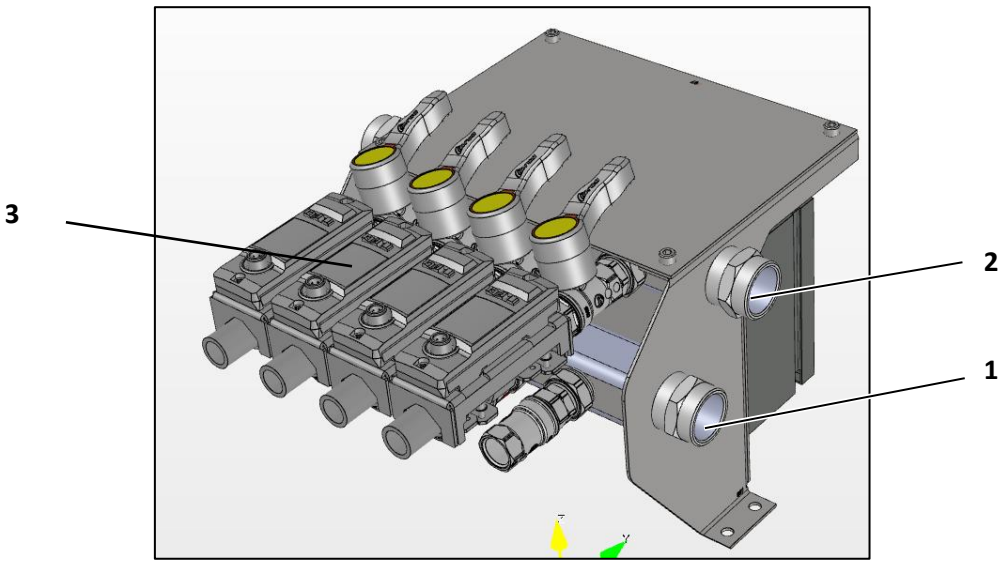


Illustration 6: Representation of 4 circular flows

Pos.	Description
1	Return flow
2	Flow
3	Flow sensors

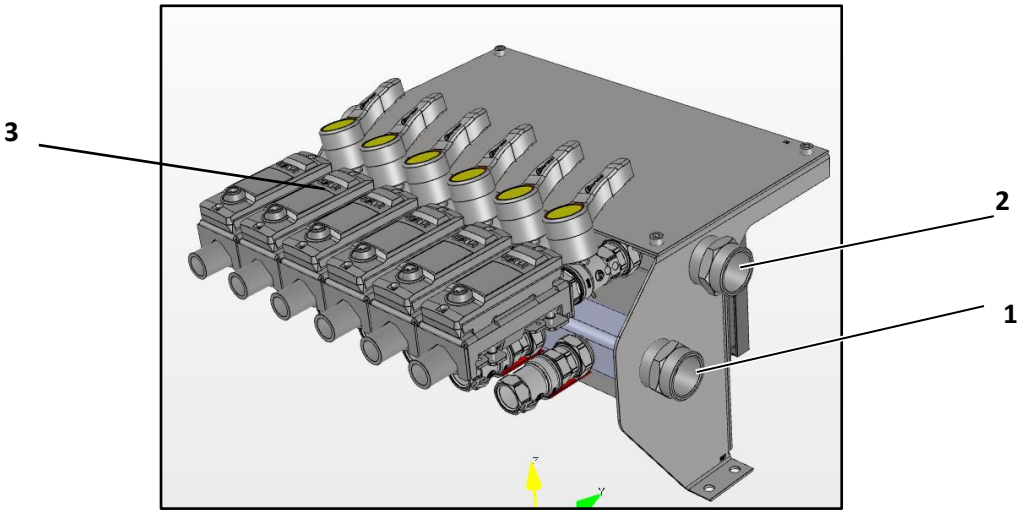


Illustration 7: Representation of 6 circular flows

Pos.	Description
1	Return flow
2	Flow
3	Flow sensors

4.2 Functional description

The Orca system is a measuring system to determine the volume flow and the temperature of liquid media in pipelines. The sensor unit can be directly mounted on the pipeline from the outside. The measuring range of the sensor amounts to 0.1 - 60 l/min at the volume flow measurement, as well as 0 - 120 °C at the temperature measurement.

It measures the temperature and the volume flow of the medium contactless via a double ultrasonic sensor and outputs it via the display of the sensor unit. At the same time, it forwards the data to the display unit.

It is possible to enter tool-specific limit values for each sensor unit via the display unit. If one of the limit values is exceeded, it will be displayed by the flashing of a red signal lamp on the corresponding sensor unit. An alarm message is also emitted on the display of the display unit, which can be allocated to the corresponding sensor unit. If the measured values are within the stipulated tolerance range, the signal lamp on the sensor unit will light up in green. It is possible to save more than 500 tool data records in the display unit.

4.3 Status light on the flow sensor

The flow rates are displayed in digital form directly on the sensor. Green and red status lights provide the user with an immediate overview of the actual status of the temperature control.

If a temperature control circuit is deactivated via the control, its display and the status display turn black. No values are shown.

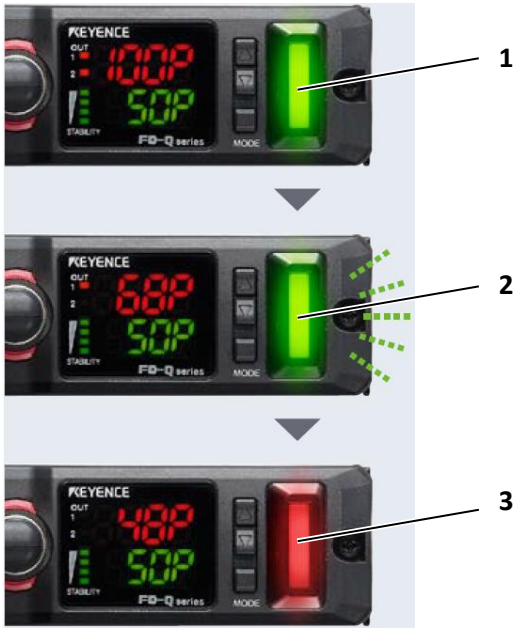


Illustration 8: Display unit

Pos.	Colour	Description
1	Illuminated in green	The values are higher than the minimum flow volume (Default limit 1 l/min)
2	Flashing in green	The values decline (function deactivated by default)
3	Illuminated in red	The values are below the minimum flow volume (Default limit 1 l/min)

4.4 Interfaces to the operator

The following interfaces are regarded as interfaces to the required transportations and other equipments of the operator:

- Power supply
- Media supply via hose lines

5 Assembly and connection

DANGER

Risk of injury by electrical voltage

- The electrical connection of the system must only be performed by an electrician.
- Work on electrical equipment is permitted only to authorized electricians.
- Electrical cabinets must be kept locked at all times.

CAUTION

Risk of tripping by supply lines

- In the working area of the system, the supply lines (power cables, hoses) must be laid in such a way that trip hazards are avoided.

The installation and assembly of the Orca system is carried out by the manufacturer of the injection molding machine.

Observe the information on required free spaces for transport and assembly provided by the manufacturer of the injection molding machine.

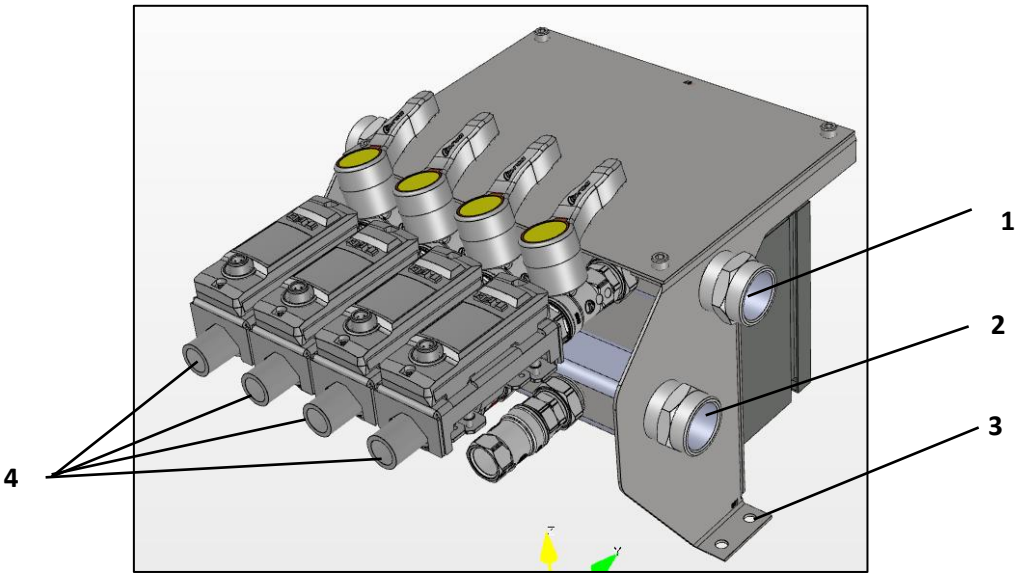


Illustration 9: Connecting the system

Pos.	Description
1	Connecting the return flow
2	Connecting the flow
3	Holes in the housing
4	Connections for hose lines to the corresponding double ultrasonic sensors

The system is fixed at the operation site with a total of 4 screws. To do so, there are corresponding holes in the housing (Illustration 9, pos. **3**).

Then, the hose lines for the inflow (pos. **1**), outlet (pos. **2**) as well as the hose line to the corresponding flow sensors (pos. **4**) need to be attached. The hose lines

After the assembly of the system, check if the operating rooms on the machine are closed and if the optical and acoustical warning devices are connected, if applicable. Connect all media lines (hose connections, mains plugs) as intended and make sure that there are no leakages.

6 Operating

6.1 Safety notes for the operator

Before commissioning the system, all connections must be checked!

The operator must ensure that the system is in the condition specified in the intended use before starting work.

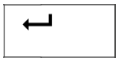
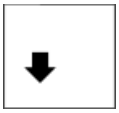
The Orca system may only be operated when all electrical cabinets are complete and locked.

The system is controlled via the control system of the injection molding machine.

6.2 Starting up the Orca system

The Orca system is started up as soon as the Schuko plug is connected to an outlet. It is necessary to disconnect the plug from the outlet, in order to switch off the system.

6.3 Entry options

Symbol	Meaning
	Close the window without saving the entry
	Close the window and save the entry
	Load the file
	Correction
	Confirm the entry
	Lower case
	Upper case

Symbol	Meaning
←	Shift to the left
→	Shift to the right
&123	Select special characters
	Spaces
q w e r t y u i o p a s d f g h j k l z x c v b n m	Select letters
+/-	Set signs
.	Character separation with a dot
,	Character separation with a comma

6.4 Basic structure of the menu

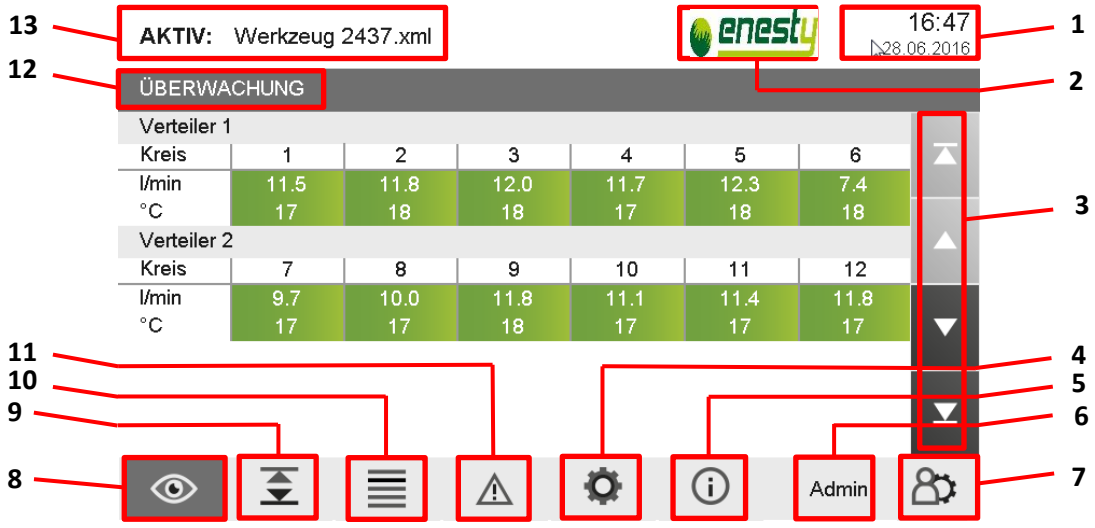


Illustration 10: Display unit

Pos.	Description
1	Display date and time
2	Company logo
3	Arrow keys to scroll to the displayed page
4	Settings
5	Diagnose
6	Designation of the registered staff
7	Logo of the registered staff
8	Monitoring
9	Limit values
10	Overview of recipes
11	Alarms and history
12	Heading of the selected page
13	Designation of the selected recipe

6.5 Groups of operators

The following chapters describe the control of the Orca system for the groups of operators, technicians and the Administrator and their corresponding rights.

6.5.1 Operator

6.5.1.1 Operator - Monitoring

In the category “Monitoring” (Illustration 11) the operator can overview which states are prevailing at the connected circuits. If the flow is represented in red, the ACTUAL values deviate from the NOMINAL values. If the measured value is highlighted in green, such as for the circuits 1 and 9, the ACUTAL values are within the pre-set range

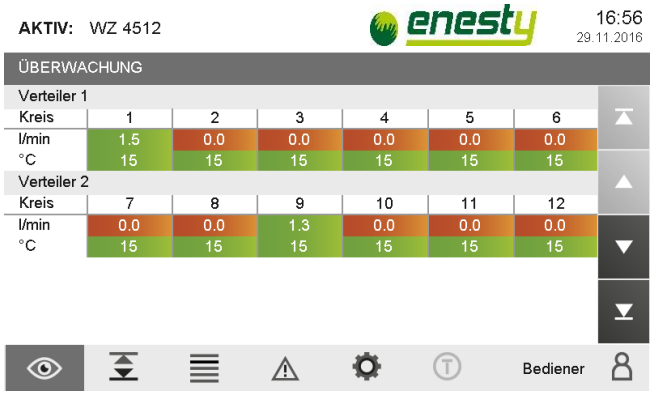


Illustration 11: Operator - Monitoring

6.5.1.2 Operator - Limit values

In the category “Limit values” (Illustration 12), the operator can have the set limit values for the flow velocity and temperature displayed. The actual value will be displayed between the maximum and minimum set value. If the value is within the determined limits, it is highlighted in white as for instance for circuit 1. If the value exceeds the limits, it is highlighted in red.

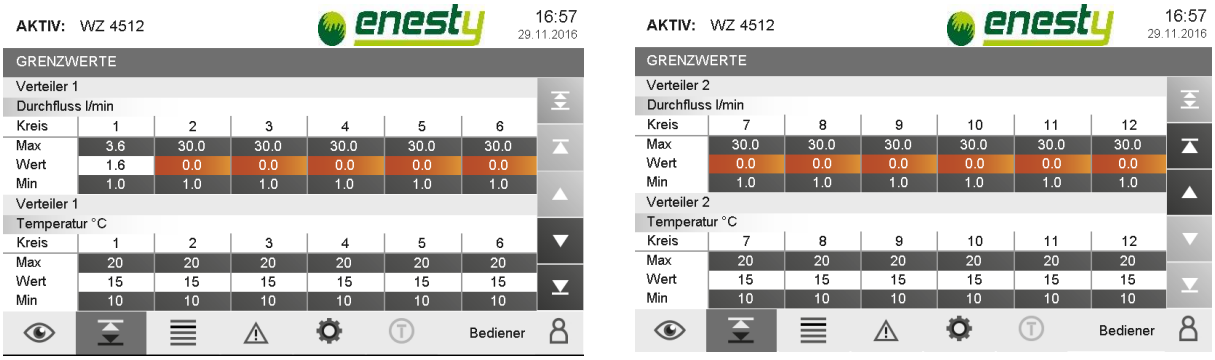


Illustration 12: Operator - Limit values

6.5.1.3 Operator – Overview of recipes

In the category “Overview of recipes” (Illustration 13), the operator can view the stored recipes.

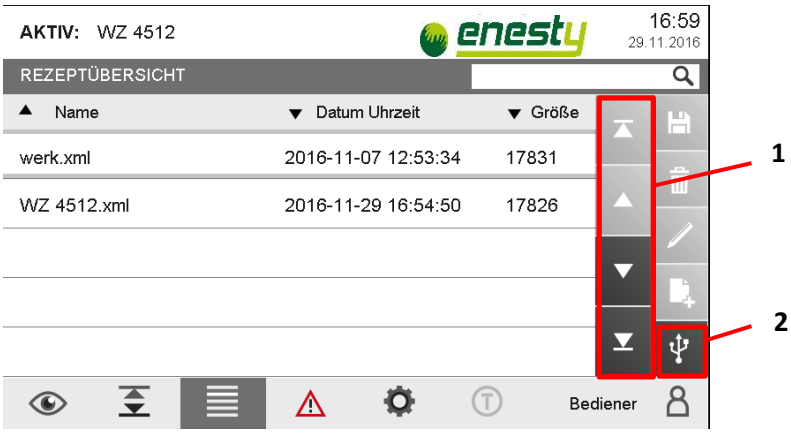


Illustration 13: Operator – Overview of recipes

Pos.	Description
1	Arrow keys
2	Share recipe

By pressing the arrow keys (pos. **1**), the operator can scroll up and down through a list of stored recipes and select a recipe. If a recipe needs to be saved on a data carrier, press on the symbol in pos. **2**.

6.5.1.4 Operator - Alarms

In the category “Alarms” (Illustration 14) all messages are output according to the date, time, title and circuit. By pressing on the arrow keys, it is also possible to scroll up or down.

Illustration 14: Operator – Alarms

Besides the overview of all alarms, it is also possible to view the history (Illustration 15). The date, time, title and circuit are output for each error message. Additionally, a warning sign will be represented which lights up or new occurring errors.

Illustration 15: Operator – History

6.5.1.5 Operator – Settings

Logged on users can perform different settings on two sides (also refer to

Illustration 16 to Illustration 18).

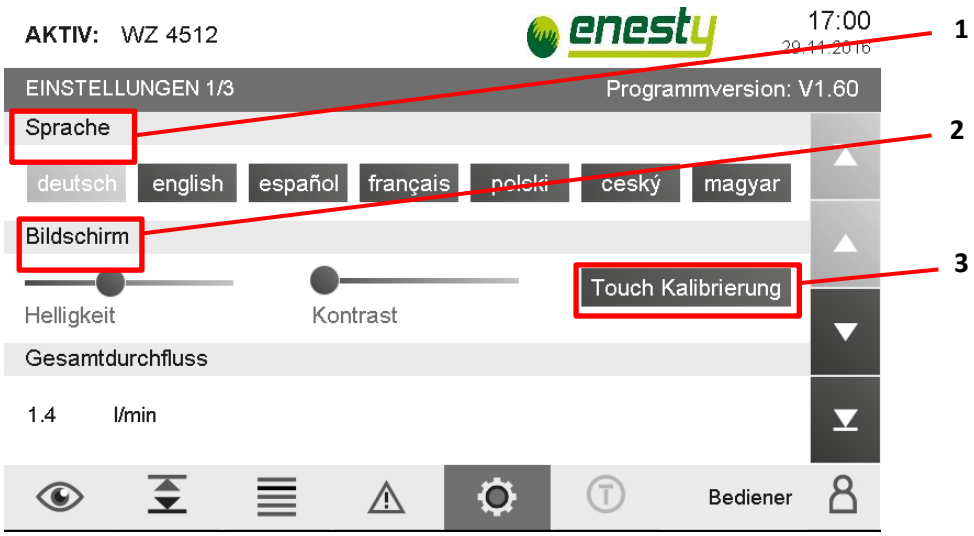


Illustration 16: Operator - Settings page 1 of 2

Pos.	Description
1	Set the language
2	Set the screen
3	Calibrate the screen (refer to Illustration 17)

The language is selected by touching the desired language field (pos. **1**). The screen settings “Brightness” and “Contrast” are changed by shifting the represented point on the line to the left or to the right (pos. **2**).

By touching the field “Touch calibration” (pos. **3**) the representation is opened in Illustration 17. The represented points are displayed on the screen one after another. The operator has to touch these points. In doing so, the display will be calibrated.

Illustration 17: Calibrate screen

Date and time are set via the input keyboard (Illustration 18, pos. **1**). The system of units is converted by touching the fields “imperial” and “metric” (pos. **2**).

Illustration 18: Operator - Settings page 2 of 2

Pos.	Description
1	Set date and time
2	Set the system of units

6.5.2 Technician

Generally, technicians can perform all settings of the group of operators “Operator”. Additional options would be to operate the control of the Orca, which are explained in the following chapters.

6.5.2.1 Technician – Limit values

In the field “Initialisation of limit values” (Illustration 19) the technician can determine the maximum and minimum values of the flow (on the left) and of the temperature (on the right). Then, the values are taken over to all circuits in general.

Illustration 19: Technician – Initialisation of limit values

In addition, it is possible to determine individual values for each circuit. To do so, the maximum or minimum value of a certain circuit needs to be touched. A small field is displayed in which the individual value may be entered (Illustration 20).

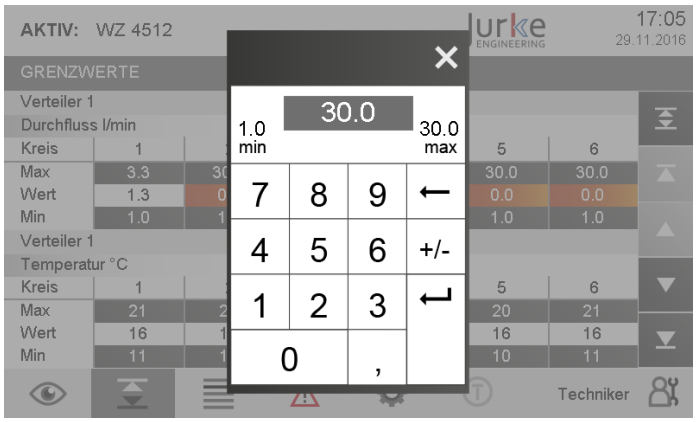


Illustration 20: Technician – Determining limit values for individual circuits

6.5.2.2 Technician – Overview of recipes

In the category “Overview of recipes” (Illustration 21) different symbols are displayed on the right margin of the menu.

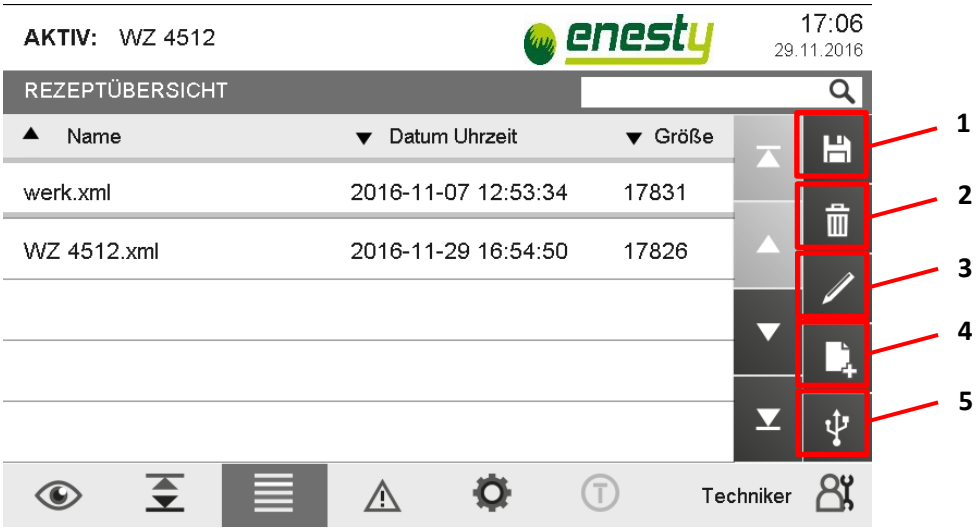


Illustration 21: Technician – Overview of recipes

Pos.	Description
1	Save recipe
2	Delete recipe
3	Rename recipe
4	Create recipe
5	Select USB

Load recipe

It is possible to select the desired recipe with the help of the arrow keys. When you touch the recipe, a small field is displayed (Illustration 22).

Illustration 22: Technician – Loading the recipe

Save recipe

It is possible to save more than 500 tool data records on the device. To do so, touch the symbol in Illustration 21, pos. **1**. A small window is displayed (refer to Illustration 23), in which the recipe name can be entered under which it shall be saved.

Illustration 23: Technician – Saving the recipe

Delete recipe

If a recipe needs to be deleted, touch the symbol in Illustration 21, pos. **2**. A small window is displayed (refer to Illustration 24). By touching the field “Delete” the recipe will be deleted. By touching the field “Cancel” you return to the menu.

Illustration 24: Technician – Deleting the recipe

Rename recipe

In order to be able to rename a recipe, the operator has to press on the symbol in pos. **3** in Illustration 21. A small field is displayed (Illustration 25), in which the new name can be entered and confirmed.

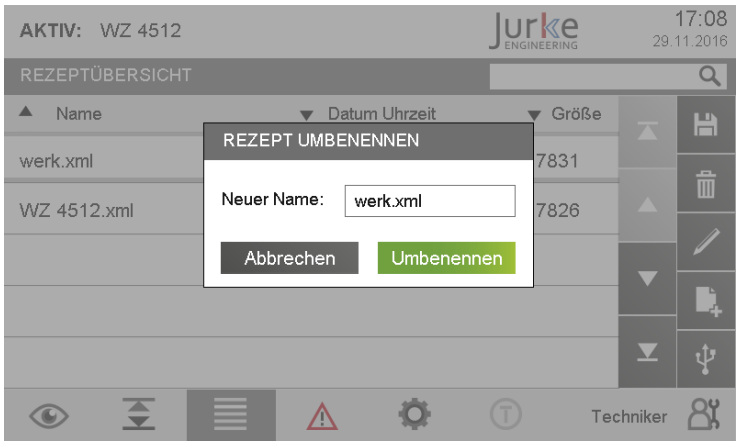


Illustration 25: Technician – Rename recipe

Create recipe

A new recipe can be created, in which the symbol pos. **4** in Illustration 21 is touched. In the field which is displayed (Illustration 26) the operator can assign a designation under “Recipe name” and save the recipe.

Illustration 26: Technician – Create recipe

Load a recipe from the USB / Save a recipe on the USB

Before saving / loading a recipe on / from an external data carrier, it is necessary to first ensure that the data carrier is connected. By touching the symbol in pos. 5 in Illustration 21, a field is displayed in which you are able to determine the storage / loading location.

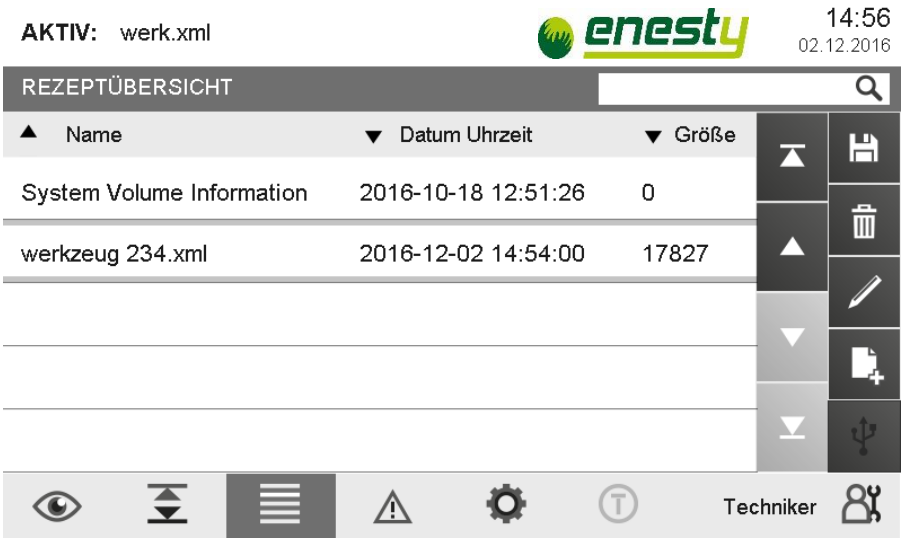


Illustration 27: Technician – Create recipe

6.5.2.3 Technician – Settings

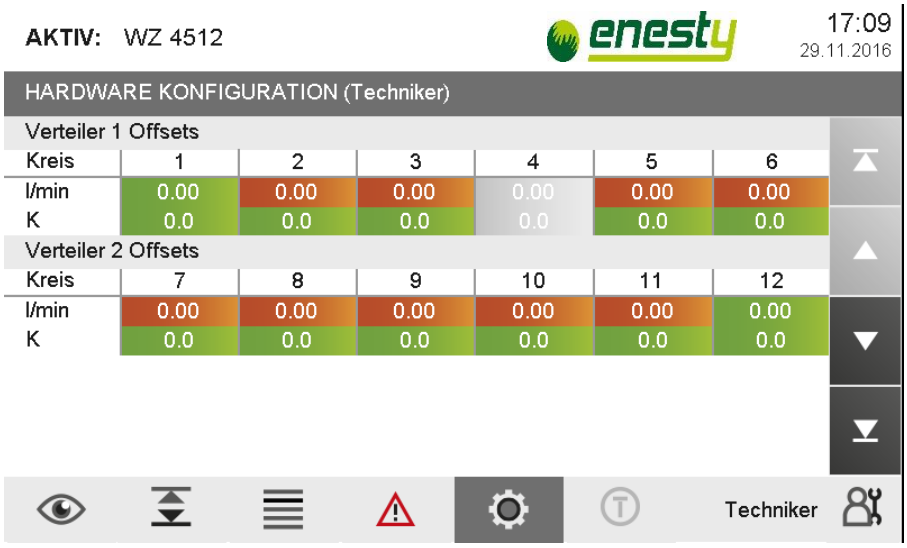


Illustration 28: Technician – Configure measuring circuits

6.5.3 Admin

The group of operators “Admin” can perform all settings of the group of operators “Operator” and “Technician”. Additional options, to operate the control of the Orca, are explained in the following chapters.

6.5.3.1 Admin – Settings

Change password

Only the Admin will be allowed by the control to assign a new password (Illustration 29). Enter the new password twice in the input field and save it by actuating the field “Confirm”.

Illustration 29: Admin – Change password

6.5.3.2 Admin – Diagnosis

In the category “Diagnosis”, the logged in Admin can have different information displayed on the system, software, hardware, among others (refer to Illustration 30).

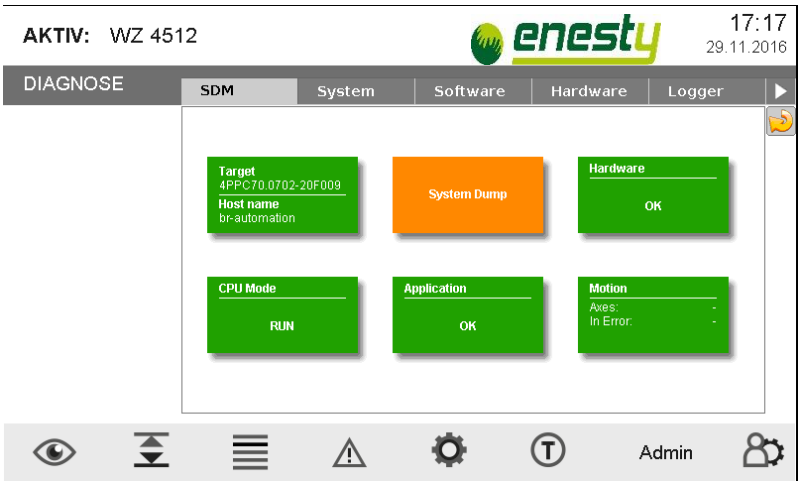


Illustration 30: Admin – Diagnosis

6.6 Error messages

Illustration 31 shows the error message (USB error: 32900), which is displayed if the recipe shall be shared, but no data carrier is available.

Illustration 31: Admin – Recipe error

7 Notes for the maintenance staff

If further information is required to carry out maintenance work, please contact the manufacturer.

7.1 Safety notes for maintenance and service

⚠DANGER

Risk of injury from electrical voltage

- Before working on the electrical equipment, the following protective measures must be carried out in the following order:

  1. Disconnect.
  2. Secure against reconnection.
  3. Ascertain that there is no voltage.
  4. Ground and short-circuit.
  5. Cover adjacent live parts.

Only skilled personnel may carry out maintenance and service work with subsequent testing.

Maintenance personnel must also observe the safety instructions listed in chapter 6.1.

After maintenance and service work and before putting the system back into operation, it must be restored to the condition specified in the intended use.

7.2 Preparation of maintenance and service works

Service work on the Orca system may require partial disassembly or replacement of individual assemblies. This work may only be carried out by suitable skilled personnel who have the necessary tools at their disposal. If necessary, suitable lifting equipment must be provided.

Service work may only be carried out on the safe system, i.e., the electric power and supplied media are switched off. Therefore, disconnect the power plugs from the Orca system and close the valves. Furthermore, ensure that all media-carrying lines are pressure-free.

7.3 Cleaning

Never use water jets for cleaning.

External soiling is to be removed when necessary.

Cleaning work may be carried out by auxiliaries or operators. If parts of the system have to be dismantled in order to access the required locations, only skilled personnel may carry out the cleaning work. Make sure that all media-carrying lines are switched off. The skilled personnel must be able to restore the condition specified in the intended use and check it.

The access routes to the Orca - System must not cause any special hazards. Clean access routes regularly.

7.4 Spare and wearing parts

All used spare and wearing parts have to comply with the determined technical requirements of the company enesty GmbH. This is only guaranteed when using original spare parts. Corresponding spare and wearing parts can be found in the further applicable documents.

8 Disposal

If the system is intended for being scrapped, take into account that the individual assemblies must be disposed of according to type. Observe the manufacturer's information for the individual components.

Check how the materials used in the system can be properly recycled. Do not cause any environmental damage when disposing of them. Before removal, the system must be professionally shut down and dismantled as far as necessary.

Proceed as follows when dismantling:

1. Empty the system. Blow out all piping and hoses.
2. Disconnect all connections (plugs, cables, hoses) and remove them.
3. Loosen the plates without components and remove them.
4. Loosen the plates with components and remove them.
5. Disassemble the components (fittings, modules and electronics, valve manifolds, …) and separate them materially.
6. Disassemble the racks.

9 Annex

9.1 Safety-relevant inspections

Test item	Scope of testing	Test interval	Auditor
Construction	Perfect and proper state, possible corrosion damages, missing or lose screwed connections	annually	Qualified person according to TRBS 1203
Electrical operating areas	Measure the internal temperature, check for dust deposits	recommended: every six months	Electrician
Fixed electrical system	According to EN 60204-1 VDE 0105-100 DGUV provision 3 View and functional test Measure the protective conductor and insulation resistance	recommended: annually, at least every 4 years	Electrician
	Residual current, differential current and fault voltage circuit breaker	Every six months	
	Continuous equipotential bonding	After maintenance works or the replacement of parts	

9.2 Description of the necessary qualifications

Personnel	Qualification
operator	An operator • can operate the machinery safely after being instructed. • must be supervised by a superior who performs regular briefings and checks and who is available in the event of exceptional occurrences. • must be able to read the instruction manual in general and understand its content.
skilled person	A skilled person • has professional training and sufficient experience to carry out complicated work or work involving residual risks independently. • must be able to make a correct assessment of the work to be carried out concerning feasibility, risks and hazards and the necessary tools. They must understand complex schematics and descriptions and can obtain missing necessary detailed information. • needs a supervisor who supports them in acquiring necessary technical tools. They must be able to check the intended condition of a system and restore it if necessary. • can also be a qualified person. Such a skilled person is a person who has the required knowledge for testing work equipment due to his professional training, professional experience and contemporary professional activity. • Work on electrical equipment is permitted only to electricians.

9.3 Further applicable documents

- Electrical schematic
- Declaration of conformity
- Drawings

9.4 List of illustrations

Imprint

Editor:

enesty GmbH / Jurke Engineering GmbH

Editing and design:

Ingenieurbüro Hannweber GmbH, Dresden

Dated: 29 April 2025 11:48:00