Flamco

ENA 5 Appendix

Installation and operating instructions

CE

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TP.03/17/09.EN Edition 2009/ EXP

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Installation and operating instructions appendix

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1 Commissioning

1.1 Commissioning ENA5

Before commissioning make sure that the unit and its items of equipment are in conformation with the regulations that apply at the place of erection and in respect of the field of application. The party erection and operating the unit will be responsible for making the checks and for carrying out commissioning.

For commissioning, the hydraulic and electric connections must be in place, and the shut-off devices open.

1.2 Parameterisation for commissioning

The ENA 5 comes with a pre- parameterized control. As this control offers a wide range of possibilities, you will have to set operating parameters so that they will be adapted to the concrete operating conditions of your heating/cooling system.

When the control is switched on, first ‘ENA 5’ and after that the start screen appears on the display. Now it is possible to make a selection by turning and pressing the control knob.

Turn and press the control knob (on System, displayed against a black background) to get to the Selection menu. Select ‘Entries’ (code 000001) to get to the Equipment, Parameter and Service menus for carrying out parameterization. Set up the control point by point – refer to the sections with explanations on the Hardware, Parameter and Service menu (ENA 5 – Installation and operating instructions).

Select ‘Back’ to return to or to complete menu items. For completely exiting submenus, you can also hold the control knob in the pressed state, causing the control to invoke the Process screen/START menu.

On completing the parameterization of the control, confirm/press Start to get to the Process screen. The ENA 5 will then commence its operation.

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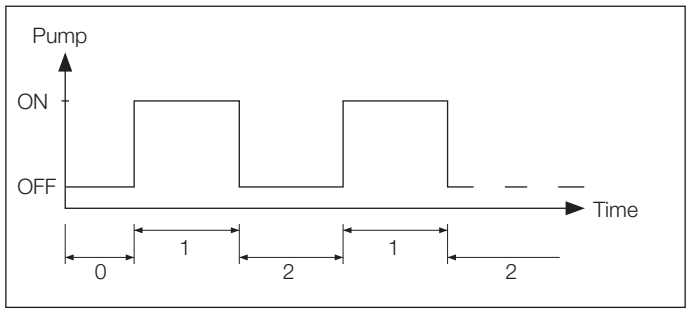
2 Items of the hardware and parameter menu

2.1 Operating modes

The operator can operate the system in the fast and normal de-aeration mode. Service personnel have also access to hand mode, and can carry out a leakage test. This leakage (vacuum) test can also be used to test the ability to operate the pump.

2.1.1 Fast/Turbo

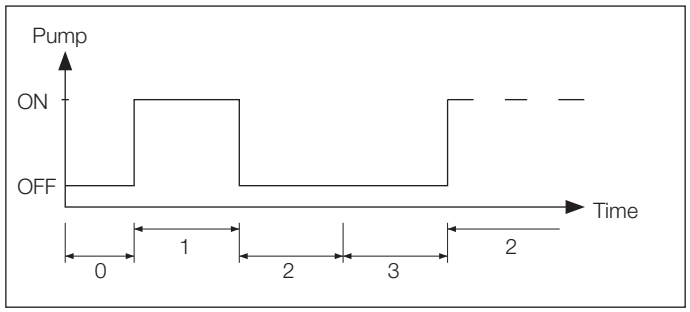
Pump running (with formation of a vacuum) takes place alternately with the evacuation interval until the period of time selected for the fast mode expires. Then, the control automatically changes to normal mode.



0 Start delay
1 Pump run
2 Deaeration time

2.1.2 Normal

The normal de-aeration mode is only automatically interrupted by a pause to avoid possible de-aeration noise during the night.



0 Start delay
1 Pump run
2 Deaeration time
3 Pause duration

2.1.3 Hand

The hand mode is intended exclusively for maintenance purposes, i.e. for checking the operation of the pump and of the solenoid valve. The plant operator cannot access this mode.

- **Vacuum test**

Activation of this mode first causes the system port (at outlet of the system return line) to be closed. The pump then generates a vacuum within 5 seconds. This vacuum must be maintained for about 100 seconds to allow the user to determine that the tank is tight, following which the test is successfully completed. This test is normally carried out prior to commissioning of the system and after maintenance of the system.

2.2 Control modes

2.2.1 Level-controlled [%]

Control takes place via an external floating signal or a non-floating signal (230 V). It depends on the used pressure-holding control and whether a pump-controlled or compressor-controlled diaphragm expansion vessel is used. When the signal is applied, the pump switches on. The filling operation takes place until the level set on the control of the expansion vessel is reached.

2.2.2 Pressure-controlled [P]

Control takes place via the pressure sensor that is integrated in the module. When the system pressure has dropped to the activation pressure ‘Fill command on’, the pump switches on and operates until ‘Fill command off’ is reached.

In both control modes, the running time and filling quantities (if the system is equipped with a pulse water meter) are monitored. In addition to this, the pressure in the system is monitored. If the system pressure falls or rises beyond the working pressure range, an error message appears.

2.2.3 Filling off

The ENA 5 unit operates solely as an automatic de-aeration unit.

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2.3 Monitoring

It is the primary purpose of the monitoring functions to detect errors in the system at an early point of time and to protect the system components to the largest possible extent by means of appropriate signals or by automatically shutting down the system. They are particularly intended for detecting leakages at an early stage and to limit leakages.

2.3.1 Make-up quantity (monitoring)

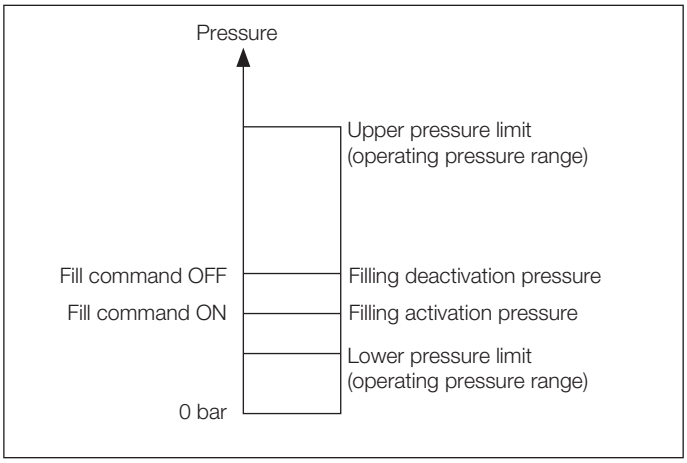
The operator can freely parameterise the make-up quantity. If the conditions described below are not satisfied, the system will indicate an error; the floating error contact will be opened until the error is manually acknowledged.

- The actual run time must not exceed a maximum time per cycle.
- The minimum interval between two cycles (pause) must not be shorter than the time programmed.
- The maximum number of cycles per time window must not exceed the number programmed in the run time window (e.g., not more than 3 cycles in the last 8 hours.)

If a litres counter (IWZ) is connected and activated, the operator can monitor a maximum filling quantity per cycle instead of the maximum filling time per cycle

2.3.2 Pressure monitoring

The maximum allowable pressure and level should not be exceeded. Therefore, pressure deviations are signalled.



- 'Fill command on' is within the limits of the working pressure range and can be parameterised between 1.0 and 2.4 bar.
- 'Fill command of' is within the limits of the working pressure range and can be parameterised between 1.1 and 2.5 bar.

De default values for pMIN and pMAX are 0.9 and 2.6 bar. The operator cannot adjust these values.

2.3.3 Monitoring of quantity of water to be treated

If a water treatment module has been installed and the pulse water meter has been set to ON, the residual water quantity can be read at the lower right in the process menu. I.e.: if the residual water quantity has been correctly entered in the parameter menu 'Water treatment prior to commissioning'. If the quantity is zero litres, the centralised fault alarm will be cycled (if activated), and an error message will be initiated. Negative values mean that the permissible treated quantity (capacity) in litres has been exceeded. The ENA 5 continues to operate in such a case.

Note concerning number of cycles in de-aeration mode
By changing the de-aeration times (idle phase, pause duration, normal de-aeration as well as duration of fast de-aeration) and, consequently, the number of cycles per day, make sure that the times will be set in such a way that unnecessary wear will be excluded. No more than 25 cycles per day should be used on an average in the operation of the system. The total number of cycles is registered in the service menu.

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3 Menu descriptions

3.1 Hardware menu

ID number
Can be parameterised only by the manufacturer and service personnel.

Language
The operator can choose between 17 languages. German (G2_1) is the default setting on delivery.

Litres counter (IWZ)
Set this item to ON only if a pulse water meter (litres counter) is used. The pulse water meter can be used for directly controlling and monitoring the supplied make-up water. The default setting is OFF.

Water treatment
If a water treatment module has been integrated in the make-up water branch and the litres counter has been set to ON, the residual water quantity that can be read in litres in the process menu. When a quantity of zero litres is reached, the centralised fault alarm is tripped, and an error message will be displayed. Negative values mean that the allowable treatment quantity (capacity) has been exceeded. The make-up unit continues to operate even if the centralised fault alarm has been tripped. The operator must activate the water treatment function.

Control mode
(Make-up mode) The operator can operate the system in a level-controlled (controlled from an external pressure-holding control) mode or in a pressure-controlled mode (default setting for normal gas-cushioned diaphragm expansion vessel). The operator also can deactivate the make-up function.

Operating mode
The unit is shipped from the factory with the fast mode activated. Upon expiry of the fast interval, the unit automatically switches to normal. However, the operator can change the operating mode at any time. The hand mode can be activated for servicing purposes only. Vacuum test serves for ensuring the de-aerating operation and for checking leakages in the system. This function must be used when the unit is commissioned and each time the unit is put back into service after maintenance. After the test has been completed, the unit must be switched back to the fast mode.

Sensor / Motor protection
Already been parameterised. Factory setting.

Common failure
If set to ON (item ticked), the common failure will be tripped upon the activation of the respective error message. The default setting is ON. It is possible to deactivate the following centralised fault alarms: ‘Exchange module’ and ‘Next maintenance’.

- Exchange module: the water treatment capacity is exhausted. If it is set to ON, a centralised fault alarm will be tripped. The unit continues to operate. If set to OFF, no centralised fault alarm will be tripped.
- Next maintenance: maintenance date has been reached. If it is set to ON, the centralised fault alarm will be tripped and the unit continues to operate. If set to OFF, no centralised fault alarm will be tripped.

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3.2 Parameter menu

Item	Factory setting
Duration of turbo	
- Remaining fast run time up to automatic change to normal mode	5 hours
Pause normal degaz	
- Duration of pause between end of evacuation time and beginning of pump run	25 minutes
- Pause ON (beginning of night pause)	06:00 pm
- Pause OFF (end of night pause)	08:00 am
Degassing	
- Pump run time (0.9 - 1.5) bar	40 seconds
- Pump run time (1.5 - 2.0) bar	45 seconds
- Pump run time (2.0 - 2.3) bar	50 seconds
- Pump run time (2.3 - 2.6) bar	55 seconds
- Deaeration time (pause)	180 seconds
System pressure	
- Fill command on: make-up feed activation pressure (range 1.0 to 2.4 bar)	1.6 bar
- Fill command off: make-up feed deactivation pressure (range 1.1 to 2.5 bar)	1.7 bar
- Lower pressure limit (lower working pressure limit)	0.9 bar
- Upper pressure limit (upper working pressure limit)	2.6 bar
- Special system pressure (irrelevant for the operator)	Factory setting
Litres counter	
- Litre/pulse: pulse water meter (can be set only by service personnel)	10 litre/pulse
- Error litres counter: monitoring of delay of cycle of litres counter	40 minutes
Water treatment	
- Treatment capacity in case of integrated water softening module	100 litres

Filling quantity:
Based on a continually referenced preceding period of time (time window), the unit allows using a certain number of filling cycles that are separated by pauses from one another. Cycles, pauses and time windows (time spending) can be freely parameterised.

Example: (default setting)
In the last 480 minutes (time spending) the make-up water quantity per cycle must not exceed 50 litres. Moreover, it is not permissible to supply this quantity during this time more than three times, and the pauses between the cycles must be 5 minutes at a minimum.

Item	Factory setting
Max quantity/filling	
- Maximum allowable quantity per cycle (also per cycle) with integrated and configured pulse water meter. See section Monitoring: make-up quantity	50 litres
Max time/filling	
- Maximum allowable make-up time per cycle (also per cycle). See section Monitoring: monitoring of run time	170 minutes
Min. interval betw. 2 cycles	
- Minimum interval between two cycles (pause)	5.0 minutes
Max cycles/time spend	
- Maximum number of cycles per time window	3
Time spending	
- Size of time window	480 minutes

Note that the values in the filling quantity menu are interdependent. Therefore, it may be necessary to first parameterise another value before the actual value becomes accessible within the intended limits. Similarly, setting ranges may be limited. It is advisable, for instance, to first parameterise a sufficiently sized time window before defining the pauses and the number and length of cycles.

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Item	Factory setting
Time and date	Operator task
- Summer time on: starting month (summer time ON is 00 for regions without change between times)	03
- Summer time off: ending month (summer time OFF=00 for regions without change between times)	10
- Maintenance gap: maintenance interval 0 .. 800 days	365 days
- Pressure sensor min.value	~ 1.0 bar
- Pressure sensor max.value	6.0 bar
Other internal	
- Factory settings (not visible). Not intended for use by operator.	

3.3 Service menu

Project number
Factory settings; not be programmed by the operator.

Software version
Readable entry made by manufacturer.

Start
Enter the time and date of the start (traceability) by pressing Start. Before pressing, the date and time must have been correctly set.

Maintenance
The date of the next maintenance is indicated in parentheses. When this time is reached, the centralised fault alarm is optionally tripped, and a fault message is displayed to remind the operator. If it is acknowledged, it will be displayed again after seven days unless 'Maintenance done' has been pressed, thus indicating that the maintenance has already been carried out. The time and date of the last maintenance as well as the code level are indicated in the upper two lines.

Error list
Shows the last acknowledged 250 errors together with time and date.

Value statistics
Display of various statistic data.

Refill statistics
Display of the last 200 make-up operations together with date, time and duration of the make-up operations and the number of litres supplied (if a pulse water meter is used).
The number of supplied litres displayed may be zero, although water has been fed into the system, if the make-up quantity was smaller than the pulse rate of the pulse water meter. Similarly, the actual quantity of water supplied may be smaller than the value registered by the pulse water meter.

Change entry code
Change to another access code. For the operator, only code 000001 is possible and required.

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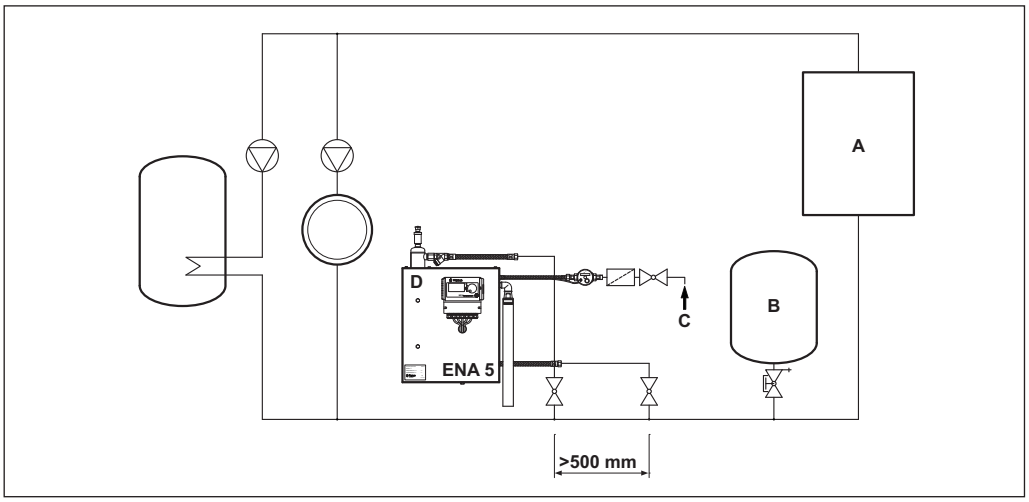
4 Examples

4.1 Example for integration



A	Heater
B	Diaphragm expansion vessel
C	Make-up water inlet
D	ENA 5

Do not use nominal bores smaller than indicated for the lenghts of the lines concerned!
The lines should be as short as possible!

DN15 < 10 m
DN20 < 20 m
DN25 < 30 m