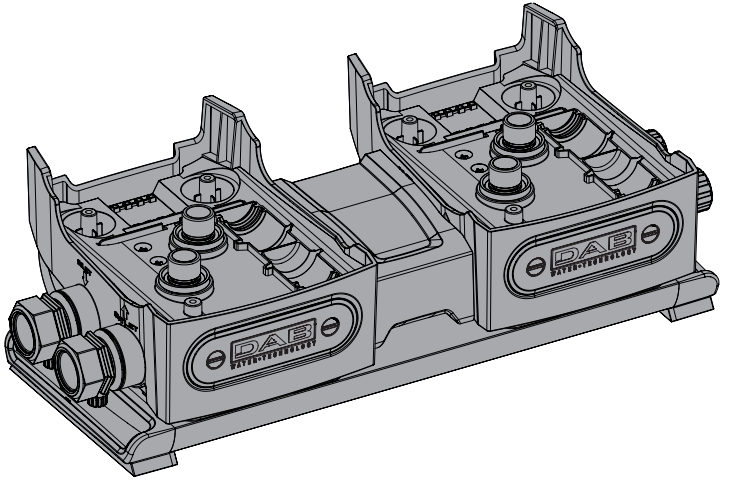
E.SYTWIN

INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE



DAB WATER•TECHNOLOGY


3,0 bar
1,24 kW
GO
2000 rpm
DAB
MODE
SET
INSTALLER MENU
RP
Pressure fall
to restart
P On
2,5 bar
0,5 bar
3,0 bar
AS
3”
MODE + SET +
MODE x4


PUMP 1
AS
INSTALLER MENU
GO
2000 rpm
3,0 bar
DAB
MODE
SET
5”

PUMP 2



US - ENGLISH

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1 - Multiple Sets

1.1 - Introduction to multipump systems

By multipump systems we mean a pump set made up of a number of pumps whose deliveries all flow into a common manifold. The devices communicate with one another by means of the connection provided (wireless).
The group may be made up of a maximum of 4 devices.
A multipump system is used mainly for:

- Increasing hydraulic performance in comparison with a single device
- Ensuring continuity of operation in the event of a device developing a fault
- Sharing out the maximum power

1.2 - Making a multipump system

The hydraulic plant must be created as symmetrically as possible to obtain a hydraulic load uniformly distributed over all the pumps.
The pumps must all be connected to a single delivery manifold:

For good operation of the pressure boosting set, the following must be the same for each device:
- hydraulic connections
- maximum speed

1.3 First start of the multipump system

Make the electric and hydraulic connections of the whole system as described in par 2.1.1, 2.2.1 and par 3.1. (see Instructions for installation and maintenance e.sybox).
Switch on the devices and create the associations as described in paragraph 1.4 – AS: Association of devices.

1.4 - AS: Association of devices

Allows connection/disconnection with the following devices

- e.sy Other e.sybox pump for operation in a pump set
- composed of max 4 elements

- COM PWM Com communication control unit
- TERM PWM Term remote control terminal
- I/O e.sybox I/O input output control unit
- RPR Remote pressure sensor
- DEV Any other compatible devices

Connections menu
The icons of the various connected devices are displayed with below an identifying acronym and the respective reception power.
An icon lit with a fixed light means that the device is connected and working correctly; a stroked through icon means the device is configured as part of the network but is not found.
Pressing "+" or "-" allows you to select a device that is already connected (function active on release) making the respective icon appear in reverse; when the device is selected, a description of the selected device appears underlined.



All the devices present over the air are not displayed on this page but only the devices that have been associated with our network.
Seeing only the devices in your own network allows the operation of several similar networks existing within the radius of action of the wireless without creating ambiguity; in this way the user does not see the elements that do not belong to his pumping system.

From this menu page it is possible to associate and disassociate an element from your personal wireless network.
When the machine starts the AS menu item does not show any connection because no device is associated. Only an action by the operator can allow devices to be added or removed with the operations of association and disassociation.

Association of devices
Pressing '+' for 5 sec puts the machine into the mode where it searches for wireless association, communicating this status by the blinking of the icon (related to the device on which the action is carried out) and of the COMM leds at regular intervals. As soon as two machines in a working communication range are put into this status, if possible, they are associated with each other. If the association is not possible for one or both machines, the procedure ends and a pop-up appears on each machine saying "association not possible". An association may not be possible because the device you are trying to associate is already present in the maximum number or because the device to be associated is not recognised.

The search status for association remains active until the device to be associated is detected (irrespective of the result of association); if not device can be seen within the space of 1 minutes, the machine automatically leaves association status. You can leave the search status for wireless association at any time by pressing SET or MODE.

Disassociation of devices
To disassociate an element you must first select it with the "+" or "-" keys, then press - for 5 s; this puts the system into device disassociation mode in which the icon of the selected device and the COMM led start to flash rapidly, indicating that the device chosen will be cancelled. The next time - is pressed the device will be disassociated; instead, if you press any key or let more than 30 sec elapse from entering disassociation mode, the procedure will be terminated.

1.5 Multipump adjustment
When a multipump system is switched on, the addresses are automatically assigned and an algorithm selects one device as the adjustment leader. The leader decides the speed and starting order of each device in the chain.
The adjustment mode is sequential (the devices start one at a time). When starting conditions occur, the first device starts, when it has reached maximum speed the next one starts, and then the others in sequence. The starting order is not necessarily in ascending order according to the machine address, but it depends on the working hours done see 2.4 - ET: Max. switching time

1.6 - Assigning the starting order

Each time the system is switched on a starting order is associated with each device. Depending on this, the sequential starts of the devices are decided.
The starting order is modified during use as necessary by the following two algorithms:

- Reaching the maximum work time
- Reaching the maximum inactivity time

1.7 - Maximum work time

Depending on the parameter ET (maximum work time), each device has a working time counter, and depending on this the starting order is updated with the following algorithm:

- if at least half of the ET value has been exceeded, the priority is exchanged the first time the inverter switches off (exchange to standby).
- if the ET value is reached without ever stopping, the inverter is switched off unconditionally and is taken to minimum restarting priority (exchange during running).

If the parameter ET (maximum work time) is set at 0, there is an exchange at each restart.

See 2.4 - ET: Max. switching time.

1.8 - Reaching the maximum inactivity time

The multipump system has an anti-stagnation algorithm, the aim of which is to keep the pumps in perfect working order and to maintain the integrity of the pumped fluid. It works by allowing a rotation in the pumping order so as to make all the pumps supply at least one minute of flow every 23 hours. This happens whatever the device configuration (enabled or reserve). The exchange of priority requires that the device that has been stopped for 23 hours be given maximum priority in the starting order. This means that as soon as it is necessary to supply flow, it will be the first to start. The devices configured as reserve have precedence over the others. The algorithm ends its action when the device has supplied at least one minute of flow.

When the intervention of the anti-stagnation algorithm is over, if the device is configured as reserve, it is returned to minimum priority to preserve it from wear.

1.9 - Reserves and number of devices that participate in pumping

The multipump system reads how many elements are connected in communication and calls this number N.

Then depending on the parameters NA and NC it decides how many and which devices must work at a certain time.

NA represents the number of devices that participate in pumping. NC represents the maximum number of devices that can work at the same time.

If there are NA active devices in a chain and NC simultaneous devices with NC smaller than NA, it means that at the most NC devices will start at the same time and that these devices will exchange with NA elements. If a device is configured with reserve preference, it will be the last in the starting order, so for example if I have 3 devices and one of these is configured as reserve, the reserve will be the third element to start, whereas if I set NA=2 the reserve will not start unless one of the two active ones develops a fault.

See also the explanation of the parameters

2.1 - NA: Active devices;
2.2 NC: Simultaneous devices;
2.3 IC: Configuration of the reserve.

1.10 Parameters concerning multipump

Parameters with local significance

These are parameters that can be divided among the various devices and in some cases it is necessary for them to be different. For these parameters it is not allowed to align the configuration automatically among the various devices. For example, in the case of manual assignment of the addresses, these must absolutely be different one from the other.
List of parameters with local significance for the device:

- CT Contrast
- BK Brightness
- TK Backlight switch-on time
- RI Revs/min in manual mode
- AD Address Configuration
- IC Reserve configuration
- RF Reset fault and warning
- PW Set Password

Sensitive parameters
These are parameters which must necessarily be aligned over the whole chain for adjustment reasons.
List of sensitive parameters:

- SP Setpoint pressure
- P1 Auxiliary setpoint input 1
- P2 Auxiliary setpoint input 2
- P3 Auxiliary setpoint input 3
- P4 Auxiliary setpoint input 4
- RP Pressure decrease to restart
- ET Exchange time
- AY Anticycling
- NA Number of active devices
- NC Number of simultaneous devices
- TB Dry run time
- T1 Switch-off time after low pressure signal
- T2 Switch-off time
- GI Integral gain
- GP Proportional gain
- I1 Input 1 setting
- I2 Input 2 setting
- I3 Input 3 setting
- I4 Input 4 setting
- OD Type of system
- PR Remote pressure sensor
- PW Change password

Automatic alignment of sensitive parameters

When a multipump system is detected, the compatibility of the set parameters is checked. If the sensitive parameters are not aligned among all the devices, a message appears on the display of each device asking whether you want to propagate the configuration of that particular device to the whole system. If you accept, the sensitive parameters of the device on which you answered the question will be distributed to all the devices in the chain.
If there are configurations that are not compatible with the system, these devices are not allowed to propagate their configuration.
During normal operation, changing a sensitive parameter of a device results in the automatic alignment of the parameter on all the other devices without asking for confirmation.

NOTE: *The automatic alignment of the sensitive parameters has no effect on all the other types of parameters.*

In the particular case of inserting a device with factory settings in the chain (a device replacing an existing one or a device on which the factory configuration has been restored), if the present configurations with the exception of the factory configurations are compatible, the device with factory configuration automatically assumes the sensitive parameters of the chain.

Parameters with optional alignment
These are parameters for which it is tolerated that they may not be aligned among the various devices. At each change of these parameters, when you come to press SET or MODE, you are asked if you want to propagate the change to the entire communication chain. In this way, if all elements of the chain are the same, it avoids setting the same data on all the devices

List of parameters with optional alignment:

- LA Language
- MS Measuring system
- AE Anti-blocking
- AF AntiFreeze
- O1 Function output 1

- O2 Function output 2
- RM Maximum speed

2 - Setting the number of devices and of reserves

2.1 - NA: Active devices

Sets the maximum number of devices that participate in pumping.
It may have values between 1 and the number of devices present (max 4). The default value for NA is N, that is the number of devices present in the chain; this means that if devices are added to or removed from the chain, NA always has the value of the number of devices present, automatically detected. If a number different from N is set, this fixes the maximum number of devices that can participate in pumping at the number set.
This parameter is used in cases where there is a limit on the pumps you can or want to be able to keep running, and if you want to keep one or more devices as a reserve (see 2.3 IC: Configuration of the reserve and other examples below).
On the same menu page you can also see (but not change) the other two system parameters linked to this, that is N, the number of devices present, acquired automatically by the system, and NC, the maximum number of simultaneous devices.

2.2 NC: Simultaneous devices

Sets the maximum number of devices that can work at the same time.
It may have values between 1 and NA. The default value of NC is NA, this means that even if NA increases, NC will have the value NA. If a number different from NA is set, this releases you from NA and fixes the maximum number of simultaneous devices at the number set. This parameter is used in cases where there is a limit on the pumps you can or want to be able to keep running (see 2.3 IC: Configuration of the reserve and other examples below).
On the same menu page you can also see (but not change) the other two system parameters linked to this, that is N, the number of devices present, read automatically by the system, and NA, the number of active devices.

2.3 IC: Configuration of the reserve

Configures the device as automatic or reserve. If set on auto (default) the device participates in normal pumping, if configured as reserves, minimum starting priority is associated with it, this means that the device with this setting will always start last. If a number of active devices is set that is one lower than the number of devices present and if one element is set as reserve, the effect obtained is that, if there are no problems, the reserve device does not participate in regular pumping; instead, if one of the devices that participates in pumping develops a fault (maybe loss of power supply, tripping of a protection, etc.), the reserve device will start. The state of configuration as a reserve can be seen as follows: on the Multi-pump System page, the top of the icon is coloured; on the AD and main pages, the communication icon representing the address of the device appears with the number on a coloured background. There may be more than one device configured as reserve in a pumping system. Even though the devices configured as reserve do not participate in normal pumping, they are nevertheless kept efficient by the anti-stagnation algorithm. The anti-stagnation algorithm changes the starting priority once every 23 hours and allows the accumulation of at least one continuous minute of supply of flow from each device. The aim of this algorithm is to avoid the deterioration of the water inside the impeller and to keep the moving parts efficient; it is useful for all devices and especially for those configured as reserve, which do not work in normal conditions.

2.3.1 - Examples of configuration for multipump systems

Example 1:
A pump set composed of 2 devices (N=2 detected automatically) of which 1 set active (NA=1), one simultaneous (NC=1 or NC=NA since NA=1) and one as reserve (IC=reserve on one of the two devices).
The result obtained is the following: the device not configured as a reserve will start and work by itself (even though it does not manage to bear the hydraulic load and the pressure achieved is too low). If it has a fault, the reserve device steps in.

Example 2:
A pump set composed of 2 devices (N=2 detected automatically) in which all the devices are active and simultaneous (factory settings NA=N and

NC=NA) and one as reserve (IC=reserve on one of the two devices). The result obtained is the following: the device that is not configured as reserve always starts first, if the pressure detected is too low the second device, configured as reserve, also starts. In this way we always try to preserve the use of one device in particular (the one configured as reserve), but this may be useful in case of necessity when a greater hydraulic load occurs.

2.4 - ET: Max. switching time

Sets the maximum continuous working time of a device in a set. It is significant only on pump sets with interconnected devices. The time can be set between 1 min and 9 hours; the factory setting is 2 hours.

When the ET of a device has elapsed the system starting order is reassigned so as to give minimum priority to the device on which the time has elapsed. The aim of this strategy is to use less the device that has already worked and to balance the working time between the various machines that make up the set. If the hydraulic load still requires the intervention of the device, even though it has been put last in starting order, it will start to guarantee pressure boosting of the system.

The starting priority is reassigned in two conditions based on the ET time:

1. Exchange during pumping: when the pump remains on without interruption until the absolute maximum pumping time has been exceeded
2. Exchange to standby: when the pump is on standby but 50% of the ET time has been exceeded

If ET has been set at 0 there will be exchange to standby. Whenever a pump in the set stops, a different pump will start first next time it is restarted.

If the parameter ET (maximum work time) is set at 0, there will be exchange at each restart, irrespective of the pump's actual work time.

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