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General

AL ^ Introduction

General Meteorological/Date

Program block 00 is a block which is always present in every controller. Namely, block 00 contains general matters, such as the measuring values of the weather station, time and date settings as well as settings regarding the astronomical clock. The lines on which date and time can be read, are so-called combined lines. This means that on these lines a value can be set as well as read-out. Block 00 refers to the date and time information of a clock module. At this clock module a battery is present, so that in case of power failure the clock will remain functioning for at least 48 hours. The sunrise and sunset times are determined on the basis of a table, which has been indicated on dealer level in block 00. The values in this schedule are dependent on the place on earth where the Belux is installed. The values in this table as well as all settings of the separate program blocks will be kept in a power independent memory. Therefore at power failure these values will not be lost.

Defaults Dumping

With the help of a dealer setting it is possible to have all settings take on their default value. The dumping of default values usually takes place when the controller is put into use. When at a later date default values are dumped, then all settings will have to be checked, travel durations of vents, mixing valves, etc. will have taken their starting positions again and will not agree with reality anymore. At this option the necessary caution should be taken into consideration.

AL = Alarms

0.00 AL = Alarm Status (#)

Bereik : 0 ⇔ 5 (#)
Default : 0 (#)

On this line the present alarm status of the general block is shown.

An alarm situation can be recognized by the character "E" in the display at the left.

When more alarms are present at the same time, these will be shown by turns.

By pressing the push-button this line will be switched to zero and the alarms present at that moment will be indicated as observed.

The alarm bell will be switched off and the character "E" in the display will start flashing now. The alarms indicated as observed, will cancel oneself when the situation becomes normal again.

The next alarms can appear:

- **0 No Alarm !** At the moment no alarm is active.
- **1 Rain Sensor Alarm !** The measured rain value is not within the pre-set alarm limitations or has not been received via the CAN-bus.
- **2 Wind Direction Sensor Alarm !** The measured wind direction is not within the pre-set alarm limitations or has not been received via the CAN-bus.
- **3 Wind Velocity Sensor Alarm !** The measured wind direction is not within the pre-set alarm limitations or has not been received via the CAN-bus.
- **4 Outside Temp Sensor Alarm !** The measured outside temperature is not within the pre-set alarm limitations or has not been received via the CAN-bus.
- **5 Light Intensity Sensor Alarm** The measured outside light intensity is not within the pre-set alarm limitations or has not been received via the CAN-bus.

AL = Meteorological Station

0.01 AL = Outside Temp (°C)

Bereik : -20.0 ⇔ 50.0 (°C)

Default : 0.0 (°C)

On this line the measured outside temperature which the meteorological station registers at the moment is shown.

0.02 AL = Lowest Outside Temp (°C)

Bereik : -20.0 ⇔ 50.0 (°C)

Default : 0.0 (°C)

On this line the lowest measured outside temperature of the night period is shown.

This value will be reset at sunset.

In this way always the lowest outside temperature of the past night can be observed.

0.03 AL = Highest Outside Temp (°C)

Bereik : -20.0 ⇔ 50.0 (°C)

Default : 0.0 (°C)

On this line the highest measured outside temperature of the day period is shown.

This value will be reset at sunrise.

In this way the highest outside temperature of the past day can be observed.

0.04 AL = Wind Velocity (m/s)

Bereik : 0 ⇔ 27 (m/s)

Default : 0 (m/s)

On this line the measured wind velocity, which at the moment is registered by the meteorological station, is indicated.

In order to manage an easy shift of the measured wind velocity a quenching of this measuring value has been applied.

This quenching has been constructed in such a way that an increasing wind velocity will be little quenched and a decreasing wind velocity will be much quenched. The value measured by the wind velocity sensor of the meteorological station, will probably be below the value indicated by the Royal Dutch Meteorological Institute at that moment. Namely, the Royal Dutch Meteorological Institute measures at a height of 10 meters in open field, the meteorological station is usually set up differently.

- | | | | |
|---|--------------|------------------|--------------------|
| • | Force | m/s | Wind scale |
| • | 2 | 0>3 | Weak wind |
| • | 4 | 3>8 | Moderate wind |
| • | 5 | 8>11 | Rather strong wind |
| • | 6 | 11>14 | Strong wind |
| • | 7 | 14>17 | Hard wind |
| • | 8 | 17>20 | Stormy |
| • | 9 | 20>24 | Storm |
| • | 10 | 24>28 | Heavy storm |
| • | 11 | 28>32 | Very heavy storm |
| • | | Hurricane | |

0.05 AL = Wind Direction (°)

Range : 0 ⇔ 360 (°)

Default : 0 (°)

On this line the measured wind direction, which at the moment is registered by the meteorological station, is indicated. The wind direction is used by the present ventilation groups in order to determine which vent side should be regarded as lee- or as wind side.

Below is given an enumeration of the point of the compass and its accessory number of degrees.

- **0** **North** The wind is coming from the North.
- **90** **East** The wind is coming from the East.
- **180** **South** The wind is coming from the South.
- **270** **West** The wind is coming from the West.
- **360** **North** The wind is coming from the North.

0.06 AL = Rain (#)

Range : 0 ⇔ 10 (#)

Default : 0 (#)

On this line the measured rain, which is being registered at the moment by the meteorological station, is shown.

The measured value of the rain sensor is a value without dimension with a reach of 0 to 10, at which the value 0 should be observed as dry and the value 10 as continual hard rain.

0.07 AL = Light Intensity (kLux)

Range : 0 ⇔ 100 (kLux)

Default : 0 (kLux)

On this line the measured light intensity is shown, which at the moment is being registered by the meteorological station.

AL = Temporarily Values

0.04 AL = Unquenched Wind Velocity(m/s)

Range : 0 ⇔ 0 (m/s)

Default : 0 (m/s)

On this line the unquenched measured wind velocity is shown.

See: *0.04 Wind Velocity (m/s)*.

AL - Date/Time

0.20 AL - Time (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 12:00 (hh:mm)

On this line the present time is shown.

This line is a so-called combined line, which in this case means that the time can be read as well as adjusted. When a clock module is present, then in case of power failure the time will remain representative for minimally 48 hours because of the fitted battery.

0.21 AL - Day (dd)

Range : 1 ⇔ 31 (dd)

Default : 0 (dd)

On this line the present day number is indicated.

This line is a so-called combined line, which means that the day number can be read as well as adjusted. When a clock module is present, then in case of power failure the day number will remain representative for minimally 48 hours because of the fitted battery.

0.22 AL - Month (mm)

Range : 1 ⇔ 12 (mm)

Default : 6 (mm)

On this line the present month number is shown.

This line is a so-called combined line, which means that the month number can be read as well as adjusted. When a clock module is present, then in case of power failure the month number will remain representative for minimally 48 hours because of the fitted battery.

0.23 AL - Year (jjjj)

Range : 1996 ⇔ 2099 (jjjj)

Default : 1996 (jjjj)

On this line the present year is shown.

This line is a so-called combined line, which means that the year can be read as well as adjusted. When a clock module is present, then in case of power failure the year will remain representative for minimally 48 hours because of the filled battery.

0.24 AL - Summer Time (#)

Range : 0 ⇔ 1 (#)

Default : 1 (#)

On this line can be set whether at the moment it is summer- or winter time.

In case of changing from summer- to winter time, or from winter- to summer time, all times related to the sunrise or sunset will be adapted.

- **0 No** At the moment winter time is active.
- **1 Yes** At the moment summer time is active.

0.25 AL - Sunrise (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 00:00 (hh:mm)

On this line today's sunrise time is shown.

This time is calculated dependent on the present date and the twelve sunrise times from the sunrise table.

0.26 AL - Sunset (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 00:00 (hh:mm)

On this line sunset time is shown.

This time is calculated dependent on the present date and twelve sunset times of the sunset table.

AL - Dealer Level

0.27 AL - To Dealer Level (#)

Range : 1000 ⇔ 2000 (#)

Default : 1000 (#)

Settings which are of minor importance to the user, are found on a separate settings level.

In case of normal use the settings on this so-called dealer level are not accessible.

In order to reach the dealer settings, the dealer level should be opened.

The procedure to open the dealer level, is described in the dealer documentation.

AL ÷ Dealer

0.73 AL ÷ ID Numb Regulator (#)

Range : 1 ⇔ 255 (#)

Default : 1 (#)

On this line the identification number of the controller is pre-set.

Inside a CAN-bus every controller should have a unique ID number.

Inside a CAN-bus several controllers with the same ID number should not appear.

0.74 AL ÷ Clock Print Present (#)

Range : 0 ⇔ 1 (#)

Default : 0 (#)

On this line can be set whether or not a clock print is physically present on the controller.

A clock print sees to it that in case of power failure time and date still remain representative during minimally 48 hours.

When the controller with a clock print is integrated into a CAN-bus loop, it will regularly sent time and date information via the bus to other connected controllers.

In this way all controllers present in the CAN-bus loop will maintain the same time and date.

- **0 Not present** No clock is physically present on this controller.
- **1 Present** A clock print is physically present on this controller.

0.75 AL ÷ Defaults Dumping (#)

Range : 0 ⇔ 3 (#)

Default : 0 (#)

With the help of this setting the adjustments of the controller can be forced to their starting positions. When the controller is started for the first time this dumping of defaults is meant to have all adjustments take on their default value.

When the controller has been set properly the dumping of defaults will result in the fact that business specific values, such as travel durations of vents and mixing valves, will get lost. After dumping of default values all adjustments have to be checked.

Dependent on the value pre-set on this line restricted or extensive dumping of default values will take place.

- **1 Extensive Dumping of Defaults** All settings of the controller will be set to their default value.
- **2 Restricted Dumping of Defaults** The settings of all program blocks that are present in the controller, except for the input and output settings, will be set to their default value.
- **3 Reset Controller** The controller will reset, settings will stay in memory and will not get lost.

AL ÷ Sunrise Times

0.76 AL ÷ Sunrise dd 21-01 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 08:36 (hh:mm)

The time of sunrise at a certain day is calculated dependent on the present date and values coming from a sunrise table.

The sunrise table contains twelve times which represent the sunrise time on the twenty-first day of every month of the year.

The sunrise table contains default the times referring to the Netherlands, for each other location where the Belux will be installed, this table will have to be filled in with values referring to the location in question.

The sunrise- and sunset times are among other things necessary for astronomical shifting of the begin of the day- and night period and the black out program.

0.77 AL ÷ Sunrise dd 21-02 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 07:45 (hh:mm)

See: 0.76 Sunrise dd 21-01 (hh:mm).

0.78 AL ÷ Sunrise dd 21-03 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 06:40 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.79 AL ÷ Sunrise dd 21-04 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 05:30 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.80 AL ÷ Sunrise dd 21-05 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 04:37 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.81 AL ÷ Sunrise dd 21-06 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 04:19 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.82 AL ÷ Sunrise dd 21-07 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 04:45 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.83 AL ÷ Sunrise dd 21-08 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 05:34 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.84 AL ÷ Sunrise dd 21-09 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 06:24 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.85 AL ÷ Sunrise dd 21-10 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 07:15 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.86 AL ÷ Sunrise dd 21-11 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 08:10 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

0.87 AL ÷ Sunrise dd 21-12 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)
Default : 08:45 (hh:mm)
See: 0.76 Sunrise dd 21-01 (hh:mm).

AL ÷ Sunset Times

0.88 AL ÷ Sunset dd 21-01 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 17:05 (hh:mm)

The time of sunset at a certain day is calculated dependent on the present date and values coming from a sunset table.

The sunset table contains twelve times which represent the sunset time on the twenty-first day of every month of the year.

The sunset table contains times referring to the Netherlands. For each other location where the Belux will be installed, this table will have to be filled in with values referring to the location in question.

The sunrise- and sunset times are among other things necessary for astronomical shifting of the begin of the day- and night period and the black out program.

0.89 AL ÷ Sunset dd 21-02 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 18:02 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.90 AL ÷ Sunset d. 21-03 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 18:54 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.91 AL ÷ Sunset dd 21-04 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 19:47 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.92 AL ÷ Sunset dd 21-05 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 20:35 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.93 AL ÷ Sunset dd 21-06 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 21:03 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.94 AL ÷ Sunset dd 21-07 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 20:46 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.95 AL ÷ Sunset dd 21-08 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 19:52 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).**0.96 AL ÷ Sunset dd 21-09 (hh:mm)**

Range : 00:00 ⇔ 23:59 (hh:mm)**Default :** 18:41 (hh:mm)**See:** 0.88 Sunset dd 21-01 (hh:mm).

0.97 AL ÷ Sunset dd 21-10 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 17:33 (hh:mm)

See: 0.88 Sunset dd 21-01 (hh:mm).

0.98 AL ÷ Sunset dd 21-11 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 16:41 (hh:mm)

See: 0.88 Sunset dd 21-01 (hh:mm).

0.99 AL ÷ Sunset dd 21-12 (hh:mm)

Range : 00:00 ⇔ 23:59 (hh:mm)

Default : 16:30 (hh:mm)

See: 0.88 Sunset dd 21-01 (hh:mm).

Field Heating

CF ^ Introduction

General Field Heating

This controller has been developed to heat football fields and keep them free of frost.

In order to restrict the number of adjustments as much as possible, a number of program blocks can be selected. In this way the user can choose which block should become active or that the regulator should be switched off entirely. When the controller has been switched off entirely, once every 24 hours the pumps will be switched on after each other for 5 minutes in order to prevent that these will get stuck. In case of normal operation a pump will be switched on.

In order to accomplish an equal wear out of the pumps, once every 24 hours the priority of the pumps will be switched.

When the calculated pipe temperature is 2 degrees above the measured field temperature a pump will be switched on.

This also means that when the controller has been switched on program 0 (calculated pipe temperature of 4 (°C)), the pump will start when the field temperature reaches 2 grades celcius.

Reading Field Heating

Which program is active can be read; the calculated and measured values of the controller as well as the status of the pumps can be looked up.

Alarms Field Heating

Because of the fact that the field is heated by hoses which may not reach a temperature above 50 (°C), alarm will be given when this temperature is exceeded by 5 (°C).

When a pump has thermically failed or has not started after a computer signal, an alarm will be given. The pump which does not cause any problems will then be switched on. When this pump does not start either, the pumps will be switched on by the computer in turns until the program has been reset.

CF = Alarms

1.00 CF = Alarm Status (#) 17

Range : 0 ⇔ 6 (#)

Default : 0 (#)

On this line the present alarm status of the group is shown.

An alarm situation can be recognized by the character "E" in the display at the left.

When several alarms are present at the same time, these will be shown by turns.

By pushing the presh-button this line will be switched on zero and the alarms present at that moment will be indicated as observed. The alarm bell will be switched off and the character "E" in the display will start flashing now.

The alarms indicated as observed will cancel themselves when the situation becomes normal again.

The next alarms could appear:

- **0 No Alarm !** At the moment no alarm is active.
- **1 Field Sensor 1 Defect !** The measured temperature is not within the pre-set alarm limitations or has not entered via the CAN-bus.
- **2 Fiels Sensor 2 Defect !** The measured temperature is not within the pre-set alarm limitations or has not entered via the CAN-bus.
- **3 Pipe Temp Sensor Alarm !** The measured pipe temperature is not within the indicated alarm limitations or has not entered via the CAN-bus.
- **4 Pipe Temp too High !** During the past 5 minutes the pipe temperature has been above 55 °C. Please check whether the mixing servo has indeed been closed and that it has not been switched on manual or that it has been manually opened.
- **5 Pump 1 Defect !** It has been ascertained that the pump has stopped or has been manually switched off. This pump will be ignored and if permitted and possible controlling will be proceeded by the other pump.
- **6 Pump 2 Defect !** It has been ascertained that the pump has stopped or has been manually switched off. This pump will be ignored and if permitted and possible controlling will be proceeded by the other pump.

CF = General

1.01 CF = Field Temperature 1 (°C)

Range : -20.0 ⇔ 50.0 (°C)

Default : 0.0 (°C)

Above the measured field temperature of the first sensor is shown.

1.02 CF = Field Temperature 2 (°C)

Range : -20.0 ⇔ 50.0 (°C)

Default : 0.0 (°C)

Above the measured field temperature of the second sensor is shown.

1.03 CF = Pipe Temp (°C)

Range : 0 ⇔ 120 (°C)

Default : 0 (°C)

Above the measured pipe temperature is shown.

1.04 CF = Status Pump 1 (#)

Range : 0 ⇔ 4 (#)

Default : 0 (#)

In this case can be indicated how the computer has controlled the pump.

- **0 Off** The pump has been switched off.
- **1 On** The pump has been switched on.
- **2 Thermal** The pump thermically failed.
- **3 Failure** The pump has been switched on by the computer, but didn't start.
- **4 Pump Sec** The pump will be switched on, because it has not been operating for more than 24 hours.

1.05 CF = Status Pump 2 (#)

Range : 0 ⇔ 4 (#)

Default : 0 (#)

In this case can be indicated how the computer has controlled the pump.

- **0 Off** The pump has been switched off.
- **1 On** The pump has been switched on.
- **2 Thermal** The pump thermically failed.
- **3 Failure** The pump has been switched on by the computer, but didn't start.
- **4 Pump Security** The pump will be switched on, because it has not been operating for more than 24 hours.

CF = Temporarily Values

1.01 CF = Calc Field Temp (°C)

Range : 0.0 ⇔ 25.0 (°C)

Default : 0.0 (°C)

Above the field temperature realized by the regulator is shown.

1.03 CF = Calc Pipe Temp (°C)

Range : 0 ⇔ 120 (°C)

Default : 0 (°C)

The calculated pipe temperature is the pipe temperature which is pursued by the central heating group. Therefore the mixing valve will control the pipe temperature to this pipe temperature.

CF - General

1.20 CF - Program Active (#)

Range : 0 ⇔ 4 (#)

Default : 4 (#)

Above can be adjusted which program should become active.

- **0 Program 0** The regulator calculates a pipe temperature of 4 °C
- **1 Program 1** The regulator follows the water temperature pre-set at program 1. (Default 15 °C)
- **2 Program 2** The regulator follows the water temperature pre-set at program 2. (Default 45 °C)
- **3 Program 3** The regulator follows the water temperature pre-set at program 3. (Default 45 °C)
- **4 Program 4** The regulator pursues a field temperature as pre-set at program 4. (Default 15 °C)

CF ÷ Dealer

1.90 CF ÷ Program 1 (°C)

Range : 0 ⇔ 50 (°C)
 Default : 15 (°C)

At this setting the desired water temperature is set that the controller will pursue when program 1 is active.

1.91 CF ÷ Program 2 (°C)

Range : 0 ⇔ 50 (°C)
 Default : 30 (°C)

At this setting the desired water temperature is set that the controller will pursue when program 2 is active.

1.92 CF ÷ Program 3 (°C)

Range : 0 ⇔ 50 (°C)
 Default : 45 (°C)

At this setting the desired water temperature is set that the controller will pursue when program 3 is active.

1.93 CF ÷ Program 4 (°C)

Range : 0.0 ⇔ 25.0 (°C)
 Default : 15.0 (°C)

At this setting the desired field temperature is set that the controller will pursue when program 4 is active.

1.94 CF ÷ Curr Mixing Valve (sec)

Range : 10 ⇔ 600 (sec)
 Default : 220 (sec)

On this line the travel duration of the mixing valve is pre-set.

This time is the duration which the servo engine needs to have the mixing valve moved from entirely closed position to entirely opened position.

The mixing valve is controlled on basis of time. It goes without saying that this travel time should be recorded exactly.

1.95 CF ÷ Ref Pipe Field Heating (°C)

Range : 0 ⇔ 50 (°C)
 Default : 40 (°C)

On this line the pipe temperature is set which is necessary to keep the field temperature at 15 (°C) when the outside temperature is equal to 0 (°C).

1.96 CF ÷ Reaction Velocity Pipe (#)

Range : 0 ⇔ 20 (#)
 Default : 10 (#)

On this line the speed is pre-set with which the pipe temperature will react to deviations between the measured pipe temperature and heating temperature, a higher number gives a quicker reaction.

When this value has been made to large, this can result in continuously fluctuating of the field temperature.

When this value has been made too small, it could take some time before the desired field temperature has been realized.

1.97 CF ÷ Contr on Pump(s) (#)

Range : 0 ⇔ 2 (s)
 Default : 0 (s)

Above can be indicated on which pump should be controlled. This is especially practical at calamities, if any.

- **0 Both** Control takes place by both pumps.
- **1 Pump 1** Control takes place on pump 1. Pump 2 will be ignored.
- **2 Pump 2** Control takes place on pump 2. Pump 1 will be ignored.

1.98 CF ÷ Contr on Field Sensor(s) (#)

Range : 0 ⇔ 2 (s)

Default : 0 (s)

Above can be indicated on which sensor(s) should be controlled. This is especially practical in case of calamities, if any.

- **0 Both** Control takes place on an average of temperature sensors 1 and 2.
- **1 Sensor 1** Control takes place on sensor 1.
- **2 Sensor 2** Control takes place on sensor 2.

1.99 CF ÷ Group Numb (#)

Range : 1 ⇔ 99 (#)

Default : 1 (#)

On this line the number of the field heating group is pre-set.

This number is of importance when several groups of the same type are present in the network.

Each group of a certain type should have a unique group number.

