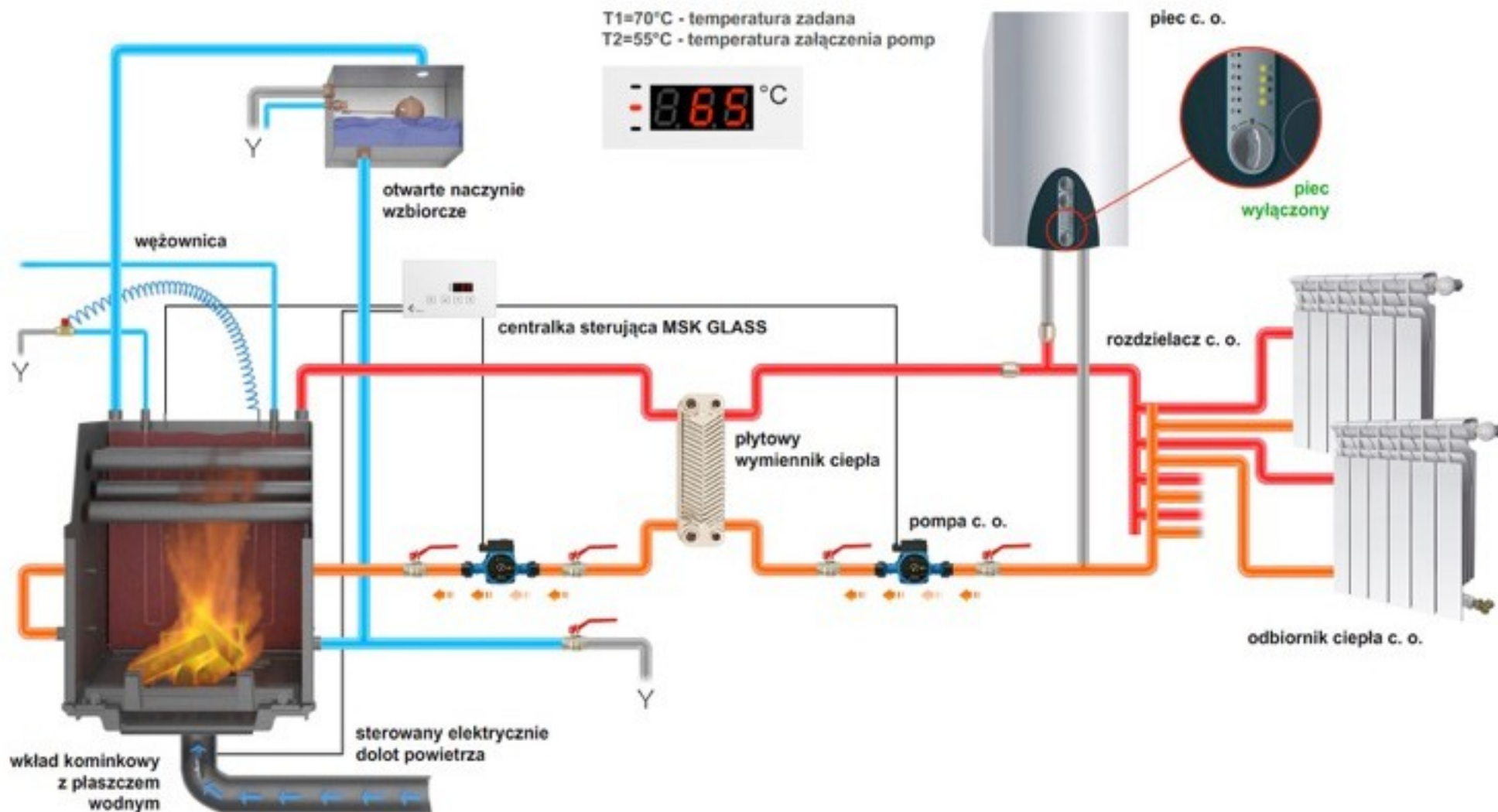CREATE
WARM
ATMOSPHERE

# CONTROLLERS

Models, selection criteria, operation, optimum settings - self-help aids - so called "ready-made" products

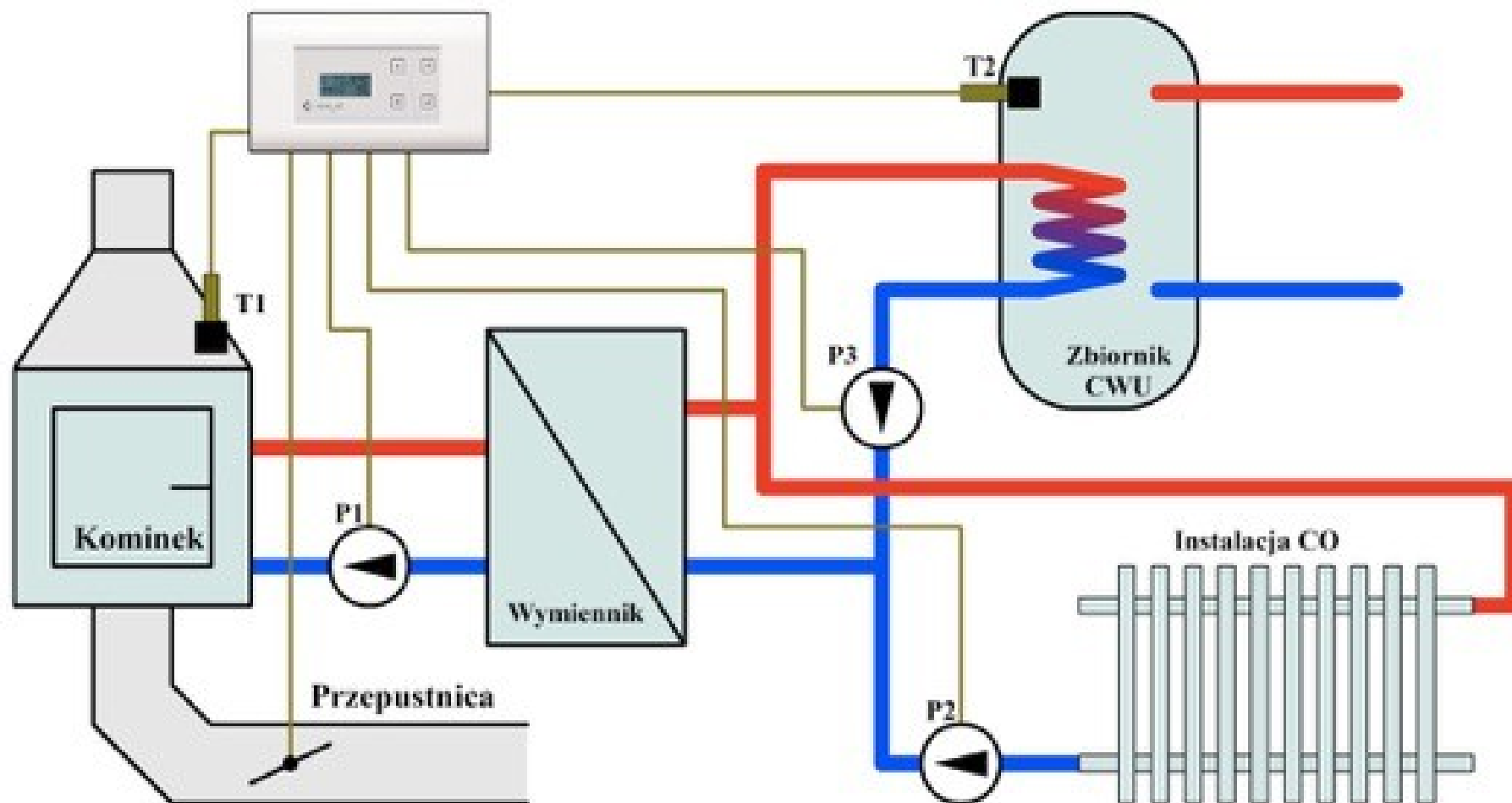# CONNECTION OF FIREPLACES WITH WATER JACKET

## SCHEMATICS/INSTALLATION ELEMENTS

# EXAMPLE WIRING DIAGRAM OF FIREPLACE INSERT WITH

# WATER JACKET WITH GAS BOILER

# EXAMPLE WIRING DIAGRAM OF FIREPLACE INSERT WITH

# WATER JACKET WITH GAS BOILER (CLOSED SYSTEM)

kratki

T1

Kominek

Przepustnica

P1

Wymiennik

P3

T2

Zbiornik CWU

Instalacja CO

P2
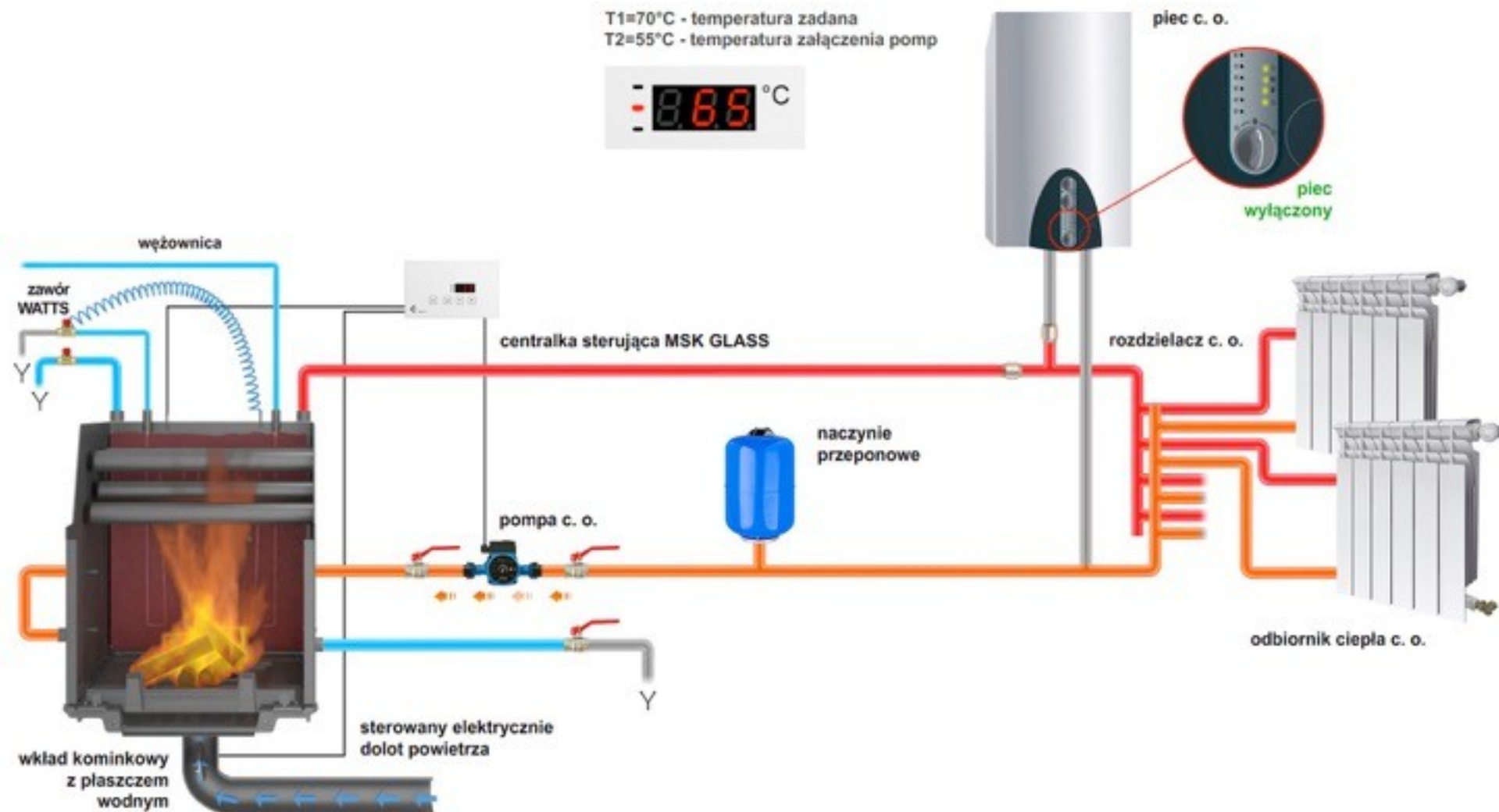
The basic question suggesting

choosing the right controller ?

How many devices - CH/HW pumps are to be managed by the controller using how many temperature sensors ?

| CONTROLLER | MSP | MSK / MSK GLASS | MSK PLUS | EKO LINE |
|---|---|---|---|---|
| operation of open fireplaces with water mantles | + | + / + | + | + |
| operation of fireplaces with water jacket in a closed system | + | + / + | + | + |
| operation of air fireplaces with DGP | - | + / + (Air option) | + | + |
| electronic throttle control with servo | - | + / + <br><br> (throttle included 100 in diameter, 125 or 150 mm) | + / + <br><br> (throttle included with a diameter of 100, 125 or 150 mm) | + / + <br><br> (no throttle included) |
| air turbine control | - | + / + <br><br> (Air option) | + | + <br><br> (smooth adjustment depending on from temperature, possible operation of turbines with electronically coupled motors) |
| electric heater control hot water. (taking into account economic tariffs) | - | - | - | + |
| operation of circulating pumps | + | + / + | + | + |
| temperature sensor | + <br><br> (1 sensor included PT 100 1 mb) | + / + <br><br> (1 sensor included PT 100 1 mb) | + <br><br> (3 PT 100 1 mb sensors included) | + <br><br> (4 PT 100 1 mb sensors included) |
| indication of lack of fuel | - | - | + | + |

| PHYSICAL APPEARANCE | | | | |
|---|---|---|---|---|
| glass panel | - | - / + | - | + |
| mounting in a flush-mounted box | + | + | + | + |
| graphic display | 7-segment LED 4 digits | 7-segment LED 4 digits | Alphanumeric LCD 2x8 characters | Graphic OLED 128x64 |
| touch sensors - instead of keys | - | - / + | - | + |
| SECURITY | | | | |
| protection against overheating (acoustic warning) | + | + / + | + | + |
| emergency throttle closure | - | + / + | + | + |
| protection of pumps against freezing | + | + / + | + | + |
| post-season pump run | - | - / - | + | + |

# MSP CONTROLLER

MSP

(microprocessor pump controller)

# MSP
# CONTROLLER

*Microprocessor pump controller -* is a device that continuously monitors the temperature in the water jacket of the fireplace and, based on the set parameters, controls two outputs to which up to 2 circulating pumps are connected as standard

central heating. (1 output) and, for example, a valve (2 **output**).
In addition to the basic functions, the controller informs about exceeding the alarm temperature, protects the installation from freezing by automatically switching on the central heating pump if the measured temperature drops below 4°C, and automatically exits the sleep state when an increase in the temperature of the liquid in the installation is detected.



MSP
(microprocessor pump controller)

MSP

pompy obiegowe CO

zawór lub inne
urządzenie

zasilanie 230 V AC L, N,
PE 3x0, 75mm2 cu

czujnik temperatury
biegunowość nieistotna

# MSP Setting

t1 - On/off temperature of the central heating pump, taking into account the hysteresis H1. Recommended - 55°C

H1 - Hysteresis (temperature) - the on/off point of the central heating pump. The pumps **are** turned on when the fireplace temperature is higher than the
t1 + H1. Pumps **are** turned off when the temperature of the fireplace is lower than t1 - H1 and waiting time P1 (pump run). -
Recommended -
5°C

P1 - Pump coasting time, that is, the time after which the pump will be turned off from the drop in temperature t1 - H1. Recommended 5 min

t2 - On/off temperature of output 2 (valve or other device, such as the second central heating circulation pump). Devices **are** on when the fireplace temperature is higher than t2 + H2. Devices **are** off when the temperature of the fireplace is lower than t2 - H2 and waiting time P2 (coast). Example: If the controller operates the 2nd central **heating pump**; Recommended 55°C.

H2 - Hysteresis (temperature) - on/off point of output 2. Recommended 5°C

P2 - Coasting time, i.e. the time after which output 2 will be turned off from the temperature drop t2 - H2. Recommended 5 min

tAl - Alarm temperature. The temperature above which the alarm **activates** and operates **until** the temperature falls below the set alarm temperature (max. 95°C). Recommended 95°C

n2 Parameter set for the second output of the controller. Depending on the connected device.

When the device connected to this output is to **operate** when the fireplace is lit (for example, the second circulation pump), set the LOF parameter.

When the device connected to this output is to **work** when the fireplace is extinguished (e.g. DHW heater), set the LON parameter.

LOF - parameter set to operate 2 pumps when the fireplace is running so that both pumps operate in the same parameters. t2
+ H2 < turn on the pump t2 - H2 > turn off the pump

LON - parameter set for the operation of 2 outputs, to which another device (such as an electric heater) is connected instead of the pump, which will **start** when the fireplace is turned off.

# MSP Setting

t2 - H2 < switch on additional device t2 + H2 > switch off additional device

# MSK AND MSK GLASS



MSK
(microprocessor-based fireplace
controller) with damper



MSK GLASS
(microprocessor-based fireplace
controller) with damper

# MSK AND MSK GLASS

MSK or MSK GLASS set with **damper** fi 100, 125, 150 mm

MSK is a modern microprocessor-based fireplace controller for all air and water jacketed inserts. Its task is to manage both the combustion process in the insert and the **operation of the** system's **equipment**, so that heating is as efficient as possible.

The MSK controller enables:

- Control of **two central heating pumps and one independently adjustable device,**

- **based on 1 temperature sensor**

- control of the **fireplace turbine** in the Air option,

- precise dosage of combustion air in such a way that it is as efficient as possible.

Protects the system from overheating by **cutting off the** air supply in the event of a power outage. In addition, it protects **the system** from freezing automatically, turning on the **central** heating **pump** if the measured temperature drops below $4oC$. Thanks to its use, we can **save** up to 30% of wood and **already** after 2 months of use **will pay** back the cost of its purchase.



MSK
(microprocessor-based fireplace controller) with damper



MSK GLASS
(microprocessor-based fireplace controller) with damper

# MSK AND MSK GLASS

pompy obiegowe CO

wentylator lub inne urządzenie

zasilanie 230 V AC L, N, PE 3x0, 75mm2 cu

sterowanie przepustnicy czarny-, czerwony+, żółty S

czujnik temperatury biegunowość nieistotna

# MSK settings AIR or H2O option

Selection of air AIR or water H2O mode of operation.

It is important to select the mode of operation of the controller (air/water). Due to the nature of the parameter, it should be set only once for a given installation it is not placed in the menu together with other parameters. In order to prevent accidental change of the parameter, it can be changed by entering its setting after performing the appropriate procedure. When exiting the standby state, the display momentarily shows three eights. During this time, press the enter key and hold it down. This sequence will enter the controller's mode selection. H2O or AIR will appear.Use the up, down arrows to select one of the 2 mode options for a fireplace with water jacket or for a fireplace with air heating. Confirm the selection with the enter / side arrow key.

# MSK settings H2O option

t 1 - set temperature for the fireplace ( water in the mantle ) which the controller will try to

maintain t 2 - temp. on/off of the CH circulating pump(s)

t 3 - temp of other device if plugged into J 7 socket if not then not applicable

tal - alarm temp - temp after exceeding which the alarm is activated and works until the temp does not fall below the set alarm

temp ( MAX 95 degrees )

p 1 - throttle position after going into standby mode ( after the temperature drops and the pumps are turned off, the controller enters

standby mode then the throttle closes to the level set by the user in order not to cool down the fireplace it is recommended to 1

- ( 10%)

p 2 - adjusts the hysteresis of the pumps off

pump(s) on when temp exceeds set temp t 2 and off when temp drops below set temp t 2

by the value of the parameter p 2 - t2 - p2 e.g. (55 - 5 =50 temp off CO pumps)

p 3 - time in minutes the pump runs out, i.e. the time after which the pump will be switched off from a drop in temp t 2, taking into

account the hysteresis, e.g. t2 - p2 e.g. (55 - 5 =50 temp CO pump off) and p3 e.g. 5 minutes after this time the pump will switch off

p 4 - on/off automatic entry of the controller into standby mode

on 1 then after 30 minutes from turning off the pumps it will go into standby mode if on 0 then the controller will not automatically go

into standby mode p 5 - after-season start of pumps every **week** for 1 **minute starts the pump** preventing stagnation.

**Value** "0" means **disabled function** for *both* **outputs**, **value** "1" means **active function for** CO pump only, **value** "2" means **active function** for auxiliary output only, **value** "3 " means **active function** for both **outputs**.

r1 - integration time ( 0 - 240 min ) if the temperature rises too fast, lengthen the time if it rises too slowly and is unstable, reduce

it Ar - on/off automatic throttle position control

1- turns on, 0 - turns off - recommended when firing on 1

# MSK settings H2O option

all parameters are chosen experimentally at the

first firing I assume - as below

t 1 - 65 degrees

t 2 - 55 degrees

t 3 - not applicable if there is no other device

powered by this controller in this installation is set to 95 degrees so that the

control LED does not light up on the controller

tal - 95 degrees

p1 - 1 throttle position p2 - 2

degrees

p3 - 0 min

p4- 1

p5 - 3

r 1 - 30 sec

Ar - 1

# MSK settings AIR option

t 1 - the set temperature for the fireplace ( in the insert housing ) which the controller will try to

maintain t 2 - not applicable in AIR

t 3 - temp of another device e.g. DGP turbine if plugged into socket J 7 if not then not applicable

tal - alarm temp - temp after exceeding which the alarm is activated and works until the temp does not fall below the set alarm

temp ( MAX 200 degrees )

p 1 - throttle position after going into standby mode ( after the temperature drops and the pumps are turned off, the controller enters

standby mode then the throttle closes to the level set by the user in order not to cool down the fireplace it is recommended to 1

- ( 10%)

p 2 - adjusts the hysteresis of the device off, e.g. DGP turbine if it is plugged into socket J 7

p 3 - time in minutes the pump runs out, i.e. the time after which the DGP turbine is switched off if plugged into socket J 7

p 4 - on/off automatic switching of the controller into standby mode

on 1 then after 30 minutes from turning off the pumps it will go into standby mode if on 0 then the controller will not automatically go

into standby mode p 5 - not applicable in AIR

r1 - integration time ( 0 - 240 min ) if the temperature rises too fast, lengthen the time if it rises too slowly and is unstable, reduce

it Ar - on/off automatic throttle position regulation

1- turns on, 0 - turns off - recommended when firing on 1

# MSK settings AIR option

all parameters are chosen experimentally at the

first firing I assume - as below


t 1 - e.g. 120 degrees Celsius - the desired temperature for the

fireplace, i.e. in the insert housing t 2 - does not apply to AIR

t 3 - e.g. 40 deg on inntilator temp if tal is

plugged in - 130 deg

p1 - 1 throttle position p2 - 10

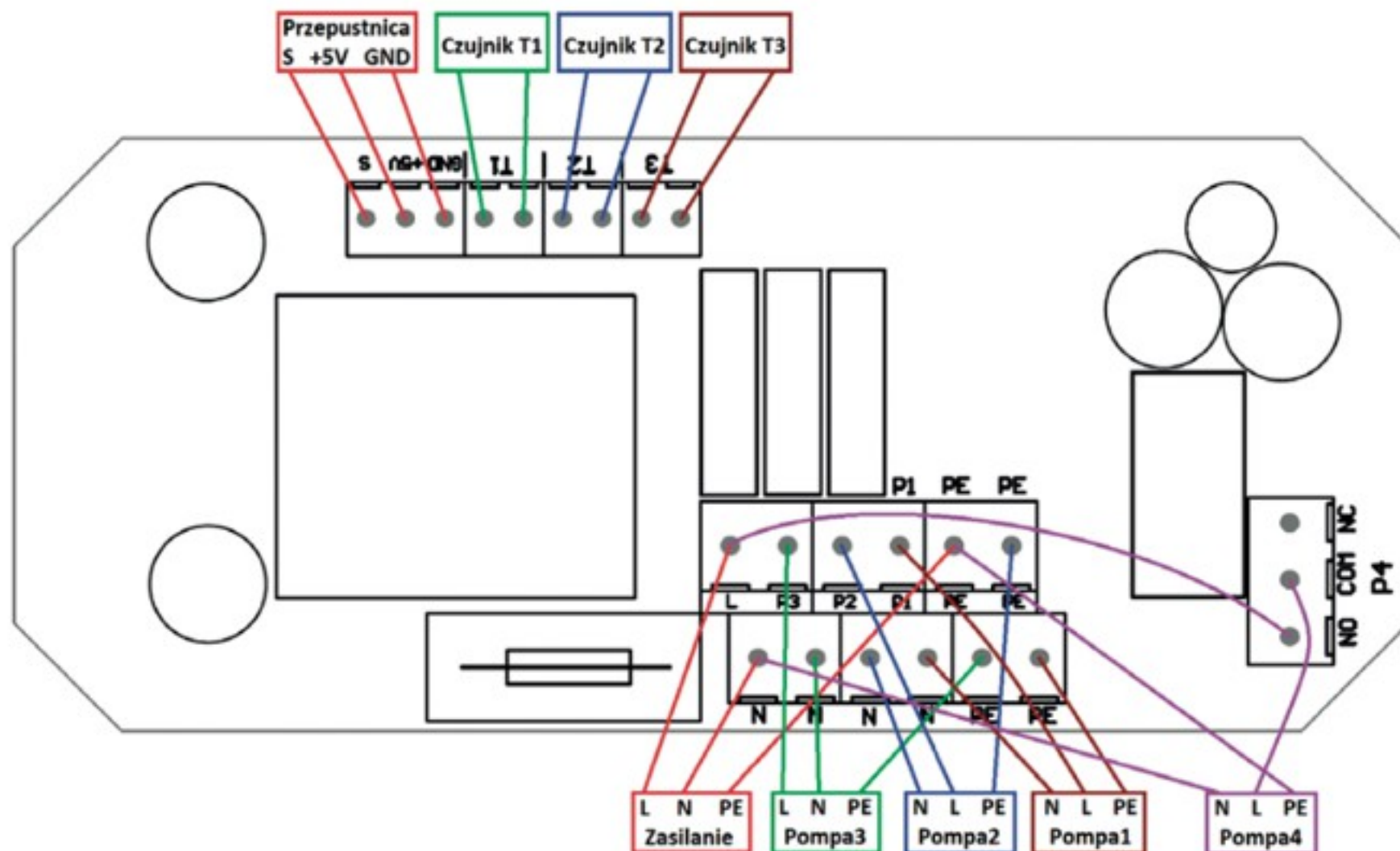degrees hysteresis

p3 - 0 min

p4- on 1

p5 - not applicable
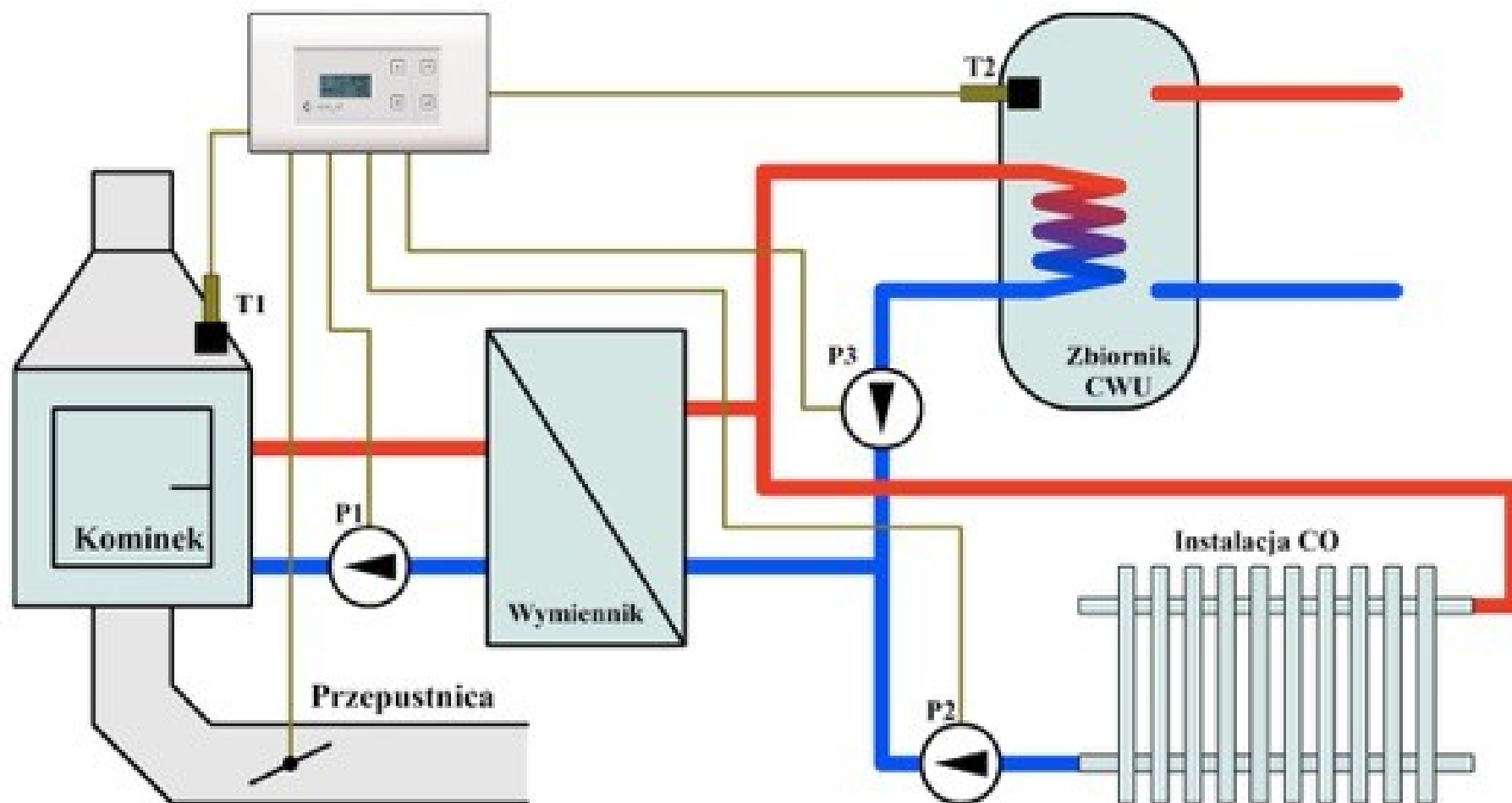
AIR r 1 - 30 sec

Ar - 1

# MSK PLUS

# MSK PLUS



S - żółty, +5V - czerwony, GND - czarny

# MSK PLUS CONTROLLER



**MSK PLUS**
**(microprocessor-based fireplace controller)**

MSK PLUS set with damper fi 100, 125, 150 mm is a modern fireplace controller with screen, which can be used for all air and water jacket inserts. The controlled quantity is the temperature of the air heated by the insert or the temperature of the water in the water jacket. It allows you to control the temperature at 3 different points of the system and independently control 4 devices such as pumps, fans or solenoid valves. Its task is to dispense, by means of an electronic throttle, cold air (for combustion) from outside the building into the combustion chamber, in such a way that it is maximally effective while maintaining the set value of the controlled temperature. Thanks to its use, we can save up to 30% of wood and already after 2 months of use will pay back the money for its purchase.

**kratki**

T2

Zbiornik
CWU

T1

P3

Kominek

P1

Wymiennik

Instalacja CO

Przepustnica

P2

# MSK PLUS 1 pump settings

P1 CO pump, T1 sensor for fireplace damper: s -
yellow, +5V red, GND - black

1. Temp. - Set temperature of the fireplace 65.0°C, which the controller is to maintain through the position of the throttle then enter the service looking for the following items (look for the item and enter it by pressing the side arrow, then use the up and down arrows to select the appropriate parameter).

Item 5 Service

5.1 Throttle control

5.1.1. T1 al - alarm temp - 90 °C

5.1.4. - Kp - 25%

5.1.5. - Ki - 20%

5.1.6.- Pm - 5%

Next we look for the control of Output P1:

5.2. P1 output rudder

5.2.1 Condition 1 T1 > 55.0°C at this temp the CO pump switches on.

5.2.2 H1 5 .0°C

5.2.3 Condition 2 - do not dot

5.2.4 H2 - no dot

5.2.5 Own Condition 1

5.2.6 Op on 0s

5.2.7 Op off 0s

5.2.8 Ch zam T1

5.2.9 posse. t

# MSK PLUS 2 CO pump settings

P 1- CO pump from chimney to exchanger , P 2 - 2 CO pump after exchanger T1
sensor to chimney, throttle: s - yellow, +5V red, GND - black

1. temp. - Set temp. for fireplace operation 65.0°C, which the controller is to maintain through the position of the throttle then enter the service looking for pos.

Continue going into item 5.
Service
5.1 Throttle control
5.1.1. T1 al - alarm temp - 90 °C
5.1.4. - Kp - 25%
5.1.5. - Ki - 20%
5.1.6.- Pm - 5%

for output P1: position no.
5.2. P1 output rudder
5.2.1 Condition 1 T1 > 55.0°C
5.2.2 H1 5 .0°C
5.2.3 Condition 2 does not apply
    to
5.2.4 H2 no dot
5.2.5 On condition 1
5.2.6 Op on 30s
5.2.7 Op off 30s
5.2.8 Ch zam T1
5.2.9 posse. t

for P2 output: position no.
5.3.  Exit rudder P2
5.3.1 Condition 1 T1 > 55.0°C
5.3.2 H1 5 .0°C
5.3.3 Condition 2 does not apply to
5.3.4 H2 no dot
5.3.5 On condition 1
5.3.6 Op on 30 sec
5.3.7 Op off 30 s
5.3.8 Ch zam T1
5.3.9 posse. t

The CH pumps (P1 and P2) will turn on simultaneously when the fireplace temperature is higher than 55°C and off when it falls below the

set temperature for the pumps by about 5 degrees.

# MSK PLUS settings 1 CH and 1 DHW pump

I suggest these settings based on our conversation : fireplace CO and DHW P1

CH pump T1 sensor for fireplace

P2 DHW tank pump and T2 sensor in the tank and now the conditions - such settings:

1 Temp. - Set temp. of the fireplace operation 65.0°C, which the controller is to maintain through the throttle position enter the service:

P1 output:

5.2. P1 output rudder

5.2.1 Condition 1 T1 > 55.0°C

5.2.2 H1 2 .0°C

5.2.3 Condition 2 T2 > 47.0°C

5.2.4 H2 1 .0°C

5.2.5 Both

5.2.6 Op on 30s

5.2.7 Op off 30s

5.2.8 Ch zam T1

5.2.9 posse. t

P2 output:

5.3. Exit rudder P2

5.3.1 Condition 1 T1 - T2 > 5.0°C

5.3.2 H1 1 .0°C

5.3.3 Condition 2 T2 < 50.0°C

5.3.4 H2 1 .0°C

5.3.5 Both

5.3.6 Op on 30s

5.3.7 Op off 30s

5.3.8 Cz zam T1,2

5.3.9 posse. t

DHW pump (P2) will turn on when the fireplace temperature is higher than the DHW temperature by at least 5°C and the DHW tank temperature is lower than 50°C. The CH pump (P1) will turn on when the fireplace temperature is higher than 55°C and the DHW tank temperature is higher than 47°C. The second condition is needed to realize DHW priority.

There is DHW priority in these settings, if you want to disable it, change setting 5.3.5 to condition1.

# MSK PLUS settings 2 central heating pumps + 1 DHW pump

I suggest these settings based on our conversation : closed system fireplace P1 and P2 CO
pump sensor T1 to the fireplace
P3 DHW tank pump and T2 sensor in the tank and now the conditions - such
settings:

1 Temp. - Set temperature of the fireplace 65.0°C, which the controller is to maintain through the position of the
throttle enter the service

| P1 output: | P2 output: | P3 output: |
|---|---|---|
| 5.2. P1 output rudder | 5.2.Output control P2 | 5.4. Rudder out P3 |
| 5.2.1 Condition 1 T1 > 55.0°C | 5.3.1 Condition 1 T1 > 55.0°C | 5.4.1 Condition 1 T1 - T2 > 5.0°C |
| 5.2.2 H1 2.0°C | 5.3.2 H1 2.0°C | 5.4.2 H1 1.0°C |
| 5.2.3 Condition 2 T2 > 47.0°C | 5.3.3 Condition 2 T2 > 47.0°C | 5.4.3 Condition 2 T2 < 50.0°C |
| 5.2.4 H2 1.0°C | 5.3.4 H2 1.0°C | 5.4.4 H2 1.0°C |
| 5.2.5 Own both | 5.3.5 Own both | 5.4.5 Own both |
| 5.2.6 Op on 30s | 5.3.6 Op on 30s | 5.4.6 Op on 30s |
| 5.2.7 Op off 30s | 5.3.7 Op off 30s | 5.4.7 Op off 30s |
| 5.2.8 Ch. T1 | 5.3.8 Ch. T1 | 5.4.8 Cz zam T1,2 |
| 5.2.9 posse T | 5.3.9 posse T | 5.4.9 posse T |

The DHW pump (P3) will turn on when the fireplace temperature is higher than the DHW temperature by at least 5°C and the DHW tank temperature is lower than 50°C. The CH pumps (P1 and P2) will turn on when the fireplace temperature is higher than 55°C and the DHW tank temperature is higher than 47°C. The second condition is needed to realize DHW priority.
There is DHW priority in these settings, if you want to disable it, change setting 5.4.5 to condition1.

# MSK PLUS settings - off gas furnace

In most cases, gas stoves are equipped with a control input, where by short-circuiting or opening 2 wires you can turn the stove on or off.

In the MSKplus controller, the P4 output is designed for such control. Screw one of the wires from the furnace into the COM socket, and the other into NO or NC, depending on whether the furnace is turned on with the wires open or shorted.

If a room thermostat is connected under the furnace control input, disconnect one wire leading to the thermostat and connect the NC and COM contacts of the P4 output so that they short circuit this wire.

You should also set the P4 output conditions accordingly, e.g. 5.4.1: T1 > 35.0°C, 5.4.5: condition1.

Any other output can also be used for this, but then an additional contactor must be used. You can also use one output to control both the pump and the gas furnace, in which case you should connect the contactor in parallel with the pump to the controller.

If the gas furnace is controlled differently, you will need a detailed description.

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