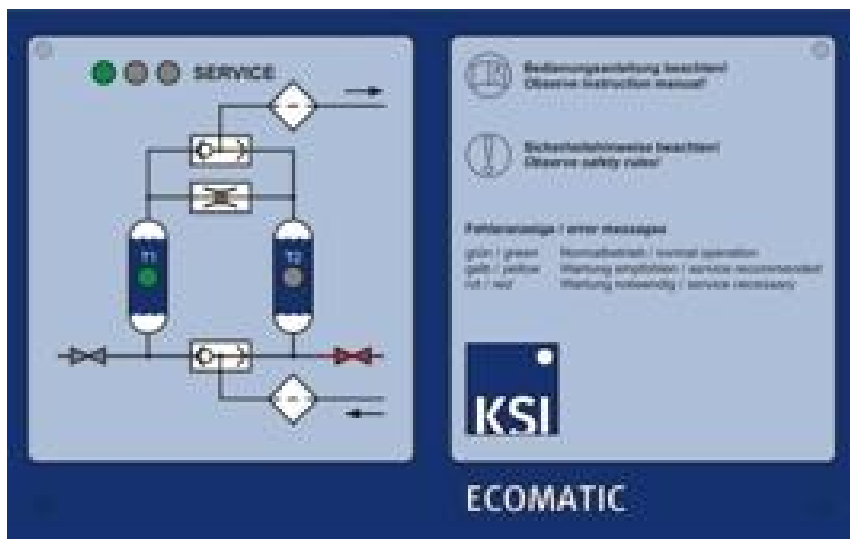


ECOTROC ECOMATIC 22

Operating manual

Rev. 0922-02



Contents

- Contents 2
- 1. General information 3
- 2. Warranties 3
- 3. Safety notes/Consignes de sécurité (EN/FR) 4
- 4. Symbols used/Symboles utilisés (EN/FR) 6
- 5. Intended purpose 7
- 6. Intended use 7
- 7. Technical data 8
 - 7.1 Controller 8
- 8. Electrical connection 9
- 9. Display layout 10
- 10. Service LED 10
- 11. Behaviour after connecting to Power supply 10
- 12. Operation 11
- 13. DIL-Switch functions and modification 11
- 14. Compressor synchronic functioning 13
- 15. EU Declaration of conformity 14

1. General information

Please read this documentation before taking any installation or operational steps.

Having the basic knowledge of this manual is a prerequisite for carrying out programming steps and the daily use of this controller.

Incorrect use or lack of know-how in the *ECOMATIC* program can cause damage to some parts and affect the operation of the adsorption dryer.

In principle, only instructed personnel or experts should be able to access the password-Protected area. This also applies in the event of an alarm. There is a reason why an alarm is triggered, and this must be analysed and rectified. Expertise in the field of compressed air is therefore a prerequisite!

Never switch the controller off completely, not even when an alarm is triggered, otherwise the dryer will only pass over the desiccant bed. Over time this has a negative effect on the compressed air quality.

2. Warranties

For the conditions necessary for compliance with the warranty, please refer to our “General Terms of Sales and Delivery”

The warranty will be void if:

- The controller is used for anything other than its intended use.
- The instructions in this operating manual are not observed.
- External influences (e.g., incorrect supply voltage, short circuit, etc.) cause damage to the controller.
- Damage is caused because an incorrect tool has been used.
- Damage is caused due to incorrect or faulty installation.
- The controller is used even though defects are evident.
- An unfortunate or incorrect installation is selected.
- The performance data on the type label is disregarded.
- Damage occurs after installation completed by unqualified personnel.
- Fundamental demands on the electrical work are disregarded.

3. Safety notes



Failure to observe the safety notes can cause physical injuries and damage the controller or adsorption dryer. Please observe not only the instructions in this operating manual but also the general applicable safety and accident prevention regulations!

1. The *ECOMATIC* controller may only be operated and serviced after this operating manual has been read.
2. The *ECOMATIC* controller may only be used for its intended purpose, as described in this operating manual.
3. The operator must ensure that only instructed and authorized personnel operate the *ECOMATIC* controller.
4. Only suitably instructed and qualified expert staff may carry out maintenance and repair work.
5. The *ECOMATIC* controller must only be used in an operationally safe state.
 - a. Operating instructions must be visible on the device.
 - b. Any use of the *ECOMATIC* controller in conjunction with other system components must comply with the performance data.
 - c. Everyone working with the device must know and observe the safety notes.
6. When disassembling parts of the housing and components of the *ECOMATIC* controller, make sure
 - a. that the mains power plug is disconnected and is protected from restarting.
 - b. that corresponding and suitable tools are used which are designed to be used for electrical purposes.
7. The *ECOMATIC* controller may only be operated when all components, e.g., following maintenance work, have been refitted and are complete. The housing must also be closed again. Safety devices on the equipment must not be removed or rendered inoperative!
8. The performance data stipulated in this manual must not be exceeded.
9. Alterations and modifications may only be made with the approval from KSI – Filtertechnik GmbH. Unauthorised modifications exclude all liability of any resulting damage.
10. The *ECOMATIC* controller must not be used if damage is evident or suspected.
11. If strange noises or odours are detected, switch the *ECOMATIC* controller off immediately.

Consignes de sécurité



Le non-respect des consignes de sécurité peut entraîner des préjudices corporels et endommager le régulateur ou le sècheur par adsorption. Veuillez respecter non seulement les instructions de ce mode d'emploi, mais également les consignes générales de sécurité et de prévention des accidents en vigueur !

1. Le régulateur *ECOMATIC* ne peut être utilisé et entretenu qu'après lecture de ce mode d'emploi.
2. Le régulateur *ECOMATIC* ne doit être utilisé qu'aux fins pour lesquelles il a été conçu, telles que décrites dans ce mode d'emploi.
3. L'opérateur est tenu de s'assurer que seul du personnel dûment formé et autorisé utilise le régulateur *ECOMATIC*.
4. Seul un personnel spécialisé dûment formé et qualifié peut effectuer des travaux d'entretien et de réparation.
5. Le régulateur *ECOMATIC* ne doit être utilisé que dans un état de fonctionnement sûr.
 - a. Les instructions d'utilisation doivent être visibles sur l'appareil.
 - b. Toute utilisation du régulateur *ECOMATIC* conjointement avec d'autres composants du système doit être conforme aux données de performance.
 - c. Toute personne travaillant avec l'appareil doit connaître et respecter les consignes de sécurité.
6. Lors du démontage des pièces du boîtier et des composants du régulateur *ECOMATIC*, veuillez vous assurer
 - a. que la prise secteur est débranchée et protégée contre un éventuel rebranchement.
 - b. que les outils correspondants et appropriés utilisés sont conçus à des fins de travaux électriques.
7. Le régulateur *ECOMATIC* ne peut être utilisé que si tous les composants, à titre d'exemple après des travaux de maintenance, ont été remis en place et sont complets. Le boîtier doit être refermé. Les dispositifs de sécurité sur l'équipement doivent être enlevés ou rendus inopérants !
8. Les données de performance stipulées dans le présent manuel ne doivent pas être dépassées.
9. Les transformations et modifications ne peuvent être effectuées qu'avec le consentement de KSI – Filtertechnik GmbH. Toute modification non autorisée exclut toute responsabilité pour tout dommage en résultant.
10. Le régulateur *ECOMATIC* ne doit pas être utilisé si des dommages sont évidents ou suspects.
11. Si des bruits ou odeurs bizarres sont détectés, arrêtez immédiatement le régulateur *ECOMATIC*.

4. Symbols used

The symbols used in the technical documentation have the following meanings:



Important!

This symbol draws attention to information and Tips concerning the correct and economical use of the ECOMATIC controller.



Electrical hazard!

This symbol indicates electrical hazards. This work must only be carried out by qualified expert personnel.



General Alert!

This symbol marks general safety instructions.

Symboles utilisés

Les symboles utilisés dans la documentation technique ont les significations suivantes :



Important !

Ce symbole attire l'attention sur des informations et des conseils concernant l'utilisation correcte et économique du régulateur ECOMATIC.



Danger électrique !

Ce symbole indique des risques électriques. Cette tâche ne doit être effectuée que par du personnel expert qualifié.



Alerte générale !

Ce symbole renvoie aux consignes de sécurité générales.

5. Intended purpose

The controller must only be used to control adsorption dryers manufactured by KSI Filtertechnik GmbH in compressed air systems. It needs a supply of electrical energy.

The controller ECOMATIC operates as a time control. The controller has no possibility of measuring pressure dewpoint and has no reference point to the medium compressed air. With this controller, a program running is constantly repeated, regardless of the outcome of the air quality.

6. Intended use

The controller is exclusively designed to control adsorption dryers manufactured by KSI Filtertechnik GmbH! If the controller is used on other manufacturers adsorption dryers, this must be agreed with the manufacturer. Other safety guidelines may apply here!

The controller must only be used in the following areas:



- The controller must be installed in a weatherproof location (exposure to sun should be avoided).
- The location must be dry (safety class IP54).
- The location must be free from frost.
- The location must be free from vibrations.
- The location must not be in a potentially explosive atmosphere.
- It must be accessible for mounting the dryer.
- With low dust concentration.
- There must be no risk of lightning or other forms of external energy.
- It must be free from aggressive or corrosive substances.



The controller must only be operated within the allowable operating conditions. These are stipulated on the type label and in the operating manual. Any other use is considered improper, and the manufacturer accepts no liability.

The controller must not be converted in any way and its components must not be modified. The use of components other than the original one from the manufacturer is not permitted unless this has been agreed with the manufacturer.

For the nominal performance data of the controller, please read chapter 7 "Technical data"

7. Technical data

7.1 Controller

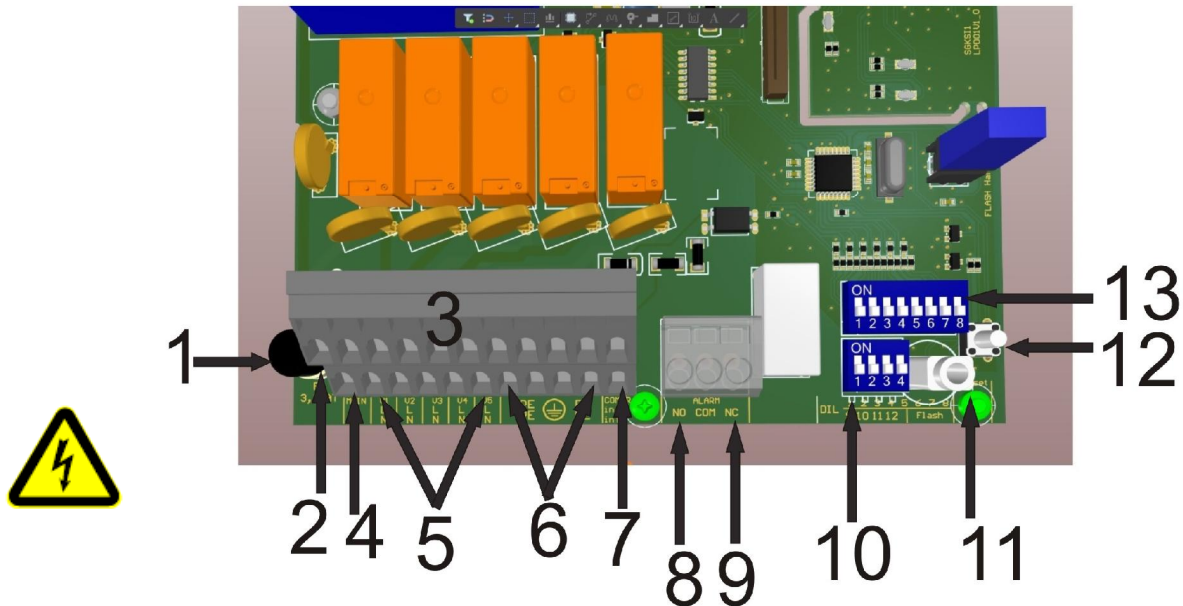


Measurement type	Specification
Max. wire cross-section for terminal connections	1,5 ²
Fuse	3,15AT fuse series 372 Littlefuse INC or equivalent
Power consumption	Max. 3,5 A
Power supply	100-240 V 50/60 Hz
Valve outputs	100-240 V 50/60 Hz
Outputs	Potential free alarm contact 250 VAC max. switching capacity 5 A AC1
Application temperature	- 40°C to + 60°C
Housing type	Bopla RCP 160 F , Flammability: UL 94 HB
Dimensions W x H x D	166 x 160 x 82,5
Weight	Ca. 500 gr
EMC immunity	EN 50081
EMC interference emission	EN 50082
Type of protection	IP54

8. Electrical connection

The Power supply is 100-240 VAC. The supply of the electronics is galvanically isolated via transformer.

The pin assignment of the controller looks like this:



Connection clamps on the double terminal block from left to right:

- 1 = Fuse 3,15 AT
- 2 = Net/Main (L)
- 3 = Valve 1-5 (L) Upper clamps are mains for earth/ground
- 4 = Neutral conductor power supply (N)
- 5 = Valve 1-5 (N) Neutral conductor valve 1-5 (conductor above each)
- 6 = Main safety clamps (8 pc., 4 down, 4 up)
- 7 = Compr (L/N) 100-240 VAC Inlet for compressor synchronization
- 8 = Alarm relay NO (potential free alarm contact as switch-over)
- 9 = Alarm relay NC (potential free alarm contact as switch-over)
- 10 = DIL Switch 9-12
- 11 = PC Connection (only to flash the software by the manufacturer)
- 12 = Reset switch (only available through Service)
- 13 = DIL Switch 1-8

Set-up DIL Switch see chapter 13.

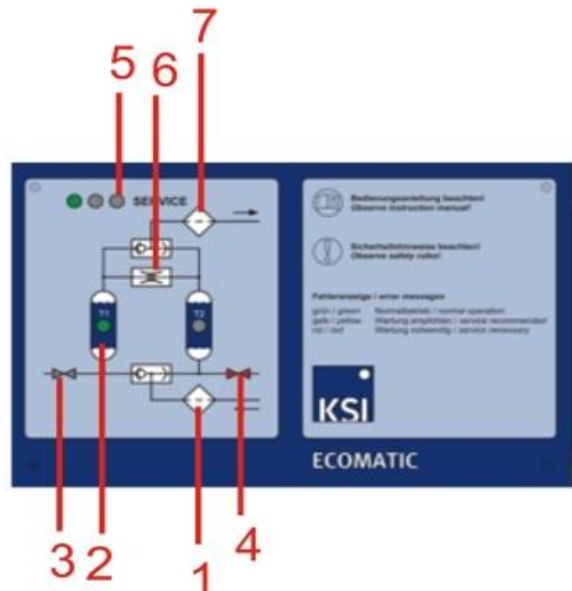
The housing has on the bottom 1 pcs. M12, 3 pcs. M16 and 1 pcs. M25 (with 4 cable inlets) cable glands for connecting the following lines:

- Power supply (M16)
- Compressor synchronic function signal (M16)
- Potential free alarmcontact (M16)
- Valve 1-5 (M12 and M25)

9. Display layout

The display of the controller ECOMATIC shows you following symbols:

- 1 – Symbol “Prefilter”
- 2 – Symbol “Active adsorbing vessel shown by LED”
- 3 – Symbol “Active expansion valve left shown by LED”
- 4 – Symbol “Active expansion valve right shown by LED”
- 5 – “Traffic Light” Service
- 6 - Symbol pressure-equalizing (opt.) shown by LED
- 7 – Symbol “After filter “



10. Service LED

The “Traffic light “LED is built up as following:

- LED green: Normal operation
- LED yellow: Prepare service (LED changes to yellow after 365 days)
- LED red: Service (LED changes to red after 380 days)

The service light also has a potential-free alarm contact

This function can be switched on and off with DIL-Switch 7 (0 = On; 1 = Off).

The reset of the Service traffic light can only be done by authorized personnel!

11. Behaviour after connecting to Power supply

After the connection to the power supply, at first there is a waiting time for the pressure build-up (60 sec, fixed set point).

Then a short cycle is run five times with 50% shorter times, without taking into consideration the dewpoint input, to bring the dryer in a defined status. The synchronic running of the compressor is not active.

Only after this the device is in normal operation.

12. Operation

The controller is present and only must be connected to the power supply. In standard program the cycle time is 10 minutes. Here for example:

- 4 ½ Minutes Adsorption (the other vessel is regenerated at the same time)
- 1 Minute Pressure build- up (both expansion valves are closed)
- 4 ½ Minutes Adsorption of the just regenerated side (the side that was just in Adsorption, will now be regenerated at the same time)

A further operation is not provided.

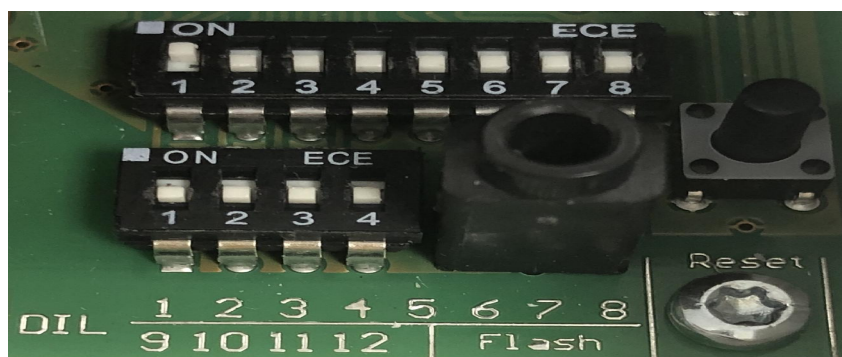
The function of the device should be checked by checking the LED`s in the front-display on function. No operations have to be made for this.

13. DIL-Switch functions and modification

In the terminal box of the ECOMATIC there are DIL switches. To reach these the cover of the box needs to be opened.

The control has 12 DIL switches total (1 x 8 = switch 1-8 and 1x4 = switch 9 and 12) as configurable inlets

- Switch 1-3 are used to set the regeneration time.
- Switch 4-6 are used to set the pressure buildup time.
- Switch 7 is used to switch the potential free alarmcontact on or off.
- Switch 8 is used to activate the compressor synchronic function.
- Switch 9 is used to change between standard and prolonged times with the DIL switches 1-6
- Switch 10 is used to deactivate the delay time
- Switch 11 no function
- Switch 12 is used for service. The cycle is run with 10x speed. Please activate only in pressure-less operation.



The times are as following:

3/4 Valve (Regeneration time 270s and Pressure buildup time 60s are standard settings)

Regeneration time	150s	180s	210s	240s	270s	300s	330s	360s
1	0	0	0	0	1	1	1	1
2	0	0	1	1	0	0	1	1
3	0	1	0	1	0	1	0	1
Pressure buildup time	60s	80s	100s	120s	150s	180s	240s	300s
4	0	0	0	0	1	1	1	1
5	0	0	1	1	0	0	1	1
6	0	1	0	1	0	1	0	1

5 Valve & HP (Regeneration time 480s and Pressure Build Up time 60s are standard settings)

Regeneration time	240s	300s	360s	420s	480s	600s	720s	900s
1	0	0	0	0	1	1	1	1
2	0	0	1	1	0	0	1	1
3	0	1	0	1	0	1	0	1
Pressure buildup time	60s	80s	100s	120s	150s	180s	240s	300s
4	0	0	0	0	1	1	1	1
5	0	0	1	1	0	0	1	1
6	0	1	0	1	0	1	0	1

Function and switching state of the DIL-Switch 7 – 12:

Switch 7 1 = Potential-free alarm contact for service deactivated
 0 = Potential-free alarm contact for service activated (pre-configured)

Switch 8 also see Chapter 14
 1 = Compressor synchronic function enabled
 0 = Compressor synchronic function disabled (Standard setting)

Switch 9 1 = 5 Valve & HP Software selected
 0 = 3/4 Valve Software selected (Standard setting)

Switch 10 1 = delay time deactivated
 0 = delay time 3 sec. activated (pre-configured)

Switch 11 in reserve

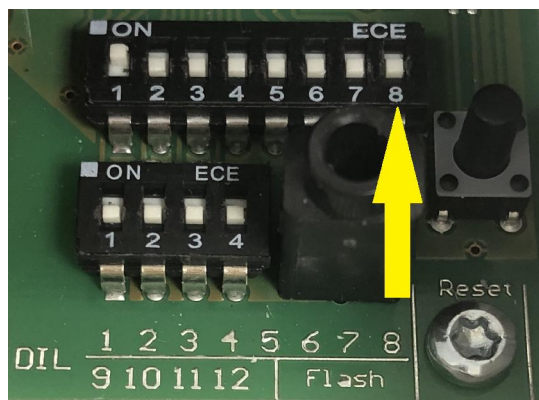
Switch 12 1 = Service activated
 0 = Service deactivated (pre-configured)

14. Compressor synchronic functioning

The controller ECOMATIC can be used with the compressor synchronic function. The controller only lets the Dryer work, when the compressor is running and produces air. Over an integrated memory function, the controller logs it's position in the running cycle, and starts from there, when the compressor starts to run again and produces air. After turning on the power the control always performs 5 cycles before the compressor synchronization is activated and depending on the signal on the terminal "Compr. in and out" opens the expansion or closes it. This is particularly useful for applications with low consumption, but which require dry compressed air.

To do this, a switched 100-240 VAC signal from the compressor must be controlled to the "Compr." Terminal (see page 8). It makes sense to use the on/off signal of the compressor.

You must also set DIL switch No. 8 to ON. Only then is the compressor synchronization activated and the green LED of the service lights flashes every 2 sec. when the first 5 cycles are performed to signal the configured status.



Therefore, you should now, that this installation only makes sense, if the dryer is installed in front of the Vessel. Otherwise, the Vessel volume will be pushed over the dryer without being regenerated. To achieve the wanted dewpoint there is a permanent running of the compressor necessary.

15. EU Declaration of conformity

EU Declaration of conformity

We, the authorized representative,

KSI Filtertechnik GmbH
Siemensring 54-56
D-47877 Willich

hereby declare that for the products listed below:

Controller for Adsorption dryer, ECOMATIC 22

in accordance with the requirements of the guideline

EMC Guideline 89/336/EEC

Guideline 2014/35/EU

2011/65/EC Guideline ROHS

conforms to the essential protection requirements which are determined in the Council Directive on the approximation of the laws of the Member States relating to the electromagnetic compatibility (89/336/EEC) and the 2014/35/EU. over voltage limits of provides resources, which are fixed, in this guideline. This declaration applies to all samples which are produced according to the respective production documents.

To assess the product with regard to electromagnetic compatibility, the following standards have been consulted:

EN 61000-6-3 Electromagnetic compatibility; Generic standard. Emission standard for residential, commercial, and light-industrial environments

EN 61000-6-1 Electromagnetic compatibility; Immunity for residential, commercial, and light-industrial environments

Any modifications made to the equipment which have not been approved by the manufacturer will annul this declaration.

Signed:



Holger Krebs,
Managing Director