

ECOTROCONOMY Comfort/Premium/Eco Operating Manual Dew Point Control Basis for System Monitoring KSI ECOCONTROL



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1. General information

Please read this documentation first before you start with installation or operation steps.

A basic knowledge of this manual is required to be able to handle programming steps and the daily use of this control.

Improper use or lack of knowledge of the ECOTROCONOMY Comfort/Premium/Eco program can lead to defects in various parts and affect the functions of the adsorption dryer.

Basically only instructed or qualified personnel should enter the password protected area. This also applies in the event of an alarm. An alarm triggering always has a cause, which must be analysed and eliminated. Specialist knowledge of compressed air is a prerequisite for this!

Do not switch off the control system even in the event of an alarm, otherwise the dryer will store more and more moisture and the desiccant will become soiled. This fact worsens the compressed air values over time!

2. Warranty

The conditions for compliance with warranty can be found in our „General Conditions of Sale and Delivery“.

The warranty cannot be given if:

- the control unit is not used for its intended purpose,
- the contents of these operating instructions are not observed,
- the control is damaged by external influences (e.g. incorrect supply voltage, short circuit, etc.),
- damage is caused by the wrong tool,
- damage occurs due to incorrect or faulty installation,
- the control is operated despite a demonstrable defect,
- an unfavourable or incorrect installation is selected,
- the performance data given on the rating plate are disregarded,
- damage occurs after installation by unqualified personnel,
- basic requirements for electrical work are disregarded.

3. Safety instructions (English)



Non-observance of the safety instructions can lead to physical injuries and damage to the control unit or the adsorption dryer. In addition to the information in this operating manual, please also observe the generally applicable safety and accident prevention regulations!

1. The control ECOTROCONOMY Comfort/Premium/Eco may only be commissioned and serviced after having read and understood these operating instructions.
2. The control ECOTROCONOMY Comfort/Premium/Eco may only be used for its intended purpose as described in this manual.

3. The control unit is only intended for control on KSI Filtertechnik GmbH adsorption dryers!
It is pre-mounted and pre-wired (except the line connection; see below) on the adsorption dryer (for details see KSI Filtertechnik GmbH Mounting and wiring instruction).
4. The device is exclusively mounted and prewired by KSI on the dryer unit. Alternate ways of mounting are not allowed.
5. The operator must ensure that only instructed and authorized personnel commission the ECOTROCONOMY Comfort/Premium/Eco control unit,
6. that only suitably instructed and qualified personnel can carry out maintenance and repairs,
7. that the control ECOTROCONOMY Comfort/Premium/Eco may only be operated in a safe operating condition,
 - a) that an instruction manual is visible on the device
 - b) that the use of the ECOTROCONOMY Comfort/Premium/Eco control system with other components of the system is appropriate for performance data,
 - c) that all persons working with the device know and observe the safety instructions
8. When disassembling housing parts and components of the ECOTROCONOMY Comfort/Premium/Eco control unit, please observe the safety instructions,
 - a) that the mains plug is pulled out and secured against being switched on again,
 - b) only appropriate and suitable tools intended for electrical purposes are used
9. The ECOTROCONOMY Comfort/Premium/Eco control unit may only be operated when all components have been reassembled and completed, e.g. after maintenance. In addition the housing must be closed again. Safety devices on the unit must not be disassembled or disabled!
10. Exceeding the performance data specified in these instructions is not permitted.
11. Conversions and changes may only be carried out with the approval of KSI Filtertechnik GmbH. Unauthorized modifications exclude any liability for resulting damage.
12. The control unit ECOTROCONOMY Comfort/Premium/Eco must not be put into operation if damage can be detected or suspected.
13. In case of particularly noticeable noises or smells the ECOTROCONOMY Comfort/Premium/Eco control unit must be switched off immediately.
14. The device is only to be used on KSI adsorption dryer
15. The device is mounted on the mounting plate fixed on the dryer unit
16. Wiring must use appropriate UL listed cable.
17. Use Copper Conductors only!
18. Do not change wiring to the plant!
19. Replace internal fuse only with UL certified 3,15AT fuse series FMS Schurter AG or equivalent
20. Ensure that the customer's fuse protection does not exceed 16 A.
The mains wire diameter shall take the primary fuse value into account! (According to standards):
Fuse 16A use at least AWG 16 (1,5mm²)
Fuse 10A use at least AWG 18 (1,0mm²)
Fuse 6A use at least AWG 20 (0,75mm²)
A mains plug must be used! Open the lower housing cover. Connect mains cable through the leftmost cable gland to the grey terminal block. Live (black) 2; neutral (white) 3; FE (green) 14 (see chapter 7)
Fasten the cable gland! Close the cover!
21. Assure that all FE / earth / Ground connections on the terminal block are correct and complete.
The valve coils are FE-connected
22. The device uses replaceable lithium primary coin cell for RTC backup. CAUTION, battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire. Warning - never put battery in mouth.
23. Swallowing may lead to serious injury or death. If ingested, call your Doctor or National Poison Control Center at (202) 625-3333.
24. Replace battery only with Lithium battery (BBCV2, UL Listed) size: CR2032 3.0V max. 250mAh, min abnormal discharge current $\geq 10\text{mA}$.
Use of another battery may present a risk of fire or explosion.

4. Used symbols

The symbols used in this technical documentation are explained as follows:



Tip

This symbol indicates information and tips for the proper and economical use of the control system.



General Attention!

This symbol indicates general information!



Electrical danger!

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

5. Purpose

The control system is primarily intended for controlling adsorption dryers from KSI Filtertechnik GmbH in compressed air systems. It requires the supply of electrical energy.

It can also be operated as a data collector, both as a basic device for connecting further measuring boxes and as a stand-alone recording device. Even the basic version is capable of sending data by means of an IOT card. This function can also be switched off.

By means of the installed pressure dew point sensor the moisture content at the adsorption dryer outlet is measured directly. The control system then switches the adsorption dryer automatically according to the set pressure dew point. Thus, compared to a pure time control, fewer cycles are required for regeneration. This results in an energy saving, because after reaching the desired pressure dew point, no further regeneration is carried out and only after a forced switch-over time one cycle is run again (2 cycles per hour instead of 6 cycles).

5.1 Intended use

The programmable controller “ECOTROCONOMY” is exclusively intended to control adsorption dryer’s of KSI Filtertechnik GmbH! It shall be mounted on the dryer unit.

If the adsorption dryer is to be used by other manufacturers, this must be agreed with the manufacturer. Other safety guidelines may apply!



The control unit may only be used in the following areas:

- The control unit must be installed in a weatherproof location (avoid solar radiation).
- The area must be dry (protection class IP54).
- The area must be frost-proof.
- The area must be free of vibration.
- The area must not be in a potentially explosive atmosphere and must be accessible for settings.
- The area may only have low dust loads,
- does not allow any hazards from lightning or other external forms of energy and
- is free from aggressive or corrosion promoting agents.

The control may only be operated within the permissible operating conditions. These are specified on the type plate and in these operating instructions. Any use other than that intended by the manufacturer is not permitted and will lead to the extinction of liability.



The control unit may not be converted or its components altered. The use of components other than those originally supplied by the manufacturer is not permitted, or, if necessary, must be agreed with the manufacturer.

The nominal performance data of the control unit can be found in chapter „6. Technical data“.

5.2 Mounting and Installation

The device is always pre-mounted and pre-wired by KSI on the dryer unit.

It is not intended to mount the device by local personnel. If an exchange of the device is necessary, contact Your KSI dealer. Only the electrical connection to the mains must be done. This work must be done by qualified personnel only! Ensure that the customer’s fuse protection does not exceed 16 A.

The mains wire diameter shall take the primary fuse value into account (According to standards):

Fuse 16A	use at least AWG 16 (1,5mm ²)
Fuse 10A	use at least AWG 18 (1,0mm ²)
Fuse 6A	use at least AWG 20 (0,75mm ²)

A mains plug must be used to connect the device to a power socket. Hardwiring is not allowed.

Open the lower housing cover.

Connect mains cable through the leftmost cable gland to the grey terminal block.

Live (black) 2; neutral (white) 3; FE (green) 14 (see chapter 7)

Fasten the cable gland! Close the cover!

6. Technical data

6.1 Dew point sensor



Measurement type	Specifications
Measuring range humidity	100° C to + 20°C pressure dew point (4-20 mA)
Humidity range	0 - 100 % rh
Power consumption	20 mA (max.)
Power supply	12 to 28 Vdc
Print area	0 to 450 bar
Accuracy	+ - 2%
Operating temperature	- 40°C to + 50°C
Flow rate	For direct use: 0-10 m/s For block seat with outflow: 1-5Nl/min
Mechanical connection	Screw-in thread 5/8" UNF with sealing washer
Material housing	Stainless steel
Dimensions	Ø 27mm x 132 mm
Weight	About 150 gr
Connection	2 wire power source
Protection filter	HDPE filter 10µm
EMV Immunity	EN 50081
EMV emitted interference	EN 50082
Probe type	Polymer
Protection class	IP66 (NEMA 4)

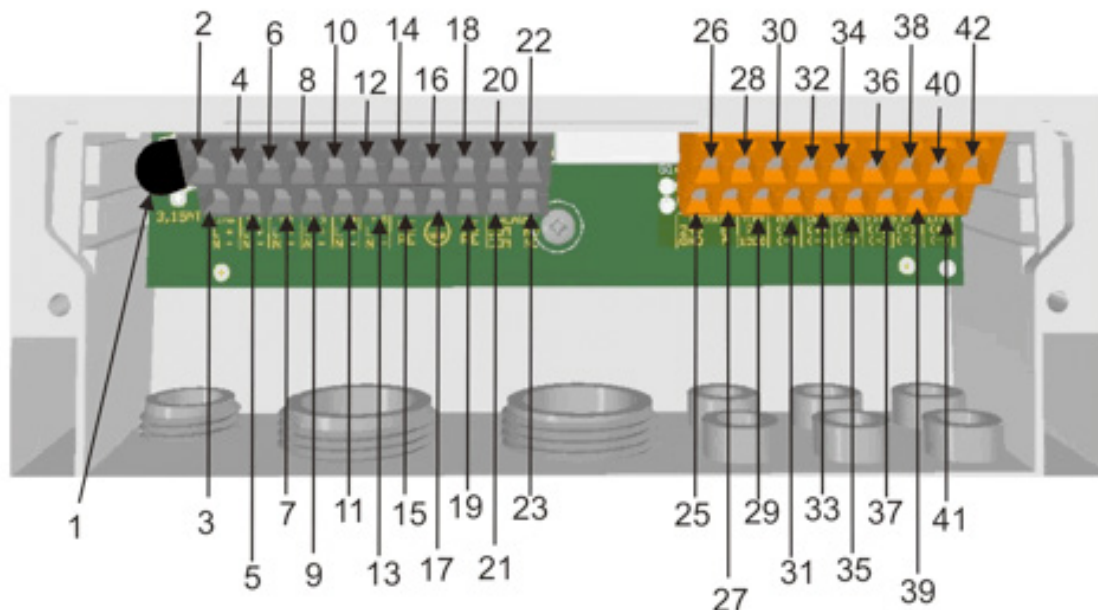
6.2 Control



Measurement type	Specifications
Max. Conductor cross section for terminal assignment	AWG 14 to 20
Internal fuse	3,15AT fuse series FMS (250V) Schurter AG or equivalent
Power consumption	Max. 100VA
Environment:	
Ambient Temperature	0°C to 50°C
Ambient Air Humidity	10% to 90% (non condensing)
Max Operating Height	2,000 m / 6,500ft
Power supply	100...240VAC(50/60Hz)
Valve relay outputs	5 x Relais; Output voltage equals input line voltage! Max. overall load current for all relays outputs: 1A load current for each valve-relais output: 1A (resistive) or 20VA Pilot duty B300 (100VA)
Ext. Output(Dewpoint)	1x 4-20 mA(SELV)
Accuracy	+ - 2%
Flow rate	For direct use: 0-10 m/s For block seat with outflow: 1-5NI/min
Type of housing	Bopla RCP 170 F (Polycarbonate)
Dimensions W x H x D	166 x 160(195) x 115
Weight	Approx. 800 g
EMV Immunity	EN 50081
EMV emitted interference	EN 50082
Protection class	Class II (Isolated)
Alarm relay (potential-free)	Max. load: 250VAC, 5A (AC1/resistive) / 24VDC,5A
Clock battery	Lithium battery size: CR2032 3.0V ~200mAh (BBCV2)
Protection class	IP54 (not evaluated by UL)

7. Electrical connection

The pin assignment of the control is as follows:



1	Fuse 3,15AT	23	Alarm terminal NC
2	Connection conductor control voltage 100...240VAC	24	Reserve
3	Neutral conductor Control voltage	25	Modbus Ground ¹
4	Manager Valve 1	26	Modbus 24 V ¹
5	Neutral conductor valve 1	27	Modbus A ¹
6	Manager Valve 2	28	Modbus B ¹
7	Neutral conductor valve 2	29	Temperature sensor PT1000(optional) ¹
8	Manager Valve 3	30	Temperature sensor PT1000 (optional) ¹
9	Neutral conductor valve 3	31	4-20 mA output - (pressure dew point) ¹
10	Manager Valve 4	32	4-20 mA output + (pressure dew point) ¹
11	Neutral conductor valve 4	33	Connection pressure dew point sensor - ¹
12	Head Valve 5	34	Connection pressure dew point sensor + ¹
13	Neutral conductor valve 5	35	Connection pressure sensor 1 - (optional) ¹
14	FE Grounding	36	Connection pressure sensor 1 + (optional) ¹
15	FE Grounding	37	EXT1 - 4-20 mA or switch ¹
16	FE Grounding	38	EXT1 + 4-20 mA or switch ¹
17	FE Grounding	39	EXT2 - 4-20 mA or switch ¹
18	FE Grounding	40	EXT2 + 4-20 mA or switch ¹
19	FE Grounding	41	EXT3 - 4-20 mA or switch ¹
20	Alarm COM	42	EXT3 + 4-20 mA or switch ¹
21	Alarm COM		
22	Alarm terminal NO		

¹ MEASURING CIRCUITS: CATEGORY I TO MAX. SELV VOLTAGES

7.1 Industrial machinery



The devices are intended to be installed according to NFPA79



KSI Filtertechnik GmbH

Siemensring 54-56 · D-47877 Willich

Tel. +49 · 2154 · 89108 – 0 · Fax +49 · 2154 · 89108 – 282

www.ksi.eu · mail@ksi.eu