

PTB 01 ATEX 2175

Solenoid coil Type AC21

Device with II 2G EX i approval

Operating Instructions



We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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Operating Instructions 1903/16_EU-ML_00804563/ Original DE



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1 OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device. Keep these instructions in a location which is easily accessible to every user and make these instructions available to every new owner of the device.

Operating instruction contain important information.

- ▶ Read the operating instructions carefully and follow the safety instructions in particular.
- ▶ Operating instructions must be available to each user.
- ▶ The liability and warranty for the device are void if the operating instructions are not followed.

1.1 Definition of terms

In these instructions, the term “device” always refers to the solenoid coil AC21.

1.2 Symbols



DANGER

Warns of an immediate danger.

- ▶ Failure to observe the warning may result in a fatal or serious injury.



WARNING

Warns of a potentially dangerous situation.

- ▶ Failure to observe the warning may result in serious injuries or death.



CAUTION

Warns of a possible danger.

- ▶ Failure to observe this warning may result in a medium or minor injury.

NOTE

Warns of damage to property.



Indicates important additional information, tips and recommendations.




Refers to information in these operating instructions or in other documentation.

▶ designates an instruction to prevent risks.

→ designates a procedure which you must carry out.

2 AUTHORIZED USE

Unauthorized use of the solenoid coil AC21 may be dangerous to people, nearby equipment and the environment.

- ▶ The device is used exclusively as a solenoid valve for media permitted according to data sheet and for use in Group II Category 2 G and temperature class T5, T6 (see specifications on the  approval plate).
- ▶ The degree of protection applied is intrinsic safety EX “i” for coils with rectangular plug-in connector, single wires and cable plug connector according to EN 175301-803, Form C.
- ▶ The faultless and reliable operation of the system assumes correct transportation, correct storage and installation as well as careful operation and maintenance. Any other use is regarded as **unauthorized**. Bürkert is not liable for any resulting damage. The user alone bears the risk.
- ▶ Only use the device for its intended purpose.

2.1 EX approval

The EX approval is only valid if the modules and components authorized by Bürkert are used as described in these operating instructions.

If any unauthorized changes are made to the device, modules or components, the EX approval will also be voided.

The following EU type examination certificate was issued by PTB - Physikalisch-Technische Bundesanstalt:

AC21 solenoid coil: PTB 01 ATEX 2175

Production is audited by: CE0102

PTB (Physikalisch-
Technische Bundesanstalt)

Bundesallee 100

38116 Braunschweig, Germany

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not consider any contingencies or incidents which occur during installation, operation and maintenance.

The operator is responsible for observing the location-specific safety regulations, also with reference to the personnel.



Danger – high pressure.

When reaching into the system, there is an acute risk of injury.

- ▶ Before working on the device or system, switch off the pressure. Vent or drain lines.
- ▶ During the installation, make certain the flow direction is correct.
- ▶ Observe applicable accident prevention and safety regulations for pressurized devices.

Risk of injury from electric shock.

- ▶ Before working on the device or system, switch off the power supply. Secure against reactivation.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of burns or fire from hot device surface due to prolonged duty cycle.

The solenoid coil can get very hot during long-term operation.

- ▶ Do not touch the device unless wearing protective gloves.
- ▶ Keep the device away from highly flammable substances and media.



Risk of explosion.

- ▶ The device is a closed system and must not be modified in any way.

A device which has already been used in a non-hazardous “i” circuit must no longer be used in the hazardous “i” circuit, as safety cannot be guaranteed.

- ▶ Use the device in the hazardous “i” circuit only.
- ▶ Devices which were used in a non-hazardous “i” circuit must be identified after they have been removed, denoting that their use is prohibited in the hazardous “i” circuit.

The solenoid coil and valve body form a closed system after installation. When used in explosion-risk areas, there is a risk of explosion if the system is opened in the operating state.

- ▶ Do not remove or open the system during operation.

Risk of explosion due to electrostatic discharge.

In the event of a sudden discharge from electrostatically charged devices or individuals, there is a risk of an explosion in the explosion-risk area.

- ▶ Take suitable measures to ensure that no electrostatic discharges can build up in the explosion-risk area.
- ▶ Do not use the device in areas where there are powerful charge-generating processes, mechanical reaming and cutting processes, the spraying of electrons (e.g. in the vicinity of electrostatic coating equipment) as well as pneumatically conveyed dust.
- ▶ Clean the device surface by gently wiping it with a damp or antistatic cloth only.

To avoid the risk of explosion, the following must be observed for operation in explosion-risk areas:

- ▶ Information on the temperature class, ambient temperature, degree of protection and voltage on the type label for explosion-risk areas.
- ▶ Installation, operation and maintenance may only be performed by qualified specialists.
- ▶ The applicable safety regulations (including national regulations) as well as general technical standards must be observed during setup and operation.
- ▶ Repairs may only be performed by the manufacturer.
- ▶ The device must not be exposed to any mechanical and/or thermal loads which exceed the limits specified in the operating instructions.

General hazardous situations.

To prevent injury, ensure:

- ▶ Secure system/equipment against unintentional activation.
- ▶ Observe the direction of flow during installation.
- ▶ After an interruption in the power supply or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- ▶ Don't use the device as a lever when screwing the valve into the line.



Failure to observe this operating manual and its operating instructions as well as unauthorized tampering with the device release us from any liability and also invalidate the warranty covering the devices and accessories!

4 GENERAL INFORMATION

4.1 Contact addresses

Germany

Bürkert Fluid Control Systems
 Sales Center
 Christian-Bürkert-Str. 13-17
 D-74653 Ingelfingen
 Tel. + 49 (0) 7940 - 10 91 111
 Fax + 49 (0) 7940 - 10 91 448
 E-mail: info@de.buerkert.com

International

Contact addresses can be found on the final pages of the printed operating instructions.

And also on the Internet at: www.burkert.com

4.2 Warranty

The warranty is only valid if the device is used as intended in accordance with the specified application conditions.

4.3 Information on the Internet

The operating instructions and data sheets for Type AC21 can be found on the Internet at: www.burkert.com → Typ 6106

5 APPLICATION CONDITIONS OF THE DEVICES

5.1 Single installation, block installation

The solenoid coils type AC21 are suitable for single installation and for block installation.

5.2 Operating temperature range

For each type observe the operating temperature range specified in the Electrical Data.

6 TECHNICAL DATA

6.1 Conformity

The solenoid coil type AC21 conforms to the EU Directives as per the EU Declaration of Conformity (if applicable).

6.2 Standards

- EN 60079-0:2018; EN 60079-11:2012

The applied standards, which are used to demonstrate conformity with the EU Directives, are listed in the EU Type Examination Certificate and/or the EU Declaration of Conformity.

6.3 Operating conditions

6.3.1 Type label



WARNING

Risk of explosion.

Exceeding the technical data specified on the type label leads to a high risk.

- ▶ Never exceed the technical data stated on the type label.

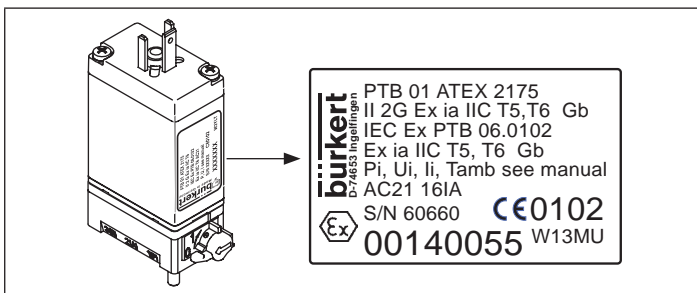


Fig. 1: Position and exemplary representation of the type label

Line	Description	Information
1	ATEX, certificate author and certificate number	PTB 01 ATEX 2175
2	Ex logo, ATEX, identification of the Ex protection	II 2G Ex ia IIC T5, T6 Gb
3	IECEX, certificate author and certificate number	IECEX PTB 06.0102
4	IECEX, identification of the Ex protection	Ex ia IIC T5, T6 Gb
5	Reference to operating instructions	Pi, Ui, li, Tamb see manual
6	Type, serial number, CE marking	AC21. S/N XXXXX CE0102
7	Order number, date of manufacture	xxxxxxx, month and year; coded

Tab. 1: Description of the type label data

6.3.2 Coil dimensions

Length [mm]	Width [mm]	Height [mm]	Weight [g]	Electrical connection
27	15.5	34	42	Without specifications

6.3.3 Type code

Example: AC21-B4-F-16IA-29 * JC29+JW19+PD88

Feature	Description	Value	Designation
Type	Bürkert type designation	AC21	
SAS	Interface armature/coil	B4	Rocker coil 16 mm, screwed
SG	Coil size	F	16 x 27 mm
SW_1	Coil winding	16IA	320 Ω
		14CA	475 Ω
		20CA	125 Ω
ELEA	Electrical connection	20	Rectangular plug-in connector 5.08 mm, 2-pin
		21	FEP wires 0.2 mm ² (AWG 24), red and black
		23	Cable plug form C, top
		26	FEP wires 0.2 mm ² (AWG 24), white
		29	FEP wires 0.2 mm ² (AWG 24), blue and red

Feature	Description	Value	Designation
VAR1	Special feature	****	Example: Assembly of the wires with customer-specific plug
VAR2	Encryption of line length	JW**	Various lengths
VAR3	Encryption of the approval	PD88	Ex ia IIC T5, T6 Gb

6.3.4 Use in temperature class T5, T6

Ignition protection type Ex ia, Gas group II C

Ambient temperature range [°C]		Installation	Max. permitted power consumption P_i [W]
T5	T6		
-40 to +75	-40 to +60	Block installation	0.4
-40 to +70	-40 to +55	Block installation	0.5
-40 to +65	-40 to +50	Block installation	0.7
-40 to +60	-40 to +45	Block installation	0.9
-40 to +55	-40 to +40	Block installation	1.1
-40 to +75	-40 to +60	Single installation	0.7
-40 to +70	-40 to +55	Single installation	0.9
-40 to +65	-40 to +50	Single installation	1.1



The maximum permitted power depends on the max. ambient temperature, the temperature class and the installation.

6.3.5 Safety data

Group:	II C
Ignition protection type:	Ex ia
Temperature class:	T5, T6
Max. permitted input voltage U_i :	35 V
Max. permitted input current I_i :	0.9 A
Inductance L_i :	~ 0
Capacity C_i :	~ 0



The maximum permitted voltages and the associated short-circuit currents can be found in Table A1 in the standard EN 60079-11 for the corresponding gas group.

Ignition protection type Ex ia II C: Coil Type AC21 (example):

U_i	15	18	20	22	25	28	30	35
I_i	0.9	0.44	0.309	0.224	0.158	0.12	0.101	0.073

The coils of type AC21 are available in two versions:

- Version for use with 300 Ω supply module (300 Ω barrier),
- High-resistance version for use with other authorized supply modules.

Version	Resistance R_{20} [Ω]	Minimum clamping voltage [V]	Minimum current [mA]	Type
Version which uses 300 Ω supply module	320	9.3	29	16IA
High-resistance version	475	10.9	23	14CA
Version for Type 8650	125	6.1	49	20CA



The maximum voltage and current values are specified by the permitted electrical equipment.

6.3.6 Permitted ambient temperature



The maximum permitted ambient temperature depends on the power fed in, the temperature class and the installation.

For the appropriate values see chapters "6.3.4".

6.3.7 Degree of protection

Electrical connection	Degree of protection with matching plug connector
Cable plug in accordance with EN 175301-803, form C	IP65
2 pressed-in single wires	-
Rectangular plug connection, 2-pole	IP20

7 INSTALLATION

7.1 Safety instructions



DANGER

Danger of explosion!

The device is a closed system. It must not be removed.

Risk of electric shock!

- ▶ Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation!
- ▶ The connection lines of the electromagnets must be permanently installed in such a way that they are adequately protected from mechanical damage.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment!



WARNING

Danger – high pressure!




When reaching into the system, there is an acute risk of injury.

- ▶ Before dismantling pneumatic lines and valves, turn off the pressure and vent the lines.
- ▶ During the installation, make certain the flow direction is correct.
- ▶ Observe applicable accident prevention and safety regulations for pressurized devices.

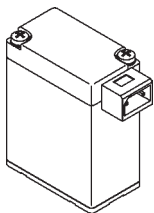
7.2 Installation of Type 6106 with Type AC21 solenoid coil



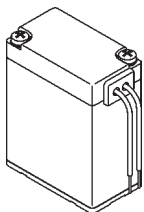
Any installation position.
Preferably with solenoid system at the top.

- Clean the pipelines.
- Install a dirt trap upstream.  Observe the direction of flow!
- Establish the fluidic connection.
- Install.   Always connect the protective conductor!

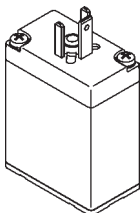
7.3 Connection types



Rectangular plug



2 single wires



Cable plug
connector

8 MAINTENANCE, TROUBLESHOOTING

8.1 Safety instructions



WARNING

Danger of explosion caused by electrostatic charge!

If there is a sudden discharge from electrostatically charged devices or persons, there is a danger of explosion in the EX area.

- ▶ Using suitable measures, ensure that no electrostatic charges can occur in the EX area.
- ▶ Clean the device surface by gently wiping it with a damp or anti-static cloth only.

Risk of injury from improper servicing, repairs and maintenance!

- ▶ The device may be serviced and maintained by authorized technicians only and with the appropriate tools!
- ▶ The unit may be repaired by the manufacturer only!

8.2 Maintenance work

The devices are maintenance-free when operated under the conditions described in this manual.

8.3 Troubleshooting

If malfunctions occur, ensure that:

- the device has been installed correctly,
- the device is not damaged,
- all screws have been tightened,
- the polarity is correct (to ensure proper function, the appropriate connection on the connector terminal is marked with “+”),
- the pipelines are free.

9 TRANSPORT, STORAGE, DISPOSAL

NOTE

Transport damages.

Inadequately protected equipment may be damaged during transport.

- ▶ During transportation protect the device against wet and dirt in shock-resistant packaging.
- ▶ Avoid exceeding or dropping below the allowable storage temperature.

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location!
- ▶ Storage temperature: -40 to +55 °C.

Damage to the environment caused by device components contaminated with media.

- ▶ Ensure the device and packaging are disposed of in an environmentally sound manner.
- ▶ Observe applicable regulations relating to refuse disposal and the environment.

www.burkert.com