

cam.Cleaner

User Manual



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History of Revisions

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0	10.08.2021	E.Schneider	Compilation of the document	
1	14.10.2024	E.Schneider	Circuit diagram for electrical connection of the cam.Cleaner added	

1 Introduction



The cam.Cleaner is a compact cleaning water supply unit for a single camera, which can be used in hazardous areas.

Centerpiece of the cam.Cleaner is the ex-valve. The system is certified in accordance with the European (ATEX) directive (ATEX group II for zones 1, 2 as well as 21 and 22 including the explosion groups IIC/IIIC). To see other approvals, please visit our website at www.samcon.eu.

2 Technical data

2.1 Explosion protection and marking

Identification marks of the device
 acc. to Directive 2014/34/EU:

 II 2G (zone 1 and 2)
 II 2D (zone 21 and 22)

Explosion protection (gas):
 Explosion protection (dust):

Ex eb mb IIC T4 Gb
 Ex mb tb IIIC T130°C Db

Protection class:
 Transport-/ storage temperature:
 Ambient temperature (Ex):

IP 65 (IEC/ EN 60529)
 0°C ... +55°C
 -10°C ... +55°C (N.N-Model)
 -30°C ... +55°C (LL.N-Model)

Solenoid valve

Explosion protection (gas):
 Explosion protection (dust):

Ex eb mb IIC T4 Gb
 Ex mb tb IIIC T130°C Db

Protection class:

IP 65 (IEC/ EN 60529)

Named testing laboratory:
 IECEx Certificate:
 EU-type approval certificate:
 Other certificates see:

Bureau Vertis
 IECEx EPS 18.0110X
 EPS 18 ATEX 1232 X
<https://www.samcon.eu/en/products/equipment/cam-cleaner/>

2.2 Models/Variants

„ExCam cam.Cleaner“ model variation				
Type	Connections	Power supply	Number of pressure tanks	Range of temp.
T05-	1-	24-	1DR-	N.N-
T05-	1-	24-	1DR-	LL.N-

Tab. 2.1: Model variation

Illustration:

- 1) **cam.Cleaner** = Funktional product description (technical data/specification)
- 2) **T05** = SAMCON Production- Type 05
- 3) **1** = Water connections
- 4) **24** = Power supply 24 VDC
- 5) **1DR** = 1 water pressure tank
- 6) **N.N** = No valve for low temperatures (-10°C)
LL.N = Valve for low temperatures (-30°C)

2.3 Electrical parameters of the supply unit

Power supply:

Voltage supply: 24V
 Maximum power consumption: 9W
 Typical power consumption: 9W @24VDC

3 Safety Instructions

It is absolutely mandatory to adhere to the national safety regulations and regulations for prevention of accidents, as well as to the safety instructions given below in this User Manual!



Attention!

Devices of the type cam.Cleaner are not suitable for use in zones 0 and 20. The ambient temperature, temperature class and explosion group written on the type plate must be absolutely adhered to! The customer is not allowed to make any alterations of the device! The device must be operated in a proper and sound condition and only in the way intended.



Attention!

Repairs may only be carried out by using original parts from the manufacturer. Repairs which affect the explosion protection may only be carried out in accordance with the nationally applied regulations and exclusively by the manufacturer.



Attention!

Prior to installation, take external sources of heat or cold into account! The temperature ranges prescribed for storage, transport and operating must be adhered to!



Attention!

Adhere to the warnings given on the nameplate:

“WARNING –DO NOT OPEN IN HAZARD AREAS“



Using in explosion-protected areas with regard to temperature and dust layers is defined in the respective national regulations. Furthermore, it must be ensured that compressed air leaks do not lead to dust turbulence and thus to a zone jump in zone 20. Appropriate construction and cleaning decisions have to be made.



When installing the cam.Cleaner, adhere to the requirements of the EN / IEC 60079-14.

4 Installation

For commissioning and operating the device, the relevant national regulations, as well as the generally accepted rules of technology shall prevail. Before mounting the cam.Cleaner, thoroughly check it for any transport damage. Installation, electrical connection and the first start must only be carried out by qualified specialists.

4.1 Work preparation:



Attention!

Prepare your work carefully and in accordance with the relevant regulations.



Attention!

Depending on classification of hazard areas, it is imperative to obtain a work approval first!

When you open the pressure-resistant enclosure under voltage, it is absolutely necessary to prevent potentially explosive atmosphere!

- Use appropriate tools and aids.
- When working, ensure a safe stand.
- Make sure that any static charge is avoided.



Attention!

Please observe the national security, installation and accident prevention regulations (e.g. DIN EN 60079-14) and the safety instructions in this User Manual!

Mount the cam.Cleaner in an appropriate distance to the camera. Mount the injector tube at the flange of the camera. After laying the tube (max. length of the tube $l_{max}=50m$) the coupler plug can easily be plugged into the device and the output tube coupling.

The washing water supply has to be connected with the water tank. For this use the coupling (water connection cam.Cleaner).

If required the tank has to be supplied with compressed air (max. 5 bar). This is done via the compressed air connection of the tank. If the customer doesn't want a compressed air connection the needed tank pressure has to be raised with the hand pump on the tank.

The temperature of the water should be between $0^{\circ}C < temp. < 80^{\circ}C$ and the pressure must not be higher than 5 bar. For lower temperatures a suitable antifreeze agent has to be used (see chapter 6).

If the tank pressure is 5 bar the loss of pressure after 100 to 150 sprayers is about 0.8 bar.

Pressure: 5bar ($\approx 72.5psi \approx 500kPa$)



Attention!

Prior to installation, take external sources of heat or cold into account! The temperature ranges prescribed for storage, transport and operating must be adhered to!



Attention!

Release the pressure before connecting or disconnecting the tank (0bar). Do not open the water tank under pressure.



Attention!

The tank must be closed with the black protective cap.



Attention!

Please pay attention to the national and local regulations for mounting heavy loads. In case of doubt, take appropriate security measures.

4.2 Optional accessory

Polyurethan-tube, antistatic		Length: up to 50m
------------------------------	--	-------------------

Tab. 4.1: Accessory

5 Electrical connection



Attention!

The electrical connection of the equipment may only be carried out by qualified and skilled personnel!



Attention!

It is absolutely necessary to ground the cam.Cleaner.



Attention!

Please observe the national security, installation and accident prevention regulations (e.g. DIN EN 60079-14) and the safety instructions in this User Manual!

5.1 Potential equalization

Potential equalization/grounding of the device is absolutely necessary, in order to avoid static charges and thus the formation of sparks. For this purpose, mount a ground screw. The cross-section of the potential equalization should comply with the National Ground Rules (at least 4mm²).

5.2 Connection work at the device

The terminal box is located in the ball of the solenoid valve. The correct connection of the individual pins has to be observed. Generally, the pins of the same color code are connected (IEC60757).



Attention!
Never open the Ex-e terminal box while energized!



Attention!
Observe the international regulations for connection spaces with increased safety (Ex-e)!

The pin assignment of the Ölflex 440P is executed as follows:

Valve	Ölflex VDE 0293-334 (IEC60757)	Cross-sectional surface	Comment
BL BU	L- (2)	1,5 mm ²	L- 24VDC*
BR BN	L+ (1)	1,5 mm ²	+ 24VDC*
GN YE	GN YN	1,5 mm ²	PE

Tab. 5-1 Wire assignment of terminal box



Attention!
Use only terminals approved by SAMCON.



Attention!
Cables and wires must comply with the requirements of the IEC 60079-0/1/7 & 14.



Attention!
The supply line must have a sufficient cross-section. The cable protection must comply with national and international regulations.



Attention!
Cable glands which are not fitted with a cable have to be closed with the red blind plug.

Wire-Ident-Code standard cable: black with white numbers acc. to VDE 0293-334

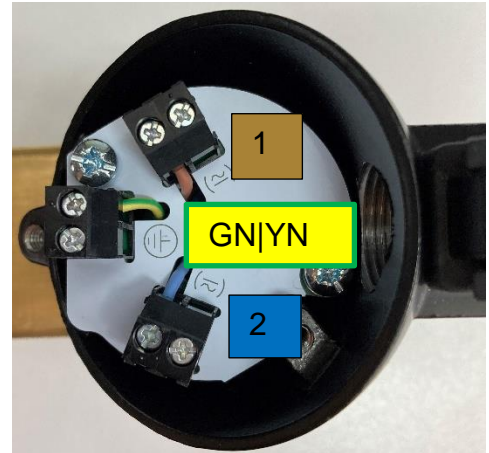


Figure 5-1 cam.Cleaner valve assignment

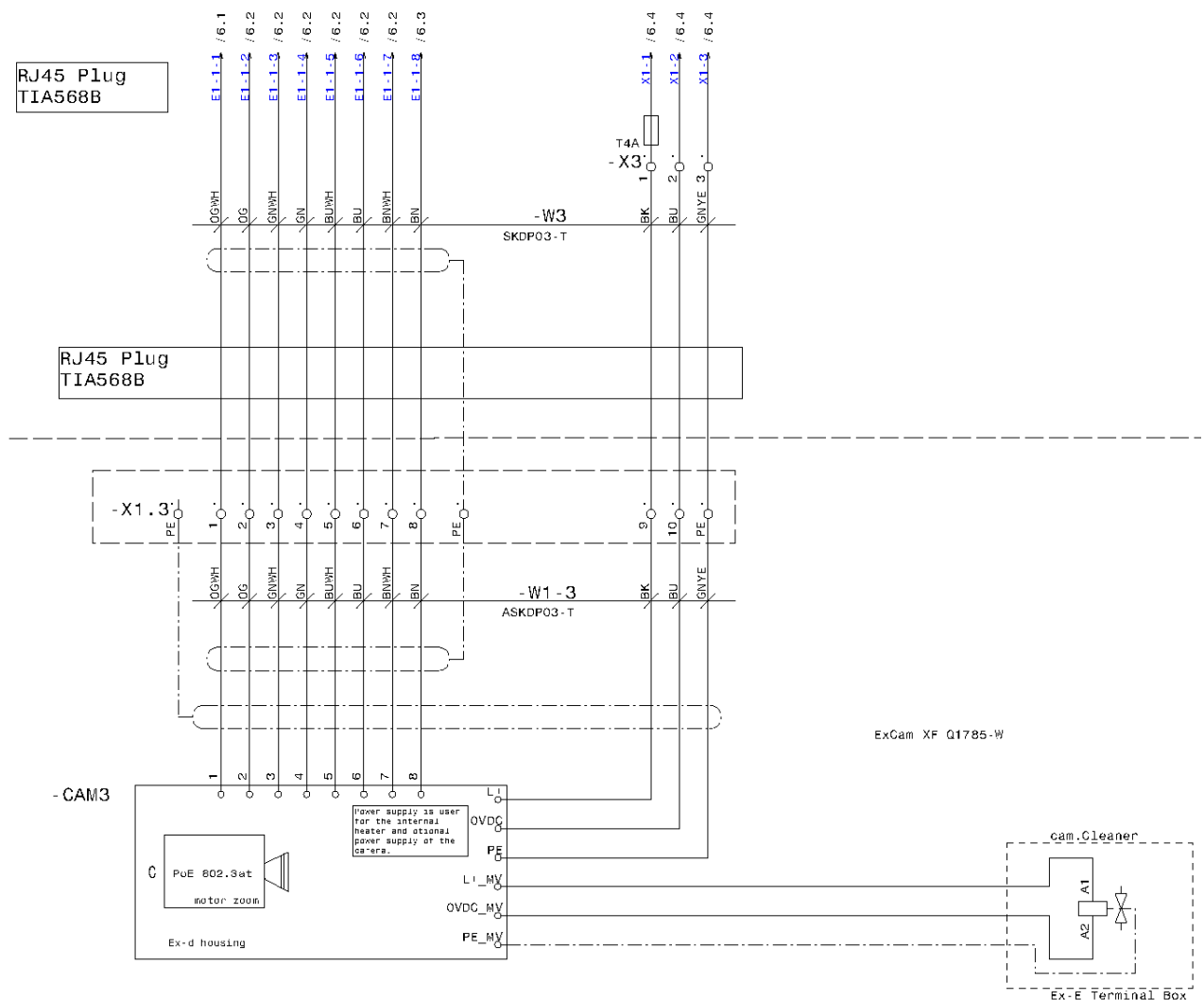


Figure 5-2 Circuit diagram for connection of Excam IPQ1785-W to cam.Cleaner

5.3 Test prior to switching on voltage



Attention!

Prior to starting the device, perform all tests as indicated by the national regulations. Furthermore, check the correct function and installation of the device in accordance with this User Manual and other applicable regulations.



Attention!

Incorrect installation or operation of the camera may lead to a loss of warranty!



Attention!

Do not switch on the cleaner at temperatures below 0°C!

6 Antifreeze agent

At temperatures below 0°C, suitable antifreeze should be used for the fluid in the tank. We recommend TECTROL antifreeze (material number 1627381). It must be ensured that the seals are fully resistant to the antifreeze. This is the case as long as the antifreeze agents do not contain any dissolved or solid alkali metals for better heat transfer or as long as they do not contain any fluorine-based substances. The amount of alkali metals such as lithium or fluorine can be taken from the datasheet of the selected antifreeze.

7 Controllable via Network (only with selected cameras)

Our camera models ExCam IPQ...-W are especially developed to be used together with a cam.Cleaner. The washing water supply unit can be controlled via Browser or VMS (VAPIX).

7.1 Configuration rules and manual triggers

The query string suffix can be used to control the cam.Cleaner and the wiper drive. You can change the settings depending on your special needs. Therefore choose:
Settings → System → Events

Device events MQTT events

Rules Schedules Recipients Manual triggers

wiper drive HTTP	▼
manual trigger HTTP	▼
cam.cleaner HTTP	▼

Please fill in the IP-address of your camera.

The following user name is set at the factory: **root**

The following password is set at the factory: **root**

manual trigger
HTTP

Name

Type

URL

Username

Password

Proxy ☐

wiper drive
HTTP

Name

Type

URL

Username

Password

Proxy ☐

IP of the camera

Figure 7-1 Events – Recipients

Device events MQTT events

Rules Schedules Recipients Manual triggers

cam.cleaner

Manual trigger | Send notification through HTTP

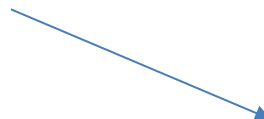
deactivate manual trigger

Manual trigger | Send notification through HTTP

wiperdrive

Manual trigger | Send notification through HTTP

+



cam.cleaner

Manual trigger | Send notification through HTTP

☒ Use this rule

Name

cam.cleaner

Wait between actions (max 23:59:59)

00:00:00

Condition

Manual trigger

Channel

Camera 1

☐ Invert this condition

☐ Use this condition as a trigger

+

Action

Send notification through HTTP

Recipient

wiper drive

Query string suffix

action=3:/2000\

Message (will be encoded)

Full recipient URL:

http://89.0.0.142/axis-ogio/port.cgi?action=3:/2000\

Save

7.2 Explanation cam.Cleaner rule

The query string suffix can be used to control the cam.Cleaner.

The following command activates the spray system for one second:

Query string suffix: `action=3:/1000\`

In this example the cam.Cleaner is connected to port 3 of the IOs of the camera:

`action=3:/1000\`

A front slash / switches the spray system of the cam.Cleaner on, a back slash \ switches it off. The numbers between a slash are the milliseconds until the following slash is executed as a control command. In the above command, the spray system is active for one second.

If another spray is to be made after a short break, the following command can be used, to spray for two seconds, break for three seconds and then spray again for one second:

`action=3:/2000\3000/1000\`

deactivate manual trigger	wiperdrive
Manual trigger Send notification through HTTP	Manual trigger Send notification through HTTP
<input checked="" type="checkbox"/> Use this rule	<input checked="" type="checkbox"/> Use this rule
Name deactivate manual trigger	Name wiperdrive
Wait between actions (max 23:59:59) 00:00:00	Wait between actions (max 23:59:59) 00:00:00
Condition Manual trigger	Condition Manual trigger
Channel Camera 1	Channel Camera 1
<input type="checkbox"/> Invert this condition	<input type="checkbox"/> Invert this condition
<input type="checkbox"/> Use this condition as a trigger	<input type="checkbox"/> Use this condition as a trigger
+	+
Action Send notification through HTTP	Action Send notification through HTTP
Recipient manual trigger	Recipient wiper drive
Query string suffix action=6/1000\	Query string suffix action=1:1000/
Message (will be encoded) 	Message (will be encoded)
Full recipient URL: http://89.0.0.142/axis-cgi/fo/virtualinput.cgi?action=6/1000\	Full recipient URL: http://89.0.0.142/axis-cgi/fo/port.cgi?action=1:1000/
Save	Save

Figure 7-2 Events – Rules

7.3 Explanation wiperdrive rule

The query string suffix can be used to control the wiper.

The wiper is connected to port 1: `action=1:\1000/1000\`

A frontslash / activates the wiper, a backslash \ turns the wiper off. The numbers between a slash are the milliseconds until the following slash is executed as a control command.

In the above command, the wiper is left off for one second and only activated after this delay, when there is enough water on the glass. After activation, two wiper cycles are executed, i.e. the wiper moves twice in both directions and requires approx. 10 seconds for this. If the wiper should be activated for a longer time, it can be switched on again after a break of 10 seconds: `action=1:\1000/1000\10000/1000\`

8 Maintenance / Modification

The applicable regulations for the maintenance and servicing of electrical devices in potentially explosive atmospheres must be adhered to.

The required maintenance intervals are specific to the individual devices. The operating company has to determine these intervals depending on the application parameters. The maintenance tasks especially include examination of parts on which the ignition protection depends (e.g., proper condition of the casing, seals and cable entry points). If maintenance measures are necessary they have to be initiated and/or executed.

9 Repairs

Repairs may only be carried out with original parts of SAMCON Prozessleittechnik GmbH. Damaged pressure-resistant housings have to be replaced completely. In case of doubt, send the part in question back to SAMCON Prozessleittechnik GmbH.

Reparations concerning the explosion protection must only be carried out in accordance with nationally applied regulations by SAMCON Prozessleittechnik GmbH or by an authorized electrical technician authorized by SAMCON Prozessleittechnik GmbH. Rebuilding of or alterations to the devices are not permitted.

10 Disposal / Recycling

When disposing of the device, nationally applicable regulations must be observed. This Document is subject to alterations and additions.

11 Drawings & 3D Models, Certificates and further Documentation

Drawings, accessories, 3D models, STEP-files, DXF shapes, certificates and other information are available in the download area of the product page on our website:

<https://www.samcon.eu/en/products/equipment/cam-cleaner/>

If you wish additional technical information, please contact us at:
support@samcon.eu



SAMCON

Schillerstraße 17, 35102 Lohra-Altenvers
www.samcon.eu, info@samcon.eu
fon: +49 6426 9231-0, fax: - 31

