



Recommendations for cleaning/disinfection of Dräger mobile gas detection devices

Dräger mobile gas detection products are used worldwide. They are easy to use and cover a wide range of different gases. They are designed robust and easy to clean. For standard purposes Dräger recommends cleaning with clear cold tap water and a lint-free cloth, soft sponge or soft brush if necessary.

The contents of this document are based on our test results for cleaning and, if necessary, disinfecting the Dräger Pac® and X-am® gas detector families (X-am 2x00, X-am 5x00, X-am 7000, X-am 3500, X-am 8000), Dräger X-pid® 9500 and other Products from the mobile gas detectors. These results can also be applied to the following Dräger products: Dräger X-dock® series, Dräger accuro® (hand pump for Dräger-Tubes®), Dräger X-act® 5x00/7000 (automatic pump for Dräger-Tubes®) and Dräger X-zone.

Background

The need for decontamination and pre-cleaning prior to maintenance of the equipment may raise in the daily operation from different reasons and applications:

- Disinfection and pre-cleaning due to contamination with biological agents, e.g. in ambulance services, sewage treatment plants, in rendering, with animal diseases, in microbiological and biotechnical laboratories.
- Pre-cleaning due to contamination by hazardous substances or heavy soiling, e.g. activities with hazardous substances in almost all industries, e.g. in the chemical industry, in the construction industry, in metal processing companies, mining, public service, fire department

Practical tip: Contaminated or dirty equipment is ideally marked with tags (e.g. traffic light system). This information transfer allows service personnel to take a corresponding procedure and appropriate protective measures.

With continuous and heavy use of cleaning and disinfecting agents, the membranes will lose their property of water impermeability (hydrophobicity). As a result, the device will lose its IP 68 (Pac family) or IP 67/68 (X-am family) protection. This can lead to damage to the sensors or the device itself. In addition, cleaning agents and disinfectants can also damage selected sensors or influence the measurement signal.

Results of cleaning and disinfection tests

The instructions for disinfection apply for cleaning as well. Cleaning is an important prerequisite for successful disinfection.

Cleaning of equipment - in addition to disinfection - is an important process for dirt removal and germ reduction on equipment.

Suma Light DI.2 (0,5 % solution) and neodisher® MediClean forte were tested as cleaning agents. Oxivir Excel® Foam is a ready-to-use disinfectant (30 seconds exposure time). These showed no effect on the sensor membranes and

device housings when used several times 10x (0.5-1% in water, then rinsed with tap water). However, both agents can lead to a small, time-limited display of a few ppm measuring signal with some sensors, especially XXS OV and PID sensors.

The following applies in principle to the cleaning and, if necessary, disinfection of gas detectors:

1. General protective and hygienic measures: The usual precautionary measures for handling chemicals must be observed. Personal protective equipment must be worn in accordance with the risk assessment. The instructions for disinfection apply *mutatis mutandis* to cleaning. Cleaning is an important prerequisite and basis for successful disinfection. Cleaning itself serves to maintain the value, optical appearance of the devices, safety and hygienic condition of the equipment as well as the regeneration of functional properties.
2. For decontamination and pre-cleaning of chemically contaminated equipment can usually be rinsed with cold tap water. If necessary, a soft sponge can be used. The equipment can then be dried with a cloth. This can be used to achieve a log level of 1. (this corresponds to 90%)
3. Cleaning of equipment is an important process, not only for germ reduction on equipment, but mainly the removal of visible and invisible contamination and is the basis for successful disinfection. If cleaning is carried out properly, a log level of 3 can be achieved. (this corresponds to 99.9%)
4. Incorrect or improper cleaning articles (hard brushes, etc.), cleaning agents and solvents can destroy the dust and water filters (membranes).
5. After cleaning, rinse thoroughly with water and wipe off, allow the device to dry in the ambient air, then, inspect the device for mechanical/chemical damage and replace any damaged components.

Additional attention must be paid to disinfection if necessary:

6. For quick disinfection with a disinfectant wipe or foam the device must be switched off. If the user has previously cleaned/disinfected his/her hands, he/she should first wait some time so that the agents used have evaporated (> 10 min). Please observe the warning and application instructions enclosed with the disinfectant wipe - in particular the notes on exposure time against viruses/bacteria.
7. When working in indoor areas that are not well ventilated, it is recommended to perform this activity if necessary under an exhaust system.

8. After the application with the disinfectant wipe, some sensors (due to the ingredients of the wipe) can display a signal, especially CatEx sensors and Organic Vapor (OV) sensors.
9. Before using the devices again, plan a sufficient decay time (> 10 min). As soon as the devices are switched on in fresh air and the devices show the normal values for fresh air, the effect of the disinfectant wipe is gone. (Oxygen 20.9 % by vol., other sensors „0“, exceptions: IR CO₂ and O₃).
10. We recommend to proceed the disinfection before charging (X-am family, X-act series). Use the charging process to recover the sensors. After the charging time, the normal procedure of e.g. bump testing and /or calibration can be performed. The information in the operating instructions on regular maintenance must be observed.

Due to internal tests, **20 times wipe disinfection** with Suma™ Alcohol Wipe or Allegro pads can be classified as safe for the Dräger portable gas detectors. Test results with more wipe disinfections are not available, but further application of the procedure is possible. Damage to the housing and membranes is not to be expected, but pre-filters of individual sensors (e.g. XXS CO LC, XXS OV(-A), XXS H2) may become saturated with alcohol. The readiness for use of the unit must be checked with a bump test before use (see manual). If sensors are affected after continuous use of the method, the sensors must be replaced. Disinfection wipes based on H₂O₂ (e.g. with a 3-percent solution) have not proven suitable in practical trials, as they can affect electrochemical sensors in particular.

Order numbers of the cleaning agents and, if necessary, disinfectants:

neodisher® MediClean forte (manufacturer: Chemische Fabrik Dr. Weigert GmbH & Co. KG):

- Dräger part number: UK: 3706135 (5 liters)

Oxivir Excel®Foam (manufacturer: Diversey, Inc.)

- Dräger part number: 3706134 (0.75 liter)

Diversey, Suma Light D1.2

- Part number: 3706290 (for Germany and Austria, all other countries procure locally, (2 x 5 liters)

Suma® Alcohol Wipe (manufacturer: Diversey IP International B.V.)

- Dräger part numbers: 3706284, 3706285, 3706286, 3706287, 3706288, 3706289 (different package sizes)

Cleaning pads: Allegro alcohol-free (for US market only), from manufacturer Allegro® Industries
Dräger part number: 40 53 845: cleaning pads (100 pcs.)

Active substance(s) for Cleaning pads Allegro alcohol-free: Benzalkonium Chloride, CAS No. 8001-54-5, 63449-41-2 (Recommendation: Dilution 200 times with water (0,05%) if not US part number 4053845 is used but the same chemical, e.g. OSVANR S).

Not all cleaning and disinfection agents mentioned are available in all countries of the world. Dräger is continuously reviewing the extension of this recommendation. Please contact Dräger via your regional partner or inform yourself via our homepage www.draeger.com.

Notes on UV disinfection:

Mobile gas detectors from Dräger were also tested for the use of UV-C disinfection: A disinfection system from Sterilsystems (Austria) was used: DS 410. After 100 disinfections with a duration of 10 min each, no functional or mechanical influence of the tested gas detectors were noted. After 100 disinfections, Dräger recommends replacing the front housing.

Please observe the instructions for use of the disinfection device. Please also note that cleaning does not take place in the unit, but disinfection does. Cleaning must be carried out in an upfront process step. The efficiency of the disinfection has not been investigated by Dräger, shadowing during disinfection must be considered. If necessary, the unit must be inserted in two different positions. In general: A permanent application of UV-C disinfection (above the tested scope) can have unknown effects on the device and especially on the housing material.

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