

SAFETY FIRST.

FULLY TESTED EQUIPMENT FOR OPTIMAL PROTECTION.

DETECTION

PERSONAL PROTECTION DIVING TECHNOLOGY SYSTEM TECHNOLOGY SERVICES



INTRODUCTION SAFETY FIRST.

Safety first: test before you measure.

GAS DETECTION AND WARNING INSTRUMENTS ARE DEVELOPED AND PRODUCED TO PROTECT YOU AND YOUR STAFF AGAINST INVISIBLE GAS HAZARDS IN THE AIR AT YOUR WORKPLACE. YOU MUST BE ABLE TO RELY COMPLETELY ON YOUR EQUIPMENT IN CRITICAL SITUATIONS, SO REGULAR SERVICING, CALIBRATION AND FUNCTION TESTING (BUMP TESTING) ARE ESSENTIAL.

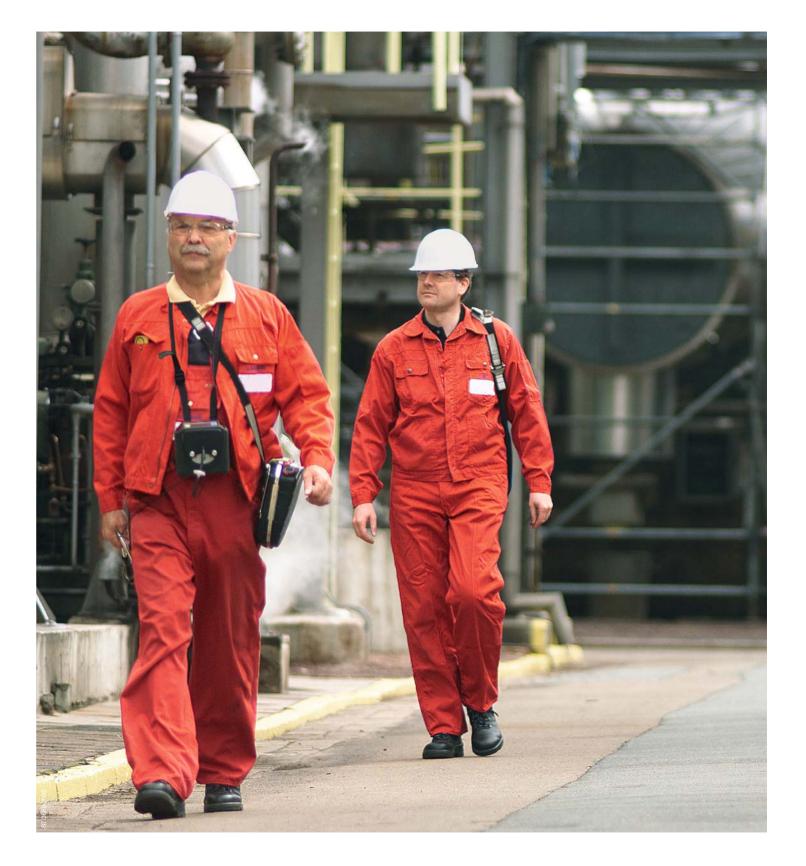
Your safety

Measuring instruments, which do not work properly, cannot give you the protection you need, and may result in accidents. If you are exposed over time to above-normal concentrations of toxic gases or to a shortage of oxygen at the workplace, this may cause illness or even death. Checking an instrument using a known gas concentration (called a function or bump test) is the only way to guarantee reliable and correct measurement of and warning against gas hazards. This test is important to verify whether the gas to be measured is able to flow through the dust and water filter to the sensor, to check that the sensor is properly adjusted, and to test that alarms are working and are correctly set.

If the measuring instrument has been in contact with very high concentrations of toxic gases and vapours, it must immediately undergo a function test and be adjusted, regardless of the applicable function test interval.

National institutions require gas detection instruments to undergo regular sensitivity or function testing (bump test), and, in some cases, specify a bump test with gas every single work day. European Standard EN 50073, "Guide for the selection, installation, use and maintenance of apparatus for the detection and measurement of combustible gases or oxygen", which is applicable in the member states of the European Union, also requires such equipment to undergo sensitivity testing directly prior to use.

The Occupational Safety & Health Administration (OSHA) a part of the U.S. Department of Labor issued in the "Safety and Health Information Bulletins" a position statement on instrument calibration which states, "A bump test or full calibration of direct-reading portable gas monitors should be made before each day's use using an appropriate test gas".



solution

We provide not only gas warning instruments for protection at the workplace, but also tailormade solutions to allow your equipment to be serviced, calibrated and function tested.



Function testing and more.

BEFORE THEY ARE SHIPPED OUT TO THE CUSTOMER, WE CALIBRATE OUR GAS DETECTORS TO A SPECIFIC GAS AND A SPECIFIC CONCENTRATION. YOU SHOULD REGULARLY PERFORM A FUNCTION TEST USING GAS. IF THE INSTRUMENT FAILS THIS FUNCTION TEST, YOU NEED TO CALIBRATE THE CONCENTRATION SHOWN ON THE INSTRUMENT'S DISPLAY TO MATCH THE ACTUAL CONCENTRATION OF THE TEST GAS.



Dräger Bump Test Station Simple and cost-effective function test

The Dräger Bump Test Station was designed to allow a bump test to be performed with gas in order to check gas detection and warning instruments. The Dräger Bump Test Station features an integrated gas control valve and the respective instrument-specific adapter to connect the specific Dräger gas detection instrument. All you need to do is connect a Dräger test gas cylinder containing the gas to be measured to the Dräger Bump Test Station. When the detector is inserted into the instrument module, the trigger control valve automatically opens the gas cylinder.

During the bump test, the detector is exposed to a known concentration of a test gas. For all previously available gas detection instruments, the bump test is performed manually, which means that you, the user, decide when the bump test has been successfully completed. The following functions should be checked during the test:

 Compare the concentration shown on the instrument's display with the concentration of the test gas (printed on the calibration gas cylinder). Compare the onset of the alarm function in your warning instrument (alarm threshold, visual and/or audible and/or vibration alarm) with the instrument functions.

The test gas concentration must be high enough to trigger the instrument's alarm. The bump test is successful and verifies the instrument calibration when the concentration shown on the instrument's display is within an acceptable tolerance range and the alarms were triggered. If the bump test is not successful, the instrument needs to be adjusted. Instruments with an event or data logger will store the result (pass or fail) of the bump test.

The Dräger Bump Test Station can be used to test the following Dräger gas detection and warning instruments: the new Dräger Pac 1000 to 7000 as well as the Dräger X-am 1100 to 7000. A Dräger Bump Test Station is available for each type of detector, and comes with the respective adapter needed for connection.



Dräger E-Cal:
Fully automatic function test and adjustment.

The Dräger E-Cal automatic test and calibration station allows reliable testing and calibration of all portable Dräger gas detection instruments. The Dräger E-Cal features a modular design and uses a PC, a Master Station and up to 10 different modules in which gas detection instruments can be simultaneously tested and adjusted.

Master Station

The Master Station allows you to switch between two, six or twelve different gases, and supports up to ten instrument modules. Because the instruments are calibrated simultaneously, you can be sure that your equipment will be quickly and cost-effectively serviced.

Instrument modules

When a portable Dräger gas detection instrument is inserted into one of the modules, its sensors are detected automatically. The result of the check is shown on both the module and the PC once adjustment has been successfully completed. In addition, you can also use the instrument module, with the respective mains adapter plug, to charge your equipment.

Dräger CC-Vision software

The Dräger CC-Vision E-Cal PC software features intuitive operation, while the configurable GO button makes the instrument even easier to use. Your specific workshop processes such as a function test, calibration, download of data logger or battery test are carried out automatically and simultaneously for up to 10 instruments. What is more, the software offers equipment management. Combined with the search function, the Dräger CC-Vision E-Cal software provides a wide range of different analysis and tracking functions, e.g. who a particular instrument belongs to, which instruments require calibration and when, and showing the calibration history for individual instruments. The software additionally prints out a record to facilitate data documentation. The workshop solution also simplifies configuration of the portable Dräger measuring instruments. The Dräger CC-Vision E-Cal is compatible with any commercially available PC.

Purge Module

An optional Purge Module is available besides the three basic components. This special option ensures the active and defined suction of waste gases – some of which are toxic and explosive – out of the Dräger E-Cal Station when no extractor system is available close by.

Scalable Dräger E-Cal

Thanks to its scalability, you can tailor the Dräger E-Cal Station to your individual needs. The modular design ensures easy expansion and quick conversion. For instance, using an optional adapter and your PC, you can manually operate any of the instrument modules independently of the Master Station, using them as a low-cost alternative for straightforward function testing.

When equipped with all optional modules, the Dräger E-Cal can easily meet every conceivable requirement for professional and fully automatic testing and adjustment of up to ten instruments simultaneously. VAPOUR CALIBRATION AND MORE. SAFETY FIRST.

Vapour calibration and more.



Calibration chamber: Vapour calibration.

The calibration chamber allows you to calibrate your equipment using organic solvents that are in liquid state at room temperature (e.g. hydrocarbons such as octane and nonane, and aromatic compounds like benzene, toluene and xylene). You put a defined volume of the liquid onto a small dish inside the calibration chamber; a propeller is then used to make the substance evaporate and distribute it evenly around the chamber. The measuring instrument requiring testing or adjustment can be connected to the calibration chamber by means of an instrument-specific calibration adapter.



Basic test with gas.

The easiest and least expensive way to test the function of your portable gas detection instrument is to conduct a basic test with gas. All you need is a test gas bottle containing the respective test gas, a trigger regulator and an instrument-specific calibration adapter. The instrument's alarm is triggered by briefly exposing the sensors to the test gas. To adjust the instrument via a PC, you additionally need the Dräger CC-Vision software, which allows individual configuration and calibration of your gas detection instruments and is tailored to your needs.



Dräger software.

Using the Dräger CC-Vision, Dräger microPac Vision or Dräger Pac Vision software, you can professionally configure and calibrate all portable Dräger gas detection instruments. The instrument functions are shown clearly on the screen in the form of a tree structure, allowing you to perform quick and individual settings of the instrument parameters and to adjust the sensors. Dräger CC-Vision and Dräger Pac Vision help you manage the data and give you quick and targeted access to the

Which accessories are used with which measuring instrument?

Devices	Dräger Bump Test Station	Dräger E-Cal Station	Calibration Chamber	Basic Test with Gas	Software
Dräger microPac				•	Dräger microPac Vision
Dräger microPac Plus				•	Dräger microPac Vision
Dräger Pac 1000 – 7000	•	•		•	Dräger CC-Vision or Dräger Pac Vision
Dräger Pac III		•		•	Dräger CC-Vision
Dräger Pac Ex 2		•	•	•	Dräger CC-Vision
Dräger X-am 1100 – 2000	•	•		•	Dräger CC-Vision
Dräger X-am 3000	•	•		•	Dräger CC-Vision
Dräger X-am 5000	•	•		•	Dräger CC-Vision
Dräger X-am 7000	•	•	•	•	Dräger CC-Vision
Dräger Multiwarn II		•	•	•	Dräger CC-Vision
Dräger MiniWarn		•	•	•	Dräger CC-Vision
Dräger Multi PID 2				•	Dräger CC-Vision

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One-stop shopping test gases and regulators.

Cylinder size 2AL

Cylinder size 8AL

Cylinder size 6D

gas volume and 69 bar

IF YOU WANT TO FUNCTION TEST AND CALIBRATE YOUR GAS DETECTION INSTRUMENTS IN THE BEST POSSIBLE WAY, YOU MUST NOT FORGET THE TEST AND CALIBRATION GASES. OUR TEST AND CALIBRATION GASES ARE PRODUCED IN ACCOR-DANCE WITH ISO 9002 AND GUARANTEE THE SAME HIGH STANDARDS OF QUALITY WORLDWIDE FOR SAFE AND RELIABLE CALIBRATION AND/OR SAFE FUNCTION TESTING OF YOUR GAS DETECTORS.





Disposable cylinders

You can take these conveniently small disposable cylinders with you wherever you go, which makes function testing of your portable detectors and gas detection systems even easier. Because these cylinders are only filled once, you always receive a new cylinder. Another advantage of the disposable cylinders is the fact that they do not need to be returned - once empty, you can simply dispose of them in an environmentally-friendly manner as metal waste. This means no rental or transport costs for returning the cylinders.

Regulators

You can choose between different types of regulators for different applications. All regulators fit the above mentioned cylinder types and have a preset flow rate of 0.5 litres/minute.

If you want to calibrate or function test an instrument without an internal pump, you will find that the Model 715 is the regulator best-suited for the job. The regulator has a knob for manually open and close the gas

Or do you have a gas detection instrument with an internal pump, and want to calibrate or function test it?

The **on-demand regulator** allows you to manually calibrate or function test instruments with an internal pump. The valve is opened automatically by the suction of the pump. This regulator can also be used for automatic calibration or automatic function testing when using the Dräger E-Cal Station in conjunction with instruments with an inter-

Or do you simply want to check that your gas detection instrument is functioning properly before you use it?

The trigger regulator enables you to manually expose the sensors of your gas detector to a calibration gas for a brief period, simply by pulling the trigger.

By pulling the trigger upwards, you can also keep the regulator open for a continuous flow of gas.

Using rental cylinders

To give you the chance to use the large refillable cylinders with DIN 14-compliant connectors, our product range includes a combination of the on-demand regulator and a DIN 14 adapter.







Trigger regulator.

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ORDER INFORMATION.

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Dräger Service

You can also arrange for regular testing or a complete service with calibration to be carried out in one of our Dräger Service workshops, which are never far away. Dräger Service is ready to serve you as a reliable partner, either in our own local branch offices worldwide or in one of our service centres. From straightforward maintenance to complete customized service programmes, we can offer you a solution tailored to your specific requirements.

Training at Dräger Safety

Another option is to undergo training yourself at our Dräger Safety location, where seminars in the maintenance and service of individual devices are offered. Dräger Safety prepares you for every event during your work and shows you what needs to be done to ensure you remain ready for action at all times.

Order information.

Dräger E-Cal

Dräger X-am 1/2/5000 single charger

Description Order no.

Master Stations (incl. Dräger CC Vision E-Cal, mains adapter & accessories for connection of	83 19 090	
Master Station 2 (for up to 2 gases)		
Master Station 6 (for up to 6 gases)	83 16 906	
Master Station 12 (for up to 12 gases)	83 16 912	
Modules (incl. accessories)		
Dräger MiniWarn Module	83 16 552	
Dräger Multiwarn II Module	83 16 553	
Dräger Pac III Module	83 16 554	
Dräger Pac Ex 2 Module	83 16 539	
Dräger Pac 1000 – 7000 Module	83 18 589	
Dräger X-am 1/2/5000 Module	83 18 754	
Dräger X-am 3000 Module	83 17 719	
Dräger X-am 7000 Module	83 17 705	
Accessories		
Module adapter (incl. Dräger CC Vision E-Cal)	83 16 555	
Purge Module	83 16 560	
On demand regulator	83 16 556	
Instrument single charger (to charge the portable instrument in an Dräger E-Cal module)		
Dräger MiniWarn single charger	83 16 990	
Dräger Multiwarn II single charger	83 16 991	
Dräger Pac III single charger	83 15 635	
Dräger Pac Ex 2 single charger	83 16 990	
Dräger X-am 3000 single charger		
Dräger X-am 7000 single charger	83 15 635	



Dräger E-Cal

83 15 635

ST-574-2005

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Dräger Bump Test Station

Description	Concentration	Remaining	Туре	Order no.
Complete (incl. 8AL calibration gas cylinder)				
Dräger Bump Test Station Dräger Pac 1000	- 7000			83 18 586
Dräger Bump Test Station Dräger X-am 1/2/	5000			83 19 130
Dräger Bump Test Station Dräger X-am 300	00			83 19 071
Dräger Bump Test Station Dräger X-am 700	0			83 19 072

Test and calibration gases

Ammonia	NΗ ₃	50	ppm	in N ₂	58 Liter, 8AL	68 11 352
Ammonia	NH ₃	100	ppm	in N ₂	58 Liter, 8AL	68 10 387
Ammonia	NH ₃	300	ppm	in N ₂	58 Liter, 8AL	68 11 353
Butane	n-C ₄ H ₁₀	0.9	Vol.%	in air	103 Liter, 6D	68 10 987
i-Butylene	i-C ₄ H ₈	100	ppm	in air	34 Liter, 2AL	68 10 687
Carbon Dioxide	CO ₂	2.5	Vol.%	in air	58 Liter, 8AL	68 10 391
Carbon Monoxide	CO	50	ppm	in N ₂	103 Liter, 6D	45 02 153
Carbon Monoxide	CO	50	ppm	in air	58 Liter, 8AL	68 11 117
Carbon Monoxide	CO	100	ppm	in N ₂	103 Liter, 6D	68 10 392
Carbon Monoxide	CO	250	ppm	in air	58 Liter, 8AL	68 11 354
Chlorine	Cl ₂	5	ppm	in N ₂	58 Liter, 8AL	36 02 322
Chlorine	Cl ₂	10	ppm	in N ₂	58 Liter, 8AL	68 10 641
Hexane	C ₆ H ₁₄	0.48	Vol.%	in air	31 Liter, 6D	68 10 988
Hydrogen	H_2	2	Vol.%	in air	103 Liter, 6D	68 10 388
Hydrogen Chloride	HCI	10	ppm	in N_2	58 Liter, 8AL	68 10 643
Hydrogen Chloride	HCI	25	ppm	in N_2	58 Liter, 8AL	45 94 626
Hydrogen Cyanide	HCN	10	ppm	in N_2	58 Liter, 8AL	68 10 642
Hydrogen Sulphide	H_2S	20	ppm	in air	58 Liter, 8AL	68 10 393
Hydrogen Sulphide	H_2S	25	ppm	in N_2	58 Liter, 8AL	45 02 155
Hydrogen Sulphide	H_2S	100	ppm	in N_2	58 Liter, 8AL	36 02 359
Methane	CH_4	2	Vol.%	in air	103 Liter, 6D	68 10 389
Methane	CH ₄	2	Vol.%	in air	58 Liter, 8AL	68 11 116
Methane	CH ₄	2.5	Vol.%	in air	103 Liter, 6D	36 03 006
Methane	CH ₄	50	Vol.%	in N_2	34 Liter, 2AL	68 11 022
Nitrogen (UHP)	N_2	99.999	Vol.%	in air	103 Liter, 6D	68 10 394
Nitrogen Dioxide	NO_2	10	ppm	in N_2	58 Liter, 8AL	68 10 646
Nitrogen Monoxide	NO	10	ppm	in N_2	58 Liter, 8AL	68 10 986
Nitrogen Monoxide	NO	25	ppm	in N_2	34 Liter, 2AL	68 10 644
Oxygen	O_2	18	Vol.%	in N_2	58 Liter, 8AL	68 11 250
Pentane	C_5H_{12}	0.75	Vol.%	in air	75 Liter, 6D	68 10 761
Phosphine	PH_3	0.5	ppm	in N_2	58 Liter, 8AL	68 10 647
Propane	C ₃ H ₈	0.9	Vol.%	in air	103 Liter, 6D	68 10 390
Propane	C ₃ H ₈	0.9	Vol.%	in air	58 Liter, 8AL	68 11 118
Sulphur Dioxide	SO_2	10	ppm	in N_2	58 Liter, 8AL	68 10 645
60 Vol.% CH ₄ / 40 Vol.% CO ₂					34 Liter, 2AL	68 10 935
8 Vol.% C ₄ H ₁₀ / 13.8 Vol.% CO ₂					15 Liter, 2AL	68 11 004
25 ppm H ₂ S / 100 ppm CO / 0.4	45 Vol.% (C ₅ H ₁₂ / in	air		58 Liter, 8AL	45 94 944
15 ppm H_2S / 50 ppm CO / 2.5 Vol.% CH_4 / 18 Vol.% O_2 58 Liter, 8AL					68 11 130	
15 ppm H ₂ S / 2 Vol.% CO ₂ / 2.5	Vol.% CH	₄ / 18 Vo	I.% O ₂		58 Liter, 8AL	68 11 131



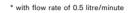
Dräger Bump Test Station



Test- and calibration

Regulators for disposable cylinders*

Description	Order no.
Standard regulator	68 10 397
Trigger regulator	68 10 649
On demand regulator, model 2001	83 16 556
Dräger E-Cal regulator with DIN14 adapter	68 10 692
Dräger Multi-PID 2 regulator	68 10 688





Accessories

Carrying case	68 11 181
This hard shell transport case has room for	
two cylinders (8AL or 6D) and regulators.	
Recycle Tool	68 11 182
This Recycle Tool is used to prevent the cylinder valve from being	
used to refill the cylinder. The cylinder is then aluminium	
or steel waste and can be disposed of as waste metal.	
If you need an additional gas not listed here, we can easily provide	
what you are looking for.	
Other gases on request (given sufficient demand)	19 63 384
The concentrations of all test and calibration gases are ideal	
for calibration and function testing of DrägerSensors.	



Carrying case

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Calibration accessories

Description	Order no.
Dräger Multiwarn II calibration adapter 1 (without int. pump)	83 13 644
for calibration with test gas cylinder	
Dräger Multiwarn II calibration adapter 2	68 09 325
for calibration of vapours with calibration chamber	
(also suitable for Dräger MiniWarn)	
Dräger Multiwarn II calibration adapter 3	83 14 041
for calibration with calibration bottle/ampoules	
Dräger MiniWarn calibration adapter 1	64 08 135
a) for calibration with test gas cylinder	
b) for calibration with calibration bottle	
for b), use with calibration bottle adapter	68 04 620
Dräger MiniWarn calibration adapter 2	68 09 325
for calibration of vapours with calibration chamber	
Dräger Pac II/Pac Ex/Pac III calibration adapter	68 06 291
Dräger Pac Ex 2 calibration adapter	83 16 300
Dräger Pac Ex 2 vapour calibration adapter	AG 02 547
Dräger X-am 3000 calibration adapter	83 17 336
Dräger X-am 7000 calibration adapter 2	83 17 970
Dräger X-am 7000 calibration adapter	83 17 656
Dräger Pac 1000 - 7000 calibration adapter	83 18 588
Dräger X-am 1/2/5000 calibration cradle	83 18 752

Hoses

Hose, electrically conductive, not suitable for H ₂ S	11 80 681
Viton hose, solvent-resistant, also suitable for H ₂ S	12 03 150

Calibration chamber and accessories

Calibration chamber for solvents	68 02 206
Calibration bottle for ampoules	68 03 407



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Calibration ampoules*

Description			Order no.
Ampoule CO	100	ppm	68 07 920
Ampoule CO	300	ppm	68 07 921
Ampoule H ₂ S	10	ppm	68 08 140
Ampoule H ₂ S	20	ppm	68 08 141
Ampoule H ₂ S	40	ppm	68 08 142
Ampoule H ₂ S	100	ppm	68 08 143
Ampoule NO ₂	10	ppm	68 07 765
Ampoule NO ₂	50	ppm	68 07 766
Ampoule NH ₃	50	ppm	68 07 924
Ampoule NH ₃	300	ppm	68 07 923
Ampoule SO ₂	10	ppm	68 07 763
Ampoule SO ₂	4	ppm	68 07 926
Ampoule SO ₂	1	ppm	68 07 925
Ampoule Cl ₂	8	ppm	68 07 928
Ampoule HCN	10	ppm	68 07 929

^{*} Set of five ampoules

Configuration accessories

Software	
Dräger CC-Vision	64 08 515
Dräger microPac software set incl. Dräger microPac Vision PC software and	64 08 505
calibration adapter	
Dräger microPac complete set incl. Dräger microPac Vision software,	64 08 500
IR interface with cable and IR interface positioning aid	
Dräger Pac Vision software, complete with USB cable	83 18 587
Interfaces	
Dräger Pac III RS 232 cable 9-25, incl. adapter from 25- to 9-pole	64 08 257
RS 232 cable, incl. Dräger Multiwarn II interface, incl. adapter from 9- to 25-pole	83 14 000
RS 232 cable, incl. Dräger MiniWarn/Dräger microPac/Dräger X-am 7000 interface,	64 08 140
incl. adapter from 9- to 25-pole	
RS 232 cable 9-25 Dräger Pac Ex 2/Dräger X-am 3000,	64 08 257
incl. adapter 25- to 9-pole	
USB Dira + USB cable for Dräger MiniWarn and Dräger X-am 7000	83 17 409



räger CC-Vision.

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