ONE VISION. ZERO EMISSIONS.



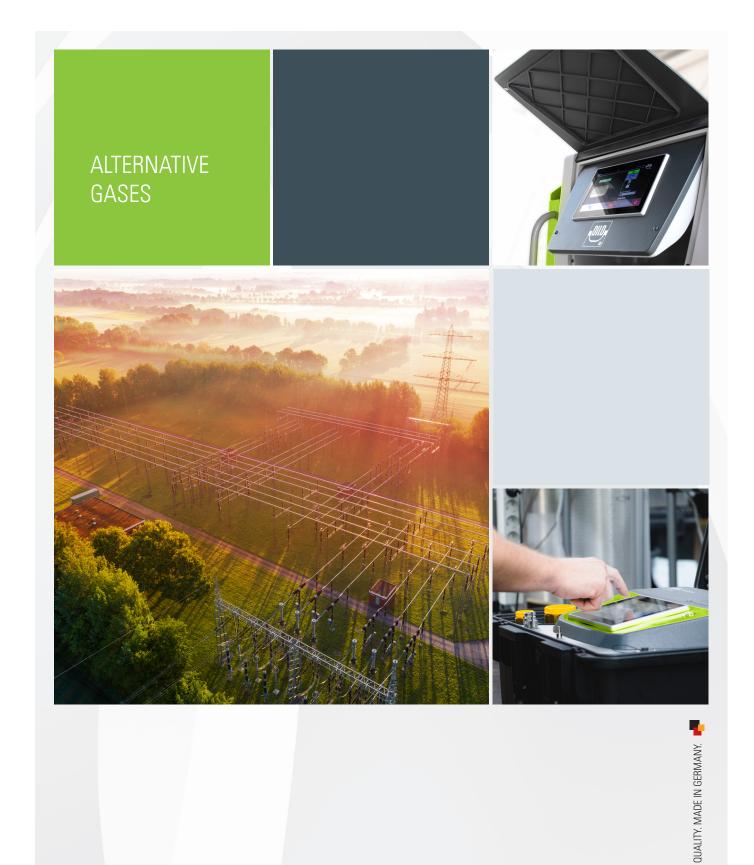


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FULL-RANGE SUPPLIER FOR ALTERNATIVE GASES



THE FUTURE AT DILO HAS ALREADY BEGUN

Massive changes and joint efforts will be necessary all over the world to achieve the ambitious goals on the path to carbon neutrality. With DILO being a pioneer in SF_6 gas handling with decades of experience and global expertise you can rely on our competencies and know-how

Our DILO "ONE VISION.ZERO EMISSIONS" philosophy has driven us to independently and proactively develop a comprehensive portfolio for Alternative Gases to offer our customers mature equipment and services.

When developing equipment for handling Alternative Gases, we combine proven procedures and experience with the requirements of new gas mixtures. This ensures that the handling of Alternative Gases does not differ significantly from that of SF_6 gas and you can trust in familiar user-friendliness.

With our well-proven and tested 'Zero Emission Concept' we have defined a closed technological cycle for alternative quenching and insulating gases that covers all gas handling processes with high reliability and without emissions. Not only can you rely on the usual DILO support, but also on our high inhouse competence. Thanks to close cooperation with manufacturers and operators we guarantee that our products and services for Alternative Gases meet all your requirements.

READY FOR USE WITH DILO CERTIFIED GAS

As part of our 'DILO Certified Gas' range of services we supply ready-prepared mixtures of Alternative Gases in gaseous or liquid form to fit your specifications, DILO quality certificate included. We prepare gas mixtures based on C4-FN and C5-FK, but we also supply other insulating gas mixtures, exactly according to your requirements.

Consequently, there is no need to transport the individual gas components and to mix the gases on site. This results in high accuracy of the required gas mixtures as well as saving time and money and thus higher operating efficiency.

Instead of ultimate disposal, DILO takes care of your unusable gas mixtures, purifies individual components from the gas mixture and provides you with new gas mixtures of highest quality. Thus, you benefit from:

- » Reduced disposal costs
- » Improved 'carbon footprint' by reconditioning and reuse
- » Quick processing of all operations
- » Direct availability of new, individual gas mixtures

The DILO laboratory offers a wide range of gas chromatographic and FT-IR spectroscopic analyses in the field of alternative gas mixtures based on C4-FN and C5-FK.

We also offer analysis for a wide range of other gases - please do not hesitate to contact us!





FULL-RANGE SUPPLIER FOR ALTERNATIVE GASES



DILO PRODUCT LINES C4-FN, C5-FK AND CA

We offer all equipment for the emission-free handling of gas mixtures based on C4-FN or C5-FK, ranging from service and measuring devices, recovery devices for gas mixtures as well as mixing units. But we also have the most suitable solutions for handling other gas mixtures with carbon dioxide (CO_2), nitrogen (N_2) or oxygen (O_2).



Our equipment allows emission-free filling and recovery of medium and high voltage gas compartments. Our main focus is on the user's familiarity and knowledge in operating DILO SF_6 gas handling units. The gas quality can also be reliably determined in the usual way and any leaks be detected thoroughly. Trust in our expertise for customised solutions for other quenching and insulating gases, gas mixtures and individual requirements.

In case of any questions please do not hesitate to contact us. We are pleased to assist you.

Contact:

sales@dilo-gmbh.com





For professional handling of gas mixtures

C4-B095R12

Compressor unit for gas mixtures with C4-FN

Operating voltage: 100 - 240 V / 50 - 60 Hz alternating current

C5-B095R12

Compressor unit for gas mixtures with C5-FK

Operating voltage: 100 - 240 V / 50 - 60 Hz alternating current



The MINI SERIES $^{C4/C5}$ is perfectly suited for efficient gas handling of small gas compartments and gas recovery down to < 5 mbar. It is specially provided for the handling of gas mixtures based on C4-FN or C5-FK.

The handy individual MINI components for recovery, consisting of a compressor and a vacuum compressor, are connected to the unit via wire braided hoses.

Gas compartments can be filled directly with gaseous mixtures from pressure vessels via the integrated pressure reducer.

Technical Data:

Dimensions: L 455 mm, W 310 mm, H 370 mm	
Weight: 28 kg	

Standard equipment:

Oilfree DILO compressor (1.6 m³/h [at 50 Hz], 25 bar; 1.9 m³/h [at 60 Hz], 25 bar)
Particle filter
Gauge
Filling pressure reducer
DILO couplings DN8 (C4-FN – M28 or C5-FK – M24)
Electric control
3 m long electrical connecting cable
Paint: green-anthracite
Operating manual

Optional accessories at an extra charge:

Storage connection with wire braided hose DN8 / 5 m long, DILO coupling DN8 (M28), ball valve DN8 and cylinder connection - C4-FN	C4-6-1401-R050
Storage connection with wire braided hose DN8 / 5 m long, DILO coupling DN8 (M24), ball valve DN8 and cylinder connection - C5-FK	C5-6-1401-R050
2 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M28) - C4-FN	C4-6-1130-R020
2 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M24) - C5-FK	C5-6-1130-R020
5 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M28) - C4-FN	C4-6-1130-R050
5 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M24) - C5-FK	C5-6-1130-R050
Aluminium transport case	3-781-R021

Spare parts kit:

Spare parts kit for compressor	6-1081-R010
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Packing for C4/C5-B095R12	3-748-R003-C
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MINI SERIES C4/C5



For professional handling of gas mixtures

C4-B093R30

Vacuum compressor unit for gas mixtures with C4-FN

Operating voltage: 220 - 240 V / 50 - 60 Hz alternating current

C5-B093R30

Vacuum compressor unit for gas mixtures with C5-FK

Operating voltage: 220 - 240 V / 50 - 60 Hz alternating current

For recovery only in conjunction with the C4/C5-B095R12 compressor unit



Technical Data:

Dimensions: L 510 mm, W 325 mm, H 290 mm

Weight: 24 kg

Standard equipment:

Vacuum compressor for recovery of gas mixtures (3.3 m³/h [at 50 Hz]; 3.9 m³/h [at 60 Hz], final vacuum < 5 mbar)

Solenoid valve

Pressure sensor

Digital vacuum indication (0 - 400 mbar)

DILO couplings DN8 (C4-FN - M28 or C5-FK - M24)

Electric control

2 m long electrical connecting cable

Paint: green-anthracite

Operating manual

Optional accessories at an extra charge:

2 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M28) - C4-FN	C4-6-1130-R020
2 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M24) - C5-FK	C5-6-1130-R020
5 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M28) - C4-FN	C4-6-1130-R050
5 m long wire braided hose DN8 with DILO coupling tongue part DN8 on both ends (M24) - C5-FK	C5-6-1130-R050
Aluminium transport case	3-781-R017

Spare parts kit:

Spare parts kit for vacuum compressor	05-1647-R100
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Packing:

Packing for C4/C5-B093R30	3-748-R003-C
	3-1 1 0-11003-0

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MINI SERIES C4/C5



Portable vacuum pump unit for the evacuation of air

C4/C5-B078R09 (with ball valve)

Operating voltage: 208 - 240 V / 50 - 60 Hz alternating current

C4/C5-B078R09S15 (with ball valve)

Operating voltage: 110 - 127 V / 60 Hz alternating current

C4/C5-B078R19 (with solenoid valve)

Operating voltage: 208 - 240 V / 50 - 60 Hz alternating current

C4/C5-B078R19S15 (with solenoid valve)

Operating voltage: 110 - 127 V / 60 Hz alternating current



Technical data:

Dimensions: L 435 mm, W 270 mm, H 370 mm

Weight: 29 kg

Standard equipment:

Vacuum pump for evacuation of air 16 m³/h (at 50 Hz) and 19 m³/h (at 60 Hz), final vacuum < 1 mbar

DILO couplings DN20 (45X2)

Ball valve or solenoid valve DN20

Digital vacuum indication (0 - 400 mbar)

3 m long electrical connecting cable

Paint: anthracite

Operating manual

Optional accessories at an extra charge:

5 m long wire braided hose DN8 with coupling tongue part DN8 (M28) on one end and coupling tongue part DN20 (M48) on the other end - C4-FN	C4-6-1173-R050
5 m long wire braided hose DN8 with coupling tongue part DN8 (M24) on one end and coupling tongue part DN20 (M43) on the other end - C5-FK	C5-6-1173-R050
Aluminium transport case	3-781-R024

Spare parts kit:

Annual maintenance kit for vacuum pump	6-1048-R111
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Packing:

Packing for C4/C5-B078R	3-748-R003-C
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C 4619-01

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ECONOMY SERIES C4/C5



Alternative Gases – Our joint contribution to climate protection

C4-G057R01

Service cart for C4-FN

C5-G057R01

Service cart for C5-FK

Our customers rely on and trust in well-proven and safe gas handling which has been thoroughly tried and tested for decades. This principle is also true for our G057 ECONOMY Series for Alternative Gases. DILO sets highest priorities to zero emissions with this series for gas mixtures with C4-FN and C5-FK.

This allows the complete gas handling of Alternative Gases in gaseous and liquid state to be carried out efficiently and safely on site in the usual manner. Thanks to a state-of-the-art control system, all essential functions run automatically and are operated and clearly displayed on a 10" touch screen. The operating software with intuitive navigation in several languages makes operation simple and convenient. This is also reflected in the operating safety of the service cart: the use of couplings adapted to the type of gas prevents unintended confusion.



Switching between different mixing ratios of the Alternative Gas is possible at any time with the optionally available compressor unit for easy gas recovery of the service cart.

Thanks to the integrated buffer tank it is easy to homogeneously fill the gas compartments, independent of the gas compartment size. Thus, a gas compartment with 1000l and 5 bar pa can be recovered down to 1mbar in only 106 minutes when using the DN20 coupling. Not only does the metal casing of the service cart protect the internal components, but also noticeably reduces the noise level. As an option, the service cart can also be operated by remote control via mobile devices such as smartphones, tablets or laptops.

The innovative ECONOMY series in ergonomic design satisfies our customers' requirements in daily use.

- Professional handling of gaseous and liquid gas mixtures
- Storage pressure of up to 100 bar for efficient gas storage
- Integrated buffer tank for storage of homogeneous gas mixtures
- Filling of the gas compartment up to 15 bar (optional)
- Induction heating system for quick gas withdrawal from liquefied cylinders
- Intuitive operation via 10" touch screen
- Optional remote control via mobile devices
- Automatic special functions for emission-free maintenance

C 4519-03





C4-G057R01

Service cart for C4-FN

C5-G057R01

Service cart for C5-FK

Technical data:

Dimensions: L 1.850 mm, W 1.000 mm, H 2.000 mm

Weight: 1.221 kg

Standard equipment:

Oilfree DILO compressor (5.7 $\,$ m³/h [at 50 Hz]; 6.8 $\,$ m³/h [at 60 Hz]), pressure 100 bar

Oilfree suction pump for recovery of gas mixtures (15 m³/h [at 50 Hz]; 18 m³/h [at 60 Hz]), final vacuum < 1 mbar)

Vacuum pump for evacuation of air (40 m³/h [at 50 Hz]; 48 m³//h [at 60 Hz], final vacuum < 1 mbar)

Operation and indication of the important process parameters via 10" touch screen with protective cover

Evaporator

Dry filter (molecular sieve)

Particle filter 1 µm

Induction heating system

Selectable pressure and vacuum units

Vacuum indication: 0 - 100 mbar, resolution accuracy 0.1 mbar

Digital weighing scales for gas mixture cylinders (with automatic function shut down), 0 - 120 kg with tare function, accuracy ±20 g

DILO couplings: on the inlet side: DN20, on the outlet side: DN8

Integrated 600l buffer tank for gaseous intermediate storage

2 m long storage connecting hose, coupling tongue part DN8

Fork lift slots

Crane eyelets

Lockable drawer for storing tools, adapters and hoses

Fixing and steerable rollers

Different wrenches

Protection class IP54

Sound pressure level < 70dB(A)

Paint: green-anthracite

Operating manual

Operating voltage:

208 - 240 V / 60 Hz	6-057SP-R051
380 - 440 V / 50 Hz or 380 - 480 V / 60 Hz	6-057SP-R052

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ECONOMY SERIES C4/C5



C4-G057R01 Service cart for C4-FN

C5-G057R01

Service cart for C5-FK

Optional additional equipment (mounted) at an extra charge for all service carts of the Economy series:

Additional price for electrical special voltage 200 V / 50 - 60 Hz 3-phase current	6-057SP-R053
Additional price for electrical special voltage 210 - 240 V 50 Hz 3-phase current	6-057SP-R054
Additional price for electrical special voltage 600 V / 60 Hz 3-phase current	6-057SP-R055
Vacuum pump, (63 m³/h [at 50 Hz]; 76 m³/h [at 60 Hz]), final vacuum < 1 mbar	6-057VP-R001
Vacuum pump, (100 m³/h [at 50 Hz], 120 m³/h [at 60 Hz]), final vacuum < 1 mbar	6-057VP-R002
Two-stage vacuum pump with exhaust filter, nominal suction capacity (55 m³/h [at 50 Hz]; 65 m³/h [at 60 Hz]), final vacuum 0.0067 mbar	6-057VP-R007
Precision vacuum sensor 100 mbar, resolution 0.001 mbar instead of 100 mbar, resolution 0.1 mbar for gas compartment A	K207R01
Precision vacuum sensor 100 mbar, resolution 0.001 mbar instead of 100 mbar, resolution 0.1 mbar for gas compartment B	K207R02
Additional price for integrated 1000l buffer tank for gaseous intermediate storage	6-057DB-R001
Automatic control and function shut down (evacuation, filling, gas recovery) when reaching the corresponding final values	K141R11
Gas recovery unit for switching over between different mixing ratios	
C4-FN	C4-K250R01
C5-FK	C5-K250R01
Tarpaulin (anthracite)	6-057KA-R002
Chassis with solid tired wheels Ø 400 mm	6-057FG-R001
Relief of fixing and steerable rollers for transport	K223R057
Relief of fixing and steerable rollers for transport Additional coupling DN20 (gas compartment B) for simultaneous evacuation and recovery or filling	
	C4-K177R12
Additional coupling DN20 (gas compartment B) for simultaneous evacuation and recovery or filling	
Additional coupling DN20 (gas compartment B) for simultaneous evacuation and recovery or filling C4-FN	C4-K177R12
Additional coupling DN20 (gas compartment B) for simultaneous evacuation and recovery or filling C4-FN C5-FK	C4-K177R12 C5-K177R12

Optional equipment at an extra charge for all service carts of the Economy series:

5 m long wire braided hose DN20 with protective sheathing and DN20 (M48) coupling tongue part on both ends - C4-FN	C4-6-1069-R050
5 m long wire braided hose DN20 with DN20 (M48) coupling tongue part on both ends - C4-FN	C4-6-1024-R050
5 m long wire braided hose DN20 with protective sheathing and DN20 (M43) coupling tongue part on both ends - C5-FK	C5-6-1069-R050
5 m long wire braided hose DN20 with DN20 (M43) coupling tongue part on both ends - C5-FK	C5-6-1024-R050
Electrical connecting cable 5 x 6 AWG 9 for 380 – 600 V (available lengths 5 - 30 m)	6-1053-R003
Electrical connecting cable 5 x 10 AWG 7 for 200 – 240 V (available lengths 5 - 30 m)	6-1053-R005

Spare parts kits for G057R01:

Annual maintenance kit for G057R01 with standard vacuum pump (40 m³/h)	C4-6-1048-R431
Annual maintenance kit for G057R01 with 6-057VP-R001 (63 m³/h) / R002 (100 m³/h) vacuum pump	C4-6-1048-R432
Annual maintenance kit for G057R01 with 2-stage 6-057VP-R007 vacuum pump	C4-6-1048-R433
Spare parts kit for compressor	6-1373-R013/ -R004
Spare filter kit (for dry and particle filter)	C4-6-1101-R122

Packing for G057R01:

Packing for G057R01 with 600I buffer tank	3-751-R018-C
Packing for G057R01 with 1000l buffer tank	3-751-R014-C

ECONOMY-RECLAIMER C4/C5



For professional handling of gas mixtures

C4-G057R51 Unit for recovery of gas mixtures with C4-FN C5-G057R51

Unit for recovery of gas mixtures with C5-FK

This model range has been specially developed for the emission-free recovery of gas mixtures based on C4-FN or C5-FK and its specific requirements and allows gas recovery down to a final vacuum of < 1 mbar. The devices are equipped with a compressor temperature control specially adapted to the gas mixtures. The maximum storage pressure is 100 bar (pe) and thus allows liquid storage of the gas mixture. The recovered gas quantity can be determined accurately by the integrated digital scales. A useful tool tray is also available for storing accessories and hoses.



- Storage of liquid gas mixtures
- Recovery of gas mixtures down to < 1 mbar
- Automatic control und 7" touch screen
- Display of the most important process parameters
- Indication units selectable on the panel (e.g. bar/mbar/kg)
- Digital weighing scales for storage cylinders
- DILO threads adapted to the basic gas to prevent incorrect connection

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For professional handling of gas mixtures

C4-G057R51

Unit for recovery of gas mixtures with C4-FN

C5-G057R51

Unit for recovery of gas mixtures with C5-FK

Technical data:

Dimensions: L 1.850 mm, W 1.100 mm, H 1.350 mm

Weight: 660 kg

Standard equipment:

Oilfree DILO compressor (5.7 m3/h [at 50 Hz]; 6.8 m³/h [at 60 Hz]), pressure 100 bar

Oilfree suction pump (15 m3/h [at 50 Hz], 18 m³/h [at 60 Hz], final vacuum < 1 mbar)

Operation and indication of the most important process parameters via 7" touch screen

DILO couplings: on the inlet side: DN20, on the outlet side: DN8

Storage connecting hose

Particle filter

Dry filter (molecular sieve)

Digital weighing scales for storage cylinders (with automatic function shut down) 0 - 120 kg with tare function, accuracy ±20 g

Indicating instruments in bar / mbar

Frame with crane eyelets

Fixing and steerable rollers

Different wrenches

Storage tray

Operating manual

Paint: green-anthracite

Operating voltage:

208 - 240 V / 60 Hz

380 - 440 V / 50 Hz or 380 - 480 V / 60 Hz

Optional accessories at an extra charge:

5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M48) - C4-FN	C4-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M48) - C4-FN	C4-6-1024-R050
5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M43) - C5-FK	C5-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M43) - C5-FK	C5-6-1024-R050
Electrical connecting cable 5 x 6 AWG 9 for 380 – 600 V (available lengths 5 - 30 m)	6-1053-R003
Electrical connecting cablel 5 x 10 AWG 7 for 200 – 240 V (available lengths 5 - 30 m)	6-1053-R005

Packing for C4/C5-G057R51	3-751-R015-C
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MEGA-RECLAIMER C4/C5



For professional handling of gas mixtures

C4-G170R51
Unit for recovery of gas mixtures with C4-FN
C5-G170R51
Unit for recovery of gas mixtures with C5-FK

This model range has been specially developed for the emission-free recovery of gas mixtures based on C4-FN or C5-FK and its specific requirements and allows gas recovery down to a final vacuum of < 1 mbar. The devices are equipped with a compressor temperature control specially adapted to the gas mixtures. The maximum storage pressure is 100 bar (pe) and thus allows liquid storage of the gas mixture. The recovered gas quantity can be determined accurately by the integrated digital scales. A useful tool tray is also available for storing accessories and hoses.



- Storage of liquid gas mixtures
- Recovery of gas mixtures down to < 1 mbar
- Automatic control und 7" touch screen
- Display of the most important process parameters
- Indication units selectable on the panel (e.g. bar/mbar/kg)
- Digital weighing scales for storage cylinders
- DILO threads adapted to the basic gas to prevent incorrect connection





For professional handling of gas mixtures

C4-G170R51

Unit for recovery of gas mixtures with C4-FN

C5-G170R51

Unit for recovery of gas mixtures with C5-FK

Technical data:

Dimensions: L 1.850 mm, W 1.100 mm, H 1.350 mm

Weight: 660 kg

Standard equipment:

Oilfree DILO compressor (19 m³/h [at 50 Hz]; 15 m³/h [at 60 Hz]), pressure 100 bar

Oilfree suction pump (35 m³/h [at 50 Hz]; 42 m³/h [at 60 Hz]), final vacuum < 1 mbar

Operation and indication of the most important process parameters via 7" touch screen

DILO couplings: on the inlet side: DN20, on the outlet side: DN8

Storage connecting hose

Particle filter

Dry filter (molecular sieve)

Digital weighing scales for storage cylinders (with automatic function shut down) 0-120 kg with tare function, accuracy ± 20 g

Indicating instruments in bar / mbar

Frame with crane eyelets

Fixing and steerable rollers

Different wrenches

Storage tray

Operating manual

Paint: green-anthracite

Operating voltage:

208 - 240 V / 60 Hz

380 - 440 V / 50 Hz or 380 - 480 V / 60 Hz

Optional accessories at an extra charge:

5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M48) - C4-FN	C4-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M48) - C4-FN	C4-6-1024-R050
5 m long wire braided hose DN40 with coupling tongue part on both ends DN40 - C4-FN	C4-6-1076-R050
5 m long wire braided hose DN40 with coupling tongue part DN40 on one end and DN20 coupling tongue part on the other end - C4-FN	C4-6-1080-R050
5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M43) - C5-FK	C5-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part on both ends DN20 (M43) - C5-FK	C5-6-1024-R050
5 m long wire braided hose DN40 with coupling tongue part on both ends DN40 - C5-FK	C5-6-1076-R050
5 m long wire braided hose DN40 with coupling tongue part DN40 on one end and DN20 coupling tongue part on the other end - C5-FK	C5-6-1080-R050
Electrical connecting cable 5 x 6 AWG 9 for 380 – 600 V (available lengths 5 - 30 m)	6-1053-R003
Electrical connecting cablel 5 x 10 AWG 7 for 200 – 240 V (available lengths 5 - 30 m)	6-1053-R005

Packing für C4/C5-G170R51	3-751-R015-C

DEVICES FOR DETERMINATION OF THE C4-FN QUALITY



C4-3-039R-R... **MULTI-ANALYSER** C4

With its innovative equipment and intuitive user interface, the MultiAnalyser ^{C4} meets the user's requirements and is ready for operation immediately after switching on. High-quality manufacture and ergonomic design guarantee the quality standards for a compact and maintenance-friendly measuring device with high measuring accuracy. This multi-functional measuring device allows the emission-free determination of up to six measuring parameters with only one sample.

Depending on the individually combinable unit configuration, the following values can be determined:

- » Percentage of susbstance amount C4-FN in carbon dioxide CO₂ or nitrogen N₂ [%]
- » Moisture concentration [div.]
- » Percentage of susbstance amount oxygen 0, [%]
- » Percentage of susbstance amount carbon dioxide CO₂ [%]
- » Concentration carbon monoxide CO [ppm]

Thanks to the easy-to-remove integrated battery, transport regulations are no longer a problem. Our field-replaceable sensors offer a great benefit as the device is ready for use immediately after the exchange without any down time.



The MultiAnalyser ^{C4} allows different methods of operation for emission-free handling of the measured gas:

- » Internal storage of the measured gas (max. inlet pressure 35 bar p_a) within the device, in an external cylinder or an external gas collecting bag. For continuous measurements without pumping the gas back it is recommended to collect the gas in an external gas collecting bag.
- » Pumping the gas back into an external cylinder, vessel or gas compartment (up to 10 bar p_s).
- » The external bag can be emptied by using the MultiAnalyser ^{C4}, a DILO service cart or compressor unit.
- No gas emissions
- Modular interchangeability of the sensors
- Easy operation and intuitive menu navigation via high quality 7"
 Adjustable user languages: colour touch screen
- Storage of up to 500 measurement results with name, date and time
- Battery operated and / or external power supply
- USB and LAN connection
- DE, EN, FR, ES, IT, PT, CZ, PL, CN, JPN, RUS
- Compact trolley case, easy to transport

DEVICES FOR DETERMINATION OF THE C4-FN QUALITY



C4-3-039R-R...

MULTI-ANALYSER C4

Precise and correct results for subsequent measurements can be guaranteed by purging the measuring hose prior to each measurement. The gas is stored internally.

Another big advantage of the MultiAnalyser $^{\text{C4}}$ is its high precision. The gas moisture is measured at operating pressure. Thus, very precise results are obtained during a short measuring time even in the critical dew point range (< -40 °C). The dew point is calculated at ambient pressure.

The device is extremely easy to maintain. The remaining lifetime of the electrochemical sensors is automatically displayed.

Technical data:

Dimensions: L 406 mm, W 538 mm, H 269 mm

Weight: 25 kg

Inlet pressure: p_a 0.2 – 35 bar

Operating temperature: -10 °C to +50 °C

Ambient moisture: max. 90 % relative moisture, non condensing during operation

Operating voltage: 85-264 VAC, 47-63 Hz

Number of measured values to be stored internally: 500

Interface: USB/LAN

Measuring time: variably calculated by the system, max. 7 minutes

Limit values can be set individually for each sensor

Indication of moisture concentration in dew point °C or °F, referred to atmospheric or inlet pressure, reversible to indication in ppm,

Inlet pressure indication in bar p_a or p_a, psi, kPa, MPa

Standard equipment:

Transport case; 6 m long connecting hose with DILO couplings DN8 (M28x1,5) and DN20 (M48x2); 2 m long connecting cable

USB stick with data file for evaluation and reading out of measured data

Operating manual

DEVICES FOR DETERMINATION OF THE C4-FN QUALITY



C4-3-039R-R... MULTI-ANALYSER C4

Sensor Data:					
	Mole percent * C4-FN in carbon dioxide (CO ₂) or nitrogen (N ₂)	Moisture	Mole percent oxygen (O₂)	Mole percent carbon dioxide (CO ₂)	Concentration carbon monoxide (CO)
Measuring principle	Non-dispersive infrared sensor (NDIR)	Electronic dew point measurement (capacitive)	Electrochemical reaction	Non-dispersive infrared sensor (NDIR)	Electrochemical reaction
Measuring range	0 – 10 mol-%	−60 °C to +20 °C	0 – 25 mol-%	0 – 100 mol-%	0 — 500 ppm
Measuring accuracy	≤±0.1 Mol-% (at < 7%) ≤±0.2 Mol-% (at ≥7%)	$\leq \pm 2$ °C (at > -40 °C) $\leq \pm 3$ °C (at < -40 °C)	≤ ±0.2 % mol-%	≤±2 mol-%	≤ ±2 % of measuring range
Recommended calibration interval	2 years	2 years	2 years lifetime	2 years	2 years lifetime

^{*}Mol-% represents the amount of substance in a mixture and is equivalent to the ideal volume fraction. Its size is independent of pressure and temperature.

Available options of the MultiAnalyser C4:

Single measuring device: Percentage C4-FN in CO ₂ (%)	C4-3-039R-R101
Two-in one measuring device: Percentage C4-FN in $\mathrm{CO_2}$ (%) and moisture	C4-3-039R-R201
Three-in-one measuring device: Percentage C4-FN in $\mathrm{CO_2}$ (%), moisture and oxygen $\mathrm{O_2}$ (%)	C4-3-039R-R301
Four-in-one measuring device: Percentage C4-FN in N ₂ (%), moisture, oxygen O ₂ (%) and carbon moxide CO (ppm)	C4-3-039R-R405
Five-in-one measuring device: Percentage C4-FN in CO_2 (%), moisture, oxygen O_2 (%), carbon dioxide CO_2 (%) and carbon moxide CO_2 (ppm)	C4-3-039R-R501

Other versions are available on request.

Optional accessories at an extra charge:

External compressor for increase of pressure for application of the MultiAnalyser $^{\text{C4}}$ in medium voltage switchgear with a pressure of < 0.2 bar $p_{_{\rm e}}$	3-826-R003
Discharge gas collecting bag	B151R95
Adapter case for measuring device	On request
6 m long connecting hose with self-closing couplings (as extension hose)	3-531-R060

Packing for C4-3-039R-R	3-775-R104
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DEVICES FOR DETERMINATION OF THE C5-FK QUALITY



C5-3-039R-R... MULTI-ANALYSER C5

With its innovative equipment and intuitive user interface, the MultiAnalyser ^{C5} meets the user's requirements and is ready for operation immediately after switching on. High-quality manufacture and ergonomic design guarantee the quality standards for a compact and maintenance-friendly measuring device with high measuring accuracy. This multi-functional measuring device allows the emission-free determination of up to six measuring parameters with only one sample.

Depending on the individually combinable unit configuration, the following values can be determined:

- » Percentage of susbstance amount C5-FK in carbon dioxide CO₂ or nitrogen N₂[%]
- » Moisture concentration [div.]
- » Percentage of susbstance amount oxygen 0, [%]
- » Percentage of susbstance amount carbon dioxide [%]
- » Concentration carbon monoxide CO [ppm]

Thanks to the easy-to-remove integrated battery, transport regulations are no longer a problem. Our field-replaceable sensors offer a great benefit as the device is ready for use immediately after the exchange without any down time.



The MultiAnalyser ^{C5} allows different methods of operation for emission-free handling of the measured gas:

- » Internal storage of the measured gas (max. inlet pressure 35 bar p_e) within the device, in an external cylinder or an external gas collecting bag. For continuous measurements without pumping the gas back it is recommended to collect the gas in an external gas collecting bag.
- » Pumping the gas back into an external cylinder, vessel or gas compartment (up to 10 bar p_e).
- » The external bag can be emptied by using the MultiAnalyser ^{C5}, a DILO service cart or compressor unit.
- No gas emissions
- Modular interchangeability of the sensors
- Easy operation and intuitive menu navigation via high quality 7" colour touch screen
- Storage of up to 500 measurement results with name, date and time
- Battery operated and / or external power supply
- USB and LAN connection
- Adjustable user languages: DE, EN, FR, ES, IT, PT, CZ, PL, CN, JPN, RUS
- Compact trolley case, easy to transport

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DEVICES FOR DETERMINATION OF THE C5-FK QUALITY



C5-3-039R-R...

MULTI-ANALYSER C5

Precise and correct results for subsequent measurements can be guaranteed by purging the measuring hose prior to each measurement. The gas is stored internally.

Another big advantage of the MultiAnalyser C5 is its high precision. The gas moisture is measured at operating pressure. Thus, very precise results are obtained during a short measuring time even in the critical dew point range (< -40 $^{\circ}$ C). The dew point is calculated at ambient pressure.

The device is extremely easy to maintain. The remaining lifetime of the electrochemical sensors is automatically displayed.

Technical data:

Dimensions: L 406 mm, W 538 mm, H 269 mm

Weight: 25 kg

Inlet pressure: p_o 0.2 – 35 bar

Operating temperature: -10 °C to +50 °C

Ambient moisture: max. 90 % relative moisture, non condensing during operation

Operating voltage: 85-264 VAC, 47-63 Hz

Number of measured values to be stored internally: 500

Interface: USB/LAN

Measuring time: variably calculated by the system, max. 7 minutes

Limit values can be set individually for each sensor

Indication of moisture concentration in dew point °C or °F, referred to atmospheric or inlet pressure, reversible to indication in ppm_v

Inlet pressure indication in bar p_a or p_a, psi, kPa, MPa

Standard equipment:

Transport case; 6 m long connecting hose with DILO couplings DN8 (M28x1,5) and DN20 (M48x2); 2 m long connecting cable

USB stick with data file for evaluation and reading out of measured data

Operating manual

DEVICES FOR DETERMINATION OF THE C5-FK QUALITY



C5-3-039R-R... MULTI-ANALYSER C5

Sensor data:					
	Mole percent * C5-FK in carbon dioxide (CO ₂) or nitrogen (N ₂)	Moisture	Mole percent oxygen (O₂)	Mole percent carbon dioxide (CO ₂)	Concentration carbon monoxide (CO)
Measuring principle	Non-dispersive infrared sensor (NDIR)	Electronic dew point measurement (capacitive)	Electrochemical reaction	Non-dispersive infrared sensor (NDIR)	Electrochemical reaction
Measuring range	0 – 15 mol-%	−60 °C to +20 °C	0 – 25 mol-%	0 – 100 mol-%	0 — 500 ppm
Measuring accuracy	≤±0.1 Mol-% (at < 7%) ≤±0.2 Mol-% (at ≥7%)	$\leq \pm 2$ °C (at > -40 °C) $\leq \pm 3$ °C (at < -40 °C)	≤ ±0.2 % mol-%	≤±2 mol-%	≤ ±2 % of measuring range
Recommended calibration interval	2 years	2 years	2 years lifetime	2 years	2 years lifetime

^{*}Mol-% represents the amount of substance in a mixture and is equivalent to the ideal volume fraction. Its size is independent of pressure and temperature.

Available options of the MultiAnalyser ^{C5}:

Single measuring device: Percentage C5-FK (%) in N ₂	C5-3-039R-R111
Single measuring device: Percentage C5-FK (%) in CO ₂	C5-3-039R-R112
Two-in-one measuring device: Percentage C5-FK (%) in N ₂ and moisture	C5-3-039R-R211
Two-in-one measuring device: Percentage C5-FK (%) in ${\rm CO_2}$ and moisture	C5-3-039R-R212
Three-in-one measuring device: Percentage C5-FK (%) in N ₂ , moisture and oxygen O ₂ (%)	C5-3-039R-R311
Three-in-one measuring device: Percentage C5-FK (%) in CO ₂ , moisture and oxygen O ₂ (%)	C5-3-039R-R312
Five-in-one measuring device: Percentage C5-FK (%) in N_2 moisture, oxygen O_2 (%), carbon dioxide CO_2 (%) and carbon monoxide CO (ppm)	C5-3-039R-R511
Five-in-one measuring device: Percentage C5-FK (%) in CO_{2^r} moisture, oxygen O_2 (%), carbon dioxide CO_2 (%) and carbon monoxide CO (ppm)	C5-3-039R-R512

Other versions are available on request.

Optional accessories at an extra charge:

External compressor for increase of pressure for application of the MultiAnalyser $^{\text{C4}}$ in medium voltage switchgear with a pressure of < 0.2 bar $p_{\rm e}$	3-826-R003
Discharge gas collecting bag	B151R95
Adapter case for measuring device	
6 m long connecting hose with self-closing couplings (as extension hose)	3-531-R060

Packing für C5-3-039R-R	3-775-R104
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DEVICES FOR DETERMINATION OF THE GAS QUALITY



For verification of several parameters with only one measurement

CA-3-035R-R...

MIRROR-ANALYSER CA

This multi-functional device allows the determination of up to five quality parameters with only one measurement:

- » Moisture concentration (frost point / dew point)
- » Oxygen concentration 0₂[%]
- » NO NO₂ concentration (nitrogen oxides) [ppm]
- » Carbon dioxid CO₂ concentration [%]

The MirrorAnalyser ^{CA} uses the physical dew point mirror measuring principle which is characterised by its high precision and utmost reliability in order to measure the moisture content. By cooling the integrated mirror the moisture content of the gas is determined by measuring the temperature depending on the condensation or icing of the mirror. The other parameters of the gas quality are determined by electrochemical and non dispersive infrared sensors (NDIR sensor).



- High accuracy and reliability in moisture determination (dew point mirror measuring principle)
- No emissions of measuring gas (integrated gas return system)
- Modular interchangeability of the sensors
- Low maintenance due to self-test functions
- Easy and user-friendly menu navigation via high quality 7" capacitive colour touch screen
- Results of up to 500 measurements can be stored with name, date and time
- USB- and LAN connection
- Adjustable user languages: DE, EN, FR, ES
- Compact design, easy handling and transportation (installed in a trolley case)
- Optional remote control via mobile devices

DEVICES FOR DETERMINATION OF THE GAS QUALITY



CA-3-035R-R...

MIRROR-ANALYSER CA

The MirrorAnalyser ^{CA} is a compact, user- and maintenance-friendly device which guarantees high measuring precision. The unit allows different kinds of measurements and treatment of the measuring gas in one of the following ways:

- » The measuring gas can be stored in an internal storage vessel and pumped back into the gas compartment (up to 10 bar p,)
- » External storage of the measuring gas into a cylinder
 For measurements on cylinders, vessels or gas compartments with higher pressure (max. inlet pressure 35 bar p_e) or if the measuring gas should not be pumped back into the unit, a cylinder can be connected directly to the outlet (max. 10 bar p_e). It is not necessary to use a pressure reducer and to separate the device from the gas cylinder or the gas compartment.
- » External storage of the measuring gas into a gas collecting bag An external gas collecting bag can be connected allowing continuous measurements (inlet pressure max. 35 bar p_e) without pumping the gas back. Emptying the external bag via the MirrorAnalyser ^{CA} or connection to a service cart or compressor unit is possible.

Precise and correct results for subsequent measurements can be guaranteed by rinsing the measuring hose prior to each measurement. The device is very maintenance-friendly. The residual lifetime of the electrochemical sensor is indicated automatically. The dew point mirror has self-test functions.

Technical data:

Dimensions: L	500 mm	W 625 mm	H 207 mm	
Diffiensions, L	. וווווו טטכ	VV OZO IIIII.	. П 297 ШШ	

Weight: approx. 27.5 kg

Inlet pressure: pe 0.2 - 35 bar

Operating temperature: -10 °C bis +40 °C

Ambient moisture: max. 90 % relative moisture, non-condensing during operation

Operating voltage: 100 - 240 VAC 50/60 Hz

Number of measured values to be stored: max. 500

Interface: USB/LAN

Measuring time: variably calculated by the system (5-7 min; max. 10 min)

Limit values can be set individually for each sensor

Indication of moisture concentration in dew point °C or °F, referred to atmospheric or inlet pressure, reversible to indication in ppm,

Inlet pressure indication in bar pa or pe, psi, kPA, MPa

Standard equipment:

Transport case; 6 m long connecting hose with DILO couplings DN8 and DN20; 2 m long connecting cable

USB stick with data evaluation and reading out of measured data

Operating manual

DEVICES FOR DETERMINATION OF THE GAS QUALITY



CA-3-035R-R... MIRROR-ANALYSER CA

Sensor data:				
	Frost-/Dew point	Mole percent* Oxygen (O ₂)	Mole percent Nitrogen oxide (NO and NO ₂)	
Measuring principle	Dew point mirror (physical measuring principle)	Electrochemical reaction	Electrochemical reaction	
Measuring range	-50 °C to +20 °C	0 – 25 mol-%	NO: 0 — 25 ppm	NO ₂ : 0 — 20 ppm
Measuring accuracy	≤ ±0.5 °C	≤±0.2 % mol-%	≤ ±2 % of measuring range	
Recommended calibration interval	2 years	2 years lifetime	2 years lifetime	2 years lifetime

^{*}Mole % represents the amount of substance in a mixture and is equivalent to the ideal volume fraction. Its size is independent of pressure and temperature.

Available options of the MirrorAnalyser CA:

Single measuring device: moisture	CA-3-035R-R101
Two-in-one measuring device: moisture and oxygen O_{2}	CA-3-035R-R201
Four-in-one measuring device for moisture, oxygen O ₂ and nitrogen oxide NO _x (NO and NO ₂)	CA-3-035R-R401

Other versions are available on request.

Optional accessories at an extra charge:

External compressor for increase of pressure for application of the MirrorAnalyser CA in medium voltage switchgear with a pressure < 0.2 bar p_e	3-826-R003
Discharge gas collecting bag	B151R95
6 m long connecting hose with self-closing couplings (as extension hose)	3-531-R060
Remote control via mobile devices	K176R11
Kit for remote control router	K176R21
Kit for remote control router with extended functions	On request

Packing for CA-035R-R	3-775-R024-C	

DEVICES FOR C4-FN LEAK DETECTION



For quick detection and quantification of smallest leaks

C4-3-033-R400

LEAKSPY ^{C4} for gas mixtures with C4-FN

The cordless battery-operated LEAKSPY ^{C4} precisely measures the C4-FN concentration in air by means of a non-dispersive infrared sensor (NDIR sensor) and indicates the value on a graphic display in ppm. The device allows precise localisation of leaks by searching the highest C4-FN concentration. Thanks to the high resolution and detection limit, it is also possible to carry out integral measurements as well as measurements to determine the resolution and detection limit by means of this device.

To protect the device from particles the sensor is equipped with a filter which can be cleaned and/or exchanged easily by the operator. In case there is C4-FN contamination already existing, the LEAKSPY ^{C4} can be adjusted to this value. Thus, it is possible to detect leaks even in already contaminated areas. The C4-FN concentration is indicated in ppm as well as by an audible signal.



- Detection of leaks up to 3 g / year
- Quick response time
- No cross sensitivity to moisture and most volatile organic compounds (VOCs)
- Small, lightweight, easy to use
- A shoulder belt facilitates mobile and ergonomic working
- Battery-operated (operating time min. 12 hours)
- Exchangeable accumulator (parallel loading of a second accumulator in separate charging unit possible)

DEVICES FOR C4-FN LEAK DETECTION



C4-3-033-R400

LeakSpy C4

Technical Data:

Dimensions: W 125 mm, H 142 mm, L 280 / 555 mm (with / without measuring sensor)

Measuring sensor length: 300 mm

Weight: 1.580 g

Power supply: lithium ion batteries (operating time min. 12 hours)

Measuring range C4-FN: 0 − 1.000 ppm

Detection limit C4-FN: 3 ppm

Sensitivity: 3 g C4-FN / year

Accuracy: \leq 50 ppm: \leq 2 ppm

50-100 ppm: $\leq 5 \text{ ppm}$

100-1000 ppm: ≤ 2 % of measuring range

No cross sensitivity to moisture (0 - 100 % relative moisture, non-condensing) and volatile organic compounds

Indication accuracy: 1 ppm

Indication unit: ppm, g/y, cc/s

Operating temperature: 0 °C to +50 °C

Storage temperature: -10 °C to +60 °

Measuring principle: non-dispersive infrared sensor (NDIR)

Response time T90: < 1s

Temperature and pressure compensated

Indication: graphic display + audible signal

Standard equipment:

Shoulder belt

Measuring sensor extension (length: 1 m)

Carrier case

Battery charger

1 accumulator

Separate charging unit

Operating manual

Optional accessories (spare parts) at an extra charge:

Shoulder belt	5009904
Measuring hose	5007237
Measuring sensor	3-033-R200-20
Particle filter	5008928
Transparent cap	5008933
Additional accumulator	5008922
Carrier case (for replacement) without foam lining	5006807
Foam lining for carrier case	5009110

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	Packing für C4-3-033-R	05-1990-R002

DEVICES FOR C5-FK LEAK DETECTION



For quick detection and quantification of smallest leaks

C5-3-033-R500

LEAKSPY C5 for gas mixtures with C5-FK

The cordless battery-operated LEAKSPY ^{C5} precisely measures the C5-FK concentration in air by means of a non-dispersive infrared sensor (NDIR sensor) and indicates the value on a graphic display in ppm. The device allows precise localisation of leaks by searching the highest C5-FK concentration. Thanks to the high resolution and detection limit, it is also possible to carry out integral measurements as well as measurements to determine the resolution and detection limit by means of this device.

To protect the device from particles the sensor is equipped with a filter which can be cleaned and/or exchanged easily by the operator. In case there is C5-FK contamination already existing, the LEAKSPY ^{C5} can be adjusted to this value. Thus, it is possible to detect leaks even in already contaminated areas. The C5-FK concentration is indicated in ppm as well as by an audible signal.



- Detection of leaks up to 3 g / year
- Quick response time
- No cross sensitivity to moisture and most volatile organic compounds (VOCs)
- Small, lightweight, easy to use
- A shoulder belt facilitates mobile and ergonomic working
- Battery-operated (operating time min. 12 hours)
- Exchangeable accumulator (parallel loading of a second accumulator in separate charging unit possible)

C 4769-01

DEVICES FOR C5-FK LEAK DETECTION



C5-3-033-R500

LeakSpy C5

Technical Data:

Dimensions: W 125 mm, H 142 mm, L 280 / 555 mm (with / without measuring sensor)

Measuring sensor length: 300 mm

Weight: 1.580 g

Power supply: lithium ion batteries (operating time min. 12 hours)

Measuring range C5-FK: $0-1.000\ ppm$

Detection limit C5-FK: 3 ppm

Sensitivity: 3 g C5-FK / year

Accuracy: $\leq 50 \text{ ppm}$: $\leq 2 \text{ ppm}$

50 - 100 ppm: $\leq 5 \text{ ppm}$

100 - 1000 ppm: ≤ 2 % of measuring range

No cross sensitivity to moisture (0 - 100 % relative moisture, non-condensing) and volatile organic compounds

Indication accuracy: 1 ppm

Indication unit: ppm, g/y, cc/s

Operating temperature: 0 °C to +50 °C

Storage temperature: $-10~^{\circ}\text{C}$ to +60 $^{\circ}$

Measuring principle: non-dispersive infrared sensor (NDIR)

Response time T90: < 1s

Temperature and pressure compensated

Indication: graphic display + audible signal

Standard equipment:

Shoulder belt

Measuring sensor extension (length: 1 m)

Carrier case

Battery charger

1 accumulator

Separate charging unit

Operating manual

Optional accessories (spare parts) at an extra charge:

Shoulder belt	5009904
Measuring hose	5007237
Measuring sensor	3-033-R200-20
Particle filter	5008928
Transparent cap	5008933
Additional accumulator	5008922
Carrier case (for replacement) without foam lining	5006807
Foam lining for carrier case	5009110

Packing for C5-3-033-R 05-19	1990-R002
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GAS-SAFETY-SENSOR



3-026-R205 / R235 GasSafetySensor

The GasSafetySensor is designed for monitoring the ambient air in rooms with gas-filled equipment for measuring different tracer gases.

The Sensor unit detects the lowest concentrations of the gas to which it is adjusted/calibrated and permanently shows the current measured value on the display.

There is no radioactive source in any of the DILO Sensors, so no special precautions regarding radioactive hazardous substances are required during operation. The Sensors are also characterised by a fast response time with stable measuring results.

Cross-sensitivities of the Sensors to other gases and to air moisture are not known. Naturally existing gas components in the air can be suppressed. For example, when using a CO_2 sensor, it can be set in such a way as to hide the natural CO_2 content in the air so that only values which are above this natural content are measured.

The warning and alarm levels of each Sensor can be freely configured. If the default setting is to be changed this can be done either via the connected GasSafetyMonitor or via a web server.

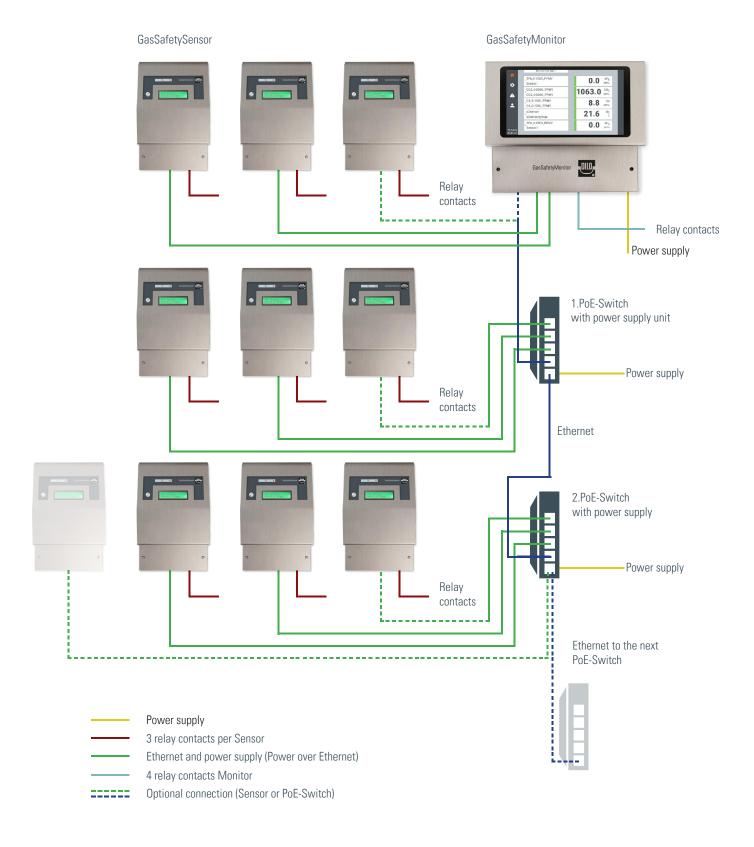


- Operation either as a stand-alone unit or in networks connected to a GasSafetyMonitor
- Different acoustic signals to be set on the unit. Visual display of errors, warnings and alarms
- Potential-free relays for errors, warnings and alarms
- High long-term stability
- Sensors are connected via an RJ45 cable (Ethernet and Power over Ethernet (PoE))
- No maintenance and no consumables required
- Analogue output (4...20 mA)
- Message on the expiry of the recommended calibration interval
- Power is supplied separately (24 V DC) or alternatively in the network via Power over Ethernet (PoE)

GAS-SAFETY-SENSOR



3-026-R205 / R235 **GasSafetySensor**



GAS-SAFETY-SENSOR



3-026-R205 / R235 GasSafetySensor



Note:

All types of Sensors can be operated together in networks with one Monitor (III. 2) or autonomously as a single unit (III. 3). Each Sensor has a 4 ... 20 mA output and 3 relays for connecting warning systems. This output can always be used irrespective of the arrangement.

In networks, up to three Sensors can be connected directly to one Monitor without separate power supply. When connecting more than three Sensors, a PoE switch is required for each additional three Sensors. An Ethernet cable is needed for each Sensor connected to the network. A maximum of 32 Sensors can be connected to one Monitor.

Sensor Data:							
	SF _€ 3-026-R205	CO ₂ 3-026-R225	0 ₂ 3-026-R210	SO ₂ 3-026-R230	C4-FN 3-026-R215	C5-FK 3-026-R220	CO 3-026-R235
Measuring principle	NDIR (dual beam)	NDIR (dual beam)	Electro-chemi- cal reaction	Electro-chemi- cal reaction	NDIR (dual beam)	NDIR (dual beam)	Electro-chemi- cal reaction
Measuring range	0 — 1500 ppm	0 – 5000 ppm	0 – 25 mol-%	0 – 20 ppm	0 — 1000 ppm	0 – 1000 ppm	0 – 500 ppm CO
Measuring accuracy	≤ ±30 ppm	≤±2 % of the upper range value	≤±2 % of the upper range value	≤±2 % of the upper range value	< 50 ppm: ±4% (of 50 ppm)	< 50 ppm: ±4% (of 50 ppm) ≙±2 ppm; *)	≤±2 % vof the upper range value
Lifetime	> 10 years	> 10 years	3 years	2 years	> 10 years	> 10 years	3 years
Operating temperature	−10 to +40 °C	−20 to +45 °C	0 to 50 °C	–20 to +45 °C	0 to +50 °C	0 to +50 °C	−40 to +50 °C
Power consumption	4.3 W	4.3 W	3.2 W	3.2 W	6.8 W	6.8 W	3.2 W

*) 50 - 100 ppm: ± 5 % (v. 100 ppm) $\triangleq \pm 5$ ppm; 100 - 1000 ppm: ± 2 % (v. 1000 ppm) $\triangleq \pm 20$ ppm

GAS-SAFETY-MONITOR



3-026-R200

GasSafetyMonitor

The central management, supply and control unit displays the measured values and messages of the connected Sensors which measure the concentration of different gases in ambient air.

The Monitor allows to display and record the measured values as well as to register messages. The potential-free relays serve for controlling further warning systems. Up to 32 Sensors can be controlled and monitored. Thanks to the well-proven DILO operating and setting principle, important data, warning and alarm limit values can be retrieved.

The installation and maintenance of the Sensors via the plug-and-play concept makes handling very comfortable. Measured values and messages are stored and can be retrieved on the 7" colour touch screen, if necessary.

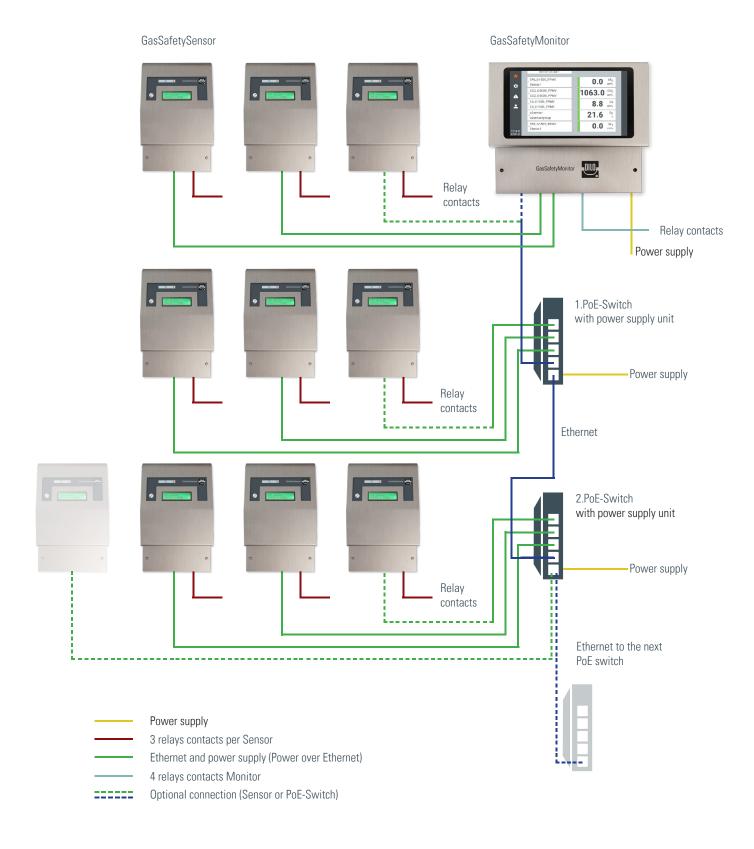


- Different acoustic warning, alarm and error signals
- Coloured visual messages on both the Monitor and the Sensor
- Registration of all messages in the device
- Individual naming of the Monitor and connected Sensors
- Permanent display of the measured values, control and settings of all connected Sensors
- Sensors are connected via an RJ45 cable (Ethernet and Power over Ethernet (PoE))
- Up to three Sensors can be connected and supplied directly via the Monitor
- The additional Sensors can be connected via a PoE-injector switch until the maximum number is reached (see illustration 2)
- Max. cable length of 100m, extension of transmission distance possible by interconnecting PoE switch

GAS-SAFETY-MONITOR



3-026-R200 GasSafetyMonitor



GAS-SAFETY-MONITOR



3-026-R200

GasSafetyMonitor

Technical Data:

Dimensions: L 238 mm, H 213 mm, W 77 mm

Weight: 0,7 kg

Display: 17.8 cm (7") colour touch screen

Connection: max. 32 Sensors; 3 Sensors directly on Monitor (PoE), other Sensors can be installed via PoE switch

Ethernet connection: 4 RJ45 connector

Cable to Sensor: patch cable with RJ45 plug, max. length 100 m

Operating voltage: 80 – 264 V AC, 47 – 63 Hz, 113 – 370 V DC, max. 84 W

Ambient moisture: max. 95 % relative humidity, non-condensing

Operating temperature: –10 °C to +40 °C

Storage temperature: –20 °C to +60 °C

4 relay contacts max. load: 8.0 A / 230 V AC

Protection class: IP 41

Sound pressure integrated alarm: > 75 dB

Optional accessories at an extra charge:

External visual and acoustic alarm signal 230 V/AC	05-1093-R001
External visual and acoustic alarm signal 115 V/AC	05-1093-R003
1 m long RJ45 Ethernet cable	05-1587-R013
2 m long RJ45 Ethernet cable	05-1587-R010
5 m long RJ45 Ethernet cable	05-1587-R015
10 m long RJ45 Ethernet cable	05-1587-R019
20 m long RJ45 Ethernet cable	05-1587-R020
30 m long RJ45 Ethernet cable	05-1587-R021
60 m long RJ45 Ethernet cable	05-1587-R022
100 m long RJ45 Ethernet cable	05-1587-R024
5 Port PoE switch with power supply and housing	3-026-R201
8 Port PoE switch with power supply and housing	3-026-R202

Note:

The Monitor can directly supply up to three Sensors without their own power supply. If more than three sensors are required, a maximum of two sensors can be connected to the monitor. The third connection is required for a PoE switch connected downstream that integrates additional sensors.

A fourth RJ45 connector on the monitor is provided for connection to an external network (e.g. network for substations IEC 61850).

An RJ45 Ethernet cable is necessary per connected Sensor (3-026-R205 - 235).

It is also possible to combine different Sensor types with each other, if desired.

MIXING UNIT C4/C5



C4-Z1004R01

Mixing unit for the production of gas mixtures with C4-FN

C5-Z1004R01

Mixing unit for the production of gas mixtures with C5-FK

The mixing units have been specially developed for the handling of gas mixtures based on C4-FN or C5-FK and their specific requirements. A total of four gas components can be mixed. The gas mixture is circulated by the compressor to generate a homogenous mixture.

Using the integrated compressor, the generated gas mixture can be filled directly into gas compartments or for transportation, stored into cylinders with up to 100 bar.



If necessary, e.g. when changing the mixing ratio, the mixing vessel can be emptied completely (< 1 mbar). The integrated vacuum compressor also enables the complete recovery of pressure cylinders, so that any residual quantities of the insulating fluids C4-FN or C5-FK can be completely fed into the mixing process and no gas loss occurs. A device that combines the latest technology with economic efficiency.

Adjustable gas components:

- » C4-FN/C5-FK
- » Carbon dioxide CO,
- » Oxygen O₂ (admissible range: 0 to 20%)
- » Nitrogen N₂
- » Other gas components available on request
- Gas storage: up to max. 100 bar
- Recovery of gas down to < 1 mbar and storage into cylinder or gas compartment
- Automatic control and 10" capacitive multi-touch screen
- Optional operation via mobile devices
- Digital weighing scales for pressure cylinders





C4-Z1004R11

Mixing unit for the production of gas mixtures with C4-FN

C5-Z1004R11

Mixing unit for the production of gas mixtures with C5-FK

Technical Data:

Dimensions: L 1.400 mm, W 900 mm, H 1.500 mm

Weight: 720 kg

Standard equipment:

Oilfree B280R80 compressor (5.7 m³/h [at 50 Hz]; 6.8 m³/h [at 60 Hz]) 100 bar

Vacuum compressor 3.3 m³/h (at 50 Hz) and 3.9 m³/h (at 60 Hz), final vacuum < 3 mbar)

Oilfree suction pump for recovery of mixing vessel (15 m³/h [at 50 Hz]; 18 m³/h [at 60 Hz]), final vacuum < 1 mbar)

100 I mixing vessel

Particle filter

Indications in bar/mbar, kPa or psi/torr, selectable on the operating panel

Fork lift provisions

Weighing scales for mixing vessel ±2 g

3 m long storage connecting hose DN8, with coupling tongue part DN20 (filling of cylinders)

Frame with crane eyelets

Couplings DN20

Fixing and steerable rollers

Different wrenches

Paint: green

Operating manual

Operating voltage:

208 - 240 V / 60 Hz

380 - 440 V / 50 Hz or 380 - 480 V / 60 Hz

Optional accessories at an extra charge:

5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M48) - C4-FN	C4-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M48) - C4-FN	C4-6-1024-R050
5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M43) - C5-FK	C5-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M43) - C5-FK	C5-6-1024-R050
Digital cylinder scales up to 120 kg with tare function	K091R65/ K091R67

Packing:

Packing for C4/C5-Z1004R01	3-751-3016-C	
1 deking for 04/00 210041101	0 751 0010 0	

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For adsorption of moisture, solid and gaseous decomposition products

C4-B077R22

Portable pre-filter unit (p_e 50 bar)

Dry filter filled with molecular sieve combined with particle filter

C5-B077R22

Portable pre-filter unit (p 50 bar)

Dry filter filled with molecular sieve combined with particle filter



Technical data:

Dimensions: L 780 mm, W 210 mm, H 200 mm

Weight: 13.5 kg

Standard equipment:

Dry filter (molecular sieve)

Particle filter

2x DILO couplings groove parts DN20 on the pre-filter unit (C4-FN - M48x2 orC5-FK - M43x2)

Safety valve (pg 50 bar)

Gauge NG63 (p_e 60 bar)

Operating manual

Optional accessories at an extra charge:

2 meter long rubber hose DN20 with coupling tongue part on both ends DN20 (M48) PN50 - C4-FN	C4-6-1365-R020
5 meter long rubber hose DN20 with coupling tongue part on both ends DN20 (M43) PN50 - C5-FK	C5-6-1365-R020
2 meter long wire braided hose DN20 with coupling tongue part on both ends DN20 (M48) PN50 - C4-FN	C4-6-1365-R050
5 meter long rubber hose DN20 with coupling tongue part on both ends DN20 (M43) PN50 - C5-FK	C5-6-1365-R050
Spare filter cartridge for dry filter	B077-29
Spare filter cartridge for particle filter	B077-06

Packing:

Packing for C4/C5-B077R22	3-763-R003-C
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For adsorption of moisture, solid and gaseous decomposition products

C4-B077R20

Pre-filter unit (pe 50 bar)

Dry filters filled with molecular sieve combined with particle filter

C5-B077R20

Pre-filter unit (pe 50 bar)

Dry filters filled with molecular sieve combined with particle filter

Technical data:

Dimensions: L 180 mm, W 106 mm, H 360 mm

Weight: 5.3 kg

Standard equipment:

Dry filter (molecular sieve)

Particle filter

2x DILO couplings groove parts DN8 on the pre-filter unit $\,$ (C4-FN - M28x1.5 or C5-FK - M24x1.5)

Safety valve (p_a 50 bar)

Gauge (p_e 60 bar)

Operating manual

Optional accessories at an extra charge:

2 m long rubber hose DN8, with DILO coupling tongue part on both ends DN8 (M28) - C4-FN	C4-6-1130-R020
2 m long rubber hose DN8, with DILO coupling tongue part on both ends DN8 (M24) - C5-FK	C5-6-1130-R020
5 m long rubber hose DN8, with DILO coupling tongue part on both ends DN8 (M28) - C4-FN	C4-6-1130-R050
5 m long rubber hose DN8, with DILO coupling tongue part on both ends DN8 (M24) - C5-FK	C5-6-1130-R050
Spare filter cartridge for dry filter	B077-20
Spare filter cartridge for particle filter	B077-06
Plastic case für C4/C5-B077R20	3-781-R022

Packing:

Packing for C4/C5-B077R20 3-9	948-R007
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PRECISION GAUGE



For precise pressure control in gas compartments

C4-3-558-R001 with coupling tongue parts for gas compartments with C4-FN (M48x2, M28x1.5) C5-3-558-R001 with coupling tongue parts for gas compartments with C5-FK (M43x2, M24x1.5)

Precision gauge with hose

Indication unit in bar, kPa, psi

Indication range: 0 - 10 bar / 0 - 1000 kPa / 0 - 145 psi

The digital precision gauge allows precise determination of pressure in gas compartments.

The connecting hose for measuring devices is equipped with a self-closing coupling so that any gas can escape into the atmosphere during the testing process. The device can be transported comfortably and safely in the handy plastic case.



Technical data:

Case dimensions: L 500 mm, W 420 mm, H 180 mm

Weight: 4.0 kg

Standard equipment:

Coupling tongue part DN20 (C4-FN - M48x2 or C5-FK - M43x2)

Coupling tongue part DN8 (C4-FN - M28x1.5 or C5-FK - M24x1.5)

Precision gauge NG 160 / class 0.6

1 m long Teflon hose with connecting coupling for measuring devices

Handy transport case

Operating manual

Optional accessories at an extra charge:

Coupling tongue part DN6	6-1161-R013
Coupling tongue part DN7	6-1161-R015
Coupling tongue part DN12	6-1161-R014

Other transition pieces are available on request.

Packing:

Packing	05-1990-R003
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C 4890-00

DIGITAL VACUUM GAUGE



For vacuum control in gas compartments

C4-Z619R01with coupling tongue parts for gas compartments with C4-FN (M48x2, M28x1.5) C5-Z619R01 with coupling tongue parts for gas compartments with C5-FK (M43x2, M24x1.5)

Digital vacuum gauge

Battery-operated (2 x 9 V)

Indication range: 0 - 400 mbar / class 0,1

After having evacuated the air or after the recovery of gas the device allows precise determination of the vacuum in gas compartments. The device is protected against overpressure up to p_a 9 bar.



Technical Data:

Case dimensions: W 360 mm, H 290 mm, L 165 mm

Weight: 5 kg

Standard equipment:

DILO coupling tongue part DN20 (C4-FN - M48x2 or C5-FK - M43x2)

DILO coupling tongue part DN8 (C4-FN - M28x1.5 or C5-FK - M24x1.5)

Elbow and intermediate piece DN8

Handy transport case

Operating manual

Optional accessories at an extra charge:

Additional operating manual	6-0004-R213
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Packing:

C 4893-00

Attention: For the operation of the device two 9-V batteries are necessary which are **not** included in the scope of supply.

GAS STORAGE TANKS C4/C5



C4/C5-B173R..

For gaseous storage in 600 l or 1,000 l tanks

C4-B173R...

Gas storage tanks for gaseous storage of gas mixtures with C4-FN ${\tt C5-B173R...}$

Gas storage tanks for gaseous storage of gas mixtures with C5-FK





- For gaseous storage or withdrawal of gas
- Pressure indication in bar, MPa, psi
- Additional tool tray for hoses and accessories
- Stable frame with pushing bar
- Steerable and fixing rollers for comfortable transportation
- Max. operating overpressure: 25 bar
- Version in accordance with the 2014/68/EU pressure equipment directive, ASME or SQL approval available as an option

GAS STORAGE TANKS C4/C5



C4/C5-B173R..

Gas storage tanks for gaseous storage of gas mixtures with C4-FN/ C5-FK - Storage volume 600 I



Technical data:

Dimensions: L 2.000 mm, W 950 mm, H 1.020 mm	Dimensions:	L 2.000 mr	n. W 950 mm	. H 1.020 mm
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Weight: 688 kg

Storage volume: 600 l

Max. operating overpressure: 25 bar

Operating temperature: -10 °C to +50 °C

Standard equipment:

Ball valve DN8

DILO coupling groove part DN20, M48x2 (version C4-FN) and DN20, M43x2 (version C5-FK)

Gauge NG 100 in bar, kPa, psi

Safety valve 25 bar

Paint: green-anthracite

Operating manual

Optional accessories at an extra charge:

5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M48) - C4-FN	C4-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M48) - C4-FN	C4-6-1024-R050
5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M43) - C5-FK	C5-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M43) - C5-FK	C5-6-1024-R050
Frame with driving rod for wheels	K226R01
Plastic tarpaulin with frame and driving rod for wheels	K226R03

Packing:

Packing for 600 I storage tanks 3-750-R0	07-C
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C 4625-02

GAS STORAGE TANKS C4/C5



C4/C5-B173R..

Gas storage tanks for gaseous storage of gas mixtures with C4-FN/ C5-FK - Storage volume 1,000 l



Technical data:

Dimensions: L 2.720 mm, W 950 mm, H 1.020 mm
Weight: 938 kg
Storage volume: 1.000 l
Max. operating overpressure: 25 bar
Operating temperature: -10 °C to +50 °C

Standard equipment:

Ball valve DN20
DILO coupling groove part DN20, M48x2 (version C4-FN) and DN20, M43x2 (version C5-FK)
Gauge NG 100 in bar, kPa, psi
Safety valve 25 bar
Paint: green-anthracite
Operating manual

Optional accessories at an extra charge:

5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M48) - C4-FN	C4-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20 (M48) - C4-FN	C4-6-1024-R050
5 m long wire braided hose DN20 with protective metal sheathing with coupling tongue part on both ends DN20 (M43) - C5-FK	C5-6-1069-R050
5 m long wire braided hose DN20 with coupling tongue part DN20 on both ends DN20	C5-6-1024-R050
Frame with driving rod for wheels	K226R02
Plastic tarpaulin with frame and driving rod for wheels	K226R04

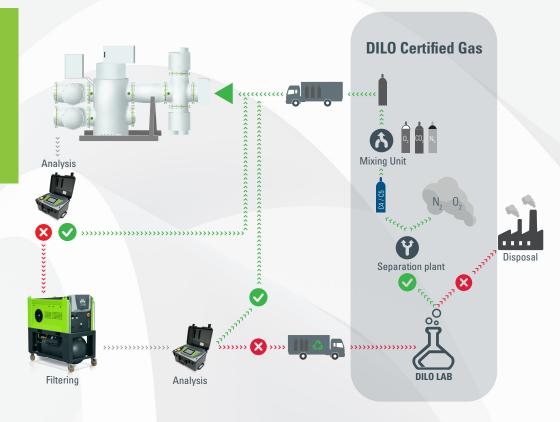
Packing:

Packing for 1,000 I storage tanks	3-751-R007-C
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RECONDITIONING OF ALTERNATIVE GASES



RECONDITIONING OF ALTERNATIVES GASES



ECONOMIC BENEFITS:



- » Lower costs compared to combustion
- » Quick availability of new, certified mixtures
- » No additional costs for new gas
- » No double transport costs due to direct reuse
- » Complete documentation by certified waste management company for alternative insulating gases
- » Compliance with the Closed Substance Cycle Waste Management Act requirements

ENVIRONMENTAL BENEFITS:



- » Lower CO₂ emissions compared to energy-intensive combustion
- » No double transport due to direct reuse
- » Conservation of resources, as no additional new gas has to be produced

If no further use is possible or a different mixing ratio is required after purification and drying on site when using alternative gas mixtures with C4-FN (C_4F_7N) or C5-FK ($C_5F_{10}0$), reconditionning and recovery of the C4-FN and C5-FK at DILO is the alternative solution to disposal by combustion.

The C4-FN or C5-FK is separated from the carrier gases and any by-products and purified in several steps. It is then used directly for new mixtures, which may also have different concentration ratios or carrier gases than the original mixtures.

The processed gas mixture has a high reconditioning efficiency (> 95 %) across all mixing ratios, in order to reuse a large quantity of C4-FN/C5-FK is reused.

Each batch of reconditioned gas is examined in the laboratory and only then released for further use.

GAS MIXING SERVICE



DILO CERTIFIED GAS



Gas mixing service according to customer specification

We offer insulating gas mixtures based on, for example, C4-FN or C5-FK with carrier gases such as $C0_2$, N_2 or synthetic air in pressure vessels of various volumes. These mixtures can be supplied in partially liquefied or gaseous form, depending on your requirements. For this purpose, either C4-FN/C5-FK new gas or gas reconditioned by DILO in new gas quality is used, guaranteed by the **DILO Certified Gas** Quality promise.



Your benefits:

- » Complete handling of the ordering process: From the calculation of the individual gas quantity to the transport on site
- » Economical and fast procurement even for small gas quantities
- » No need to use individual gases on site

Production:

- » Gravimetric in mol-%
- » Traceable to the international unit system
- » Highest quality standards through regular calibration of the measuring systems and certified processes

Our promise:

- » Every gas mixture is supplied with a safety data sheet in accordance with (EC) 1907/2006
- » Use of exclusively TÜV-approved pressure vessels
- » Analytical verification of every gas mixture in the in-house DILO laboratory

Contact: certified-gas@dilo-gmbh.com

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FOR YOUR NOTES

ONE VISION. ZERO EMISSIONS.



SF ₆ GAS	ALTERNATIVE GASES	INDUSTRIAL GAS EQUIPMENT	HIGH PRESSURE PRODUCTS
DILO CERTIFIED GAS	AFTER SALES SERVICES	TRAINING & CERTIFICATION	

DILO

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