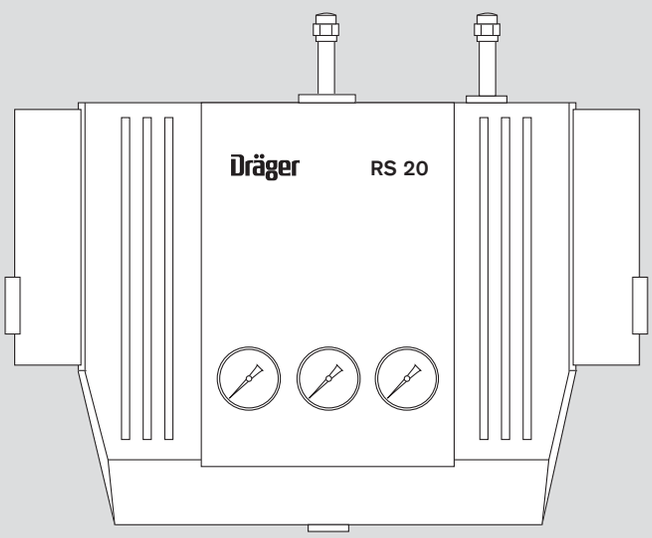
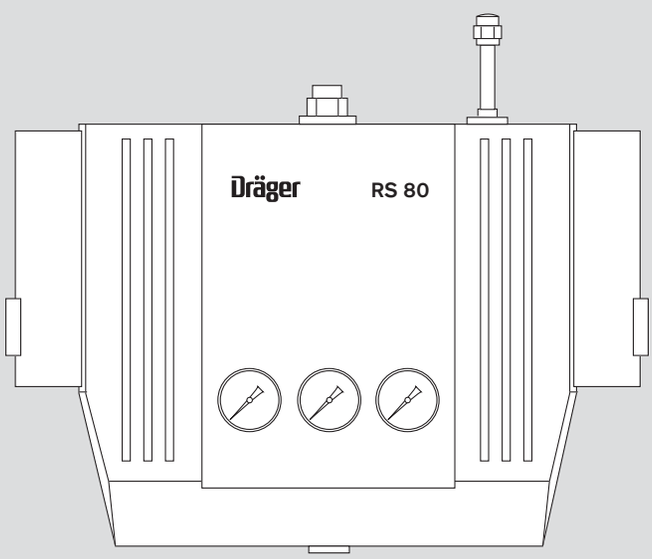
RS 20 / RS 80
Reducing Station
Stanica za redukciju





00138012

For Medical Gas Pipeline Systems
Instructions for Use

Za cjevovodne sustave medicinskih plinova
Upute za rad

Contents

Sadržaj

For Your Safety and that of Your Patients

Strictly follow the Instructions for Use
Any use of the apparatus requires full understanding and strict observation of these instructions. The apparatus is only to be used for purposes specified here.

Maintenance
The apparatus must be inspected and serviced regularly by trained service personnel at six monthly intervals (and a record kept). Repair and general overhaul of the apparatus may only be carried out by trained service personnel. We recommend that a service contract be obtained with DrägerService and that all repairs also be carried out by them. Only authentic Dräger spare parts may be used for maintenance.
Observe chapter "Maintenance Intervals".

Accessories
Do not use accessory parts other than those in the order list.

Not for use in areas of explosion hazard
This device is neither approved nor certified for use in areas where combustible or explosive gas mixtures are likely to occur.

Liability for proper function or damage
The liability for the proper function of the apparatus is irrevocably transferred to the owner or operator to the extent that the apparatus is serviced or repaired by personnel not employed or authorized by DrägerService or if the apparatus is used in a manner not conforming to its intended use.
Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above. The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Regulations
The national laws and regulations governing pressure reducers and compressed-gas systems are to be observed.

Dräger Medical GmbH

Za Vašu sigurnost i sigurnost Vaših pacijenata

Strogo se pridržavajte ovih Uputa za rad
Svaka upotreba ovog aparata zahtijeva potpuno razumijevanje i strogo pridržavanje ovih uputa. Ovaj se aparat može koristiti samo u ovdje specificirane svrhe.

Održavanje
Obučeno servisno osoblje mora provoditi inspekciju i servis ovog aparata u intervalima od šest mjeseci (i čuvati evidenciju o tome) Popravak i generalni remont aparata smije provoditi samo stručno osoblje servisa. Preporučujemo sklapanje servisnog ugovora sa DrägerService-om i da oni izvrše sve popravke. Samo se izvorni Dräger-ovi zamjenski dijelovi smiju koristiti za održavanje.
Pridržavajte se poglavlja "Intervali održavanja".

Pribor
Koristite samo dijelove pribora koji se nalaze na popisu za naručivanje.

Nije namijenjen upotrebi u eksplozijom ugroženim područjima
Ovaj uređaj nema odobrenje niti certifikat za rad u prostorima gdje je moguća pojava smjesa zapaljivih ili eksplozivnih plinova.

Odgovornost za ispravan rad ili štetu
Odgovornost za ispravan rad ovog aparata neopozivo se prenosi na vlasnika ili operatera u slučaju da aparat servisira ili popravlja osoblje koje nije zaposleno u ili ovlašteno od strane DrägerService-a ili ako se aparat upotrebljava na način koji ne odgovara njegovoj svrsi upotrebe.
Dräger ne može snositi odgovornost za štetu uzrokovanu nepoštivanjem gore navedenih preporuka. Isto tako, klauzule jamstva i odgovornosti uvjeta prodaje i isporuke koje daje Dräger nisu modificirane gore navedenim preporukama.

Propisi
Potrebno je pridržavati se nacionalnih zakona i propisa koji reguliraju reduktore tlaka i sustave komprimiranog zraka.

Dräger Medical GmbH

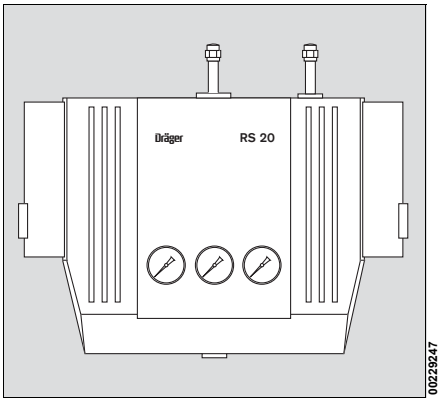
Intended Use

Reducing Station
for reducing and monitoring pressure in medical gas pipeline systems in hospitals.

Suitable for:
Oxygen, nitrous oxide, carbon dioxide, nitrogen as well as for inert, non-corrosive gases.

May not be used for:
Corrosive, aggressive or toxic gases, acetylene, propane, butane and flammable gases.

Reducing Station RS 20
Nominal flow 20 m^3/h at supply pressure PV = 21 bar and operating pressure PB = 5 bar ±0.5 bar*.



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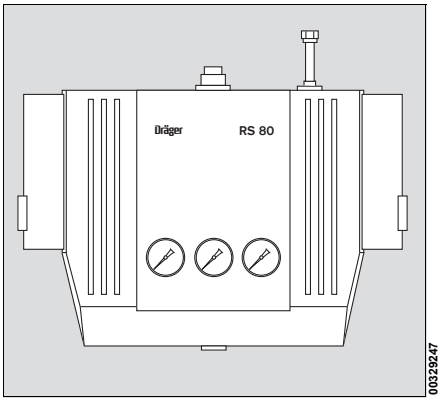
Reducing Station RS 80
Nominal flow 80 m^3/h at supply pressure PV = 21 bar and operating pressure PB = 5 bar ±0.5 bar.



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Installation

- Only by trained service personnel and according to Installation Instructions 90 28 671.
- Install control unit to monitor, protect and maintain the operating pressure.
- Install EN set for systems according to EN 737-3. Servicing is then possible without shutting-down operation (see page 20).

* 1 bar = 1 kPa x 100

Svrha upotrebe

Stanica za redukciju
za redukciju i nadzor tlaka u cjevovodnim sustavima medicinskog plina u bolnicama.

Prikladna za:
kisik, dušični oksidul, ugljični dioksid, dušik kao i za inertne, nekorozivne plinove.

Ne smije se koristiti za:
korozivne, agresivne ili otrovne plinove, acetilen, propan, butan i zapaljive plinove.

Stanica za redukciju RS 20
Nazivni protok 20 m^3/h pri tlaku opskrbe PV = 21 bar i radnom tlaku PB = 5 bar ±0,5 bar*.

Stanica za redukciju RS 80
Nazivni protok 80 m^3/h pri tlaku opskrbe PV = 21 bar i radnom tlaku PB = 5 bar ±0,5 bar.

Montaža

- Samo od strane obučenog osoblja servisa i prema Uputama za montažu 90 28 671.
- Montirajte kontrolnu jedinicu za nadzor, zaštitu i održavanje radnog tlaka.
- Montirajte EN komplet za sustave sukladno normi EN 737-3. Servisiranje je tada moguće bez prekidanja upotrebe (vidi stranicu 20).

* 1 bar = 1 kPa x 100

Testing and Commissioning

For use of the Reducing Station in medical gas pipeline systems:
Pressure reducing stations may not be operated until they have been tested and commissioned by trained and qualified personnel.

National regulations must be observed.
For example, in the European Economic Area (EEA), EN 737-3.

When installation or maintenance procedures have been carried out, a comprehensive testing and commissioning programme must be undertaken by trained personnel.

These tests determine:

1. whether the safety requirements for the protection of patients and staff have been fulfilled –

   and

2. whether the performance characteristics of the medical gas pipeline system are met.

Written records of the tests must be kept.

Following this testing programme, the pipeline system which is ready for operation and the documentation are handed over to the user, and users are then given instructions.

The handing-over procedure must be formally recorded.

Testiranje i puštanje u rad

Kod upotrebe stanice za redukciju u cjevovodnim sustavima medicinskog plina:
Stanice za redukciju se ne smiju pustiti u rad prije testiranja i izdavanja odobrenja od strane obučenog i kvalificiranog osoblja.

Potrebno je pridržavati se nacionalnih propisa.
Primjerice, u Europskom ekonomskom području (EEA), EN 737-3.

Kada su izvršeni montaža ili postupci održavanja, mora se provesti opširan program testiranja i puštanja u rad od strane obučenog osoblja.

Tim se testovima utvrđuje:

1. jesu li ispunjeni sigurnosni zahtjevi potrebni za zaštitu pacijenata i osoblja –

   i

2. jesu li zadovoljene radne značajke cjevovodnog sustava medicinskog plina.

O provedenim testovima treba voditi i pohraniti zapisnik.

Nakon ovog programa testiranja, cjevovodni sustav koji je spreman za rad i popratna dokumentacija se predaju korisniku a osoblje koje će rukovati sustavom upućuje se u način rukovanja sustavom.

O postupku primopredaje potrebno je voditi i pohraniti službeni zapisnik.

Operation

General Recommendations for Use

- Open and close valves of cylinder manifolds slowly. Pressure surges due to opening the valves too quickly can cause explosions!
- Empty all gas cylinders in the cylinder manifold in use at the same time.
- Make sure information labels are used in the Federal Republic of Germany according to UVV (Accident Prevention Regulation) for Welding, Cutting and Similar Processes. Mark all empty and full gas cylinders, with removable labels for instance.
- Only the gas cylinders which are actually required should be stored in the room – every unneeded cylinder is a potential hazard that can be avoided.
- Keep the protective valve caps from gas cylinders which are in use safe, by storing them with the cylinder manifold.
- Do not discharge gas cylinder completely, otherwise moisture will leak in. The gas cylinder will corrode and may be destroyed.
  For cylinder manifolds RS 20 / RS 80 a residual pressure of about 7 bar is normal in the gas cylinders on this station.
- Ensure appropriate ventilation in the room where the cylinder manifold is located – to protect the user against the harmful effect of the gases.
- Do not allow equipment for oxygen or other oxidizing gases to come into contact with oil and grease, or other lubricants which are not certified for use with oxygen by the appropriate authority.
  In the Federal Republic of Germany: BAM, Berlin (Federal Institute for Material Research and Testing).
  Oil and grease can react violently with some compressed gases and cause explosions!
- It is forbidden to use cylinder manifolds to fill gas cylinders without the approval of the appropriate authorities.

Upotreba

Opće preporuke za rad

- Ventile baterije boca otvarajte i zatvarajte polako. Vršni tlakovi nastali prebrzim otvaranjem ventila mogu prouzročiti ekspozije!
- Istovremeno trošite sve plinske boce na onoj strani baterije boca koja je u upotrebi.
- Uvjerite se da su u Federalnoj Republici Njemačkoj korištene informacijske oznake sukladno Propisima o sprječavanje nezgoda (Accident Prevention Regulation, UVV) kod zavarivanja, rezanja i sličnih postupaka. Označite sve prazne i pune plinske boce sa odstranjivim oznakama.
- Samo se plinske boce koje su stvarno potrebne mogu skladištiti u prostoriji – svaka nepotrebna plinska boca je potencijalna opasnost koja se može izbjeći.
- Čuvajte na sigurnom zaštitne kape ventila plinskih boca koje su u upotrebi tako da ih pohranite uz bateriju boca.
- Nemojte potpuno isprazniti plinske boce jer u suprotnom vlaga može ulaziti u boce. Plinska boca će korodirati i može biti uništena.
  Za baterije boca RS 20 / RS 80 ostatni tlak od oko 7 bar je normalan za plinske boce u ovoj stanici.
- Osigurajte odgovarajuće prozračivanje prostorije gdje se nalazi baterija boca kako bi se korisnik zaštitio od štetnih učinaka plinova.
- Nemojte dozvoliti da oprema za kisik ili druge oksidirajuće plinove dođe u dodir s uljem i mastima ili ostalim mazivima koji nemaju certifikat od nadležnog tijela za upotrebu s kisikom.
  U Federalnoj Republici Njemačkoj: BAM, Berlin (Federalni institut za istraživanje i testiranje materijala).
  Ulje i masti mogu žestoko reagirati s nekim komprimiranim plinovima i prouzročiti eksplozije!
- Zabranjeno je koristiti baterije boca za punjenje plinskih boca bez odobrenja odgovarajućih nadležnih tijela.

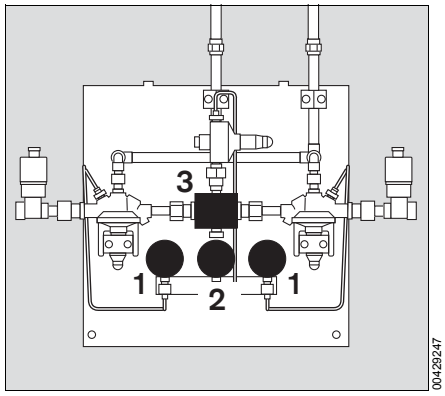
The Reducing Station operates with the pressure values set during start-up:

1 The gauges indicate the pressure of the left and the right cylinder manifold, e.g. 200 bar for a full cylinder manifold of oxygen or nitrogen.

2 The gauge indicates the pressure at the second pressure reducing stage = operating pressure of pipeline system of about 5 bar.

Depending on the setting of the

3 changeover valve, gas supply is effected from the left or right cylinder manifold.



Stanica za redukciju radi sa vrijednostima tlaka koje su postavljene tijekom početnog pokretanja:

1 Manometri pokazuju tlak lijeve i desne strane baterije boca, npr. 200 bar za punu bateriju boca s kisikom ili dušikom.

2 Manometar pokazuje tlak drugog stupnja redukcije tlaka = radni tlak cjevovodnog sustava od približno 5 bar.

Ovisno o postavki

3 preklopnog ventila, opskrba plinom se uspostavlja iz lijeve ili desne baterije boca.

When one cylinder manifold runs empty

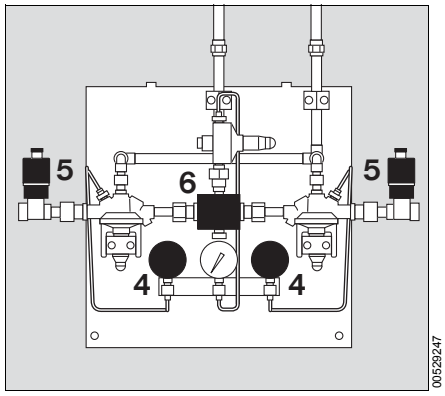
4 The gauge on the empty manifold indicates a pressure of about 10 bar.

5 The pressure switch on the empty manifold activates an accessory which is connected, e.g. an operating signal.

When the medium pressure has fallen to about 7 bar:

6 The changeover valve switches automatically to the other, full cylinder manifold.

- Replace the gas cylinders on the empty cylinder manifold – see page 10.



Kad se jedna od baterija plinskih boca isprazni

4 Manometar prazne baterije boca pokazuje tlak od približno 10 bar.

5 Tlačna sklopka na praznoj bateriji boca aktivira priključeni pribor, npr. signal upotrebe.

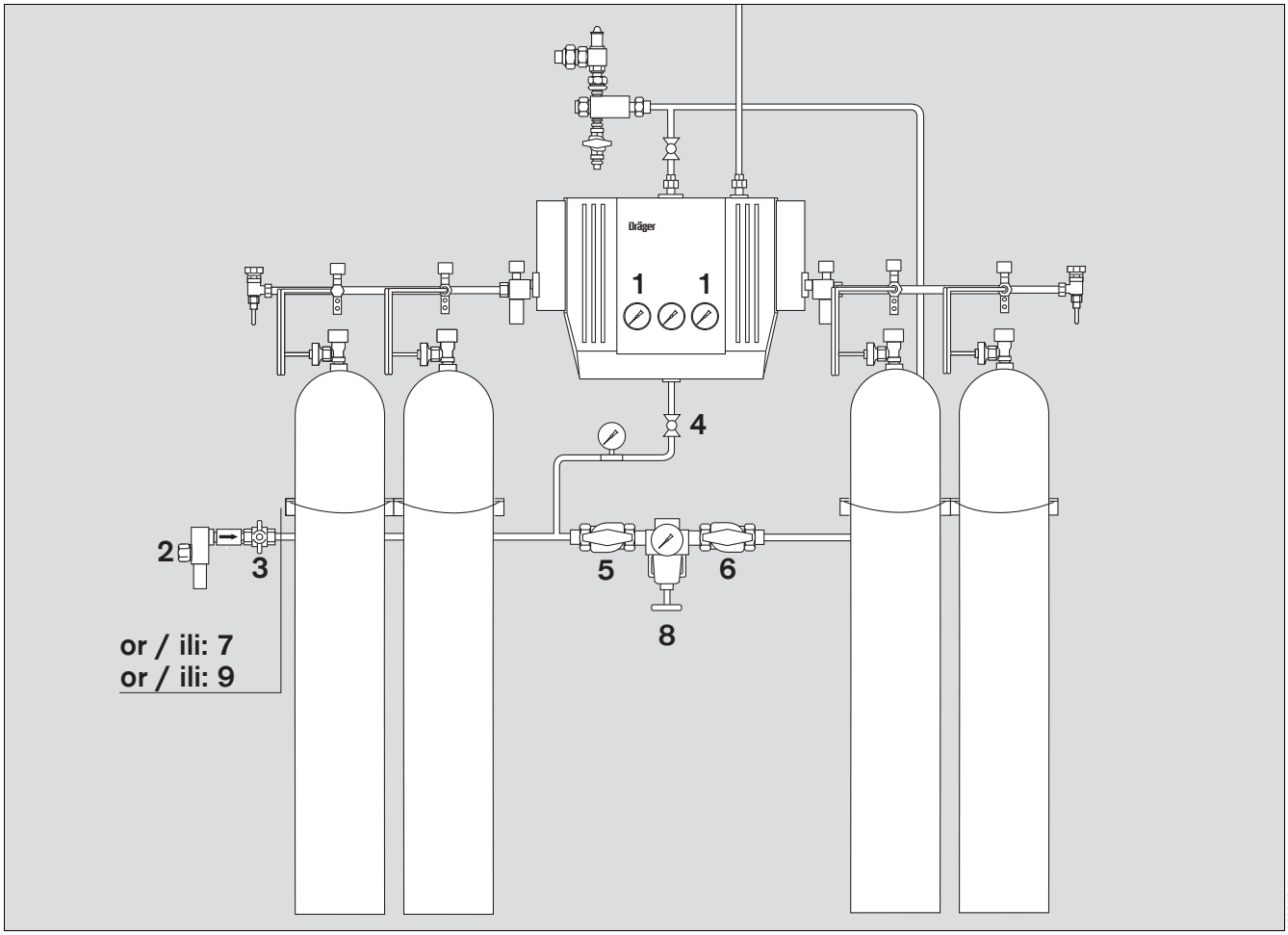
Kad srednji tlak padne na približno 7 bar:

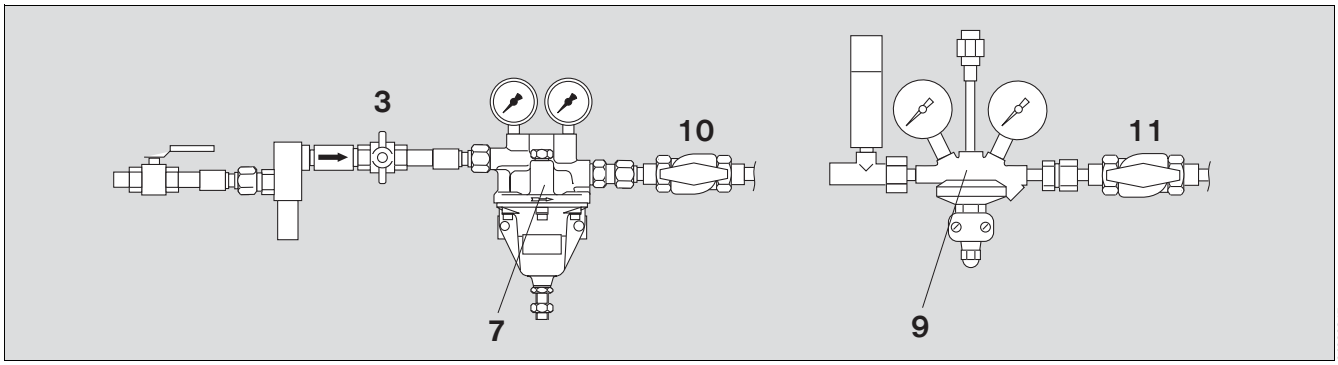
6 preklopni ventil se automatski prebacuje na drugu, punu bateriju plinskih boca.

- Zamijenite plinske boce u praznoj bateriji plinskih boca – vidi stranicu 10.

Operating with VIE / EN set / 3rd source (reserve supply)

Rad s VIE / EN kompletom / 3. izvorom (rezervna opskrba)





1 The pressure gauges show the pressure on the right and left-hand side of the cylinder manifold.

1 Manometri pokazuju tlak desne ili lijeve strane baterije boca.

Operating with VIE (vacuum insulated evaporator):

- Both cylinder manifolds are full and used as reserve supply.
- The right or left-hand cylinder manifold automatically takes over as the active supply if the VIE fails or is empty.

Rad sa VIE (Vacuum Insulated Evaporator, VIE – vakuumski izolirani isparivač):

- Obje baterije boca su pune i koriste se kao rezervna opskrba.
- Desna ili lijeva baterija boca automatski preuzima rad kao aktivna opskrba ukoliko je VIE neispravan ili prazan.

VIE pressure under 15 bar:

2 The VIE delivers a pressure of approx. 15 bar at the changeover valve.

3, 4, 5, 6 Ball valves are open.

VIE pressure over 18 bar:

2 The VIE delivers a pressure of approx. 18 bar at the changeover valve.

7 VIE pressure reducer

3, 4, 5, 6, 10 Ball valves are open.

Filling the VIE:

- Check gas supply in cylinder manifold – Pressure x cylinder volume = approximate gas supply in litres of compressed gas.

VIE pressure under 15 bar:

3 Close ball valve. Since the pressure in the vacuum insulated evaporator can briefly rise above 17 bar during the filling process, this prevents the relief valve in the reducer station being tripped. When the VIE is full and the pressure is below 17 bar:

3 Open ball valve – gas is once again supplied via the vacuum insulated evaporator.

VIE pressure over 18 bar:

3, 4, 5, 6, 10 Ball valves are open.

Operating with EN set:

8 EN set

3, 4, 5, 6, **10** Operating with VIE: ball valves are open.

9 RE 20 / RE 80 – 3rd source (reserve supply)

11 Operating with RE 20 / RE 80 – 3rd source (reserve supply): ball valve closed.

Operating with 3rd source (reserve supply):

- Gas is supplied via both cylinder manifolds.
- When both cylinder manifolds are empty, the supply must be switched over to the 3rd source (reserve supply) by hand.

11 Normal operation: ball valve closed. Open ball valve if both primary and secondary supply fail.

4, 5, 6 Ball valves are open.

9 RE 20 / RE 80 – 3rd source (reserve supply)

VIE tlak ispod 15 bar:

2 VIE isporučuje tlak od približno 15 bar preklopnom ventilu.

3, 4, 5, 6 Kuglasti ventili su otvoreni.

VIE tlak preko 18 bara:

2 VIE isporučuje tlak od približno 18 bar preklopnom ventilu.

7 VIE reduktor tlaka

3, 4, 5, 6, 10 Kuglasti ventili su otvoreni.

Punjenje VIE-a:

- Provjerite opskrbu plinom baterije boca – Tlak x volumen plinske boce = približna opskrba plinom u litrama komprimiranog plina.

VIE tlak ispod 15 bar:

3 Zatvorite kuglasti ventil. Budući da se tlak u vakuumski izoliranom isparivaču (VIE) može nakratko povećati iznad 17 bar tijekom postupka punjenja, to sprječava proradu ispušnog ventila u stanici za redukciju. Kad je VIE pun i tlak je ispod 17 bar:

3 Otvorite kuglasti ventil – plin se ponovno dovodi preko vakuumski izoliranog isparivača.

VIE tlak preko 18 bara:

3, 4, 5, 6, 10 Kuglasti ventili su otvoreni.

Rad s EN kompletom:

8 EN komplet

3, 4, 5, 6, **10** Rad s VIE: kuglasti ventili su otvoreni.

9 RE 20 / RE 80 – 3. izvor (rezervna opskrba)

11 Rad s RE 20 / RE 80 – 3. izvor (rezervna opskrba): kuglasti ventil je zatvoren.

Rad s 3. izvorom (rezervna opskrba):

- Plin se isporučuje putem obje baterije boca.
- Kad su obje baterije boca prazne, opskrba se mora ručno prebaciti na 3. izvor (rezervna opskrba).

11 Normalan rad: kuglasti ventil zatvoren. Otvorite kuglasti ventil ukoliko i primarna i sekundarna opskrba zakaže.

4, 5, 6 Kuglasti ventili su otvoreni.

9 RE 20 / RE 80 – 3. izvor (rezervna opskrba)

Replacing Gas Cylinders

- All the gas cylinders in an empty cylinder manifold must be replaced at the same time.

  To do so:

- Close each cylinder valve.

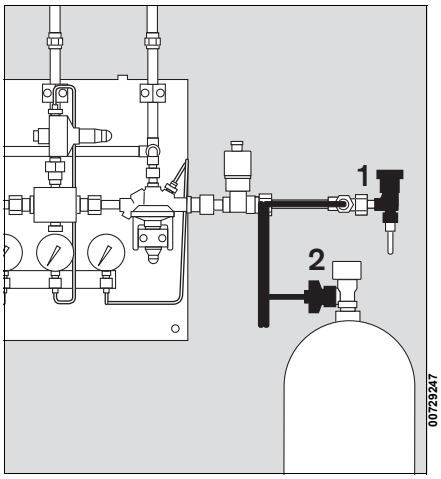
1 Open appropriate exhaust valve on the collecting pipe until the pipe is depressurized, then close again.
For collecting pipes with a non-return valve, a residual pressure of about 2 bar will remain in the connecting bends.

2 Disconnect connecting bends from the cylinder valves.

- Replace gas cylinders. The gas cylinders must be transported to the site with the protective valve cap in place, on a suitable trolley or (slightly tilted from the vertical) by rolling on the roller base.
  Gas cylinders must never be left unsecured.

- Check sealing rings in the connectors to the gas cylinders, replace any damaged sealing rings. Use only new replacement sealing rings which are specified for the connector and type of gas.
  Danger of accident.
  Never place 2 sealing rings on top of each other.

  Lubricants must not be used near the sealing rings and threaded fittings.
  Oil and grease are not allowed when using oxygen. The exterior of fittings must also be kept clear of oil and grease.
  Danger of explosion.



Zamjena plinskih boca

- Sve plinske boce u praznoj bateriji boca se moraju zamijeniti u isto vrijeme.

  Da biste to učinili:

- Zatvorite ventil svake plinske boce.

1 Držite otvorenim odgovarajući ispusni ventil na sabirnoj cijevi sve dok se tlak u cijev ne spusti, zatim ga ponovno zatvorite.
Za sabirne cijevi s protutlačnim ventilom, ostatni tlak od otprilike 2 bar će ostati na spojnim koljenima.

2 Odspojite spojna koljena s ventila plinskih boca.

- Zamijenite plinske boce. Plinske boce se moraju transportirati na mjesto s odgovarajućom zaštitnom kapom ventila, pomoću prikladnih kolica (malo nagnutih u odnosu na okomiti položaj) ili kotrljanjem oko podnožja za kotrljanje.
  Plinske se boce nikad ne smiju ostaviti neosiguranima.

- Provjerite brtvene prstenove u priključcima plinskih boca, i zamijenite svaki oštećen brtveni prsten. Koristite samo nove zamjenske brtvene prstenove specifične za taj priključak i tu vrstu plina.
  Opasnost od nezgode.
  Nemojte nikad staviti 2 brtvena prstena jedan na drugog.

  Ne smiju se koristiti maziva u blizini brtvenih prstena i nastavaka s navojem.
  Ulje i maziva nisu dozvoljeni kada se koristi kisik. Vanjski dio spojnih nastavaka se mora isto tako održavati bez ulja i maziva.
  Opasnost od eksplozije.

- Screw connecting bends to the cylinder valves.
  For hand connections, lightly screw the cap nut on by hand as far as it will go.
  Do not use any tools.
  The connection becomes leak-proof when the cylinder valve is opened and the pressure forces the profiled sealing ring into the joint.
- Slowly open all the valves on the gas cylinders, test connections for leaks with leak-testing solution.

Shut-down

The cylinder manifold may only be shut down if no patients are going to be put at risk by turning off the gas supply.

Follow internal regulations and any legal requirements in the European Economic Area (EEA), such as EN 737-3.

- An emergency supply must be guaranteed.
- Close cylinder valves on the cylinder manifolds.
- Shut-off VIE, if connected.
- Depressurize the cylinder manifold by opening the exhaust valve.
- Close all the valves on the cylinder manifold, provided that no maintenance or repair work has to be carried out, to prevent any moisture or air from entering the cylinder manifold.
- Attach information labels.

- Navijte spojna koljena na ventile plinske boce.
  Za ručno spajanje, lagano navijte kapicu s navojem rukom toliko koliko ide.
  Nemojte koristiti nikakve alate.
  Priključak postaje nepropusan kad se otvori ventil plinske boce i tlak utiskuje profilirani brtveni prsten u dosjed.
- Polako otvorite sve ventile na plinskim bocama i pomoću otopine za testiranje propuštanja testirajte priključke da ne propuštaju.

Isključivanje (Shut-down)

Baterija boca se smije isključiti samo ukoliko se pacijente ne stavlja u opasnost isključivanjem opskrbe plina.

Pridržavajte se internih propisa i svih pravnih zahtjeva u Europskom ekonomskom području (EEA), kao što je EN 737-3.

- Mora se jamčiti opskrba u slučaju nužde.
- Zatvorite ventile plinskih boca u baterijama boca.
- Isključite VIE, ukoliko je priključen.
- Smanjite tlak baterije boca tako da otvorite ispusni ventil.
- Zatvorite sve ventile baterije boca, pod uslovom da se ne trebaju provoditi nikakvi radovi na održavanju ili popravku, kako bi se sprječilo da vlaga ili zrak ulaze u bateriju boca.
- Pričvrstite informativne oznake.

Maintenance Intervals

Daily:

- Cylinder manifolds in continuous use must be visually checked for correct operation.

  Operation should always be effected from the manifold with the lower pressure. The reserve pressure of the standby cylinder manifold should be at least 150 bar for O_2 and 40 bar for N_2O or CO_2. When gas is extracted, the operational side of the manifold can be recognized by the decrease in pressure. Temporary shut off of the manifold side with the higher pressure facilitates change over to the other side of the manifold.

  For operation with VIE, both sides of the manifold should be fully charged.

Regularly, at least every six months:

- Function check and visual check of the entire cylinder manifold by trained service personnel.
  We recommend that a service contract is obtained with DrägerService.

Regularly, at least once a year:

- Check connecting bends.
- Check collecting pipes (including shut-off valves, non-return valves and exhaust valves).
- Check pressure switch, incl. alarm activation.
- Check pressure reducers for set values and subsequent pressure rise.
- Check function and condition of safety valve.
- Make leak test of the entire system.

Every 6 years:

- Complete overhaul / replacement of the following:
  - pressure reducers,
  - safety valves and blow-off valves,
  - sintered metal filter inserts,
  - all Elastomer parts, such as O-rings, pressure reducerdiaphragm, closing bolts.

- Use only original Dräger replacement parts for all maintenance procedures.

Intervali održavanja

Svakodnevno:

- Baterije boca u stalnoj upotrebi moraju biti vizualno pregledane na ispravnost rada.

  Na rad treba uvijek utjecati baterija s manjim tlakom. Rezervni tlak pripravne (standby) baterije boca mora biti najmanje 150 bar za O_2 i 40 bar za N_2O ili CO_2. Prilikom ekstrakcije plina, radna strana baterije boca se može prepoznati po smanjenju tlaka. Privremeno isključenje strane baterije boca s višim tlakom izaziva preklapanje na bateriju s druge strane.

  Za rad s VIE, obje strane baterije boca moraju biti potpuno napunjene.

Redovno, najmanje svakih šest mjeseci:

- Provjera ispravnog rada i vizualna provjera cijele baterije boca od strane obučenog osoblja servisa. Preporučujemo sklapanje servisnog ugovora sa službom DrägerService.

Redovito, barem jednom godišnje:

- Provjerite spojnih koljena.
- Provjerite sabirne cijevi (uključujući zaporne ventile, protutlačne ventile i ispusne ventile).
- Provjerite tlačnu sklopku, uključujući aktiviranje alarma.
- Provjerite postavljene vrijednosti reduktora tlaka i naredni porast tlaka.
- Provjerite ispravnost rada i stanje sigurnosnog ventila.
- Testirajte cijeli sustav na propuštanje.

Svakih 6 godina:

- Kompletan remont / zamjena kako slijedi:
  - reduktora tlaka,
  - sigurnosnih i ispušnih ventila,
  - filterskih umetaka od sinteriranog metala,
  - svih dijelova od elastomera, kao O-prstenovi, membrana reduktora tlaka, zaporni klinovi.

- Koristite samo izvorne zamjenske dijelove tvrtke Dräger za sve postupke održavanja.

Fault – Cause – Remedy

Fault	Cause	Remedy
Breakdown in operating pressure	Breakdown of gas supply	Establish emergency supply. Reduce gas consumption. Cylinder empty? If yes, replace. Cylinder valve closed? If yes, open. Have repaired by experts.
Operating pressure too low (P3 < 4 bar)	Inadequate gas supply	Establish emergency supply. Reduce gas consumption. Pressure OK after these measures? If not, have repaired by experts.
Operating pressure too high (P3 > 6 bar)	Increased gas consumption	Have repaired by experts.
Pressure gauge defective	Misinformation	Have repaired by experts.
No empty message	Misinformation	Observe pressure gauge. Replace cylinders if P1 / P2 is approx. 10 bar. Have repaired by experts.
Blow-off valve blows off	Increased gas consumption Incorrect change-over	Observe pressure gauge. Check VIE, if connected. Have repaired by experts.
Safety valve blows off	Increased gas consumption Incorrect change-over	Observe pressure gauge. Have repaired by experts.
Change-over effected too early	Increased residual pressure in gas cylinder Empty message fails	Reduce gas consumption. Observe pressure gauge. Switch to fuller manifold by brief shut off. Replace cylinder upon receipt of empty message. Change-over OK now? If not, have repaired by experts.
Both manifolds feed in simultaneously	Reserve supply being used	Observe pressure gauge. Shut off side with higher pressure, for use the side with lower pressure. After empty message: open side with higher pressure and replace empty cylinders. Have repaired by experts.

Fault	**Cause**	**Remedy**
Change-over switches constantly to and fro	Reserve supply will exhaust	Reduce gas consumption. Observe pressure gauge. Shut off side with higher pressure, for use the side with lower pressure. After empty message: open side with higher pressure and replace empty cylinders. Have repaired by experts.
Pressure drop in reserve manifold although change-over valve is OK	Reserve supply will exhaust	Observe pressure gauge. Exhaust valve open? If yes, close it. Leakage? If yes, close cylinder valve at leak manifold until manifold in operation is full. Have repaired by experts.
Minor leakage	Increased gas consumption	Have repaired by experts.
Major leakage	Increased gas consumption Inadequate gas supply Gas accumulates in the room	No fire, do not smoke. Establish emergency supply. Reduce gas consumption. If possible, shut off respective range of gas supply. Have repaired by experts.
Line valve cannot be actuated by normal force of hand	Restricted operation	Have repaired by experts.
Cylinder valve cannot be actuated by normal force of hand	Restricted operation	Return cylinder back to manufacturer.
Leak in connection between connecting bend and gas cylinder	Gas escapes	Use new sealing ring appropriate to respective type of gas.
Both cylinder manifolds and the 3rd source (reserve supply) are empty.	3rd source (reserve supply) was not shut off via ball valve.	3rd source (reserve supply) must be shut off via ball valve during normal operation with cylinder manifolds. Ball valve to 3rd source (reserve supply) must only be opened when cylinder manifolds are reported empty. Install new cylinders.

Greška – Uzrok – Rješenje

Greška	**Uzrok**	**Rješenje**
Prekid radnog tlaka	Prekid opskrbe plina	Uspostavite opskrbu u nuždi. Smanjite potrošnju plina. Prazna plinska boca? Ako je prazna zamijenite ju. Ventil plinske boce je zatvoren? Ako je zatvoren, otvorite ga. Popravak od strane stručnjaka.
Prenizak radni tlak (P3 < 4 bar)	Opskrba plinom nije odgovarajuća	Uspostavite opskrbu u nuždi. Smanjite potrošnju plina. Je li tlak u redu nakon ovih mjera? Ukoliko nije, neka stručnjaci izvrše popravak.
Previsok radni tlak (P3 > 6 bar)	Povećana potrošnja plina	Popravak od strane stručnjaka.
Manometar je neispravan	Pogrešna informacija	Popravak od strane stručnjaka.
Nema poruke – prazno	Pogrešna informacija	Promatrajte manometar. Zamijenite plinske boce ako je P1 / P2 približno 10 bar. Popravak od strane stručnjaka.
Ispušni ventil je proradio	Povećana potrošnja plina Neispravno preklapanje	Promatrajte manometar. Provjerite VIE, ukoliko je priključen. Popravak od strane stručnjaka.
Sigurnosni ventil je proradio	Povećana potrošnja plina Neispravno preklapanje	Promatrajte manometar. Popravak od strane stručnjaka.
Preklapanje je nastupilo prerano	Povišeni ostatni tlak u plinskoj boci Zakazala poruka – prazno	Smanjite potrošnju plina. Promatrajte manometar. Kratkim zatvaranjem prebacite na puniju bateriju boca. Zamijenite plinsku bocu nakon primitka poruke – prazno. Je li preklapanje sada u redu? Ukoliko nije, neka stručnjaci izvrše popravak.
Obje baterije opskrbljuju istovremeno	Koristi se rezervna opskrba	Promatrajte manometar. Zatvorite stranu s višim tlakom zbog upotrebe strane s nižim tlakom. Nakon poruke – prazno: otvorite stranu s višim tlakom i zamijenite prazne plinske boce. Popravak od strane stručnjaka.

Greška	**Uzrok**	**Rješenje**
Preklopnici stalno mijenjaju stanje	Rezervna opskrba će se iscrpiti	Smanjite potrošnju plina. Promatrajte manometar. Zatvorite stranu s višim tlakom zbog upotrebe strane s nižim tlakom. Nakon poruke – prazno: otvorite stranu s višim tlakom i zamijenite prazne plinske boce. Popravak od strane stručnjaka.
Pad tlaka u rezervnoj bateriji iako je preklopni ventil u redu.	Rezervna opskrba će se iscrpiti	Promatrajte manometar. Ispusni ventil otvoren? Ako je, zatvorite ga. Propuštanje? Ako ga ima, zatvorite ventil plinske boce na bateriji koja propušta sve dok baterija koja se koristi ne bude puna. Popravak od strane stručnjaka.
Manje propuštanje	Povećana potrošnja plina	Popravak od strane stručnjaka.
Veliko propuštanje	Povećana potrošnja plina Isporuka plina nije odgovarajuća Plin se nakuplja u prostoriji	Ne smije biti vatre, pušenje zabranjeno. Uspostavite opskrbu u nuždi. Smanjite potrošnju plina. Ukoliko je to moguće, isključite odgovarajuće područje opskrbe plinom. Popravak od strane stručnjaka.
Linijski ventil se ne može pokrenuti normalnom snagom ruke	Ograničena upotreba	Popravak od strane stručnjaka.
Ventil plinske boce se ne može pokrenuti normalnom snagom ruke	Ograničena upotreba	Vratite plinsku bocu proizvođaču.
Propuštanje na spoju između spojnog koljena i plinske boce	Plin izlazi	Koristite novi brtveni prsten koji je prikladan za odgovarajuću vrstu plina.
Obje baterije boca i 3. izvor (rezervna opskrba) su prazni.	3. izvor (rezervna opskrba) nije bio isključen putem kuglastog ventila.	3. izvor (rezervna opskrba) se mora isključiti putem kuglastog ventila tijekom normalnog rada s baterijama boca. Kuglasti ventil za 3. izvor (rezervna opskrba) se može jedino otvoriti kad se dojavi da su baterije boca prazne. Montirajte nove plinske boce.

Technical Data

Supply pressure P_V	200 bar*
Intermediate pressure P_M	10 bar 15 bar for operation with VIE
Operating pressure P_B	5 bar
Nominal flow RS 20	 20 m^3/h at P_V = 21 bar P_B = 5 bar ±0.5 bar
RS 80	80 m^3/h at P_V = 21 bar P_B = 5 bar ±0.5 bar
Pressure switch set at	 15 bar
Operating temperature	–20 to 60 °C
Ambient temperature	0 to 60 °C
Materials	brass, copper diaphragms – elastomer
Weight RS 20 RS 80	 about 14 kg about 28.5 kg
Classification as per EC Directive 93/42/EEC Annex IX	Class II b
UMDNS-Code Universal Medical Device Nomenclature System – Nomenclature for medical products	18-046

* 1 bar = 1 kPa x 100

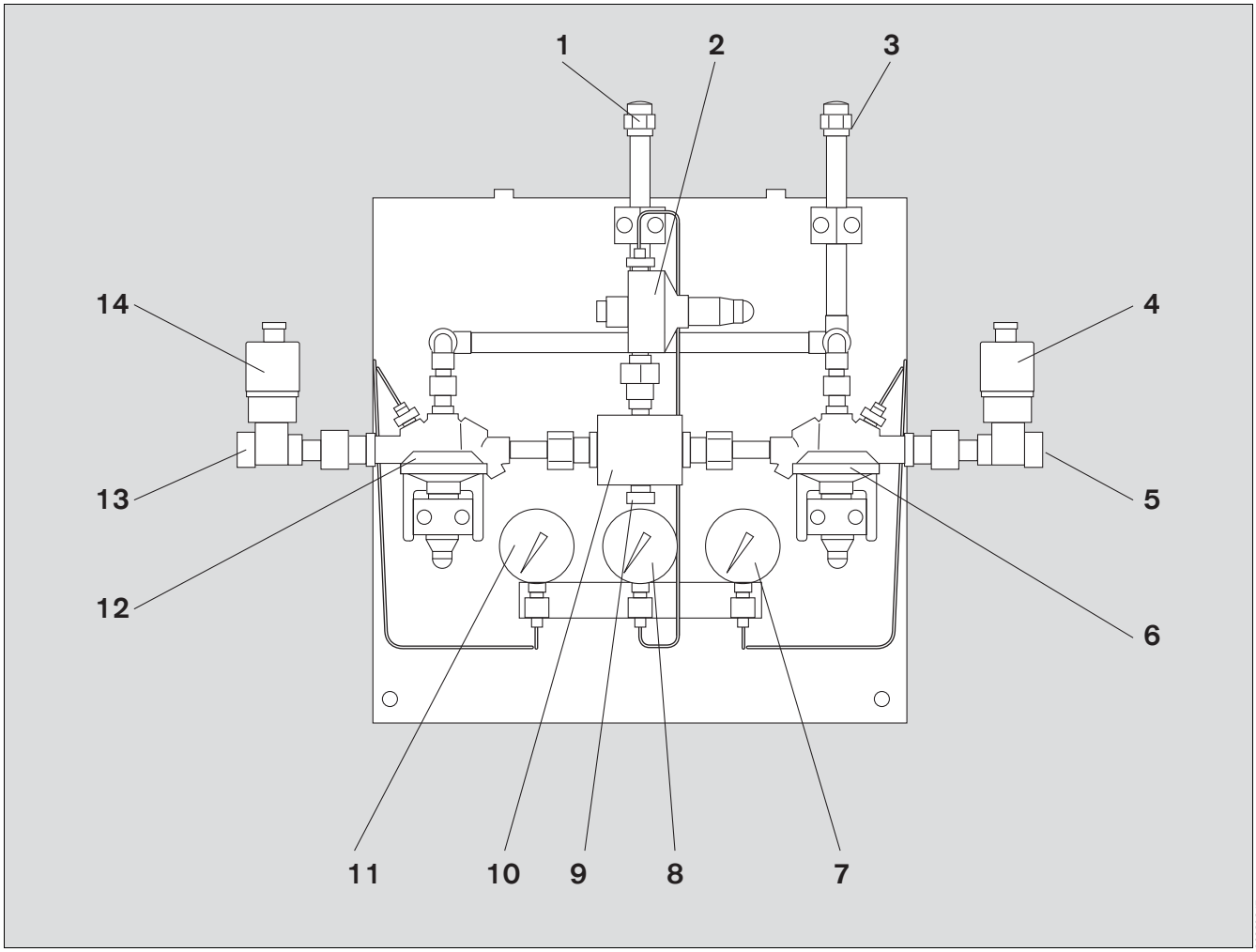
Tehnički podaci

Tlak opskrbe P_V	200 bar*
Srednji tlak P_M	10 bar 15 bar za rad sa VIE
Radni tlak P_B	5 bar
Nazivni protok RS 20	 20 m^3/h pri P_V = 21 bar P_B = 5 bar ±0,5 bar
RS 80	80 m^3/h pri P_V = 21 bar P_B = 5 bar ±0,5 bar
Tlačna sklopka postavljena na	 15 bar
Radna temperatura	–20 to 60 °C
Temperatura okoline	0 do 60 °C
Materijali	mjed, bakar membrane – elastomer
Težina RS 20 RS 80	 približno 14 kg približno 28,5 kg
Klasifikacija prema EC Direktivi 93/42/EEC Dodatak IX	Klasa II b
UMDNS kôd Universal Medical Device Nomenclature System – Nomenklatura za medicinske proizvode	18-046

* 1 bar = 1 kPa x 100

What's What

RS 20 Reducing Station:



1 Pipeline system outlet **AVN**
2 Pressure reducer, 2nd stage **DM3**
3 Connection vent pipe
4 Pressure switch, right **S2**
5 High pressure connector, right
6 Pressure reducer, 1st stage right **DM2**
7 Supply pressure gauge, right **P2**
8 Operating pressure gauge **P3**
9 VIE connector
10 Change-over valve **UV**
11 Supply pressure gauge, left **P1**
12 Pressure reducer, 1st stage left **DM1**
13 High pressure connector, left
14 Pressure switch, left **S1**

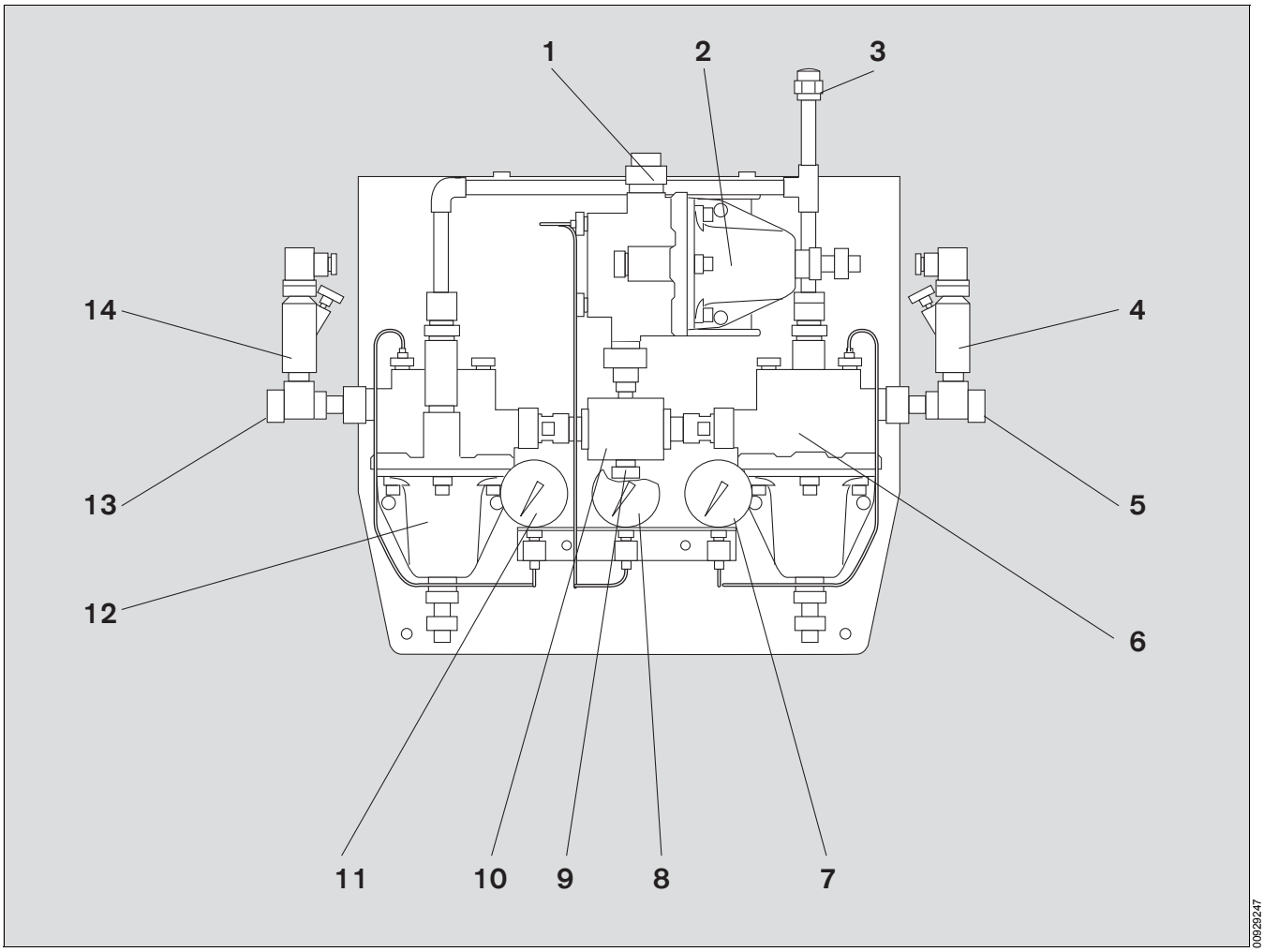
Što je što

Stanica za redukciju RS 20:

1 Izlaz cjevovodnog sustava **AVN**
2 Reduktor tlaka, 2. stupanj **DM3**
3 Priključak ispušne cijevi
4 Tlačna sklopka, desna **S2**
5 Visokotlačni priključak, desni
6 Reduktor tlaka, 1. stupanj desni **DM2**
7 Manometar tlaka opskrbe, desni **P2**
8 Manometar radnog tlaka **P3**
9 VIE priključak
10 Preklopni ventil **UV**
11 Manometar tlaka opskrbe, lijevi **P1**
12 Reduktor tlaka, 1. stupanj lijevi **DM1**
13 Visokotlačni priključak, lijevi
14 Tlačna sklopka, lijeva **S1**

RS 80 Reducing Station:

Stanica za redukciju RS 80:

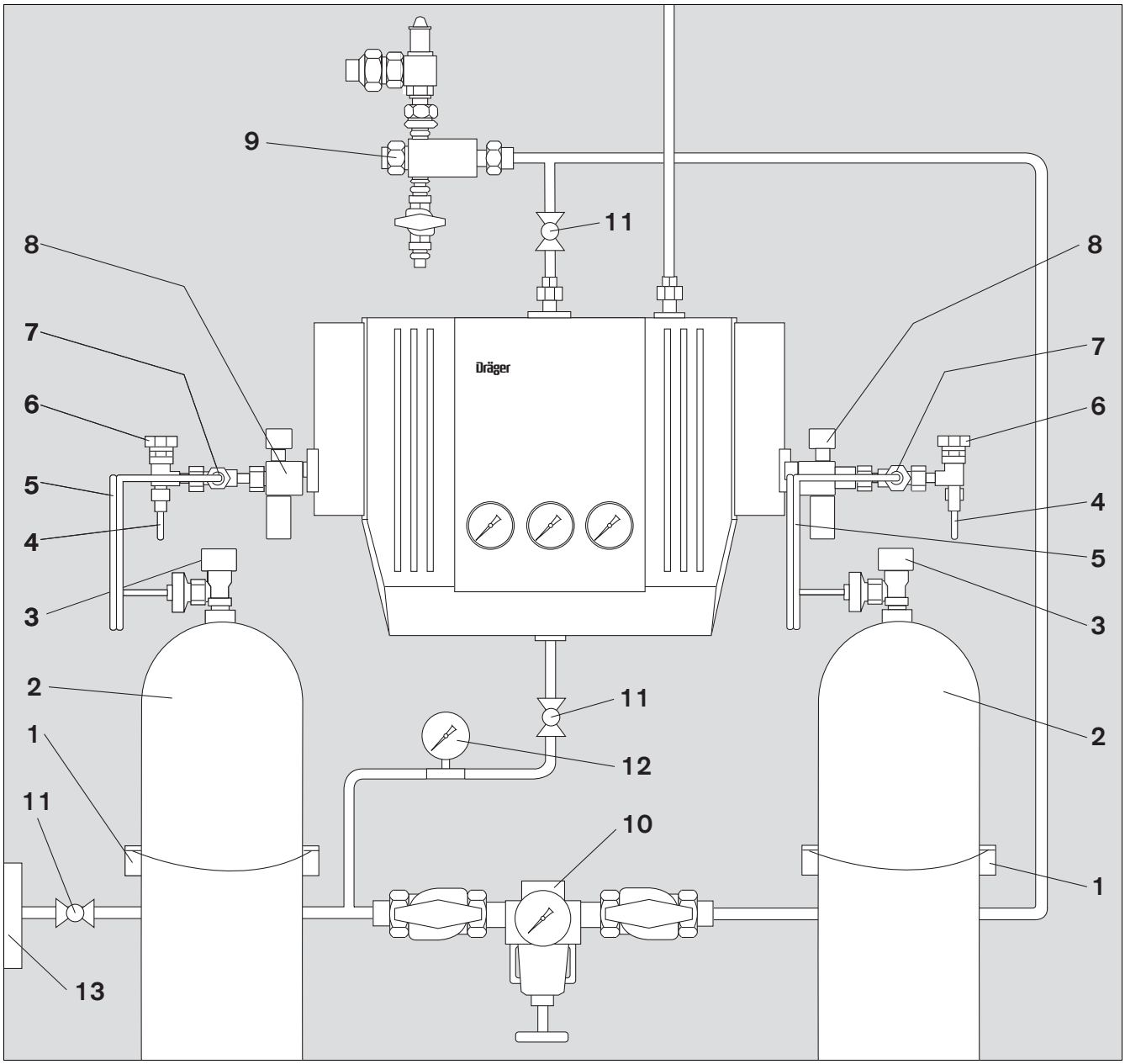


1 Pipeline system outlet **AVN**
2 Pressure reducer, 2nd stage **DM3**
3 Connection vent pipe
4 Pressure switch, right **S2**
5 High pressure connector, right
6 Pressure reducer, 1st stage right **DM2**
7 Supply pressure gauge, right **P2**
8 Operating pressure gauge **P3**
9 VIE connector
10 Change-over valve **UV**
11 Supply pressure gauge, left **P1**
12 Pressure reducer, 1st stage left **DM1**
13 High pressure connector, left
14 Pressure switch, left **S1**

1 Izlaz cjevovodnog sustava **AVN**
2 Reduktor tlaka, 2. stupanj **DM3**
3 Priključak ispušne cijevi
4 Tlačna sklopka, desna **S2**
5 Visokotlačni priključak, desni
6 Reduktor tlaka, 1. stupanj desni **DM2**
7 Manometar tlaka opskrbe, desni **P2**
8 Manometar radnog tlaka **P3**
9 VIE priključak
10 Preklopni ventil **UV**
11 Manometar tlaka opskrbe, lijevi **P1**
12 Reduktor tlaka, 1. stupanj lijevi **DM1**
13 Visokotlačni priključak, lijevi
14 Tlačna sklopka, lijeva **S1**

Accessories for Reducing Station:

Pribor stanice za redukciju:



1 Cylinder bracket
2 Gas cylinder **FL**
3 Cylinder valve **FV**
4 Exhaust pipe
5 Connecting bend
6 Exhaust valve **EV**
7 High pressure collecting pipe
8 High-pressure valve with sintered filter resp. sinter filter
9 Control unit
10 EN set
11 Ball valve
12 Pressure gauge (optional)
13 VIE or one-sided cylinder manifold with RE 20 / RE 80 – 3rd source (reserve supply)

1 Nosač plinske boce
2 Plinska boca **FL**
3 Ventil plinske boce **FV**
4 Ispusna cijev
5 Spojno koljeno
6 Ispusni ventil **EV**
7 Visokotlačna sabirna cijev
8 Visokotlačni ventil sa sinteriranim filtrom odnos. sinter filtrom
9 Upravljačka jedinica
10 EN komplet
11 Kuglasti ventil
12 Manometar (opcionalno)
13 VIE ili jednostrana baterija boca sa RE 20 / RE 80 – 3. izvor (rezervna opskrba)

Order-List Replacement Parts

Designation and description	Order No.
Rubber washer for connecting bend and double connectors (manifold cylinder valve – hand connection) with order no. V 03962, V 04042 and V 04052. Gas type: O_2	**R 21 399**
Rubber washer for connecting bend and double connectors (manifold cylinder valve – hand connection) with order no. V 03963, V 04043 and V 04053. Gas type: CO_2, inert gas	**R 21 001**
Sealing ring for connecting bend and double connectors (manifold cylinder valve – hand connection) with order no. V 03966, V 04046 and V 04056. Gas type: N_2O	**D 11 404**

Popis za naručivanje zamjenskih dijelova

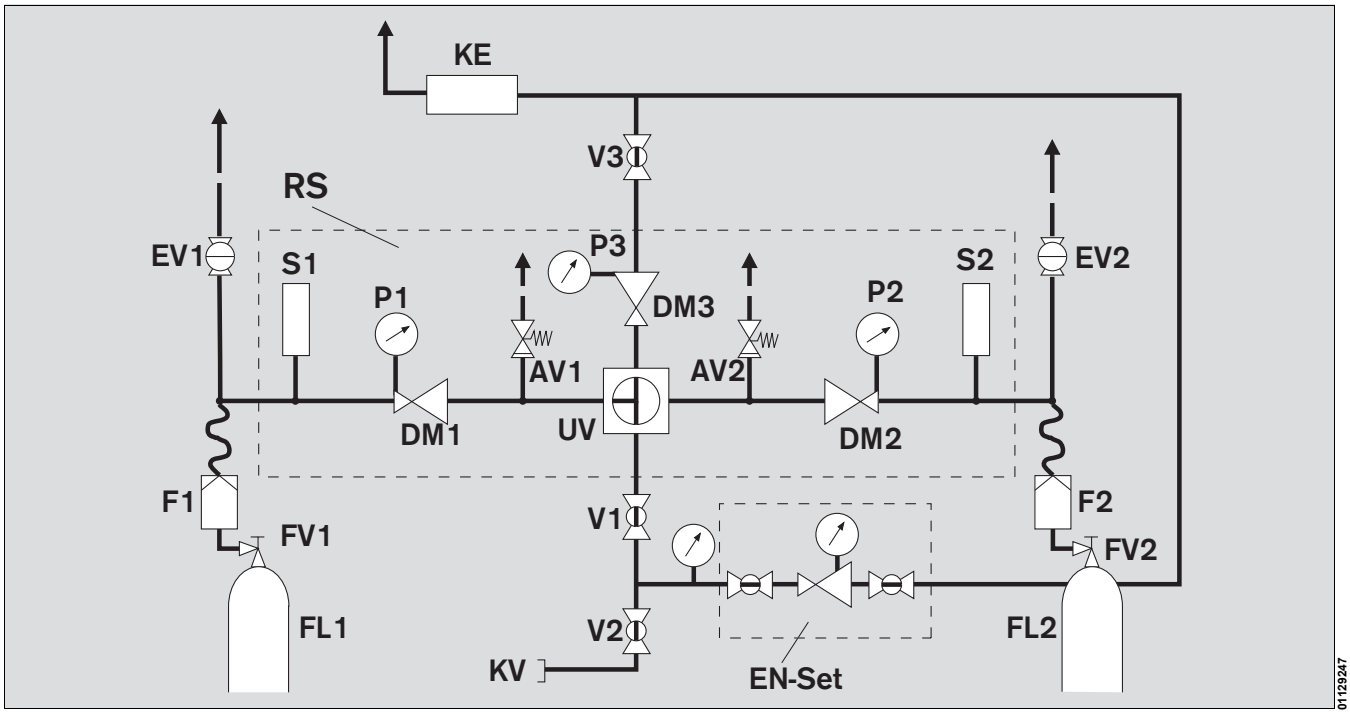
Naziv i opis	Br. narudžbe
Gumena podloška za spojno koljeno i dvostruke priključke (ventil baterije boca – ručno spajanje) s brojem za narudžbu V 03962, V 04042 i V 04052. Vrsta plina: O_2	**R 21 399**
Gumena podloška za spojno koljeno i dvostruke priključke (ventil baterije boca – ručno spajanje) s brojem za narudžbu V 03963, V 04043 i V 04053. Vrsta plina: CO_2, inertni plin	**R 21 001**
Brtveni prsten za spojno koljeno i dvostruke priključke (ventil baterije boca – ručno spajanje) s brojem za narudžbu V 03966, V 04046 i V 04056. Vrsta plina: N_2O	**D 11 404**

Functional Description

Opis rada

Flow chart

Dijagram toka



AV1 Blow-off valve on pressure reducer DM1
AV2 Blow-off valve on pressure reducer DM2
DM1 Pressure reducer, 1st stage left
DM2 Pressure reducer, 1st stage right
DM3 Pressure reducer, 2nd stage
EV1 Exhaust valve, left
EV2 Exhaust valve, right
F1 Filter in connecting bend, left*
F2 Filter in connecting bend, right*
FL1 Gas cylinder, left
FL2 Gas cylinder, right
FV1 Cylinder valve, left
FV2 Cylinder valve, right
KE Control unit
KV Connection for VIE or RE 20 / RE 80 – 3rd source (reserve supply) –
P1 Supply pressure gauge, left
P2 Supply pressure gauge, right
P3 Operating pressure gauge
S1 Pressure switch, left
S2 Pressure switch, right
UV Change-over valve
V1 Ball valve
V2 Ball valve
V3 Ball valve

AV1 Ispušni ventil na reduktoru tlaka DM1
AV2 Ispušni ventil na reduktoru tlaka DM2
DM1 Reduktor tlaka, 1. stupanj lijevi
DM2 Reduktor tlaka, 1. stupanj desni
DM3 Reduktor tlaka, 2. stupanj
EV1 Ispusni ventil, lijevi
EV2 Ispusni ventil, desni
F1 Filtar u spojnom koljenu, lijevi*
F2 Filtar u spojnom koljenu, desni*
FL1 Plinska boca, lijeva
FL2 Plinska boca, desna
FV1 Ventil plinske boce, lijevi
FV2 Ventil plinske boce, desni
KE Upravljačka jedinica
KV Priključak za VIE ili RE 20 / RE 80 – 3. izvor (rezervna opskrba) –
P1 Manometar tlaka opskrbe, lijevi
P2 Manometar tlaka opskrbe, desni
P3 Manometar radnog tlaka
S1 Tlačna sklopka, lijeva
S2 Tlačna sklopka, desna
UV Preklopni ventil
V1 Kuglasti ventil
V2 Kuglasti ventil
V3 Kuglasti ventil

* The connecting bend for N_2O contains no filter. Connect a sintered filter to high pressure connector.

* Spojno koljeno za N_2O ne sadrži filter. Priključite sinterirani filter na visokotlačni priključak.

Normal operation:

The Reducing Station reduces the pressure of the cylinder manifold in two stages from a maximum of 200 bar to an operating pressure of about 5 bar.
The pressure reducers of the 1st stage, **DM1** and **DM2**, are fixed at a medium pressure of 10 bar.
If both cylinder manifolds are fully charged, there is the same pressure on both sides of the change-over valve **UV** which remains in its set position. Gas is supplied from only one side of the cylinder manifold, with the other side remaining in reserve.

When the pressure of the cylinder manifold in operation falls below 10 bar, pressure switch **S1** or **S2** activates an accessory which is connected, e.g. to an operating alarm panel. If the pressure continues to fall and the intermediate pressure falls below 7 bar, the change-over valve **UV** automatically switches over to the other full side of the cylinder manifold. The empty gas cylinders must now be replaced (see page 10).

If a fault develops in the pressure reducers **DM1** and **DM2**, an unacceptable increase in pressure is prevented by blow-off valves **AV1** and **AV2**.

The components on the unit can be repaired or replaced during operation without having to shut down.

When repairing or replacing the pressure reducers in the first stage **DM1** and **DM2**, as well as the pressure reducer in the second stage **DM3**, gas is still supplied through a VIE (vacuum insulated evaporator) or by starting the 3rd source (reserve supply). Valves **V1** and **V3** must be closed in this case and **V2** opened
(only with RE 20 / RE 80).

In the case of systems which do not comply with DIN EN 737-3 (EN set and 3rd source not installed), the emergency supply can be provided via the gas-specific emergency inlet point of the control unit (valves **V1**, **V2** and **V3** closed). A gas cylinder with cylinder pressure reducer is connected to the emergency inlet point via a hose (NIST/DIN EN 739 or M12x1 O_2 /
M14x1 – N_2O / M22x1.5 AIR / DIN 13252) for this purpose. The cylinder pressure reducer is set to a pressure of 5 bar.

VIE operation:

Optionally a VIE **KV** can be connected to the change-over valve **UV**. The VIE pressure of 15 ±2 bar keeps the pressure reducers **DM1** and **DM2** closed (The cylinder manifold is used as reserve supply). If the pressure falls, one side of the cylinder manifold takes over the supply.

Normalna upotreba:

Stanica za redukciju reducira tlak baterije boca u dva stupnja od maksimalno od 200 bar na radni tlak od približno 5 bar.
Reduktori tlaka 1. stupnja, **DM1** i **DM2**, su fiksirani na srednji tlak od 10 bar.
Ako su obje baterije boca potpuno napunjene, postoji isti tlak na obje strane preklopnog ventila **UV** koji ostaje u svom postavljenom položaju. Opskrba plinom odvija se samo iz jedne strane baterije boca, dok druga strana ostaje u rezervi.

Kada tlak u korištenoj bateriji boca padne ispod 10 bar, tlačna sklopka **S1** ili **S2** aktivira priključeni pribor, npr. na panelu radnih alarma. Ukoliko tlak nastavlja padati i srednji tlak padne ispod 7 bar, preklopni ventil **UV** se automatski prebacuje na drugu stranu, punu bateriju razvodnika boca. Prazne plinske boce se sada moraju zamijeniti (vidi stranicu 10).

Ukoliko se pojavi kvar u reduktorima tlaka **DM1** i **DM2**, neprihvatljivo povišenje tlaka je sprječeno pomoću ispušnih ventila **AV1** i **AV2**.

Komponente jedinice se mogu popraviti ili zamijeniti tijekom rada bez da se upotreba mora prekidati.

Prilikom popravka ili zamjene reduktora tlaka u prvom stupnju **DM1** i **DM2**, kao i reduktora tlaka u drugom stupnju **DM3**, plin se još uvijek isporuluje preko vakuumski izoliranog isparivača (VIE) ili pokretanjem 3. izvora (rezervna opskrba). Ventili **V1** i **V3** moraju u tom slučaju biti zatvoreni a **V2** otvoren (samo sa RE 20 / RE 80).

U slučaju da sustav ne udovoljava DIN EN 737-3 (EN komplet i 3. izvor nisu instalirani), opskrba u slučaju nužde se može omogućiti preko ulazne točke upravljačke jedinice za slučaj nužde za specifičan plin (ventili **V1**, **V2** i **V3** zatvoreni). Plinska boca s reduktorom tlaka plinske boce je u tu svrhu spojena na ulaznu točku za slučaj nužde preko cijevi (NIST/DIN EN 739 ili M12x1 O_2 /
M14x1 – N_2O / M22x1.5 AIR / DIN 13252). Reduktor tlaka plinske boce je postavljen na tlak od 5 bar.

Upotreba s VIE:

Opcionalno VIE **KV** se može priključiti na preklopni ventil **UV**. VIE tlak od 15 ±2 bar drži reduktore tlaka **DM1** i **DM2** zatvorenima (baterija boca se koristi kao rezervna opskrba). Ukoliko tlak padne, jedna strana baterija boca preuzima opskrbu.

3rd source (reserve supply):

Ball valve **V2** must be closed in normal operation.
The 3rd source is connected manually by opening ball valve **V2** if the cylinder manifold fails (2nd fault case).

3. izvor (rezervna opskrba):

Kuglasti ventil **V2** mora biti zatvoren u normalnoj upotrebi.
3. izvor se ručno spaja otvaranjem kuglastog ventila **V2** ukoliko baterija boca zakaže (2. slučaj kvara).

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CE 0123

Directive 93/42/EEC
concerning Medical Devices

Manufacturer

Dräger Medical GmbH
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Od 08/2015.:
Dräger Medical GmbH
mijenja se u
Drägerwerk AG & Co. KGaA