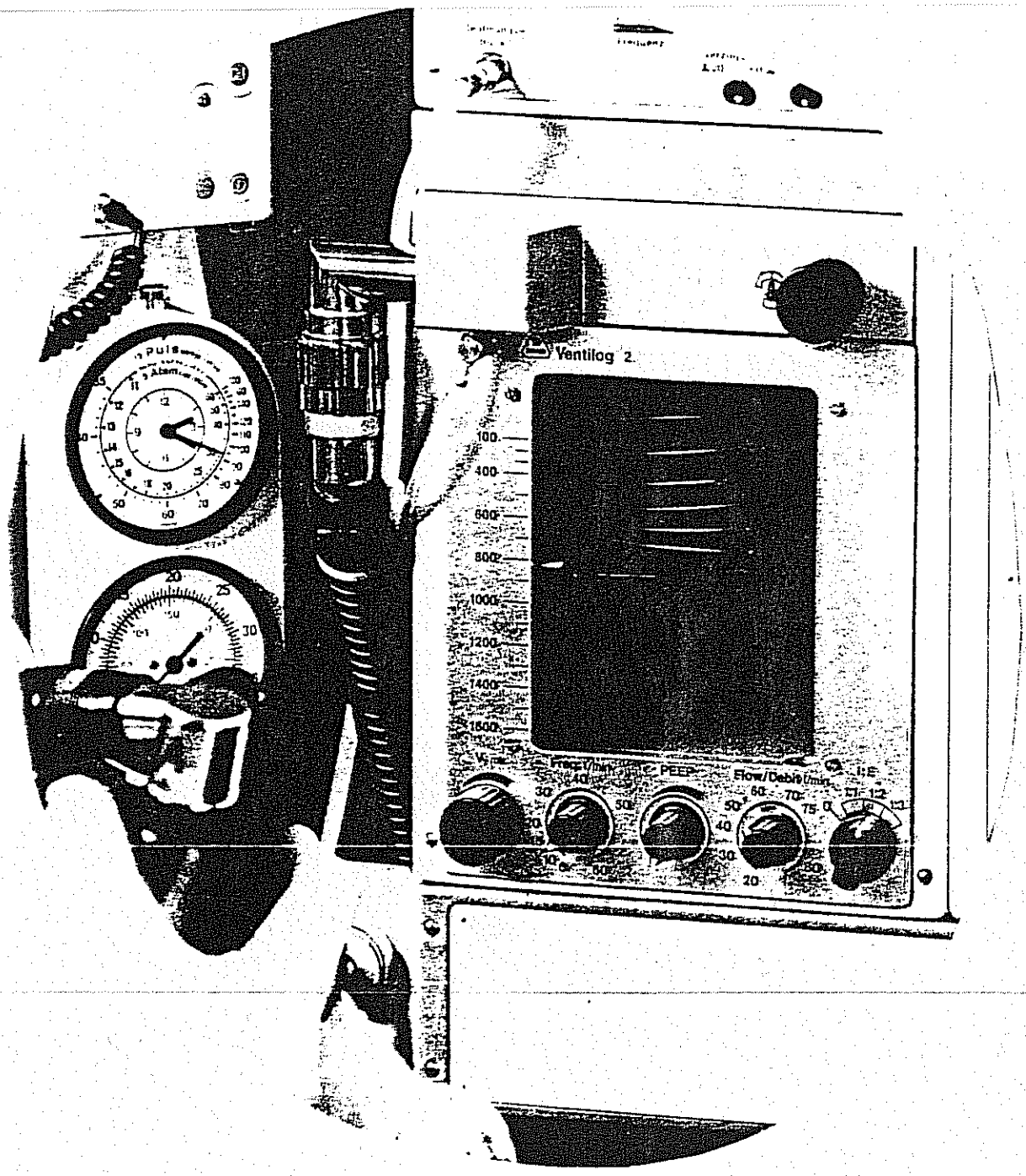
Anaesthetic Ventilators

Ventilog



Anaesthetic Ventilators

Ventilog

Technical training work sheets

Anaesthetic Ventilators

Ventilog

Technical Data

Operating principle	Bellows-in-bottle ventilator with primary/ secondary system
Control principle	pneumatic, time-cycled, volume constant
Ventilation frequency	Ventilog: 6 to 40/min ± 20 % Ventilog 2: 6 to 60/min ± 15 %
I:E ratio	Ventilog: 1:2 ± 20 %, permanently set Ventilog 2: 1:1, 1:2, 1:3, ± 20 % adjustable
Switch »0«/»1«	Main switch for Ventilog
Switch »0«/»I:E«	Main and selector switch for Ventilog 2
Inspiratory flow	Ventilog: 20 to 80 L/min ± 15 %, infinitely adjustable Ventilog 2: 20 to 80 L/min ± 15 % at 20 mbar counter pressure, infinitely adjustable
Tidal volume	50 to 150 mL with bellows K for children 150 to 1600 mL with bellows E for adults
Internal compliance	2.3 mL/mbar with bellows K for children, corrugated hose 1 m 3.0 mL/mbar with bellows E for adults, corrugated hose 1 m 6.4 mL/mbar with bellows E, corrugated hose 1 m, switching valve, circle system 7 a/8 ISO with 2 absorbers
Minute volume (as per ISO)	up to 25 L/min with a fresh-gas flow of 4 L/min
Working pressure	30 mbar ± 15 %, permanently set
PEEP	up to 19 mbar ± 20 %, infinitely adjustable
Compressed-gas supply	Oxygen or oil-free compressed air from a central supply system or from compressed-gas cylinders. Connecting thread M 15 x 1, male
Compressed-gas consumption	Ventilog: ⅓ of the set inspiratory flow Ventilog 2: 16 L/min (at I:E = 1:2)
Patient system	autoclavable bellows, removable after releasing slide-in unit
Anaesthetic-gas disposal	Excess exhaled gas is routed to the anaesthetic gas exhaust via an exhaust socket at the rear of the unit
Dimensions	W x H x D = 212 x 266 x 300 mm
Weight	12 kg

Deviations of settings and operating ranges are indicated pertinent to desired values.
The frequency control elements are calibrated with oxygen.
If compressed air is used as drive gas, this results in an increase of frequency of approx. 10 %.

Cleaning and desinfection or steam sterilisation of Ventilog/2 and accessories

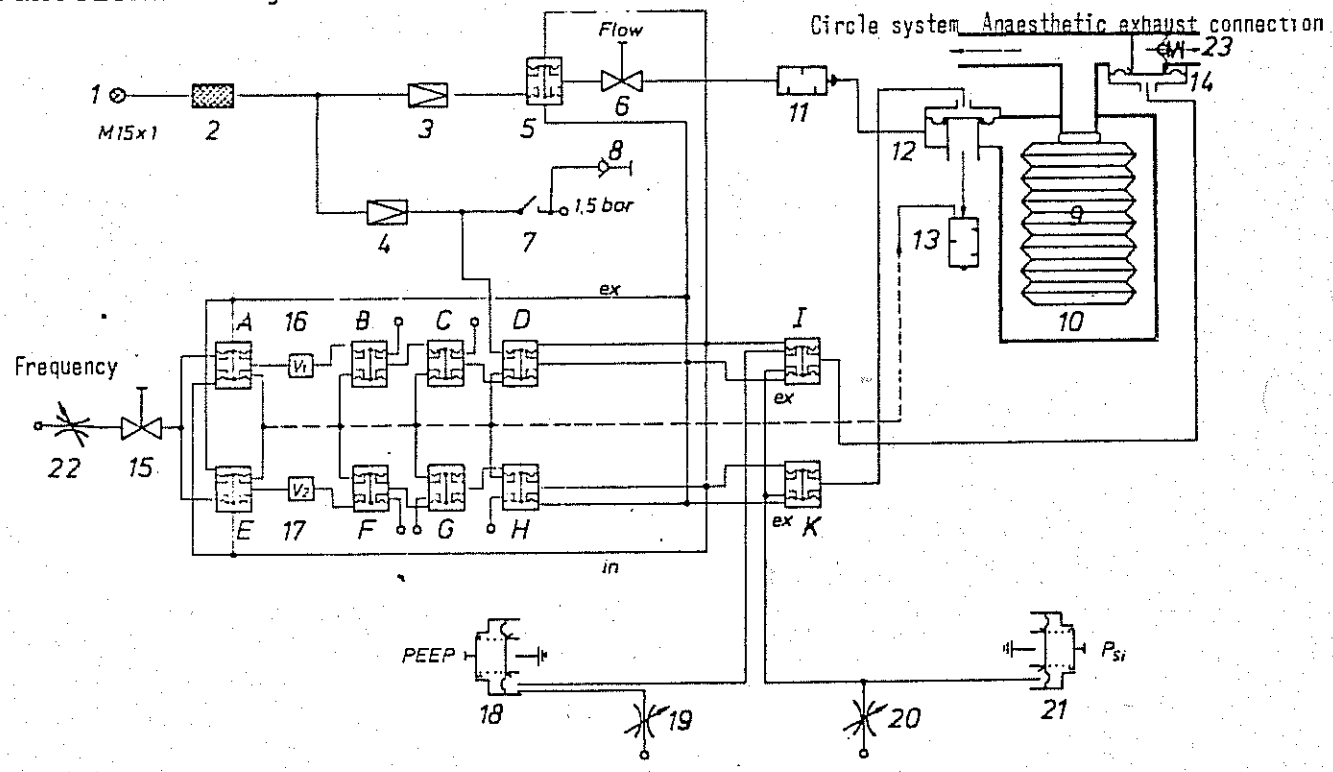
	cleaning			desinfection				sterilisation		
	running water	wiping	bath	bath	wiping	asepto	Purfactor	gas	steam 120 °C	steam 134 °C
Ventilog - Basic unit		X			X	X				
Patient system	X					X		X	X	X
switching valve	X					X		X	X	X
Exhaust gas nozzle	X					X		X	X	X
corrugated bellows	X		X			X	X	X	X	X
Connecting tube to circuit system	X		X			X		X	X	X
Barolog		X			X	X				
Precom - pressure gauge		X			X	X		X	X	
Precom - alarm unit		X			X	X		X		

Note!
Aluminium parts such as the switching valve and patient system may not be cleaned in the Dräger Purfactor or similar machines. Mechanical cleaning of such parts with chlorinated cleansers may cause corrosion and is therefore not permissible.

Anaesthetic Ventilators

Ventilog

Functional diagram



Key:

1 Connection M 15 x 1
2 Filter
3 Pressure regulator 8402745
4 Pressure regulator 8402745
5 3/2-way valve 8403006
6 Flow control valve 8404680
7 Switch "Automatic-manual, spontaneous" 8402441
8 Plug-in coupling with check valve 8404948
9 Bellows 2M 8138
10 Pressure chamber
11 Silencer)
12 Vent valve) Vent valve 8404660
13 Silencer)
14 Excess gas discharge valve
15 Frequency control valve 8403845
16 Vessel 8404675
17 Vessel 8404673
18 PEEP valve 8404730
19 Metering unit 8403795
20 Metering unit 8403795
21 Plateau valve 8404404 (single)
22 Metering unit 8403795
23 Anaesthetic exhaust socket 8404690

A, E, B, F Amplifier relays M 25716
C, D, G, H, I, K Amplifier relays M 22260

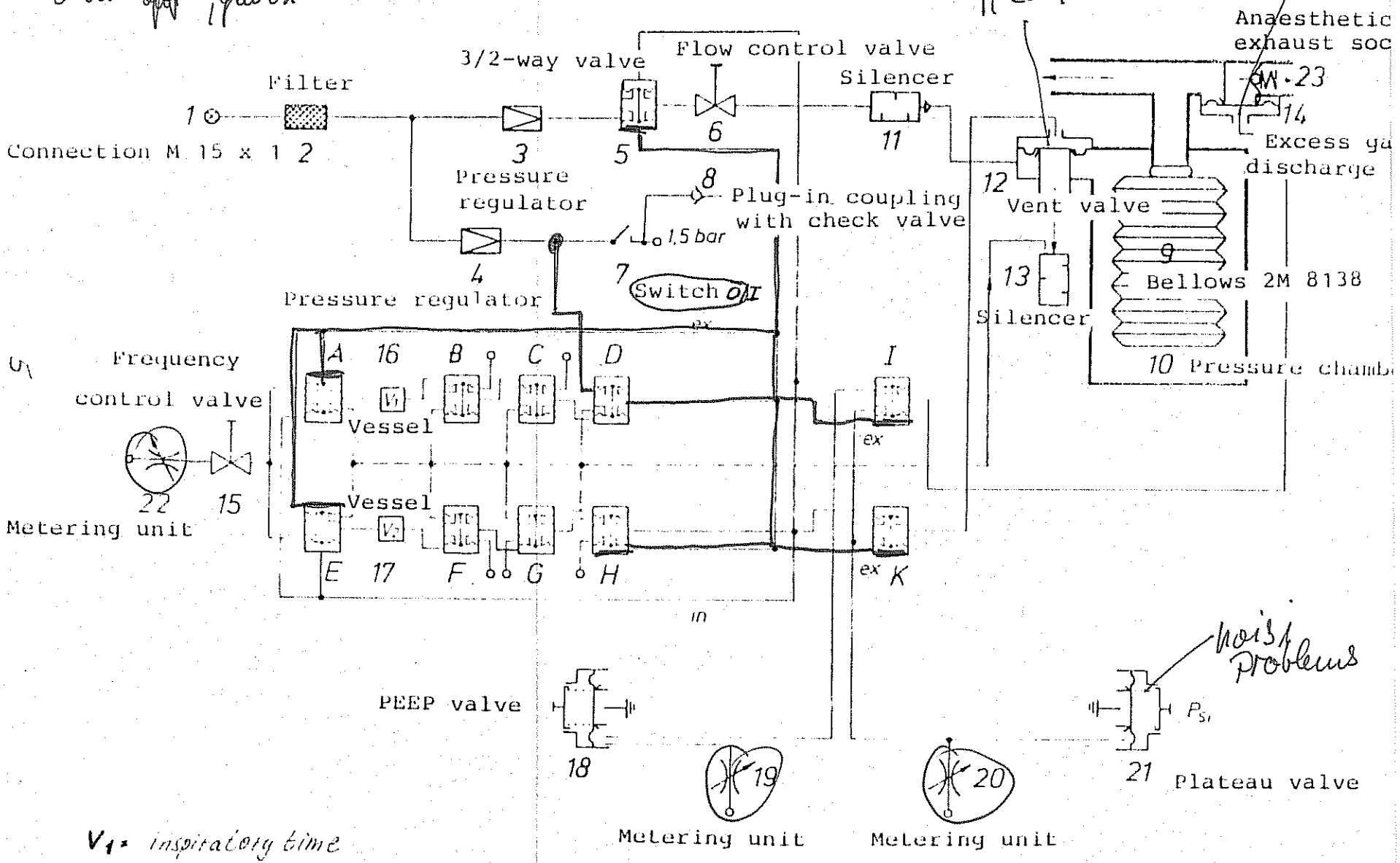
The oldest one

Functional diagram, units up to serial No. 3218

84033

Unit off, gas on

M 28475



V_1 = inspiratory time

V_2 = exspiratory time

A, E, B, F Amplifier relays M 25716
C, D, G, H, I, K Amplifier relays M 22260

Ventilog

Anaesthetic Ventilators

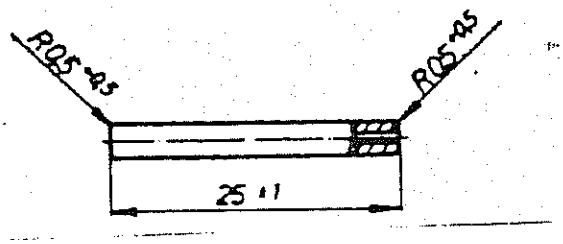
Anaesthetic Ventilators

Ventilog

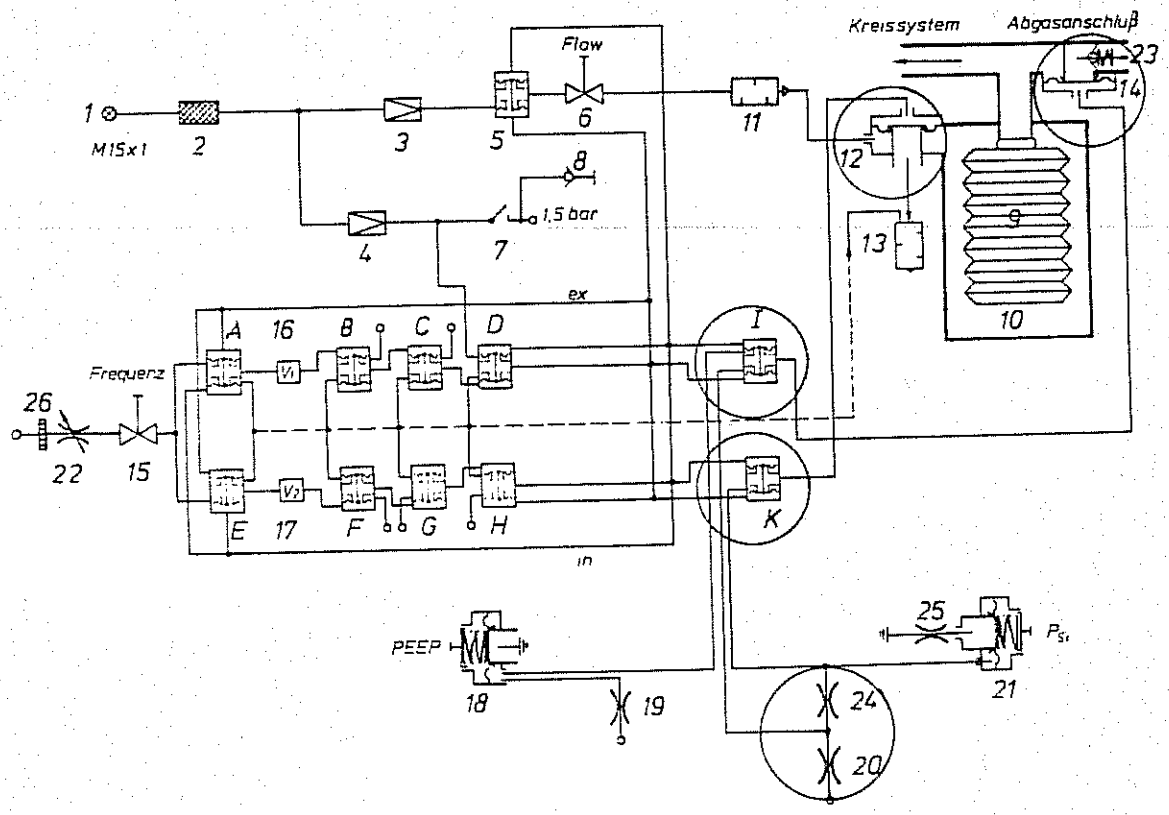
Modifications as of device No. 3219 middle age

1. Changes have been made to the material used for the diaphragm 8403377 installed in the pressure-chamber vent valve (12) and in the surplus-gas discharge valve (14). The new diaphragms can be recognized from their colour (old version red, new version translucent).
   Due to these modifications a pressure divider (24) had to be additionally fitted to ensure that the diaphragm in the valve (14) is actuated with a higher pressure than the diaphragm in the valve (12). This measure was necessary in order to prevent vibration of the diaphragm in the valve (12).

   Metering pipe M 27297 Pipe 3 x 1 DIN 1754 SF-CU F22

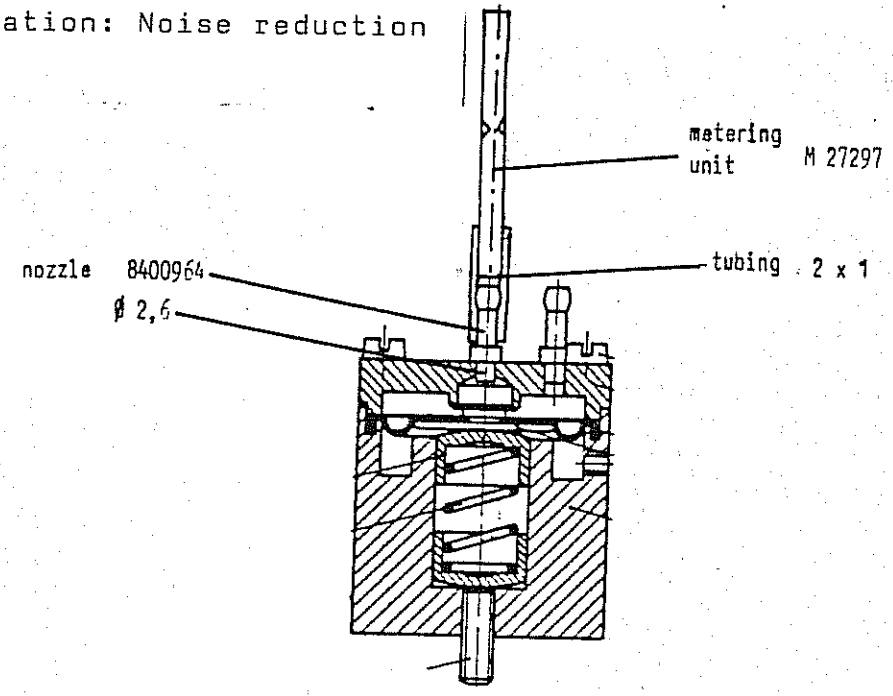


Reason for modification: The intention was to prevent a PEEP of > 2 mbar in the system in the "0" setting of the PEEP valve (18).



2. A metering unit M 27297 is to be placed on the plateau valve 8406266. This metering unit is not to be set to a fixed value, but will rather be manufactured as required. The copper pipe will be pressed together until the vibration noise of the diaphragm in the plateau valve can no longer be heard.

   Reason for modification: Noise reduction



3. The metering units (19) and (20) are being converted to fixed metering units.

   Reason for modification: No possibility of self-adjustment.

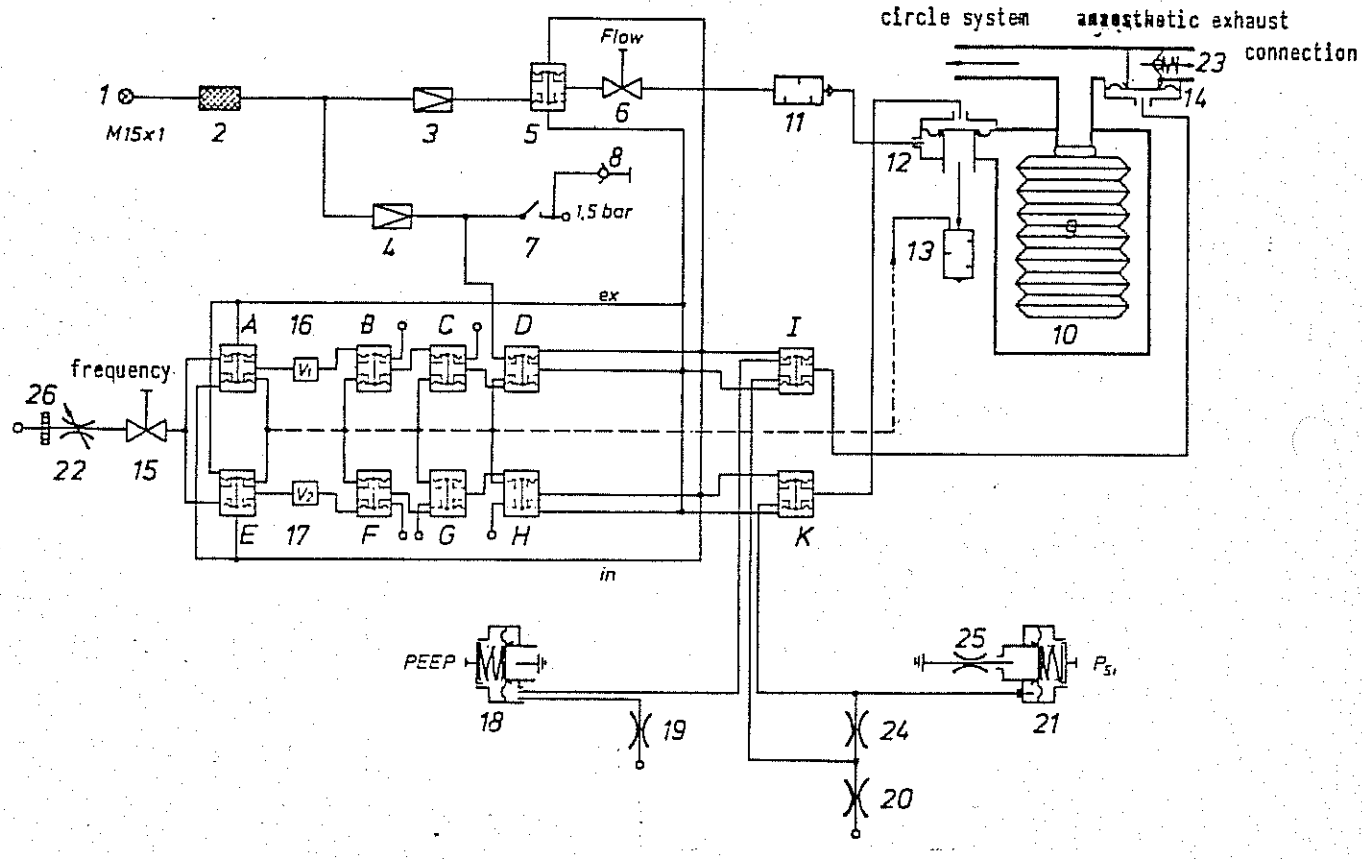
4. A filter 8405241 is being located ahead of the metering unit (22).

   Reason for modification: Protection of metering unit (22) and ratio valve (15) against dirt.

Anaesthetic Ventilators

Ventilog

Functional diagram as of device 3219

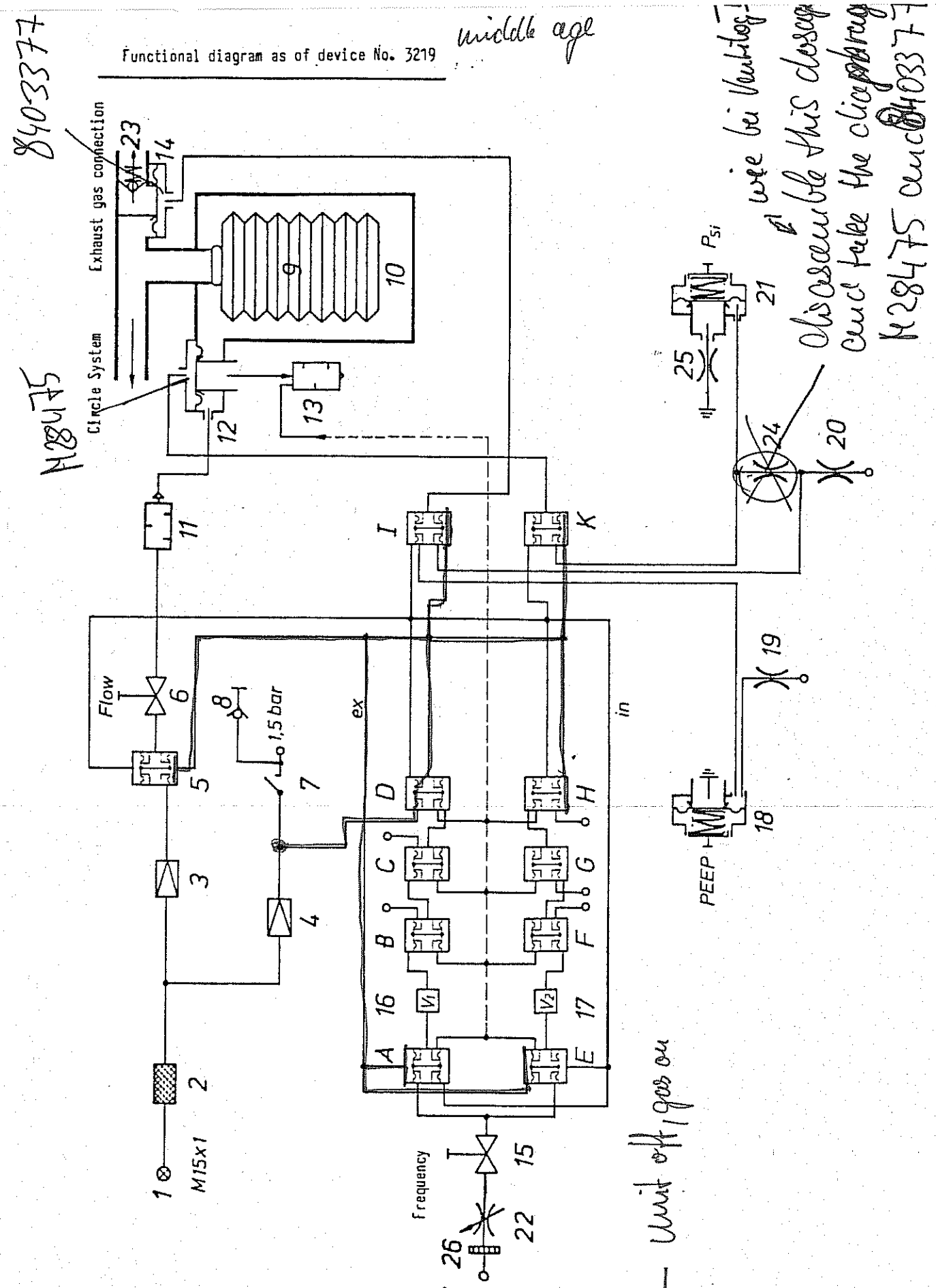


Key				
	1	Connection M 15 x 1	A, E, B, F, D	Amplifier relays M 25716
	2	Filer	C, G, H, I, K	Amplifier relays M 22260
	3	Pressure regulator 8402745		
	4	Pressure regulator 8402745		
	5	3/2 -way valve 8403006		
	6	Flow control valve 8404680		
	7	Switch "0 - 1" 8402441		
	8	Plug-in coupling with check valve 8404948		
	9	Bellows 2M 8138		
	10	Pressure chamber		
	11	Silencer)		
	12	Vent valve) vent valve 8404660		
	13	Silencer)		
	14	Excess gas discharge valve		
	15	Frequency control valve 8403845		
	16	Vessel 8404675		
	17	Vessel 8404673		
	18	PEEP valve 8404730		
	19	Metering unit 8406292		
	20	Metering unit 8406314		
	21	Plateau valve 8406266 (single)		
	22	Metering unit 8403795		
	23	Anaesth. exhaust socket 8404690		
	24	Metering unit M 27297		
	25	Metering unit M 27297		
	26	Filter		

Anaesthetic Ventilators

Ventilog

Functional diagram as of device No. 3219

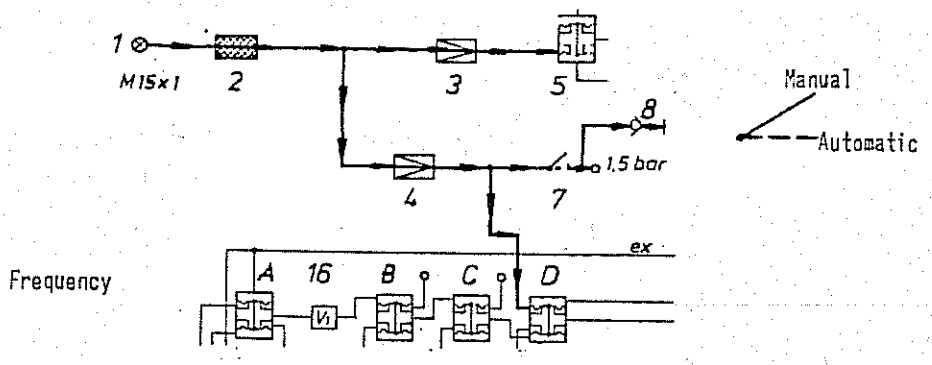


Ventilog

Pneumatic description

Drive gas

Oxygen or compressed air passes via the connection M 15 x 1 (1) through a filter (2) to the pressure reducer (3), which constantly reduces the pressure of the gas to 1.8 bar. From the pressure reducer the gas is passed to to the 3/2-way valve (5). At the same time the gas coming from the connection (1) passes into the pressure reducer (4), which constantly reduces the pressure of the gas to 1.5 bar. From there the gas is passed to the switch "Automatic-manual, spontaneous" (7) and the relay D.
After moving the switch (7) to "Automatic" the gas passes to the distributor "—0" and the plug-in coupling (8). Via a distributor this pressure is applied to all points marked with "0—".

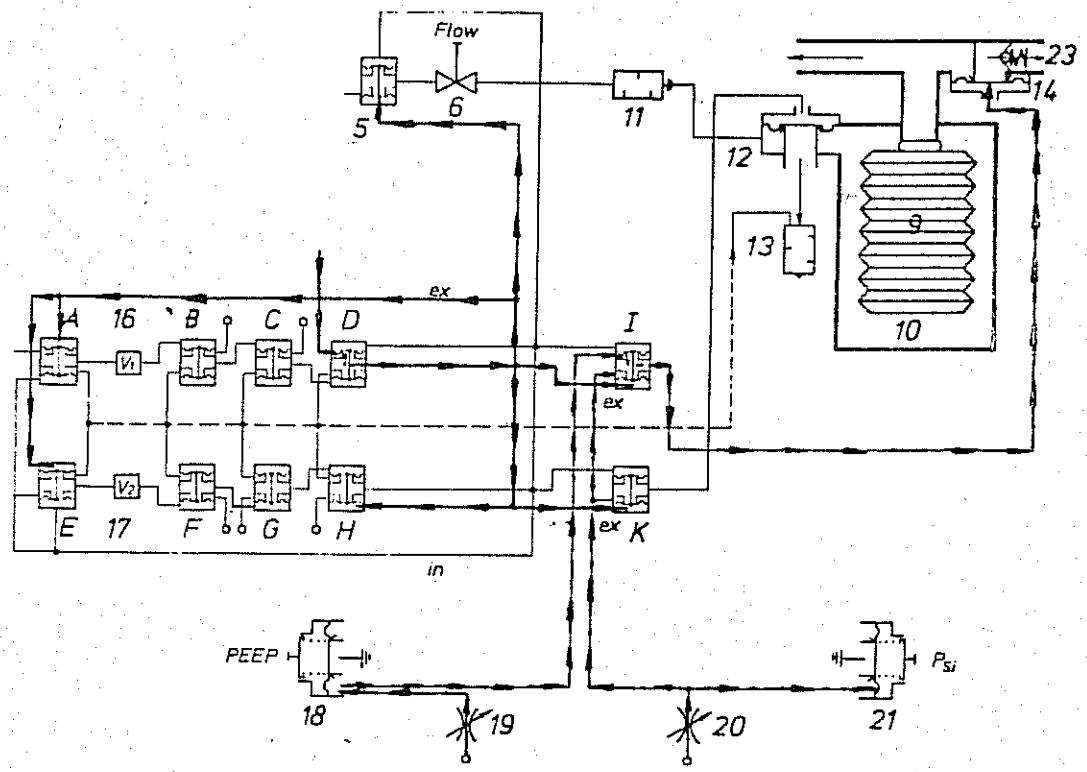


Expiration Control group

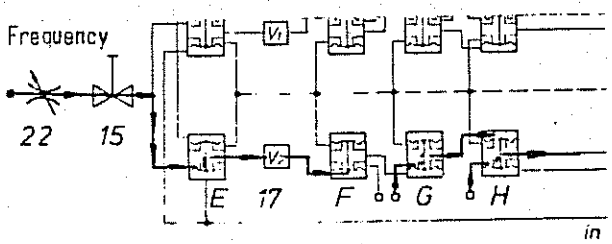
The expiration signal is applied as a result of the relay D being driven.
The expiration signal is supplied to the relays A, E, H, I, K. As a result the inspiration and frequency signals in relays H and A respectively are blocked. Relay I is driven such that a connection is made between the PEEP valve (18) and the excess gas discharge valve (14). (In the PEEP valve the diaphragm is pretensioned against the seat by way of a spring. Via a metering unit (19) the system is filled up to the set spring pressure with a constant flow (0.5 l/min); the remainder is discharged into the atmosphere).

PEEP setting

At the same time the gas coming from the metering unit (20)(the plateau valve (21) has the task of limiting the pressure in the pressure chamber and patient system to 80 mbar) is blocked off in relays I and K.
The 3/2-way valve (5) is also blocked off.

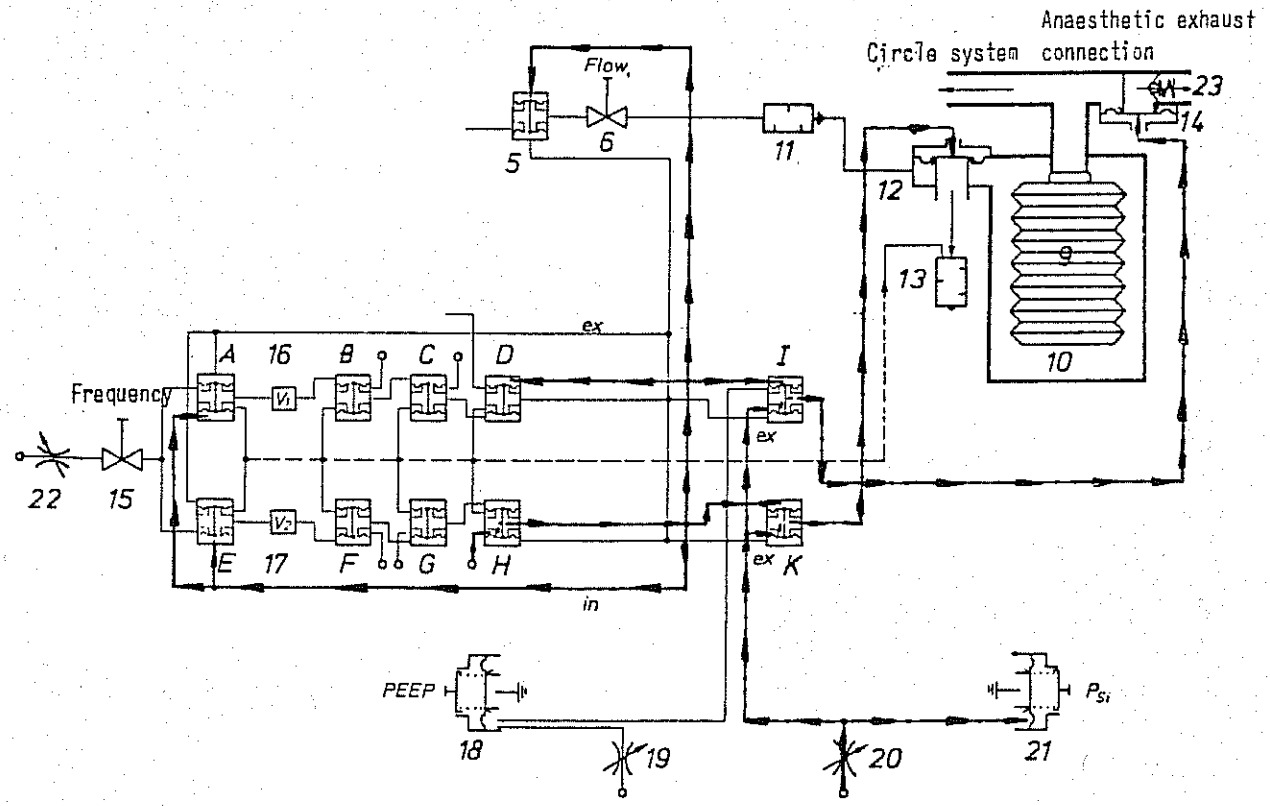


The gas coming via the metering unit (22) into the frequency valve (15) and from there into relay E is routed into the vessel V_2 (17). A time-delayed build-up of the switching pressure for relay F is effected via the vessel (17). Following switchover the output of relay F is relieved of pressure and the 1.5 bar in relay G are passed to relay H which conducts.

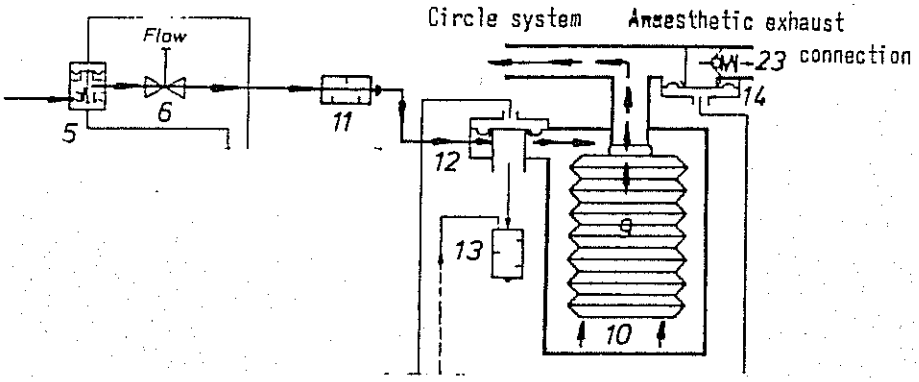


With the commencement of inspiration the relays I, K, D, E, A and the 3/2-way valve (5) are driven via relay H. In relay I the PEEP signal is blocked and as a result the gas passes from the plateau valve (21) to the surplus gas discharge valve (14) which is closed.

Via relay K gas also passes from the plateau valve (21) to the vent valve (12) which is closed. In relays D and E the expiration/ frequency signals are blocked.



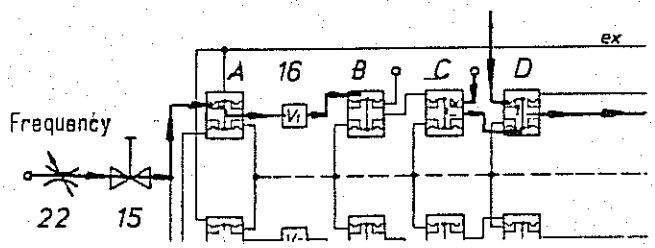
The 1.8 bar at the 3/2-way valve (5) pass via the flow control valve (6) and the silencer (11) into the pressure chamber (10). With the valve (12) closed the bellows (9) are compressed and the gas from the bellows passes via the switching valve into the circle system and from there to the patient.



The gas coming from the frequency valve (15) is routed into the vessel V_1 (16) via relay A.

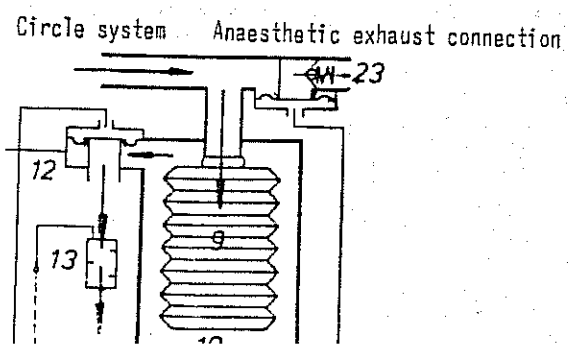
When the switching pressure is attained the output of relay B is relieved of pressure (as with expiration) and the 1.5 bar from relay C are passed to relay D as a result of which the expiration signal is again switched through.

Expiration



The 3/2-way valve (5) is reversed thereby ending inspiration.

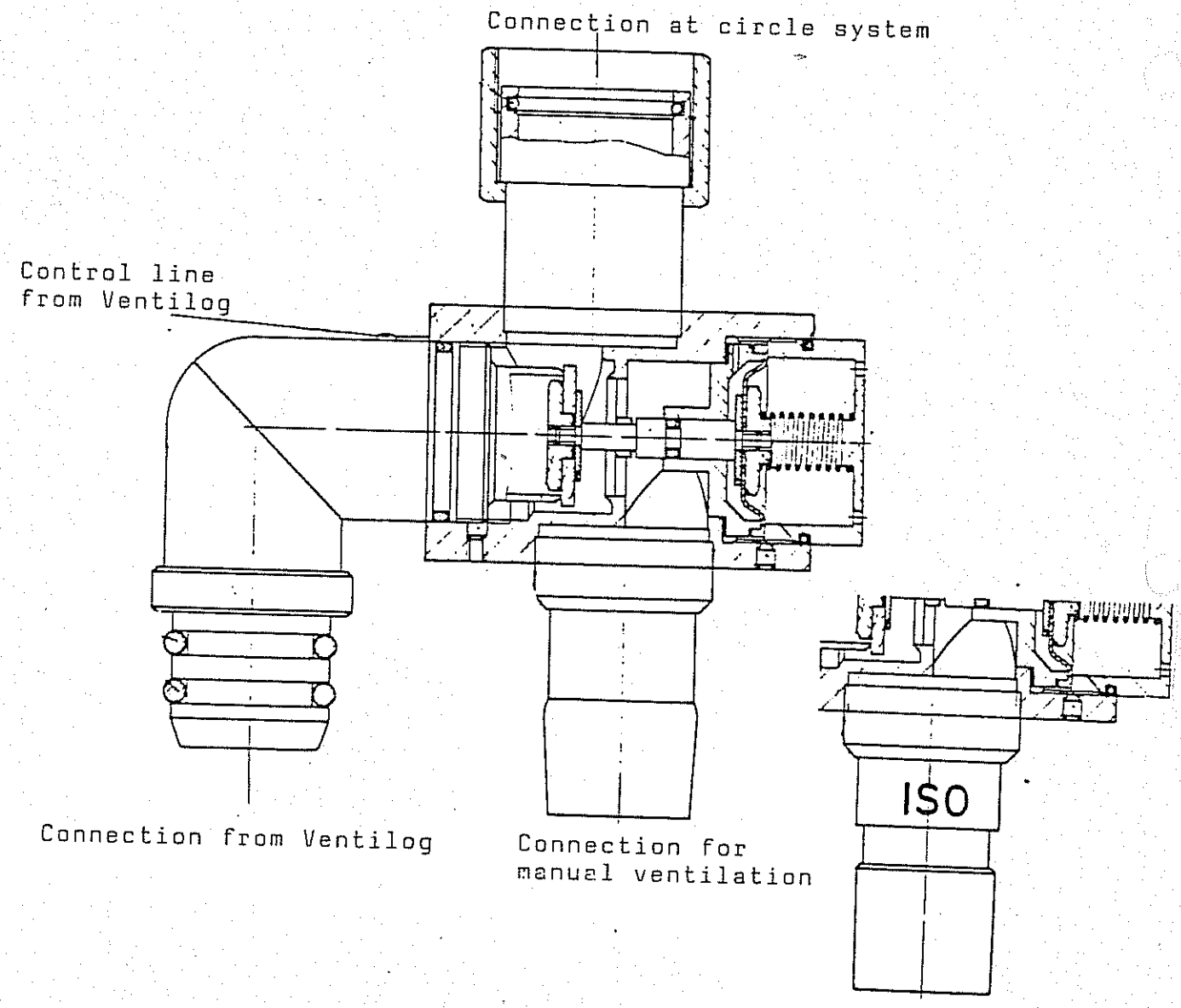
The pressure on the vent valve (12) is relieved thus enabling the gas in the pressure chamber (10) to escape into the atmosphere via the silencer (13). As a result of their own weight the bellows (9) then unfold and fill up.



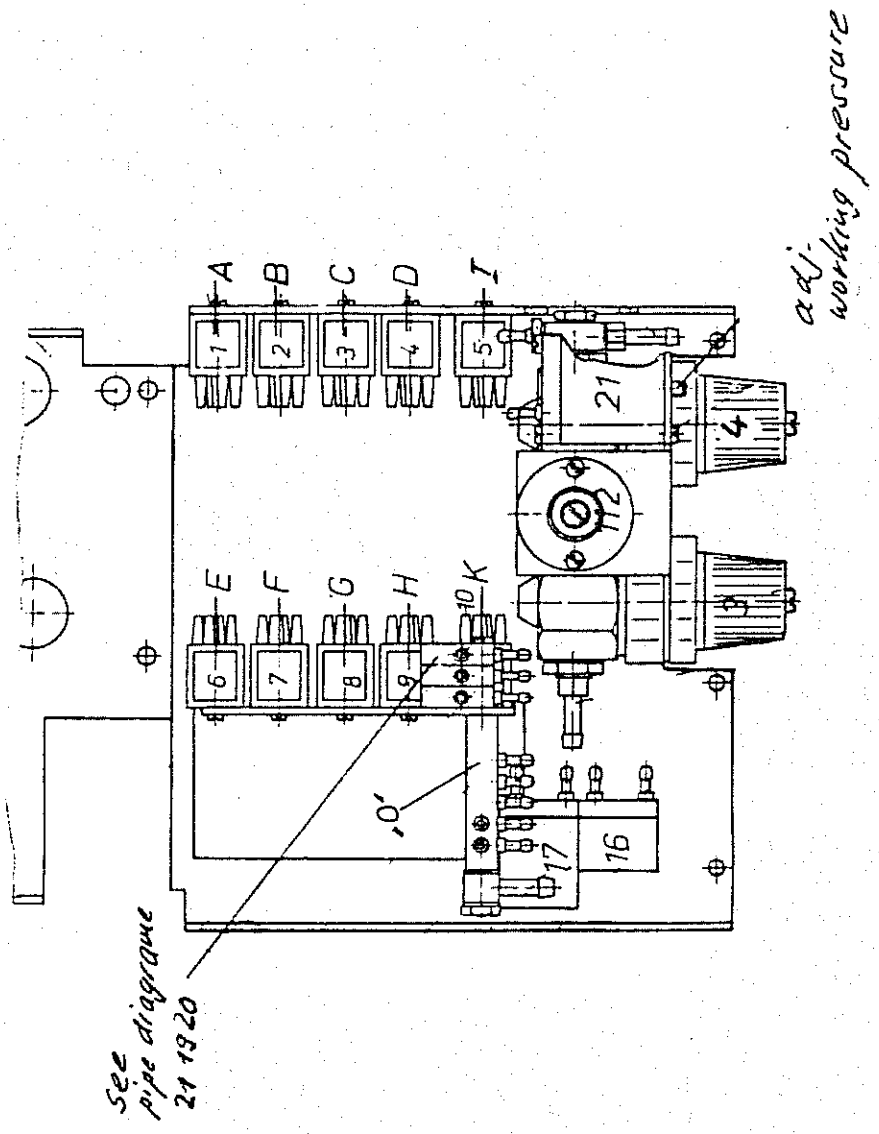
Ventilog

Pneumatic switching valve M 27235 / ISO M 27240

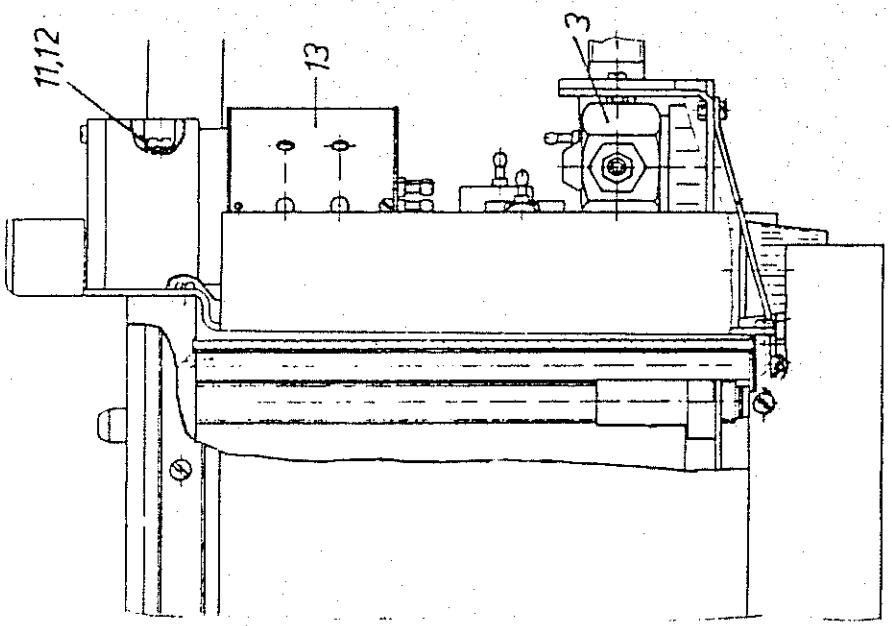
Depending on the setting "automatic" or "manual, spontaneous", the switching valve routes the gas coming from the Ventilog or manual ventilation bellows to the circle system.



Ventilog



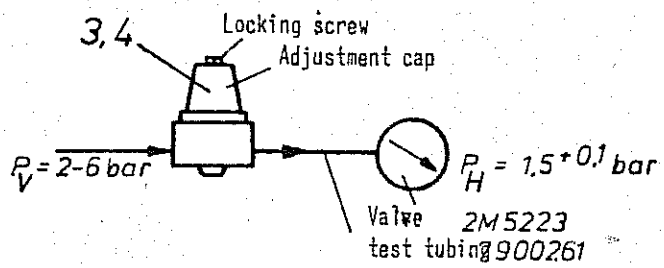
Location of components:



Sub-assemblies

Pressure regulator 8402745 (3, 4)

Given a supply pressure of 2 - 6 bar the pressure reducer keeps the downstream pressure at a constant 1.5 bar or 1.8 bar.

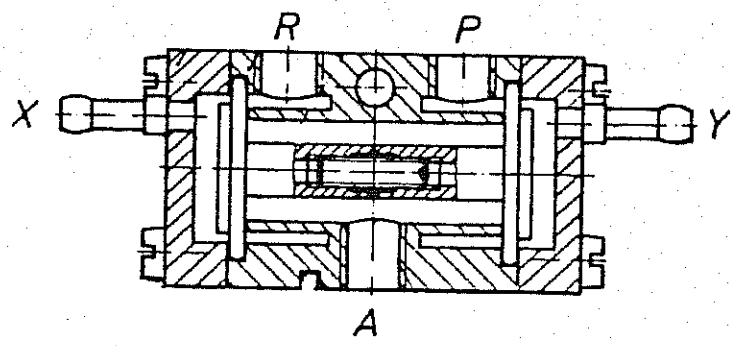


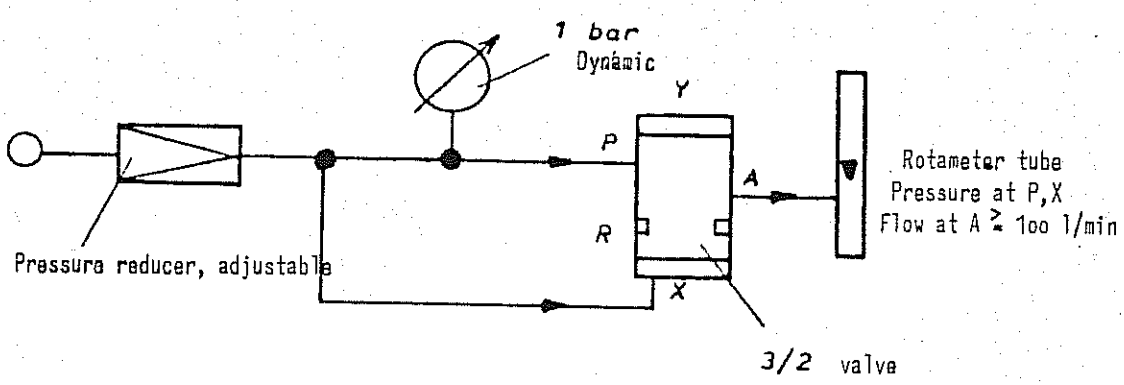
The pressure reducer (3) (set to 1.8 ± 0.1 bar) generates the drive gas for the bellows.
The pressure reducer (4) (set to 1.5 - 0.1 bar) generates the control pressure for the circuit.

After loosening the locking screw the downstream pressure (P_H) can be changed using the cap. The cap is then to be secured in position again using the screw.

3/2-way valve 8403006 (5)

The 3/2-way valve operates in the same manner as the amplifier relays, however with a greater capacity.

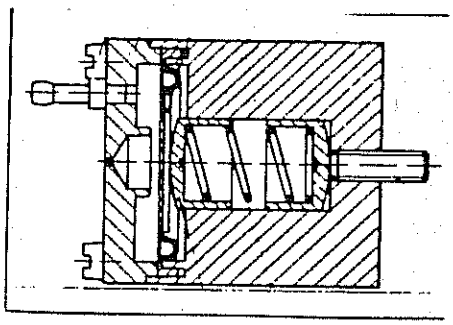




Plateau valve, single 8404404 (21)

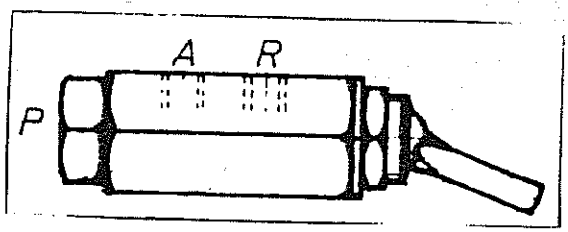
The plateau valve 8404404 is used to limit the working pressure. This is permanently set in the range 80 - 95 mbar.

(corresponding to min. - max. flow)



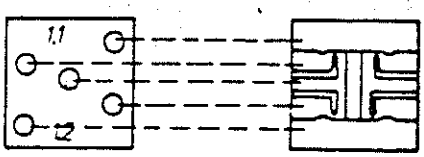
3/2-way valve 8402441 (7)

The 3/2-way valve is used as a changeover switch.



Amplifier relays M 22260 (C, D, G, H, I, K)

The identification code for M 22260 is UO B. The double diaphragm relays are subjected to a functional check (dynamic intake) and a leakage test.

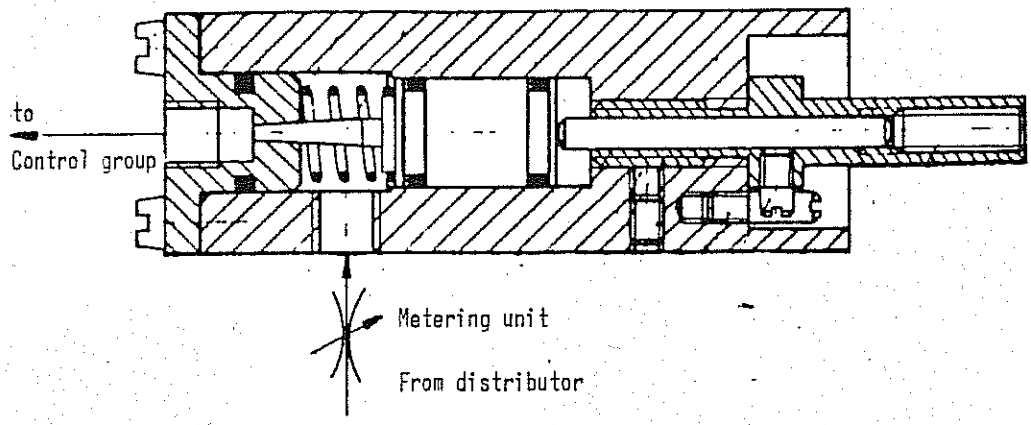


Amplifier relays M 25716 (A, B, E, F)

The identification code for M 25716 is UO BS. These double diaphragm relays are additionally subjected to checking of the switching characteristic.

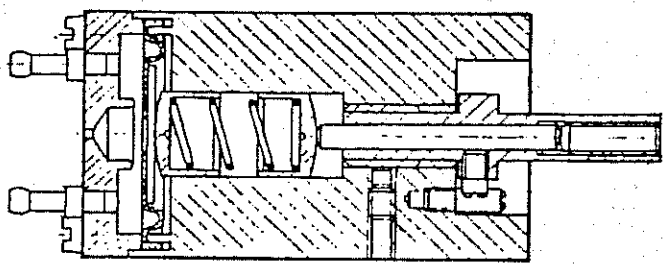
Precision metering valve 8403845 (15)

The precision metering valve 8403845 is used for frequency adjustment. The frequency is altered by changing the annulus.



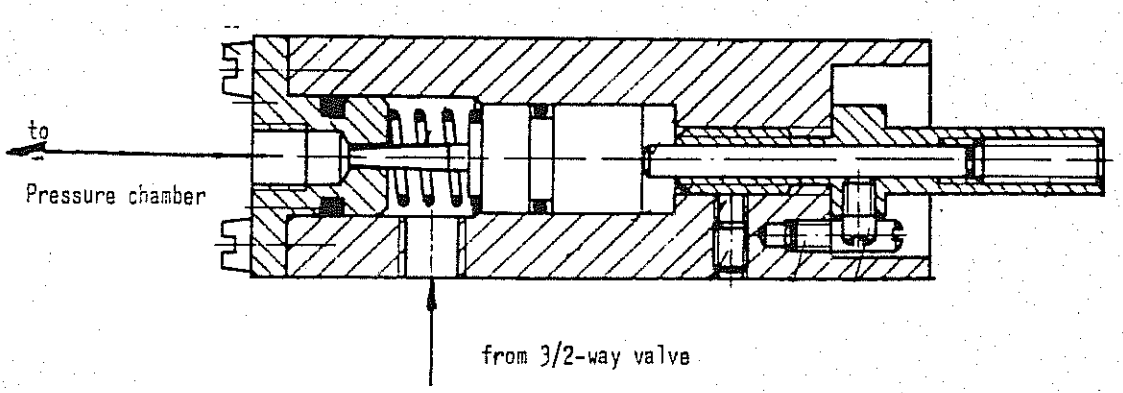
PEEP valve 8404730 (18)

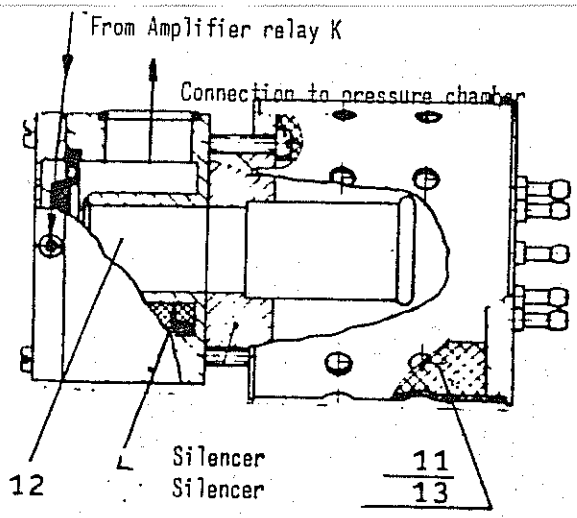
During expiration the PEEP valve limits the ventilation pressure (0 - 15 mbar).

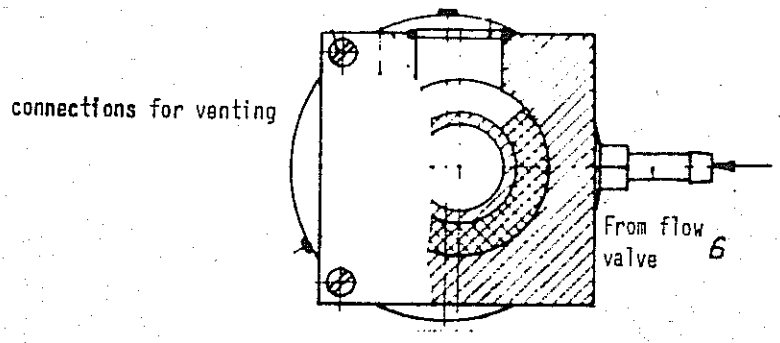


Flow valve 8404680 (6)

The flow valve 8404680 is used to regulate the working flow. The flow is altered by changing the annulus.

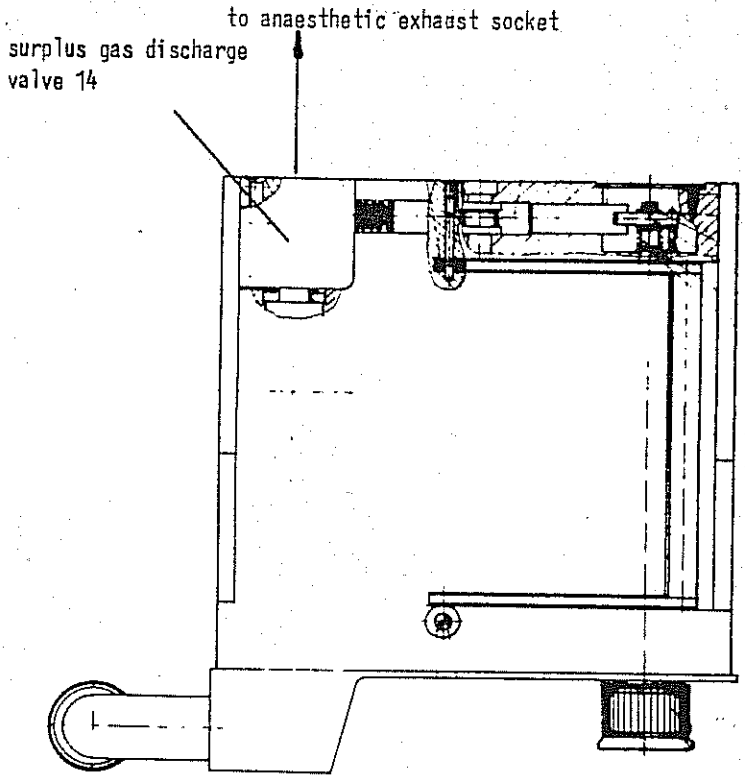


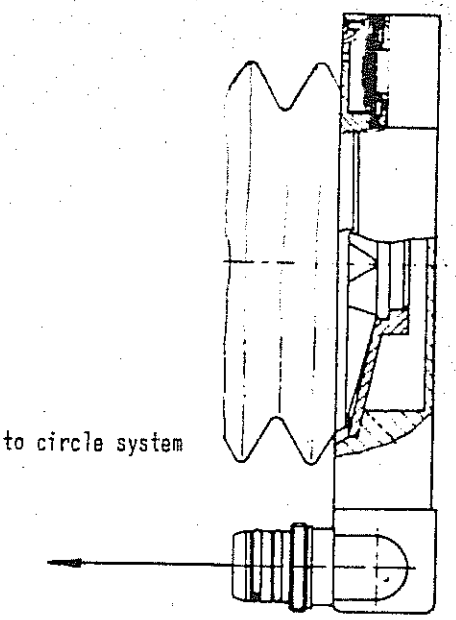




Patient system 8404700 (9, 14)

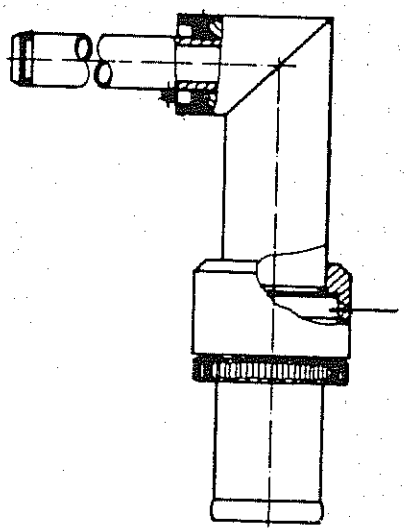
The patient system is designed to separate the patient air from the drive air of the device. During inspiration the valve 14 shuts off the path to the anaesthetic exhaust socket and limits the pressure to 80 - 95 mbar by way of the plateau valve 21. During expiration the PEEP pressure is controlled via the valve 14.





Anaesthetic exhaust socket 8404690 (23)

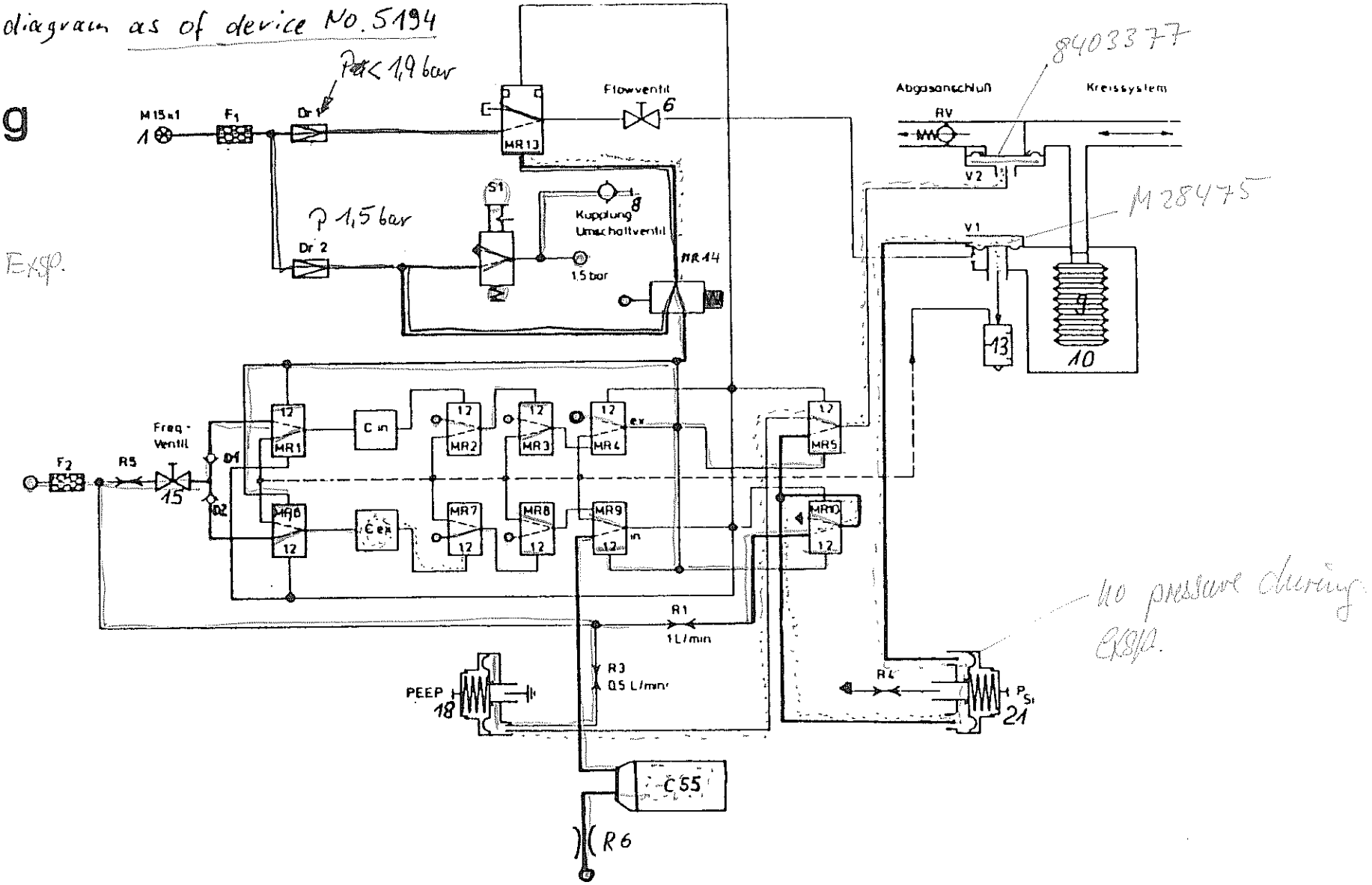
The anaesthetic exhaust socket is used for removing the excess fresh gas. The built-in check valve prevents the intake of "extraneous air".



Functional diagram as of device No. 5194

Ventilog

- Gas in „mit off"
- Gas in „mit in Exsp.



Anaesthetic Ventilators

Ventilog

Explanation of symbols:

OK	: —	Check condition	C
Defect	: |	Check funtion	O
Spare parts used	: ◯	Check for leakage	L
Report	: /	Enter test value	V

Location of apparatus: _____

_____

_____

Serial No. : _____

Date of delivery

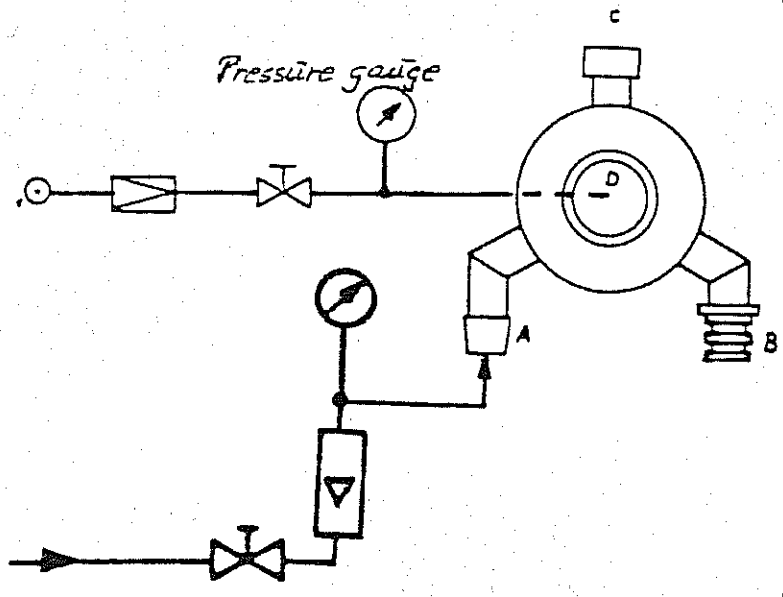
Startup : _____

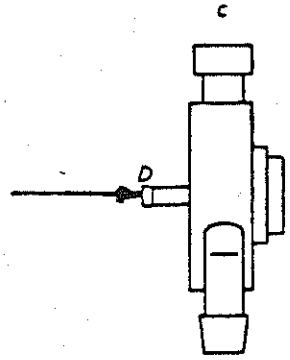
Invoice No. or delivery No. : _____

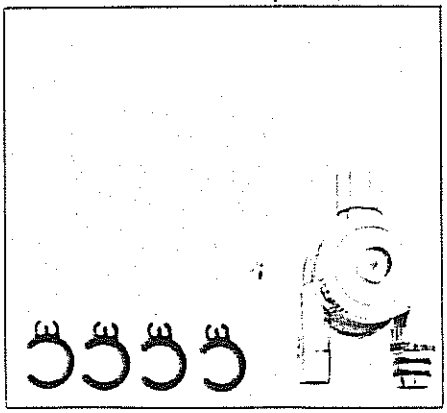
Others : _____

The anaesthetic apparatus and circle system are to be tested in accordance with the Test Card before checking the Ventilog.

1.	Pneumatic switching valve 8404950 Pneumatic switching valve ISO 8405276	C
1.1.	Open valve	
* 1.1.1.	Diaphragm 8401650 2 x Replace every 2 years	C
1.1.2.	Thrust piece 8404945	C
1.1.3.	O-ring 8402234	C
1.1.4.	O-ring 2M 8777 2 x	C
1.2.	Assemble valve Leak test	





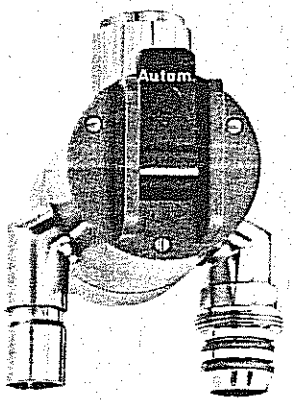


Pneumatic switching valve

Test set-up:
Seal connection C with cork
Connections B and D open.
Build up pressure of 100 mbar via connection A.

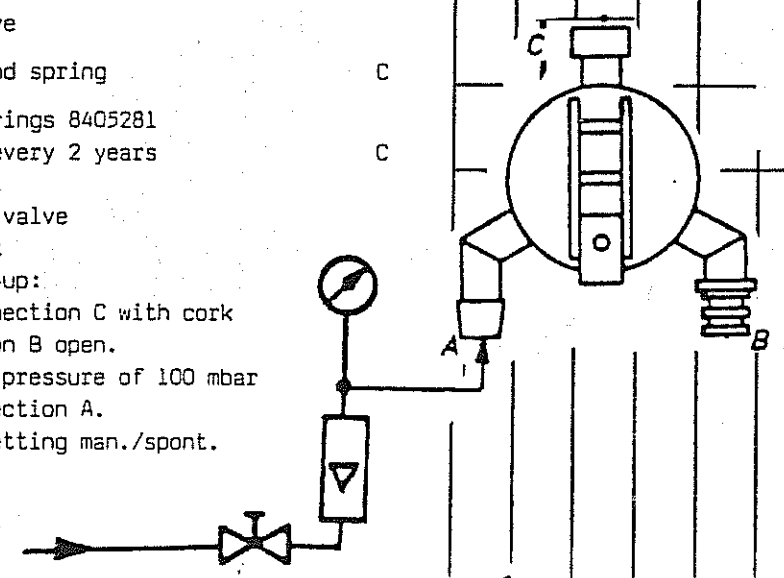
9003963

1.2.1.	Test value Gas flow $\leq$ 0.2 L/min	O
1.2.1.1.	Test set-up: Remove cork from connection C, otherwise as item 1.2.	
1.2.1.1.1.	Test value: Pressure drops to 0 bar	O
1.2.2.	Test set-up: Seal connection C with cork. Connection A open. Build up pressure of 1.2 bar at connection D. Build up pressure of 100 mbar via connection B.	
1.2.2.1.	Test value: Gas flow $\leq$ 0.2 L/min	O
1.2.2.2.	Test set-up: Remove cork from connection C, otherwise as item 1.2.2.	
1.2.2.2.1.	Test value: Pressure drops to 0 bar	O
1.2.3.	Test set-up: Build up pressure of 1.2 bar at connection D. All other connections open. Seal actuator 1.2 bar.	
1.2.3.1.	Test value: Pressure must not drop in 5 s.	L
1.2.4.	Build up alternating pressure of 1.2 bar and 0 bar at connection D, otherwise as Item 1.2.3.	
1.2.4.1.	Test value: Visual inspection through connection C. Tappet must move from stop to stop in each case without visible delay when switching.	O
1.3.	Manual switching valve 8405305 Manual switching valve ISO 8405295	C
1.3.1.	Open valve	
1.3.1.1.	Tappet and spring	C
* 1.3.1.2.	Sealing rings 8405281 Replace every 2 years	C
1.4.	Assemble valve Leak test Test set-up: Seal connection C with cork Connection B open. Build up pressure of 100 mbar via connection A. Switch setting man./spont.	



Manual switching valve

39754



1.4.1. Test value:
Gas flow ≤ 0.2 L/min O

1.4.1.1. Test set-up:
Remove cork from connection C,
otherwise as Item 1.4.

1.4.1.1.1. Test value:
Pressure drops to 0 bar O

1.4.2. Test set-up:
Seal connection C with cork
Connection A open.
Build up pressure of 100 mbar via
connection B.
Switch setting automatic

1.4.2.1. Test value:
Gas flow ≤ 0.2 L/min O

1.4.2.1.1. Test set-up:
Remove cork from connection C,
otherwise as Item 1.4.2.

1.4.2.1.1.1. Test value:
Pressure drops to o bar O

1.4.3. Switch lever alternately

1.4.3.1. Test value:
Visual inspection through connection C.
Tappet must switch.
Tappet pressure must be noticeable in
all lever positions. O

1.5. Pneumatic switching valve M 27235
Pneumatic switching valve ISO M 27240

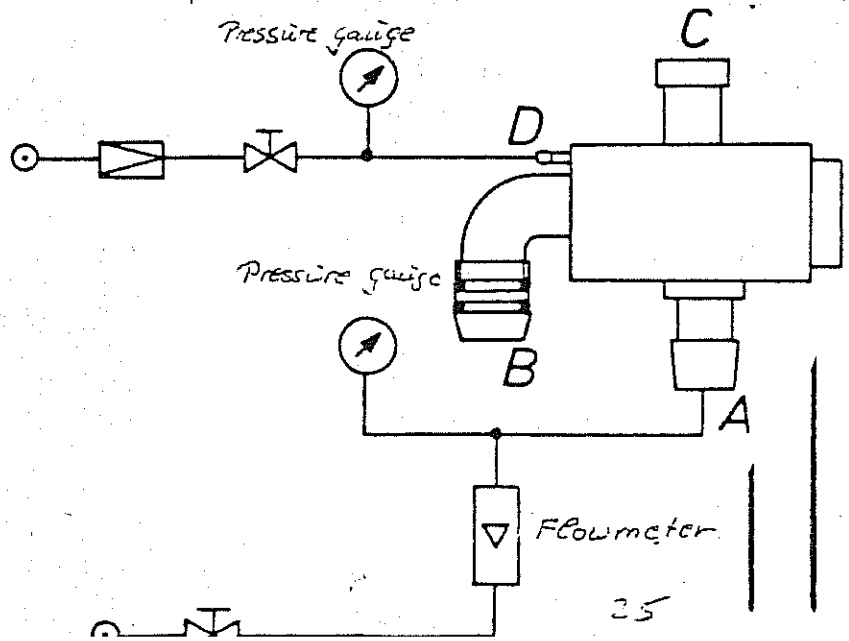
1.5.1. Open valve:
* Diaphragm 8403352

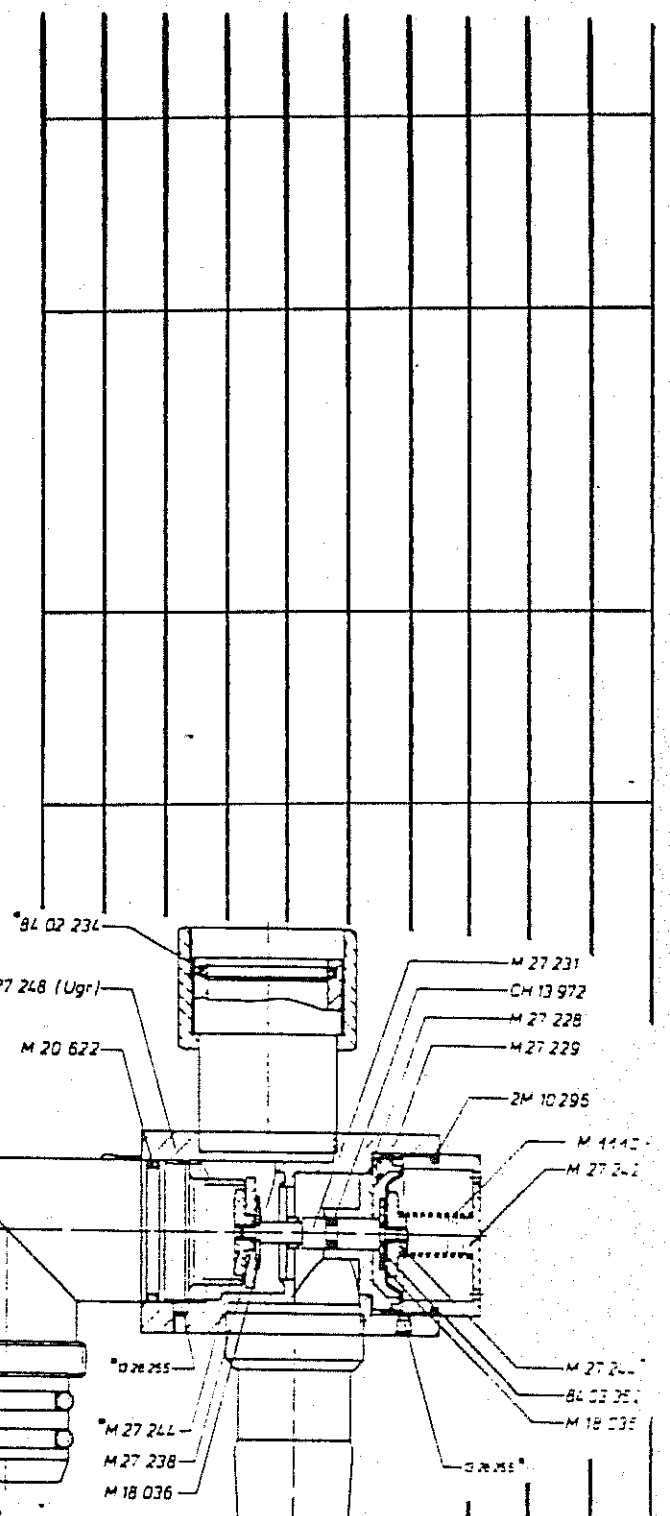
* O-ring CH 13972 (replace annually)

1.5.2. O-ring 8402234

1.5.3. O-ring 2M 8777 2x

1.6. Assemble valve - see Item No. 11,
File 5324 - Leak test
Test set-up:





Anaesthetic Ventilators

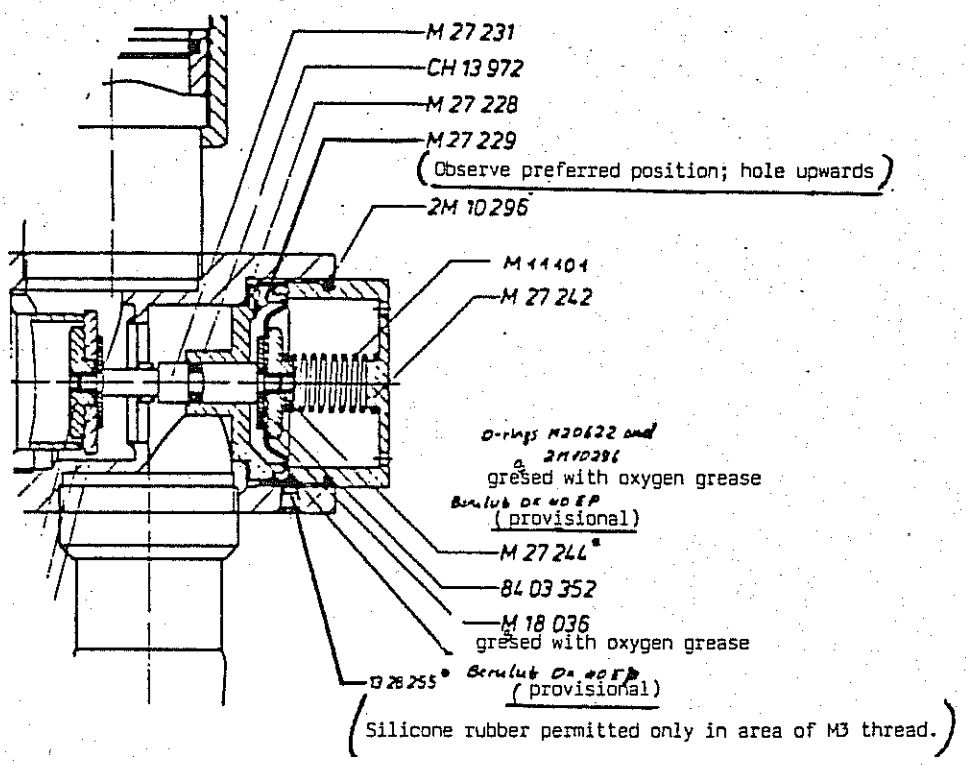
Ventilog

02.85 Steinwarder No. 11

Pneumatic switching valve M 27235
Pneumatic switching valve ISO M 27240

Replacement of diaphragm 8403352 and O-ring CH 13972 (required once a year in accordance with Test card). The following procedure is to be adopted when replacing the diaphragm:

- Loosen screw 1328255
- Unscrew cover M 27242
- Loosen clamping piece M 27244 (fitted with silicone rubber Elastosil E 41)
- Remove insert M 27229
- Replace O-ring CH 13972
- Thoroughly grease tappet and O-ring
- Fit insert M 27229. Observe preferred position!
- Replace diaphragm 8403352
- Re-insstall clamping piece M 27244 using silicone rubber Elastosil E 41
- Grease O-ring 2M 10296 and cover M 27242
- Screw in cover such that O-ring projects halfway into valve housing.



- Seal connection C, apply a flow of 0.5 L/min. to connection A
  Run a hose 2 x 1 into a water bath from connection D.
- Now screw in cover until air bubbles no longer emerge from the hose
  (float of flowmeter goes to "0").
- Decure cover with screw (fitted with silicone rubber Elastosil E 41).

Technical Customer Service

B J Siegel

Test set-up:
Seal connection C with cork.
Connections B and D open.
Build up pressure of 100 mbar via connection A.

1.6.1. Test value:
Gas flow $\leq$ 0.2 L/min O

1.6.1.1. Test set-up:
Remove cork from connection C, otherwise as Item 1.6.

1.6.1.1.1. Test value:
Pressure drops to 0 bar O

1.6.2. Test set-up:
Seal connection C with cork.
Connection A open.
Build up pressure of 1.2 bar at connection D.
Build up pressure of 100 mbar via connection B.

1.6.2.1. Test value:
Gas flow $\leq$ 0.2 L/min O

1.6.2.2. Test set-up:
Remove cork from connection C, otherwise as Item 1.6.2.

1.6.2.2.1. Test value:
Pressure drops to 0 bar O

1.6.3. Test set-up:
Build up pressure of 1.2 bar at connection D.
All other connections open.
Seal actuator 1.2 bar.

1.6.3.1. Test value:
Pressure must not drop in 5 s. L

1.6.4. Build up alternating pressure of 1.2 bar and 0 bar at connection D.
Otherwise as item 1.6.3.

1.6.4.1. Test value:
Visual inspection through connection C.
Tappet must move from stop to stop in each case without visible delay when switching. O

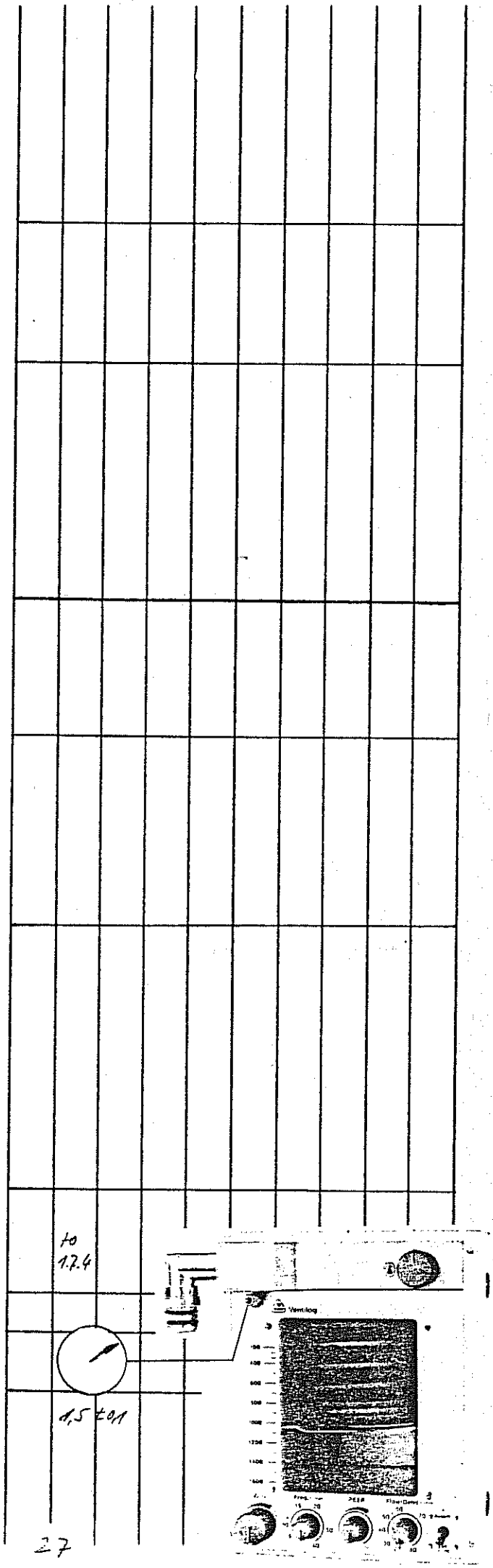
1.7. Gas supply "pneumatic switching valve"

1.7.1. Plug-in coupling 8404948 C O

1.7.2. Plug-in nipple 8404951 C O

1.7.3. Hose 2 m, silicone hose 2 x 1.5 1190520 C

1.7.4. Gas supply
Test set-up
Connect plug-in nipple to pressure gauge.
Switch setting "automatic" or "I"



1.7.4.1. Test value:
P = 1.5 ± 0.1 bar O

1.7.4.2. Test set-up:
Switch setting "Man/Spont" or "O",
otherwise as Item 1.7.4.

1.7.4.2.1. Test value:
P = 0 bar O

---

2. Remove Ventilog from anaesthetic apparatus. Swivel waste-gas socket 8404690 through 45° and pull out. Detach locking screws on slide-in unit, pull out slide-in unit.

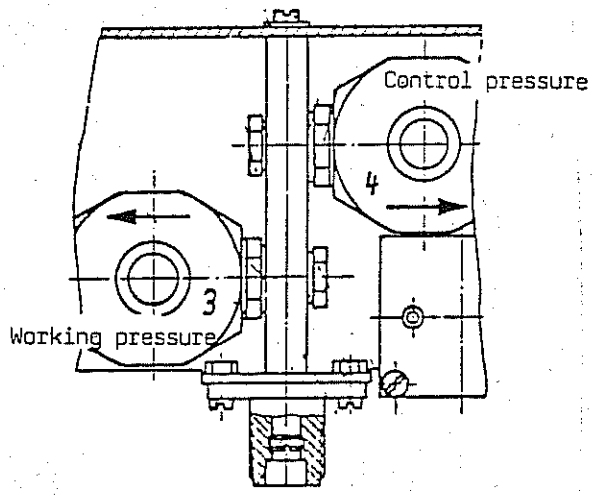
2.1. Gas supply

2.1.1. Connection M 15 x 1. C

* 2.1.1.1. Filter element D 11521
Replace every 2 years C

2.1.2. Pressure regulator
"Working pressure"

* Diaphragm 8404049 (replace every 6 years)
* Inlet valve 8404048 (replace every 6 years)

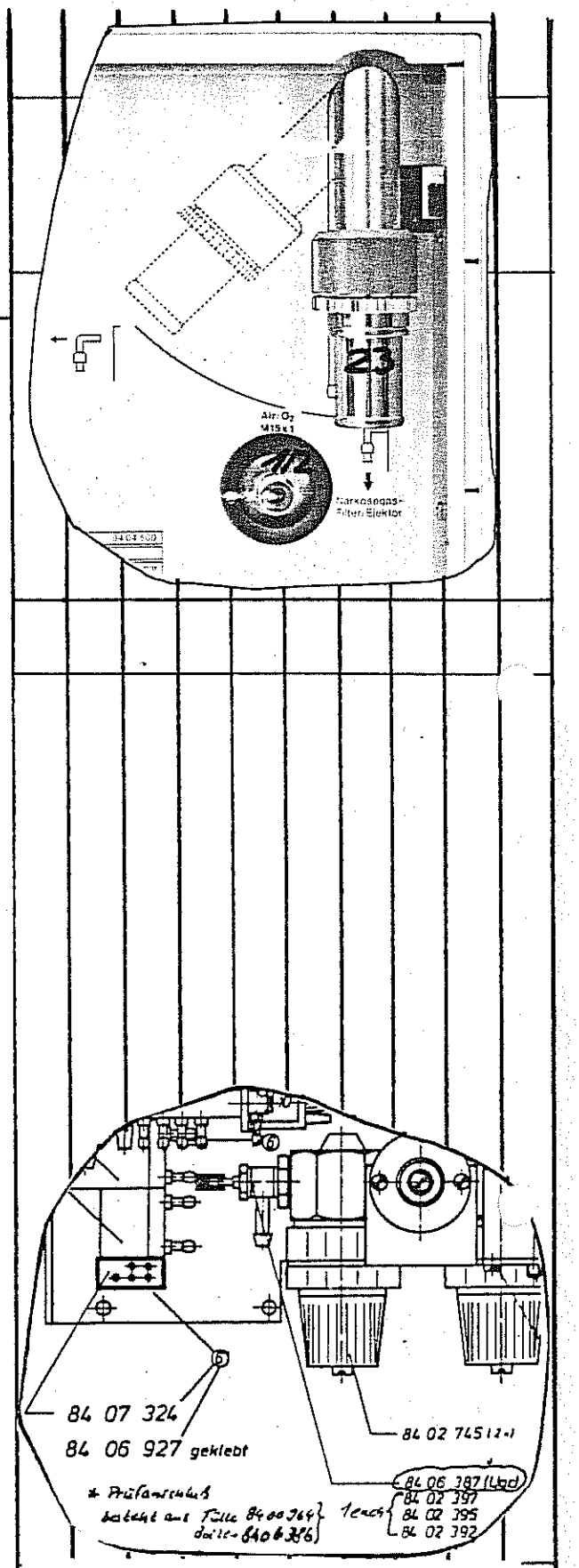


2.1.2.1. Pressure regulator "working pressure"
Downstream pressure
Remove hose screw connection
Connect valve 2 M 5223 with test hose 7900261.

2.1.2.1.1. Test value
$P_{stat} \leq 1.9$ bar
(Flow must be guaranteed) O L

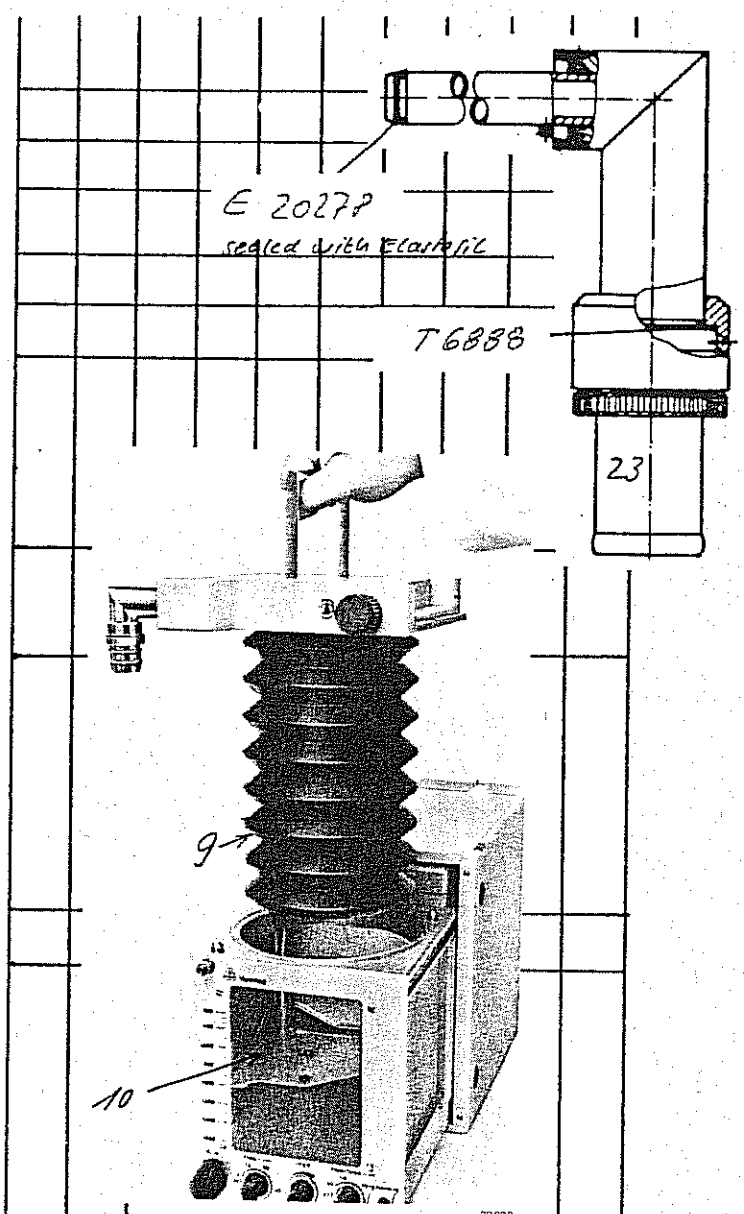
---

3. Waste-gas socket and patient system
Insert slide-in unit and secure screws.
Remove cover plate.

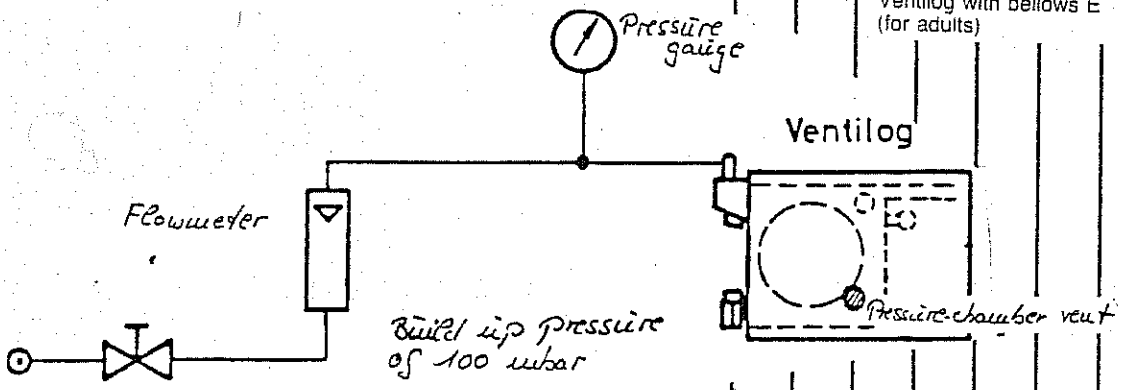


Test point, in older units not connected. For modification use a.m. parts.

3.1.	Waste-gas socket 8404690	C
3.1.1.	O-ring E 20278	C
3. '.	Check valve M 23543	C
3.2.	Patient system 8204700	C
3.2.1.	Connection socket	C
3.2.1.1.	O-ring 2M 8777	C
3.2.2.	Rotary-knob locking Pull out rotary knob and turn in an anti-clockwise direction.	
3.2.2.1.	Locking mechanism released, pull out patient system	O
3.2.3.	As of device no. 2154 insert slide-in unit without patient system. Locking es effected.	O
3.2.4.	Open fesh-gas discharge valve once a year. Replace diaphragm 8403377 and O-ring M 19241. Imorotant: ensure proper seating of diaphragm when assembling.	
3.2.3.	Seal (pressure chamber)	
*	Lip seal 8404064	C
*	Seal 8404065	C
	Repalce every 2 years (fit using silicone adhesive)	
3.2.6.	Leak test: Patient system - pressure chamber Test set-up: Remove bellows. Seal pressure-chamber vent with cork. Seal waste-gas socket.	

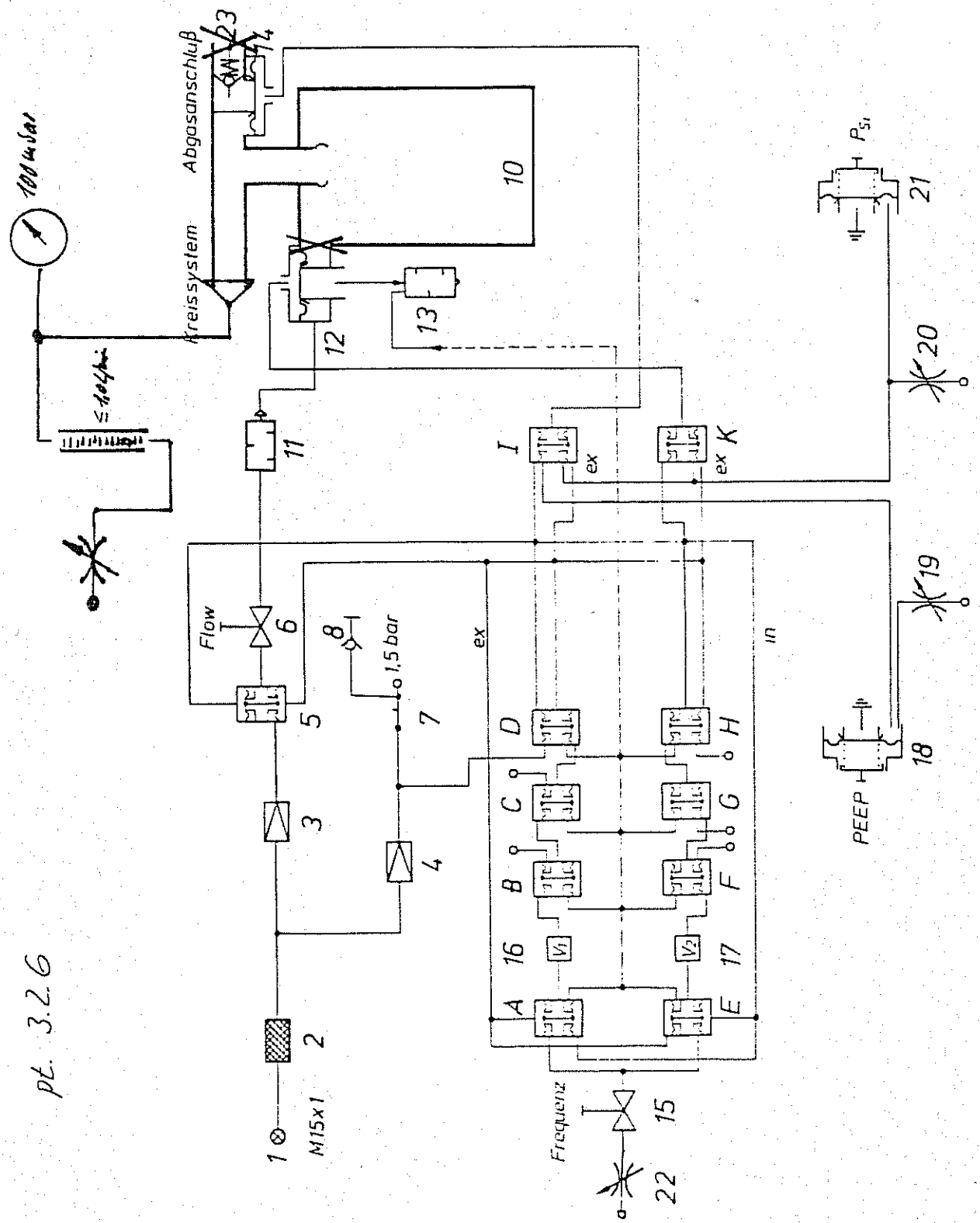


Ventilog with bellows E (for adults)

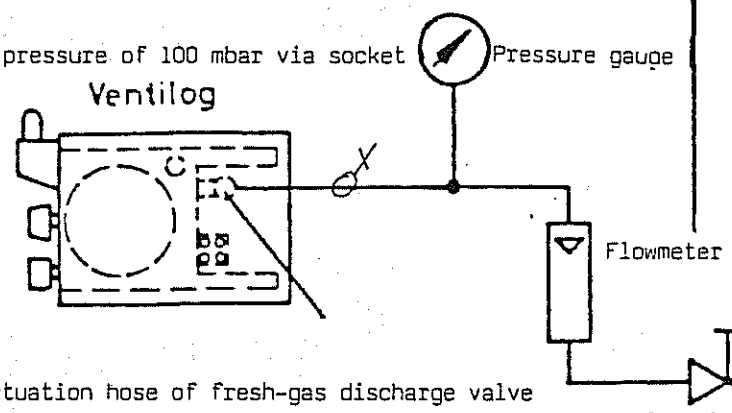


2.6.1.	Test value: Patient system locking	O
	Gas flow ≤ 1 L/min	L

Ventilog


Abgasanschluß
Kreissystem
10
12
13
11
I
ex
K
ex
20
21
19
18
PEEP
Flow
6
8
1,5 bar
ex
in
5
7
D
H
C
G
B
F
3
4
16
17
A
E
2
1
M15x1
Frequenz
15
22
pt. 3.2.6

3.3. Leak test, actuation of fresh-gas discharge valve
Test set-up:



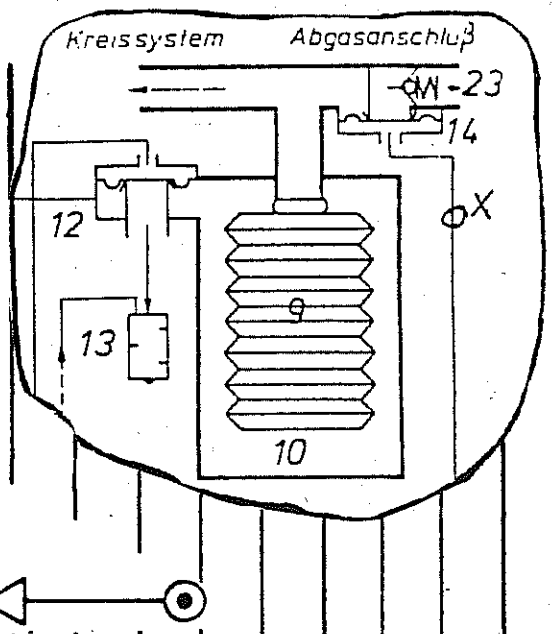
Detach actuation hose of fresh-gas discharge valve

3.3.1. Test value:
Gas flow ≤ 0.05 L/min O

3.4. Servo pressure test (PEEP control pressure) for discharge valve

Test set-up:
Switch setting "automatic" or "I"
PEEP max.
Connect pressure gauge between DMRI and discharge valve 14 via T-piece

3.4.1. Test value:
P = 12 + 1 mbar O V



4. Mount apparatus (without bellows and cover plate) and assemble ready for operation.

4.1. O_2/Compressed-air connecting
M 17670 C L

4.2.	Connecting hose	M 25050	C L
4.3.	Hose 1/.07 m	8404733	C L
4.4.	Hose 1/1 m	8404731	C L
4.5.	Hose 2/1 m	8404748	C L
4.6.	Hose 2/1.5 m	8404732	C L

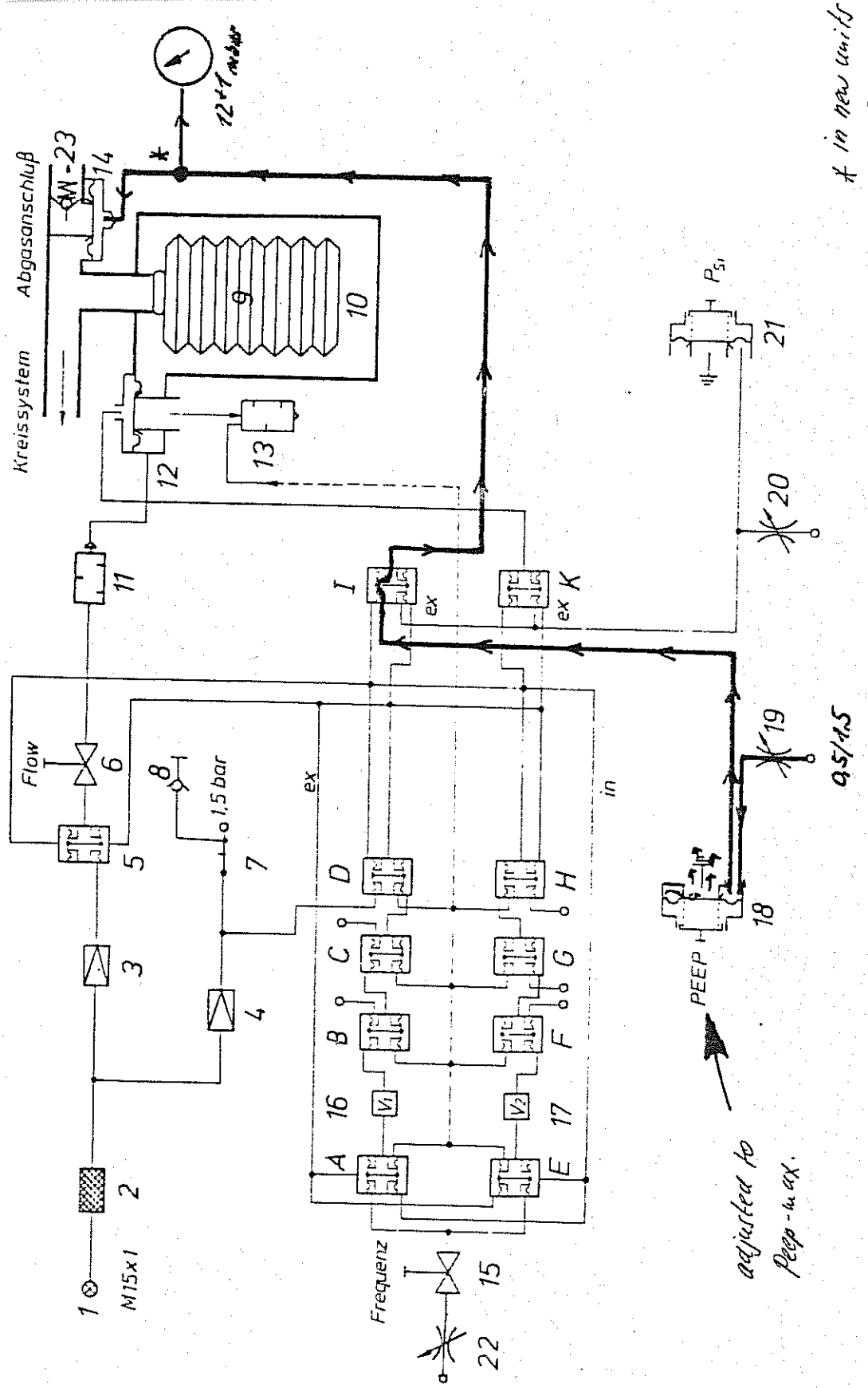
4.7. Ventilog - anaesthetic apparatus attachment C O

4.8. Base plate, latching of Ventilog C O

5. Functional check
Drive pressure 2 - 5 bar O_2

Anaesthetic Ventilators

Ventilog



5.1. Working flow
Test set-up:
Switch setting "automatic" or "I"
Ratio min.
PEEP 0
Remove bellows, remove cork!
Seal waste-gas socket
Connect patient system outlet,
Ventilog to flowmeter 10 - 100 L/min.

5.1.1. Test value:
Flow min. = 20 ± 2 L/min. 0
Flow max. = 80 ± 8 L/min. 0

5.2. Working pressure
Test set-up:
As Item 5.1.
However connect patient system
outlet, Ventilog to pressure gauge.

5.2.1. Test value:
Flow min. = 86 ± 9 mbar (V1)! 0
Flow max. = 86 ± 9 mbar 0

adjustable with plateau valve 21

5.2.2. Safety pressure anders als bei Ventilog II
Test set-up:
As Item 5.2.
Actuate pressure relief valve with
150 mbar, remove waste-gas socket.
Caution! Remove cork.
close control hose with plug!

5.2.2.1. Test values:
Flow min. = in each case min. 5 mbar
in excess of values 0
Flow max. = from Item 5.2.1. (V2)! 0
However ≤ 100 mbar

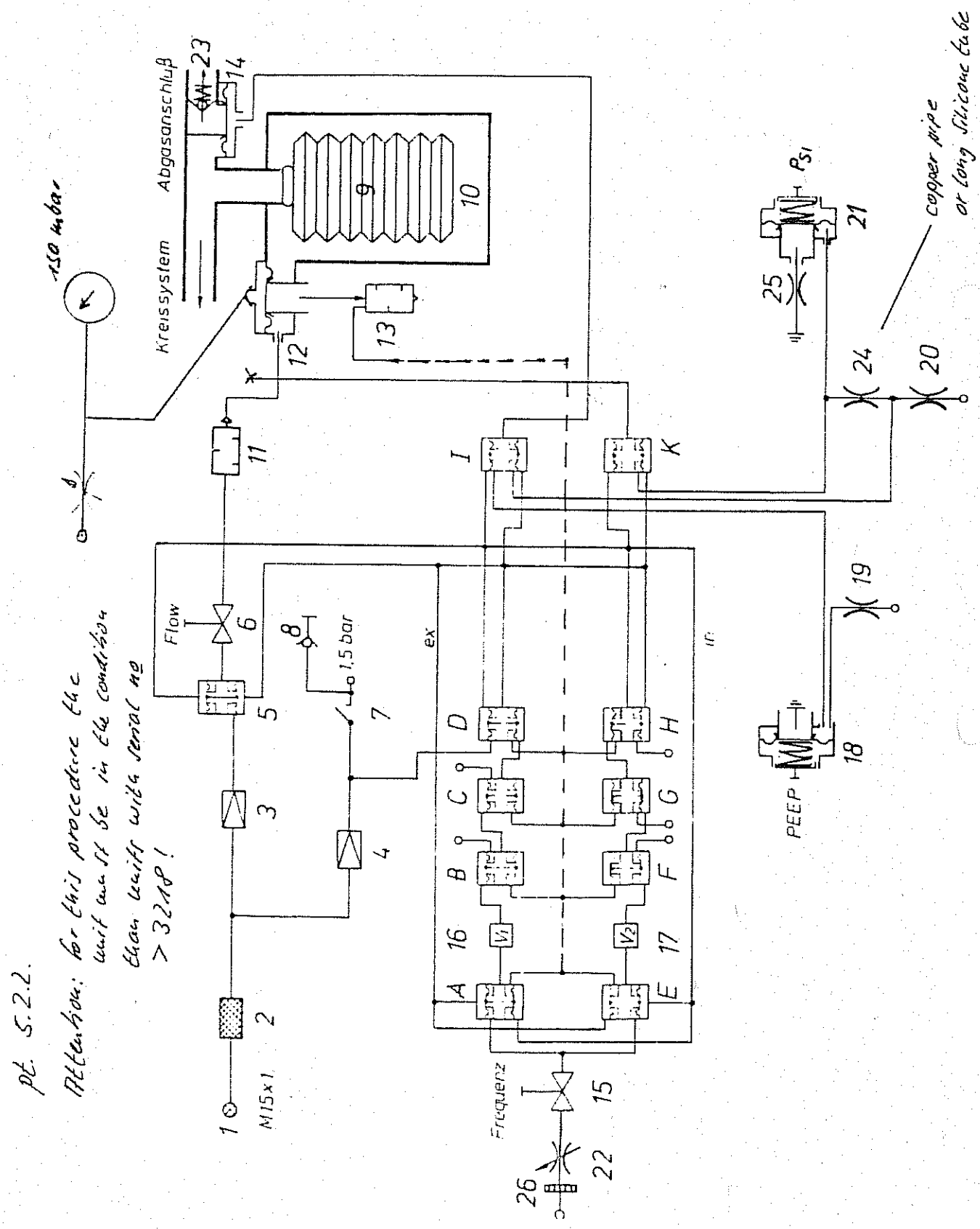
5.2.3. Test set-up:
As Item 5.2.,
however fit bellows
Volume 500 mL, waste-gas socket
open

5.2.3.1. Test value:
Flow min. = 80 ± 9 mbar 0
Flow max. = 80 ± 9 mbar 0

5.3. Ratio setting
Test set-up:
Switch setting "automatic" or
"I"
Flow max.
PEEP 0
Volume 500 mL
Patient system outlet, Ventilog
open.

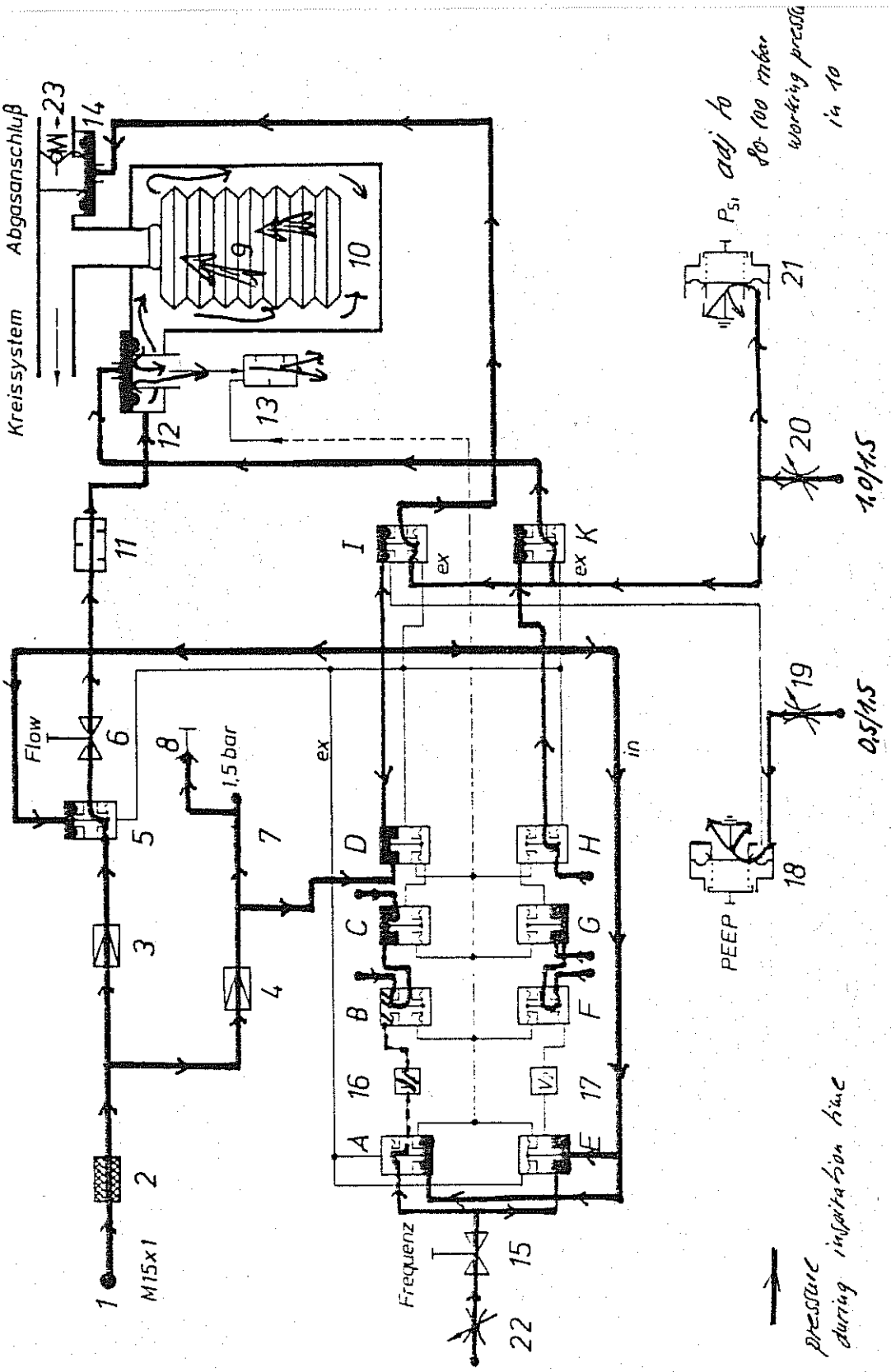
5.3.1. Test value:
6 = 6 ± 1 min^{-1}
15 = 15 ± 2.5 min^{-1} } EDM 13 0 V
30 = 30 ± 4.5 min^{-1} 0 V

Ventilog


Abgasanschluß
Kreissystem
150 mbar
Flow
1,5 bar
ex
Frequenz
M15x1
PEEP
copper wire
or long Silicone tube
pt. 5.2.2.
Attention: for this procedure the
unit must be set in the condition
than tariff with serial no
> 32190 !

Anaesthetic Ventilators

Ventilog

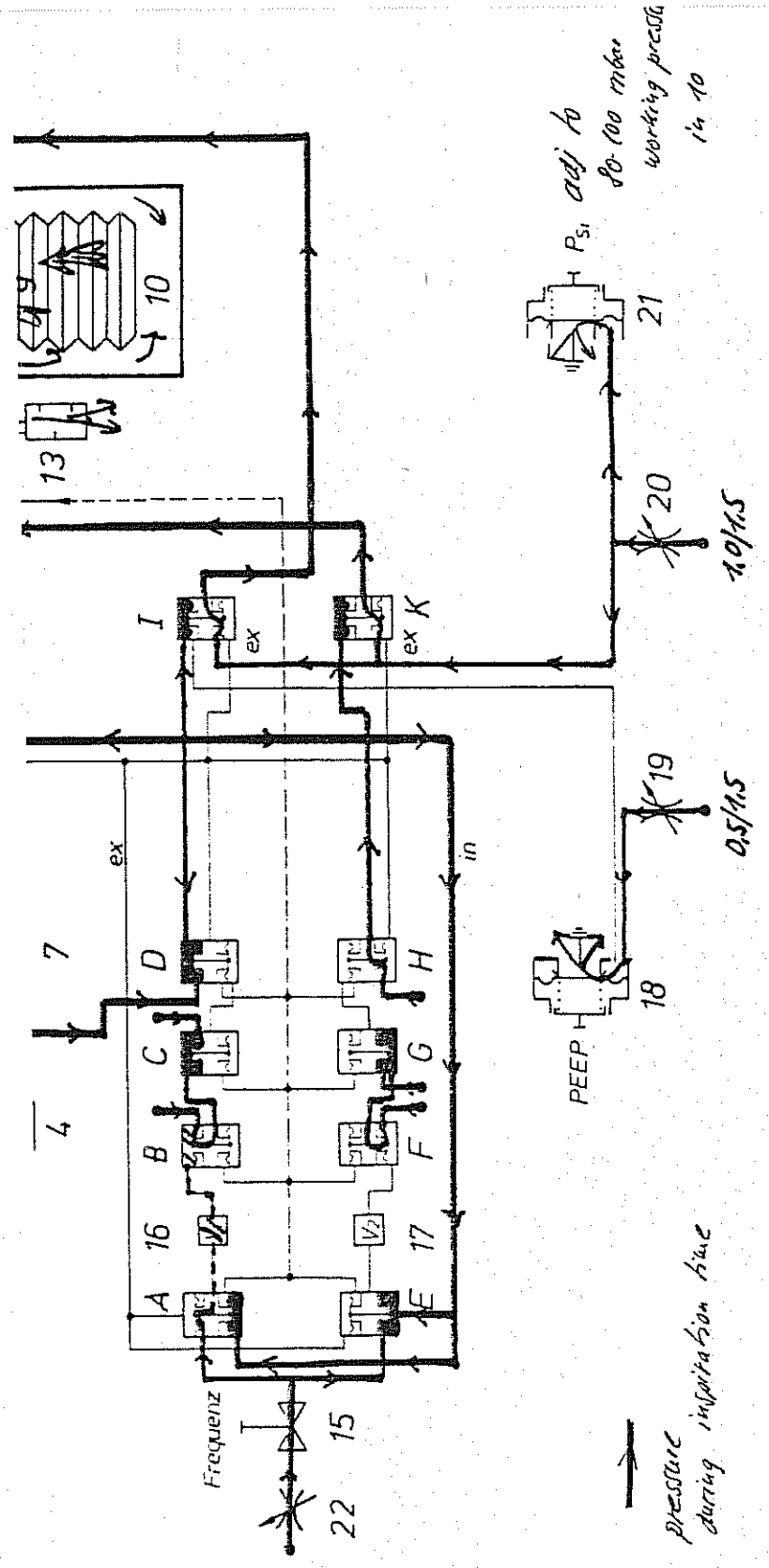


Pt. S. 3

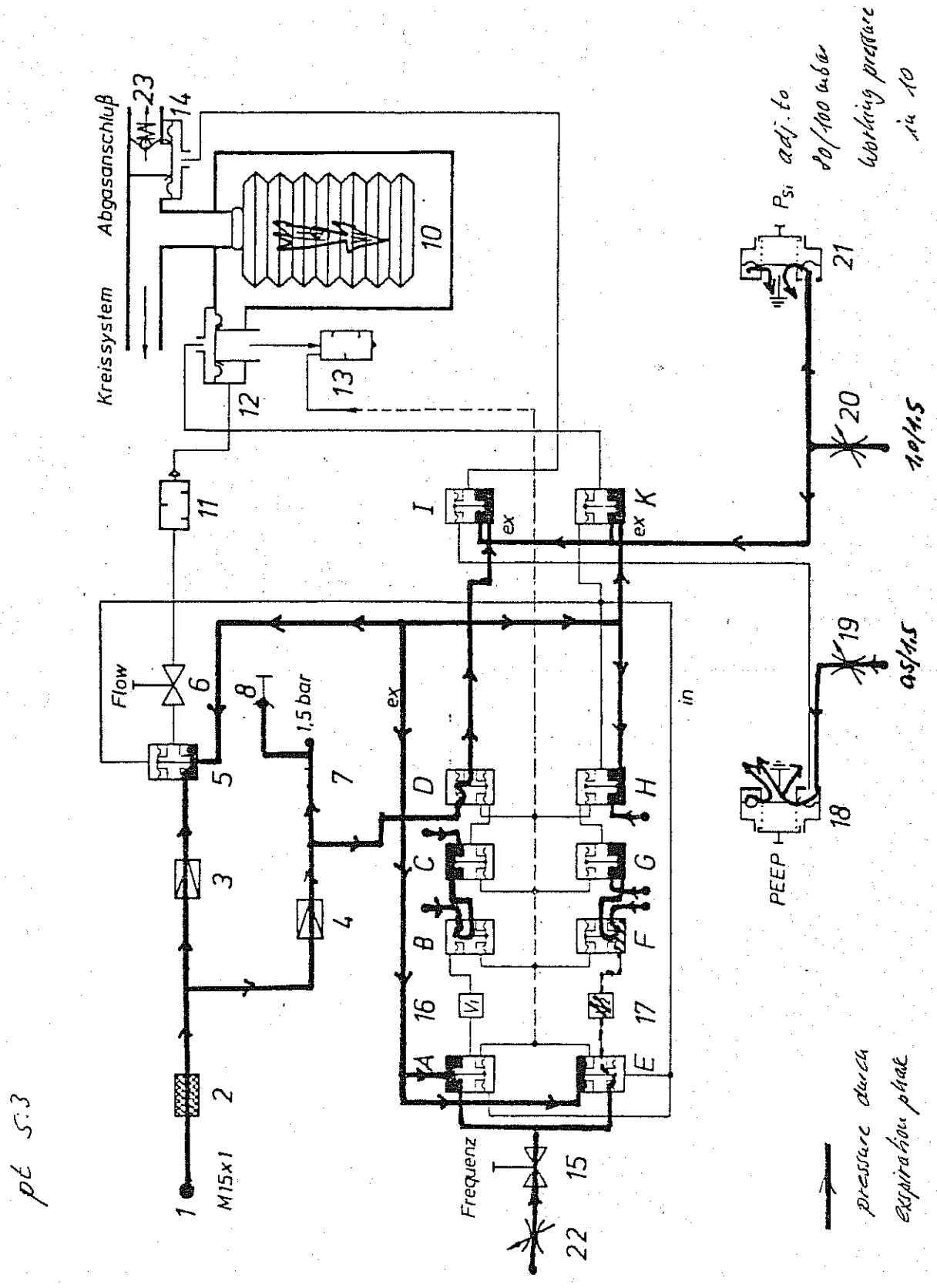
Anaesthetic Ventilators

Ventilog

4 plateau valve 21



Ventilog


Abgasanschluß
Kreissystem
Flow
1,5 bar
ex
in
Frequenz
M15x1
PEEP
working pressure
Druckluft durch
Expirationsphase

5.4. I : E - ratio
Test set-up:
as Item 5.3.
Ratio min

5.4.1. Test value:

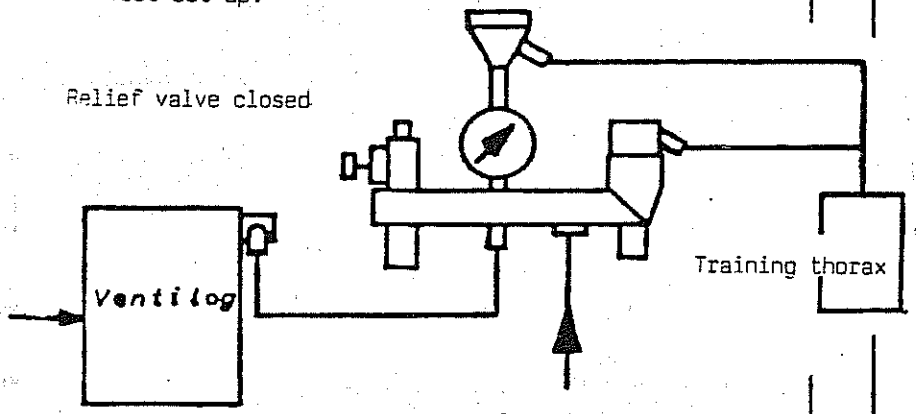
Reference value = $\frac{\text{Inspiration time}}{\text{Expiration time}}$

Reference value = 0.43 - 0.58 O

5.5. Check valve function - waste-gas socket
Test set-up:
As Item 5.4.
During inspiration, in plateau phase, seal patient system outlet; switch apparatus to "man./spontan." or "O".

5.5.1. Test value:
Bellows must not move downwards O

5.6. PEEP setting
Test set-up:



Slip anaesthetic gas filter with tubing over waste-gas socket.

Setting "automatic" or "I"
Flow max
Ratio min
Volume 500 mL

5.6.1. Test value:
PEEP setting on right stop
Fresh-gas flow 2 L/min
PEEP $\geq$ 15 mbar O V

~~Fresh-gas flow 4 L/min~~
~~PEEP = 19 - 3.5 mbar~~ O V

Fresh-gas flow 8 L/min
PEEP $\leq$ 23 mbar O V

PEEP setting on left stop
Fresh-gas flow 8 L/min
PEEP $\leq$ 2 mbar O V

Apparatus must not hum or whistle in any setting. 104 6

Attention!
look for control pressure
12 +1 mbar (pt. 3.4)
out of the tolerance
change diaphragm flow valve 4

6. Make device available to the user in a ready-to-operate condition.

Expenditure on such work is classed as repair services and not included in the Inspection Service price.

7. Confirmation of test

Name:

Date:

8. Report:

colored tubes, if available:

blue = supply

green = inspiration

red = exspiration

brown = control line 200 mbar

orange = relief

yellow } = free
(nature) clear }

Modification of Ventilog

1. To get safe starting conditions and no interruptions of the pneumatic time control system during work, we assembled 2 „Non return" valves into the tubes to MR 1 and MR 6.

   Ord. no 8406909

   In general we plan not to fix this non return valves automatically in older units. Please do this only in case of a.m. problems.

☞ ! After fixing non return valve control and adjust the frequency

2. To get no gas in the pneumatical time control system when the unit is switched of, but the gassupply is connected it is possible to assemble one more Diaphragm vale. In this case MR 14.

   Ord-no 8407324

   A additional volume C55

   Ord no 8403809 (fixed with clamp G50 236) with metering unit R6

   Ord. no. M27297

   will give the safety that the unit is starting after switching „ON" with the exshalation phase.
   For old units only in case of problems, not in general.

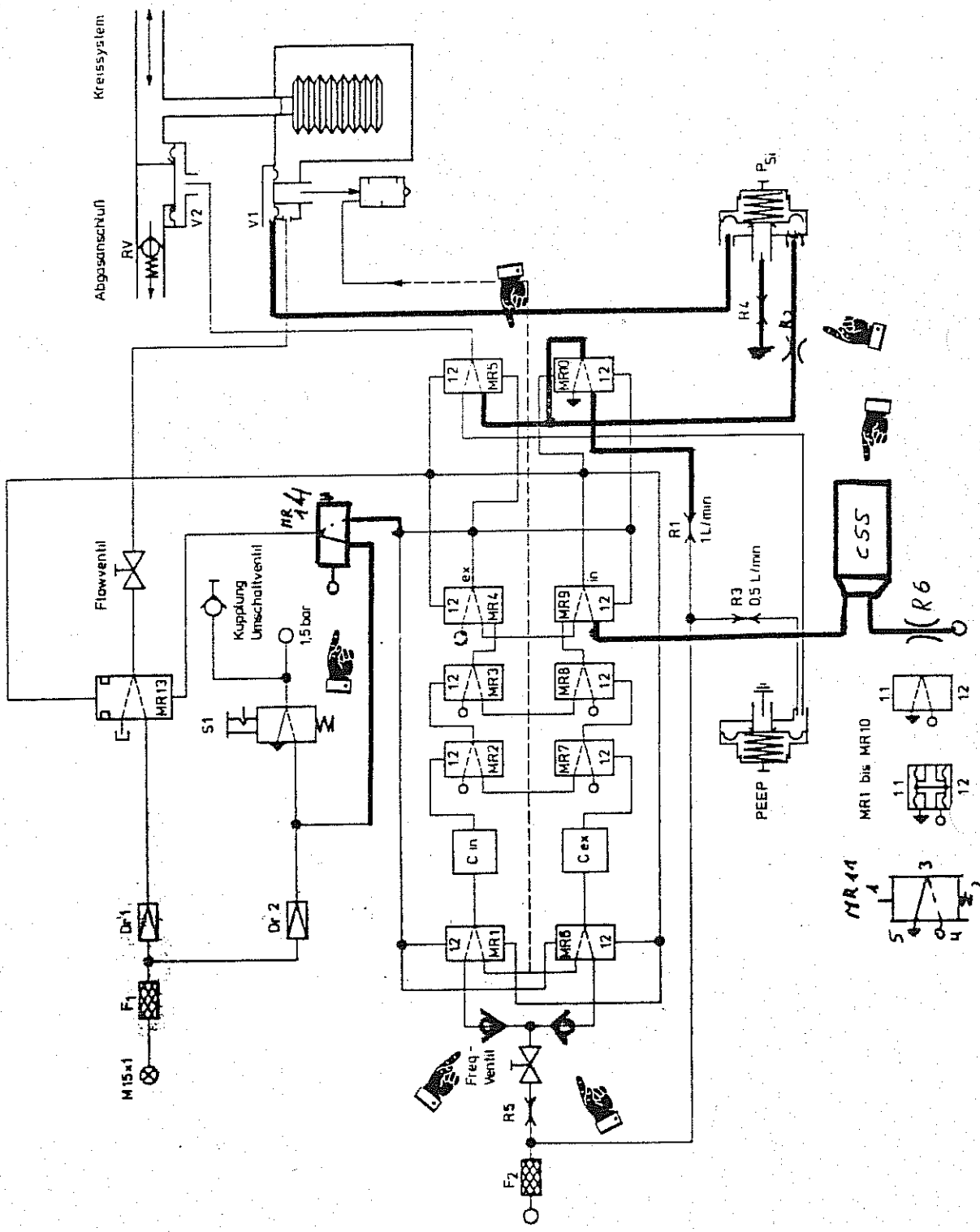
3. Loudness of psi valve (21)

To avoid giving noise during the exhalation phase from the psi valve (21), we change the connections of MR 5 and MR 10. So the psi valve is not supplied with cool gas during the exhalation phase.
The metering unit R4 is only connected, if it is accessary.
For old we plan not in general the modification.

All units since approx. July 1986 are in the new condition.

Anaesthetic Ventilators

Ventilog



Vau 6/09
with modification from July 1986