evoqua
WATER TECHNOLOGIES

WALLACE & TIERNAN® VACUUM GAS FEEDER V-2030

INSTRUCTION MANUAL

Please note

Original manual!

Contents

1. Introduction

1.1 Documentation

1.1.1 Target groups

This instruction manual is intended to provide assembly, operating, and maintenance personnel with the information they need for running and servicing the V-2030 vacuum gas feeder.

This instruction manual contains important information which will enable the operator to run the system in a safe, reliable, trouble-free, and economical way. Carefully observing these instructions will help to avoid dangers, reduce repair costs and down times, improve the system's reliability, and prolong its service life.

The chapter „Installation“ and parts of the chapter „Maintenance“ are intended exclusively for authorized technicians or specialists trained and authorized by the manufacturer. These sections contain important information on assembling, configuring, and commissioning the system and on maintenance and repair work.

All persons working with the system must have read and understood the instruction manual, in particular the safety instructions it contains.

Please consult the table of contents to quickly find the information you require.

1.2 Conventions

Notes This Instruction manual contains a number of notes with different priorities marked with symbols.

Picto-gram	Note	Meaning
	*Danger!*	Danger to life and limb! If the situation is not handled properly, death or serious injury may be the result.
	*Caution!*	If this warning is not observed, medium or slight injury or damage to the equipment may the result.
	*Warning!*	Electrical hazard.
	*Note*	These notes assist in the operation of the system.

2. Safety

2.1 Intended use

The V-2030 is the central item of a stationary disinfection system which doses chlorine gas or sulphur dioxide gas into a flow of water.

The V-2030 vacuum gas metering system must be connected to a vacuum gas supply.

Action time is up to 100%.

Other use is prohibited without permission from the manufacturer.

The operational safety of the system can only be guaranteed if it is used in accordance with its intended purpose. It may only be used for the purpose defined in the contract and under the installation, operating and environmental conditions stated in this operating manual. No substances (chemicals) may be used other than those described in this instruction manual. All inspection and maintenance work must be carried out at the prescribed intervals.

Compliance with the intended use also includes reading this operating manual and observing all the instructions it contains.

The operator bears full and sole responsibility if this unit is put to any use which does not comply strictly and exclusively with this intended use.

Not intended use

Not intended use is especially

- use of other media (other gases)
- gas supply under pressure

2.2 General safety instructions

The manufacturer attaches great importance to the safety of all work relating to the system. This was already taken into account in the design of the system, by the integration of safety features.

Safety instructions

The safety instructions in this documentation must always be observed. These do not affect the validity of any additional national or company safety instructions.

Safety instructions printed on the system

All safety instructions attached to the system must be observed. They must always be complete and easily legible.

Technical standard

The system has been constructed using the best available technology and according to the accepted safety regulations. However, danger to the life and limbs of users or third parties or damage to the system or other property cannot be ruled out if the system, if the system is used by unqualified persons. Installation and maintenance, as well as any work that is not described in this operating manual may only be performed by authorized personnel.

Personnel

The operator of the overall system must ensure that only authorized and qualified technicians can work on or with the system, and within their specified area of responsibility.

"Authorized and qualified personnel" include:

Operation and Maintenance leve 1

Personnel of the operator who have been trained and instructed by the manufacturer or a service partner.

Installation, Commissioning and Maintenance level 2

Only the manufacturer service personnel or personnel who have been trained and authorized by the manufacturer.

Electrical work

Authorized and qualified electrical technicians

Spare parts/components

The trouble-free operation of the system can only be guaranteed, if original spare parts and components are used in the combination described in this instruction manual. Otherwise there is a danger of malfunction or damage to the system.

Modifications and extensions

Never attempt to rebuild, modify or extend the system without written approval from the manufacturer!

Electrical power

Connect cables in accordance with the wiring diagram.
During normal operation, the positioner must remain closed.
Switch off the plant before starting mounting, inspection, maintenance or repair, secure against switching-on.

Waste disposal

Ensure safe and environmentally-friendly disposal of agents and replaced parts.

2.3 Specific safety instructions

Warning!

Danger due to chlorine gas/sulphur dioxide!
Chlorine gas or sulphur dioxide gas irritates the respiratory tracts. Contact with chlorine or sulphur dioxide gas in high concentrations irritates and damages the membranes, respiratory system and the skin. In extreme cases death can result due to suffocation.

Note

In this manual the use of the V-2030 system with chorine gas is described. The safety instructions for chlorine are similar to those for sulphur dioxide. When sulphur dioxide is used refer to the safety informations of the gas supplier (e.g. the safety data sheet).

- This unit may only be installed and serviced by qualified personnel who are familiar with the contents of the operating instructions, works directives and regulations for handling chlorine.
- The operators of the gas feed system must be instructed in safe use of the unit.
- All personnel coming in contact with the unit must be in full knowledge of the site operation and emergency procedures and also regulations for accident prevention.
- The vacuum gas feeder V-2030 must be connected to a vacuum gas supply only, never connect to a pressurized gas line.
- The discharge of chlorine gas from chlorine containers should not exceed one percent of the nominal container contents per hour, as otherwise there is the risk that the chlorine container and the vacuum control valve become iced. Therefore ensure that a sufficient number of chlorine containers are connected and open at the same time.
  When chlorine drums are used the vacuum regulator valve must be heated.
- When changing the gas cylinders always wear a suitable and functional gas mask. Practice use of the mask regularly. If chlorine gas is discharged, only use a breathing system which is independent of ambient air!
- Do not tolerate any leakages in the chlorine system. Leakage points must be sealed immediately as they will become larger with time if they remain unattended. When inspecting the system for leakage always keep your gas mask to hand.
- All connections and system components must be carefully inspected for leaks during commissioning, when chlorine pipes have been released and re-connected and also regularly during routine daily inspection, and any leaks must be sealed correctly. If there are any traces of chlorine in the air the cause

must be determined and remedied immediately.

- When locating leaks with ammonia, never pour, spray or drip liquid ammonia over metal components (corrosion).
- One of the most common causes for leaks on chlorine pipes are seals which have been used more than once. For this reason never re-use seals which have been removed from the system, but dispose of these immediately (also when changing the gas cylinders!). Ensure that a sufficient supply of new seals of the right size and correct material is always available (refer to chapter 7.).
- Gaskets must always be stored in a dry place! Damp seals lose their stability permanently, increase the danger of corrosion and should never be re-used!
- If a gas pipe is interrupted or opened, close the openings immediately with a rubber plug or similar material to prevent the ingress of moisture. Moisture must be kept away from all parts of the system which only come in contact with dry chlorine during operation. Dry chlorine is not corrosive below 100°C. However, chlorine in combination with moisture is extremely corrosive and corrodes most metals such as bronze or steel.
- Before servicing the system the gas supply must be closed off directly on the gas cylinders or tank and the chlorine gas in the system must be consumed completely (exception: leakage location or calibration)
- Only use original spare parts. Employment of non-specified parts can cause faults which can have dangerous consequences. The manufacturer does not accept any liability in such cases.
- After installation always keep this instruction manual in a safe, easily accessible place. It is important for safe operation and correct servicing.
- Secure loose warning signs and replace when illegible.
- Safety inspection once annually by a competent technician.
- Servicing of the system at least once annually by a competent technician. We recommend concluding a servicing contract with the manufacturer to this purpose.

3. Description

3.1 Theory of operation

(also refer to the flow scheme on the next page)

The vacuum gas feeder V-2030 is a gas feeder of the solution feed type. At an injector the metered gas is dissolved in water, and the resultant solution is discharged to the point of application. Feed rate control is achieved by changing the position of the V-notch plug. The plug provides ease of adjustment and excellent repeatability of the feed rate set.

Operating water passes through an injector (11) and creates a vacuum. This vacuum makes the vacuum regulator valve (2) on the gas supply open. Chlorine gas enters the gas feeder V-2030 under the influence of the vacuum and passes through the flowmeter and further to the injector. There it mixes with the operating water which then passes to the solution distribution system.

If the operating water is shut off, the vacuum breakes down and the vacuum demand valve interrupts the chlorine flow. The check valve in the injector prevents water from entering the gas line.

In case of a leak in the tubing from the regulating valve to the injector or in the gas feeder, only air can enter into the system, but no chlorine can escape. If the vacuum regulator valve leakes and pressurized chlorine flows into the vacuum lines, a relief valve (3) blows the chlorine into the vent line and into an activated carbon filter.

It is highly recommended to have the sensor of a gas monitoring system installed in the chlorine room.

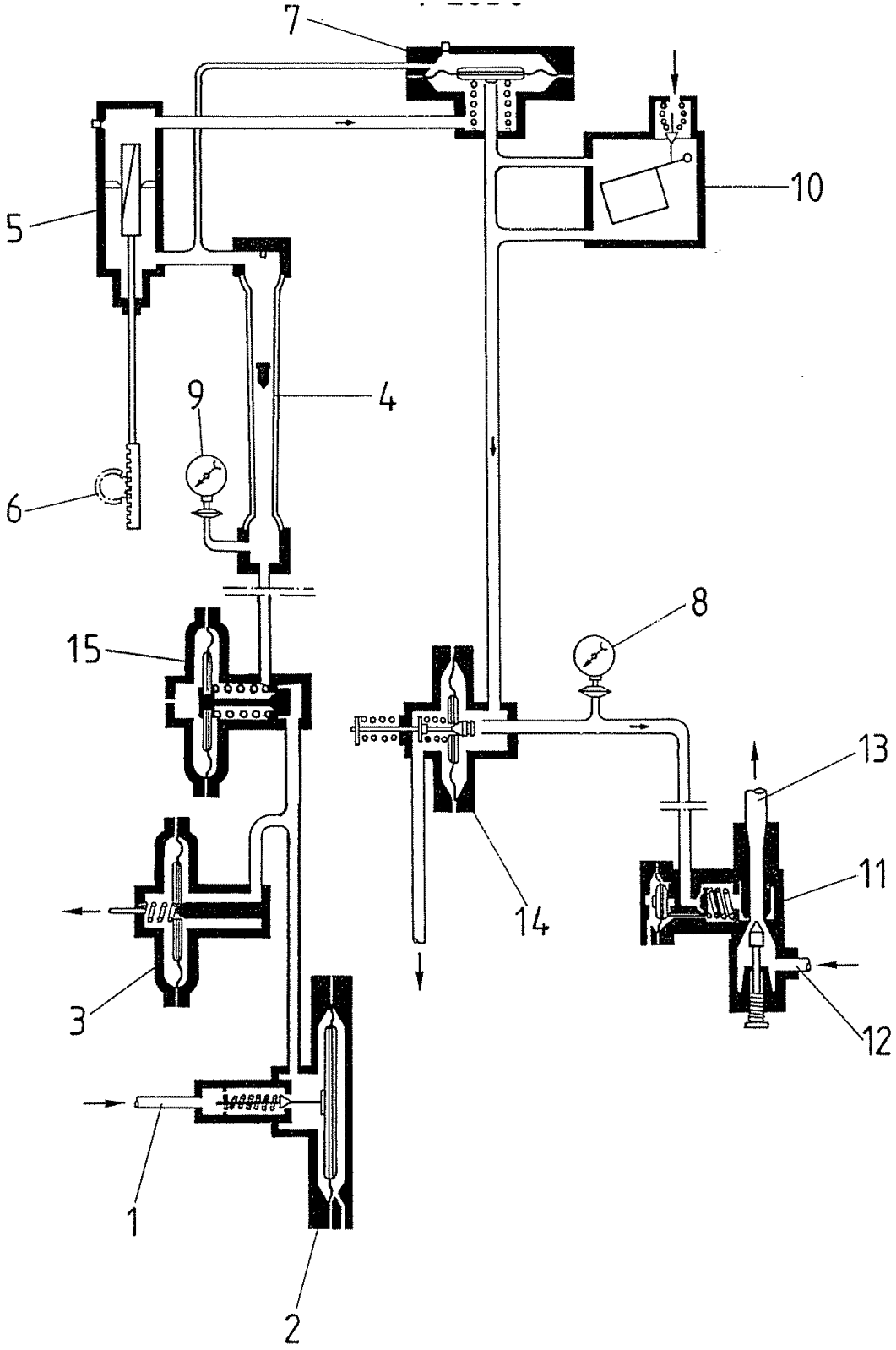
The gas feed rate is indicated in kg/h on the flowmeter. The gas feed rate is adjusted via the V-notch plug either manually or automatically by means of an electric positioner.

The differential regulating valve maintains a constant pressure drop across the V-notch orifice for maximum accuracy. This valve will compensate for pressure variations. If an insufficient gas supply or a defect differential regulating valve should cause an excess vacuum, the combined vacuum relief valve/drain valve (14) will admit atmospheric air into the system. This air will not be indicated on the gas flowmeter.

When the operating water is turned off, the check valve in the in-

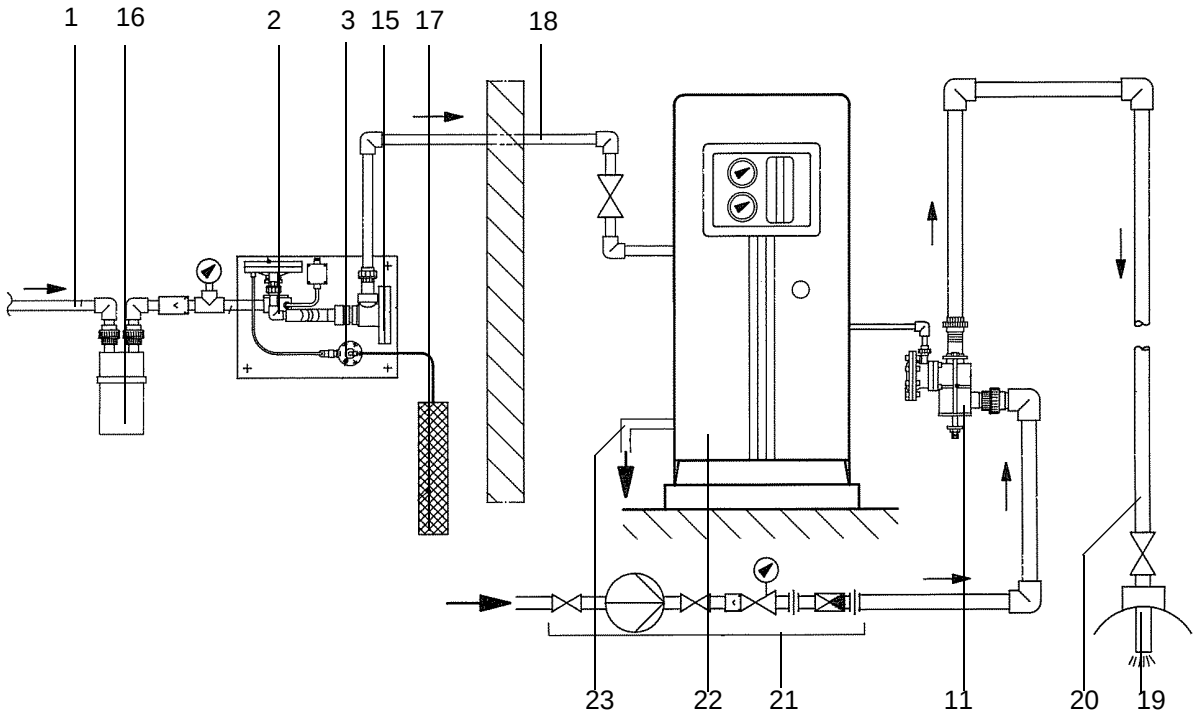
jector will prevent any water from entering the vacuum gas feeder. At the same time, the vacuum will cease thus causing the vaccum regulator valve (2) and the vacuum safety valve (15) to close automatically.
If the check in the injector should become leaky, the drain valve (14) will prevent water from entering the vacuum gas feeder.

3.2 Flow scheme



1 Gas inlet
2 Vacuum regulator valve
3 Pressure relief valve
4 Flowmeter
5 V-notch plug and orifice
6 Feedrate adjuster (manual or via positioner)
7 Differential regulating valve
8 Injector vacuum gauge
9 Gas supply vacuum gauge
10 Float valve
11 Injector with diaphragm check valve
12 Operating water inlet
13 Solution discharge
14 Drain valve
15 Vacuum safety valve

3.3 Typical Installation



1 Gas inlet (steel pipe)from the evaporator, from gas cylinders or gas drum
2 Vacuum regulator valve
3 Pressure relief valve
11 Injector with check valve
15 Vacuum safety valve
16 Chlorine liquid catch pot
17 Activated carbon filter
18 Vacuum line (pvc pipe)
19 Chlorine solution injection unit
20 Solution line
21 Set of operating water line accessories with booster pump
22 Remote vacuum gas feeder V-2030
23 Safety drain

3.4 Modes of control

The gas flow is directly indicated on the flow meter in kg/h. Within the dosing range every dosage rate can be adjusted (for the max. capacity refer to chapter 7.4.4).

3.4.1 V-2030 with positioner

automatic: Dosage rate is adjusted by the positioner. The positioner is controlled depending on water flow and/or chlorine residue.

semi-automatic:

- Dosage rate is adjusted manually. The injector is switched on and off by solenoid valves in the water supply line or by booster pump.
- Dosage rate is adjusted by the positioner switched up and down via an external controller. The injector is switched on and off by solenoid valves in the water supply line or by booster pump.

manual: Pull out the knob on the positioner and turn to adjust the dosing rate (e.g. in case of failure on the automatic control). To turn back to automatic control push back the knob and slightly turn it until it snaps in.

3.4.2 V-2030 manual version

semi-automatic:

- Dosage rate is adjusted manually. The injector is switched on and off by solenoid valves in the water supply line or by booster pump.

manual

- Dosage rate is adjusted manually at the adjusting knob of the V-2030.

3.5 Technical data

Vacuum gas feeder V-2030 in housing mounted to the floor

manual version	part no. W3T243596
version with positioner	part no. W3T244794

Adjusting range of the V-notch plug and range of the flowmeter *)	Chlorine: max. 200 kg/h SO_2: max. 180 kg/h refer to the shipping documents
Operating temperature	0°C to +50°C
Operating vacuum	approx. 200 mbar
Operating pressure of the 2“ injectors	PVC version: max. 8.8 bar up to 38°C max. 4.5 bar up to 54°C Bronze/PVC version: max. 17.5 bar up to 38°C max. 8.approx.8 bar up to 54°C
Operating pressure of the 3“ and 4‘‘ injectors	max. 12 bar
Noise	< 70 dB (A)
Positioner	230 V, 50 Hz or 115 V, 60 Hz Potentiometer 100 Ohm and 1 kOhm
Dimensions	refer to chapter 7.

*) The gas feeder can be equipped with different flowmeter tubes and V-notches (refer to chapter 7.4.4). By changing these parts and if necessary the injector, the dosing range can be changed.

4. Installation

4.1 Scope of supply

The scope of supply includes according to the selected version:

- Chlorinator with or without positioner
- Injector
- Operating water supply
- Point of injection

also necessary

- Gas supply with
  - Vacuum regulator unit
  - Release line and activated carbon filter

4.2 Transport and storage

The gas feeder is shipped in several packages.

1 Check that the packages are not damaged.

2 Immediately report any damage to the freight forwarder.
If the gas feeder is damaged, immediately inform the manufacturer.

3 Check all items against the packing note.

4.2.1 Unpacking

1 Unpack the equipment in a clean, dry area, preferably at the installation site.

2 Open the packing only on the upper side.

3 Take the accessories out of the cardboard pocket above the gas feeder.

4 To prevent damage during transport the flowmeter glas is packed separately. Handle this glas tube very carefully. Cracks make the glas tube useless.
Preferably mount the flowmeter just before commissioning.

5 Check all items against the packing note to ensure that none is discarted with the packing materials.

6 Retain the packing until the system has been completely installed.

4.2.2 Location requirements

For drawings of typical installations refer to 7.1

- Unauthorized persons must be excluded from the installation.
- Adequate access should be available to permit ease of operation and maintenance of all plant items.
- The ambient temperature around the vacuum gas feeder should be at least 0°C (install a heater if necessary) with a maximum at 50°C (preferably 15 - 20°C).
- The system shall be protected against direct exposure to sun and moisture.
- Gas containers are heavy and the location should be choosen to give the shortest possible gas supply line, consistent with safe handling of the containers.
- Position and equipment of the chlorine storage and operation room must correspond to the resp. regulations.

Warning!

Danger due to chlorine gas (gas escape)!
To avoid personal injury by chlorine gas, install the equipment so that in case of a fault chlorine gas may escape within the storage room only. Those parts of the chlorine system that may be under pressure (such as tanks, regulating valves, relief valve, relief line and activated carbon filter) may be installed in the storage room only. Refer to the national or regional regulations.

4.3 Mounting the gas supply

Warning!

To avoid possible severe personal injury or damage to the plant this equipment should be installed, operated and serviced only by trained qualified personnel.
Do not modify the installation beyond what is described in this manual without explicit consent of the manufacturer.

(See drawings in the chapters 3.3 and 7.1.)

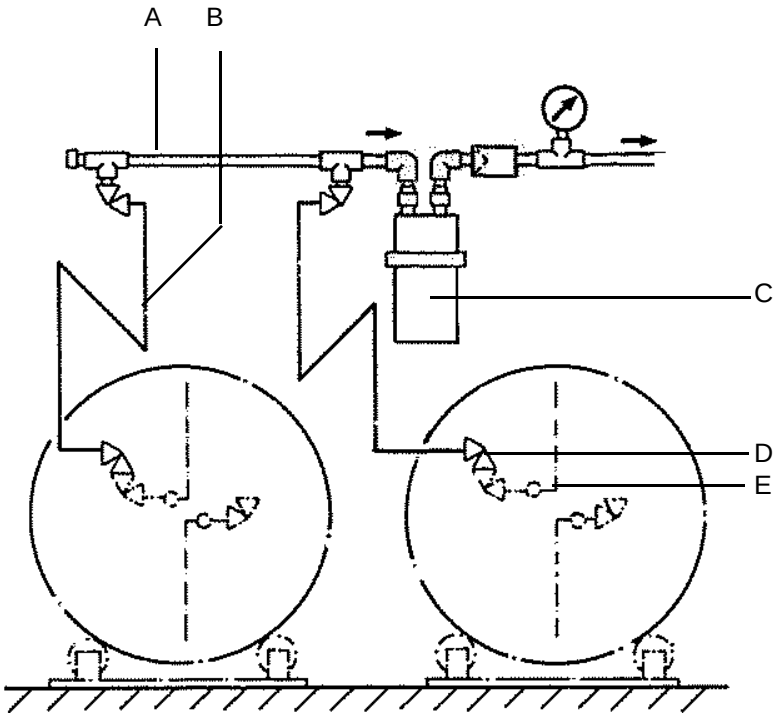
4.3.1 Gas supply with evaporator

Refer to the separate instruction manual „Evaporator E-2000“.

4.3.2 Gas supply without evaporator

The discharge of chlorine gas from chlorine containers should not exceed one percent of the nominal container contents per hour, as otherwise there is the risk that the chlorine container and the vacuum regulator valve become iced. Therefore ensure that a sufficient number of chlorine containers are connected and open at the same time.
When chlorine drums are used the vacuum regulator valve must be heated.

Example for the withdrawal of gazeous chlorine from two chlorine drums:



A Pressure manifold with angle valves
B Flexible pipe, e.g. W3T159895
C Chlorine liquid catch pot W3T159300
D Drum auxiliary valve
E Drum valve for gas withdrawal

Warning!

Danger due to liquid chlorine!
Liquid chlorine must not enter the vacuum regulator valve!
Always use the upper drum valve for the withdrawal of gaseous chlorine.

4.3.3 Pressurized gas manifold

1 Connect an auxiliary valve to the main valve of each gas container.

2 Install a flexible metal tubing connection between each auxiliary valve and the manifold. The manifold should be made of seamless steel with proper fittings.

3 Install a chlorine liquid catch pot in the manifold when no evaporator is used.

4.3.4 Automatic switchover

To ensure an uninterrupted gas supply to the vacuum gas feeder, install an automatic gas container switchover unit.
Refer to the separate instruction manual.

4.3.5 Vacuum regulator valve

1 Mount the vacuum regulator unit (e.g. W3T171408 / W3T163792) to a vertical surface.

2 When an evaporator is used:
Mount the gas pressure line from the evaporator and the reducing and shutoff valve type 50-185 to the vacuum regulator valve.

Without evaporator:
Mount the gas pressure line from the chlorine liquid catchpot to the vacuum regulator valve.

4.4 Vacuum gas feeder V-2030

The housing of the vacuum gas feeder is fixed on the base with the screws and dowels supplied (refer to drawing 7.2.1).

1 Drill the holes Ø14 x 80 mm into the base.

2 Fix the housing with the screws and dowels supplied.

3 Install the vacuum gas feeder into the housing.

4.5 Flowmeter

refer to drawing in chapter 7.4, details W and Z.

1 Apply some silicone grease to the two 'O'-rings pos. 69 and place them into the grooves.

2 Place the lower float stop pos. 92.

3 Hold the flowmeter tube pos 102 in the middle, the high values at the top, the tip of the float pointing to the bottom.

4 Place the upper float stop pos. 91 and the gasket pos. 65 into the flowmeter tube.

5 Place the flowmeter tube onto the lower 'O'-ring, the high values of the scale on top, press down the lower seat with two fingers of the other hand, if necessary press down the lower 'O'-ring with the flowmeter tube.

6 Position the tube into the upper seat, turn the tube until the scale is in front and slowly release the lower seat. Hold the tube until the tube safely rests on the ’O’-rings.

4.6 Injector

refer to the mounting drawings in chapter 7.2.

1 Install the injector either close to the vacuum gas feeder or in an other location close to the point of application.

2 Install the injector in a vertical position with the operating water flowing in an upward direction. Sufficient space should be provided for servicing.

4.6.1 Solution discharge line

1 Install a solution-proof discharge line between the injector and the point of application.
The pipe connected to the injector tailway must run straight for a minimum length of 0.5 m before an elbow or valve may be installed in this line.

4.6.2 Point-of-application

To apply the solution to a main, the main must either contain a threaded coupling or an other suitable connection which will fit the injection tube.

The injection tube consists of a pvc stop valve and a tube with threaded connection, that extends to approx. 1/3 of the mains diameter when extended.

It is recommended that all solution delivery lines be fitted with a suitable valve and drain pipe to enable any pressure build up to be safely released prior to maintenance work.

Note

Behind the point-of-application a pipe length of at least 10...15 x pipe diameter is necessary for a homogenious mixing of the solution into the main water. After that, samples can be taken for residue control etc.
If the point-of-application is into a basin, channel etc. a diffusor can be supplied (refer to the project documentation.

4.6.3 Water supply

To operate the injector, a water supply pipe of 2“ up to 4“ diameter is necessary according to the operating conditions.

There must always be sufficient operating water available at an adequate supply pressure (see Technical Data for details). The operating water must not contain any particulates (potable water quality).

Water pressure and quantity depend on the maximum dosing capacity, the counterpressure at the point of application, the difference in geodetic altitude between gas feeder and point of application and the friction in the dosage line. On these values depend the selection of the injector.

If the operating water pressure is too low, a booster pump is required.

The water line should include a suitable shut-off valve, strainer, pressure gauge, pressure reducing valve check-valve and solenoid valve (see chapter 7.1).

It is recommended that all solution delivery lines lines be fitted with a suitable valve and drain pipe to enable any pressure build up to be safely released prior to maintenance work.

4.7 Vacuum gas supply line

The diameter of the suction line between vacuum regulator valve, vacuum gas feeder and injector depends on the the gas flow and the distance (see table below).

The vacuum gas supply line is usually made from commercially available pvc pipes.

Max. pipe length from vacuum regulator valve to the vacuum gas feeder

gas flow Cl_2, SO_2	pvc pipe DN25	pvc pipe DN32	pvc pipe DN40	pvc pipe DN50	pvc pipe DN65		
60 kg/h	-	10 m	30 m	90 m	180 m		
80 kg/h	-	5 m	18 m	50 m	100 m		
113 kg/h	-	-	10 m	25 m	55 m		
158 kg/h	-	-	5 m	15 m	30 m		
200 kg/h	-	-	3 m	10 m	20 m		

Max. pipe length from the vacuum gas feeder to the injector

gas flow Cl_2, SO_2	pvc pipe DN25	pvc pipe DN32	pvc pipe DN40	pvc pipe DN50	pvc pipe DN65	pvc pipe DN80	pvc pipe DN100
60 kg/h	20 m	80 m	190 m	650 m			
80 kg/h	10 m	50 m	110 m	380 m	950 m		
113 kg/h	-	25 m	55 m	180 m	480 m	1300 m	
158 kg/h	-	-	30 m	100 m	260 m	800 m	
200 kg/h	-	-	18 m	70 m	170 m	480 m	1700 m

4.7.1 Pressure relief valve

The pressure relief valve is installed in the vacuum regulator valve unit. It prevents pressure built-up in the vacuum line. In this case the chlorine will be released into the relief line.

4.7.2 Pressure relief line

1 Install the pressure relief line in compliance with the local regulations.
It is recommended to connect an activated carbon filter to the end of the pressure relief line for the prevention of undesired odours.

4.8 Electric connection

Warning!

Danger of electric shock!
Only authorized and qualified electrical personnel may carry out works on electrical parts of the system.
Connect the control cabinet according to the wiring diagrams and the national and local codes.
Before opening positioner or electric control unit, ensure that mains supply is switched off.

4.8.1 Connecting solenoid valve / booster pump

refer to Typical Installations in chapter 7.1

Warning!

Danger of over-chlorination!
The water through the injector may flow only when the water in the main water line flows.

Booster pump

A booster pump is necessary if the operation water pressure is too low.

1 Lock the booster pump to the flow in the main water line (e.g. by using a flow sensor).

Solenoid valve

When using a solenoid valve in the main water line:

1 Lock the solenoid valve to the flow in the main water line (e.g. by using a flow sensor).

4.8.2 Connecting the positioner

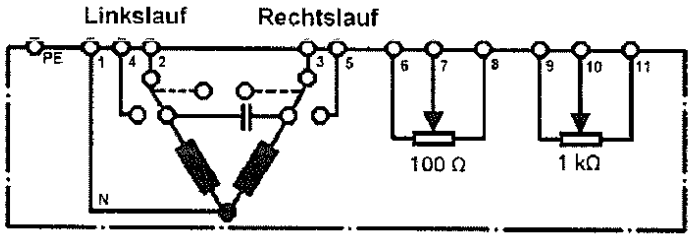
Warning!

Danger of electric shock!
Only authorized and qualified electrical personnel may carry out works on the positioner.

The positioner can be connected to a Wallace & Tiernan® control unit, other controls or a remote control panel.

Connect the positioner according to the following wiring diagram or the wiring diagram in the instructions of the control unit).

left-handed rotation right-handed rotation



Movement direction:

- Right-handed rotation: connecting rod moves out, gas feeder flow decreases,
- Left-handed rotation: connecting rod moves in, gas feeder flow increases.

1 Make sure that the gear case of the positioner is safely connected to protection ground.

2 Connect the positioner.

3 In order to separate the positioner from the mains during service or repair, install a 2 pole switch between the control unit and the positioner not far from the positioner.

4 Check the function.

4.8.3 Adjusting the positioner

Warning!

Danger of electric shock!
Only authorized and qualified electrical personnel may carry out works on the positioner.

The positioner is supplied pre-adjusted to the gas feeder. Adjusting can become necessary e.g. if the system should be adjusted to a different '0'-position or after repair. The leak test of the system should be carried out before adjusting the positioner.

Preparation

- Switch off the mains to the positioner and to the limit switches and ensure that the wires are free of voltage.

1 Remove clamp W3T163642 from the manual shaft. Remove also connection screw W3T159379.

2 On positioner pull out the knob and then turn the knob to move the rack upward to the stop.

3 Remove the cover from the positioner.

4 Loosen the set screw on the potentiometer gear with hex. socket head wrench (1.5 mm) to prevent the potentiometer from being damaged.

5 Loosen also the set screw on the coupling of the second potentiometer.

6 Loosen the set screw on both limit switch cams with hex. socket head wrench so that the cams can be turned easily by hand.
If necessary operate the motor by hand (e.g. via push-buttons) to move the cams into a position where these set screws are accessible.

7 By turning the knob, move the rack downward, approx. 2 mm away from its stop and hold it there in this position.

8 Run the motor (e.g. via push-buttons) while preventing the knob from turning, push the knob steadily downward until it snaps into a lower position. After the snap, stop the motor immediately because it is very important that the rack is still in a position where it is approx. 2 mm away from its stop. If not, repeat steps 2, 7 and 8.

9 Put the injector in operation with the gas on.

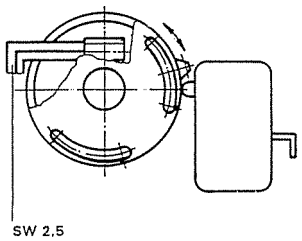
Adjusting the zero point

1 While observing the gas flowmeter, push the V-notch shaft by hand slowly upward just enough to set the gas flow to zero.

2 Turn connecting screw W3T159379 in a position to fit, and connect the coupling. Lock the connecting screw into this position with lock nut W3T172738.
Do not move the V-notch shaft off the zero-position whilst completing step 2.

3 On limit switch located in back (terminals 2 and 4) turn the cam by hand carefully counter clockwise just to the position where the switch switches. At this point a clicking noise can be noticed. Lock the cam at this point.

4 After locking the cam, the cam can also be turned to the switching point by fine adjustment, observe the required direction of rotation.



Adjusting the maximum value

1 While observing the flowmeter, run the motor to adjust the positioner to the desired max. feed rate and stop at this point.

2 On limit switch located in front turn the cam carefully clockwise just to the point where the switch switches. Lock the cam at this point.

Adjusting the potentiometer

1 Adjust Ohm-meter exactly to zero and connect its leads to the terminals 7 and 8.

2 Run the motor to adjust the positioner to 50% of the desired max. feed rate.

3 By hand carefully turn the potentiometer to a point where the Ohm-meter reads 50 Ohms. At this point lock the potentiometer by set screw.

4 When the second potentiometer is used:
Adjust it as described above but measure the resistance on terminals 10 and 11.
Note that the second potentiometer will turn in an other direction than the first potentiometer.

4.9 Preparation

Chlorination plants should be checked by a specialist for condition according to the rules before being taken into operation. Especially the chlorine parts of the plant must be checked for leaks.

When all the connections have been made, the following pre-start checks must be carried out before the plant can be taken into operation.

4.9.1 Check for water leaks

1 Close the regulating knob of the positioner by hand or by the control.

2 Ensure that the gas cylinder or drum valves are closed.

3 Open the stop valve at the point of application.

4 Open the stop valve and the solenoid valve in the water supply.

5 If installed start the booster pump.

6 Adjust the injector inlet pressure so that the operation vacuum of 170 mbar is displayed at the pressure gauge of the V-2030.

7 Check the water supply and the chlorine solution line for leaks. Repair if necessary.

4.9.2 Check for gas leaks

Warning!

Danger due to chlorine gas!
Chlorine gas irritates the respiratory tracts. Contact with chlorine gas in high concentrations irritates and damages the membranes, respiratory system and the skin. In extreme cases death can result due to suffocation.
When inspecting the system for leakage always keep your gas mask to hand.Practice use of the mask regularly.
If chlorine gas is discharged, only use a gas mask which is independent of ambient air!
Do not tolerate any leakages in the chlorine system.
Before servicing the system the gas supply must be closed off directly on the gas cylinders or tank and the chlorine gas in the system must be consumed completely.
In case of strong chlorine smell put on your gas mask.

Testing for chlorine or SO2 gas leaks is accomplished by introdu-

cing ammonia fumes to the area under test (part no. W3T165079).

Warning!

Danger due to ammonia!
Any escaping gas will combine with the ammonia to form dense white clouds. Liquid ammonia solution must not be applied directly to the part being tested. Hold a bottle of 25% ammonia solution in the vicinity of the part under test.
Ammonia must not be inhaled, splashed or spilled.

Note

When an evaporator is used:
Refer to the separate evaporator instruction manual.

1 Connect the auxiliary valve to the chlorine container, use a new gasket.
Close the auxiliary valve.

2 Keep the valves on the chlorine cylinder or drum closed.

3 Open the valves in the water supply line to the injector and at the point of application.
A vacuum of min. 170 mbar must be indicated on the manometer of the control unit.
Check that the flowmeter float remains at its bottom stop (at the latest after 10 minutes). Any movement of the float indicates an ingress of air on one of the following locations:

- through the safety relief valve
- through the "O"-ring on the bottom of the flowmeter or
- through cracks in the flowmeter
- through the "O"-rings at the pipe connections
- through any incorrectly cemented joints or slack unions in the pipework.

Repair any leaks immediately.

4 Close the water supply.

5 Open the valves on the chlorine cylinder or drum carefully and close again.

6 Check for leaks.
Hold a bottle of 25% ammonia solution in the vicinity of the part under test. In case of a leak the escaping gas will form dense white clouds.

7 In case of a leak check that the cylinder or drum valve is closed.
Open the auxiliary valve(s).
Let the operating water flow.
Open the regulating knob of the positioner and let the gas from the gas lines be sucked away until the float in the flowmeter of

the V-2030 is down on the lower stop.
Immediately tighten the leak.

8 Open the gas container valve.

9 Check the gas manifold step by step for leaks.

10 When all parts have been checked:
Open the valve on the chlorine cylinder or drum again.

11 Adjust the desired dosing capacity. The operation vacuum is shown on the pressure gauge of the V-2030.

12 Close the valves on the chlorine cylinder or drum.
Within a minute the float in the flowmeter of the V-2030 should be down on the lower stop. Otherwise refer to step 2.

Note

When the desired gas flow cannot be reached:
Adjust the knob of the injector to optimize the injector performance.

4.10 Commissioning

When the water and gas leak test have been performed successfully, the system can be started as follows
(the positions refer to the drawing in chapter 3.2)

1 Activate the gas warning device.

2 Open the point-of-application.
Open the operating water valve incl. solenoid valve.

3 If necessary start the booster pump.

4 Adjust the injector water pressure at the reducing valve.

5 Open the gas container valve one turn.

6 To adjust the dosage manually, set the control to the suitable dosage rate. The dosing rate can be read at the flowmeter (4).

7 To adjust the dosage automatically, switch the positioner to automatic operation (knob pushed in),.

8 Check that the dosage rate on the control corresponds with the display on the flowmeter.

For further information see the instruction manual of the control.

4.11 Training the operator

1 Train the operator for understanding at least in safety, operation and fault finding.

Note

The operator of the overall system must ensure that only authorized and qualified personnel can work on or with the system, and within their specified area of responsibility.

All personnel who work on the system must have read and understood the instruction manual, especially the safety instructions.

5. Operation

5.1 General

If the gas feeder is installed and adjusted correctly, only the following measures are necessary during operation:

- Check and adjustment of the dosage rate
- Daily check of tightness
- Function check of the gas warning device
- Change of the gas containers
- Cleaning the strainer in the operation water line.
- When testing the sprinkler system take care that the gas cylinders and armatures don't get wet unnecessarily. Slip a hose over the spray nozzles and lead the water into the sink.

5.2 Start dosing

1 Check that the gas monitoring system is activated.

2 Open the operating water valves and the point-of-application.

3 Open the gas container valves.

4 Open the auxiliary valves.

5 Adjust the dosage

- manually with the knob on the positioner
- or with the control (the knob must be pressed).

5.3 Stop dosing

- Close the operating water valves or
- Close the gas supply valves or
- Stop the dosage
  - manually with the knob on the positioner
  - or with the control (the knob must be pressed).

5.4 Changing gas containers

Warning!

Danger due to chlorine gas!
Chlorine gas irritates the respiratory tracts. Contact with chlorine gas in high concentrations irritates and damages the membranes, respiratory system and the skin. In extreme cases death can result due to suffocation.
When changing gas containers always put on your gas mask.

Warning!

Danger due to ammonia!
Testing for chlorine or SO2 gas leaks is accomplished by introducing ammonia fumes to the area under test. Any escaping gas will combine with the ammonia to form dense white clouds. Liquid ammonia solution must not be applied directly to the part being tested. Hold a bottle of 25% ammonia solution in the vicinity of the part under test.
Ammonia must not be inhaled, splashed or spilled.

1 Close the valve of the empty chlorine container.

2 Close the auxiliary valve.

3 Remove the auxiliary valve from the chlorine container.

4 Remove the empty chlorine container, place and secure a full container.

5 Connect the auxiliary valve to the container valve, using a new gasket.
When using a drum without evaporator:
Use the upper drum valve for gazeous withdrawal.

6 Open the container valve for a moment and close again, check for leaks.

7 Open the container valve if the connections are tight.

If the connections are not tight:
Leave the container valve closed, open the auxiliary valve and let the chlorine be sucked away.
Tighten the connection.
Check again for leaks.

8 Open the auxiliary valve.

5.5 To stop for extended periods or maintenance

1 Turn off the gas container valve.

2 Allow the control unit to operate until the flowmeter float remains on the bottom stop.

3 Turn off the water supply to the injector. The manometer pointer comes down to 0.

4 Against frost remove all the water from the water supply and solution line.

5.6 Fault finding

Warning!

Danger due to chlorine gas!
Chlorine gas irritates the respiratory tracts. Contact with chlorine gas in high concentrations irritates and damages the membranes, respiratory system and the skin. In extreme cases death can result due to suffocation.
Before carrying out any fault finding operations involving dismantling, the system should be cleared of gas. Follow procedure at chapter 5.5.
When disassembling the system always put on your gas mask.

Warning!

Danger of electric shock!
Only authorized and qualified electrical personnel may carry out works on electrical parts of the system. Make sure that the system is free from voltage during the time of maintenance or repair.
Pay attention to external voltage even if the main swith is off.
Assign repairs to the service of the manufacturer.

5.6.1 Fault on the gas feeder, valves, injector

No.	Symptoms	Probable cause	Remedy
1	Vacuum gas feeder will not feed	Chlorine supply exhausted	Change chlorine container.
		Chlorine supply is turned off	Open valves.
		Closed or clogged solution tube at point of application	Open or clean both corporation cock and solution tube.
		Leakage in the pipe lines	Check pipes and unions for leaks.
		Injector switched off (only 2” injector W3T167389)	Turn the knob at the injector.
		Insufficient injector vacuum	Check operating water pressure. Check pressure at point of application.
		Broken membrane in the injector check valve	Replace membrane.
		Injector misadjusted	Adjust injector at the adjusting knob to 170 mbar.
		Clogged injector	Clean injector parts. Replace injector parts when worn or damaged.
		Clogged strainer in operating water line	Clean stainer insert.
		Gas filter clogged	Clean the filter.
		Diaphragm in the vacuum regulator valve broken	Repair the valve (specialist).
		Leakage or broken membrane in the vacuum relief valve or drain valve	Replace the membrane.
		V-notch orifice clogged	Clean orifice.
2	Chlorine residual too low in spite of sufficient chlorine feed rate indication	Air is sucked into the chlorine gas stream	Check for leakage upstream of flowmeter. Change and grease O-rings on flowmeter.
		Increased chlorine demand	Check chlorine demand.
		Pressure relief valve not tight	Check valve.

No.	Symptoms	Probable cause	Remedy
3	Vacuum gas feeder will not run up to full capa-	Insufficient injector vacuum	see 1.
		Injector does not meet requirements	Change injector parts
		Gas filter clogged	Clean the filter
4	Flowmeter float moves erratically	Deposits on flowmeter parts	Clean flowmeter
5	Odour of chlorine in gas feeder room or vicinity	Pressure relief valve blows	Clean resp. replace vacuum regulator valve. Replace the filling of the activated carbon filter.
		Gas pressure lines not tight	Check and tighten.
6	Water in flowmeter	Defective check valve in injector	Dry the system, check injector, check the drain valve.
		Drain valve leaking	
7	Gas feed rate cannot be adjusted properly	V-notch stem worn	Replace V-notch stem
		V-notch orifice worn	Replace orifice
		Vacuum regulator defective	Replace regulator
8	Feed rate too high	Membrane in differential control valve broken	replace the membrane (specialist).

5.6.2 Fault at the positioner and the control

No.	Symptoms	Probable cause	Remedy
1	Rack does not move, although the positioner receives signal from the control	Positioner is in manual operation (knob is pulled)	Switch to automatic operation (push the knob)
		External separation switch (optional) is set to OFF or manual	Switch to AUTO
		No mains	Check the mains from control unit, mains supply, switches, fuses
		Rack is blocked	Check load
		Limit switch in the positioner has switched	Check the limits, adjust if necessary
		Motor defective	Check the motor
		Gear defective (chattering noise)	Replace positioner
2	Rack does not move, although knob turns	Rack defective (wear)	Replace rack
		Tooth wheel defective	Check toothes and clamping of the tooth wheel, replace v-notch positioner W3T167407 if necessary
3	Rack moves to the wrong direction	wrong electric wiring	Check the terminals connections
4	Rack moves to the stop	Limit switch misadjusted or defective	Adjust positioner
5	Feedback signal cannot be aligned	Potentiometer misadjusted	Check potentiometer adjustment
		Potentiometer defective (1kOhm ±10% resp. 100 Ohm ±10%)	Replace board (Note: special potentiometer, may not be replaced by a standard potentiometer)
		Wiring and terminals defective	Check wiring and terminals to the board
		Toothed wheels or potentiometer shaft loose	Adjust potentiometer and clamp toothed wheels

No.	Symptoms	Probable cause	Remedy
6	Positioner moves without finding the right position	Potentiometer defect or loose	Check potentiometer resistance while moving the rack by hand, if necessary replace potentiometer.
		Cable to the control unit loose	Check the cables.
		Capacitor defective	Replace the board
7	Positioner moves fore and back	Positioner not correctly fixed to the mounting plate or potentiometer loose	Check mounting
8	Movement too slow	Load too great, e.g. by bad alignment	Check load, check positioner without load, check alignment

For more information see the manual of the control unit.

Maintenance and inspection plan for V-2030

Interval	Maintenance level	Work to beperformed	resources	o.k.	not o.k.	remedied
daily	1	• Visual check for function and leaks				
weekly	1	• Check the chlorine lines for leaks • Check the function of the system				
monthly	1	• Clean the strainer in the operation water line. • Check the water level in the syphon of the sink				
every 3 months	1	• Check the auxiliary valves for smooth operation, replace if necessary				
every 6 months	1	• Check the gas monitoring system, replace the electrolyte				
	1	• Check the system for leaks				
yearly	2	• Maintenance of the system, replace the gaskets				
2-yearly	2	• Replace the copper pipes				
3-yearly	2	• Replace the auxiliary valves				

* Maintenance level 1 can be performed by the operator/operating personnel.
Maintenance level 2 must be performed by specialist technicians trained by the manufacturer or the customer service technicians of the manufacturer.
Any work over and above this may only be performed subject to prior consultation with the customer service of the manufacturer.

6. Maintenance

Warning!

Danger due to chlorine gas/sulphur dioxide!
Chlorine gas irritates the respiratory tracts. Contact with chlorine gas in high concentrations irritates and damages the membranes, respiratory system and the skin. In extreme cases death can result due to suffocation.
Before disassembling the system always shut down the system and put on your gas mask.

Warning!

Danger of electric shock!
Only authorized and qualified electrical personnel may carry out works on electrical parts of the system.
Assign repairs to the service of the manufacturer.

- Remedy gas leaks immediately. Check the chlorine container room and the chlorinater room daily.
- Maintenance of the gas control system should be carried out at least once a year by one of the Evoqua specialists. This is not only recommended, but will reduce costly maintenance and repairs by providing good operating conditions.
- Chlorine and sulphur dioxide gas, when moist, are extremely corrosive. All metal parts which normally come into contact with moist gas are made from materials which will withstand the corrosive action; common metals are used only where the part is exposed to dry gas. All connections should be checked daily for signs of leaks. Every leak must be rectified as soon as it is discovered.
- The presence of a leak of chlorine or sulphur dioxide will be indicated by odour and/or fume detection equipment, if supplied. The exact location may be determined by ammonia vapour. Dense white clouds of ammonium chloride form near the leak in the presence of ammonia.
- When a connection is broken, if only for a short time, the opening should be plugged immediately to prevent the ingress of moisture which should be excluded from any part of the equipment normally exposed only to dry gas.
- Water leaks must not be tolerated and should be rectified as soon as they are discovered.
- Whenever threaded plastic parts are assembled, silicone type grease should be used used to prevent the parts locking toge-

ther. In general, tools should not be used to make up plastic connections, this type of connection should be made up by hand only.

- If the flowmeter tube, float, V-notch plug or any valve seat becomes contaminated with impurities sometimes found in gases, it should be removed and cleaned.
- Replace all chlorine lines made of copper every 2 years.
- Replace the auxiliary valves every 3 years.
- Replace chlorine lines including the unions when they are damaged or corroded.
- Check the chlorine lines for leaks at least every 6 months.
- Replace all o-rings and gaskets of the chlorine system at least every year.
- Store the gaskets in a dry place. Wet gaskets lose their solidity forever and must not be used again.

6.1 Changing the activated carbon filter

Warning!

Danger due to hydrochloric acid!
Chlorine loaded carbon reacts with water generating hydrochloric acid. Don't pour into water or pour water on it, but neutralize first!
Wear breathing equipment, eye protection and protecting clothing!

The carbon has to be replaced when smelling to chlorine or when lumped.

1 Remove the filter and open carefully.

2 If there is no smell of chlorine, stir the carbon powder and the ceramic rings and check for lumps. If the powder is still in order, shut the filter and place again.

If necessary replace the carbon as follows:

Cl_2 loaded carbon

1 Carry the filter to the open air.

2 Mix 300 g sodium thiosulphate with 8 l of water.

3 Remove upper cover of the filter.

4 Pour the carbon carefully into the solution.

5 Dilute with more water and pour away.

6 Dispose the ceramic rings.

7 Fill the filter with new carbon and ceramic rings (part no. W3T161729) and put in place.

SO_2 loaded carbon

As above, but use caustic soda solution.

6.2 Cleaning the parts

General

Most of the residue which accumulates can usually be removed with warm water and a soft brush, deposits can usually be removed by watering.

- Plastic and hard rubber parts should be cleaned only with warm water (not over 40°C). If necessary add ethyl alcohol.
- To clean the flowmeter tube use clean cloth strips.

Caution!

Danger due to chemicals!
Carbon tetrachloride is a satisfactory cleaning agent, but its use is not recommend because of the possible toxic effect of exposure to its fumes. Do not use wood alcool, petrol or petroleum distillates. Do not use pvc solvent to clean the cover.

All traces of moisture must be removed from parts which come in contact with the gas before being returned to service. Do not use heat on plastic or hard rubber parts.

All cleaning should be carried out in an open area or in a well ventilated room.

Water filter

1 Every month, check and if necessary clean the filter in the water supply.

6.3 Maintenance of the gas control system

(at least once a year)

Note

When removing O-rings: Pick with a needle and pull the O-ring out, don't damage the tightening faces. Apply a thin coat of silicone grease to O-rings and threads.

Note

For maintenance parts and spare parts refer to the parts lists in chapter 7.

1 Before maintenance:
Shut down the gas feeder as described in chapter 5.5.

6.3.1 Maintenance of the gas feeder V-2030

1 Remove the cover.

2 Remove the flowmeter carefully.
Clean with warm water and detergent and soft cloth.
Dry completely.

3 Clean the V-notch plug (pos. 96), replace if damaged.

4 Replace the parts that are marked „M“ in the parts lists in the chapters 7.4 to 7.5.

5 Every two years replace the parts that are marked „M2“ in the parts lists in the chapters 7.4 to 7.5.

6 Reassemble the gas feeder V-2030.

7 Check for function and leaks.

The positioner is maintenance-free.

6.3.2 Maintenance of the vacuum regulator unit

Vacuum regulator valve W3T163661

1 Clean the chlorine inlet valve (pos. 5).

2 Replace the parts that are marked „M“ in the parts list W3T163661.

3 Every two years replace the parts that are marked „M2“ in the parts list W3T163661.

4 Reassemble the valve.

Vacuum safety valve W3T163674

1 Clean the valve.

2 Replace the parts that are marked „M“ in the parts list W3T163674.

3 Every two years replace the parts that are marked „M2“ in the parts list W3T163674.

4 Reassemble the valve.

Safety vent valve W3T162429

1 Clean the valve.

2 Replace the parts that are marked „M“ in the parts list W3T162429.

3 Every two years replace the parts that are marked „M2“ in the parts list W3T162429.

4 Reassemble the valve.

Complete vacuum regulator unit

1 Reassemble the vacuum regulator valve unit and check for leaks and function.

6.4 Maintenance of the injector

1 Clean the injector.

2 Replace the parts that are marked „M“ in the corresponding parts list in chapter 7.7.

3 Reassemble the injector and check for leaks and function.

6.5 Maintenance of the auxiliary valves and pipes

- Replace all chlorine lines made of copper every 2 years.
- Replace the auxiliary valves every 3 years.

For the gaskets for the vacuum regulator valve and the injector refer to chapter 7.

6.6 Gaskets

Replace the gaskets of the system at least every year to have troublefree operation for a long time. We recommend to have a complete set of gaskets at hand to be able to replace single gaskets if necessary.

Note

The spare parts can be replaced by competent personnel referring to the maintenance and safety instructions.
Repairs going further may only be carried out by personnel being especially instructed by the manufacturer.
Only use original spare parts!

6.7 Dismantling and disposal

Warning!

Danger by gas residues and deposits.
Put on protective clothes, keep your gas mask to hand.
Care for sufficient ventilation.
Do not touch deposits, but remove them with water.

Warning!

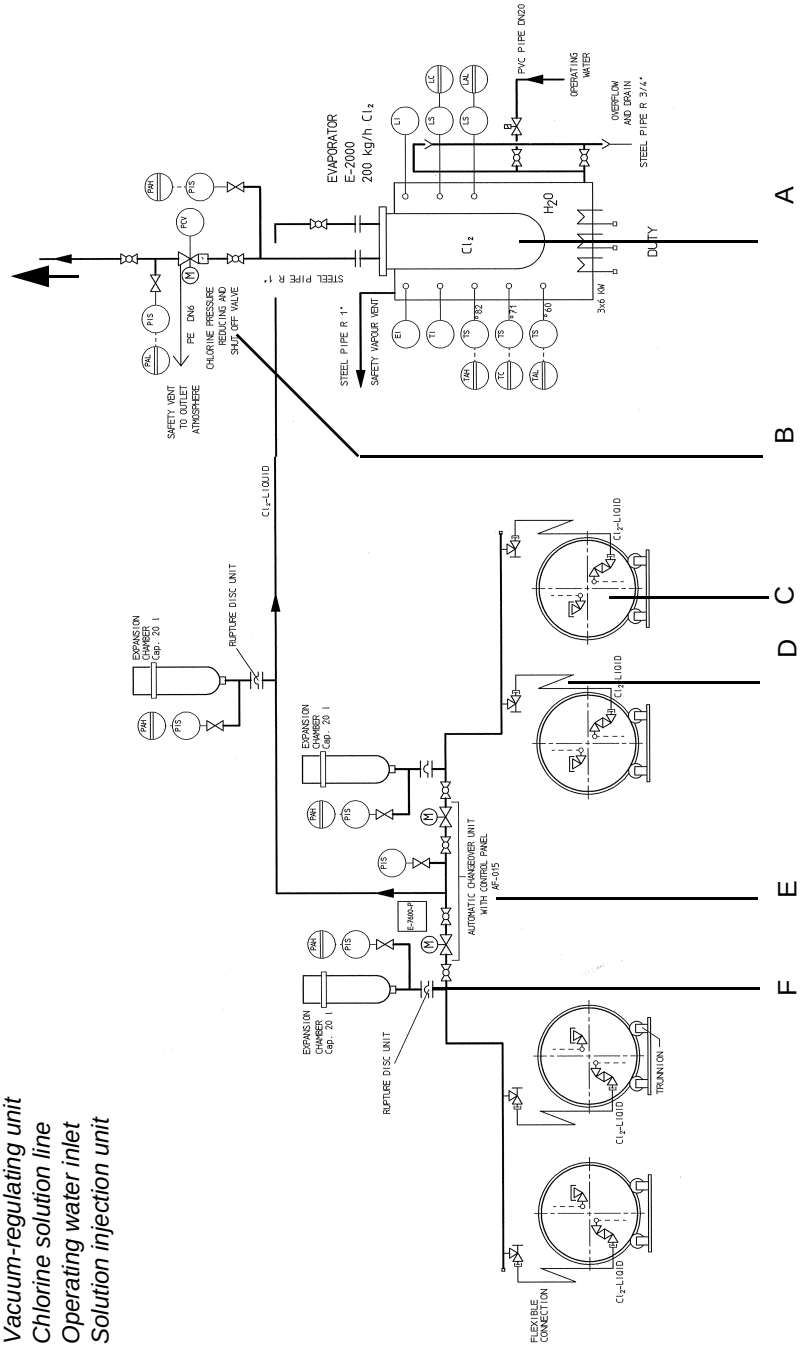
Danger of electric schock.
Before dismantling isolate the unit .
Only qualified and authorised electricians are permitted to work on electrical devices.

1. Put the unit out of services as described in chapter 5.5 and remove the gas out of the unit.
2. Remove all connections.
3. Wash the parts in water.
4. Dispose off the parts professionally.

7. Drawings and parts lists

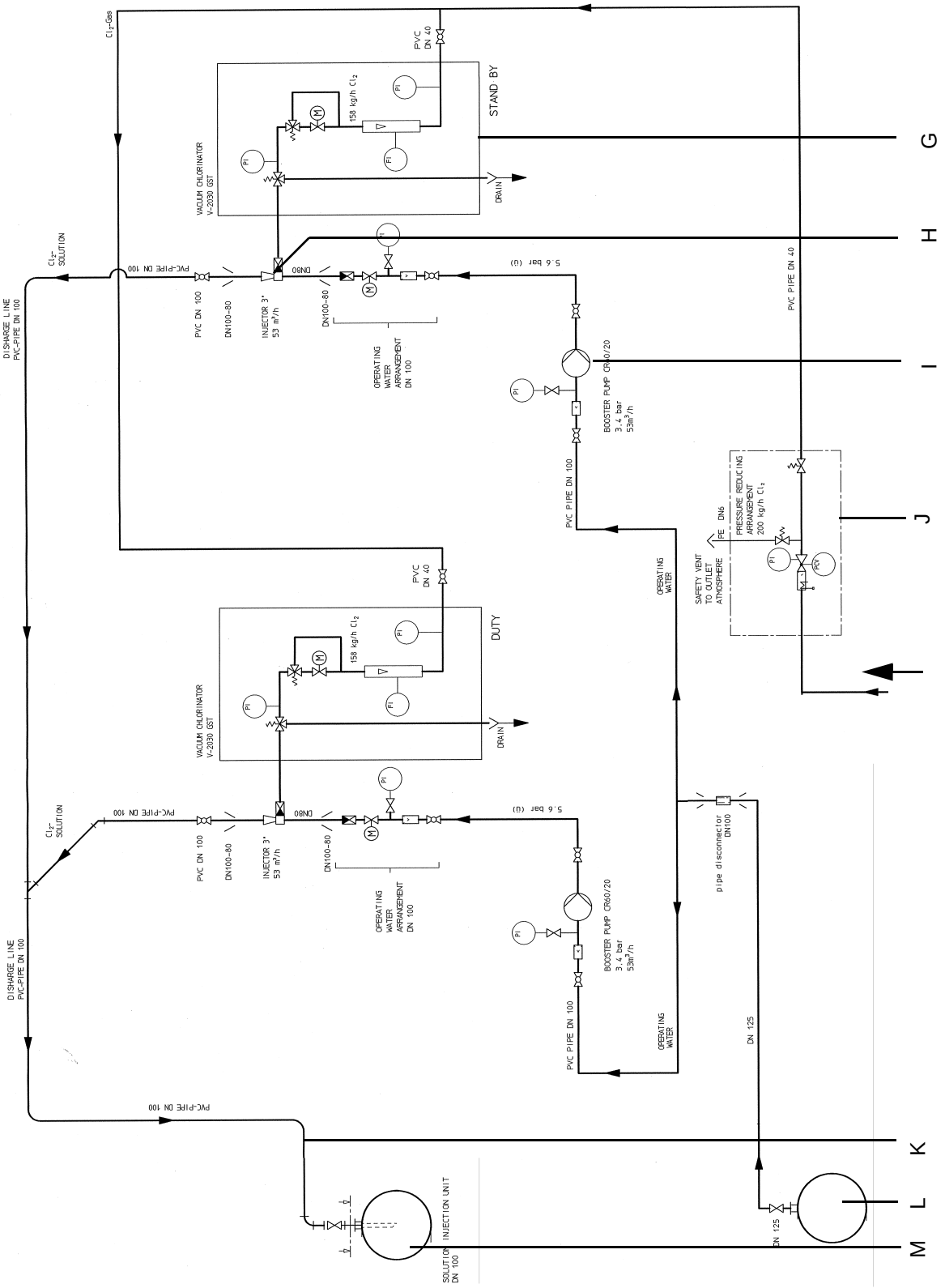
7.1 Typical installations

Part 1: Chlorine drums, switchover unit, evaporator



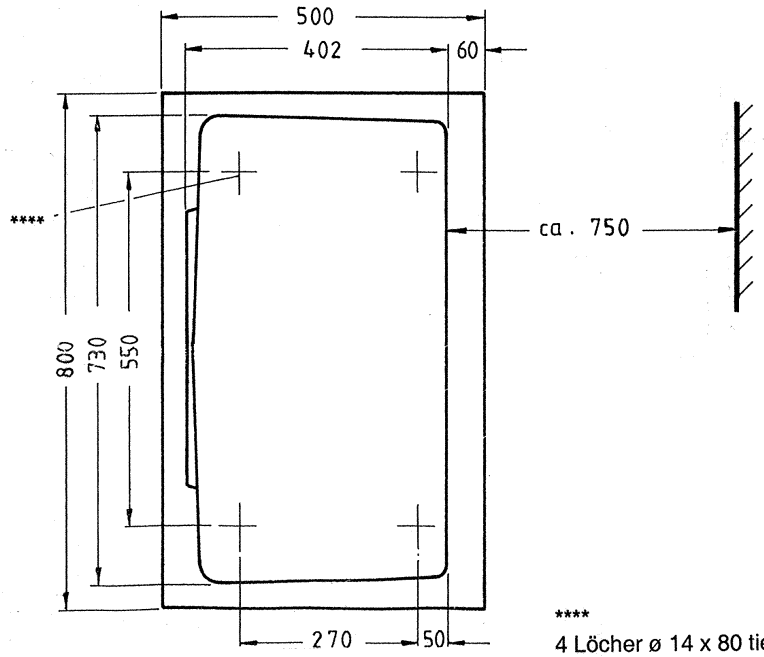
A Evaporator E-2000
B Reducing and shut-off valve 50-185
C Chlorine drum
D Flexible chlorine pipe
E Switch-over unit AU/AF-015
F Rupture disk with extension vessel
G Vacuum gas feeder V-2030
H Injector
I Booster pump
J Vacuum-regulating unit
K Chlorine solution line
L Operating water inlet
M Solution injection unit

Part 2: Vacuum regulator valve, gas feeder, injector



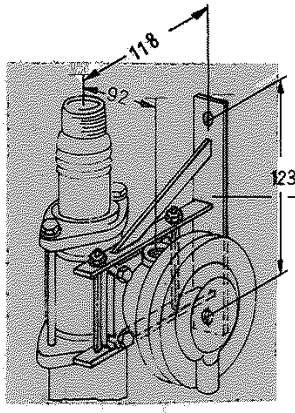
7.2 Mounting drawings

7.2.1 Mounting of the vacuum gas feeder V-2030



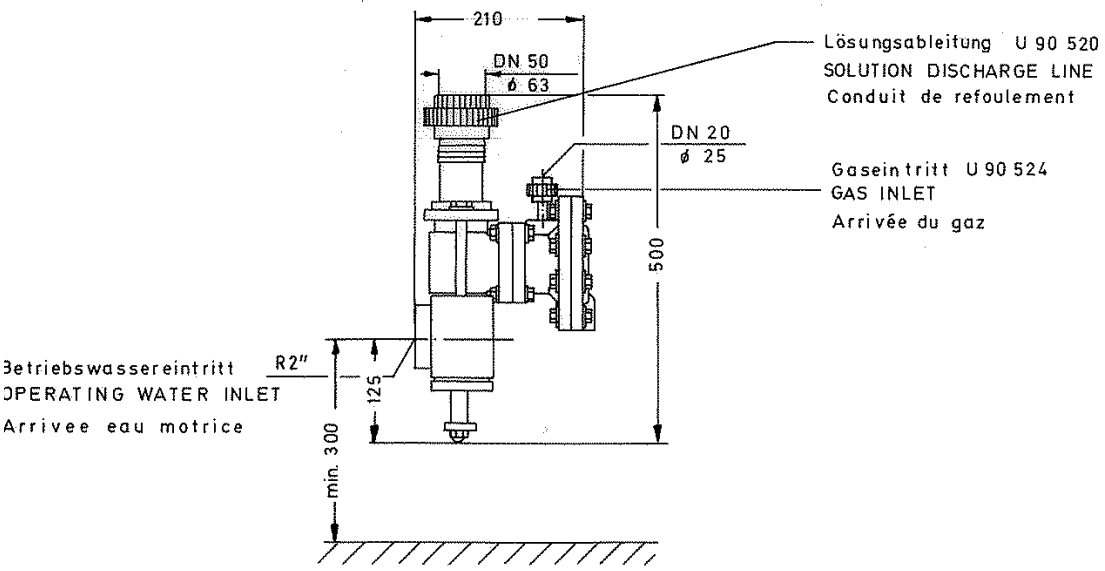
****
4 Löcher ø 14 x 80 tief für Befestigungsmaterial
4 HOLES ø 14 x 80 DEEP FOR HARDWARE
4 trous ø 14 x 80 pour matérial de scellement

7.2.2 Mounting of the injector 2“



Konsole U 91 758
BRACKET
Console

Union W3T171309



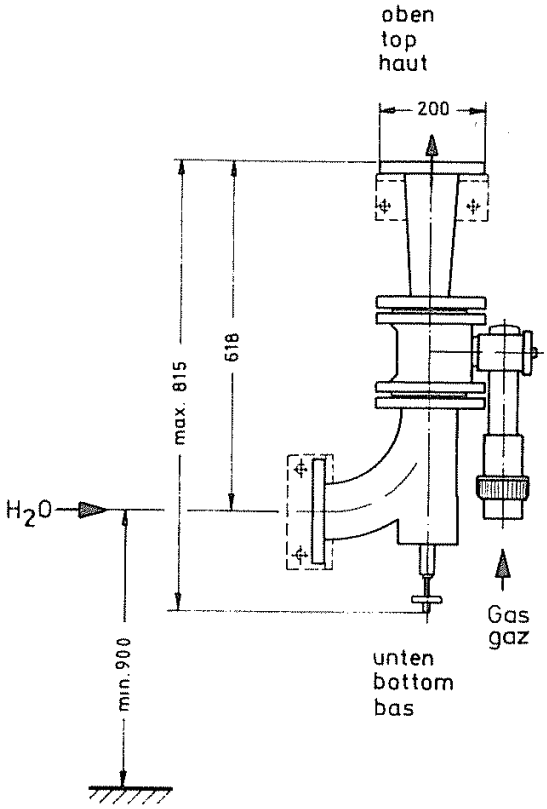
Lösungsableitung U 90 520
SOLUTION DISCHARGE LINE
Conduit de refoulement

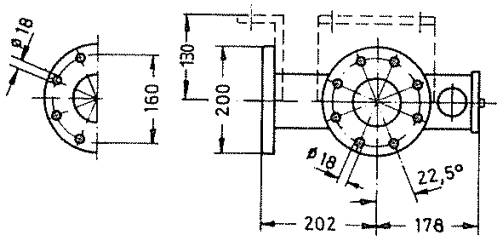
Gaseintritt U 90 524
GAS INLET
Arrivée du gaz

Note

It is important to install the injector in a vertical position with the operating water flowing in upward direction.
To maintain injector efficiency, be sure that elbows, valves and pipe-size reductions are more than 500 mm from the discharge connection of the injector.

7.2.3 Mounting of the injector 3“





Mounting bracket complet: W3T163916 and W3T167328

Note

It is important to install the injector in a vertical position with the operating water flowing in upward direction.
To maintain injector efficiency, be sure that elbows, valves and pipe-size reductions are more than 500 mm from the discharge connection of the injector.

7.3 Scope of supply

7.3.1 Vacuum gas feeder V-2030, manual (W3T243596)

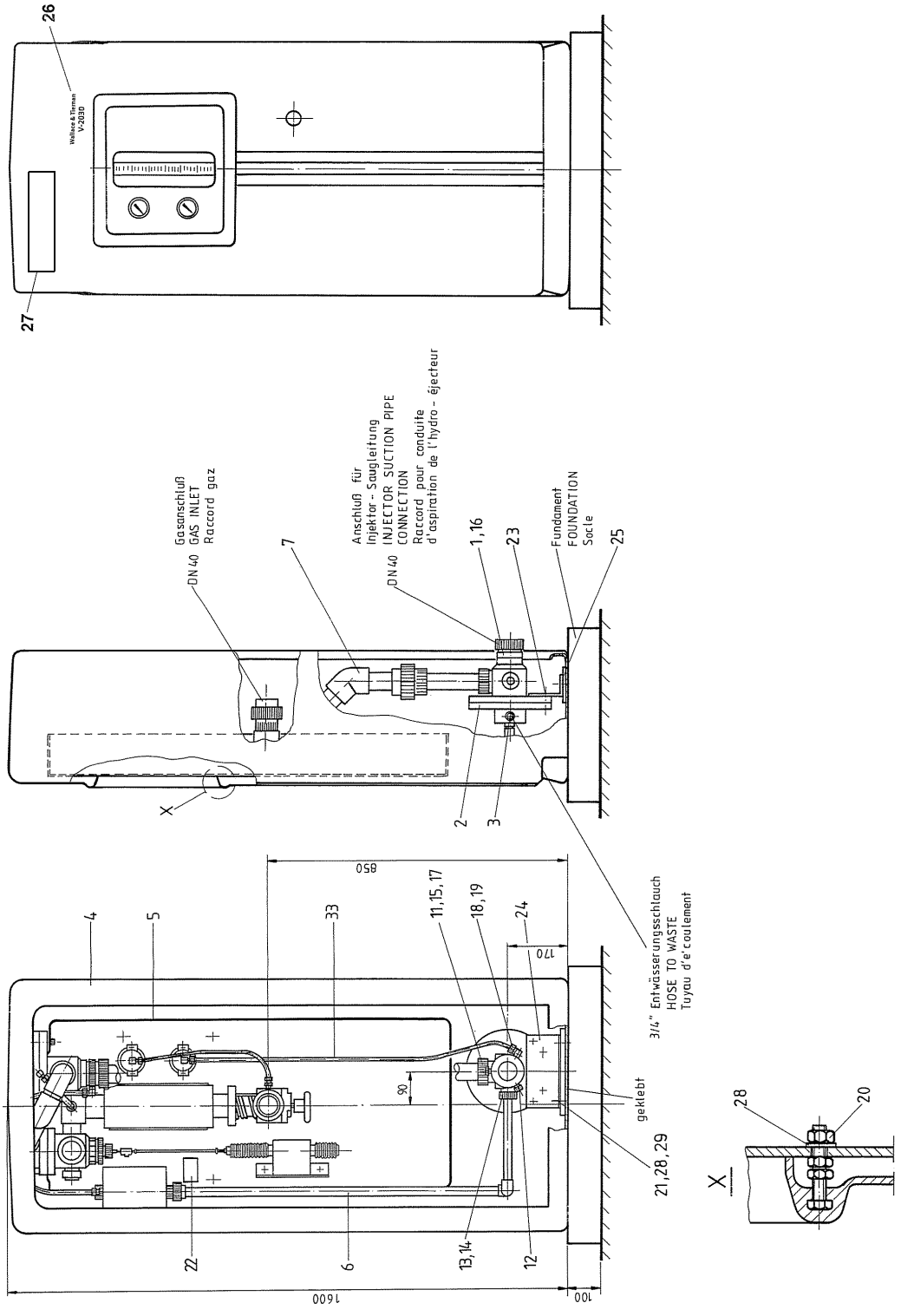
Pos	Part no.	Description		Quant.
	W3T167534	Vacuum gas feeder	V-2030	1
	W3T167673	Flowmeter	see separate table	1
	W3T163505	V-notch plug	see separate table	1
	W2T505333	Drain hose	Ø19 x 3.5; PVC transparent	5 m
	W3T161937	Clamp	d23-35/V2A	1
	W3T167395	Fixing set	screw M10 x 90, washer, dowel (each 2 x)	2
	W2T506631	Pipe	d50 x 3.7, PVC-U PN16	5 m

7.3.2 Vacuum gas feeder V-2030, automatic (W3T244794)

Pos	Part no.	Description		Quant.
	W3T167535	Vacuum gas feeder	V-2030 with positioner 230 V	1
	W3T167673	Flowmeter	see separate table	1
	W3T159777	V-notch plug	see separate table	1
	W2T505333	Drain hose	Ø19 x 3,5; PVC transparent	5 m
	W3T161937	Clamp	d23-35/V2A	1
	W3T167395	Fixing set	screw M10 x 90, washer, dowel (each 2 x)	2
	W2T506631	Pipe	d50 x 3,7, PVC-U PN16	5 m

7.4 Drawings and parts lists V-2030

7.4.1 Vacuum gas feeder V-2030, W3T167534, manual

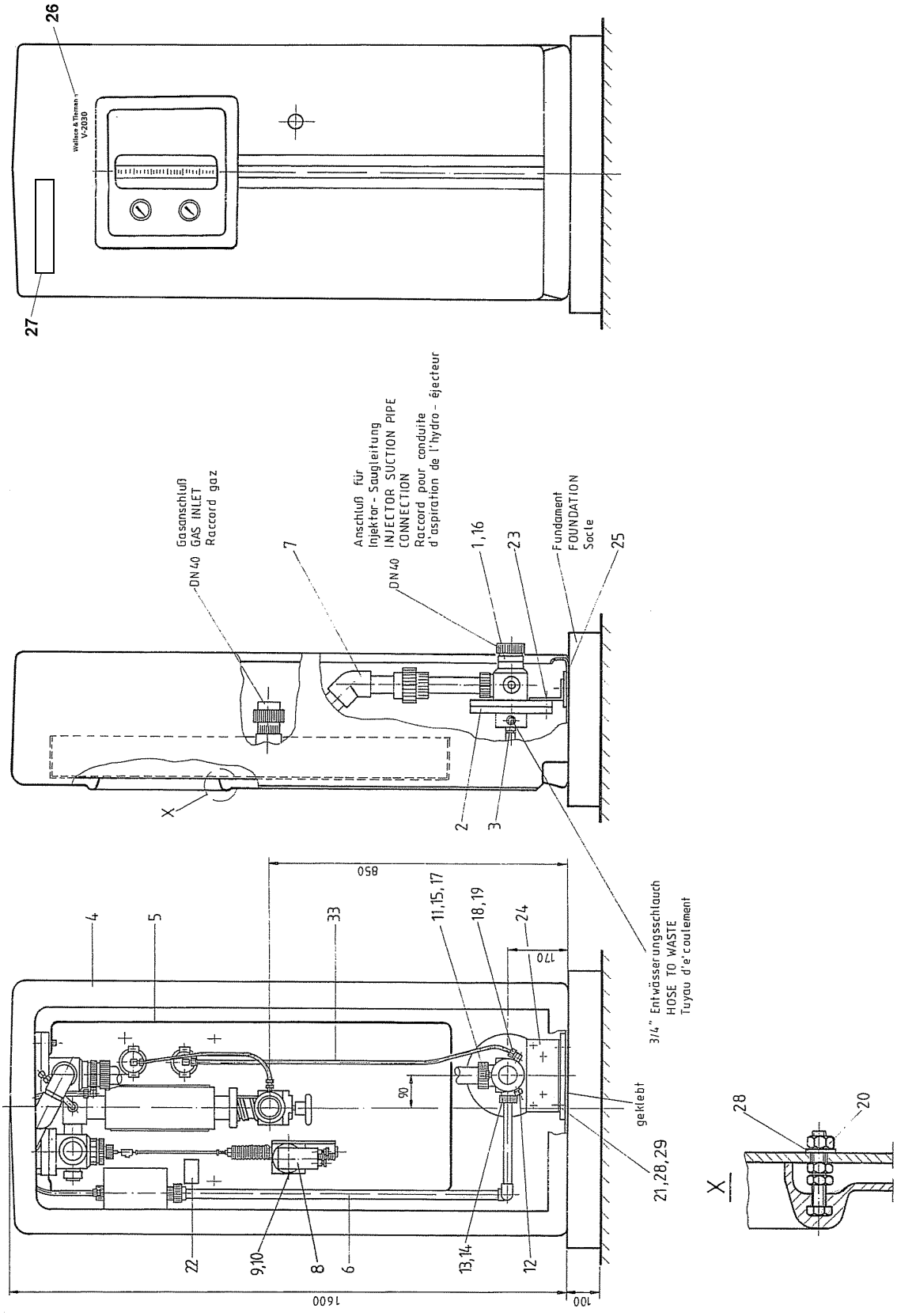


Vacuum gas feeder V-2030, W3T167534, manual

Pos	Part no.	Description		Quant.
1	W3T171290	Seat		1
2	W3T159897	Drain valve		1
3	W3T163621	Drain connecting piece		1
4	W3T173162	Cabinet		1
5	W3T171403	Vacuum gas feeder	for V-2030	1
6	W3T167446	PVC tube DN 20		1
7	W3T167447	PVC tube DN 40		1
11 M	W3T168890	O-ring	d47,6 x 6,35/CSM	2
12	W3T168893	Plug	PVC-U;1/4-18NPT x 21(*W)	2
13 M	W3T172748	O-ring	d24.77 x 5.33/CSM	1
14	W3T159373	Union nut	PVC; 8	1
15	W3T167041	Union nut		2
16 M	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	1
17	W3T159400	Washer, conical		2
18	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
19	W3T172760	Union elbow	PVC; 1/4-18NPTx1/2-20UNF	2
20	W3T172818	Hexagon nut	DIN 934, M 8, A 2	5
21	W3T161582	Hexagon head screw	DIN 933, M 8 x 20, A 2	2
22	W2T507548	Type plate		1
23	W3T170966	Knurled nut	PVC	4
24	W3T163388	Angle	100 x 65 x 6; 210lg.;St-37	1
25	W3T163389	Plate		1
26	W3T168524	Product label		1
27	W3T168521	Company label		1
28	W3T172730	Plain washer	DIN 125 A, 8,4 mm, A 2	7
29	W2T505159	Self-tapping insert	M 8, Ms	2
33	W2T505671	Hose	6.35 x 1.6; PE-LD	1.2 m

- „M“ in the first column: to be replaced every year.

7.4.2 Vacuum gas feeder V-2030, W3T167535, automatic

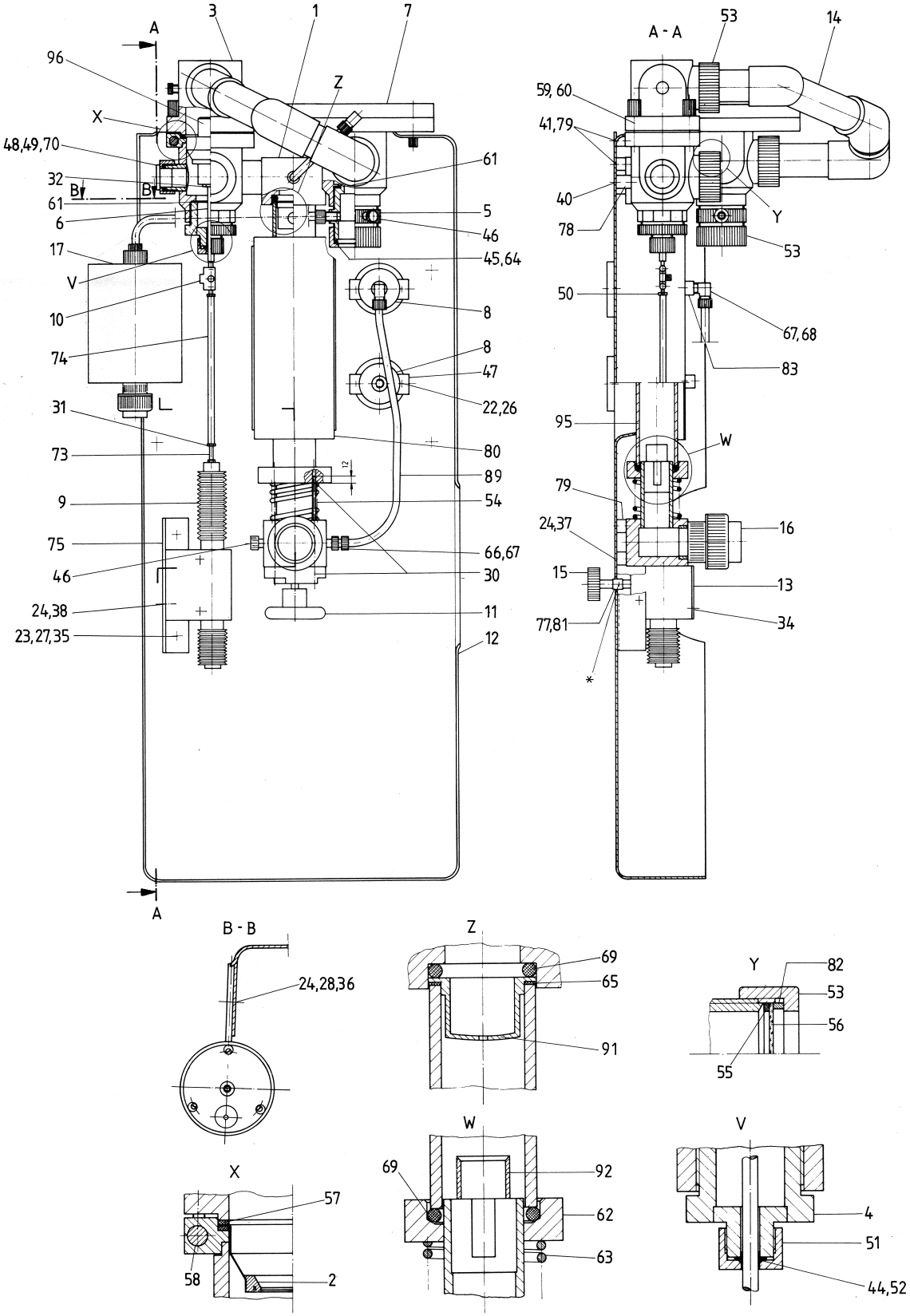


Vacuum gas feeder V-2030, W3T167535, automatic

Pos	Part no.	Description		Quant.
1	W3T171290	Seat		1
2	W3T159897	Drain valve		1
3	W3T163621	Drain connecting piece		1
4	W3T173162	Cabinet		1
5	W3T171403	Vacuum gas feeder	for V-2030	1
6	W3T167446	PVC tube	DN 20	1
7	W3T167447	PVC tube	DN 40	1
8	W3T161735	Positioner motor	230 V, 50-60 Hz	1
9	W2T506096	Spring lock washer	DIN 127 B, 5 mm, A 2	4
10	W2T505743	Cross rec. pan head screw	M5 x 22/DIN 7985/V2A	2
11 M	W3T168890	O-ring	d47.6 x 6.35/CSM	2
12	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	2
13 M	W3T172748	O-ring	d24.77 x 5.33/CSM	1
14	W3T159373	Union nut	PVC	1
15	W3T167041	Union nut		2
16 M	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	1
17	W3T159400	Washer, conical		2
18	W3T169111	Union nut	PVC; 1/2-20UNF-2B	
19	W3T172760	Union elbow PVC	1/4-18NPTx1/2-20UNF	2
20	W3T172818	Hexagon nut	DIN 934, M 8, A 2	5
21	W3T161582	Hexagon head screw	DIN 933, M 8 x 20, A 2	2
22	W2T507548	Type plate		1
23	W3T170966	Knurled nut	PVC	4
24	W3T163388	Angle	100 x 65 x 6;210lg.; St-37	1
25	W3T163389	Plate		1
26	W3T168524	Product label		1
27	W3T168521	Company label		1
28	W3T172730	Plain washer	DIN 125 A, 8.4 mm, A 2	7
29	W2T505159	Self-tapping insert	M 8, Ms	
33	W2T505671	Hose	IdxWdg 6.35 x 1.6; PE-LD	1.5 m

„M“ in the first column: to be replaced every year.

7.4.3 Vacuum gas feeder for V-2030 (W3T171403)



Pos	Part no.	Description		Quant.
1	W3T159798	Distribution block		1
2	W3T161684	Orifice unit		1
3	W3T159799	Block		1
4	W3T159800	Connecting piece		1
5	W3T171290	Seat		1
6	W3T171299	Shaft Assembly		1
7	W3T163620	Diff. regulating valve		1
8	W3T173135	Vacuum gauge	-1000/0 mbar	2
9	W3T167407	Notch positioner, man.		1
10	W3T163642	Clamp		1
11	W3T171330	Clamp		1
12	W3T161723	Instrument plate		1
13	W3T159836	Cover PVC		1
14	W3T167434	Tube		1
15	W3T163823	Control knob		1
16	W3T163662	Connection piece		1
17	W3T171346	Float valve		1
22	W2T506019	Plain washer	DIN 125 A, 5.3 mm	4
23	W3T168884	Plain washer	DIN 125 A, 6.4 mm	4
24	W3T172730	Plain washer	DIN 125 A, 8.4 mm	14
26	W3T172836	Hexagon nut	DIN 934, M 5, A 2	4
27	W3T168883	Hexagon nut	DIN 934, M 6, A 2	3
28	W3T172818	Hexagon nut	DIN 934, M 8, A 2	2
30	W3T172807	Nut	1/4"	2
31	W3T172738	Hexagon nut		2
32	W3T159389	Locknut	3/8-16	1
34	W2T505743	Cross rec. pan head screw	M5 x 22/DIN 7985/V2A	2
35	W3T165210	Hexagon head screw	DIN 933, M 6 x 25, A 2	3
36	W3T161384	Hexagon head screw	DIN 933, M 8 x 25, A 2	2
37	W3T161631	Hexagon head screw	DIN 933, M 8 x 40, A 2	4
38	W3T161418	Hexagon head screw	DIN 931/M8 x 110/V2A	2

Pos	Part no.	Description		Quant.
40	W2T503873	Screw	R 5/16 x 19; Monel; like DIN 84	1
41	W3T161168	Screw		4
44 M	W3T172743	O-ring	d9.25 x 1.78/NBR	1
45 M	W3T168890	O-ring	d47.6 x 6.35/CSM	3
46	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	4
47	W3T159368	Bracket		2
48 M	W3T172748	O-ring	d24.77 x 5.33/CSM	1
49	W3T159373	Union nut	PVC	1
50	W3T159379	Coupling screw	with P-40137, P-97027	1
51	W3T167039	Seal clamping nut	PVC;11/4-12NF	1
52 M	W3T170894	Shaft seal PTFE	D19/10,5; d8.9; x 4/0.8	1
53	W3T167041	Union nut		4
54	W3T167042	Stud		2
55 M	W3T161281	Gasket	PVC-P; D63.5 x 51 x 3	1
56	W3T168902	Glass		1
57 M	W3T161282	Gasket	PVC-P; D89.7 x 76.2 x 3	2
58	W3T159394	Stud		2
59	W3T159395	Stud		4
60	W3T159396	Nut		4
61 M	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	2
62	W3T159397	Collar		1
63	W3T161284	Spring		1
64	W3T159400	Washer, conical		3
65 M	W3T161289	Gasket	part of the flowmeter assembly	1
66	W3T169110	Union nipple PVC	1/4NPT x 1/2-20UNF-2A	4
67	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
68	W3T172760	Union elbow PVC	1/4-18NPT x 1/2-20UNF	2
69	W3T168910	O-ring	part of the flowmeter assembly	2
70	W3T167075	Plug	PVC; d26, 7 x 38	1
73	W3T167180	Nipple	1/4"BSW x 55 lg; V2A	1
74	W3T163349	Shaft	PVC	1
75	W3T170965	Angle	45 x 5; 215lg.; St-37	1
77	W3T170967	Extension rod	Ms 58h	1

Pos	Part no.	Description		Quant.
78	W3T171154	Spacer	L= 5.5	1
79	W3T171224	Spacer	L= 15	1
80	W3T170969	Flowmeter shield		1
81	W3T161593	Spring type straight pin	DIN 1481/d2.5 x 14/FST	1
82	W3T163365	Spacer	PVC	1
83	W3T170989	Reducing bush PVC	1/4-18NPT x 1/8-27NPT	2
89	W2T505671	Hose	6.35 x 1.6; PE-LD	1.5 m

„M“ in the first column: to be replaced every year.

7.4.4 Flowmeters

Range (Chlorine)	Flow meter (Pos. 95+91+ 92+2x69+65)	Float stop bottom (Pos. 92)	Float stop top (Pos. 91)	O-rings (Pos. 69)	Gasket (Pos. 65)
1 - 20 kg/h	W3T167533	W3T166078	W3T170986	2 x W3T168910	1 x W3T161289
2 - 40 kg/h	W3T167600	W3T166079			
3 - 60 kg/h	W3T163816				
4 - 80 kg/h	W3T167647	W3T167216	W3T168973		
6 - 113 kg/h	W3T167657				
8 - 158 kg/h	W3T167666				
10 - 200 kg/h	W3T167673				

Range (SO2)	Flow meter (Pos. 95+91+ 92+2x69+65)	Float stop bottom (Pos. 92)	Float stop top (Pos. 91)	O-rings (Pos. 69)	Gasket (Pos. 65)
0.9 - 18 kg/h	W3T171402	W3T166078	W3T170986	2 x W3T168910	1 x W3T161289
1.8 - 36 kg/h	W3T171425	W3T166079			
2.7 - 54 kg/h	W3T171442				
3.6 - 72 kg/h	W3T171452	W3T167216	W3T168973		
5.1 - 102 kg/h	W3T171462				
7.1 - 142 kg/h	W3T171467				
9 - 180 kg/h	W3T171473				

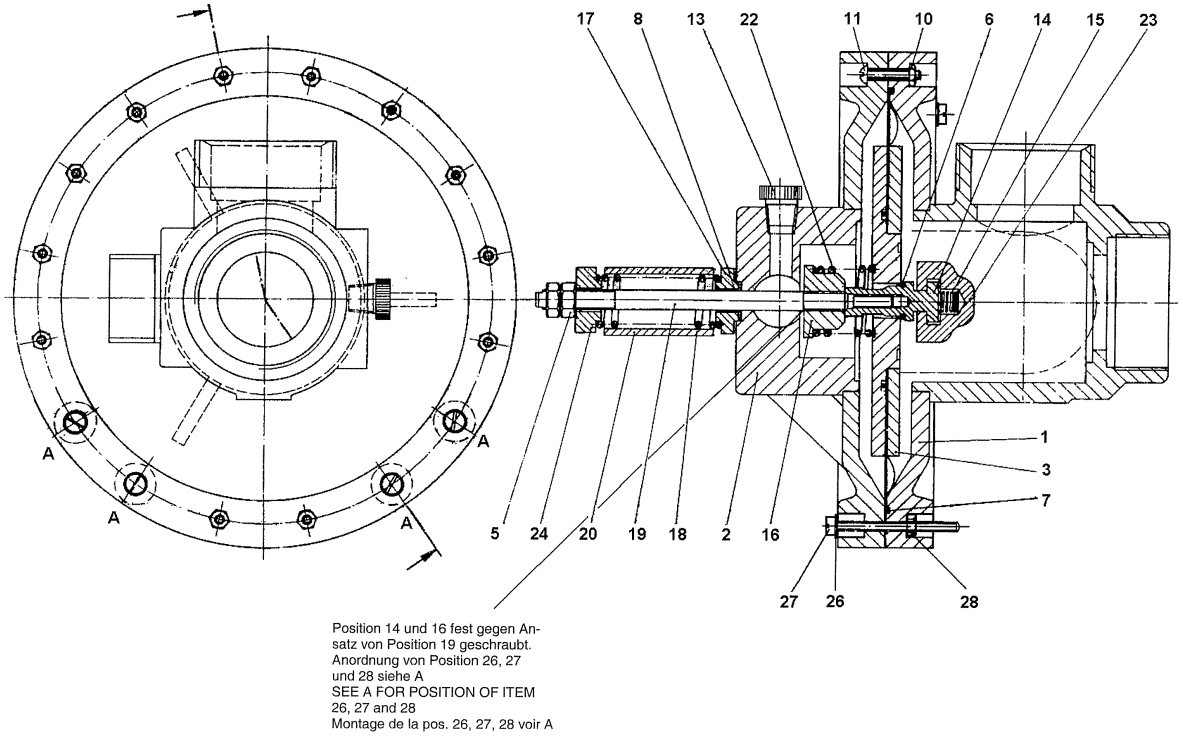
The flowmeter (W3T167533..., W3T171402...) also includes the float and the float stops as well as the two O-rings.

7.4.5 V-notch plug

Range for chlorine	Range for SO_2	V-notch plug (Pos. 96)
0 - 57 kg/h	51 kg /h	W3T163473
0 - 188 kg/h	169 kg/h	W3T163505

7.5 Drawings and parts lists of components

7.5.1 Drain valve W3T159897

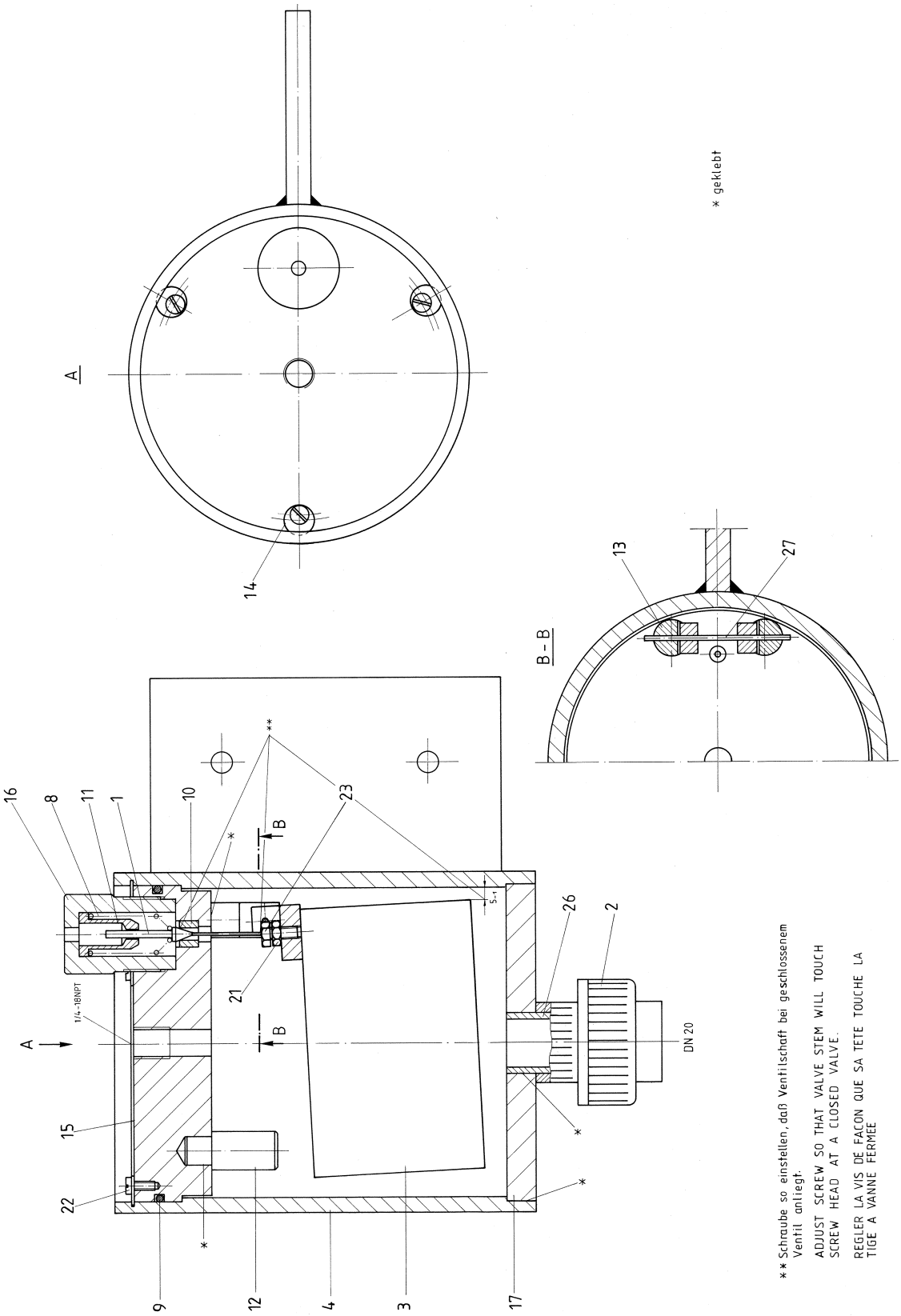


Pos	Part no.	Description		Quant.
1	W3T159812	Body		1
2	W3T159813	Housing		1
3 M2	W3T159817	Diaphragm unit	PTFE - 250 µm, ø235	1
5	W3T168885	Nut	5/16"-18 Gg	2
6 M	W3T169068	O-ring	d13.94 x 2.62/FPM	1
7 M2	W3T168938	O-ring	d196.52 x 2.62/CSM	1
8 M	W3T170894	Shaft seal PTFE	D19/10.5; d8.9; x 4/0.8	1
10	W3T168897	Nut	10 x 24 Gg; Monel; SW9.3 x 3.2	12
11	W2T503872	Screw	10-24UNC x 25; Monel	12
13	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	2
14	W3T167099	Stem holder		1
15	W3T172754	Spring		1
16	W3T167097	Spring guide		1

Pos	Part no.	Description		Quant.
17	W3T167055	Ring		1
18	W2T507727	Spring		1
19	W3T167096	Valve rod		1
20	W3T159421	Sleeve	PVC; D33 x 27	1
22	W3T161309	Spring		1
23	W3T163279	Stem	PVC	
24	W3T167098	Spring support		1
26	W3T161592	Washer	DIN 9021-A - 6.4 - A2-70	4
27	W2T505793	Cross rec. pan head screw	M5 x 70/DIN 7985/V2A	4
28	W3T172836	Nut	DIN 934, M 5, A 2	4

- „M“ in the first column: to be replaced every year.
- „M2“ in the first column: to be replaced every two years.

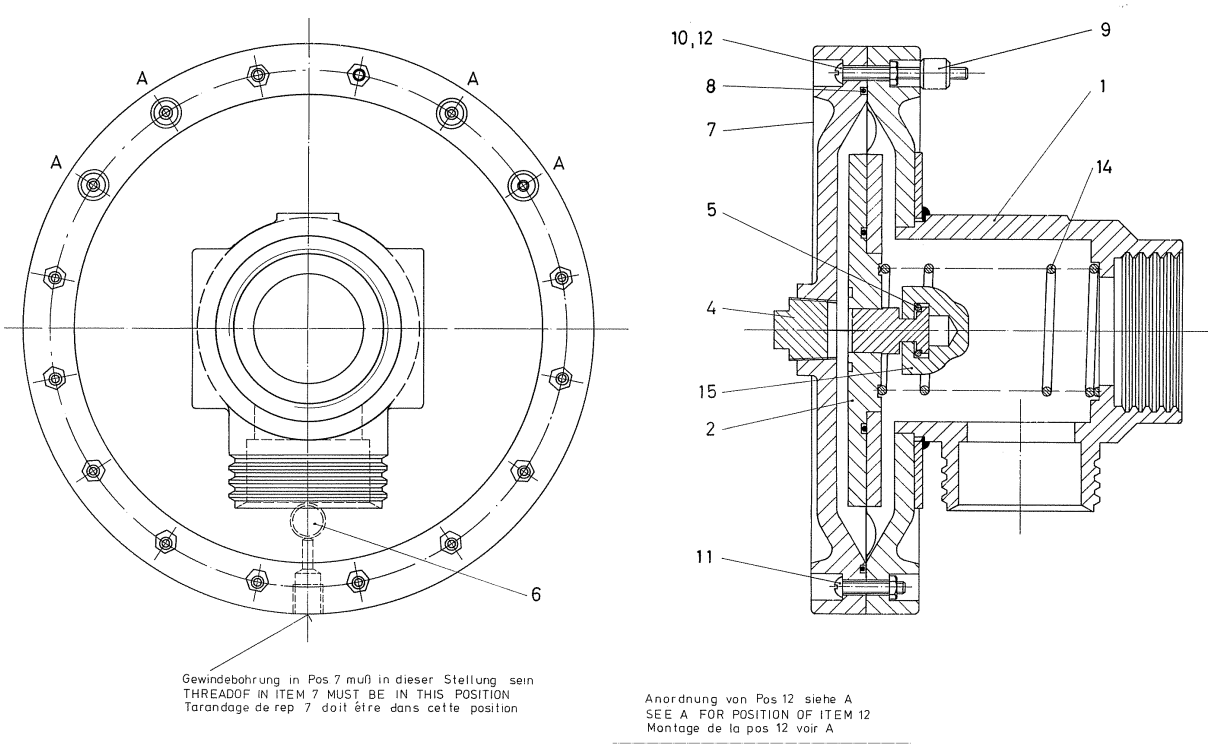
7.5.2 Float valve W3T171346



Pos	Part no.	Description		Quant.
1	W3T167393	Valve stem		1
2	W2T505182	Union	PVC; d25; with EPDM O-ring W3T172720	1
3	W3T171347	Float		1
4	W3T171352	Valve assembly		1
8	W3T168912	Spring		1
9 M	W3T168924	O-ring	d123.42 x 3.53	
10	W3T167076	Seat		1
11	W3T167201	Retainer guide	(made from Kynar)	1
12	W3T159597	Post		1
13	W3T159598	Bearing rod		2
14	W3T159599	Washer		3
15	W3T159600	Cover		1
16	W3T159602	Cap screw		1
17	W3T159603	Bottom plate		1
21	W3T172836	Nut	DIN 934, M 5, A 2	1
22	W2T505720	Cross rec. pan head screw	M4 x 12/DIN 7985/V2A	3
23	W3T163391	Screw		1
26	W2T506628	Pipe	d 25 x 2.8; PVC-U; PN16	36
27	W2T505877	Rod	d 1.58; NiMo16Cr16Ti	65

- „M“ in the first column: to be replaced every year.

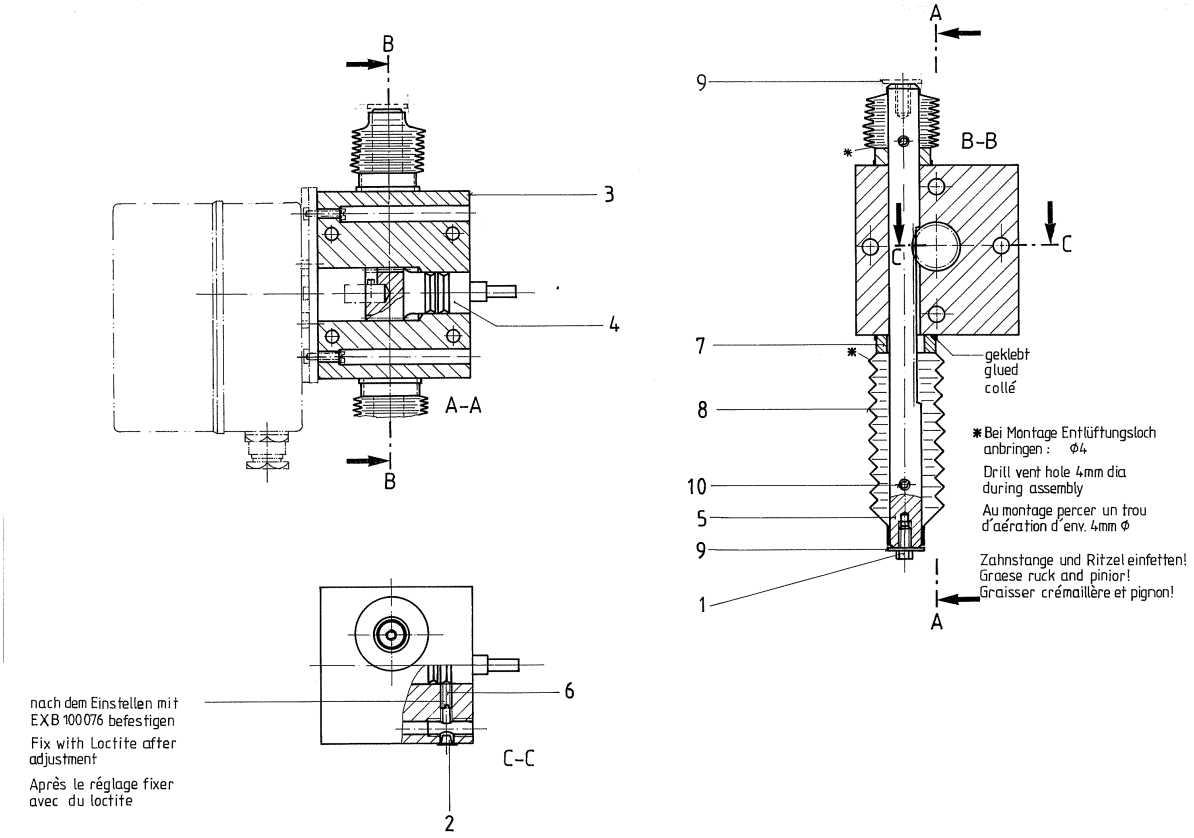
7.5.3 Differential regulating valve W3T163620



Pos	Part no.	Description		Quant.
1	W3T159814	Body		1
2 M2	W3T159861	Diaphragm unit	with shaft	1
4	W3T163262	Plug	PVC; 3/4-14NPT	1
5 M2	W3T169068	O-ring	d13.94 x 2.62/FPM	1
6	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	1
7	W3T167102	Backing plate		1
8 M2	W3T168938	O-ring	d196.52 x 2.62/CSM	1
9	W3T159382	Nut	10"-24Gg.NC; PVC	
10	W3T168897	Nut (Monel)	10 x 24 Gg; SW9, 3 x 3.2	16
11	W2T503872	Screw	10-24UNC x 25; Monel	12
12	W3T168898	Screw		4
14	W3T172753	Spring		1
15	W3T163279	Backing plate	PVC	1

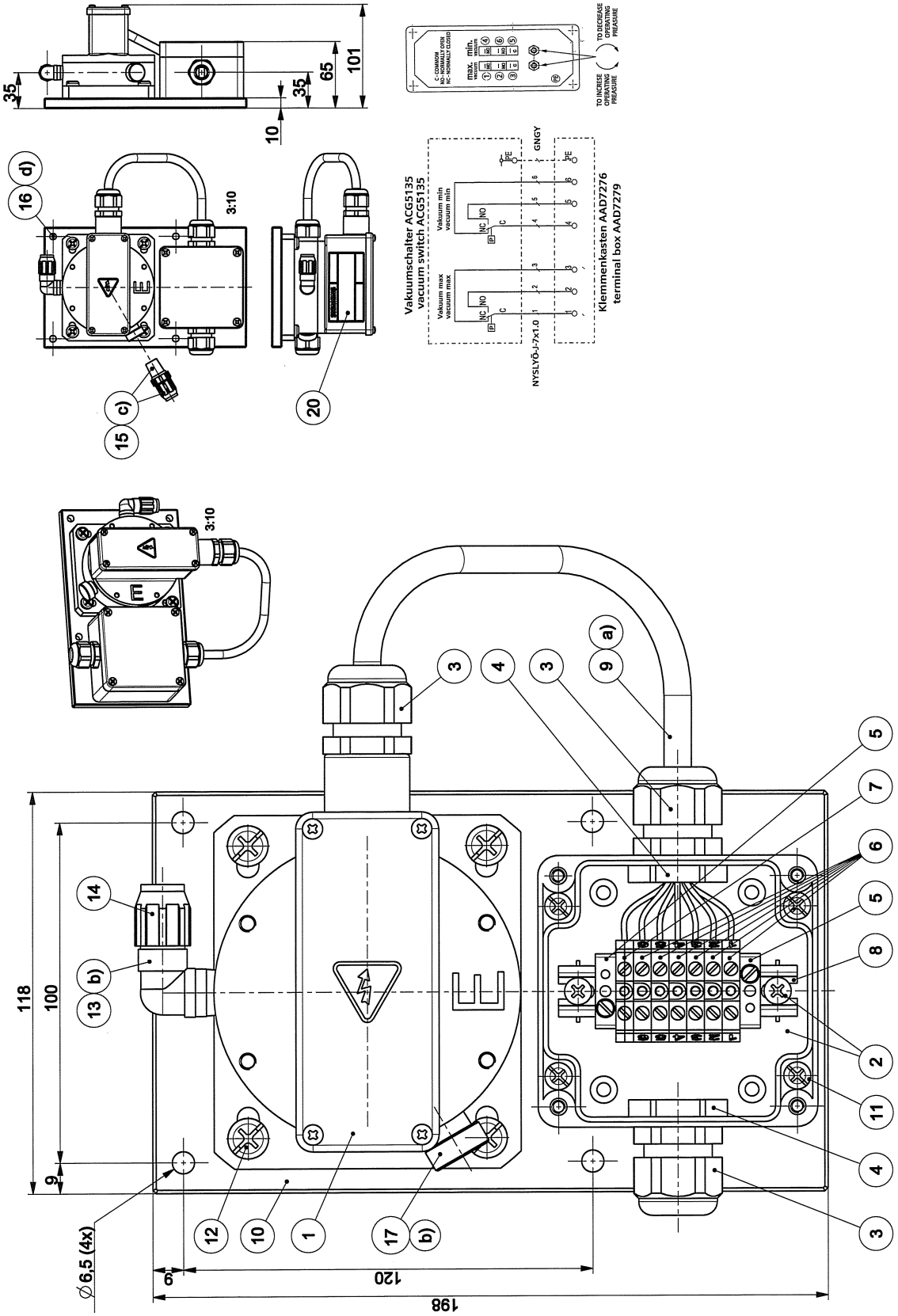
- „M2“ in the first column: to be replaced every two years.

7.5.4 V-Notch Positioner W3T167407



Pos	Part no.	Description		Quant.
1	W3T165183	Screw	1/4-20UNC; A2	
2	W2T503852	Plug		5
3	W3T167153	Positioner element		1
4	W3T167154	Pinion		1
5	W3T167155	Rack		1
6	W2T507718	Spring washer		1
7	W3T170961	Ring	PVC	2
8	W2T507719	Bellow		2
9	W3T159521	Washer	3 mm thick	2
10	W3T161251	Tension pin	DIN 1481/d5 x 28/FST	2

7.5.5 Vacuum switch W3T166428 (option)

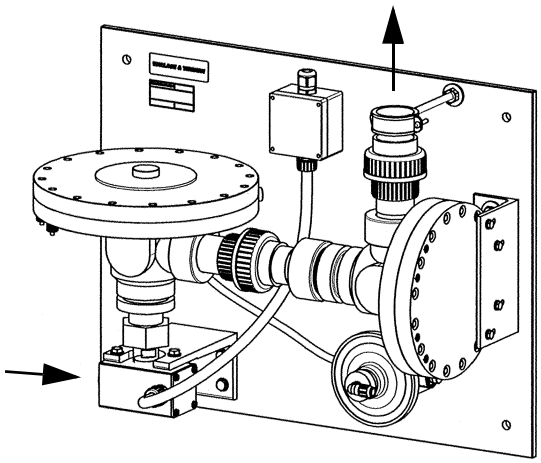


Vacuum switch W3T166428

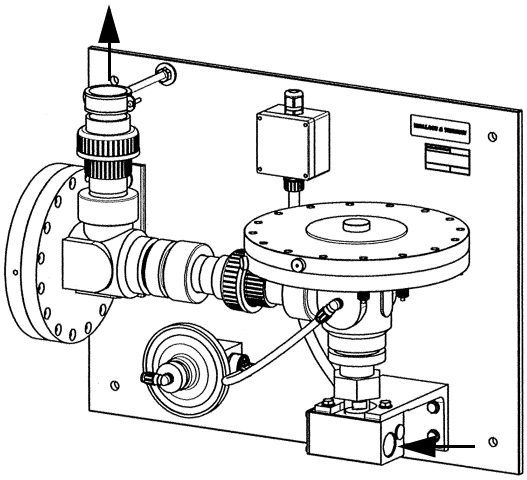
Pos	Part no.	Description		Quant.
1	W3T164991	Vacuum switch	240VAC 5A	1
2	W3T166427	Terminal box	IP 65	1
3	W2T504179	Cable gland	M20 x 1.5; SW24; PA;RAL7035	3
4	W3T160551	Hexagon nut	M20 x 1.5; SW26; DIN 46319; PA	2
5	W2T506086	Endholder	E/MBK; plastic grey	2
6	W2T506245	Terminal	MBK 3/E-Z	
7	W2T505197	Terminal	MBK 3/E-Z-PE	1
8	W2T505547	Mounting rail		1
9	W2T505241	Control cable	7 x 1 mm² ÖLFLEX 110	0.5 m
10	W3T166430	Back board		1
11	W2T504397	Screw	d4 x 10/piece	4
12	W2T504417	Screw	d6 x 20/piece	4
13	W3T172760	Union elbow	PVC; 1/4-18NPTx1/2-20UNF	1
14	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
15	W3T169110	Union nipple	PVC; 1/4NPT x 1/2-20UNF-2A	1
16	W2T504417	Screw	d6 x 20/piece	4
17	W3T168893	Plug	PVC-U; 1/4-18NPT x 21(*W)	
20	W2T507548	Type plate		

7.6 Vacuum regulator unit

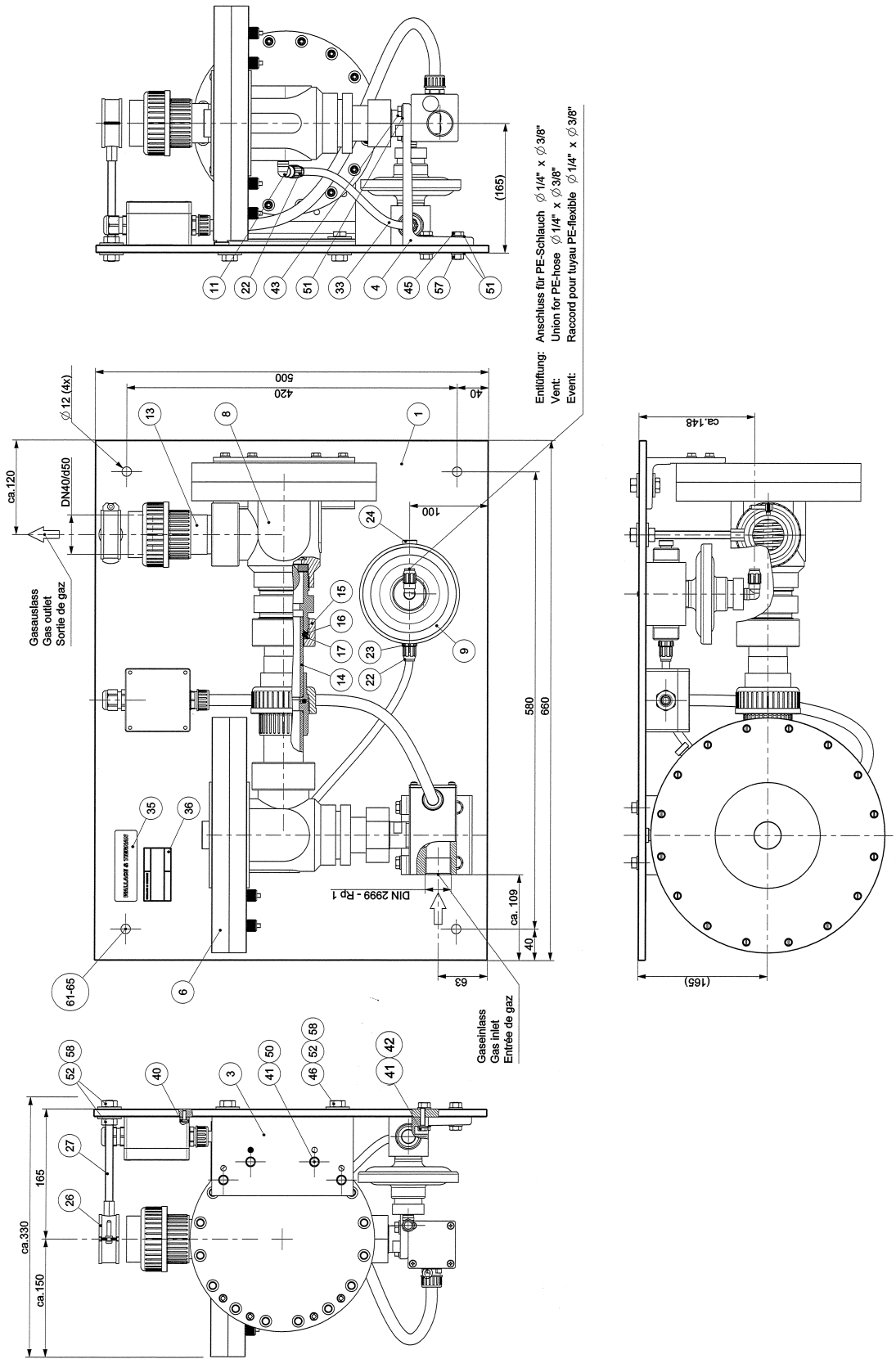
Version „left“ W3T171408



Version „right“ W3T163792



7.6.1 Vacuum regulator unit „left“ W3T171408

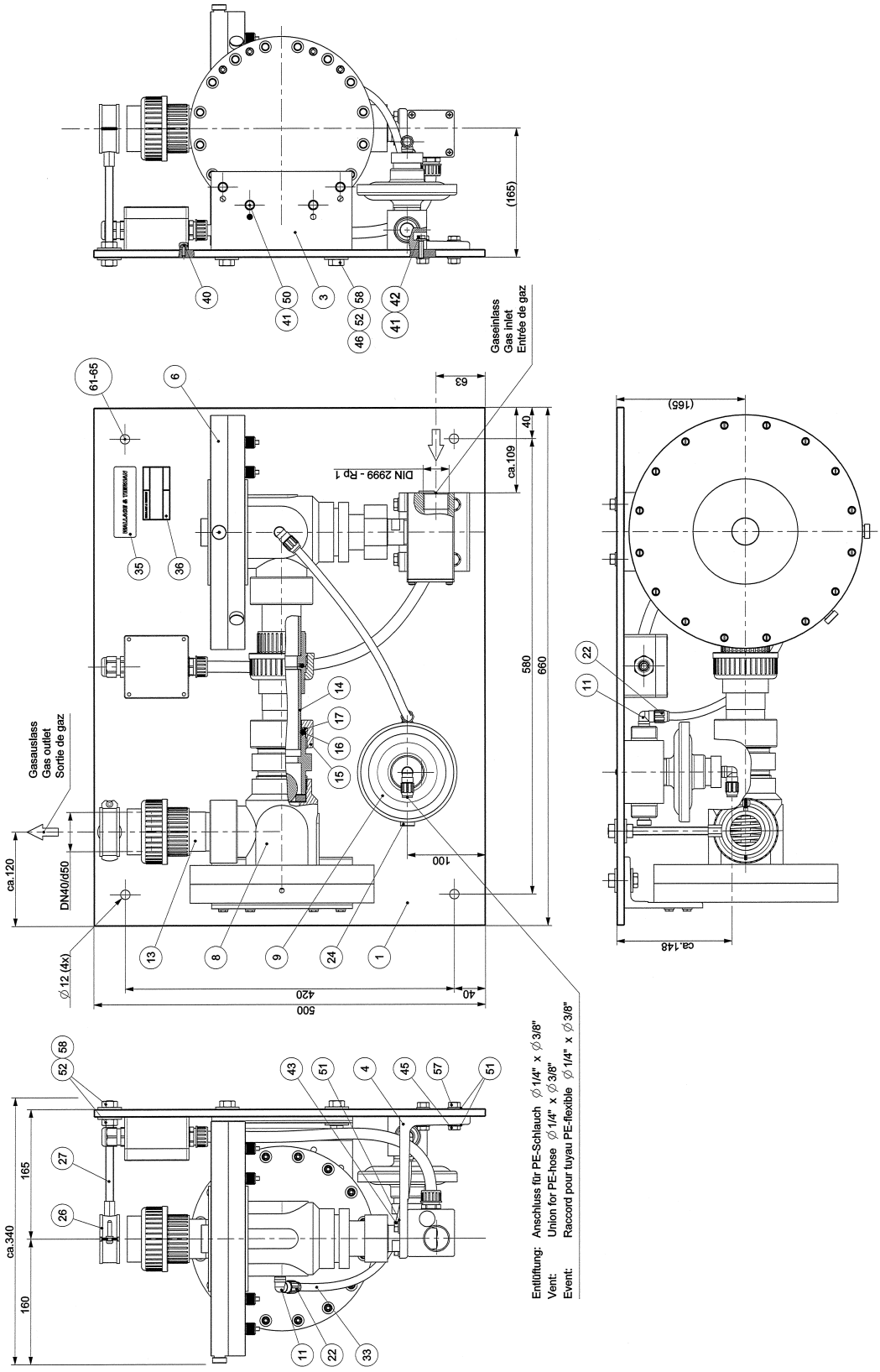


Vacuum regulator unit „left“ W3T171408

Pos	Part no.	Description		Quant.
1	W3T163434	Mounting plate, lacquered		1
3	W3T163433	Angle galvanized		1
4	W3T165269	Angle galvanized		1
6	W3T163661	Vacuum regulator valve		1
8	W3T163674	Vacuum safety valve		1
9	W3T162429	Safety vent valve		1
11	W3T172760	Union elbow	1/4-18NPT x 1/2-20UNF	1
13	W3T159922	Connecting part	DN 40	1
14	W3T159646	Clamping tube	PVC tube DN 40	1
15	W3T167041	Union nut		1
16 M	W3T168890	O-ring	d47,6x6,35/CSM	1
17	W3T159400	Washer, conical		1
22	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
23	W3T169110	Union nipple PVC	1/4NPT x 1/2-20UNF-2A	1
24	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	1
26	W3T169462	Clamp	D=47-52; St.	1
27	W2T505337	Threaded rod	M 10; X5CrNiMo 1810	150 mm
33	W2T505671	Hose	Id x Wdg 6.35 x 1,6; PE-LD	0.5 m
40	W2T505720	Cross rec. pan head screw	M4 x 12/DIN 7985/V2A	4
41	W3T165210	Hexagon screw	DIN 933, M 6 x 25, A 2	5
42	W3T161592	Washer	DIN 9021-A - 6.4 - A2 - 70	1
43	W3T161582	Hexagon head screw	DIN 933, M 8 x 20, A 2	2
45	W3T161613	Hexagon head screw	DIN 933; M 8 x 30; A 2	4
46	W3T161632	Hexagon head screw	DIN 933, M 10 x 30, A 2	2
50	W3T168884	Plain washer	DIN 125 A, 6.4 mm, A 2	4
51	W3T172730	Plain washer	DIN 125 A, 8.4 mm, A 2	10
52	W3T173081	Plain washer	DIN 9021-A -10.5-A2-70	6
57	W3T172818	Hexagon nut	DIN 934, M 8, A 2	4
58	W3T172819	Hexagon nut	DIN 934, M 10, A 2	4
61	W2T507596	Dowel	Nylon S 14	4
62	W2T506799	Screw for wood or dowel	M10 x 120 A 2	4
63	W3T172819	Hexagon nut	DIN 934, M 10, A 2	4
64	W2T505357	Domed nut	DIN 1587, M 10, Msvn	4
65	W3T172742	Plain washer	DIN 125 A, 10.5 mm, A 2	8
66	W2T505671	Hose PE nature	Id6.35 x 1.6 mm/1/4" x 3/8"	10 m
67	W3T167402	Fastening kit; cable clamp	d6-16	20
68	W2T506327	Pipe DIN 8062	D40 x 3; PVC-U; PN16	200 mm
69	W3T163870	Union	Rp1; EN 10241; St.	1
70	W3T165439	Gasket	KL-SIL; D44 x 29 x 2mm	2
71	W3T163564	Hexagon nipple	R1; EN 10241; St.	1

- „M“ in the first column: to be replaced every year

Vacuum regulator unit „right“ W3T163792

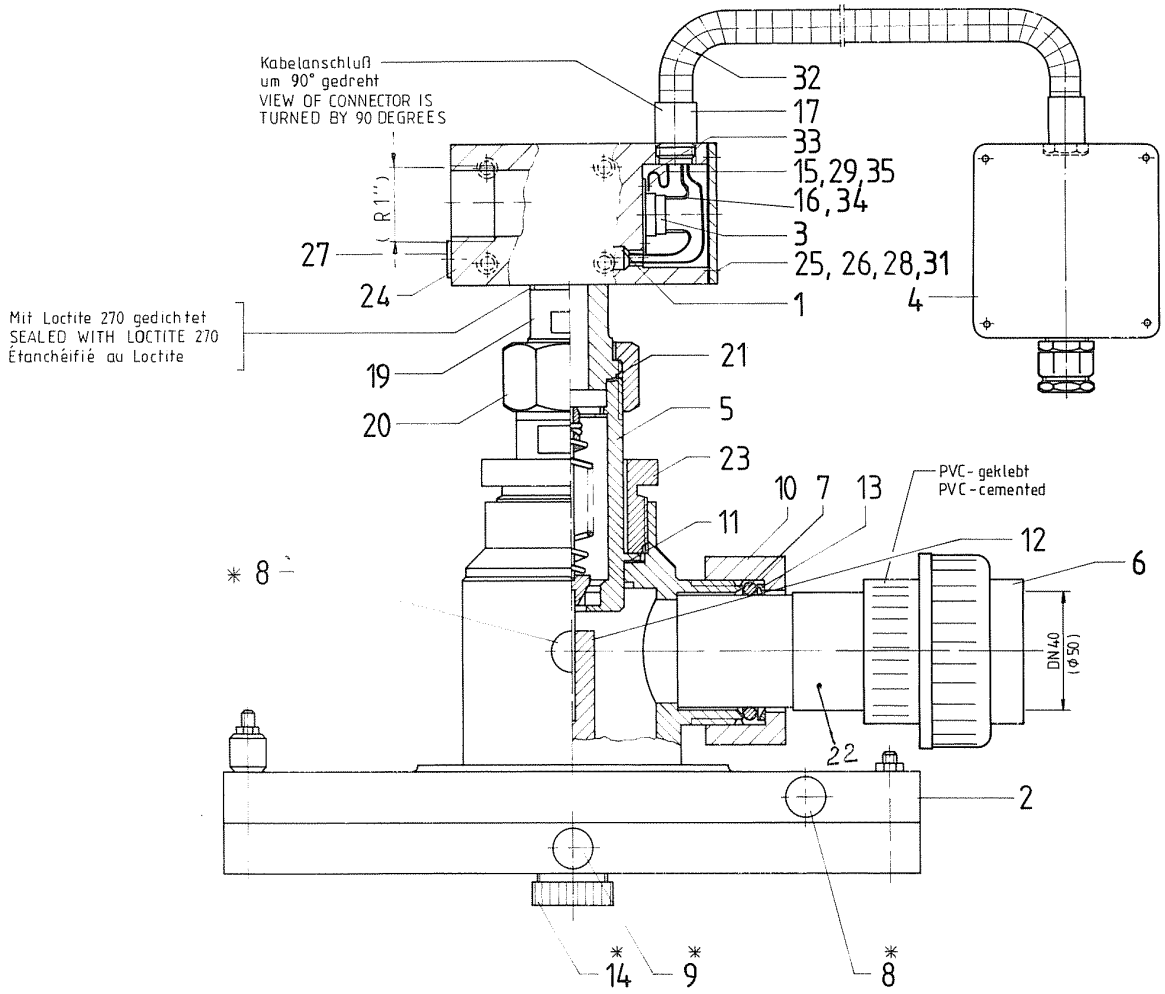


Vacuum regulator unit „right“ W3T163792

Pos	Part no.	Description		Quant.
1	W3T163434	Mounting plate, lacquered		1
3	W3T163433	Angle galvanized		1
4	W3T165269	Angle galvanized		1
6	W3T163661	Vacuum regulator valve		1
8	W3T163674	Vacuum safety valve		1
9	W3T162429	Safety vent valve		1
11	W3T172760	Union elbow PVC	1/4-18NPT x 1/2-20UNF	1
13	W3T159922	Connecting part	DN 40	1
14	W3T159646	Clamping tube	PVC pipe DN 40	1
15	W3T167041	Union nut		1
16 M	W3T168890	O-ring	d47.6 x 6.35/CSM	1
17	W3T159400	Washer, conical		1
22	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
24	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	1
26	W3T169462	Clamp	D=47-52; St	1
27	W2T505337	Threaded rod	M10; X5CrNiMo 1810	150 mm
33	W2T505671	Hose	Idxwall g 6.35 x 1.6; PE-LD	0.5 m
40	W2T505720	Cross rec. pan head screw	M4 x 12/DIN 7985/V2A	4
41	W3T165210	Hexagon screw	DIN 933, M 6 x 25, A 2	5
42	W3T161592	Washer	DIN 9021-A - 6.4 - A2-70	1
43	W3T161582	Hexagon screw	DIN 933, M 8 x 20, A 2	2
45	W3T161613	Hexagon screw	DIN 933; M 8 x 30; A 2	4
46	W3T161632	Hexagon screw	DIN 933, M 10 x 30, A 2	2
50	W3T168884	Plain washer	DIN 125 A, 6.4 mm, A 2	4
51	W3T172730	Plain washer	DIN 125 A, 8.4 mm, A 2	10
52	W3T173081	Plain washer	DIN 9021-A -10.5-A2-70	6
57	W3T172818	Plain washer	DIN 934, M 8, A 2	4
58	W3T172819	Hexagon nut	DIN 934, M 10, A 2	4
61	W2T507596	Dowel	Nylon S 14	4
62	W2T506799	Screw for wood or dowel	M10 x 120 A 2	4
63	W3T172819	Hexagon nut	DIN 934, M 10, A 2	4
64	W2T505357	Domed nut	DIN 1587, M 10, Msvn.	4
65	W3T172742	Plain washer	DIN 125 A, 10.5 mm, A 2	8
66	W2T505671	Hose PE nature	Id 6.35 x 1.6 mm/1/4" x 3/8"/	10 m
67	W3T167402	Fastening kit; cable clamp	d6-16	20
68	W2T506327	Pipe DIN8062	D40 x 3; PVC-U; PN16	200 mm
69	W3T163870	Union	Rp1; EN 10241; St	1
70	W3T165439	Gasket	KL-SIL; D44 x 29 x 2 mm	2
71	W3T163564	Hexagon nipple	R1; EN 10241; St.	1

- „M“ in the first column: to be replaced every year

Vacuum regulator valve W3T163661



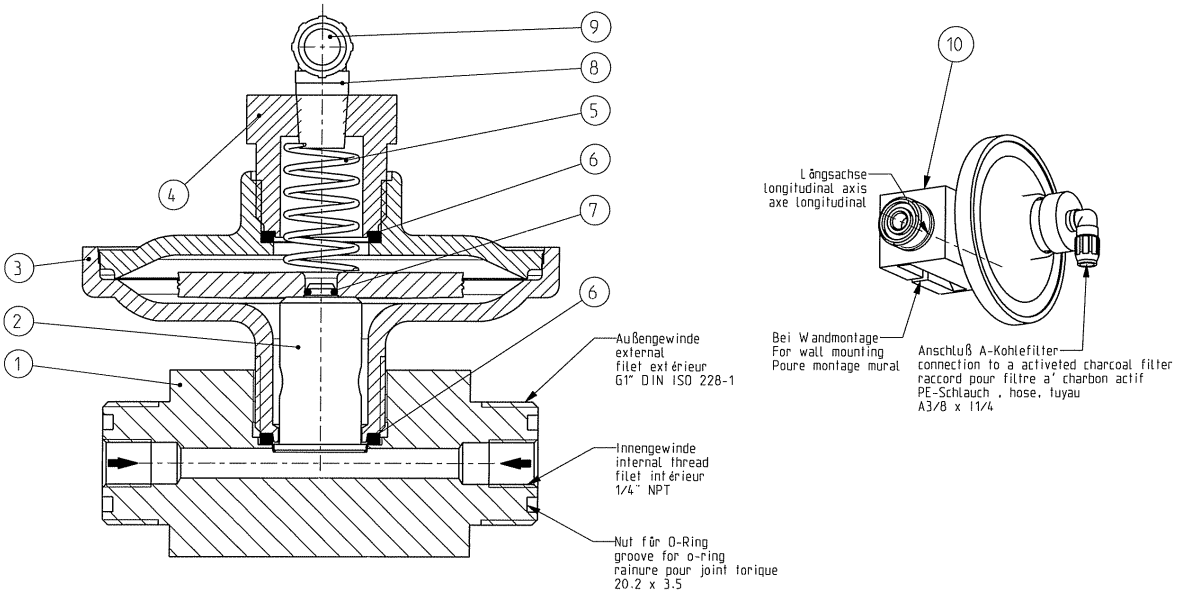
* sealed with teflon tape

Pos	Part no.	Decription		Quant.
1	W3T161835	Electric heater	230 V; 55 Watt	1
2	W3T159797	Pressure regulating valve		1
3	W2T506383	Temperature switch	10A/230 V	1
4	W3T171331	Junction box		1
5 M2	W3T171345	Gas inlet valve		1
6	W3T163894	Union	PVC-U;d50; with Viton O-ring PXG-94733	1
7 M	W3T168890	O-ring	d47.6 x 6.35/CSM	1
8	W3T168893	Plug PVC-U	1/4-18NPT x 21(*W)	2

Pos	Part no.	Decription		Quant.
9	W3T159371	Plug	PVC hard; 1/4-18NPT x 21	1
10	W3T167041	Union nut		1
11 M	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	1
12	W3T159398	Stem		1
13	W3T159400	Washer, conical		1
14	W3T170900	Plug PVC hard	NEF11/8" x 18 x 22	1
15	W3T168969	Washer	DIN 125 A, 3.2 mm, A 2	2
16	W2T505203	Cable gland		2
17	W2T504554	NH-Verschraubung	Pg 9	1
18	W2T505364	Screw	3 x 25; A2	4
19	W3T167210	Nipple		1
20	W3T167211	Union nut	M45; Ms58h	1
21 M	W3T172870	Gasket	39 x 32 x 0.8	1
22	W3T167212	Pipe adapter		1
23	W3T167213	Clamping nut		1
24	W3T159616	Inlet block		
25	W3T159617	Cover	ST 37 -Fe/Zn 5 cC	1
26 M	W3T159618	Gasket		1
27	W2T504748	Plug	GPN300F11/d14.6/PE-LD	1
28	W2T505788	Cross rec. pan head screw	M4 x 16/DIN 7985/V2A	4
29	W2T505904	Slotted cheese head screw	M3 x 5/DIN84/V2A	2
30	W2T507637	Plain washer	DIN 125 A; 4.3mm; A2	4
31	W3T172750	Plain washer	DIN 125 A, 4,3 mm, A2	4
32	W2T503861	Cable protecting hose	pG9; NW11; Iø10,0; Aø14,7	700 mm
33	W3T161185	Cable	Si-Li 0,75 green/yellow	900 mm
34	W2T506227	Single core cable	Silicone, brown, 2.5 qmm	900 mm

„M“ in the first column: to be replaced every year

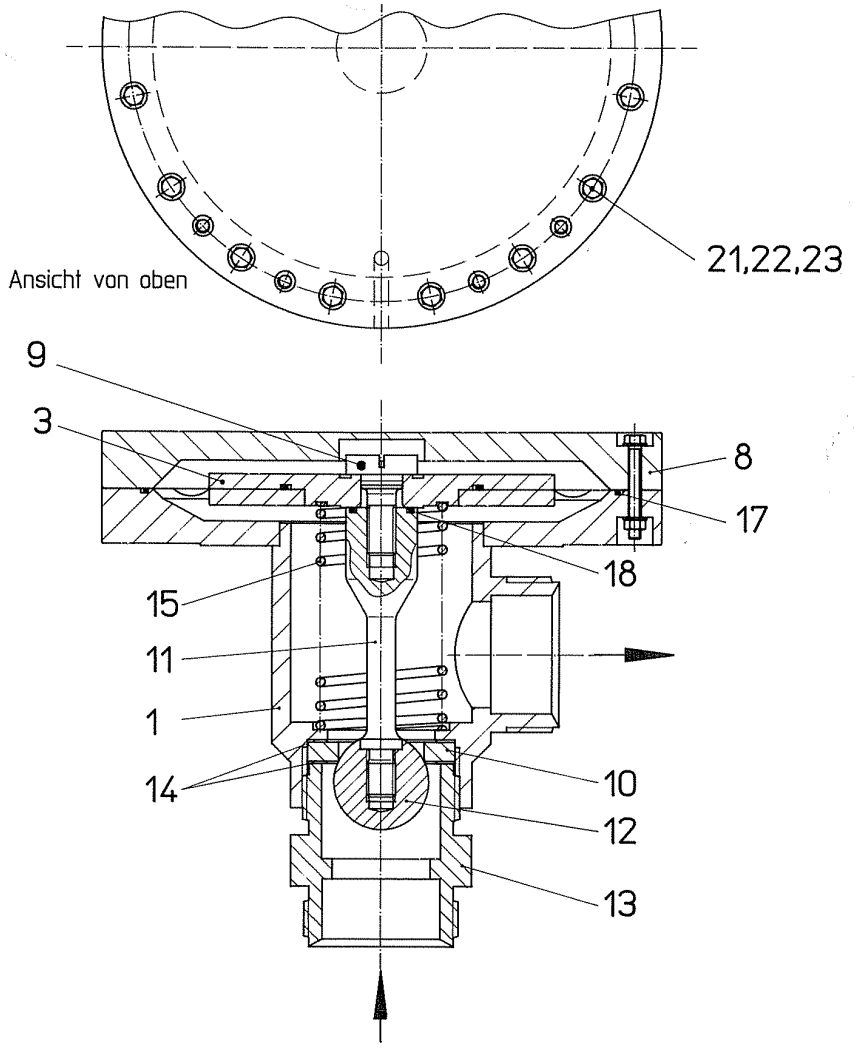
7.6.2 Safety vent valve W3T162429



Pos	Part no.	Description		Quant.
1	W3T162428	Valve housing		1
2	W3T170945	Valve stem		1
3 M2	W3T165515	Valve body assembly		1
4	W3T161490	Plug	PVC; Tr13/8" x 8 x 38; NPT1/4"	1
5	W3T165193	Spring		1
6 M	W3T161334	Gasket	CSM; D32 x 25.4 x 3	2
7 M	W2T507221	O-ring	d5.28 x 1.78/CSM	1
8	W3T172760	Union elbow	PVC; 1/4-18NPT x 1/2-20UNF	1
9	W3T169111	Union nut	PVC; 1/2-20UNF-2B	1
10	W2T507548	Type plate		1

„M“ in the first column: to be replaced every year
„M2“ in the first column: to be replaced every 2 years

7.6.3 Vacuum safety valve W3T163674



Pos	Part no.	Description		Quant.
1	W3T159872	Valve body		1
3 M2	W3T159817	Diaphragm unit	PVC, PTFE-250 µm, ø235	1
8	W3T159873	Housing		1
9	W3T171090	Screw	PVC	1
10	W3T171091	Valve seat	PTFE	1
11	W3T171092	Stem	PVC	1
12	W3T171206	Ball PVC		1
13	W3T171093	Connecting piece		1
14 M	W3T171094	Gasket	PVC-P; D61 x 46 x 1	2

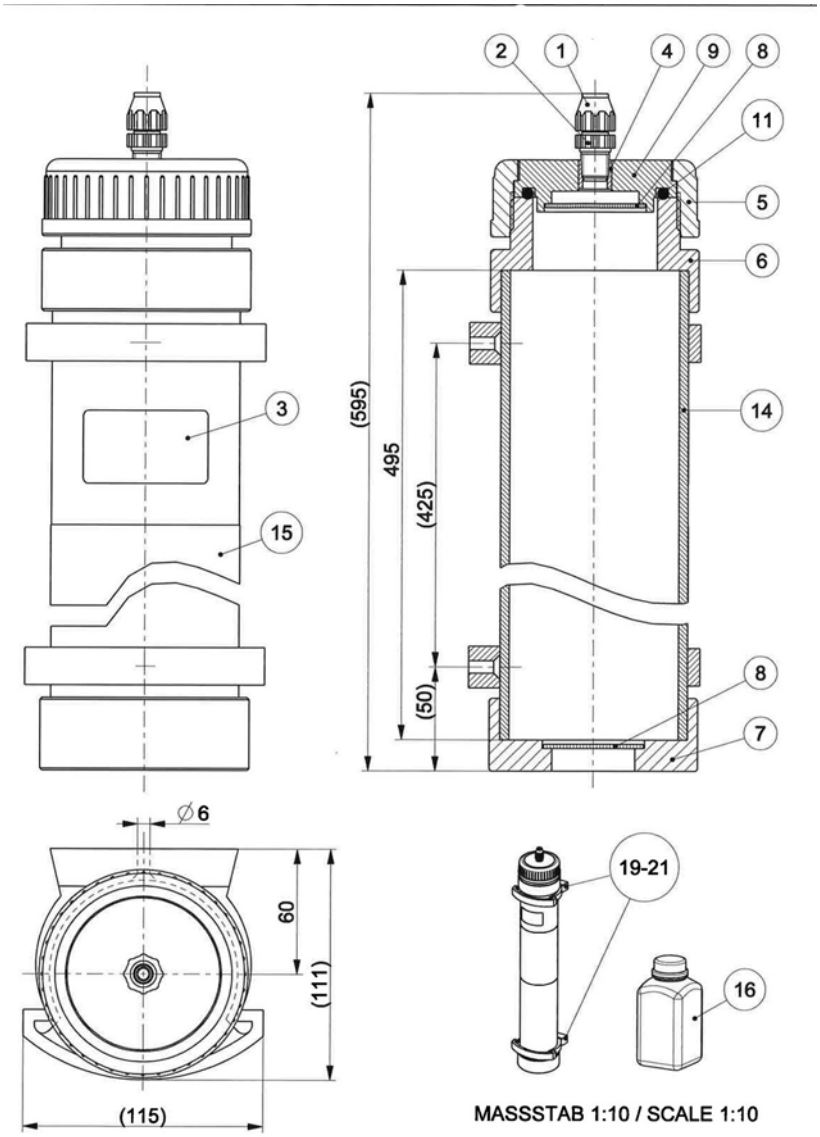
Pos	Part no.	Description		Quant.
15	W3T172753	Spring		1
17 M2	W3T168938	O-ring	d196.52 x 2.62/CSM	1
18 M2	W3T169086	O-ring	d22 x 2.5/FPM	16
21	W3T161654	Hexagon head screw	DIN 933, M 5 x 40, A 2	16
22	W2T506019	Plain washer	DIN 125 A, 5.3 mm, A 2	32
23	W3T172836	Nut	DIN 934, M 5, A 2	16

„M“ in the first column: to be replaced every year
„M2“ in the first column: to be replaced every 2 years

Connecting parts W3T159922 (each 2x)

Pos	Part no.	Description		Quant.
1	W3T163894	Union	PVC-U; d50; with Viton- O-ring W3T169194	1
2	W3T159646	Clamping tube	PVC tube DN 40	1
3	W3T167041	Union nut		1
4	W3T168890	O-ring	d47.6 x 6.35/CSM	1
5	W3T159400	Washer, conical		1

7.6.4 Activated carbon filter W3T159902

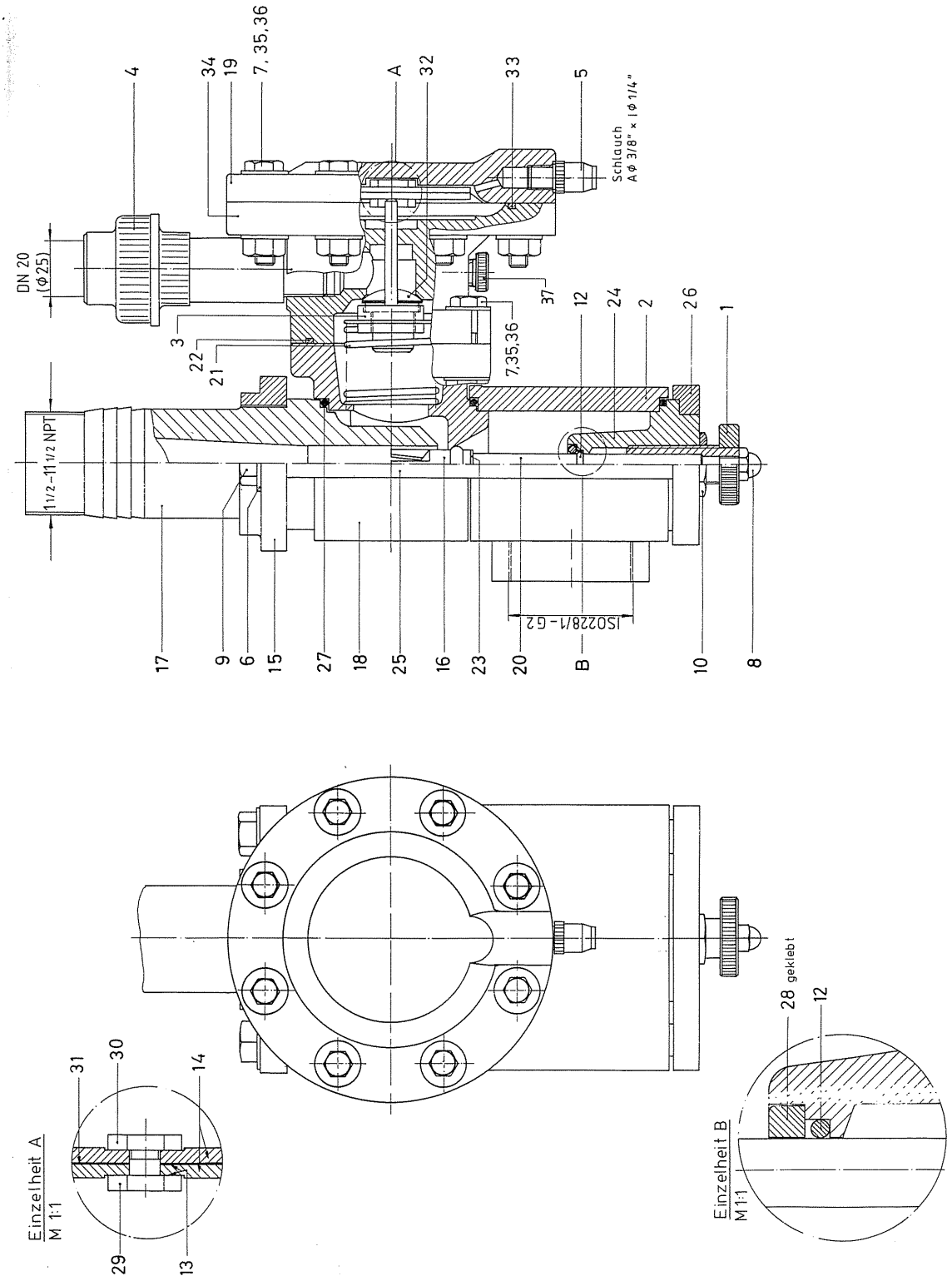


Pos	Part no.	Description	Quant.
1	W3T169111	Union nut PVC; 1/2-20UNF-2B	1
2	W3T169110	Union nipple PVC; 1/4NPTx1/2-20UNF-2A	1
3	W2T507548	Type plate 68 x 35	1
4	W3T167287	Threaded socket 1/4-18NPT; D16; PVC-U	1
5	W2T506923	Union nut PVC-U; G2-3/4; PN16	1
6	W3T167181	Upper part PVC	1
7	W3T163345	Lower part PVC	1
8	W3T163510	Sieve	2

Pos	Part no.	Description	Quant.
9	W3T170976	Adapter cover PVC-U; 1/4" NPT	1
11	W3T172722	O-ring D59.69 x 5.33/EPDM	1
14	W2T506634	Pipe DIN 8062 D90 x 4.3; PVC-U; PN10	495 mm
15	W3T161206	Caution label	1
16	W3T161729	Activated carbon mixture 2500 ml	1
19	W3T165741	Pipe clamp PP; D90	2
20	W3T172833	Chipboard screw count. 6 x 60; A2	2
21	W2T507639	Dowel nylon 8 x 40	2

7.7 Injectors

7.7.1 2“-Injector (PVC, W3T167390, W3T167391)



2“-Injector W3T167390 (20 kg/h, PVC)

Pos	Part no.	Description		Quant.
1	W3T163613	Adjusting knob	Ms58h	1
2	W3T159802	Inlet tee	PVC	1
3	W3T159807	Stem and post unit		1
4	W3T171310	Union nipple	PVC; 3/4NPT; d25	1
5	W3T171353	Clamping union	for hose D3/8" d1/4"	1
6	W3T172829	Washer	DIN 125 A, 13 mm, A 2	2
7	W3T172742	Washer	DIN 125 A, 10.5 mm, A 2	24
8	W3T172619	Nut		1
9	W3T172617	Nut		2
10	W3T161263	Nut		1
12 M	W3T169069	O-ring	d9.19 x 2.62/FPM	1
13 M	W3T170891	Gasket	FPM (Viton); D14.3 x 9.5 x 0.5	2
14	W3T159374	Disc		2
15	W3T159383	Flange		1
16	W2T507640	Injector plug		1
17	W3T163474	Tail piece		1
18	W3T163476	Throat		1
19	W2T17490	Cover		1
20	W3T170922	Stem		1
21	W2T507724	Spring		1
22 M	W3T169074	O-ring	d69.52 x 2.62/FPM	1
23	W3T170926	Washer	Silver; D14 x 8.2 x 1.5	1
24	W3T171152	Packing gland		1
25	W3T170930	Stud		2
26	W3T170931	Plate		1
27 M	W3T169075	O-ring	d56.74 x 3.53/FPM	3
28	W3T163278	Retainer, O-ring	PVC	1
29 M	W3T163283	Screw	PVC; 3/8" UNF	1
30 M	W3T163284	Nut	PVC; 3/8" UNF	1
31 M	W3T172794	Diaphragm	PTFE; d=151,6	1
32	W3T171021	Valve stem	PTFE	1

Pos	Part no.	Description		Quant.
33 M	W3T168916	O-ring	d107.62 x 2.62/CSM	1
34	W3T14726	Valve body	for 2" injector	1
35	W3T172819	Nut	DIN 934, M 10, A 2	12
36	W3T165227	Hexagon head bolt		12
37	W3T168893	Plug	PVC-U; 1/4-18NPT x 21	1

„M“ in the first column: to be replaced every year

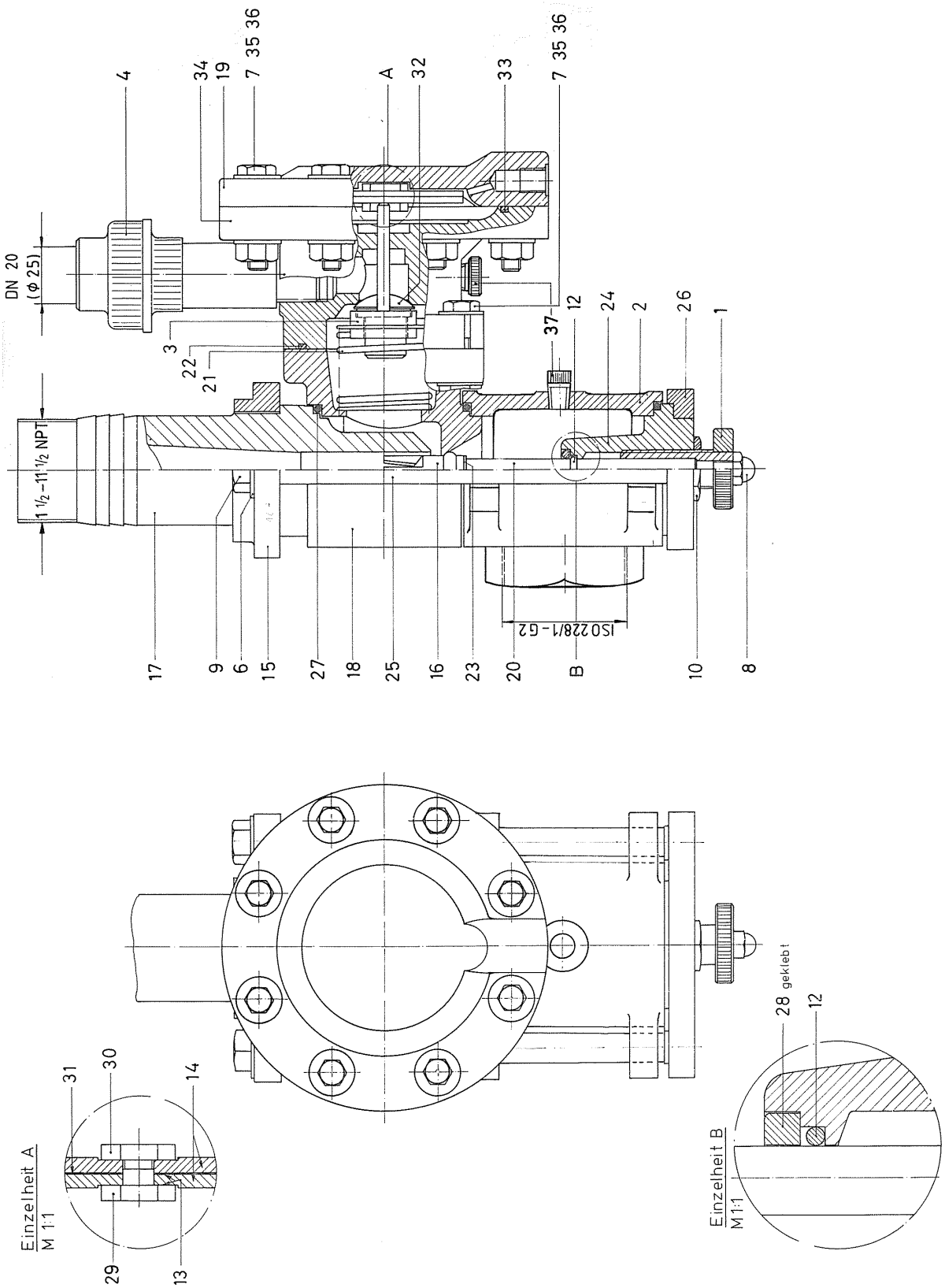
2“-Injector W3T167391 (40 kg/h, PVC)

Pos	Part no.	Description		Quant.
1	W3T163613	Adjusting knob	Ms58h	1
2	W3T159802	Inlet tee	PVC	1
3	W3T159807	Stem and post unit		1
4	W3T171310	Union nipple	PVC; 3/4NPT; d25	1
5	W3T171353	Clamping union	for hose D3/8" d1/4"	1
6	W3T172829	Washer	DIN 125 A, 13 mm, A 2	2
7	W3T172742	Washer	DIN 125 A, 10,5 mm, A 2	24
8	W3T172619	Nut		1
9	W3T172617	Nut		2
10	W3T161263	Nut		1
12 M	W3T169069	O-ring	d9.19 x 2.62/FPM	1
13 M	W3T170891	Gasket	FPM (Viton); D14.3 x 9.5 x 0.5	2
14	W3T159374	Disc		2
15	W3T159383	Flange		1
16	W3T165184	Injector plug		1
17	W3T163475	Tail piece		1
18	W3T163477	Throat		1
19	W2T17490	Cover		1
20	W3T170922	Stem		1
21	W2T507724	Spring		1
22 M	W3T169074	O-ring	d69.52 x 2.62/FPM	1
23	W3T170926	Washer	Silver D14 x 8.2 x 1.5	1
24	W3T171152	Packing gland		1

Pos	Part no.	Description		Quant.
25	W3T170930	Stud		2
26	W3T170931	Plate		1
27 M	W3T169075	O-ring	d56.74 x 3.53/FPM	3
28	W3T163278	Retainer, O-Ring	PVC	1
29 M	W3T163283	Screw	PVC; 3/8" UNF	1
30 M	W3T163284	Nut	PVC; 3/8" UNF	1
31 M	W3T172794	Diaphragm	PTFE; d=151.6	1
32	W3T171021	Valve stem	PTFE	1
33 M	W3T168916	O-ring	d107.62 x 2.62/CSM	1
34	W3T14726	Valve body	for 2" injector	1
35	W3T172819	Nut	DIN 934, M 10, A 2	12
36	W3T165227	Hexagon head bolt	DIN 931, M10 x 45, A2	12
37	W3T168893	Plug	PVC-U; 1/4-18NPT x 21	1

„M“ in the first column: to be replaced every year

7.7.2 2“ Injector W3T163724, W3T163780



Injector 2" W3T163724 (20 kg/h, bronze/PVC)

Pos	Part no.	Description		Quant.
1	W3T163613	Adjusting knob		1
2	W3T167070	Inlet tee		1
3	W3T159807	Stem and post unit		1
4	W3T171310	Union nipple	PVC; 3/4NPT; d25	1
6	W3T172829	Washer	DIN 125 A, 13 mm, A 2	2
7	W3T172742	Washer	DIN 125 A, 10.5 mm, A 2	24
8	W3T172619	Nut		1
9	W3T172617	Nut		2
10	W3T161263	Nut		1
12 M	W3T169069	O-ring	d9,19 x 2.62/FPM	1
13 M	W3T170891	Gasket	FPM(Viton); D14.3 x 9.5 x 0.5	2
14 M	W3T159374	Disc		2
15	W3T159383	Flange		1
16	W2T507640	Injector plug		1
17	W3T163474	Tail piece		1
18	W3T163476	Throat		1
19	W2T17490	Cover		1
20	W3T170922	Stem		1
21	W2T507724	Spring		1
22 M	W3T169074	O-ring	d69.52 x 2.62/FPM	1
23	W3T170926	Washer	Silver; D14 x 8.2 x 1.5	1
24	W3T171152	Packing gland		1
25	W3T170930	Stud		2
26	W3T170931	Plate		1
27 M	W3T169075	O-ring	d56.74 x 3.53/FPM	3
28	W3T163278	Retainer, O-ring		1
29 M	W3T163283	Screw	PVC; 3/8" UNF;	
30 M	W3T163284	Nut	PVC; 3/8" UNF	1
31 M	W3T172794	Diaphragm	PTFE; d=151.6	1
32	W3T171021	Valve stem	PTFE	1
33 M	W3T168916	O-ring	d107.62 x 2.62/CSM	1

Pos	Part no.	Description		Quant.
34	W3T14726	Valve body		1
35	W3T172819	Nut	DIN 934, M 10, A 2	12
36	W3T165227	Screw	DIN 931/M10 x 45/V2A	12
37	W3T168893	Plug	PVC-U; 1/4-18NPT x 21(*W)	2

„M“ in the first column: to be replaced every year

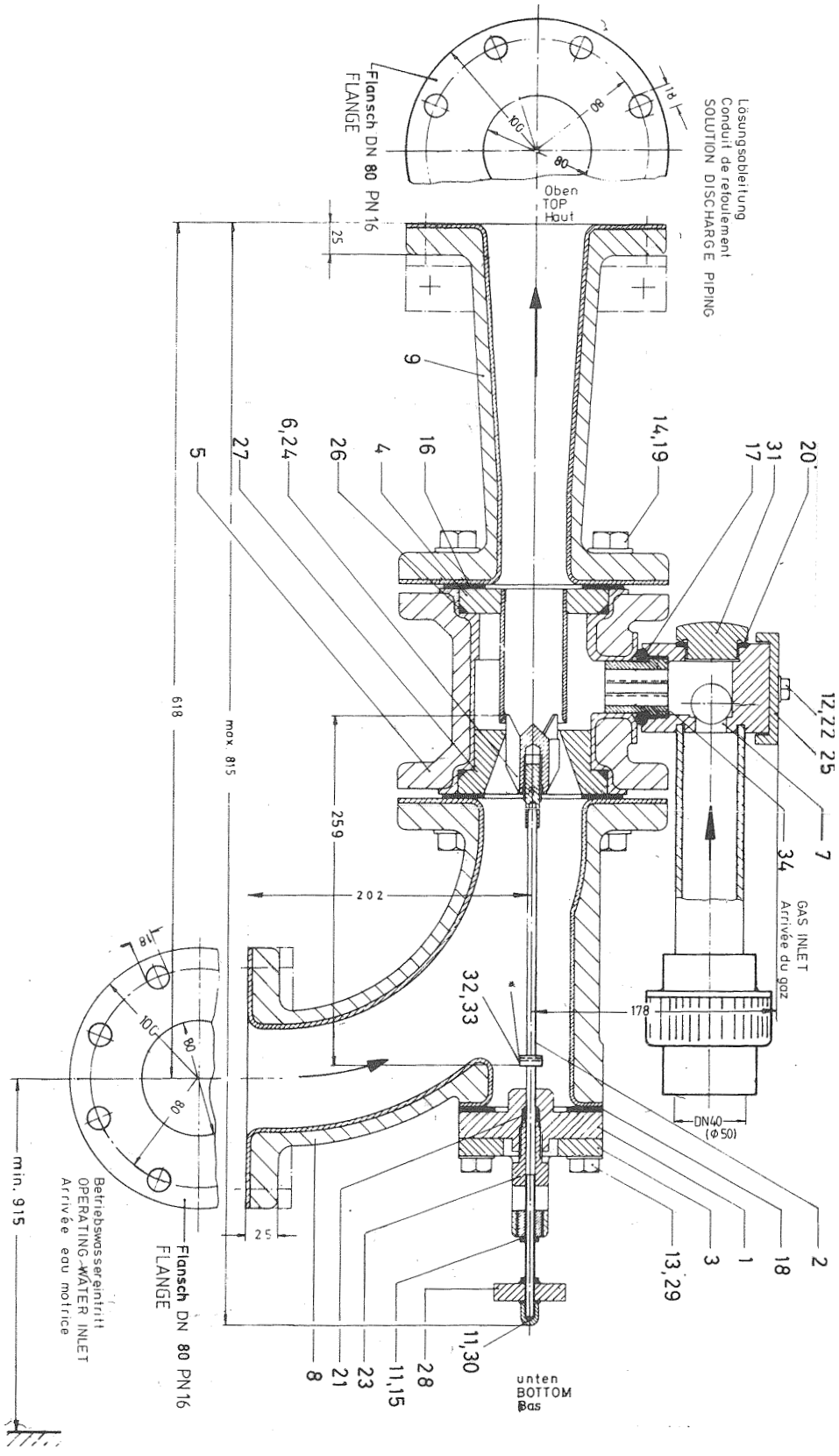
Injector 2" W3T163780 (40 kg/h, bronze/PVC)

Pos	Part no.	Description		Quant.
1	W3T163613	Adjusting knob		1
2	W3T167070	Inlet tee		1
3	W3T159807	Stem and post unit		1
4	W3T171310	Union nipple	PVC; 3/4NPT; d25	1
6	W3T172829	Washer	DIN 125 A, 13 mm, A 2	2
7	W3T172742	Washer	DIN 125 A, 10,5 mm, A 2	24
8	W3T172619	Nut		1
9	W3T172617	Nut		2
10	W3T161263	Nut		1
12 M	W3T169069	O-ring	d9.19 x 2.62/FPM	1
13 M	W3T170891	Gasket	FPM(Viton); D14.3 x 9.5 x 0.5	2
14 M	W3T159374	Disc		2
15	W3T159383	Flange		1
16	W3T165184	Injector plug		1
17	W3T163475	Tail piece		1
18	W3T163477	Throat		1
19	W2T17490	Cover		1
20	W3T170922	Stem		1
21	W2T507724	Spring		1
22 M	W3T169074	O-ring	d69.52 x 2.62/FPM	1
23	W3T170926	Washer	Silver; D14 x 8.2 x 1.5	1
24	W3T171152	Packing gland		1
25	W3T170930	Stud		2
26	W3T170931	Plate		1

Pos	Part no.	Description		Quant.
27 M	W3T169075	O-ring	d56.74 x 3.53/FPM	3
28	W3T163278	Retainer, O-Ring		1
29 M	W3T163283	Screw	PVC; 3/8" UNF;	
30 M	W3T163284	Nut	PVC; 3/8" UNF	1
31 M	W3T172794	Diaphragm	PTFE; d=151,6	1
32	W3T171021	Valve stem	PTFE	1
33 M	W3T168916	O-ring	d107.62 x 2.62/CSM	1
34	W3T14726	Valve body		1
35	W3T172819	Nut	DIN 934, M 10, A 2	12
36	W3T165227	Hexagon head bolt	DIN 931/M10 x 45/V2A	12
37	W3T168893	Plug	PVC-U;1/4-18NPT x 21(*W)	2

„M“ in the first column: to be replaced every year

7.7.3 3“-Injector W3T166003

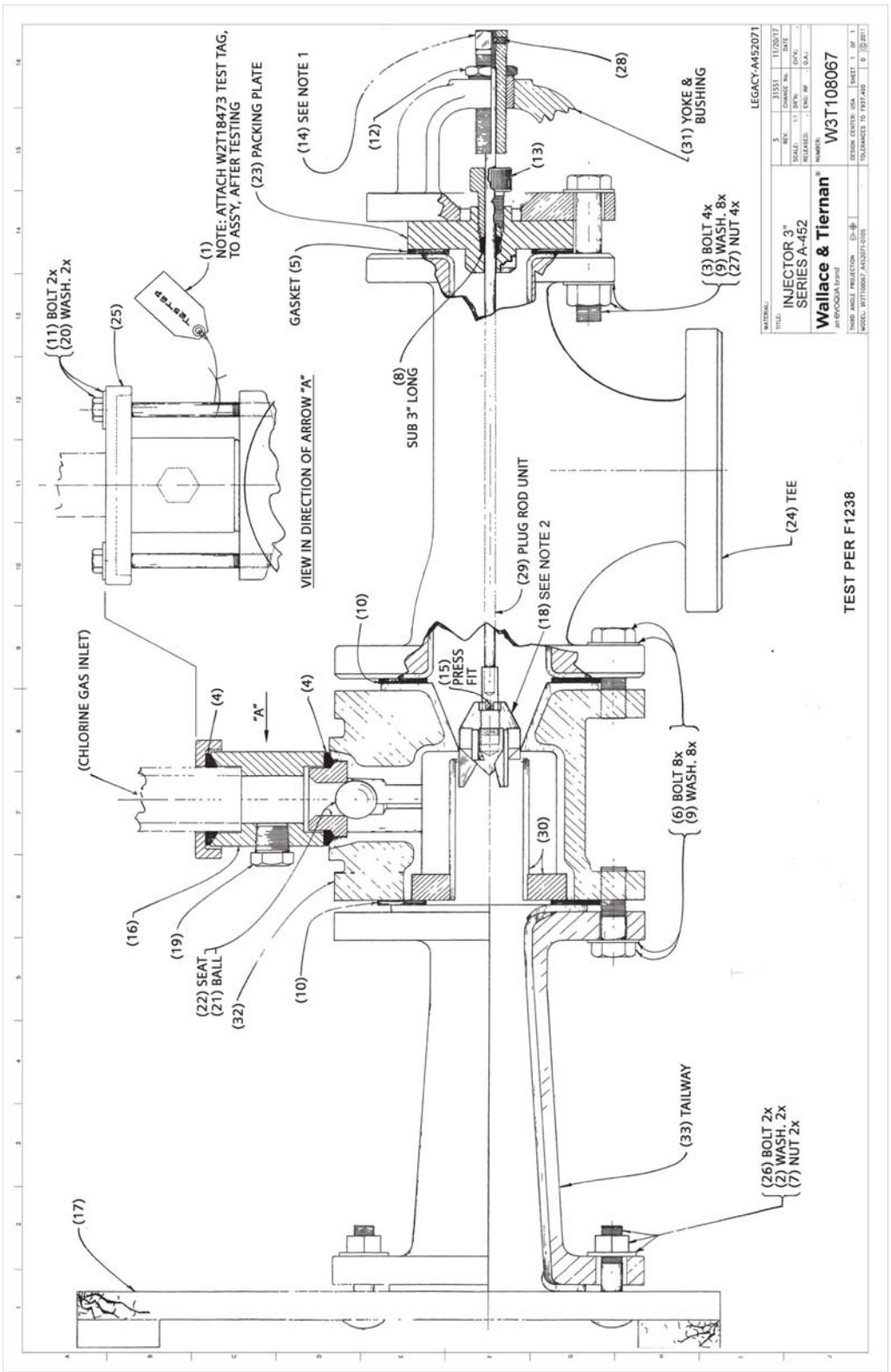


3“-Injector W3T166003

Pos	Part no.	Description		Quant.
1	W3T167108	Packing plate unit		1
2	W3T171291	Plug rod unit		1
3	W3T171292	Yoke ass'y		1
4	W3T171295	Throat exit ass'y		1
5	W3T171296	Throat housing		1
6	W3T171297	Plug		1
7	W3T159819	Ball and seat unit		1
8	W3T159822	Tee		1
9	W3T159823	Injector tail		1
11	W3T168884	Plain washer	DIN 125 A, 6.4	2
12	W3T172742	Plain washer	DIN 125 A, 10.5 mm, A 2	2
13	W3T172829	Plain washer	DIN 125 A, 13 mm, A 2	4
14	W3T172848	Plain washer	DIN 125 A, 17 mm, A 2	8
15	W3T172737	Nut		2
16	W3T161358	Gasket	CSM; D127 x 70 x 3	2
17 M	W3T161265	O-ring	d39.69 x 7.94/NR	1
18	W3T170881	Gasket		1
19	W3T164393	Screw	5/8" x 2 1/4" Withw.,A2	8
20 M	W3T161267	Gasket	d=51 x 38, Hypalon	1
21	W2T507683	Packing		1
22	W3T161277	Bolt		2
23	W3T159408	Packing nut		1
24	W2T507749	Pin		1
25	W3T159412	Outer clamp		1
26	W3T161350	Gasket		2
27	W3T170949	Injektor throat		1
28	W3T170950	Handwheel		1
29	W3T161351	Bolt		4
30	W3T170951	Domed nut		1
31	W3T163319	Plug	PVC; 11/2-12UNF x 24	1
32	W3T172661	Tension pin		1
33	W3T163321	Stop collar		1
34	W3T170955	Ball stop	PVC	1

„M“ in the first column: to be replaced every year

7.7.4 3“-Injector W3T108067

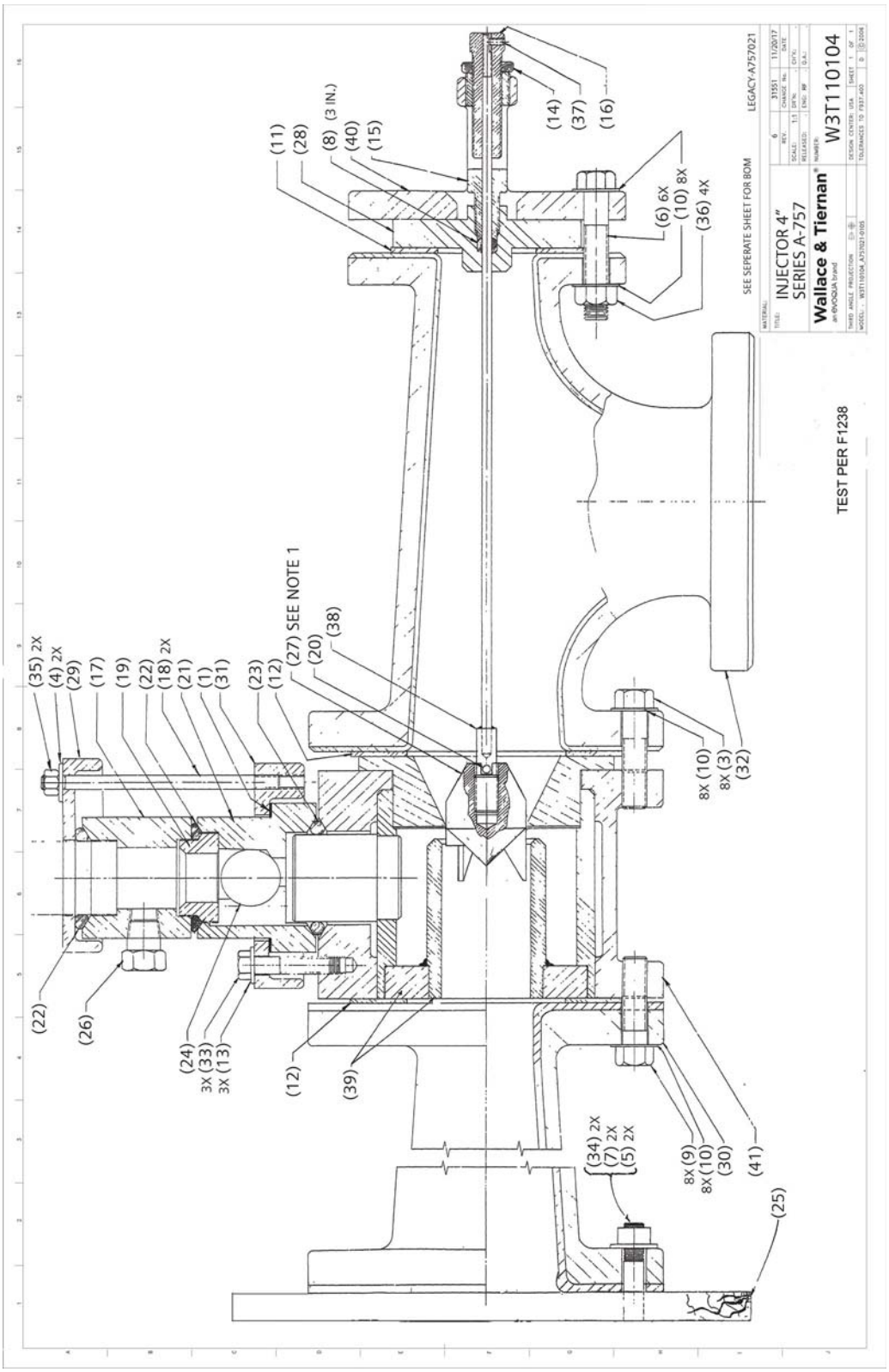


3“-Injector W3T108067

Pos	Part no.	Description	Quant
1	W2T18473	Tag, tested prior to shipping	1
2	W2T17614	Washer	2
3	W2T15937	Bolt	4
4	W2T17127	Gasket	2
5	W2T375791	Gasket	1
6	W2T17128	Bolt	8
7	W2T17353	Nut	2
8	W2T16538	Packing	0.25 ft.
9	W2T17444	Washer	16
10	W2T16104	Gasket	2
11	W2T18648	Bolt	2
12	W2T17720	Nut	1
13	W2T17721	Nut	1
14	W2T17722	Nut	1
15	W2T17726	Pin	1
16	W2T11965	PVC Housing	1
17	W2T17279	Base	1
18	W2T17510	Plug	1
19	W2T123647	Plug	1
20	W2T16527	Washer	2
21	W2T15446	Ball	1
22	W2T15445	Ball seat	1
23	W2T12004	Plate backing bushing	1
24	W3T373314	Tee	1
25	W3T241104	Clamp	1
26	W2T17040	Bolt	2
27	W2T418059	Nut	4
28	W2T17780	Screw	1
29	W2T19469	Rod unit	1
30	W3T107686	Throat	1

Pos	Part no.	Description	Quant
31	W3T107871	Yoke	1
32	W3T110036	Housing throat	1
33	W3T241106	Tailway	1

7.7.5 4“-Injector W3T110104



4“-Injector W3T110104

Pos	Part no.	Description	Quant
1	W2T17572	Gasket	1
2	W2T18473	Tag, tested prior to shipping	1
3	W2T18191	Bolt	8
4	W2T17613	Washer	2
5	W2T17614	Washer	2
6	W2T15937	Bolt	4
7	W2T17353	Nut	2
8	W2T16538	Packing	0.25 ft
9	W2T16600	Bolt	8
10	W2T17444	Washer	24
11	W2T16102	Gasket	1
12	W2T16103	Gasket	2
13	W3T107627	Washer	3
14	W2T17720	Nut	1
15	W2T17721	Nut	1
16	W2T17722	Nut	1
17	W2T17863	Block	1
18	W2T17295	Stud	2
19	W2T17296	Seat	1
20	W2T376000	Pin	1
21	W2T17299	Housing	1
22	W2T17304	O-ring	2
23	W2T376001	Gasket	1
24	W2T376002	Ball	1
25	W2T17864	Base	1
26	W2T123647	Plug	1
27	W2T18350	Plug	1
28	W2T13978	Plate backing bushing	1
29	W3T241105	Clamp	1
30	W3T367647	Tailway	1

Pos	Part no.	Description	Quant
31	W2T12806	Plate	1
32	W3T373311	Tee	1
33	W2T17791	Bolt	3
34	W2T17040	Bolt	2
35	W2T19519	Nut	2

7.8 Spare parts kits

7.8.1 W3T159313 Spare parts kit V-2030; for 2 years

Pos	Part no.	Description		Quant.
1	W3T169194	O-ring	D46.99 x 5.33/FPM	4
2	W3T168890	O-ring	D47.6 x 6.35/CSM	10
3	W3T172748	O-ring	d24.77 x 5.33/CSM	4
4	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	10
5	W3T161684	Orifice unit		1
6	W3T171290	Seat		1
7	W3T172743	O-ring	d9.25 x 1.78/NBR	2
8	W3T170894	Shaft seal	D19/10.5; D8.9; x 4/0.8 / PTFE	4
9	W3T161281	Gasket	PVC-P;D63.5 x 51 x 3	2
10	W3T168902	Glass		1
11	W3T161282	Gasket		4
12	W3T161284	Spring		1
13	W3T161289	Gasket	PVC-P; d63.5/51x2	2
14	W3T168910	O-ring	d47.6 x 9.5/CSM	4
15	W3T159861	Diaphragm unit		1
16	W3T169068	O-Ring	D13.94 x 2.62/FPM	4
17	W3T168938	O-Ring	d196.52 x 2.62/CSM	4
18	W3T172753	Spring		1
19	W3T163279	Stem		2
20	W3T173010	O-ring	D28.17 x 3.53/FPM	2
21	W3T168924	O-ring	d123.42 x 3.53/FPM	
22	W3T159817	Diaphragm unit		
23	W3T172754	Spring	0.437"OD 0.5"LG HASTELLOY	1
24	W2T507727	Spring		1
25	W3T161309	Spring		1

7.8.2 W3T159314 Spare parts kit V-2030 manual

for 5 years

Pos	Part no.	Description		Quant.
1	W3T169194	O-ring	D46.99 x 5.33/FPM	10
2	W3T168890	O-ring	D47.6 x 6.35/CSM	25
3	W3T172748	O-ring	d24.77 x 5.33/CSM	10
4	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	25
5	W3T161684	Orifice unit		1
6	W3T171290	Seat		2
7	W3T171299	Shaft assembly		1
8	W3T173135	Gauge -1000 mbar	NS80/110; NPT1/8CBM; Cl_2	2
9	W3T163642	Clamp		1
10	W3T172743	O-Ring	d9.25 x 1.78/NBR	5
11	W3T170894	Shaft seal	D19/10.5; D8.9; x 4/0.8 / PTFE	10
12	W3T161281	Gasket	PVC-P; D63.5 x 51 x 3	5
13	W3T168902	Glass		2
14	W3T161282	Gasket		10
15	W3T159397	Collar		1
16	W3T161284	Spring		2
17	W3T161289	Gasket	PVC-P; d63.5/51 x 2	5
18	W3T169110	Union nipple	PVC; 1/4NPT x 1/2-20 UNF-2A	1
19	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
20	W3T172760	Union elbow 90°	PVC; 1/4-18NPT x 1/2-20UNF	1
21	W3T168910	O-Ring	d47.6 x 9.5/CSM	10
22	W2T505671	Hose	Id6.35 x 1.6 mm/1/4" x 3/8"/PE	3 m
24	W3T159861	Diaphragm unit		2
25	W3T169068	O-ring	D13.94 x 2.62/FPM	10
26	W3T168938	O-ring	d196.52 x 2.62/CSM	10
27	W3T172753	Spring		2
28	W3T163279	Stem		4
29	W3T167393	Valve stem		1
30	W3T173010	O-ring	D28.17 x 3.53/FPM	5
31	W3T168912	Spring		1
32	W3T168924	O-ring	d123.42 x 3.53/FPM	5
33	W3T167076	Seat		1

Pos	Part no.	Description	Quant.
34	W3T159817	Diaphragm unit	2
35	W3T167099	Stem holder	1
36	W3T172754	Spring 0.437"OD 0.5"LG HASTELLOY	2
37	W2T507727	Spring	2
38	W3T161309	Spring	2
39	W3T167154	Pinion	1
40	W3T167155	Rack	1
41	W2T507719	Bellow	2

7.8.3 W3T159315 Spare parts kit V-2030 auto.

for 5 years

Pos	Part no.	Description		Quant.
1	W3T169194	O-ring	D46.99 x 5.33/FPM	10
2	W3T168890	O-ring	D47.6 x 6.35/CSM	25
3	W3T172748	O-ring	d24.77 x 5.33/CSM	10
4	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	25
5	W3T161684	Orifice unit		1
6	W3T171290	Seat		2
7	W3T171299	Shaft Assembly		1
8	W3T173135	Gauge -1000 mbar	NS80/110; NPT1/8CBM; Cl_2	2
9	W3T163642	Clamp		1
10	W3T172743	O-Ring	d9.25 x 1.78/NBR	5
11	W3T170894	Shaft seal	D19/10.5; D8.9;x 4/0.8 / PTFE	10
12	W3T161281	Gasket	PVC-P; D63.5 x 51 x 3	5
13	W3T168902	Glass		2
14	W3T161282	Gasket		10
15	W3T159397	Collar		1
16	W3T161284	Spring		2
17	W3T161289	Gasket	PVC-P; d63.5/51 x 2	5
18	W3T169110	Union nipple	PVC; 1/4NPT x 1/2-20 UNF-2A	1
19	W3T169111	Union nut	PVC; 1/2-20UNF-2B	2
20	W3T172760	Union elbow 90°	PVC; 1/4-18NPT x 1/2-20UNF	1
21	W3T168910	O-Ring	d47.6 x 9,5/CSM	10
22	W2T505671	Hose	Id6,35 x 1.6 mm/1/4" x 3/8"/PE	3 m
24	W3T159861	Diaphragm unit		2
25	W3T169068	O-ring	D13.94 x 2.62/FPM	10
26	W3T168938	O-ring	d196.52 x 2.62/CSM	10
27	W3T172753	Spring		2
28	W3T163279	Stem		4
29	W3T167393	Valve stem		1
30	W3T173010	O-ring	D28.17x3.53/FPM	5
31	W3T168912	Spring		1
32	W3T168924	O-ring	d123.42 x 3.53/FPM	5
33	W3T167076	Seat		1

Pos	Part no.	Description		Quant.
34	W3T159817	Diaphragm unit		2
35	W3T167099	Stem holder		1
36	W3T172754	Spring	0.437"OD 0.5"LG HASTELLOY	2
37	W2T507727	Spring		2
38	W3T161309	Spring		2
39	W3T167154	Pinion		1
40	W3T167155	Rack		1
41	W2T507719	Bellow		2
42	W3T161735	Positioner motor	230V +/-20%; 50-60Hz	1

7.8.4 W3T159318 Spare parts kit Vacuum Regulator Valve

for 2 years

Pos	Part no.	Description		Quant.
1	W3T161835	Electrical heater	230 V; 55 W	1
2	W2T506383	Temperature switch	50°C+/-3°; 10 A/250 V	1
3	W3T172751	Diaphragm	ECTFE, 125 µM, D298	1
4	W3T168945	O-ring	D259.89 x 3.53/CSM	1
5	W3T170892	Gasket	D9.5 x 4.2 x 0.5/PVC-P	3
6	W3T161706	Stem assembly	Pure Tungsten (99,6%)	1
7	W3T161357	Spring		1
8	W3T159406	Seat		2
9	W3T169194	O-ring	D46.99 x 5.33/FPM	2
10	W3T168890	O-ring	D47.6 x 6.35/CSM	2
11	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	2
12	W3T172870	Gasket	D39 x 32 x 0.8; PB	2
13	W3T159618	Gasket		1

7.8.5 W3T159320 Spare parts kit Vacuum Safety Valve

for 2 years

Pos	Part no.	Description		Quant.
1	W3T159817	Diaphragm unit		1
2	W3T171094	Gasket	PVC-P; D61 x 46 x 1	4
3	W3T172753	Spring		1
4	W3T168938	O-ring	d196.52 x 2.62/CSM	2
5	W3T169086	O-ring	D 22 x 2 5/FPM	2

7.8.6 W3T159319 Spare parts kit Vacuum Regulator Valve

for 5 years

Pos	Part no.	Description		Quant.
1	W3T161835	Electrical heater	230 V; 55 W	2
2	W2T506383	Temperature switch	50°C+/-3°, 10A/250V	1
3	W3T172751	Diaphragm ECTFE	125 µm, D298	2
4	W3T168945	O-ring	D259.89 x 3.53/CSM	2
5	W3T170892	Gasket	D9.5 x 4.2 x 0.5/PVC-P	6
6	W3T161706	Stem assembly	Pure tungsten (99.6%)	2
7	W3T161357	Spring		2
8	W3T159406	Seat		5
9	W3T169194	O-ring	D46.99 x 5.33/FPM	5
10	W3T168890	O-ring	D47.6 x 6.35/CSM	5
11	W3T161283	Gasket	PVC-P; D61.9 x 46 x 3	5
12	W3T172870	Gasket	D39 x 32 x 0.8; PB	5
13	W3T159618	Gasket		2

7.8.7 W3T159321 Spare parts kit Vacuum Safety Valve

200kg/h; for 5 years

Pos	Part no.	Description		Quant.
1	W3T159817	Diaphragm unit		1
2	W3T171091	Valve seat		1
3	W3T171206	Ball		1
4	W3T171094	Gasket	PVC-P;D61 x 46 x 1	10
5	W3T172753	Spring		2
6	W3T168938	O-ring	d196.52 x 2.62/CSM	5
7	W3T169086	O-ring	D 22 x 2 5/FPM	5

7.8.8 W3T158670 Spare parts kit Safety Vent Valve

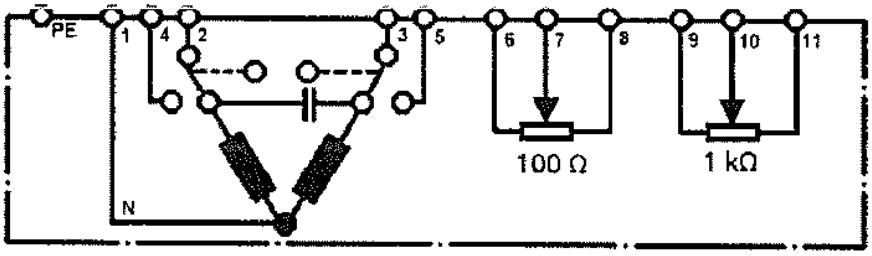
for 5 years

Pos	Part no.	Description		Quant.
1	W3T172724	O-ring	D20.22 x 3.53/FPM	10
3	W3T165515	Valve body assy.		1
5	W3T165193	Spring		1
6	W3T161334	Gasket	CSM; D32 x 25.4 x 3	10
7	W2T507221	O-ring	d5.28 x 1.78/CSM	5

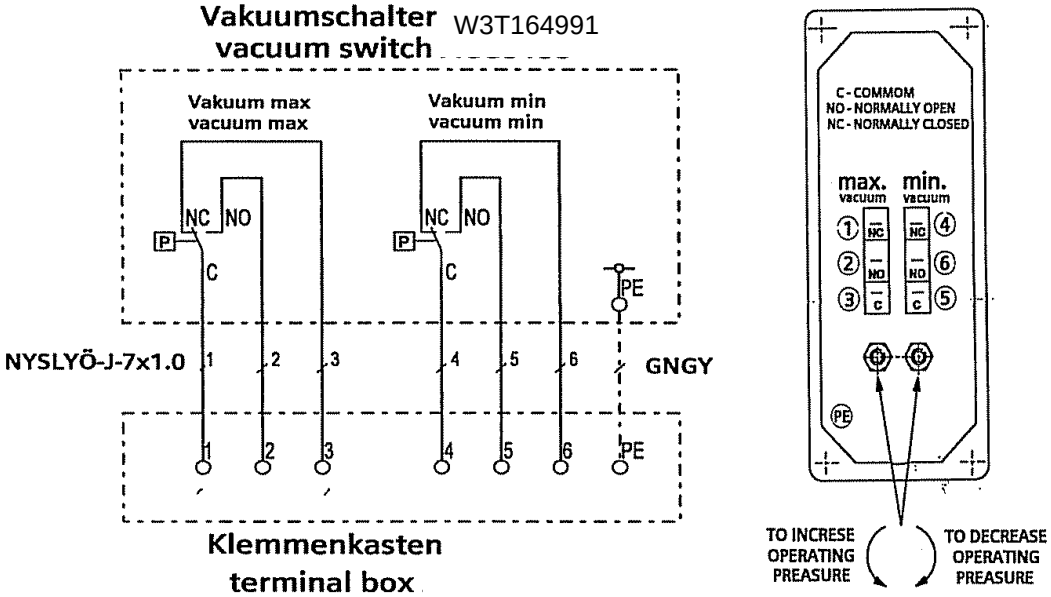
8. Wiring diagrams

8.1 Wiring diagram of the positioner

left-handed rotation right-handed rotation



8.2 Wiring diagram vacuum switch (optional)



W3T166427

Wallace & Tiernan® Products worldwide

Australia
+61 1300 661 809
info.au@evoqua.com

Canada
+1 905 944 2800
wtoe.can@evoqua.com

China
+86 21 5118 3777
sales.cn@evoqua.com

France
+33 1 41 15 92 20
wtfra@evoqua.com

Germany
+49 8221 9040
wtger@evoqua.com

Singapore
+65 6559 2600
sales.sg@evoqua.com

UK
+44 300 124 0500
info.uk@evoqua.com

USA
+1 800 524 6324
wt.us@evoqua.com

Wallace & Tiernan®
an EVOQUA brand

EVOQUA
WATER TECHNOLOGIES

Auf der Weide 10, 89312 Günzburg, Germany

+49 (8221) 904-0 www.evoqua.com

WT.025.030.000.DE.IM.0520
W3T162944 Issue 08-0520