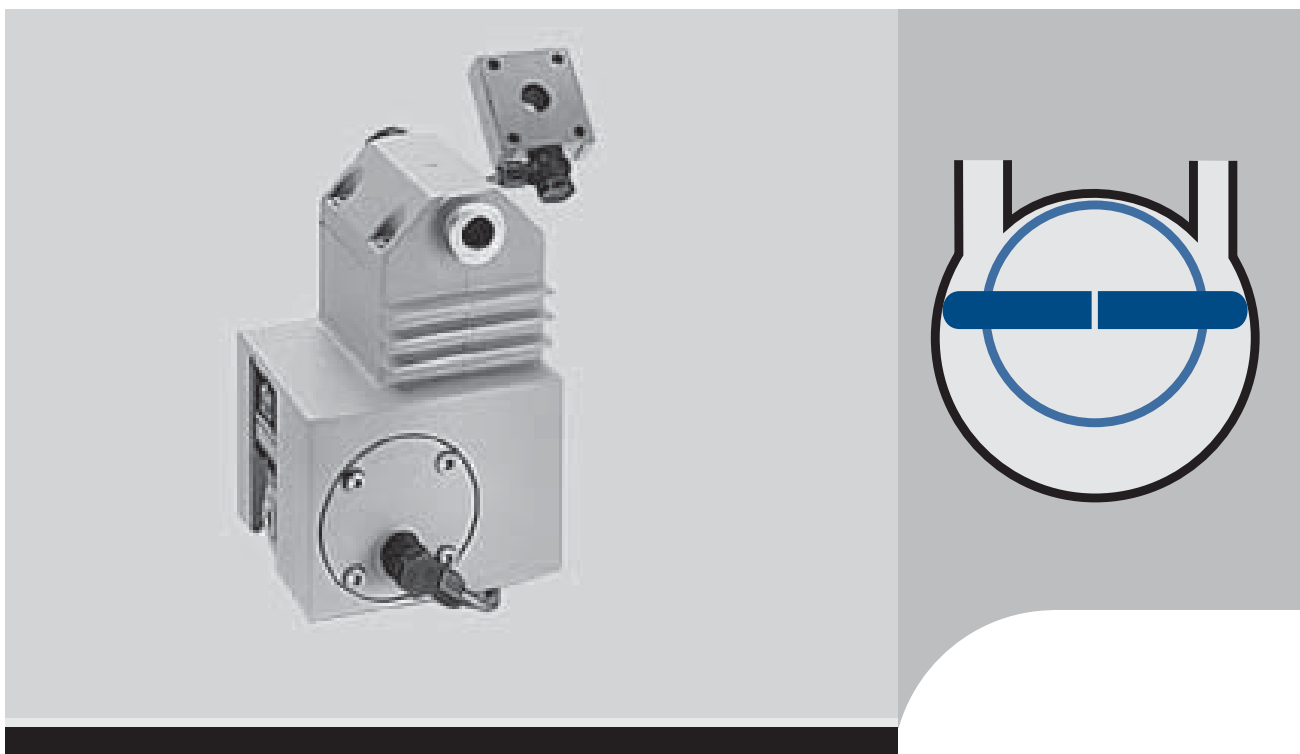


OPERATING INSTRUCTIONS

GA01298_1002



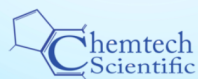
AR

Exhaust Filter with Lubricant Feedback

Cat.-No.

189 20/21/22

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Leybold Service

If a pump is returned to Leybold indicate whether the pump is free of substances damaging to health or whether it is contaminated.

If it is contaminated also indicate the nature of the hazard. Leybold must return any pumps without a "Declaration of Contamination" to the sender's address.

Disposal of Waste Oil

Owners of waste oil are entirely self-responsible for proper disposal of this waste.

Waste oil from vacuum pumps must not be mixed with other substances or materials.

Waste oil from vacuum pumps (Leybold oils which are based on mineral oils) which are subject to normal wear and which are contaminated due to the influence of oxygen in the air, high temperatures or mechanical wear must be disposed of through the locally available waste oil disposal system.

Waste oil from vacuum pumps which is contaminated with other substances must be marked and stored in such a way that the type of contamination is apparent. This waste must be disposed of as special waste.

European, national and regional regulations concerning waste disposal need to be observed. Waste must only be transported and disposed of by an approved waste disposal vendor.

Figures The references to diagrams, e.g. (1/2) consist of the Fig. No. and the Item No. in that order.

We reserve the right to modify the design and the specified data. The illustrations are not binding.

The icon indicates procedures that must be strictly observed to prevent hazards to persons.

Warning

This special icon warns about dangers caused by high electric voltages. Touching parts at a high voltage can result in immediate death.

Covers which are marked with this icon must only be removed by trained electricians after having reliably disconnected the electric power source.

Warning

Indicates procedures that must strictly be observed to prevent damage to, or destruction of the equipment.

Caution

Emphasises additional application information and other useful information provided within these Operating Instructions.

Note

1 Description

1.1 Design and Function

The AR is an exhaust filter with a lubricant feedback controlled by a float-operated valve. It is attached to the exhaust adapter of the respective TRIVAC B/BCS pump.

The easy interchangeability (alternative vertical or horizontal connection) of the intake adapter and the functioning of the intake adapter valve are unaffected by the installation of the AR.

The oil mist and aerosols are trapped and eliminated in the filter element. Volatile substances and aromatic substances pass through the filter.

Depending on the nature of the volatile substances and aromatic substances, it is advisable to connect an additional exhaust line.

An exhaust line fulfilling the safety requirements concerned is imperative if poisonous gases or vapours are filtered.

Observe the applicable safety regulations for the media which are pumped.

Warning

Description

The oil separated in the casing of the AR is collected.

When a certain oil level is exceeded, the built-in float valve opens the fluid suction port.

The oil is sucked out of the collecting basin of the AR and brought back into the circulation via the intermediate piece (1/10) below the intake adapter (1/12) due to the fact that the pressure in the collecting basin is greater than that below the intake adapter when the pump is running.

The float then sinks, closing the fluid suction port. The oil level, which is again slowly rising, causes the same course of events as described above.



Wastes and cracking products of the oil can clog the filter during operation causing excess pressure in the pump.

An excess pressure valve is built into the exhaust filter so that the excess pressure does not exceed a permissible value (approx. 1.5 bar; 22 psig) damaging the pump or motor.

If the filter is clogged, the built-in excess pressure valve opens so that the oil mist emitted by the pump escapes directly into open air. Possible damage caused by accumulating excess pressure is therefore prevented.

However, oil contamination is not removed from the exhaust gas any longer.

1.2 Technical Data

AR		4-8	16-25	40-65
Use with pumps		S/D 4 B S/D 8 B	S/D 16 B/BCS S/D 25 B/BCS	S/D 40 B/BCS S/D 65 B/BCS
Connection flange	DN	16 KF	25 KF	40 KF
Weight	kg	3,1	4,7	8,5
Amount of lubricant required to open the float valve				
- Mineral oil	cm ³	430	510	760
- PFPE	cm ³	290	340	420
Remaining amount of lubricant				
- Mineralöl	cm ³	350	430	700
- PFPE	cm ³	250	300	390
Cat.-no.				
AR		189 20	189 21	189 22
Replacement filter element FE		189 71	189 72	189 73 (2x)
Cat.-no.				
Connecting parts (necessary for connection of additional components)				
Centering ring		183 26	183 27	183 28
Clamping ring		183 41	183 42	183 43

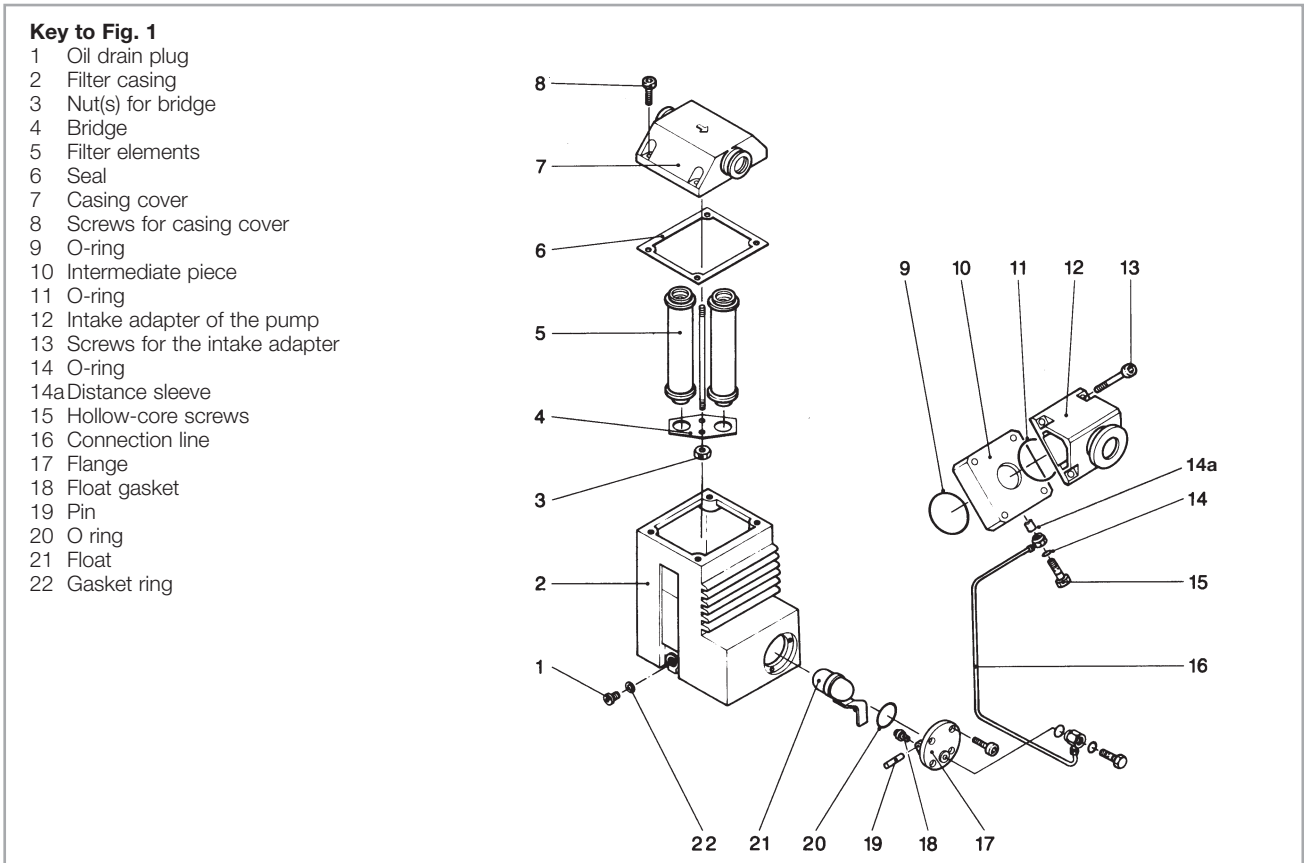


Fig. 1 Exploded diagram of AR 40-65 (AR 4-8 and AR 16-25 are similar)

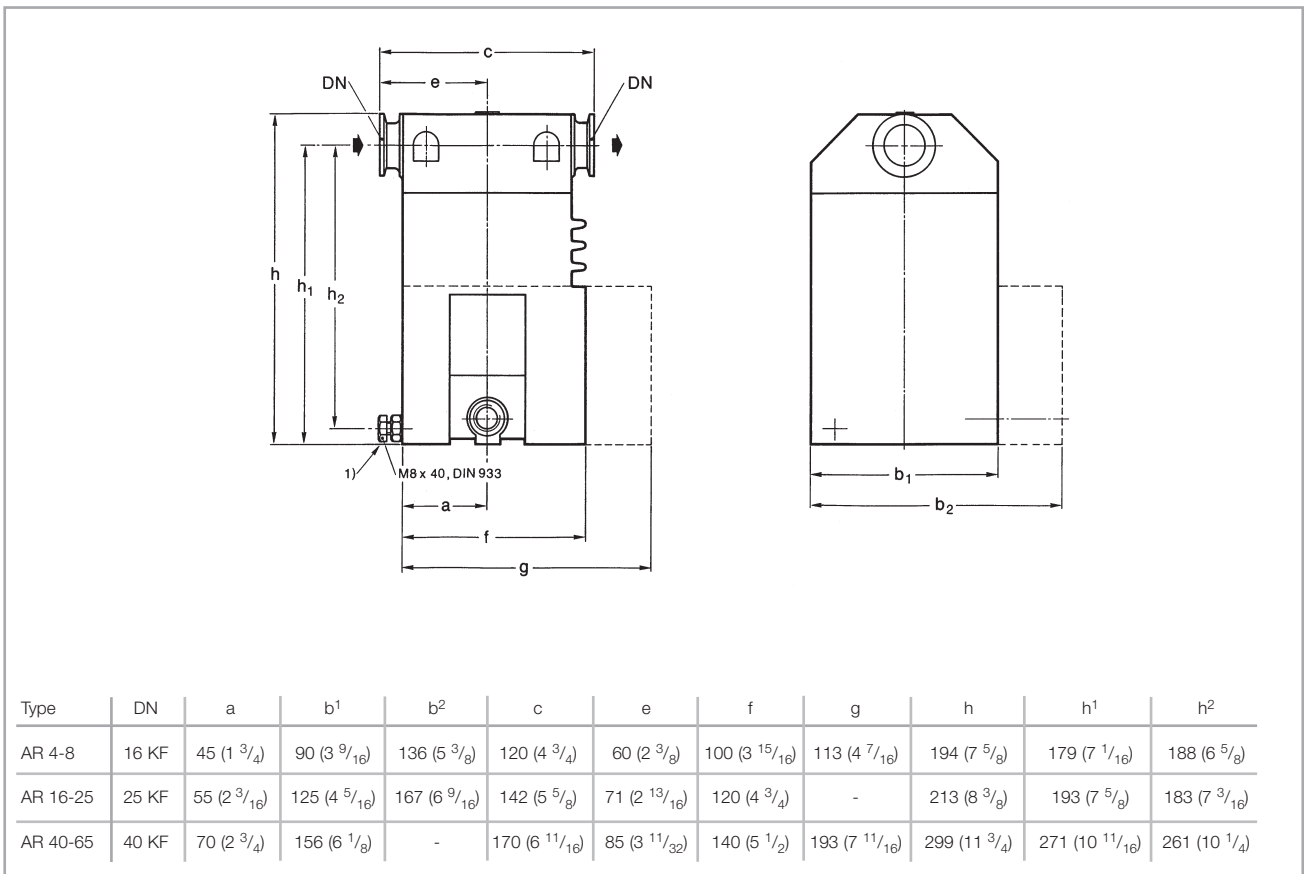


Fig. 2 Dimensioned drawing of the AR

1.3 Scope of Supply

The exhaust filter AR is supplied complete with lubricant feedback including intermediate flange and the necessary seal rings, connection lines with hollow-core screws and the required seal rings as well as longer fastening screws for the intake flange.

For transport the AR is sealed airtight in foil. It can be used alternatively with mineral oil (e.g. N62; HE-200 in the USA) or with the special lubricant perfluoropolyether (PFPE; e. 9. NC 1/14 or HE-1600 in USA).

Caution

When using PFPE please observe any notes as to this lubricant mentioned in the Operating Instructions of the pump and in the Operating Instructions 07.009 „PFPE for vacuum pumps“.

Warning



Only use original spare parts from Leybold.

During installation work and servicing be careful so as not to spill any oil. There is the danger that someone might slip on spilt oil.

Wear suitable safety clothing.

2 Installation

Required tools:

6 mm hexagon socket spanner,

13 mm and 19 mm open jaw or ring spanners

Remove the intake adapter of the TRIVAC BCS or B pump to be converted

Loosen and unscrew screws (1/13). Inspect the O ring in the intake adapter to see if it is in perfect condition, replace if necessary with the new O-ring supplied.

The intake adapter of the TRIVAC 16/25 B/BCS contains a panel as a sealing surface for the intake adapter valve. Remove this panel during assembly.

Caution

Clean the sealing surface of the pump and then mount the intermediate piece (1/10) with the cleaned, inlaid O-ring (1/19).

Attach the intake adapter (1/12) along with an O ring (1/11) in perfect condition and screw it tight with the screws included in the scope of supply.

Loosen the 4 screws (1/8) and pull the cover off the filter casing(1/7). Pour the (remaining) amount of lubricant specified in the technical data (refer to Section 1) into the filter casing. Refasten filter cover to the casing.

Attach the filter casing (1/2) together with the cover (1/7) to the exhaust adapter of the pump using centering ring sealing ring and clamping ring.

Finally, loosen the counter nut on the support screw (2/1) of the filter casing and tighten the screw by hand so that it has tight contact to the pump casing and thereby supporting the exhaust filter casing.

The connection flanges must, however, be parallel to each other - not at an angle.

Caution

Now screw in the connection line (1/16) between the intermediate piece (1/10) and the filter casing (1/2).

The connection line with threaded pipe elbow is bent to fit exactly and tested for airtightness.

Equip the inner faces of each threaded pipe elbow with one O-ring (1/14).

Equip both hollow-core screws (1/15) with one O ring (1/14) each and, threading them through the threaded pipe elbows together with the distance sleeve (1/14a), tightly fasten to the intermediate piece (1/10) and to the opening on the filter casing (1/2).

The cutting ring fitting must not be loosened since otherwise leaks may occur.

Caution

The leak-tightness of the screw joints can be tested by measuring the final pressure of the pump. This must not be any higher with the feedback line than without it.

The TRIVAC BCS or B pump with exhaust filter and lubricant feedback is now ready for operation.

3 Operation and Maintenance

Attaching the AR reduces the lubricant consumption of the pump to an insignificant level.

This does not, however, affect the service life of the lubricant. Controlling the lubricant condition and changing the oil are therefore still necessary. It is not necessary to change lubricant PFPE in case of normal operation.

Since the AR has a lower operating temperature than the pump in operation condensates may accumulate in the AR when pumping vapours. The back-streaming of condensates (e.g. water) into the pump impairs the lubricant's quality.

That's why the AR should not be used when pumping condensable vapours. Please contact us if any questions as to this occur.

The filter element(s) (1/5) must occasionally be replaced. The interval between replacements depends on the conditions of use and the type of operation of the TRIVAC pump.

The dirtier the operation and the hotter the pump, the shorter the interval between necessary filter changes.

Cracking products of the oil clog the filter under normal operating conditions (not valid for PFPE). A clogged exhaust filter is therefore an indication of decreasing oil quality. For this reason, every time the filter element is changed, the oil and, if necessary, the chemical filter should be changed.

3.1 Oil Change

(not necessary with PFPE)

At every pump oil change you should replace the oil of the AR as well.

Required tools:

8 mm hexagon socket spanner.

Switch off pump.

Remove oil drain plug (1/1) and let the old oil drain off into an appropriate container.

Warning



Dangerous substances can escape from the filter and from the oil. Take appropriate safety precautions (e.g., use gloves, face masks or breathing masks).

Observe safety regulations.

Screw oil drain plug back on (check gasket (1/22), change if necessary).

Add the remaining amount of fresh oil specified in the technical data (refer to Section 1) into the pump (refer to the operating instructions for the pump in question).

3.2 Changing Filter Elements

(Description for AR 40-65, similar to AR 4-8 and AR 16-25, but only one filter element and one nut)

When using PFPE please observe any notes as to this lubricant mentioned in the Operating Instructions of the pump and in the GA 7.009 „PFPE for vacuum pumps“.

Caution

Required tools:

6 mm hexagon socket spanner

10 mm openjaw or ring spanner

Switch off pump.

Drain lubricant.

Dangerous substances can escape from the filter and lubricant. Take appropriate safety precautions! (e.g., use gloves, face mask or breathing mask).

Warning



Observe safety regulations!

Support up the filter casing (1/2) by placing wooden planks beneath it, for example.

Loosen 4 screws (1/8).

Loosen the small-flange connections between the exhaust adapter of the pump and the exhaust line.

Remove filter casing (1/2) and pull off the cover of the filter casing (1/7).

Loosen 2 nuts (1/3) on bridge (1/4) and remove bridge.

Replace the used filter elements with new ones. Make sure that the vulcanised seal of the filter elements is seated in the centering groove in the housing cover.

When disposing of used oil and spent filter elements, please observe the relevant environmental protection regulations.

Caution

Tightly screw bridge and nuts back on, paying attention to the correct fit of the filter elements in the openings of the bridge and casing cover.

Pour in lubricant again (for amount refer to technical data) and carry out an oil change on the pump (refer to corresponding operating instructions for the pump).

Check seal (1/6), change if necessary.

Flange-mount AR between exhaust adapter of the pump and exhaust line.

Screw filter cover (1/7) back on.

Tightening torque for the screws is 5 Nm.

3.3 Leybold Service

If equipment is returned to Leybold, indicate whether the equipment free of substances damaging to health or whether it is contaminated.

If it is contaminated also indicate the nature of the hazard. For this you must use a form which has been prepared by us which we will provide upon request.

A copy of this form is reproduced at the end of these Operating Instructions: "Declaration of Contamination of Vacuum Instruments and Components".

Please attach this form to the equipment or enclose it with the equipment.

This declaration of contamination is needed to meet the requirements of German Law and to protect our personnel.

Leybold must return any equipment without a "Declaration of Contamination" to the sender's address.

Warning



The equipment must be packed in such a way, that it will not be damaged during shipping and so that any contaminants are not released from the package.

Declaration of Contamination of Compressors, Vacuum Pumps and Components

The repair and / or servicing of compressors, vacuum pumps and components will be carried out only if a correctly completed declaration has been submitted. **Non-completion will result in delay.** The manufacturer can refuse to accept any equipment without a declaration.

A separate declaration has to be completed for every single component.

This declaration may be completed and signed only by authorised and qualified staff.

Customer/Dep./Institute: _____ Address _____ Person to contact: _____ Phone: _____ Fax: _____ Order number of customer: _____	Reason for returning <input checked="" type="checkbox"/> applicable please mark <input type="checkbox"/> repair <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> replacement <input type="checkbox"/> chargeable <input type="checkbox"/> warranty <input type="checkbox"/> DKD-calibration <input type="checkbox"/> Factory calibration Returning of goods because of following reason: <input type="checkbox"/> rent/loan <input type="checkbox"/> for credit <input type="checkbox"/> against exchange <input type="checkbox"/> exchange already received/arranged
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A. Description of the equipment (machine or component)	Ancillary equipment
Type: _____	_____
Part number: _____	_____
Serial number: _____	_____
Type of oil used: _____	_____

B. Condition of the equipment					
	No	Yes	No	Contamination:	No
1. Has the equipment been used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	toxic	<input type="checkbox"/>
2. Drained (Product/service fluid)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	corrosive	<input type="checkbox"/>
3. All openings sealed airtight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	microbiological	<input type="checkbox"/>
4. Purged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	explosive	<input type="checkbox"/>
If yes which cleaning agent:	_____			radioactive	<input type="checkbox"/>
and which method of cleaning:	_____			other harmful substances	<input type="checkbox"/>

C. Description of processed substances (Please fill in absolutely)			
1. What substances have come into contact with the equipment:			
Trade name and / or chemical term of service fluids and substances processed, properties of the substances; According to safety data sheet (e.g. toxic, inflammable, corrosive, radioactive)			
Trade name:	Chemical name:	Residues:	
a) _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	
b) _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	
c) _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	
d) _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2. Are these substances harmful?	Yes	No	
	<input type="checkbox"/>	<input type="checkbox"/>	
3. Dangerous decomposition products when thermally loaded	Yes	No	
Which:	<input type="checkbox"/>	<input type="checkbox"/>	

Components contaminated by microbiological, explosive or radioactive products will not be accepted without written evidence of decontamination.

D. Legally binding declaration	
I / we hereby declare that the information supplied on this form is accurate and sufficient to judge any contamination level.	
Name of authorised person (block letters): _____	
Date _____ Signature of authorised person _____	<div style="border: 1px dashed black; width: 100%; height: 40px; margin-bottom: 5px;"></div> Company stamp