HYDAC FILTER SYSTEMS

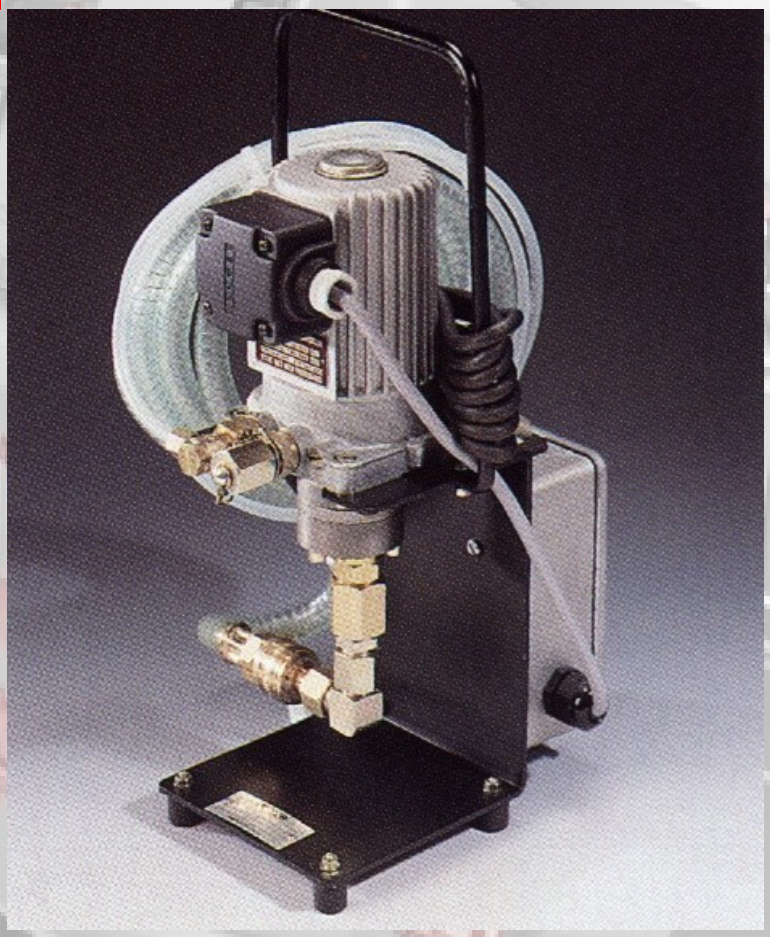
REU

ReservoirExtraction Unit

Operating and Maintenance Instructions

English (translation of original instructions)

Document no.: 3308817b



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Content

Preface

For you, as the owner of a product manufactured by us, we have produced this manual, comprising the most important instructions for its **operation** and **maintenance**.

It will acquaint you with the product and assist you in using it as intended in an optimal manner.

Keep this documentation in the vicinity of the product for immediate reference.

Note that the information on the unit's engineering contained in the documentation was that available at the time of publication.There may be deviations in technical details, figures, and dimensions as a result.

If you discover errors while reading the documentation or have suggestions or other useful information, please don’t hesitate to contact us:

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We look forward to receiving your input.

“Putting experience into practice”

Technical Support

If you have any questions, suggestions, or encounter any problems of a technical nature, please don't hesitate to contact us. When contacting us, please always include the model/type designation, serial no. and part-no. of the product:

Fax: ++49 (0) 6897 / 509 - 846

E-Mail: filtersystems@hydac.com

Modifications to the Product

We would like to point out that changes to the product (e.g. purchasing options, etc.) may result in the information in the operating instructions no longer being completely accurate or sufficient.

After modification or repair work that affects the safety of the product has been carried out on components, the product may not be returned to operation until it has been checked and released by a HYDAC technician.

Please notify us immediately of any modifications made to the product whether by you or a third party.

Warranty

For the warranty provided by us, please refer to the General Terms of Sale and Delivery of HYDAC FILTER SYSTEMS GmbH.

You'll find this under www.hydac.com -> Legal information

Using the Documentation

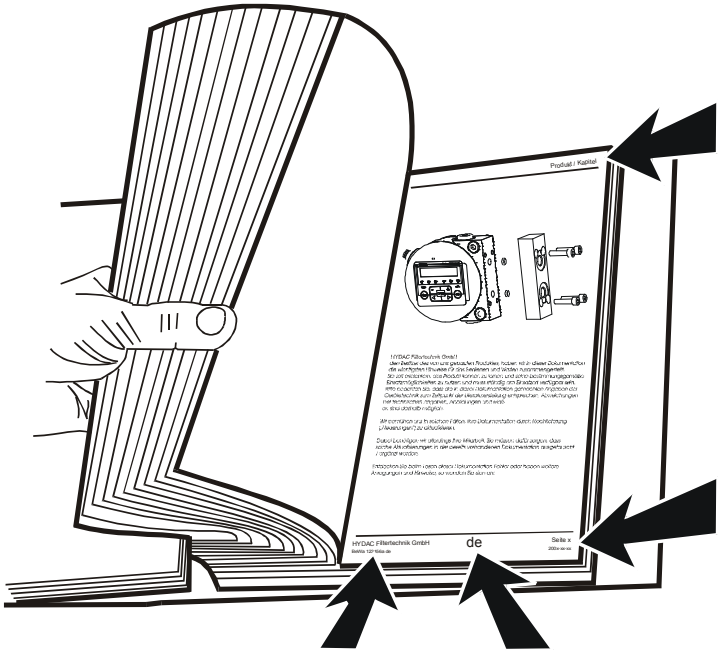
Note that the method described for locating specific information does not release you from your responsibility of carefully reading these instructions prior to starting the unit up for the first time and at regular intervals in the future.

What do I want to know?

I determine which topic I am looking for.

Where can I find the information I'm looking for?

The documentation has a table of contents at the beginning. There, I select the chapter I'm looking for and the corresponding page number.



The documentation number with its index enables you to order another copy of the operating and maintenance instructions.
The index is incremented every time the manual is revised or changed.

Safety information and instructions

The unit was built according to the statutory provisions valid at the time of delivery and satisfies current safety requirements.

Any residual hazards are indicated by safety information and instructions and are described in the operating instructions.

Observe all safety and warning instructions attached to the unit. They must always be complete and legible.

Do not operate the unit unless all the safety devices are present.

Secure the hazardous areas which may arise between the unit and other equipment.

Maintain the unit inspection intervals prescribed by law.

Document the results in an inspection certificate and keep it until the next inspection.

Hazard symbols

These symbols are listed for all safety information and instructions in these operating instructions which indicate particular hazards to persons, property or the environment.

Observe these instructions and act with particular caution in such cases.

Pass all safety information and instructions on to other users.

General hazard

Danger due to electrical voltage / current

Exposed electrical components

Danger of electrical shock

Danger due to operating pressure

Risk of burns due to hot surfaces

Substances that are health hazards or irritants

Danger from explosive atmosphere

Use the necessary tool

Signal words and their meaning in the safety information and instructions

DANGER

DANGER indicates a danger with a high risk and which will lead to death or serious injury if not avoided.

WARNING

WARNING indicates a danger with a medium risk and which can lead to death or serious injury if not avoided.

CAUTION

CAUTION indicates a danger with a low risk and which can lead to minor injury if not avoided.

NOTICE

NOTICE indicates a danger which will lead to damage to property if not avoided.

Structure of the safety information and instructions

All warning instructions in this manual are highlighted with pictograms and signal words. The pictogram and the signal word indicate the severity of the danger.

Warning instructions listed before an activity are laid out as follows:

HAZARD SYMBOL	**SIGNAL WORD** **Type and source of danger** Consequence of the danger ► Measures to avert danger

Observe regulatory information

Observe the following regulatory information and guidelines:

- Legal and local regulations for accident prevention
- Legal and local regulations for environmental protection
- Country-specific regulations, organization-specific regulations

Proper/Designated Use

Use the unit only for the application described in the following.

The REU is a portable, self-priming motor–gear pump unit enabling the oil cleanliness to also be measured in non-pressurized reservoirs using the FCU.

Any other use shall be deemed to be improper and not in keeping with the product's designated use.

The manufacturer will not assume any liability for any damage resulting from such use.

Proper or designated use of the product extends to the following:

- Maintaining adherence to all the instructions contained herein.
- Performing requisite inspection and maintenance work.

NOTICE

The pumping of non-permissible media

The unit will be destroyed

► Operate the unit using only:
- the mineral oils specified in DIN 51524; DIN 51525 or
- mineral-oil-based fluids as specified in DIN 1524-1 to DIN 1524-3, HLPD.

► Only pump mineral oils with a viscosity in the range from 20 … 800 mm²/s (100 … 3700 SUS).

Improper Use or Use Deviating from Intended Use

DANGER

Danger due to unanticipated use of the unit

Bodily injury and damage to property will result when operated improperly.

► Never operate the unit in potentially explosive atmospheres.

► The unit is only to be used with permissible media.

Any use extending beyond or deviating therefrom shall not be considered intended use. HYDAC Filter Systems GmbH will assume no liability for any damage resulting from such use. The user alone, shall assume any and all associated risk

Improper use may result in hazards and/or will damage the unit. Examples of improper use:

- Operation in potentially explosive atmospheres.
- Operation under non-approved operational conditions.
- Operation when the safety devices are defective.
- Modifications to the power unit made by the user or purchaser.
- Inadequate monitoring of parts that are subject to wear and tear
- Improperly performed repair work.
- Operation with a non-permissible media or operating fluid, such as for example: with water, acids, solvents, aggressive liquids, oil sludge or sediment.
- Operation without a suction strainer

Qualifications of personnel / target group

Persons who work on the power unit must be aware of the associated hazards when using the power unit.

Operating and specialist personnel must have read and understood the operating instructions, in particular the safety information and instructions, and applicable regulations before beginning work.

The operating instructions and applicable regulations are to be kept so they are accessible for operating and specialist personnel.

These operating instructions is intended for:

Operating personnel: such persons have been instructed in power unit operation and are aware of potential hazards due to improper use.

Specialist personnel: such persons with corresponding specialist training and several years work experience. They are able to assess and perform the work assigned to them, they are also able to recognize potential hazards.

Activity	Person	Knowledge
Transport / storage	Auxiliary personnel	▸ No specialist knowledge required
Hydraulic / electrical installation,	Auxiliary personnel	▸ Product-specific knowledge
Commissioning troubleshooting, maintenance, decommissioning, disassembly	Auxiliary personnel	▸ Product-specific knowledge ▸ Knowledge about how to handle operating media.
Operation Operations control	Auxiliary personnel	▸ Product-specific knowledge ▸ Knowledge about how to handle operating media.
Disposal	Specialist personnel	▸ Proper and environmentally-friendly disposal of materials and substances ▸ Decontamination of contaminants ▸ Knowledge about reuse

Wear suitable clothing

Loosely worn clothing increases the danger of getting caught or wound up in rotating parts and the danger of getting snagged on protruding parts. You can be severely injured or killed.

- Wear close-fitting clothing.
- Do not wear any rings, chains or any other jewelry.
- Wear work safety shoes.

Stoppage in an emergency (EMERGENCY STOP)

In an emergency, switch the unit off at the main switch or unplug the power connector.

Unpacking the unit

Before delivery, the unit is checked for leaks and proper functioning at the factory, and is then properly packed.

Upon receipt of the unit, check for any damage from transportation.

Dispose of the packaging material in an environmentally friendly manner.

Transporting the unit

Only transport the unit using its handle or with it standing on its rubber feet.

When transporting the unit, never pick it up by its attachments or components.

Storing the unit

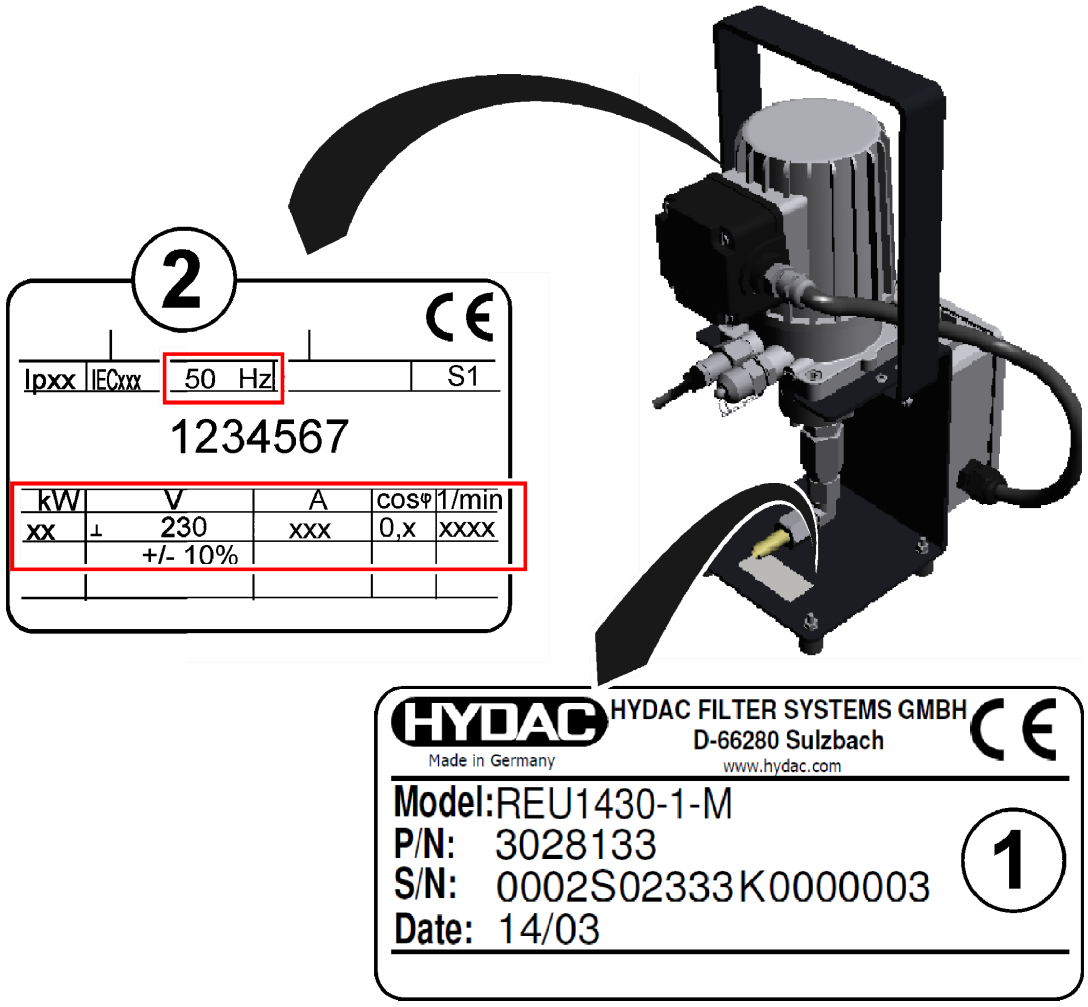
Drain the unit completely, including its cartridge, before putting it into storage. Pull out the power plug and securely fasten the hoses and power cord to the unit.

Store the unit in an upright position in a clean, dry (non-condensing) space.

Storage temperature:	-20 … 60 °C
Humidity:	up to 80% relative humidity, non-condensing
Air	Clean, salt-free air, not near oxidizing substances (rust film).
Storage duration	Indefinite. Before the unit is started up again after being stored for more than 2 years, we recommend replacing all seals and especially the hoses.

Decoding the model code label

Details for identifying the filtration unit can be found on the name plates on the unit and the components.



Item	->	Description
(1)	->	Name plate of filtration unit
(2)	->	Name plate of electric motor
Model	->	Model code; for details, see page **Fehler! Textmarke nicht definiert.**
P/N	->	Unit part no.
S/N	->	Unit serial number
Date	->	Year/week of production

Checking the scope of delivery

The REU ReservoirExtraction Unit REU comes packed and ready for operation. Before commissioning the unit, check the contents of the package to make sure everything is present.

The following items are supplied:

Qty.	Designation
1	ReservoirExtraction Unit REU
1	Return-line hose, DN 4 (fix mounted)
1	Suction hose, DN 7 (not mounted)
1	Operation and Maintenance Instructions (this document)
1	EC declaration of conformity

Performance features

The REU ReservoirExtraction Unit is supplied as an accessory for the FCU 2000 or 8000 FluidControl Unit. It is a portable, self-priming motor–gear pump to enable the oil cleanliness to be measured also in non-pressurized reservoirs using the FCU.

The FCU itself permits direct measurements at measuring points in a pressure range of 1 ... 350 bar. For lower pressures < 1 bar, you need the REU.

With the REU, the oil to be analyzed is sucked from the non-pressurized reservoir and is supplied at a pressure of 20 bar to the FCU for measurement. The REU vents itself automatically.

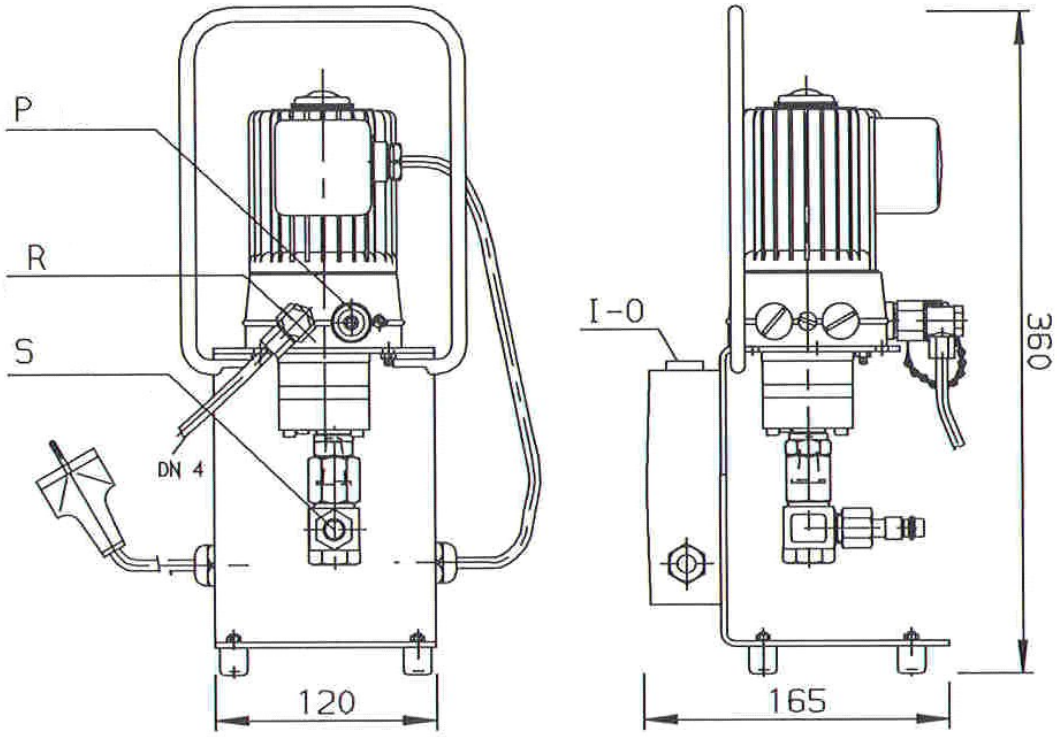
Function description

The oil to be analyzed is suctioned at port (s) via the suction hose and suction strainer and conveyed through a pressure channel in the direction of (P). The oil pressure causes the relief valve to close. If air is sucked in (as a result of the oil level in the reservoir/tank being too low) the bleed valve will remain open to separate off the air or oil mixed with air into the return channel (R) and the securely mounted return hose.

The pressure relief valve also allows excess oil to flow out into the return channel.

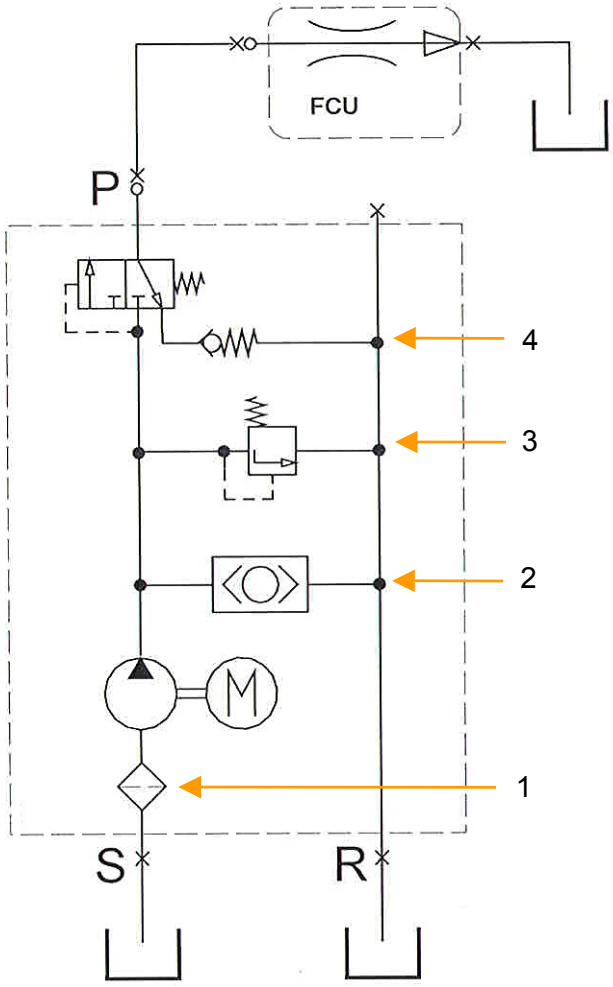
Once the REU is switched off, the spring-loaded relief valve will open. The system pressure (accumulator in the FCU) at the pressure inlet (P) can now be released to a low residual pressure via the relief valve.

Dimensions



Item	**Designation**
P	Pressure port connection
S	Suction port connection
R	Return port connection

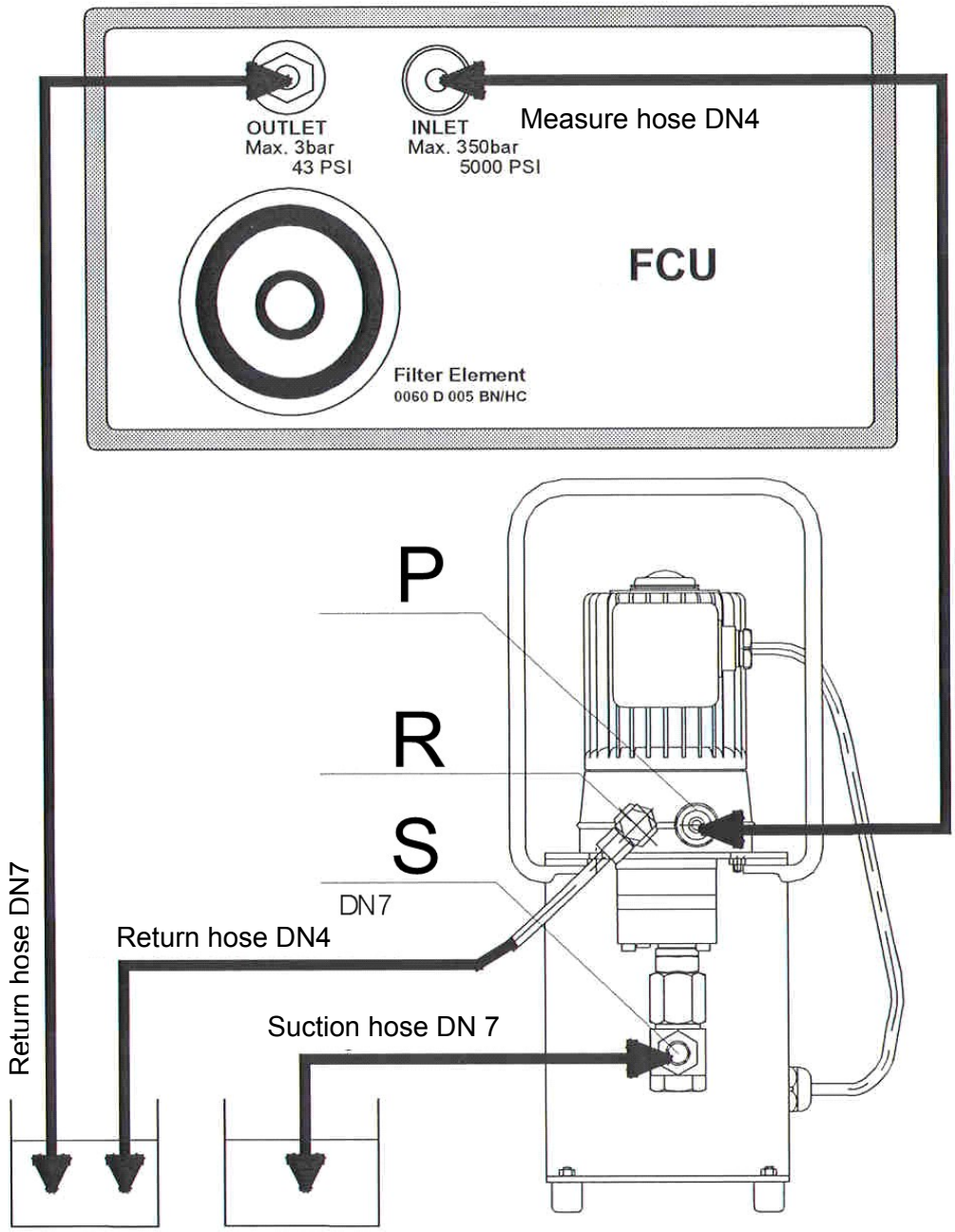
Hydraulic diagram



Item	**Designation**
FCU	FluidControl Unit
P	Pressure port connection
S	Suction port connection
R	Return port connection
1	Suction screen, 400 µm
2	Breather valve
3	Pressure relief valve
4	Safety valve

Connection, Commissioning

Hydraulic connection overview



Item	Description
FCU	FluidControl Unit
P	Pressure port connection
S	Suction port connection
R	Return port connection

Making the hydraulic connections to the unit

NOTICE

Return port connection (OUT) closed off

The unit will be destroyed

► Make sure that the return port is always open

Insert the return hose (DN7) with the quick release coupling into the FCU's return connection (OUTLET). Put the open end into a suitable container (hydraulic tank or any other reservoir).

Only connect the REU to a hydraulic line, if you have ensured that the pressure is less than 3 bar and that no pressure swings (e.g. pulses) are to be expected.

Put the return hose from the REU (DN4) from connection (R) into the same container as the return hose from the FCU.

Screw the measurement hose (DN4) with its connector onto the FCU's reverse connection (INLET). Twist the other end (DN2) onto the REU's pressure port (P).

With its quick release coupling, push the DN7 suction hose, (this is identical to the FCU's return hose) onto the REU's suction port. Connect the other end with the reservoir to be checked or dip it into the hydraulic tank to be checked.

Set the FCU's flow regulator to position 4. For most hydraulic oils, you will achieve a flow in the permissible range of 50 … 150 ml/min with this setting.

Electrical connection of the unit

For the 110 V / 230 V, 1 phase version, the filtration unit is supplied ready for connection with a plug.

DANGER

Exposed electrical terminals in the terminal box on the electric motor

Danger of fatal injury due to electric shock

► Any work involving the electrical system may only be done by a properly trained, certified electrician.

Remove the connector cable from its holder and unwind it completely.

Before plugging in the power plug, make sure that the On/Off switch is in the 0 or OFF position.

Compare the voltage and frequency specifications with those for your electrical supply. You will find the unit's electrical data on the electric motor's name plate.

Plug the power plug into a suitable power outlet.

Use the switch on the electric motor's terminal box to switch the unit on and off. The unit has a motor protection switch to protect it from electrical overload.

Measurement operation with the FCU 2000 / 8000

Switch the REU on via the mains switch. The pump will start to operate. The automatic ventilation goes into operation at the start. Air and oil exit the return-line hose. This process completes after a brief period of time. However, the return-line hose has to remain in the reservoir.

Switch on the FCU (On/Off switch on the rear side of the FCU).
When the FCU is switched on, various things are shown in the display, i.e. model no., firmware version, available memory, battery charge status, bus address and, possibly, error messages (cf. Error Messages / Troubleshooting chapter).

Example:

1. HYDAC FILTER SYSTEMS
FCU xxxx V3.xx
2. Memory: 25.4% 61
Battery: 13.49 V 80%
3. Bus address: 1
Battery: 13.49 V 80%
4. Viscosity:
20 …800 mm²/s
5. Measure -> OK/START
Abort -> STOP

While the FCU is starting up, check the setting the viscosity range of 5 ... 1000 mm²/s.
Should this viscosity range not be set, then the corresponding range must be selected prior to a measurement. See in this connection the operating and servicing instructions for the FCU

The following message will appear in the display after a brief period of time:

```
Measure  -> OK/START
Abort    -> STOP
```

The FCU is ready for operation.

Press the 

key in order to start with the measurement.

The measurement volume flow Q is displayed on the FCU monitor. This may vary between 50 ... 150 ml/min.. If necessary, this must be corrected/or a fine adjustment made to around 100 ml/min using the flow regulator.

As the air present in the REU as well as in the FCU must first be expelled from the system, it may take some time for the flow to stabilize.

The FCU is now in measurement mode and continuously displays the values measured.

For more details on using the FCU, please see its operation and maintenance manual.

Errors and troubleshooting

Error	Cause(s)	Remedy
No oil flow	The suction strainer is clogged	Check or clean the suction strainer.
	The suction hose is kinked or faulty or a shut-off device is closed	Check the suction hose for freedom of passage. Replace it if necessary.
	There is air in the suction line and the pump.	Fill the pump via the suction hose / hose coupling.
	The viscosity of the fluid is too high	Check the viscosity of the medium. Heat the medium to reach the permissible viscosity.
	The is no power to the electric motor.	Check the supply line to the filtration unit. Replace it if necessary.
	The electric motor or the pump is faulty	Contact HYDAC.
	The transport seals have not been removed.	Remove the transport seals. The transport seals are the yellow plastic bungs.

Performing Maintenance

Perform all maintenance work regularly.

DANGER

Exposed electrical lines

Danger of fatal injury due to electric shock

► Any work involving the electrical system may only be done by a properly trained, certified electrician.

► Disconnect the power plug before performing any work on the unit.

Perform the following steps in order to carry out the maintenance work.

Perform visual check

Regularly perform a visual check of the mains connector cable, the mains connection plug and the hoses. Replace damaged or brittle parts immediately.

Check the unit for leaks while it is operating. Replace damaged seals immediately.

Check/clean the suction strainer.

NOTICE

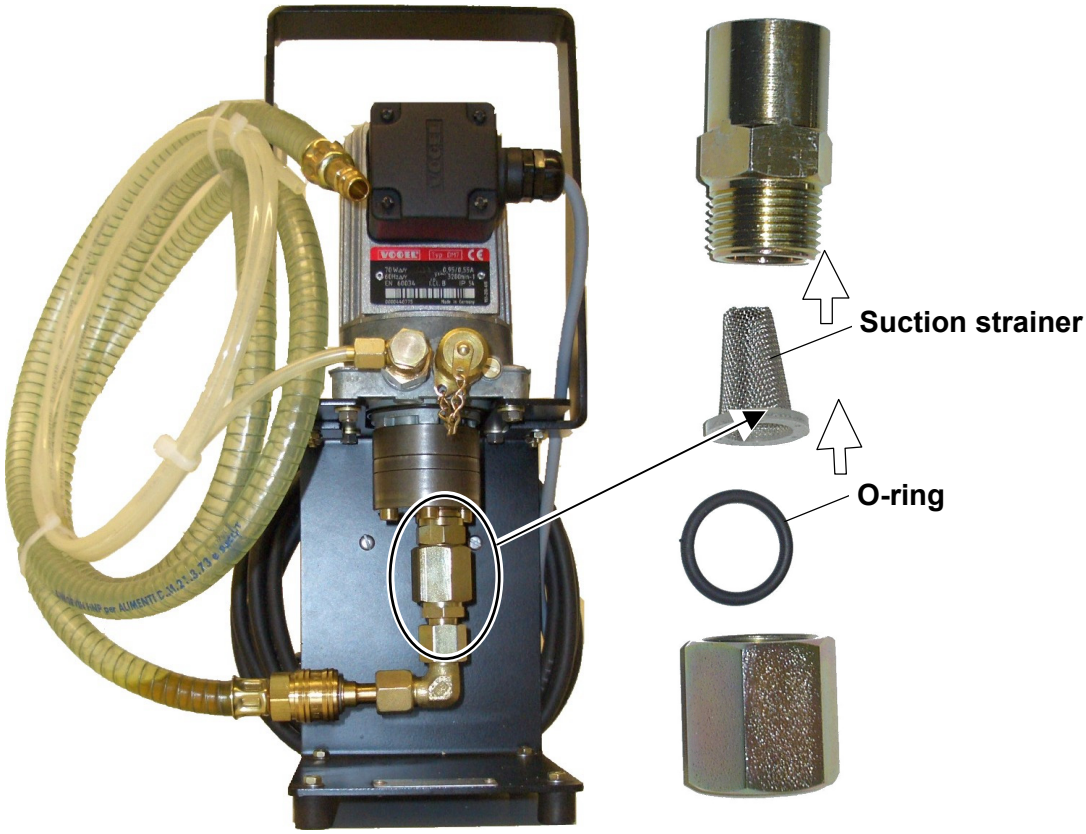
Suction strainer missing / operating without a suction strainer

The unit will be destroyed

- ► Never operate the unit without a suction screen.
- ► Check / clean the suction strainer regularly.

A strainer in integrated in the suction inlet (S) of the REU to protect the pump from coarse contamination. Clean the suction strainer regularly.

To do this, undo the suction side connector and remove the suction strainer. Clean the suction strainer by washing it out and then drying it with compressed air.



Check/clean the suction strainer immediately if insufficient fluid is sucked or pumped. The unit may not be operated without the suction strainer.

No falsification of the fluid purity is to be expected from the upstream 400 µm strainer.

Customer service

Regular inspection and maintenance work are indispensable to ensure trouble-free operation and a long service life for your unit.

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Taking the unit out of operation

Drain the unit completely, including all of its components, before taking it out of operation. Pull out the power plug and securely fasten the hoses and power cord to the unit.

Shutting down the unit

See chapter "Taking the unit out of operation".

Spare parts

The following spare parts are available for the unit:

Designation	Qty.	Part no.
Plastic pipe DN4, L = 2 m	1	617539
Insert sleeve for plastic pipe	1	612709
Suction hose DN 7	1	92649
Suction strainer	1	278475
O-ring for suction strainer	1	601981

Technical Data

General data	
Fluid temperature	0 … 70°C (32 … 158°F)
Ambient temperature	0 … 40°C (32 … 104°F)
Weight	~ 4.5 kg
Hydraulic data	
Operating pressure	Suction port (S): +/- 0.5 bar (+/- 7psi) Pressure port (P): 20 bar (290 psi)
Delivery action	0.5 l/min at 100 mm²/s (460 SUS)
Viscosity range	20 … 800 mm²/s (100 … 3700 SUS)
Max suction height	500 mm
Sealing material	NBR
Suction port (S):	Plug nipple DN7
Return port (R):	Return hose DN4
Pressure port (P):	Test point 1620

Electrical data for **REU 1430-M-xx**	
Voltage	230 V, 50 Hz, 1 Ph
Current consumption	0.4 A
Nominal power	70 W
Continuous duty rating	100%
Rotation speed	2700 rpm
IP class	IP 44
Insulation class	B
Electrical data for REU 1430-K-xx	
Voltage	120 V, 60 Hz, 1 Ph
Current consumption	0.9 A
Nominal power	70 W
Continuous duty rating	100%
Rotation speed	2700 rpm

IP class	IP 44
Insulation class	B
Electrical data for **REU 1430-U-xx**	
Voltage	24 V DC
Current consumption	0.9 A
Nominal power	70 W
Continuous duty rating	100%
Rotation speed	2700 rpm
IP class	IP 44
Insulation class	B

Model code

REU 14 3 0 - 1 - M

Basic type
REU = ReservoirExtraktion Unit

Model
14 = Standard

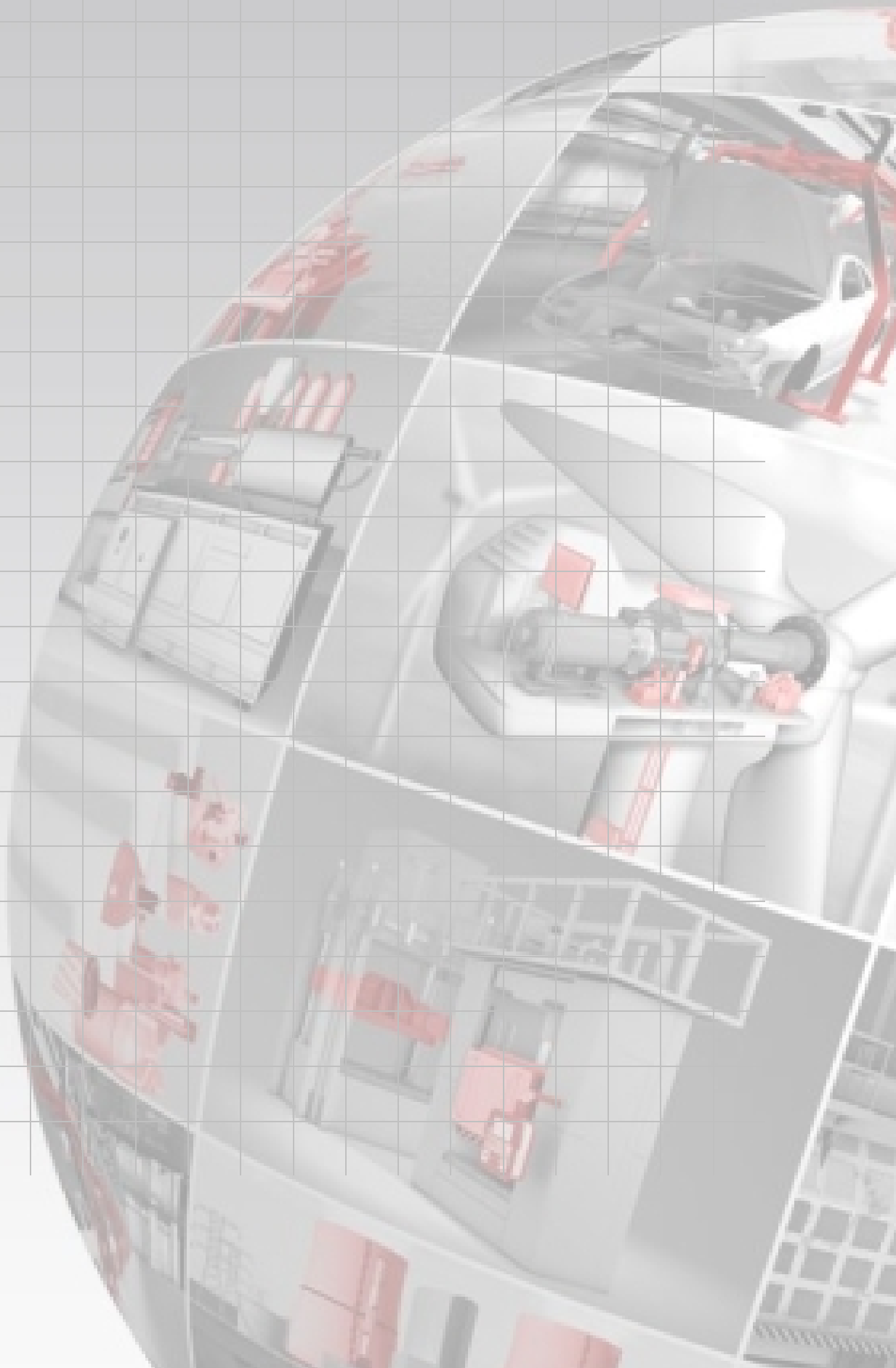
Motor / pump
3 = Standard

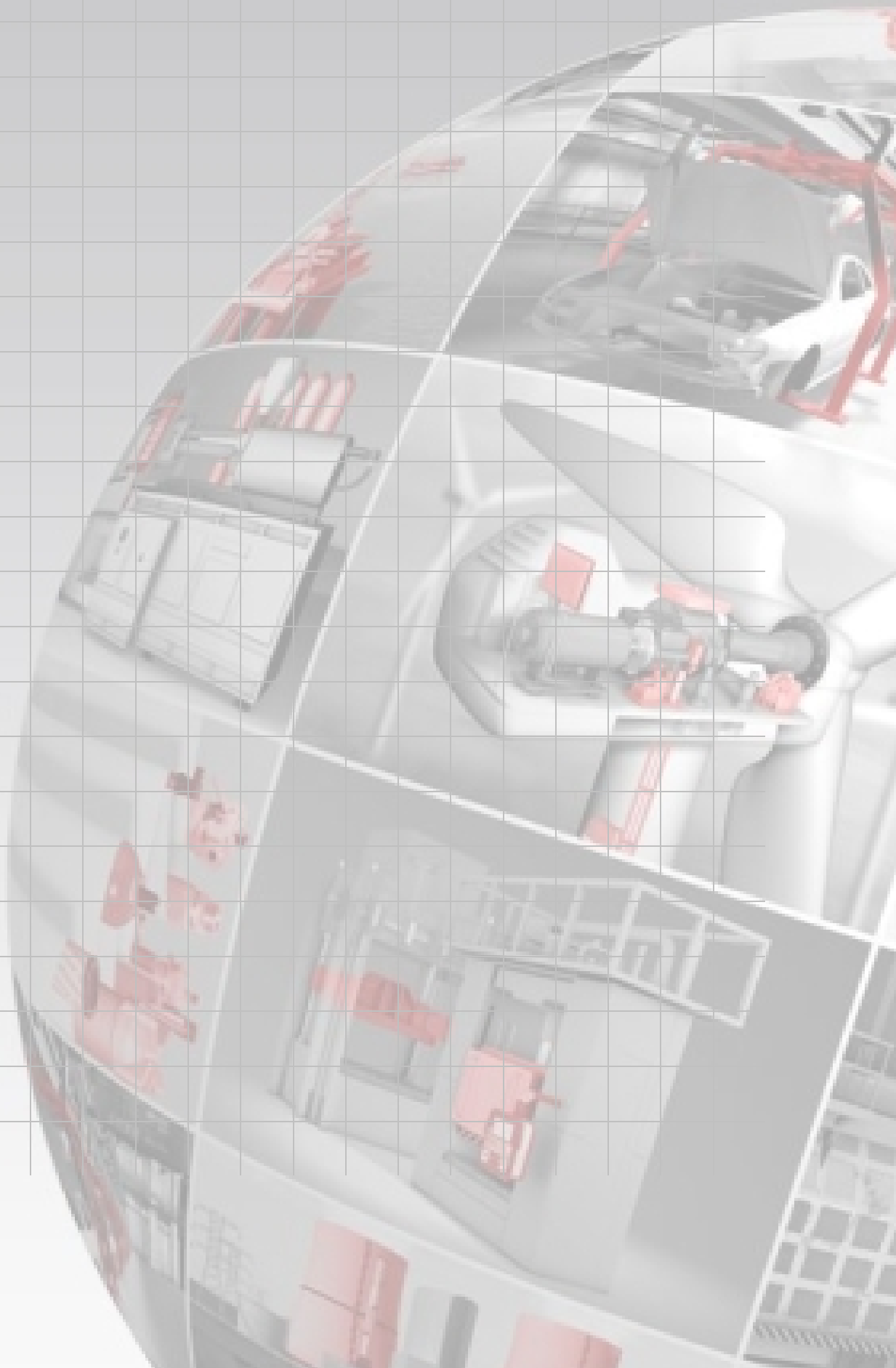
Fluids
0 = Mineral oil

Option
1 = Standard, without any options

Supply Voltage
K = 110 V AC, 60 Hz, 1 phase (USA / CDN)
M = 230 V AC / 50 Hz / 1 phase (Europe)

Index





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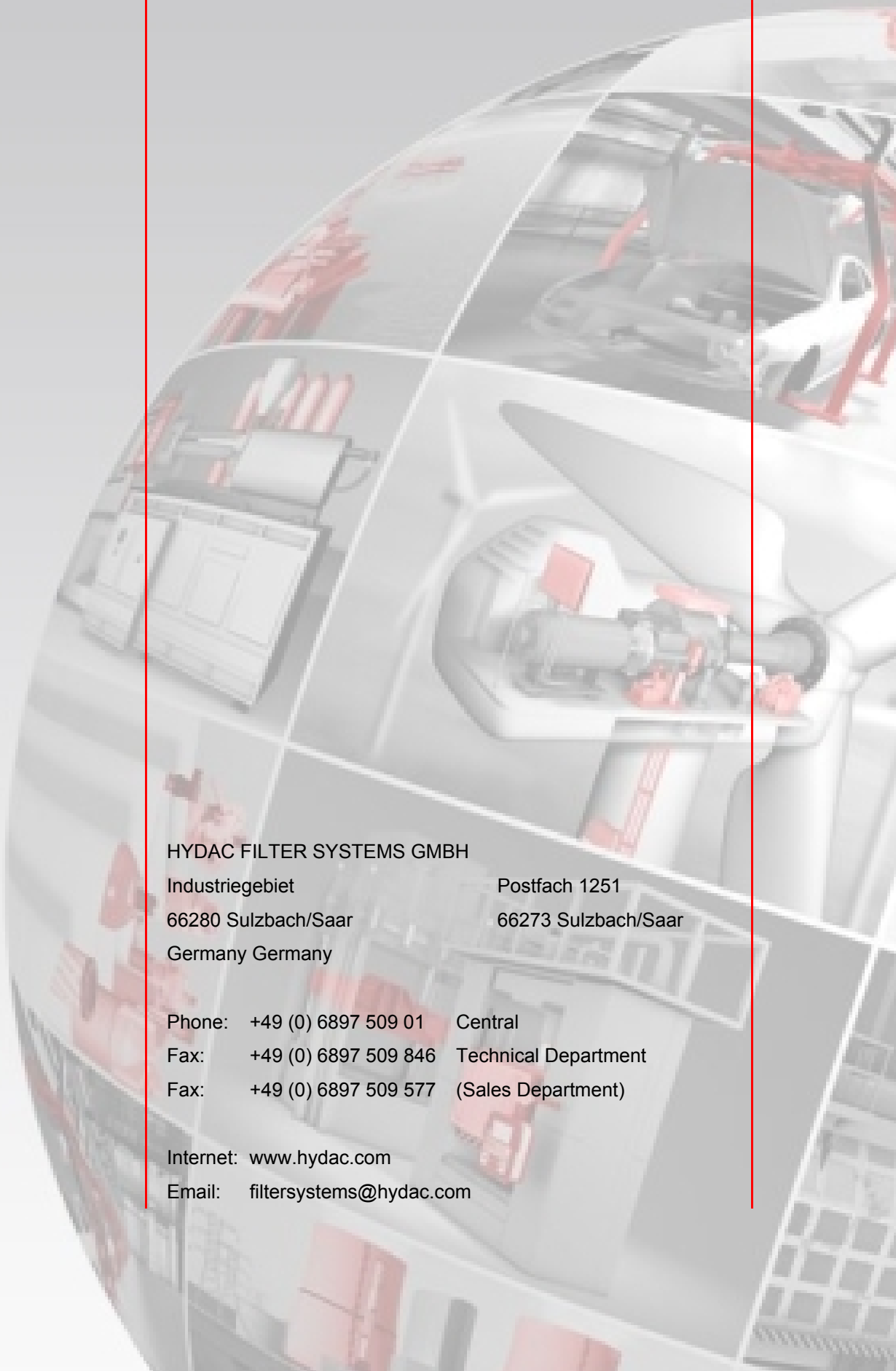

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