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Instruction-

and

Service Manual

Fischer

Plate Heat Exchanger

ATTENTION **READ CAREFULLY THESE OPERATING INSTRUCTIONS BEFORE MAKING CONNECTIONS AND START UP!**

OBSERVE ALL MENTIONED SAFETY MARKS !

OBSERVE WORKS INTERNAL OPERATING AND SAFETY RULES !

COMPLY WITH NOT MENTIONED NATIONAL REGULATIONS !

FOR SAFETY REASONS, DO NOT MAKE REBUILDS AND CHANGES OF PRODUCT WITHOUT CONSULTING SUPPLIER!

NON-OBSERVANCE OF REMARKS CAN LEAD TO
- **THREAT OF BODY AND LIFE**
- **DAMAGE OF DEVICES**

EXPLANATION OF SIGNS:

Non-observance of remarks can endanger persons

Warning of electric voltage (electric shock)

Special danger by agressive substances.
Use Protective Equipment !

ATTENTION **Safety remarks - when misregarded - resulting in possible danger for machines and function.**

26.03.15

1 GENERAL

ATTENTION

- **This operating instruction contains important information for**
  - **safe**
  - **appropriate**
  - **economic**

  operation of the pasteurising system.

- **Please read these instructions**
  - **completely and**
  - **exactly**

  and follow the instructions.

- **Non-observance of these remarks can lead to**
  - **threat of body and life**
  - **damage of system**

Plate Heat Exchangers of Fischer GmbH are

- developed especially for the **FOOD INDUSTRY** and **industrial applications**
- manufactured with **utmost care**
- subjected to **continuous quality control**
- of **high efficiency**
- **easy to service**

A wear allowance of 0 mm has been considered in the calculation.

2 SAFETY REMARKS

ATTENTION

- **The following work must only be done by qualified and instructed personnel:**
  - installation
  - connection
  - start up
  - operation
  - Inspection
  - maintenance

- **Erection:**
  - rrection site must have sufficient solidity
  - provide sufficient stability for unit
  - horizontal
  - sufficient space for servicing (min 90 cm on top and on sides of Plate Heat Exchanger)

- **Connections:**

Pipework:
- Stress or moments must not be exercised on the connections of the system (e.g. thermal expansion)
- dangerous parts of hot matters must be protected against contact
- pipework to be carefully cleaned (rinsed) before connection

Electric:
- connection only by authorised and qualified personnel
- only at disconnected (off-circuit) condition (danger for life by electric shock)
- observe suitable protective measures(e.g. protection earthing,grounding)
- observe connection conditions of local energy supplier
- cross section for connection as per standard
- observe nominal voltage of system
- relieve tension on feed wire connection
- observe direction of rotary field

• Start-Up:

ATTENTION

- only by qualified and instructed personnel
- check-up
  - Installation of system firm, stable, and horizontal
  - correct connections of
    - inlets
    - outlets
  - all screens,shrouds and lids in place
- observe the direction of rotation of pumps

• Operation / Attendance:

ATTENTION

- please observe:
  - national regulations
  - operating and safety regulations
  - works internal regulations
  - working regulations
- do never surpass mentioned technical data
- use system only for the defined purpose

- **protect against contact:**
  - hot system parts (surface temperature could reach 60°C or more)
  - incorrect escaping hot fluids

- **never remove during operation:**
  - covers of hot parts
  - other covers and safety devices

• Control:

ATTENTION

control regularly

- gaskets to detect leaking spots in time

• Maintenance:

- only by authorised and instructed personnel
- only at shut-down condition protected against re-start
- only without pressure in the system
- empty pipework before servicing
- let hot parts cool down
- observe maintenance and inspection instructions
- use only genuine spare parts
- never use force

• Use of dangerous matters:

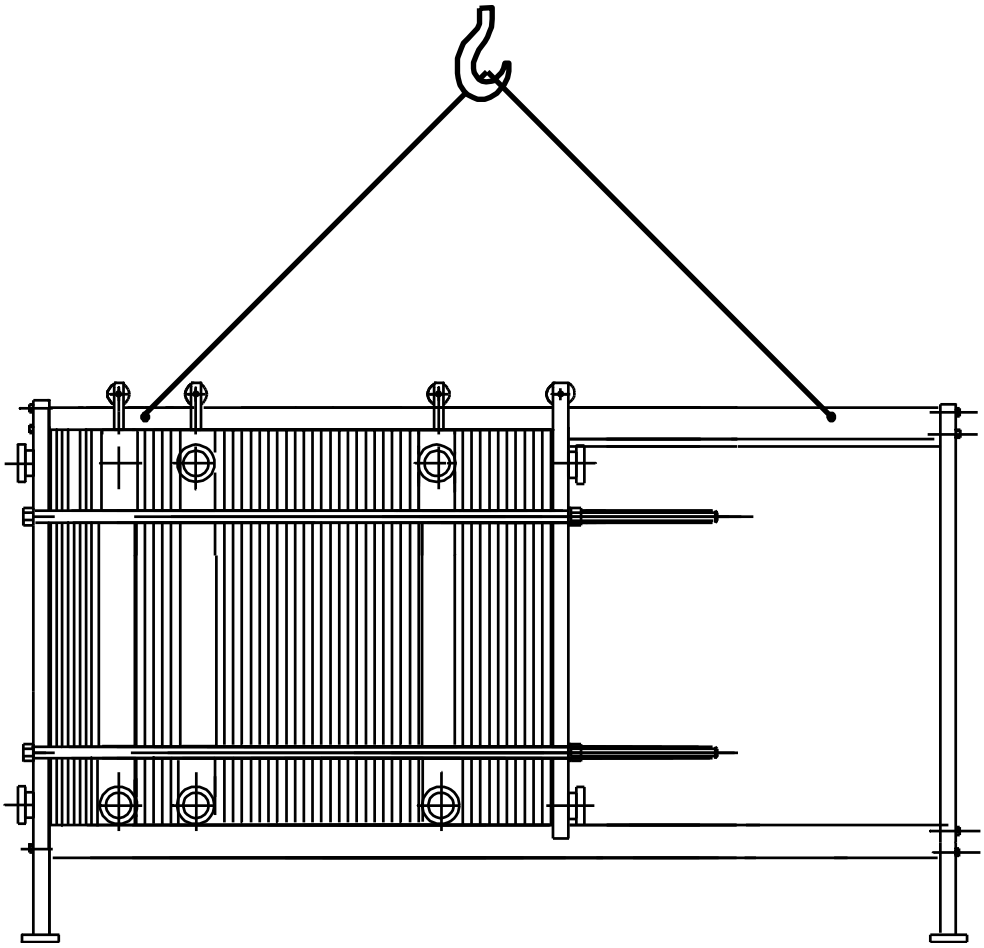
for cleaning purposes and exchange of gaskets **acid** and **caustic** solutions are used.
Observe the following for contact with acids and caustics
- make all required safety provisions
- observe legal regulations
- observe work internal regulations
- use
  rubber gloves
  apron
  safety glasses
- disposal of acids and caustics as per local regulations

For degreasing at change of gaskets the following substances can be used:
- light benzine
- adhesive-cleaner
- acetone
- toluol
- ketone
- spirit

When using these substances wear suitable breathing mask.
Please also observe fire hazards of these stubstances.

3 TRANSPORT

- make sure that transport is made professionally
- avoid concussions and shocks
- at the transport, the Plate Heat Exchanger must be protected against slipping
- the Plate Heat Exchanger has to be transported in horizontally position
- use the transport holes



4 STORING

- empty the Plate Heat Exchanger if it is not used for longer period
- disassemble and clean the Heat Exchanger
- assemble the Heat Exchanger again
  (gaskets must be dry)
- tension Heat Exchanger slightly
- close any connection pipework

5 CONNECTION PIPEWORK

ATTENTION

- use diameter for pipework of at least the same size as on Plate Heat Exchanger
- for enlargements use bell mouthed tapers
- install pipework at a distance of ≥90cm from Heat Exchanger
- fix pipework directly at connections
- pipes must not exert strain nor moments on Heat Exchanger (e.g. at thermal expansion) - adequate compensators are to be provided
- use flexible pipework (longitudinal), for connections of movable parts at Heat Exchanger (e.g. turnable bends or compensation pieces)
- connect pipelines according to labels (IN / OUT)
- use an overpressure safety device at inlet (maybe also at outlet)
- for CIP-cycles (cleaning in place) suitable pipes and fittings must be used
- in case of dangerous or very hot substances use covers or insulation (option)

Straines or moments exerted to Plate Heat Exchanger by pipework may cause leaks. Leaking hot substances may endanger life!

6 START UP / OPERATION

6.1 Preparation:

ATTENTION

- clean carefully pipework, tanks, a.s.f. and remove any foreign matter (e.g. weld particles, shavings, forge scales, packing material)

6.2 Before the first Start Up check the following:

- erection site must have sufficient solidity
- sufficient space for servicing (min. 90 cm on top and on sides of Plate Heat Exchanger)
- correct mechanical fastening
- correct pipe connection
- tensioning limits (see name plate)
- connection of all safety devices
- all covers in installed
- if necessary tighten the Heat Exchanger to the required tensioning limit (refer to enclosed operation diagram)

6.3 Filling:

The first operation of the Plate Heat Exchanger has to be made with clean water – never with the product!

- start pump at closed valve
- open control valve after pump slowly
- increasing of pressure and temperature have to be made slowly
- avoid pressure shocks in any case

Leaks at first start up may occur until
- operating pressure reached
- operating temperature reached
- all section are under pressure

6.4 After storing for a longer period:

If the Plate Heat Exchanger was stored for a longer period (more than some weeks) the unit can leak after start up. In this case it is necessary to retension the Heat Exchanger (see section 9)

6.5 Venting:

as soon as operating temperature and operating pressure is reached:
vent Plate Heat Exchanger
- air enclosed in Plate Heat Exchanger is deaerated by liquid stream

6.6 Permissible Pressure:

ATTENTION

indicated on name plate:

- **OPERATING PRESSURE:**
  max. pressure during operation
- **TEST PRESSURE:**
  max. pressure at which Heat Exchanger may be tested

Conditions for indicated pressure values:
- all sections under pressure

At big pressure differences between single sections leaks may occur.

6.7 Retensioning

If the Heat Exchanger is in operation for some weeks, the gaskets are adapted exact to the countours of the Heat Exchanger Plate.
Check the tightness after 4 weeks operation and retension the Plate Heat Exchanger a little bit.
Note section 9.

6.8 Operation:

ATTENTION

- **Avoid:**
  - unnecessary switching ON/OFF
  - pressure shocks
  - vibrations
  - concussions
- **Do not exceed:**
  - permissible density of pumping medium
  - max. permissible operating pressure
  - permissible temperatures for medium
- **Check regularly**
  - temperatures
  - pressure drops (increased pressure drop -> plates scaled)
  - leak proof of gaskets

FISCHER plate heat exchangers are produced with modern know-how, maximum accuracy and undergo extensive quality assurance. Despite this it is not possible to 100% exclude a defect in one of the plates. Therefore it is necessary to implement certain safety procedures to avoid the mixing the media (protection against overpressure, positive pressure gradient, conductance measuring, and so on). FISCHER is always available for your advice.
The producer isn't liable for secondary damages.

6.9 Taking Out of Operation:

- shut Valves of feed line slowly
- switch off Pump
- forced cooling down or letting cool off

7 DISASSEMBLING

- pumps must be switched off
- Heat Exchanger and pipework must be without pressure
- Heat Exchanger and medium must be cooled down
- close shutting devices for feed and discharge
- empty Heat Exchanger
  - collect liquids
  - deposit medium in accordance to law
- disconnect pipework

for dangerous substances:

- exclude danger for persons and environment
- comply with law and order
- wear protective clothing
- clean and/or neutralize Heat Exchanger

8 STORING

- **Disassembling**
  - as discribed in section 7
- **Storing**
  - empty Heat Exchanger completely
  - let dry up Heat Exchanger
  - close:
    - inlet union
    - outlet union
  - store Heat Exchanger in dry place

9 RETENSIONING OF PLATE HEAT EXCHANGER

ATTENTION

The Retensioning procedure is allowed to be done only at a Plate Heat Exchanger without any pressure.
All pressures have to be decreased to zero.

The tensioning limit is the limit between frame plate (4) and the pressure plate (10) (measured on side of plate pack) i.e. size of plate pack.

This size must be within the values shown on the name plate.
If medium leaks out between single plates of the heat exchanger retensioning of the Plate Heat Exchanger might be necessary.

Retensioning Process:

- remove the nuts (12a) versus clockwise
- tighten all tensioning nuts for tensioning bolt (12) clockwise
- observe to
  - tighten tensioning nuts for tensioning bolt (12) crosswise
  - parallelism between frame plate (4) and pressure plate (10)
  - tensioning limit as shown at the name plate (between min. and max.)
- fix the tensioning nuts for tensioning bolt (12) by mounting the locking nuts (12a)

If minimum limit as shown at the name plate is reached and heat exchanger is still leaking
gaskets have to be renewed.
Please also check as described in section 14 if there could be another fault.

9.1 Retensioning after first start up or gasket change

If the Heat Exchanger is in operation for some weeks, the gaskets are adapted exact to the countours of the Heat Exchanger Plate.
Check the tightness after 4 weeks operation and retension the Plate Heat Exchanger a little bit.

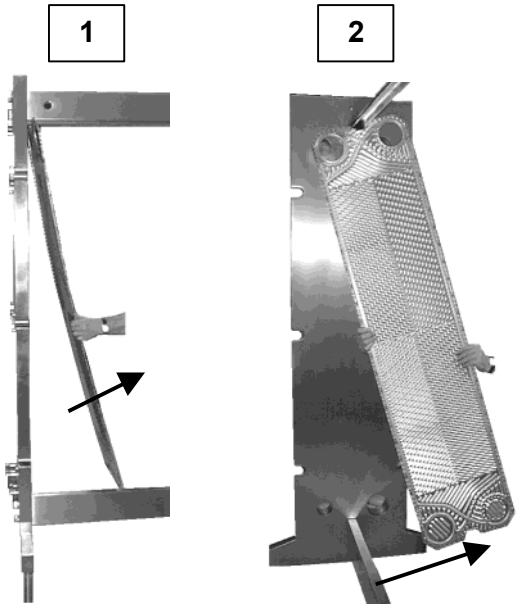
10 MANUAL CLEANING OF PLATE HEAT EXCHANGER

10.1 Disconnect pipework from pressure plate

- disconnect pipework from pressure plate as described in section 5

Taking Out Heat Exchanger Plates

- remove the nuts (12a) versus clockwise
- losen all nuts for tensioning bolt (12) crosswise
- unscrew nuts for tensioning bolt (12) from tensioning bolt (1)
- remove washer for tie bar (13)
- remove tensioning bolts (1)
- push pressure plate (10) away from plate pack
- swing out first heat exchanger plate at bottom 20 - 30 cm in longitudal direction **[1]**
- swing out plate laterally under an angle of 30 - 45° **[2]**



- take the plate off the frame
- remove plate by plate in the same manner
- observe the sequence and face position of plates - after cleaning they must be installed back the same way

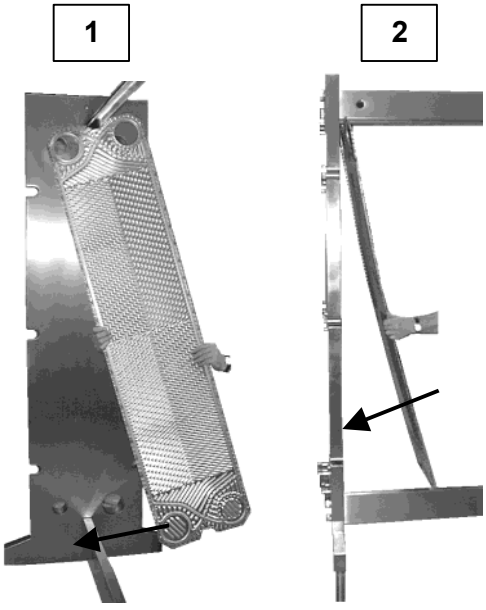
10.2 Cleaning of Heat Exchanger Plates

- rinse each plate with a suitable detergent (must neither attack gasket nor plate)
  information about suitable detergents can be obtained from Heat Exchanger manufacturer
- clean plates with a soft brush
- **gaskets not to be exchanged**:
  - avoid soaking of plate in cleaning solution
- **gaskets to be exchanged**:
  - soak plate in hot cleaning solution (approx. 100°C)
- at thick layers of scaling :
  - soak plate in hot cleaning solution (approx. 100°C)

DO NOT use:
- steel brush
- steel scraper or similar

10.3 Re-assembling

- re-install again the cleaned plates
  observe
  - original sequence and position of each plate
    (as per numbers and plate arrangement drawing)
  - gaskets installed and in good order
- fit individual plates (lateral insertion under 30 - 40°inclination)



- push pressure plate (10) to the plate plack
- re-insert tensioning bolts (1) back in lateral slots
- fit washers for tensioning bolt (13) to the tensioning bolts (1)
- tension the plate pack with the nuts for tensioning bolt (12)
  - uniformly
  - crosswise
  - observe parallelism between pressure plate (10) and frame plate (4)

- observe tesnioning limit on name plate
- avoid:
  - overtensioning (below min. tensioning limit on name plate)
  - too little tensioning (above max. tensioning limit on name plate)
- fix the nuts for tensioning bolt (12) by mounting the nuts (12a)
- connect pipework again
- start up Heat Exchanger as per section 6

11 CLEANING BY CIP SYSTEM

Plate Heat Exchangers used in the food and beverage industry require cleaning in place at certain invervals. With FISCHER CIP System CIP cleaning is very simple and efficient.
At correct intensity and duration:
- plates will be metallic clean
- all scaling will be removed

Shortly after start up of CIP System (between first and fourth cleaning)
- open Plate Heat Exchanger (Point 10)
- check all plates for cleanliness

Insufficient cleaning may be caused by:
- too short cleaning time
- temperature of cleaning solution too low
- concentration of cleaning solution too low
- detergent not suitable
- flow velocity of cleaning solution too low (circulation rate too small)
- impurities by solid substances
- plates not correctly installed

Impurities by solid substances
- Plate Heat Exchanger has always be cleaned manually

If plates are incorrectly installed after manual cleaning or changing of gaskets, dead ends may occur.
If insuffient cleaning is noted in single plate groups, check plate arrangement in this area.
In case of uncertainties ask manufacturer.

To obtain the best possible result for cleaning
- increase flowrate of cleaning solution to maximum (pump at maximum possible pumping duty)

11.1 One Step Cycle

Rinsing Process:

- clear water
  - until product residues rinsed out
- 1,5% soda solution at max. 80°C
  - about 30 minutes (max. 45 minutes)
- clear water
  - until caustic rests cleared

11.2 Two Step Cycle

Rinsing Process:

- clear water
  - until product residues rinsed out
- 1,5% soda solution at max. 80°C
  - about 30 minutes (max. 45 minutes)
- clear water
  - until caustic rests cleared
- 0,5% Nitric Acid or 1% phosphoric acid at 50°C
  - max. 20 minutes
- clear water
  - until acid rests cleared

If daily clycle with acid treatment not possible:
- cycle of 7 days reommended (important for hard mains water)

Other cleaning agents must not be used without constltation the manufacturer.

Never use cleaning agents with free chlorine ions!

Give preference to liquid rinsing agents instead of washing powder particularly if also
- homogenisers and
- separators

are to be cleaned.

For cleaning, please follow
- recommendations of detergents makers with regard to cleaning of Plate Heat Exchangers
- manufacturers instructions for Heat Exchangers

ATTENTION: All used caustics and acids must be deposed as per local regulations!

12 MAITNENANCE / INSPECTION

Check periodically:

- temperature
- pressure difference (increasing pressure -> plates are dirty)
- constant conditions (no pressure fluctations)
- plate heate exchanger doesn`t leak
- leek of the Heat Exchanger

Tie Screw and Spindle:

take care that:
- tie screw
- spindle (central closure)

are always greased well.
Recommanded: FISCHER Special Grease

Retensioning

The tensioning limit is the limit between fix head and adjustable pressure plate measured on side of plate pack) i.e. size of plate pack.

This size must be within the values shown on the name plate.
If medium leaks out between single plates of the heat exchanger retensioning of the Plate Heat Exchanger might be necessary.

Retensioning Process:
see section 9

If minimum limit as per name plate is reached and heat exchanger is still leaking gaskets have to be renewed.
Please also check as per section 14 if there could be another fault.

13 EXCHANGE OF GASKETS OF PLATE HEAT EXCHANGER

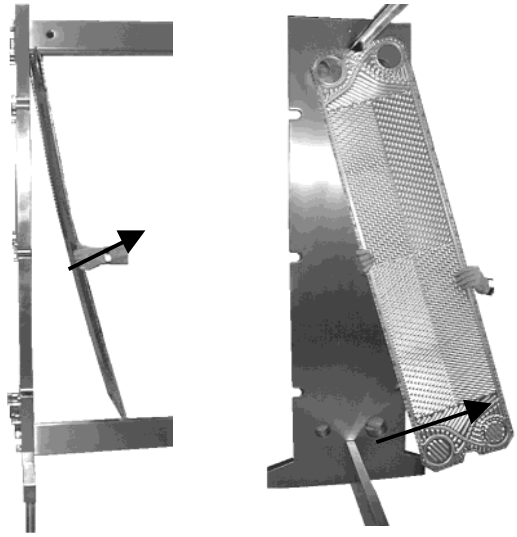
Most of gaskets used are made of one piece or of two parts (end plate gaskets could be made out of several parts).
and sized exactly for the respective heat exchanger.
Seeming surplus lengths must not be cut. The ends must be pressed together at joint.

13.1 Glue In Rubber Gaskets

Removal of Plates

- remove the nuts (12a) versus clockwise
- screw off nuts for tensioning bolt (12) from tensioning bolts (1)
- remove washers for tensioning bolt (13)
- remove tensioning bolts (1)
- push pressure plate (10) away from plate pack
- swing out first heat exchanger plate at bottom
- swing out first heat exchanger plate at bottom 20 - 30 cm in longitudal direction **[1]**
- swing out plate laterally under an angle of 30 - 45° **[2]**

1 **2**



- take the plate off the frame
- remove plate by plate in the same manner
- observe the sequence and face position of the plates - after cleaning they must be installed exactly back the same way (plates have numbers on top)

Remove old gaskets

- soak plates in
- 10% soda solution at about 20°C
  (observe safety remarks for use of dangerous substances point 2)
- for a period of 8 - 10 hours
- remove gaskets
- remove thoroughly glue rests
  (possible by careful scraping by scraper blades)
- rinse plates properly
- if necessary, clean plates by adequate cleaning solution

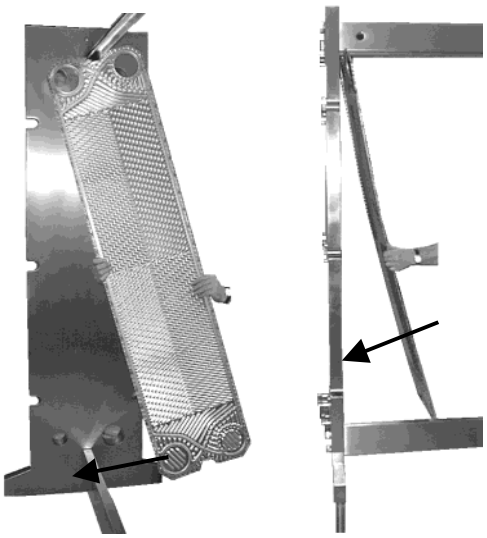
Glue in new gaskets

- degrease grooves by
  - light benzine
  - adhesive-cleaner
  - acetone
  - tuluol
  - ketone
  - spirit

  Not to be used
  - degreasing liquids containing chlorides (may damage plate material)
    (observe safety remarks for using dangerous substances of point 2)
- take care that gaskets are
  - free of fat and grease and
  - free of dust
- FISCHER special glue to be brushed on
  - grooves of plates
  - bottom side of gasket (glueing side)
  - joints of gaskets
- leave glue to dry for about 5 minutes
- place in gaskets by starting at head pieces (top and bottom)
  and press slightly
- then press on slightly lateral gasket parts

Assembling

- install again cleaned plates
  by observing:
  - original sequence and position of each plate
    (as per numbers and plate arrangement drawing)
  - gaskets installed and in good order
- fit in each plate (lateral insertion under 30-45° inclination)

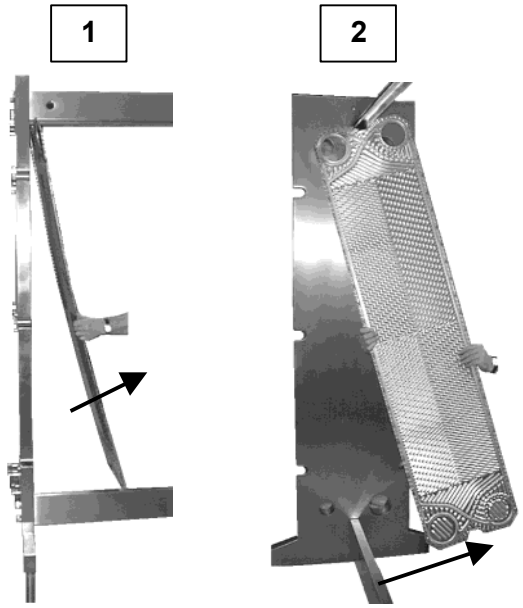


- push pressure plate (10) to plate pack
- re-insert tensioning bolts (1) back in their corresponding holes
  resp. in their lateral slots
- put the washers for tensioning bolt (13) on the tensioning bolts (1)
- tension plate pack with the nuts for tensioning bolt (12)
  - uniformly
  - crosswise
  - observing parallelism between pressure plate (10) and frame plate (4)
- observe tensioning limit of name plate
- avoid:
  - overtensioning (below min.tensioning limit on name plate)
  - too little tensioning (above max. tensioning limit on name plate)
- fix the nuts for tensioning bolt (12) by mounting the nuts (12a)
- connect pipework again
- to obtain maximum glue effect before start up
  - pump hot water (at about 90°C)
  - for 2 to 3 hours through Plate Heat Exchanger.
- start up of Heat Exchanger as per section 6

13.2 Rubber Gaskets „PIN CLIP“

Removal of Plates

- remove the nuts (12a) versus clockwise
- unscrew the nuts for tensioning bolt (12) off the tensioning bolt (1)
  Spannschraube (1) herunter
- remove the washers for tensioning bolt (13)
- remove the tensioning bolt (1)
- push pressure plate (10) away from plate pack
- swing out first heat exchanger plate at bottom 20 - 30 cm in longitudinal direction **[1]**
- swing out plate laterally under an angle of 30 - 45° [2]



- take the plate off the frame
- remove plate by plate in the same manner
- observe the sequence and face position of plates -
  after cleaning they must be installed exactly back the same way

Remove Old Gaskets

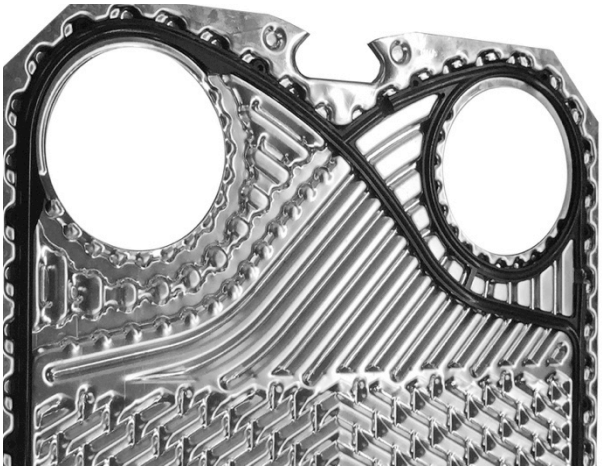
- pull out carefully rubber gaskets off groove
- clean plates with suitable cleaning solution

  Do not use

  - degreasing substances containing chlorides (can damage plate material)

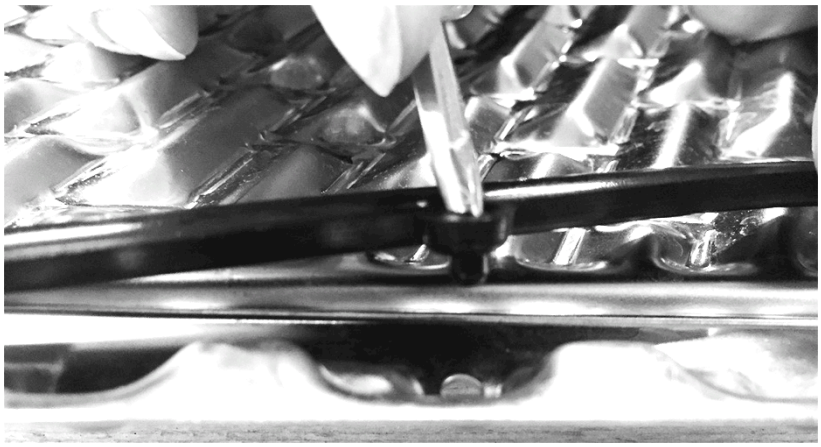
Press in new Gasket

- put gaskets into groove

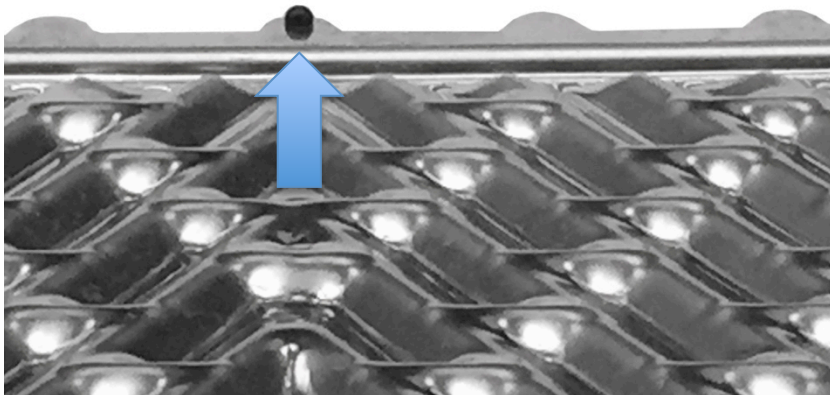


- burlings (attachment of the gasket) have to be directly at the position of the openings in the groove

- press the gasket (burlings) carefully into the openings, by using your finger or a blunt object



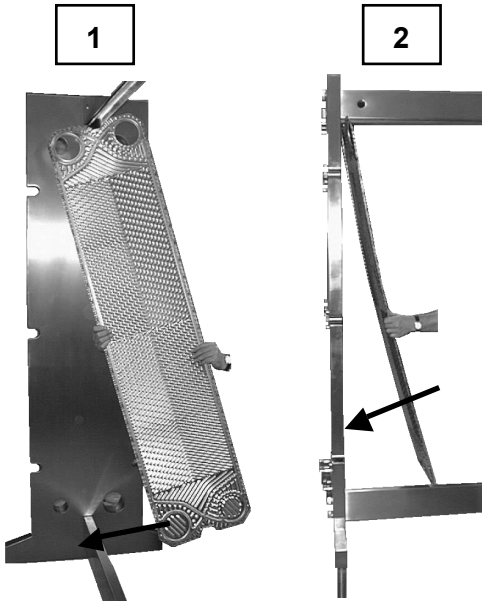
- on the backside of the plate, the burlings have to be visible



- Take care, that the gasket is at the right position

Assembling

- re-install again the cleaned plates
  observe:
  - original sequence and position of each plate
    (as per numbers and plate arrangement drawing)
  - gaskets installed and in good order
- fit individual plates (lateral insertion under 30 - 40°inclination)

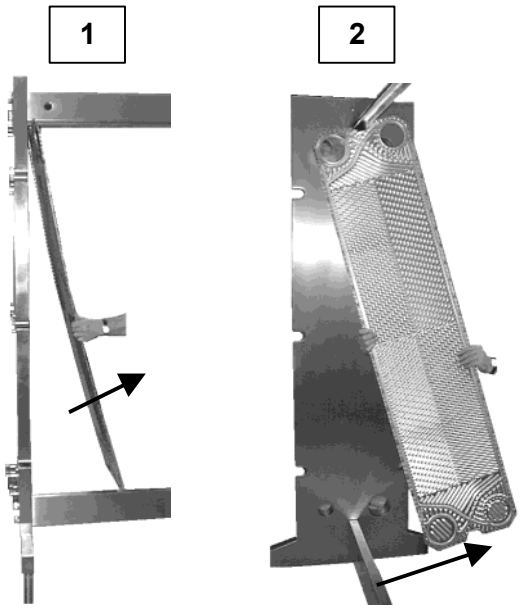


- push pressure plate (10) to the plate pack
- re-insert tensioning bolts (1) back in their corresponding holes
  resp. in their lateral holes
- put the washers for tensioning bolt (13) on the tensioning bolt (1)
- tension plate pack with the nuts for tensioning bolt (12)
  - uniformly
  - crosswise
  - observe parallelism between pressure plate (10) and frame plate (4)
- observe tensioning limit of name plate
- avoid:
  - overtensioning (below min.tensioning limit on name plate)
  - too little tensioning (above max. tensioining limit on name plate)
- fix the nuts for tensioning bolt (12) by mounting the nuts (12a)
- connect pipework again
- start up of Heate Exchanger as per section 6

13.3 Rubber Gaskets "PRESS IN"

Removal of Plates

- remove the nuts (12a) versus clockwise
- unscrew the nuts for tensioning bolt (12) off the tensioning bolt (1)
- remove the washers for tensioning bolt (13)
- remove the tensioning bolt (1)
- push pressure plate (10) away from plate pack
- swing out first heat exchanger plate at bottom 20 - 30 cm in longitudinal direction **[1]**
- swing out plate laterally under an angle of 30 - 45° **[2]**



- take the plate off the frame
- remove plate by plate in the same manner
- observe the sequence and face position of plates - after cleaning they must be installed exactly back the same way

Remove Old Gaskets

- pull out carefully rubber gaskets off groove
- clean plates with suitable cleaning solution
  Do not use
  - degreasing substances containing chlorides (can damage plate material)

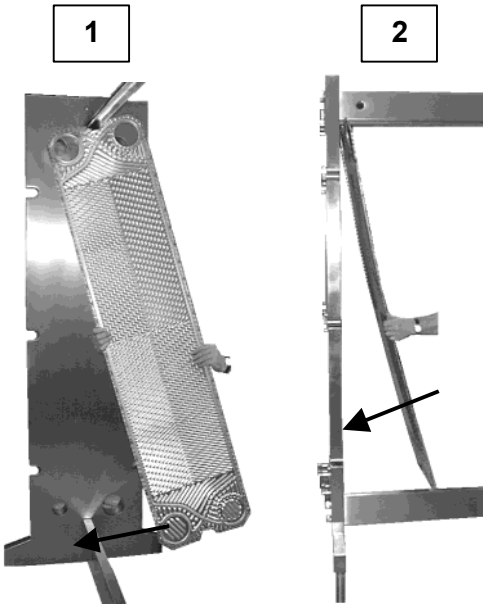
Press in new Gasket

- apply to new gaskets
  - Glycerine or
  - liquid soap
- press in gasket into recessed groove (if necessary, by means of an edgeless screw driver or similar)
- press in gasket first at head pieces (top and bottom)
- then, press in gasket along sides

Seeming surplus lengths must not be cut.

Assembling

- re-install again the cleaned plates
  observe:
  - original sequence and position of each plate
    (as per numbers and plate arrangement drawing)
  - gaskets installed and in good order
- fit individual plates (lateral insertion under 30 - 40°inclination)

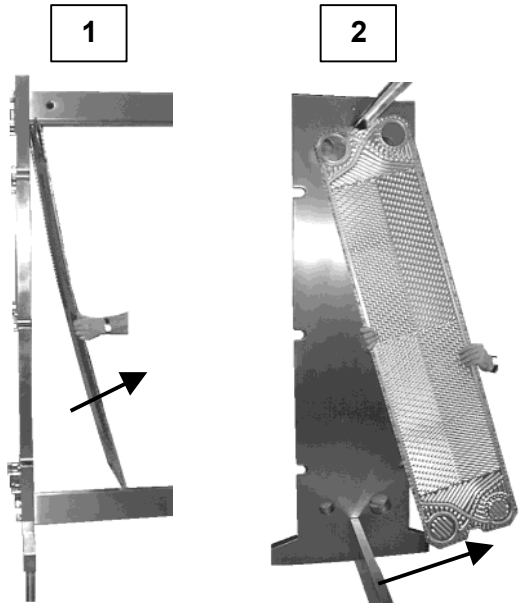


- push pressure plate (10) to the plate pack
- re-insert tensioning bolts (1) back in their corresponding holes
  resp. in their lateral holes
- put the washers for tensioning bolt (13) on the tensioning bolt (1)
- tension plate pack with the nuts for tensioning bolt (12)
  - uniformly
  - crosswise
  - observe parallelism between pressure plate (10) and frame plate (4)
- observe tensioning limit of name plate
- avoid:
  - overtensioning (below min.tensioning limit on name plate)
  - too little tensioning (above max. tensioining limit on name plate)
- fix the nuts for tensioning bolt (12) by mounting the nuts (12a)
- connect pipework again
- start up of Heate Exchanger as per section 6

13.4 IT Gaskets

Removal of Plates

- remove the nuts (12a) versa clockwise
- screw off nuts for tensioning bolt (12) from tensioning bolts (1)
- remove washers for tensioning bolt (13)
- remove tensioning bolts (1)
- push pressure plate (10) away from plate pack
- swing out first heat exchanger plate at bottom
- swing out first heat exchanger plate at bottom 20 - 30 cm in longitudal direction **[1]**
- swing out plate laterally under an angle of 30 - 45° **[2]**



- take the plate off the frame
- remove plate by plate in the same manner
- observe the sequence and face position of the plates - after cleaning they must be installed exactly back the same way (plates have numbers on top)

Remove Old Gaskets

- soak plates in
- 8% Soda Solution at about 20°C
  (observe safety remarks for use of dangerous substances Point 2)
- for a period of 8 - 10 hours
- remove gaskets
- remove thoroughly glue rests
  (possible by careful scraping by scraper blades)
- rinse plates properly
- if necessary, clean plates by adequate cleaning solution

Glue in new Gaskets

- degrease grooves by
  - light benzine
  - adhesive-cleaner
  - acetone
  - tuluol
  - ketone
  - spirit

  Not to be used
  - degreasing liquids containing chlorides (may damage plate material)
    (observe safety remarks for using dangerous substances of Point 2)
- take care that gaskets are
  - free of fat and grease and
  - free of dust

Gaskets are made in one piece:

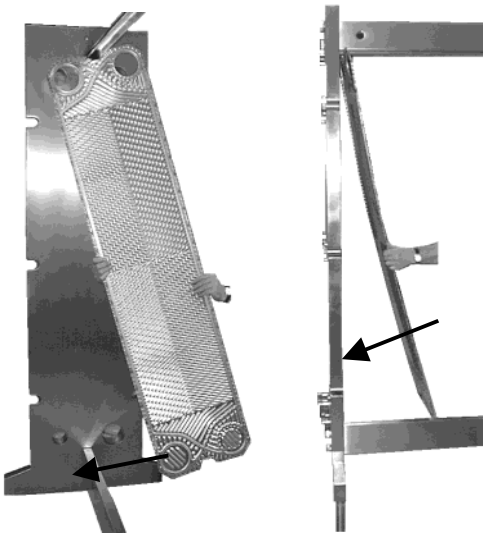
- FISCHER special glue to be brushed on
  - complete grooves of plates
  - bottom side of gasket (glueing side)
  - joints of gaskets
- leave glue to dry for about 5 minutes
- place in gaskets by starting at head pieces (top and bottom)
  and press slightly
- then press on slightly lateral gasket parts

Gaskets are made of several pieces:

- FISCHER special glue to be brushed on
  - complete grooves of plates
  - top and bottom part of the gaskets at the bottom side (glueing side)
  - middle part of the gaskets at the bottom side (glueing side)
  - joints of gaskets
- leave glue to dry for about 5 minutes
- place in gaskets by starting at head pieces (top and bottom)
  and press slightly
- then press on slightly the inserted gasket parts
- place in the middle pieces of the gaskets and press slightly
- then press on slightly the inserted gasket parts
- stack the plates with the new gaskets
- leave glue to dry for some hours

Assembling

- install again cleaned plates
  by observing:
  - original sequence and position of each plate
    (as per numbers and plate arrangement drawing)
  - gaskets installed and in good order
- fit in each plate (lateral insertion under 30-45° inclination)

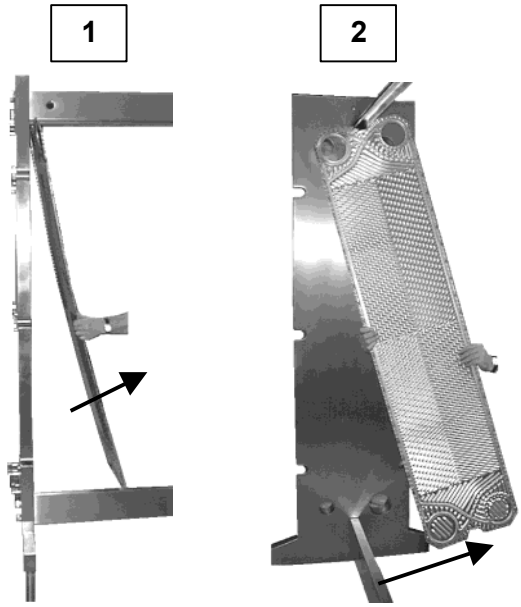


- push pressure plate (10) to plate pack
- re-insert tensioning bolts (1) back in their corresponding holes
  resp. in their lateral slots
- put the washers for tensioning bolt (13) on the tensioning bolts (1)
- tension plate pack with the nuts for tensioning bolt (12)
  - uniformly
  - crosswise
  - observing parallelism between pressure plate (10) and frame plate (4)
- observe tensioning limit of Name Plate
- avoid:
  - overtensioning (below min.tensioning limit on name plate)
  - too little tensioning (above max. tensioning limit on name plate)
- fix the nuts for tensioning bolt (12) by mounting the nuts (12a)
- connect pipework again
- to obtain maximum glue effect before start up
  - pump hot water (at about 90°C)
  - for 2 to 3 hours through Plate Heat Exchanger.
- start up of Heat Exchanger as per section 6

13.5 Silicon Gaskets

Removal of Plates

- remove the nuts (12a) versus clockwise
- screw off nuts for tensioning bolt (12) from tensioning bolts (1)
- remove washers for tensioning bolt (13)
- remove tensioning bolts (1)
- push pressure plate (10) away from plate pack
- swing out first heat exchanger plate at bottom
- swing out first heat exchanger plate at bottom 20 - 30 cm in longitudal direction **[1]**
- swing out plate laterally under an angle of 30 - 45° **[2]**



- take the plate off the frame
- remove plate by plate in the same manner
- observe the sequence and face position of the plates - after cleaning they must be installed exactly back the same way (plates have numbers on top)

Remove old gaskets

- remove gaskets by scraper blades
- if necessary, clean plates by adequate cleaning solution

Glue in new gaskets

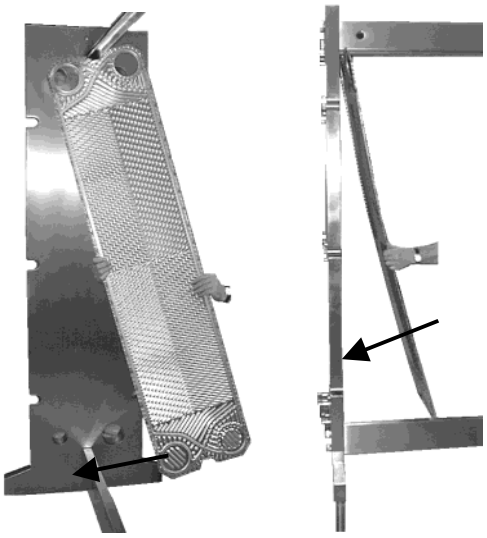
- degrease grooves by
  - light benzine
  - adhesive-cleaner
  - acetone
  - tuluol
  - ketone
  - spirit

  Not to be used
  - degreasing liquids containing chlorides (may damage plate material)

    (observe safety remarks for using dangerous substances of section 2)
- take care that gaskets are
  - free of fat and grease and
  - free of dust
- lay down the first cleanes plate in vertical position
- spread fluid silicon on the groove of the plate
- place in gaskets into the groove
- brush on the joints of the gasket by fluid silicon
- put the next exchanger plate on the first
- glue in the gasket like the first plate
- repeat this procedure until all gaskets are glued in
- place a plate which is a little bit larger than the exchanger plates on the exchanger plates stack
- wightdown the top plate symmetrical by a weight of about 30kg
- after 6 to 8 hours the plates can be mounted in the frame

Assembling

- install again cleaned plates
  by observing:
  - original sequence and position of each plate
    (as per numbers and plate arrangement drawing)
  - gaskets installed and in good order
- fit in each plate (lateral insertion under 30-45° inclination)

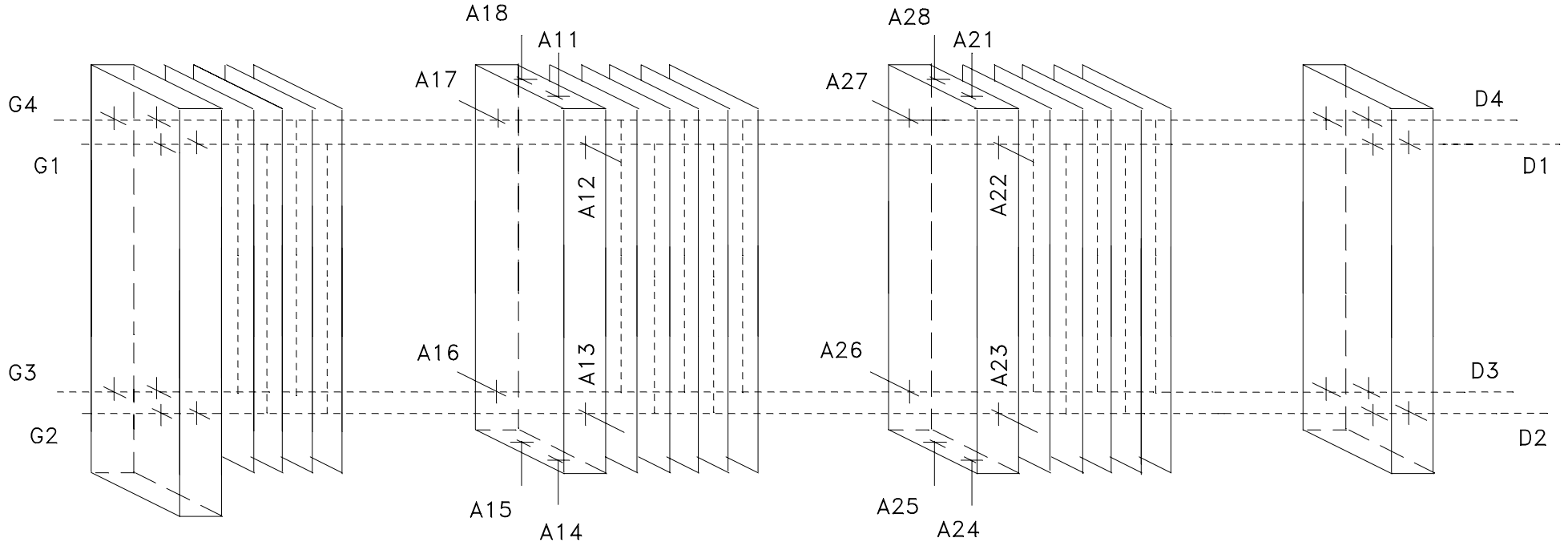


- push pressure plate (10) to plate pack
- re-insert tensioning bolts (1) back in their corresponding holes
  resp. in their lateral slots
- put the washers for tensioning bolt (13) on the tensioning bolts (1)
- tension plate pack with the nuts for tensioning bolt (12)
  - uniformly
  - crosswise
  - observing parallelism between pressure plate (10) and frame plate (4)
- observe tensioning limit of name plate
- avoid:
  - overtensioning (below min.tensioning limit on name plate)
  - too little tensioning (above max. tensioning limit on name plate)
- fix the nuts for tensioning bolt (12) by mounting the nuts (12a)
- connect pipework again
- to obtain maximum glue effect before start up
  - pump hot water (at about 90°C)
  - for 2 to 3 hours through Plate Heat Exchanger.
- start up of Heat Exchanger as per section 6

14 Faults / Cause / Remedy

15 Drawings / Part list

GESTELLPLATTE	ANSCHLUSSPLATTE 1	ANSCHLUSSPLATTE 2	DRUCKPLATTE
FRAME	CONNECTION PLATE 1	CONNECTION PLATE 2	PRESSURE PLATE
CADRE	PLAQUE DE RACCORDEMENT 1	PLAQUE DE RACCORDEMENT 2	PLAQUE DE PRESSION
PLACA DE BASTIDOR	PLACA DE CONEXION 1	PLACA DE CONEXION 2	PLACA DE PRESION
COLONNA PRINCIPALE	PIASTRONE INTERMEDIO 1	PIASTRONE INTERMEDIO 2	PIASTRA DI PRESSOIO
РАМА	РАЗДЕЛИТЕЛНАЯ ПЛИТА 1	РАЗДЕЛИТЕЛНАЯ ПЛИТА 2	НАЖИМНАЯ ПЛИТА



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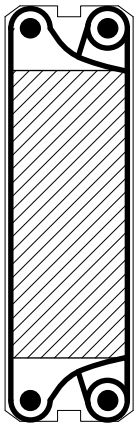
ANSCHLÜSSE
CONNECTIONS
RACCORD
CONEXIONES
COINCIDENZA
ПРИСОЕДИНЕНИЕ

R33



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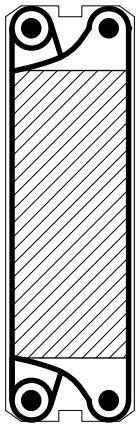

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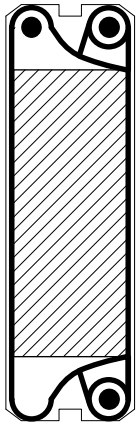

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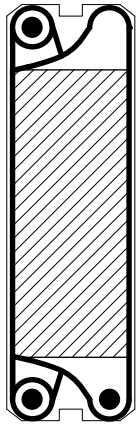

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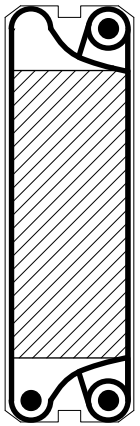

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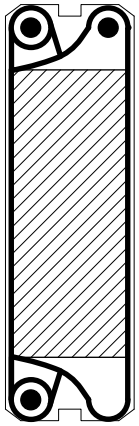

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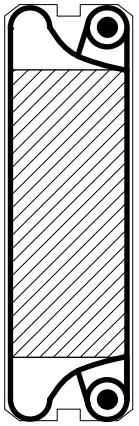

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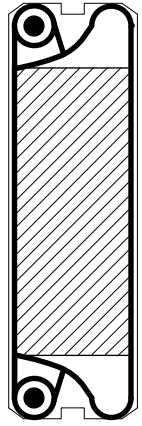

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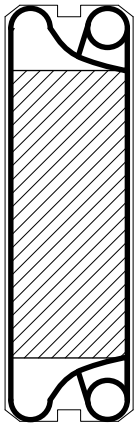

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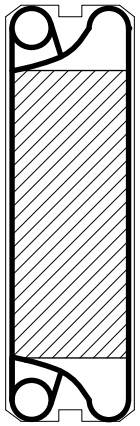

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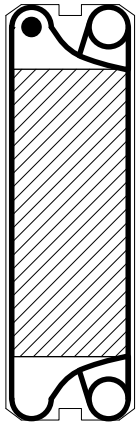

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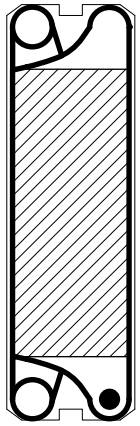

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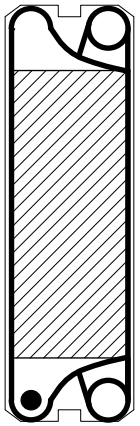

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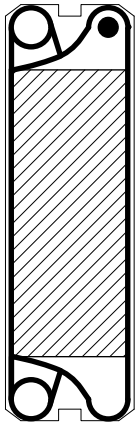

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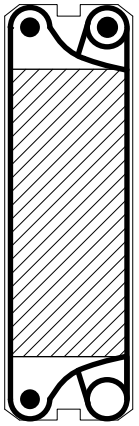

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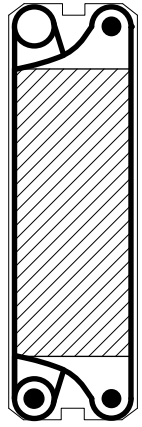

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PLACAS INTERCAMBIADORAS DE CALOR
PIASTRA SCAMBIATRICE DI CALORE

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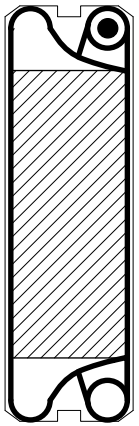
R02



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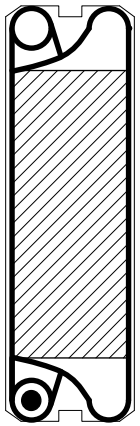

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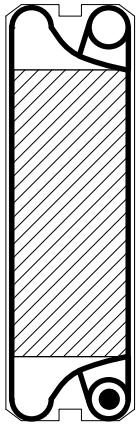

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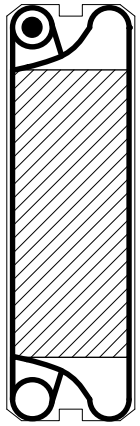

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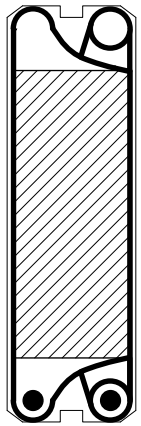

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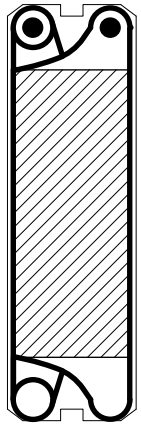

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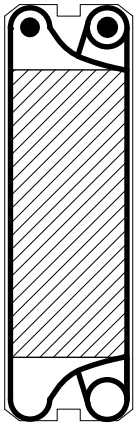

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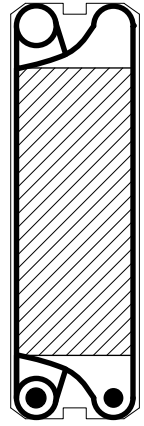

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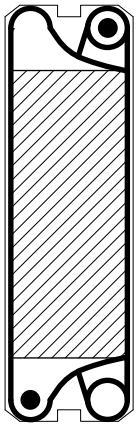

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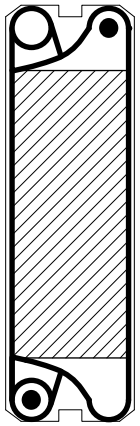

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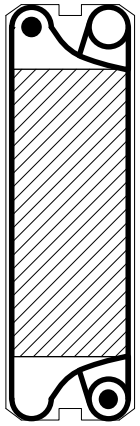

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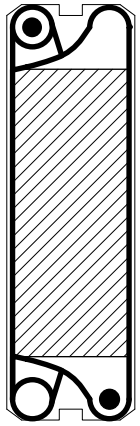

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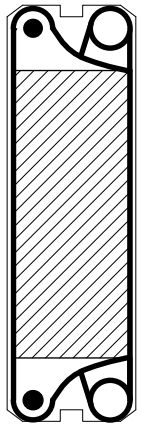

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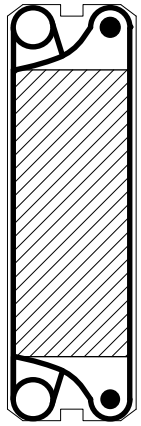

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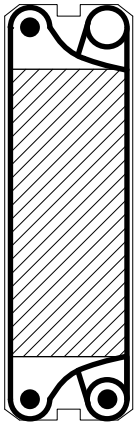

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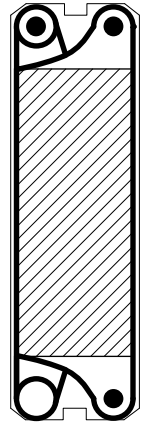

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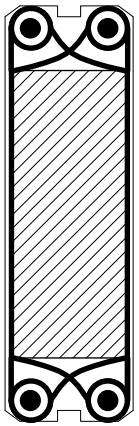
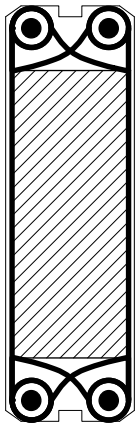
R33a L33a





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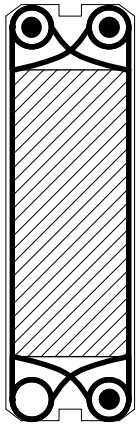

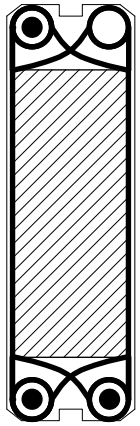

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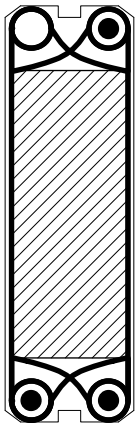
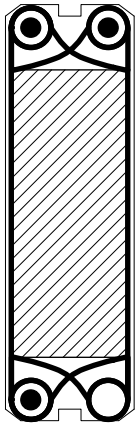
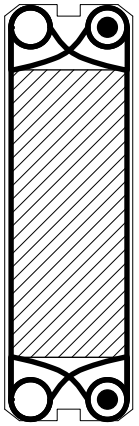
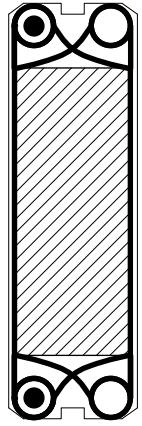


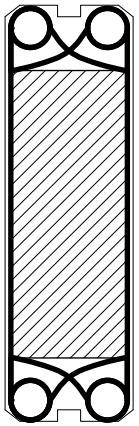


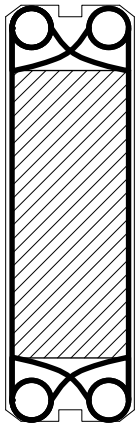
R03a L30a



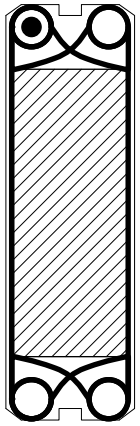


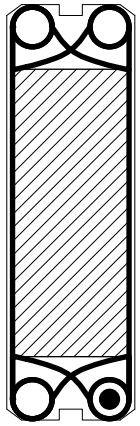
R00a L00a





R20a L01a





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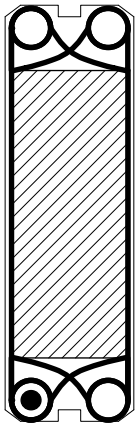
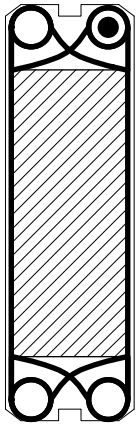
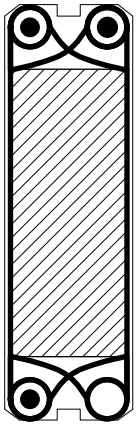
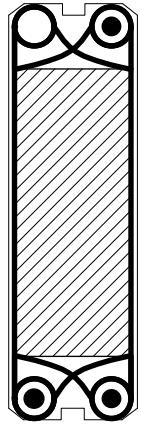




R32a L13a





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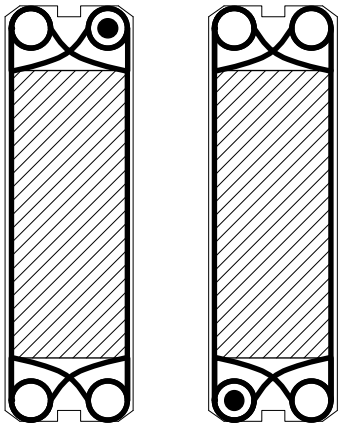
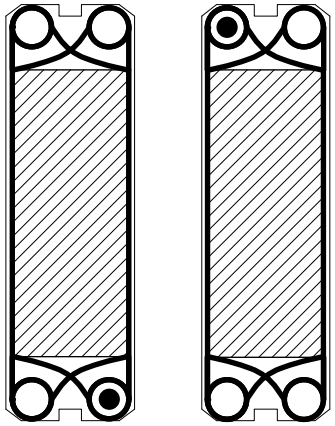
ANFANGSPLATTEN
END PLATES
AU DÉBUT DE PLAQUES
PIASTRE TERMINALI
A PARTIR DE PLACAS

3/5

R02a L10a



R01a L20a



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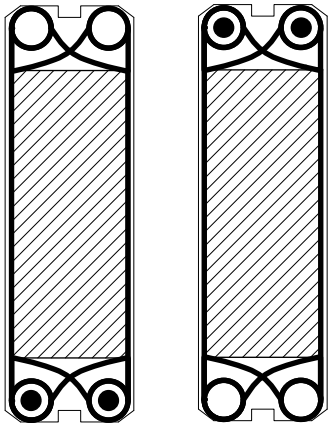
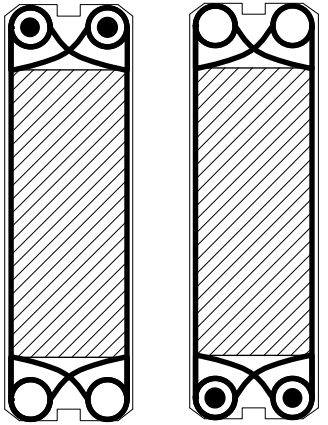
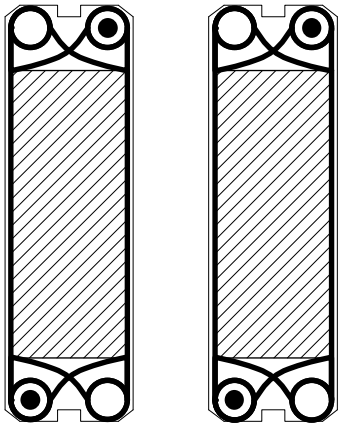


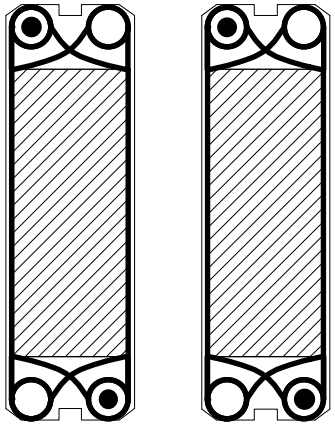
R22a L11a



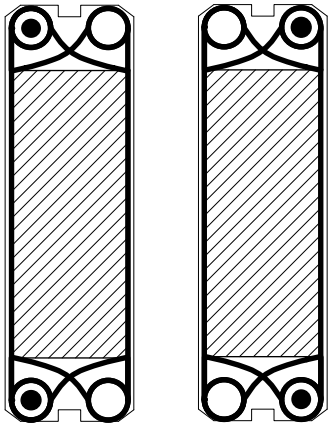
R12a L12a



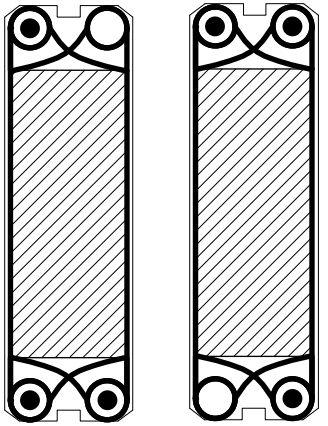
R21a L21a



R30a L03a



R31a L23a



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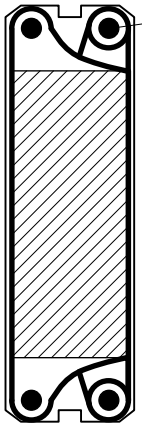
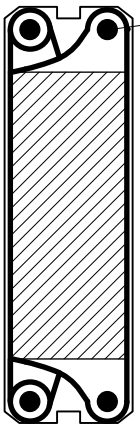
ANFANGSPLATTEN
END PLATES
AU DÉBUT DE PLAQUES
PIASTRE TERMINALI
A PARTIR DE PLACAS

4/5



DREIECKSLOCH
▽-HOLE

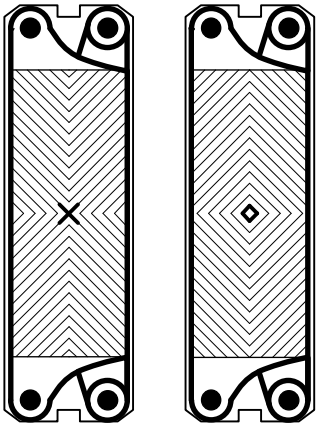
RECHTE PLATTE
RIGHT PLATE



DURCHGANGSLOCH
PASSING-HOLE

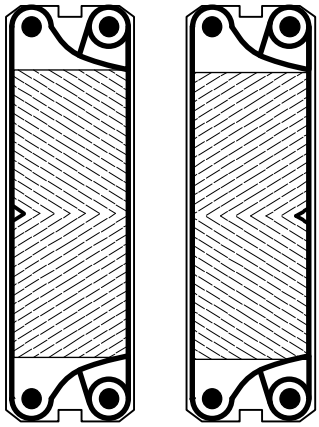
LINKE PLATTE
LEFT PLATE

COMBI FLOW - CF



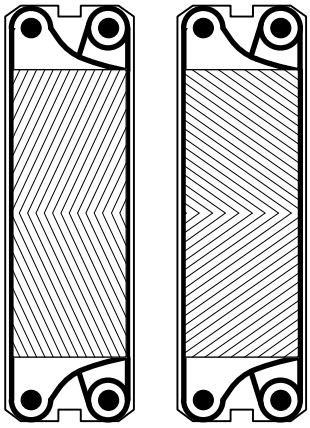
X Z

DOUBLE FLOW - DF



A V

FISCHGRAT



FW FH

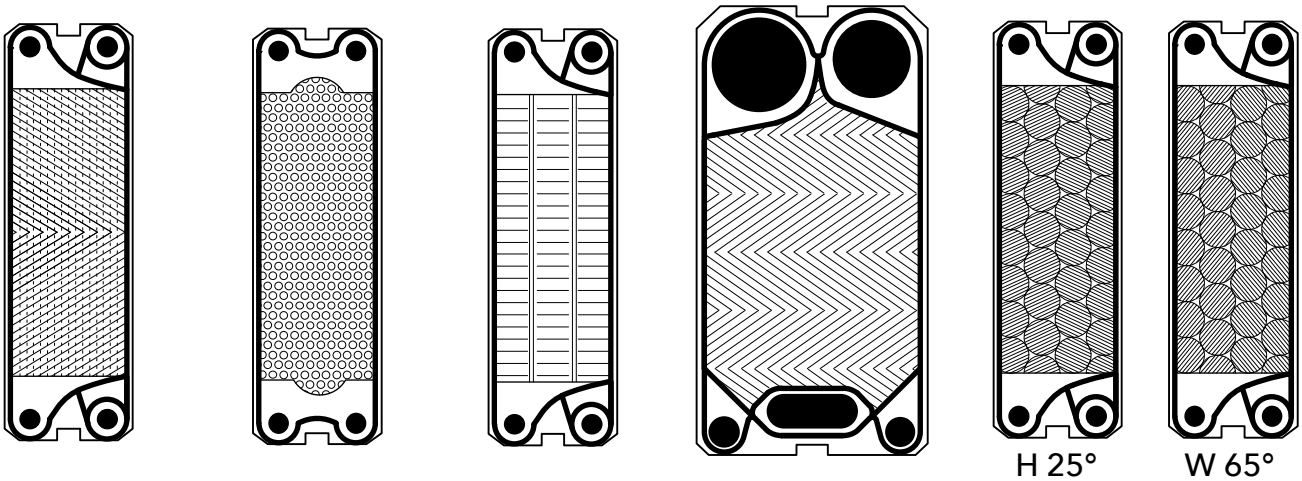
UNIVERSAL
HARD
UH

HEISSHALTE
HEAT HOLDING
HH

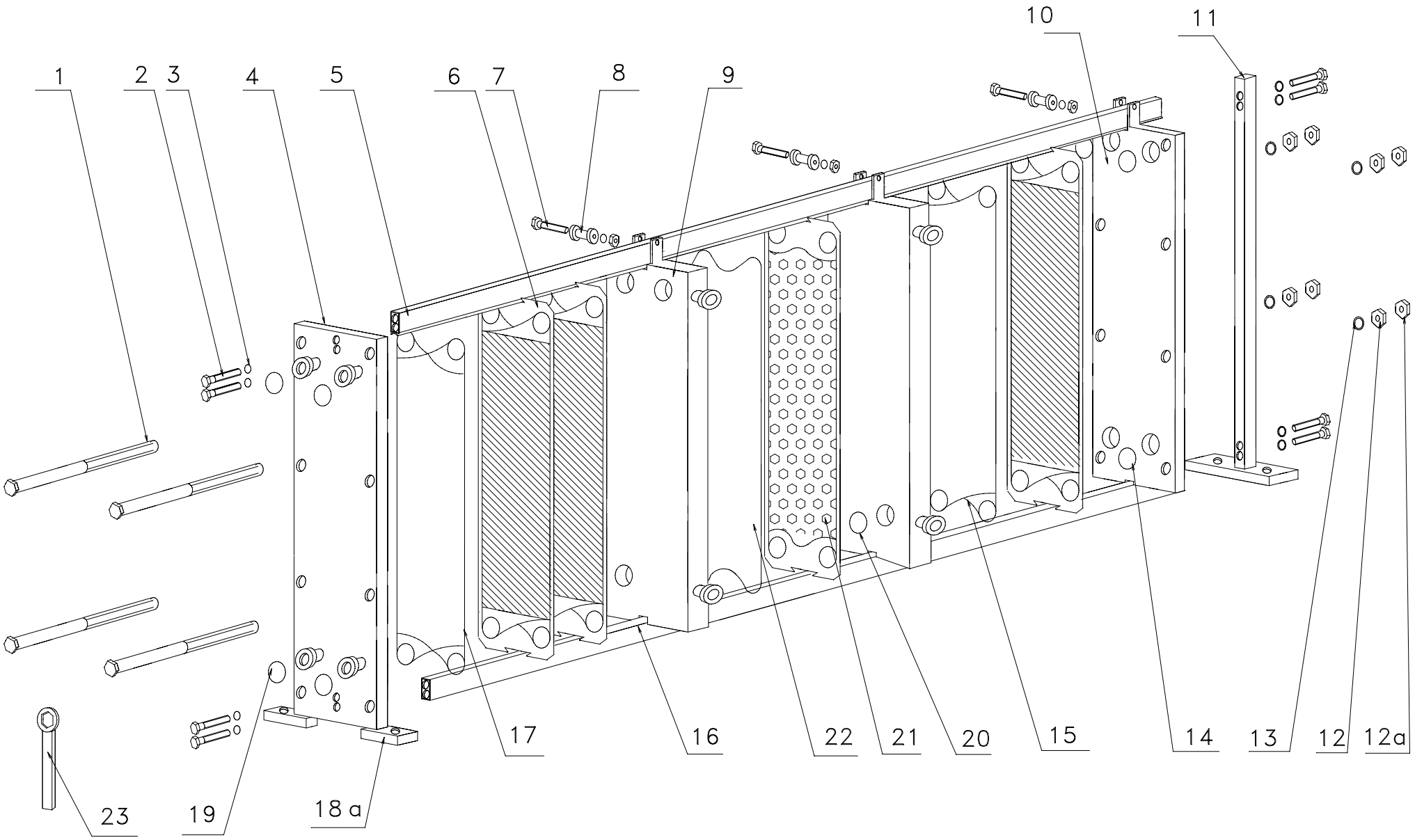
FREISTROM
FREE FLOW
FF

STEAM/PRODUCT
SP

OMNI FLOW
OF



H 25° W 65°



FISCHER

MASCHINEN– UND APPARATEBAU AG

BESTANDTEILLISTE
LIST OF ELEMENTS
LISTE DE PIECES
LISTA DE PIAZAS
ELEMENTI
СПЕЦИФИКАЦИЯ ДЕТАЛЕЙ

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