Assembly and testing instruction for gasketed plate heat exchanger kits

Applies for Alfa Laval M6, TS6, TL6, T8 and M10 units

The Alfa Laval GPHE Kits assortment is setup with Frame Kits and Plate Kits. Each Frame Kit contains all frame components necessary to assemble a complete heat exchanger, including the 0-holed and 4-holed end plates, and has a pre-set number of 2-5 frames depending on the model. Each Plate Kit contains 50 channel plates and gaskets to be used together with a Frame Kit. The amount of plates to be used within a frame is determined by using one of Alfa Laval's configuration tools.

This instruction concerns assembling of Alfa Laval GPHE Kits unit based on the assembly process of a standard M6 unit with studded connections and rubber linings with distance rings.

M6

TS6

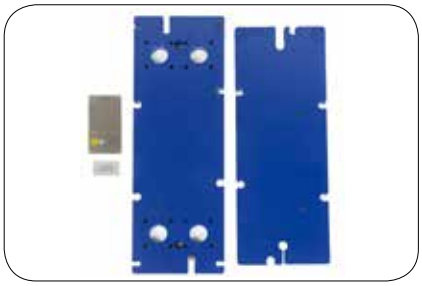
TL6

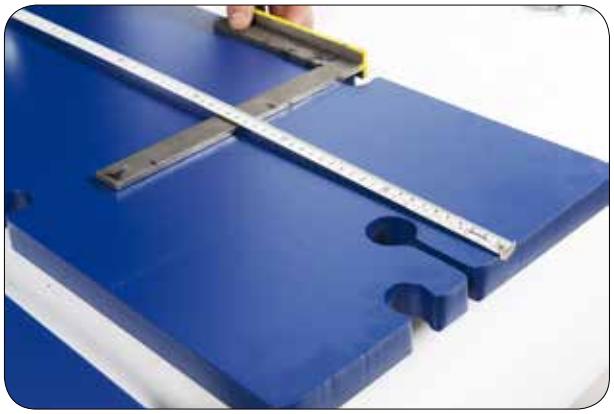
T8

M10

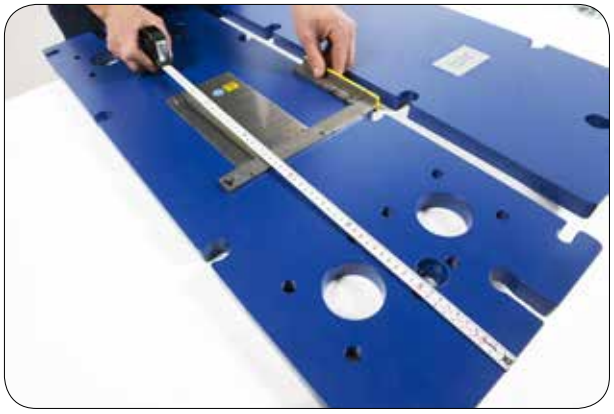
Index

Step 1 – Put on Alfa Laval logotype sticker and prepare assembly of name plate





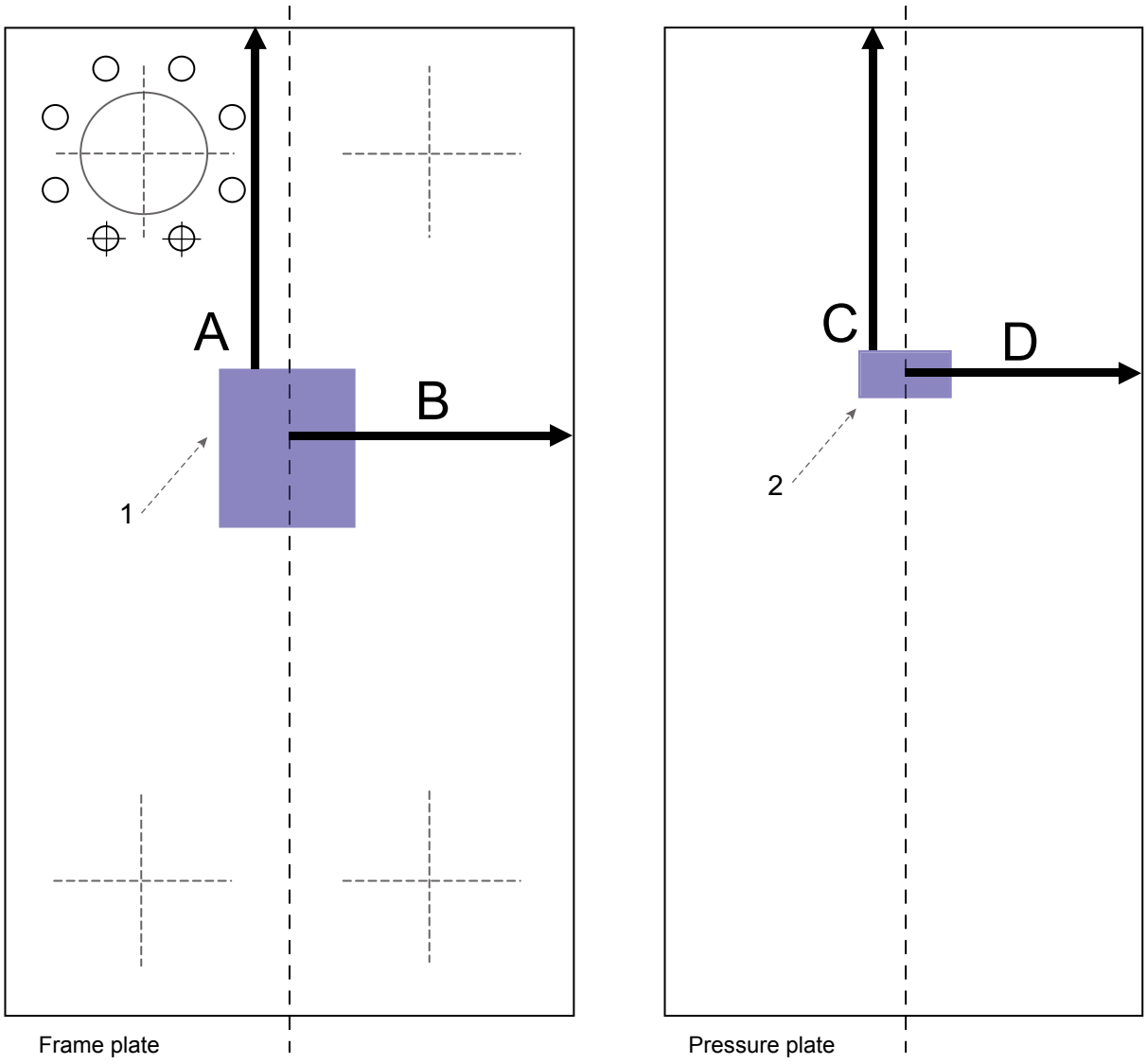
1.1 Place the sticker onto the pressure plate according to the location sketch.



1.2 Mark the name plate position on the frame plate according to the location sketch on page 6.

1.3 Drill four holes on the frame plate to fit the holes in name plate.

Marking elements location sketch



1. Name plate
2. Alfa Laval logotype sticker

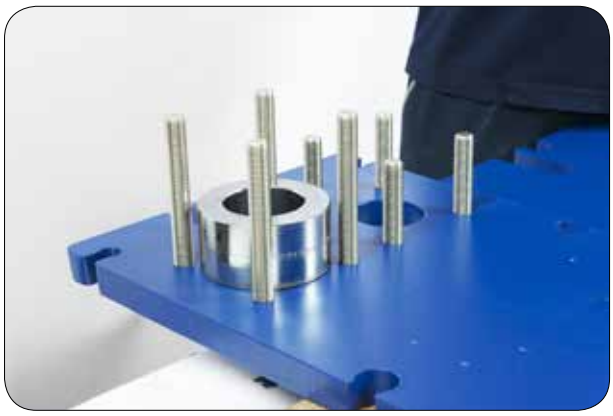
Unit type	A	B	C	D
M6	353 mm	To centre	265 mm	To centre
TS6	220 mm	To centre	220 mm	To centre
TL6	375 mm	To centre	375 mm	To centre
T8	280 mm	To centre	280 mm	To centre
M10	375 mm	To centre	220 mm	To centre

Step 2 – Assemble stud bolts

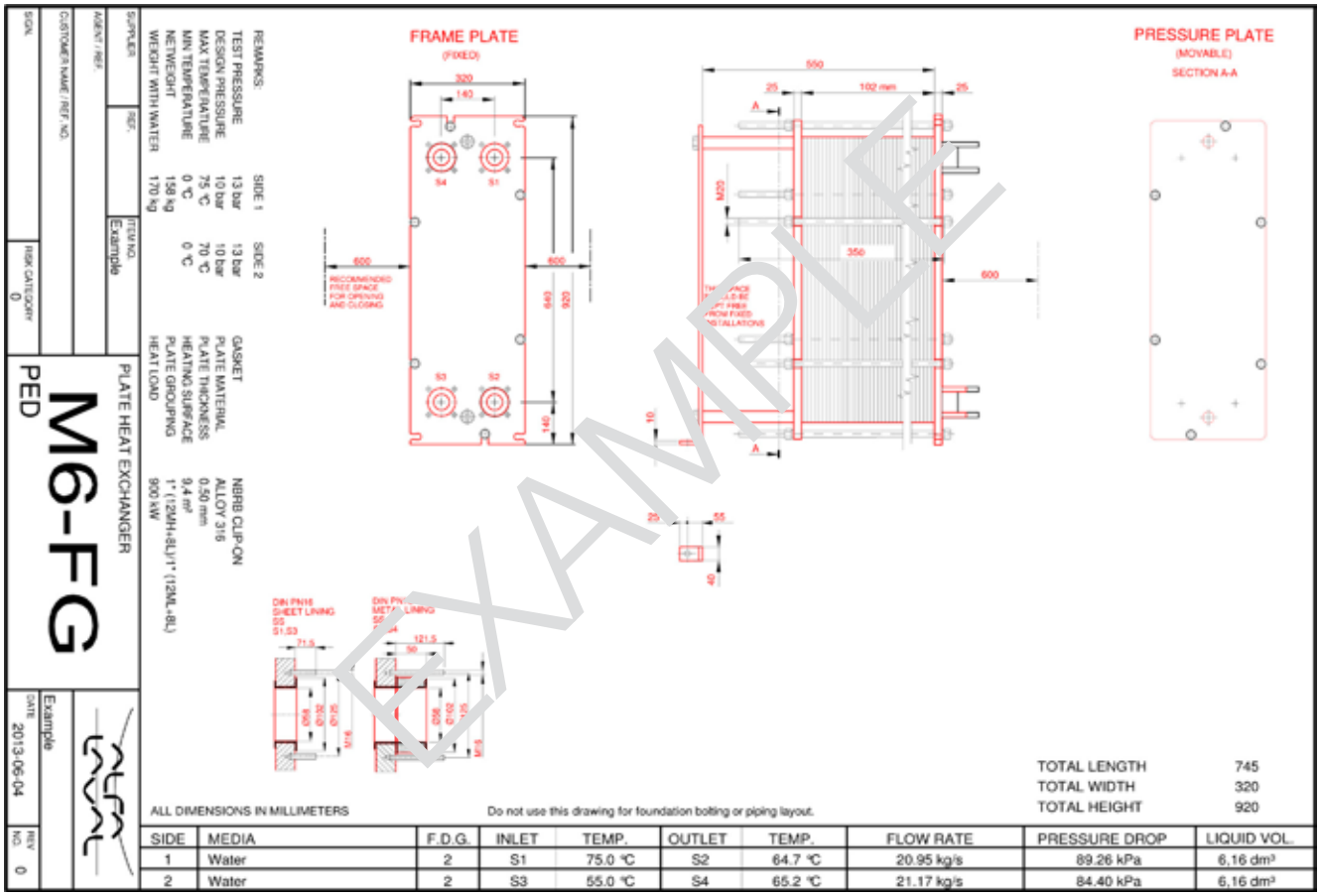
2.1 Clean the threads from paint.

2.2 Screw the stud bolts until they reach the end of the threads in the frame plate.

Step 3 – Assemble rubber linings and distances



3.1 Position the distance rings according to the drawing of the heat exchanger.

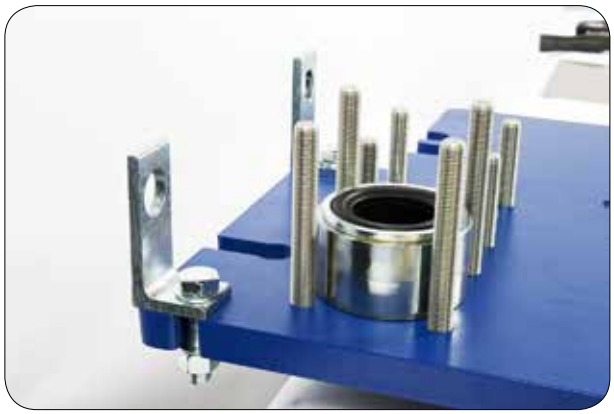


SIDE	MEDIA	F.D.G.	INLET	TEMP.	OUTLET	TEMP.	FLOW RATE	PRESSURE DROP	LIQUID VOL.
1	Water	2	S1	75.0 °C	S2	64.7 °C	20.95 kg/s	89.26 kPa	6,16 dm³
2	Water	2	S3	55.0 °C	S4	65.2 °C	21.17 kg/s	84.40 kPa	6,16 dm³

3.2 Assemble the rubber linings.

3.3 Glue the metal rings onto the rubber linings.

Step 4 – Assemble feet

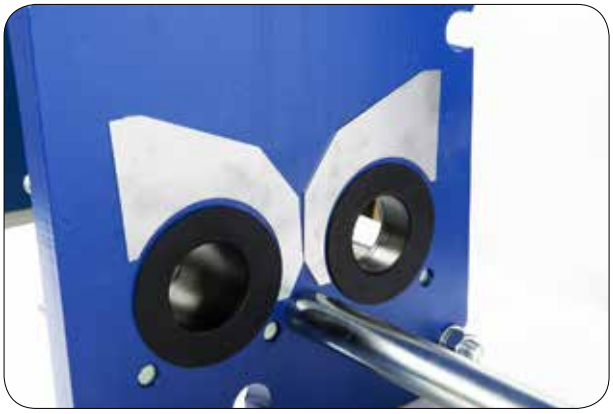


4.1 Assemble the feet onto the frame plate.

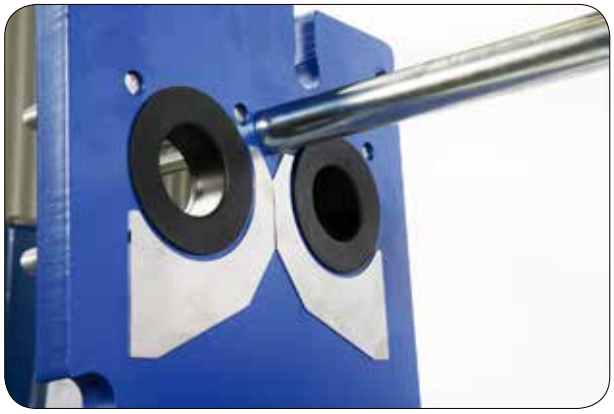
Step 5 – Assemble carrying bar and guiding bar

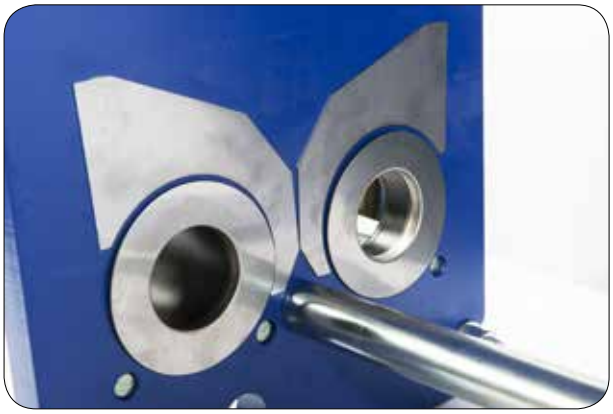
5.1 Raise the frame plate into up-standing position and assemble the carrying bar into the hole on the top of the frame plate with help of the nut. Repeat the procedure to assemble the guiding bar into the frame plate.

Step 6 – Assemble distance sheet and pressed collars



6.1 Apply glue onto the distance sheets and assemble the distance sheets around the linings on the frame plate's inside.



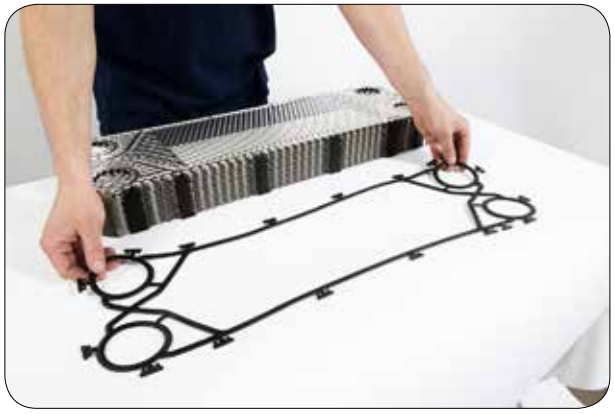


6.2 Assemble the pressed collars.

Step 7 – Assemble gaskets

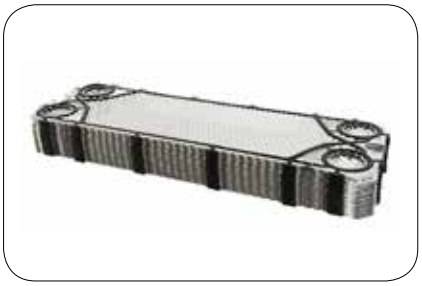
7.1 Assemble the gaskets onto the four-holded channel plate by using the fastening clips.

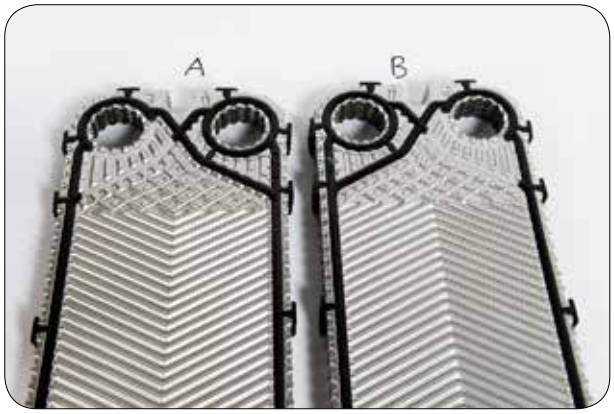
7.2 Repeat the above procedure to assemble the gasket onto the zero-holed end plate.

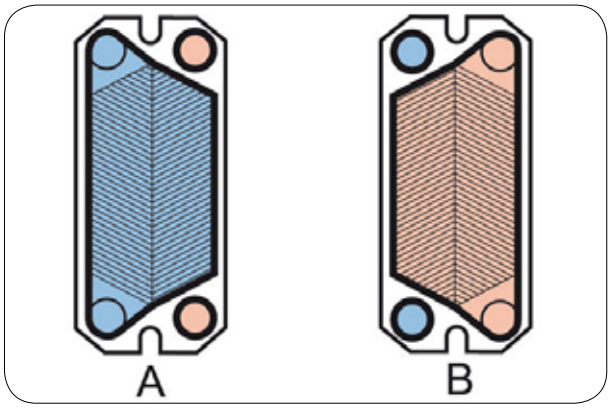


7.3 Assemble the end plate gasket onto the four-holed end plate.

Step 8 – Assemble plates

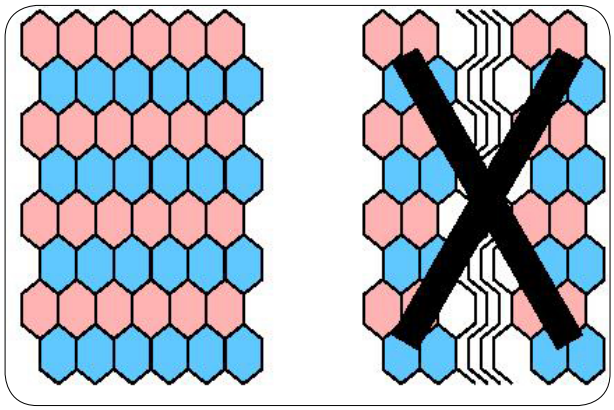






8.1 Assort the A-plates and B-plates according to the fishbone pattern.

8.2 Hang the plates according to the plate list of the configured heat exchanger.



8.3 Check that the plate pack forms a honeycomb pattern. If not the plates are not properly inserted.

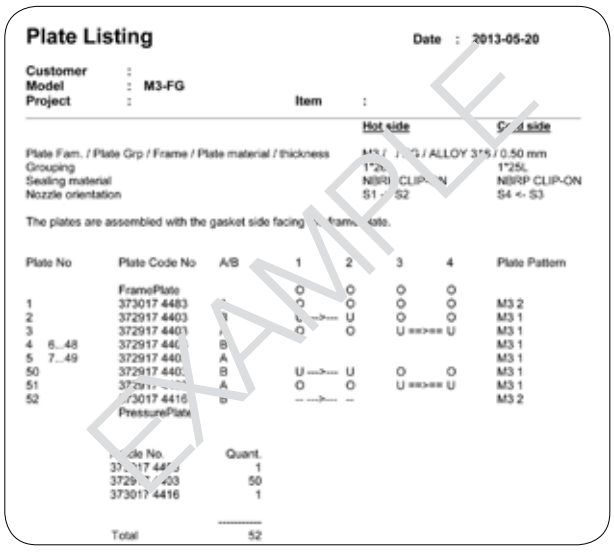


Plate Listing Date : 2013-05-20

Customer :
Model : M3-FG
Project : Item :

	Hot side	Cold side
Plate Fam. / Plate Grp / Frame / Plate material / thickness	M3 / [illegible] / ALLOY 3[illegible] / 0.50 mm	
Grouping	1"2[illegible]	1"25L
Sealing material	NBR[illegible] CLIP[illegible]N	NBRP CLIP-ON
Nozzle orientation	S1 - S2	S4 <- S3

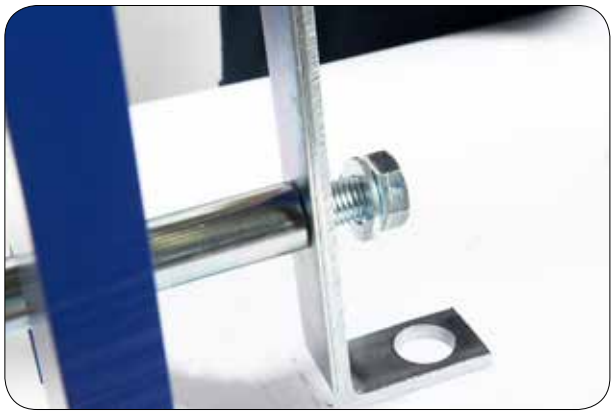
The plates are assembled with the gasket side facing [illegible] frame [illegible] plate.

Plate No	Plate Code No	A/B	1	2	3	4	Plate Pattern
	FramePlate		O	O	O	O	
1	373017 4483		O	O	O	O	M3 2
2	372917 4403		U ---> U		O	O	M3 1
3	372917 4403		O	O	U <=== U		M3 1
4 6..48	372917 440[illegible]	B					M3 1
5 7..49	372917 440	A					M3 1
50	372917 440[illegible]	B	U ---> U		O	O	M3 1
51	372917 [illegible]	A	O	O	U <=== U		M3 1
52	[illegible]3017 4416	B	-- ---> --				M3 2
	PressurePlate						

Code No.	Quant.
372917 4403	50
373017 4416	1
Total	52

EXAMPLE

Step 9 – Assemble pressure plate and support column



9.1 Hang the pressure plate onto the carrying bar and assemble the support column thereafter.

9.2 Fasten the bolts to secure the support column.

Step 10 – Assemble tightening bolts

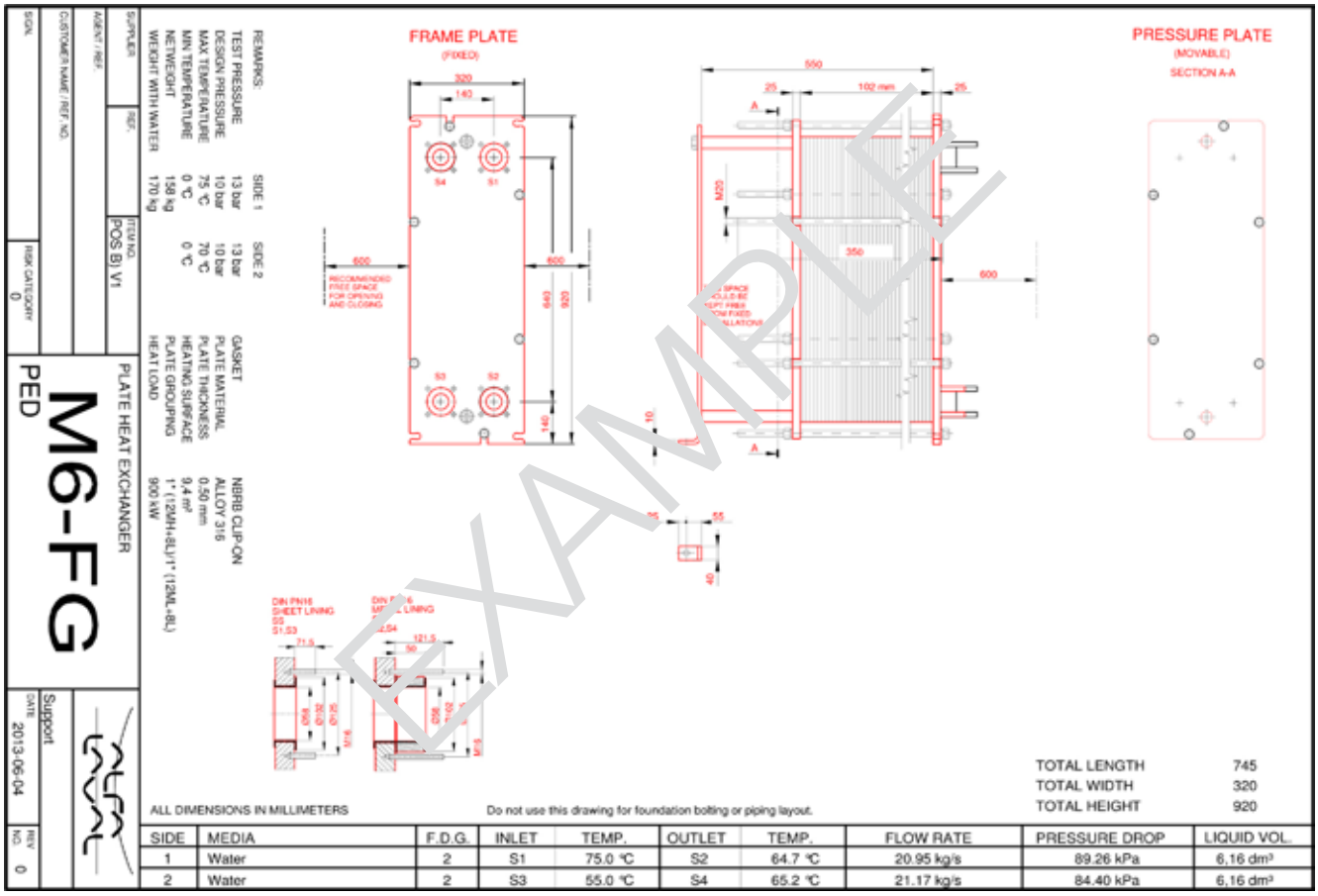
10.1 Grease the head of the tightening bolts and the washers.

10.2 Put the protection tubes onto the tightening bolts.

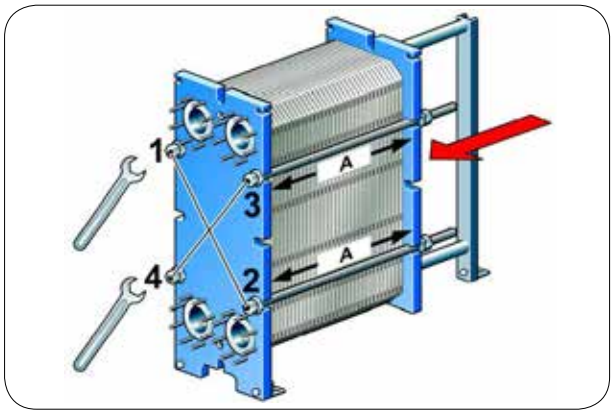
10.3 Grease the threads of the tightening bolts.

10.4 Assemble the washers and nuts.

10.5 Tighten the bolts to reach the A-measure stated on the drawing of the heat exchanger.



SIDE	MEDIA	F.D.G.	INLET	TEMP.	OUTLET	TEMP.	FLOW RATE	PRESSURE DROP	LIQUID VOL.
1	Water	2	S1	75.0 °C	S2	64.7 °C	20.95 kg/s	89.26 kPa	6,16 dm³
2	Water	2	S3	55.0 °C	S4	65.2 °C	21.17 kg/s	84.40 kPa	6,16 dm³



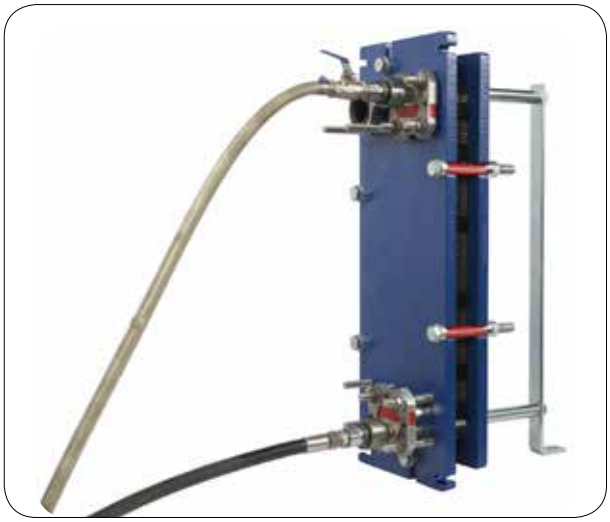
10.6 Check the A-measure and parallel between the frame and pressure plate.

Step 11 – Assemble name plate

11.1 Add design parameters, serial number and manufacturer’s company name on the name plate.

11.2 Assemble the name plate into position on the pressure plate.

Step 12 – Pressure test



12.1 Perform a single-sided pressure testing of the primary side. This is recommended to be done with pres surised water. Use a holding time of 10 minutes and a test pressure of 1.3 x design pressure. During the meantime, keep the secondary side open for visible inspection of the portholes for internal leakage.

12.2 Perform a visual inspection to detect leakage, gasket/plate deformation or other abnormal changes.

12.3 Fill out the holding time and test result for the primary side on the Quality Card, see example on page 19.

12.4 Perform a single-sided pressure testing of the secondary side. This is recommended to be done with pressurised water. Use a holding time of 10 minutes and a test pressure of 1.3 x design pressure. During the meantime, keep the primary side open for visible inspection of the portholes for internal leakage.

12.5 Perform a visual inspection to detect leakage, gasket/plate deformation or other abnormal changes.

12.6 Fill out the holding time and test result for the secondary side on the Quality Card

Note: Test pressure = 1.3 x design pressure. If the customer order contains any special requirements regarding pressure test then those are to be carried out. Examples of special requirements are different holding time or double sided pressure testing.

12.7 Make sure the following information is stated on the quality card:
a. general order information
b. design parameters
c. component marking numbers.

12.8 Fill out the following information on the quality card:
d. manometer number
e. result of pressure test.

12.9 Perform a final inspection and fill out the information on the quality card.

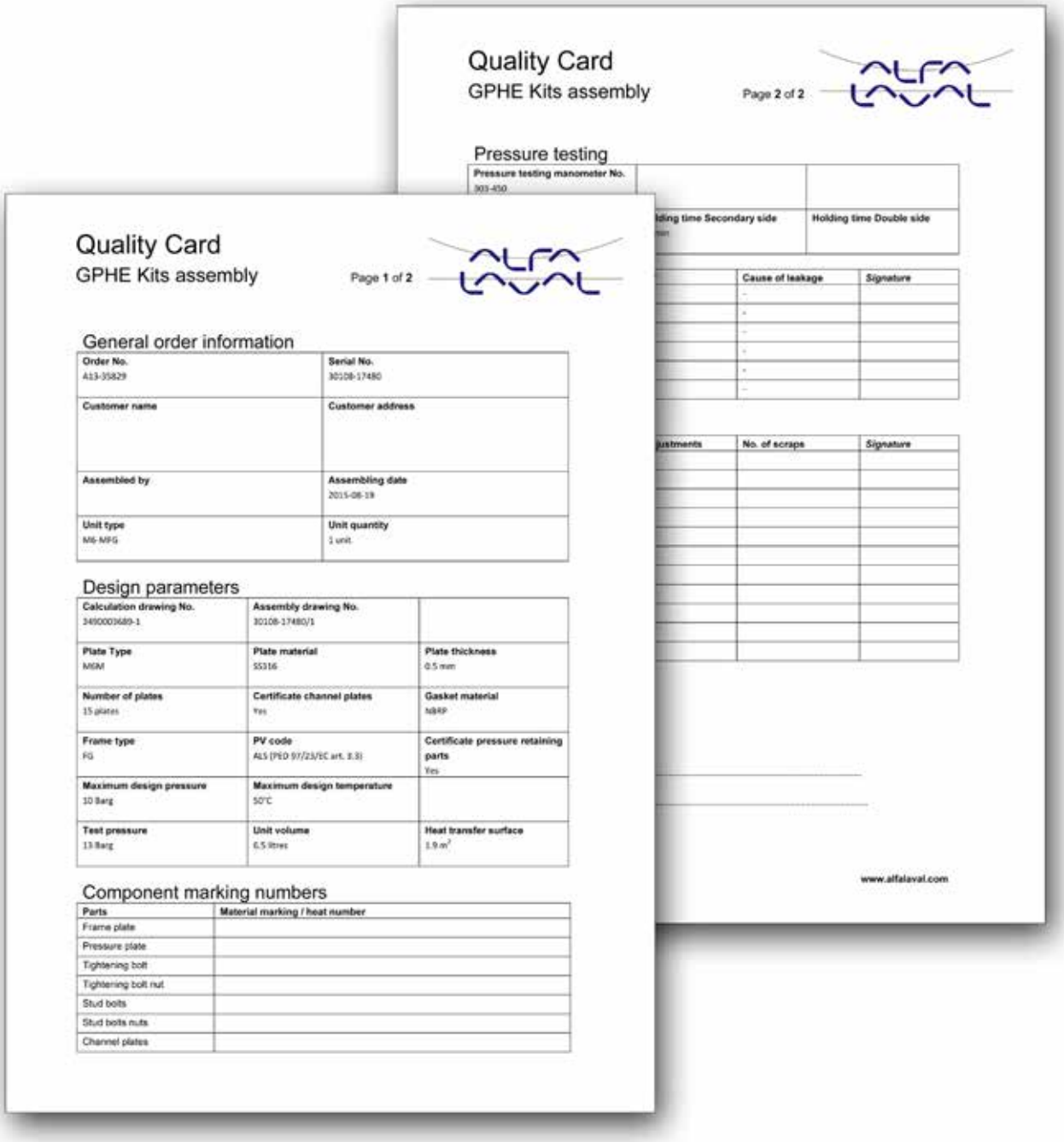
12.10 The assembly responsible person signs the quality card.

12.11 The manufacturer’s quality inspector checks that the unit is built in accordance with GPHE Kits instruction, Assembly instruction and local regulations.

12.12 Clean the unit and do touch-up painting to make sure no paint is missing on the unit.

12.13 Perform a final check of the following:
a. general accomplishment of assembly
b. outward finish of all visible surfaces
c. the symmetric appearance of the unit
d. position of holes for anchoring bolts.

Example Quality Card, provided by local Alfa Laval representative



Quality Card
GPHE Kits assembly
Page 1 of 2

General order information

Order No.	Serial No.
413-35829	30108-17480
Customer name	Customer address
Assembled by	Assembling date
Unit type	Unit quantity

Design parameters

Calculation drawing No.	Assembly drawing No.	
Plate Type	Plate material	Plate thickness
Number of plates	Certificate channel plates	Gasket material
Frame type	PV code	Certificate pressure retaining parts
Maximum design pressure	Maximum design temperature	
Test pressure	Unit volume	Heat transfer surface

Component marking numbers

Parts	Material marking / heat number
Frame plate	
Pressure plate	
Tightening bolt	
Tightening bolt nut	
Stud bolts	
Stud bolts nuts	
Channel plates	

Quality Card
GPHE Kits assembly
Page 2 of 2

Pressure testing

Pressure testing manometer No.		
	Holding time Secondary side	Holding time Double side

	Cause of leakage	Signature

	No. of scraps	Signature

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Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com