

Installation And Operation Manual



SUPERCHANGER[®]
PLATE & FRAME HEAT EXCHANGER

EQUIPMENT LOG SHEET

You will need the information shown in the table below whenever you contact the factory for service. Upon delivery of your SUPERCHANGER unit(s), be sure to record the information from the Data Plate on each unit in case the nameplate is destroyed, lost or becomes illegible.

Equipment Tag #	Serial #*	Drawing #*	Model*

* Tranter must have serial or drawing number to properly identify your equipment.

For PHE parts, service or performance ratings, contact one of Tranter’s authorized Service Centers (see full information for contacting on page 46).

IDENTIFYING YOUR SUPERCHANGER® UNIT

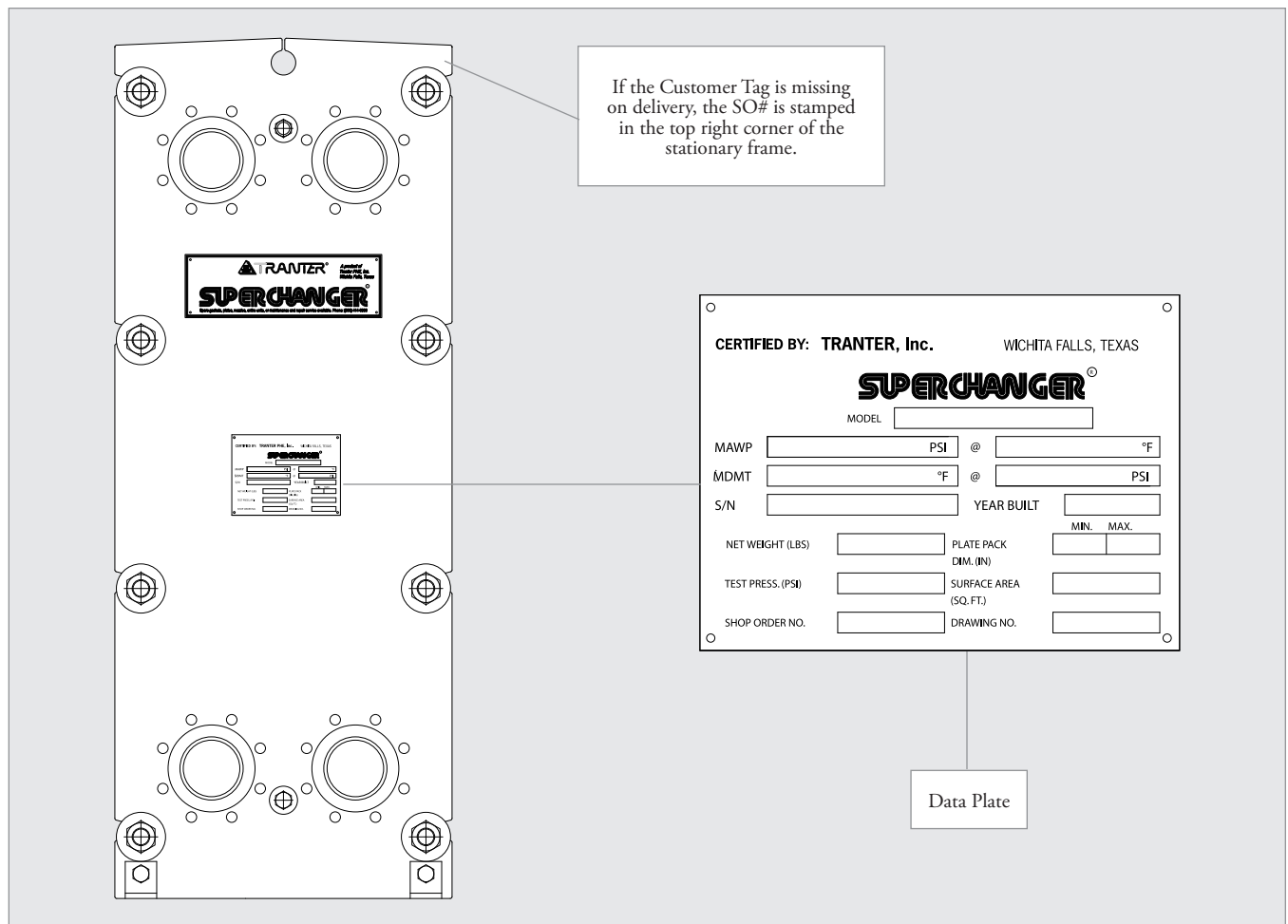


Figure 1
A data plate like the one shown on the picture above is fixed to the stationary frame of the unit and provides the following information. This information is helpful when contacting the factory.

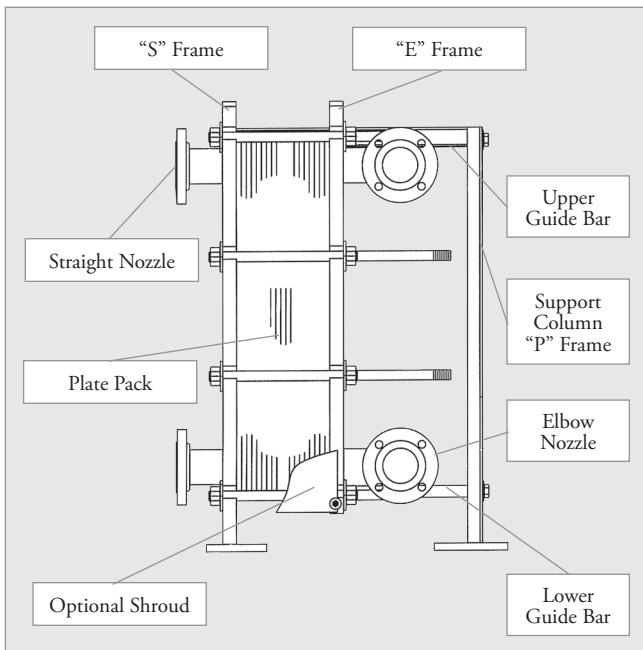


Figure 2
Superchanger Frame, Models HP, UP, SP, MP and FP.

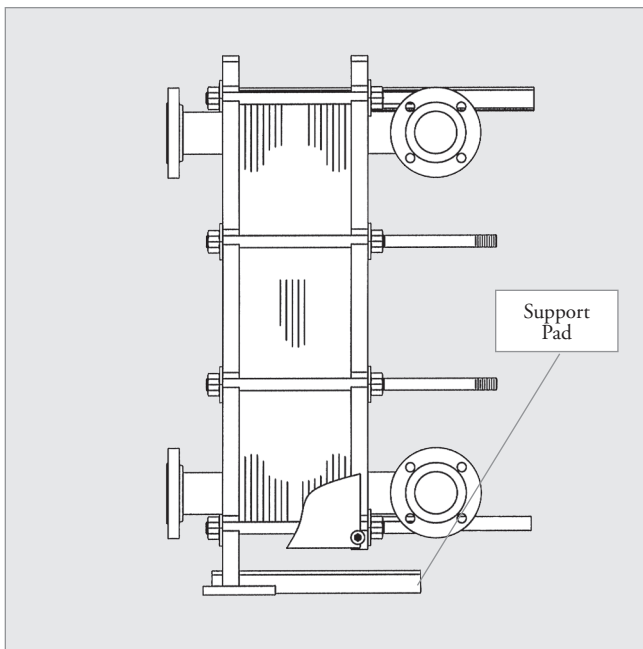


Figure 3
Superchanger Frame, Models HJ, UJ, SJ and MJ.

PLATE DESCRIPTION AND CONSTRUCTION

SUPERCHANGER plate corrugations are available in four patterns. Depending on the applications, the GF, UX, SX, GC and GX Series plates are used to achieve maximum heat transfer.

UX, SX and GC Series plates: Herringbone (chevron) pattern is ideally suited for handling aqueous solutions.

GF Series: Wide gap and parallel (washboard) patterns are designed for applications where there are high viscosity fluids or fluids containing fibers or coarse particles.

GX Series: An asymmetrical four quadrant plate suited for low viscosity and close temperature approach applications or processes involving two vastly different flow rates. It is also well suited for equal flows and close approach.

All plates are manufactured from die-formed sheet metal in virtually any material that can be cold worked, such as stainless steel, titanium, Alloy C-276, Alloy-20, etc. There are grooves around the circumference of the plates which accept the sealing gasket and also add reinforcement because of the ribbed edges. Fluid passage holes are pierced at the corners of each plate. The number and location of the holes is dependent upon the design conditions.

The gaskets are single piece, molded construction, and generally bonded to the plates with Pliobond 30 adhesive. The gasket material is selected for compatibility with the fluids being processed and the operating temperatures.

Each plate also contains flow directors at the top and bottom of the heat transfer surface in the port hole areas, which evenly distribute the fluids. Some plates require a hanger, which attaches the plate to the upper guide bar. For most models, the upper guide bar is the plate's sole support member in the frame, while the lower guide bar serves as an alignment member in all plates except the UXP-005 and the UXP-001, which are supported by the lower guide bar. See Figures 4 through 7 and Tables 1a and 2 for specific models.

Plate Details

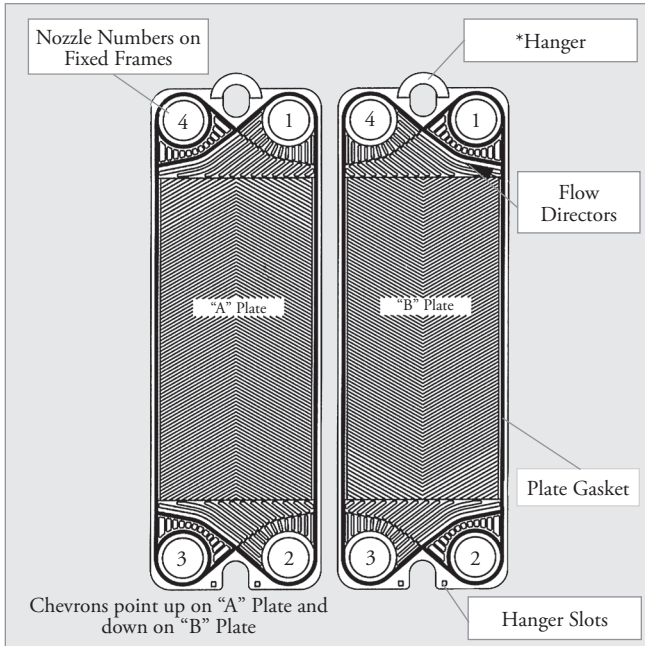


Figure 4
 Typical UX, SX or GC Series (herringbone) plate with gasket and hanger. Note that the chevron angle for the herringbone plate can differ on various models.

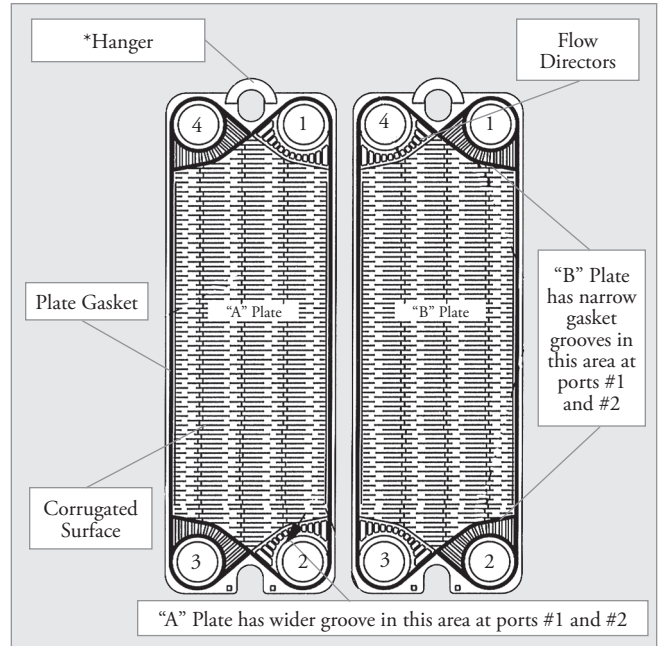


Figure 5
 Typical GF Series (washboard) plate with gasket and hanger.

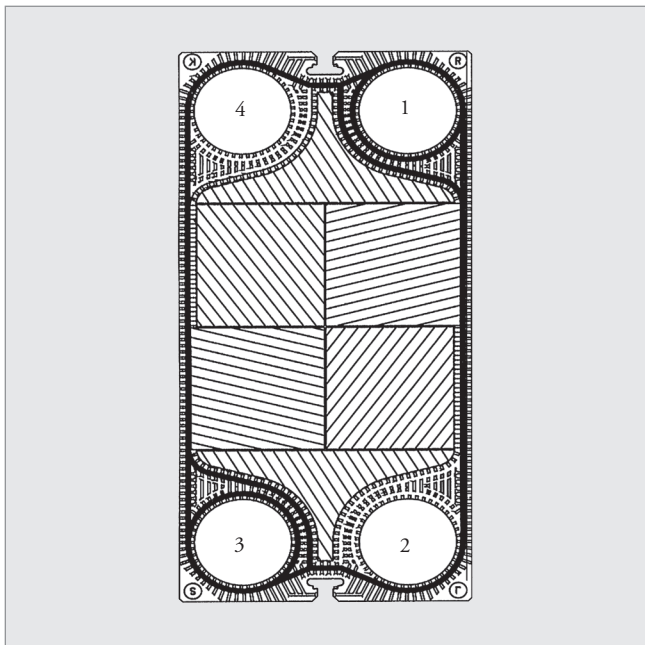


Figure 6
 Typical GX plate with gasket. Note that the chevron angle for the herringbone plate can differ on various models.

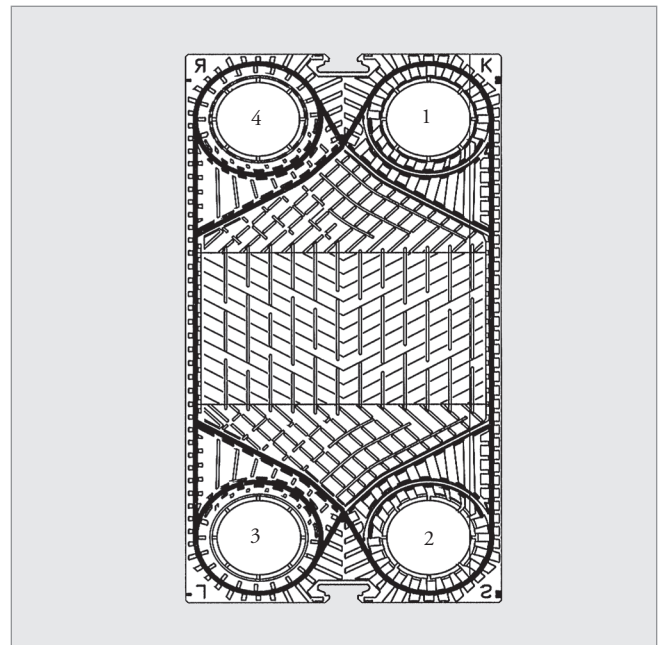


Figure 7
 Typical GF (wide gap) plate with gasket.

Unit Part Numbers

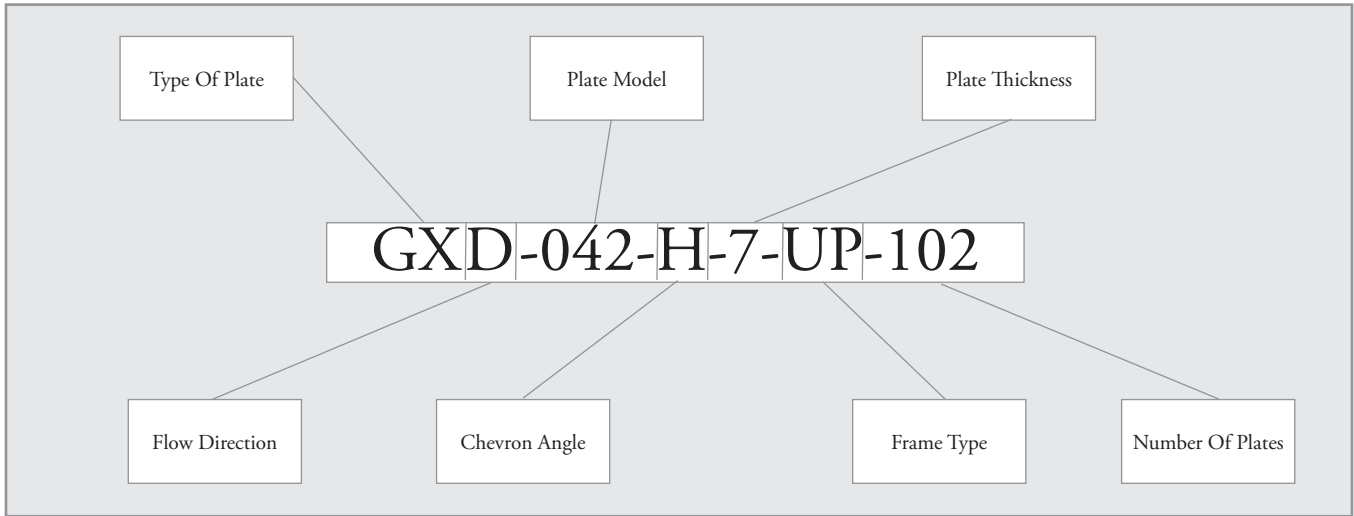


Figure 8
 Typical SUPERCHANGER model number, in this case a diagonal flow GX-42 unit with glued gaskets, 0.7 mm thick high-theta plates, a UP frame and 102 plates.

Figure 8 displays a typical SUPERCHANGER unit part number. The first entry represents the plate style (two-letter code) and flow, such as:

- | | |
|----|--|
| GX | Gasketed Ultraflex / Gasket groove in the neutral plane |
| GC | Gasketed Conventional / Gasket groove in the bottom plane |
| GD | Gasketed Double Wall |
| GW | Gasketed Semi Welded |
| GF | Gasketed Free Flow (Wide Gap and Washboard) |
| GM | Gasketed Mechanical Glue (Snap-In gaskets) |
| GL | Gasketed Conventional / Gasket groove in the neutral plane |

The second entry (third character) represents the flow; D for diagonal and P for parallel.

The third entry (three-digit code) represents the plate model or surface area.

The fourth entry represents the plate profile angle, or theta:

- H (high)
- L (low)
- M (mixed)
- A (30°+45° for UXP-960)
- Z (45°+60° for UXP-960)

The fifth entry represents the plate thickness:

- 5 (0.5 mm)
- 6 (0.6 mm)
- 7 (0.7 mm)
- 8 (0.8 mm)
- 9 (0.9 mm)
- 0 (1 mm)

The sixth entry shows the frame type (HP, UP, etc.).

The final entry (three-digit code) represents the plate count.

Plate Material and Date of Manufacture Data

All plates are stamped with identification numbers. The numbers are located on both ends of the plates as indicated in the sketches below. The heat number, material and month and year of manufacture can be determined from these numbers.

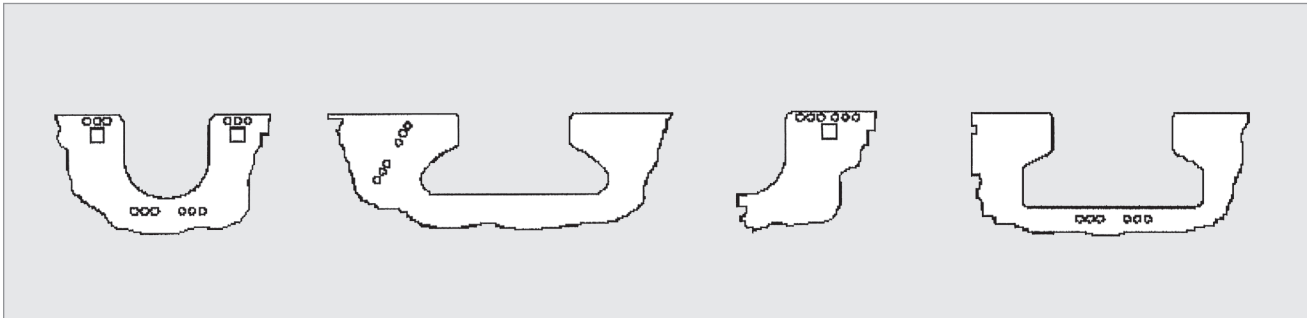
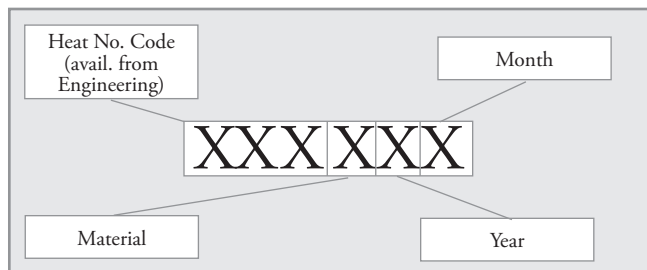
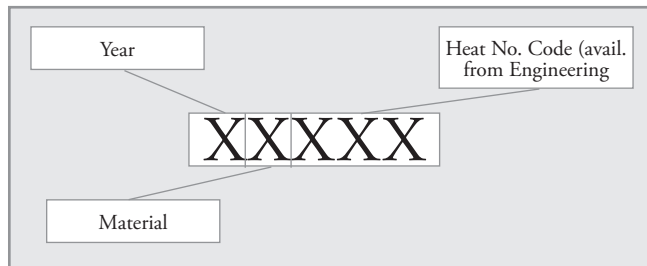


Figure 9
General locations of code stamping for various plate models.

Six-Digit Codes



Five-Digit Codes



P-Prefix Codes

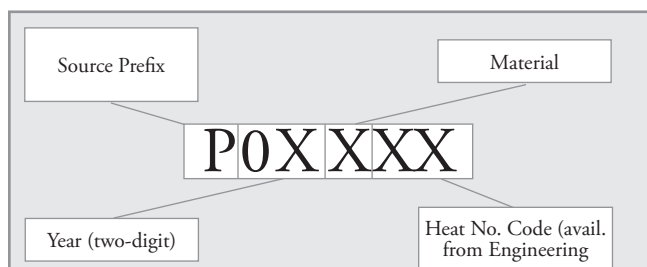


Table 1 Plate Codes

	Six-Digit	Five-Digit or P-Prefix
Material		
0	Other (Nickel, 317 SS, 317L SS, etc.)	AISI 304
1	304 SS	AISI 316
2	316 SS	AISI 316L
3	Titanium	654 SMO
4	316L SS	254 SMO or other SS
5	Hastelloy-C-276	Titanium Grade 1
6	Incolloy 825	Titanium Grade 2
7	Monel 400	Hastelloy-C-276
8	316 High Moly	G-30
9	304L SS	Other materials
Year Of Manufacture		
8 or 08		1998
9 or 09		1999
0 or 00		2000
1 or 01		2001
2 or 02		2002
3 or 03		2003
4 or 04		2004
5 or 05		2005
6 or 06		2006
7 or 07		2007
Month Of Manufacture		
1	Jan/Feb	NA
2	Mar/Apr	NA
3	May/June	NA
4	July/Aug	NA
5	Sept/Oct	NA
6	Nov/Dec	NA



Model Nomenclature

If your unit was manufactured before July 1, 2002, use Table 1a to determine the current plate style nomenclature for your unit. Note

the port numbering has changed to the new design (see page 13).

Table 1a Updated Nomenclature Codes

Old Name	New Name
Glued Gasket Models	
GC-12	GCD-012
GC-30	GCD-030
GC-48	GCD-048
GC-50	GCD-050
GC-26	GCP-026
GC-28	GCP-028
GC-51	GCP-051
GC-60	GCP-060
S3	GFP-030
S8	GFP-080
TW-05	GFP-057
TW-10	GFP-097
TW-18	GFP-187
TD-10	GCD-010
TP-10	GCP-010
GW-81	GWP-081
GW-82	GWP-082
GW-83	GWP-083
WH-040	GWP-400
WX-050	GWP-500
UFX-6/GX-6	GXD-006
GX-7	GXD-007
UFX-12/GX-12	GXD-012
UFX-18/GX-18	GXD-018
UFX-26/GX-26	GXD-026
UFX-37/GX-37	GXD-037
UFX-42/GX-42	GXD-042
UFX-51/GX-51	GXD-051
UFX-60/GX-60	GXD-060
UFX-64/GX-64	GXD-064
UFX-85/GX-85	GXD-085
UFX-91/GX-91	GXD-091
UFX-100/GX-100	GXD-100
Old Name	New Name

Glued Gasket Models	
UFX-118/GX-118	GXD-118
UFX-140/GX-140	GXD-140
UFX-145/GX-145	GXD-145
UFX-180/GX-180	GXD-180
UFX-205/GX-205	GXD-205
UFX-265/GX-265	GXD-265
UFX-325/GX-325	GXD-325
07S	SXP-070
14S	SXP-140
SX41	SXP-400
UX-05	UXP-005
UX-01	UXP-010
06T	UXP-060
UX-10	UXP-100
11T	UXP-110
UX-20	UXP-200
UX-40	UXP-400
UX-81	UXP-801
UX-83	UXP-802
UX-90	UXP-900
LP-80	UXP-960
Snap-In Gaskets	
GC-26	GMP-026
UX-05	UMP-005
UX-01	UMP-010
UX-20	UMP-200
UX-40	UMP-400
06T	UMP-060
TP-10	GMP-010
TD-10	GMD-010
Double Wall	
GX-42	GDD-042
UX-01	UDP-010

Frame Pressure Ratings

Table 1b Frame Pressure Ratings

FRAME TYPE	NOMINAL ASME CODE PRESSURE RATINGS	
	Design Pressure, (psig)	Test Pressure, (psig)
NJ/NP/VJ/VP	Non-code; contact factory	Non-code; contact factory
HJ/HP	100	130
UJ/UP	150	195
SJ/MJ/SP/MP	300	390
FP	350	455

Standard unit pressure ratings are shown. Contact the factory for higher design pressures, up to 400 psig, depending upon the application.

Condensed Unit Specifications

Table 2 Condensed Unit Specifications

Model	Nominal Frame Dimensions		Connection (in.)	Max. Flow (gpm)	Channel Volume Between Plates (gal)		
	Height (in.)	Width (in.)			Wide	Medium	Narrow
GXD-007	37	8-1/4	1	75	NA	0.0423	NA
GXD-012	39	14	2	292	NA	0.0872	NA
GXD-018	48	14	2	292	NA	0.124	NA
GXD-026	54	22	2, 4	1171	NA	0.227	NA
GXD-042	71	22	2, 4	1171	NA	0.351	NA
GXD-051	72	27	4, 6	2264	NA	0.444	NA
GXD-037	60	27	4, 6	2769	NA	0.246	NA
GXD-064	79	27	4, 6	2769	NA	0.423	NA
GXD-091	98	27	4, 6	2769	NA	0.6	NA
GXD-118	117	27	4, 6	2769	NA	0.777	NA
GXD-060	69	38	4, 6, 8	4755	NA	0.502	NA
GXD-100	92	38	4, 6, 8	4755	NA	0.845	NA
GXD-140	115	38	4, 6, 8	4755	NA	1.162	NA
GXD-180	138	38	4, 6, 8	4755	NA	1.479	NA
GXD-085	81	50	10, 12, 14	10471	NA	0.88	NA
GXD-145	104	50	10, 12, 14	10471	NA	1.334	NA
GXD-205	127	50	10, 12, 14	10471	NA	1.788	NA
GXD-265	149	50	10, 12, 14	9183	NA	2.243	NA
GXD-325	172	50	10, 12, 14	9183	NA	2.695	NA
UXP-005	24	12	1, 2	265	NA	0.06	NA
UXP-010	31	12	1, 2	292	NA	0.08	NA
UXP-100	45	17	2, 3	520	NA	0.13	NA
GFP-030	58	22	2, 3, 4	1060	NA	0.4	NA
UXP-200	62	24	2, 3, 4	1060	NA	0.34	NA
UXP-060	74	32	4, 6, 8	3825	NA	0.67	NA
SXP-070	71	36	4, 6, 8	4754	NA	0.52	NA
GFP-080	85	30	4, 6, 8	3450	NA	0.9	NA
UXP-400	85	32	4, 6, 8	3825	NA	0.87	NA
SXP-400	83	36	4, 6, 8	4754	NA	0.63	NA
UXP-110	106	32	4, 6, 8	3825	NA	1.21	NA
SXP-140	103	36	4, 6, 8	4754	NA	0.81	NA
UXP-801	105	54	10, 12, 14	11200	NA	2.40	NA
GCP-010	38	13	1, 2	292	NA	0.1135	NA
GCP-016	39	14	2, 5	292	NA	0.063	NA
GCP-026	54	22	2, 3, 4	1171	NA	0.2642	NA
GCP-028	31	7	1	75	NA	0.4	NA
GCP-051	72	27	4, 6	2324	NA	0.55	NA
GCP-060	69	38	4, 6, 8	4755	NA	0.783	NA
GFP-057	71	35	4, 6, 8	4755	2.36	2	1.63
GFP-097	88	35	4, 6, 8	4755	3.23	2.61	1.99
GFP-187	126	35	4, 6, 8	4755	5.08	3.92	2.76
GLP/GLD-013	39	14	2.5	475	NA	0.087	NA
GL-230	121	66	20	23465	NA	3.33	NA
GL-330	145	66	20	23465	NA	3.78	NA
GL-430	169	66	20	23465	NA	4.65	NA



Plate Pack Widths

“A” Dimension for standard thickness materials

Calculating the “A” dimension (Plate Pack Width in Inches) for various SUPERCHANGER Models can be accomplished by using the formulas indicated in Table 3. N = Number of Plates.

PLATE DESIGNATION, p	PLATE THICKNESS, t
4	0.015748
5	0.019685
6	0.023622
7	0.027559
8	0.031496
0	0.039370

N = Number of Plates

p = Plate Thickness Designation

t = Plate Thickness in Inches

Please contact Tranter for the “A” Dimension when other plate thicknesses are involved.

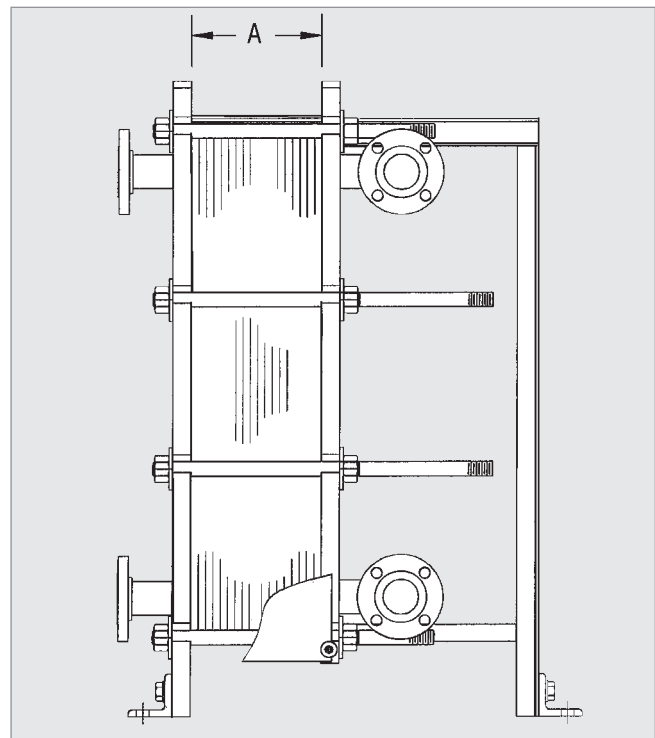


Figure 10
Plate thicknesses.

Plate Pack Tightening Dimensions

Table 3 Plate Pack Tightening Dimensions

Plate Type	A Max.* (in.)	A Min.* (in.)	Plate Type	A Max.* (in.)	A Min.* (in.)
UXP-005	(t + 0.102362) N	(t + 0.094488) N	GXD-026, GXD-042	(t + 0.13441) N	(t + 0.12541) N
UXP-010	(t + 0.102362) N	(t + 0.094488) N	GXD-037, -064, -091, -118	(t + 0.11821) N	(t + 0.11021) N
UXP-100	(t + 0.0944) N	(t + 0.0866) N	GXD-051	(t + 0.13441) N	(t + 0.12541) N
UXP-200	(t + 0.108268) N	(t + 0.102362) N	GXD-060, -100, -140, -180	(t + 0.13441) N	(t + 0.12541) N
UXP-060	(t + 0.141732) N	(t + 0.133858) N	GXD-085, -145, -205, -265, -325	(t + 0.13441) N	(t + 0.12541) N
UXP-400	(t + 0.141732) N	(t + 0.133858) N	GFP-057, -097, -187	(t + 0.2965) N	(t + 0.3025) N
UXP-110	(t + 0.141732) N	(t + 0.133858) N	GCP-010	(t + 0.1378) N	(t + 0.1299) N
SXP-070, SXP-400, SXP-140	(t + 0.102362) N	(t + 0.094488) N	GCP-016	(t + 0.07205) N	(t + 0.06969) N
UXP-801	(t + 0.181102) N	(t + 0.173228) N	GCP-026	(t + 0.1633) N	(t + 0.1523) N
UXP-802	(t + 0.181102) N	(t + 0.173228) N	GCP-051	(t + 0.1601) N	(t + 0.1548) N
GFP-030	(0.1881N) + 0.07874	(0.1767N) + 0.07874	GCP-060	(t + 0.1790) N	(t + 0.1676) N
GFP-080	(0.189013N) + 0.07874	(0.1796N) + 0.07874	GCD-012	(t + 0.1000) N	(t + 0.09685) N
GXD-007	(t + 0.10191) N	(t + 0.09491) N	GLD-230, -330, -430	(t + 0.1831) N	(t + 0.1713) N
GXD-012, GXD-018, GL-013	(t + 0.11821) N	(t + 0.11021) N			

*Applicable to units with elastomeric gaskets, round off to the nearest 1/32 in. Units with teflon encapsulated gaskets should be tightened to the “A Max.” formula.

The single digit of the model number given just before the frame designation indicates the plate thickness in tenths of a millimeter. The only exception is the zero (0) designation, which indicates a 1.0 mm plate thickness.

HOW TO USE TABLE 3:

EXAMPLE: Given a model UXP-100-L-6-MP-32, go to the Plate Pack Width chart above and select Plate Designation 6, the Plate Designation for a model UXP-100. The corresponding Plate Thickness is 0.023622 in. Now find the Plate Type row showing UXP-100 in Table 3. The “A Max.” dimension is calculated by: (t+0.0944)N = (0.023622+0.0944)32 = 3.78 in. The “A Min.” dimension is calculated in a similar manner. Round off calculated number to nearest 1/32 in.