

P-LINE

HEAT EXCHANGERS IN
THE PHARMACEUTICAL
INDUSTRY



P-LINE

HEAT EXCHANGERS IN THE PHARMACEUTICAL INDUSTRY

Water is the most commonly used raw material in the pharmaceutical industry. Used not only as the main ingredient in the production of medicines and vaccines, it is also utilized for cleaning technological lines and rinsing of packages.

Water for injection (WFI) is produced from purified water that has been treated to eliminate substances harmful to the human body. In the production of medicines, it plays the role of a solvent, substance for dilution of preparations, as well as means for sterilizing containers, equipment or systems.

Generation, storage, and distribution of WFI takes place in carefully designed systems. The required work parameters are usually determined at the design stage and depend on the parameters of the process for which a given medium is used.

Sanitary aspects in the pharmaceutical industry are extremely important. The WFI systems must meet strict hygiene requirements to prevent product contamination. In order to meet these requirements, Hexonic offers specialized P-line heat exchangers that are ideal to be used in WFI generators, storage and distribution systems, and points of use.

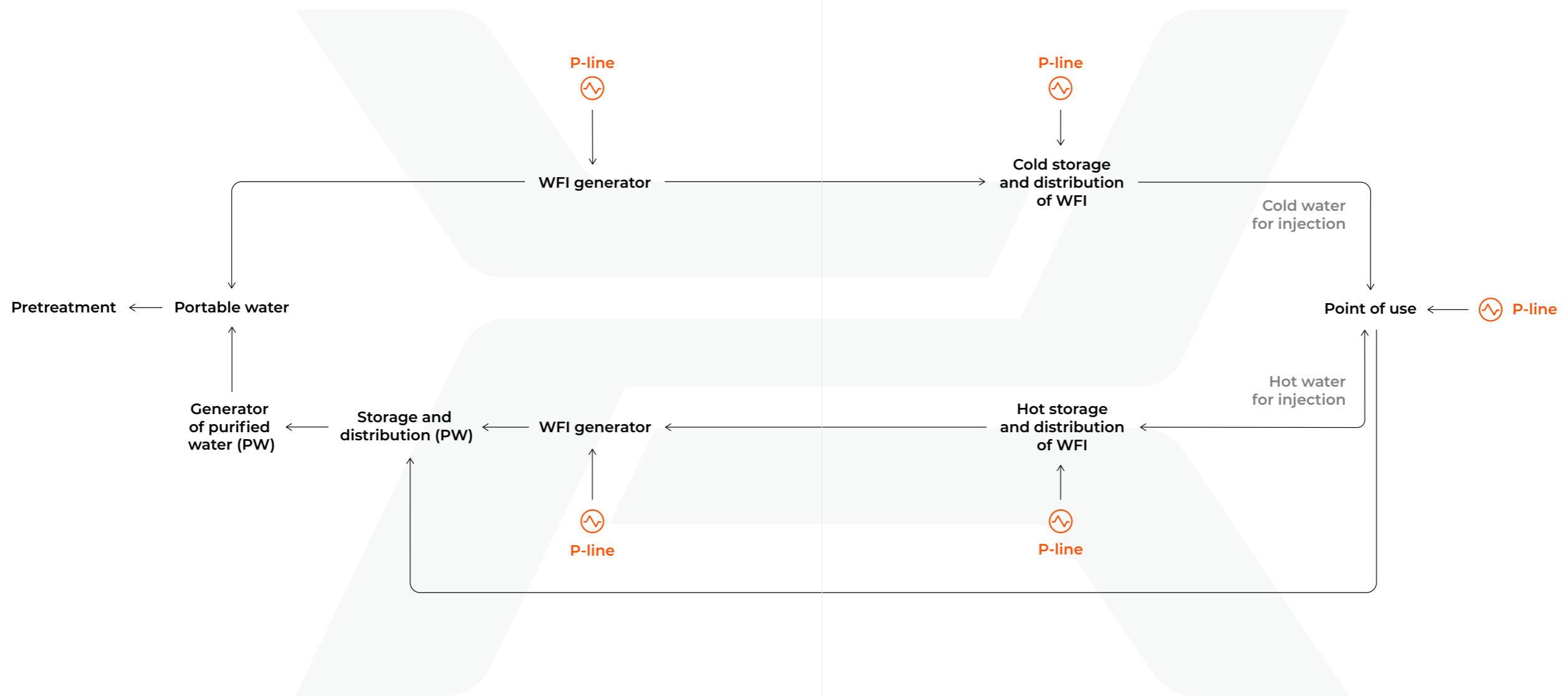


DIAGRAM OF PW AND WFI SYSTEMS WITH P-LINE HEAT EXCHANGERS

WFI — WATER FOR INJECTION

PW — PURIFIED WATER

WFI APPLICATIONS



PRODUCTION OF INJECTABLE MEDICINES



PRODUCTION OF BIOTECHNOLOGICAL PREPARATIONS



PRODUCTION OF HIGH PURITY INHALATION MEDICINES



PRODUCTION OF OPHTHALMIC MEDICINES AND CONTACT LENSES



PRODUCTION OF ADVANCED THERAPY



PRODUCTION OF DIAGNOSTIC PREPARATIONS



MEDICINAL PRODUCTS (ATMP): GENE THERAPY PRODUCTS



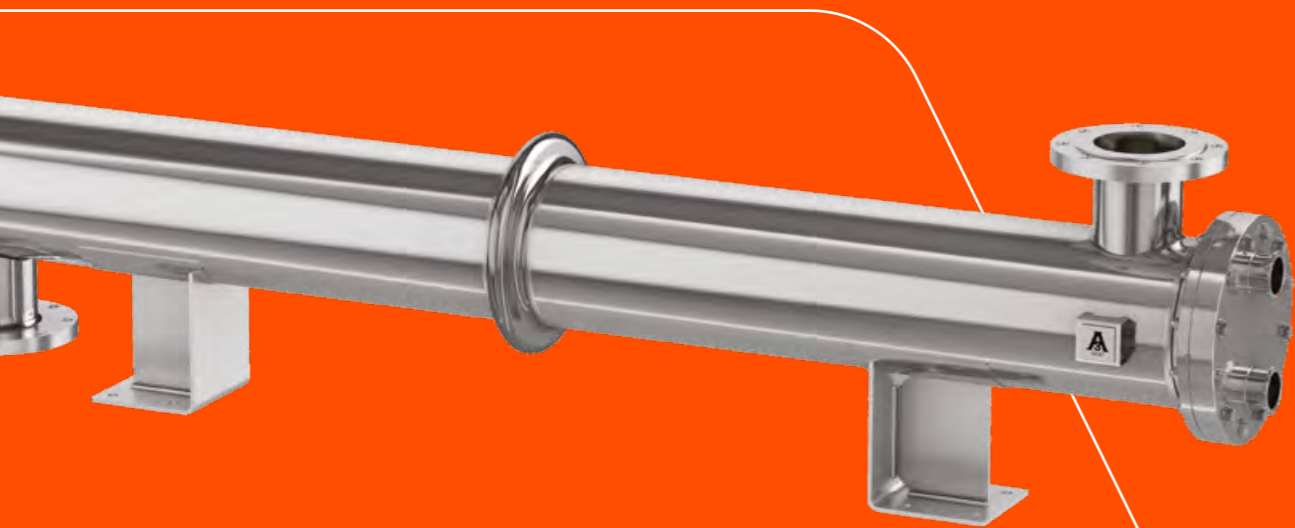
CLEANING OF CONTAINERS, PACKAGING AND INSTALLATIONS



SOMATIC CELL THERAPY MEDICINAL PRODUCTS



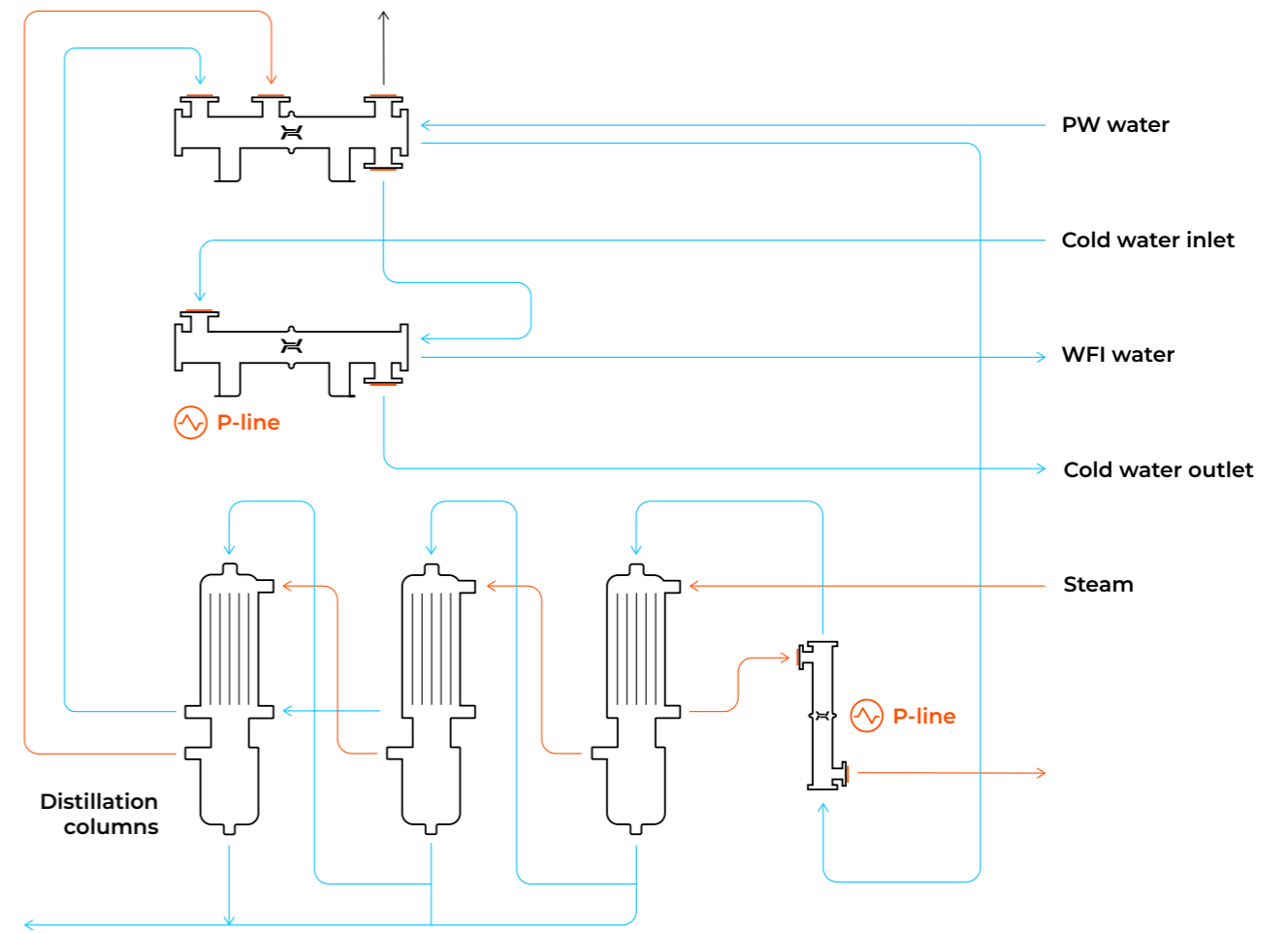
TISSUE ENGINEERING PRODUCTS



HEAT EXCHANGERS IN WFI GENERATORS

Thermal distillation is the most common method used to obtain water for injection (WFI). WFI generator consists of one or more distillation columns in which the process of repeated evaporation and condensation of purified water takes place. As the process is carried out at a high temperature, this method gives complete assurance of the microbiological purity of the WFI water. P-line heat exchangers are used in the WFI generators for preheating, regenerative heating, as well as for final condensation of pure steam and cooling of generated water for injection.

DIAGRAM OF THE WFI GENERATOR WITH P-LINE HEAT EXCHANGERS



WFI — WATER FOR INJECTION

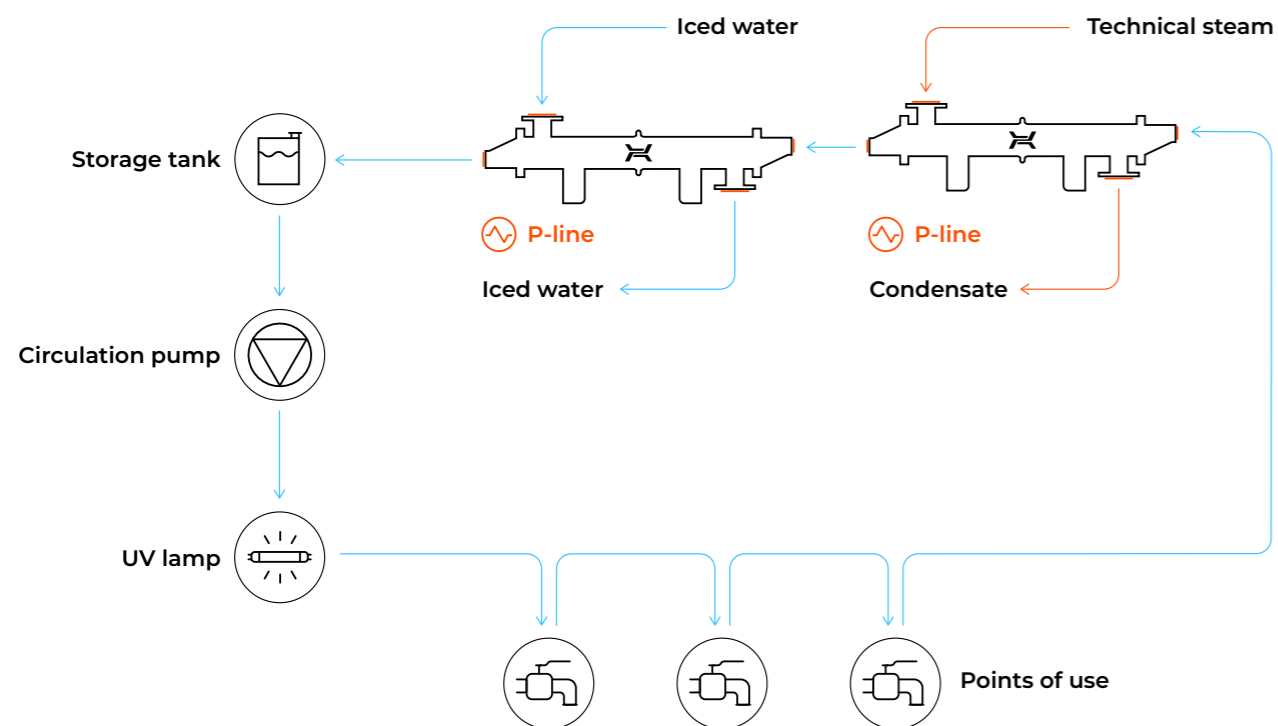
PW — PURIFIED WATER

WFI COLD STORAGE AND DISTRIBUTION SYSTEM

The distilled water generated must be properly stored and distributed to the points of use.

In the cold water storage and distribution system, two P-line heat exchangers are installed. The first one is designed to keep the water temperature low (at 15–30°C) and cool the system. The second heat exchanger periodically heats the WFI water to sterilize the system.

DIAGRAM OF THE WFI COLD WATER STORAGE AND DISTRIBUTION SYSTEM WITH TWO P-LINE HEAT EXCHANGERS INSTALLED



Another option is the system with only one P-line exchanger installed. It then performs both functions. Depending on whether cold water or technical steam flows through the shell, it cools or heats WFI.

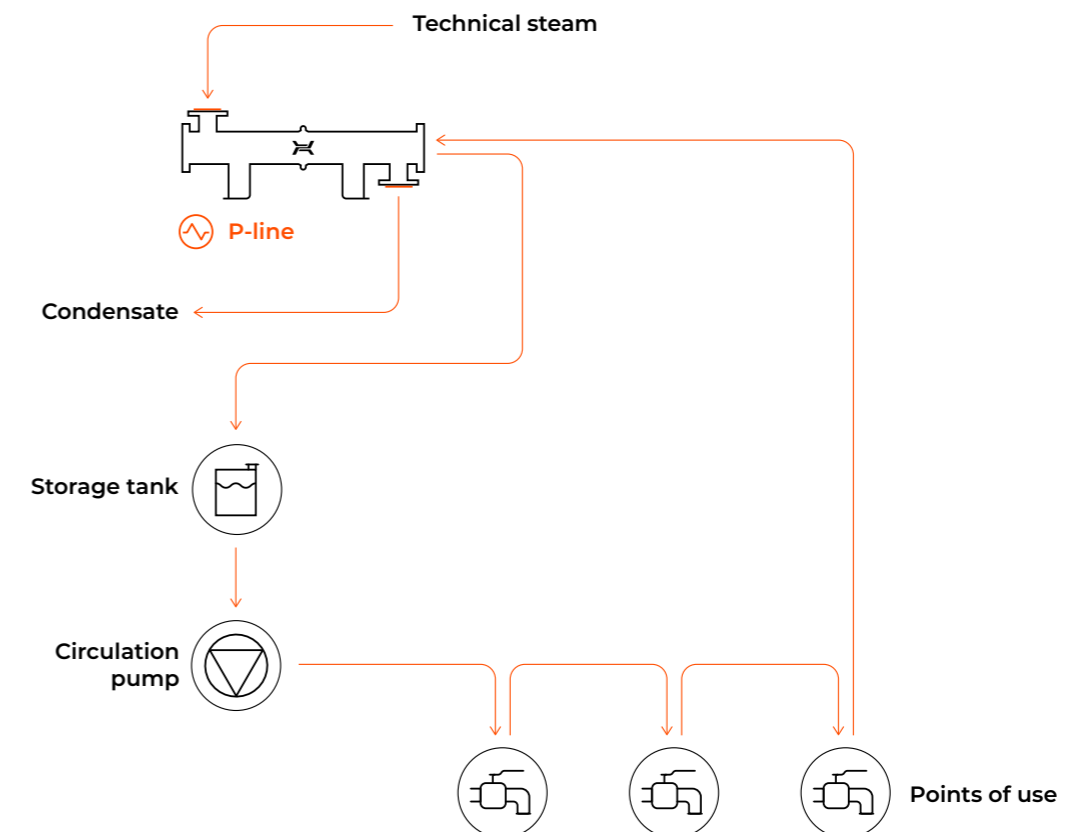
WFI — WATER FOR INJECTION

WFI HOT STORAGE AND DISTRIBUTION SYSTEM

Another method of storage and distribution is by keeping the water at a constant high temperature of 80°C–85°C.

The task of the P-line heat exchanger installed in this system is to maintain the temperature using steam or hot water as a working medium.

DIAGRAM OF HOT STORAGE AND DISTRIBUTION SYSTEM WITH A TWO-PASS P-LINE HEAT EXCHANGER INSTALLED



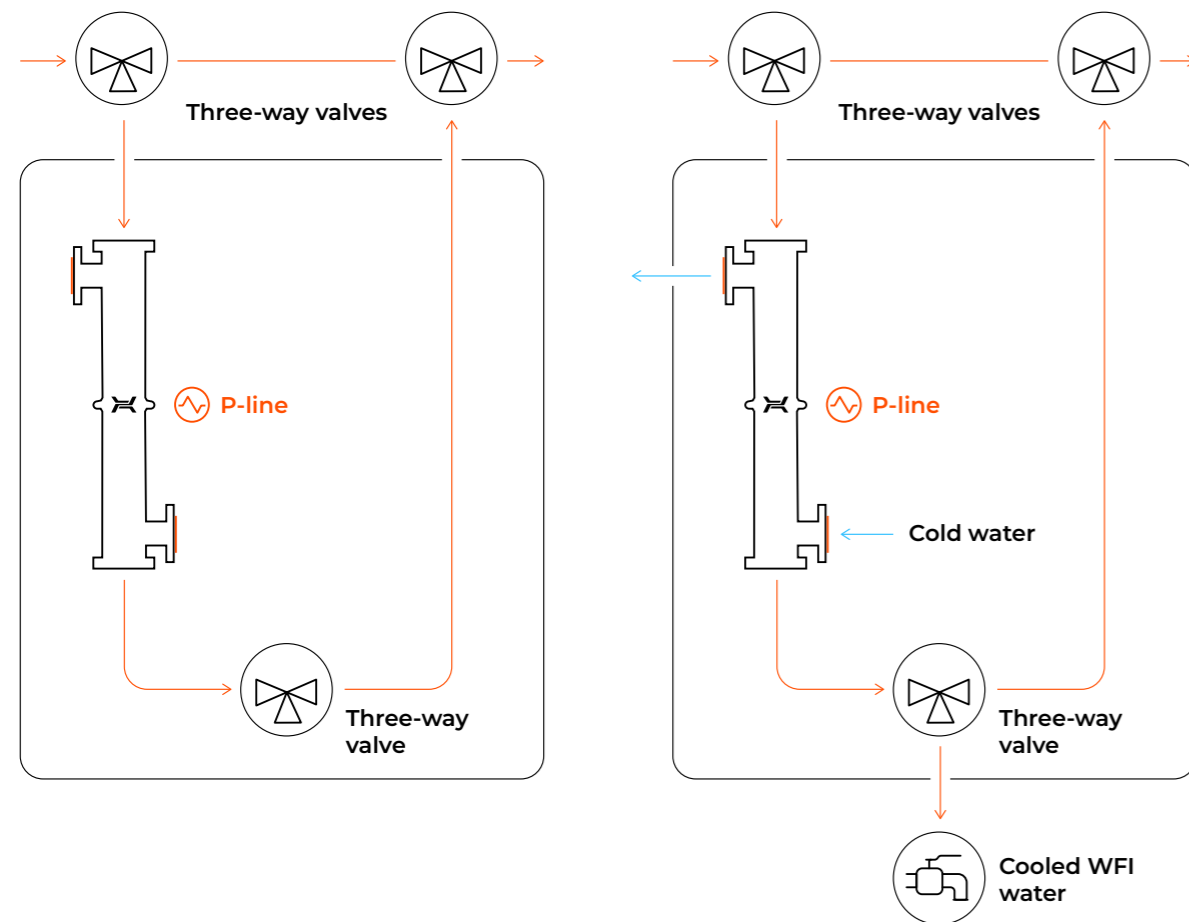
WFI — WATER FOR INJECTION

WFI POINTS OF USE

In order to use WFI it must be cooled to the application temperature, which is usually 25°C to 45°C.

If there are many points of use with the same temperature required, an additional circuit may be separated in the system in which the P-line heat exchanger is installed. Its task is to cool the water to the application temperature.

DIAGRAM OF THE POINT OF USE (POU) WITH THE P-LINE EXCHANGER INSTALLED



Another option is to place a heat exchanger just in front of the point of use (POU).

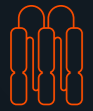


P-LINE HEAT EXCHANGERS

P-line heat exchangers meet the highest requirements of the pharmaceutical industry. At the same time, they meet its stringent hygiene standards imposed by inspection bodies. They have been designed to minimize the risk of contamination and to ensure safe and sterile work.

APPLICATION

PHARMACEUTICAL INDUSTRY



WFI GENERATOR



WFI HOT STORAGE AND DISTRIBUTION



WFI COLD STORAGE AND DISTRIBUTION



WFI POINT OF USE



CLEAN STEAM GENERATION

OTHER



FOOD INDUSTRY



DAIRY INDUSTRY



BREWING INDUSTRY

WHY CHOOSE **HEXONIC** P-LINE HEAT EXCHANGERS?



DESIGNED TO OPERATE IN PHARMACEUTICAL PRODUCTION



3-A CERTIFIED



MADE ENTIRELY OF STAINLESS STEEL



ONE-, TWO-, AND FOUR-PASS TYPES



HORIZONTAL AND VERTICAL MODELS AVAILABLE



SURFACES THAT COME INTO CONTACT WITH PURE MEDIUM HAVE BEEN POLISHED TO RA ≤ 0.5 μM ROUGHNESS



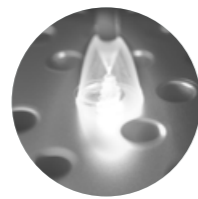
MANUFACTURED IN ACCORDANCE WITH CGMP, PED, ASME



P-LINE DESIGN

TUBES ARE CONNECTED WITH TUBESHEETS

using the pressure expansion method with pure pressurized water up to 6000 bar, which eliminates the risk of damaging their inner surface



TUBES ARE CONNECTED WITH THE EXTERNAL TUBESHEET

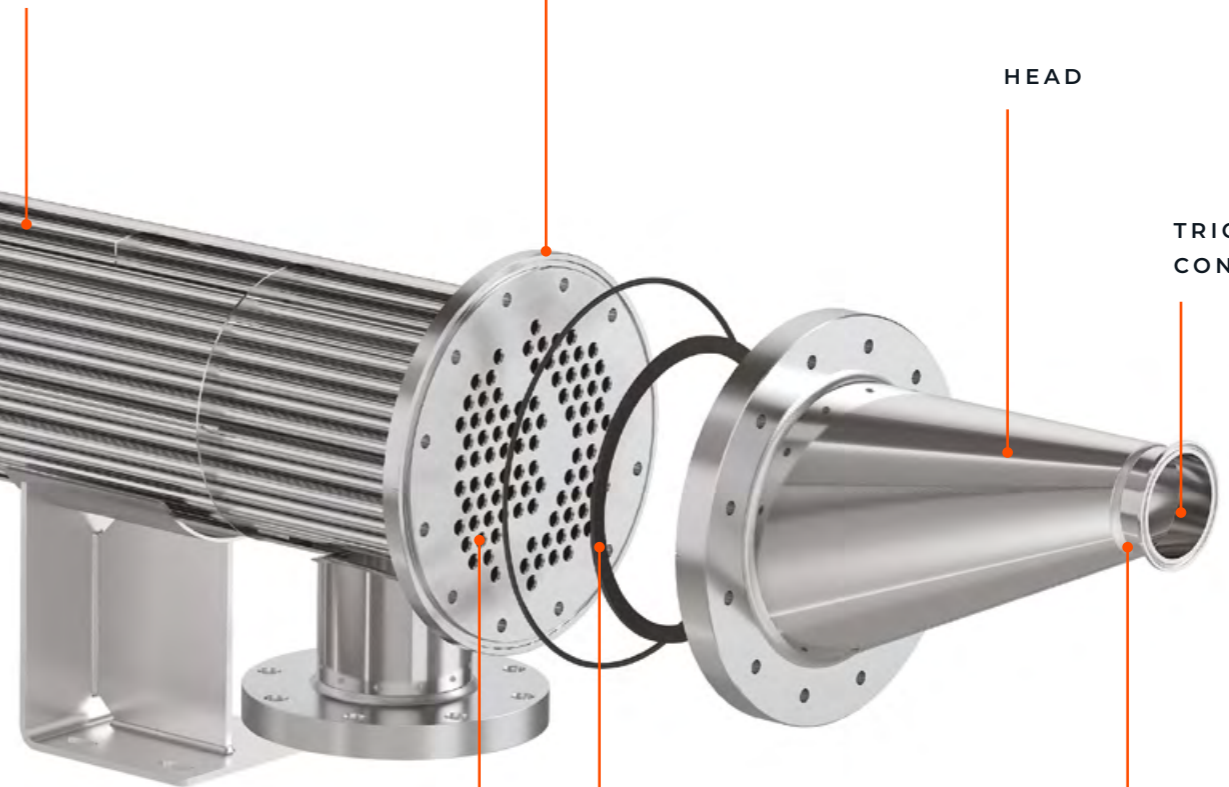
the tubes, expanded using the pressure method, are welded to the external tubesheet using pure argon shield method



COMPENSATOR

STAINLESS STRAIGHT TUBES

with a diameter of 0.3 in or 0.5 in



HEAD

TRICLAMP CONNECTION



DOUBLE TUBESHEET

reduces the risk of media mixing in case of potential leakage

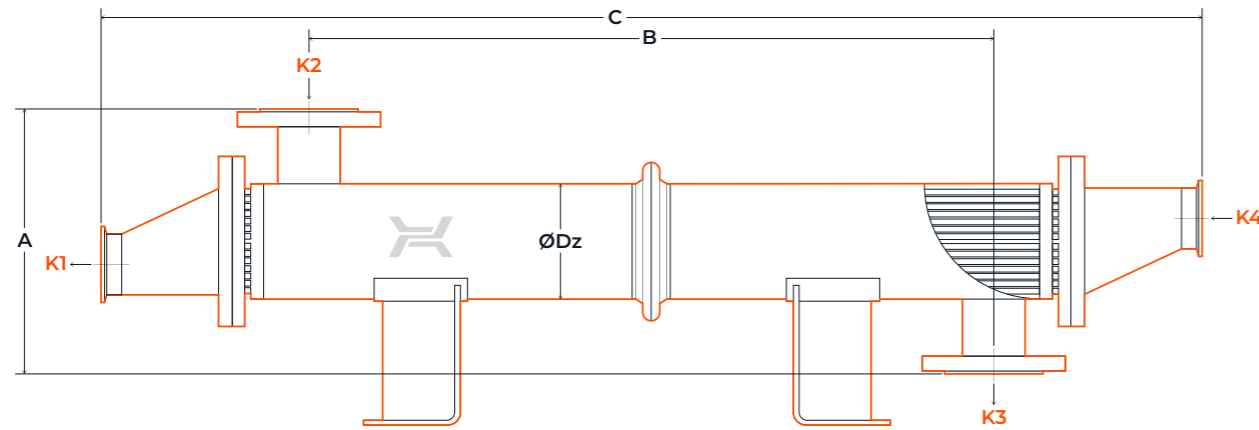
CERTIFIED GASKETS

made of silicone and Viton and clean side Triclamp connections

TECHNICAL DATA

STANDARD LOCATION OF CONNECTIONS:

- K1 / K4** — inlet / outlet tube side (hygienic side)
- K3 / K2** — inlet / outlet shell side (service side)



EXEMPLARY MEDIA

SHELL SIDE

- WATER
- STEAM
- OTHER (CONSULT THE MANUFACTURER)

TUBE SIDE

- PHARMACEUTICAL PRODUCT

WORKING PARAMETERS

TUBES

- MAX. TEMPERATURE
- VITON — 140°C / 284°F
- SILICON — 121°C* / 249°F

MIN. TEMPERATURE

- VITON — -17°C* / 1.4°F
- SILICON — -25°C / -13°F

MAX. PRESSURE

- VITON — 10 BAR / 145 PSI
- SILICON — 10 BAR / 145 PSI

SHELL

- MAX. TEMPERATURE — 200°C / 392°F
- MIN. TEMPERATURE — -25°C / -13°F
- MAX. PRESSURE — 10 BAR / 145 PSI

* PARAMETERS FOR P-050:
 MAX. TEMPERATURE — 140°C / 284°F
 MIN. TEMPERATURE — -25°C / -13°F

TECHNICAL PARAMETERS

Type	Dimensions												Flow	Tube diameter	
	A		B		C				ØDz						
	mm	in	mm	in	Type 1P		Type 2P		Type 4P		mm	in			
P-050.070.08	176	6.9	709	27.9	880	34.6	-	-	-	-	60,3	2.4	1P	8	0.3
P-050.110.08	176	6.9	1009	39.7	1180	46.5	-	-	-	-	60,3	2.4	1P	8	0.3
P-050.140.08	176	6.9	1309	51.5	1480	58.3	-	-	-	-	60,3	2.4	1P	8	0.3
P-080.070.08	300	11.8	518	20.4	1002	39.4	-	-	-	-	88,9	3.5	1P	8	0.3
P-080.110.08	300	11.8	958	37.7	1442	56.8	-	-	-	-	88,9	3.5	1P	8	0.3
P-080.140.08	300	11.8	1258	49.5	1742	68.6	-	-	-	-	88,9	3.5	1P	8	0.3
P-100.070.08	325	12.8	518	20.4	1036,3	40.8	-	-	-	-	114,3	4.5	1P	8	0.3
P-100.110.08	325	12.8	958	37.7	1476,3	58.1	-	-	-	-	114,3	4.5	1P	8	0.3
P-100.140.08	325	12.8	1258	49.5	1776,3	69.9	-	-	-	-	114,3	4.5	1P	8	0.3
P-125.110.08	350	13.8	958	37.7	1525,6	60.1	1269	50	-	-	139,7	5.5	1P, 2P	8	0.3
P-125.140.08	350	13.8	1258	49.5	1825,6	71.9	1569	61.8	-	-	139,7	5.5	1P, 2P	8	0.3
P-125.190.08	350	13.8	1728	68.0	2295,6	90.4	2039	80.3	-	-	139,7	5.5	1P, 2P	8	0.3
P-150.110.08	370	14.6	960	37.8	1546,8	60.9	1254,5	49.4	-	-	159	6.3	1P, 2P	8	0.3
P-150.140.08	370	14.6	1260	49.6	1846,8	72.7	1554,5	61.2	-	-	159	6.3	1P, 2P	8	0.3
P-150.190.08	370	14.6	1730	68.1	2316,8	91.2	2024,5	79.7	-	-	159	6.3	1P, 2P	8	0.3
P-200.110.08	460	18.1	924	36.4	1789,8	70.5	1262,5	49.7	1262,5	49.7	219,1	8.6	1P, 2P, 4P	8	0.3
P-200.140.08	460	18.1	1224	48.2	2089,8	82.3	1562,5	61.5	1562,5	61.5	219,1	8.6	1P, 2P, 4P	8	0.3
P-200.190.08	460	18.1	1694	66.7	2559,8	100.8	2032,5	80	2032,5	80	219,1	8.6	1P, 2P, 4P	8	0.3
P-250.110.08	555	21.9	926	36.5	1953,2	76.9	1278	50.3	1271,5	50.1	273	10.7	1P, 2P, 4P	8	0.3
P-250.140.08	555	21.9	1226	48.3	2253,2	88.7	1578	62.1	1571,5	61.9	273	10.7	1P, 2P, 4P	8	0.3
P-250.190.08	555	21.9	1696	66.8	2732,2	107.6	2048	80.6	2041,5	80.4	273	10.7	1P, 2P, 4P	8	0.3
P-050.070.12	176	6.9	709	27.9	880	34.6	-	-	-	-	60,3	2.4	1P	12,7	0.5
P-050.110.12	176	6.9	1009	39.7	1180	46.5	-	-	-	-	60,3	2.4	1P	12,7	0.5
P-050.140.12	176	6.9	1309	51.5	1480	58.3	-	-	-	-	60,3	2.4	1P	12,7	0.5
P-080.070.12	300	11.8	518	20.4	1002	39.4	-	-	-	-	88,9	3.5	1P	12,7	0.5
P-080.110.12	300	11.8	958	37.7	1442	56.8	-	-	-	-	88,9	3.5	1P	12,7	0.5
P-080.140.12	300	11.8	1258	49.5	1742	68.6	-	-	-	-	88,9	3.5	1P	12,7	0.5
P-100.070.12	325	12.8	518	20.4	1036,3	40.8	-	-	-	-	114,3	4.5	1P	12,7	0.5
P-100.110.12	325	12.8	958	37.7	1476,3	58.1	-	-	-	-	114,3	4.5	1P	12,7	0.5
P-100.140.12	325	12.8	1258	49.5	1776,3	69.9	-	-	-	-	114,3	4.5	1P	12,7	0.5
P-125.110.12	350	13.8	958	37.7	1525,6	60.1	1269	50	-	-	139,7	5.5	1P, 2P	12,7	0.5
P-125.140.12	350	13.8	1258	49.5	1825,6	71.9	1569	61.8	-	-	139,7	5.5	1P, 2P	12,7	0.5
P-125.190.12	350	13.8	1728	68	2295,6	90.4	2039	80.3	-	-	139,7	5.5	1P, 2P	12,7	0.5
P-150.110.12	370	14.6	960	37.8	1546,8	60.9	1254,5	49.4	-	-	159	6.3	1P, 2P	12,7	0.5
P-150.140.12	370	14.6	1260	49.6	1846,8	72.7	1554,5	61.2	-	-	159	6.3	1P, 2P	12,7	0.5
P-150.190.12	370	14.6	1730	68.1	2316,8	91.2	2024,5	79.7	-	-	159	6.3	1P, 2P	12,7	0.5
P-200.110.12	460	18.1	924	36.4	1789,8	70.5	1262,5	49.7	1262,5	49.7	219,1	8.6	1P, 2P, 4P	12,7	0.5
P-200.140.12	460	18.1	1224	48.2	2089,8	82.3	1562,5	61.5	1562,5	61.5	219,1	8.6	1P, 2P, 4P	12,7	0.5
P-200.190.12	460	18.1	1694	66.7	2559,8	100.8	2032,5	80	2032,5	80	219,1	8.6	1P, 2P, 4P	12,7	0.5
P-250.110.12	555	21.9	926	36.5	1953,2	76.9	1278	50.3	1271,5	50.1	273	10.7	1P, 2P, 4P	12,7	0.5
P-250.140.12	555	21.9	1226	48.3	2253,2	88.7	1578	62.1	1571,5	61.9	273	10.7	1P, 2P, 4P	12,7	0.5
P-250.190.12	555	21.9	1696	66.8	2732,2	107.6	2048	80.6	2041,5	80.4	273	10.7	1P, 2P, 4P	12,7	0.5

H - horizontal | V - vertical | 1P - single-pass | 2P - two-pass | 4P - four-pass
 All dimensions and technical data are approximate only and may be changed without further notice.

Type	Heat exchange area		Weight						Tube side capacity						Shell side capacity	
			Type 1P		Type 2P		Type 4P		Type 1P		Type 2P		Type 4P			
	m ²	ft ²	kg	lb	kg	lb	kg	lb	l	gal	l	gal	l	gal	l	gal
P-050.070.08	0,3	3,5	10,7	23,6	-	-	-	-	0,5	0,1	-	-	-	-	1,2	0,3
P-050.110.08	0,5	4,9	12,6	27,9	-	-	-	-	0,6	0,2	-	-	-	-	1,7	0,4
P-050.140.08	0,6	6,2	14,6	32,1	-	-	-	-	0,8	0,2	-	-	-	-	2,1	0,6
P-080.070.08	0,5	4,9	33,3	73,5	-	-	-	-	1,3	0,3	-	-	-	-	2,9	0,8
P-080.110.08	0,8	8,2	38,1	84	-	-	-	-	1,7	0,5	-	-	-	-	4,7	1,2
P-080.140.08	1	10,5	41,4	91,2	-	-	-	-	2	0,5	-	-	-	-	5,9	1,6
P-100.070.08	0,8	8,3	34,2	75,5	-	-	-	-	2,5	0,7	-	-	-	-	4,9	1,3
P-100.110.08	1,3	13,8	41,4	91,2	-	-	-	-	3,2	0,8	-	-	-	-	7,8	2,1
P-100.140.08	1,6	17,6	46,2	101,9	-	-	-	-	3,7	1	-	-	-	-	9,9	2,6
P-125.110.08	2	21	61,3	135,1	64,9	143,1	-	-	5,3	1,4	3,2	0,9	-	-	11,5	3,1
P-125.140.08	2,5	26,8	68,1	150,1	71,7	158	-	-	6	1,6	3,9	1	-	-	14,6	3,9
P-125.190.08	3,3	35,9	79,5	175,3	83,1	183,3	-	-	7,2	1,9	5,1	1,4	-	-	19,2	5,1
P-150.110.08	2,9	30,8	80	176,5	85,1	187,6	-	-	7,6	2	4,5	1,2	-	-	28,6	7,6
P-150.140.08	3,6	39,3	90,3	199,1	95,4	210,2	-	-	8,6	2,3	5,6	1,5	-	-	30,8	8,1
P-150.190.08	4,9	52,5	107,7	237,3	112,7	248,4	-	-	10,4	2,8	7,4	1,9	-	-	38,3	10,1
P-200.110.08	4,2	45,6	125,5	276,8	130,2	287,1	131,1	289	15,8	4,2	7	1,8	6,9	1,8	31,7	8,4
P-200.140.08	5,4	58	140,9	310,7	145,6	321	146,4	322,9	17,3	4,6	8,5	2,2	8,4	2,2	39,6	10,5
P-200.190.08	7,2	77,5	165	363,8	169,7	374,1	170,5	376	19,7	5,2	10,8	2,9	10,7	2,8	52	13,7
P-250.110.08	7,8	84,3	185,2	408,4	202,4	446,3	203,7	449	31,5	8,3	12,8	3,4	12,5	3,3	44,9	11,9
P-250.140.08	10	107,3	211,3	465,8	228,4	503,6	229,7	506,4	34,3	9,1	15,5	4,1	15,3	4	56,5	14,9
P-250.190.08	13,3	143,3	252,1	555,8	269,3	593,6	270,5	596,4	38,6	10,2	19,9	5,2	19,6	5,2	74,5	19,7
P-050.070.12	0,2	2	10,6	23,4	-	-	-	-	0,4	0,1	-	-	-	-	1,3	0,3
P-050.110.12	0,3	2,8	12,5	27,6	-	-	-	-	0,6	0,2	-	-	-	-	1,8	0,5
P-050.140.12	0,3	3,6	14,4	31,8	-	-	-	-	0,7	0,2	-	-	-	-	2,2	0,6
P-080.070.12	0,4	4,6	35,2	77,5	-	-	-	-	1,6	0,4	-	-	-	-	2,4	0,6
P-080.110.12	0,7	7,7	41,3	91	-	-	-	-	2,2	0,6	-	-	-	-	3,8	1
P-080.140.12	0,9	9,8	45,4	100,2	-	-	-	-	2,6	0,7	-	-	-	-	4,7	1,2
P-100.070.12	0,6	6,3	35,7	78,6	-	-	-	-	2,7	0,7	-	-	-	-	4,5	1,2
P-100.110.12	1	10,5	43,8	96,7	-	-	-	-	3,5	0,9	-	-	-	-	7,2	1,9
P-100.140.12	1,2	13,4	49,4	108,9	-	-	-	-	4,1	1,1	-	-	-	-	9	2,4
P-125.110.12	1,7	17,8	67,8	149,5	70,7	155,9	-	-	6,1	1,6	4,1	1,1	-	-	9,8	2,6
P-125.140.12	2,1	22,7	76,3	168,2	79,2	174,5	-	-	7	1,9	5	1,3	-	-	12,5	3,3
P-125.190.12	2,8	30,4	90,7	200	93,6	206,4	-	-	8,7	2,3	6,6	1,7	-	-	16,3	4,3
P-150.110.12	2	21,9	83,5	184	88,5	195,1	-	-	8	2,1	5	1,3	-	-	27,7	7,3
P-150.140.12	2,6	27,9	94,8	209	99,8	220,1	-	-	9,1	2,4	6,1	1,6	-	-	29,6	7,8
P-150.190.12	3,5	37,3	114	251,4	119,1	262,5	-	-	11,1	2,9	8,1	2,1	-	-	36,7	9,7
P-200.110.12	3,6	39,2	138,8	305,9	143,5	316,3	144,3	318,1	17,8	4,7	9	2,4	9	2,4	27,8	7,3
P-200.140.12	4,6	49,9	157,9	348,1	162,6	358,4	163,4	360,3	19,8	5,2	11	2,9	10,9	2,9	34,7	9,2
P-200.190.12	6,2	66,7	187,9	414,2	192,6	424,5	193,4	426,4	23	6,1	14,1	3,7	14	3,7	45,5	12
P-250.110.12	6,8	73,4	210,5	464,2	228,5	503,8	229,8	506,6	35,4	9,4	16,7	4,4	16,4	4,3	37,4	9,9
P-250.140.12	8,7	93,5	243,9	537,8	261,9	577,4	263,2	580,2	39,2	10,3	20,4	5,4	20,1	5,3	47	12,4
P-250.190.12	11,6	124,8	296,3	653,1	314,2	692,8	317,3	699,5	45	11,9	26,3	6,9	26	6,9	62,1	16,4

* Weight for the horizontal exchanger model.

H – horizontal | V – vertical | 1P – single-pass | 2P – two-pass | 4P – four-pass
All dimensions and technical data are approximate only and may be changed without further notice.

Type	Type and material of connections	Connection size		
		Type 1P	Type 2P	Type 4P
P-050.070.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 Type A, SS	DN25, DN65	-	-
P-050.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 Type A, SS	DN25, DN65	-	-
P-050.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 Type A, SS	DN25, DN65	-	-
P-080.070.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 Type A, SS	DN40, DN32	-	-
P-080.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN40, DN32	-	-
P-080.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN40, DN32	-	-
P-100.070.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN50	-	-
P-100.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN50	-	-
P-100.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN50	-	-
P-125.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN65	DN50, DN50	-
P-125.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN65	DN50, DN50	-
P-125.190.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN65	DN50, DN50	-
P-150.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN80, DN80	DN80, DN50	-
P-150.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN80, DN80	DN80, DN50	-
P-150.190.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN80, DN80	DN80, DN50	-
P-200.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN80	DN100, DN50	DN100, DN50
P-200.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN80	DN100, DN50	DN100, DN50
P-200.190.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN80	DN100, DN50	DN100, DN50
P-250.110.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN100	DN100, DN80	DN100, DN50
P-250.140.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN100	DN100, DN80	DN100, DN50
P-250.190.08	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN100	DN100, DN80	DN100, DN50
P-050.070.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN25, DN65	-	-
P-050.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN25, DN65	-	-
P-050.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN25, DN65	-	-
P-080.070.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN40, DN32	-	-
P-080.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN40, DN32	-	-
P-080.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN40, DN32	-	-
P-100.070.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN50	-	-
P-100.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN50	-	-
P-100.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN50	-	-
P-125.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN65	DN50, DN50	-
P-125.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN65	DN50, DN50	-
P-125.190.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN50, DN65	DN50, DN50	-
P-150.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN80, DN80	DN80, DN50	-
P-150.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN80, DN80	DN80, DN50	-
P-150.190.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN80, DN80	DN80, DN50	-
P-200.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN80	DN100, DN50	DN100, DN50
P-200.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN80	DN100, DN50	DN100, DN50
P-200.190.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN80	DN100, DN50	DN100, DN50
P-250.110.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN100	DN100, DN80	DN100, DN50
P-250.140.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN100	DN100, DN80	DN100, DN50
P-250.190.12	FLANGE EN 1092-1 PN16 01B, TRI-CLAMP DIN 32676 TYPE A, SS	DN100, DN100	DN100, DN80	DN100, DN50

* Weight for the horizontal exchanger model.

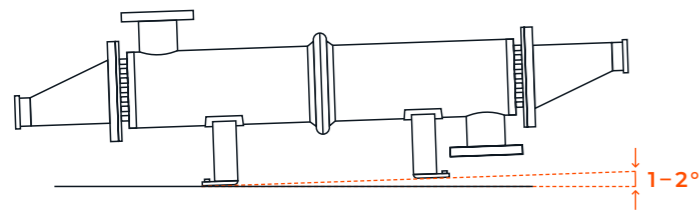
H – horizontal | V – vertical | 1P – single-pass | 2P – two-pass | 4P – four-pass
All dimensions and technical data are approximate only and may be changed without further notice.

MOUNTING

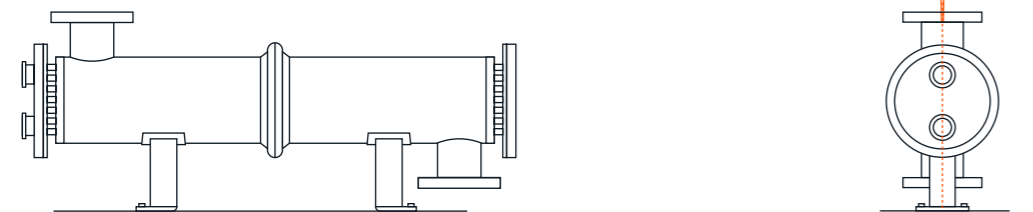
P-line heat exchangers can be installed vertically or horizontally depending on the application and available space.

HORIZONTAL MOUNTING

1P HEAT EXCHANGER

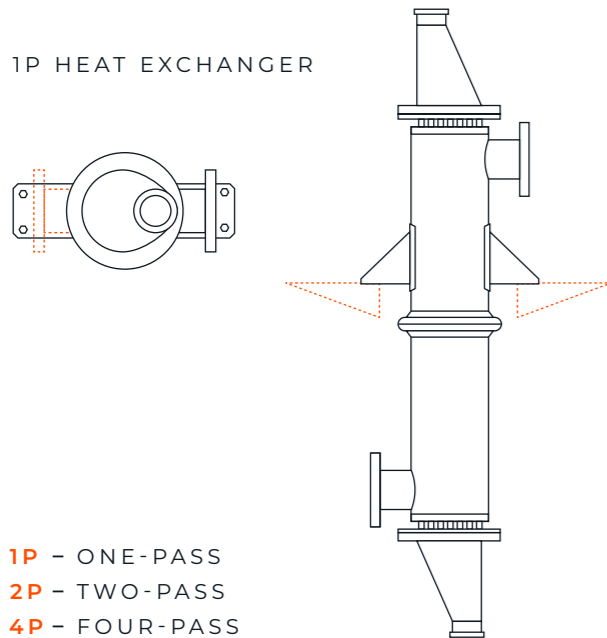


2P AND 4P HEAT EXCHANGER

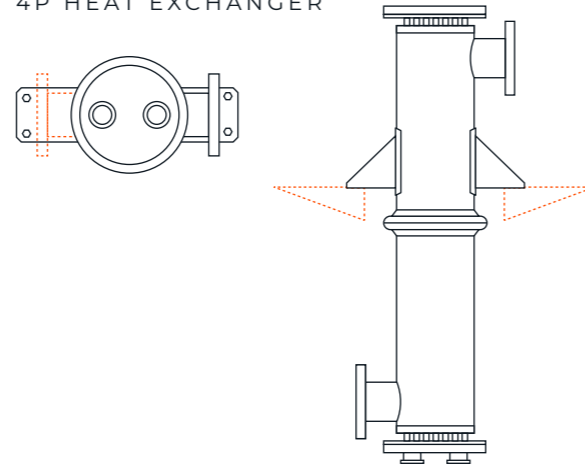


VERTICAL MOUNTING

1P HEAT EXCHANGER

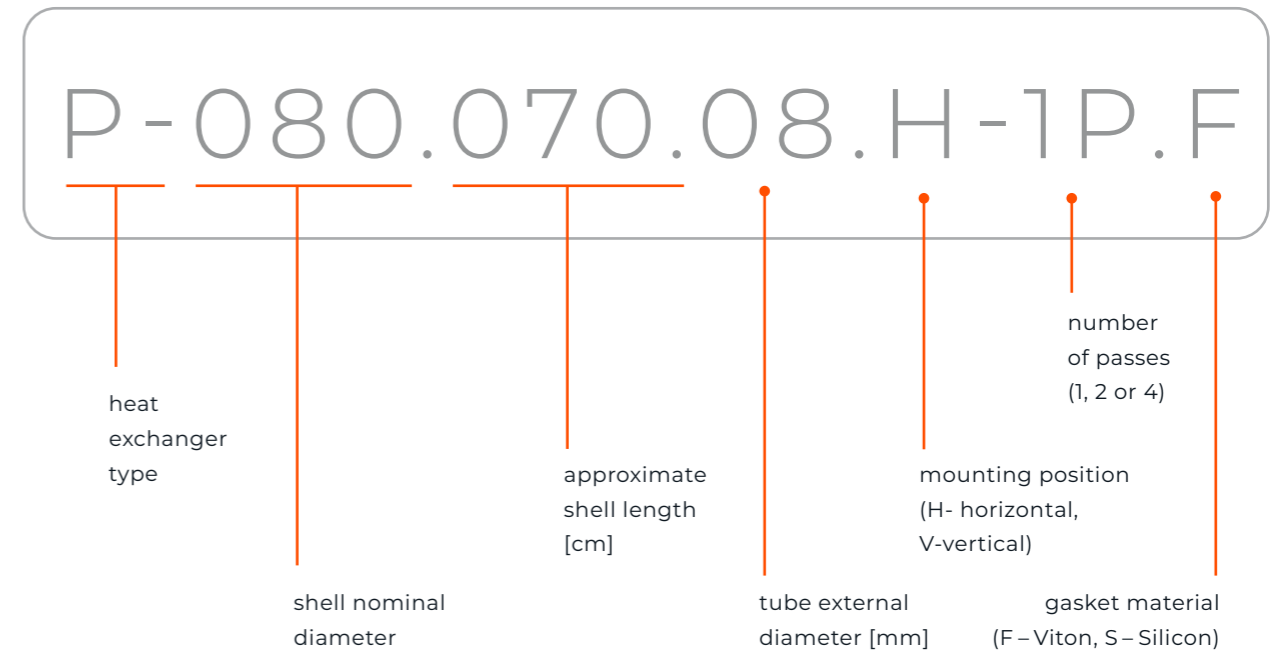


2P HEAT EXCHANGER 4P HEAT EXCHANGER



- 1P - ONE-PASS
- 2P - TWO-PASS
- 4P - FOUR-PASS

EXEMPLAR DESIGNATION



PRODUCT LINE

