

P-LINE

HEAT EXCHANGERS IN
THE PHARMACEUTICAL
INDUSTRY



P-LINE

HEAT EXCHANGERS IN THE PHARMACEUTICAL INDUSTRY

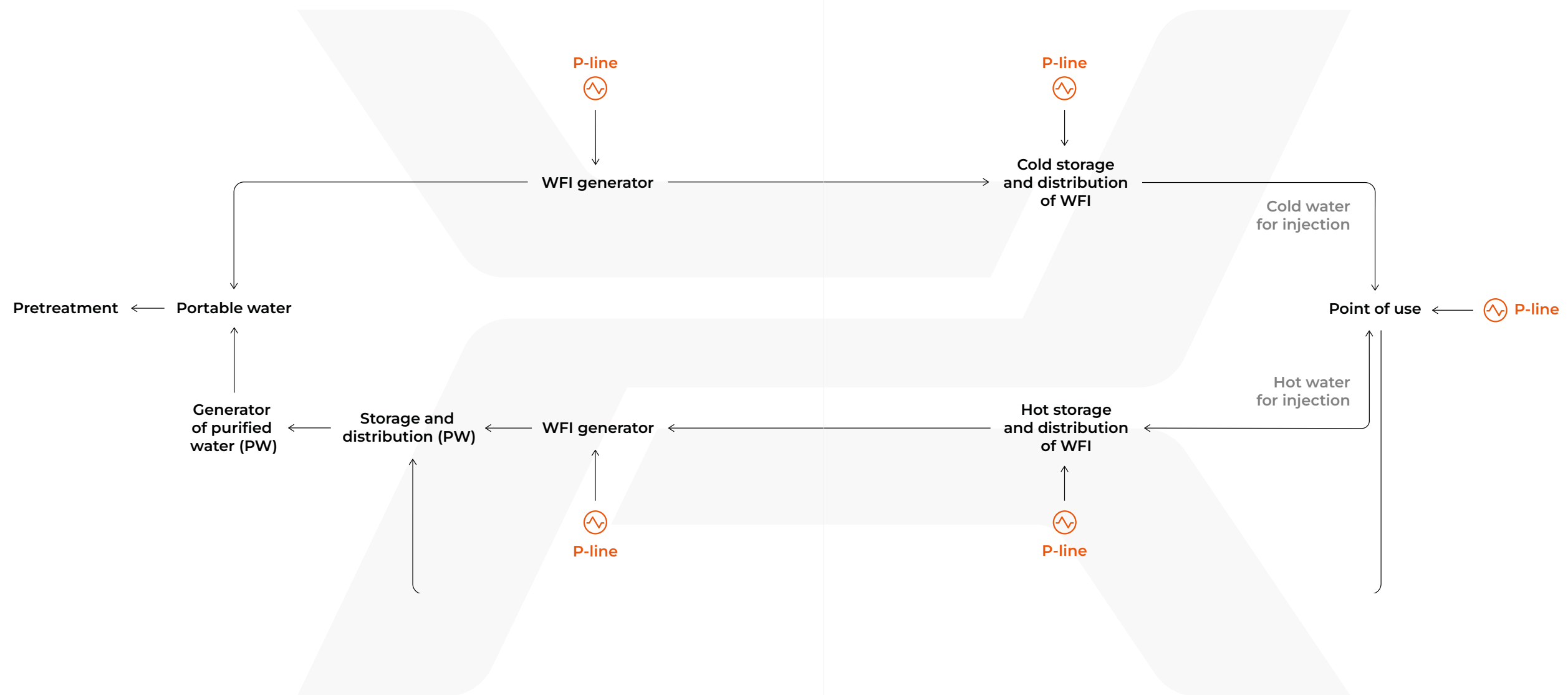


DIAGRAM OF PW AND WFI SYSTEMS WITH P-LINE HEAT EXCHANGERS

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.

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



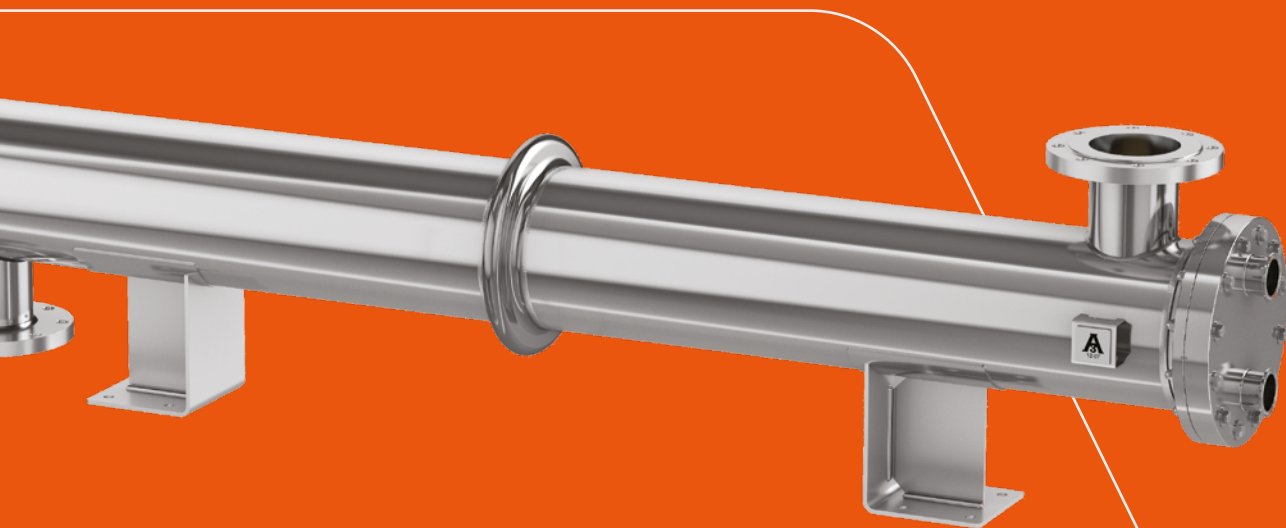
CLEANING OF
CONTAINERS,
PACKAGING AND
INSTALLATIONS



SOMATIC CELL
THERAPY MEDICINAL
PRODUCTS



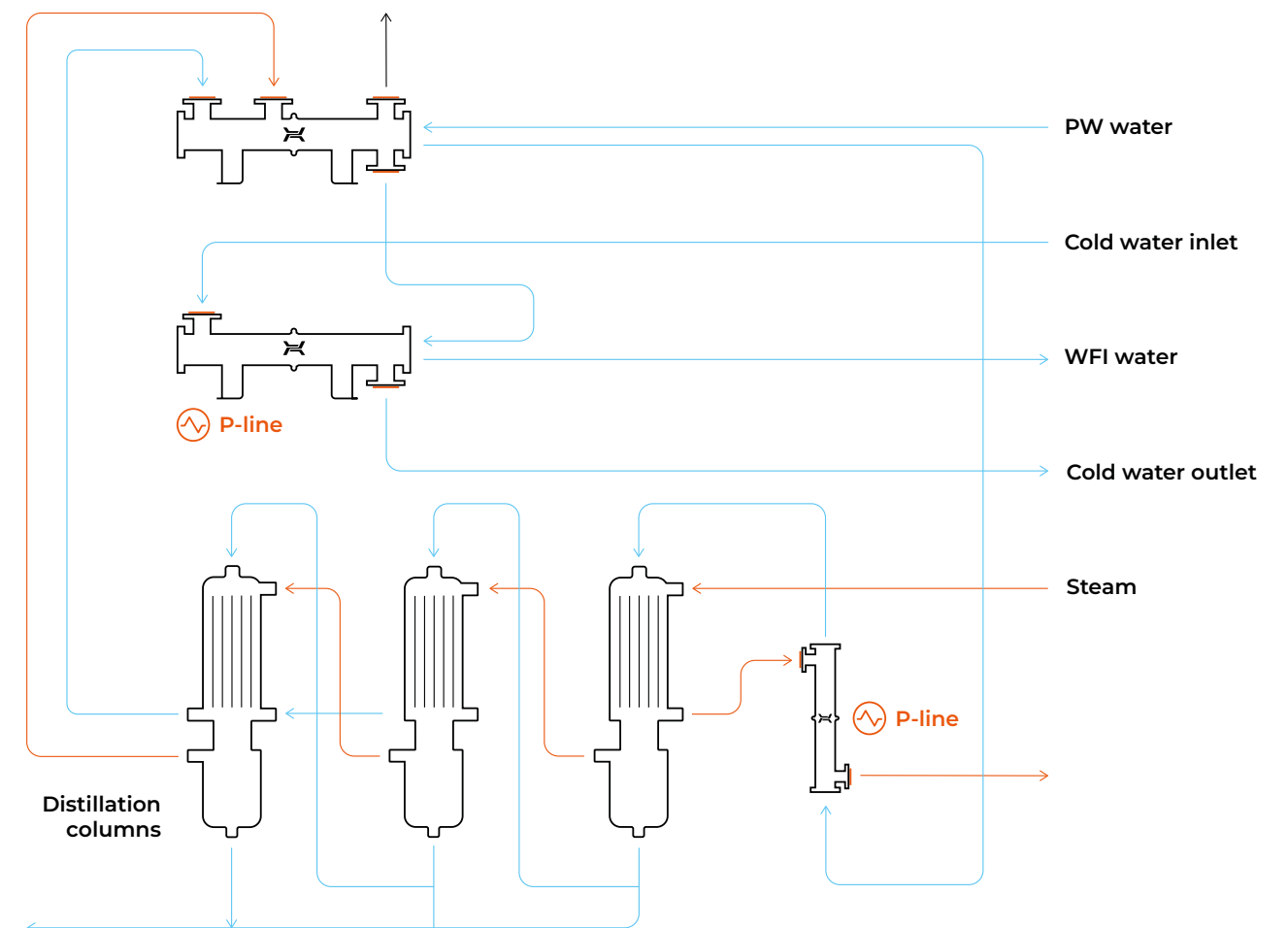
TISSUE
ENGINEERING
PRODUCTS



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

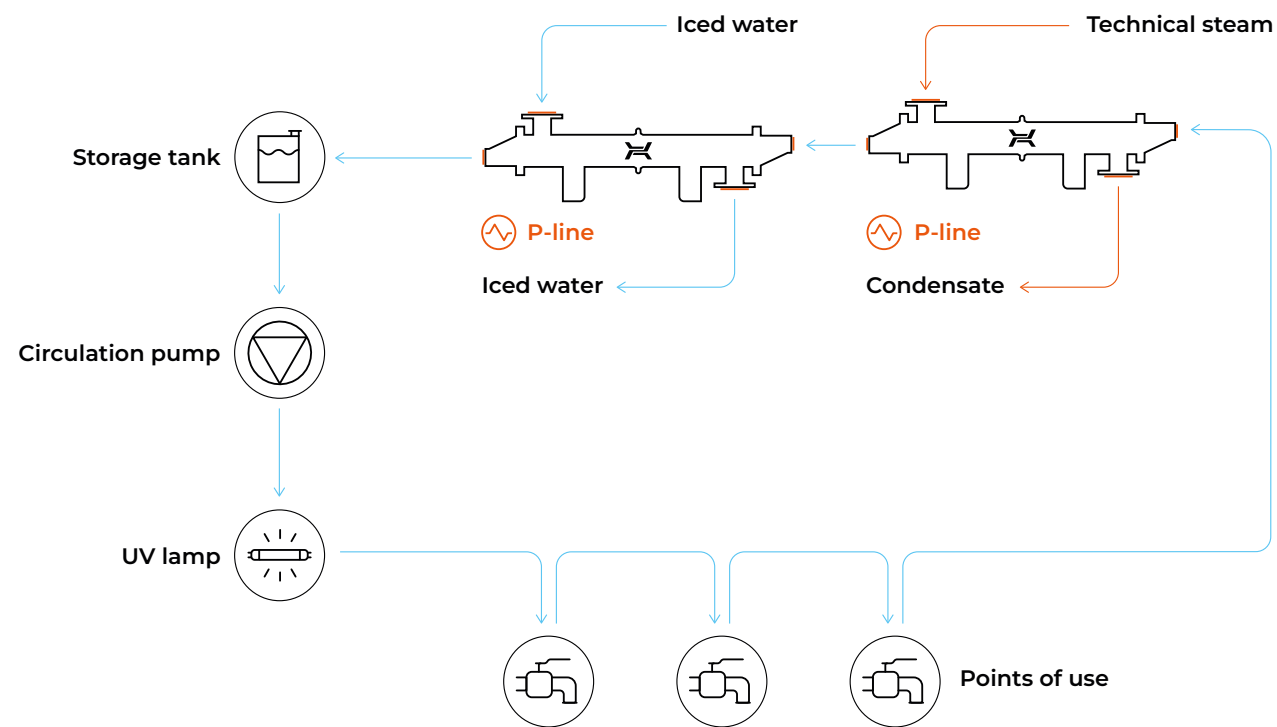
PW — PURIFIED WATER

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.

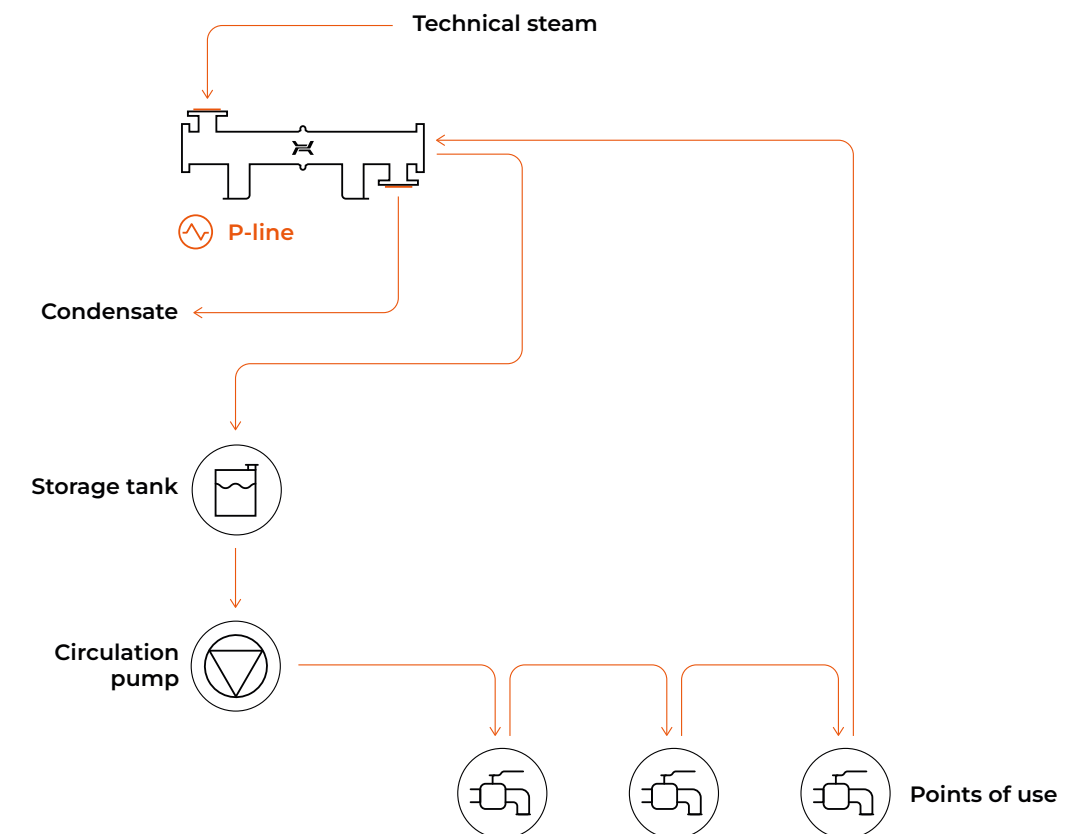
WFI — WATER FOR INJECTION

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



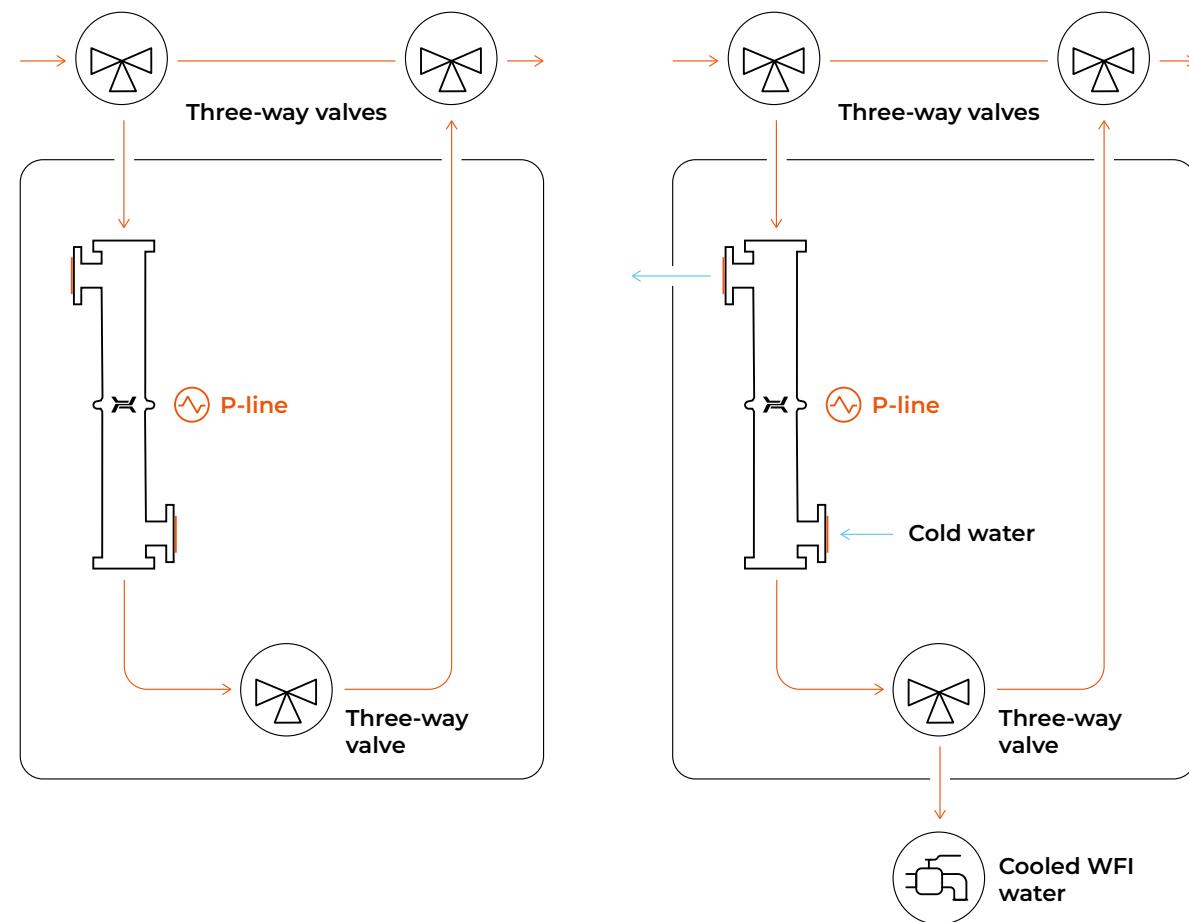
WFI — WATER FOR INJECTION

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

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 $RA \leq 0.5 \mu m$ 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

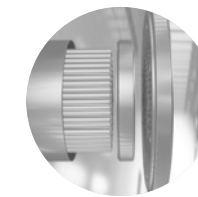


CORRUGATED TUBE OPTION FOR ENHANCED FLOW TURBULENCE

with a diameter of 8 mm (0.3 in)

STAINLESS STRAIGHT TUBES

with diameter 8 mm (0.3 in) or 12.7 mm (0.5 in)



DOUBLE TUBESHEET

reduces the risk of media mixing in case of potential leakage

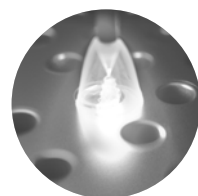
HEAD

TRICLAMP CONNECTION

COMPENSATOR

CERTIFIED GASKETS

made of silicone and Viton and clean side Triclamp connections



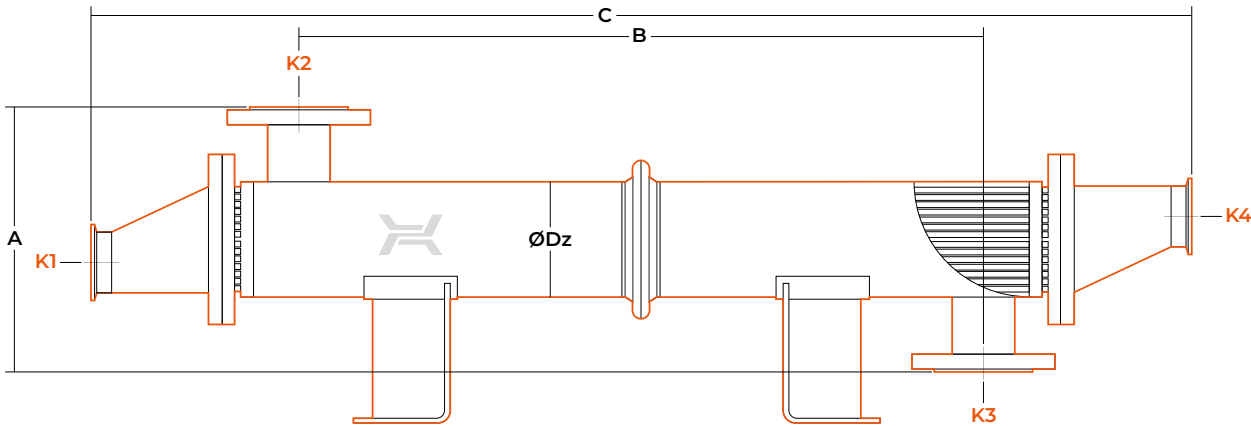
TUBES ARE CONNECTED WITH THE EXTERNAL TUBESHEET

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

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

TUBE SIDE

- PHARMACEUTICAL PRODUCT
[WATER FOR INJECTION (WFI), PURIFIED WATER]

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	mm	in	mm	in	mm	in	mm	in	—	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	1 009	39.7	1 180	46.5	—	—	—	—	60,3	2.4	1P	8	0.3
P-050.140.08	176	6.9	1 309	51.5	1 480	58.3	—	—	—	—	60,3	2.4	1P	8	0.3
P-080.070.08	300	11.8	518	20.4	1 002	39.4	—	—	—	—	88,9	3.5	1P	8	0.3
P-080.110.08	300	11.8	958	37.7	1 442	56.8	—	—	—	—	88,9	3.5	1P	8	0.3
P-080.140.08	300	11.8	1258	49.5	1 742	68.6	—	—	—	—	88,9	3.5	1P	8	0.3
P-100.070.08	325	12.8	518	20.4	1 036,3	40.8	—	—	—	—	114,3	4.5	1P	8	0.3
P-100.110.08	325	12.8	958	37.7	1 476,3	58.1	—	—	—	—	114,3	4.5	1P	8	0.3
P-100.140.08	325	12.8	1258	49.5	1 776,3	69.9	—	—	—	—	114,3	4.5	1P	8	0.3
P-125.110.08	350	13.8	958	37.7	1 525,6	60.1	1 269	50	—	—	139,7	5.5	1P, 2P	8	0.3
P-125.140.08	350	13.8	1 258	49.5	1 825,6	71.9	1 569	61.8	—	—	139,7	5.5	1P, 2P	8	0.3
P-125.190.08	350	13.8	1 728	68.0	2 295,6	90.4	2 039	80.3	—	—	139,7	5.5	1P, 2P	8	0.3
P-150.110.08	370	14.6	960	37.8	1 546,8	60.9	1 254,5	49.4	—	—	159	6.3	1P, 2P	8	0.3
P-150.140.08	370	14.6	1 260	49.6	1 846,8	72.7	1 554,5	61.2	—	—	159	6.3	1P, 2P	8	0.3
P-150.190.08	370	14.6	1 730	68.1	2 316,8	91.2	2 024,5	79.7	—	—	159	6.3	1P, 2P	8	0.3
P-200.110.08	460	18.1	924	36.4	1 789,8	70.5	1 262,5	49.7	1 262,5	49.7	219,1	8.6	1P, 2P, 4P	8	0.3
P-200.140.08	460	18.1	1 224	48.2	2 089,8	82.3	1 562,5	61.5	1 562,5	61.5	219,1	8.6	1P, 2P, 4P	8	0.3
P-200.190.08	460	18.1	1 694	66.7	2 559,8	100.8	2 032,5	80	2 032,5	80	219,1	8.6	1P, 2P, 4P	8	0.3
P-250.110.08	555	21.9	926	36.5	1 953,2	76.9	1 278	50.3	1 271,5	50.1	273	10.7	1P, 2P, 4P	8	0.3
P-250.140.08	555	21.9	1 226	48.3	2 253,2	88.7	1 578	62.1	1 571,5	61.9	273	10.7	1P, 2P, 4P	8	0.3
P-250.190.08	555	21.9	1 696	66.8	2 732,2	107.6	2 048	80.6	2 041,5	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	1 009	39.7	1 180	46.5	—	—	—	—	60,3	2.4	1P	12,7	0.5
P-050.140.12	176	6.9	1 309	51.5	1 480	58.3	—	—	—	—	60,3	2.4	1P	12,7	0.5
P-080.070.12	300	11.8	518	20.4	1 002	39.4	—	—	—	—	88,9	3.5	1P	12,7	0.5
P-080.110.12	300	11.8	958	37.7	1 442	56.8	—	—	—	—	88,9	3.5	1P	12,7	0.5
P-080.140.12	300	11.8	1 258	49.5	1 742	68.6	—	—	—	—	88,9	3.5	1P	12,7	0.5
P-100.070.12	325	12.8	518	20.4	1 036,3	40.8	—	—	—	—	114,3	4.5	1P	12,7	0.5
P-100.110.12	325	12.8	958	37.7	1 476,3	58.1	—	—	—	—	114,3	4.5	1P	12,7	0.5
P-100.140.12	325	12.8	1 258	49.5	1 776,3	69.9	—	—	—	—	114,3	4.5	1P	12,7	0.5
P-125.110.12	350	13.8	958	37.7	1 525,6	60.1	1 269	50	—	—	139,7	5.5	1P, 2P	12,7	0.5
P-125.140.12	350	13.8	1 258	49.5	1 825,6	71.9	1 569	61.8	—	—	139,7	5.5	1P, 2P	12,7	0.5
P-125.190.12	350	13.8	1 728	68	2 295,6	90.4	2 039	80.3	—	—	139,7	5.5	1P, 2P	12,7	0.5
P-150.110.12	370	14.6	960	37.8	1 546,8	60.9	1 254,5	49.4	—	—	159	6.3	1P, 2P	12,7	0.5
P-150.140.12	370	14.6	1 260	49.6	1 846,8	72.7	1 554,5	61.2	—	—	159	6.3	1P, 2P	12,7	0.5
P-150.190.12	370	14.6	1 730	68.1	2 316,8	91.2	2 024,5	79.7	—	—	159	6.3	1P, 2P	12,7	0.5
P-200.110.12	460	18.1	924	36.4	1 789,8	70.5	1 262,5	49.7	1 262,5	49.7	219,1	8.6	1P, 2P, 4P	12,7	0.5
P-200.140.12	460	18.1	1 224	48.2	2 089,8	82.3	1 562,5	61.5	1 562,5	61.5	219,1	8.6	1P, 2P, 4P	12,7	0.5
P-200.190.12	460	18.1	1 694	66.7	2 559,8	100.8	2 032,5	80	2 032,5	80	219,1	8.6	1P, 2P, 4P	12,7	0.5
P-250.110.12	555	21.9	926	36.5	1 953,2	76.9	1 278	50.3	1 271,5	50.1	273	10.7	1P, 2P, 4P	12,7	0.5
P-250.140.12	555	21.9	1 226	48.3	2 253,2	88.7	1 578	62.1	1 571,5	61.9	273	10.7	1P, 2P, 4P	12,7	0.5
P-250.190.12	555	21.9	1 696	66.8	2 732,2	107.6	2 048	80.6	2 041,5	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			
	m²	ft²	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

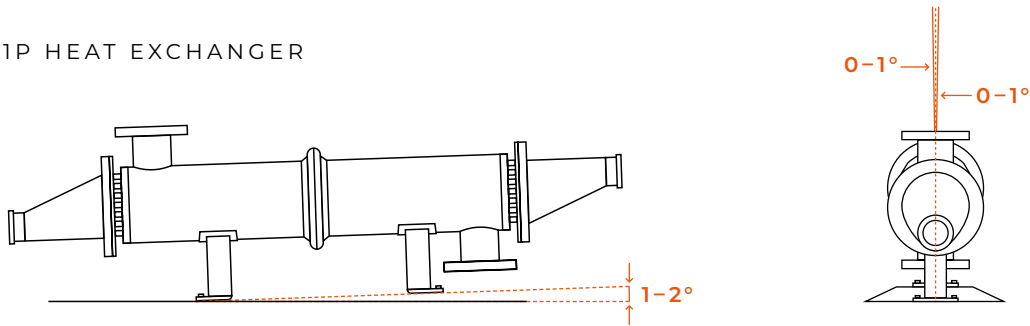
All dimensions and technical data are approximate only and may be changed without further notice.

MOUNTING

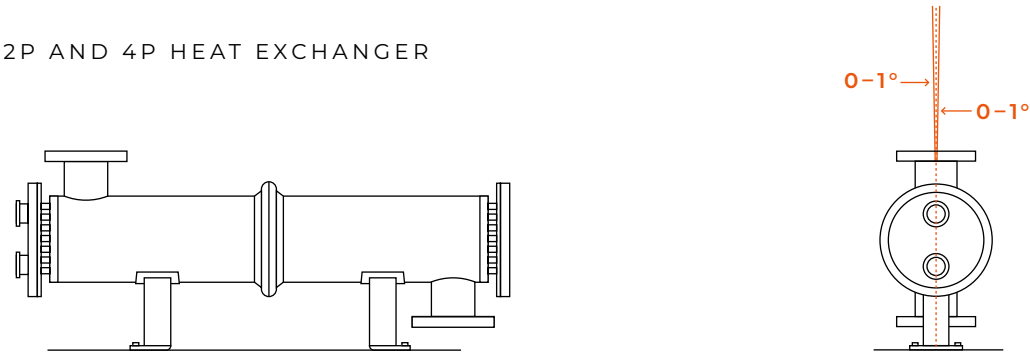
P-line heat exchangers can be installed vertically or horizontally depending on the application and available space.

HORIZONTAL MOUNTING

1P HEAT EXCHANGER

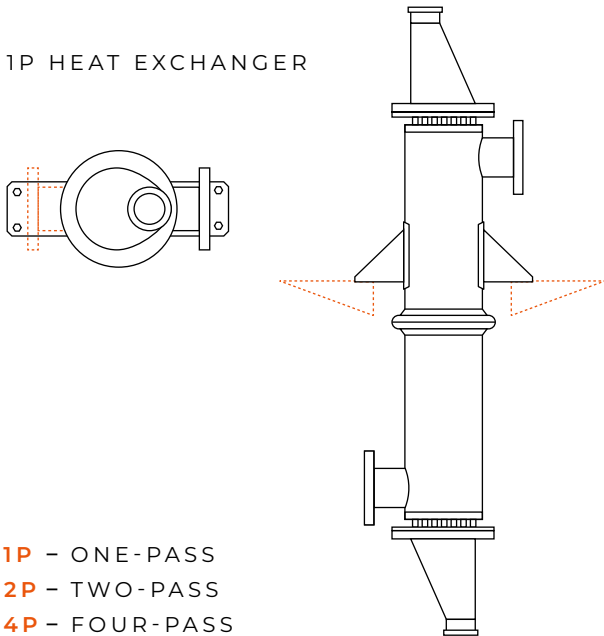


2P AND 4P HEAT EXCHANGER

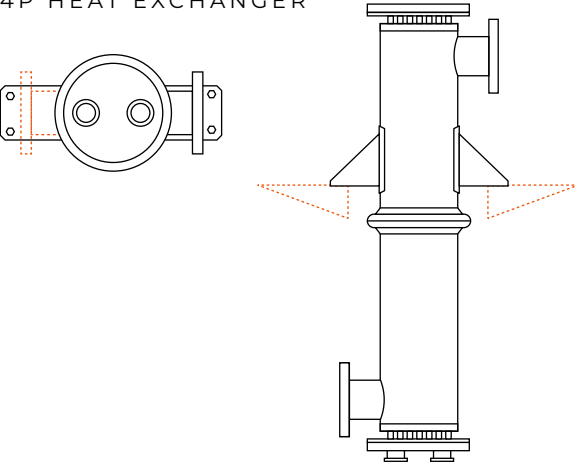


VERTICAL MOUNTING

1P HEAT EXCHANGER

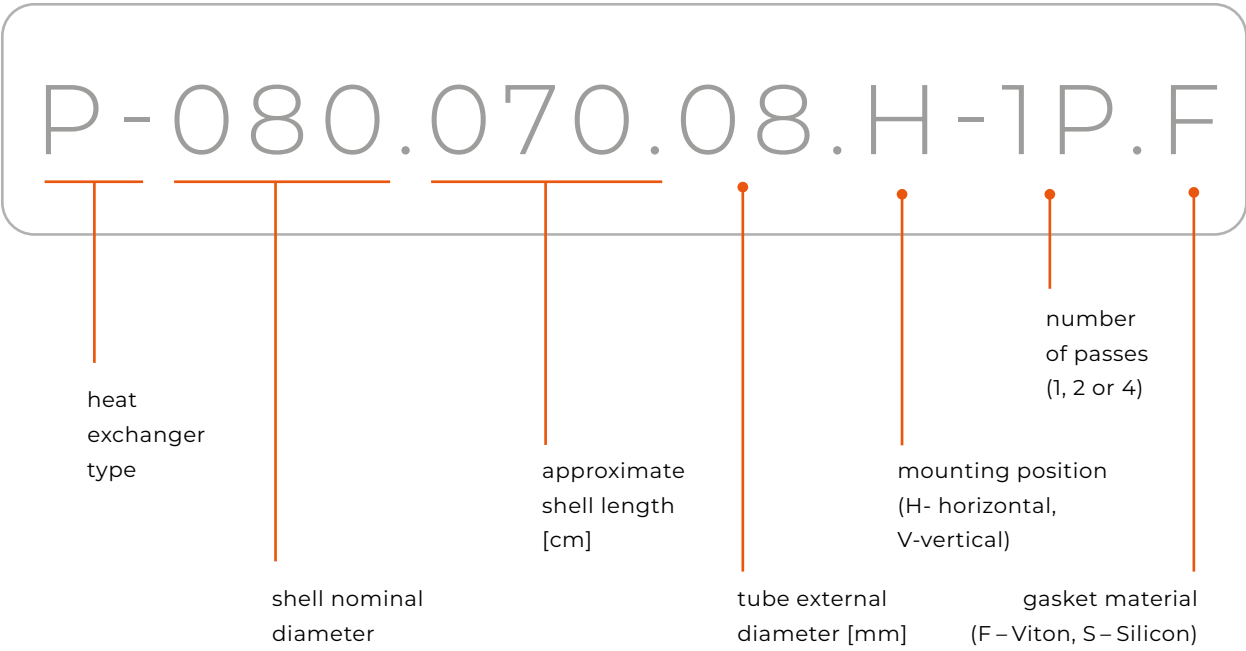


2P HEAT EXCHANGER
4P HEAT EXCHANGER



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

EXEMPLAR DESIGNATION



PRODUCT LINE

