PENEX®
expert cooling

DRY-EXPANSION
EVAPORATORS

FUTURE OF ENERGY

PENEX®
expert cooling

Table of Contents

Performance & Features 03

Design Data PDHE 04

- PDHE
- Denomination
- Materials

Capacity and Maximum Allowable Water Flowchart 05

General Dimensions 06

Penex Quality Standards 07

PDHE Series

PDHE standard version's' not extractable tube bundle' one. This means that the tube bundle is expanded to the shell so the copper tubes can't be removed from it.

Performance and Features

The PDHE design has been optimized for R407C and R22 refrigerants but it can also work with R134a as well as other HFC refrigerants. It has been Developed for commercial and industrial refrigeration cooling with positive evaporation temperature, typically in a range of 2°C/-7°C.

With its innovative patented refrigerant distributor and new optimized plastic baffles designed to improve the brine side heat transfer performances, the PDHE shell-and-tube evaporator series guarantees maximum efficiency, low cost, and compactness. The PDHE exchange tubes have a specific inner grooved/plain pattern to maximize the heat transfer coefficient and to limit the pressure drop negative effects.

PENEX®
expert cooling

DESIGN DATA PDHE

Version	Tube Side				Shell Side			
	PS (bar)	TS max (°C)	TS min (°C)	TP (bar)	PS (bar)	TS max (°C)	TS min (°C)	TP (bar)
STD	20	90	-10	24	15	90	-10	17

STD : Standard version - **PS :** Maximum allowable pressure - **TS max :** Maximum allowable temperature - **TS min :** Minimum allowable temperature - **TP :** Test Pressure

PDHE special version with Tmin = -40°C is available on demand. Please refer to PENEX for more information.

Denomination

PDHE **1** **-** **32**

Product line

Number of circuits
1=1 Circuit
2=2 Circuit

Cooling Capacity In TR
05=5 TR
10=10 TR

Material

The materials used for standard version of PDHE are the following:

Tubes : Copper / CU Nickle
Baffles : Plastic / SS
Tubes sheet : MS / SS
Shell and water connections : MS / SS
Header and refrigerant connections : MS / SS

Different materials are available on request, according to the following list. Please refer to PENEX for more information.

CAPACITY AND MAXIMUM ALLOWABLE WATER FLOW CHART

The capacities in the chart below are calculated with the following working conditions:

Refrigerant = 407c
Brine = Water
T_in_brine = 12°C
T_out_brine = 7°C
T_evap_dew = 2.60°C
T_cond_dew = 45°C
SC = 3K
SH = 5K

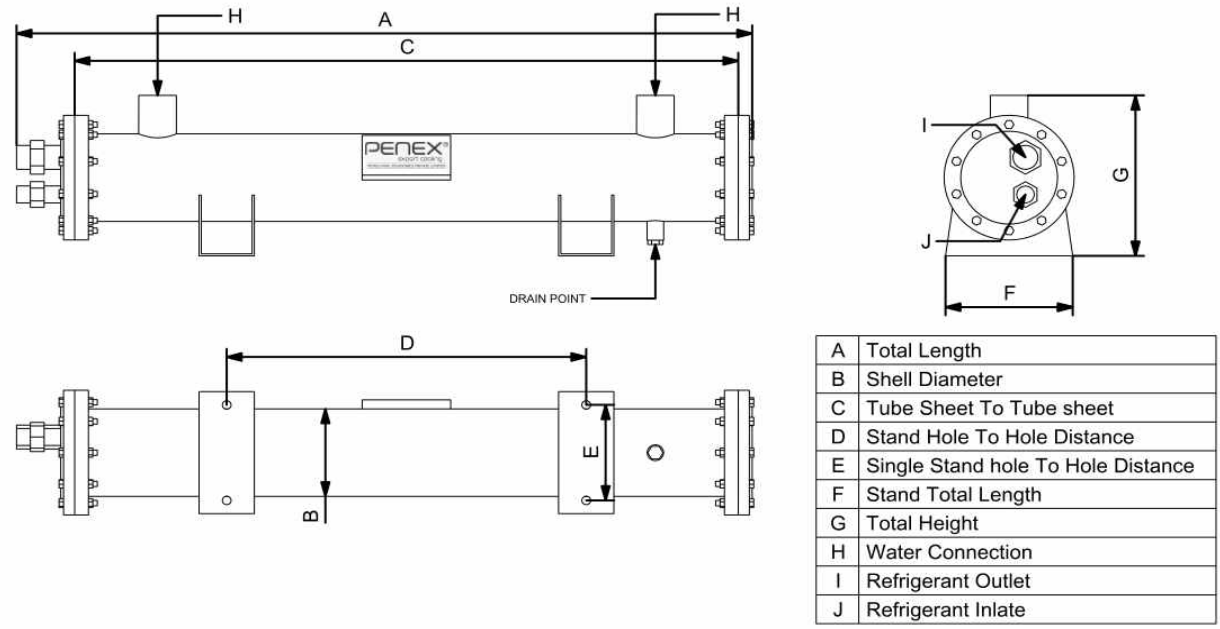
PDHE special version with Tmin = -40°C is available on demand. Please refer to PENEX for more information.

Model No.	Gas	Q_nom (kW)	Q_nom (TR)	W_nom (m^3/h)	DP_nom (PSI)	Weight (App.) kg
PDHE 1-05	R407c	17.55	5	3.12	300	50
PDHE 1-08	R407c	28.08	8	5	300	52
PDHE 1-10	R407c	35.1	10	6.25	300	76
PDHE 1-12	R407c	42.12	12	7.50	300	84
PDHE 1-15	R407c	52.65	15	9.37	300	89
PDHE 1-20	R407c	70.2	20	12.5	300	135
PDHE 1-25	R407c	87.75	25	15.6	300	141
PDHE 1-30	R407c	105.3	30	18.7	300	168
PDHE 1-35	R407c	122.85	35	21.8	300	177
PDHE 1-40	R407c	140.4	40	25	300	188
PDHE 1-50	R407c	175.5	50	31.2	300	265
PDHE 1-60	R407c	210.6	60	37.5	300	276
PDHE 1-70	R407c	245.7	70	43.7	300	287
PDHE 1-80	R407c	280.8	80	50	300	335
PDHE 1-100	R407c	351	100	62.5	300	425

Q_nom : Nominal cooling capacity KW
Q_nom : Nominal cooling capacity TR
DP_nom : Design pressure
W_nom : Nominal water flow
SH : Super Heating
SC : Sub Cooling

GENERAL DIMENSIONS

Water Cooled Evaporator Approx. Dimensions



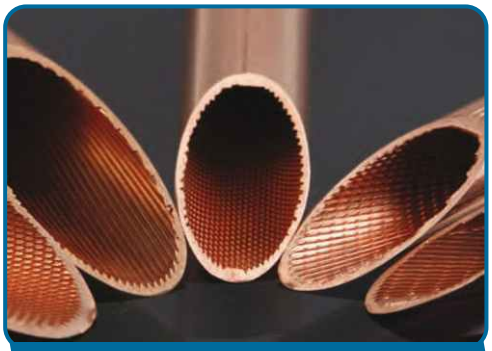
A	Total Length
B	Shell Diameter
C	Tube Sheet To Tube sheet
D	Stand Hole To Hole Distance
E	Single Stand hole To Hole Distance
F	Stand Total Length
G	Total Height
H	Water Connection
I	Refrigerant Outlet
J	Refrigerant Inlate

Approx. Dimensions

PDHE Model	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H inch	I mm	J mm
PDHE 1-05	1018	141	890	441	180	228	245	1.5	23	19
PDHE 1-08	1320	141	1195	650	180	228	245	1.5	28	19
PDHE 1-10	1320	168	1195	650	180	254	315	2	35	23
PDHE 1-12	1620	168	1500	900	180	254	315	2	35	23
PDHE 1-15	1620	168	1500	900	180	254	315	2	35	23
PDHE 1-20	1645	219	1510	900	225	304	362	2	41	23
PDHE 1-25	1645	219	1510	900	225	304	362	2	41	23
PDHE 1-30	1645	219	1510	900	225	304	362	2.5	41	28
PDHE 1-35	2550	219	2420	1825	225	304	362	2.5	54	28
PDHE 1-40	2550	219	2420	1825	225	304	362	2.5	54	28
PDHE 1-50	2690	273	2420	1825	280	355	410	3	54	35
PDHE 1-60	2690	273	2420	1825	280	355	410	3	76	41
PDHE 1-70	2690	273	2420	1825	280	355	410	4	76	41
PDHE 1-80	3315	273	3034	1965	280	355	410	4	76	41
PDHE 1-100	3315	323	3034	1965	326	406	465	4	76	41

Seamless Shell Pipe
Thickness : 6 - 8 mm

Tube Sheet
Thickness : 35-50 mm



Copper Internally Finned Tubes with 75 internal ridges of 0.3 mm groove depth at helix angle of 18 degrees

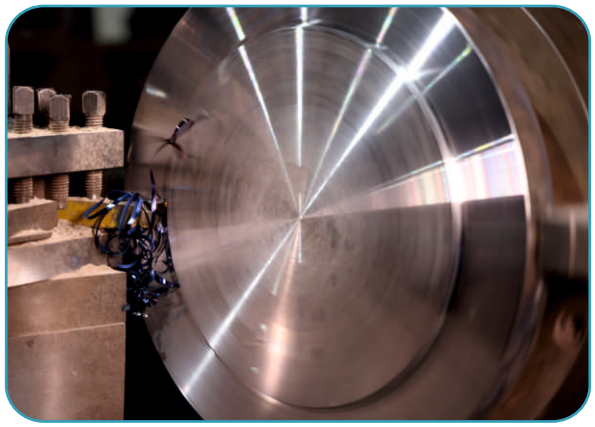
Copper Condenser Fin Tubes outer fins of 42 FPI with cross knurling, plain ID

Copper Tube Standards

Phosphorus Deoxidized Copper (DLP)	**Standard**	SB - 75, 111, 359, 395	BS 2871	JIS H 3300	DIN 1787	IS: 1545
	Symbol	C - 12000	C 106	C 1201	SW-CU 25	Cu-DLP
Phosphorus Deoxidized Copper (DHP)	**Standard**	SB - 68, 75, 111, 280, 355, 395, 819	BS 2871	JIS H 3300	DIN 1787	IS:2501, 10773, 14810
	Symbol	C - 12000	C 106	C 1220	C 1220	Cu-DHP
Toudh Pithc Copper (ETP)	**Standard**	ASTM B-188	BS 2871	JIS H 3300	DIN 1787	IS: 2501
	Symbol	C - 11000	C 101	C 1100	ECU 58	Cu-ETP

PENEX®
expert cooling

MANUFACTURING LINE TO FINISH GOODS





PENEX®
expert cooling

PENEX HVAC INDUSTRIES
PRIVATE LIMITED

H.O. : Rajkot-Bhavnagar Highway,
Village : Gadhka - 360 020. Rajkot (Gujarat) INDIA.
B.O. : Surat / Ahmedabad (Gujarat) INDIA
Mo. : +91 97253 61863, +91 96017 96320
Email : sales@penexindia.com
Web : www.penexindia.com