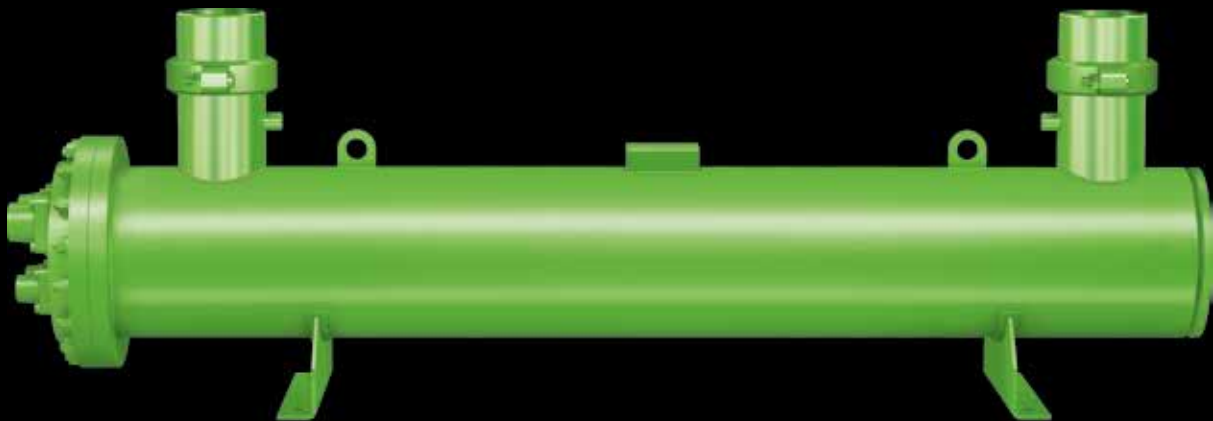




DAS HERZ DER FRISCHE

DRY-EXPANISON EVAPORATORS

DP-273-2 EN



DH SERIES



HEAT
EXCHANGERS



HFO
READY

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Shell-and-tube dry expansion evaporators: DH Series

Performance and features

DH series of dry-expansion evaporators represents a standard in the industry for refrigeration, process cooling, air-conditioning and marine refrigeration applications. Thanks to the flexibility in terms of possible configurations and the robust design, these evaporators can fit almost all duties.

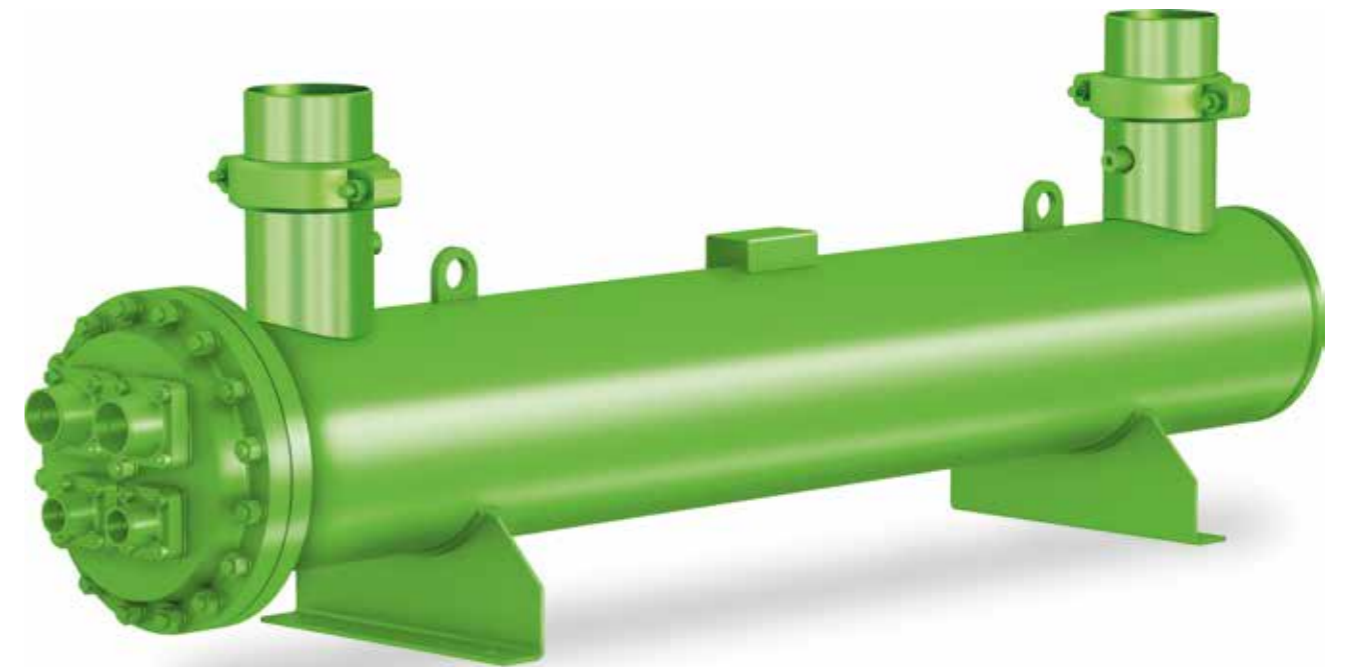
The DH design has been developed for medium pressure refrigerants such as R407F, R448A and R449A, but it can be operated as well with high pressure refrigerants (R410A, R32), low pressure refrigerants (R134a, R1234ze, R513A) and hydrocarbons (R290, R1270). Thanks to its innovative and patented refrigerant distribution system, tubes are always fed with an optimized amount of refrigerant at full and part load. The new baffle design, on the water/brine side, is ensuring maximum heat transfer performances.

As flexibility is the keyword for this universal evaporator series, many different versions are available:

- // Standard temperature (down to -10°C design temperature) and low temperature (down to -40°C d.t.)
- // Standard pressure (30 bar), high pressure (45 bar) and extra-high pressure (50 bar) design pressure on the refrigerant side, in order to fulfil also the operation in reversible heat pump systems
- // Standard tube version (high efficiency inner grooved copper tubes), AISI316L stainless steel, copper-nickel 90/10, carbon steel

Starting with DH..16 models, all evaporators have a design which allows the complete extraction of the tube bundle for inspection, maintenance and cleaning purposes.

A wide range of stationary and marine pressure vessel approvals is available.



Design data

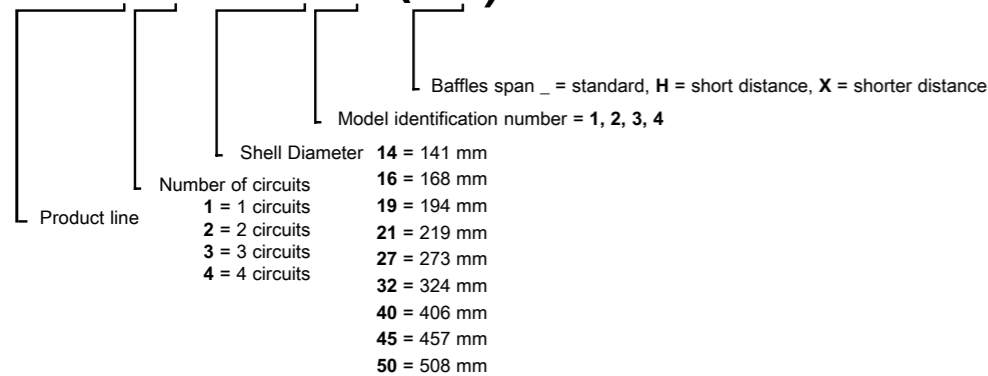
CE approval according Directive 2014/68/EU of the European Parliament and of the Council of 15 May 2014

| Series | Version | Tube (refrigerant) side | | | Shell (brine) side | | |
|--------|----------|-------------------------|----------------------------|----------------------------|------------------------|----------------------------|----------------------------|
| | | Design pressure bar | Design temp. min. °C | Design temp. max. °C | Design pressure bar | Design temp. min. °C | Design temp. max. °C |
| DH | Standard | -1/30.5 | -10 | 90 | -1/16 | -10 | 90 |
| | LT | -1/30.5 | -40 | 90 | -1/16 | -40 | 90 |
| | HPR | -1/45 | -10 | 120 | -1/10 | -10 | 90 |
| | HPW | -1/30.5 | -10 | 90 | -1/16 | -10 | 90 |
| | HP | -1/45 | -10 | 120 | -1/16 | -10 | 90 |
| | XP | -1/50 | -10 | 150 | -1/16 | -10 | 90 |

The intended use of DH evaporators with HC refrigerants (R290, R1290, R600, R600a etc.), has to be clearly mentioned in the order, as a dedicate material version needs to be supplied.

Denomination

DH2-323 (H)



In the description there may also be a letter indicating the water connections orientation. There are three available orientations: top (standard), left (L) and right (R).

Materials

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

- Tubes:** copper
- Baffles:** plastic
- Tubes sheet:** carbon steel
- Shell and water connections:** carbon steel
- Header and refrigerant connections:** carbon steel

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

- Tubes:** copper-nickel 90/10 alloy, stainless steel AISI316L, carbon steel
- Baffles:** carbon steel, stainless steel AISI316L
- Tubes sheet:** stainless steel AISI316L
- Shell and water connections:** stainless steel AISI316L

Capacity and maximum allowable water flow chart

| | R454B | | | R448A | | | R290 | | | W_max (standard version) | W_max (H version) | W_max (X version) |
|---------|-------|-------|--------|-------|-------|--------|-------|-------|--------|--------------------------|-------------------|-------------------|
| | Q_nom | W_nom | DP_nom | Q_nom | W_nom | DP_nom | Q_nom | W_nom | DP_nom | | | |
| | kW | 3 | kPa | kW | 3 | kPa | kW | m³/h | kPa | m³/h | m³/h | m³/h |
| DH..141 | 10,9 | 1,9 | 4 | 12,6 | 2,2 | 5 | 13,8 | 2,4 | 6 | 6,2 | | |
| DH..142 | 16,4 | 2,8 | 7 | 19,5 | 3,3 | 9 | 19,8 | 3,4 | 10 | 7,7 | | |
| DH..143 | 26,8 | 4,6 | 16 | 32,5 | 5,6 | 23 | 31,3 | 5,4 | 22 | 9,6 | | |
| DH..144 | 36,2 | 6,2 | 25 | 43,9 | 7,5 | 36 | 40,8 | 7,0 | 32 | 11,1 | | |
| DH..161 | 47,2 | 8,1 | 25 | 52,3 | 9,0 | 31 | 56,3 | 9,7 | 35 | 11,6 | 9,2 | |
| DH..162 | 52,6 | 9,0 | 25 | 58,9 | 10,1 | 31 | 61,5 | 10,6 | 34 | 14,5 | 11,3 | |
| DH..163 | 65,1 | 11,2 | 28 | 73,9 | 12,7 | 36 | 73,4 | 12,6 | 35 | 19,0 | 14,5 | |
| DH..164 | 76,7 | 13,2 | 30 | 87,8 | 15,1 | 39 | 84,1 | 14,4 | 36 | 22,2 | 17,5 | |
| DH..191 | 81,5 | 14,0 | 18 | 98,4 | 16,9 | 26 | 116,8 | 20,0 | 36 | 35,0 | 35,0 | 35,0 |
| DH..192 | 96,9 | 16,6 | 22 | 118,2 | 20,3 | 33 | 133,6 | 22,9 | 42 | 35,0 | 35,0 | 35,0 |
| DH..193 | 110,3 | 18,9 | 17 | 137,3 | 23,6 | 26 | 145,3 | 24,9 | 29 | 35,0 | 35,0 | 35,0 |
| DH..211 | 136 | 23,3 | 16 | 165 | 28,3 | 23 | 184 | 31,6 | 29 | 55,0 | 55,0 | 55,0 |
| DH..212 | 168 | 28,8 | 21 | 197 | 33,8 | 29 | 207 | 35,5 | 32 | 55,0 | 55,0 | 55,0 |
| DH..271 | 224 | 38,4 | 22 | 262 | 45,0 | 30 | 299 | 51,3 | 39 | 80,0 | 80,0 | 80,0 |
| DH..272 | 263 | 45,1 | 17 | 302 | 51,8 | 22 | 316 | 54,2 | 24 | 80,0 | 80,0 | 80,0 |
| DH..273 | 292 | 50,1 | 22 | 332 | 57,0 | 29 | 350 | 60,1 | 32 | 80,0 | 80,0 | 80,0 |
| DH..321 | 312 | 53,5 | 24 | 354 | 60,8 | 30 | 401 | 68,8 | 38 | 110,0 | 110,0 | 110,0 |
| DH..322 | 385 | 66,1 | 23 | 416 | 71,4 | 27 | 454 | 77,9 | 32 | 110,0 | 110,0 | 110,0 |
| DH..323 | 445 | 76,4 | 33 | 483 | 82,9 | 39 | 519 | 89,1 | 45 | 110,0 | 110,0 | 110,0 |
| DH..401 | 398 | 68,3 | 23 | 474 | 81,4 | 33 | 658 | 112,9 | 60 | 180,0 | 180,0 | 180,0 |
| DH..402 | 514 | 88,2 | 26 | 576 | 98,9 | 32 | 726 | 124,6 | 49 | 180,0 | 180,0 | 180,0 |
| DH..403 | 662 | 113,6 | 43 | 711 | 122,0 | 49 | 860 | 147,6 | 70 | 180,0 | 180,0 | 180,0 |
| DH..404 | 872 | 149,7 | 79 | 875 | 150,2 | 79 | 931 | 159,8 | 89 | 200,0 | 200,0 | 200,0 |
| DH..451 | 865 | 148,5 | 49 | 877 | 150,5 | 50 | 1072 | 184,0 | 72 | 240,0 | 240,0 | 240,0 |
| DH..452 | 1034 | 177,5 | 66 | 1039 | 178,3 | 67 | 1195 | 205,1 | 86 | 240,0 | 240,0 | 240,0 |
| DH..501 | 1104 | 189,5 | 66 | 1110 | 190,5 | 66 | 1320 | 226,6 | 91 | 300,0 | 300,0 | 300,0 |
| DH..502 | 1487 | 255,2 | 98 | 1365 | 234,3 | 84 | 1470 | 252,3 | 96 | 320,0 | 320,0 | 320,0 |

Nominal capacities, brine flow rate and brine-side pressure drop are rated at the following conditions:

Evaporation temperature (dew): 3.5°C for R454B and R290; 2.5°C for R448A

Condensing temperature (bubble): 45°C

Superheating: 5K

Subcooling: 3K

Brine: water

Brine inlet/outlet temperatures: 12/7°C

Brine-side fouling factor: 0.000043 m²K/W

Q_nom: Nominal cooling capacity

W_nom: Nominal brine flow rate

DP_nom: Brine-side pressure drop at nominal flow rate

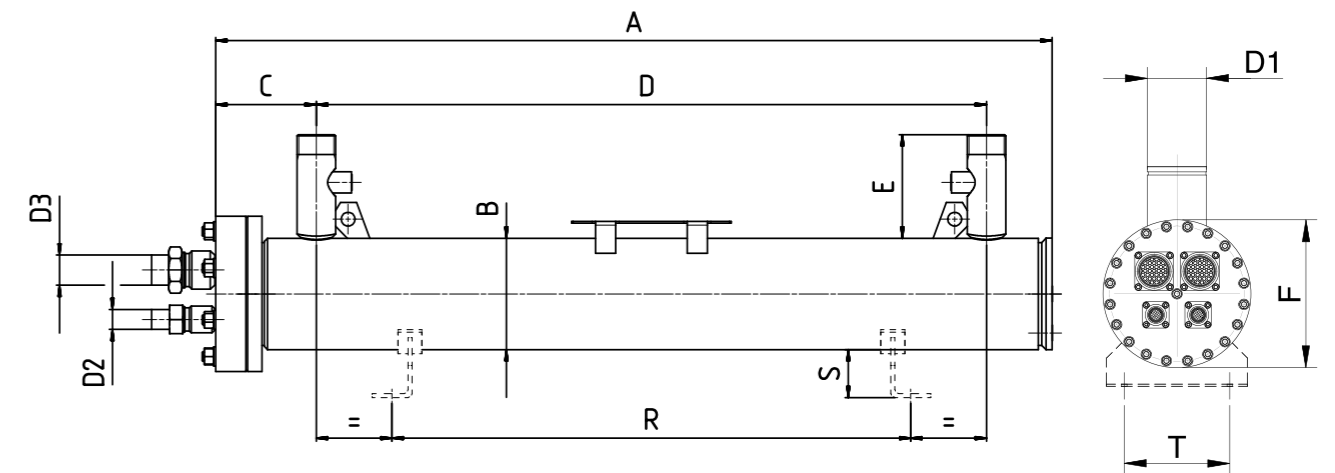
W_max: Maximum allowable brine flow rate

General dimensions

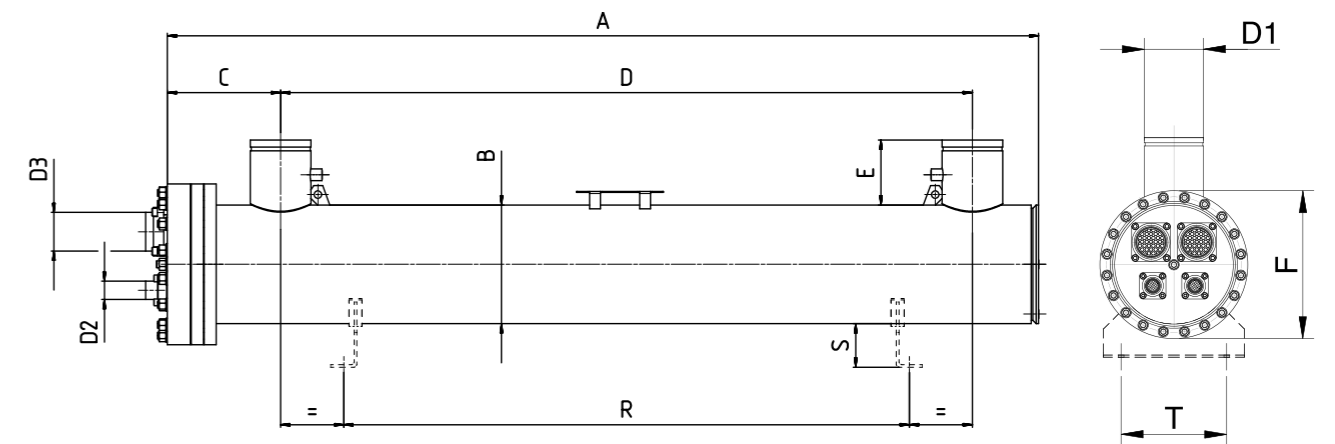
DH standard version is the “extractable tube bundle” one. This means that unbolting the refrigerant header, the complete tube bundle can be pulled out and extracted from the shell.

This is valid for all the models with the exception of size DH..14 models, which are only available in the “not extractable” version (tube bundle welded to the shell).

DH not extractable version

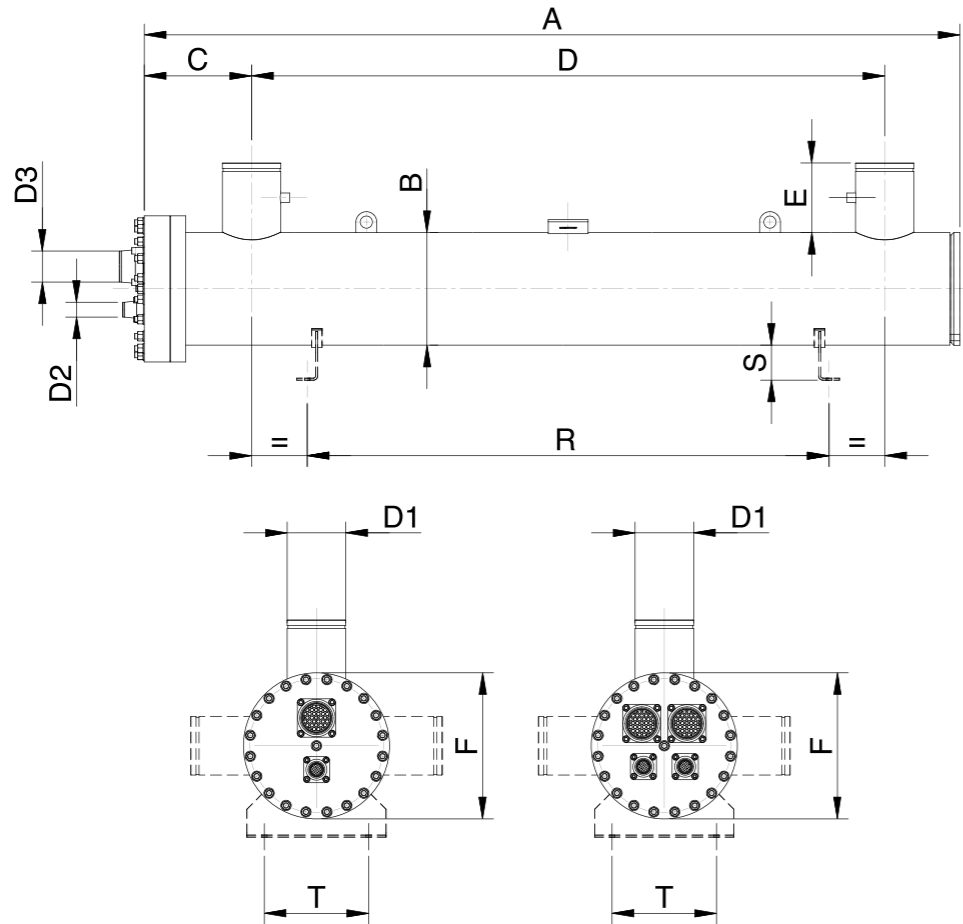


DH extractable version



Shell diameter = 141 mm

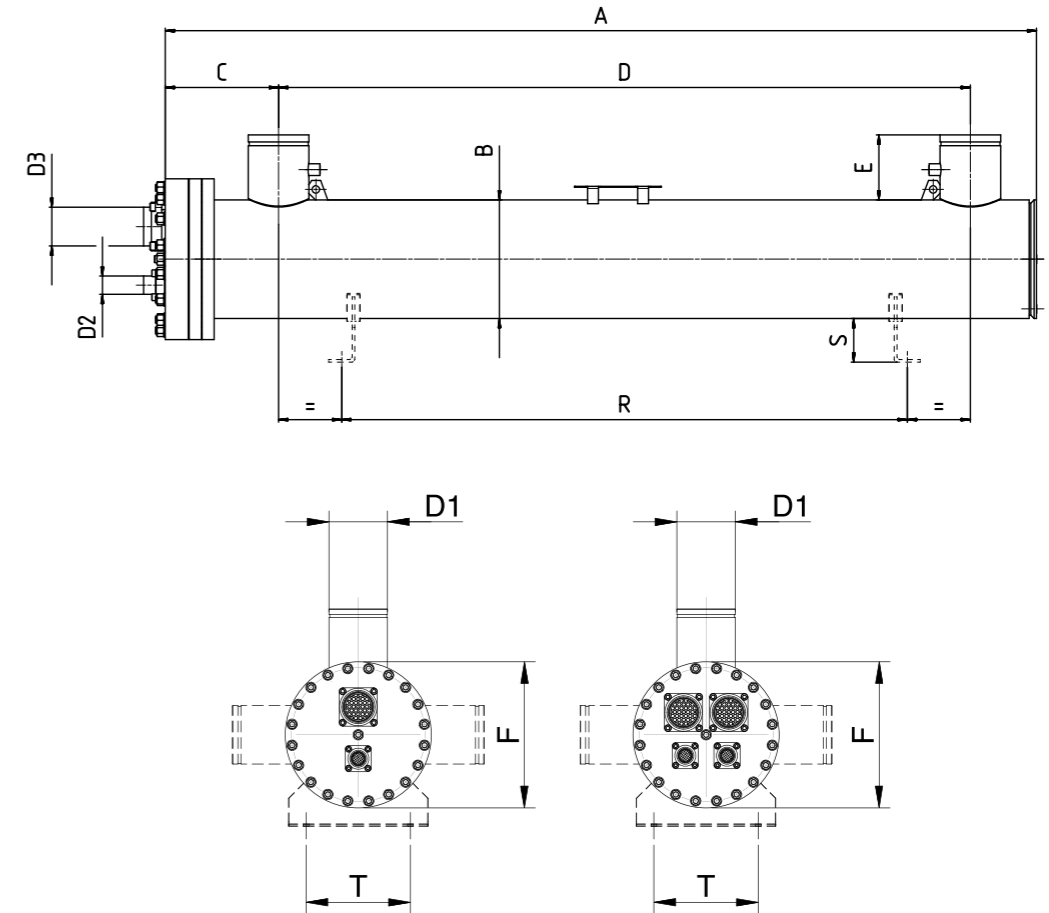
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-------|-----|------|-----|-----|----------|-----|----|---------------|-------|---------------|-------|-------------------|------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH1-141 | 898 | 139,7 | 126 | 690 | 130 | 195 | 550 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN40 | 34 | 4,0 | 6,7 | I | I | II |
| DH1-142 | 1048 | 139,7 | 126 | 840 | 130 | 195 | 650 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN40 | 38 | 4,0 | 7,9 | I | I | II |
| DH1-143 | 1248 | 139,7 | 132 | 1040 | 130 | 195 | 800 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN50 | 43 | 5,0 | 9,5 | I | II | II |
| DH2-143 | 1248 | 139,7 | 132 | 1040 | 130 | 195 | 800 | 160 | 60 | RT | ODS16 | RT | ODS28 | T | DN50 | 43 | 5,0 | 9,5 | I | II | II |
| DH1-144 | 1398 | 139,7 | 132 | 1190 | 130 | 195 | 950 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN50 | 47 | 6,0 | 11,0 | I | II | II |
| DH2-144 | 1398 | 139,7 | 132 | 1190 | 130 | 195 | 950 | 160 | 60 | RT | ODS16 | RT | ODS28 | T | DN50 | 47 | 6,0 | 11,0 | I | II | II |

Shell diameter = 168 mm

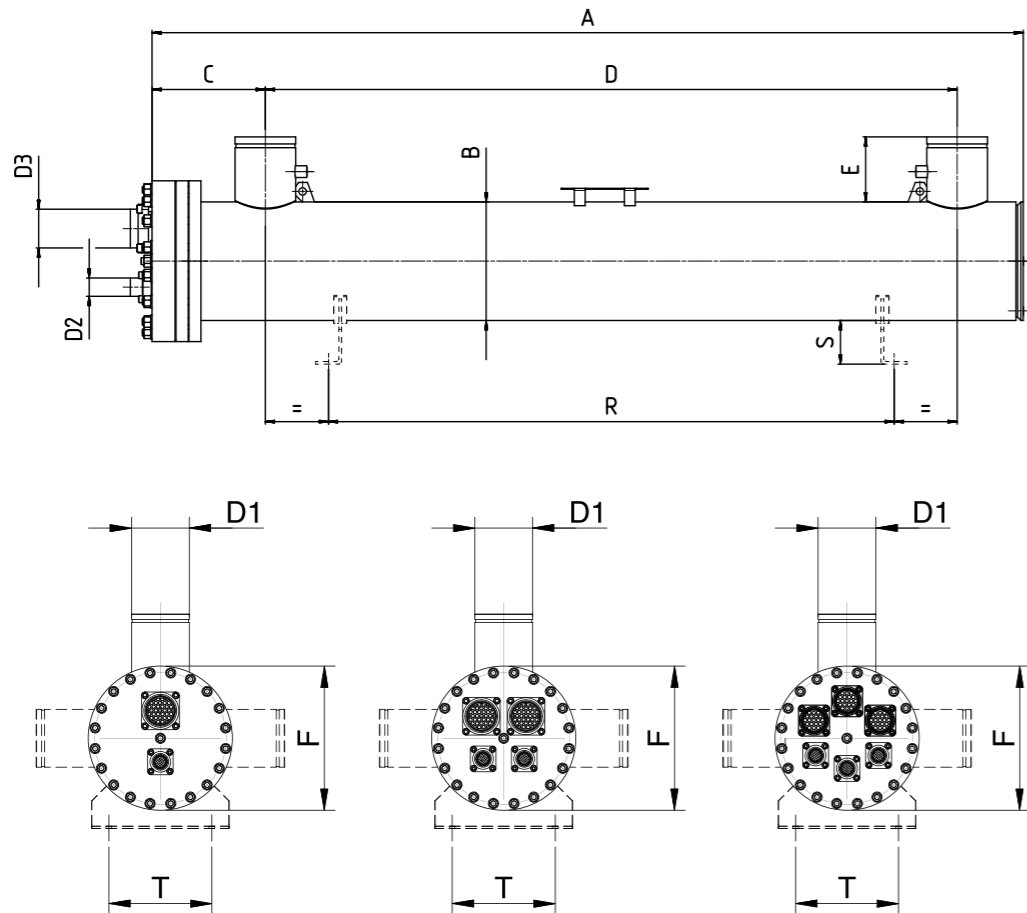
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-------|-----|------|-----|-----|----------|-----|----|---------------|-------|---------------|-------|-------------------|------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH1-161 | 1276 | 168,3 | 154 | 1030 | 130 | 245 | 800 | 160 | 60 | RT | ODS22 | FL70 | ODS54 | T | DN65 | 58 | 7,0 | 15,3 | II | II | II |
| DH2-161 | 1276 | 168,3 | 154 | 1030 | 130 | 245 | 800 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN65 | 58 | 7,0 | 15,3 | II | II | II |
| DH1-162 | 1426 | 168,3 | 154 | 1180 | 130 | 245 | 950 | 160 | 60 | RT | ODS22 | FL70 | ODS54 | T | DN65 | 62 | 8,0 | 17,2 | II | II | II |
| DH2-162 | 1426 | 168,3 | 154 | 1180 | 130 | 245 | 950 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN65 | 62 | 8,0 | 17,2 | II | II | II |
| DH1-163 | 1626 | 168,3 | 154 | 1380 | 130 | 245 | 1100 | 160 | 60 | RT | ODS22 | FL70 | ODS54 | T | DN65 | 69 | 9,0 | 19,8 | II | II | II |
| DH2-163 | 1626 | 168,3 | 154 | 1380 | 130 | 245 | 1100 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN65 | 69 | 9,0 | 19,8 | II | II | II |
| DH1-164 | 1776 | 168,3 | 154 | 1530 | 130 | 245 | 1200 | 160 | 60 | RT | ODS22 | FL70 | ODS54 | T | DN65 | 73 | 10,0 | 21,7 | II | II | II |
| DH2-164 | 1776 | 168,3 | 154 | 1530 | 130 | 245 | 1200 | 160 | 60 | RT | ODS22 | RT | ODS35 | T | DN65 | 74 | 10,0 | 21,7 | II | II | II |

Shell diameter = 194 mm

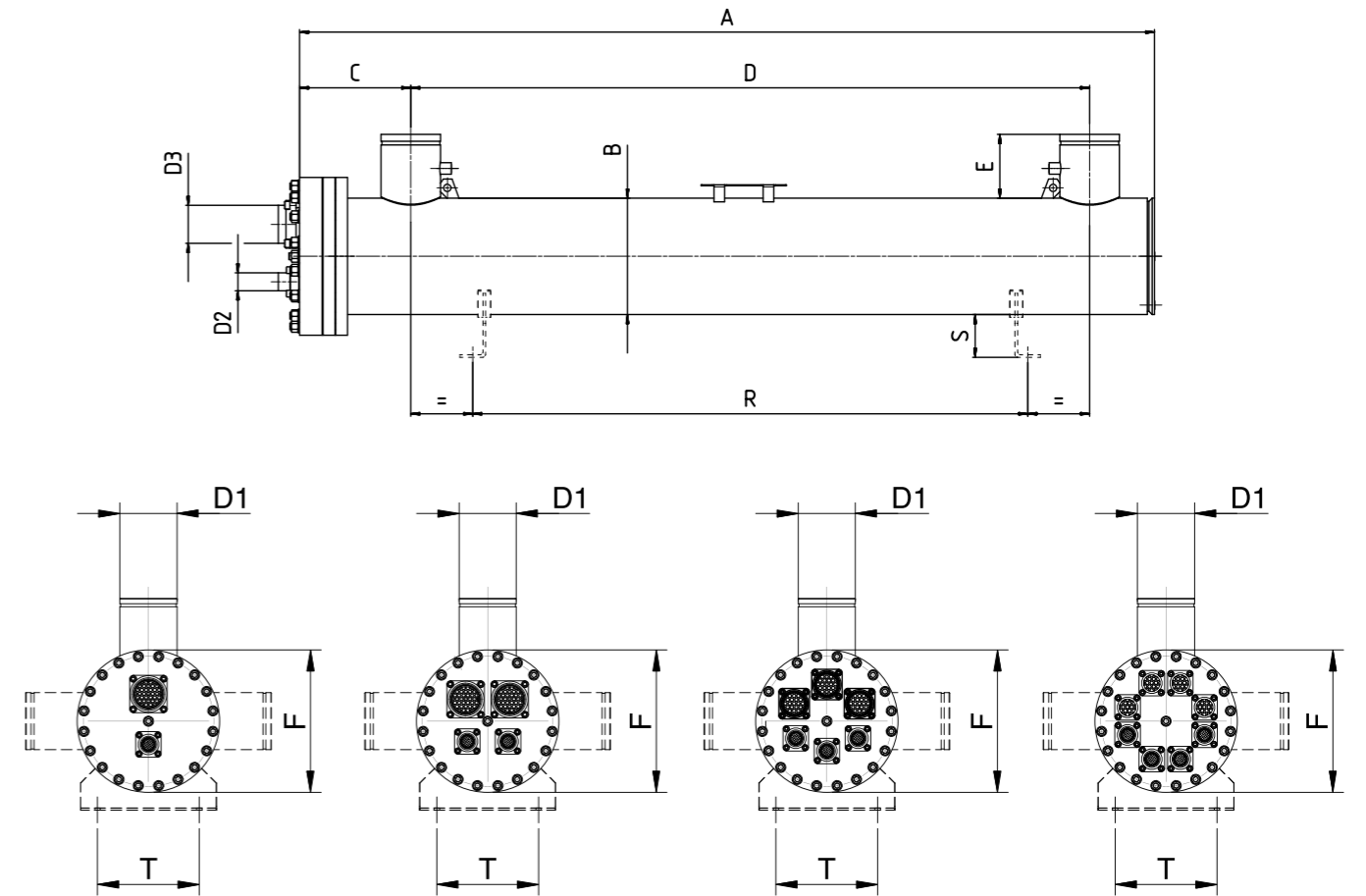
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-------|-----|------|-----|-----|----------|-----|----|---------------|-------|---------------|-------|-------------------|------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH1-191 | 1478 | 193,7 | 212 | 1160 | 130 | 270 | 800 | 160 | 60 | FL55 | ODS35 | FL70 | ODS67 | J | DN80 | 79 | 11,0 | 26,5 | II | II | II |
| DH2-191 | 1478 | 193,7 | 212 | 1160 | 130 | 270 | 800 | 160 | 60 | RT | ODS22 | FL55 | ODS42 | J | DN80 | 79 | 11,0 | 26,5 | II | II | II |
| DH3-191 | 1478 | 193,7 | 212 | 1160 | 130 | 270 | 800 | 160 | 60 | WA | ODS22 | WA | ODS35 | J | DN80 | 79 | 11,0 | 26,5 | II | II | II |
| DH1-192 | 1608 | 193,7 | 212 | 1290 | 130 | 270 | 1000 | 160 | 60 | FL55 | ODS35 | FL70 | ODS67 | J | DN80 | 84 | 12,0 | 28,9 | II | II | II |
| DH2-192 | 1608 | 193,7 | 212 | 1290 | 130 | 270 | 1000 | 160 | 60 | RT | ODS22 | FL55 | ODS42 | J | DN80 | 84 | 12,0 | 28,9 | II | II | II |
| DH3-192 | 1608 | 193,7 | 212 | 1290 | 130 | 270 | 1000 | 160 | 60 | WA | ODS22 | WA | ODS35 | J | DN80 | 84 | 12,0 | 28,9 | II | II | II |
| DH1-193 | 1778 | 193,7 | 212 | 1460 | 130 | 270 | 1200 | 160 | 60 | FL55 | ODS35 | FL70 | ODS67 | J | DN80 | 90 | 13,0 | 31,9 | II | II | II |
| DH2-193 | 1778 | 193,7 | 212 | 1460 | 130 | 270 | 1200 | 160 | 60 | RT | ODS22 | FL55 | ODS42 | J | DN80 | 90 | 13,0 | 31,9 | II | II | II |
| DH3-193 | 1778 | 193,7 | 212 | 1460 | 130 | 270 | 1200 | 160 | 60 | WA | ODS22 | WA | ODS35 | J | DN80 | 90 | 13,0 | 31,9 | II | II | II |

Shell diameter = 219 mm

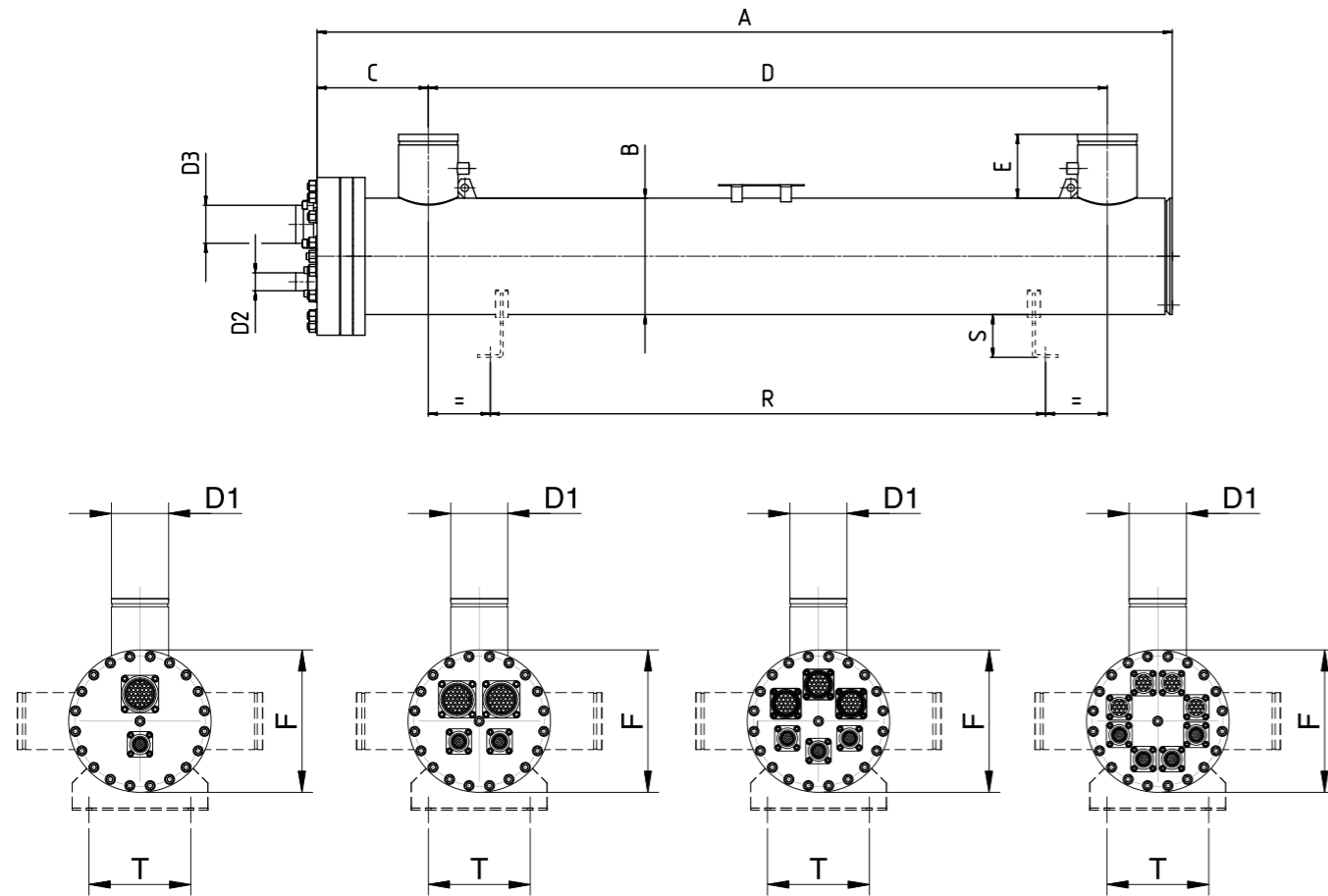
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-------|-----|------|-----|-----|----------|-----|----|---------------|-------|---------------|-------|-------------------|-------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH1-211 | 1820 | 219,1 | 234 | 1460 | 150 | 310 | 1200 | 260 | 80 | FL55 | ODS35 | FL70 | ODS67 | J | DN100 | 113 | 18,0 | 43,1 | II | II | II |
| DH2-211 | 1820 | 219,1 | 234 | 1460 | 150 | 310 | 1200 | 260 | 80 | RT | ODS35 | FL55 | ODS54 | J | DN100 | 113 | 18,0 | 43,1 | II | II | II |
| DH3-211 | 1820 | 219,1 | 234 | 1460 | 150 | 310 | 1200 | 260 | 80 | WA | ODS22 | WA | ODS42 | J | DN100 | 113 | 18,0 | 43,1 | II | II | II |
| DH4-211 | 1820 | 219,1 | 234 | 1460 | 150 | 310 | 1200 | 260 | 80 | WA | ODS22 | WA | ODS35 | J | DN100 | 113 | 18,0 | 43,1 | II | II | II |
| DH1-212 | 2030 | 219,1 | 234 | 1670 | 150 | 310 | 1400 | 260 | 80 | FL55 | ODS35 | FL70 | ODS67 | J | DN100 | 123 | 20,0 | 47,7 | II | II | III |
| DH2-212 | 2030 | 219,1 | 234 | 1670 | 150 | 310 | 1400 | 260 | 80 | RT | ODS35 | FL55 | ODS54 | J | DN100 | 123 | 20,0 | 47,7 | II | II | III |
| DH3-212 | 2030 | 219,1 | 234 | 1670 | 150 | 310 | 1400 | 260 | 80 | WA | ODS22 | WA | ODS42 | J | DN100 | 123 | 20,0 | 47,7 | II | II | III |
| DH4-212 | 2030 | 219,1 | 234 | 1670 | 150 | 310 | 1400 | 260 | 80 | WA | ODS22 | WA | ODS35 | J | DN100 | 123 | 20,0 | 47,7 | II | II | III |

Shell diameter = 273 mm

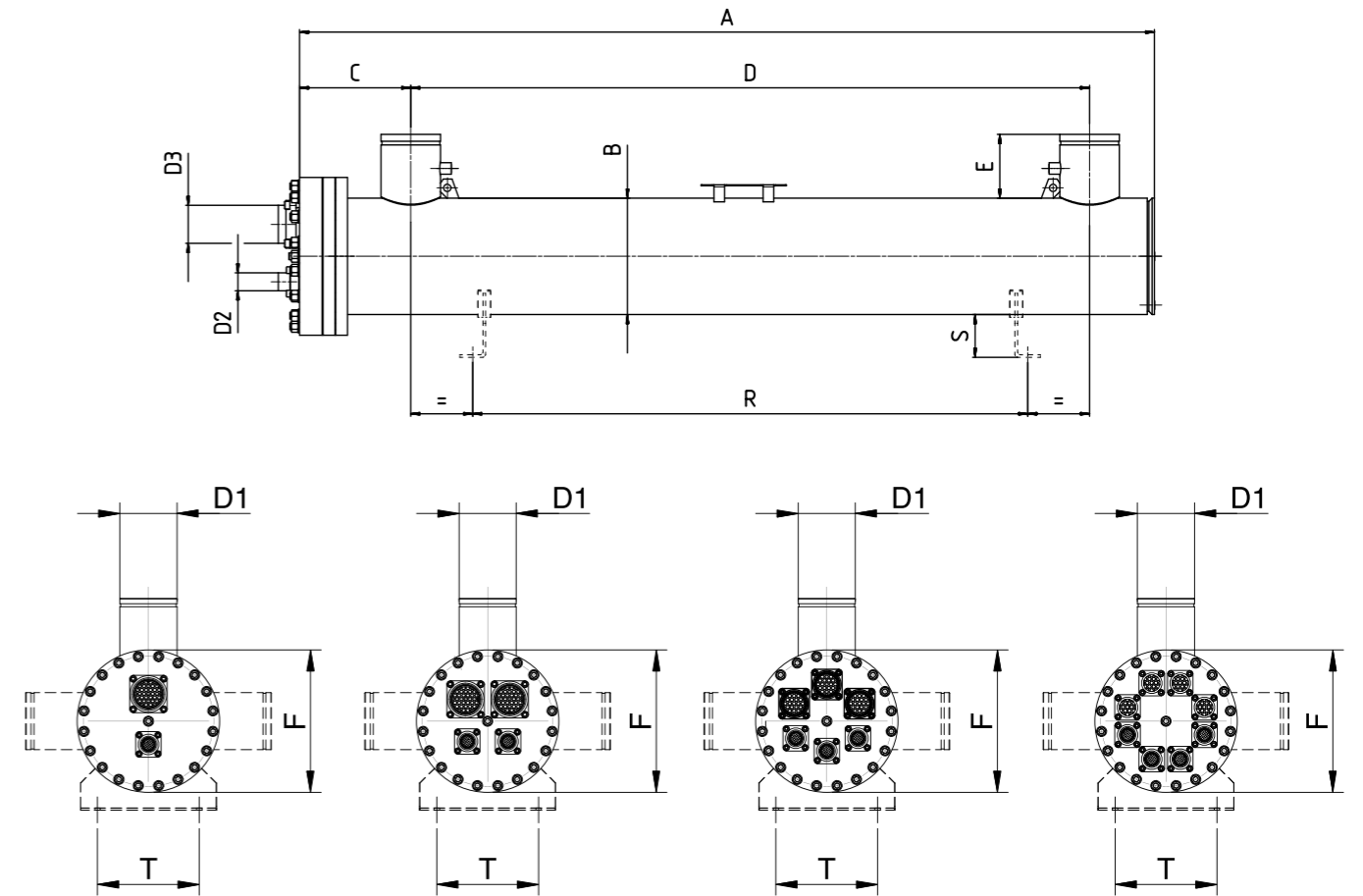
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-----|-----|------|-----|-----|----------|-----|-----|---------------|-------|---------------|-------|-------------------|-------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH1-271 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN125 | 188 | 26,0 | 77,4 | II | III | III |
| DH2-271 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | FL55 | ODS35 | FL70 | ODS54 | J | DN125 | 188 | 26,0 | 77,4 | II | III | III |
| DH3-271 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | WA | ODS35 | WA | ODS54 | J | DN125 | 188 | 26,0 | 77,4 | II | III | III |
| DH4-271 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | WA | ODS22 | WA | ODS42 | J | DN125 | 189 | 26,0 | 77,4 | II | III | III |
| DH1-272 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN125 | 196 | 29,0 | 73,4 | II | III | III |
| DH2-272 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | FL55 | ODS35 | FL70 | ODS54 | J | DN125 | 196 | 29,0 | 73,4 | II | III | III |
| DH3-272 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | WA | ODS35 | WA | ODS54 | J | DN125 | 196 | 29,0 | 73,4 | II | III | III |
| DH4-272 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | WA | ODS22 | WA | ODS42 | J | DN125 | 196 | 29,0 | 73,4 | II | III | III |
| DH1-273 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN125 | 204 | 33,0 | 68,8 | III | III | III |
| DH2-273 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | FL55 | ODS35 | FL70 | ODS54 | J | DN125 | 204 | 33,0 | 68,8 | III | III | III |
| DH3-273 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | WA | ODS35 | WA | ODS54 | J | DN125 | 204 | 33,0 | 68,8 | III | III | III |
| DH4-273 | 2002 | 273 | 260 | 1590 | 150 | 370 | 1300 | 300 | 100 | WA | ODS22 | WA | ODS42 | J | DN125 | 204 | 33,0 | 68,8 | III | III | III |

Shell diameter = 324 mm

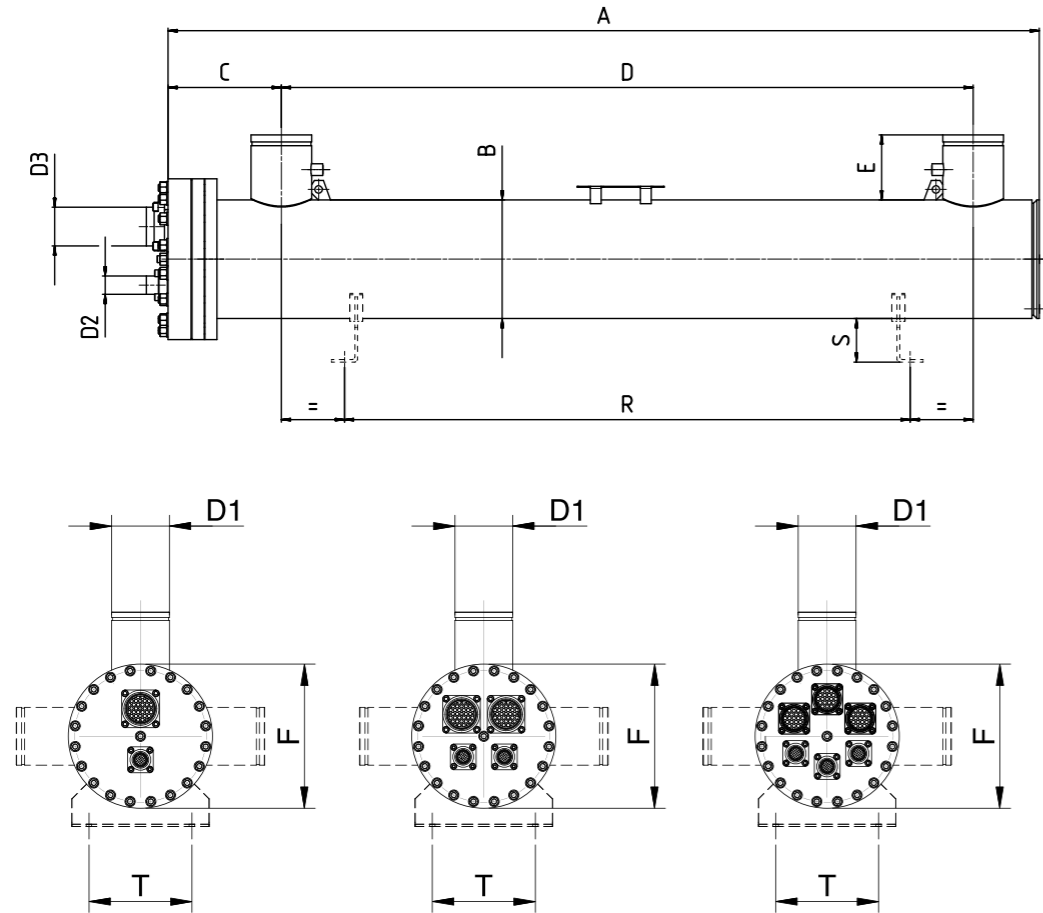
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-------|-----|------|-----|-----|----------|-----|-----|---------------|-------|---------------|-------|-------------------|-------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH1-321 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN150 | 285 | 44,0 | 127,6 | III | III | III |
| DH2-321 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN150 | 285 | 44,0 | 127,6 | III | III | III |
| DH3-321 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL70 | ODS67 | J | DN150 | 285 | 44,0 | 127,6 | III | III | III |
| DH4-321 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL55 | ODS54 | J | DN150 | 285 | 44,0 | 127,6 | III | III | III |
| DH1-322 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN150 | 292 | 49,0 | 121,5 | III | III | III |
| DH2-322 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN150 | 292 | 49,0 | 121,5 | III | III | III |
| DH3-322 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL70 | ODS67 | J | DN150 | 292 | 49,0 | 121,5 | III | III | III |
| DH4-322 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL55 | ODS54 | J | DN150 | 292 | 49,0 | 121,5 | III | III | III |
| DH1-323 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN150 | 315 | 57,0 | 111,0 | III | III | III |
| DH2-323 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL90 | ODS80 | J | DN150 | 315 | 57,0 | 111,0 | III | III | III |
| DH3-323 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL70 | ODS67 | J | DN150 | 315 | 57,0 | 111,0 | III | III | III |
| DH4-323 | 2316 | 323,9 | 292 | 1820 | 200 | 420 | 1500 | 300 | 100 | FL55 | ODS35 | FL55 | ODS54 | J | DN150 | 315 | 57,0 | 111,0 | III | III | III |

Shell diameter = 406 mm

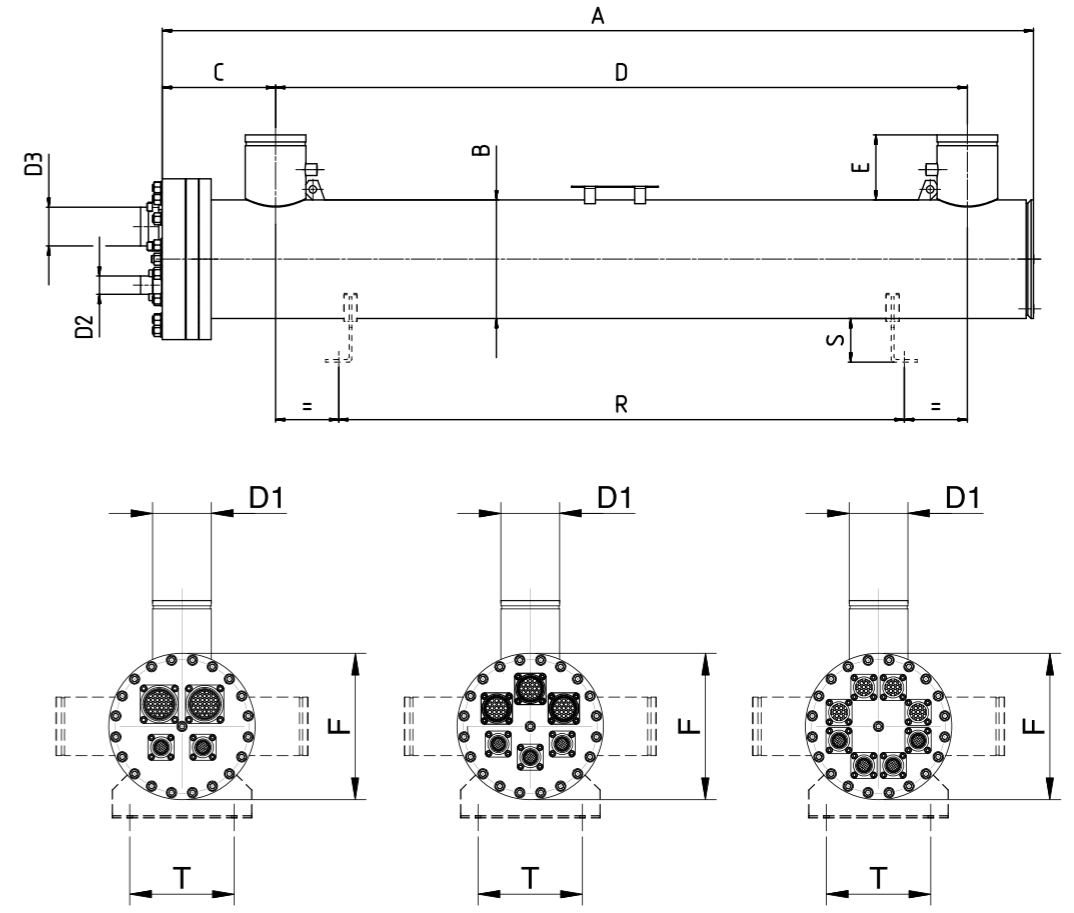
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-------|-----|------|-----|-----|----------|-----|-----|---------------|-------|---------------|-------|-------------------|-------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH2-401 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 415 | 66,0 | 195,6 | III | III | IV |
| DH3-401 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 415 | 66,0 | 195,6 | III | III | IV |
| DH4-401 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL70 | ODS67 | J | DN200 | 415 | 66,0 | 195,6 | III | III | IV |
| DH2-402 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 433 | 74,0 | 185,7 | III | IV | IV |
| DH3-402 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 433 | 74,0 | 185,7 | III | IV | IV |
| DH4-402 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL70 | ODS67 | J | DN200 | 433 | 74,0 | 185,7 | III | IV | IV |
| DH2-403 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 462 | 88,0 | 168,8 | III | IV | IV |
| DH3-403 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 462 | 88,0 | 168,8 | III | IV | IV |
| DH4-403 | 2232 | 406,4 | 336 | 1660 | 200 | 510 | 1400 | 400 | 120 | FL55 | ODS35 | FL70 | ODS67 | J | DN200 | 462 | 88,0 | 168,8 | III | IV | IV |
| DH2-404 | 2752 | 406,4 | 336 | 2180 | 200 | 510 | 1800 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 544 | 110,0 | 214,4 | IV | IV | IV |
| DH3-404 | 2752 | 406,4 | 336 | 2180 | 200 | 510 | 1800 | 400 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 544 | 110,0 | 214,4 | IV | IV | IV |
| DH4-404 | 2752 | 406,4 | 336 | 2180 | 200 | 510 | 1800 | 400 | 120 | FL55 | ODS35 | FL70 | ODS67 | J | DN200 | 544 | 110,0 | 214,4 | IV | IV | IV |

Shell diameter = 457 mm

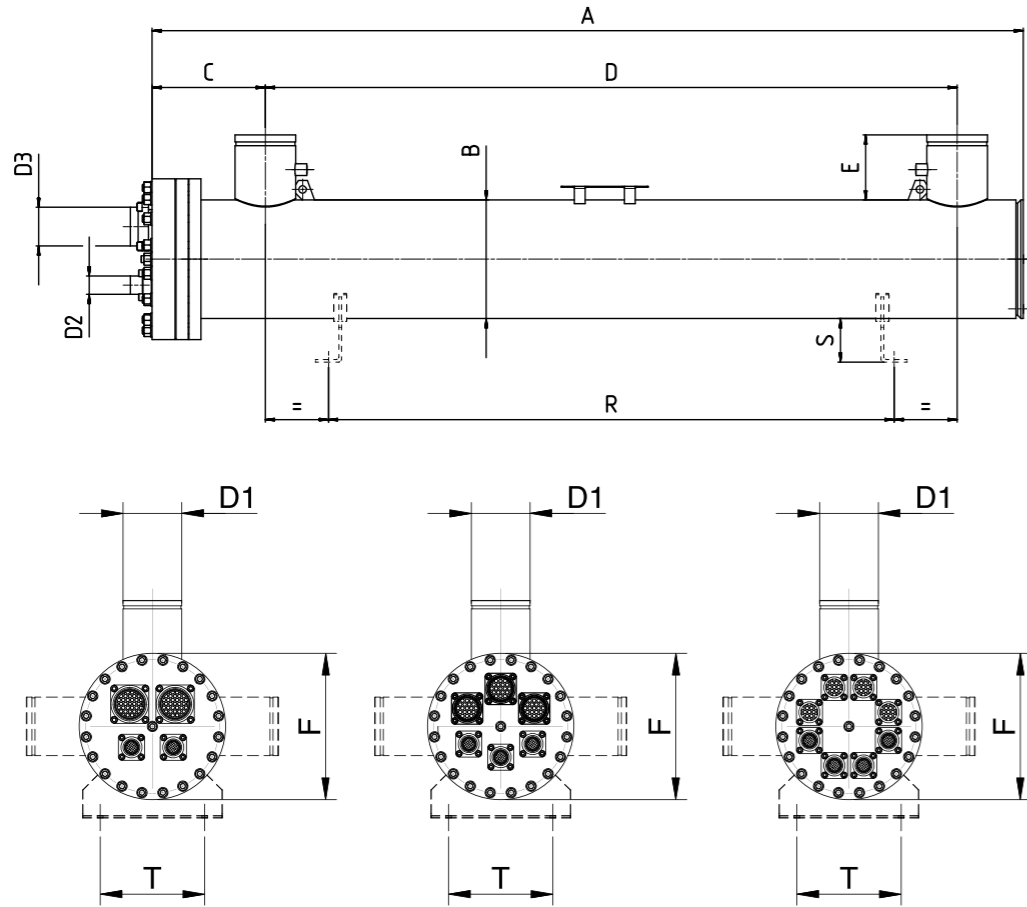
General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-----|-----|------|-----|-----|----------|-----|-----|---------------|-------|---------------|-------|-------------------|-------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH2-451 | 2382 | 457 | 366 | 1760 | 200 | 570 | 1500 | 310 | 121 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 602 | 111,0 | 304,9 | IV | IV | IV |
| DH3-451 | 2382 | 457 | 366 | 1760 | 200 | 570 | 1500 | 310 | 121 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 602 | 111,0 | 304,9 | IV | IV | IV |
| DH4-451 | 2382 | 457 | 366 | 1760 | 200 | 570 | 1500 | 310 | 121 | FL55 | ODS35 | FL70 | ODS67 | J | DN200 | 602 | 111,0 | 304,9 | IV | IV | IV |
| DH2-452 | 2382 | 457 | 366 | 1760 | 200 | 570 | 1500 | 310 | 121 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 632 | 124,0 | 288,0 | IV | IV | IV |
| DH3-452 | 2382 | 457 | 366 | 1760 | 200 | 570 | 1500 | 310 | 121 | FL55 | ODS35 | FL90 | ODS80 | J | DN200 | 632 | 124,0 | 288,0 | IV | IV | IV |
| DH4-452 | 2382 | 457 | 366 | 1760 | 200 | 570 | 1500 | 310 | 121 | FL55 | ODS35 | FL70 | ODS67 | J | DN200 | 632 | 124,0 | 288,0 | IV | IV | IV |

Shell diameter = 508 mm

General dimensions



| DH Model | Dimensions* | | | | | | Supports | | | Connections** | | | | Volumes - weights | | | | | | | |
|----------|-------------|-----|-----|------|-----|-----|----------|-----|-----|---------------|-------|---------------|-------|-------------------|-------|-----------|--------------------------------|---------------------------|------------------|-----------------|-----------------|
| | A | B | C | D | E | F | R | T | S | Ref-IN conn. | | Ref-OUT conn. | | Brine conn. | | Weight*** | Refrigerant (tube) side volume | Brine (shell) side volume | PED category**** | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | mm | Type | D2 | Type | D3 | Type | D1 | | | | kg | dm ³ | dm ³ |
| DH2-501 | 2812 | 508 | 390 | 2140 | 250 | 640 | 1800 | 350 | 120 | FL55 | ODS42 | FL90 | ODS80 | J | DN250 | 777 | 142,0 | 382,6 | IV | IV | IV |
| DH3-501 | 2812 | 508 | 390 | 2140 | 250 | 640 | 1800 | 350 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN250 | 777 | 142,0 | 382,6 | IV | IV | IV |
| DH4-501 | 2812 | 508 | 390 | 2140 | 250 | 640 | 1800 | 350 | 120 | FL55 | ODS35 | FL70 | ODS67 | J | DN250 | 777 | 142,0 | 382,6 | IV | IV | IV |
| DH2-502 | 2812 | 508 | 390 | 2140 | 250 | 640 | 1800 | 350 | 120 | FL55 | ODS42 | FL90 | ODS80 | J | DN250 | 832 | 166,0 | 352,3 | IV | IV | IV |
| DH3-502 | 2812 | 508 | 390 | 2140 | 250 | 640 | 1800 | 350 | 120 | FL55 | ODS35 | FL90 | ODS80 | J | DN250 | 832 | 166,0 | 352,3 | IV | IV | IV |
| DH4-502 | 2812 | 508 | 390 | 2140 | 250 | 640 | 1800 | 350 | 120 | FL55 | ODS35 | FL70 | ODS67 | J | DN250 | 832 | 166,0 | 352,3 | IV | IV | IV |

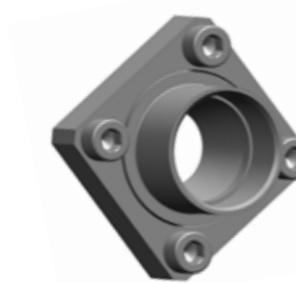
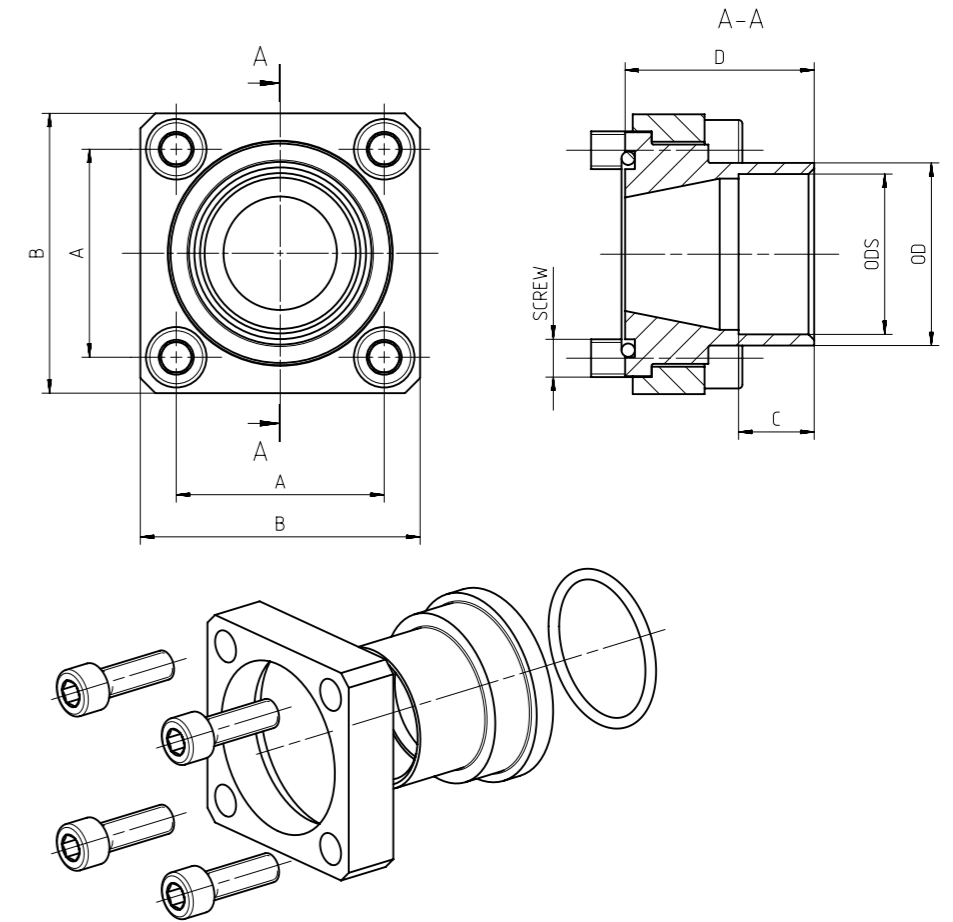
* Overall length refer to the evaporator not including refrigerant connections
 ** Standard refrigerant and brine connections; different connections type and sizes are available
 *** Considering the evaporator empty and not including packaging
 **** According to table 2, Annex II of the directive 2014/68/EU of the European Parliament and of the Council of 15 May 2014 - For refrigerants classified as fluids in Group 2

- RT Rotalock
- FL.. Flange (55, 70, 90 are the sizes of the flange block)
- WA Brazing/welding
- T Threaded (ISO 7/1-R)
- J Flexible joint (Victaulic)

Refrigerant connections

The connection between the evaporator and the refrigerant circuit is made, depending on the evaporator size, with flange connections, welding connections or Rotalock connections.

General dimensions – Flange connections

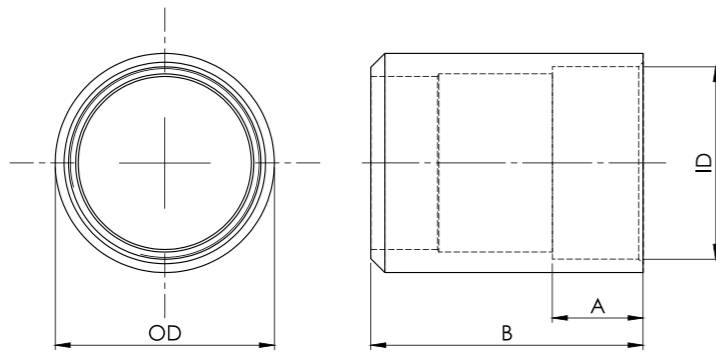


| Flange connections | | | | | | | | | |
|--------------------|----|-----|-------|-------------|--------|------------|------|----|----|
| Type | A | B | Screw | ODS | | Hole diam. | OD | C | D |
| | mm | mm | | Copper pipe | | mm | mm | mm | mm |
| FL55 | 55 | 74 | M10 | 35 | 1 3/8" | 35,3 | 42,2 | 20 | 50 |
| | 55 | 74 | M10 | 42 | 1 5/8" | 42,4 | 48,3 | 20 | 50 |
| | 55 | 74 | M10 | 54 | 2 1/8" | 54,4 | 58 | 20 | 50 |
| FL70 | 70 | 88 | M10 | 54 | 2 1/8" | 54,4 | 60,3 | 20 | 50 |
| | 70 | 88 | M10 | 67 | 2 5/8" | 67,2 | 72 | 20 | 50 |
| FL90 | 90 | 112 | M12 | 80 | 3 1/8" | 80,4 | 88,9 | 20 | 50 |

Refrigerant connections

The connection between the evaporator and the refrigerant circuit is made, depending on the evaporator size, with flange connections, welding connections or Rotalock connections.

General dimensions – Welding connections



| Welding connections | | | | | | |
|---------------------|---------|---------|------|------------|---------|---------|
| Type | A mm | B mm | Name | Connection | | |
| | | | | ODS (mm) | ID (mm) | OD (mm) |
| A | 20 | 60 | WA22 | 22 | 23 | 26,7 |
| | 20 | 60 | WA35 | 35 | 35,3 | 42,4 |
| | 20 | 60 | WA42 | 42 | 42 | 48,3 |
| | 20 | 60 | WA54 | 54 | 54,5 | 60,3 |

General dimensions – Rotalock connections



| Rotalock connections | | | | | | | | |
|----------------------|---------|---------|---------|----------------|------|------------|------------|---------|
| Type | A mm | B mm | C mm | RT | Name | Connection | | |
| | | | | | | ODS (mm) | ODS (Inch) | ID (mm) |
| A | 20 | 80 | 30 | 1" - 14UNF | RA16 | 16 | 5/8" | 16,3 |
| B | 20 | 80 | 36 | 1 1/4" - 12UNF | RB22 | 22 | 7/8" | 22,5 |
| C | 20 | 80 | 50 | 1 3/4" - 12UNF | RC28 | 28 | - | 28,3 |
| | 20 | 80 | 50 | 1 3/4" - 12UNF | RC35 | 35 | 1 3/8" | 35,3 |

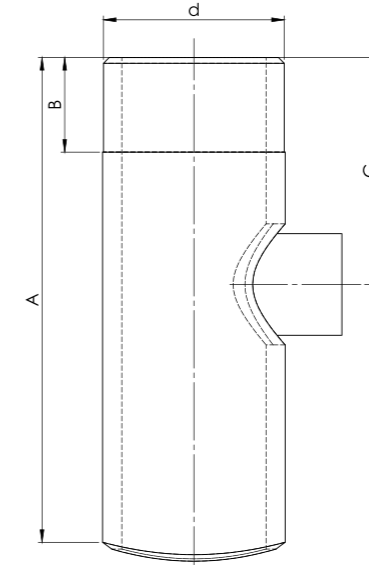
Brine connections

Different connections are available, depending on the evaporator size:

- // with UNI/ISO 7/1 R thread up to 2 1/2"
- // with Victaulic flexible joint starting with 3" (DN 80)
- // with Vic-Flange water connections starting with 3" (DN 80)
- // with welded flange according to EN 1092-1

The flexible joint gasket are compatible with liquids normally used in refrigeration and air conditioning applications and are suitable to be used within -40°C and +90°C. The joints are supplied with flexible joint and a slot end with groove.

General dimensions

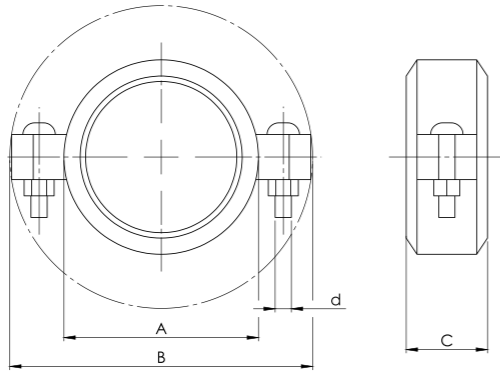


| Threaded water connections | | | | | |
|----------------------------|---------|---------|---------|------|-----------|
| Type | A mm | B mm | C mm | Name | d inch |
| | | | | | |
| DH 143-144 | 130 | 25 | 60 | T2 | 2" |
| DH 161-162-163-164 | 130 | 35 | 60 | T21 | 2 1/2" |

Brine connections

General dimensions

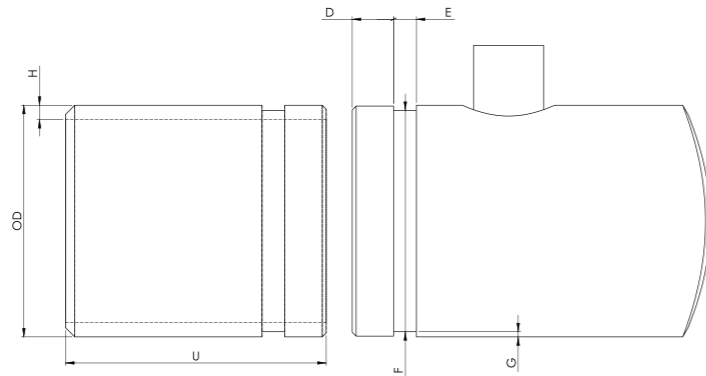
Flexible joint



| Victaulic flexible joint water connections | | | | | | |
|--|---------|---------|---------|------|----------|-----------|
| Type | A mm | B mm | C mm | Name | OD mm | DN |
| DH 191-192-193 | 127 | 181 | 48 | J3 | 88,9 | 80 (3") |
| DH 211-212 | 149,2 | 212,8 | 50,8 | J4 | 114,3 | 100 (4") |
| DH 271-272-273 | 177,8 | 250,8 | 50,8 | J5 | 141,3 | 125 (5") |
| DH 321-322-323 | 203,2 | 285,8 | 50,8 | J6 | 168,3 | 150 (6") |
| DH 401-402-403-404-451-452 | 263,5 | 349,3 | 60,3 | J8 | 219,1 | 200 (8") |
| DH 501-502 | 346 | 435 | 67 | J10 | 273 | 250 (10") |

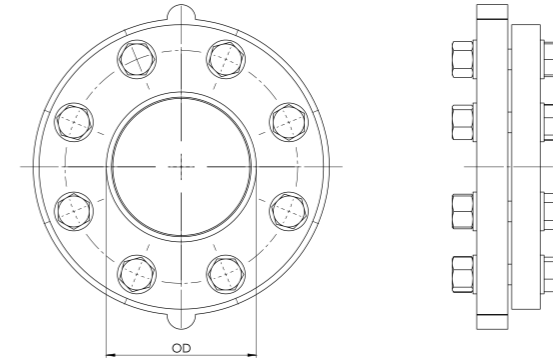
General dimensions

Connection pipe



| Victaulic flexible joint water connections | | | | | |
|--|-----------|---------|---------|---------|---------|
| Type | DN | D mm | E mm | F mm | G mm |
| DH 191-192-193 | 80 (3") | 15,9 | 7,95 | 84,9 | 2 |
| DH 211-212 | 100 (4") | 15,9 | 9,5 | 110,1 | 2,1 |
| DH 271-272-273 | 125 (5") | 15,9 | 9,51 | 35,5 | 2,9 |
| DH 321-322-323 | 150 (6") | 19 | 9,5 | 163,9 | 2,2 |
| DH 401-402-403-404-451-452 | 200 (8") | 19 | 11,1 | 214,4 | 2,3 |
| DH 501-502 | 250 (10") | 19 | 12,7 | 268,3 | 2,4 |

General dimensions



Vic-Flange water connections

On request Vic-flanges can be supplied for water side connections.
The Vic-Flange kit contains:

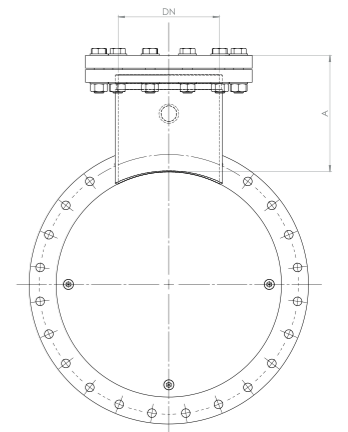
- // Vic-Flange adapter (see picture below) with gasket
- // Carbon steel counter flange according to EN 1092-1

General dimensions



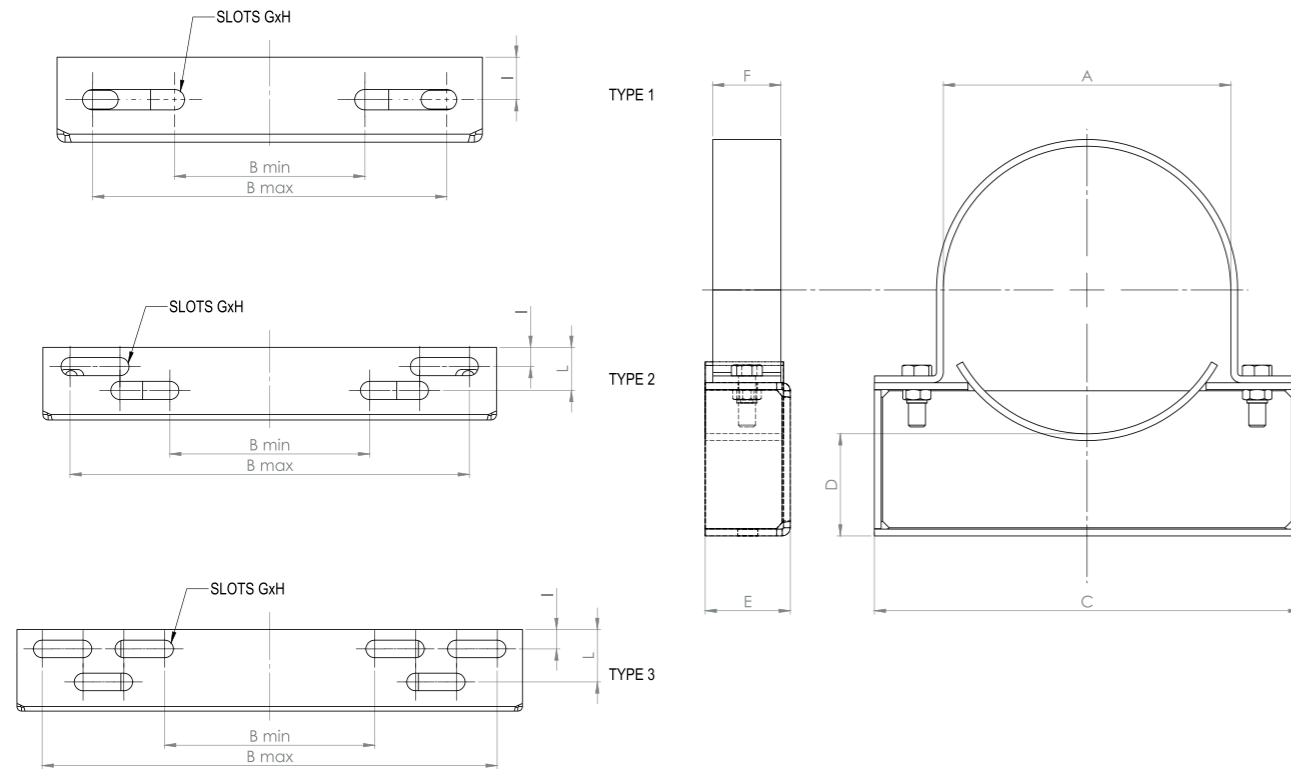
Only for extractable tube bundle version, the DH can also be supplied with welded flange according to EN 1092-1.

| Welded flange water connections | | |
|---------------------------------|----------|-----|
| Type | DN mm | A |
| DH 141-142 | 40 | 130 |
| DH 143-144 | 50 | 130 |
| DH 161-162-163-164 | 65 | 130 |
| DH 191-192-193 | 80 | 165 |
| DH 211-212 | 100 | 165 |
| DH 271-272-273 | 125 | 165 |
| DH 321-322-323 | 150 | 215 |
| DH 401-402-403-404-451-452 | 200 | 215 |
| DH 501-502 | 250 | 265 |



Options

General dimensions



Options

The following options are available for DH evaporator:

- // Vic-flanges water connections (see 'Brine connections' section for more details)
- // Insulation (thickness $\frac{3}{4}$ ") made of close cell elastomer layer (glued) to the evaporator surface with textile covering. The thickness of the insulation is 19 mm.
- // Welded supports (see 'General dimension' section more informations)
- // Brackets supports: The DH can be equipped with supports welded to the shell (illustrated in the 'General dimension' section) or with universal brackets which are positioned in the installation phase and allows therefore the maximum flexibility (available up to shell diameter 406 mm). See table below for brackets dimensions. All dimensions are in mm.



| Universal brackets | | | | | | | | | | | |
|--------------------|-----|-----|-----|-----|----|----|-------|----|------|----|----|
| A | B | | C | D | E | F | Slots | | | i | L |
| | min | max | | | | | G | H | Type | | |
| 140 | 82 | 178 | 220 | 60 | 50 | 40 | 12 | 60 | 1 | 25 | - |
| 168 | 112 | 208 | 250 | 60 | 50 | 40 | 12 | 60 | 1 | 25 | - |
| 194 | 46 | 238 | 280 | 60 | 50 | 40 | 12 | 60 | 2 | 15 | 32 |
| 219 | 82 | 276 | 320 | 80 | 50 | 40 | 12 | 60 | 2 | 15 | 32 |
| 273 | 176 | 352 | 400 | 100 | 60 | 50 | 16 | 60 | 2 | 17 | 38 |
| 324 | 108 | 372 | 420 | 100 | 60 | 50 | 16 | 60 | 3 | 17 | 38 |
| 406 | 216 | 468 | 520 | 120 | 60 | 50 | 16 | 60 | 3 | 20 | 54 |

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