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# Technical Submittal

**Project** : **One Piccadilly Gardens** **13 March 2024**
**Tech Sub Ref.** : **V103158R01 TS**

## Customer Details

**Company** : Seba UK Ltd
**Contact** : Adrian Wellman (Project Manager)
**Telephone** : Tel: 0113 288 7986 / Mob: 07847 726 620
**Email** : adrian@seba-uk.com

**Many thanks for your enquiry. Please find the relevant equipment listed below, further detailed information can be found on the following pages of this technical submittal**

| Item | Qty | Description |
|---|---|---|
| 1 | 2 | 400 kW SE270-081 Single Pass Plate Heat Exchanger - Ref. **PHX 01** & **PHX 02** |
| 2 | 1 | 750 kW SE455-175 Single Pass Plate Heat Exchanger - Ref. **PHX 03** |
| 3 | 1 | 4,800 Litre SSAD4800 LDX Stainless Steel Buffer Vessel - Ref. **TS 01** |
| 4 | 1 | 4,800 Litre SSAD4800 LDX Stainless Steel Buffer Vessel - Ref. **TS 02** |
| 5 | 1 | 1,800 Litre SSAD1800 LDX Stainless Steel Buffer Vessel - Ref. **TS 03** |

**Please Note** - For all of the Vessels we offer two Sparge Pipes and two Baffle Plates - as the Schedule states 'Yes' for sparge pipes on all connections (which may lead to clashes internally) and 'Yes' for baffle plates with no quantity stated

## Contact Details

| | | | | |
|---|---|---|---|---|
| **Estimator** | : | **Tom Storey** | 01274 009929 | tom.storey@ormandygroup.com |
| **Commercial** | : | **Jason Barber** | 07879 772044 | jason.barber@ormandygroup.com |

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# PLATE HEAT EXCHANGER TECHNICAL SUBMITTAL

| | | |
|---|---|---|
| **ITEM/PLANT REFERENCE** | : | **PHX 01** & **PHX 02** |
| UNIT TYPE | : | SE270-081 |
| NUMBER OFF | : | 2 |
| | | |
| OPTIONAL EXTRAS | : | 45mm thk Insulation Box (Kit Form) |
| | : | Stainless Steel Drip Tray (Loose) |

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# PLATE HEAT EXCHANGER DESIGN SPECIFICATION

| OPERATING CONDITION | | COLD SIDE | | HOT SIDE | |
|---|---|---|---|---|---|
| Fluids | | Water | | Water | |
| Inlet flow rates | kg/s | 9.54 | | 9.54 | kg/s |
| INLET temperatures | °C | 68.0 | | 80.0 | °C |
| OUTLET temperatures | °C | 78.0 | | 70.0 | °C |
| Pressure drop (calc.) | kPa | 38.21 | | 38.24 | kPa |
| Operating pressure | bar G | 3.000 | | 3.000 | bar G |
| Capacity | kW | | 400.00 | | |
| Total oversizing | % | | 1.11 | | |

| FLUID PROPERTIES | | | |
|---|---|---|---|
| Density | kg/m³ | 976.16 | 974.98 |
| Specific heat capacity | J/(kg K) | 4191 | 4193 |
| Thermal conductivity | W/(m K) | 0.666 | 0.667 |
| Dynamic viscosity | cP | 0.3879 | 0.3778 |

| PRODUCT CONFIGURATION | | | |
|---|---|---|---|
| Product code | | SE#0270+081A00PNPV0AA11 | |
| Frame material | | Carbon steel | |
| Plates (material / thickness) | | AISI 316L (EN 1.4404) / 0.4 mm | |
| Gaskets (material / type) | | NBR / Glue-free Plug-In® design | |
| Connections size | | DN80 | DN80 |
| Connections type | | Studded ports EN | Studded ports EN |
| Connections material | | Rubber lining | Rubber lining |
| Fluids position (inlet -> outlet) | | F3 -> F4 | F1 -> F2 |
| No. of passes | | 1 | 1 |
| Relative directions of fluids | | Counter Current | |
| Max. number of plates allowed on | | 101 | |

| DESIGN | | | |
|---|---|---|---|
| Design standard | | PED 2014/68/EU | |
| PED risk category | | Art. 4.3 (Gr. 2 - L) / - | |
| Pressure (design / test) | bar | 10 / 15 | |
| Temperature (min / design) | °C | 0 / 100 | |
| Volume (each side) | l | 27.5 | 27.5 |
| Specific compliance and certification | | - | |

| DIMENSIONS AND WEIGHT | | |
|---|---|---|
| Overall dimensions (width x height x | mm | 400 x 1291 x 615 |
| Weight (empty / operating) | kg | 304 / 358 |

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# PLATE HEAT EXCHANGER TECHNICAL SUBMITTAL

| | | |
|---|---|---|
| **ITEM/PLANT REFERENCE** | : | **PHX 03** |
| UNIT TYPE | : | SE455-175 |
| NUMBER OFF | : | 1 |
| | | |
| OPTIONAL EXTRAS | : | 45mm thk Insulation Box (Kit Form) |
| | : | Stainless Steel Drip Tray (Loose) |

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# PLATE HEAT EXCHANGER DESIGN SPECIFICATION

| OPERATING CONDITION | | COLD SIDE | | HOT SIDE | |
|---|---|---|---|---|---|
| Fluids | | Mono-Ethylene Glycol 20% | | Mono-Ethylene Glycol 20% | |
| Inlet flow rates | kg/s | 32.15 | | 32.12 | kg/s |
| INLET temperatures | °C | 6.0 | | 14.0 | °C |
| OUTLET temperatures | °C | 12.0 | | 8.0 | °C |
| Pressure drop (calc.) | kPa | 49.52 | | 49.25 | kPa |
| Operating pressure | bar G | 3.000 | | 3.000 | bar G |
| Capacity | kW | | 750.00 | | |
| Total oversizing | % | | 2.12 | | |

| FLUID PROPERTIES | | | |
|---|---|---|---|
| Density | kg/m³ | 1027.30 | 1026.70 |
| Specific heat capacity | J/(kg K) | 3888 | 3892 |
| Thermal conductivity | W/(m K) | 0.495 | 0.498 |
| Dynamic viscosity | cP | 2.3442 | 2.1911 |

| PRODUCT CONFIGURATION | | |
|---|---|---|
| Product code | SE#0455+175M50PNPV0AA11 | |
| Frame material | Carbon steel | |
| Plates (material / thickness) | AISI 316L (EN 1.4404) / 0.4 mm | |
| Gaskets (material / type) | NBR / Glue-free Plug-In® design | |
| Connections size | DN100 | DN100 |
| Connections type | Studded ports EN | Studded ports EN |
| Connections material | Rubber lining | Rubber lining |
| Fluids position (inlet -> outlet) | F3 -> F4 | F1 -> F2 |
| No. of passes | 1 | 1 |
| Relative directions of fluids | Counter Current | |
| Max. number of plates allowed on | 201 | |

| DESIGN | | | |
|---|---|---|---|
| Design standard | | PED 2014/68/EU | |
| PED risk category | | Art. 4.3 (Gr. 2 - L) / - | |
| Pressure (design / test) | bar | 10 / 15 | |
| Temperature (min / design) | °C | 0 / 100 | |
| Volume (each side) | l | 90.2 | 90.2 |
| Specific compliance and certification | | - | |

| DIMENSIONS AND WEIGHT | | |
|---|---|---|
| Overall dimensions (width x height x | mm | 530 x 1569 x 1441 |
| Weight (empty / operating) | kg | 821 / 1006 |

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# STAINLESS STEEL BUFFER VESSEL TECHNICAL SUBMITTAL

| | | |
|---|---|---|
| **ITEM/PLANT REFERENCE** | : | **TS 01** |
| UNIT TYPE | : | SSAD4800 |
| NUMBER OFF | : | 1 |
| OPTIONAL EXTRAS | : | 50mm thick Mineral Wool Insulation encased in Aluminium Stucco Cladding (Factory Fitted), excludes Manway/Inspection Opening |

# STAINLESS STEEL BUFFER VESSEL DESIGN SPECIFICATION

| | | |
|---|---|---|
| SHELL MATERIAL | : | LDX Stainless Steel |
| OTHER MATERIAL | : | Stainless Steel |
| CAPACITY | : | 4,800 Litres |
| ORIENTATION | : | Vertical |
| ESTIMATED DRY WEIGHT | : | TBC kg (Excluding Insulation) |
| MAX WORKING PRESSURE | : | 6.0 BarG |
| DESIGN PRESSURE | : | 6.6 BarG |
| TEST PRESSURE | : | 9.9 BarG |
| SYSTEM TEMPERATURE | : | 85°C |
| DESIGN TEMPERATURE | : | 100°C |
| DIMENSIONS | : | 1600mm Shell Diameter (Excl. Insulation or Connections)<br>2650mm Over Dished Ends<br>2950mm Vessel Height |
| (Alternative dimensions available upon request) | | |
| DESIGN CODE | : | Commercial Standard and PESR (2016) |
| CONNECTIONS / INCLUSIONS | : | Generally as per supplied enquiry, including:- |
| | | 1-off Inspection Opening<br>1-off DN150/PN16 Flanged ASHP Connection c/w Sparge Pipe<br>1-off DN80/PN16 Flanged ASHP Connection c/w Sparge Pipe<br>3-off DN80/PN16 Flanged LTHW Connection<br>1-off 1" BSP Screwed Connection (PU)<br>4-off 1/2" BSP Screwed Tapping (Pockets & Sensors by others)<br>Any other connections (for Drain, Safety Valve, Air Vent, Gauges etc) generally as per Brochure |
| | : | Connection location and orientation can be amended to suit prior to manufacture |
| | : | Additional and/or different size connections can be provided but may incur additional charges |

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# STAINLESS STEEL BUFFER VESSEL TECHNICAL SUBMITTAL

| | | |
|---|---|---|
| **ITEM/PLANT REFERENCE** | : | **TS 02** |
| UNIT TYPE | : | SSAD4800 |
| NUMBER OFF | : | 1 |
| OPTIONAL EXTRAS | : | 50mm thick Mineral Wool Insulation encased in Aluminium Stucco Cladding (Factory Fitted), excludes Manway/Inspection Opening |

# STAINLESS STEEL BUFFER VESSEL DESIGN SPECIFICATION

| | | |
|---|---|---|
| SHELL MATERIAL | : | LDX Stainless Steel |
| OTHER MATERIAL | : | Stainless Steel |
| CAPACITY | : | 4,800 Litres |
| ORIENTATION | : | Vertical |
| ESTIMATED DRY WEIGHT | : | TBC kg (Excluding Insulation) |
| MAX WORKING PRESSURE | : | 6.0 BarG |
| DESIGN PRESSURE | : | 6.6 BarG |
| TEST PRESSURE | : | 9.9 BarG |
| SYSTEM TEMPERATURE | : | 85°C |
| DESIGN TEMPERATURE | : | 100°C |
| DIMENSIONS | : | 1600mm Shell Diameter (Excl. Insulation or Connections)<br>2650mm Over Dished Ends<br>2950mm Vessel Height |
| (Alternative dimensions available upon request) | | |
| DESIGN CODE | : | Commercial Standard and PESR (2016) |
| CONNECTIONS / INCLUSIONS | : | Generally as per supplied enquiry, including:-<br><br>1-off Inspection Opening<br>2-off DN100/PN16 Flanged ASHP Connection c/w Sparge Pipe<br>1-off DN150/PN16 Flanged ASHP Connection<br>1-off 1" BSP Screwed Connection (PU)<br>4-off 1/2" BSP Screwed Tapping (Pockets & Sensors by others)<br>Any other connections (for Drain, Safety Valve, Air Vent, Gauges etc) generally as per Brochure |
| | : | Connection location and orientation can be amended to suit prior to manufacture |
| | : | Additional and/or different size connections can be provided but may incur additional charges |

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# STAINLESS STEEL BUFFER VESSEL TECHNICAL SUBMITTAL

| | | |
|---|---|---|
| **ITEM/PLANT REFERENCE** | : | **TS 03** |
| UNIT TYPE | : | SSAD1800 |
| NUMBER OFF | : | 1 |
| OPTIONAL EXTRAS | : | 50mm thick Mineral Wool Insulation encased in Aluminium Stucco Cladding with all joints Vapour Sealed for CHW application (Factory Fitted) |

# STAINLESS STEEL BUFFER VESSEL DESIGN SPECIFICATION

| | | |
|---|---|---|
| SHELL MATERIAL | : | LDX Stainless Steel |
| OTHER MATERIAL | : | Stainless Steel |
| CAPACITY | : | 1,800 Litres |
| ORIENTATION | : | Vertical |
| ESTIMATED DRY WEIGHT | : | TBC kg (Excluding Insulation) |
| MAX WORKING PRESSURE | : | 6.0 BarG |
| DESIGN PRESSURE | : | 6.6 BarG |
| TEST PRESSURE | : | 9.9 BarG |
| SYSTEM TEMPERATURE | : | 20°C |
| DESIGN TEMPERATURE | : | 100°C |
| DIMENSIONS | : | 1200mm Shell Diameter (Excl. Insulation or Connections)<br>1810mm Over Dished Ends<br>2110mm Vessel Height |
| (Alternative dimensions available upon request) | | |
| DESIGN CODE | : | Commercial Standard and PESR (2016) |
| CONNECTIONS / INCLUSIONS | : | Generally as per supplied enquiry, including:-<br><br>1-off Inspection Opening<br>2-off DN150/PN16 Flanged ASHP Connection c/w Sparge Pipe<br>1-off 1" BSP Screwed Connection (PU)<br>2-off 1/2" BSP Screwed Tapping (Pockets & Sensors by others)<br>Any other connections (for Drain, Safety Valve, Air Vent, Gauges etc) generally as per Brochure |
| | : | Connection location and orientation can be amended to suit prior to manufacture |
| | : | Additional and/or different size connections can be provided but may incur additional charges |