

Customer ST-3A Internal frame plant with remote gas cooler specification & quotation – ECO2-MINI-I-S 3x0

TCG CORNBROOK

Q.SES_ID:	1450
Customer:	City Holdings
Requested By:	Steve Grundy
Date:	04/03/2020
Quote Completed by:	Sam Clifford



Specification: 1 x **ST-3A** Format ECO₂ Mini I S 3x0 with internal gas cooler

Pack Drawing Code **79011**

Gas Cooler Code **TBC**

Compressors Criteria

- HT Evaporating Temperature: -6 °C
- Evaporator Superheat 10 K
- Non-useful Superheat 10 K
- Suction Line Pressure Drop 1 K
- Design Ambient Temperature 35 °C
- Gas Cooler Outlet Temperature 37 °C
- Receiver Operating Pressure 38 bar

Compressors

- HT Compressors (Copeland) = 1 x 4MTL-07X (Lead with external VSD)
+ 2 x 4MTL-07X
- Delivered Fixture Capacity = 36 kW @ 59 Hz
- Minimum Delivered Capacity = 6.2 kW @ 30 Hz
- Pack THR = 61.7 kW
- Lead compressor variable speed drive mounted within pack frame
- Emerson Traxoil oil management per compressor
- Suction discharge isolation valves per compressor

Receiver

- 1 OFF 60L Intermediate liquid receiver vessel
- Low level liquid switch
- 4 off level sight glasses at 20, 30 and 80% with 30% inclusive of moisture indicator.
- Receiver dual PRV set on 3-way bypass valve.
- Receiver nameplate.
- Charging valve 1/4" flare connection.

Electrical

- Integral electrical control panel
- Fault indication lights
- Transducers, temperature probes and pressure gauges
- Primary controls – RDM PRO650 CO₂ pack controller
- Touch screen display
- Energy Monitoring
- Duplicate primary controller for back-up control
- Pack Power Supply
- Mains incomer junction box
- Operating Design current = 48.7 A

Pack Safety Relief Devices

- HT Discharge Dual 120 Bar
- Receiver: Dual 60 Bar
- HT Suction Dual 60 Bar
- All PRVs set on 3-way bypass valve

- All PRVs are connected by flexible hoses to a PRV header to be vented to a safe external location (Internal packs only)

Others

- HT isolation ball valve
- HT suction filter shell and core with bypass arrangement
- Liquid injection solenoid to HT suction
- K65 Cooper HT discharge connection 1-1/8"
- HT pipework insulated and fixed with stauff clamps
- Discharge header fixed using stauff clamps
- Temprite CO₂ Coalescing oil separator
- High pressure oil system
- DN50 Oil header
- Individual oil isolation valves
- High pressure Flexible hose lines to compressor oil devices
- Discharge isolation ball valve
- K65 copper discharge connection 7/8"
- K65 copper gas/liquid return connection 7/8"
- Gas/liquid return isolation ball valve
- Gas/liquid return inline filter with replaceable element
- HPV on receiver inlet
- Gas Bypass with pressure valve
- Gas/liquid return isolation ball valve before receiver inlet
- Liquid feed isolation ball valve after receiver outlet
- Liquid feed inline filter with replaceable element
- Liquid feed isolation ball valve
- K65 copper liquid feed connection 7/8"
- Pack supplied pre-commissioned and loaded with basic set-points
- CE marked and R744 labelling

Optional Enclosure

- Kelvion Searle GHU Enclosure for external location
- Double skinned
- Lockable drop in doors, 3 off to the front & 1 off to right-hand end.
- Air inlet grilles
- Discharge air through 2 off integral centrifugal extract fans.
- Noise 30dBA @ 10m (Free-Field)

Compressor Information

Lead VSD Compressor 1 at 59Hz.

***PERFORMANCE AT SPECIFIED OPERATING POINT
4MTL-07_ [INV] drive frequency at 59Hz***

Evaporator Capacity, kW	13.30
Power, kW	8.96
COP	1.49
Inverter Current at 400 V, A	16.81
Mass Flow, g/s	97.70
Heat Rejection, kW	23.10

Compressors 2 & 3.

***PERFORMANCE AT SPECIFIED OPERATING POINT
4MTL-07_ Data at 50Hz***

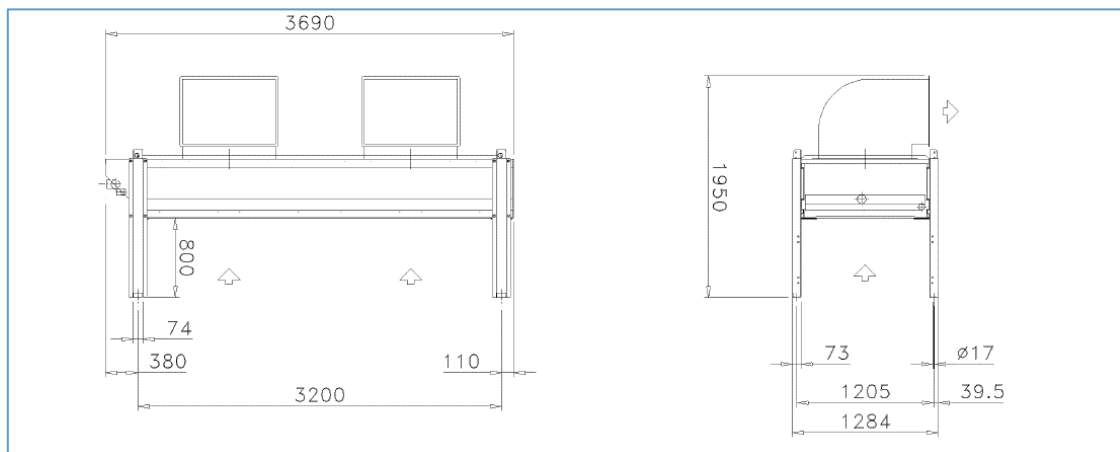
Evaporator Capacity, kW	11.35
Power, kW	7.27
COP	1.56
Current at 400 V, A	12.48
Mass Flow, g/s	83.10
Heat Rejection, kW	19.30

Specification – Gas Cooler

RAD63 212HC-Al/Mg

- Wiring of EC fan set
- 1000mm extended legs
- Alplus

Air inlet temperature	[°C]	35,0	
CO2 inlet temperature	[°C]	109,0	
CO2 outlet temperature	[°C]	37,0	
Pressure	[bar]	95,2	
Fluid		CO2	
CO2 flow	[kg/s]	0,295	
CO2 pressure drop	[kPa]	153,1	
External static pressure	[Pa]	240	
Version		Horizontal	
EC Motor - Connection 400V-3PH-50Hz			
Capacity	[kW]	63,09	
Air flow	[m3/h]	15.965,0	
Outlet air temperature	[°C]	47,9	
Power consumption	[W]	2.204	
Max absorbed current	[A]	8,8	
Fan speed	[rpm]	900	
Sound pressure level @ 10 m	[dB(A)]	43	
Sound power level	[dB(A)]	74	
Fans number and diameter		2 x 630	COIL CODE *****
Poles		EC	Surface [m2] 204,45
Fin spacing	[mm]	2,1	Indicative weight [kg] 450
Internal volume	[dm3]	17,7	Circuits [n] 1 x 9
Max working pressure	[bar]	130	Connections [n] x [mm] TBD
Max operating temperature	[°C]	150,0	Overall dimensions [mm] 3.690 x 1.284 x 1.950
Casing material	Powder coated galvanized steel RAL 9003		Fin material Aluplus
Headers material	Special Cu alloy (K65)		Tube material Special Cu alloy (K65)



Pricing

1) Co-Op 2019 Specification Plant Cost – ST-3A

3 Compressor HT Frame Pack CO₂ unit
= £ 21,883.00

Optional Plant Enclosure Additional Cost
= £ 2,280.00

Gas Cooler

RAD (Lu-Ve)
= £ 11,160.00

Additional pricing for Blygold finish Gas cooler
= £ 805.00

Delivery – Normal weekday hours and flatbed no off load. UK Mainland = £ 1,000.00

Delivery – Out of hours and flatbed no off load. UK Mainland = £ 1,250.00

Additional cost for Hiab Curb Side delivery = £ 300.00

Lead time from instruction/order – 10 weeks (12 weeks with Blygold)

Important Information about this Quotation:

1. All prices exclude VAT
2. The above prices are valid for 30 days
3. Our standard Conditions of Sale apply

Your contacts for Space Engineering Services:

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|--------------------|--------------------------------------|
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