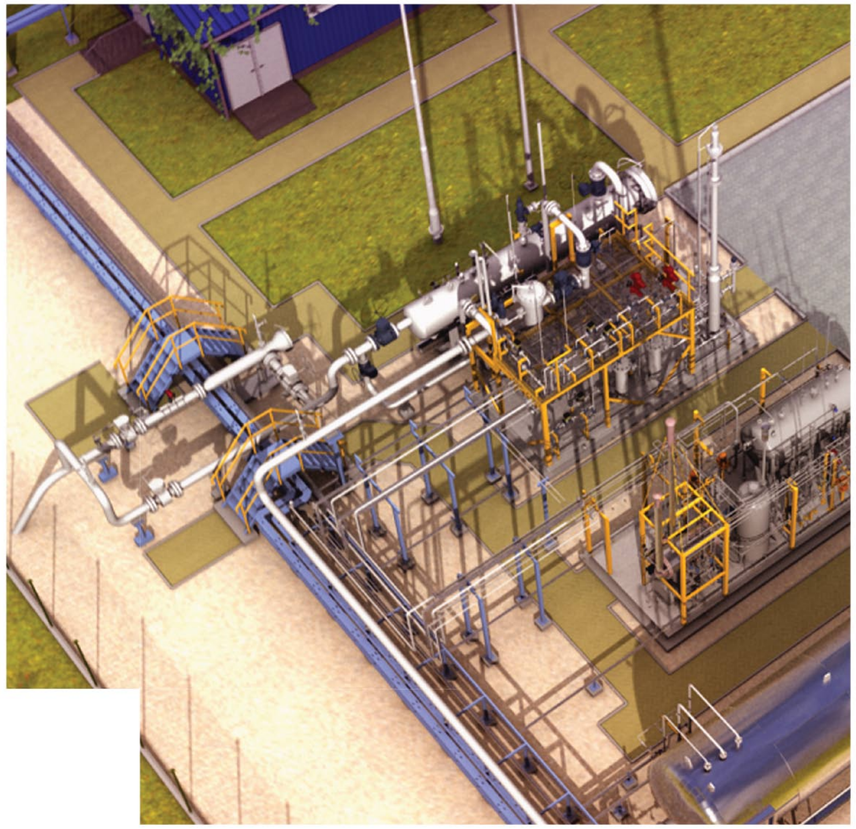


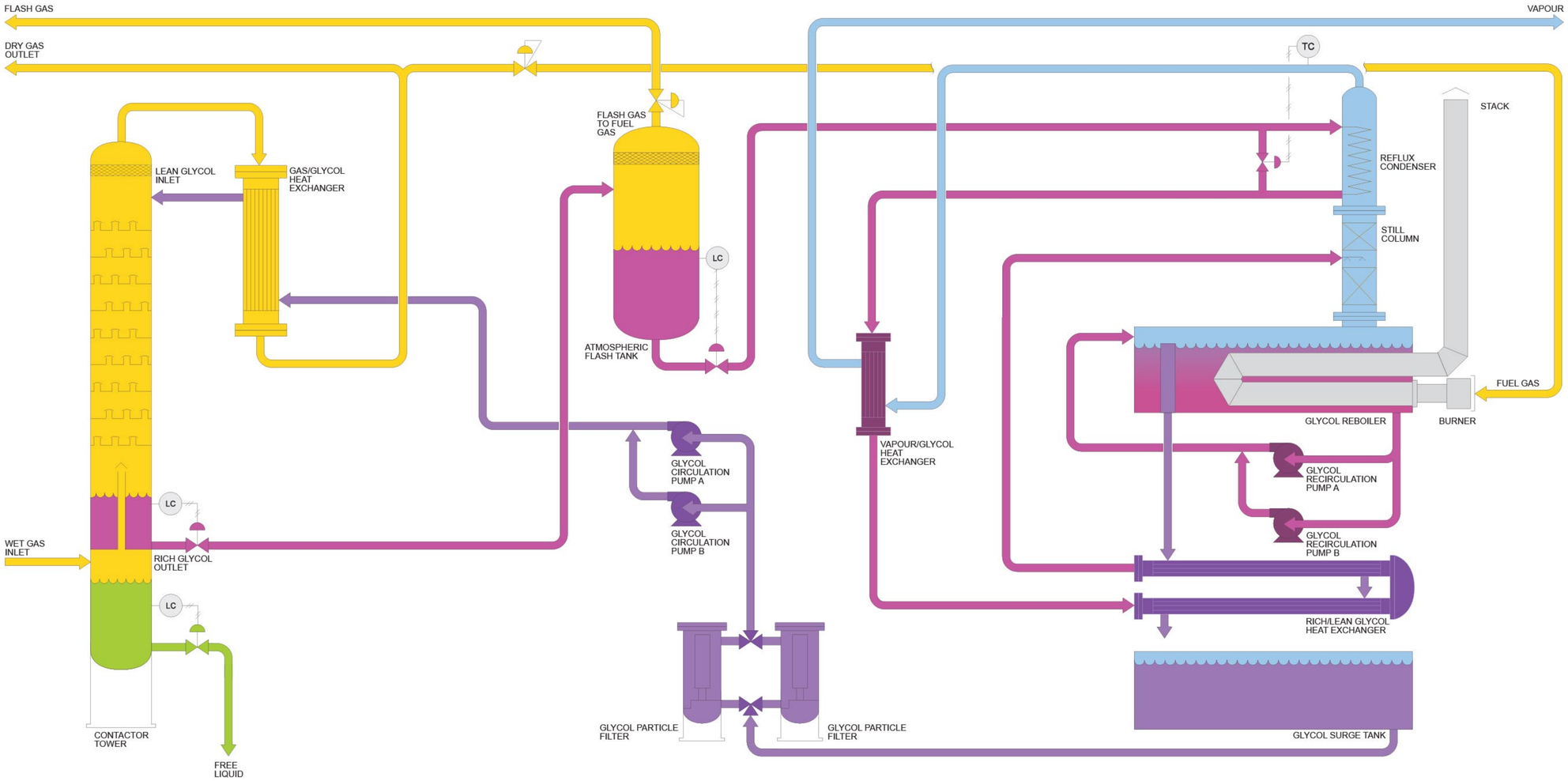
PBG PORTFOLIO: OIL&GAS SECTOR

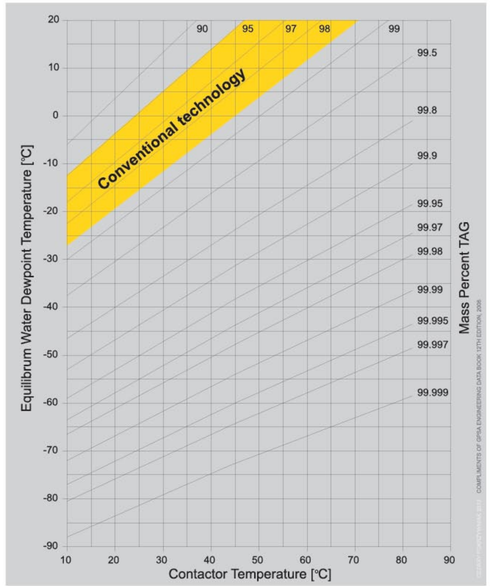
GLYCOL GAS DEHYDRATION AND REGENERATION UNIT

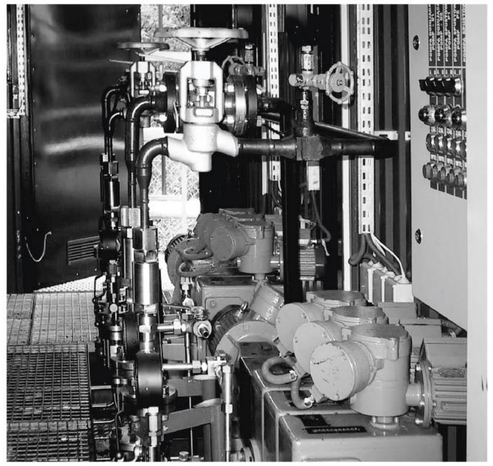
Revision: September 06, 2012

BONIKOWO CONVENTIONAL GLYCOL GAS DEHYDRATION AND REGENERATION UNIT

Completion year: 1999 | Location: Bonikowo, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU







CONTACTOR TOWER DATA:

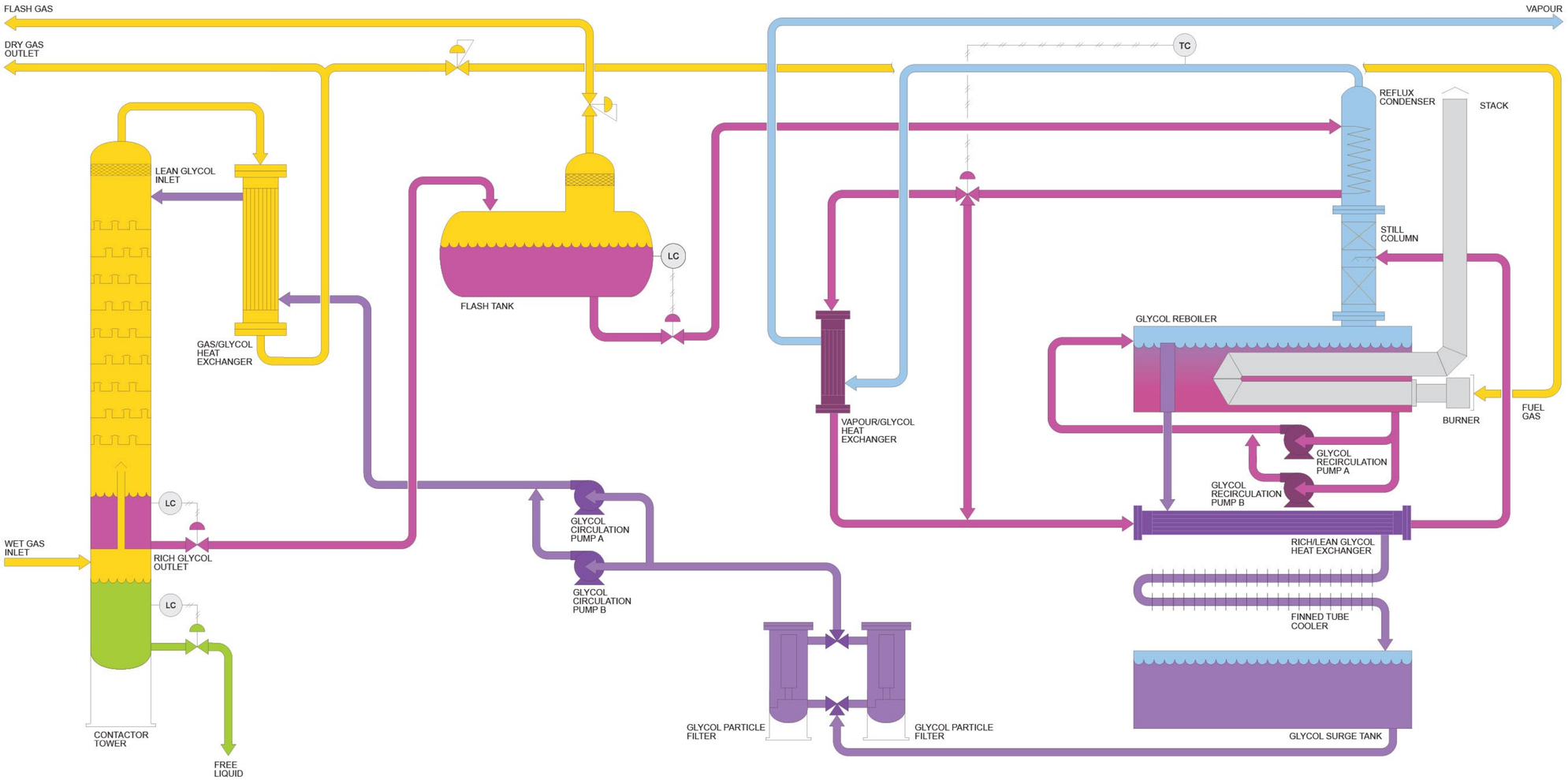
No of Contactors	1
Contactor Diameter	660 mm OD (26")
Contactor Height	6400 mm TAN/TAN (21')
Internals	Bubble Cup Trays
Operating Pressure min	50 bar(g)
Operating Pressure max	63 bar(g)
Inlet Gas Temp min	5°C
Inlet Gas Temp max	10°C
Gas Flow Rate min	5000 m³/h
Gas Flow Rate max	12000 m³/h

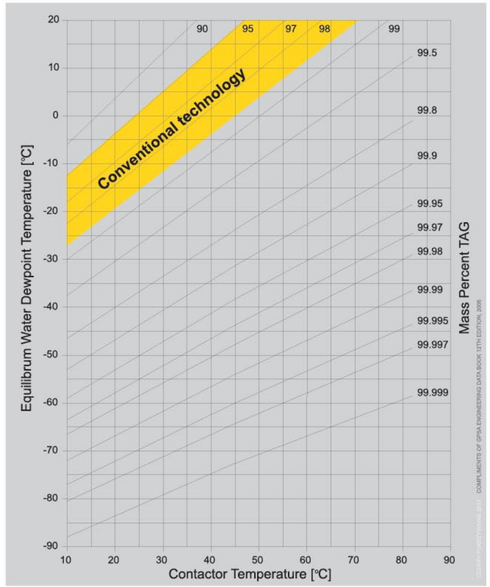
GLYCOL REGENERATION DATA:

No of Regeneration Units	1
Water Content of Dry Gas	0.044 % mol
Dew Point of Dry Gas	-13°C
Glycol Type	DEG
Lean Glycol Purity	96 %
Lean Glycol Circulation Rate	200 kg/h
Glycol Regeneration Temp	163°C
Reboiler Duty	40 kW + 25 %
Fuel Gas Consumption by Burner	5 m³/h
Unit Size / Shipping (O/A)	3.00 mW x 6.00 mL / 4.00 mH

RACOT CONVENTIONAL GLYCOL GAS DEHYDRATION AND REGENERATION UNIT

Completion year: 2000 | Location: Racot, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU





CONTACTOR TOWER DATA:

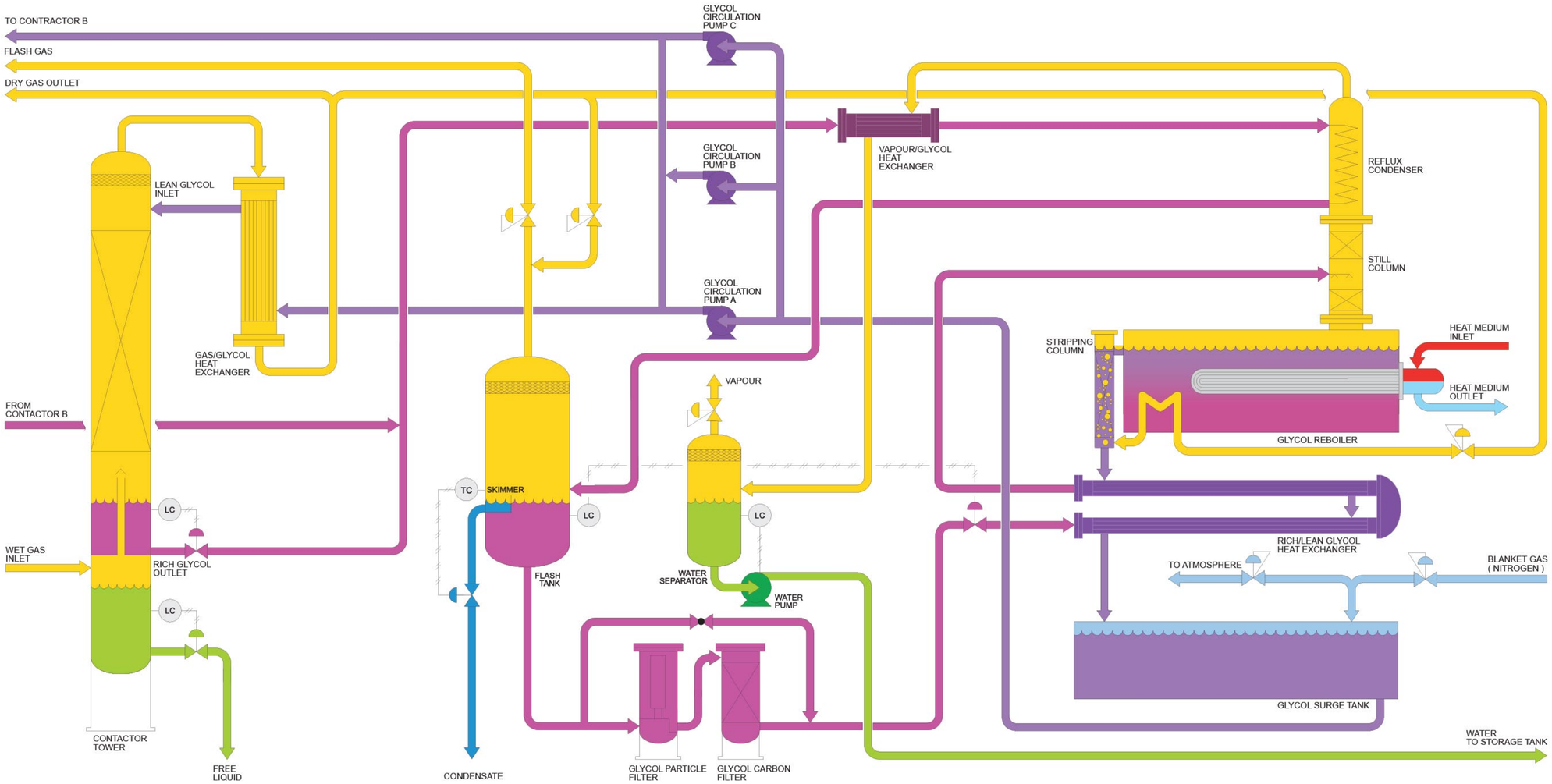
No of Contactors	1
Contactor Diameter	355 mm OD (14")
Contactor Height	6400 mm TAN/TAN (21'-6")
Internals	Bubble Cup Trays
Operating Pressure min	55 bar(g)
Operating Pressure max	63 bar(g)
Inlet Gas Temp min	5°C
Inlet Gas Temp max	16°C
Gas Flow Rate min	3600 m³/h
Gas Flow Rate max	6000 m³/h

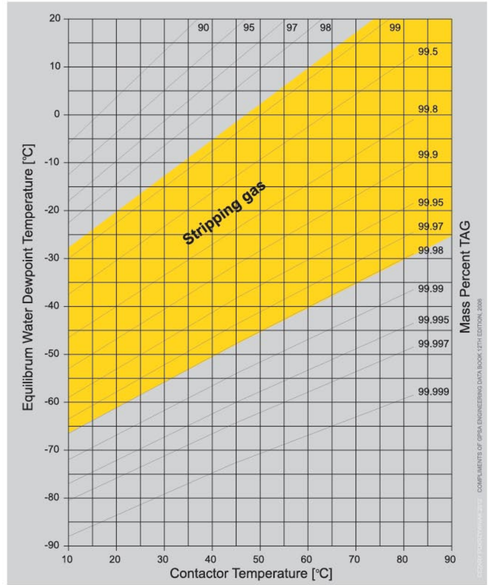
GLYCOL REGENERATION DATA:

No of Regeneration Units	1
Water Content of Dry Gas	0.029 % mol
Dew Point of Dry Gas	-22°C
Glycol Type	TEG
Lean Glycol Purity	98 %
Lean Glycol Circulation Rate	97 kg/h
Glycol Regeneration Temp	193°C
Reboiler Duty	45 kW + 25 %
Fuel Gas Consumption by Burner	1.4 - 6.0 m³/h
Unit Size / Shipping (O/A)	4.00 mW x 6.00 mL / 4.00 mH

KOSCIAN GLYCOL GAS DEHYDRATION AND REGENERATION UNIT WITH STRIPPING

Completion year: 2002 | Location: Koscian, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU





CONTACTOR TOWER DATA:

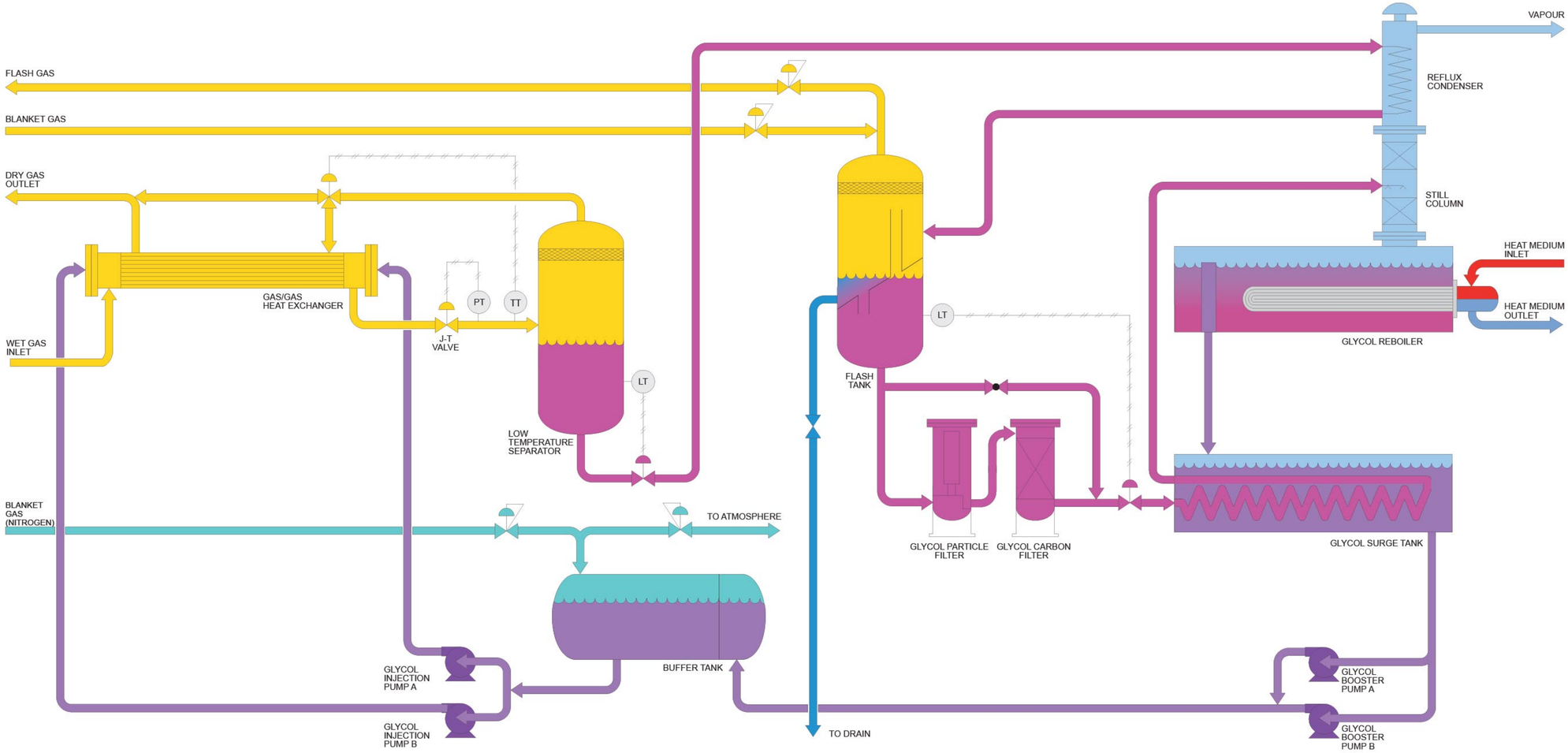
No of Contactors	2
Contactor Diameter	914 mm OD (36")
Contactor Height	10668 mm TAN/TAN (36')
Internals	Structural Packing
Operating Pressure min	55 bar(g)
Operating Pressure max	65.8 bar(g)
Inlet Gas Temp min	35°C
Inlet Gas Temp max	40°C
Gas Flow Rate min	15000 m³/h
Gas Flow Rate max	50000 m³/h

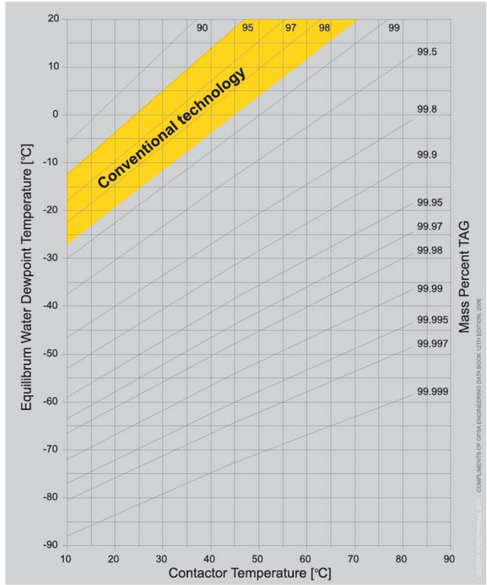
GLYCOL REGENERATION DATA:

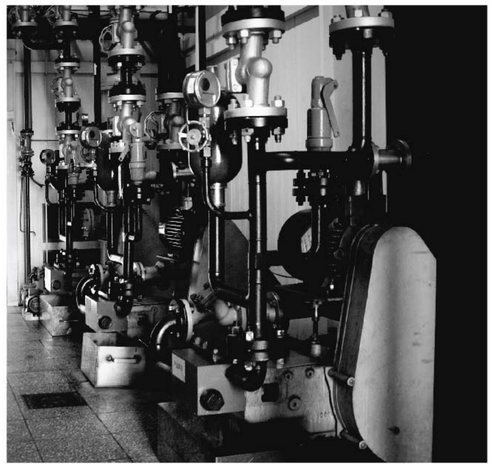
No of Regeneration Units	1
Water Content of Dry Gas	0.016 % mol
Dew Point of Dry Gas	-30°C
Glycol Type	TEG
Lean Glycol Purity	99.5 %
Lean Glycol Circulation Rate	3044 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	154 kW + 25 %
Stripping Gas Flow	2.95 m³/h
Fuel Gas Consumption by Burner	N/A
Unit Size / Shipping (O/A)	3.67 mW x 9.21 mL / 3.83 mH

KOSCIAN WELLSITE LOW TEMP SEPARATION SYSTEM WITH CONVENTIONAL GLYCOL REGENERATION UNIT

Completion year: 2002 | Location: Koscian, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU







LOW TEMP SEPARATION SYSTEM DATA:

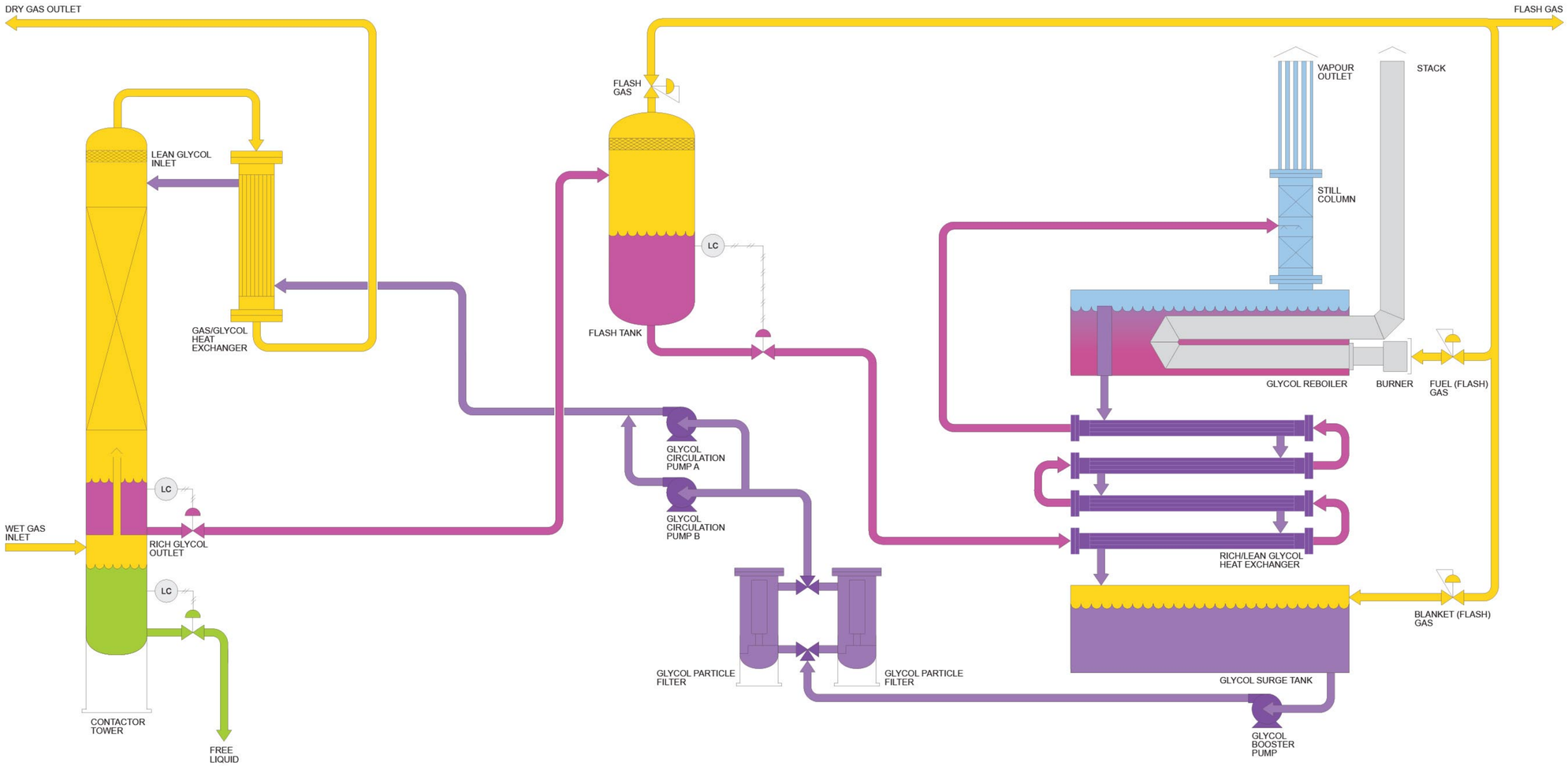
No of Packages	10
Gas/Gas Heat Exchanger Size	324 mm OD x 3962 mm TS/TS
Gas/Gas Heat Exchanger Operating Data/Tube Side	207.5 bar(g) @ -29/+50 °C
Gas/Gas Heat Exchanger Operating Data/Shell Side	71.8 bar(g) @ -29/+50 °C
Gas/Gas Heat Exchanger Heat Duty	190 kW + 15 %
Gas/Gas Heat Exchanger Type (by Tema)	NEN
Low Temp Separator Shell Size	711 mm OD x 2438 mm S/S
Low Temp Separator Volume	1.1 m^3
Low Temp Separator Operating Data	71.8 bar(g) @ -29/+50 °C
Low Temp Separator Type	2-phase, Vertical
Low Temp Separator Interanals	Vane Pack

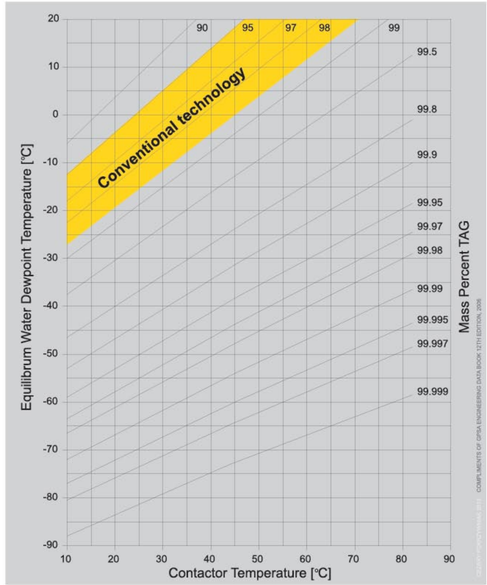
GLYCOL REGENERATION DATA:

No of Regeneration Units	1
Water Content of Dry Gas	N/A
Dew Point of Dry Gas	N/A
Glycol Type	DEG
Lean Glycol Purity	80 %
Lean Glycol Circulation Rate	740 kg/h
Glycol Regeneration Temp	188°C
Reboiler Duty	175 kW + 20 %
Fuel Gas Consumption by Burner	N/A
Unit Size / Shipping (O/A)	3.39 mW x 7.38 mL / 3.02 mH

BUKOWIEC CONVENTIONAL GLYCOL GAS DEHYDRATION AND REGENERATION UNIT

Completion year: 2004 | Location: Bukowiec, Poland | Client: Polish Oil & Gas Company | Design Standard: NONE





CONTACTOR TOWER DATA:

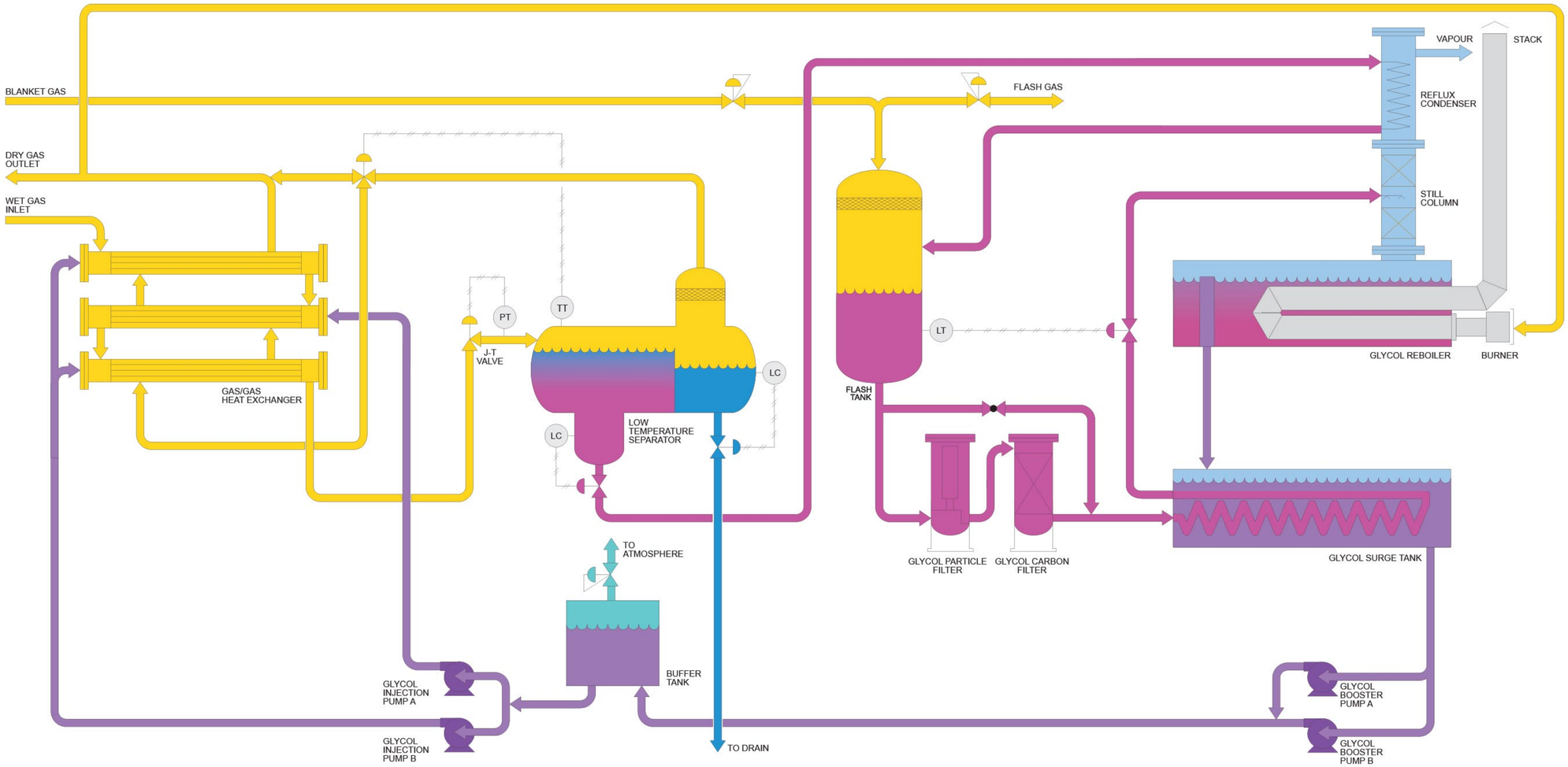
No of Contactors	1
Contactor Diameter	219 mm OD 8⅝
Contactor Height	5740 mm TAN/TAN (18'-10")
Internals	Structural Packing
Operating Pressure min	55 bar(g)
Operating Pressure max	63 bar(g)
Inlet Gas Temp min	7°C
Inlet Gas Temp max	10°C
Gas Flow Rate min	1000 m³/h
Gas Flow Rate max	6000 m³/h

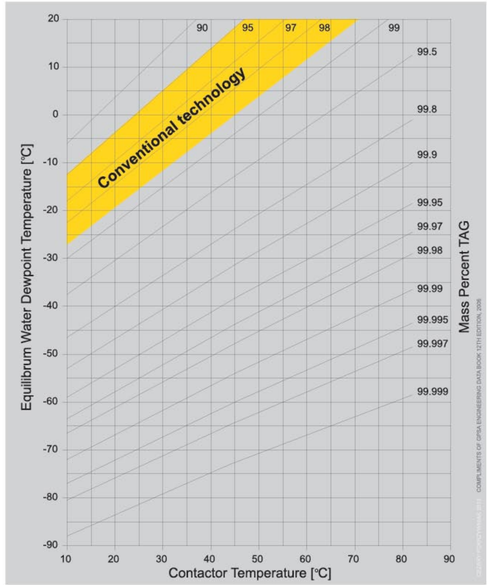
GLYCOL REGENERATION DATA:

No of Regeneration Units	1
Water Content of Dry Gas	0.022 % mol
Dew Point of Dry Gas	-26°C
Glycol Type	TEG
Lean Glycol Purity	98.5 %
Lean Glycol Circulation Rate	380 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	35 kW + 25 %
Fuel Gas Consumption by Burner	5 m³/h
Unit Size / Shipping (O/A)	1.13 mW x 3.26 mL / 2.40 mH

WILGA LOW TEMP SEPARATION SYSTEM WITH CONVENTIONAL GLYCOL REGENERATION UNIT

Completion year: 2005 | Location: Wilga, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU





LOW TEMP SEPARATION SYSTEM DATA:

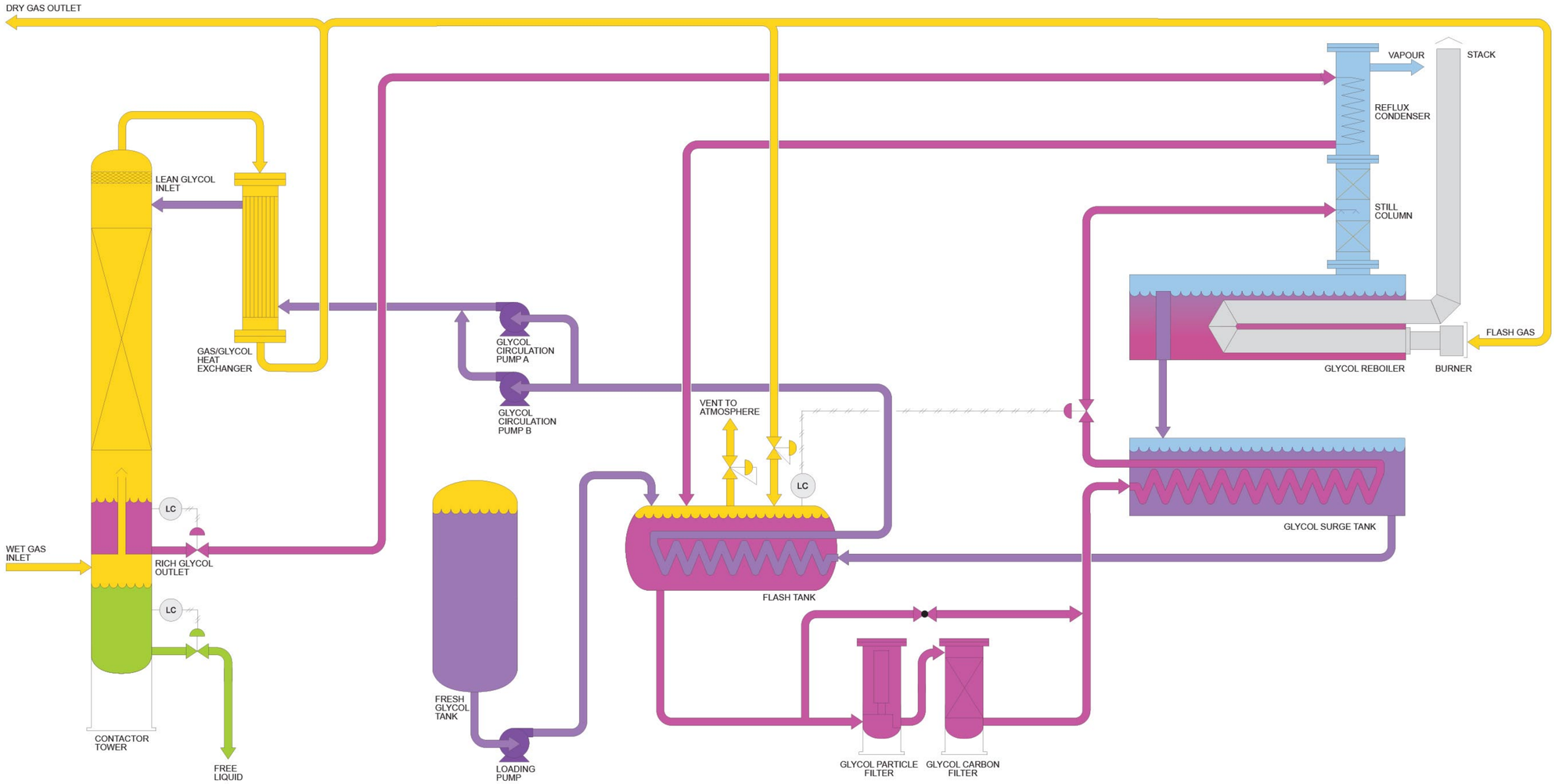
Gas/Gas Heat Exchanger Size	10 x 168 mm OD x 6000 mm
Gas/Gas Heat Exchanger Operating Data/Tube Side	107 bar(g) @ -29/+50 °C
Gas/Gas Heat Exchanger Operating Data/Shell Side	72.9 bar(g) @ -29/+50 °C
Gas/Gas Heat Exchanger Heat Duty	200 kW + 10 %
Gas/Gas Heat Exchanger Type	NEN
Gas/Gas Heat Exchanger Heat Transfer Area	79 m^2
Low Temp Separator Shell Size	610 mm OD x 3000 mm S/S
Low Temp Separator Boot Size	508 mm OD x 970 mm
Low Temp Separator Volume	1.234 m^3
Low Temp Separator Operating Data	72.9 bar(g) @ -29/+50 °C
Low Temp Separator Type	3-phase, Horizontal

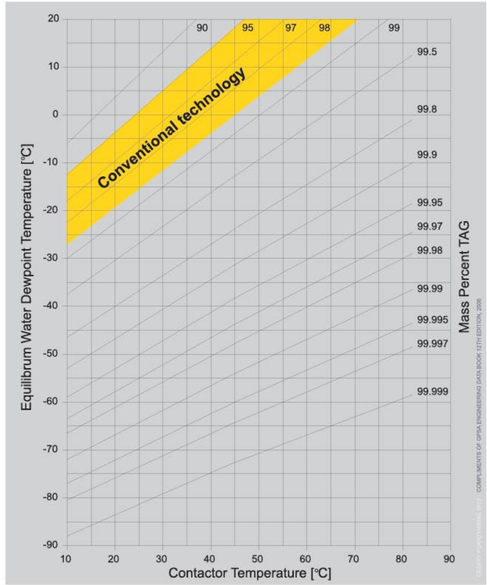
GLYCOL REGENERATION DATA:

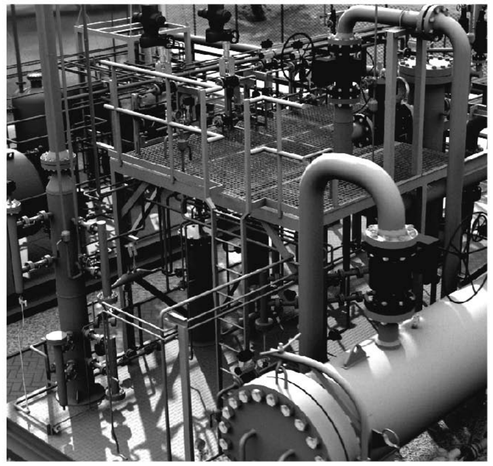
No of Regeneration Units	1
Water Content of Dry Gas	0.0032 % mol
Dew Point of Dry Gas	-20°C
Glycol Type	MEG
Lean Glycol Purity	80 %
Lean Glycol Circulation Rate	130 kg/h
Glycol Regeneration Temp	126°C
Reboiler Duty	15 kW + 25 %
Fuel Gas Consumption by Burner	80 kg/h
Unit Size / Shipping (O/A)	4.00 mW x 7.50 mL / 3.00 mH

PAPROC-W CONVENTIONAL GLYCOL GAS DEHYDRATION AND REGENERATION UNIT

Completion year: 2007 | Location: Paproc-W, Poland | Client: Naftomontaz | Design Standard: API SPEC. 12GDU







CONTACTOR TOWER DATA:

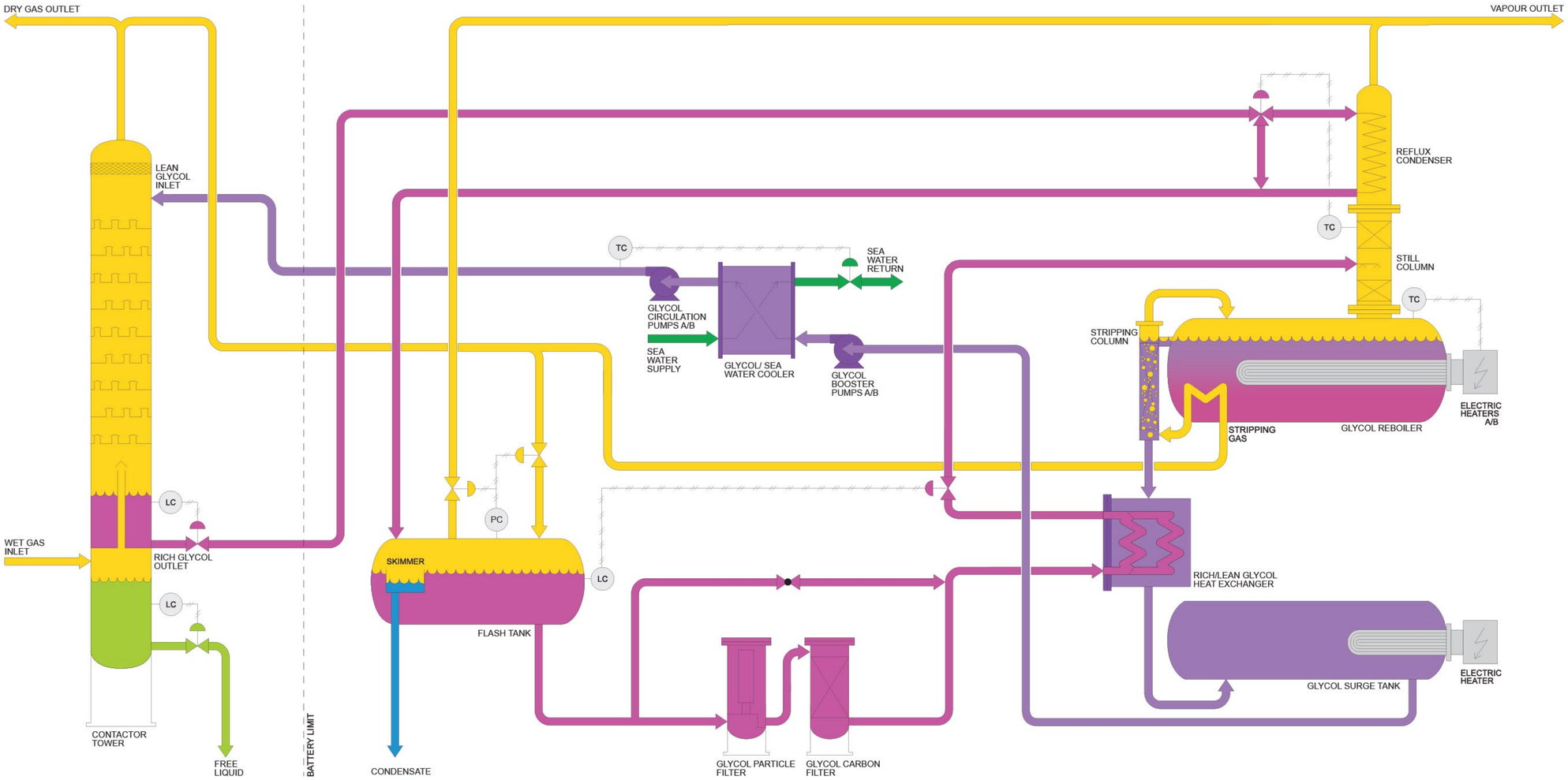
No of Contactors	1
Contactor Diameter	323/168 mm OD
Contactor Height	2620/4894 mm S/F
Internals	Structural Packing
Operating Pressure min	66 bar(g)
Operating Pressure max	72 bar(g)
Inlet Gas Temp min	7°C
Inlet Gas Temp max	10°C
Gas Flow Rate min	10000 m³/h
Gas Flow Rate max	30000 m³/h

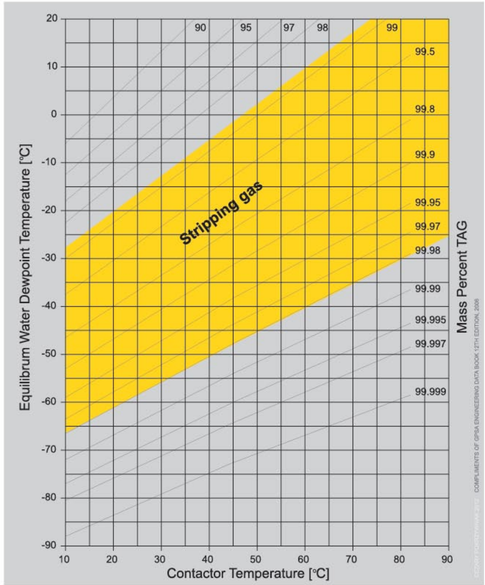
GLYCOL REGENERATION DATA:

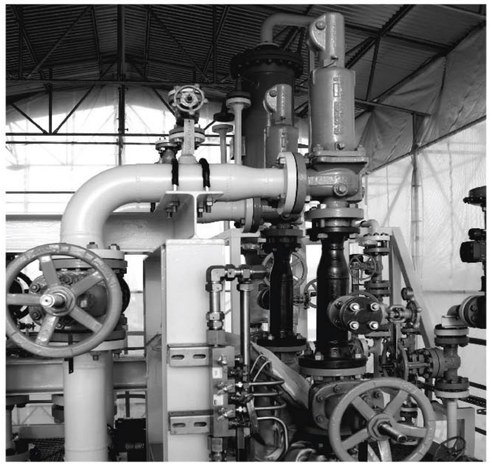
No of Regeneration Units	1
Water Content of Dry Gas	0.0026 % mol
Dew Point of Dry Gas	-30°C
Glycol Type	TEG
Lean Glycol Purity	99 %
Lean Glycol Circulation Rate	5 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	10 kW + 25 %
Fuel Gas Consumption by Burner	40 m³/h
Unit Size / Shipping (O/A)	3.00 mW x 5.50 mL / 3.00 mH

OLOWI GLYCOL GAS REGENERATION UNIT WITH STRIPPING, FPSO

Completion year: 2007 | Location: South Atlantic Ocean, Gabon | Client: Kanfa Aragon AS | Design Standard: API SPEC. 12GDU







CONTACTOR TOWER DATA:

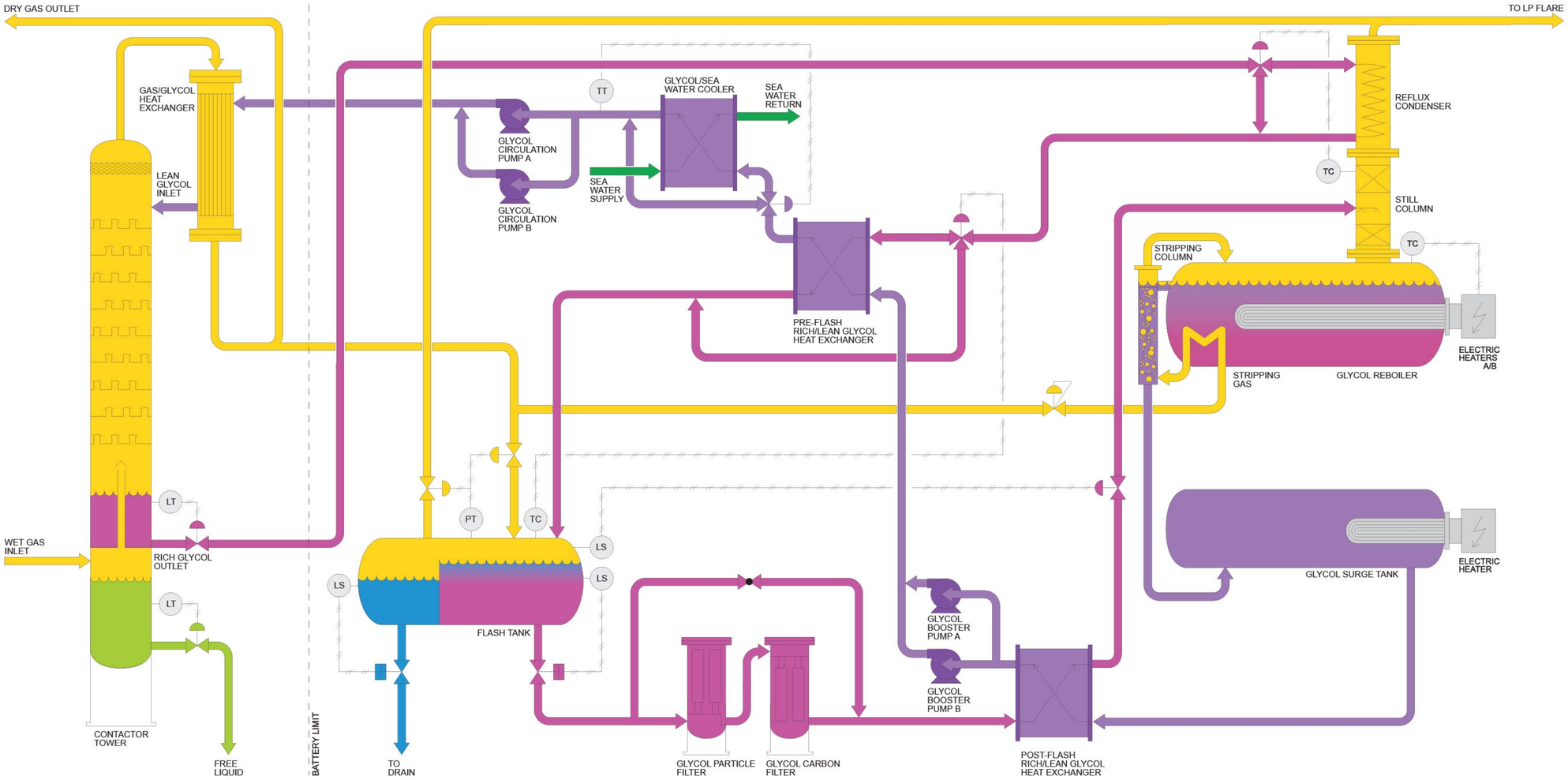
No of Contactors	1
Contactor Diameter	1066 mm ID (42")
Contactor Height	11080 mm TAN/TAN
Internals	Bubble Cup Trays
Operating Pressure min	88 bar(g)
Operating Pressure max	105 bar(g)
Inlet Gas Temp min	40°C
Inlet Gas Temp max	45°C
Gas Flow Rate min	22000 m³/h
Gas Flow Rate max	88700 m³/h

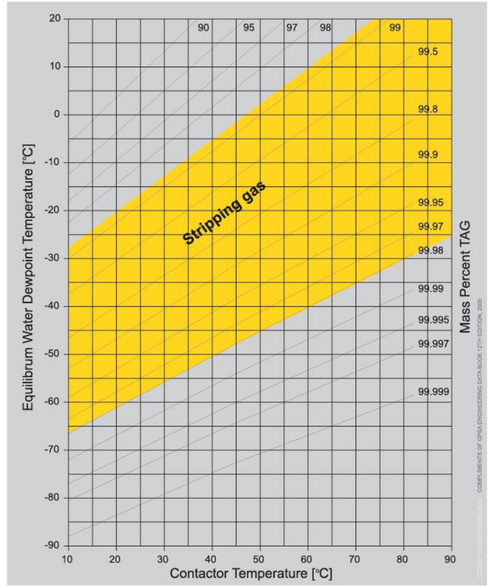
GLYCOL REGENERATION DATA:

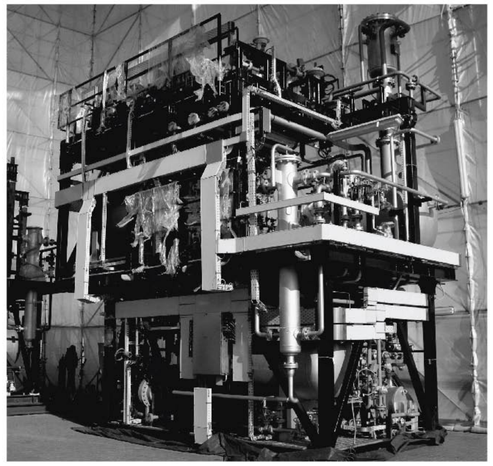
No of Regeneration Units	1
Water Content of Dry Gas	0.0008 % mol
Dew Point of Dry Gas	-20°C
Glycol Type	TEG
Lean Glycol Purity	99.9 %
Lean Glycol Circulation Rate	3690 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	180 kW + 20 %
Stripping Gas Flow	70 m³/h
Electric Heaters	2 x 265 kWe
Unit Size / Shipping (O/A)	4.80 mW x 8.30 mL / 11.50 mH

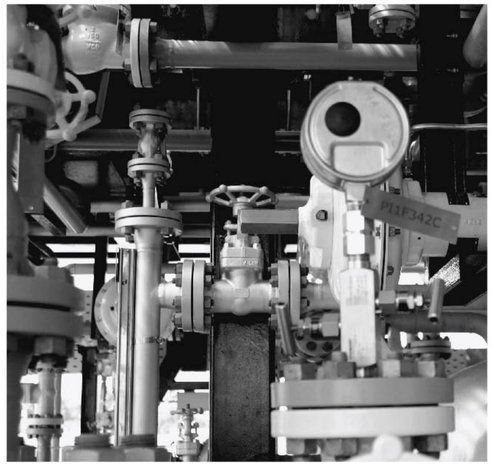
FORTIES ALPHA GLYCOL GAS REGENERATION UNIT WITH STRIPPING, OFFSHORE

Completion year: 2008 | Location: North Sea, UK Sector | Client: Kanfa Aragon AS | Design Standard: API SPEC. 12GDU









CONTACTOR TOWER DATA:

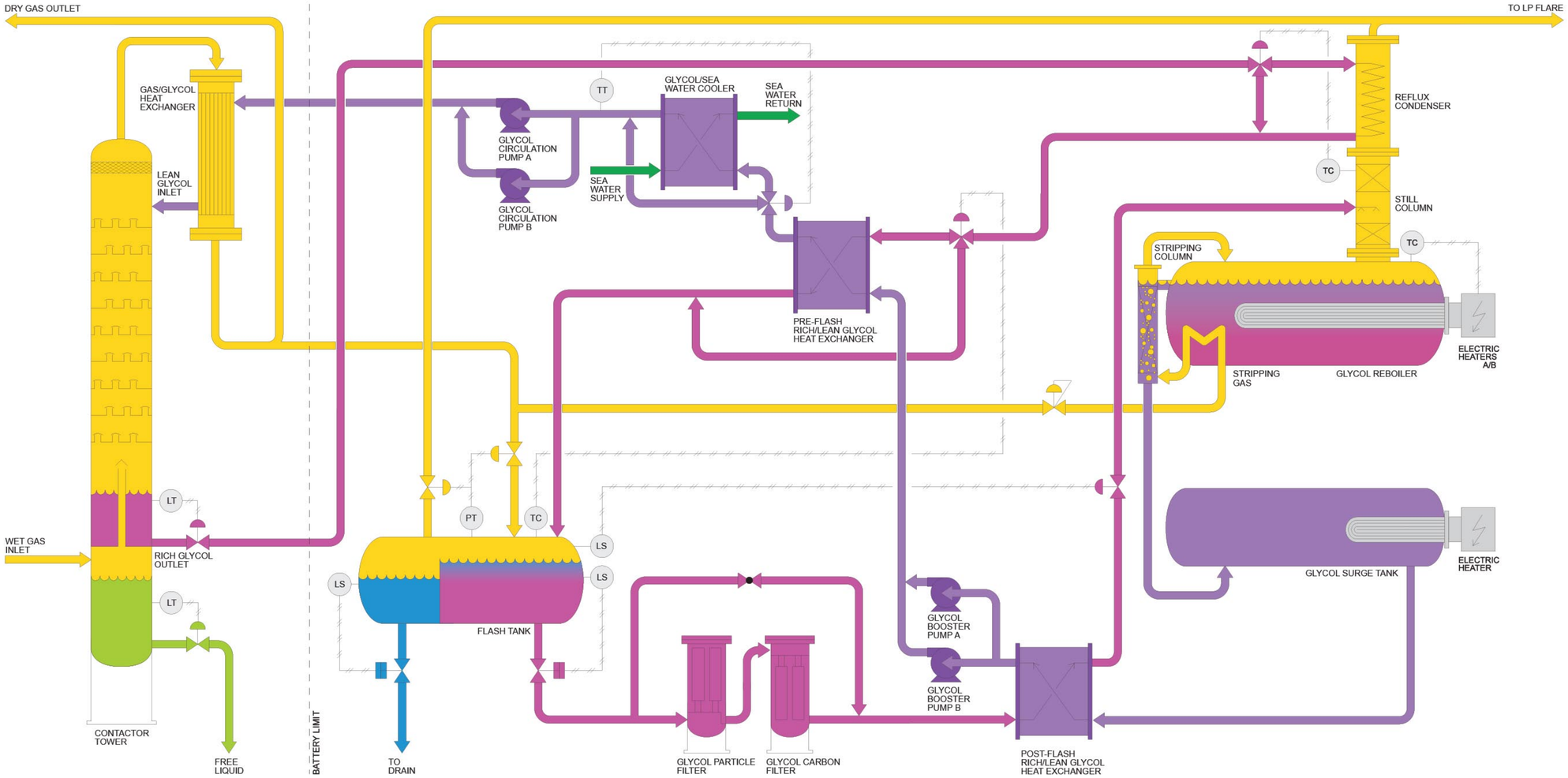
No of Contactors	1
Contactor Diameter	1050 mm ID
Contactor Height	10050 mm TAN/TAN
Internals	Bubble Cup Trays
Operating Pressure min	33 bar(g)
Operating Pressure max	38 bar(g)
Inlet Gas Temp min	40°C
Inlet Gas Temp max	45°C
Gas Flow Rate min	8200 m³/h
Gas Flow Rate max	45000 m³/h

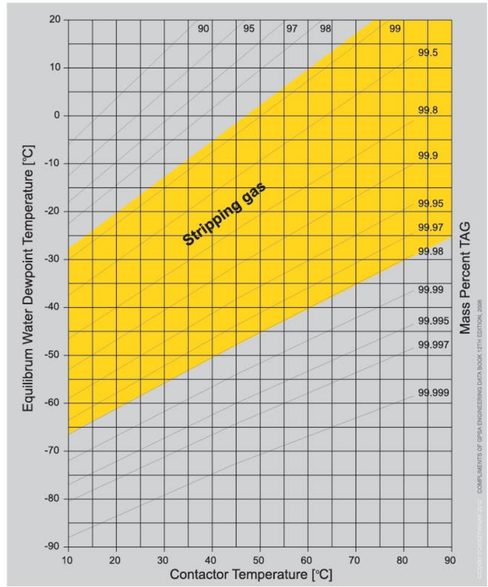
GLYCOL REGENERATION DATA:

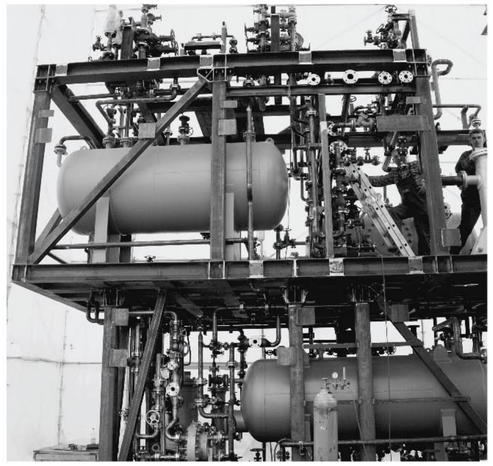
No of Regeneration Units	1
Water Content of Dry Gas	0.013 % mol
Dew Point of Dry Gas	7°C
Glycol Type	TEG
Lean Glycol Purity	99.82 %
Lean Glycol Circulation Rate	2094 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	120 kW + 20 %
Stripping Gas Flow	75 m³/h
Electric Heaters	2 x 159 kWe
Unit Size / Shipping (O/A)	3.07 mW x 5.08 mL / 7.30 mH

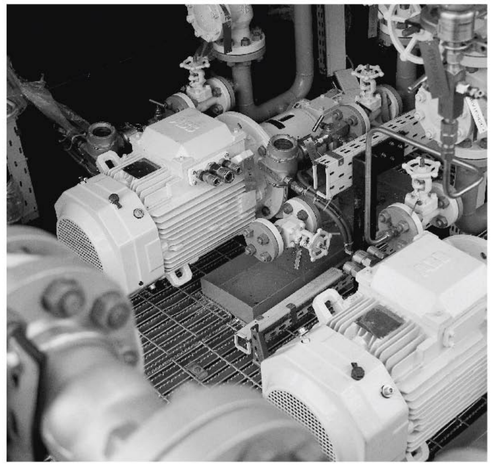
FORTIES CHARLIE GLYCOL GAS REGENERATION UNIT WITH STRIPPING, OFFSHORE

Completion year: 2008 | Location: North Sea, UK Sector | Client: Kanfa Aragon AS | Design Standard: API SPEC. 12GDU









CONTACTOR TOWER DATA:

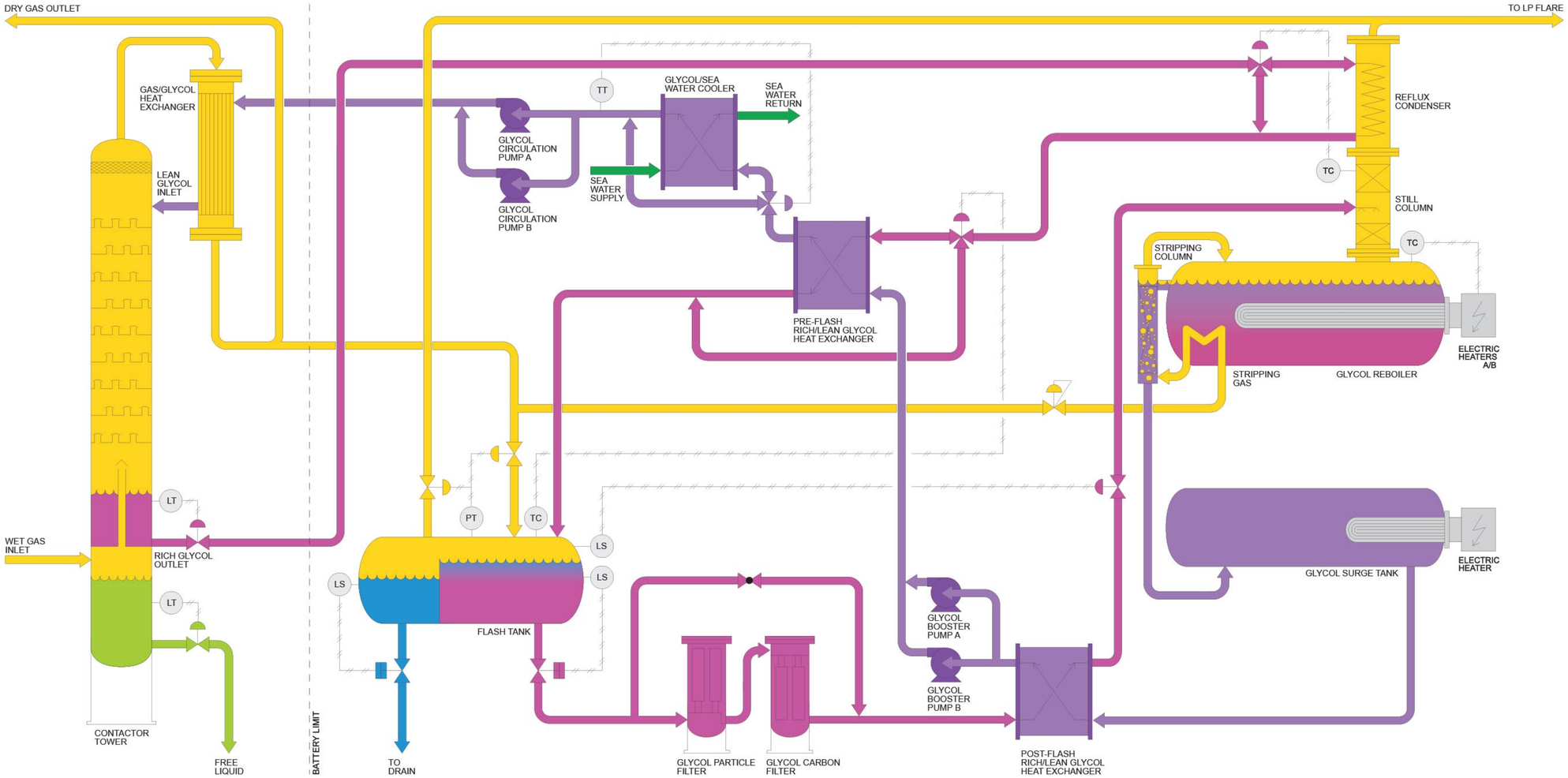
No of Contactors	1
Contactor Diameter	1050 mm ID
Contactor Height	10050 mm TAN/TAN
Internals	Bubble Cup Trays
Operating Pressure min	33 bar(g)
Operating Pressure max	38 bar(g)
Inlet Gas Temp min	40°C
Inlet Gas Temp max	45°C
Gas Flow Rate min	8200 m^3/h
Gas Flow Rate max	45000 m^3/h

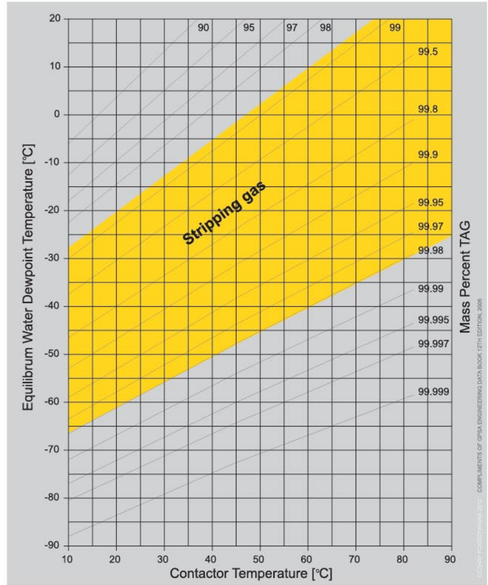
GLYCOL REGENERATION DATA:

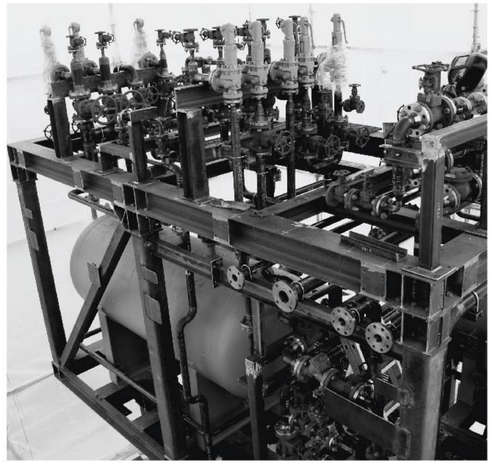
No of Regeneration Units	1
Water Content of Dry Gas	0.013 % mol
Dew Point of Dry Gas	7°C
Glycol Type	TEG
Lean Glycol Purity	99.82 %
Lean Glycol Circulation Rate	2094 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	120 kW + 20 %
Stripping Gas Flow	75 m^3/h
Electric Heaters	2 x 159 kWe
Unit Size / Shipping (O/A)	3.07 mW x 5.08 mL / 7.30 mH

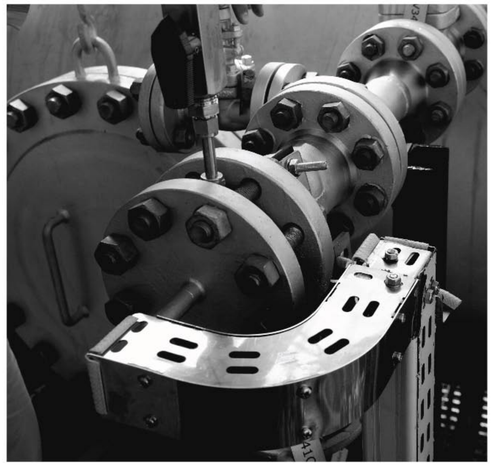
FORTIES DELTA GLYCOL GAS REGENERATION UNIT WITH STRIPPING, OFFSHORE

Completion year: 2008 | Location: North Sea, UK Sector | Client: Kanfa Aragon AS | Design Standard: API SPEC. 12GDU









CONTACTOR TOWER DATA:

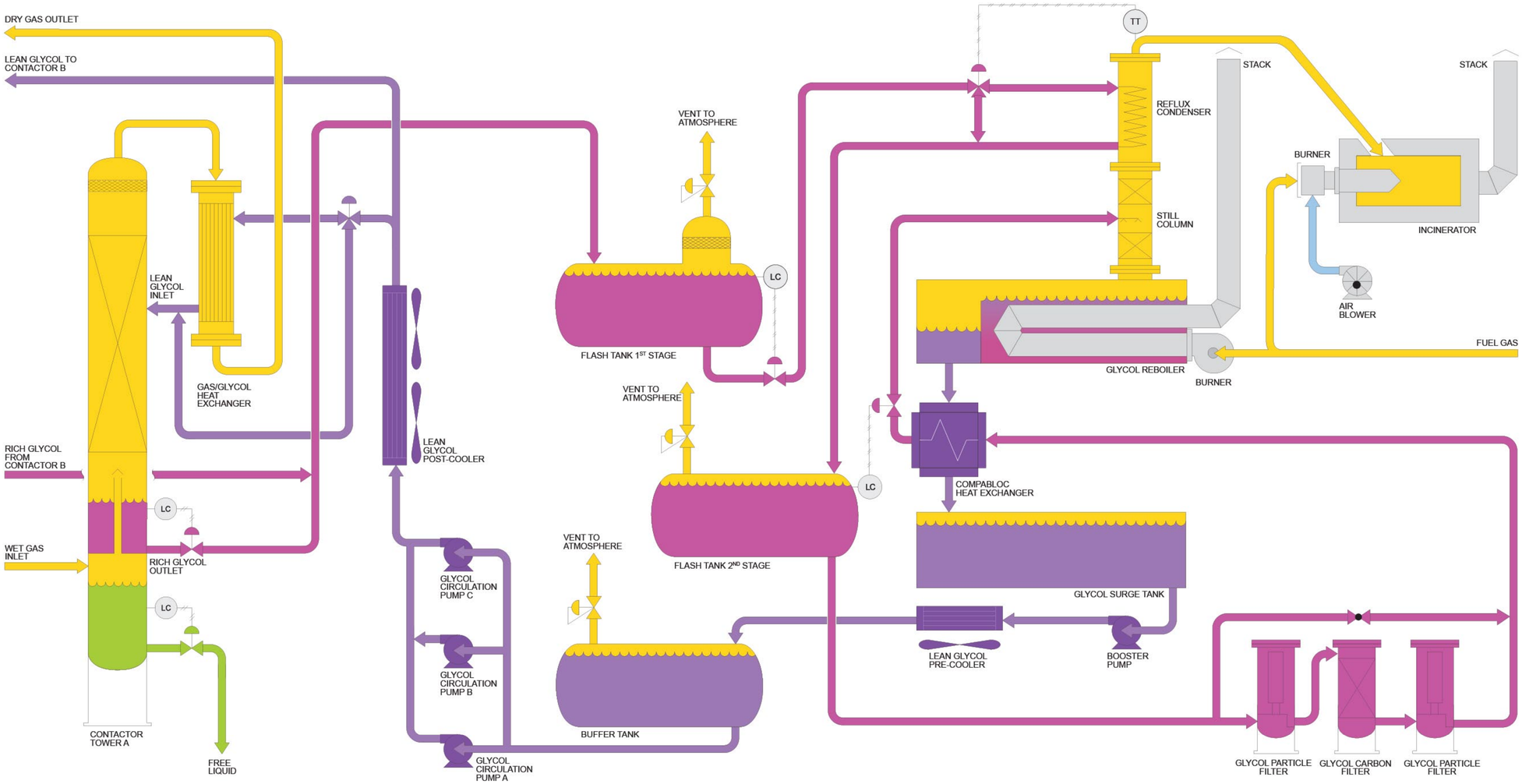
No of Contactors	1
Contactor Diameter	1050 mm ID
Contactor Height	10050 mm TAN/TAN
Internals	Bubble Cup Trays
Operating Pressure min	33 bar(g)
Operating Pressure max	38 bar(g)
Inlet Gas Temp min	40°C
Inlet Gas Temp max	45°C
Gas Flow Rate min	8200 m³/h
Gas Flow Rate max	45000 m³/h

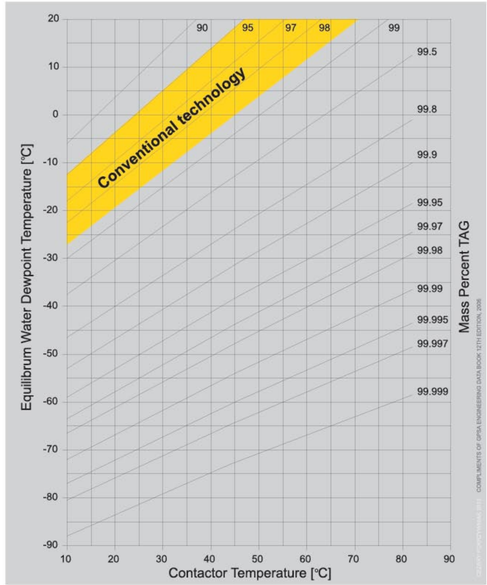
GLYCOL REGENERATION DATA:

No of Regeneration Units	1
Water Content of Dry Gas	0.013 % mol
Dew Point of Dry Gas	7°C
Glycol Type	TEG
Lean Glycol Purity	99.82 %
Lean Glycol Circulation Rate	2094 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	120 kW + 20 %
Stripping Gas Flow	75 m³/h
Electric Heaters	2 x 159 kWe
Unit Size / Shipping (O/A)	3.07 mW x 5.08 mL / 7.30 mH

WIERZCHOWICE CONVENTIONAL GLYCOL GAS DEHYDRATION AND REGENERATION UNIT

Completion year: 2012 | Location: Wierzchowice, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU





CONTACTOR TOWER DATA:

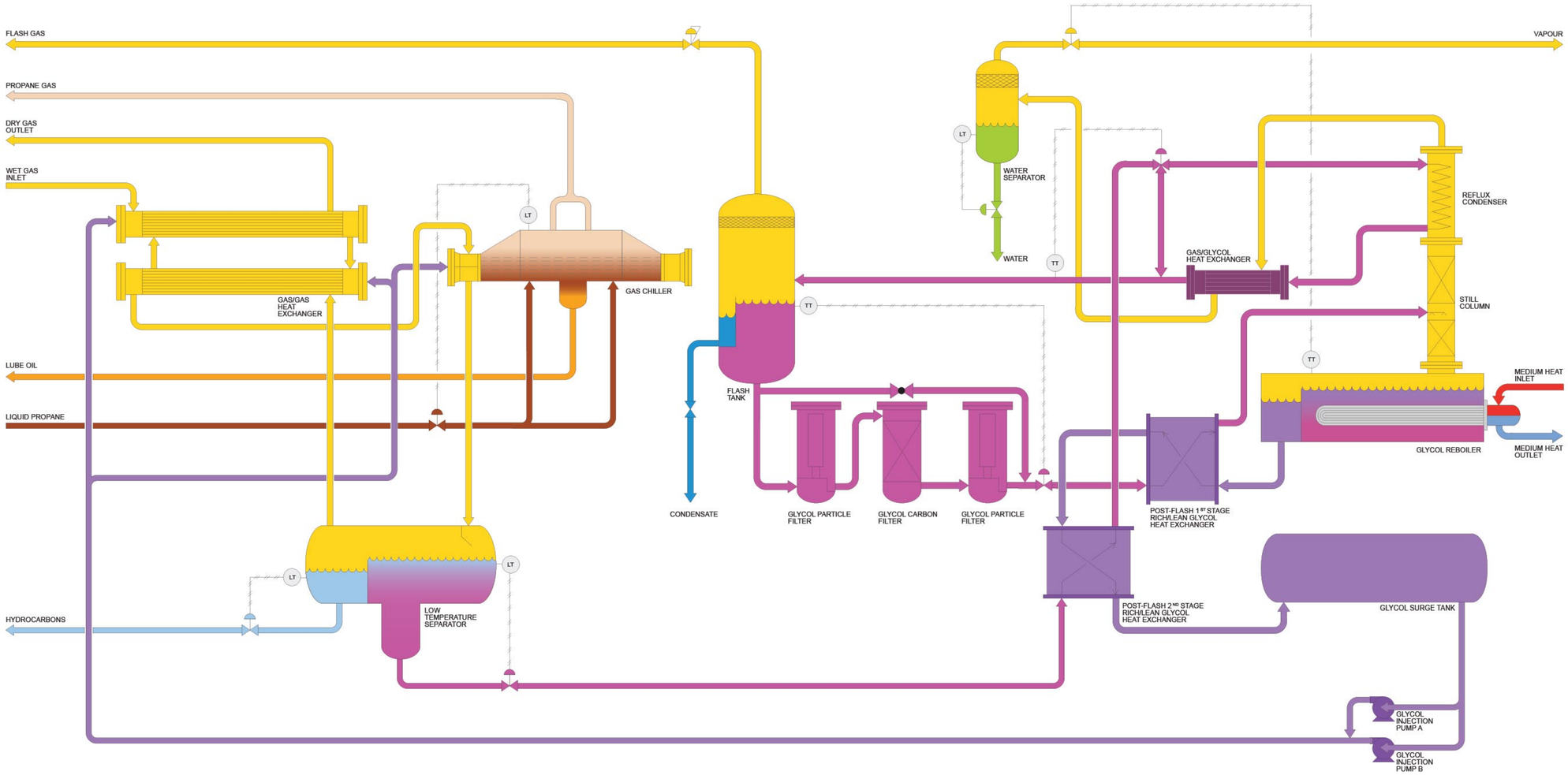
No of Contactors	2
Contactor Diameter	1600 mm OD
Contactor Height	13000 mm TAN/TAN
Internals	Structural Packing
Operating Pressure min	59 bar(g)
Operating Pressure max	125 bar(g)
Inlet Gas Temp min	20°C
Inlet Gas Temp max	25°C
Gas Flow Rate min	100000 m³/h
Gas Flow Rate max	2 x 300000 m³/h

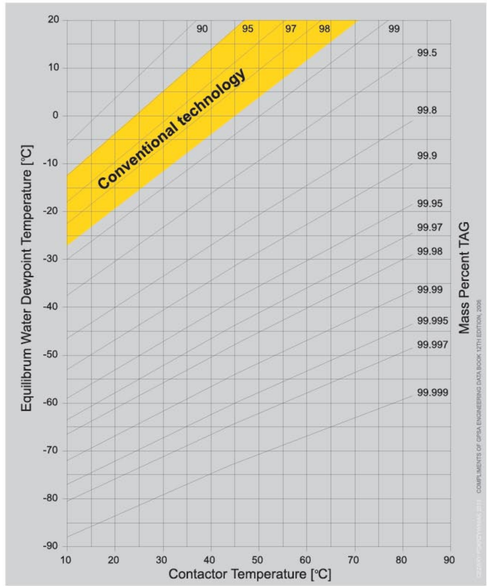
GLYCOL REGENERATION DATA:

No of Regeneration Units	3 (2 in operation, 1 stand by)
Water Content of Dry Gas	0.0062 % mol
Dew Point of Dry Gas	-20°C
Glycol Type	TEG
Lean Glycol Purity	98.7 %
Lean Glycol Circulation Rate	3000 kg/h
Glycol Regeneration Temp	204°C
Reboiler Duty	2 x 350 kW
Fuel Gas Consumption by Burner	2 x 36 nm³/h
Unit Size / Shipping (O/A)	2.90 mW x 3.40 mL / 6.70 mH

LUBIATOW LOW TEMP SEPARATION SYSTEM WITH CONVENTIONAL GLYCOL REGENERATION UNIT, LMG PROJECT

Completion year: 2013 | Location: Lubiatow, Poland | Client: Polish Oil & Gas Company | Design Standard: API SPEC. 12GDU





LOW TEMP SEPARATION SYSTEM DATA: :

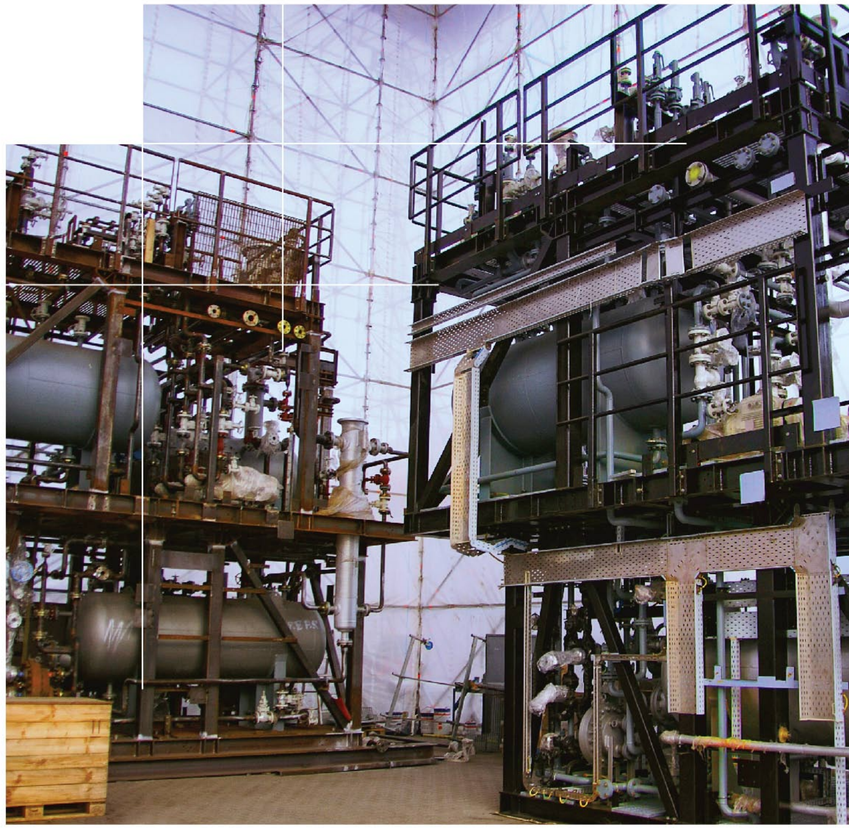
Gas/Gas Heat Exchanger Size	2 x 508 mm OD x 10000 mm TS/TS
Gas/Gas Heat Exchanger Operating Data	88.2 bar(g) @ -45/+75 °C
Gas/Gas Heat Exchanger Heat Duty	1250 kW + 10 %
Gas Chiller Shell Size	610/1200 mm OD x 10000 mm TS/TS
Gas Chiller Boot Size	406 mm OD x 500 mm LG
Gas Chiller Operating Data/Tubes	88.2 bar(g) @ -45/+75 °C
Gas Chiller Operating Data/Shell	24.1 bar(g) @ -45/+75 °C
Gas Chiller Heat Duty	780 kW + 15 %
Low Temp Separator Shell Size	1500 mm ID x 6000 mm S/S
Low Temp Separator Boot Size	457 mm ID x 600 mm LG
Low Temp Separator Operating Data	88.2 bar(g) @ -45/+75 °C

GLYCOL REGENERATION DATA:

No of Regeneration Units	1
Water Content of Dry Gas	0.0012 % mol
Dew Point of Dry Gas	-45°C
Glycol Type	TEG
Lean Glycol Purity	80 %
Lean Glycol Circulation Rate	2700 kg/h
Glycol Regeneration Temp	137°C
Reboiler Duty	131 kW + 20 %
MP Steam Parameters	21 bar(g) @ 218°C
Unit Size / Shipping (O/A)	4.20 mW x 6.40 mL / 5.20 mH

COVER PAGE 1 Glycol Dehydration Unit, Wierzchowice, Poland
2 Glycol Regeneration Unit, Paproc - W, Poland
3 Glycol Regeneration Unit, Olowi Project, Gabon

CURRENT PAGE 1 Glycol Regeneration Unit, Wierzchowice, Poland
2 Glycol Dehydration Unit, Koscian, Poland
3 Glycol Regeneration Unit, Forties Project, North Sea



PBG S.A.
ul. Skorzewska 35
Wysogotowo, Poznan
62-081 Przezmierowo
Poland

phone: +48 61 66 51 700
fax: +48 61 66 51 701
www.pbgsa.com
email: polska@pbg-sa.pl