Design Hub Plant · Design Basis

rev 0.71 · 12-Nov-2026 · the plant built in the Design Hub "Process Design" series · designhubindia.org

FEED

Gas	10 MMSCFD	SG 0.65
Oil	2,000 bbl/d	SG 0.82
Water	1,500 bbl/d	SG 1.05
Gas standard	60 °F, 14.696 psia	379.49 scf/lbmol
Live oil at V-100	778 kg/m³	13.97 m³/h actual

CONDITIONS + CASES

Separator normal	12 barg	60 °C
Max operating	13 barg	
Well shut-in	35 barg	upstream of SDV-100
Cases	normal 1 · max ×1.2	turndown ×0.3

EQUIPMENT + LINES

V-100	ID 1,800 × 6,000 T/T mm	SA-516 Gr 70
Design	15 barg / 120 °C	MAWP 16.74 barg
MDMT · CA	-29 °C · 3 mm	hydrotest 21.76 barg
PSV-100	set 15 barg	3L4 (API 526)
6"-P-1001	35 barg / 180 °C	300#
H-100	894 kW normal · 1,192 kW fired	30 → 60 °C
Choke HV-134	30 → 12.5 barg	between the heater coils
K-100 (proposed)	12 → 62 barg	2 stages, reciprocating

SEPARATOR GAS COMPOSITION, mol % (dry) · water in gas 1.59 mol %

N2	CO2	C1	C2	C3	iC4	nC4	iC5	nC5	nC6	C7+
1.01	1.99	87.98	5.31	2.35	0.43	0.52	0.14	0.13	0.08	0.07

HEAT + MASS BALANCE · normal case · H-100 894 kW

No.	Stream	P, barg	T, °C	kg/h
1	Well fluid, manifold to H-100 coil 1	30	30	30,818
2	H-100 coil 1 out, to choke HV-134	30	45	30,818
3	Choke out, to H-100 coil 2	12.5	41.9	30,818
4	H-100 out, 6"-P-1001 > SDV-100 > V-100 N1	12.5	60	30,818
5	V-100 gas, N2 > PV-100	12	60	9,520
6	Fuel gas to H-100 burner	—	—	94
7	Gas to K-100 suction (via V-110)	12	60	9,426
8	V-100 oil, N3 > LV-101	12	60	10,864
9	Oil to T-100 after LV-101	≈ 0	60	10,864
10	T-100 flash gas, to vent / flare	≈ 0	60	130
11	Stabilised oil, T-100 > P-101 > export	≈ 0	60	10,734
12	V-100 water, N4 > LV-102 > produced water	12	60	10,434

ROUTE

production manifold (shut-in 35 barg) → H-100 indirect bath heater: coil pass 1 -> choke -> coil pass 2 → 6"-P-1001 (300#, B3A side) → SDV-100 (spec break 300# | 150#) → 6"x12" expander → 12"-P-1102 (A1A 150#) → V-100 N1 12"

A generic teaching plant: not a real project, a client job or a measured analysis. The composition is synthetic (sweet, no H_2S); C7+ is one hypothetical component. Streams 1–4 come from the simulator heater case (V-100 inlet 12.5 barg), 5, 8 and 12 from the separator case (12.0 barg), 10 from a Peng-Robinson flash to atmospheric at 60 °C (an upper bound). K-100 and the plant downstream are proposed and confirmed in a later episode. Check every value against your own project's codes and data before you use it. © Design Hub · designhubindia.org