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		Revision / Date	A · September 29, 2026		
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Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

GENERAL

The general data for V-101 are given in Table 1.

Table 1: General Data

Field	Value	Field	Value
Tag	V-101	Quantity	One
Service	Inlet filter separator, pipeline-quality natural gas with free liquids and solids	Type	Horizontal two-stage (coalescing filter section and vane mist extractor) with lower liquid barrel
P&ID	 PRO-DWG-102	Plot location	Station grid (84, 40), shell east-west
Flow direction	East to west; quick-opening closure on the east (filter section) head	Process sizing	 PRO-CAL-005, Filter Separator
Design code	ASME BPVC Section VIII Division 1, 2023 edition, U-stamped and National Board registered	Overpressure protection	ASME Section XIII per UG-150; PSV-101 on nozzle N3

SERVICE AND DESIGN CONDITIONS

The service and design conditions are given in Table 2. The shell alone supports 1,529 psig; the Class 600 nozzle flanges limit the vessel to 1,440 psig up to 133 °F and to 1,420 psig at 150 °F (ASME B16.5 Table 2-1.1, Group 1.1). Post-weld heat treatment is mandatory because the nominal thickness exceeds 1-1/2 in (UCS-56, P-No. 1).

Table 2: Service and Design Conditions

Field	Value	Field	Value
Capacity	120 MMSCFD at 900 psig (case C5) and all operating cases C1 to C7	Gas	Sweet, dehydrated to 7 lb/MMscf
Filter section	16 element positions, 1 micron coalescing, 4.5 in OD x 72 in	Vane section	99 % removal of 8 micron droplets and larger at C5
Pressure drop	2 psi clean, 10 psi at element change-out (PDIT-103)	Element collapse rating	50 psid minimum
Design pressure	1,440 psig internal	Design temperature	-20 °F to 150 °F
MAWP at 133 °F	1,440 psig	MAWP at 150 °F	1,420 psig (Class 600 flange limit)
MDMT	-20 °F at 1,440 psig	External pressure	Not required (no vacuum source)
Corrosion allowance	1/16 in	Joint efficiency	1.0, full radiography
PWHT	Required	Wind / seismic	ASCE 7-22, 108 mph Exposure C, Risk Category II; SDC B, Site Class D (HOLD H-06)



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MATERIALS

The materials are listed in Table 3. At the governing thickness of 1.750 in, Fig. UCS-66 curve D gives an unimpacted MDMT well above -20 °F (TBV by the vendor's UCS-66 calculation), so base metal, weld metal and heat-affected zone are impact tested. The UCS-66(b) stress-ratio reduction is not relied on.

Table 3: Materials

Component	Material	Requirement
Shell, heads, liquid barrel	SA-516-70N	Charpy impact tested at -20 °F (SA-20 S5, UG-84)
Nozzle necks	SA-333-6 or SA-106 B SMLS, or SA-105N forgings	Impact tested at -20 °F
Flanges	SA-105N with impact test at -20 °F, or SA-350 LF2 Cl 1	Class 600 RF weld neck, 125 to 250 AARH
Quick-opening closure	SA-350 LF2 Cl 1 forged hub and door	Yoke or bandlock type, UG-35.2
Internals	Carbon steel; vane pack 316 SS; tube sheet 1 in minimum	Tube sheet designed for the 50 psid element load
Bolting	SA-193 B7 / SA-194 2H	External
Gaskets	Spiral-wound 316 / flexible graphite, CS outer ring, 316 inner ring	ASME B16.20
Saddles	SA-36 with SA-516-70 wear plates	Wear plate welds seal welded

DIMENSIONS AND ELEVATIONS

Dimensions and elevations are given in Table 4; elevations are NAVD88 feet on the civil finished-grade plane.

Table 4: Dimensions and Elevations

Field	Value	Field	Value
Upper shell	42 in ID x 15 ft S/S, OD 45.5 in	Shell / head thickness	1.750 in / 1.625 in minimum after forming
Liquid barrel	NPS 24 x 1.000 in x 14 ft S/S, two compartments	Downcomers	Two NPS 6 Sch 80 (filter and vane compartments)
Overall length	About 19 ft including the closure (plot X 75 to 94)	Grade at vessel	EL 1151.21 ft
Upper shell centerline	EL 1158.50 ft	N1 / N2 flange faces	EL 1161.25 ft
Barrel centerline / bottom	EL 1154.10 / 1153.10 ft	Saddles	X 78.5 fixed, X 89.5 sliding (slotted holes)

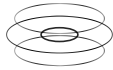
NOZZLES

The nozzle schedule is given in Table 5. The vendor shall accept the piping loads at N1 and N2 from  MEC-CAL-004, Piping Flexibility and Stress Screening, or show the local stresses acceptable by WRC 537 or finite element analysis.

Table 5: Nozzle Schedule

Mark	Size	Rating / face	Service	Location	Connects to
N1	12 in	Cl 600 RF WN	Gas inlet	Top, X 89.5	12"-G-1002-A6
N2	12 in	Cl 600 RF WN	Gas outlet	Top, X 78.5	12"-G-1003-A6
N3	2 in	Cl 600 RF WN	PSV-101 inlet	Top, X 84.8	HV-101G (CSO), PSV-101 orifice E
N4	42 in	Closure	Element access	East head	Davit by vendor



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Mark	Size	Rating / face	Service	Location	Connects to	
N5	2 in	Cl 600 RF WN	Liquid outlet, vane compartment	Barrel bottom, X 87	1060: SDV-106, LCV-104, RO-104	
N6	2 in	Cl 600 RF WN	Filter compartment drain	Barrel bottom, X 92.5	1110: HV-104D / HV-104E	
N7A/B	2 in	Cl 600 RF WN	Level bridle LT-104, LG-104	Barrel side	Bridle by vendor	
N8	2 in	Cl 600 RF WN	LSHH-105	Barrel side, 85 %	Level instrument	
N9	2 in	Cl 600 RF WN	LSLL-106	Barrel side, low	Level instrument	
N10A/B	3/4 in	Cl 6000 SW	PDIT-103 taps	Each side of tube sheet	Root valves	
N11	3/4 in	Cl 6000 SW	PI-103	Top	Gauge manifold	
N12	3/4 in	Cl 6000 SW	Vent	Top, each compartment	Valve and plug	
N13	2 in	Cl 600 RF WN	Spare	Shell bottom, east	Blind flange	

INTERNALS AND ACCESSORIES

Internals and accessories are listed in Table 6.

Table 6: Internals and Accessories

Field	Value
Inlet device	Vane-type inlet diverter
Coalescing elements	16 glass-fibre elements, 1 micron, changed at 10 psid
Mist extractor	High-capacity double-pocket vane pack, 316 SS
Liquid barrel	Two compartments or internal weir with separate drains, vendor to propose
Closure	Quick-opening closure with pressure-warning device and vent interlock per UG-35.2
Liquid line equipment (piping scope)	SDV-106 spring-return fail-closed shutoff and RO-104 blow-by orifice on line 1060
Platforms	None; closure operated from grade with the vendor davit

INSPECTION AND TESTING

Inspection and testing requirements are given in Table 7. The shop test pressure equals the ASME B16.5 Class 600 shell test, so the vessel is tested once at the shop and not again in the field, where the station test pressure would otherwise exceed its code test.

Table 7: Inspection and Testing

Field	Value
Shop hydrotest	2,225 psig, 1 h minimum hold (UG-99(b) minimum 1,872 psig)
Field test	V-101 is blinded at its nozzles and excluded from the station hydrotest as a pre-tested unit ( SPC-SPC-011)
Radiography	100 % RT of butt welds (RT-1)
Surface examination	100 % MT of nozzle and attachment welds after PWHT
Hardness	Welds and heat-affected zone 200 HB maximum
Impact testing	Base metal, welds and heat-affected zone at -20 °F
Nameplate	Tag, MAWP 1,440 psig at 133 °F and 1,420 psig at 150 °F, MDMT, test pressure, PWHT, RT, year, NB number

PAINTING AND INSULATION

Painting is given in Table 8.



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Table 8: Painting and Insulation

Field	Value
Internal	Blast SSPC-SP 10, uncoated (dry gas)
External	Zinc-rich epoxy, epoxy, polyurethane per  SPC-SPC-010
Saddle contact faces	Painted before wear plate welding
Insulation	None

WEIGHTS

Weights for foundation design are given in Table 9.

Table 9: Weights

Condition	Weight (lb)	Basis
Empty, including elements	29,500	Calculated plate weights; closure, internals and saddles typical, confirm with vendor data (HOLD H-15)
Operating, liquid at normal level	31,200	Gas at 6.75 lb/ft ³ (1,440 psig, 45 °F)
Operating, liquid at LSHH-105	32,700	Upset
Test, full of water	41,600	Internal volume 194 ft ³

DESIGN CALCULATIONS SUMMARY

Table 10 summarizes the thickness checks, with SA-516-70 at S = 20,000 psi (ASME II-D Table 1A), E = 1.0 and 1/16 in corrosion allowance. The liquid barrel wall of 0.75 in in  PRO-CAL-005 is below the 0.902 in required, so this datasheet specifies 1.000 in. The barrel ID falls from 22.50 in to 22.00 in, 4 % less liquid volume, which  PRO-CAL-005 shall confirm against the slug surge requirement.

Table 10: Design Calculations Summary

Check	Basis	Required	Selected / result
Shell	$UG-27(c)(1), t = PR/(SE - 0.6P) + CA$	1.647 in	1.750 in
2:1 ellipsoidal heads	$UG-32(d) / 1-4, t = PD/(2SE - 0.2P) + CA$	1.590 in	1.625 in after forming
Liquid barrel NPS 24	$1-1(a)(1), t = PR_o/(SE + 0.4P) + CA$	0.902 in	1.000 in
Shell MAWP, corroded	$P = SEt/(R + 0.6t)$	1,440 psig	1,529 psig
Shop test membrane stress	2,225 psig, new thickness	90 % of yield, 34,200 psi	28,000 psi (74 %)
PWHT	UCS-56, P-No. 1 over 1-1/2 in	Mandatory	Specified

NOTES AND HOLDS

1. Element, vane and closure data, weights and nozzle projections are typical, confirm with vendor data (HOLD H-15).
2. Liquid composition and flash gas depend on the extended gas analysis (HOLD H-12).
3. The pig slug volume depends on the Owner's pigging program (HOLD H-16).



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VENDOR DATA REQUIRED

General arrangement with nozzle orientations and elevations; code calculations including saddles, wind, seismic and nozzle loads; element and vane performance at 900 to 1,150 psig with pressure drop curves; weights and lifting procedure; welding procedures with impact results; inspection and test plan; U-1A data report; closure operating manual.

