PSB INDUSTRIES

NG Series - Natural Gas Dryers

NG-EV | NG-SRD | NG-SR | NG-SV | NGR

- **Fueling Stations**
- **Virtual Pipeline Stations**
- **Biogas Facilities**

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Intertek

THIRD PARTY CERTIFIED

PSB "NG" series dryers are specifically designed for natural gas fueling stations and biogas upgrading facilities. As gas supply pressure varies, PSB's typical dryer pressure options range from 200 to 1525 psig MWP. The dryers are designed and manufactured in Erie, Pennsylvania, USA with a certified quality system.

PSB Industries Inc., General Air Division, specializes in the Design and Fabrication of compressed air, gas, and liquid dehydration and purification systems. Our standard and custom packaged systems remove moisture and contaminants from process streams.

Adsorption technologies utilizing activated alumina, molecular sieve, activated carbon, and other selective adsorbents are employed to dehydrate, treat, and purify the fluid stream to the required exit specification. Catalyst systems are also designed and often incorporated within adsorption packages for purification.

PSB units are installed worldwide and currently serve the Air Separation, Chemical, Petrochemical, Refining, Fuel Gas, and Electronics markets. PSB fabrication capabilities and quality of packaged systems are unmatched. Vessels, piping, structural, control panels, sandblasting, painting, instrumentation, insulation, testing, etc are completed under "one roof" to closely monitor and quickly react to scope changes.

MADE IN U.S.A.

c UL us

ASME

c ETL us LISTED Intertek

CRN

Dual Vessel Fully Automatic Regeneration

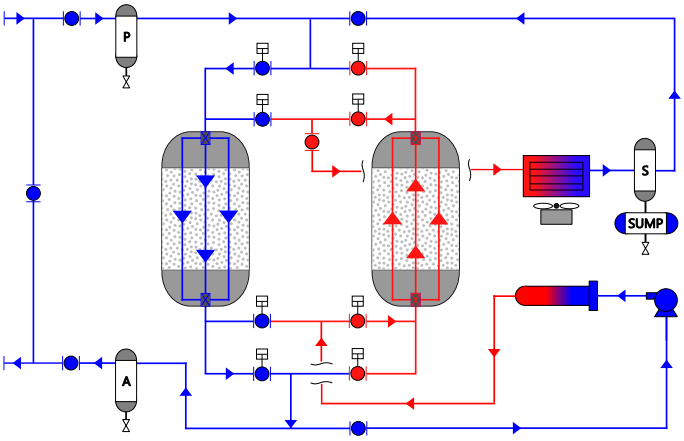
PSB type NG-EV is an ideal system for drying natural gas needing 24/7 operation. Each unit is conservatively sized to remove moisture from gas.

Continuous operation is assured with automatic switching valves and dual vessels. While one vessel is on stream drying, the other vessel is regenerating or in standby mode and will automatically be placed back on stream.

"DDP" Digital Dew Point Meter is provided to indicate the effluent dew point, confirming performance.

PSB's standard package includes factory fit pre filter for removing dirt/aerosols and after filter for removing desiccant dust.

Flow Diagram:



Dryer Design Features:

- Dual vessel design, manufactured and stamped per ASME coded Section VIII. Alternatives available.
- Piping designed per ASME B31.3
- NEMA / NEC electrical construction standard
- Closed-loop regeneration of the molecular sieve adsorbent
- Three valve block and bypass piping arrangement for isolation of the dryer
- Pre filter and after filter complete with differential pressure indicators
- Insulated adsorber vessels and electric heater for heat conservation
- Incoloy sheath, low watt density flanged immersion type electric heater

PSB MODEL	Process Connections Inches	Dimensions Inches			Package Weight lbs.
		L	W	H	
NG-EV33-1.5	1.5 FLG	138	80	96	6,750
NG-EV45-2	2 FLG	138	80	96	7,400
NG-EV90-3	3 FLG	126	96	112	9,600
NG-EV120-4	4 FLG	203	88	114	12,000
NG-EV150-4	4 FLG	203	88	114	13,000
NG-EV210-6	6 FLG	224	120	123	26,400
NG-EV300-6	6 FLG	224	120	141	28,000
NG-EV400-8	8 FLG	240	120	161	32,000

NG - SRD

Dual Vessel Manual Regeneration

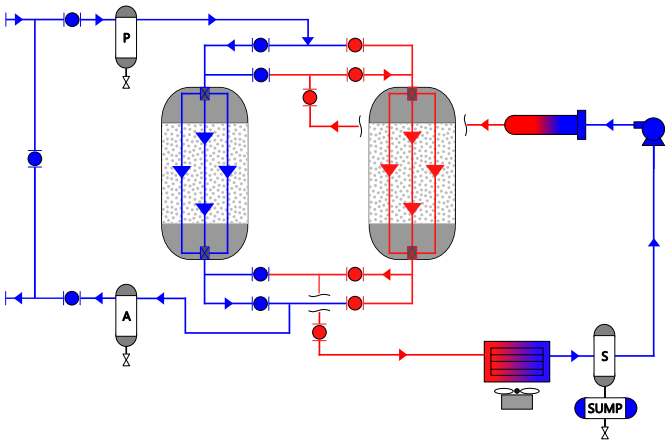
NG-SRD is the dual vessel version allowing for continuous drying. While one vessel is drying the other can be manually regenerated without interrupting the drying flow.

When the desiccant vessel has reached maximum drying capacity, it can be regenerated manually with the operator initiated, on skid regeneration package. A "DDP" Digital Dew Point Meter is provided to indicate the effluent dew point, confirming performance and need for regeneration. PSB's standard package includes factory fit pre filter for removing dirt / aerosols and after filter for removing desiccant dust.

Dryer Design Features:

- Dual vessel design manufactured and stamped per ASME code Section VIII. Alternatives available.
- Piping designed per ASME B31.3
- NEMA / NEC electrical construction standard
- Closed-loop regeneration of the molecular sieve adsorbent
- Three valve block and bypass piping arrangement for isolation of the dryer
- Pre filter and after filter complete with differential pressure indicators
- Insulated adsorber vessels and electric heater for heat conservation
- Incoloy sheath, low watt density flanged immersion type electric heater

Flow Diagram:



PSB MODEL	(1) MMSCF Capacity @ 7 lb. H2O/MMSCF	Flow Capacity SCFM @ PSIG 20/100	Process Connections Inches	Dimensions Inches L	W	H	Package Weight lbs.
NG-SRD-6.5-2	6.5	260 / 820	2 FLG	120	80	102	5,600
NG-SRD-10-3	10	550 / 1,375	3 FLG	153	72	102	5,900
NG-SRD-15-3	15	550 / 1,375	3 FLG	180	88	97	9,300
NG-SRD-15-4	15	800 / 2,160	4 FLG	180	88	97	9,400
NG-SRD-21-4	21	950 / 2,300	4 FLG	192	88	102	11,600
NG-SRD-21-6	21	2,000 / 3,500	6 FLG	192	88	110	13,400
NG-SRD-30-6	30	2,200 / 4,200	6 FLG	192	88	122	15,000
NG-SRD-42-6	42	2,400 / 5,800	6 FLG	218	114	141	19,000
NG-SRD-42-8	42	4,000 / 7,800	8 FLG	238	120	143	21,000

(1) Capacity multiplier for inlet moisture contents other than 7 lb. H2O/MMSCF for type SV, SR and SRD models

Example: Capacity of model NG-SRD-21-6 with actual inlet natural gas with 10 lb. H2O/MMSCF
Multiply model # (which is dryer capacity) 21 MMSCF x 0.7 (multiplier) = 14.7 MMSCF new capacity

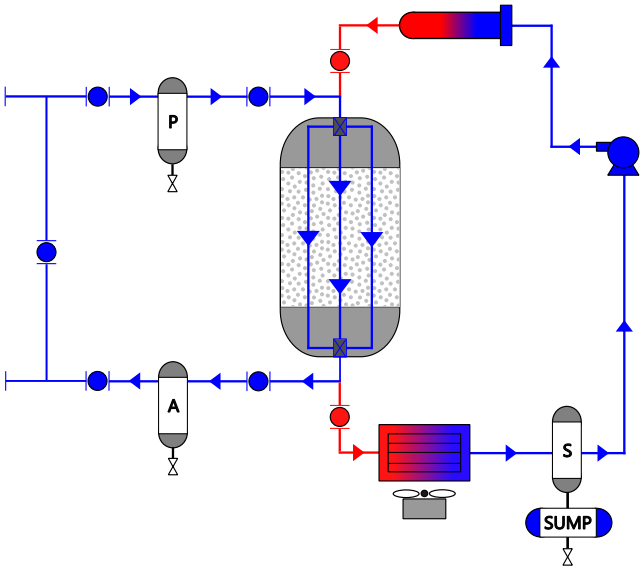
Actual lb. H2O/MMSCF	2	3	4	5	6	7	10	15	20	30	40	50
Multiplier	2.27	1.82	1.49	1.25	1.11	1	0.7	0.5	0.39	0.3	0.21	0.17

Single Vessel Manual Regeneration

PSB type NG-SR is an ideal system for drying small to medium volumes of natural gas for stations with intermittent use. Each unit is conservatively sized to remove moisture from gas stream.

When the initial charge of desiccant has reached maximum drying capacity, it can be regenerated manually with the operator initiated, on-skid regeneration package. A “DDP” Digital Dew Point Meter is provided to indicate the effluent dew point, confirming performance and need for regeneration. PSB’s standard package includes factory fit pre filter for removing dirt/aerosols and after filter for removing desiccant dust.

Flow Diagram:



Dryer Design Features:

- Adsorber vessel designed, manufactured and stamped per ASME coded Section VIII. Alternatives available.
- Piping designed per ASME B31.3
- NEMA / NEC electrical construction standard
- Closed-loop regeneration of the molecular sieve adsorbent
- Three valve block and bypass piping arrangement for isolation of the dryer
- Pre filter and after filter complete with differential pressure indicators
- Insulated adsorber vessel and electric heater for heat conservation
- Incoloy sheath, low watt density flanged immersion type electric heater

PSB MODEL	(1) MMSCF Capacity @ 7 lb. H2O/MMSCF	Flow Capacity SCFM @ PSIG 20/100	Process Connections Inches	Dimensions Inches L	W	H	Package Weight lbs.
NG-SR-6.5-2	6.5	260 / 820	2 FLG	104	68	100	3,900
NG-SR-10-3	10	550 / 1,375	3 FLG	104	68	100	4,500
NG-SR-15-3	15	550 / 1,375	3 FLG	104	68	100	5,200
NG-SR-15-4	15	800 / 2,160	4 FLG	104	68	100	5,500
NG-SR-21-4	21	950 / 2,300	4 FLG	132	88	100	7,350
NG-SR-21-6	21	2,000 / 3,500	6 FLG	132	88	100	7,900
NG-SR-30-6	30	2,200 / 4,200	6 FLG	132	88	122	8,810
NG-SR-42-6	42	2,400 / 5,800	6 FLG	162	105	141	14,500
NG-SR-42-8	42	4,000 / 7,800	8 FLG	168	120	146	15,500

(1) See note on page 3.

NG - SV

Single Vessel Natural Gas Dryer

PSB type NG-SV is an ideal system for drying small volumes of natural gas for stations with intermittent use. Each unit is conservatively sized to remove moisture from gas stream.

When the initial charge of desiccant has reached maximum drying capacity, it can either be replaced or regenerated with an external regeneration package, consult PSB for more information.

An optional "DDP" Digital Dew Point meter will provide indication of effluent dew point confirming performance or need for desiccant replacement/regeneration.

PSB's standard package includes factory fit pre-filter and particulate after-filter.

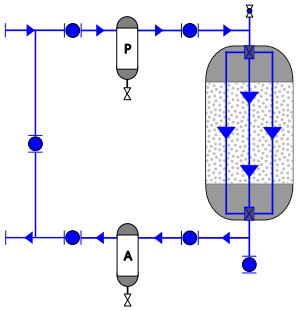
Dryer Design Features:

- Modular design matches regeneration package
- Stainless steel desiccant screens
- Installed pre-filter & after-filter
- Three valve system block and bypass package
- Initial charge of desiccant
- Adsorber vessel designed, manufactured and stamped per ASME code Section VIII Alternatives available
- Two (2) manual regeneration valves on NG-SV-3.0-1.5 and larger models

Typical Options:

- DDP - Digital Dew Point Meter (CL 1. DIV 2, GR C, D)
- MI - Color change moisture indicator
- Higher design pressure (> 200 PSIG)
- Vessel insulation
- Regeneration skid, see NGR description

Flow Diagram:



PSB MODEL	(1) MMSCF Capacity @ 7 lb. H2O/MMSCF	Flow Capacity SCFM @ PSIG 20/100	Process Connections Inches	Dimensions Inches L	W	H	Package Weight lbs.
NG-SV-1.5-1.0	1.5	50 / 100	1 NPT	28	20	86	430
NG-SV-3.0-1.5	3	145 / 510	1.5 FLG	50	34	86	950
NG-SV-5.0-1.5	5	145 / 510	1.5 FLG	50	34	86	1,225
NG-SV-6.5-2	6.5	260 / 820	2 FLG	50	40	86	1,750
NG-SV-10-3	10	550 / 1,375	3 FLG	50	48	86	2,470
NG-SV-15-3	15	525 / 1,375	3 FLG	52	57	89	2,750
NG-SV-15-4	15	800 / 2,160	4 FLG	52	57	89	2,950
NG-SV-21-4	21	950 / 2,300	4 FLG	72	66	92	4,400

(1) See note on page 3.

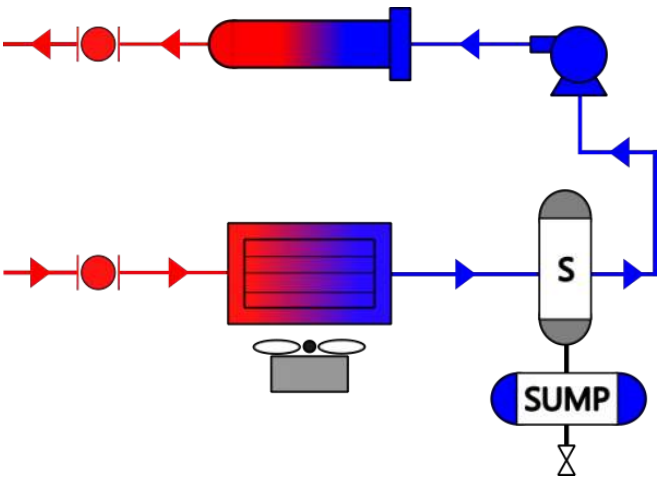
Natural Gas Regeneration Skid

PSB regeneration skids are used to regenerate single tower natural gas dryers that do not have an on-board regeneration system.

The system operates in a closed loop, utilizing a captive volume of natural gas. Once connected to the dryer vessel and properly vented, natural gas will begin flowing when the regeneration start button is initiated by the operator. A blower pushes gas to the electric heater and the hot gas flows to the vessel to be heated. The moisture held up on the desiccant will then be carried back with the gas and flows to the regeneration skid. A heat exchanger then cools the gas and condenses the water. The water is then efficiently removed from the gas stream and drains to the condensate sump. Cool gas then flows to the blower to be circulated to the heater again.

After the desiccant has been adequately heated, the electric heater is de-energized and the blower continues to recycle gas to reduce the desiccant temperature. Once cooled, regeneration is complete.

Flow Diagram:



Design Features:

- NGR21U is designed to regenerate medium and small single vessel dryers (PSB model SV21 and smaller)
- NGR42U will regenerate larger PSB models SV30 through SV42.
- Compact design to ease transportation between sites
- Regeneration blower is hermetically sealed in an ASME code stamped vessel
- Electric regeneration heater, flanged immersion type, low watt density and heater sheath thermocoupe included for safety shutdown
- Air-cooled fin tube after cooler with motor
- High efficiency separator and condensate sump
- Pressure relief valve, 200 mwp
- High heater sheath chamber and outlet temperature control and alarms are provided
- High after cooler outlet temperature alarm is provided
- NEMA 4 electrical control panel contains the PLC which automatically controls the heating and cooling cycle upon operator initiation
- NEMA 7 High Voltage panel contains the regeneration heater and motor contactors/starters
- Electrical rating is Class 1, Div 2 Group D

PSB MODEL	FLC @ 460/3/60	Connections Inches	Dimensions Inches L	W	H	Package Weight lbs.
NGR21U	44.3	2 FLG	114	53	81	2,400
NGR42U	87	3 FLG	134	87	95	4,800

FIELD SERVICES

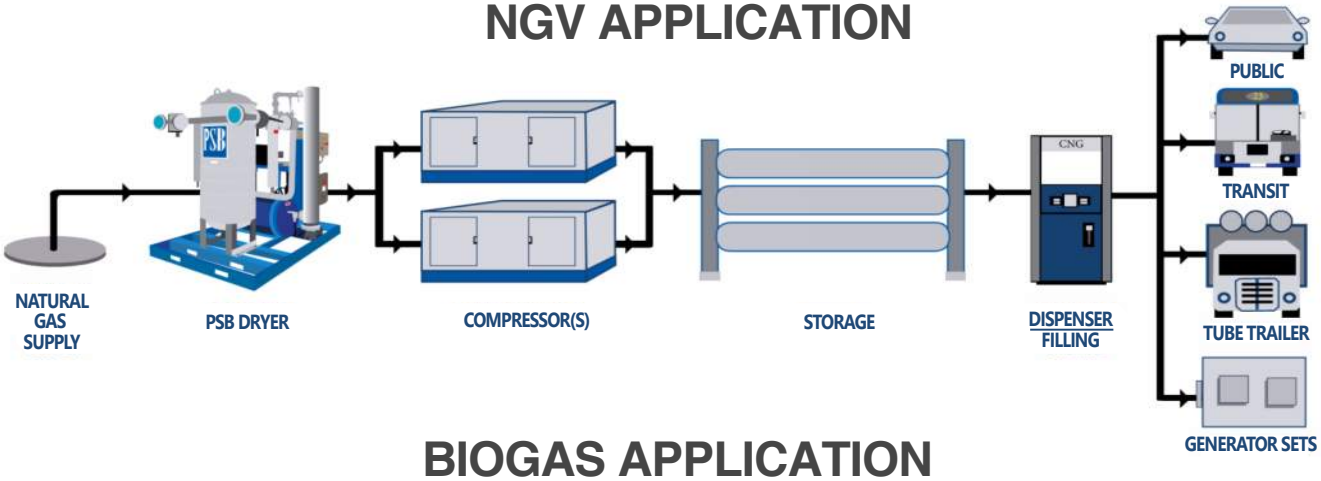
PSB SERVICES

PSB Services specializes in field service, start-ups, regeneration and maintenance of dryers across North America. Our knowledgeable technicians are dedicated to providing fast and reliable dryer maintenance to keep your equipment running at peak efficiency.

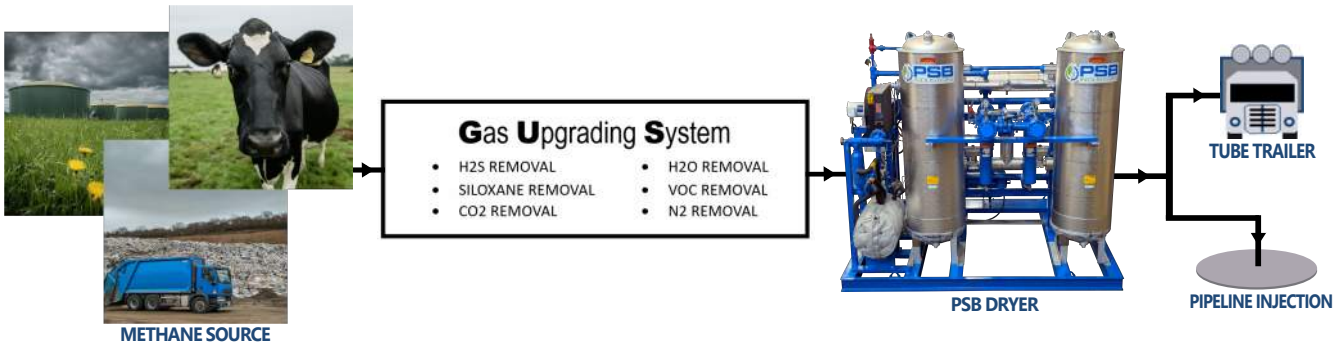
- **Dryer Start-up / Commissioning**
- **Natural Gas Regeneration**
- **Aftermarket Replacement Parts**
- **Planned Service / Preventative Maintenance Agreements**
- **Operator Training onsite or at PSB's Factory**

To learn more about what PSB Services can provide, contact us at **psbservices@psbservices.com** or visit us at **http://www.psbservices.com**.

NGV APPLICATION



BIOGAS APPLICATION



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