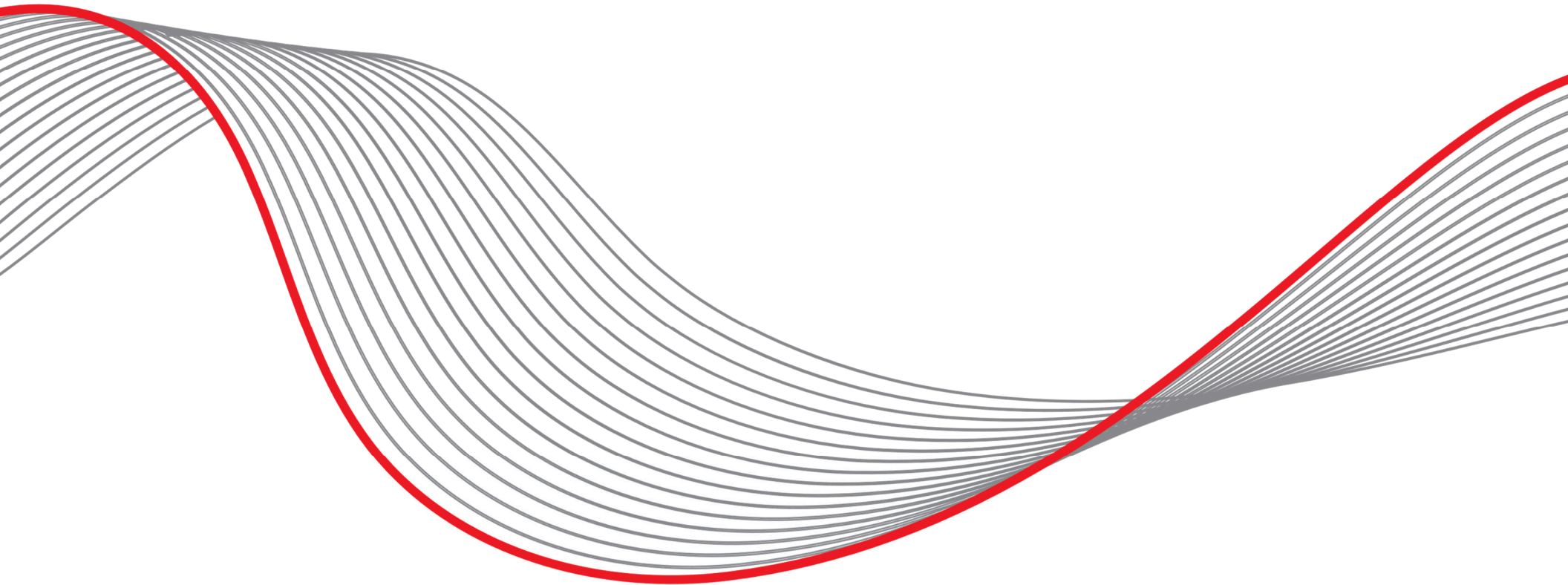


Noise Attenuation Jackets (NAJ)

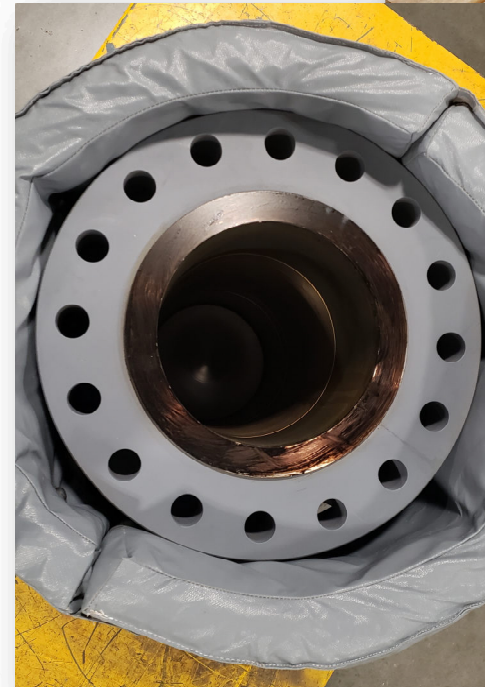


Description

VRG Controls' Noise Attenuation Jackets (NAJ) are installed on our Natural Gas Control Valves, related equipment and its adjoined natural gas pipelines that require acoustical attenuation. They provide noise attenuation in the range of 8-12 dBA when applied to elevated noise applications exceeding 95 dBA. The acoustical performance of removable covers is frequency dependent. Performance increases with increased frequency of the incident noise.

The NAJ offers a cost-effective solution that is applicable during design stage of station or retrofitted in noise applications found after service. Its unique design utilizes a double layer of acoustical septums coupled with a triple layer of selected insulations of dissimilar densities allowing for a series of air gaps, significantly increasing the acoustical performance, resulting in up to 25dBA of noise reduction in some instances.

The custom "tailored" design ensures rugged noise attenuation with easy removal and reinstallation in case of maintenance.



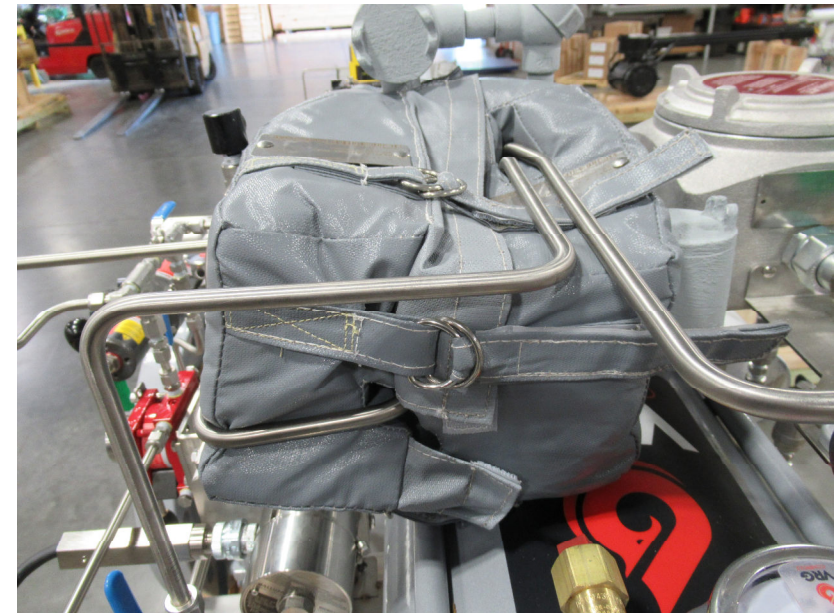
NAJ CONSTRUCTION DETAIL

HEATAINER® REMOVABLE ACOUSTIRAP® COVER

SUBMITTAL SHEET SPEC. A550-2-ATC

ACOUSTIRAP®

INNER JACKETING	-----	16.5oz/sq.yd Teflon impregnated fiberglass cloth
OUTER JACKETING	-----	16.5oz/sq.yd Teflon impregnated fiberglass cloth
SIDE GUSSETS	-----	16.5oz/sq.yd Teflon impregnated fiberglass cloth
INSULATION CORE	-----	1" Thk-- 9-11#/CF Type "E" Needled Fiberglass Mat 1" Thk-- 6-8#/CF Type "E" Needled Fiberglass Mat 1" Thk—1.8#/CF Type LD Fiberglass,(3" compr. to 1)
ACOUSTICAL LINER	-----	Double layers 16 oz/s.f. Mass Loaded Acoustical Septum
SEAM CLOSURE	-----	PTFE coated fiberglass thread
SEAM FASTENERS	-----	Teflon cloth straps with S.S. double D-rings and Hook & Loop Seam flap & Fastener
I.D. TAGS	-----	Type 304 S.S. with laser-etched lettering, (1.75"x3.5")



NAJ CONSTRUCTION DETAIL

HEATAINER® REMOVABLE ACOUSTIRAP® COVER

INSIDE OF COVER



16.5oz/sq.yd Teflon impregnated fiberglass cloth

1.8#/Cf Low Density Fiberglass

1#/sqft Acoustical Septum

Type “E” Needled Fiberglass
Mat, 9-11# and 6-8# Density

1#/sqft Acoustical Septum

Type “E” Needled Fiberglass
Mat, 9-11# and 6-8# Density

16.5oz/sq.yd Teflon impregnated fiberglass cloth



The NAJ Noise Attenuation Jacket layout provides absorption of airborne sound through the fiberglass layers. The acoustical septums structurally decouple the outer jacketing layer from the radiating pipe wall. The Teflon-impregnated fiberglass cloth layer provides additional mass for reduction of sound transmission. The accumulative materials laminated together dampens vibratory energy to mitigate noise in conjunction with applicable noise attenuated valve.

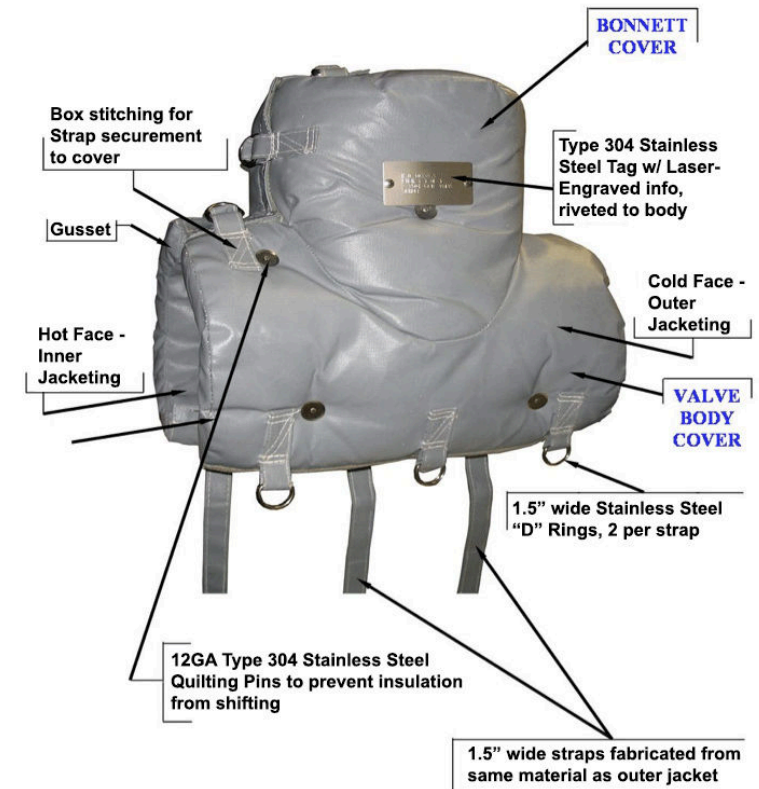
VRG Controls – Noise Attenuation Jackets Technical Overview

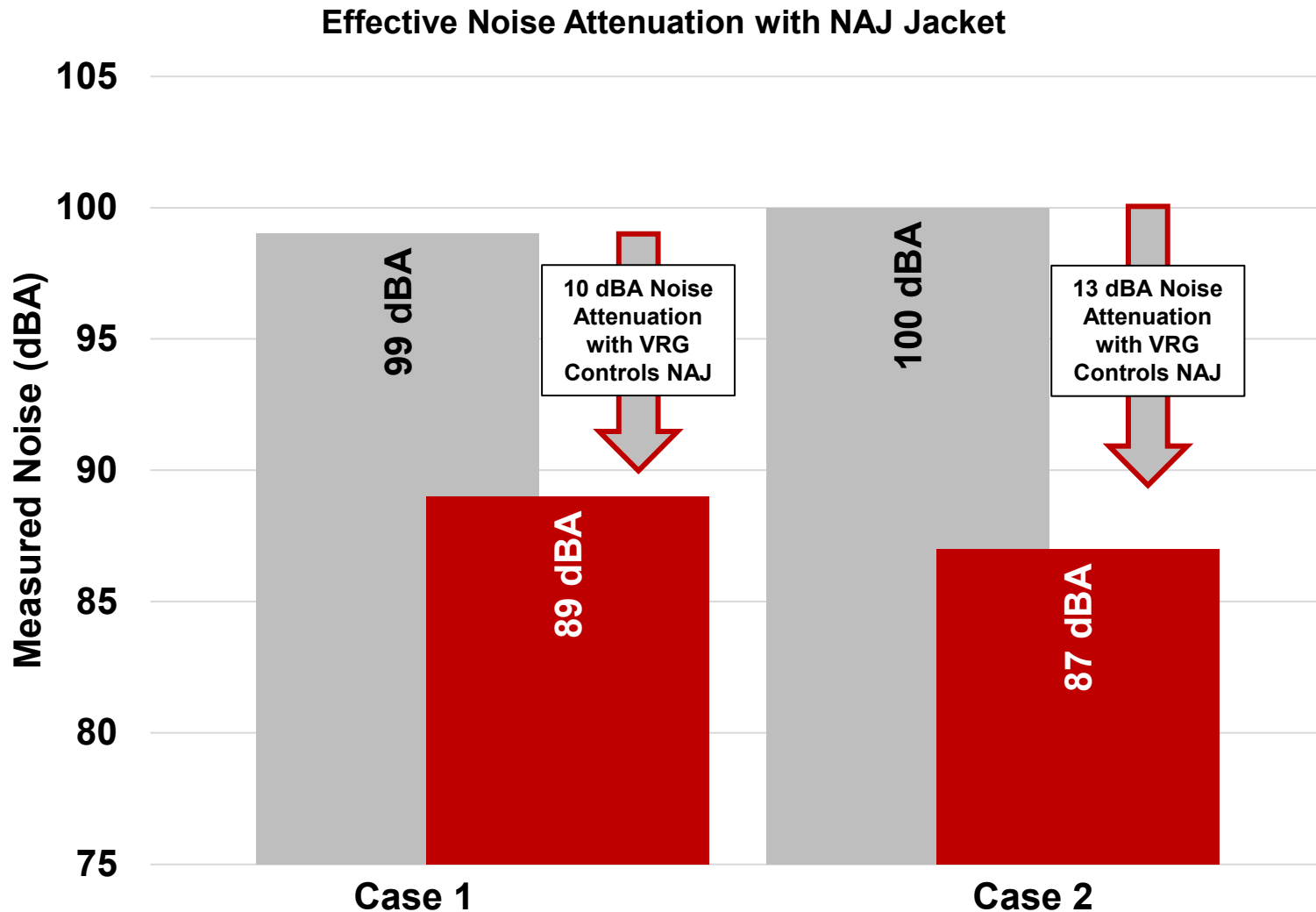
Benefits

- Provides noise attenuation of 8-12 dBA for severe noise applications. (Unattenuated Noise ≥ 90 dbA)
- Combinable with additional VRG Controls' noise attenuation solutions for additional noise reduction.
- “Tailored” jackets are fitted to assure maximized performance and reduced heat loss.
- Easily retrofitted for use in operating stations without requiring shut-down.
- Noise attenuation achieved without any additional pressure-drop caused by in-line devices.
- Reduced heat loss (thermal insulation).
- Relatively cost-effective solution to meet or exceed industry noise requirements.

Products

- NAJ for VRG Controls PRCV
- NAJ for VRG Controls GVR
- NAJ for VRG Controls Instrumentation
- Other Custom NAJ available for special applications.

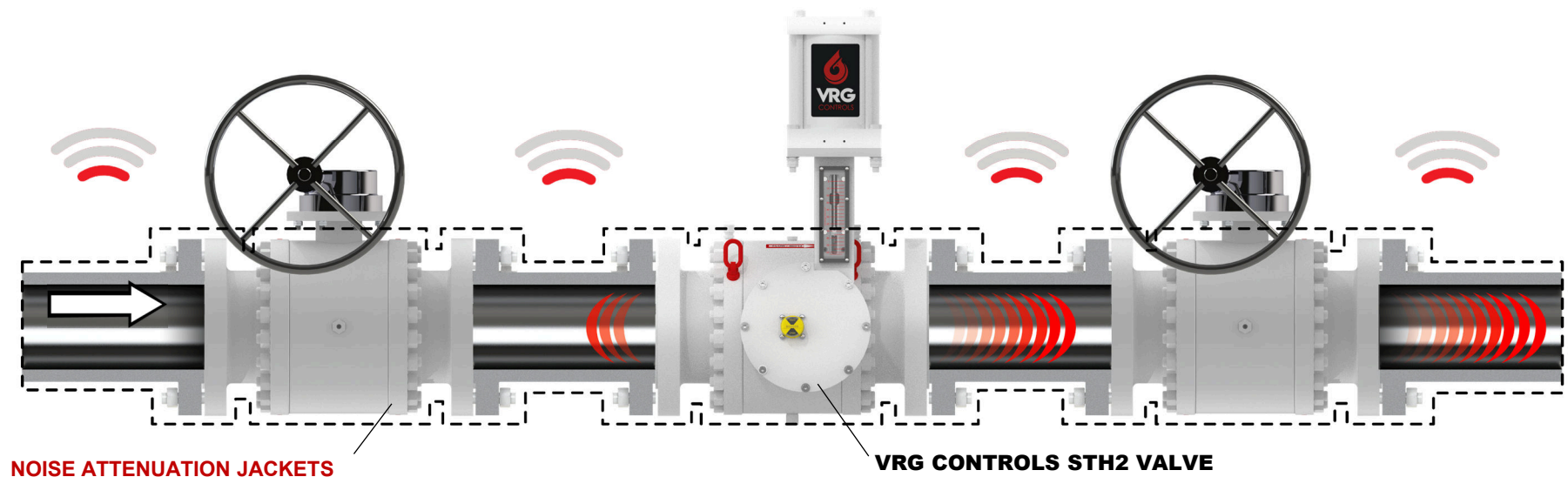




The VRG Controls NAJ Noise Attenuation Jacket demonstrates its most effective noise mitigating performance between the 90-100 dBA range. This is based on empirical data taken during several field case studies.

TYPICAL BALL VALVE REGULATOR WITH NAJ INSTALLATION

NAJ (NOISE ATTENUATION JACKET) + VALVE NOISE ATTENUATION



NAJ: 9 - 12 Dba + STH2: 11 dBA = **TOTAL – 20 - 23 dBA**



The above NAJ Noise Attenuation Jacket depiction mitigates noise levels ranging from 9-12 dBA. This noise attenuation is additive to the other noise attenuative technologies already implemented into the design. For example, if a VRG Controls STH2 valve provides 11 dBA in noise attenuation, the total noise attenuation in the system can accumulate up to 20-23 in total noise mitigation.

Our Contact Information

VRG Controls, LLC
Toll-Free: +844-FLOW-VRG (USA & CANADA)
e-Mail: Sales@VRGControls.com
www.VRGControls.com

VRG Controls, LLC
1199 Flex Court, Unit B
Lake Zurich, Illinois 60047 USA



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