



# XG-RA-500 RETROFIT AIR TERMINAL UNIT

## SPECIFIABLE FEATURES

- Customized retrofit valves for existing single or dual duct systems
- Optional flow controllers available on satellite mounted panels
- Pneumatic or electronic control sequences available
- Metal inlet flow sensor with extra balancing taps

## INDEX OF SECTIONS

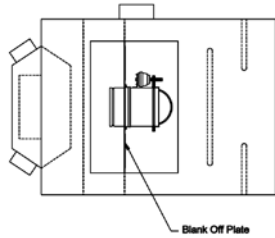
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## XG-RA-500 RETROFIT AIR TERMINAL UNITS

Series XG-RA-500 retrofit assemblies are customized retrofit valves designed to slip into existing mechanically regulated single or dual duct terminals. The units allow the conversion of constant volume systems to more energy efficient, variable volume systems. XG-RA-500 assemblies are currently available to fit most brands of terminals manufactured from the 1960s to the 1980s. The XG-RA-500 valves can be installed, in most applications, without disrupting existing ductwork. Units are installed by removing existing volume regulators and inserting the XG-RA valve. One or two valves in a single panel may be controlled by a single actuator.

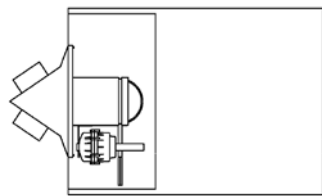
## XG-RA-500 TECHNICAL DATA



**Titus® HD, TDH, TDL, TSH, LD, HS Series**  
Replace all mechanical regulators with combination of flanged retrofit assembly(ies) and blank off plate(s) through bottom access panel. One actuator per valve, field or factory mounts on valve body. Flow controller panel is mounted in the field on outside of HD air terminal casing.

### TITUS®

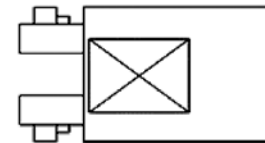
The Titus® Series of single and dual duct mechanical air terminals may have as many as ten mechanical regulators. They were originally manufactured in a variety of sizes to deliver from 50 to 3120 CFM. Retrofitting these air terminals requires the removal of all mechanical regulators. The regulators are replaced with up to 4 Greenheck XG-RA retrofit valves to achieve the desired CFM. The remaining holes left as a result of removing the mechanical regulators are covered with blank-off plates. Retrofit is achieved through a bottom access panel. Control submittal 590 illustrates the Greenheck Retrofit Assembly for Titus® Series air terminals. A chart detailing the number of nominal 8 retrofit valves and blank-off plates required to retrofit each size air terminal is presented on the submittal. Each valve is furnished with a multi-point air flow sensor. Order XG-RA Assembly 590A for sizes 4 thru 7. Order 590B for larger sizes in multiples depending on CFM desired. Blank-off plates can be field fabricated, or ordered as 590X.



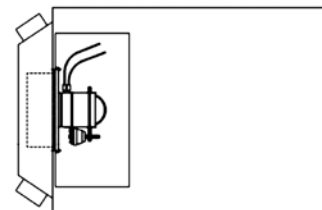
**Tuttle & Bailey® MVC Series**  
Replace mechanical regulator(s) with panel mounted single round retrofit valve through bottom access panel. A divider panel, if present, must be cut to provide clearance for the new valve. One actuator per valve, field or factory mounted on valve body. Flow Controller panel mounted on MVC air terminal casing in the field.

### TUTTLE & BAILEY®

Tuttle & Bailey® Series MPM-MVC mechanical air terminals require a single Greenheck XG-RA retrofit valve per air terminal. Tuttle & Bailey® air terminals were built in a variety of sizes to deliver from 100 to 2600 CFM. Retrofitting these Tuttle & Bailey® air terminals requires removing the mechanical regulator(s) and replacing it (them) with a single, panel mounted retrofit valve equipped with a multi-point air flow sensor. The size of the valve and the panel it is mounted on varies with the size of the retrofitted air terminal. Retrofit is achieved through a bottom access panel. A divider panel, if present, must be cut to provide clearance for the new valve. Control sequence drawings 591A through 591F illustrate the dimensions of the panel and valve required for each MVC air terminal model.



MPM Series and alternate method for MVC series. Replace inlet damper assembly with dual flange mounted RA valves. Remove and discard internal regulator.

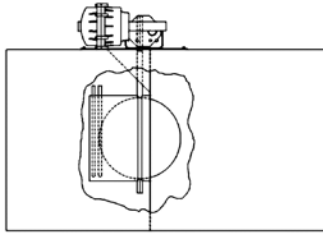


**Anemostat® HV-C Series**  
Replace mechanical regulator(s) with panel mounted single or dual round retrofit valves. Retrofit is achieved through a bottom access panel. One actuator per valve or pair of valves, field or factory mounted on valve body. Flow Controller panel mounted on HVC air terminal casing in the field.

### ANEMOSTAT®

Anemostat® Series HV-C mechanical air terminals may require 1, 2, 4, 5, 7 or 8 Greenheck XG-RA retrofit valves mounted on 1 or 4 panels. Each valve is equipped with a multi-point air flow sensor. Anemostat® HV-C air terminals were originally manufactured in a variety of sizes to deliver from 150 to 5400 CFM. Retrofitting the Anemostat® air terminals requires removing the mechanical regulator(s) and replacing it (them) with the appropriate number of retrofit valves usually mounted in a single panel, but in the case of the largest air terminal, 6 valves in 4 panels are required. Retrofit is achieved through a bottom access panel. Control sequence drawings 592A through 592G illustrate the dimensions of the panel and valve(s) required for each HV-C air terminal model.

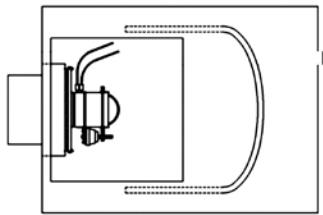
**XG-RA-500 TECHNICAL DATA continued**



**Barber-Colman® HS and HD Series**  
Replace mechanical regulator(s) with panel mounted single or dual round or oval retrofit valves. Retrofit is achieved through a side access panel. One actuator and flow controller are mounted on outside of the HS or HD side access panel in the field.

**BARBER-COLMAN®**

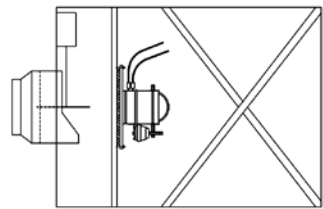
Barber-Colman® HS, and HD mechanical air terminals require 1 or 2 Greenheck RA round or oval retrofit valves mounted on a single panel. Each valve is equipped with a multi-point air flow sensor. Barber Colman®'s HS and HD air terminals were originally manufactured in a variety of sizes to deliver from 100 to 5000 CFM. Retrofitting the Barber-Colman® air terminals requires removing the mechanical regulator(s) and replacing it (them) with 1 or 2 valves mounted in an appropriately sized panel. Each replacement valve is furnished with a multi-point flow sensor. Retrofit is achieved through a side access panel. Controls, including the actuator, are mounted on the outside of this panel. Control sequence drawings 593A through 593G illustrate the dimensions of the panel and valve(s) required for each HS or HD air terminal model.



**Buensod® H and HL Series**  
Replace mechanical regulator(s) with 1, 2, or 3 panel mounted round or oval retrofit valves. Retrofit is achieved through a bottom access panel. One panel mounted round or oval retrofit valve(s). One actuator per air terminal field or factory mounted on 1 valve body. Flow controller panel mounted on H or HL air terminal in the field.

**BUENSOD®**

Buensod® Model H and HL mechanical air terminals require from 1 to 3 Greenheck RA round retrofit valves, each valve mounted on a single panel and furnished with a multi-point air flow sensor. Buensod® Model H and HL air terminals were originally manufactured in a variety of sizes to deliver from 50 to 4800 CFM. Retrofitting the Buensod® air terminals requires removing the mechanical regulator(s) and replacing it (them) with the appropriate number of panel mounted retrofit valves. Retrofit is achieved through a bottom access panel. Control sequence drawings 594B through 594I illustrate the number and dimensions of panels and valves required for each H or HL air terminal.

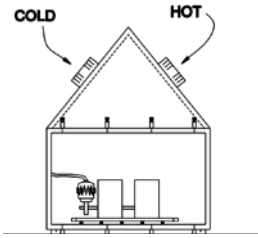


**Krueger® CVM Series**  
Replace mechanical regulator(s) with 1 or 2 panels, each supporting 1 or 2 round retrofit valves. One actuator per panel, field or factory mounted on 1 valve body. Flow Controller panel mounted on CVM air terminal casing in the field.

**KRUEGER®**

Krueger® Model CVM mechanical air terminals require 1 or 2 Greenheck RA round retrofit valves mounted in a single panel or 4 valves mounted in two panels. Each valve is furnished with a multi-point air flow sensor. Krueger® CVM air terminals were originally manufactured in a variety of sizes to deliver from 100 to 3900 CFM. Retrofitting the Krueger® air terminals requires removing the mechanical regulator(s) and replacing it (them) with a panel containing the appropriate number and size retrofit valves. Control sequence drawings 595A through 595D illustrate the number of valves and the dimensions of the panel required for each CVM air terminal.

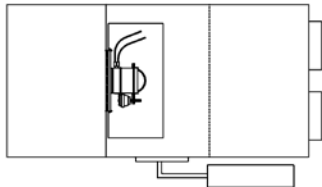
**XG-RA-500 TECHNICAL DATA continued**



**Connor® Series**  
Replace mechanical regulator(s) with panel mounted single or dual round retrofit valves. Retrofit is achieved through a bottom access panel. One actuator per valve or pair of valves, field or factory mounted on valve body. Flow Controller panel mounted on HVE air terminal casing in the field.

**CONNOR®**

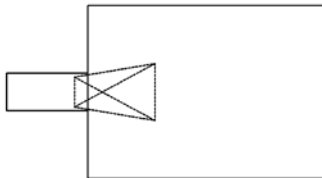
Connor® Series HV, SD, DD, DS, RH and DC mechanical air terminals may require 1 or 2 Greenheck XG-RA retrofit valves mounted on 1 to 4 panels. Each valve is equipped with a multi-point air flow sensor. Connor® HV air terminals were originally manufactured in a variety of sizes to deliver from 100 to 4000 CFM. Retrofitting the Connor® air terminals requires removing the mechanical regulator(s) and replacing it (them) with the appropriate number of retrofit valves usually mounted in a single panel, but in the case of the largest air terminal, 8 valves in 4 panels are required. Retrofit is achieved through a bottom access panel. Control sequence drawings 596A through 596F illustrate the dimensions of the panel and valve(s) required for each air terminal model.



**Carnes® Series**  
Replace mechanical regulator(s) with 1 or 2 panels, each supporting 1 or 2 round retrofit valves. One actuator per panel, field or factory mounted on 1 valve body. Flow Controller panel mounted on air terminal casing in the field.

**CARNES®**

Carnes® Models MH, SH and TH mechanical air terminals require 1, 2 or 3 Greenheck XG-RA round retrofit valves mounted in a single panel. Each valve is furnished with a multi-point air flow sensor. Carnes® air terminals were originally manufactured in a variety of sizes to deliver from 100 to 2000 CFM. Retrofitting the Carnes® air terminals requires removing the mechanical regulator(s) and replacing it (them) with a panel containing the appropriate number and size retrofit valves. Control sequence drawings 597A through 597H illustrate the number of valves and the dimensions of the panel required for each air terminal.



**Trane® Series**  
Replace mechanical regulator (inlet valve) with a flanged retrofit valve. Flow controller is factory mounted on retrofit unit.

**TRANE® SERIES**

Trane® models VD, VC and VF mechanical air terminal require a single retrofit valve, the same nominal size as the terminal inlet. Retrofit valve is equipped with a flow sensor. Retrofitting requires removing the original inlet mechanical regulator and replacing it with a retrofit unit. Trane® retrofit can be shipped with controls mounted and wired.

## XG-RA-500 SELECTION DATA

Mechanical Air Terminal Data				Greenheck Model XG-RA-500 Retrofit Assembly Data*			
Manufacturer's Name (Models)	Size	Inlet Size	Flow Range	Quantity Needed	Order Number	Valve Size(s)	Total Capacity
<b>Anemostat® HV-C</b>	5	5"	150-174	1	592A	6"	600
	5	5"	175-300	1	592B	6"	600
	6	6"	200-300	1	592B	6"	600
	6	6"	300-500	1	592C	6"	600
	7	7"	300-500	1	592C	6"	600
	7	7"	450-750	1	592D	6"	1200
	8	8"	450-750	1	592D	6"	1200
	8	8"	700-1150	1	592E	6"	1200
	10	10"	700-1150	1	592E	6"	1200
	10	10"	1000-1300	1	592F	10"	1600
	12	12"	1000-1500	1	592F	10"	1600
	12	12"	1501-2100	1	592G	10"	2200
	14	14"	1600-2200	2	592E	2-6"	2400
	14	14"	2201-4000	4	2-592D&E	4-6"	4800
	16	16"	3000-4000	3	1-592D,F&G	2-6", 3-10"	5000
	16	16"	4001-5400	4	1-592D,E,F,G	4-6", 3-10"	6200
<b>Barber-Coleman® HS, HD</b>	5	5"	100-400	1	593A	6"	600
	6	6"	300-600	1	593B	8"	1000
	8	8"	600-900	1	593C	8"	1000
	10	10"	900-1600	1	593D	10"	1600
	12	12"	1600-2400	1	593E	10"	3200
	14	14"	2400-3400	1	593F	2-12" Oval	4400
	16	16"	3400-5000	1	593G	2-14" Oval	6000

\* One XG-RA unit may have multiple valves. Since XG-RA valves have higher capacities than existing mechanical regulators, select quantity of XG-RA units by retrofitted CFM desired and blank off extra openings. XG-RA assemblies are offered as basic units (502B), units with pneumatic actuators (510N) and units with 24V floating electric actuators (550N). All XG-RA units include the Greenheck, multipoint, averaging and amplifying flow sensor. See submittal drawings for full descriptions.

Caution: Manufacturers sometimes vary mounting dimensions without changing model numbers. It is recommended that several XG-RA assemblies be tested at the installation site before large orders are manufactured.

**XG-RA-500 SELECTION DATA continued**

<i>Mechanical Air Terminal Data</i>				<i>Greenheck Model XG-RA-500 Retrofit Assembly Data*</i>			
<i>Manufacturer's Name (Models)</i>	<i>Size</i>	<i>Inlet Size</i>	<i>Flow Range</i>	<i>Quantity Needed</i>	<i>Order Number</i>	<i>Valve Size(s)</i>	<i>Total Capacity</i>
<b>Buensod® H, HL</b>	4H	4"	50-230	1	594B	6"	600
	5H	5"	200-350	1	594B	6"	600
	6H	6"	300-450	1	594B	6"	600
	7H	7"	400-650	1	594C	8"	1000
	8H	8"	600-850	1	594D	8"	1000
	9H	9"	800-1050	1	594D	8"	1000
	10H	10"	1000-1300	1	594E	10"	1600
	HLA	30x14"	1200-2000	2	594D	2-8"	2000
	HLB	30x14"	2000-2500	2	594E	2-10"	3200
	HLC	40x16"	2500-3000	1	594H	3-8"	3000
HLD	40x16"	3000-4000	1	594I	3-10"	4800	
<b>Krueger® CVM</b>	4	4"	100-200	1	595A	6"	600
	5	5"	175-300	1	595A	6"	600
	6	6"	300-450	1	595A	6"	600
	7	7"	400-600	1	595B	8"	1000
	8	8"	500-800	1	595B	8"	1000
	9	9"	700-1000	1	595B	8"	1000
	10	10"	800-1200	1	595C	2-6"	1200
	12	12"	1000-1600	1	595D	6", 8"	1600
	1212	12 1/2"x12"	1500-2500	2	595C	4-6"	2400
	1614	16 1/2"x16"	1800-3000	2	595D	2-6", 2-8"	3200
2014	20 1/2"x20"	2400-3900	2	595D	2-6", 2-8"	3200	
<b>Titus® HD, LD, HS, TD, TS</b>	A	4-5-6"	50-240	1	590B	8"	1000
	B	6-7-8"	100-480	1	590B	8"	1000
	C	7-8-9-10"	150-720	2	590B	8"	2000
	D	9-10-12"	200-960	2	590B	8"	2000
	E	12-14"	250-1200	2	590B	8"	2000
	F	14-16"	350-1680	2	590B	8"	2000
	G	20x16"	450-2160	3	590B	8"	3000
	H	20x16 / 24x16	550-2640	3	590B	8"	4000
	J	24x16	650-3120	4	590B	8"	4000

\* One XG-RA unit may have multiple valves. Since XG-RA valves have higher capacities than existing mechanical regulators, select quantity of XG-RA units by retrofitted CFM desired and blank off extra openings. XG-RA assemblies are offered as basic units (502B), units with pneumatic actuators (510N) and units with 24V floating electric actuators (550N). All XG-RA units include the Greenheck, multipoint, averaging and amplifying flow sensor. See submittal drawings for full descriptions.

Caution: Manufacturers sometimes vary mounting dimensions without changing model numbers. It is recommended that several XG-RA assemblies be tested at the installation site before large orders are manufactured.

**XG-RA-500 SELECTION DATA continued**

Mechanical Air Terminal Data				Greenheck Model XG-RA-500 Retrofit Assembly Data*			
Manufacturer's Name (Models)	Size	Inlet Size	Flow Range	Quantity Needed	Order Number	Valve Size(s)	Total Capacity
<b>Turtle &amp; Bailey® MPM-MVC</b>	A	5"	50-200	1	591A	6"	600
	AB	5"	100-350	1	591B	6"	600
	B	6"	150-550	1	591B	6"	600
	C	7"	200-800	1	591C	8"	1000
	D	8"	800-1300	1	591D	10"	1600
	E	10"	500-2000	1	591E	12" Oval	2200
	F	12"	700-2600	1	591F	14" Oval	3000
<b>Connor® SD, DD, DS, RH, DC</b>	4	4"	100-200	1	596A	6"	600
	5	5"	150-325	1	596B	6"	600
	6	6"	250-425	1	596C	6"	600
	7	7"	350-650	1	596D	2-6"	1200
	8	8"	500-850	1	596E	2-6"	1200
	10	10"	650-1200	1	596F	2-6"	1200
	12	12"	800-1800	2	596E	4-6"	2400
	14	14"	1500-3000	4	596E	8-6"	4800
	16	16"	2100-4000	4	596F	8-6"	4800
<b>Carnes® MH, SH, TH</b>	1004-2004	4"	75-200	1	597A	6"	600
	0005	5"	175-350	1	597B	6"	600
	0006	6"	250-500	1	597C	6"	600
	0007	7"	325-650	1	597D	6"	600
	0008	8"	425-850	1	597E	2-6"	1200
	0009	9"	550-1100	1	597F	2-6"	1200
	0010	10"	700-1400	1	597G	3-6"	1800
	0012	12"	1000-2000	1	597H	2-8"	2000
<b>Trane® VD, VC, VF</b>	03	5"	300	1	598A	1-6"	600
	06	6"	600	1	598A	1-6"	600
	11	8"	1100	1	598B	1-8"	1000
	17	10"	1700	1	598C	1-10"	1600
	24	12"	2400	1	598D	1-12"	2400
	32	14"	3200	1	598E	1-14"	3200
	42	16"	4200	1	598F	1-16"	4200

\* One XG-RA unit may have multiple valves. Since XG-RA valves have higher capacities than existing mechanical regulators, select quantity of XG-RA units by retrofitted CFM desired and blank off extra openings. XG-RA assemblies are offered as basic units (502B), units with pneumatic actuators (510N) and units with 24V floating electric actuators (550N). All XG-RA units include the Greenheck, multipoint, averaging and amplifying flow sensor. See submittal drawings for full descriptions.

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## XG-RA-500 CONTROL SEQUENCE OFFERINGS



### PPD-PNEUMATIC PRESSURE DEPENDENT

- Consult Factory



### PPI-PNEUMATIC PRESSURE INDEPENDENT

- Consult Factory



### EPD-ELECTRIC PRESSURE DEPENDENT

- Consult Factory



### API-ANALOG PRESSURE INDEPENDENT

- Consult Factory



### DDC-DIRECT DIGITAL CONTROL

*BACnet*

- Consult Factory