TECHNICAL BULLETIN
PRODUCT INQUIRY

Air-Tight
Butterfly Valves

GENERAL

NuAire air-tight Butterfly Valves are available in a wide variety of sizes and configurations to direct and control airflow in heating, exhausting and air conditioning installations. The air-tight butterfly valve design features all stainless steel construction and silicon gasketing for high reliability. In addition, each valve is individually pressure tested to assure gas tightness to 2 inches of water. Each air-tight butterfly valve incorporates a single belled and enlarged to accommodate the nominal duct diameter for ease of installation.

NuAire offers two general categories of air-tight butterfly valves:

- Manual Control
- Motorized Control

Both air-tight butterfly valves offer the same quality and reliability features with the only difference being the control method of the valve.

Manual Control

The manual air-tight butterfly valve incorporates a lockable handle to open and close the valve. The heavy duty handle consists of a pointer to indicate percent open, setscrew to lock valve position desired and PVC cover for operator comfort. Below is a list of available manual air-tight butterfly valves.

1. Manual Air-Tight Butterfly Valves

Nominal Valve Diameter	NuAire Model Number
6" Dia.	NU-940-006
8" Dia.	NU-940-008
10" Dia.	NU-940-010
12" Dia.	NU-940-012
14" Dia.	NU-940-014
15" Dia.	NU-940-015

Performance Specifications

To apply these air-tight butterfly valves, additional information is provided.

Construction

Valve Body:	14 GA Type 304 Stainless Steel
Valve Plate:	16 GA Type 304 Stainless Steel (triple layer construction)
Valve Gasket:	Silicon
Hardware:	Stainless Steel

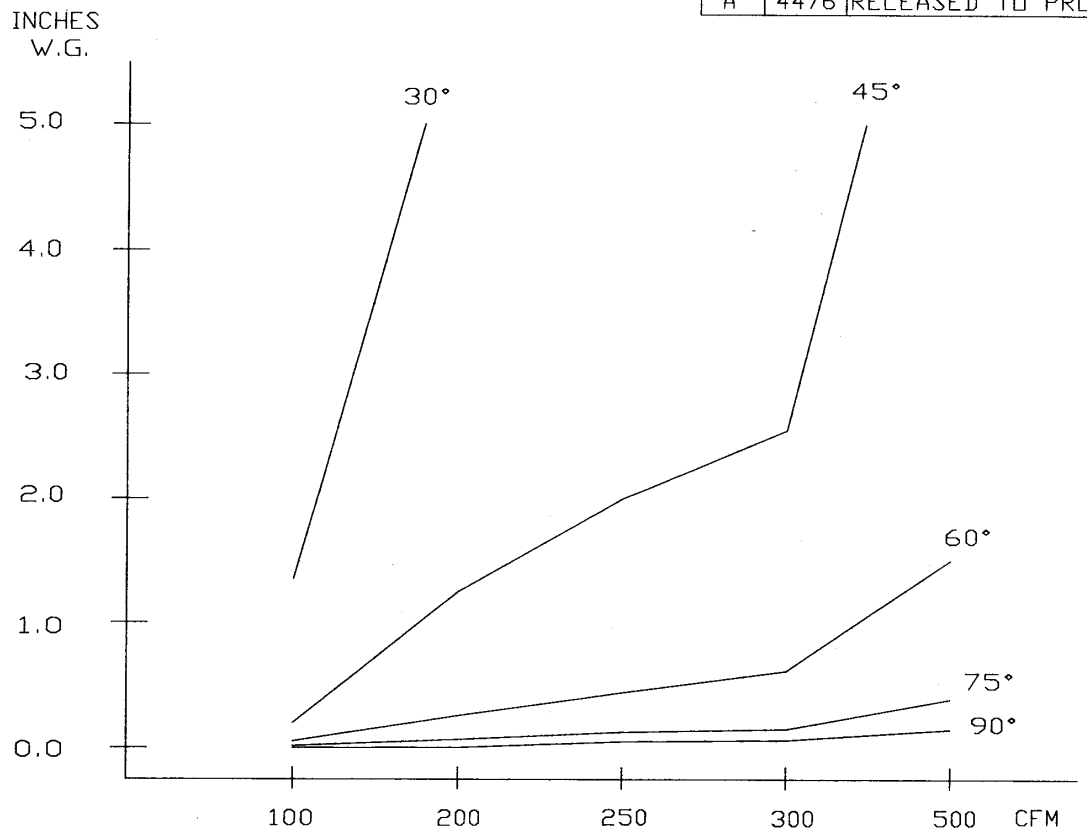
Gas Tightness

Each valve is pressured tested to hold 2 inches H_2O for a minimum of 10 minutes. An additional water leak test is performed by filling the valve with a minimum of 3 inches of water and observing for leakage for a minimum of 10 minutes.

Pressure Loss

The following charts indicate the static losses for each valve diameter. Each chart indicates the valve plate position (30°, 45°, 60°, 75°) with respect to the given CFM which then corresponds to the static loss.

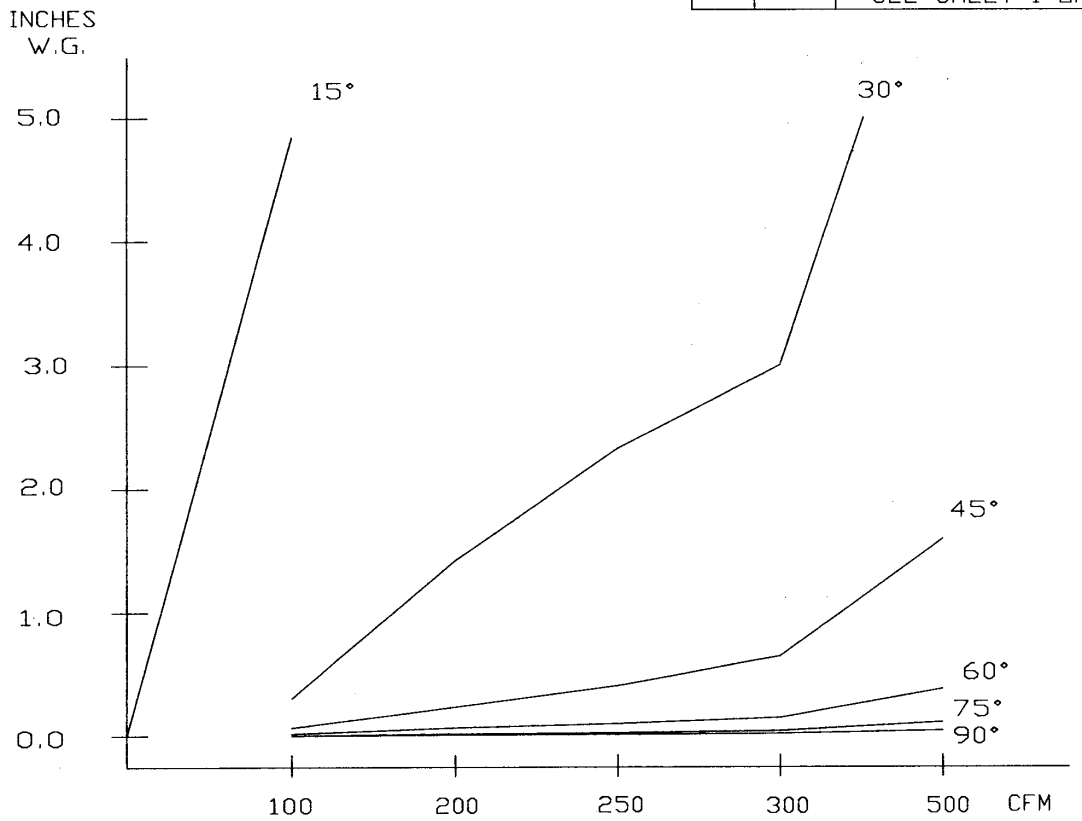
REV	ECO	DESCRIPTION	DATE	INL	INL
A	4476	RELEASED TO PRODUCTION	11/1/94	TH	ES



6 INCH ROUND DAMPER
PRESSURE LOSS CHART

NUAIRE PLYMOUTH, MINNESOTA		
DFTM TH	11/1/94	
CHKD		TITLE: DAMPER LOSS CHART
APPR		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES -TOLERANCES- DECIMALS ±.032 ANGLES ±2°		MATERIAL
		NUMBER ACD-05103 A
		DO NOT SCALE DRAWING SHEET 1 OF 6

REV	ECO	DESCRIPTION	DATE	INL	INL
		SEE SHEET 1 OF 6			



8 INCH ROUND DAMPER
PRESSURE LOSS CHART

NUAIRE
PLYMOUTH, MINNESOTA

DFTM	TH	11/1/94
CHKD		
APPR		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.032
ANGLES ±2°

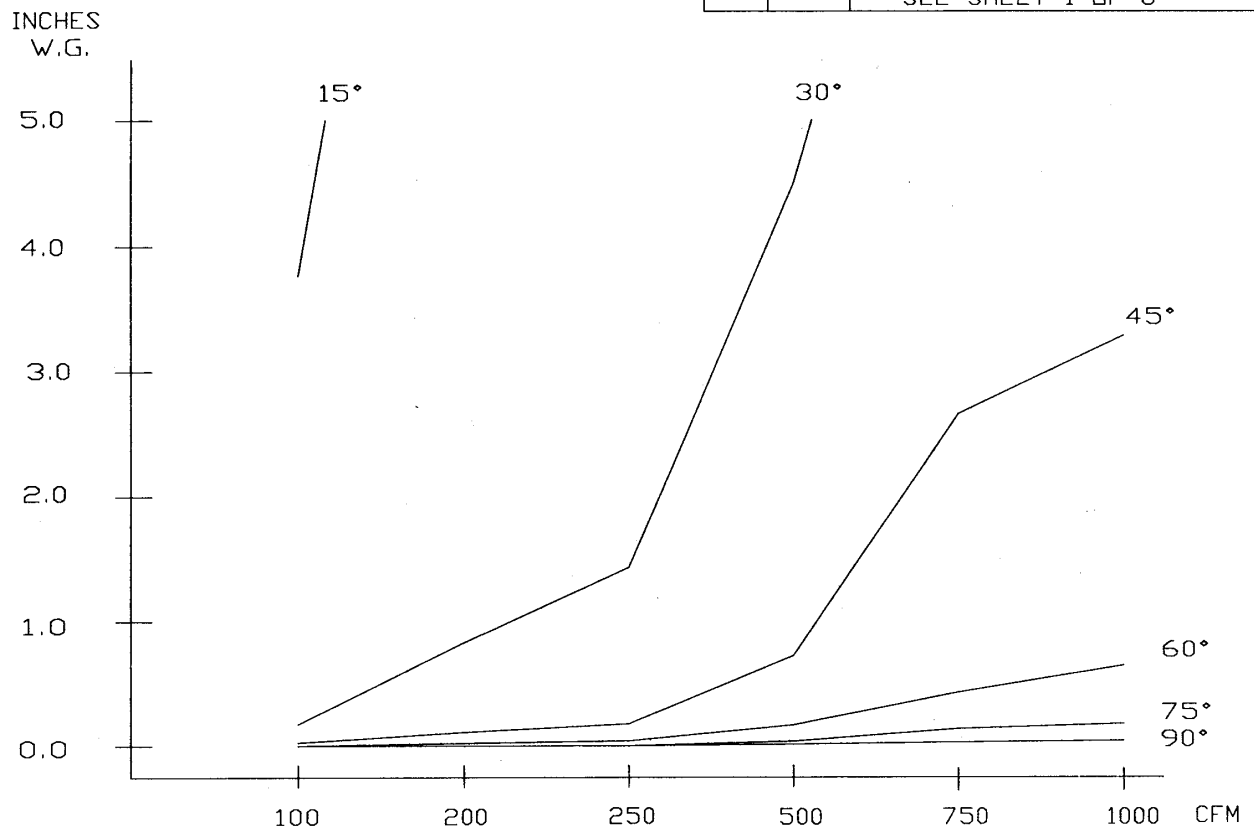
TITLE
DAMPER LOSS CHART

MATERIAL

NUMBER ACD-05103 A

DO NOT SCALE DRAWING | SHEET 2 OF 6

REV	ECO	DESCRIPTION	DATE	INL	INL
		SEE SHEET 1 OF 6			



10 INCH ROUND DAMPER
PRESSURE LOSS CHART

NUAIRE
PLYMOUTH, MINNESOTA

DFTM	TH	11/1/94
CHKD		
APPR		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.032
ANGLES ±2°

TITLE
DAMPER LOSS CHART

MATERIAL

NUMBER ACD-05103 A

DO NOT SCALE DRAWING | SHEET 3 OF 6

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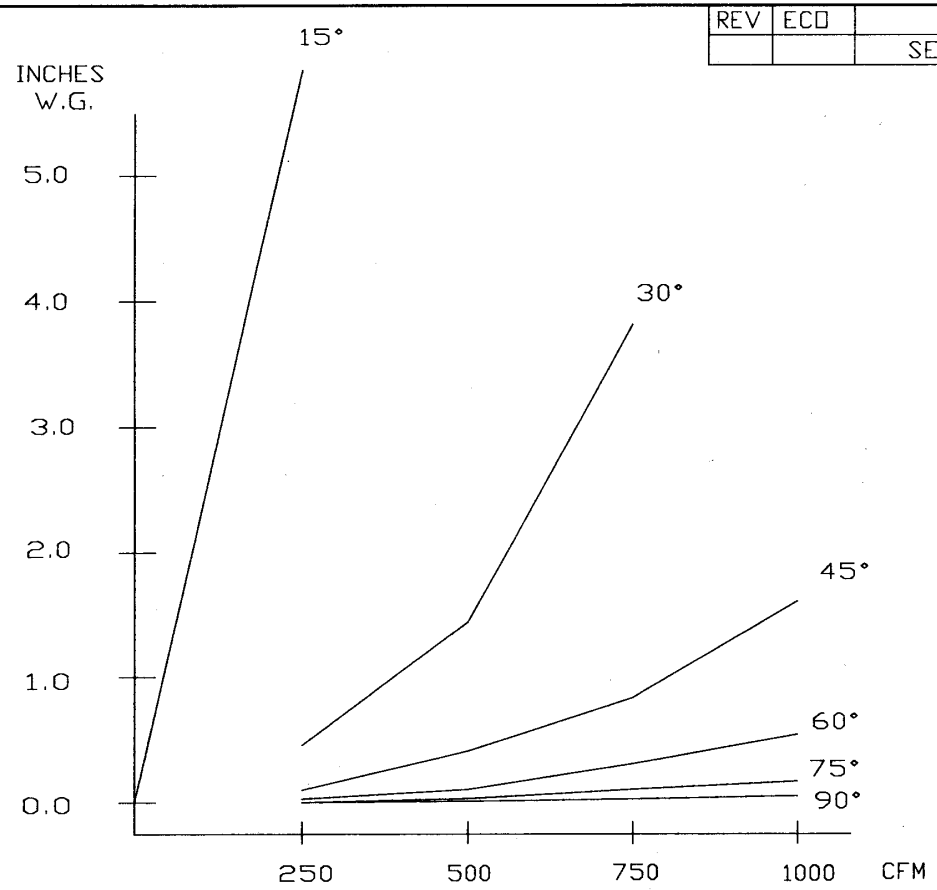
		SEE SHEET 1 OF 6			



12 INCH ROUND DAMPER
PRESSURE LOSS CHART

NUAIRE
PLYMOUTH, MINNESOTA

DFTM	TH	11/1/94
CHKD		
APPR		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.032
ANGLES ±2°

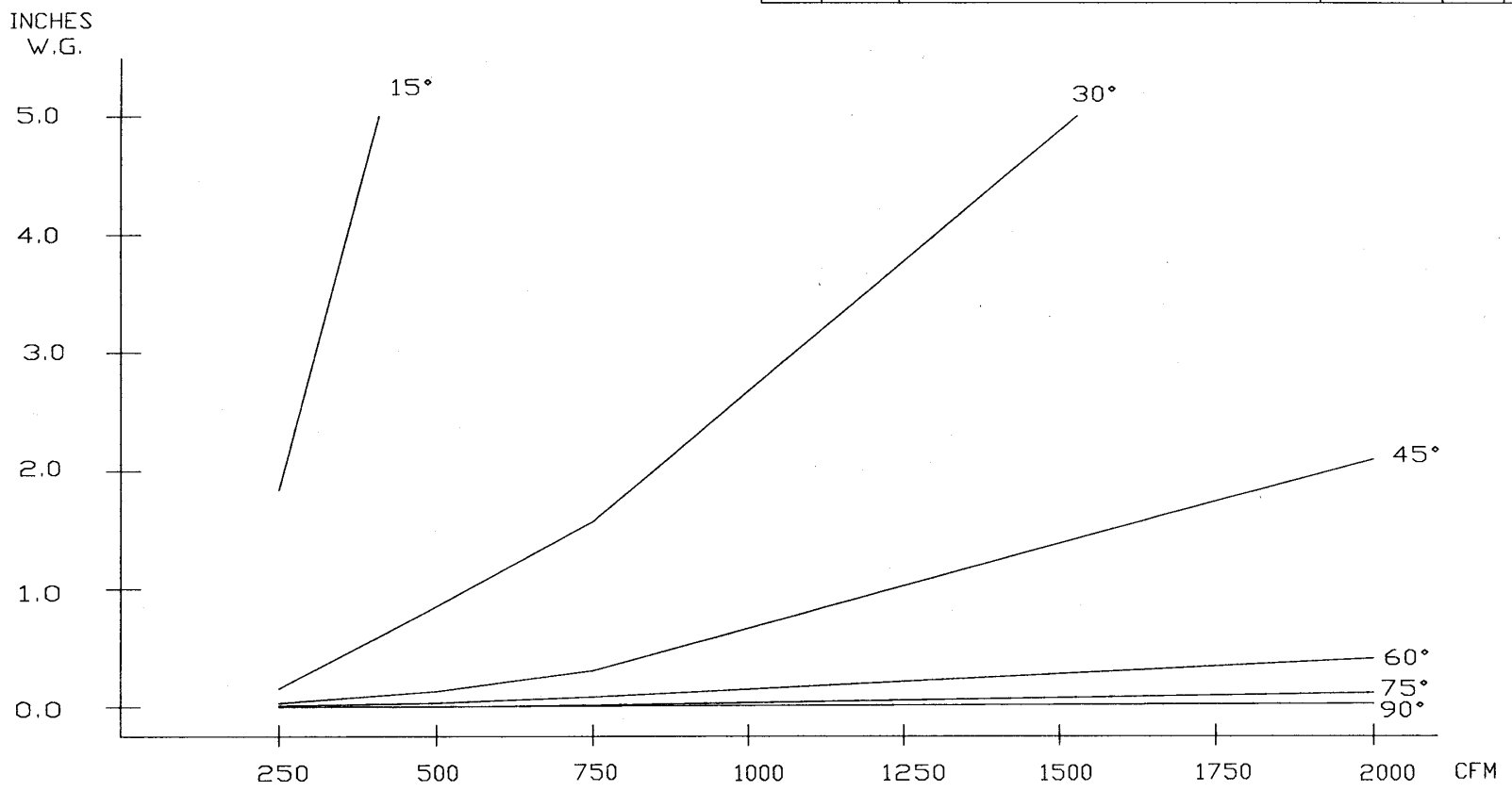
TITLE
DAMPER LOSS CHART

MATERIAL

NUMBER ACD-05103 A

DO NOT SCALE DRAWING SHEET 4 OF 6

REV	ECO	DESCRIPTION	DATE	INL	INL
		SEE SHEET 1 OF 6			



14 INCH ROUND DAMPER
PRESSURE LOSS CHART

NUAIRE
PLYMOUTH, MINNESOTA

DFTM	TH	11/1/94
CHKD		
APPR		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.032
ANGLES ±2°

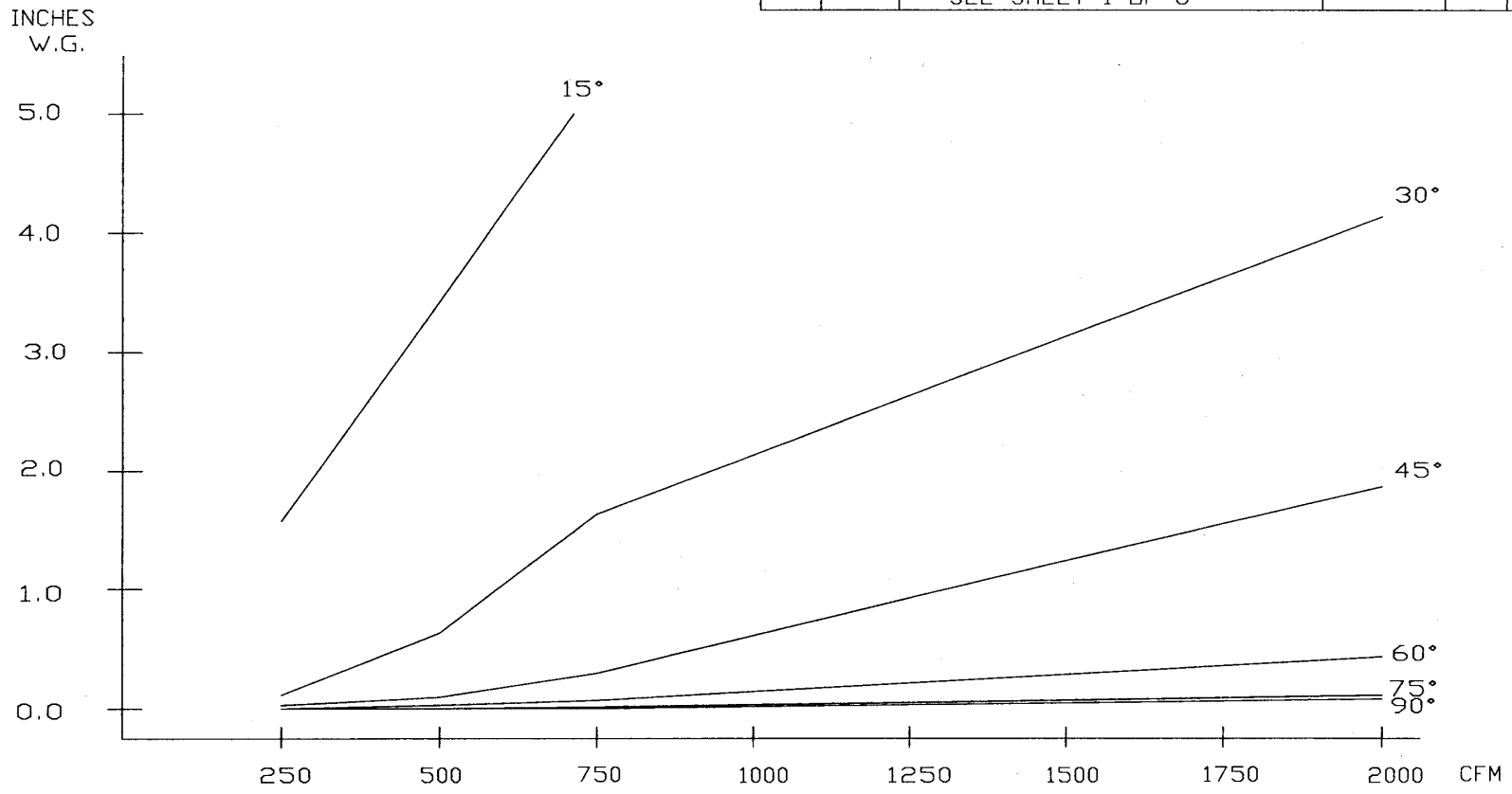
TITLE
DAMPER LOSS CHART

MATERIAL

NUMBER ACD-05103 A

DO NOT SCALE DRAWING SHEET 5 OF 6

REV	ECO	DESCRIPTION	DATE	INL	INL
		SEE SHEET 1 OF 6			



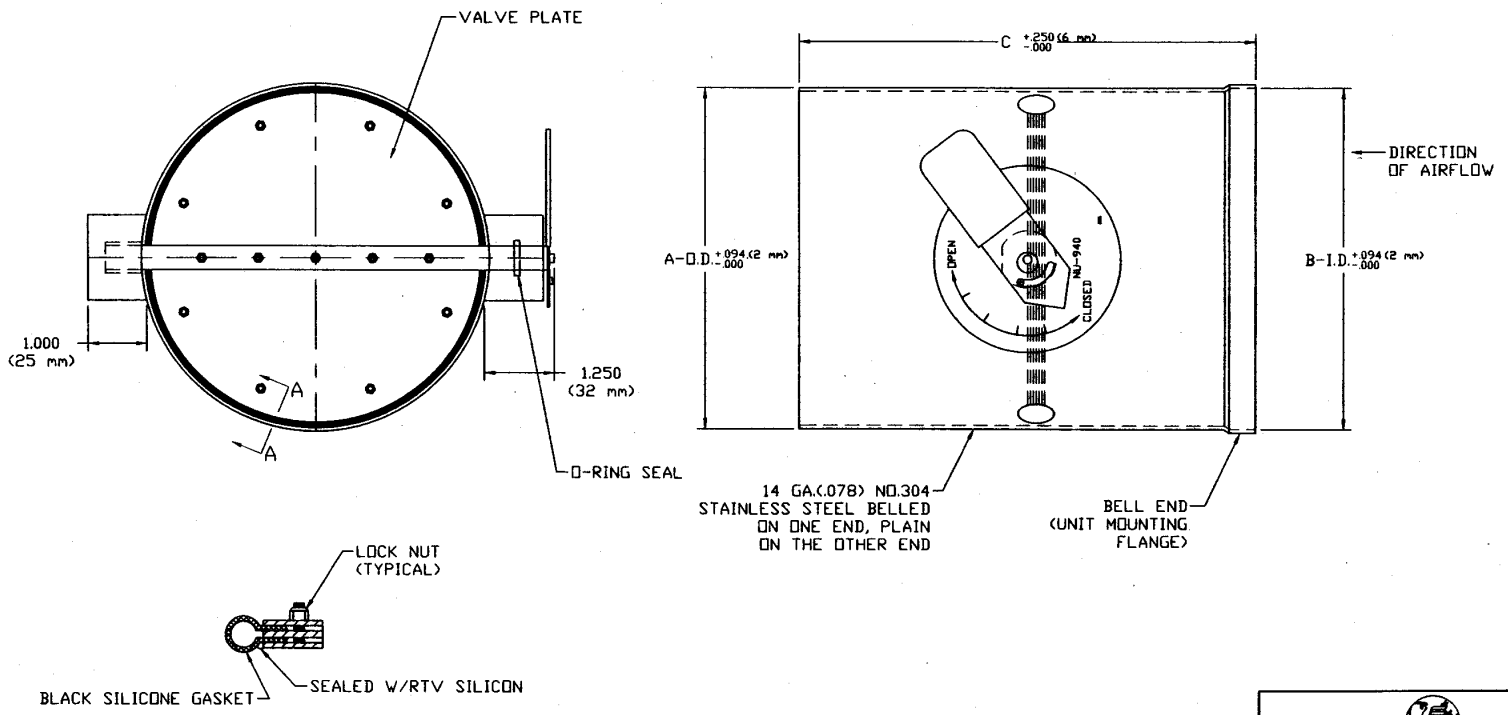
15 INCH ROUND DAMPER
PRESSURE LOSS CHART

NUAIRE PLYMOUTH, MINNESOTA		
DFTM TH	11/1/94	
CHKD		TITLE DAMPER LOSS CHART
APPR		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES -TOLERANCES- DECIMALS ±.032 ANGLES ±2°		MATERIAL
		NUMBER ACD-05103 A
		DO NOT SCALE DRAWING SHEET 6 OF 6

MODEL	A-O.D.	B-I.D.	"C"
NU-940-006	6"(152mm)	6"(152mm)	8"(203mm)
NU-940-008	8"(203mm)	8"(203mm)	10"(254mm)
NU-940-010	10"(254mm)	10"(254mm)	10"(254mm)
NU-940-012	12"(305mm)	12"(305mm)	12"(305mm)
NU-940-014	14"(356mm)	14"(356mm)	14"(356mm)
NU-940-015	15"(381mm)	15"(381mm)	15"(381mm)

REV	ECO	DESCRIPTION	DATE	DRFT	CHKD
E	8430	MAKE STANDARD BCD	8/23/02	JR	DSH

VSV



SECTION A-A

NOTE: EACH DAMPER IS DYNAMICALLY PRESSURE TESTED TO HOLD 2 INCHES(100 MM) W.G. FOR 10 MINUTES AND STATISTICALLY WATER LEAK TESTED TO HOLD A MINIMUM OF 3 INCHES(76 MM) FOR 10 MINUTES.

MANUAL
GAS-TIGHT BUTTERFLY
VALVE

DFTM	BR	11/29/92	CHKD	DSH	SHEET 1 OF 1

DRAWING NUMBER BCD-01412 E

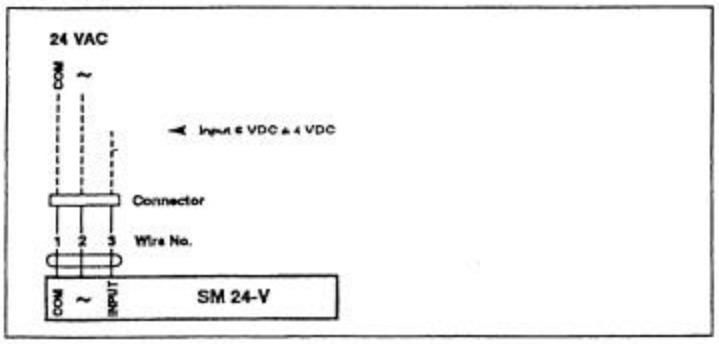
Motorized Control

The automatic air-tight butterfly valve features the use of Belimo R Actuators. Several varieties of Belimo Actuators are available depending upon the application. Below is a list of available motorized air tight butterfly valves with the associated Belimo part number in parenthesis.

1. Motorized Air-Tight Butterfly Valve
   Modulating High Torque (SM24-V)

Nominal Valve Diameter	NuAire Model Number
8" Dia.	NU-950-008
10" Dia.	NU-950-010
12" Dia.	NU-950-012

Wiring diagram

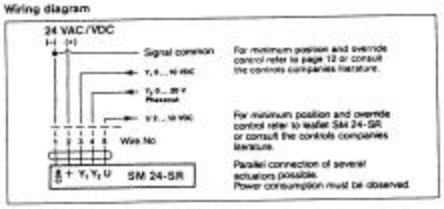


Technical Data	SM 24-V
Power supply	24 VAC ± 20% 50/60 Hz
Power consumption	2.2 W
Transformer sizing	3.6 VA
Electrical connection	3 ft. 18 GA cable with plug connector
Control signal	6 VDC ± 4 VDC (special)
Input impedance	100kΩ (0.1 mA)
Angle of rotation	mechanically limited to 95°
Torque at rated voltage	min. 133 in-lb [15 Nm], max. 180 in-lb [20 Nm]
Direction of rotation	reversible with switch A/B
Position indication	0 . . . 10 (0= stop ↶) and reversible indicator
Running time	200 sec minimum for 0 to 133 in-lb [0 to 15 Nm]
Humidity	5 to 95% RH noncondensing
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	UL 94-V Ø
Noise level	max. 45 dB (A)
Servicing	maintenance free
Weight	3.2 lbs. [1.46 kg]

R Belimo - Belimo Aircontrols (USA) Inc.

2. Motorized Air-Tight Butterfly Valve DC Modulating High Torque (SM24-SR)
(Compatible w/most Commercial (*GM24-SR) Control Systems)

Wiring diagram



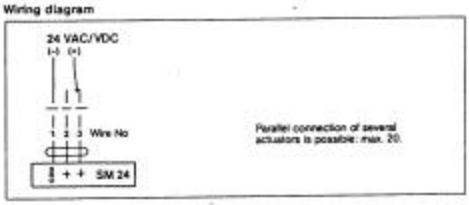
Technical Data	SM 24-SR	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%	
Power consumption	2 W	
Transformer sizing	5 VA	
Electrical connection	3 ft, 18 GA cable	½ in. conduit connector
Control signal Y	Y, 0...10 VDC	Y, 0...20 V phasecut
Input impedance	100 kΩ (0.1 mA)	8 kΩ (50 mW)
Operating range	2...10 VDC	2...10 V phasecut
Parallel running	±5%	
Measuring voltage 'U'	2...10 VDC (max. 0.5 mA) for 0...100%	
Angle of rotation	mechanically limited to 95°	
Torque at rated voltage	min. 133 in-lb [15 Nm], max. 180 in-lb [20 Nm]	
Direction of rotation	reversible with switch A/B with Y=0 Volt A=O stop B=10	
Position indication	0...10 (0 = stop) and reversible indicator	
Running time	100...200 sec for 0 to 133 in-lb [0 to 15 Nm]	
Humidity	5 to 80% RH noncondensing	
Ambient temperature	-22°F to +122°F	[-30°C to +50°C]
Housing	UL 94-V0	
Noise level	max. 45 dB (A)	
Servicing	maintenance free	
Weight	3.2 lbs	[1.46 kg]

Nominal Valve Diameter	NuAire Model Number
6" Dia.	NU-951-006
8" Dia.	NU-951-008
10" Dia.	NU-951-010
12" Dia.	NU-951-012
14" Dia.	*NU-951-014
15" Dia.	*NU-951-015

*GM24-SR is identical to the SM24-SR except it has a higher torque availability at 266 in. lb. minimum.

3. Motorized Air-Tight Butterfly Valve On/Off High Torque (SM-24)

Wiring diagram



Technical Data	SM 24	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%	
Power consumption	1.5 W	
Transformer sizing	4 VA	
Electrical connection	3 FT, 18 GA cable	½ in. conduit connector
Angle of rotation	mechanically limited to 95°	
Torque at rated voltage	min. 133 in-lb max. 180 in-lb	[15 Nm] [20 Nm]
Direction of rotation	reversible with switch A/B	
Position indication	0...10 (0 = stop) and reversible indicator	
Running time	90...150 sec	for 0 to 133 in-lb [0 to 15 Nm]
Humidity	5 to 80% RH noncondensing	
Ambient temperature	-22°F to +122°F	[-30° C to +50° C]
Housing	UL 94-V0	
Noise level	max. 45 dB (A)	
Servicing	maintenance free	

Nominal Valve Diameter	NuAire Model Number
6" Dia.	NU-952-006
8" Dia.	NU-952-008
10" Dia.	NU-952-010
12" Dia.	NU-952-012

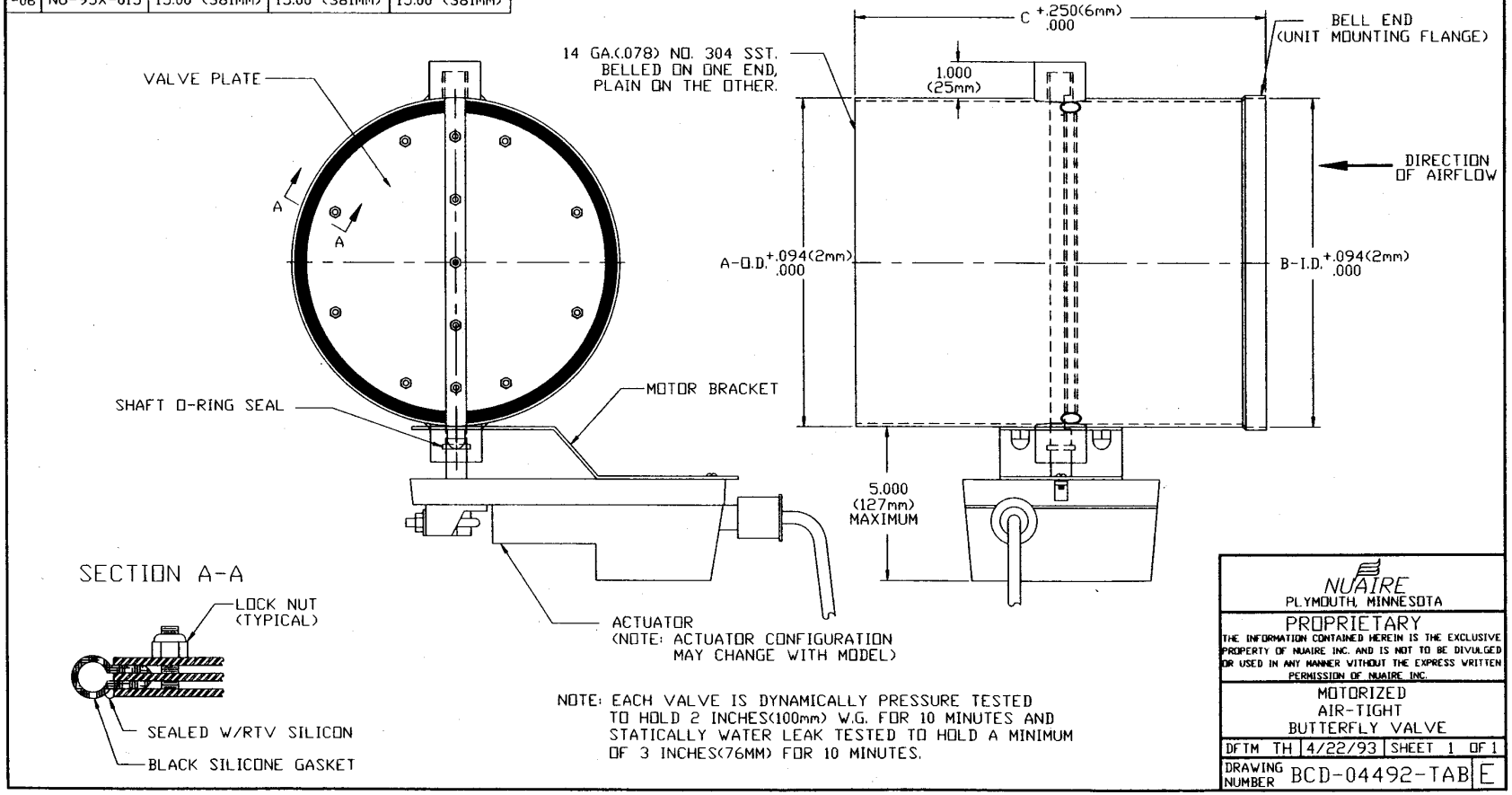
4. Motorized Air-Tight Butterfly Valve DC Modulating High Torque With Spring Return (AF24-SR US)

Technical Data	AF24-SR (-S) us
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running: 6 W ; holding: 2 W
Transformer sizing	10 VA (class 2 power source)
Electrical connection	3 ft, 18 GA appliance cable 1/2" conduit connector
Overload protection	Electronic throughout 0 to 95° rotation
Control signal Y	Y_1 0 to 10 VDC, Y_2 0 to 20 V phasecut, 0 to 20 mA
Input impedance	100 kΩ (0.1 mA), 8 kΩ (50 mW), 500Ω
Operating range	2 to 10 VDC, 2 to 10 V phasecut, 4 to 20 mA
Feedback output "U"	2 to 10 VDC (max. 0.5 mA) for 95°
Angle of rotation	mechanically limited to 95°
Torque	133 in-lb [15 Nm] constant
Direction of rotation	spring return selected by L/R mounting motor can be selected by L/R switch
Position indication	visual indicator, -5° to 90° (-5° is spring return position)
Manual override	3mm hex crank (shipped w/actuator)
Auxiliary switches (AF24-SR-S)	2 x SPDT 6A (2.5A) @ 240 VAC, UL listed one set at +5°, one adjustable 25° to 65°
Running time	150 sec. constant, independent of load, spring return < 20 sec
Humidity	5 to 95% RH noncondensing
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA type 1
Housing material	zinc coated metal
Agency listings	UL 873 listed; CSA 4813 02 certified
Noise level	max. 45 dB (A)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	6.0 lbs (2.7 kg.)

Nominal Valve Diameter	NuAire Model Number
6" Dia.	NU-953-006
8" Dia.	NU-953-008
10" Dia.	NU-953-010
12" Dia.	NU-953-012

TAB	MODEL	A-O.D.	B-I.D.	"C"
-01	NU-95X-006	6.00 (152mm)	6.00 (152mm)	8.00 (203mm)
-02	NU-95X-008	8.00 (203mm)	8.00 (203mm)	10.00 (254mm)
-03	NU-95X-010	10.00 (254mm)	10.00 (254mm)	10.00 (254mm)
-04	NU-95X-012	12.00 (305mm)	12.00 (305mm)	12.00 (305mm)
-05	NU-95X-014	14.00 (356mm)	14.00 (356mm)	14.00 (356mm)
-06	NU-95X-015	15.00 (381mm)	15.00 (381mm)	15.00 (381mm)

REV	ECO	DESCRIPTION	DATE	INL	INL
E	5109	UPDATED PRINT	1/5/96	TW	TW



NOTE: EACH VALVE IS DYNAMICALLY PRESSURE TESTED TO HOLD 2 INCHES(100mm) W.G. FOR 10 MINUTES AND STATICALLY WATER LEAK TESTED TO HOLD A MINIMUM OF 3 INCHES(76MM) FOR 10 MINUTES.

NUAIRE
PLYMOUTH, MINNESOTA

MOTORIZED
AIR-TIGHT
BUTTERFLY VALVE

DFTM TH	4/22/93	SHEET 1 OF 1

DRAWING NUMBER BCD-04492-TAB E

Installation

NuAire air-tight butterfly valves can be installed using standard HVAC duct connection techniques. To assure a tight connection, NuAire recommends the use of silicon RTV. NuAire also recommends the use of a neoprene sleeve (NuAire neoprene connection collar Part #NU-940-001) on at least one side of the valve connection. The neoprene sleeve facilitates the potential removal of the valve for service. Below, figures 1 & 2 illustrate typical air-tight butterfly valve installations.

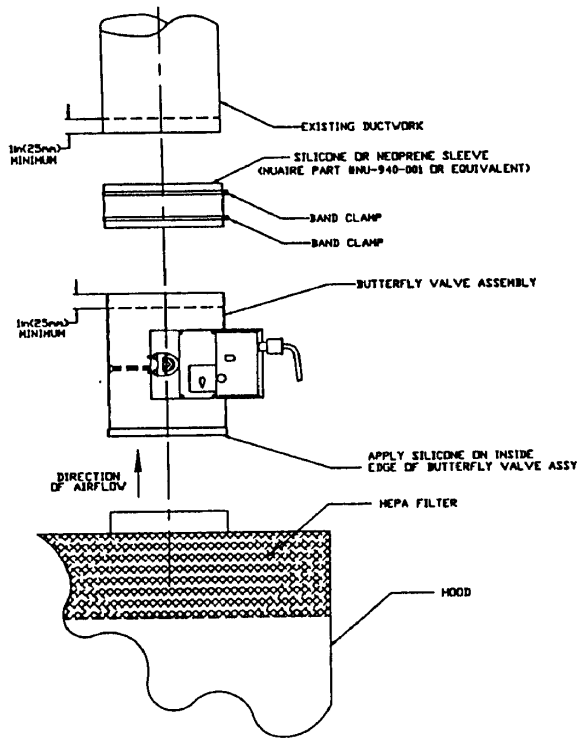


FIGURE 1
RECOMMENDED AIR-TIGHT
BUTTERFLY VALVE INSTALLATION TO HOOD

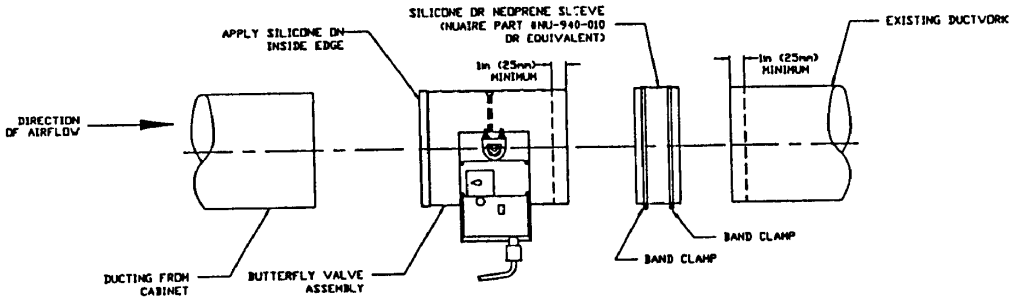


FIGURE 2
RECOMMENDED AIR-TIGHT
BUTTERFLY VALVE INSTALLATION TO A DUCT