



ECON VENTURI VALVE

CONSTANT VOLUME(CV)

BINARY STATE(BV)/VARIABLE VOLUME(VV)

Operating and Instruction Manual



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Venturi Type Valve

ECON venturi type valve is pressure independent airflow terminal unit to control airflow accurately. Venturi type of valve is widely used in critical operation area to control fume cupboard face velocity and room pressure. The variable volume valve can maintain preset volume over a range of 150 to 750 Pa by internal spring cone structure to sense the pressure change across the valve.

ECON venturi valve is available in aluminum body with stainless steel components. When corrosion resistance required, special coating will be applied. ECON series have several standard sizes from 6" to 16" in diameter for single valve body. When more flow required than can be furnished through a single 16" valve, multiple valves can be paralleled to meet required additional flow. The venturi valve will control air flow for both supply and exhaust ducts based on air volume preset by fast actuator. This valve in its normal operating mode is pressure independent so that flow can always maintain constant volume.

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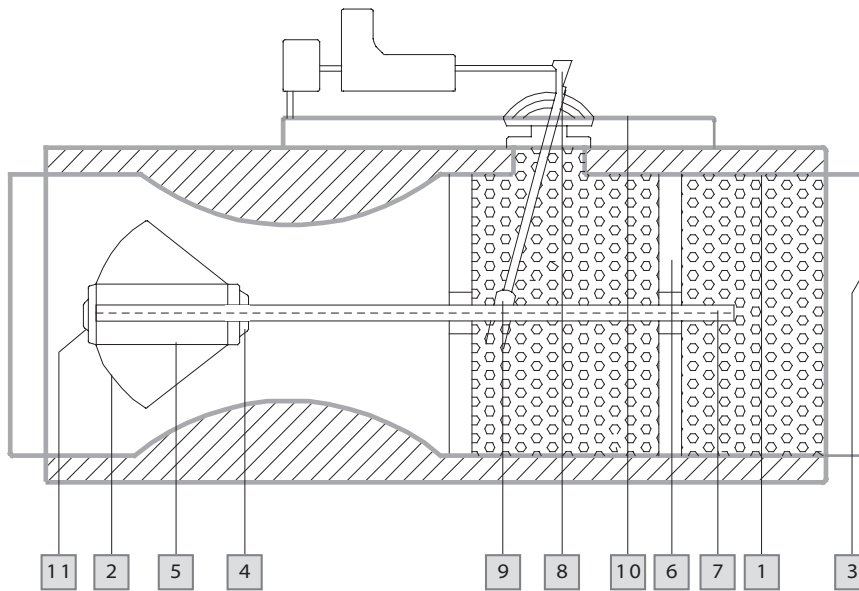
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Valve Structure

1.0



Item	Description	Material
1	Valve body	Aluminum
2	Adjusting cone	Aluminum
3	Linkage	SS440
4	Spring cap	Aluminum
5	Cylinder	Aluminum
6	Draft frame	SUS304
7	Draft	SUS304
8	Lever	SUS304
9	Cone guide	SUS304
10	Actuator base	SUS304
11	Cylinder cap	Aluminum

Design Features

1.1

ECON venturi valve incorporates a built – in sound attenuator. It is uniquely constructed of perforated aluminum with one-inch high quality fiberglass lined with special coating to resist erosion. The outside is covered with a 26 gauge galvanized steel jacket. The discharge and radiated noise levels are substantially reduced. The unit is completely thermally insulated.

If required volume through valve is over single valve, multiple venturi valves can be paralleled to provide additional flow. The static pressure range is 150Pa to 750Pa. The material of valve body and cone are aluminum. The shaft is stainless and the bearing is Teflon or Heresite coated.

**Note:**

Special coating available if required.

ECON venturi valve can be controlled either by pneumatic or electric control system. No main air piping or consumption is required.

Standard Design Features:

- Fully pressure independent on range of 150 to 750 Pa
- No main air consumption of pneumatic actuator
- Factory set on range of whole designed volume
- Fully insulated with 26g Galv. Cover
- High accuracy of 5% on designed volume range
- Less than 1 second response time
- 16 points pre-calibrated in factory for VV valve
- Compact design for easy installation

Optional Design Features:

- Hot water & electric booster coils
- Dual duct systems
- Multiple valve assemblies
- Special coating provided for acid resistance
- Pressure switch optional for fume cupboard alarm

Volume Range

1.2

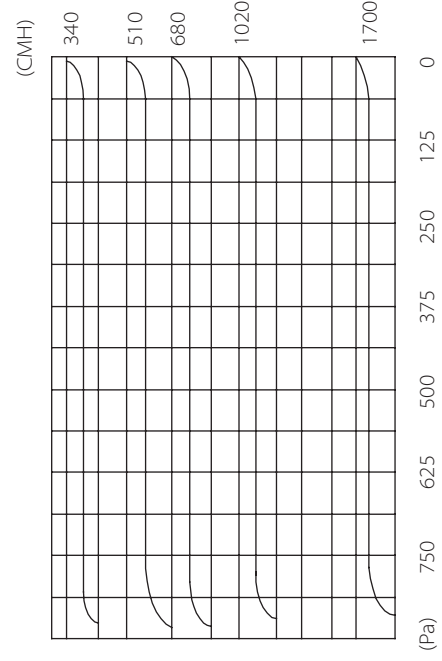
1.2b Multiple Valve CV/BV/VV NORMAL TYPE

SIZE of single valve	No. of valves	Middle Pressure 150-750Pa (CMH)	High Pressure 300-1250Pa (CMH)
12"(300mm)	1	300-2400	510-3400
	2	600-4800	1020-6800
	3	900-7200	1530-10200
	4	1200-9600	2040-13600
16"(400mm)	1	550-4000	
	2	1100-8000	
	3	1650-12000	
	4	2200-16000	

1.2a Single Valve CV/BV/VV NORMAL / SHUT-OFF TYPE

Operating Static Pressure	Middle Pressure 150-750 Pa		High Pressure 300-1250 Pa	
	NORMAL TYPE(CMH)	SHUT-OFF TYPE(CMH)	NORMAL TYPE(CMH)	SHUT-OFF TYPE(CMH)
06"(150mm)	50-450	0-425	85-770	0-680
08"(200mm)	155-770	0-680	190-1300	0-1100
10"(250mm)	200-1700	0-1250	260-2400	0-2100
12"(300mm)	300-2400	0-1800	510-3400	0-2600
16"(400mm)	550-4000	0-3000	800-5400	0-4000

1.2d Pressure Independence Curve



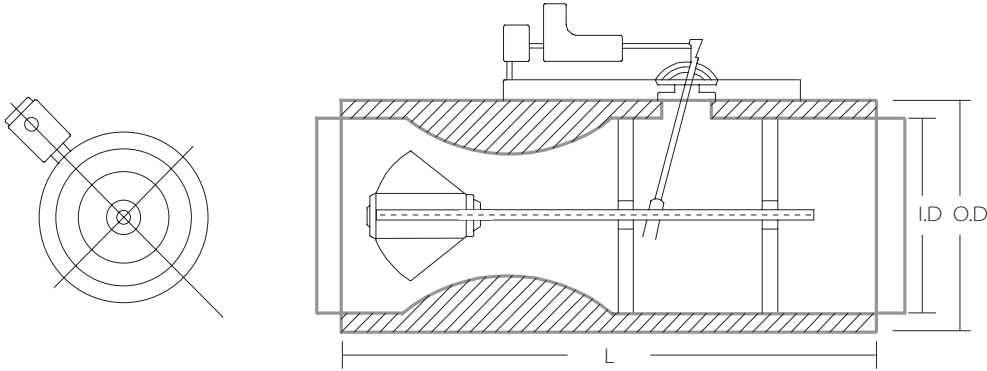
1.2c Multiple Valve CV/BV/VV SHUT-OFF TYPE

SIZE of single valve	No. of valves	Middle Pressure 150-750Pa (CMH)	High Pressure 300-1250Pa (CMH)
12"(300mm)	1	0-1800	0-2600
	2	0-3600	0-5200
	3	0-5400	0-7800
	4	0-7200	0-10400
16"(400mm)	1	0-3000	
	2	0-6000	
	3	0-9000	
	4	0-12000	

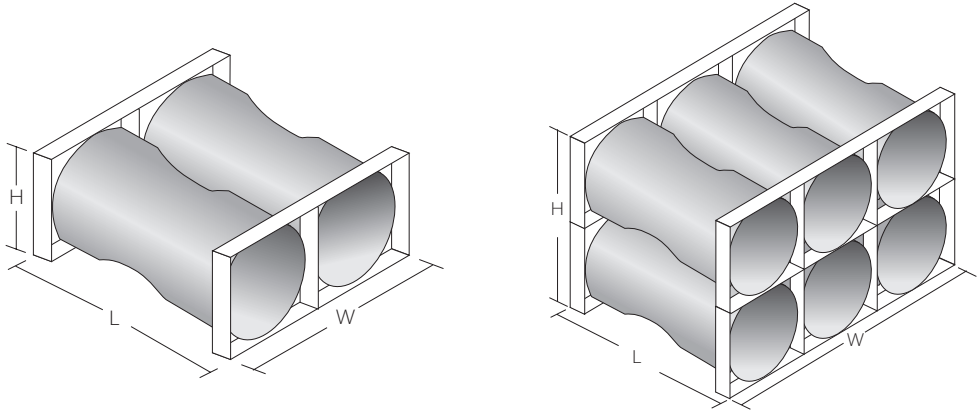
Dimensions

1.3

1.3a Single Valve CV/BV/VV NORMAL TYPE / SHUT-OFF TYPE



1.3b Multiple Valve CV/BV/VV NORMAL TYPE / SHUT-OFF TYPE



SIZE (Diameter)	DIMENSIONS (mm)		
	I.D	O.D	L
06" (150mm)	150	200	560
08" (200mm)	200	250	630
10" (250mm)	250	300	680
12" (300mm)	300	350	680
16" (400mm)	400	450	920

SIZE of single valve	No. of valves	DIMENSIONS (mm)		
		W	H	L
12"(300mm)	1	350	350	680
	2	740	370	840
	3	1110	370	840
	4	740	740	840
16"(400mm)	1	450	450	920
	2	940	470	1080
	3	1410	470	1080
	4	940	940	1080

Air-Regenerated Noise

1.4

Discharge Noise, Single Valve, Normal Type

SIZE (Diameter)	100 Pa							250 Pa							500 Pa							750 Pa										
	VOLUME (CMH)							OCTAVE BAND							OCTAVE BAND							OCTAVE BAND										
	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC				
6"	170	58	38	36	29	25	27	<20	<20	55	45	43	37	32	34	<20	<20	59	52	51	44	39	41	<20	<20	63	59	51	46	48	23	
	255	53	40	38	32	28	27	<20	<20	56	47	45	40	35	36	<20	<20	62	55	53	46	42	43	<20	<20	64	61	61	53	49	50	24
	340	55	42	40	35	31	31	<20	<20	57	49	40	35	31	31	<20	<20	65	58	55	48	45	45	<20	<20	65	63	63	55	52	52	27
	425	56	44	42	38	34	33	<20	<20	58	51	42	38	34	33	<20	<20	68	61	57	40	48	47	20	20	70	65	65	57	55	54	29
8"	510	58	43	42	38	34	33	<20	<20	63	51	42	38	34	33	<20	<20	68	59	57	52	48	47	20	20	72	66	65	58	55	54	29
	595	59	45	44	37	32	28	<20	<20	64	53	44	37	32	28	<20	<20	69	61	59	53	51	49	23	23	73	68	67	60	58	56	31
	680	60	47	46	39	35	30	<20	<20	65	55	46	39	35	30	<20	<20	70	63	62	55	54	51	25	25	74	70	69	58	59	59	30
	765	61	46	48	41	38	32	<20	<20	66	57	48	41	38	32	20	20	71	65	64	57	57	53	29	29	76	72	71	64	64	60	35
10"	765	61	51	47	39	35	41	<20	<20	67	59	47	39	35	41	20	20	72	63	61	51	51	52	26	26	76	70	69	58	59	59	30
	1105	63	52	49	41	38	43	<20	<20	70	59	56	58	47	49	21	21	75	65	63	54	54	54	27	27	79	72	71	61	62	61	31
	1445	65	53	51	44	41	45	<20	<20	73	64	58	64	50	51	22	22	78	67	65	57	57	56	28	28	82	74	73	64	65	63	32
	1700	66	55	53	47	44	47	<20	<20	76	63	60	64	53	53	24	24	81	79	67	60	60	58	30	30	85	76	75	67	68	65	35
12"	1350	60	51	48	43	39	36	<20	<20	69	58	55	53	50	48	<20	<20	73	65	62	59	59	57	24	24	75	69	65	64	62	63	28
	1700	64	55	51	46	42	39	<20	<20	71	60	59	56	51	50	20	20	76	69	65	62	62	60	25	25	79	73	69	67	65	67	29
	2040	68	59	54	49	45	42	<20	<20	73	62	63	59	52	52	21	21	79	73	68	65	65	63	28	28	83	77	73	70	78	71	31
	2380	70	62	57	52	57	45	<20	<20	75	64	67	62	53	54	22	22	82	76	71	68	69	66	30	30	87	81	77	73	71	75	34

Note:

Variable volume valve (V) type (10% up to 100%)

Radiated Noise, Single Valve, Normal Type

SIZE (Diameter)	100 Pa							250 Pa							500 Pa							750 Pa							
	VOLUME(CMH)							OCTAVE BAND							OCTAVE BAND							OCTAVE BAND							
	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	
6"	170	43	27	22	21	17	16	<20	46	46	27	22	23	21	<20	50	51	32	28	29	29	<20	53	54	35	33	32	33	<20
	255	45	29	25	24	20	19	<20	48	48	30	25	26	24	<20	53	53	35	31	31	31	<20	56	56	38	36	35	35	<20
	340	47	31	28	27	23	22	<20	50	51	33	28	29	26	<20	56	45	38	34	33	33	<20	59	58	41	39	38	37	<20
	425	49	34	31	30	28	25	<20	54	54	37	32	33	29	<20	60	48	42	38	37	36	<20	63	60	45	43	42	41	<20
	510	52	36	31	27	20	17	<20	58	41	37	32	33	29	<20	62	47	43	39	37	35	<20	65	60	46	43	41	39	<20
8"	595	56	39	34	30	23	20	<20	62	44	40	35	34	32	<20	65	51	46	42	40	39	<20	69	53	49	46	45	43	<20
	680	60	42	37	33	26	23	<20	65	48	43	38	38	36	<20	68	48	43	40	34	31	<20	70	57	52	49	49	46	<20
	765	64	45	40	36	29	26	<20	68	51	45	41	41	39	<20	71	58	53	48	47	46	<20	74	61	55	52	53	48	<20
	765	51	40	35	31	25	25	<20	64	51	45	41	41	39	<20	69	48	43	40	34	31	<20	71	52	46	43	38	38	<20
	1105	55	43	38	34	28	28	<20	67	44	41	37	33	28	<20	72	52	46	43	37	35	<20	74	55	49	46	42	41	<20
10"	1445	59	46	41	37	31	31	<20	70	48	44	40	39	31	<20	75	56	49	46	41	39	<20	77	58	51	49	46	44	<20
	1700	63	49	44	40	43	34	<20	74	51	47	43	42	34	<20	78	59	51	48	44	43	<20	80	61	55	52	50	47	<20
	1350	58	44	43	35	29	25	<20	64	47	45	42	38	38	<20	69	53	50	47	42	43	<20	72	57	55	51	46	43	<20
	1700	61	48	47	39	33	29	<20	68	51	49	46	42	42	<20	74	57	54	50	46	47	20	76	61	58	53	51	47	<20
	2040	64	52	51	43	37	33	<20	72	55	53	50	47	46	<20	78	62	58	55	40	51	20	81	65	63	57	55	51	22
12"	2380	67	56	55	47	41	37	<20	74	56	55	52	49	48	<20	81	64	60	57	53	54	22	84	68	65	59	57	53	25

Note :

Sound Data Based on ETL Report on 479355

The performance tests were conducted in accordance with ARI 880-83, "Industry Standards for Air Terminals"

1. Discharge noise NC based on:

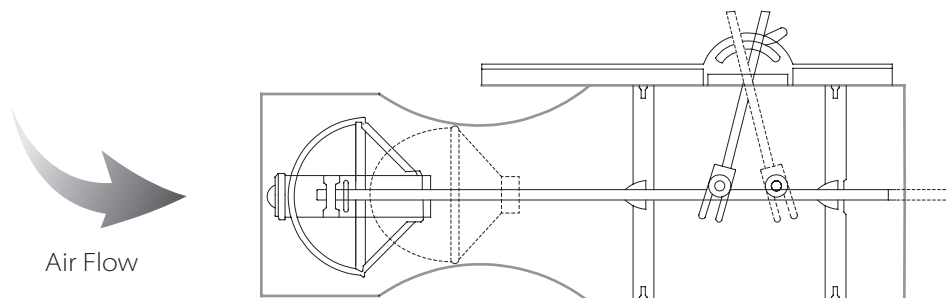
- 5ft(6" and 8" valve) and 10ft(10" and 12" valve)
- Inlet and outlet size equal to valve diameter
- Number of outlets: 340 up to 680 CMH per diffuser

2. Radiated noise NC based on:

- 10dB room absorption
- Ceiling sound transmission class 37-41

3. For 2 Valves in Parallel ADD 3dB

1.5a Constant Volume (CV) Series



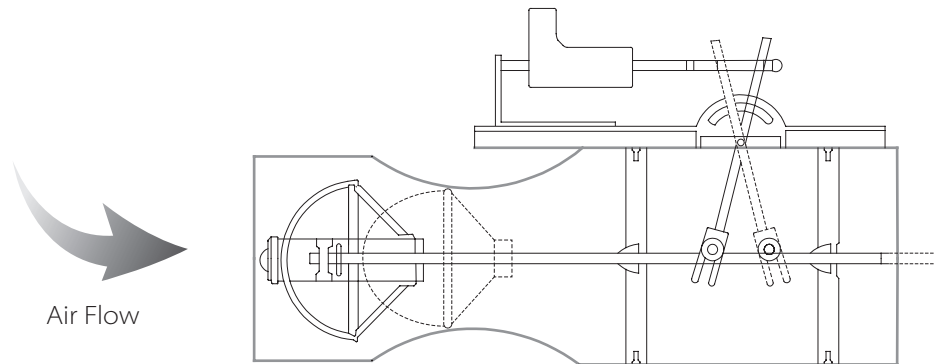
Pressure independent type Constant Volume (CV)

Regardless of the change of static pressure across the valve, it accurately maintains preset volume through the valve according to the location of shaft which can be adjusted manually. The volume through is pre-calibrated in factory of the preset value. The cone structure moves by sensing the changing static pressure and if the pressure between valve ends increases, the cone will move towards the cylinder housing to increase the resistance and if the pressure decreases, the cone will move towards the opposite side to reduce the resistance and maintain the preset volume. Operator can adjust the lever to any position by reading the scale panel if the volume is required to change.

! **Note:**

For highly accuracy required area, on site calibration is recommended.

1.5b Binary State (BV) / Variable Volume (VV) Series



Pressure independent type

Binary State (BV) / Variable Volume (VV)

Regardless of the change of static pressure across the valve, it accurately maintains preset volume through the valve according to the location of shaft which can be adjusted automatically by fast actuator either pneumatic or electronic. The BV type of venturi, only two position can be applied by analog signal or simple on-off signal. In factory only these 2 points are pre-calibrated.

! **Note:**

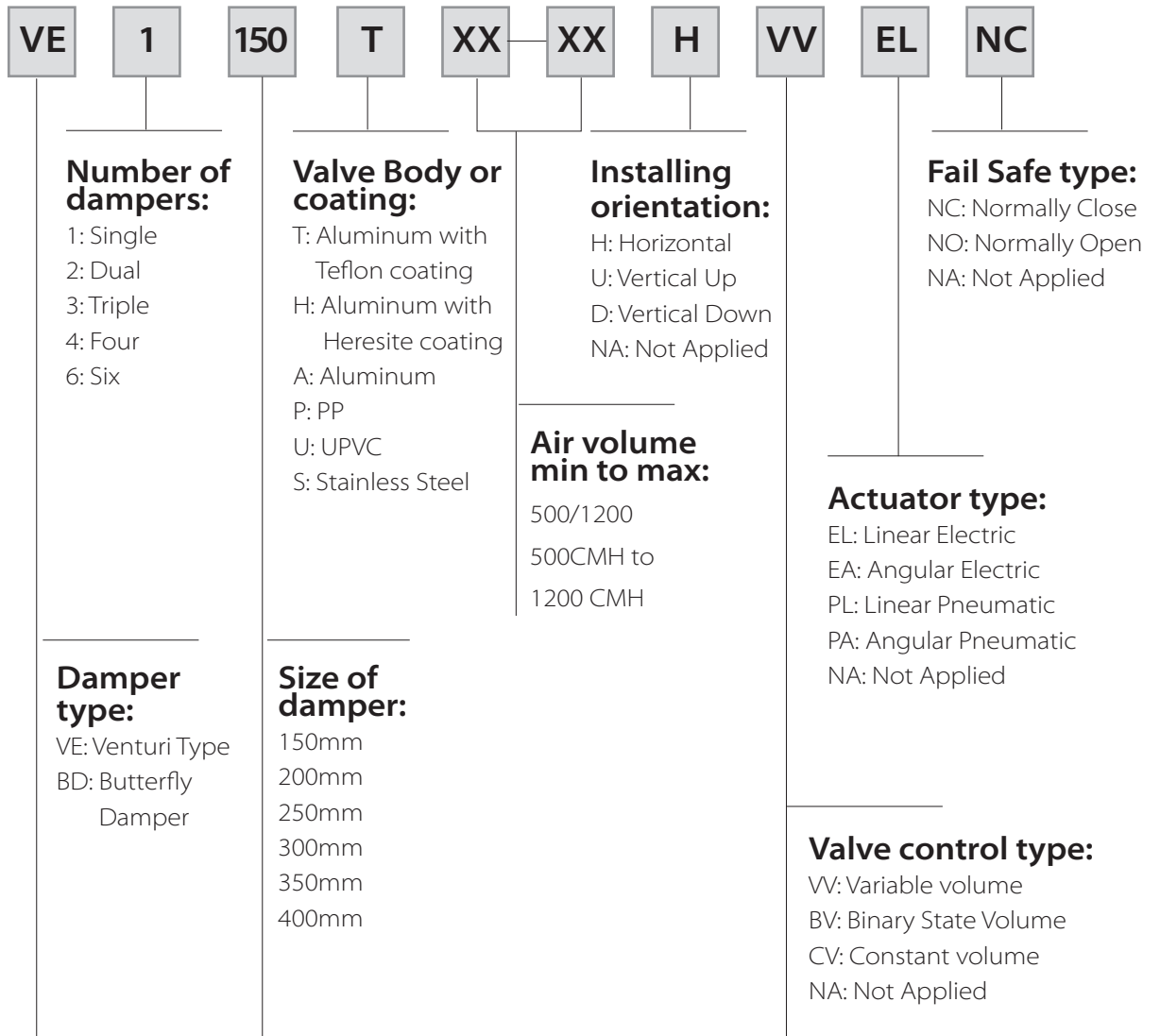
Changing of the preset air volume is not suggested unless accurate on-site calibration can be ensured.

The variable volume type of venturi, 16 points will be factory pre-calibrated which will ensure accuracy for all the specified range.

The cone structure moves by sensing the changing static pressure when shaft position is fixed and if the pressure between both valve ends increases, the cone will move towards the cylinder housing to increase the resistance and if the pressure decreases, the cone will move towards the opposite side to reduce the resistance and maintain the preset volume.

Order Instructions

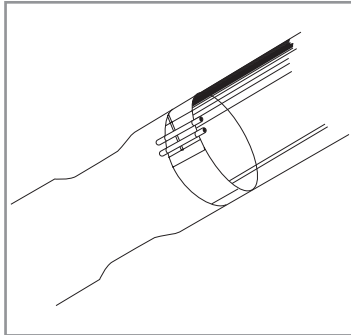
1.6



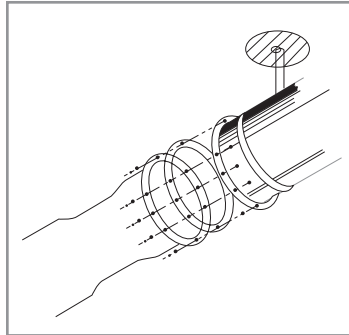
Installation

1.7

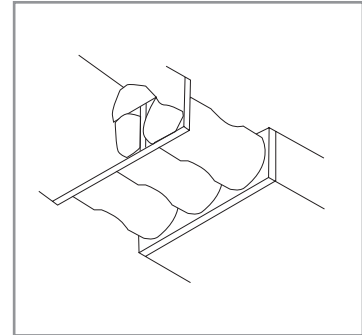
Procedures for installing ECON series venturi valves:



Single Valve Draw-band



Single Valve Circular Flange



Multiple Valve Slip-type Flange

1. Read all instructions before installing valves.
2. Check the tag number on valve label to ensure valve matches as scheduled.
3. Verify correct airflow direction and orientation of the valve as scheduled.

! Note:

Valves mounted out of horizontal or vertical (as planned and factory calibrated) will affect performance and control accuracy.

4. Allow a minimum of 14 inches of free unobstructed around the valve for maintenance and installation. Generally the valve may be installed in a 360° rotation. However, single horizontal hood valves should be installed so that the pivot arm located between 8 and 4 o'clock (not within 4 to 8 o'clock).
5. Allow 6 inches of unobstructed space in the duct on valve's inlet side for the shaft to reach the maximum flow position.
6. Use duct sealant on all valve/duct connection(or flange gaskets for circular flanges).
7. Install a hanger stock to support the ductwork within 12 inches of the valve connection. Install valve into duct after hanger stock is in position.
8. Follow appropriate installation diagram and abiding to relevant codes.

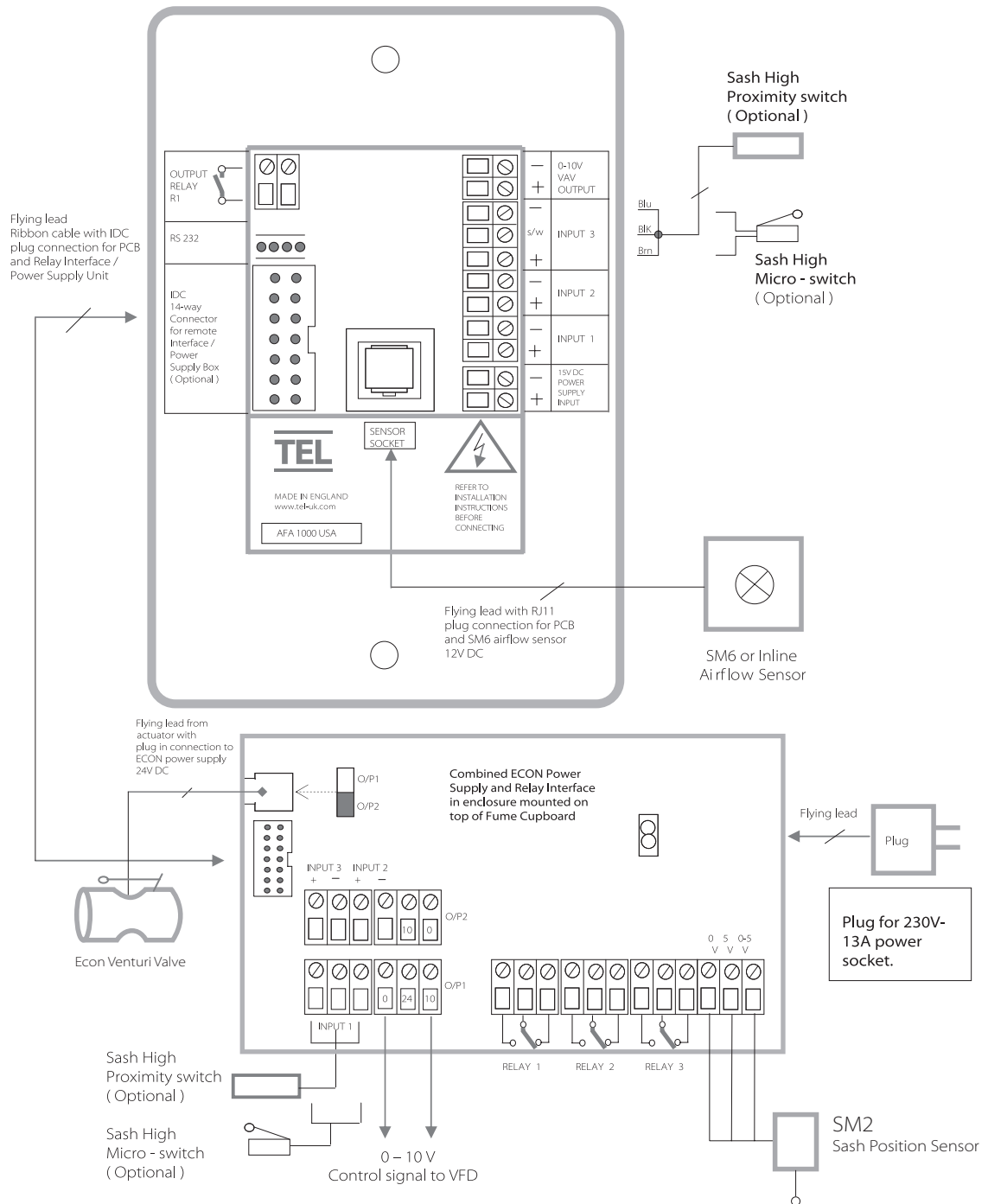
! Note:

Screws, fasteners, duct sealant, hanger stocks, companion flanges, and gaskets are not provided with venturi valve.

Typical Wiring Diagram

1.8

Exhaust Venturi Valve and PSU / Relay Interface Unit



A. Venturi Valve Actuator connections using cable kit

1.9a

Blue and Yellow wires with Blue crimp to terminal 1 on the actuator

Green and Red wires with Blue crimp to terminal 2 on the actuator

Black and White wires with White crimp to terminal 3 on the actuator

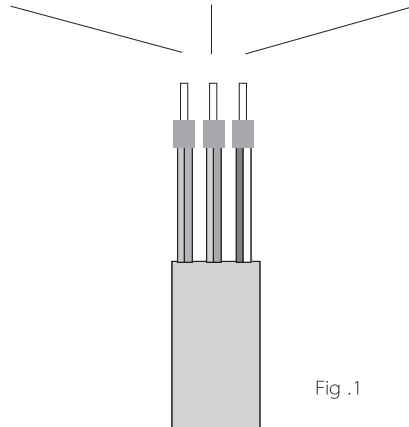
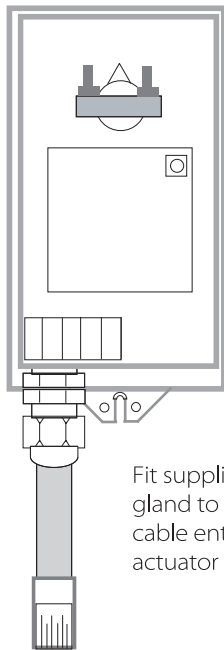


Fig .1

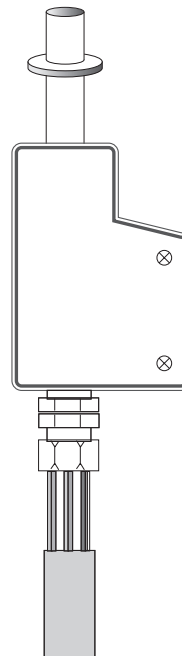
Angular Actuator



Fit supplied cable gland to left hand cable entry on the actuator

RJ11 Connection to Econ Power Supply

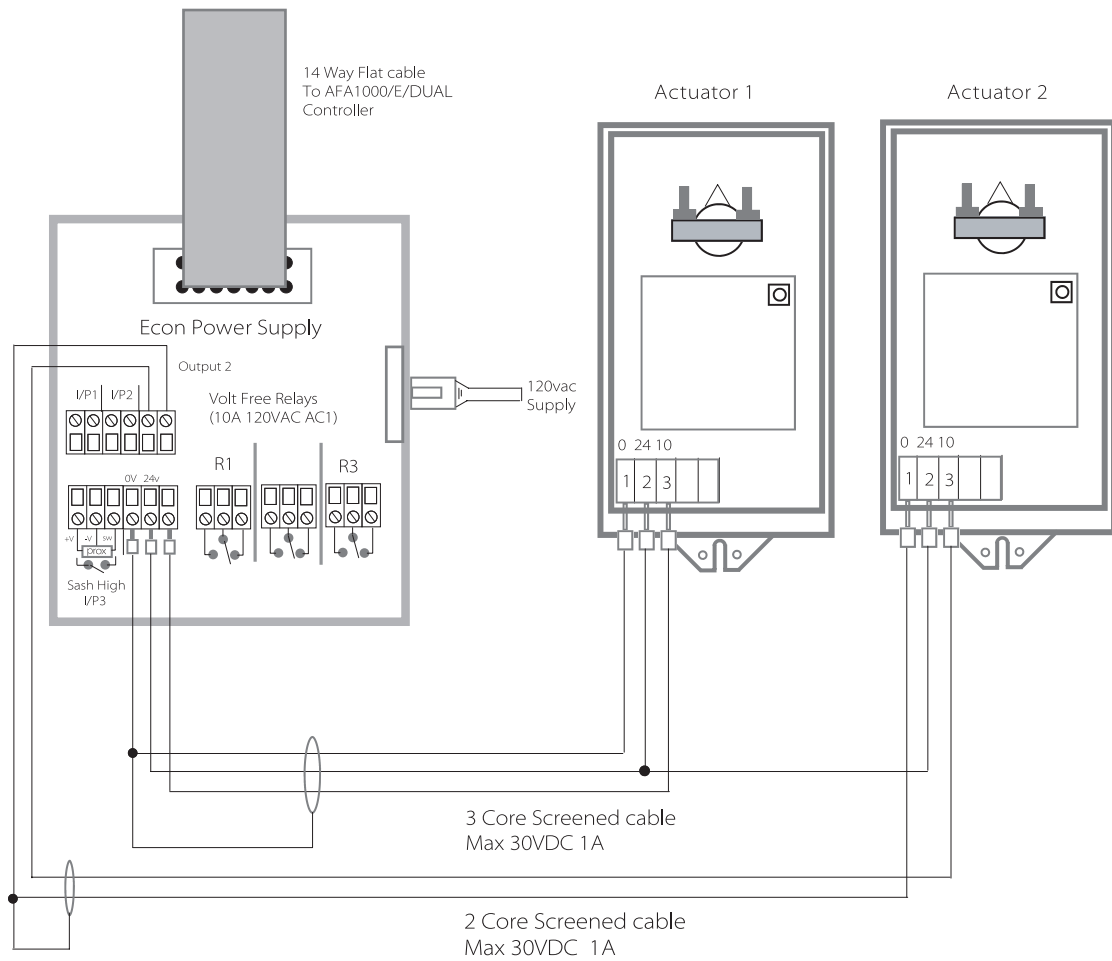
Linear Actuator



Connect supplied flying lead using the supplied cable gland as per Fig.1

B. Venturi Valve Actuator hard wired connections

1.9b



Limitation of Warranty and Liability

2.0

Seller warrants that this product, under normal use and service as described in the operator's manual shall be free from defects in workmanship and material for a period of twelve (12) months, or the length of time specified in the operator's manual, from the date of shipment to the customer. This limited warranty is subject to the following exclusion :

- a.** Batteries and certain other components when indicated in specifications are warranted for a period of 90 days from the date of shipment to the customer.
- b.** With respect to any repair services rendered, Seller warrants that the parts repaired or replaced will be free from defects in workmanship and material, under normal use, for a period of 90 days from the date of shipment to the customer.
- c.** Seller does not provide any warranty on finished goods manufactured by others. Only the original manufacturer's warranty applies.
- d.** Unless specifically authorised in a separate writing by Seller, Seller makes no warranty with respect to, and shall have no liability in connection with, any goods which are incorporated into other products or equipment by the Buyer. All goods returned under warranty shall be at the Buyer's risk of loss, Seller's factory prepaid, and will be returned at Seller's risk of loss, Buyer's factory prepaid.

The foregoing is in lieu of all other warranties and is subject to the conditions and limitations stated herein. No other express or implied warranty of fitness for particular purpose or merchantability is made. The exclusive remedy of the user or purchaser, and the limit of liability of seller for any and all losses, injuries, or damages in connection with this product (including claims based on contract negligence, strict liability, other tort, or otherwise) shall be the return of the product to the factory or designated location and the refund of the purchase price, or, at the option of the seller, the repair or replacement of the product. in no event shall seller be liable for any special, incidental or consequential damages.seller shall not be responsible for installation, dismantling, reassembly or reinstallation costs or charges. No action, regardless of form, may be brought against the seller more than one year after the cause of action has accrued.

The purchaser and all users are deemed to have accepted the terms of this limitation of warranty and liability, which contains the complete and exclusive limited warranty of Seller. This limitation of warranty and liability may not be amended or modified nor may any of its terms be waived except by a writing signed by an authorised representative of the Seller.

