



Virtec Instruments Inc.

EM760 HVAC Inverter



Frequency Inverter Selection guide

EM760 HVAC Inverter

Three-phase AC 340V-460V 0.75kW-710kW
660V-690V 18.5kW-800kW



The Virtec Instruments HVAC VFD Series EM 760 is a state-of-the-art variable frequency drive designed for HVAC applications. This series is engineered to provide superior performance, energy efficiency, reliability and making it an ideal choice for modern HVAC systems.

Key Features

- 1. HVAC-Dedicated Functionality:** The EM 760 series is tailored to meet the unique demands of HVAC systems. It includes advanced features such as automatic energy optimization, which ensures that the system operates at peak efficiency, reducing energy consumption and operational costs.
- 2. DC Reactor and EMC Filters:** To enhance performance and ensure compliance with international standards, the EM 760 series comes equipped with a built-in 5% Impedance DC reactor and EMC filters. The DC reactor helps in reducing harmonic distortion, improving the overall power quality. The EMC filters, C2 as standard and C1 optional, minimize electromagnetic interference, ensuring smooth and reliable operation of the HVAC system.
- 3. User-Friendly Interface:** The VFD features an intuitive and user-friendly interface, making it easy for operators to configure and monitor the system. The interface includes a clear display and simple navigation, allowing for quick adjustments and troubleshooting.
- 4. Robust Design and Reliability:** Built to withstand the demanding conditions of HVAC environments, the EM 760 series boasts a robust design that ensures long-term reliability and durability. The VFD is designed to operate efficiently in a wide range of temperatures upto 50°C and environmental conditions, providing consistent performance and reducing maintenance requirements.
- 5. Energy Efficiency and Cost Savings:** One of the primary benefits of the EM 760 series is its ability to significantly reduce energy consumption. By optimizing the operation of HVAC systems, the VFD helps in lowering energy bills and reducing the overall carbon footprint. The energy savings achieved with the EM 760 series contribute to a more sustainable and environmentally friendly operation.

The Virtec Instruments HVAC VFD Series EM 760 is a powerful and versatile solution for modern HVAC systems. With its dedicated HVAC functionality, advanced features, and robust design, it offers unparalleled performance and reliability. Whether you are looking to improve energy efficiency, enhance system control, or ensure long-term reliability, the EM 760 series is the ideal choice for your HVAC needs.

Color LCD with clear text Display



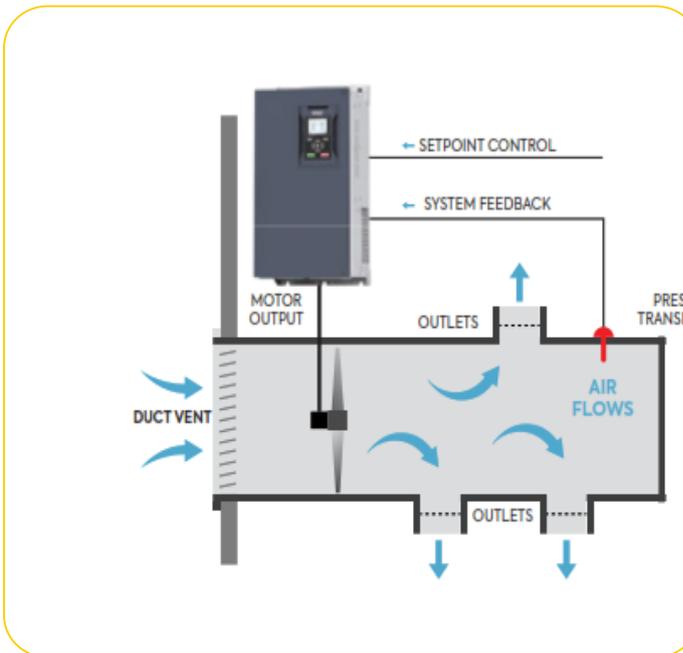
DC Reactor



Compact Design



PID LOOP



Model and Product List



EM760 - 4R0G/5R5P-3B

① ② ③ ④⑤

1

2

3

4

5

em760:
High-performance series

Null:
Installation in cabinet
C: Cabinet type

Identification

G
P

Compatible
motor type

Universal model
Fan pump type

Voltage level

2: Three-phase 220V
3: Three-phase 380V
6: Three-phase 660V

B: Built-in braking unit
None: Without braking unit

COMPATIBLE LOAD POWER

OR7	4R0	...	018	...
0.75kW	4.0kW	...	18.5kW	...



Product List

RATED VOLTAGE OF POWER SUPPLY:
THREE-PHASE AC 340V TO 460V



Model	Applicable motor power (kW)	Rated output current (A)
EM760-0R7G/1R5P-3B	0.75/1.5	2.5/4.2
EM760-1R5G/2R2P-3B	1.5/2.2	4.2/5.6
EM760-2R2G/3R0P-3B	2.2/3.0	5.6/7.2
EM760-4R0G/5R5P-3B	4.0/5.5	9.4/12
EM760-5R5G/7R5P-3B	5.5/7.5	13/17
EM760-7R5G/9R0P-3B	7.5/9.0	17/20
EM760-011G/015P-3B	11/15	25/32
EM760-015G/018P-3B	15/18.5	32/38
EM760-018G/022P-3B	18.5/22	38/44
EM760-022G/030P-3B	22/30	45/59
M760-030G/037P-3/3B	30/37	60/73
M760-037G/045P-3/3B	37/45	75/87
M760-045G/055P-3/3B	45/55	90/106
M760-055G/075P-3/3B	55/75	110/145
M760-075G/090P-3/3B	75/90	150/169
EM760-090G/110P-3	90/110	176/208
EM760-110G/132P-3	110/132	210/248
EM760-132G/160P-3	132/160	253/298
EM760-160G/185P-3	160/185	304/350
EM760-200G/220P-3	200/220	380/410
EM760-220G/250P-3	220/250	426/456
EM760-250G/280P-3	250/280	465/510
EM760-280G/315P-3	280/315	520/573
EM760-315G/355P-3	315/355	585/640
EM760-355G/400P-3	355/400	650/715
EM760-400G/450P-3	400/450	725/810
EM760C-450G/500P-3	450/500	820/900
EM760C-500G/560P-3	500/560	900/1010
EM760C-560G/630P-3	560/630	1010/1140

Technical Specification



POWER SUPPLY

Item	Specification
Rated voltage of power supply	Three-phase 340V-10% to 460V+10% 50-60Hz \pm 5%; voltage unbalance rate: <3%



OUTPUT

Item	Specification
Maximum output voltage	The maximum output voltage is the same as the input power voltage.
Rated output current	Continuous output of 100% rated current
Maximum overload current	G model: 150% rated current for 60s (for Compressors) P model: 120% rated current for 60s (for Pump & Fans) (2kHz carrier; please derate for carriers above this level)



CONTROL FUNCTION

Item	Specification
Driving mode	V/F control (WF) Speed sensorless vector control (SVC)
Input mode	Frequency (speed) input
Start and stop control mode	Keyboard, control terminal (two-line control and three-line control), communication
Frequency control range	0.00 ~ 600.00Hz/0.0 ~ 3000.0Hz
Input frequency resolution	Digital input: 0.01Hz Analog input: 0.1% of maximum frequency
Speed control range	1:50 (WF) 、 1:200 (SVC)
Acceleration and deceleration time	0.01 s to 600.00 s / 0.1 s to 6,000.0 s / 1 s to 60,000 s
Voltage/frequency characteristics	Rated output voltage: 20% to 100%, adjustable; fundamental frequency: 1Hz to 600Hz/3000Hz, adjustable
Torque boost	Fixed torque boost curve, any V/F curve optional
Starting torque	150%/3Hz (VVF) 、 150%/0.25Hz (SVC)
Torque control accuracy	\pm 5% rated torque (SVC), \pm 3% rated torque (FVC)
Self-adjustment of output voltage	When the input voltage changes, the output voltage will basically remain unchanged.
Automatic current limit	Output current is automatically limited to avoid frequent overcurrent trips.
Signal input source	Communication, multi-speed, analog.

 INPUT/OUTPUT

Item	Specification
Reference power supply	10.5V±0.5V/20mA
Terminal control power	24V/200mA
Digital input terminal	7 (standard X1 to X7) + 3 (extension card X8 to X10) digital multi-function inputs: X7 can be used as a high-speed pulse input terminal (F02.06 = 35/38/40); The remaining 9 channels (X1 to X6 and X8 to X10) can only be used as ordinary digital input terminals.
Analog input terminal	3 (standard AI1 to AI3) + 1 (extension card AI4) analog inputs: One AI1: support 0 to 10V or -10 to 10V, optional through function code F02.62; Two AI2/AI3: support 0 to 10V or 0 to 20mA or 4 to 20mA, through the function code F02.63, F02.64 is optional; One AI4: support 0 to 10V or -10 to 10V, optional through function code F02.65
Digital output terminal	2 (standard Y1/Y2) open-collector multi-function outputs + 2 (R1:EA/EB/EC and R2:RA/RB/RC) relay multi-function outputs + 2 (extension card) (R3: RA3/RC3 and R4: RA4/RC4) relay multi-function outputs Maximum output current of the collector: 50 mA; Relay contact capacity 250VAC/3A or 30VDC/1A, with EA-EC and RA-RC normally open, EB-EC and RB-RC normally closed; RA3-RC3, RA4-RC4 normally open
Analog output terminal	2 (M1/M2) multi function analog output terminals with output of 0 to 10V or 0 to 20mA or 4 to 20mA, optional through function codes F03.34 and F03.35

 OPERATION PANEL

Item	Specification
LCD display	The LCD displays relevant information about the inverter.
Parameter copying	Parameter settings of the inverter can be uploaded and downloaded for fast parameter copying.

 PROTECTION

Item	Specification
Protective Function	Short circuit, overcurrent, overvoltage, undervoltage, phase loss, overload, overheat, overspeed, load loss, external fault, etc.

 USE CONDITIONS

Item	Specification
Location	Indoor, at an altitude of less than 1 km, free of dust, corrosive gases and direct sunlight
Applicable environment	-10°C to +50°C, derating by 5% per 1°C increase above 40°C, 20% to 90%RH (non-condensing)
Vibration	Less than 0.5g
Storage environment	-40°C~ +70°C
Installation method	Wall-mounted, floor-standing electrical control cabinet, through-wall

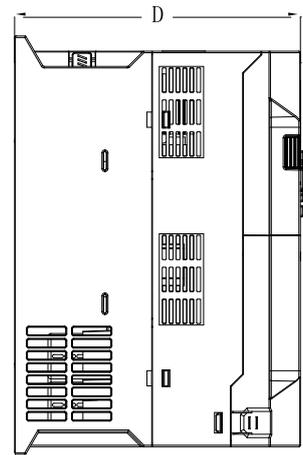
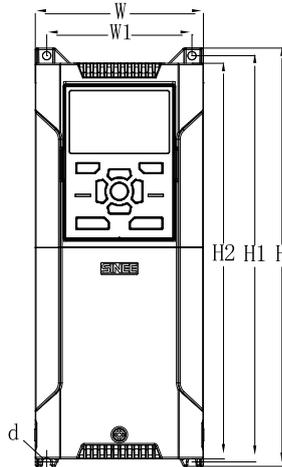
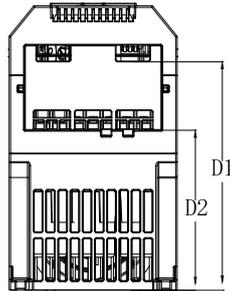
 PROTECTION LEVEL

Item	Specification
Protection level	Standard IP21/IP20 (remove the plastic cover at the top of the plastic case) Coated PCB for harsh environment

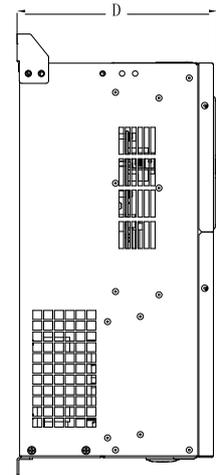
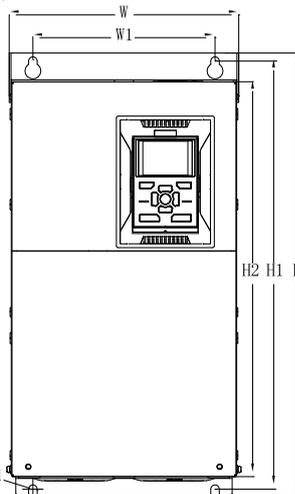
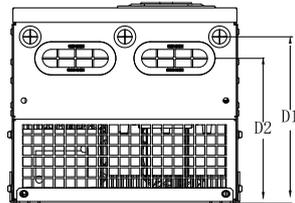
 COOLING METHOD

Item	Specification
Cooling method	Forced air cooling

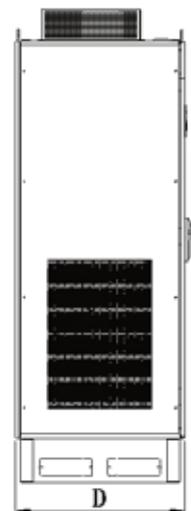
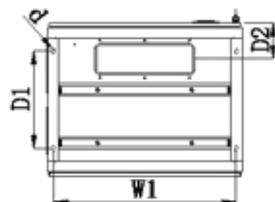
Dimension



(b)

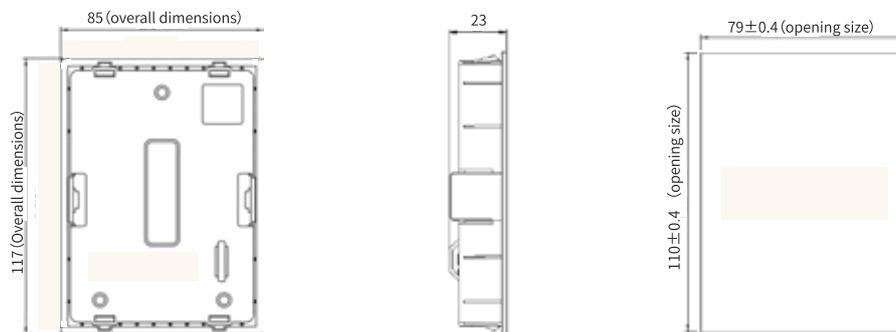


(c)



(d)

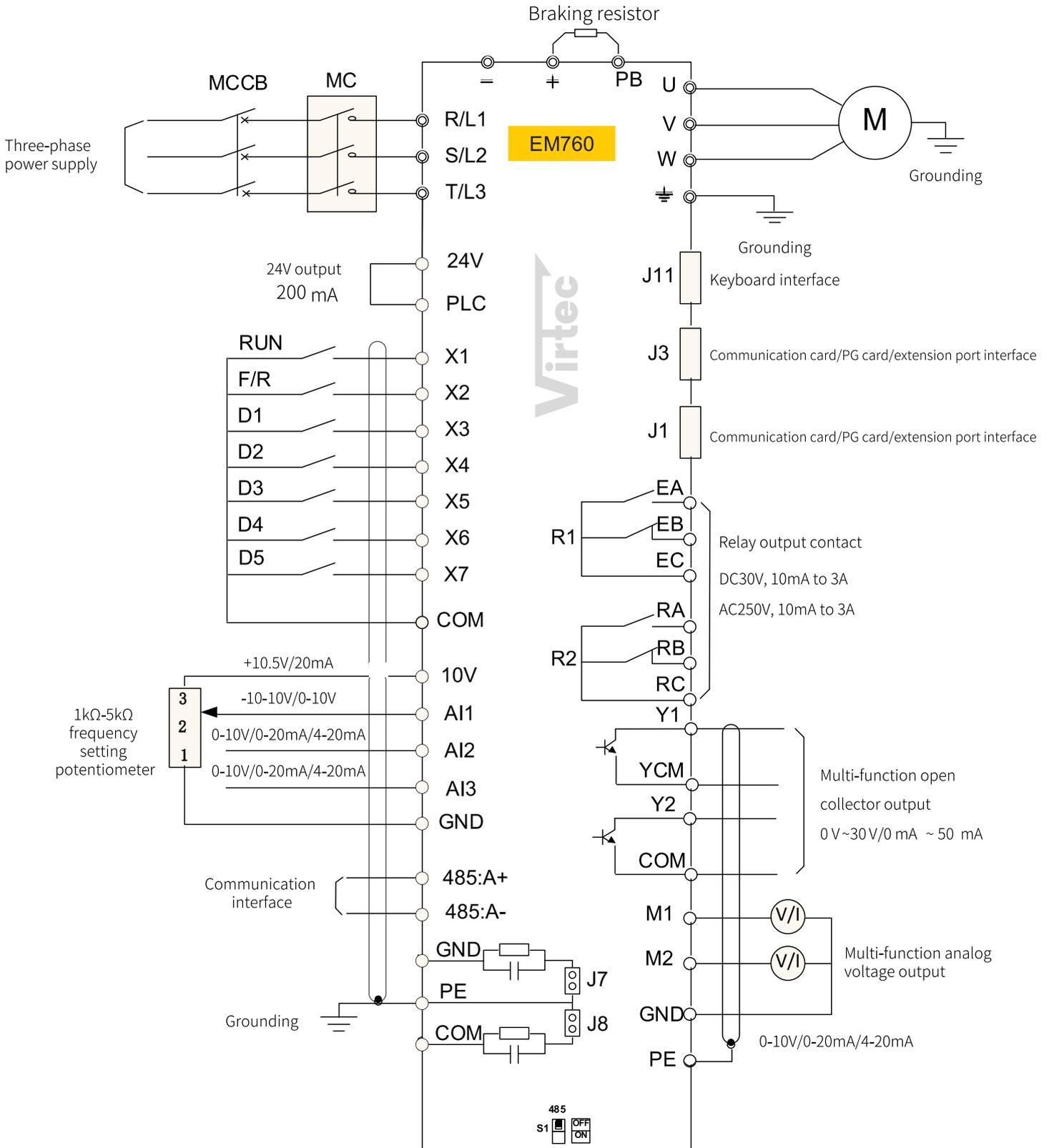
Specifications	W(mm)	W1(mm)	H(mm)	H1(mm)	H2(mm)	D(mm)	D1(mm)	D2(mm)	d(mm)	appearance				
EM760-0R7G/1R5P-3B	95	82	230	222	218	171	132	96	4.5	(b)				
EM760-1R5G/2R2P-3B														
EM760-2R2G/3R0P-3B														
EM760-4R0G/5R5P-3B														
EM760-5R5G/7R5P-3B	110	95	275	267	260	187	146	105	5.5					
EM760-7R5G/9R0P-3B														
EM760-011G/015P-3B	140	124	297	289	280	207	163	120	5.5		(c)			
EM760-015G/018P-3B														
EM760-018G/022P-3B	190	171	350	340	330	220	173	128	7			(d)		
EM760-022G/030P-3B														
EM760-030G/037P-3/3B	254	200	484	465	440	221	180.5	158	9.5	(c)				
EM760-037G/045P-3/3B														
EM760-045G/055P-3/3B	304	210	540	519	480	263	217	197	9.5				(c)	
EM760-055G/075P-3/3B														
EM760-075G/090P-3/3B	324	230	638	613	570	264	220	181	11.5					(c)
EM760-090G/110P-3	339	270	623	600	578	296	243	243	11.5					
EM760-110G/132P-3														
EM760-132G/160P-3	422	320	786	758	709	335	271	256.4	11.5		(c)			
EM760-160G/185P-3														
EM760-200G/220P-3	441	320	1025	989	942	357	/	285	11.5			(c)		
EM760-220G/250P-3														
EM760-250G/280P-3	560	450	1204	1170.5	1100	400	/	333	13	(c)				
EM760-280G/315P-3														
EM760-315G/355P-3	660	443	1597	1567	1504	430	375.5	323.5	13				(c)	
EM760-355G/400P-3														
EM760-400G/450P-3														
EM760C-450G/500P-3	805	756	2145	1945	1804	700	440	165	13					(d)
EM760C-500G/560P-3														
EM760C-560G/630P-3														



Opening size: 110mmX79mm
63200542

(reference size of keyboard bracket opening)

Standard Wiring Diagram of Control Circuit



Options of EM760 series inverter

Select accessories	Name & Model	Function	Photo
Communication card	EM760-CM-C1	This communication card is required for BACnet IP bus communication. Connect the inverter to BMS on IP layer.	
IO expansion card	EM760-IO-A1	The IO expansion card is used for expansion to 3 multi-function digital inputs, 2 relay outputs and 4 analog inputs, supporting PT100/PT1000/PTC/KTY84 and other common motor temperature sensors, respectively.	

KEY FEATURES

Fire Mode



Enables safe and efficient operation during emergency situations by running motor at full speed for maximum smoke extraction in ventilation application

Communication

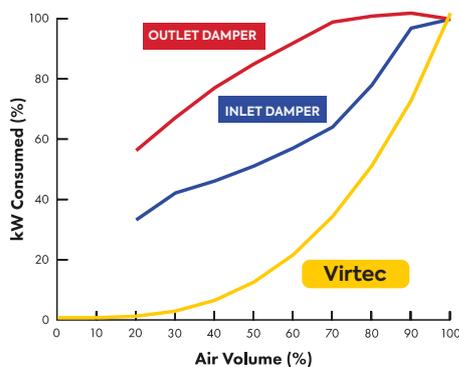
Modbus RTU is standard communication. BACnet IP can be offered as option.

Coated PCB



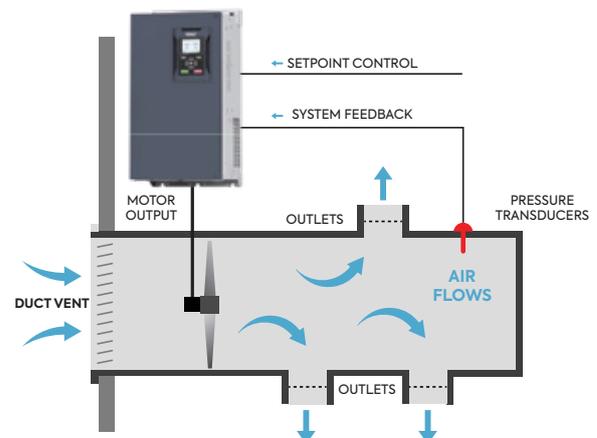
Coated printed circuit boards (PCBs) enhance reliability and durability in drives by protecting against environmental factors like moisture, dust, and chemicals. This coating ensures better performance and extends the lifespan of electronic components.

Energy Saving



The graph above shows a comparison between the efficiency of various methods which can be used to control the airflow produced by a fan.

Built-in PID, expandable upto 3 PID's





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