



**Your Smart Way To  
Energy Efficient HVAC Control**

# Smart energy savings

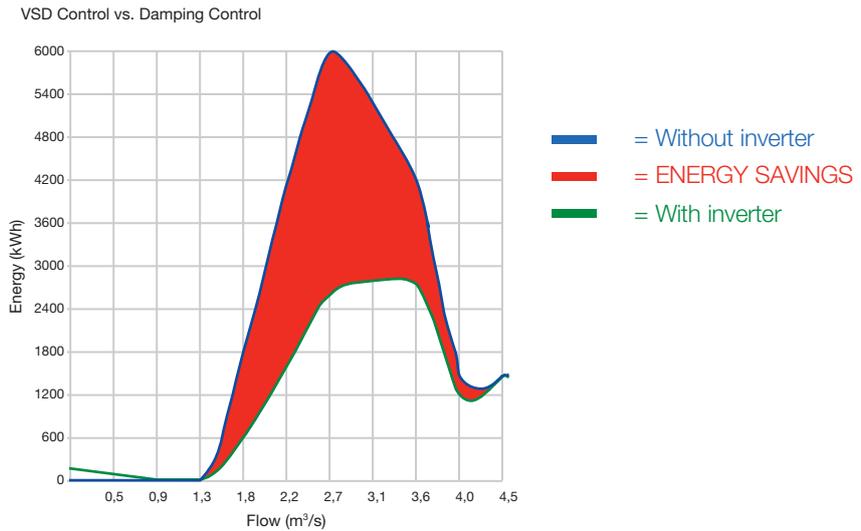
Flow-generating equipment, such as fans, pumps and compressors, are often used without speed control. Therefore motors run at full speed.

As a customer said:

**“It’s like driving a car and regulating the speed with the brakes, while the engine runs at full speed!”**

Up to 70% of energy can be saved with Honeywell inverters, as Heating, Ventilation, Air Conditioning (HVAC) systems rarely require maximum flow.

## Energy savings potential (typical ventilation application)



**Inverters** are known by many names, such as a variable frequency drives (VFD), variable speed drives (VSD), frequency converters and AC drives. All mean essentially the same thing: an electronic device that provides step-less speed control for an electric motor. However, today’s inverters also feature other functionalities, including control and protection for other equipment in the system.

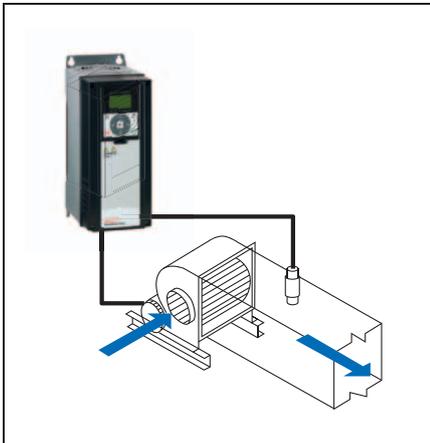


Payback on Honeywell inverter investments is usually less than two years and could be as little as three months. The payback period varies according to the cost of electricity, fan or pump size, length of running time and the achievable reduction in flow rate.

Visit our Energy Savings Calculator at <http://inverter.ecc.emea.honeywell.com> and calculate the payback for your system.

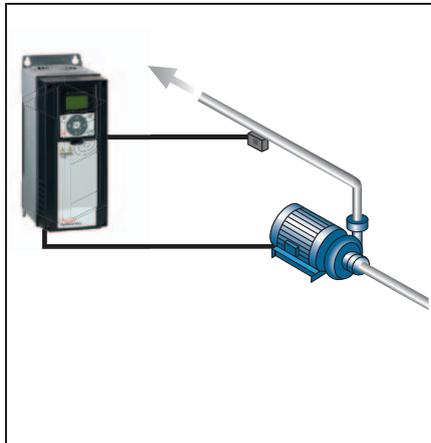


### Typical inverter applications



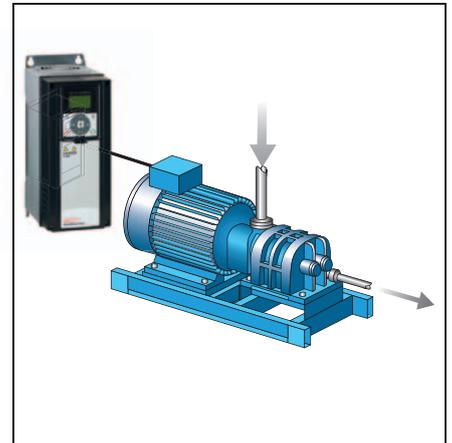
#### Fans

- Supply & extract ventilation fans
- Variable Air Volume (VAV) systems
- Constant Air Volume (CAV) systems
- Cooling tower fans
- Condenser fans
- Boiler fans
- Car Park ventilation fans
- Stairway ventilation



#### Pumps

- Chilling
- Heating
- Booster pump
- Pressurisation set
- Cold and hot water pumps
- Cooling tower pumps
- Delta P regulation on heat exchangers
- Swimming pool pumps



#### Compressors

- Chilling
- Clean air compressors
- Gas compressors
- Heat pumps

# Benefits of Honeywell inverters



## Fast installation and set-up

- 30 second Start Up Wizard for basic pump and fan applications
- Additional wizards for stand-alone applications, e.g. PID
- Quick menus
- Easy parameter copy from one unit to another
- Easy-to-use PC tools to help commissioning
- Extremely compact size and light weight – easy handling and space savings
- Convenient cabling arrangements
- IP54 available for wall mounting applications
- European standards fulfilled with standard products, no external accessories needed

## Reliable and comfortable operation

- Robust design with cooling air completely separated from electrical parts
- Varnished boards helping to prevent damage from dirt and dust
- Electrolyte-free capacitors to increase the lifetime of the product
- Temperature-controlled fans and high switching frequency to reduce the audible noise from the device
- Extensive software and hardware protection functions
- Software features to guarantee continuous operation, e.g. trip-free function with maintenance/safety switch operation

## Smart energy savings

- Extensive standalone control capabilities: PI/PID, pump and fan cascade
- Additional PID controller for controlling other devices
- Special energy saving mode
- High class flying start
- Timed functions with the help of real-time-clock
- Specialized features for HVAC, e.g. Ramp time optimizer, Pump soft fill

## Easy integration

- Wide selection of fieldbuses
- Ideal input and output configuration for HVAC applications
- Possibility to expand the I/O mix
- Inverter I/O can be used as remote I/O for BMS system

Note: Listed features dependent on model selection

Honeywell's inverter portfolio is ideally suited to cover your energy saving needs in HVAC installations.

	SmartDrive HVAC		NXL HVAC	SmartDrive COMPACT	
<b>Voltage</b>	208-240V 3~	380-480V 3~	380-500V 3~	208-240V 1~in/3~out	380-480V 3~
<b>Power</b>	0.55-55 kW	1.1-160 kW	1.1-30 kW	0.37-2.2 kW	0.55-5.5 kW
<b>Installation</b>	Panel mounting - IP21 Wall mounting - IP54		Panel mounting - IP21 Wall mounting - IP54	Panel mounting - IP20 (IP21 with option)	
<b>Keypad (HMI)</b>	Text		Code	Code	
<b>Fieldbus connections as standard</b>	ModbusRTU Bacnet MS/TP Metasys N2 Modbus TCP/IP Bacnet IP		Modbus RTU	Modbus RTU	
<b>Optional fieldbus connections</b>	LONworks		Several: LONworks, Bacnet MS/TP, Modbus TCP/IP, Profibus, etc.	-	
<b>EMC/RFI -level *</b>	C2 (C1 with external filters)		IP21: C2 IP54: C1	C2	
<b>Control modes available</b>	Standard speed control Preset speed control Advanced PID-control Pump cascade control Fire mode Time based control (real time clock)		Standard speed control Preset speed control Standard PID-control Pump cascade control	Standard speed control Preset speed control Basic PI-control	

\* C2 fulfills the requirements in public electrical network connection (e.g., typical building). C1 is the highest specified level of filtering and fulfills the requirements which are sometimes specified for highly sensitive areas (e.g., hospitals)



SmartDrive HVAC



NXL HVAC



SmartDrive COMPACT

# SmartDrive HVAC

The advanced HVAC drive to cover any application need.

## Key Features

- 1.1 - 160 kW in 400V (3~)
- 0.55 - 55 kW in 230 V (3~)
- IP21 and IP54 enclosure classes
- EMC/RFI filters for installation in public electrical network (e.g. typical buildings) integrated as standard (EN61800-3 category C2)
- Compliance with THD standard EN61000-3-12
- Multilanguage text display as standard



## Fast installation and set-up

- Start-up Wizard – typical HVAC application commissioned in 30 seconds
- Mini wizards for PID and pump and fan cascade control to make the settings for even advanced applications extremely fast
- Resonance sweep wizard to help identify possible resonances in the system
- Quick setup menu – fast and easy way to get most-typical settings
- Advanced commissioning display with graphical display and parameter copy available
- Easy-to-use PC tool for full commissioning and diagnostics (USB connection)
- Very compact size and light weight – easy handling and space savings
- Wide cabling space for easier and quicker installation
- Integrated stress removal and 360° EMC grounding inside the unit – no need for extra glands

## A smart drive with real intelligence

- Special energy saving mode to provide more savings than a standard inverter in the market for fan and pump applications
- Built-in real-time clock with battery for time-based control and time-stamped fault messages
- PID-controller with advanced features built-in: Sleep mode, pressure loss compensation, pump soft fill etc.
- Additional PID-controller for controlling other devices e.g. Damper actuator
- Pump and fan cascade controller with full auto-change functionality
- High class flying start function to obtain the control of already rotating motor very fast
- Ramp time optimisation - automatically avoid the pressure spikes in pipes or air ducts that are caused by increasing or decreasing speed too rapidly.

## Reliable operation with comfort

- Smart cooling channel design to separate all electrical parts from cooling air
- Varnished boards helping to prevent damage from dirt and dust
- Electrolyte free capacitors increase the lifetime of the product
- Extensive software and hardware protection functions
- Software features to guarantee continuous operation:
  - Configurable Automatic restart
  - Overtemperature ride through
  - Power ride through
  - Trip-free operation with maintenance/safety switch
- Temperature-controlled fans and high switching frequency to reduce device noise

## Easy to integrate

- Wide selection of built-in field buses (RS485 and Ethernet), e.g. BACnet
- LONworks option available
- Ideal input and output configuration to answer to all the typical needs in HVAC
- Also possibility to expand the I/O with option cards
- With the fieldbus connection the expanded I/O can also be used as remote I/O for your building automation system
- Parameter setting through fieldbus

**Type overview:** Mains voltage 380-480 V, 50/60 Hz, 3~, enclosure class IP21/IP54, EMC level C2

Inverter type (*)	Motor shaft power P (kw) 400V 40°C	Loadability		Mechanical size	Dimensions WxHxD (mm)	Weight (kg)
		Rated continuous current (A)	110% overload current (1min/10min) (A)			
HVAC400-1P1-xx	1.1	3.4	3.7	MR4	128x328x190	6
HVAC400-1P5-xx	1.5	4.8	5.3	MR4	128x328x190	6
HVAC400-2P2-xx	2.2	5.6	6.2	MR4	128x328x190	6
HVAC400-3P0-xx	3	8	8.8	MR4	128x328x190	6
HVAC400-4P0-xx	4	9.6	10.6	MR4	128x328x190	6
HVAC400-5P5-xx	5.5	12	13.2	MR4	128x328x190	6
HVAC400-7P5-xx	7.5	16	17.6	MR5	144x419x214	10
HVAC400-11P-xx	11	23	25.3	MR5	144x419x214	10
HVAC400-15P-xx	15	31	34.1	MR5	144x419x214	10
HVAC400-18P-xx	18.5	38	41.8	MR6	195x557x229	20
HVAC400-22P-xx	22	46	50.6	MR6	195x557x229	20
HVAC400-30P-xx	30	61	67.1	MR6	195x557x229	20
HVAC400-37P-xx	37	72	79.2	MR7	237x660x259	37.5
HVAC400-45P-xx	45	87	95.7	MR7	237x660x259	37.5
HVAC400-55P-xx	55	105	115.5	MR7	237x660x259	37.5
HVAC400-75P-xx	75	140	154	MR8	290x966x343	71
HVAC400-90P-xx	90	170	187	MR8	290x966x343	71
HVAC400-110-xx	110	205	225.5	MR8	290x966x343	71
HVAC400-132-xx	132	261	287.1	MR9	480x1150x365	113
HVAC400-160-xx	160	310	341	MR9	480x1150x365	113

(\* IP21 and IP54 products are the same size. For defining which enclosure class is used change the **xx** in the end of product type **21** for **IP21** units and **54** for **IP54** units.

**NOTE!** Add letter "A" to the end of the product code to order the product with advanced commissioning display instead of basic text display

MORE INFO on options and accessories : Product Catalog at: <http://products.ecc.emea.honeywell.com/europe/>

### Standard control I/O

Input/Output type	QTY
Analogue input	2
Digital Input	6
Analogue output	1
Relay output	2
Thermistor input (PTC)	1
Fieldbus RS485	BACnet MS/TP, Modbus RTU, Metasys N2
Fieldbus Ethernet	BACnet IP, Modbus TCP/IP

Note: Using option boards, the inverter's I/Os can be expanded and an extra fieldbus added.



MR4 MR5



MR6 MR7



MR8 MR9

# NXL HVAC

The standard HVAC drive for any installation in buildings.

## Key Features

- 1.1 - 30 kW in 400V (3~)
- IP21 and IP54 enclosure classes
- EMC/RFI filters for installation even in the highly sensitive areas (e.g., hospitals, airport control towers) as standard
- IP21 models EN61800-3 category C2
- IP54 models EN61800-3 category C1



## Fast installation and set-up

- Start-up Wizard – typical HVAC application commissioned in 30 seconds
- Quick menu – only the most typical parameters visible as standard
- Easy to use PC tool for full commissioning and diagnostics
- Multilanguage quick guides attached to each unit
- Very compact size and light weight – easy handling and space savings

## Easy to integrate

- Modbus built-in as standard
- Wide selection of fieldbus options available, e.g., BACnet MS/TP, LonWorks, Profibus
- Ideal input and output configuration for HVAC applications
- Possibility to change the standard I/O configuration for special applications e.g. cascade control with 4 pumps
- NXL HVAC inputs could be used as remote I/O for the BMS system.
- Parameter setting through fieldbus

## Smart drives with real intelligence

- Special energy saving mode to provide more savings than a standard inverter in the market for fan and pump applications
- Built-in PID-controller with sleep mode for stand alone applications
- Pump and fan cascade controller with full auto-change functionality
- High class flying start functionality to take control of already rotating motor

## Reliable operation with comfort

- Robust design in metal frame with cooling air completely separated from electrical parts
- Disturbance-free operation with highest level RFI filtering
- Extensive software and hardware protection functions
- Software features to guarantee continuous operation:
  - Automatic restart for uninterrupted operation in fault situation
  - Overtemperature ride through to automatically adapt to short time over temperatures
  - Power ride through to adapt to changes in input voltage
  - Trip-free operation when maintenance/safety switch is operated between inverter and motor
- Temperature-controlled fans and high switching frequency to reduce the audible noise from the device

**Type overview:** Mains voltage 380-500 V, 50/60 Hz, 3~, enclosure class IP21/IP54, EMC level C2/C1

Inverter type (*)	Motor shaft power P (kw) 400V 40°C	Loadability		Mechanical size	Dimensions WxHxD (mm)	Weight (kg)
		Rated continuous current (A)	110% overload current (1min/10min) (A)			
HVAC03Cx	1.1	3.3	3.7	MF4	128x292x190	5
HVAC04Cx	1.5	4.3	5.3	MF4	128x292x190	5
HVAC05Cx	2.2	5.6	6.2	MF4	128x292x190	5
HVAC07Cx	3	7.6	8.8	MF4	128x292x190	5
HVAC09Cx	4	9	10.6	MF4	128x292x190	5
HVAC12Cx	5.5	12	13.2	MF4	128x292x190	5
HVAC16Cx	7.5	16	17.6	MF5	144x391x214	8.1
HVAC23Cx	11	23	25.3	MF5	144x391x214	8.1
HVAC31Cx	15	31	34.1	MF5	144x391x214	8.1
HVAC38Cx	18.5	38	41.8	MF6	195x519x237	18.5
HVAC46Cx	22	46	50.6	MF6	195x519x237	18.5
HVAC61Cx	30	61	67.1	MF6	195x519x237	18.5

(\* IP21 and IP54 products are the same size. For defining which enclosure class is used change the **x** in the end of product type **2** for **IP21** units and **5** for **IP54** units

**NOTE!** IP21 units fulfill the EMC class EN61800-3 category C2 (installation in normal public electrical network e.g. typical building) as standard, but IP54 units fulfill also the requirements of category C1 (highly sensitive areas, e.g., hospitals)

MORE INFO on options and accessories : Product Catalog at: <http://products.ecc.emea.honeywell.com/europe/>

### Standard control inputs and outputs:

Input/Output type	QTY
Analogue input	2
Digital Input	6
Analogue output	1
Relay output	2
Thermistor input (PTC)	1
Fieldbus RS485	Modbus RTU

Note: Using option boards, the inverter's I/Os can be changed and an extra fieldbus added.



MF4

MF5

MF6

# SmartDrive COMPACT

The ideal basic drive solution for panel mounting.

## Key Features

- 0.37 - 2.2 kW in 230V (1~in, 3~out)
- 0.55 - 5.5 kW in 400V (3~)
- IP20 enclosure (IP21 upgrade kits available)
- EMC/RFI filters for installation in public electrical network (e.g. typical buildings) integrated as standard (EN61800-3 category C2)



## Fast installation and set-up

- Start-up Wizard – typical HVAC application commissioned in 30 seconds
- Quick menu – only the most typical parameters visible as standard
- Easy to use PC tool for parameter setting (USB connection)
- Extremely compact size and light weight – easy handling and space savings
- Screw or DIN-rail side-by-side mounting as standard – flexibility in installation
- Easy parameter copy with COMP-LOADER

## Smart drives with real intelligence

- Built-in PI-controller for stand alone applications
- PI-controller could also be used to control other equipment e.g., damper actuator
- Flying start functionality to take control of already rotating motor

## Reliable operation

- Varnished boards to prevent damage from dirt and dust
- Extensive software and hardware protection functions
- Automatic reset for avoiding system stops in fault situations
- Overtemperature ride-through for automatic adaption to short-term raises in ambient temperature
- Power ride through for automatic adaptation to short-term drops in input voltage

## Easy to integrate

- Modbus built-in as standard
- Wide selection of freely programmable inputs and outputs
- SmartDrive Compact inputs usable as remote I/O for the BMS system.
- Parameter setting through fieldbus



COMP-LOADER accessory is used for parameter copy and PC connection (USB)



**Type overview:** Mains voltage 208-240 V, 50/60 Hz, 1~input (3~output for the motor), enclosure class IP20, EMC level C2

Inverter type	Motor shaft power P (kw) 230V 50°C	Loadability		Mechanical size	Dimensions WxHxD (mm)	Weight (kg)
		Rated continuous current (A)	150% overload current (1 min/10min) (A)			
COMP230-P37-20	0.37	2.4	3.6	MI1	66x157x98	0.55
COMP230-P75-20	0.75	3.7	5.6	MI2	90x195x102	0.7
COMP230-1P1-20	1.1	4.8	7.2	MI2	90x195x102	0.7
COMP230-1P5-20	1.5	7	10.5	MI2	90x195x102	0.7
COMP230-2P2-20	2.2	9.6	14.4	MI3	100x251x109	0.99

**Type overview:** Mains voltage 380-480 V, 50/60 Hz, 3~, enclosure class IP20, EMC level C2

Inverter type	Motor shaft power P (kw) 400V 50°C	Loadability		Mechanical size	Dimensions WxHxD (mm)	Weight (kg)
		Rated continuous current (A)	150% overload current (1 min/10min) (A)			
COMP400-P55-20	0.55	1.9	2.9	MI1	66x157x98	0.55
COMP400-P75-20	0.75	2.4	3.6	MI1	66x157x98	0.55
COMP400-1P1-20	1.1	3.3	5.0	MI2	90x195x102	0.7
COMP400-1P5-20	1.5	4.3	6.5	MI2	90x195x102	0.7
COMP400-2P2-20	2.2	5.6	8.4	MI2	90x195x102	0.7
COMP400-3P0-20	3	7.6	11.4	MI3	100x251x109	0.99
COMP400-4P0-20	4	9	13.5	MI3	100x251x109	0.99
COMP400-5P5-20	5.5	12	18.0	MI3	100x251x109	0.99

MORE INFO on options and accessories : Product Catalog at: <http://products.ecc.emea.honeywell.com/europe/>

**Standard control inputs and outputs:**

Input/Output type	QTY
Analogue input	2
Digital Input	6
Analogue output	1
Open collector output	1
Relay output	2
Fieldbus	Modbus RTU



MI1



MI2



MI3



More than 100 million homes and 5 million buildings worldwide rely on Honeywell to control and protect their indoor environment!

We are perfectly suited to bridge the gap between the rising demand for more personal comfort, convenience and working efficiency on one hand and the growing scarcity of natural resources and rising energy costs on the other.

Our products and systems control temperature, humidity, air quality, potable water, lighting and appliances in homes and buildings.

**Find out more**

For more information on Honeywell inverters and other Honeywell products visit us online at <http://ecc.emea.honeywell.com>

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