Honeywell

HVAC400-xxx-xxA
SMARTDRIVE HVAC INVERTERS

- Wide range of I/O expansion and field bus option boards
- Integrated real-time clock with battery back-up for timed functions and fault time stamps
- USB connection to PC with SMARTDRIVE-USBC cable

SOFTWARE FEATURES
- 30s Start-Up Wizard
- Mini wizards: PID, cascade control, and resonance sweep wizards
- Very silent motor operation with high switching frequency
- Over-temperature ride-through
- Power ride-through
- Trip-free operation with maintenance/safety switch between the inverter and the motor
- Configurable auto-reset
- RTO – Ramp Time Optimizer
- PID controller with advanced functionality: sleep mode, pump soft fill, feed forward, pressure loss compensation, etc.
- Extra PID controller for controlling other devices
- Pump and Fan Cascade (PFC) controller with full auto-change functionality

GENERAL

The SmartDrive HVAC inverter is an easy-to-use solution for all Heating, Ventilation and Air Conditioning applications in which speed control of the motor can be applied. The software also offers extensive possibilities for stand-alone PID control and Pump and Fan Cascade control. The drive is suitable for induction and permanent magnet motors and synchronous reluctance motors.

Main applications in HVAC:
- Pumps
- Fans
- Compressors

SPECIFICATIONS

Mains Connection
Input voltage U_{in}	380…480 Vac (-10…+10%), 3~
Input frequency	47…66 Hz
Connection to mains	Once per minute or less

Motor Connection
Output voltage	0 - U_{in}, 3~
Output current	I_N: Continuous output current with maximum +40 °C ambient temperature, overloadability 1.1 x I_N (1min/10min)
Output frequency	0…320 Hz
Frequency resolution	0.01 Hz

HARDWARE FEATURES
- Compact size
- Multilanguage HMI with advanced commissioning display / keypad (parameter copy function)
- Increased cabling space
- Stress removal and 360° grounding possibility for cabling inside the unit – no need for cable glands
- Integrated RFI-filters for typical building installation
- Integrated DC Choke to comply with EN 61000-3-12
- Varnished printed circuit boards as standard to maximize reliability
- Wide input and output connection possibilities
- Several integrated field buses:
  - Ethernet(IP): BACnet IP, Modbus TCP/IP
  - RS485(MS/TP): BACnet MS/TP, Modbus RTU, N2

Control Characteristics
Control method	Frequency control U/f
Switching frequency	1.5...16 kHz; default 6 kHz (1.1-30 kW) default 4 kHz (37-160 kW)
Field weakening point	8…320 Hz
Acceleration time	0.1…3000 sec

Deceleration time	0.1…3000 sec

Ambient Conditions

Operating temperature	-10 °C (no frost)…+40 °C ambient: rated loadability I_N (also higher ambient with derating)
Storage temperature	-40…+70 °C

Air Quality

Tested according to:	IEC 60068-2-60 Flowing mixed gas corrosion test, Method 1 (H_2S [hydrogen sulfide] and SO_2 [sulfur dioxide])
Designed according to:	Chemical vapors: IEC 60721-3-3, unit in operation, class 3C2
	Mechanical particles: IEC 60721-3-3, unit in operation, class 3S2
Altitude	100% load capacity (no derating) up to 1000 m
	1% derating for each 100 m above 1000 m; max. 4500 m
	Allowed voltage for I/O signals:
	Up to 2000 m: max 240V
	2000-4500 m: max 120V
Relative humidity	0…95% RH, non-condensing, non-corrosive, no dripping water
Mechanical vibration EN 50178, EN 60068-2-6	5...150 Hz
	Displacement amplitude 1 (peak) mm at 5...15.8 Hz
	Max acceleration amplitude 1 G at 15.8...150 Hz
Mechanical shock EN 50178, IEC 68-2-27	UPS Drop Test (for applicable UPS weights)
	Storage and shipping: max 15 g, 11 ms (in package)
Enclosure class	IP21 and IP54 models available NOTE! IP54 fulfilled only when the HMI is in place

Electromagnetic Compatibility (EMC)

RFI Immunity	EN 61800-3 1st and 2nd environment (industrial and public electrical networks)
RFI Emissions	EN 61800-3 Category C2 (C1 with optional filter)
Harmonics emissions	EN 61000-3-12

Safety

EN 61800-5-1	CE
UL508C	UL, cUL

(See unit nameplate for more detailed approvals.)

Control Connections

Analog inputs	2 inputs as standard selection for mA or V with dip switches:
	0(2)...+10 V (Ri = 200 kΩ)
	0(4)…20 mA (Ri = 250 Ω)
	Resolution 0.1%, accuracy ±1%, short-circuit protected
Digital inputs	6 inputs as standard with positive or negative logic:
	0…5 V = "0"
	15…30 V = "1"
	Ri = min. 5 kΩ
Motor thermistor input	R_{TRIP}=4.7 kΩ (PTC); measuring voltage 3.5V
Aux. DC-voltage input	24 Vdc, ±10%; can be used for power backup of the control unit
Analog output	1 output as standard selection for mA or V with dip-switches:
	0(2)...+10 V
	0(4)…20 mA
	Load <500Ω, resolution 0,1%, accuracy ±2%, short-circuit protected
Digital outputs	2 programmable relay outputs (NO/NC) as standard.
	Max. switching load: 24 Vdc / 8 A, 250 Vac / 8 A or 125 Vdc / 0.4 A
	Min. switching load: 5 V / 10 mA
24V aux. voltage outputs	2 outputs: +24 Vdc, ±10%, max. load 250 mA, short-circuit protected
10V ref. voltage output	+10 Vdc, +3%, max. load 10 mA

Protections

Overvoltage	911 Vdc (~675 Vac) in HVAC400
Undervoltage	Depends on supply voltage (0.8775*V_{IN})
	333 Vdc (~250 Vac) with 400 V V_{IN}
Overcurrent	Trip limit 4.0*I_N instantaneously
Earth-fault	YES
Inverter over temperature	YES
Input phase loss	YES

Output phase loss	YES
Motor overload	YES
Motor stall	YES
(Fan/pump blocked)	
Motor underload	YES
(Pump dry / Belt broken detection)	
Short-circuit of +24V and +10V ref. voltages	YES
Pump soft fill timeout	YES

PRODUCT IDENTIFICATION CODE


```
HVAC    400    1P1    54    A

                            └─ Advanced display / keypad

                      └────── Enclosure classification
                              21 = IP21
                              54 = IP54

               └───────────── Nominal power
                              1P1 = 1.1 kW
                              15P = 15 kW etc.

        └────────────────────  Supply voltage
                              230 = 230 Vac 3~ (208-240 Vac)
                              400 = 400 Vac 3~ (380-480 Vac)

└─────────────────────────── Product range: HVAC = SmartDrive HVAC
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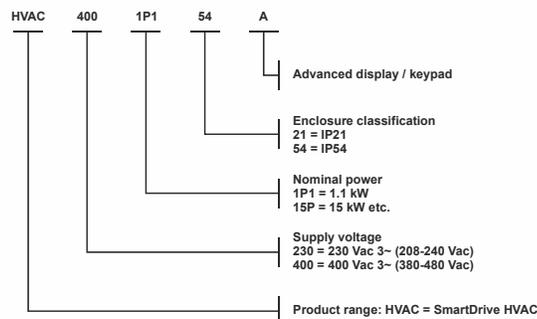
Fig. 1. Product Identification Code

MODELS

Mains voltage 400 V 3~ (380-480 V), 50/60 Hz

Inverter type *)	Motor nominal shaft power 400V supply 40°C P[kW]	Loadability		Enclosure class	Mechanical size	Dimensions WxHxD [mm]	Weight [kg]
		Rated continuous current I_N [A]	10% overload current [A]				
HVAC400-**1P1**-xxA	**1.1**	3.4	3.7	IP21/54	MR4	128x328x190	6
HVAC400-**1P5**-xxA	**1.5**	4.8	5.3	IP21/54	MR4	128x328x190	6
HVAC400-**2P2**-xxA	**2.2**	5.6	6.2	IP21/54	MR4	128x328x190	6
HVAC400-**3P0**-xxA	**3.0**	8	8.8	IP21/54	MR4	128x328x190	6
HVAC400-**4P0**-xxA	**4.0**	9.6	10.6	IP21/54	MR4	128x328x190	6
HVAC400-**5P5**-xxA	**5.5**	12	13.2	IP21/54	MR4	128x328x190	6
HVAC400-**7P5**-xxA	**7.5**	16	17.6	IP21/54	MR5	144x419x214	10
HVAC400-**11P**-xxA	**11.0**	23	25.3	IP21/54	MR5	144x419x214	10
HVAC400-**15P**-xxA	**15.0**	31	34.1	IP21/54	MR5	144x419x214	10
HVAC400-**18P**-xxA	**18.5**	38	41.8	IP21/54	MR6	195x557x229	20
HVAC400-**22P**-xxA	**22.0**	46	50.6	IP21/54	MR6	195x557x229	20
HVAC400-**30P**-xxA	**30.0**	61	67.1	IP21/54	MR6	195x557x229	20
HVAC400-**37P**-xxA	**37.0**	72	79.2	IP21/54	MR7	237x660x259	37.5
HVAC400-**45P**-xxA	**45.0**	87	95.7	IP21/54	MR7	237x660x259	37.5
HVAC400-**55P**-xxA	**55.0**	105	115.5	IP21/54	MR7	237x660x259	37.5
HVAC400-**75P**-xxA	**75.0**	140	154.0	IP21/54	MR8	290x966x343	66
HVAC400-**90P**-xxA	**90.0**	170	187.0	IP21/54	MR8	290x966x343	66
HVAC400-**110**-xxA	**110**	205	225.5	IP21/54	MR8	290x966x343	66
HVAC400-**132**-xxA	**132**	261	287.1	IP21/54	MR9	480x1150x365	108
HVAC400-**160**-xxA	**160**	300	341.0	IP21/54	MR9	480x1150x365	108

*) xx in inverter type can be 21 for IP21 units and 54 for IP54 units. The sizes of both models are exactly the same.
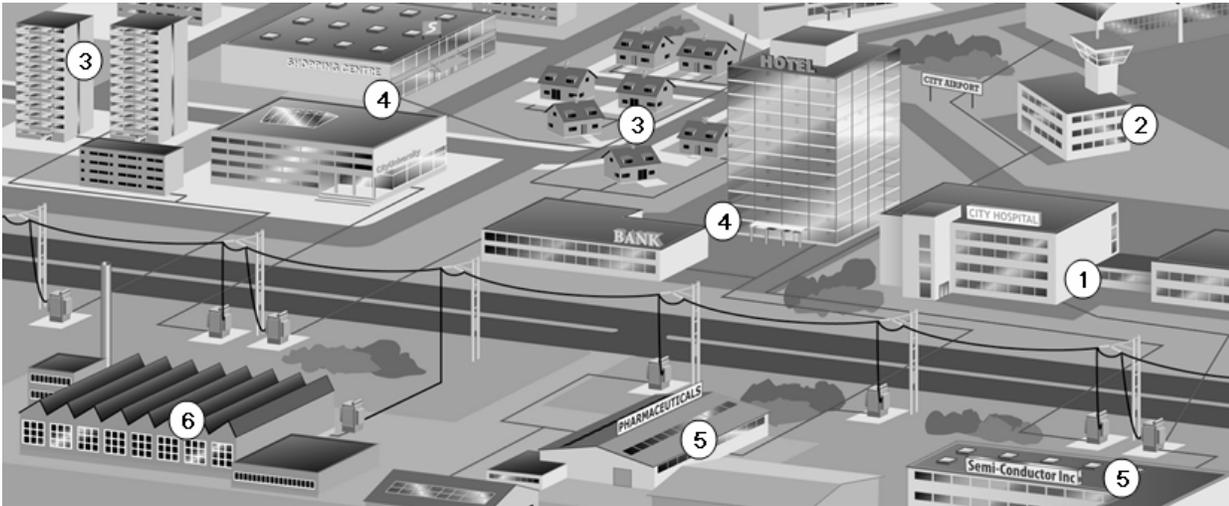
HONEYWELL EMC CLASSES AND MARKET REQUIREMENTS

Fig. 2. EMC classes in practice

EMC levels	① Hospital	② Airport	③ Residential Area	④ Commercial	⑤ Light Industry Area	⑥ Heavy Industry
C1	O	O	-	-	-	-
C2	R	R	R	R	O	O
C3	-	-	-	-	R	R
T						R (IT Network)

O = Optional, R= Required

C1 = EN61800-3 Category C1 (see also section "Optional Accessories and Spare Parts" on pg. 12)

C2 = EN61800-3 Category C2 (standard in SmartDrive HVAC)

C3 = EN61800-3 Category C3 (standard in Honeywell inverters >160 kW)

T = EN61800-3 IT network (e.g., ships) requirements fulfilled, units can be easily converted to T-class from standard EMC. Instructions for this can be found from manuals which can be downloaded from **Download Center** on the Honeywell inverter page http://inverter.ecc.emea.honeywell.com
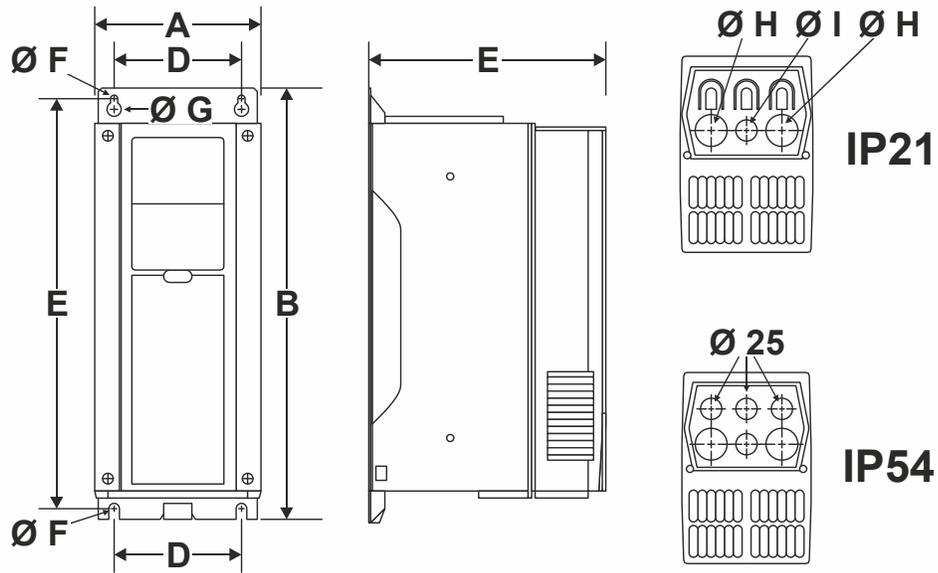
MECHANICAL DIMENSIONS

Fig. 3. Dimensions in millimeters

Mechanical size	Unit dimensions			Mounting hole distances		Hole sizes Ø			
	A	B	C	D	E	F	G	H	I
MR4	128	328	190	100	313	7	13	25	25
MR5	144	419	214	115 (*	406	7	14	33	25
MR6	195	557	229	148	541	9	16	40	33
MR7	237	660	259	190	645	9	16	50	50
MR8	290	966	343	217	947	9	16	60	60
MR9	480	1150	365	400	1122	9	16	60	60

 (* Two mounting hole options: 100 mm also available for Honeywell NX_ replacements

See also RFI Filters for SmartDrive HVAC400 Inverters MR4, MR5, MR6 and MR7 – Product Data (EN0B-0705GE51) for further dimensions.

NOTE! All units have mounting holes equal to Honeywell NX_ products to ensure trouble-free replacement

COOLING

Forced-air flow cooling is used in all SmartDrive HVAC drives. Enough free space shall be left around the inverter to ensure sufficient air circulation and cooling. SmartDrive HVAC IP54 products can be mounted side by side. You will find the required dimensions for free space and cooling air in the tables below:
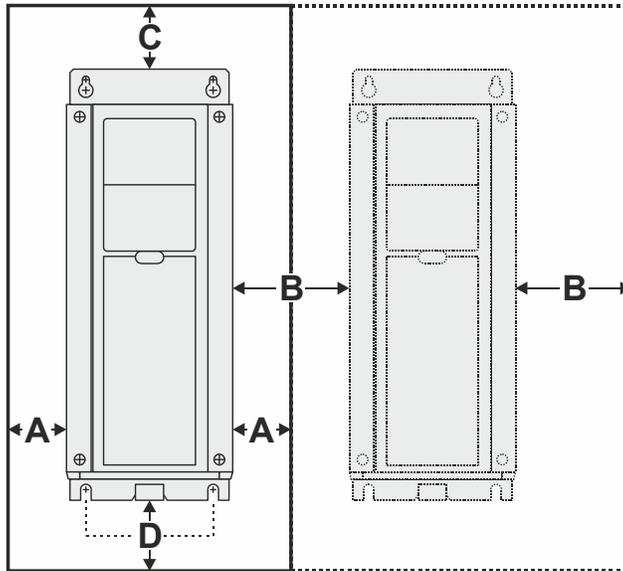

Fig. 4. Distances to ensure proper cooling

Mechanical size	Dimensions [mm]			
	A *)	B *)	C	D
MR4	20	20	100	50
MR5	20	20	120	60
MR6	20	20	160	80
MR7	20	20	250	100
MR8	20	20	300	150
MR9	20	20	350	200

A = clearance around the freq. converter (see also **B**)
B = distance from one frequency converter to another or distance to cabinet wall
C = free space above the frequency converter
D = free space underneath the frequency converter

*) No free space needed for A and B for IP54 models

Note! If several units are mounted above each other, the outlet air used for cooling by the lower unit must be directed away from the air intake of the upper unit by means of, e.g., a piece of metal plate fixed to cabinet wall between the drives. Cooling air required for each model can be found from the table below. For maximum heat losses in each product, check the SmartDrive HVAC installation manual (http://inverter.ecc.emea.honeywell.com)

| Mechanical size	Cooling air requirements (m³ / h)
MR4	45
MR5	75
MR6	190
MR7	185
MR8	335
MR9	621

CABLING AND FUSES

Use cables with a heat resistance of at least +70 °C. The cables and the fuses must be dimensioned according to the following tables. The fuses function also as cable overload protection. These instructions apply only to cases with one motor and one cable connection from the inverter to the motor. In any other case, ask the technical support for more information.

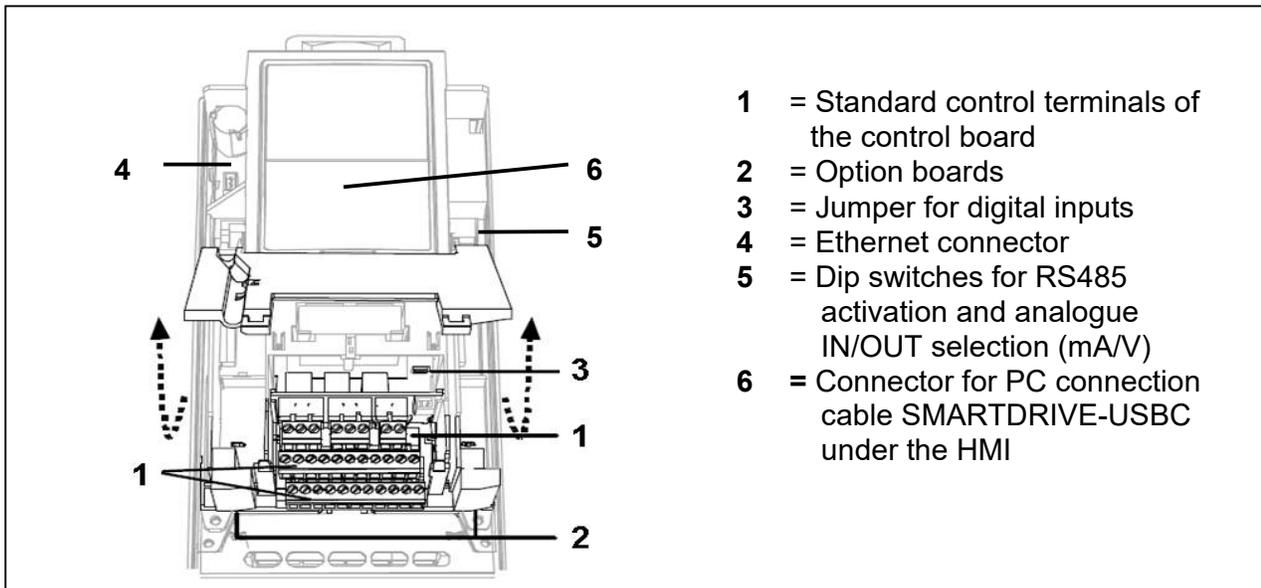| Connection	Cable type
Mains cable	Power cable intended for fixed installation and the specific mains voltage. Shielded cable not required. (MCMK or similar recommended).
Motor cable	Power cable equipped with compact low-impedance shield and intended for the specific mains voltage. (NKCABLES /MCCMK, SAB/ÖZCUY-J or similar recommended). 360º grounding of both motor and inverter connections required to meet the standards.
Control cable	Screened cable equipped with compact low-impedance shield (NKCABLES /Jamak, SAB/ÖZCuY-O or similar).

Cable and fuse sizes						
Size	Type (voltage-power)	I_N [A]	Fuse [A]	Mains cable Cu [mm²]	Terminals cable size (min/max)	
					Main terminal [mm²]	Earth terminal [mm²]
MR4	400-1P1 – 400-1P5	3.7 – 4.8	6	3x1.5 + 1.5	1 – 6 (solid) 1 – 4 (stranded)	1 – 6
	400-2P2 – 400-3P0	5.6 – 8.0	10	3x1.5 + 1.5	1 – 6 (solid) 1 – 4 (stranded)	1 – 6
	400-4P0 – 400-5P5	9.6 – 12.5	16	3x2.5 + 2.5	1 – 6 (solid) 1 – 4 (stranded)	1 – 6
MR5	400-7P5	16.0 – 18.0	20	3x6 + 6	1 – 10 Cu	1 – 10
	400-11P	23.0 – 24.0	25	3x6 + 6	1 – 10 Cu	1 – 10
	400-15P	31.0	32	3x10 + 10	1 – 10 Cu	1 – 10
MR6	400-18P	38.0	40	3x10 + 10	2.5 – 50 Cu/Al	2.5 – 35
	400-22P	46.0 – 48.0	50	3x16 + 16 (Cu) 3x25 + 16 (Al) (*	2.5 – 50 Cu/Al	2.5 – 35
	400-30P	61.0 – 62.0	63	3x25 + 16 (Cu) 3x35 + 16 (Al) (*	2.5 – 50 Cu/Al	2.5 – 35
MR7	400-37P	72.0 – 75.0	80	3x35 + 16 (Cu) 3x50 + 16 (Al) (*	6 – 70 Cu/Al	6 – 70
	400-45P	87.0 – 88.0	100	3x35 + 16 (Cu) 3x70 + 21 (Al) (*	6 – 70 Cu/Al	6 – 70
	400-55P	105.0	125	3x50 + 25 (Cu) 3x70 + 21 (Al) (*	6 – 70 Cu/Al	6 – 70
MR8	400-75P	140.0	160	3x70 + 35 (Cu) 3x95 + 29 (Al) (*	Bolt size M8	Bolt size M8
	400-90P	170.0	200	3x95 + 50 (Cu) 3x150 + 41 (Al) (*	Bolt size M8	Bolt size M8
	400-110	205.0	250	3x120 + 70 (Cu) 3x185 + 57 (Al) (*	Bolt size M8	Bolt size M8
MR9	400-132	261.0	315	3x185 + 95 (Cu) 2x3x120 +41 (Al) (*	Bolt size M8	Bolt size M8
	400-160	310.0	350	2x3x95 + 50 (Cu) 2x3x120 +41 (Al) (*	Bolt size M8	Bolt size M8

(* Note! In the case of aluminum (Al) cables, only the phase cables are of aluminum; the earthing cable size is for copper (Cu).
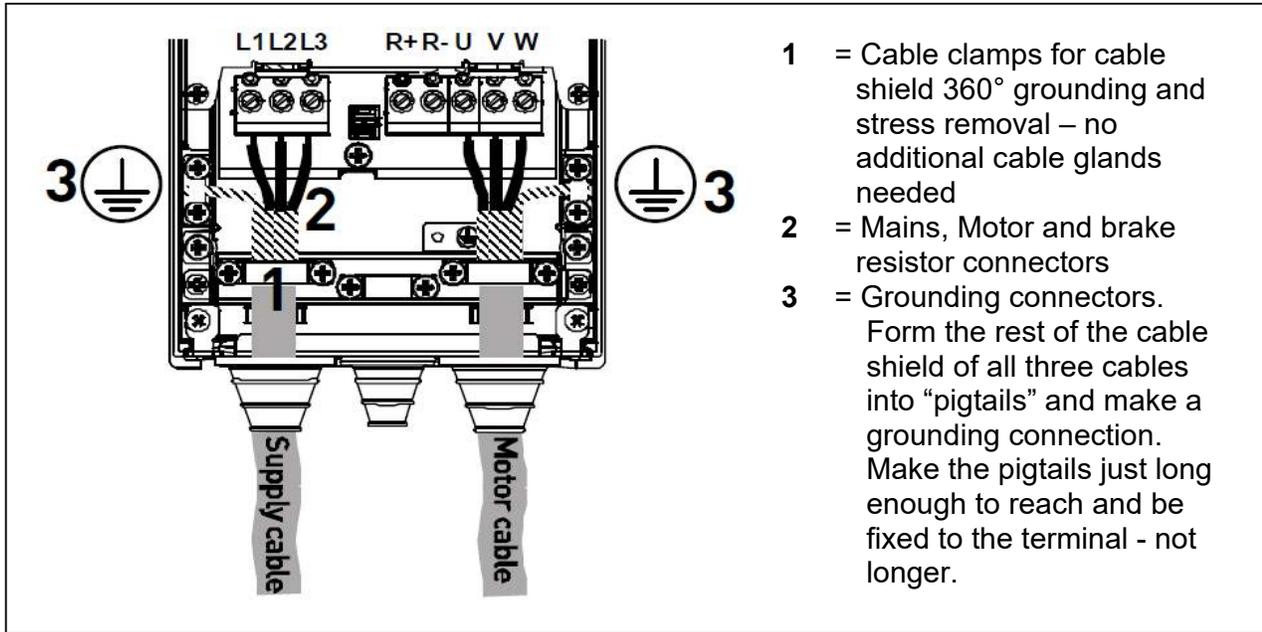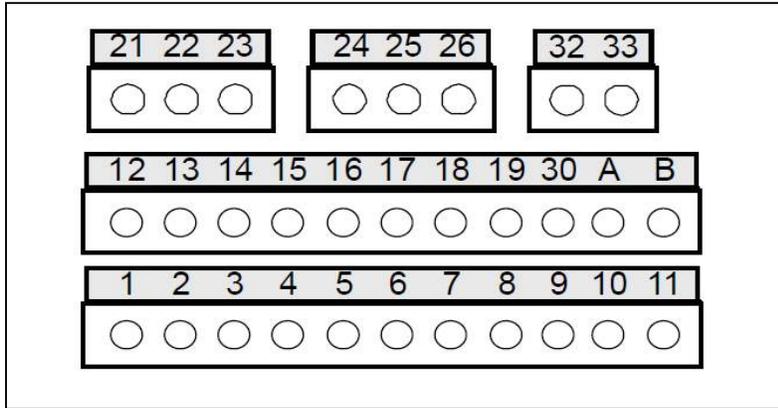
1 = Cable clamps for cable shield 360° grounding and stress removal – no additional cable glands needed

2 = Mains, Motor and brake resistor connectors

3 = Grounding connectors. Form the rest of the cable shield of all three cables into "pigtails" and make a grounding connection. Make the pigtails just long enough to reach and be fixed to the terminal - not longer.

Fig. 5. SmartDrive HVAC power connections

1 = Standard control terminals of the control board

2 = Option boards

3 = Jumper for digital inputs

4 = Ethernet connector

5 = Dip switches for RS485 activation and analogue IN/OUT selection (mA/V)

6 = Connector for PC connection cable SMARTDRIVE-USBC under the HMI

Fig. 6. SmartDrive HVAC control connections location

```
 21 22 23      24 25 26     32 33
  ○  ○  ○       ○  ○  ○      ○  ○

 12 13 14 15 16 17 18 19 30  A   B
  ○  ○  ○  ○  ○  ○  ○  ○  ○   ○   ○

  1  2  3  4  5  6  7  8  9 10  11
  ○  ○  ○  ○  ○  ○  ○  ○  ○  ○   ○
```

	Terminal	Signal	Factory setting
1	+10V$_{RE}$	+10Vdc Reference Voltage output	
2	AI1+	Analog Input 1 (mA or V)	Speed reference, 0-10V **(P)**
3	AI1-	Analog Input 1 common (mA)	
4	AI2+	Analog Input 2 (mA or V)	PID actual value 1, 4-20 mA **(P)**
5	Ai2-	Analog Input 2 common (mA)	
6	24V$_{OUT}$	24Vdc Auxiliary Voltage Output	
7	GND	I/O Signal Ground	
8	DI A.1	Digital Input A.1	Start forward **(P)**
9	DI A.2	Digital Input A.2	No function **(P)**
10	DI A.3	Digital Input A.3	External Fault, close **(P)**
11	CM	Common for DI A.1 - 6	
12	24V$_{OUT}$	24Vdc Auxiliary Voltage Output	
13	GND	I/O Signal Ground	
14	DI A.4	Digital Input A.4	Preset speed select B0 **(P)**
15	DI A.5	Digital Input A.5	Preset speed select B1 **(P)**
16	DI A.6	Digital Input A.6	Fault Reset **(P)**
17	CM	Common for DI A.1 - 6	
18	AO1+	Analog Output A.1	Output frequency, 0-20mA **(P)**
19	AO1- / GND	Analog Output A.1 common	
30	+ 24 V$_{IN}$	24 Vdc auxiliary input for backup power	
A	A	RS485 Signal A (negative)	Field bus communication
B	B	RS485 Signal B (positive)	Field bus communication
21	RO1/1		
22	RO1/2	Relay Output1	Active = RUN **(P)**
23	RO1/3		
24	RO2/1		
25	RO2/2	Relay Output2	Active = FAULT **(P)**
26	RO2/3		
32	TI+	Motor Protection Thermistor Input;	Not active (P3.9.21 = 0)
33	TI-	R$_{TRIP}$ = 4.7 kΩ (PTC)	

(P) = programmable function, see parameter lists in SmartDrive HVAC manuals (http://inverter.ecc.emea.honeywell.com)

Fig. 7. SmartDrive HVAC control connection terminals

FEATURES / FUNCTIONS

- ## *Easy-to-set-up features*

Feature	Functions	Benefit
Start-up wizard	Similar Start-up wizard as in Honeywell NXL HVAC and SmartDrive Compact inverters for basic pump and fan applications. 1. Language selection 2. Real-time clock setting 3. Select mode (Fan or Pump) 4. Tune the motor nominal speed 5. Tune the motor nominal current DONE	• Fully configured inverter for the application in question • Ready to accept 0-10V analog speed signal in just 30 seconds
Quick Setup Menu	Only the most commonly used parameters visible in this menu to provide easier navigation.	• Easy navigation through the most common parameters
Mini wizards	Also the following mini wizards for quick and easy setup of more demanding applications. All accessible from the Quick setup menu: 1. PID wizard 2. Pump and Fan Cascade wizard 3. Resonance sweep wizard (for easy elimination of possible resonance points in the system)	• Easy guided set-up for even more demanding applications
"Local – Remote" button	Dedicated push button on the HMI to enter the control place change selection and manual control view.	• Single button operation to change the control to manual (keypad) and back. Useful function when commissioning and testing applications
Honeywell Drive Care – PC tool	Easy-to-use PC-tool for commissioning the SmartDrive Inverters. Connection with SMARTDRIVE-USBC cable directly to the USB port of the PC. PC-tools available for download free of charge from http://inverter.ecc.emea.honeywell.com (download center)	• Parametering with PC • Saving settings to PC • Creating commissioning documentation • Comparing parameter settings • Monitoring view with graphics • Diagnostics
Parameter copy with HVAC-HMI-A	Parameter sets can be copied from one SmartDrive HVAC unit to another with the help of Advanced Commissioning HMI	• Fast and easy setup of several similar applications

- ## *Compact and robust design with easy installation*

Feature	Functions	Benefit
Compact size	One of the most compact and light products in the market place. Available both IP21 and IP54 enclosures.	• Space savings • Easy handling and mounting
Integrated RFI-filters	The units comply with EN61800-3 category C2 as standard. This level is the required level for public electricity networks such as buildings.	• Easy selection and installation of products • Space savings • Cost savings
Integrated DC-choke	To minimize harmonics (THD) from the device, all products equipped with chokes as standard.	• Low THD • Fulfils EN61000-3-12
Varnished Printed Circuit Boards	All SmartDrive HVAC PCBs (also option boards) are varnished.	• Increased reliability
Integrated stress removal	Stress removal and 360° grounding of power cables inside the unit with clamps. No need for extra glands.	• Cost saving • Easy Installation

- *Uninterruptible operation and energy saving functions*

Feature	Functions	Benefit
Over-temperature ride-through	Automatically adjusts switching frequency and speed of the motor to adapt to unusual increase in ambient.	• Uninterruptible operation
Power ride-through	Automatically lowers motor speed to adapt to sudden voltage drop such as power loss.	• Uninterruptible operation
RTO – Ramp Time Optimizer	When problematic areas are identified in acceleration or deceleration, the drive automatically expands the times needed for this to avoid mechanical stress to the system.	• Decreased mechanical stress to the system
Motor switch function	Ensures trip-free operation when an output switch (e.g., safety switch) is operated between the motor and the VFD. Truly intelligent and highly reliable function to ensure better functionality than with any other VFD.	• Uninterruptible operation
Energy Saving function	Automatically minimizes energy consumption by optimizing the voltage/frequency curve.	• Up to 5% increase in energy savings.
Configurable auto reset function	Auto restart function can be configured to make VFD restart automatically once fault is addressed.	• Uninterruptible operation

- *VFD and motor control features*

Feature	Functions	Benefit
Single input control	Analog signal rising edge can be used to start the device without additional start signal to a digital input.	• Cost and time savings
Flying start	Ability to get an already spinning fan under speed control.	• Improved performance • Very important in clean room production
Automatic torque boost function	Boosts initial voltage to start high inertia fans.	• Avoids tripping and enables smooth starts even to high inertia loads
High Switching Frequency	Honeywell SmartDrive COMPACT is capable of providing the maximum power with high switching frequency.	• Low audible noise from the motor
Prohibit frequency	Overriding the critical frequencies to avoid resonance. Can be set with the help of resonance sweep wizard.	• Elimination of resonance
Maintenance counters/alarms	The drive can be programmed to notify on upcoming maintenance for the system or the drive itself.	• Reliability
Temperature-controlled fans	Fan stops operating when not needed.	• Less audible noise from the VFD itself • Energy savings

- *Advanced HVAC control features*

Feature	Functions	Benefit
Time-based control	With the help of the real-time clock and calendar functionality the drive can be programmed to perform functions based on time.	• Cost savings • Flexibility
Inbuilt PID controller	• Normal and Inverse Regulation • Delta P regulation with 2 standard pressure transmitters • Feed forward control • Less wiring since sensor normally close to inverter	• Cost saving • Faster response to process closed loop
Sleep Mode	Shutting down the motor, when no demand	• Energy savings
Pressure loss compensation	For compensating, e.g., incorrectly placed sensor in the system	• Time and cost saving
Pump Soft fill	Feature to prevent the overpressures when filling empty pipe work.	• Longer lifetime of the system
Fire override mode	Keeps fan/pump running in case of fire.	• Legal requirement
Pump and Fan Cascade control with full auto-change	Controls total pumping system with several parallel pumps by equally sharing the load. The master pump can also be included in auto-change loop.	• Longer lifetime of the system • Cost savings

OPTIONAL ACCESSORIES AND SPARE PARTS

Option boards	Order type code
6 selectable digital IN/OUT	OPTB1
1 analog IN and 2 analog OUT, 0(4)-20 mA, galvanically isolated	OPTB4
3 relay (NO) OUT	OPTB5
1 relay (NO) OUT and 5 high voltage (41-240Vac) digital IN	OPTB9
1 analog OUT (0/2-10V or 0/4-20mA), 2 digital OUT: 1 open collector and 1 relay (NO)	OPTBF
Field bus: LONWORKS	OPTC4

Keypads and Keypad mounting kits	Order type code
Standard text HMI for SmartDrive HVAC	HVAC-HMI-S
Advanced Commissioning HMI for SmartDrive HVAC with parameter copy function	HVAC-HMI-A
Door mounting kit for SmartDrive HVAC HMI with 3.0 m connection cable	HVAC-DOOR-KIT
Hand Held kit for SmartDrive HVAC HMI with 3.0 m connection cable	HVAC-HAND-KIT

PC connection options	Order type code
SmartDrive 3.0m USB PC connection cable	SMARTDRIVE-USBC

Spare parts	Order type code
Main cooling fan spare part for SmartDrive HVAC size MR4 (HVAC400-1P1 to 5P5)*	HVAC-FAN-4
Main cooling fan spare part for SmartDrive HVAC size MR5 (HVAC400-7P5 to 15P)*	HVAC-FAN-5
Main cooling fan spare part for SmartDrive HVAC size MR6 (HVAC400-18P to 30P)*	HVAC-FAN-6
Main cooling fan spare part for SmartDrive HVAC size MR7 (HVAC400-37P to 55P)*	HVAC-FAN-7
Main cooling fan spare part for SmartDrive HVAC size MR8 (HVAC400-75P to 110P)*	HVAC-FAN-8
Main cooling fan spare part for SmartDrive HVAC size MR9 (HVAC400-132P to 160P)*	HVAC-FAN-9
Internal IP54 fan spare part for HVAC VFD FR04**	HVAC-IP54FAN-FR04
Internal IP54 fan spare part for HVAC VFD FR05**	HVAC-IP54FAN-FR05
Internal IP54 fan spare part for HVAC VFD FR06**	HVAC-IP54FAN-FR06
Internal IP54 fan spare part for HVAC VFD FR07**	HVAC-IP54FAN-FR07
Internal IP54 fan spare part for HVAC VFD FR08**	HVAC-IP54FAN-FR08
Internal IP54 fan spare part for HVAC VFD FR09**	HVAC-IP54FAN-FR09
SmartDrive HVAC spare part kit: 5-piece real-time clock batteries	OPT-BT-MC02-5
SmartDrive HVAC control unit spare part with preloaded firmware	HVAC-CONTROL
SmartDrive HVAC control terminal spare part set, includes all control cable terminals	HVAC-TERM-KIT

*Main cooling fans have a maintenance interval of 50,000 hours; **Internal fans have a maintenance interval of 25,000 hours.

C1 Filter	Order type code
C1 RFI Filter for SmartDrive HVAC size MR4 (HVAC400-1P1 to 5P5) 520 VAC, 16 A (50 °C);128 x 395 x 61.5 mm; 2.8 kg; IP54	RFI-0012-5-IP54
C1 RFI Filter for SmartDrive HVAC size MR5 (HVAC400-7P5 to 15P) 520 VAC, 42 A (50 °C);144 x 690 x 61.5 mm; 4.4 kg; IP54	RFI-0031-5-IP54
C1 RFI Filter for SmartDrive HVAC size MR6 (HVAC400-18P to 30P) 520 VAC, 75 A (50 °C);195 x 625 x 90 mm; 8.2 kg; IP54	RFI-0061-5-IP54
C1 RFI Filter for SmartDrive HVAC size MR7 (HVAC400-37P to 55P) 520 VAC, 130 A (50 °C);230 x 75 x 100 mm; 15.5 kg; IP54	RFI-0105-5-IP54

Honeywell