NX Series Inverters

Honeywell

# HVAC Pocket Programming Guide

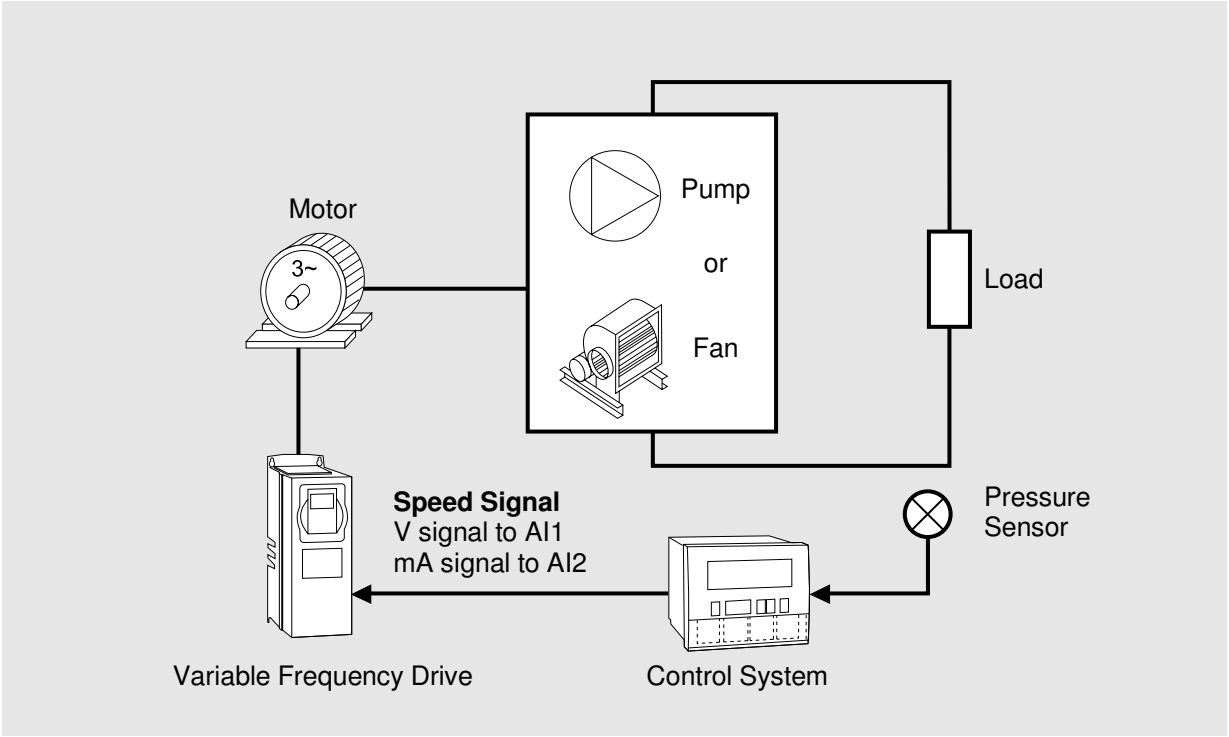
# HVAC Pocket Programming Guide

This guide provides a single reference document for the user of NXL HVAC (product codes starting with HVAC) and NXS (product codes starting with NXS) inverters, when using Basic Speed Control and PID Control in HVAC applications.

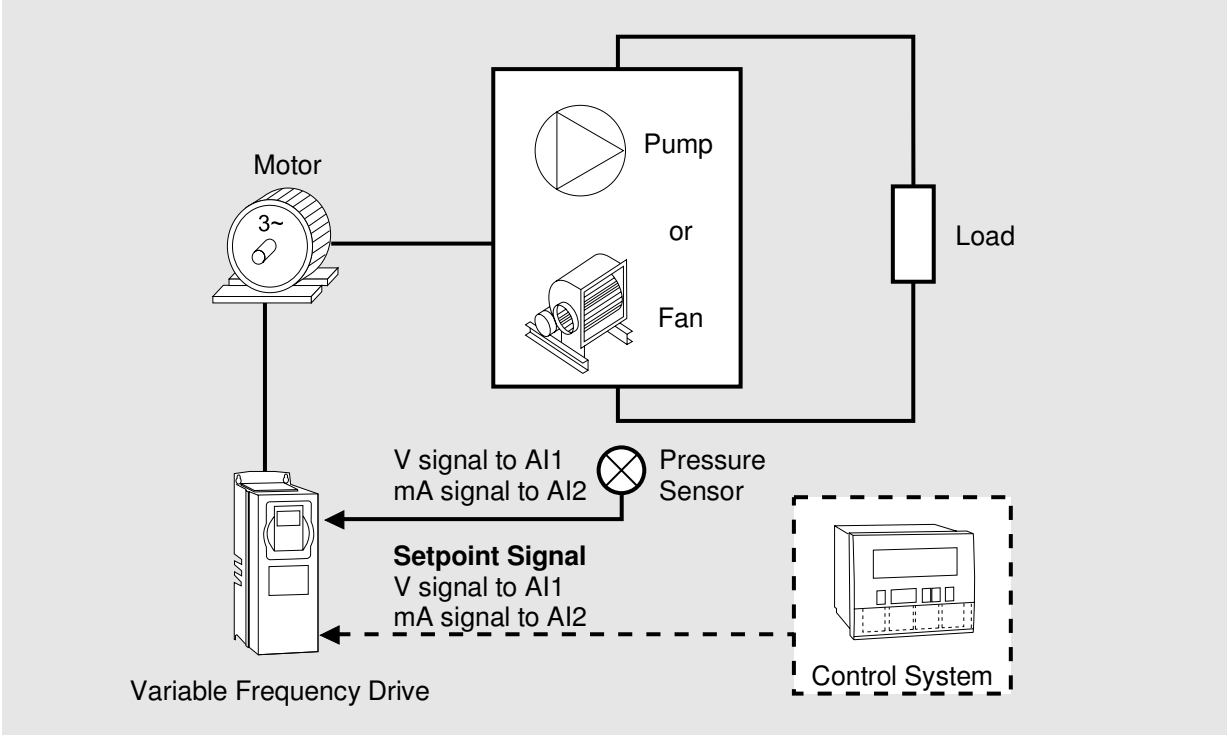
## Contents

# Introduction

## Basic Speed Control




## PID Control



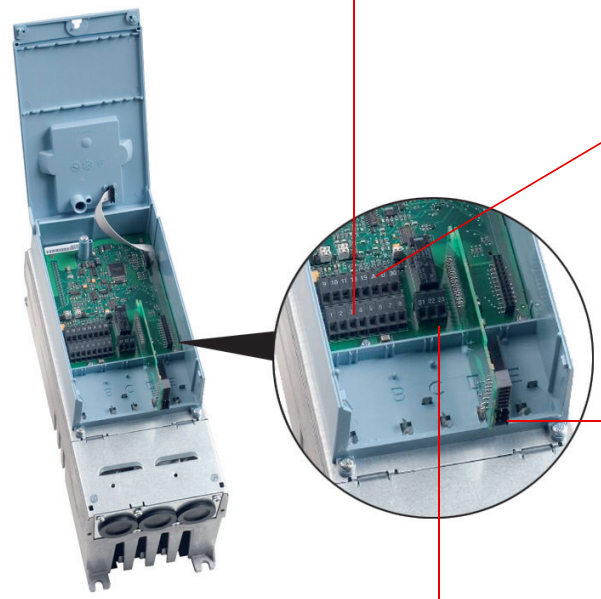
# NXL HVAC Inverter Connections

## Installation and Power Connections

See the **NXL HVAC Quick Guide** and **NXL HVAC Safety Guide** (attached to each drive) for information on installation, cabling, cooling, power connections and safety. More information can be found in the **NXL HVAC User's Manual**, which can be downloaded from **http://inverter.ecc.emea.honeywell.com**

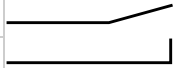
## Control Terminal Connections

| | | |
|---|---|---|
| 1 | + 10 $V_{ref}$ | Reference output (voltage for potentiometer etc.) |
| 2 | AI1 + | Analogue Input 1 (V signal) |
| 3 | AI1 – | I/O Ground |
| 4 | AI2 + | Analogue Input 2 (mA signal) |
| 5 | AI2 – | |
| 6 | +24 V | +24 V output (max. 0.1 A) |
| 7 | GND | I/O ground |
| 8 | DIN1 | Digital Input 1 (Start forward) |



| | | | |
|---|---|---|---|
| 21 | RO1 |  | Relay 1 NO/NC (fault) |
| 22 | RO1 | | |
| 23 | RO1 | | |

| | | |
|---|---|---|
| 9 | DIN2 | Digital Input 2 (Start reverse) |
| 10 | DIN3 | Digital Input 3 (Preset speed 1, default: 10 Hz) |
| 11 | GND | I/O Ground |
| 18 | AO1 + | Analogue output 1 Range 0–20 mA/$R_L$, max. 500 Ω |
| 19 | AO1 – | |
| A | RS485 | Modbus RTU, serial bus |
| B | RS485 | |
| 30 | +24V | Input for +24 V backup voltage |

| | | | |
|---|---|---|---|
| 12 | + 24 V | +24 V output (max. 150 mA) | |
| 13 | GND | I/O ground | |
| 14 | DIE1 | Exp. Digital Input 1 (Preset speed 2, default: 50 Hz) | |
| 15 | DIE2 | Exp. Digital Input 2 (Fault Reset) | |
| 16 | DIE3 | Exp. Digital Input 3 (Disable PID) | |
| 25 | ROE1 |  | Exp. Relay 1 NO (run) |
| 26 | ROE1 | | |
| 28 | TI+ | Thermistor Input; Rtrip = 4.7 k1Ω (PTC) | |
| 29 | TI – | | |

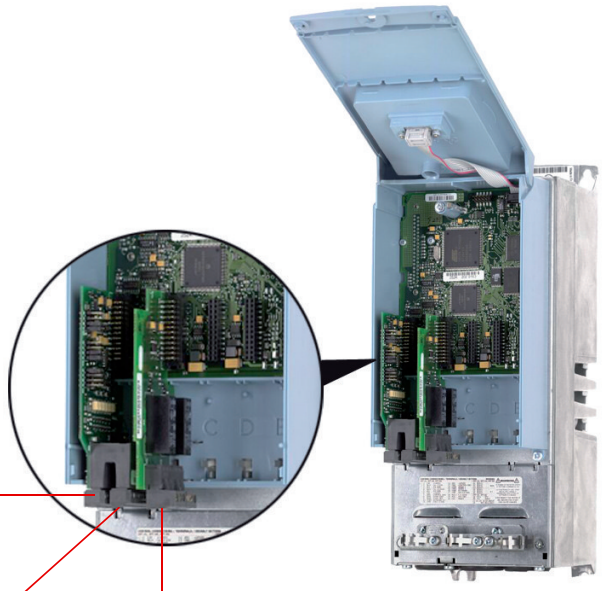
# NXS Inverter Connections

## Installation and Power Connections

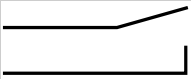
See the **NX Series User's Manual** (included with every shipment) for information on installation, cooling, power connections and safety. The manual can also be downloaded from **http://inverter.ecc.emea.honeywell.com**

## Control Terminal Connections

| | | |
|---|---|---|
| 1 | +10 $V_{ref}$ | Reference output (voltage for potentiometer etc.) |
| 2 | AI1 + | Analogue Input 1 (V signal) |
| 3 | AI1 – | I/O ground |
| 4 | AI2 + | Analogue Input 2 (mA signal) |
| 5 | AI2 – | |
| 6 | +24 V | +24 V input/output (max. 0.1 A) |
| 7 | GND | I/O ground |
| 8 | DIN1 | Digital Input 1 |
| 9 | DIN2 | Digital Input 2 |
| 10 | DIN3 | Digital Input 3 |



| | | |
|---|---|---|
| 11 | CMA | Digital input common for DIN1, DIN2 and DIN3 |
| 12 | +24 V | Same as terminal 6 |
| 13 | GND | I/O ground |
| 14 | DIN4 | Digital Input 4 |
| 15 | DIN5 | Digital Input 5 |
| 16 | DIN6 | Digital Input 6 |
| 17 | CMB | Digital input common for DIN4, DIN5 and DIN6 |
| 18 | AO1 + | Analogue output 1, default range: 0–20 mA/$R_L$, max. 500 Ω |
| 19 | AO1 – | |
| 20 | DO1 | Open collector Output |

| | | | |
|---|---|---|---|
| 21 | RO1 |  | Relay 1 NO/NC |
| 22 | RO1 | | |
| 23 | RO1 | | |
| 25 | RO2 |  | Relay 2 NO |
| 26 | RO2 | | |
| 28 | TI+ | | Thermistor Input; Rtrip = 4.7 kΩ (PTC) |
| 29 | TI- | | |

# Operating the NXL HVAC Keypad

## Reading the Display

**RUN and STOP**
Indicate if the drive is running. When RUN blinks, STOP command has been given but the motor is still rotating.

**DIRECTION**
Active motor direction visible: forward or reverse.

**READY**
Lights up when AC power is on. In case of a fault, the symbol will not light up.

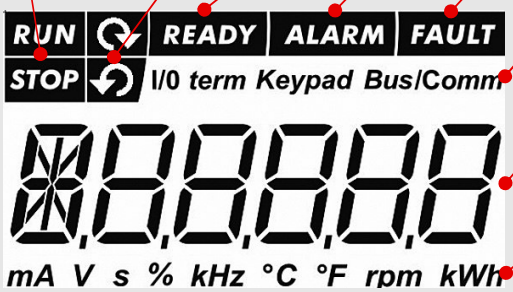
**ALARM**
Lights up to warn that the drive is running outside a certain limit.

**FAULT**
Indicates that unsafe operating conditions caused the drive to stop.

**CONTROL PLACE**
Active control place is visible: keypad, I/O or fieldbus.

**NUMERIC INDICATIONS**
Provide information on values and location in the menu structure.

**UNIT**
Unit of the value on screen visible.




## Keypad Push-Buttons

**LEFT**
- In menu: move backward
- In parameter edit mode: move cursor left
- Exit edit mode

**Tip:** Hold LEFT down 3 – 5 s for control place change KEYPAD ↔ REMOTE

**UP+ and DOWN–**
- Browse the pages in main and submenus
- Edit values

**RIGHT**
- In menu: move forward
- In parameter edit mode: move cursor right
- Enter edit mode

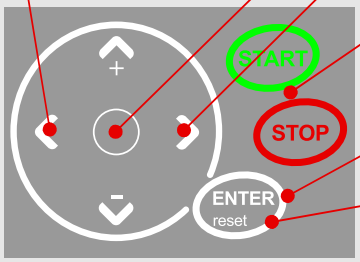
**START and STOP**
Control the motor if the keypad is the active control

**Tip:** Hold STOP down 5 s to launch the START UP WIZARD

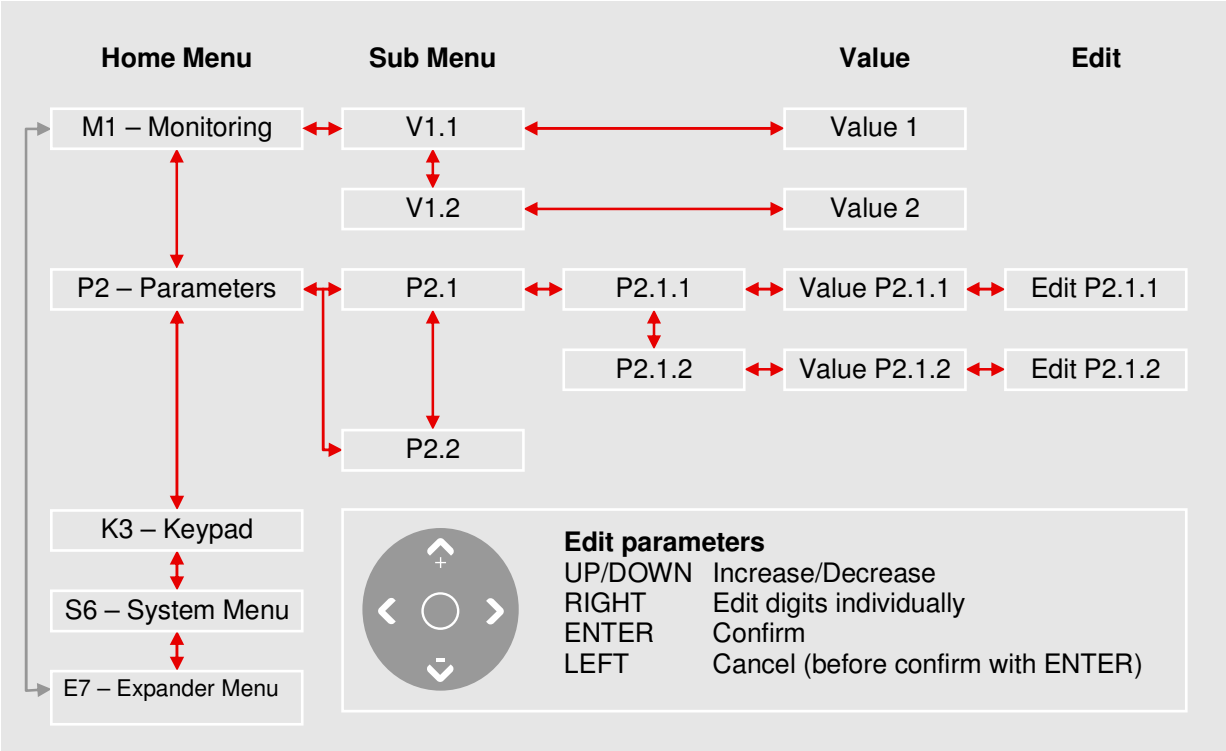
**ENTER**
- Confirmation of selections
- Fault history reset (2 – 3 s)

**RESET**
Reset active faults

**Note:** The motor may start immediately after resetting the fault!



# Navigating the Menu




# Monitoring Values (Menu M1)

| | |
|---|---|
| V1.1 | Output Frequency |
| V1.2 | Frequency Reference |
| V1.3 | Motor Speed |
| V1.4 | Motor Current |
| V1.5 | Motor Torque |
| V1.6 | Motor Power |
| V1.7 | Motor Voltage |
| V1.8 | DC-link Voltage |
| V1.9 | Unit Temperature |
| V1.10 | Analogue Input 1 |
| V1.11 | Analogue Input 2 |
| V1.12 | Analogue Output Current |
| V1.13 | Extra Analogue Output 1 |
| V1.14 | Extra Analogue Output 2 |
| V1.15* | DIN1, DIN2, DIN3 |
| V1.16** | DIE1, DIE2, DIE3 |
| V1.17* | Relay Output 1 |
| V1.18** | Extra Relays ROE 1, 2, 3 |
| V1.19 | Digital Output 1 |
| V1.20 | PID Reference |
| V1.21 | PID Actual Value |
| V1.22 | PID Error Value |
| V1.23 | PID Output |
| V1.24 | PFC Autochange 1, 2, 3 |
| V1.25 | Mode<br>(0 = Not Selected,<br>1 = Standard,<br>2 = Fan,<br>3 = Pump,<br>4 = High Performance) |

* *Standard I/O*
** *Expander Board I/O (ROE2 and ROE3 not included in standard delivery)*

# NXL HVAC Basic Speed Control

## What You Need to Know

**Motor nameplate data**
- Nominal Current
- Nominal Speed

**Speed signal specification**
- Signal type (volts, milliamps)
- Range (0-10, 2-10, 0-20, 4-20)

## Setup

**1 Run the Start Up Wizard**
**Note: Running the Start Up Wizard resets all parameters to their default values.**
- Hold STOP button down for 5 seconds
- Select application type FAN or PUMP and confirm with ENTER
- Select motor nominal speed and confirm with ENTER
- Select motor nominal current and confirm with ENTER
- For speed signal 0 – 10 V use AI1 (Analogue Input 1)

**2 Control Signal Settings for Speed Signals other than 0 – 10 V**
- For other selections full parameter view is needed:
  P2.1.14 Parameter Conceal Set to 0 (not in use)
- For speed signal 2 – 10 V use Analogue Input 1
  P2.2.6 AI1 Signal Range Set to 4 (2 – 10 V)
- For speed signal 4 – 20 mA use Analogue Input 2
  P2.1.15.14 I/O Reference Set to 1 (AI2)
- For speed signal 0 – 20 mA use Analogue Input 2
  P2.1.15.14 I/O Reference Set to 1 (AI2)
  P2.2.12 AI2 Signal Range Set to 1 (0 – 20 mA)

## Manual Testing

**1 Hold LEFT down for 3 seconds**
**Control Place automatically switches to Keypad**

**2 Use normal keypad buttons for speed control**
- UP and DOWN to adjust the speed
- START and STOP for control

**3 Hold LEFT down for 3 seconds to return to remote control (I/O or Fieldbus)**

# Parameter List

This is the list of the most commonly used parameter group: HVAC parameters. Default values on the list equal the values if FAN or PUMP has been selected in Start Up Wizard.

| Code | Parameter | Unit | Default | | Note |
|---|---|---|---|---|---|
| | | | FAN | PUMP | |
| P2.1.1 | Min. frequency | Hz | 20 | 20 | |
| P2.1.2 | Max. frequency | Hz | 50 | 50 | |
| P2.1.3 | Accel. time 1 | S | 20.0 | 5.0 | |
| P2.1.4 | Decel. time 1 | S | 20.0 | 5.0 | |
| P2.1.5 | Current limit | A | 1.1 x $I_L$ | | |
| P2.1.6 | Motor nominal current | A | $I_L$ | | Value set in Start Up Wizard |
| P2.1.7 | Motor nominal speed | Rpm | 1440 | | Value set in Start Up Wizard |
| P2.1.8 | Start function | | 2 | | 0 = Ramp<br>1 = Flying Start<br>2 = Conditional Flying Start* |
| P2.1.9 | Stop function | | 0 | | 0 = Coasting<br>1 = Ramp |
| P2.1.10 | Automatic restart | | 0 | | 0 = Not used<br>1 = Used |
| P2.1.11 | Motor nominal voltage | V | 400 | | |
| P2.1.12 | Motor nominal frequency | Hz | 50.00 | | |
| P2.1.13 | Preset speed 1 | Hz | 10.00 | | |
| P2.1.14 | Parameter conceal | | 1 | | 0 = All parameters and menus visible<br>1 = HVAC group P2.1 visible |

* Start mode where Tripless Output Switching is enabled, recommended to be used with all pump and fan applications

# NXL HVAC PID Control

## What You Need to Know

**Motor nameplate data**
- Nominal Current
- Nominal Speed

**Signal/sensor specification**
- Signal type
  (volts, milliamps)
- Range
  (0-10, 2-10, 0-20, 4-20)
- Sensor span

## Setup

**3 Run the Start Up Wizard**
**Note: Running the Start Up Wizard resets all parameters to their default values.**
- Hold STOP down for 5 seconds
- Select application type FAN or PUMP and confirm with ENTER
- Select motor nominal speed and confirm with ENTER
- Select motor nominal current and confirm with ENTER

**4 Full view of parameters**
- P2.1.14 Parameter Conceal Set to 0 (not in use)

**5 Control Signal Settings**
- For Volt sensor signal use Analogue Input 1 (AI1)
  0 – 10 V Default (no settings needed)
  2 – 10 V P2.2.6 AI1 signal range Set to 4
- For milliamp sensor signal use Analogue Input 2 (AI2)
  4 – 20 mA Default (no settings needed)
  0 – 20 mA P2.2.12 AI2 signal range Set to 1

**6 PID**
- PID settings
  P2.9.1 PID activation Set to 1 (activate)
  P2.9.2 PID reference
  no external reference Set to 2 (value from keypad)
  external reference Set to 0 (AI1) or 1 (AI2)
- Where is the sensor connected?
  P2.9.3 Actual value input Set to 0 (AI1) or 1 (AI2)
- PID reference (set-point)
  **Note: Only apply if not using external reference from controller!**
  P3.5 PID reference value (Set point value in percentage)
  % = ((set-point – minimum) / span) x 100
  For example: set-point is 3.2 bar, the sensor span is 0 – 5 bar.
  3.2 divided by 5 is 0.64; the value to set in P3.5 is thus 64

**Note:** Only one function per input. If there is a need to change mA input to V input or vice versa, please see instructions in the NXL HVAC User's Manual. Available for download at **http://inverter.ecc.emea.honeywell.com**

# Manual Testing

1 **Hold LEFT down for 3 seconds**
**Control Place automatically switches to Keypad**

2 **Use normal keypad buttons for speed control**
- UP and DOWN for adjusting the speed
- START and STOP for control

3 **Hold LEFT down for 3 seconds to return to remote control (I/O or Fieldbus)**

# Parameter List

This is the list of the most commonly used parameter group: HVAC parameters. Default values on the list equal the values if Start Up Wizard selection has been FAN or PUMP.

| Code | Parameter | Unit | Default | | Note |
|---|---|---|---|---|---|
| | | | FAN | PUMP | |
| P2.1.1 | Min. frequency | Hz | 20 | 20 | |
| P2.1.2 | Max. frequency | Hz | 50 | 50 | |
| P2.1.3 | Accel. time 1 | S | 20.0 | 5.0 | |
| P2.1.4 | Decel. time 1 | S | 20.0 | 5.0 | |
| P2.1.5 | Current limit | A | 1, 1x$I_L$ | | |
| P2.1.6 | Motor nominal current | A | $I_L$ | | Value set in Start Up Wizard |
| P2.1.7 | Motor nominal speed | Rpm | 1440 | | Value set in Start Up Wizard |
| P2.1.8 | Start function | | 2 | | 0 = Ramp<br>1 = Flying Start<br>2 = Conditional Flying Start* |
| P2.1.9 | Stop function | | 0 | | 0 = Coasting<br>1 = Ramp |
| P2.1.10 | Automatic restart | | 0 | | 0 = Not used<br>1 = Used (3x for automatic Restart) |
| P2.1.11 | Motor nominal voltage | V | 400 | | |
| P2.1.12 | Motor nominal frequency | Hz | 50.00 | | |
| P2.1.13 | Preset speed 1 | Hz | 10.00 | | |
| P2.1.14 | Parameter conceal | | 1 | | 0 = All parameters and menus visible<br>1 = HVAC group P2.1 visible |

* Start mode where Tripless Output Switching is enabled.

# Operating the NXS Keypad

## Reading the Display


**RUN and STOP**
Indicate if the drive is running. When RUN blinks, STOP command has been given but the motor is still rotating.

**DIRECTION**
Active motor direction visible: forward or reverse.

**READY**
Lights up when AC power is on. In case of a fault, the symbol will not light up.

**ALARM**
Lights up to warn that the drive is running outside a certain limit.

**FAULT**
Indicates that unsafe operating conditions caused the drive to stop.

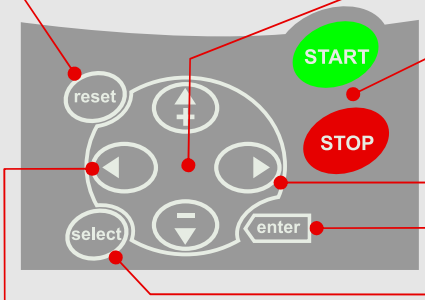
**CONTROL PLACE**
Active control place is visible: keypad, I/O or fieldbus.

**DESCRIPTION LINE**
Displays the description of menu, value or fault.

**VALUE LINE**
Displays the numerical and textual values of references, parameters etc. and the number of submenus available in each menu.

**LOCATION INDICATION**
Displays the symbol and number of menu, parameter etc.

## Keypad Push-Buttons




**RESET**
Reset active faults
**Note:** The motor may start immediately after resetting the fault!

**UP+ and DOWN–**
- Browse the pages in main and submenus
- Edit values

**START AND STOP**
Control the motor if the keypad is the active control

**RIGHT**
- In menu: move forward
- In menu: enter edit mode
- In parameter edit mode: move cursor right

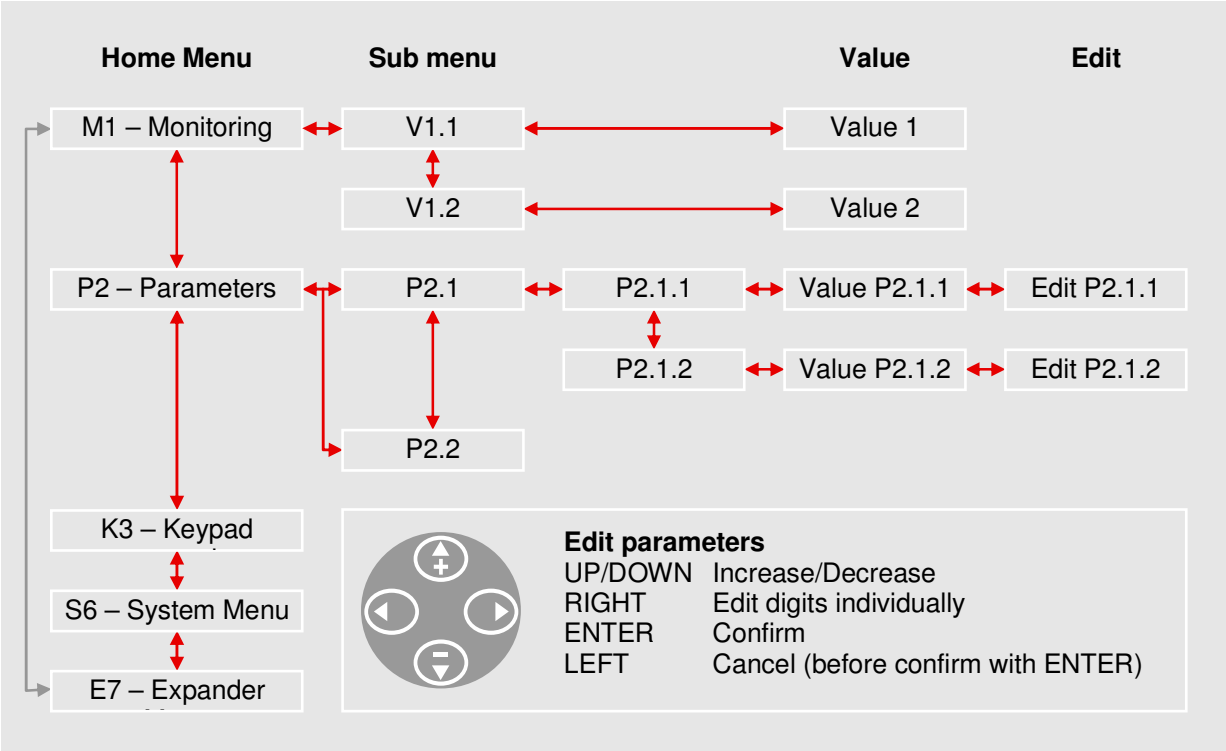
**ENTER**
- Confirmation of selections
- Fault history reset (2 – 3 s)

**SELECT**
Switch between the last two displays. To see how the changed new value influences some other value.

**LEFT**
- In menu: move forward
- In parameter edit mode: move cursor left
- In edit mode: exit

**Tip:** Hold LEFT down 3 – 5 s for control place change KEYPAD ↔ REMOTE

# Navigating the Menu




# Monitoring Values (Menu M1)

| | |
|---|---|
| V1.1 | Output Frequency |
| V1.2 | Frequency Reference |
| V1.3 | Motor Speed |
| V1.4 | Motor Current |
| V1.5 | Motor Torque |
| V1.6 | Motor Power |
| V1.7 | Motor Voltage |
| V1.8 | DC-link Voltage |
| V1.9 | Unit Temperature |
| V1.10 | Motor Temperature |

| | |
|---|---|
| V1.11 | Voltage Input (AI1) |
| V1.12 | Current Input (AI2) |
| V1.13 | DIN1, DIN2, DIN3 |
| V1.14 | DIN4, DIN5, DIN6 |
| V1.15 | DO1, RO1, RO2 |
| V1.16 | Analogue output current (AO1) |
| V1.17* | Multimonitoring items (displays 3 selectable items simultaneously) |

* Multimonitoring values can be selected in V1.17 by using RIGHT arrow to enter the edit mode

# NXS Basic Speed Control

## What You Need to Know

**Motor nameplate data**
- Nominal Current
- Nominal Speed
- Nominal Voltage, etc.

**Speed signal specification**
- Signal type (volts, milliamps)
- Range (0-10, 2-10, 0-20, 4-20)

## Setup

**1 Run the Start Up Wizard**
Automatically activated at 1st start.
To restart the wizard, set P6.5.3 Start Up Wizard to Yes and cycle the main power.

| Step | Question | Recommendation | Note |
|---|---|---|---|
| **Basic Settings** | | | |
| 1 | Language | English | |
| 2 | Application | Basic | |
| **Application Settings** | | | |
| 3 | Min. Frequency | 20 Hz | Typical for Fan or Pump |
| 4 | Max. Frequency | 50 Hz | Typical for Fan or Pump |
| 5 | Acceleration Time | 30 s for Fan, 15 s for Pump | |
| 6 | Deceleration Time | 30 s for Fan, 15 s for Pump | |
| **Motor Settings** | | | |
| 7 | Nom. Voltage for the motor | Check motor nameplate | Default typically OK |
| 8 | Nom. Frequency for the motor | Check motor nameplate | Default typically OK |
| 9 | Nom. Speed for the motor | Check motor nameplate | Critical |
| 10 | Nom. Current for the motor | Check motor nameplate | Critical |
| 11 | Motor Cos φ | Check motor nameplate | Default typically OK |
| **Speed Signal Settings** | | | |
| 12 | I/O Reference | mA signal: AI2 | Default signal: 4 – 20 V |
| | | V signal: AI1 | Default signal: 0 – 10 V |

**2 Other Control Signal Settings**
P2.15 Current reference offset Set to “No offset, 0 – 20 mA”

**3 Start function**
P2.11 Start Function Set to “CondFlyStart”
Start mode where Tripless Output Switching is enabled. Recommended function to be used especially in fan and pump applications.

## Input and Output Functions

Only DIN3 is programmable in Basic application. If the other functions are required, change the application to Standard from System Menu (S6.2 Application selection).

| | |
|---|---|
| DIN1 | Start Forward |
| DIN2 | Start Reverse |
| DIN3 | External Fault |

| | |
|---|---|
| DIN4 | Preset Speed 1 |
| DIN5 | Preset Speed 2 |
| DIN6 | Fault reset |

| | |
|---|---|
| DO1 | Ready |
| RO1 | Run |
| RO2 | Fault |

## Manual Testing

1 **Hold LEFT down for 3 seconds**
**Control Place automatically switches to Keypad**

2 **Use normal keypad buttons for speed control**
- UP and DOWN to adjust the speed
- START and STOP for control

3 **Hold LEFT down for 3 seconds to return to remote control (I/O or Fieldbus)**

## Parameter List

This is the list of the basic parameters that is the only group visible when the Basic application is selected (in addition to Keypad and System Menu, which are always visible).

| Code | Parameter | Default |
|---|---|---|
| P2.1 | Min. frequency | 0 Hz |
| P2.2 | Max. frequency | 50 Hz |
| P2.3 | Acceleration time | 3.0 s |
| P2.4 | Deceleration time | 3.0 s |
| P2.5 | Current limit | $I_L$ |
| P2.6 | Motor nominal voltage | 400 V* |
| P2.7 | Motor nominal frequency | 50 Hz |
| P2.8 | Motor nominal speed | 1440 |
| P2.9 | Motor nominal current | $I_H$ |
| P2.10 | Motor Cos φ | 0.85 |

| Code | Parameter | Default |
|---|---|---|
| P2.11 | Start function | Ramp |
| P2.12 | Stop function | Coasting |
| P2.13 | U/f optimization | Not used |
| P2.14 | I/O reference | AI1 |
| P2.15 | Current reference offset | Offset 4-20 mA |
| P2.16 | Analogue output function | Output Freq. |
| P2.17 | DIN3 function | External Fault |
| P2.18 | Preset speed 1 | 0 Hz |
| P2.19 | Preset speed 2 | 50 Hz |
| P2.20 | Automatic restart | Disabled |

* In 230 V series this is 230 V and in 690 V series this is 690 V.

# NXS PID Control

## What You Need to Know

**Motor nameplate data**
- Nominal Current
- Nominal Speed

**Signal/sensor specification**
- Signal type (volts, milliamps)
- Range (0-10, 2-10, 0-20, 4-20)
- Sensor span

## Setup

**1 Run the Start Up Wizard**
Automatically activated at 1st start. To restart the wizard, set P6.5.3 Start Up Wizard to Yes and cycle the main power.

| Step | Question | Recommendation | Note |
|---|---|---|---|
| **Basic Settings** | | | |
| 1 | Language | English | |
| 2 | Application | PID Control | |
| **Application Settings** | | | |
| 3 | Min. Frequency | 20 Hz | Typical for Fan or Pump |
| 4 | Max. Frequency | 50 Hz | Typical for Fan or Pump |
| 5 | Acceleration Time | 30 s for Fan, 15 s for Pump | |
| 6 | Deceleration Time | 30 s for Fan, 15 s for Pump | |
| **Motor Settings** | | | |
| 7 | Nom. Voltage for the motor | Check motor nameplate | Default typically OK |
| 8 | Nom. Frequency for the motor | Check motor nameplate | Default typically OK |
| 9 | Nom. Speed for the motor | Check motor nameplate | Critical |
| 10 | Nom. Current for the motor | Check motor nameplate | Critical |
| 11 | Motor Cos φ | Check motor nameplate | Default typically OK |
| **PID and Sensor Settings** | | | |
| 12 | PID Reference | Keypad reference | No controller |
| | | mA signal: AI2<br>V Signal: AI1<br>Fieldbus | Signal from controller |
| 13 | Actual Input | mA signal: AI2 | Default: 4 – 20 mA |
| | | V signal: AI1 | Default: 0 – 10 V |

**2 Other Control Signal Settings**
2 – 10 V: change the value of P2.2.16 AI1 signal range to 20 – 100 %
0 – 20 mA: change the value of P2.2.22 AI2 signal range to 0 – 20 mA

**3 PID reference from keypad (if no external reference signal)**
R3.4 PID reference value (set-point value in percentage)
% = ((set-point – minimum) / span) x 100
For example: set-point is 3.2 bar, the sensor span is 0 – 5 bar.
3.2 divided by 5 is 0.64; the value to set in P3.5 is thus 64

**4 Start function**
Set P2.4.6 Start Function to “CondFlyStart”
Start mode where Tripless Output Switching is enabled. Recommended function to be used especially in fan and pump applications.

**Note: Only one function per input. If there is a need to change mA input to V input or vice versa, please see instructions in NX User’s Manual.**

## Input and Output Functions

All inputs and outputs are programmable. Here are the default values:

| | |
|---|---|
| DIN1 | Start A (PID controller) |
| DIN2 | External Fault |
| DIN3 | Fault Reset |
| DIN4 | Start B (direct frequency reference) |
| DIN5 | Jogging Speed |
| DIN6 | Control place A/B selection:<br>open = A (PID)<br>closed = B (direct reference) |

| | |
|---|---|
| DO1 | Ready |
| RO1 | Run |
| RO2 | Fault |
| AO1 | Output frequency |

## Manual Testing

**1 Hold LEFT down for 3 seconds**
**Control Place automatically switches to Keypad**

**2 Use normal keypad buttons for speed control**
- Up and down arrows to adjust the speed
- START and STOP for control

**3 Hold LEFT down for 3 seconds to return to remote control (I/O or Fieldbus)**

## Parameter Menus

Here is the list of parameter menus available in PID application.

| Code | Parameter | Description |
|---|---|---|
| 2.1 | Basic parameters | All basic settings for operation and PID |
| 2.2 | Input signals | Settings for input signals |
| 2.3 | Output signals | Settings for output signals |
| 2.4 | Drive control | Specific settings for VFD (Start/Stop functions etc.) |
| 2.5 | Prohibit frequency | Settings for resonance elimination |
| 2.6 | Motor control | Specific settings for motor control |
| 2.7 | Protections | Settings for VFD protections |
| 2.8 | Auto restart | Settings for automatic restart functions |

# Inverter Fault Tracing

Conveniently, the fault coding and trip logic are similar in all Honeywell NX inverters. This table thus applies to both NXS and NXL HVAC.

| Fault Code | Fault | Possible Cause | Correcting measures |
|---|---|---|---|
| 1 | Overcurrent | Frequency converter has detected too high a current (> 4 * $I_n$) in the motor cable:<br>- Sudden heavy load increase.<br>- Short circuit in motor cables.<br>- Unsuitable motor. | Check loading.<br>Check cables.<br>Check motor size. |
| 2 | Overvoltage | The DC-link voltage has exceeded the limits<br>- Too short a deceleration time.<br>- High overvoltage spikes in utility. | Increase deceleration time. |
| 3 | Earth fault | Current measurement has detected that the sum of motor phase current is not zero:<br>- Insulation failure in cables or motor. | Check motor cables and motor. |
| 5 | Charging switch | The charging switch is open when the Start command has been given.<br>- Faulty operation.<br>- Component failure. | Reset the fault and restart.<br>Should the fault recur, contact the technical support. |
| 7 | Saturation trip | Various causes, e.g. faulty component. | Cannot be reset from the keypad. Switch off power. Do not connect power. Contact Honeywell.<br>If this fault appears simultaneously with Fault 1, check motor cables and motor. |
| 8 | System fault | - Component failure.<br>- Faulty operation. | Reset the fault and restart.<br>Should the fault recur, contact the technical support. |
| 9 | Undervoltage | DC-link voltage is under the voltage limits:<br>- Most probable cause: too low a supply voltage.<br>- Frequency converter internal fault. | In case of temporary supply voltage break, reset the fault and restart the frequency converter. Check the supply voltage. If it is adequate, an internal failure has occurred.<br>Contact the technical support. |
| 10 | Input line supervision | Input line phase is missing. | Check supply voltage and cable. |
| 11 | Output Phase Supervision | Current measurement has detected that there is no current in one motor phase. | Check motor cables and motor. |
| 13 | Inverter under temp. | Heatsink temperature is under – 10 °C. | Check that the inverter is operated under specified conditions. |
| 14 | Inverter over temp. | Heatsink temperature is over 90 °C. Overtemperature warning is issued when the heatsink temperature exceeds 85 °C. | Check the correct amount and flow of cooling air.<br>Check the heatsink for dust.<br>Check the ambient temperature.<br>Make sure that the switching frequency is not too high in relation to ambient temperature and motor load. |
| 15 | Motor stalled | Motor stall protection has tripped. | Check motor.<br>Check that pump or fan is not blocked. |
| 16 | Motor over temp. | Motor overheating has been detected by frequency converter motor temperature model. Motor is overloaded. | Decrease the motor load.<br>If no motor overload exists, check the temperature model parameters. |

| Fault Code | Fault | Possible Cause | Correcting measures |
|---|---|---|---|
| 17 | Motor under load | Motor underload protection has tripped. | FAN: check that belt is not broken.<br>PUMP: check that pump is not dry. |
| 22 | EEPROM checksum fault | Parameter save fault:<br>- Faulty operation.<br>- Component failure. | Contact the technical support. |
| 24 | Counter fault | Values displayed on counters are incorrect. | Contact the technical support. |
| 25 | Microprocessor watchdog fault | - Faulty operation.<br>- Component failure. | Reset the fault and restart. Should the fault recur, contact the technical support. |
| 29 | Thermistor fault | The thermistor input has detected increase of the motor temperature. | Check motor cooling and loading.<br>Check thermistor connection.<br>(If thermistor input is not in use, it has to be short circuited.) |
| 32 | Fan cooling | Cooling fan of the inverter does not start, when ON command is given. | Contact the technical support. |
| 34 | Internal bus communication | Ambient interference of defective hardware. | Should the fault recur, contact the technical support. |
| 35 | Application fault | Selected application does not function. | Contact the technical support. |
| 39 | Device removed | Option board removed. Drive removed. | Reset. |
| 40 | Device unknown | Unknown option board or drive. | Contact the technical support. |
| 41 | IGBT temperature | IGBT Inverter Bridge overtemperature protection has detected to high a motor current. | Check loading.<br>Check motor size. |
| 44 | Device change | Option board changed. Option board has default settings. | Reset. |
| 45 | Device added | Option board added. | Reset. |
| 50 | Analogue input $I_{in}$ < 4 mA (selected signal range 4 to 20 mA) | Current at the analogue input is < 4 mA.<br>- Control cable is broken or loose.<br>- Signal source has failed. | Check the current loop circuitry. |
| 51 | External fault | Digital input fault. Digital input has been programmed as external fault input and this input is active. | Check the programming and the device indicated by the external fault information. Check also the cabling of this device. |
| 52 | Keypad communication fault | The connection between the control keypad and the frequency converter is broken. | Check keypad connection and possible keypad cable. |
| 53 | Fieldbus fault | The data connection between the fieldbus Master and the fieldbus board is broken. | Check installation.<br>If installation is correct, contact the technical support. |
| 54 | Slot fault | Defective option board or slot. | Check board and slot.<br>Contact the technical support. |
| 55 | Actual value supervision | Actual value has exceeded or fallen below the actual value supervision limit. | Check the process. |

**Find out more**
For more information on Honeywell's frequency converters and other Honeywell products, visit us online at http://ecc.emea.honeywell.com

**Automation and Control Solutions**
Honeywell GmbH
Böblinger Straße 17
71101 Schönaich
Telephone (49) 7031 637 01
Telefax (49) 7073 637 493
www.honeywell.com

EN2B-0338GE51 R0410
April 2010


Honeywell