

**USER'S MANUAL**

**N X**  
FREQUENCY CONVERTERS

**ADD ON PAGES  
FOR THE FIRE  
MODE PID  
APPLICATION**

FOR SMOOTH CONTROL

**vacon**

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## FIRE MODE PID APPLICATION

### 1. INTRODUCTION

The application is functionally the same as the PID application (ASFIF05) with the addition of the fire mode features. Fire mode is selected via a digital input (programmable). The frequency is set according to logic in Figure 1. When fire mode is active, a fire mode warning (A81) is brought up on the display. When running in fire mode, the converter is programmed to enable the user to run the converter until either the digital input is removed or the converter is damaged.


#### **Additional features when fire mode is selected:**

- Run enable always active
- Run request always active
- Direction change not allowed
- Fault signal on digital outputs inactive
- Possible to connect fire mode signal to digital outputs
- Software generated faults are changed to warnings (Drive does not stop)
- Forced reset of hardware system faults (Delay time is set with parameter P2.10.5)
- Fire Mode frequency reference can be PID-output or two selectable preset speeds
- Monitor value V1.22 is stored if fire mode have been used (Counter)

## 2. Fire Mode PID Application – Parameter lists

On the next pages you will find the lists of parameters within the respective parameter groups. The parameter descriptions are given on pages 8.

### Column explanations:

Code	=	Location indication on the keypad; Shows the operator the present parameter number
Parameter	=	Name of parameter
Min	=	Minimum value of parameter
Max	=	Maximum value of parameter
Unit	=	Unit of parameter value; Given if available
Default	=	Value preset by factory
Cust	=	Customer's own setting
ID	=	ID number of the parameter (used with PC tools)
	=	On parameter code: Parameter value can only be changed after the frequency converter has been stopped.

## 2.1 Monitoring values (Control keypad: menu M1)

The monitoring values are the actual values of parameters and signals as well as statuses and measurements. Monitoring values cannot be edited.

See Vacon NX User's Manual, Chapter 7 for more information.

Code	Parameter	Unit	ID	Description
V1.1	Output frequency	Hz	1	Output frequency to motor
V1.2	Frequency reference	Hz	25	Frequency reference to motor control
V1.3	Motor speed	rpm	2	Motor speed in rpm
V1.4	Motor current	A	3	
V1.5	Motor torque	%	4	
V1.6	Motor power	%	5	Motor shaft power
V1.7	Motor voltage	V	6	
V1.8	DC link voltage	V	7	
V1.9	Unit temperature	°C	8	Heatsink temperature
V1.10	Voltage input	V	13	AI1
V1.11	Current input	mA	14	AI2
V1.12	Analogue input 3		27	AI3
V1.13	Analogue input 4		28	AI4
V1.14	DIN1, DIN2, DIN3		15	Digital input statuses
V1.15	DIN4, DIN5, DIN6		16	Digital input statuses
V1.16	DO1, RO1, RO2		17	Digital and relay output statuses
V1.17	Analogue I <sub>out</sub>	mA	26	AO1
V1.18	PID Reference	%	20	In percent of the maximum frequency
V1.19	PID Actual value	%	21	In percent of the max actual value
V1.20	PID Error value	%	22	In percent of the max error value
V1.21	PID Output	%	23	In percent of the max output value
V1.22	Fire mode used	x	1510	Counter, how many times fire mode have been in use

Table 1. Monitoring values

## 2.2 Input signals (Control keypad: Menu M2 → G2.2)

Code	Parameter	Min	Max	Unit	Default	Cust	ID	Note
P2.2.1	DIN2 function	0	15		1		319	<b>0</b> =Not used <b>1</b> =External fault cc <b>2</b> =External fault oc <b>3</b> =Run enable <b>4</b> =Acc/Dec time selection <b>5</b> =CP: I/O terminal <b>6</b> =CP: Keypad <b>7</b> =CP: Fieldbus <b>8</b> =Forward/Reverse <b>9</b> =Jogging frequency (cc) <b>10</b> =Fault reset (cc) <b>11</b> =Acc/Dec prohibit (cc) <b>12</b> =DC braking command <b>13</b> =Motor pot. UP (cc) <b>14</b> =Fire Mode <b>15</b> =Fire mode preset reference selection, 1 (cc) or 2 (cc)
P2.2.2	DIN3 function	0	15				301	<b>0</b> =Not used <b>1</b> =External fault cc <b>2</b> =External fault oc <b>3</b> =Run enable <b>4</b> =Acc/Dec time selection <b>5</b> =CP: I/O terminal <b>6</b> =CP: Keypad <b>7</b> =CP: Fieldbus <b>8</b> =Forward/Reverse <b>9</b> =Jogging frequency (cc) <b>10</b> =Fault reset (cc) <b>11</b> =Acc/Dec prohibit (cc) <b>12</b> =DC braking command <b>13</b> =Motor pot.DOWN (cc) <b>14</b> =Fire Mode <b>15</b> =Fire mode reference selection, PID or Preset
P2.2.3	DIN5 function	0	15				330	<b>0</b> =Not used <b>1</b> =External fault cc <b>2</b> =External fault oc <b>3</b> =Run enable <b>4</b> =Acc/Dec time selection <b>5</b> =CP: I/O terminal <b>6</b> =CP: Keypad <b>7</b> =CP: Fieldbus <b>8</b> =Forward/Reverse <b>9</b> =Jogging frequency (cc) <b>10</b> =Fault reset (cc) <b>11</b> =Acc/Dec prohibit (cc) <b>12</b> =DC braking command <b>13</b> =Enable PID reference <b>14</b> =Fire Mode <b>15</b> =Fire mode reference selection, PID or Preset

Table 2. Digital input functions, G2.2

### 2.3 Output signals (Control keypad M2 → G2.3)

Code	Parameter	Min	Max	Unit	Default	Cust	ID	Note
P2.3.6	Digital output 1 function	0	21		1		312	<b>0</b> =Not used <b>1</b> =Ready <b>2</b> =Run <b>3</b> =Fault <b>4</b> =Fault inverted <b>5</b> =FC overheat warning <b>6</b> =Ext. fault or warning <b>7</b> =Ref. fault or warning <b>8</b> =Warning <b>9</b> =Reversed <b>10</b> =Preset speed <b>11</b> =At speed <b>12</b> =Mot. regulator active <b>13</b> =OP freq. limit superv.1 <b>14</b> =OP freq. limit superv.2 <b>15</b> =Torque limit superv. <b>16</b> =Ref. limit supervision <b>17</b> =External brake control <b>18</b> =Control place: IO <b>19</b> =FC temp. limit superv. <b>20</b> =Unrequested direction <b>21</b> =Ext. brake control inv. <b>22</b> =Thermistor Fault/Warn. <b>23</b> =Fieldbus digital input. <b>24</b> =Fire mode selected.
P2.3.7	Relay output 1 function	0	21		2		313	As parameter 2.3.6
P2.3.8	Relay output 2 function	0	21		3		314	As parameter 2.3.6

Table 3. Digital output functions, G2.3

## 2.4 Fire Mode (Control keypad M2 -> G2.10)

Code	Parameter	Min	Max	Unit	Default	Cust	ID	Note
P2.10.1	Fire mode function	0	1		0		1501	<b>0</b> =Closing contact <b>1</b> =Opening contact
P2.10.2	Fire mode preset reference selection	0	1		0		1502	<b>0</b> =Not inverted <b>1</b> =Inverted
P2.10.3	Fire mode min frequency	Par 2.1.1	Par. 2.1.2	Hz	15,00		1503	Min frequency when in fire mode
P2.10.4	Fire mode preset frequency 1	Par 2.1.1	Par 2.1.2	Hz	35,00		1504	Fire mode preset frequency reference 1
P2.10.5	Fire mode preset frequency 2	Par 2.1.1	Par 2.1.2	Hz	50,00		1505	Fire mode preset frequency reference 2
P2.10.6	Fire mode forced reset delay	0,50	10,00	s	5,00		1506	Delay time for forced reset when in fire mode

Table 4. Fire Mode parameters, G2.10

## 3. DESCRIPTION OF PARAMETERS

### 3.1 FIRE MODE PARAMETERS

#### 2.10.1 Fire mode function

- 0** Closing contact
- 1** Opening contact

#### 2.10.2 Fire mode preset reference selection

- 0** Not inverted
- 1** Inverted

#### 2.10.3 Fire mode min frequency

Sets the min frequency when the Fire Mode is active

#### 2.10.4 Fire mode preset frequency 1

Parameter value is automatically limited between the minimum and maximum frequencies (P2.1.1, P2.1.2)

#### 2.10.5 Fire mode preset frequency 2

Parameter value is automatically limited between the minimum and maximum frequencies (P2.1.1, P2.1.2)

#### 2.10.6 Fire mode forced reset delay

Time delay before forced reset after a hardware generated fault.

### 4. Frequency reference signal logic in Fire Mode PID Application

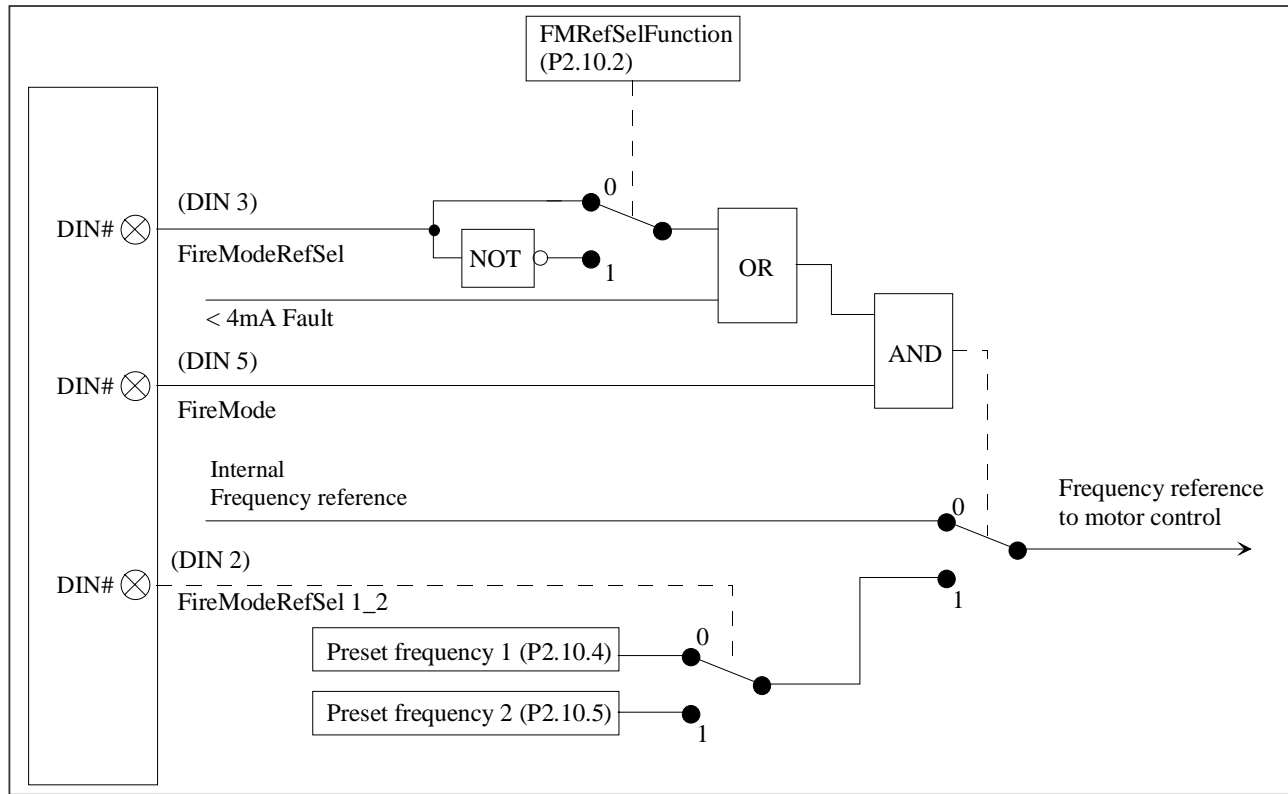


Figure 1. Frequency reference logic of the Fire Mode PID Application when running in Fire Mode

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