Section 7.18
[Pump monitoring] - [Anti jam]

[Anti-jam monit] ⌿ＡＭ - Menu

Access

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About This Menu

In waste water applications, clogging substances reduce the efficiency of the system and may decrease the pump life time.

It may also help to clear a blocked impeller, pipe, or valve at downstream location.

The anti-jam function allows, manually and/or automatically, to execute forward and reverse pump rotation cycles.

The frequency reference, acceleration and deceleration, in forward and in reverse direction can be adjusted by dedicated parameters. It allows you to set up the function in accordance with the application specifications. Refer to the pump datasheet while setting up the function.

NOTE: The anti-jam configuration overrides other configurations such as [PID acceleration time] ＡＣＣＰ or [Start Accel Ramp] ＡＣＣＳ.

NOTICE
DAMAGE TO THE PUMP
This function uses forward and reverse operations. Verify that the pump and the installation are compatible with reverse operation before setting up this function.
Failure to follow these instructions can result in equipment damage.

Anti-Jam Cycle

The anti-jam function can be triggered:
- By an external trigger that can be assigned to a digital input (or word bit in IO profile).
- Automatically:
  - An automatic trigger can occur at each start command, or
  - Automatic triggers can occur within a predefined duration, or
  - Automatic triggers can occur depending on the motor torque threshold monitoring.
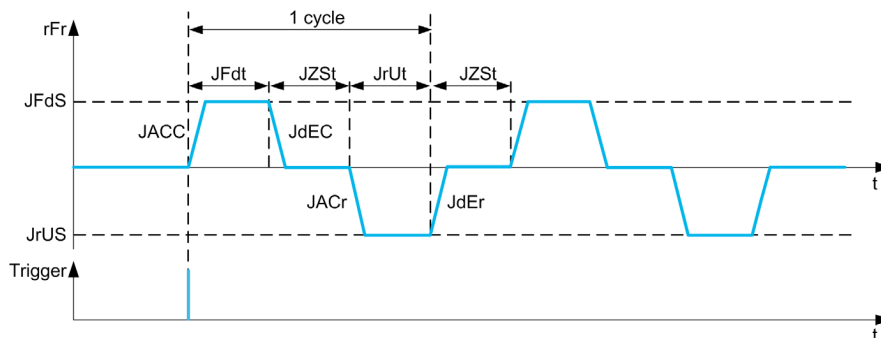
An anti-jam cycle is composed of:
- 1 forward action according to [Anti-Jam Fwd Acc] ⌿ＡＣＣ, [Anti-Jam Fwd Time] ⌿ＦｄＥ, [Anti-Jam Fwd Speed] ⌿ＦｄＳ, [Anti-Jam Fwd Dec] ⌿ｄＥＣ,
- 1 stop action during [Anti-Jam Stop Time] ⌿ＺＳＥ,
- 1 reverse action according to [Anti-Jam Rv Acc] ⌿ＡＣｒ,[Anti-Jam Rv Time] ⌿ｒｄＥ, [Anti-Jam Rv Speed] ⌿ｒＶＳ, [Anti-Jam Rv Dec] ⌿ｄＥｒ,
- 1 stop action during [Anti-Jam Stop Time] ⌿ＺＳＥ,

An anti-jam sequence corresponds to a number of consecutive anti-jam cycles: **[Anti-Jam Cycle Nb]** ⊐ n b C

NOTE: In case of an external trigger, if the command is removed before the end of the anti-jam sequence, the anti-jam sequence continues up to the end. In addition to the trigger, a Run command is necessary during the whole anti-jam sequence.

Anti-Jam Counting

The anti-jam function monitors the number of sequences during a configured time window **[Anti-Jam Interval]** ⊐ A Π Ł . It helps to detect untimely aging of the system and abnormal operation. For example, it occurs on an automatic trigger on a motor torque threshold.

An internal counter counts the number of sequences. Each time the sequence is started, the counter is incremented. It is decremented for each time window corresponding to one start.

If the counter reaches the maximum number allowed, **[Anti-Jam Max Seq]** ⊐ A Π n , a warning **[Anti-Jam Warning]** ⊐ A Π A and an error **[Anti Jam Error]** ⊐ A Π F are triggered. The application follows the **[Anti-Jam Error Resp]** ⊐ A Π b behavior defined.

[Anti-Jam Ext Trig] ⊐ E Ł C

Switch input selection.

Setting	Code / Value	Description
[Not Assigned]	n o	Not assigned
[DI1]...[DI6]	L ı 1...L ı 6	Digital input DI1...DI6
[DI11]...[DI16]	L ı 1 1...L ı 1 6	Digital input DI11...DI16, if VW3A3203 I/O extension module has been inserted
[CD00]...[CD10]	C d 0 0...C d 1 0	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** ı o configuration
[CD11]...[CD15]	C d 1 1...C d 1 5	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C100]...[C110]	C 1 0 0...C 1 1 0	Virtual digital input CMD1.0...CMD1.10 with integrated Modbus Serial in **[I/O profile]** ı o configuration
[C111]...[C115]	C 1 1 1...C 1 1 5	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C200]...[C210]	C 2 0 0...C 2 1 0	Virtual digital input CMD2.0...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** ı o configuration
[C211]...[C215]	C 2 1 1...C 2 1 5	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C300]...[C310]	C 3 0 0...C 3 1 0	Virtual digital input CMD3.0...CMD3.10 with a fieldbus module in **[I/O profile]** ı o configuration
[C311]...[C315]	C 3 1 1...C 3 1 5	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C500]...[C510]	C 5 0 0...C 5 1 0	Virtual digital input CMD5.0...CMD5.10 with integrated Ethernet ModbusTCP in **[I/O profile]** ı o configuration
[C511]...[C515]	C 5 1 1...C 5 1 5	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet ModbusTCP regardless of configuration
[DI1 (Low level)]...[DI6 (Low level)]	L ı 1 L ...L 6 L	Digital input DI1...DI6 used at low level
[DI11 (Low level)]...[DI16 (Low level)]	L ı 1 1 L ...L ı 1 6 L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Anti-Jam Auto Trig] ⊐ A Ł C

Anti-jam trigger mode.

Setting	Code / Value	Description
[No]	n o	Inactive
[Start]	5 Ł r Ł	An automatic trigger occurs at each start command
[Time]	Ł ı Π E	Automatic triggers occur within a predefined duration
[Torque]	Ł r 9	Automatic triggers can occur depending on the motor torque threshold monitoring.

[Anti-Jam Trigger Time] ⌐ŁⅭŁ ★

Time to trigger an anti sequence when the pump has not been running.

This parameter can be accessed if **[Anti-Jam Auto Trig]** ⌐ЯŁⅭ is set to **[Time]** ŁıⅡE .

Setting ⟨⟩	Description
0...9,999 h	Setting range **Factory setting**: 24 h

[Anti-jam Torque] ⌐ŁⅭⅬ ★

Level of torque to trigger.

This parameter can be accessed if **[Anti-Jam Auto Trig]** ⌐ЯŁⅭ is set to **[Torque]** Ł⌐9.

Setting ⟨⟩	Description
10...150%	Setting range **Factory setting**: 110%

[Anti-Jam Start Delay] ⌐ŁⅭⅾ★

Delay to trigger when an overtorque is detected.

This parameter can be accessed if **[Anti-Jam Auto Trig]** ⌐ЯŁⅭ is set to **[Torque]** Ł⌐9.

Setting ⟨⟩	Description
0...3,600 s	Setting range **Factory setting**: 10 s

[Anti-Jam Fwd Acc] ⌐ЯⅭⅭ ★

Anti-jam acceleration in forward.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** ⌐ЕŁⅭ is not set to **[No]** ⌐ø, or
- **[Anti-Jam Auto Trig]** ⌐ЯŁⅭ is not set to **[No]** ⌐ø.

Setting ⟨⟩	Description
By default, with ıⅎ⌐ = 0.1: 0.00...300.00 s	Setting range **Factory setting**: 3 s
If ıⅎ⌐ = 0.01: 0.00...30.00 s	Setting range
If ıⅎ⌐ = 1: 0.00...3000.00 s	Setting range

[Anti-Jam Fwd Dec] ⌐ⅾЕⅭ ★

Anti-jam deceleration in forward.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** ⌐ЕŁⅭ is not set to **[No]** ⌐ø, or
- **[Anti-Jam Auto Trig]** ⌐ЯŁⅭ is not set to **[No]** ⌐ø.

Setting ⟨⟩	Description
By default, with ıⅎ⌐ = 0.1: 0.00...300.00 s	Setting range **Factory setting**: 3 s
If ıⅎ⌐ = 0.01: 0.00...30.00 s	Setting range
If ıⅎ⌐ = 1: 0.00...3000.00 s	Setting range

[Anti-Jam Rv Acc] $JACr$ ★

Anti-jam acceleration in reverse.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** $JEtC$ is not set to **[No]** no, or
- **[Anti-Jam Auto Trig]** $JAtC$ is not set to **[No]** no.

Setting ( )	Description
By default, with inr = 0.1: 0.00...300.00 s	Setting range **Factory setting**: 3 s
If inr = 0.01: 0.00...30.00 s	Setting range
If inr = 1: 0.00...3000.00 s	Setting range

[Anti-Jam Rv Dec] $JdEr$ ★

Anti-jam deceleration in reverse.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** $JEtC$ is not set to **[No]** no, or
- **[Anti-Jam Auto Trig]** $JAtC$ is not set to **[No]** no.

Setting ( )	Description
By default, with inr = 0.1: 0.00...300.00 s	Setting range **Factory setting**: 3 s
If inr = 0.01: 0.00...30.00 s	Setting range
If inr = 1: 0.00...3000.00 s	Setting range

[Anti-Jam Fwd Speed] $JFdS$ ★

Anti-jam speed in forward.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** $JEtC$ is not set to **[No]** no, or
- **[Anti-Jam Auto Trig]** $JAtC$ is not set to **[No]** no.

Setting ( )	Description
0.0...500.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Anti-Jam Rv Speed] $JruS$ ★

Anti-jam speed in reverse.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** $JEtC$ is not set to **[No]** no, or
- **[Anti-Jam Auto Trig]** $JAtC$ is not set to **[No]** no.

Setting ( )	Description
0.0...500.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Anti-Jam Fwd Time] $JFdt$ ★

Anti-jam time in forward.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** $JEtC$ is not set to **[No]** no, or
- **[Anti-Jam Auto Trig]** $JAtC$ is not set to **[No]** no.

Setting ( )	Description
0...300 s	Setting range **Factory setting**: 1 s

[Anti-Jam Rv Time] ⌨⌐┘⊢ ★

Anti-jam time in reverse.

This parameter can be accessed if:
● **[Anti-Jam Ext Trig]** ⌨⊢⊢⊏ is not set to **[No]** ⌐□, or
● **[Anti-Jam Auto Trig]** ⌨�⊢⊏ is not set to **[No]** ⌐□.

Setting ( )	Description
0...300 s	Setting range **Factory setting**: 1 s

[Anti-Jam Stop Time] ⌨Z5⊢ ★

Anti-jam time between forward and reverse.

This parameter can be accessed if:
● **[Anti-Jam Ext Trig]** ⌨⊢⊢⊏ is not set to **[No]** ⌐□, or
● **[Anti-Jam Auto Trig]** ⌨fl⊢⊏ is not set to **[No]** ⌐□.

Setting ( )	Description
0...300 s	Setting range **Factory setting**: 0 s

[Anti-Jam Cycle Nb] ⌨⌐⊢⊏ ★

Anti-jam cycle number.

This parameter can be accessed if:
● **[Anti-Jam Ext Trig]** ⌨⊢⊢⊏ is not set to **[No]** ⌐□, or
● **[Anti-Jam Auto Trig]** ⌨fl⊢⊏ is not set to **[No]** ⌐□.

Setting ( )	Description
1...100	Setting range **Factory setting**: 10

[Anti-Jam Max Seq] ⌨fl⌐⌐ ★

Anti-jam maximum consecutive anti-jam sequence allowed.

This parameter can be accessed if:
● **[Anti-Jam Ext Trig]** ⌨⊢⊢⊏ is not set to **[No]** ⌐□, or
● **[Anti-Jam Auto Trig]** ⌨fl⊢⊏ is not set to **[No]** ⌐□.

Setting ( )	Description
1...99	Setting range **Factory setting**: 2

[Anti-Jam Interval] ⌨fl⌐⊢ ★

Anti-jam minimum time between 2 non-consecutive sequences.

This parameter can be accessed if:
● **[Anti-Jam Ext Trig]** ⌨⊢⊢⊏ is not set to **[No]** ⌐□, or
● **[Anti-Jam Auto Trig]** ⌨fl⊢⊏ is not set to **[No]** ⌐□.

Setting ( )	Description
0...3,600 s	Setting range **Factory setting**: 60 s

[Anti-Jam Error Resp] ⌐ＡＭｂ ★

Anti-jam monitoring function response to a detected error.

This parameter can be accessed if:
- **[Anti-Jam Ext Trig]** ＪＥｔＣ is not set to **[No]** ⌐ｏ, or
- **[Anti-Jam Auto Trig]** ＪＡｔＣ is not set to **[No]** ⌐ｏ.

Setting	Code / Value	Description
[Ignore]	⌐ｏ	Detected error ignored
[Freewheel Stop]	ＹＥＳ	Freewheel stop **Factory setting**
[Per STT]	ＳｔＥ	Stop according to **[Type of stop]** ＳｔＥ parameter but without an error triggered after stop
[Fallback Speed]	ＬＦＦ	Change to fallback speed, maintained as long as the detected error persits and the run command has not been removed [1]
[Ramp stop]	⌐ＭＰ	Stop on ramp