

Section 8.41

[Generic functions] - [Torque control]

[Torque control] $\bar{L} \square r$ - Menu

Access

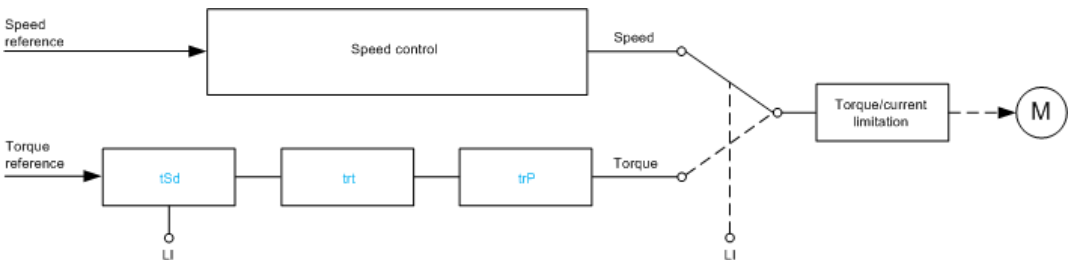
[Complete settings] $\rightarrow$ [Generic functions] $\rightarrow$ [Torque control]

About This Menu

This function can be used if [Motor control type] $\bar{L} \bar{L} \bar{L}$ is set to [SVCV] $\bar{S} \bar{V} \bar{L}$ or [FVC] $\bar{F} \bar{V} \bar{L}$ or [Sync. mot.] $\bar{S} \bar{Y} \bar{n}$ or [Sync.CL] $\bar{F} \bar{S} \bar{Y}$.

NOTE: This function cannot be used with some other functions.

NOTE: This function is not compatible with the handling of the [Load slipping] $\bar{R} \bar{n} \bar{F}$ error.

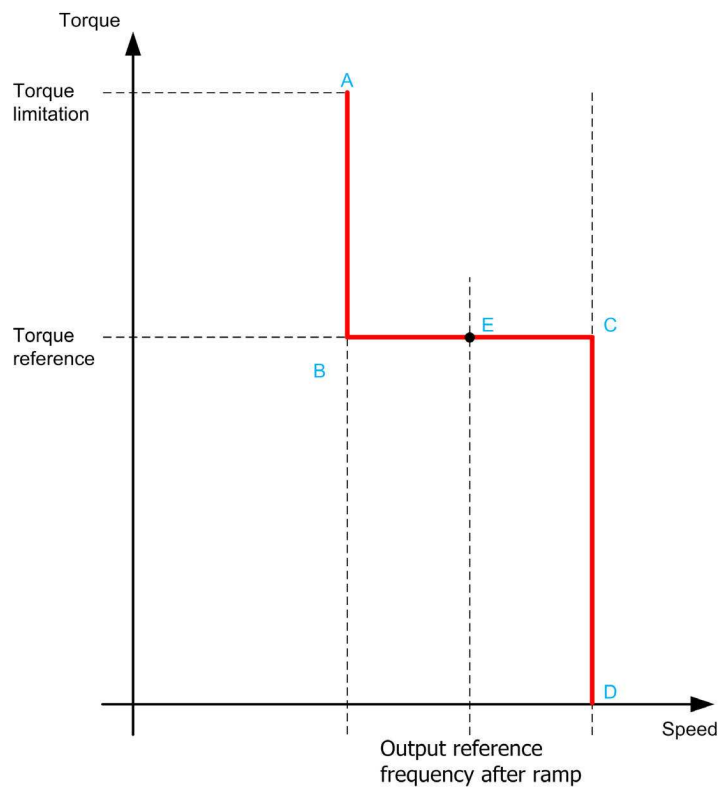


The function can be used to switch between operation in speed regulation mode and operation in torque control mode.

In torque control mode, the speed may vary within a configurable "deadband". When it reaches a lower or upper limit, the drive automatically reverts to speed regulation mode and remains at this limit speed. The regulated torque is therefore no longer maintained and two scenarios may occur.

- If the torque returns to the required value, the drive returns to torque control mode.
- If the torque does not return to the required value at the end of a configurable period, the drive switches to [Torque Reg Warning] $r \bar{L} \bar{R}$ or [Torque timeout] $\bar{S} \bar{r} \bar{F}$.

 WARNING
UNANTICIPATED EQUIPMENT OPERATION Verify that activating this function does not result in unsafe conditions. Failure to follow these instructions can result in death, serious injury, or equipment damage.



AB, CD Fallback to speed regulation

BC Torque control zone

E Ideal operating point

The torque sign and value can be transmitted via a logic output and an analog output.

[Trq/spd switching] 5.5

Torque / speed regulation switching by a logic input.

Setting	Code / Value	Description
[Not Assigned]	n.a.	Not assigned Factory setting
[Yes]	YES	Yes
[DI1]...[DI8]	L1...L8	Digital input DI1...DI8
[DI11]...[DI16]	L11...L16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...[CD10]	CD0...CD10	Virtual digital input CMD.0...CMD.10 in [I/O profile] configuration
[CD11]...[CD15]	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...[C110]	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in [I/O profile] configuration
[C111]...[C115]	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...[C210]	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in [I/O profile] configuration
[C211]...[C215]	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...[C310]	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in [I/O profile] configuration
[C311]...[C315]	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...[C510]	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in [I/O profile] configuration
[C511]...[C515]	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Torque ref. channel] $\mathfrak{L} \mathfrak{r} \mathfrak{I}$ ★

Channel for torque reference.

This parameter can be accessed if **[Trq/spd switching] $\mathfrak{L} \mathfrak{S} \mathfrak{S}$** is not set to **[No] $\mathfrak{n} \mathfrak{o}$** .

Setting	Code / Value	Description
[Not Configured]	$\mathfrak{n} \mathfrak{o}$	Not assigned Factory setting
[AI1]...[AI3]	$\mathfrak{A} \mathfrak{I} \mathfrak{1} \dots \mathfrak{A} \mathfrak{I} \mathfrak{3}$	Analog input AI1...AI3
[AI4]...[AI5]	$\mathfrak{A} \mathfrak{I} \mathfrak{4} \dots \mathfrak{A} \mathfrak{I} \mathfrak{5}$	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref. Freq- Rmt.Term]	$\mathfrak{L} \mathfrak{C} \mathfrak{C}$	Reference frequency via remote terminal
[Ref. Freq-Modbus]	$\mathfrak{M} \mathfrak{d} \mathfrak{b}$	Reference frequency via Modbus
[Ref. Freq-CANopen]	$\mathfrak{C} \mathfrak{A} \mathfrak{n}$	Reference frequency via CANopen
[Ref. Freq-Com. Module]	$\mathfrak{n} \mathfrak{E} \mathfrak{L}$	Reference frequency via communication module
[Embedded Ethernet]	$\mathfrak{E} \mathfrak{t} \mathfrak{H}$	Embedded Ethernet
[DI7 PulseInput]...[DI8 PulseInput]	$\mathfrak{P} \mathfrak{I} \mathfrak{7} \dots \mathfrak{P} \mathfrak{I} \mathfrak{8}$	Digital input DI7...DI8 used as pulse input

[Torque Ref Assign] $\mathfrak{L} \mathfrak{r} \mathfrak{I}$ ★

Torque reference channel assignment.

This parameter can be accessed if **[Trq/spd switching] $\mathfrak{L} \mathfrak{S} \mathfrak{S}$** is not set to **[No] $\mathfrak{n} \mathfrak{o}$** .

Setting	Code / Value	Description
[DI1]...[DI8]	$\mathfrak{L} \mathfrak{I} \mathfrak{1} \dots \mathfrak{L} \mathfrak{I} \mathfrak{8}$	Digital input DI1...DI8
[DI11]...[DI16]	$\mathfrak{L} \mathfrak{I} \mathfrak{1} \mathfrak{1} \dots \mathfrak{L} \mathfrak{I} \mathfrak{1} \mathfrak{6}$	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[C101]...[C110]	$\mathfrak{C} \mathfrak{I} \mathfrak{0} \mathfrak{1} \dots \mathfrak{C} \mathfrak{I} \mathfrak{1} \mathfrak{0}$	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in [I/O profile] $\mathfrak{I} \mathfrak{o}$ configuration
[C111]...[C115]	$\mathfrak{C} \mathfrak{I} \mathfrak{1} \mathfrak{1} \dots \mathfrak{C} \mathfrak{I} \mathfrak{1} \mathfrak{5}$	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...[C210]	$\mathfrak{C} \mathfrak{2} \mathfrak{0} \mathfrak{1} \dots \mathfrak{C} \mathfrak{2} \mathfrak{1} \mathfrak{0}$	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in [I/O profile] $\mathfrak{I} \mathfrak{o}$ configuration
[C211]...[C215]	$\mathfrak{C} \mathfrak{2} \mathfrak{1} \mathfrak{1} \dots \mathfrak{C} \mathfrak{2} \mathfrak{1} \mathfrak{5}$	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...[C310]	$\mathfrak{C} \mathfrak{3} \mathfrak{0} \mathfrak{1} \dots \mathfrak{C} \mathfrak{3} \mathfrak{1} \mathfrak{0}$	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in [I/O profile] $\mathfrak{I} \mathfrak{o}$ configuration
[C311]...[C315]	$\mathfrak{C} \mathfrak{3} \mathfrak{1} \mathfrak{1} \dots \mathfrak{C} \mathfrak{3} \mathfrak{1} \mathfrak{5}$	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...[C510]	$\mathfrak{C} \mathfrak{5} \mathfrak{0} \mathfrak{1} \dots \mathfrak{C} \mathfrak{5} \mathfrak{1} \mathfrak{0}$	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in [I/O profile] $\mathfrak{I} \mathfrak{o}$ configuration
[C511]...[C515]	$\mathfrak{C} \mathfrak{5} \mathfrak{1} \mathfrak{1} \dots \mathfrak{C} \mathfrak{5} \mathfrak{1} \mathfrak{5}$	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[Torque ref. channel]	$\mathfrak{L} \mathfrak{r} \mathfrak{I}$	Torque reference channel 1
[Torque ref. 2 channel]	$\mathfrak{L} \mathfrak{r} \mathfrak{2}$	Torque reference channel 2

[Torque ref. 2 channel] $\mathfrak{L} \mathfrak{r} \mathfrak{2}$ ★

Torque reference channel 2.

This parameter can be accessed if **[Trq/spd switching] $\mathfrak{L} \mathfrak{S} \mathfrak{S}$** is not set to **[No] $\mathfrak{n} \mathfrak{o}$** .

Identical to **[Torque ref. channel] $\mathfrak{L} \mathfrak{r} \mathfrak{I}$** (see page 416).

[Torque ref. sign] $\mathfrak{L} \mathfrak{S} \mathfrak{d}$ ★

Assignment for the inversion of the sign of the reference for the torque regulation function.

This parameter can be accessed if **[Trq/spd switching] $\mathfrak{L} \mathfrak{S} \mathfrak{S}$** is not set to **[No] $\mathfrak{n} \mathfrak{o}$** .

Identical to **[Trq/spd switching] $\mathfrak{L} \mathfrak{S} \mathfrak{S}$** (see page 415).

[Torque ratio] $\mathbb{E} \mathbb{r} \mathbb{E}$ ★

Torque regulation: torque ratio.

This parameter can be accessed if **[Trq/spd switching] $\mathbb{E} \mathbb{S} \mathbb{S}$** is not set to **[No] $\mathbb{n} \mathbb{o}$** .

Setting ()	Description
0.0...1000.0%	Coefficient applied to [Torque ref. channel] $\mathbb{E} \mathbb{r} \mathbb{1}$ or [Torque ref. 2 channel] $\mathbb{E} \mathbb{r} \mathbb{2}$ Factory setting: 100.0%

[Torque Ratio Assign] $\mathbb{E} \mathbb{q} \mathbb{r}$ ★

Torque regulation: torque ratio value selection.

This parameter can be accessed if **[Trq/spd switching] $\mathbb{E} \mathbb{S} \mathbb{S}$** is not set to **[No] $\mathbb{n} \mathbb{o}$** .

Setting	Code / Value	Description
[No]	$\mathbb{n} \mathbb{o}$	Analog input is not assigned Factory setting
[AI1]...[AI3]	$\mathbb{A} \mathbb{1} \dots \mathbb{A} \mathbb{3}$	Analog input AI1...AI3
[AI4]...[AI5]	$\mathbb{A} \mathbb{4} \dots \mathbb{A} \mathbb{5}$	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[AI Virtual 1]	$\mathbb{A} \mathbb{V} \mathbb{1}$	Virtual analogic input 1
[DI7 PulseInput]...[DI8 PulseInput]	$\mathbb{P} \mathbb{7} \dots \mathbb{P} \mathbb{8}$	Digital input DI7...DI8 used as pulse input

[Torque Ref Offset] $\mathbb{E} \mathbb{q} \mathbb{o} \mathbb{P}$ ★

Torque reference offset.

This parameter can be accessed if **[Trq/spd switching] $\mathbb{E} \mathbb{S} \mathbb{S}$** is not set to **[No] $\mathbb{n} \mathbb{o}$** .

Setting ()	Description
-1000.0...1000.0%	Setting range Factory setting: 0.0%

[Torque Offset Assign] $\mathbb{E} \mathbb{q} \mathbb{o}$ ★

Torque regulation: Torque offset value selection

This parameter can be accessed if **[Trq/spd switching] $\mathbb{E} \mathbb{S} \mathbb{S}$** is not set to **[No] $\mathbb{n} \mathbb{o}$** .

Identical to **[Torque Ratio Assign] $\mathbb{E} \mathbb{q} \mathbb{r}$** (see page 417).

[Low Torque] $\mathbb{L} \mathbb{E} \mathbb{q}$ ★

Low torque threshold.

This parameter can be accessed if **[Trq/spd switching] $\mathbb{E} \mathbb{S} \mathbb{S}$** is not set to **[No] $\mathbb{n} \mathbb{o}$** .

This parameter cannot be higher than **[High Torque] $\mathbb{H} \mathbb{E} \mathbb{q}$** .

Setting ()	Description
-300.0... [High Torque] $\mathbb{H} \mathbb{E} \mathbb{q}$	Setting range Factory setting: -100.0%

[High Torque] H L 9 ★

High torque threshold.

This parameter can be accessed if **[Trq/spd switching] L 5 5** is not set to **[No] n o**.

This parameter cannot be lower than **[Low Torque] L L 9**.

Setting ()	Description
[Low Torque] L L 9 ...300.0%	Setting range Factory setting: 100.0%

[Torque ramp time] L r P ★

Torque ramp time.

This parameter can be accessed if **[Trq/spd switching] L 5 5** is not set to **[No] n o**.

Setting ()	Description
0.00...99.99 s	Rise and fall time for a variation of 100% of the rated torque Factory setting: 3.00 s

[Torque Filter] L r F ★

Torque filter activation.

This parameter can be accessed if **[Trq/spd switching] L 5 5** is not set to **[No] n o**.

Setting	Code / Value	Description
[No]	n o	Not activated. Factory setting
[Yes]	y e s	Activated

[Torque Filter Bandwidth] L r W ★

Torque filter bandwidth.

This parameter can be accessed if **[Torque Filter] L r F** is set to **[Yes] y e s**.

Setting ()	Description
1...1000 Hz	Setting range Factory setting: 20 Hz

[Torque control stop] L 5 L ★

Torque regulation: stop command type.

This parameter can be accessed if **[Trq/spd switching] L 5 5** is not set to **[No] n o**.

Setting	Code / Value	Description
[Speed]	S P d	Speed regulation stop, in accordance with the type of stop configuration Factory setting
[Freewheel Stop]	n 5 L	Freewheel stop
[Spin]	S P n	Zero torque stop, but maintaining the flux in the motor (only in close loop)

[Spin time] 5 P 1 ★

Torque regulation: spin time.

Spin time following stop, in order to remain ready to restart quickly.

This parameter can be accessed if:

- **[Trq/spd switching] 1 5 5** is not set to **[No] n o**, and
- **[Torque control stop] 1 5 1** is set to **[Spin] 5 P 1**.

Setting ()	Description
0.0...3600.0 s	Setting range Factory setting: 1.0 s

[Positive deadband] d b P ★

Torque regulation positive deadband.

This parameter can be accessed if **[Trq/spd switching] 1 5 5** is not set to **[No] n o**.

Value added algebraically to the speed reference.

Example for **d b P** = 10:

- If reference = +50 Hz : +50 + 10 = 60 Hz
- If reference = -50 Hz : -50 + 10 = -40 Hz

Setting ()	Description
0...2 x [Max Frequency] 1 F r	Setting range Factory setting: 10 Hz

[Negative deadband] d b n ★

Torque regulation negative deadband.

This parameter can be accessed if **[Trq/spd switching] 1 5 5** is not set to **[No] n o**.

Value subtracted algebraically from the speed reference.

Example for **d b n** = 10:

- If reference = +50 Hz: + 50 - 10 = 40 Hz
- If reference = -50 Hz: -50 - 10 = -60 Hz

Setting ()	Description
0...2 x [Max Frequency] 1 F r	Setting range Factory setting: 10 Hz

[Torque ctrl time out] r 1 o ★

Torque control time-out.

This parameter can be accessed if **[Trq/spd switching] 1 5 5** is not set to **[No] n o**.

Time following automatic exit of torque control mode in the event of an error or a warning has been triggered.

Setting	Description
0.0...999.9 s	Setting range Factory setting: 60 s

[Torque Ctrl ErrorResp] **L 0 b** ★

Response to torque control error.
This parameter can be accessed if [Trq/spd switching] **L 5 5** is not set to [No] **n 0**.
Response of drive once time [Torque ctrl time out] **r L 0** has elapsed.

Setting	Code / Value	Description
[Warning]	R L r 0	Warning is triggered on time-out Factory setting
[Error]	F L L	An error is triggered with freewheel stop