

ABB machinery drives

Supplement ACS355 high speed program (+N826)



Power and productivity
for a better world™



List of related manuals

| Drive manuals and guides | Code (English) |
|--|---------------------------------|
| <i>ACS355 user's manual</i> | 3AUA0000066143 |
| <i>ACS355 drives with IP66/67 / UL Type 4x enclosure supplement</i> | 3AUA0000066066 |
| <i>ACS355 quick installation guide</i> | 3AUA0000092940 |
| <i>ACS355 common DC application guide</i> | 3AUA0000070130 |
| <i>ACS355 enhanced sequence program (+N830) Supplement</i> | 3AXD50000017465 |
| <i>ACS355 high speed program (+N826) Supplement</i> | 3AXD50000017574 |
| Option manuals and guides | |
| <i>FCAN-01 CANopen adapter module user's manual</i> | 3AFE68615500 |
| <i>FDNA-01 DeviceNet adapter module user's manual</i> | 3AFE68573360 |
| <i>FECA-01 EtherCAT® adapter module user's manual</i> | 3AUA0000068940 |
| <i>FENA-01/-11 Ethernet adapter module user's manual</i> | 3AUA0000093568 |
| <i>FLON-01 LonWORKS® adapter module user's manual</i> | 3AUA0000041017 |
| <i>FMBA-01 Modbus adapter module user's manual</i> | 3AFE68586704 |
| <i>FPBA-01 PROFIBUS DP adapter module user's manual</i> | 3AFE68573271 |
| <i>FRSA-00 RS-485 adapter board user's manual</i> | 3AFE68640300 |
| <i>MFDT-01 FlashDrop user's manual</i> | 3AFE68591074 |
| <i>MPOT-01 potentiometer module instructions for installation and use</i> | 3AFE68591082 |
| <i>MREL-01 output relay module user's manual</i> | 3AUA0000035974 |
| <i>MTAC-01 pulse encoder interface module user's manual</i> | 3AFE68591091 |
| <i>MUL1-R1 installation instructions for ACS150, ACS310, ACS320, ACS350 and ACS355</i> | 3AFE68642868 |
| <i>MUL1-R3 installation instructions for ACS310, ACS320, ACS350 and ACS355</i> | 3AFE68643147 |
| <i>MUL1-R4 installation instructions for ACS310, ACS320, ACS350 and ACS355</i> | 3AUA0000025916 |
| <i>SREA-01 Ethernet adapter module quick start-up guide</i> | 3AUA0000042902 |
| <i>SREA-01 Ethernet adapter module user's manual</i> | 3AUA0000042896 |
| <i>ACS355 and AC500-eCo application guide</i> | 2CDC125152M0201 |
| <i>AC500-eCo PLC and ACS355 quick installation guide</i> | 2CDC125145M0201 |

Maintenance manuals and guides

Guide for capacitor reforming in ACS50, ACS55, ACS150, ACS310, ACS350, ACS355, ACS550, ACH550 and R1-R4 OINT/SINT boards [3AFE68735190](#)

You can find manuals and other product documents in PDF format on the Internet. See section [Document library on the Internet](#) on the inside of the back cover. For manuals not available in the Document library, contact your local ABB representative.

Supplement

ACS355 high speed program (+N826)

Table of contents



Table of contents

1. Introduction to the supplement

| | |
|-----------------------------------|---|
| What this chapter contains | 7 |
| Safety | 7 |
| Scope | 7 |
| Applicability | 8 |
| Target audience | 8 |
| Purpose of the manual | 8 |
| Contents of this supplement | 9 |
| Related documents | 9 |

2. Program features

| | |
|-------------------------------------|----|
| What this chapter contains | 11 |
| Drive selection tables | 11 |
| Fault reaction for EM STOP | 12 |
| Settings | 12 |
| Fault reaction for Power loss | 13 |
| Settings | 13 |
| Smooth start ramp | 13 |
| Settings | 13 |
| Start enable | 13 |
| Settings | 13 |
| Fast user set change | 14 |
| Settings | 14 |
| | 14 |



3. Actual signals and parameters

| | |
|----------------------------------|----|
| What this chapter contains | 15 |
| Actual signals | 16 |
| Parameters | 17 |

Further information

| | |
|--|----|
| Product and service inquiries | 27 |
| Product training | 27 |
| Providing feedback on ABB Drives manuals | 27 |
| Document library on the Internet | 27 |





Introduction to the supplement

What this chapter contains

The chapter describes safety issues, scope of this supplement, applicability, target audience and purpose of this supplement. It describes the contents of this supplement and refers to a list of related manuals for more information.

Safety

Safety related instructions please refer to *ACS355 user's manual* (3AUA0000066143 [English]). The safety instructions must be followed when installing, operating and servicing the drive. Please study the complete safety instructions carefully.

Scope

This document is supplement of *ACS355 user's manual* (3AUA0000066143 [English]). This supplement covers all differences between high speed program and ACS355 standard firmware. Only the high speed program contents are given in each chapter of this supplement.

Following chapters please refer to *ACS355 user's manual* (3AUA0000066143 [English]):

- Operation principle and hardware description
- Mechanical installation
- Planning the electrical installation
- Electrical installation
- Installation checklist
- Control panels
- Application macros
- Startup, control with I/O and ID run
- Fieldbus control with fieldbus adapter
- Fault tracing
- Maintenance and hardware diagnostics
- Technical data
- Appendixes

Applicability

The manual is applicable to the ACS355 high speed program firmware version 6303 or later. See parameter *3301 FIRMWARE*. Option code +N826 in the drive type code shows that the drive has the high speed program installed.

Target audience

This supplement is intended for people who work with ACS355 high speed program. The reader of this supplement is expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

Purpose of the manual

This manual provides information needed for commissioning, operating and maintaining the ACS355 high speed program.


Contents of this supplement

The supplement consists of the following chapters:

- [Introduction to the supplement](#) (this chapter, page 7) describes safety issues, scope of supplement, applicability, target audience and purpose of this manual.
- [Program features](#) (page 11) describes program features. There are also lists of related user settings in each section.
- [Actual signals and parameters](#) (page 15) describes the actual signals and parameters related to high speed program and gives the fieldbus equivalent values for each signal/parameter.
- [Further information](#) (inside of the back cover) tells how to make product and service inquiries, get information on product training, provide feedback on ABB Drives manuals and how to find documents on the Internet.

Related documents

See [List of related manuals](#) on page 2 (inside of the front cover).



Program features

What this chapter contains

The chapter describes ACS355 high speed program features. There are also lists of related user settings in each section. Other standard program features please refer to chapter Program features in *ACS355 user's manual* (3AUA0000066143 [English]).

Control program introduction

Application specific firmware for high speed grinding and polishing machines. Spindles can operate up to 1400Hz output frequency in scalar mode and up to 32000rpm in vector mode.

Drive selection tables

| Motor rated frequency range[Hz] | | Min switching frequency | Recommended switching frequency | Switching frequency control (2607) | Minimum derating | | Recommended derating | | Max ambient temperature |
|---------------------------------|------------|-------------------------|---------------------------------|------------------------------------|------------------|-------------|----------------------|------------|-------------------------|
| | | | | | 200V drive | 400V drive | 200V drive | 400V drive | |
| 0 | 300...600 | 4kHz | 8kHz | 0 = ON (LOAD) | No derating | No derating | 90% | 75% | 40 |
| 300 | 800...1000 | 8kHz | 12kHz | 1 = ON | 90% | 75% | 80% | 50% | 30 |
| 800 | 1400 | 12kHz | 12kHz | 1 = ON | 80% | 50% | 80% | 50% | 30 |

| Motor rated frequency range[Hz] | | Minimum derating | | Recommended derating | | Max ambient temperature |
|---------------------------------|------------|------------------|-------------|----------------------|------------|-------------------------|
| | | 200V drive | 400V drive | 200V drive | 400V drive | |
| 0 | 300...600 | No derating | No derating | 90% | 75% | 40 |
| 300 | 800...1000 | 90% | 75% | 80% | 50% | 30 |
| 800 | 1400 | 80% | 50% | 80% | 50% | 30 |

Note: These derating rules do not consider R0 frame. Please check the user's manual for derating the R0 frame size.

Fault reaction for EM STOP

Emergency ramp stop in case of non critical faults and 500ms delayed fault for under voltage controller. Especially meant for blackouts. Spindle can keep on coasting for an hour in worst case.

- New parameter 30.29 added which enables emergency ramp stop when drive faults:
 - 30.29 = 0 Fault reaction same as in standard FW.
 - 30.29 = 1 Drive makes ramp stop during fault (except HW critical faults).
- Drive makes an emergency ramp stop when fault occurs using the emergency ramp stop deceleration time (par. 22.08).
- Hardware critical faults ("OVERCURRENT", "DC OVERVOLT" and "SHORT CIRC") will still make a coast stop in order to protect the drive. When hardware critical faults occur among several other faults, the drive will make a coast stop.
- "SAFE TORQUE OFF", "STO1 LOST" and "STO2 LOST" faults will behave the same way as hardware critical faults since it is not possible to drive the motor anyway.

Related parameters are listed in the table below:

■ Settings

| Parameter | Additional information |
|----------------------|---|
| 2208 EMERG DEC TIME | Time within which the drive is stopped if an emergency stop is activated. |
| 3029 FAULT RAMP STOP | Enables emergency ramp stop when drive faults |

Fault reaction for Power loss

When 20.06 UNDERVOLT CTRL = ENABLE(TIME) and 30.29 = ENABLE (fault ramp stop enabled) then drive faults after being in under-voltage control for 500ms. Fault will also trigger an emergency ramp stop.

Related parameters are listed in the table below:

■ Settings

| Parameter | Additional information |
|----------------------|--|
| 2006 UNDERVOLT CTRL | Activates or deactivates the undervoltage control of the intermediate DC link. |
| 3029 FAULT RAMP STOP | Enables emergency ramp stop when drive faults |

Smooth start ramp

For PM motor there is possibility for different ramping during the smooth start period. This function can ensure succesful start of PM motor in case of high inertia and encoderless operation.

When option “SMOOTH START”(11) of parameter 22.01 “ACC/DEC 1/2 SEL” is selected, then ramp 2 is used while smooth start is active and ramp 1 when smooth start is not active.

Related parameters are listed in the table below:

■ Settings

| Parameter | Additional information |
|----------------------|---|
| 2201 ACC/DEC 1/2 SEL | Source from which the drive reads the signal that selects between the two ramp pairs. |

Start enable

When start enable 1 or 2 is lost while drive is running, then drive will make the stop set by par. 21.02 STOP FUNCTION.

Related parameters are listed in the table below:

■ Settings

| Parameter | Additional information |
|---------------------|---|
| 1608 START ENABLE 1 | Selects the source for the Start enable 1 signal. |
| 1609 START ENABLE 2 | Selects the source for the Start enable 2 signal. |
| 2102 STOP FUNCTION | Selects the motor stop function. |

Fast user set change

Totally 6 user sets and possibility change quickly between them. User can switch from different ramp and controller values for different tools in case machine has several tools.

Parameter 0186 ACTIVE MACRO – shows which user set was last loaded, updated after start inhibits are removed. Parameter 0186 changes to 0, when user set load starts and drive is ready to start when parameter 0186 changes to loaded user set value.

Related parameters are listed in the table below:

■ Settings

| Parameter | Additional information |
|-----------------------|---|
| 0186 ACTIVE MACRO | Shows which user macro is actively loaded. |
| 1605 USER PAR SET CHG | Enables the change of the User parameter set through a digital input. |
| 1614 LOAD USER SET | Selects which user set will be loaded. |
| 1615 SAVE USER SET | Selects which user set will be saved. |
| 9902 APPLIC MACRO | Selects the application macro. |



Actual signals and parameters

What this chapter contains

The chapter describes the actual signals and parameters related to high speed program and gives the fieldbus equivalent values for each signal/parameter.

Terms and abbreviations

| Term | Definition |
|---------------|--|
| Actual signal | Sequence program related signals measured or calculated by the drive. Can be monitored by the user. No user setting possible. |
| Def | Parameter default value |
| Parameter | A user-adjustable sequence program operation instruction of the drive. Note: Parameter selections are shown on the basic control panel as integer values. Eg parameter 1001 EXT1 COMMANDS selection COMM is shown as value 10 (which is equal to the fieldbus equivalent FbEq). |
| FbEq | Fieldbus equivalent: The scaling between the value and the integer used in serial communication. |

Note: More information about drive parameters please refer to the section Actual signal and parameters in ACS355 User's manual (3AUA0000066143 [English]).

Actual signals

| Actual signals | | | |
|--------------------------|--------------|--|-------|
| No. | Name/Value | Description | FbEq |
| 01 OPERATING DATA | | Basic signals for monitoring the drive (read-only) | |
| 0186 | ACTIVE MACRO | Shows which user macro is loaded. | 1 = 1 |

Parameters

| All parameters | | | |
|----------------------------|---------------------------------|---|--------------------------|
| No. | Name/Value | Description | Def/FbEq |
| 11 REFERENCE SELECT | | | |
| 1104 | REF1 MIN | Defines the minimum value for external reference REF1. Corresponds to the minimum setting of the used source signal. | 0.0 Hz / 1 rpm |
| | 0.0...1400.0 Hz / 0...32000 rpm | <p>Minimum value in rpm. Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ.</p> <p>Example: Analog input AI1 is selected as the reference source (value of parameter 1103 is AI1). The reference minimum and maximum correspond to the 1301 MINIMUM AI1 and 1302 MAXIMUM AI1 settings as follows:</p> | 1 = 0.1 Hz / 1 rpm |
| 1105 | REF1 MAX | Defines the maximum value for external reference REF1. Corresponds to the maximum setting of the used source signal. | E: 50.0 Hz U: 60.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Maximum value in rpm. Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. See the example for parameter 1104 REF1 MIN . | 1 = 0.1 Hz / 1 rpm |
| 12 CONSTANT SPEEDS | | | |
| 1202 | CONST SPEED 1 | Defines constant speed (or drive output frequency) 1. | E: 5.0 Hz U: 6.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. | 1 = 0.1 Hz / 1 rpm |
| 1203 | CONST SPEED 2 | Defines constant speed (or drive output frequency) 2. | E: 10.0 Hz U: 12.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. | 1 = 0.1 Hz / 1 rpm |
| 1204 | CONST SPEED 3 | Defines constant speed (or drive output frequency) 3. | E: 15.0 Hz U: 18.0 Hz |

| All parameters | | | |
|---------------------------|------------------------------------|---|--------------------------|
| No. | Name/Value | Description | Def/FbEq |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. | 1 = 0.1 Hz / 1 rpm |
| 1205 | CONST SPEED 4 | Defines constant speed (or drive output frequency) 4. | E: 20.0 Hz U: 24.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. | 1 = 0.1 Hz / 1 rpm |
| 1206 | CONST SPEED 5 | Defines constant speed (or drive output frequency) 5. | E: 25.0 Hz U: 30.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. | 1 = 0.1 Hz / 1 rpm |
| 1207 | CONST SPEED 6 | Defines constant speed (or drive output frequency) 6. | E: 40.0 Hz U: 48.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. Constant speed 6 is used also as jogging speed. | 1 = 0.1 Hz / 1 rpm |
| 1208 | CONST SPEED 7 | Defines constant speed (or drive output frequency) 7. Constant speed 7 is used also as jogging speed or with fault functions (3001 AI<MIN FUNCTION and 3002 PANEL COMM ERR). | E: 50.0 Hz U: 60.0 Hz |
| | 0.0...1400.0 Hz / 0...32000 rpm | Speed in rpm. Output frequency in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. Constant speed 7 is used also as jogging speed. | 1 = 0.1 Hz / 1 rpm |
| 16 SYSTEM CONTROLS | | Parameter view, Run enable, parameter lock etc. | |
| 1605 | USER PAR SET CHG | <p>Enables the change of the User parameter set through a digital input. See parameter 9902 APPLIC MACRO. The change is only allowed when the drive is stopped. During the change, the drive will not start.</p> <p>Note: Always save the User parameter set with parameter 9902 after changing any parameter setting, or reperforming the motor identification. The last settings saved by the user are loaded into use whenever the power is switched off and on again or the parameter 9902 setting is changed. Any unsaved changes will be lost.</p> <p>Note: The value of this parameter is not included in the User parameter sets. A setting once made remains despite User parameter set change.</p> <p>Note: Selection of User parameter set 2 can be supervised through relay outputs RO 1...4 and digital output DO. See parameters 1401 RELAY OUTPUT 1 ... 1403 RELAY OUTPUT 3, 1410 RELAY OUTPUT 4 and 1805 DO SIGNAL.</p> | NOT SEL |

| All parameters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|------------|---|----------------------|-----|--------------------|--------------------|---|----------------------|---|----------------------|----------------------|---|---|----------------------|---|---|----------------------|----------------------|---|---|---|----------------------|---|---|---|----------------------|---|---|---|----------------------|---|---|---|-------------|----|
| No. | Name/Value | Description | Def/FbEq | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NOT SEL | User parameter set change is not possible through a digital input. Parameter sets can be changed only from the control panel. | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI1 | User parameter set control through digital input DI1. Falling edge of digital input DI1: User parameter set 1 is loaded into use. Rising edge of digital input DI1: User parameter set 2 is loaded into use. | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI2 | See selection DI1 . | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI3 | See selection DI1 . | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI4 | See selection DI1 . | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI5 | See selection DI1 . | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI1,2 | User parameter set selection through digital inputs DI1 and DI2. 1 = DI active, 0 = DI inactive. <table border="1" data-bbox="364 614 851 750"> <thead> <tr> <th>DI1</th> <th>DI2</th> <th>User parameter set</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>User parameter set 1</td> </tr> <tr> <td>1</td> <td>0</td> <td>User parameter set 2</td> </tr> <tr> <td>0</td> <td>1</td> <td>User parameter set 3</td> </tr> <tr> <td>1</td> <td>1</td> <td>User parameter set 4</td> </tr> </tbody> </table> | DI1 | DI2 | User parameter set | 0 | 0 | User parameter set 1 | 1 | 0 | User parameter set 2 | 0 | 1 | User parameter set 3 | 1 | 1 | User parameter set 4 | 7 | | | | | | | | | | | | | | | | | |
| DI1 | DI2 | User parameter set | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | User parameter set 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | User parameter set 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | User parameter set 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | User parameter set 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI2,3 | See selection DI1,2 . | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI3,4 | See selection DI1,2 . | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI4,5 | See selection DI1,2 . | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI1,2,3 | User parameter set selection through digital inputs DI1, DI2 and DI3. 1 = DI active, 0 = DI inactive. <table border="1" data-bbox="364 933 918 1149"> <thead> <tr> <th>DI1</th> <th>DI2</th> <th>DI3</th> <th>User parameter set</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>User parameter set 1</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>User parameter set 2</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>User parameter set 3</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>User parameter set 4</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>User parameter set 5</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>User parameter set 6</td> </tr> <tr> <td>x</td> <td>1</td> <td>1</td> <td>No reaction</td> </tr> </tbody> </table> | DI1 | DI2 | DI3 | User parameter set | 0 | 0 | 0 | User parameter set 1 | 1 | 0 | 0 | User parameter set 2 | 0 | 1 | 0 | User parameter set 3 | 1 | 1 | 0 | User parameter set 4 | 0 | 0 | 1 | User parameter set 5 | 1 | 0 | 1 | User parameter set 6 | x | 1 | 1 | No reaction | 12 |
| DI1 | DI2 | DI3 | User parameter set | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 0 | User parameter set 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | User parameter set 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | User parameter set 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 0 | User parameter set 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | User parameter set 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 1 | User parameter set 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 1 | 1 | No reaction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI2,3,4 | See selection DI1,2,3 . | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI3,4,5 | See selection DI1,2,3 . | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI1(INV) | User parameter set control through inverted digital input DI1. Falling edge of inverted digital input DI1: User parameter set 2 is loaded into use. Rising edge of inverted digital input DI1: User parameter set 1 is loaded into use. | -1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI2(INV) | See selection DI1(INV) . | -2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI3(INV) | See selection DI1(INV) . | -3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI4(INV) | See selection DI1(INV) . | -4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| All parameters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---------------|---|----------------------|-----|--------------------|--------------------|---|----------------------|---|----------------------|----------------------|---|---|----------------------|---|---|----------------------|----------------------|---|---|---|----------------------|---|---|---|----------------------|---|---|---|----------------------|---|---|---|-------------|-----|
| No. | Name/Value | Description | Def/FbEq | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI1,2(INV) | User parameter set selection through inverted digital inputs DI1 and DI2. 1 = DI inactive, 0 =DI active. <table border="1" data-bbox="311 272 799 408"> <thead> <tr> <th>DI1</th> <th>DI2</th> <th>User parameter set</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>User parameter set 1</td> </tr> <tr> <td>0</td> <td>1</td> <td>User parameter set 2</td> </tr> <tr> <td>1</td> <td>0</td> <td>User parameter set 3</td> </tr> <tr> <td>0</td> <td>0</td> <td>User parameter set 4</td> </tr> </tbody> </table> | DI1 | DI2 | User parameter set | 1 | 1 | User parameter set 1 | 0 | 1 | User parameter set 2 | 1 | 0 | User parameter set 3 | 0 | 0 | User parameter set 4 | -7 | | | | | | | | | | | | | | | | | |
| DI1 | DI2 | User parameter set | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | User parameter set 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | User parameter set 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | User parameter set 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | User parameter set 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI2,3(INV) | See selection DI1,2(INV) . | -8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI3,4(INV) | See selection DI1,2(INV) . | -9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI4,5(INV) | See selection DI1,2(INV) . | -10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI1,2,3(INV) | User parameter set selection through inverted digital inputs DI1, DI2 and DI3. 1 = DI inactive, 0 =DI active. <table border="1" data-bbox="311 588 869 804"> <thead> <tr> <th>DI1</th> <th>DI2</th> <th>DI3</th> <th>User parameter set</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>1</td> <td>User parameter set 1</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>User parameter set 2</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>User parameter set 3</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>User parameter set 4</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>User parameter set 5</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>User parameter set 6</td> </tr> <tr> <td>x</td> <td>0</td> <td>0</td> <td>No reaction</td> </tr> </tbody> </table> | DI1 | DI2 | DI3 | User parameter set | 1 | 1 | 1 | User parameter set 1 | 0 | 1 | 1 | User parameter set 2 | 1 | 0 | 1 | User parameter set 3 | 0 | 0 | 1 | User parameter set 4 | 1 | 1 | 0 | User parameter set 5 | 0 | 1 | 0 | User parameter set 6 | x | 0 | 0 | No reaction | -12 |
| DI1 | DI2 | DI3 | User parameter set | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 1 | User parameter set 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 1 | User parameter set 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 1 | User parameter set 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | User parameter set 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 0 | User parameter set 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 0 | User parameter set 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 0 | 0 | No reaction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI2,3,4(INV) | See selection DI1,2,3(INV) . | -13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DI3,4,5(INV) | See selection DI1,2,3(INV) . | -14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1614 | LOAD USER SET | Selects which user set will be loaded | NOT SEL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Done | No user set will be loaded. | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S1 LOAD | User set1 will be loaded. | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S2 LOAD | User set2 will be loaded. | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S3 LOAD | User set3 will be loaded. | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S4 LOAD | User set4 will be loaded. | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S5 LOAD | User set5 will be loaded. | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S6 LOAD | User set6 will be loaded. | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1615 | SAVE USER SET | Selects which user set will be saved | NOT SEL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Done | No user set will be saved. | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | USER S1 SAVE | User set1 will be saved. | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| All parameters | | | |
|------------------|------------------------|--|---------------------------------|
| No. | Name/Value | Description | Def/FbEq |
| | USER S2 SAVE | User set2 will be saved. | 2 |
| | USER S3 SAVE | User set3 will be saved. | 3 |
| | USER S4 SAVE | User set4 will be saved. | 4 |
| | USER S5 SAVE | User set5 will be saved. | 5 |
| | USER S6 SAVE | User set6 will be saved. | 6 |
| 20 LIMITS | | Drive operation limits. Speed values are used in vector control and frequency values are used in scalar control. The control mode is selected by parameter 9904 MOTOR CTRL MODE. | |
| 2001 | MINIMUM SPEED | <p>Defines the allowed minimum speed. A positive (or zero) minimum speed value defines two ranges, one positive and one negative. A negative minimum speed value defines one speed range.</p> <p>Note: Rotation direction can be fixed with parameter 1003 DIRECTION.</p> | 0 rpm |
| | -32000... 32000 rpm | Minimum speed | 1 = 1 rpm |
| 2002 | MAXIMUM SPEED | Defines the allowed maximum speed. See parameter 2001 MINIMUM SPEED . | E: 1500 rpm / U: 1800 rpm |
| | 0...32000 rpm | Maximum speed | 1 = 1 rpm |

| All parameters | | | |
|---|-------------------------|--|--------------------------|
| No. | Name/Value | Description | Def/FbEq |
| 2007 | MINIMUM FREQ | <p>Defines the minimum limit for the drive output frequency. A positive (or zero) minimum frequency value defines two ranges, one positive and one negative. A negative minimum frequency value defines one speed range.</p> <p>Note: $MINIMUM\ FREQ \leq MAXIMUM\ FREQ.$</p> | 0.0 Hz |
| | -1400.0 ...1400.0 Hz | Minimum frequency | 1 = 0.1 Hz |
| 2008 | MAXIMUM FREQ | <p>Defines the maximum limit for the drive output frequency.</p> | E: 50.0 Hz U: 60.0 Hz |
| | 0.0...1400.0 Hz | Maximum frequency | 1 = 0.1 Hz |
| 22 ACCEL/DECEL Acceleration and deceleration times | | | |
| 2201 | ACC/DEC 1/2 SEL | <p>Defines the source from which the drive reads the signal that selects between the two ramp pairs, acceleration/deceleration pair 1 and 2. Ramp pair 1 is defined by parameters 2202...2204. Ramp pair 2 is defined by parameters 2205...2207.</p> | <i>DI5</i> |
| | NOT SEL | Ramp pair 1 is used. | 0 |
| | DI1 | Digital input DI1. 1 = ramp pair 2, 0 = ramp pair 1. | 1 |
| | DI2 | See selection <i>DI1</i> . | 2 |
| | DI3 | See selection <i>DI1</i> . | 3 |
| | DI4 | See selection <i>DI1</i> . | 4 |
| | DI5 | See selection <i>DI1</i> . | 5 |
| | COMM | <p>Fieldbus interface as the source for ramp pair 1/2 selection, ie Control word 0301 FB CMD WORD 1 bit 10. The Control word is sent by the fieldbus controller through the fieldbus adapter or embedded fieldbus (Modbus) to the drive. For the Control word bits.</p> <p>Note: This setting applies only for the DCU profile.</p> | 7 |
| | SEQ PROG | Sequence programming ramp defined by parameter 8422 ST1 RAMP (or 8423/.../8492) | 10 |

| All parameters | | | |
|---------------------------|--|--|--------------------------------------|
| No. | Name/Value | Description | Def/FbEq |
| | SMOOTH START | Smooth start ramp time will be effect in ramp time according to settings of parameter 2621...2624. | 11 |
| | DI1(INV) | Inverted digital input DI1. 0 = ramp pair 2, 1 = ramp pair 1. | -1 |
| | DI2(INV) | See selection DI1(INV) . | -2 |
| | DI3(INV) | See selection DI1(INV) . | -3 |
| | DI4(INV) | See selection DI1(INV) . | -4 |
| | DI5(INV) | See selection DI1(INV) . | -5 |
| 25 CRITICAL SPEEDS | | Speed bands within which the drive is not allowed to operate. | |
| 2502 | CRIT SPEED 1 LO 0.0...1400.0 Hz / 0...32000 rpm | Defines the minimum limit for critical speed/frequency range 1. Limit in rpm. Limit in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. The value cannot be above the maximum (parameter 2503 CRIT SPEED 1 HI). | 0.0 Hz / 1 rpm 1 = 0.1 Hz / 1 rpm |
| 2503 | CRIT SPEED 1 HI 0.0...1400.0 Hz / 0...32000 rpm | Defines the maximum limit for critical speed/frequency range 1. Limit in rpm. Limit in Hz if parameter 9904 MOTOR CTRL MODE setting is SCALAR: FREQ. The value cannot be below the minimum (parameter 2502 CRIT SPEED 1 LO). | 0.0 Hz / 1 rpm 1 = 0.1 Hz / 1 rpm |
| 2504 | CRIT SPEED 2 LO 0.0...1400.0 Hz / 0...32000 rpm | See parameter 2502 CRIT SPEED 1 LO . See parameter 2502 . | 0.0 Hz / 1 rpm 1 = 0.1 Hz / 1 rpm |
| 2505 | CRIT SPEED 2 HI 0.0...1400.0 Hz / 0...32000 rpm | See parameter 2503 CRIT SPEED 1 HI . See parameter 2503 . | 0.0 Hz / 1 rpm 1 = 0.1 Hz / 1 rpm |
| 2506 | CRIT SPEED 3 LO 0.0...1400.0 Hz / 0...32000 rpm | See parameter 2502 CRIT SPEED 1 LO . See parameter 2502 . | 0.0 Hz / 1 rpm 1 = 0.1 Hz / 1 rpm |
| 2507 | CRIT SPEED 3 HI 0.0...1400.0 Hz / 0...32000 rpm | See parameter 2503 CRIT SPEED 1 HI . See parameter 2503 . | 0.0 Hz / 1 rpm 1 = 0.1 Hz / 1 rpm |
| 26 MOTOR CONTROL | | Motor control variables | |
| 2611 | USER DEFINED F1 0.0...1400.0 Hz | Defines the first frequency point of the custom U/f curve. Frequency | 10.0 Hz 1 = 0.1 Hz |
| 2613 | USER DEFINED F2 | Defines the second frequency point of the custom U/f curve. | 20.0 Hz |

| All parameters | | | |
|-----------------------------|---------------------------------|--|---------------------|
| No. | Name/Value | Description | Def/FbEq |
| | 0.0...1400.0 Hz | Frequency | 1 = 0.1 Hz |
| 2615 | USER DEFINED F3 | Defines the third frequency point of the custom U/f curve. | 25.0 Hz |
| | 0.0...1400.0 Hz | Frequency | 1 = 0.1 Hz |
| 2617 | USER DEFINED F4 | Defines the fourth frequency point of the custom U/f curve. | 40.0 Hz |
| | 0.0...1400.0 Hz | Frequency | 1 = 0.1 Hz |
| 30 FAULT FUNCTIONS | | Programmable protection functions | |
| 3029 | FAULT RAMP STOP | Selects how the drive reacts when the drive trips to fault excepting Hardware critical faults (OVERCURRENT, DC OVERVOLT and SHORT CIRC), SAFE TORQUE OFF, STO1 LOST and STO2 LOST faults. | 1 |
| | DISABLE | Drive makes coast stop when drive trips fault. | 0 |
| | ENABLE | Drive makes emergency ramp stop when drive trips fault using the emergency ramp stop deceleration time (par. 22.08). | 1 |
| 40 PROCESS PID SET 1 | | Process PID (PID1) control parameter set 1. | |
| 4023 | PID SLEEP LEVEL | <p>Defines the start limit for the sleep function. If the motor speed is below a set level (4023) longer than the sleep delay (4024), the drive shifts to the sleeping mode: The motor is stopped and the control panel shows alarm message PID SLEEP (2018).</p> <p>Parameter 4022 SLEEP SELECTION must be set to INTERNAL.</p> | 0.0 Hz / 0 rpm |
| | | | |
| | 0.0...1400.0 Hz / 0...32000 rpm | Sleep start level | 1 = 0.1 Hz 1 rpm |

| All parameters | | | |
|-------------------------|-----------------|--|---------------------|
| No. | Name/Value | Description | Def/FbEq |
| 99 START-UP DATA | | | |
| 9902 | APPLIC MACRO | Selects the application macro. | ABB STANDA RD |
| | ABB STANDARD | Standard macro for constant speed applications | 1 |
| | 3-WIRE | 3-wire macro for constant speed applications | 2 |
| | ALTERNATE | Alternate macro for start forward and start reverse applications | 3 |
| | MOTOR POT | Motor potentiometer macro for digital signal speed control applications | 4 |
| | HAND/AUTO | Hand/Auto macro to be used when two control devices are connected to the drive: <ul style="list-style-type: none"> • Device 1 communicates through the interface defined by external control location EXT1. • Device 2 communicates through the interface defined by external control location EXT2. EXT1 or EXT2 is active at a time. Switching between EXT1/2 through digital input. | 5 |
| | PID CONTROL | PID control. For applications in which the drive controls a process value, eg pressure control by the drive running the pressure boost pump. Measured pressure and the pressure reference are connected to the drive. | 6 |
| | TORQUE CTRL | Torque control macro | 8 |
| | AC500 MODBUS | AC500 PLC macro. | 10 |
| | LOAD FD SET | FlashDrop parameter values as defined by the FlashDrop file. Parameter view is selected by parameter 1611 PARAMETER VIEW. FlashDrop is an optional device for fast copying of parameters to unpowered drives. FlashDrop allows easy customization of the parameter list, eg selected parameters can be hidden. For more information, see <i>MFDT-01 FlashDrop user's manual</i> (3AFE68591074 [English]). | 31 |
| | USER S1 LOAD | User 1 macro loaded into use. Before loading, check that the saved parameter settings and the motor model are suitable for the application. | 0 |
| | USER S1 SAVE | Save User 1 macro. Stores the current parameter settings and the motor model. | -1 |
| | USER S2 LOAD | User 2 macro loaded into use. Before loading, check that the saved parameter settings and the motor model are suitable for the application. | -2 |

| All parameters | | | |
|----------------|--------------------|---|--------------------------|
| No. | Name/Value | Description | Def/FbEq |
| | USER S2 SAVE | Save User 2 macro. Stores the current parameter settings and the motor model. | -3 |
| | USER S3 LOAD | User 3 macro loaded into use. Before loading, check that the saved parameter settings and the motor model are suitable for the application. | -4 |
| | USER S3 SAVE | Save User 3 macro. Stores the current parameter settings and the motor model. | -5 |
| | USER S4 LOAD | User 4 macro loaded into use. Before loading, check that the saved parameter settings and the motor model are suitable for the application. | -6 |
| | USER S4 SAVE | Save User 4 macro. Stores the current parameter settings and the motor model. | -7 |
| | USER S5 LOAD | User 5 macro loaded into use. Before loading, check that the saved parameter settings and the motor model are suitable for the application. | -8 |
| | USER S5 SAVE | Save User 5 macro. Stores the current parameter settings and the motor model. | -9 |
| | USER S6 LOAD | User 6 macro loaded into use. Before loading, check that the saved parameter settings and the motor model are suitable for the application. | -10 |
| | USER S6 SAVE | Save User 6 macro. Stores the current parameter settings and the motor model. | -11 |
| 9907 | MOTOR NOM FREQ | Defines the nominal motor frequency, ie the frequency at which the output voltage equals the motor nominal voltage: Field weakening point = Nom. frequency · Supply voltage / Motor nom. voltage | E: 50.0 Hz U: 60.0 Hz |
| | 0.0...1400.0 Hz | Frequency | 1 = 0.1 Hz |
| 9908 | MOTOR NOM SPEED | Defines the nominal motor speed. Must be equal to the value on the motor rating plate. | Type dependent |
| | 50...32000 rpm | Speed | 1 = 1 rpm |

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to www.abb.com/drives and select *Training courses*.

Providing feedback on ABB Drives manuals

Your comments on our manuals are welcome. Go to www.abb.com/drives and select *Document Library – Manuals feedback form (LV AC drives)*.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet. Go to www.abb.com/drives and select *Document Library*. You can browse the library or enter selection criteria, for example a document code, in the search field.

Contact us

www.abb.com/drives

www.abb.com/drivespartners

3AXD50000017574 Rev A (EN) 2014-07-09