ABB machinery drives

Supplement
ACS355 drives with Ex tc dust explosion protection enclosure for explosive atmospheres (option +B063 +C215)

Power and productivity
for a better world™

List of related manuals

Drive hardware manuals and guides	Code (English)
ACS355 user's manual	*3AUA0000066143*
ACS355 drives with IP66/67 / UL Type 4x enclosure supplement	*3AUA0000066066*
ACS355 quick installation guide	*3AUA0000092940*
ACS355 common DC application guide	*3AUA0000070130*
ACS355 enhanced sequence program (+N830) supplement	*3AXD50000017465*
ACS355 high speed program (+N826) supplement	*3AXD50000017574*

Option manuals and guides	
ACS355 drives with Ex tc dust explosion protection enclosure for explosive atmospheres (option +B063 +C215) supplement	*3AXD50000042618*
Potentially explosive atmospheres. The basics you need to know about motors and drives	*3AUA0000037223*
Manuals and quick guides for I/O extension modules, fieldbus adapter, etc.	

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 drives with Ex tc dust explosion protection enclosure for explosive atmospheres (option +B063 +C215)

Table of contents

© 2017 ABB Oy. All Rights Reserved.

3AXD50000042618 Rev A
EN
EFFECTIVE: 2017-04-19

Table of contents

List of related manuals 2

1. Introduction to the manual

Contents of this chapter 7
Applicability 7
Safety instructions 8
Target audience 8
Contents 8
Terms and abbreviations 9
Exclusion of liability 9

2. Option description and instructions

Contents of this chapter 11
Checking the delivery 11
Markings of the drive 12
Transportation and storage 13
Installation 13
Special conditions (X conditions) 13
Other instructions 13
Start-up and operation 13
Maintenance 13
Ambient conditions 14
Related standards and directives 14
Compliance with the European ATEX Directive 14
ATEX certificate 14

Further information

Product and service inquiries 19
Product training 19
Providing feedback on ABB manuals 19
Document library on the Internet 19

1

Introduction to the manual

Contents of this chapter

This chapter contains information on the manual, gives safety instructions and other general information for the reader.

Applicability

This supplement applies to ACS355 drives when used in potentially explosive dust atmospheres in Zone 22.

The drive must include:

- the option +C215: Dust explosion protection enclosure for explosive atmospheres, ATEX II 3D, Ex tc IIIB T65°C Dc
- the option +B063: IP66/IP67/UL Type 4X enclosure, and
- the ATEX/Ex marking label.

The relevant type codes are:

- ACS355-03E-01A2-4+B063+C215
- ACS355-03E-02A4-2+B063+C215

The drive must **not** include these options:

- +F278, +C169, +G406, +L502, +L511, +J402.

See sections *Markings of the drive* on page *12* and *Ambient conditions* on page *14*.

Safety instructions

This supplement does not repeat the complete safety instructions of the drive but it only includes the instructions related to the scope of this manual.

WARNING! If you ignore these instructions, injury or death, or damage to the equipment can occur.

Only a qualified electrician is allowed to install, start up and maintain the drive!

Never work on the drive, motor cable or motor when input power is applied. After disconnecting the input power, always wait for 5 minutes to let the intermediate circuit capacitors discharge before you start working on the drive, motor or motor cable. This avoids both the risk of electrical shock and the risk of explosion.

WARNING! Read and obey all safety instructions given for the drive in *ACS355 user's manual* (3AUA0000066143 [English]). If you ignore them, injury or death, or damage to the equipment can occur.

Target audience

The supplement is intended for people who install, start-up, use and service the drive in a potentially explosive atmospheres. Read the manual before working on the drive. You are expected to know the fundamentals of electricity, wiring, electrical components, electrical schematic symbols and ATEX/Ex regulations.

Contents

This document is a supplement to *ACS355 user's manual* (3AUA0000066143 [English]).

The chapters of this supplement are briefly described below.

- *Introduction to the manual* (this chapter) introduces this manual.
- *Option description and instructions* contains instructions for checking the delivery, transportation and storage and installation of the drive. It also contains the ambient condition requirements and lists the relevant standards and directives. The EU declaration of conformity and the ATEX certificate are also included.

Terms and abbreviations

Term	Description
ATEX	Directives 2014/34/EU and 1999/92/EC are commonly referred to as the ATEX directives (from "*Atmosphères Explosibles*")
Ex	An IEC term used in the context of explosive atmospheres
Ex t, Ex tc	Electrical equipment protected by an enclosure and a surface temperature limitation for use in explosive dust atmospheres. Type of protection "t" is divided into three levels of protection based on the risk of the electrical equipment becoming an ignition source in an explosive dust atmosphere. Level of protection Ex tc is suitable in Zone 22.
Zone	An IEC term for explosive atmospheres. Explosive atmospheres are divided into zones, according to the degree of hazard. The degree of hazard is defined according to the frequency and duration of the occurrence of explosive atmospheres.

Exclusion of liability

ABB is not responsible for the implementation, verification and validation of the overall system. It is the responsibility of the end user (or other party) who is responsible for the overall system, system safety and compliance with ATEX/Ex regulations.

The end user (or other responsible party) must make sure that the entire implementation complies with all relevant standards, directives and local electrical code, and that the system is tested, verified and validated correctly.

2

Option description and instructions

Contents of this chapter

The chapter contains instructions for checking the delivery, transportation and storage and installation of the drive. It also contains the ambient condition requirements and lists the relevant standards and directives.

Checking the delivery

The delivery contains:

- the ACS355 drive with the ATEX/Ex marking label
- a set of warning stickers in 10 languages
- this manual (3AXD50000042618 [English]).

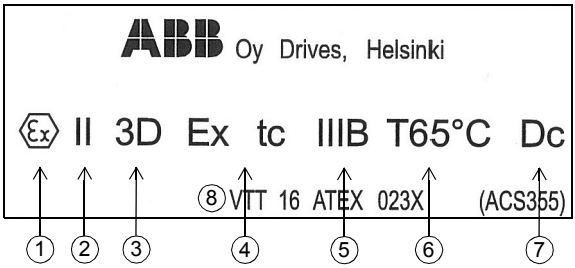
Make sure that all items are present and that there are no signs of damage. Notify the shipper immediately if damaged components are found.

Before installation, check the information on the type designation label of the drive to verify that the drive is of the correct type. See section *Applicability* on page *7*.

Make sure that all necessary markings are found. See section *Markings of the drive* on page *12*.

Markings of the drive

This sticker is attached next to the type designation label of the drive to signify the ATEX/Ex classification.



Item	Description
1	The European Commission mark for Ex products.
2	Equipment group II: Product for surface industry (other than mining applications).
3	Category 3D equipment. The drive can be installed inside the potentially explosive atmosphere (Zone 22).
4	Type of protection Ex t; level of protection Ex tc
5	Dust group (non-conductive dust)
6	Maximum surface temperature of the equipment
7	Equipment for explosive dust atmospheres, having an “enhanced” level of protection (Zone 22)
8	Type examination certificate reference with Notified Body identification: The manufacturer declares that the product conforms with ATEX Product Directive 2014/34/EU. Notified Body: VTT Expert Services Ltd. X = There are “Specific Conditions of Use” that the user must meet when installing the product. See the X conditions in section *Installation* on page *13*.

The CE mark is in the standard type designation label of the drive.

This warning sticker (in English) is attached on the front cover of the drive to warn about the risk of electrical shock and explosion.

A set of warning stickers in different languages is included in the package.

If necessary, replace the English sticker with a translated one.

Transportation and storage

- Avoid shocks, falls and humidity during transportation.
- Store the drive always indoors (above -20 °C [-4 °F]) in dry, vibration-free and dust-free conditions.

Installation

Special conditions (X conditions)

- Install the drive always in an upright position.
- Protect the drive from ultra-violet radiation.
- Use only cable glands that comply with the ATEX/Ex requirements.
- Overload is not allowed.

Other instructions

Follow the instructions in *ACS355 drives user's manual* (3AUA0000066143 [English]).

Note: Make sure that the installation is designed and done according to the applicable local laws and regulations. ABB does not assume any liability whatsoever for any installation which breaches the local laws and/or other regulations. If the recommendations given by ABB are not followed, the drive may experience problems that the warranty does not cover.

Start-up and operation

Follow the instructions in *ACS355 drives user's manual* (3AUA0000066143 [English]).

WARNING! The surface temperature of the drive can rise up to 65 °C (149 °F).

Maintenance

Follow the instructions in *ACS355 drives user's manual* (3AUA0000066143 [English]).

Ambient conditions

These environmental limits must be followed to fulfill the ATEX/Ex requirements.

Installation site altitude	0…2000 m (6600 ft) above sea level
Air temperature during storage	-20 °C (-4 °F) … +50 °C (122 °F)
Air temperature during operation	-20 °C (-4 °F) … +50 °C (122 °F)

Related standards and directives

The drive with the option +B063 +C215 complies with the standards listed below.

Standard / directive	Description
EN 60079-0:2012 +A11:2013	*Explosive atmospheres - Part 0: Equipment - General requirements*
EN 60079-31:2014	*Explosive Atmospheres - Part 31: Equipment dust ignition protection by enclosure “t”*
2014/34/EU	*European ATEX Product Directive*

Compliance with the European ATEX Directive

The ACS355 drive with the option +B063+C215 complies with the European ATEX product directive 2014/34/EU. The EU declaration of conformity is shown below.

ATEX certificate

The ATEX certificate for the ACS355 drive with the option +B063+C215 (VTT 023X) is shown below.

Power and productivity
for a better world™

EU Declaration of Conformity

ATEX Directive 2014/34/EU

We

Manufacturer: ABB Oy
Address: Hiomotie 13, 00380 Helsinki, Finland
Phone: +358 10 22 11

Declare under our sole responsibility that the following products:

Frequency converters

ACS355-03E-01A2-4+B063 and **ACS355-03E-02A4-2+B063,** with option code **+C215**

identified with serial numbers beginning with 1

are in conformity with all the relevant requirements for protective system of EU Directive for Equipment for Explosive Atmospheres 2014/34/EU.

Specific marking of explosion protection

Ex II 3 D Ex tc IIIB T65°C Dc

The following harmonized standards have been applied:

EN 60079-0:2012 + A11:2013	*Explosive atmospheres - Part 0: Equipment - General requirements*
EN 60079-31:2014	*Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"*

Certification Body: VTT Expert Services Ltd
Address: Kivimiehentie 4, P.O.Box 1001, 02044 Espoo, Finland

has assessed the conformity of ACS355 frequency converter and has issued the certificate VTT 16 ATEX 023X.

The products referred in this Declaration of Conformity fulfil the relevant provisions of other European Union Directives which are notified in Single EU Declaration of Conformity 3AXD10000499279.

Helsinki, 02 Jan 2017

Manufacturer representative:

Tuomo Hoysniemi
Vice president, ABB Oy

3AXD10000538714

1/(1)

Note: If the EU Declaration of Conformity is needed in any other official language of European Union than in English, contact ABB

VTT EXPERT SERVICES LTD

TYPE EXAMINATION CERTIFICATE
VTT 16 ATEX 023X 1 (2)

1. **TYPE EXAMINATION CERTIFICATE**

2. **Equipment or Protective System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU**

3. Reference: **VTT 16 ATEX 023X**

4. Equipment: **Converter drive**

   Certified types: **ACS355-03E-01A2-4 +B063 +C215**
   ACS355-03E-02A4-2 +B063 +C215

5. Applicant: **ABB Oy Drives**
   Hiomotie 13
   FI-00380 Helsinki
   Finland

6. This equipment and any acceptable variations thereto are specified in the schedule and possible supplements to this Certificate and the documents therein referred to.

7. VTT Expert Services Ltd, Certification Body No.S017 accredited by the Finnish Accreditation Service (FINAS), certifies that this equipment has been found to comply with the Essential Health and Safety Requirements in Annex II to European Union Directive 2014/34/EU of February 2014 relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres.

   The examination and test results are recorded in confidential report no. VTT-S-05048-16.

8. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

   EN 60079-0 (2012)
   EN 60079-31 (2014)

9. If there appears sign X in the code, there are special conditions for safe use which are specified in the Annex of this Certificate.

VTT Expert Services Ltd
Kivimiehentie 4, Espoo
P.O.Box 1001, FI-02044 VTT, Finland

Tel + 358 20 722 111

FINAS
Finnish Accreditation Service
S017 (EN ISO/IEC 17065)

VTT EXPERT SERVICES LTD

TYPE EXAMINATION CERTIFICATE
VTT 16 ATEX 023X

2 (2)

10. This Type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of these equipment. These are not covered by this certificate.

11. The marking of the equipment shall include the following:

II 3D Ex tc IIIB T65°C Dc

Espoo, 19.04.2017

VTT Expert Services Ltd

Martti Siirola
Senior Expert

Jenni Hirvelä
Expert

Certificate without signatures shall not be valid.
This certificate, including the schedule, may only be reproduced in its entirety and without any change.

VTT EXPERT SERVICES LTD

SCHEDULE TO TYPE
EXAMINATION CERTIFICATE
VTT 16 ATEX 023X

1 (1)

12. **Schedule**

13. **TYPE EXAMINATION CERTIFICATE VTT 16 ATEX 023X**

14. Description of Equipment

The equipment is a converter drive for controlling asynchronous AC induction motors and permanent magnet synchronous motors. A converter drive may also be called e.g. variable speed drive, drive or converter.

The enclosure consists of a metallic back part with cooling ribs and a plastic cover. A control panel is embedded to the cover under a separate clear plastic cover.

A cell of type CR 2032 is included in the control panel for clock operation.

Rated values

		ACS355-03E-01A2-4 +B063 +C215	**ACS355-03E-02A4-2 +B063 +C215**
Input values	Voltage U1 (V)	380…480	200…240
	Current I1 (A)	2.2	4.3
	Frequency f1 (Hz)	48…63	
Output values	Voltage U2 (V)	0…U1	
	Current I2 (A)	1.2	2.4
	Frequency f2 (Hz)	0…600	
	Power PN (kW)	0.37	

15. Report No. VTT-S-05048-16.

16. Special Conditions for Safe Use

The allowed ambient temperature range of the equipment is -20 °C … +50 °C.

Overload is not allowed.

The equipment shall be installed in the upright position.

The equipment shall be protected from UV light.

Use only Ex certified cable glands and blanking elements suitable for dust atmospheres.

17. Essential Health and Safety Requirements

Met by the compliance with the standards EN 60079-0 and EN 60079-31.

Espoo, 19.04.2017

VTT Expert Services Ltd

Martti Siirola
Senior Expert

Jenni Hirvelä
Expert

Certificate without signatures shall not be valid.
This certificate, including the schedule, may only be reproduced in its entirety and without any change.

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 new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.

Contact us

www.abb.com/drives
www.abb.com/drivespartners

3AXD50000042618 Rev A (EN) 2017-04-19

Power and productivity
for a better world™