

# Recycling instructions and environmental information PSR cycloconverter



# List of related manuals

## Drive hardware manuals and guides

## Code (English)

*PSR cycloconverter recycling instructions and environmental information*

[\*DOCRIPSRCYC01\*](#)

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.

# Recycling instructions and environmental information

## PSR cycloconverter

Table of contents





# Table of contents

---

## **1. Introduction to the manual**

What this chapter contains .....	7
Applicability .....	7
Target audience .....	7
Contents of the manual .....	7
Frame size .....	8
Disclaimer .....	8

## **2. Product materials**

Contents of this chapter .....	9
Package .....	11
Product manuals and sales brochures .....	12



## **3. Manufacturing and use**

Manufacturing .....	13
Use .....	13

## **4. Product disposal**

Contents of this chapter .....	15
Disposal .....	15
Dismantling .....	15
Manual dismantling .....	16
Mechanical shredding .....	16
ABB list of prohibited and restricted substances .....	16
Reference list .....	16
Recycling information in accordance with the WEEE .....	17
A recycling example .....	18

## **Further information**

Product and service inquiries .....	19
Product training .....	19
Providing feedback on ABB manuals .....	19
Document library on the Internet .....	19
ABB environment policy .....	19
ABB group sustainability objectives .....	19
ABB list of prohibited and restricted substances .....	19

---



# 1

## Introduction to the manual

---

### What this chapter contains

This chapter describes the contents of the manual. It also contains information on the compatibility and intended audience.

### Applicability

This document covers the environmental information of the following products:

- PSR cycloconverter product family.

### Target audience

This document is intended for ABB customers and for professional recyclers.

### Contents of the manual

The document contains information for treatment facilities in accordance with the EU directive on waste electrical and electronic equipment (WEEE).

This manual contains the following chapters:

- [Product materials](#)
- [Manufacturing and use](#)
- [Product disposal](#)

The WEEE directive is implemented through national regulations and therefore requirements vary in each EU member state.

Drives are always parts of other machines or equipment and they are covered by the WEEE directive when the end product is covered. Inclusion or exclusion depends on the application of the drive.

---

The WEEE directive does not apply to drives which are used in large-scale fixed installations, large-scale stationary industrial tools, means of transport for persons and goods, or non-road mobile machinery made available exclusively for professional use.

We recommend to contact local environmental authorities for up-to-date information about national recycling requirements.

## **Frame size**

This manual covers all different frame sizes of the product family. The frame size is marked on the type designation label of the drive. The frame size is also shown in the rating tables for each drive type. The rating tables are in the *drive user's manual*.

## **Disclaimer**

The information presented in this publication does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequences of its use. Publication thereof does not convey nor imply any license under patent - or other industrial or intellectual - property rights.



## 2

# Product materials

---

## Contents of this chapter

This chapter describes the main components and product materials of the PSR cycloconverter.

Cycloconverter	Total weight	2600...6000 kg
Zn-coated steel, painted steel	Doors, side and roof plates	48%
Copper + surface coating (Ni, Sn)	Busbar	18%
ALMnSi	Heatsinks	17%
Various	Power components, separate units	10%
Various	Electromechanics (PCB, relay, etc)	3%
SS	Water cooling unit	2%
Water	Cooling liquid	1%
GF	Insulative plates	1%

Control unit (C1 and C2 cabinets)	
Control panel	GF, Cu, Sn, plastic
Printed circuit boards	GF, Cu, Sn, plastic
I/O modules	GF, Cu, Sn, plastic
Power supply units	Zn-coated steel, GF, Cu, Sn, plastic
Relays, contactors	Cu, steel, brass, plastic
Miniature circuit breakers	Cu, steel, brass, plastic
Transformers	Steel, Cu, plastic, varnish
Phase units and excitation (cabinets A1-3, B1-3, E1)	
Printed circuit boards	GF, Cu, Sn, plastic
Transient absorbers (MVR)	Al, plastic

---

## 10 Product materials

Overvoltage protection module SCYC 51201	Al + see thyristors and printed circuit boards
Earth fault relay	Cu, steel, brass, plastic
Shunt resistances	Cu
Fuse bases	Cu, steel, plastic
Fuses	Cu, SS, ceramics, Ag
Measuring transducers	PC, Cu, Pt
Measuring transformers, meters	Steel, Cu, plastics, varnish
Power resistors (preresistors)	Plastics, steel, ceramics
Pulse transformers	Cu, plastics
Current transformers	Cu, plastics
Thyristors	Cu, Si, Mo, Q, ceramics, Ni, Rh
Cooling elements (heatsinks)	Al
Capacitor of RC circuits	PUR, PP, metals
Power resistors of RC circuits	Al, MgO, ceramics, NiCr, Si, PTFE, Cu, ceramics
Thyristor clamps	Plastic, steel
Heat transmission grease for thyristors	Q, ZnCr, Li stearate
<b>Cooling system</b>	
<b>Water cooled system (W1 and W2 cabinets)</b>	
Pumps	SS (AISI 316), Fe,Cu, plastics, FPM (Viton), EPDM
Heat exchanger	SS (AISI 316), Cu
Valves	SS (AISI 316)
Metallic water pipes	SS (AISI 316)
Water pipes with insulative material	PEX, PVDF, PA
Flow meter	SS (AISI 316, AISI 329), PA, NBR, PBT, PC
Temperature measuring transducer and sensor	Pt, Cu, PVC
Pressure sensor and transmitter	SS (AISI 316), plastics
Hour counter	Steel, Cu, plastics
Housing for conductivity sensor	Al
Conductivity sensor, transmitter	SS (AISI 316), plastic
Measuring and control apparatus	SS (AISI 316)
Expansion vessel	SS, EPDM
Mechanical filter element	Akrylic-phenolic resin
Deionizing filter housing	SS, plastic
Filter housing	Al, brass, steel
Ion-exchange resin	- SO <sub>3</sub> , - N(CH <sub>3</sub> ) <sub>2</sub> , DVB, PS
Cooling water	Deionized water, MEG or PEG
Couplings, fast couplings	Al, SS (AISI 316)
<b>Air cooled system (F1 and F2 cabinets)</b>	
Fans	SS (AISI 316), Fe, Cu
Air channel walls	GF
Grids on doors	Plastics
Air flow plate	Al
Air flow equaliser	Zn-coated steel
Air pressure sensor	Plastics
<b>Mechanics (all cabinets)</b>	
Protective covers	PC, Zn-coated steel
Supporting insulators	PA , PTFE, EP, brass, Al, steel

Busbar	Al, Cu, Sn-coated CU, Ni-coated Cu
Doors, side and roof plates	Zn-coated steel/polyester powder paint
Frame bars, partition plates, base channels, slide rails	Galvanized steel
Cover plates, cover strips	Galvanized steel + paint
Intermediate supports	Steel + paint
Lifting bars	Steel + paint
Insulating material	PC (Makrolon, Lexan), GF
Bolt and screw connection materials	Zn-coated steel
<b>Other (all cabinets)</b>	
Wires, cables	Cu, Sn, PVC, PTFE (Teflon*), Si
Optic cables, optic connectors	Plastic
Strip terminals	Cu, Ag, Sn
Terminal blocks, socket outlets	Steel, brass, Cu, plastics
* Teflon® is registered trademark of DuPont)	

Abbreviations	
Brass	Cu, Zn
Ceramics	Mg- and Al-oxides
DVB	Divinylbenzene
EP	Epoxy
EPDM	Ethylenepropylenediene rubber
FPM	Fluoro elastomer (rubber)
GF	Glass fiber
MEG	Monoethylene glycol
PBT	Polybutyleneterephthalate
PC	Polycarbonate
PCB	Printed circuit board
PE	Polyethylene
PEG	Propylene glycol
PEI	Polyether imide
PEX	Cross-linker polyethylene
PF	Phenol formaldehyde
PMMA	Polymethyl methacrylate
PP	Polypropylene
PS	Polystyrene
PTFE	Polytetrafluoroethylene (Teflon) *
PUR	Polyurethane
PVC	Polyvinyl chloride
PVDF	Polyvinylidene fluoride
Q	Silicone (rubber)
SS	Stainless steel
UP	Unsaturated polyester
VCI	Volatile corrosion inhibitor
* Teflon® is registered trademark of DuPont	

## Package

The product package is made of plastic and wood-based materials.

You can recycle all materials used in the package.

To avoid pollution caused by unnecessary transportation, the factory does not take back used packages. Contact your local ABB office for package recycling instructions if needed.

ABB recommends package recycling as it preserves raw materials and reduces waste being landfilled.

Different packing materials are listed in the table below.

<b>Standing crate</b>	<b>Seaworthy export packing to Europe</b>	<b>Seaworthy export packing outside Europe (Al foil)</b>	<b>Seaworthy export packing to Europe and North America (volatile corrosion inhibitor film)</b>
Rough board	Rough board	Rough board	Rough board
Cardboard	Corrugated board		
	Plywood, wood	Plywood, wood	Plywood, wood
	Antistatic polyethylene film	Antistatic polyethylene film	-
	Stretch polyethylene film		
	Polyethylene film		Polyethylene film with volatile corrosion inhibitor
		Bubble plastic	Bubble plastic
	Polycarbonate board		
			Plastic supports
		Rubber board (optional)	
		Aluminum foil	
Steel strap			
	Volatile corrosion inhibitor paper	Volatile corrosion inhibitor paper	Volatile corrosion inhibitor paper
	Desiccant	Desiccant	
	Silicone seal	Silicone seal	

## Product manuals and sales brochures

To save natural resources and reduce paper waste, all product manuals are available in ABB Library and on the Internet.

# 3

## Manufacturing and use

---

### Manufacturing

ABB Oy (Finland) has a company-wide integrated quality, environmental and occupational health & safety management system. The system is certified in accordance with requirements of the international standards ISO 9001:2015 and ISO 14001:2015.

The Integrated Management System applies to all units of the company.

### Use

The use of a drive has several positive environmental impacts, such as:

- Substantial energy savings and reduced operating costs can be reached using a drive. Rather than have an electric motor running continuously at full speed, an electric drive allows the user to slow down or speed up the motor.
  - Process control is optimized. An electric drive enables a process to achieve the right speed and torque while maintaining its accuracy.
  - Need for maintenance is reduced. Being able to vary the speed and torque of an electric motor means there is less wear and tear on the motor and the driven machine.
-



# 4

## Product disposal

---

### Contents of this chapter

This chapter contains product disposal instructions.

### Disposal

The main parts of the drive can be recycled to preserve natural resources and energy. Product parts and materials should be dismantled and separated.

Generally all metals, such as steel, aluminum, copper and its alloys, and precious metals can be recycled as material. Plastics, rubber, cardboard and other packaging material can be used in energy recovery.

Printed circuit boards and DC capacitors need selective treatment according to IEC 62635 guidelines.

To aid recycling, plastic parts are marked with an appropriate identification code.

Contact your local ABB distributor for further information on environmental aspects. End of life treatment must follow international and national regulations.

### Dismantling

You can dismantle the drive manually or in a shredding machine. The chapter is divided in two sections on basis of the dismantling method.

---

## ■ **Manual dismantling**

Sort the parts of the product according to their material contents as follows:

- ferrous metals (plates, screws)
- aluminum (heatsink)
- plastics
- printed circuit boards
- electrolytic capacitors (mounted on the main circuit board)
- other.

You can recycle metal parts (iron and aluminum) and most of the other materials according to local regulations.

For information on harmful materials, see subsection [ABB list of prohibited and restricted substances](#).

## ■ **Mechanical shredding**

In this method, a whole product is mechanically shredded into small pieces and materials are sorted using dedicated sorting processes.

Remove the harmful material before shredding the drive in the shredding machine. See subsection [ABB list of prohibited and restricted substances](#).

## **ABB list of prohibited and restricted substances**

The purpose of this list is to comply with legislation to avoid substances that may present hazards to the environment or the health.

This document provides information about “Prohibited substances”, substances that must not be used, and “Restricted substances”, substances whose use should be limited within ABB.

Definitions and regulations of hazardous materials differ from country to country and are likely to change when knowledge of materials increases. The materials used in the product are materials typically used in electrical and electronic equipment.

## ■ **Reference list**

1. Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS II).
  2. Regulation No 1907/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH):
    - Annex XIV: List of substances subject to authorization
    - Annex XVII: Restrictions on use of substances in articles
    - SVHC: Candidate list of substances of very high concern for authorization.
  3. Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).
-

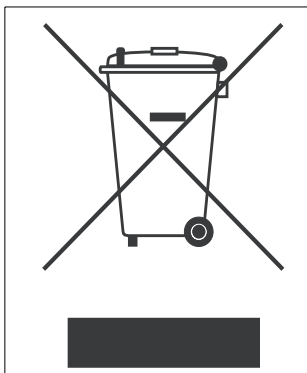


## Recycling information in accordance with the WEEE

The product is marked with the wheelie bin symbol. It indicates that at the end of life the product should enter the recycling system.

You should dispose of it separately at an appropriate collection point and not place it in the normal waste stream.

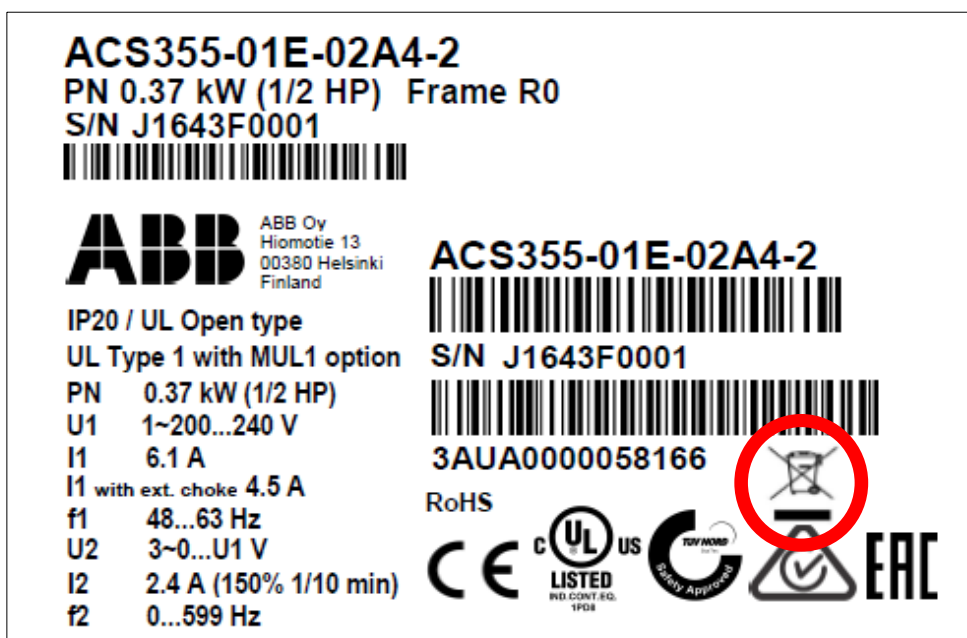
The figure below shows the wheelie bin symbol indicating separate collection for electrical and electronic equipment (EEE).



The horizontal bar underneath the crossed-out wheelie bin indicates that the equipment has been manufactured after the Directive came into force in 2005.

The wheelie bin symbol is added to the type designation label of the product since 2017.

The figure below shows an example.



## A recycling example

This example complies with typical national regulations valid at the time of publishing this manual.

Materials	Recycling method
Steel	Recycled as material
Aluminum	Recycled as material
Plastics	Energy recovery (incineration)
Printed circuit boards	Recycled as WEEE
Electrolytic capacitors	Recycled as WEEE
Cables	Recycled as material
Ceramics	Landfilled
Other materials	Energy recovery (incineration)

## 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](http://www.abb.com/searchchannels).

### Product training

For information on ABB product training, navigate to [new.abb.com/service/training](http://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](http://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](http://www.abb.com/drives/documents).

### ABB environment policy

You can find ABB's environmental policy on the Internet at [new.abb.com/sustainability/environment-policy](http://new.abb.com/sustainability/environment-policy).

### ABB group sustainability objectives

For information on ABB group sustainability objectives, navigate to [new.abb.com/sustainability/creating-value/objectives](http://new.abb.com/sustainability/creating-value/objectives)

### ABB list of prohibited and restricted substances

You can find the ABB list of prohibited and restricted substances at [new.abb.com/sustainability/environment](http://new.abb.com/sustainability/environment).

# Contact us

**[www.abb.com/drives](http://www.abb.com/drives)**

**[www.abb.com/drivespartners](http://www.abb.com/drivespartners)**

DOCRIPSRCYC01 Rev C (EN) 2017-02-02