

Weldability®



User manual

Protecto Vac

Portable Welding Fume Extractor

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ORIGINAL INSTRUCTION

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PREFACE

Using this manual

This manual is intended to be used as a work of reference for professional, well trained and authorised users to be able to safely install, use, maintain and repair the product mentioned on the cover of this document.

Pictograms and symbols

The following pictograms and symbols are used in this manual:

	TIP Suggestions and recommendations to simplify carrying out tasks and actions.
	CAUTION! Procedures, if not carried out with the necessary caution, could damage the product, the workshop or the environment.
	WARNING! Procedures which, if not carried out with the necessary caution, may damage the product or cause serious personal injury.
	WARNING! Denotes risk of electric shock.
	WARNING! Fire hazard! Important warning to prevent fire.

Text indicators

Listings indicated by “-” (hyphen) concern enumerations.
Listings indicated by “•” (bullet point) describe steps to perform.

1 INTRODUCTION

1.1 Identification of the product

The identification plate contains, among other things, the following data:

- product name
- serial number
- supply voltage and frequency
- power consumption

1.2 General description

The Protecto Vac is a portable high vacuum welding fume extractor. It is equipped with two motors. Instead of switching off one motor, at speed setting LOW both motors run at lower speed, which results in a longer lifespan of the motor package. The Protecto Vac can be switched on/off manually or automatically. The automatic start/stop device is activated by the mass cable of the connected welding machine. With its wheels, the handle and its compact design the machine is extremely suited to be used in relatively small workshops, in confined spaces or near sources of pollution without a fixed location.

1.3 Options and accessories

The following products can be obtained as an option/ accessory:

- FAC-HV activated carbon filter
- MBH wall bracket
- HCH-45 hose connection
- NKT nozzle kit
- NKC nozzle kit
- EN-20 funnel nozzle
- EN-40 slit extraction nozzle
- H-2.5/45 extension/exhaust hose 2,5 m
- H-5.0/45 extension/exhaust hose 5 m

- CP-45 connection piece

1.4 Technical specifications

Weight	18.6 kg
Dimensions: - height - width (incl. wheels)	- 730 mm - 420 mm
Connection voltage	- 110V/1ph/50Hz - 230V/1ph/50Hz
Power consumption: - speed setting LOW - speed setting HIGH	max. 2 x 1000 W - 70% - 100%
Max. extraction capacity (clean filter with 2,5 m hose and EN-20): - speed setting LOW - speed setting HIGH	- 160 m³/h - 230 m³/h
Filter surface: - main filter cartridge - HEPA filter	- 11 m² - 0.4 m²
Filter class: - pre filter - main filter cartridge - HEPA filter	- G2 according to DIN EN 779 - H10 according to DIN EN 1822 - H12 according to DIN EN 1822
Noise level according to ISO 3746: - speed setting LOW - speed setting HIGH	- speed LOW: 63 dB(A) - speed HIGH: 70 dB(A)

1.5 Ambient conditions

Operating temperature: - min. - nom. - max.	- 5°C - 20° - 45°C
Max. relative humidity	80%

2 PRODUCT DESCRIPTION

2.1 Components

The product consists of the following main components and elements:

Fig. 2.1

- A control panel
- B motor (2)
- C air inlet Ø 48 mm
- D pre-separator
- E wheel (2)
- F main filter cartridge with integrated prefilter underneath
- G outlet cover
- H HEPA filter
- I top cover
- J handle

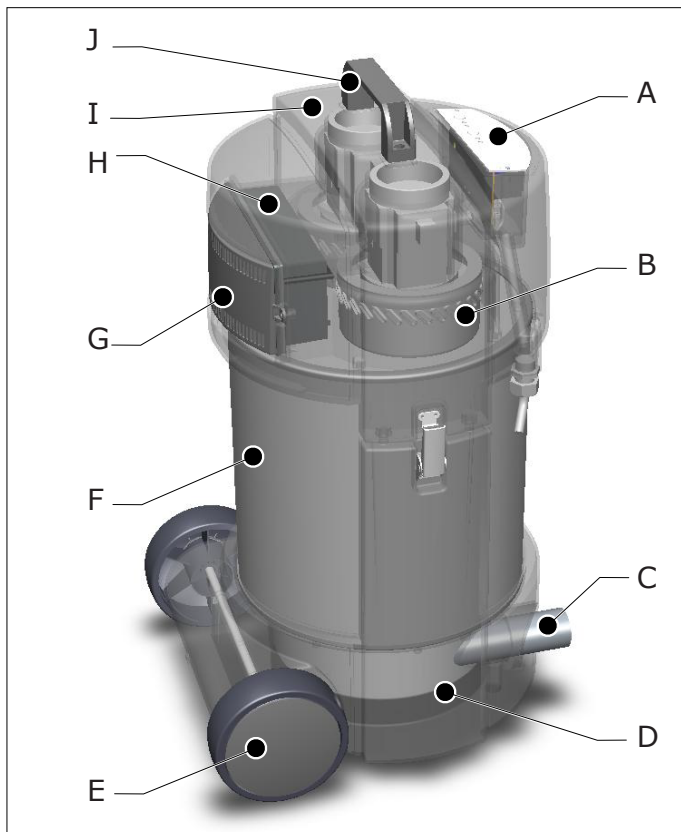


Fig. 2.1 Main components and elements

2.2 Operation

The machine works in accordance with the recirculation principle. The extracted fumes pass the air inlet and enter the pre-separator in which primary filtration takes place and where sparks, if any, are separated. Subsequently the air passes the prefilter and the main filter, in which most of the fume particles are filtered out. Finally, the fan blows the air into the HEPA filter where the remaining fumes are separated. The cleaned air is returned into the workshop via the outlet grid. With the optional hose connection HCH 45 the air can be discharged elsewhere, for example into the atmosphere.

The welding fumes can be extracted at source in the following ways:

- by the supplied extraction hose Ø 45 mm connected to the welding torch;
- by the supplied extraction hose Ø 45 mm connected to an extraction nozzle (refer to section 1.3).

3 SAFETY

General

The manufacturer does not accept any liability for damage to the product or personal injury caused by ignoring of the safety instructions in this manual, or by negligence during installation, use, maintenance, and repair of the product mentioned on the cover of this document and any corresponding accessories.

Specific working conditions or used accessories may require additional safety instructions. Immediately contact your supplier if you detect a potential danger when using the product.

The user of the product is always fully responsible for observing the local safety instructions and regulations. Observe all applicable safety instructions and regulations.

User manual

- Everyone working on or with the product, must be familiar with the contents of this manual and must strictly observe the instructions therein. The management should instruct the personnel in accordance with the manual and observe all instructions and directions given.
- Never change the order of the steps to perform.
- Always keep the manual with the product.

Pictograms and instructions on the product (if present)

- The pictograms, warning and instructions attached to the product are part of the safety features. They must not be covered or removed and must be present and legible during the entire life of the product.
- Immediately replace or repair damaged or illegible pictograms, warnings and instructions.

Intended use¹

The product has been designed exclusively for extracting and filtering gases and particles which are released during the most common welding processes. Using the product for other purposes is considered contrary to its intended use. The manufacturer accepts no liability for any damage or injury resulting from such use. The product has been built in accordance with state-of-the-art standards and recognised safety regulations. Only use this product when in technically perfect condition in accordance with its intended use and the instructions explained in the user manual.

Technical specifications

The specifications given in this manual must not be altered.

Modifications

Modification of (parts of) the product is not allowed.



WARNING!

Fire hazard! **Never** use the product for:

- extracting and/or filtering flammable, glowing or burning particles or solids or liquids
- extracting and/or filtering of aggressive fumes (such as hydrochloric acid) or sharp particles
- extracting and/or filtering dust particles which are released when welding surfaces treated with primer
- sucking cigarettes, cigars, oiled tissues, and other burning particles, objects, and acids

1. (1) "Intended use" as explained in EN-ISO 12100-1 is the use for which the technical product is suited as specified by the manufacturer, inclusive of his directions in the sales brochure. In case of doubt it is the use which can be deduced from the construction, the model and the function of the technical product which is considered normal use. Operating the machine within the limits of its intended use also involves observing the instructions in the user manual.

**WARNING!**

Never use the product for:

- oxy-fuel cutting
- aluminium laser cutting
- arc-air gouging
- oil mist
- paint mist
- heavy oil mist in welding fume
- extraction of hot gases (more than 45°C continuously)
- grinding aluminium and magnesium
- flame spraying
- extraction of cement, saw dust, wood dust, grit etc.
- explosive environments or explosive substances/gases

Note: this list is not all-embracing.

Installation

- Never place the product in front of entrances and exits which must be used for emergency services.
- Make sure that the workshop, in the vicinity of the product, contains sufficient approved fire extinguishers.
- Air containing particles such as chromium, nickel, beryllium, cadmium, lead etc., which is a health hazard, should never be recycled. This air must always be brought outside the working area.

Use

- Inspect the product and check it for damage. Verify the functioning of the safety features.
- During use, always use Personal Protective Equipment (PPE) to avoid injury. This also applies for persons who enter the work area.
- Check the working environment. Do not allow unauthorised persons to enter the working environment.
- Protect the product against water and humidity.
- Make sure the room is always sufficiently ventilated; this applies especially to confined spaces.

Service, maintenance and repairs

- Observe the maintenance intervals given in this manual. Overdue maintenance can lead to high costs for repair and revisions and can render the guarantee null and void.
- During service, maintenance and repair jobs, always use Personal Protective Equipment (PPE) to avoid injury. This also applies for persons who enter the work area.

**ATTENTION!**

Service, maintenance and repairs should only be performed in accordance with directive TRGS 560 by authorised, qualified and trained persons (skilled) using appropriate work practices.

**WARNING**

Before carrying out service, maintenance and/or repair jobs:

- fully disconnect the machine from the mains

**WARNING**

Always wear face mask and gloves during filter exchange/cleaning.
Industrial vacuum cleaner used during service and maintenance should meet dust class H according to EN 60335-2-69.

**WARNING**

Never reach into the intake or outlet of the fan.

**WARNING**

Never drive over the mains cord with any device.

4 INSTALLATION**4.1 Unpacking**

Check that the product is complete. The package should contain:

- portable welding fume extractor
- extraction hose 2,5 m/Ø 45 mm
- carbon brush (4)

If parts are missing or damaged, contact your supplier.

4.2 Installation

In the standard configuration, the machine contains an extraction hose and nozzle.

- Connect the extraction hose to the air inlet of the machine.
- Connect the desired nozzle to the hose.

4.2.1 Extension/exhaust hose

The machine can optionally be equipped with an extension hose and/or an exhaust hose. The hoses are interconnected by a connection piece CP-45.

An exhaust hose is connected to machine by a hose connection HCH-45, which comes instead of the outlet cover.

- If applicable: mount the extension and/or exhaust hose.

4.3 Electric connection**WARNING**

Make sure the machine is suitable for connection to the local mains. Information about the connection voltage and frequency can be found on the identification plate.

5 USE

5.1 Controls

The control panel contains the following controls:

Fig. 5.1

A Button: on/off; low/high

Button for switching the machine on and off and for switching from 'low' to 'high' motor speed and vice versa.

B Button: manual/auto

Button for switching the machine from automatic on/off to manual control and vice versa.

C Groove mass cable; automatic start/stop

Slit for inserting the mass cable of the welding machine; this activates the arc sensor for automatic on/off switching of the extractor. Min. current 50 Amps.

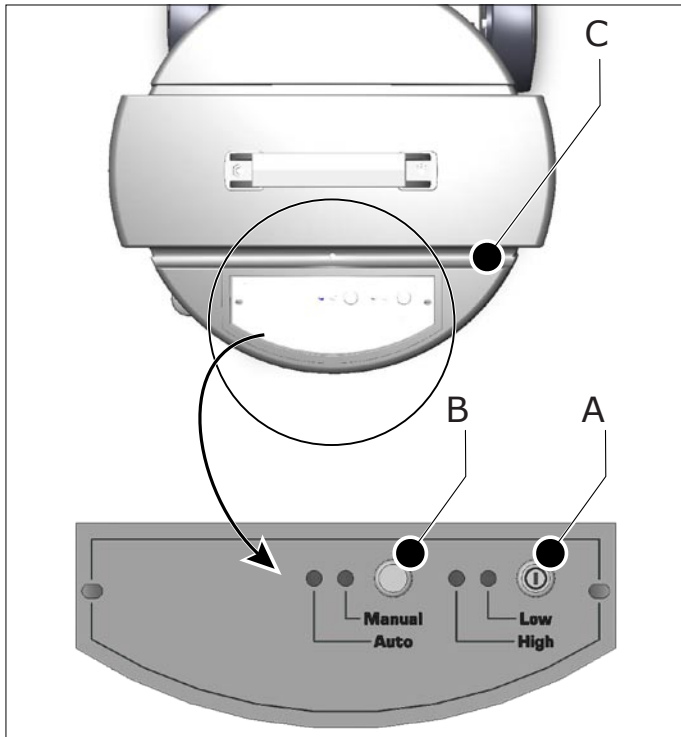


Fig. 5.1 Control panel Protecto Vac

5.2 Use

Since it concerns a portable unit, it can be used at any desirable place.

	CAUTION Do not position the machine in places where it is exposed to vibrations or radiation from heat sources. Observe the ambient conditions as described in chapter 1.6.
	CAUTION! Always use the product in an upright position. Make sure that the inlet is closed when transporting the product over larger distances.
	WARNING Never use the machine without full filter package.

- Connect the machine to the mains.

5.2.1 Protecto Vac with welding torch + integrated extraction

- Connect the welding torch to the nozzle kit (NKT or NKC).
- Connect the machine to the mains.
- Put the mass cable of the welding machine into the slit on top of the machine.
- Start up the machine by pressing the on/off button. Preferably use the automatic start/stop device ('auto') to extend the life of the carbon brushes.

The machine continues to run for 15 seconds (in the 'auto' setting) after welding is completed.

5.2.2 Protecto Vac with extraction nozzle

The machine can be supplied with two types of extraction nozzles:

- EN-20: funnel nozzle with magnetic foot for various welding processes/situations;
- EN-40: slit extraction nozzle with magnetic foot for horizontal welding activities, such as stick welding.

It is recommended that the extraction nozzle EN-20 is positioned above the welding spot (when possible) to achieve optimum welding fume extraction.

- Place the extraction nozzle at 2-4 cm from the source of pollution.
- Connect the machine to the mains.
- Insert the mass cable of the welding machine into the slit on top of the extractor.
- Start up the machine by pressing the on/off button. Preferably use the automatic start/stop device ('auto') to extend the life of the carbon brushes.
- The machine continues to run for 15 seconds (in the 'auto' setting) after welding is completed.

5.3 Extraction capacity check



- When using the machine, regularly check that the extraction capacity is sufficient.
- When the extraction capacity decreases, the filters should be replaced. Refer to section 6.2 for filter replacement procedure.

6 MAINTENANCE

6.1 Periodic maintenance

The product has been designed to function without problems for a long time with a minimum of maintenance. In order to guarantee this some simple, regular maintenance activities are required which are described in this chapter.

The indicated maintenance intervals can vary depending on the specific working and ambient conditions. Therefore it is recommended to thoroughly inspect the complete product once every year beside the indicated periodic maintenance. For this purpose contact your supplier.


	WARNING! Overdue maintenance can cause fire.
	WARNING! Always fully disconnect the machine from the mains before carrying out maintenance jobs as mentioned below. First read the maintenance regulations at the beginning of this manual.

The maintenance activities in the table below indicated by ^[1] can be carried out by the user; other activities shall only be carried out by qualified personnel.

Component	Action	Frequency: every # months		
		#=1	#=6	#=12
Outside	Clean with a non-aggressive detergent.		X ^[1]	
Pre-separator	Clean or empty.	X ^[1]		
Main filter cartridge	Check for damage.	X ^[1]		
Seals of main filter	Check for damage			X
Integrated prefilter and separate prefilter	Clean using an industrial vacuum cleaner.	X ^[1]		
Mains cord	Check for damage	X ^[1]		

6.2 Filter replacement

The main filter cartridge and the HEPA filter cannot be cleaned and therefore have to be replaced periodically. It is recommended to replace the main filter cartridge and the HEPA filter at the same time.

	WARNING! Always wear face mask and gloves during filter replacement.
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You must learn from experience when to replace the filters, since the lifespan strongly depends on the welding process, the composition of the welding fumes, the intensity of use and the humidity.

Replace the filters:

- when damaged
- when the airflow remains insufficient

6.2.1 Replacement of main filter cartridge

To replace the main filter cartridge, proceed as follows.

Fig. 6.1

- Loosen the draw latches (A).
- Remove the top cover (B).

- Carefully remove the main filter cartridge (C) from the bottom of the machine.
- Pack the used filter cartridge in the plastic bag in which the new filter is supplied. Seal the bag firmly.
- Check the seals of the machine before placing a new filter. If the seals need to be replaced, contact your supplier.
- Place the new filter and mount the disassembled parts in reverse order. Check that the integrated aluminium prefilter is placed at the bottom.
- Dispose of the used filter cartridge in accordance with state or local regulations.

6.2.2 Replacement of HEPA filter

To replace the HEPA filter, proceed as follows.

Fig. 6.1

- Remove the outlet cover by loosening the two screws (D)
- Remove the HEPA filter (E).
- Pack the used HEPA filter in the plastic bag in which the new filter is supplied. Seal the bag firmly.
- Place a new HEPA filter in the correct position (open side at the top); to facilitate this, apply some suds to the seals.
- Remount the outlet cover by fastening the two screws. Make sure that the outlet cover is in the right position; the open side of the HEPA filter should correspond with the smallest opening of the outlet cover.

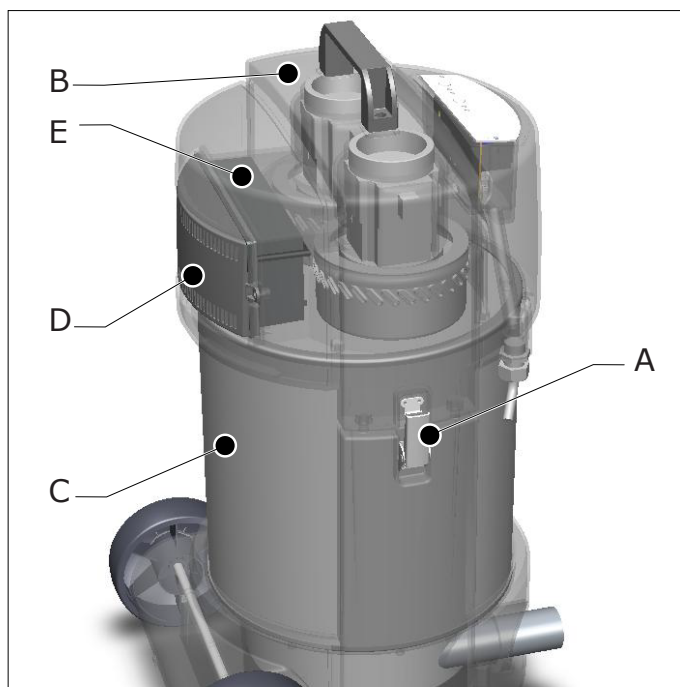



Fig. 6.1 Filter replacement

	ATTENTION! By taking out the HEPA filter, its seals will deform. For this reason, never replace a used HEPA filter, but always place a new one.
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7 TROUBLESHOOTING

If the machine does not function (correctly), consult the checklist below to see if you can remedy the error yourself. Should this not be possible, contact your supplier.



WARNING

Always disconnect the machine from the mains before carrying out the activities below. First read the maintenance regulations at the beginning of this manual.

The repair activities in the table below indicated by ^[1] can be carried out by the user; other activities shall only be carried out by qualified personnel.

Symptom	Problem	Possible cause	Solution
Motor does not start.	No extraction	No mains voltage.	Check the mains voltage.
		Supply cord defective.	Repair or replace the supply cord.
		Carbon brushes worn.	Replace the carbon brushes.
		Motor defective.	Replace both motors.
Extraction capacity insufficient.	Machine does not function properly.	Main filter polluted.	Replace both main filter and HEPA filter ^[1] .
		Extraction hose damaged or leak.	Replace the extraction hose ^[1] .
		Seals damaged or leaking.	Replace the seals.
Motor stops automatically.	No extraction	Thermal protection is activated.	Check that the cooling slits underneath the top cover and/or the outlet are not obstructed.
Dust or smoke coming out of the outlet grid.	Pollution of the facility	Filter torn or placed incorrectly.	Replace the filter or position it correctly ^[1] .

8 SPARE PARTS

The following spare parts are available for the machine (refer to Fig. 8.1).

Part No.	Part Description
Protecto Vac - general	
TWX0102080120	Prefilter
TWX0806010120	Handle Black
TWX9820060140	Starlock + Circlip (10 pieces)
TWX9850040030	Wheel Set excl. wheel coverS
TWX9850040060	Wheel Covers Set Grey
TWX9850060140	HEPA Filter H12
TWX9850070080	Activated Carbon Filter FAC-HV
TWX9850070090	Activated Carbon Filter FAC-HV (5 pieces)
TWX9850070130	Draw Latch set of 2
TWX9850070150	Outlet Cover
TWX9850080140	Seals Main Filter
TWX9999007070	Main Filter Cartridge
Protecto Vac - 110V	
TWX9820034130	Carbon Brushes (2 sets); 110V
TWX9880030030	Control Panel + PC board; 110-230V/1ph/50-60Hz
TWX9840251030	Motor 110V, incl. Seals
Protecto Vac - 230V	
TWX9820034120	Carbon Brushes (2 sets); 230V
TWX9880030040	Control Panel + PC board; 115-230V/1ph/50Hz
TWX9840251040	Motor 230V, incl. Seals

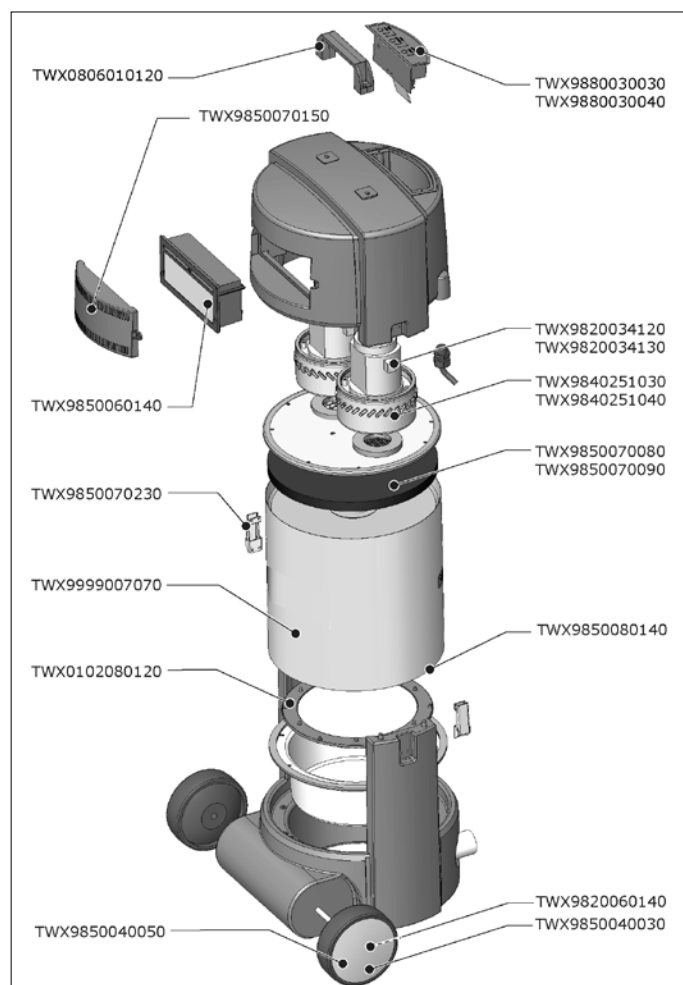


Fig. 8.1 Spare parts

CE DECLARATION

CE declaration of conformity for machinery

We, Weldability | Sif, Peters House, The Orbital Centre,
Icknield Way, Letchworth Garden City, Hertfordshire, SG6 1ET,
United Kingdom, herewith declare, on our own responsibility,
that the product:

- Protecto Vac

which this declaration refers to, is in accordance with the
conditions of the following Directives:

- Machine Directive 2006/42 EC
- EMC 2004/108 EC
- LVD 2006/95 EC

and is in conformity with the following harmonized standard(s)
and/or other such normative documents + amendments, if
any:

- EN-IEC 60335-1
- EN-IEC 60335-2-65

Letchworth Garden City, Hertfordshire (UK), 1 March 2011

