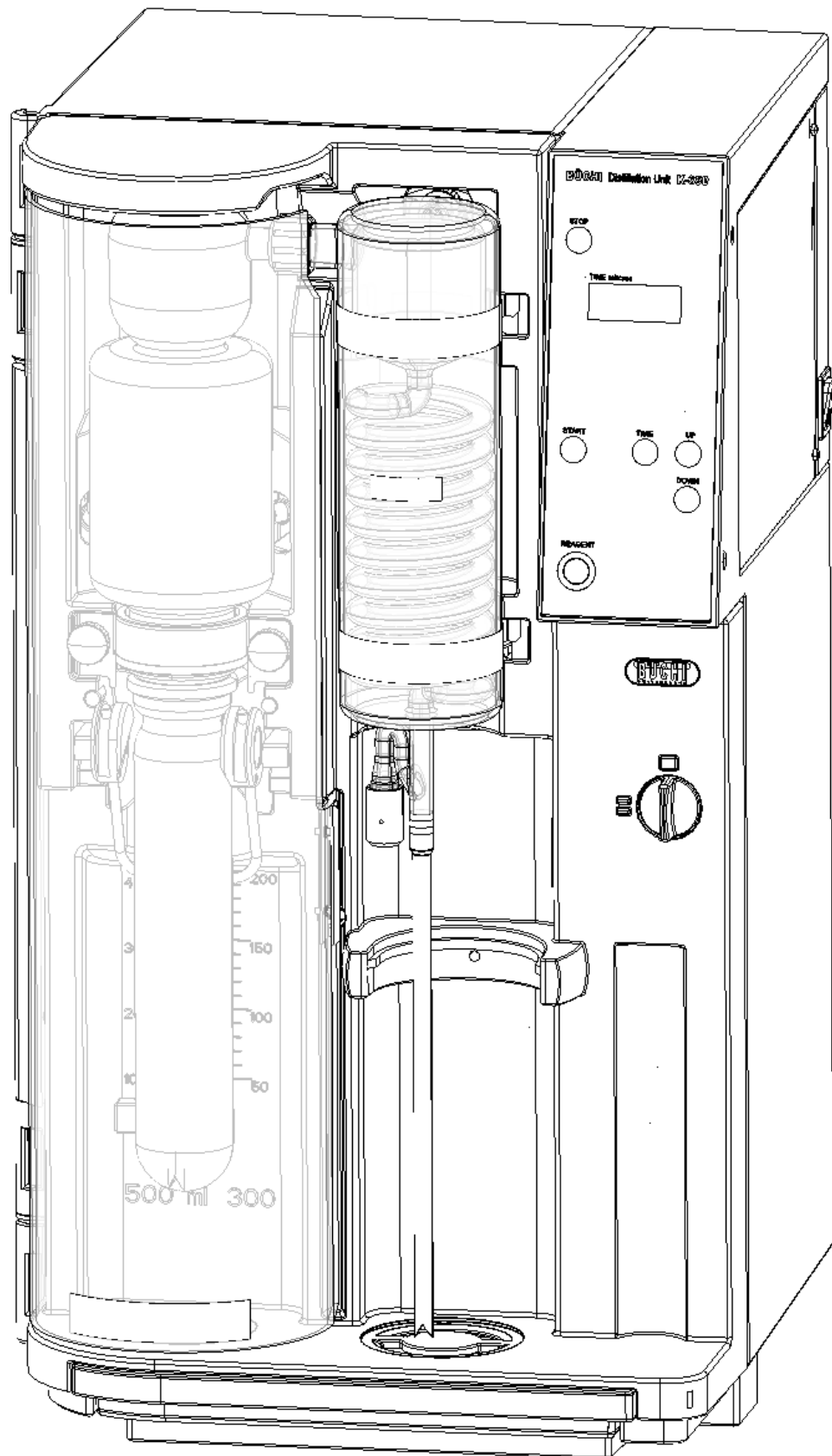




K-350 Distillation Unit

Operation Manual



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Table of contents

1	About this manual	5
1.1	Abbreviations	5
2	Safety.	6
2.1	User qualification	6
2.2	Proper use	6
2.3	Improper use	6
2.4	Warning notices used in this manual	7
2.5	Product safety.	7
2.5.1	Instrument-related hazards	7
2.5.2	Other hazards	8
2.5.3	Safety measures	8
2.5.4	Safety elements	8
2.6	General safety rules	9
3	Technical data	10
3.1	Scope of delivery	10
3.1.1	Standard instrument.	10
3.1.2	Standard accessories	11
3.1.3	Optional accessories	12
3.2	Technical data.	15
3.3	Materials used.	15
4	Description of function	16
4.1	Instrument overview	16
4.2	Function principle	17
4.3	Controls of the instrument	18
5	Putting into operation.	19
5.1	Installation site.	19
5.2	Electrical connections	19
5.3	Reagent and water connections.	20
5.3.1	Cooling water connection	20
5.3.2	Drainage of cooling water	21
5.3.3	Storage tank connection	21

Read this manual carefully before installing and running your system and note the safety precautions in chapter 2 in particular. Store the manual in the immediate vicinity of the instrument, so that it can be consulted at any time.

No technical modifications may be made to the instrument without the prior written agreement of BUCHI. Unauthorized modifications may affect the system safety or result in accidents.

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6	Operation	22
6.1	Addition of chemicals	22
6.1.1	Manual dosage	22
6.1.2	Automatic dosage	22
6.1.3	General information	22
6.2	Setting the distillation time	23
6.3	Steam generator status	23
6.3.1	Heating	23
6.3.2	Standby mode (after 30 minutes)	23
6.4	Switching ON/OFF checklist	23
6.5	Carrying out a Kjeldahl distillation	24
7	Maintenance	25
7.1	Daily maintenance	25
7.1.1	Cleaning the instrument from inside	25
7.1.2	Cleaning the housing	25
7.1.3	Cleaning the glass parts	25
7.1.4	Preparing the instrument for a standstill overnight	26
7.2	Weekly maintenance	26
7.2.1	Cleaning the splash protector and the rubber bung seal	26
7.3	Monthly maintenance	26
7.3.1	Checking the distillate amount	26
7.4	Half-yearly maintenance	27
7.4.1	Replacing the NaOH tube	27
7.5	Yearly maintenance	27
7.5.1	Replacing the rubber bung seal	27
7.5.2	Replacing the NaOH pump	27
7.6	Customer service	27
8	Troubleshooting	28
8.1	Malfunctions and their remedy	28
9	Shutdown, storage, transport and disposal	29
9.1	Preparing the instrument for transport	29
9.2	Storage and transport	29
9.3	Disposal	29
10	Spare parts	30
10.1	Spare parts K-350	30
10.2	Hosing connection scheme	31
11	Declarations and requirements	33
11.1	FCC requirements (for USA and Canada)	33

1 About this manual

This manual describes the Distillation Unit K-350 and provides all information required for its safe operation and to maintain it in good working order. It is addressed to laboratory personnel in particular.

NOTE

The symbols pertaining to safety (WARNINGS and ATTENTIONS) are explained in chapter 2.

1.1 Abbreviations

EPDM: Ethylene Propylene Dimonomer

FEP: Fluorinated Ethylene Propylene

FPM: Fluoroelastomer

PP: Polypropylene

PTFE: Polytetrafluoroethylene

RSD: Relative Standard Deviation

2 Safety

This chapter points out the safety concept of the instrument and contains general rules of behavior and warnings from hazards concerning the use of the product.

The safety of users and personnel can only be ensured if these safety instructions and the safety-related warnings in the individual chapters are strictly observed and followed. Therefore, the manual must always be available to all persons performing the tasks described herein.

2.1 User qualification

The instrument may only be used by laboratory personnel and other persons who on account of training or professional experience have an overview of the dangers which can develop when operating the instrument.

Personnel without this training or persons who are currently being trained require careful instruction. The present Operation Manual serves as the basis for this.

2.2 Proper use

The instrument has been designed and built for laboratories. It serves for the distillation of steam-volatile substances.

2.3 Improper use

Applications not mentioned above are improper. Also, applications which do not comply with the technical data are considered improper.

The operator bears the sole risk for any damages caused by such improper use.

The following uses are expressly forbidden:

- Use of the instrument in rooms which require ex-protected instruments.
- Use on samples, which can explode or inflame (e.g. explosives, etc.) due to shock, friction, heat or spark formation.

2.4 Warning notices used in this manual



WARNING

Generally, the triangular warning symbol indicates the possibility of personal injury or even loss of life if the instructions are not followed.



WARNING

Hot surface.



WARNING

Electrical hazard.



WARNING

Corrosive substances.



ATTENTION

With the general „Read this“ symbol, ATTENTIONs indicate the possibility of equipment damage, malfunctions or incorrect process results, if instructions are not followed.

NOTE

Useful tips for the easy operation of the instrument.

2.5 Product safety

The instrument is designed and built in accordance with state-of-the-art technology. Nevertheless, risks to users, property, and the environment can arise when the instrument is used carelessly or improperly.

The manufacturer has determined residual dangers emanating from the instrument

- if the instrument is operated by insufficiently trained personnel.
- if the instrument is not operated according to its proper use.

Appropriate warnings in this manual serve to make the user alert to these residual dangers.

2.5.1 Instrument-related hazards

Pay attention to the following safety notices:



WARNING

Potential implosion risk if used with damaged glassware.

- Beware of damaged or cracked glass parts.



WARNING

Potentially hot surfaces during operation (surface temperatures at times exceed 60 °C) and hot steam passing off the waste outlet.

- Always be aware of the risk of being burned.



WARNING

Potentially lethal voltage inside the instrument.

- Do not remove covers and other parts protecting from electricity.
- Always keep the areas of electric parts, such as power supply plug, mains switch, etc. dry.

2.5.2 Other hazards

**WARNING**

Certain solvents in or in the vicinity of the instrument can form peroxides and/or are highly inflammable.

- Always be aware of the explosion risk when working with hazardous substances or with substances of unknown composition.
- Always provide a good ventilation within or in the vicinity of the system.

2.5.3 Safety measures

**WARNING**

Sodium hydroxide, acids and lye are used for applications according to Kjeldahl. For this reason, protective goggles must be worn at all times when using the instrument or working in its immediate proximity.



2.5.4 Safety elements

The instrument is provided with the following safety elements:

- Protective door: Safety appliance to protect users from burns at the splash protector (distillation area), which is hot during distillation.
- Protective door sensor: Prevents the start of a distillation with the protective door open and stops a running distillation and the dosing of reagents immediately when the protective door is opened during the process.
- Sample tube sensor: Prevents the start of a distillation without a sample tube inserted.
- Protective shield (cover) at condenser: Protection of glass parts.
- Service door sensor/switch: Electrical power is disconnected immediately when the service door is opened, thus preventing electrical shock during maintenance.

2.6 General safety rules

Responsibility of the operator

The head of laboratory is responsible for training his personnel.

The operator shall inform the manufacturer without delay of any safety-related incidents which might occur during operation of the instrument. Legal regulations, such as local, state and federal laws applying to the instrument must be strictly followed.

Duty of maintenance and care

The operator is responsible for ensuring that the instrument is operated in proper condition only, and that maintenance, service, and repair jobs are performed with care and on schedule, and by authorized personnel only.

Spare parts to be used

Use only genuine consumables and genuine spare parts for maintenance to assure good system performance and reliability. Any modifications to the spare parts used are only allowed with the prior written permission of the manufacturer.

Modifications

Modifications to the instrument are only permitted after prior consultation with and with the written approval of the manufacturer. Modifications and upgrades shall only be carried out by an authorized BUCHI technical engineer. The manufacturer will decline any claim resulting from unauthorized modifications.

3 Technical data

This chapter introduces the reader to the instrument specifications. It contains the scope of delivery, technical data, requirements and performance data.

3.1 Scope of delivery

Check the scope of delivery according to the order number.

NOTE

For detailed information on the listed products see www.buchi.com or contact your local dealer.

3.1.1 Standard instrument

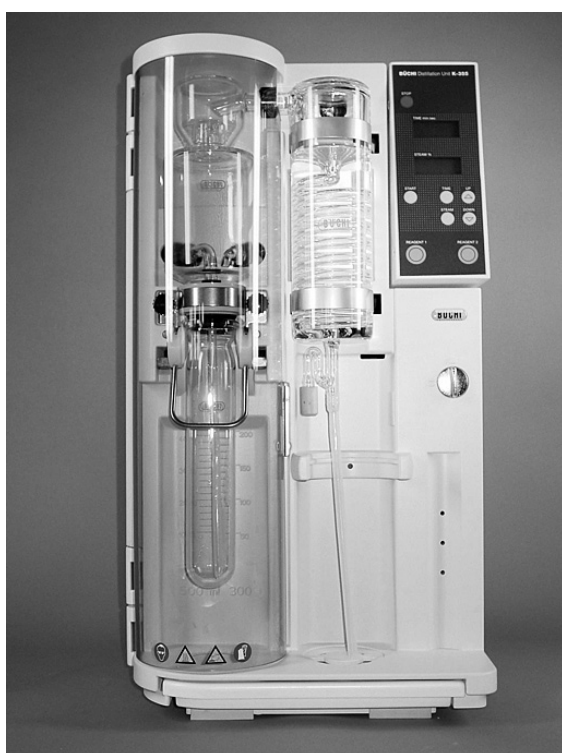


Table 3-1: Standard instrument

Product	Order number
Distillation Unit K-350 Standard with glass splash protector, 230 V, 50/60 Hz	43500
Distillation Unit K-350 with splash protector made of fiber glass reinforced polypropylene, 230 V , 50/60 Hz	43418

3.1.2 Standard accessories

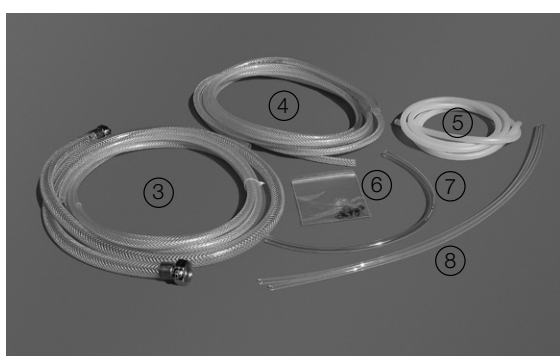
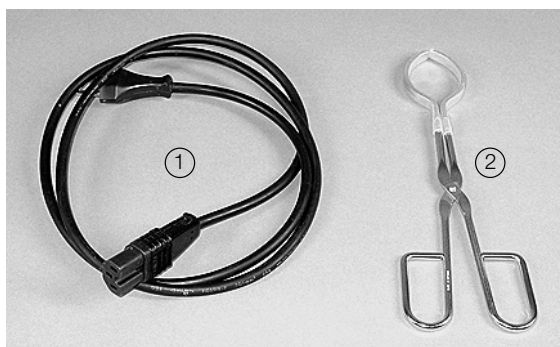
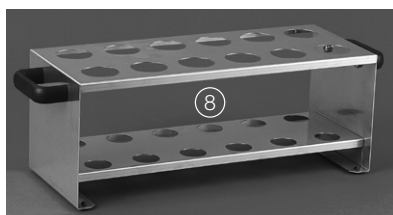
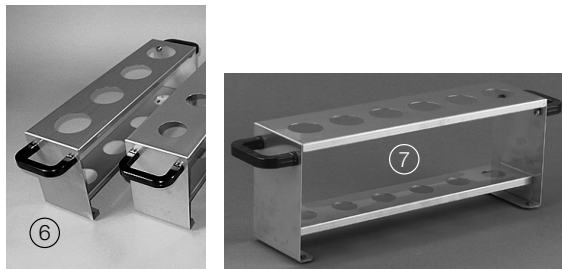
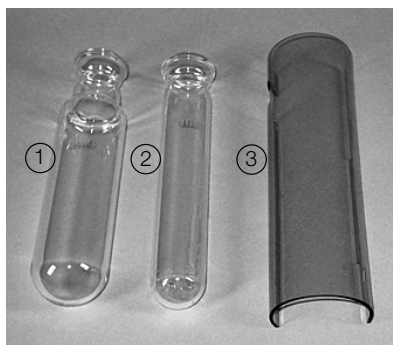


Table 3-2: Standard accessories

Product	Order number
① 1 mains cable of the following types	
Type CH	10010
Type Schuko	10016
Type GB	17835
Type AUS	17836
Type USA	33763
Type Japan	10016
② 1 pair of glass tongs	02004
③ 1 cooling water hose complete: G 3/4", 1/2", L = 1.5 m	37780
④ 1 hose chemical supply, solaflex, L = 3.5, Ø 10/5 mm	43555
⑤ 1 hose cooling water drain, silicone, L = 1.5 m	43940
⑥ 1 clamp Ø 9.6 mm	27738
⑦ 2 clamps Ø 11.9 mm	43841
⑧ 1 hose tygon, L = 530 mm	43029
⑨ 2 suction tubes to tanks, FEP, L = 580 mm	43407
⑩ 2 tanks 10 l, without caps	43410
⑪ 2 caps for 10 l tanks, large	25869
⑫ 2 tank labels	43434
⑬ 3 caps for 10 l and 20 l tanks, small	43477

3.1.3 Optional accessories


Table 3-3: Optional accessories K-350

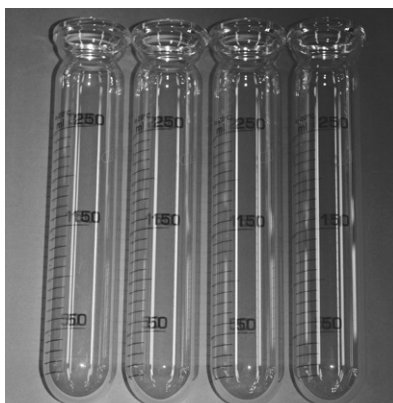
Product	Order number
① 1 sample tube 500 mL	26128
② 1 sample tube (set of 4) 300 mL	37377
③ Condenser cover, complete	43484
④ 20 l tank for chemicals	43469
⑤ 10 l tank for chemicals	43468
⑥ Holder for 4 sample tubes, 500 mL	16951
⑦ Holder for 6 sample tubes, 300 mL	43039
⑧ Holder for 12 sample tubes, 300 mL	43041

**Table 3-3: Optional accessories K-350 (cont.)**

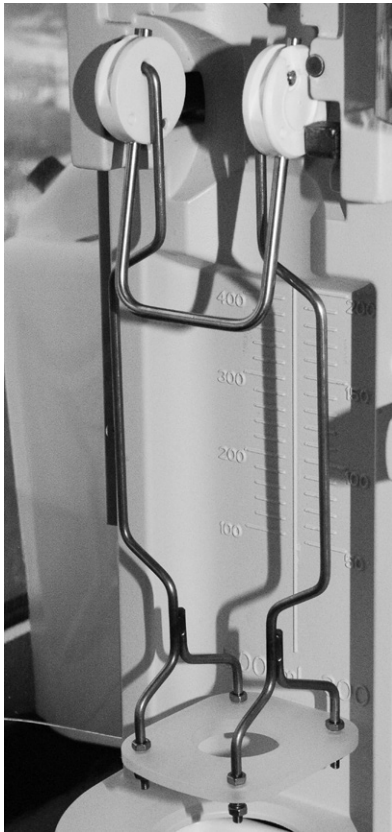
Product	Order number
Splash protector for Devarda method K-350/K-355/K-370	43335



Constricted distillate outlet tube \varnothing 5 mm	43096
---	-------



Sample tubes graduated, 300 mL, set of 4	43049
---	-------

**Table 3-3: Optional accessories K-350 (cont.)**

Product	Order number
Universal adapter for K-350, K-355 or K-370	43115



SO ₂ accessory	48680
---------------------------	-------

3.2 Technical data

Table 3-4: Technical data K-350	
	Distillation Unit K-350
Power consumption	max. 2.2 kW
Connection voltage	230 V \pm 10 % / 200 V \pm 10 %
Frequency	50/60 Hz
Current consumption (230 V)	8.5 A
Mains connection	3-pole (P, N, E) via power cord
Recovery rate	\geq 99.5 %
Reproducibility (RSD)	\leq 1 %
Detection limit	\geq 0.1 mg Nitrogen
Environmental conditions	for indoor use only
Temperature	5 - 35 °C
Altitude	up to 2000 m
Humidity	maximum relative humidity 80 % for temperatures up to 31°C decreasing linearly to 67 % relative humidity at 35 °C
Installation category	II
Pollution degree	2
Dimensions (W x H x D)	400×660×360 mm
Weight	16.5 kg

3.3 Materials used

Table 3-5: Materials used for the K-350		
Component	Material designation	Material code
Housing	Polyurethane	PUR / UL V0
Glass parts	Borosilicate glass 3.3	DIN/ISO 3585
Steam generator isolation	Ceramic fiber	Multitherm 550
Steam generator housing	Stainless steel	1.4301
Protective door	Polymethyl methacrylate	PMMA
Condenser cover	Polymethyl methacrylate	PMMA
Connecting stopper	Hypalon	CSM
NaOH tube	Ethylene Propylene Dimonomer	EPDM

4 Description of function

This chapter explains the basic principle of the instrument, shows how it is structured and gives a functional description of the assemblies.

4.1 Instrument overview



- ① Splash protector
- ② Sample tube
- ③ Protective door

- ④ Condenser
- ⑤ Operating panel
- ⑥ Service door

Fig. 4.1: Instrument overview

4.2 Function principle

The Distillation Unit K-350 is suitable for determining nitrogen using the Kjeldahl (TKN; Total Kjeldahl Nitrogen) and Devarda methods as well as for other distillations of steam-volatile substances (e.g. of alcohol, SO_2 , volatile acids).

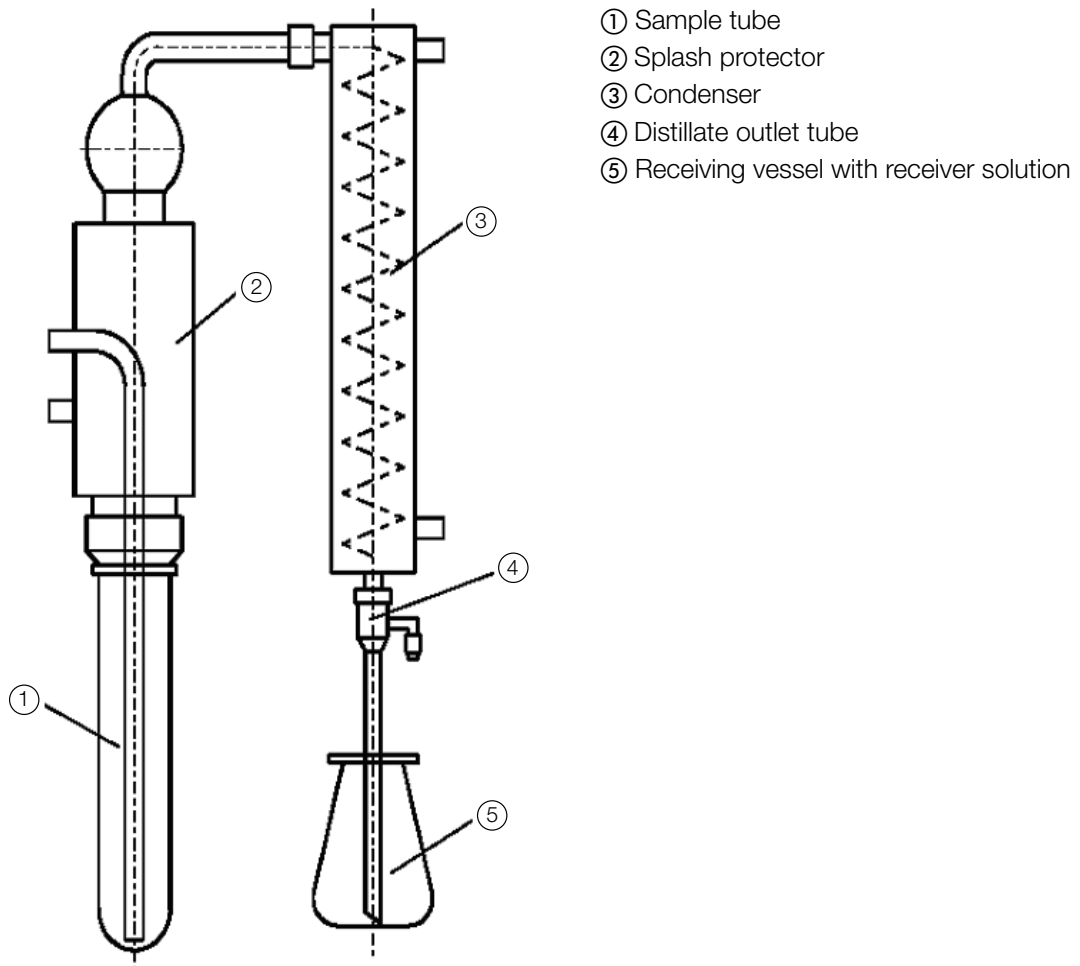


Fig. 4.2: Function principle

Steam is introduced into the sample solution (in sample tube ①) to drive out volatile components (such as ammonia, alcohol, etc.). After condensation (in condenser ③) the condensate is collected in a receiver solution (in receiving vessel ⑤).

4.3 Controls of the instrument



- ① STOP: Stops a distillation or the addition of reagent
- ② TIME display
- ③ START: Starts a distillation
- ④ TIME: Sets time in min:sec
- ⑤ UP: Increases time and steam up
- ⑥ DOWN: Decreases time and steam down
- ⑦ REAGENT: Button that adds reagent (e.g. water, sodium hydroxide solution)

Fig. 4.3: Controls of the instrument

5 Putting into operation

This chapter describes how the instrument is installed and gives instructions on initial startup.

NOTE

Inspect the instrument for damages during unpacking. If necessary, prepare a status report immediately to inform the postal company, railway company or transportation company.

Keep the original packaging for future transportation.

5.1 Installation site

Install the instrument on a clean, flat and stable base and place the storage tanks on the same level as the instrument (not higher and not more than 1 m lower).



ATTENTION

To ensure the instrument safety do not place any object on top of it.



ATTENTION

For safety reasons, make sure that the distance between the instrument and another object or a wall is at least 30 cm.



ATTENTION

For safety reasons do not place any containers, chemicals or other instruments behind the instrument.

5.2 Electrical connections



Fig. 5.1: Electrical connections

**ATTENTION**

Make sure that the voltage on the socket corresponds to the voltage given on the type plate of the instrument.

Always connect the instrument to an earthed socket. External connections and extension cables must be provided with an earthed conductor lead (3-pole couplings, cable or plug equipment) as the mains lead has a molded plug, thus avoiding risks due to inadvertent defective wiring.

The instrument cable must be well attainable at all times.

Make sure that no electric sparks form in the instrument or its surroundings as they might damage the instrument.

5.3 Reagent and water connections



- ① H₂O inlet (for steam generator) from tank
- ② NaOH input from tank
- ③ Cooling water outlet
- ④ Cooling water inlet
- ⑤ Drain to waste

Fig. 5.2: Reagent and water connections

All pumps are self-priming, no overpressure is necessary at the tanks.

5.3.1 Cooling water connection

Secure the cooling water hose with a hose clamp on both the instrument and the water connection side. The water pressure should be at a maximum of 4 bar. The built in valve reduces the water flow to 1.2 liters per minute.

The flanged screw coupling for the water connection has a standard screw thread of G 3/4".

5.3.2 Drainage of cooling water

Place the drain hose for the cooling water directly into the drain. For this purpose, shorten the silicone hose to the optimal length. The drain hose should not show any kinks, sharp bends and/or siphoning effect. Prevent flooding inside and outside the instrument by securing the drain hose.

5.3.3 Storage tank connection

To connect the storage tanks, proceed as follows:

- Cut the solaflex tube into pieces of the appropriate length (use an acid resistant tube, if acid is dosed).
- Insert a PTFE suction tube into the solaflex tube.
- Push an EPDM sealing ring over the solaflex tube.
- Now fasten the tubes to the tank with the red screw cover.
- Connect the tubes at the appropriate connections at the instrument side and secure them with the clamps.

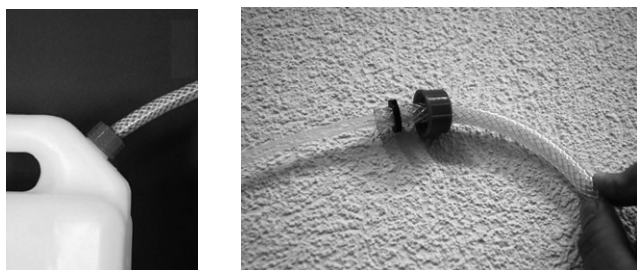


Fig. 5.3: Tank connection

All pumps are self-priming, no overpressure is necessary at the tanks.



ATTENTION

To ensure proper system functioning, consider the following:

- Use only distilled water for the H_2O storage tank to keep the steam generator maintenance-free.
- Make sure that the tanks are connected correctly. If the wrong tank (e. g. reagent tank containing NaOH) is connected to the pump labelled „ H_2O steam“, the steam generator will be damaged.

6 Operation

This chapter gives examples of typical instrument applications and instructions on how to operate the instrument properly and safely.

**WARNING**

Risk of injury.

- *Never operate the instrument when glassware is damaged.*

**WARNING**

Sodium hydroxide, acid and lye are used for applications according to Kjeldahl. For this reason, protective goggles must be worn at all times when using this instrument or working in its immediate proximity.

**NOTE**

Close unused connections with plug caps.

6.1 Addition of chemicals

6.1.1 Manual dosage

When pressing “REAGENT” the connected reagent is dosed as long as the switch is pressed.

6.1.2 Automatic dosage

The reagent volume dosed before the distillation is started is stored. This volume can be recalled after distillation.

The stored volume is dosed by pressing “REAGENT” shortly. After releasing the switch, the volume is dosed automatically.

6.1.3 General information

The reagent switch is also active when the instrument is “Ready” or “Busy” (during distillation), so that additional dosage of reagent is possible during distillation.

During preheating, reagent addition is not possible.

The reagent volume stored before the start of the distillation is defined as the pump operating time.

The stored pump operating time (reagent volume) can be recalled after the distillation or after pressing “STOP”.

If “STOP” is pressed during the automatic addition of reagent, the default volume is set to 0 mL.

6.2 Setting the distillation time

To set the distillation time, proceed as follows:

- Press "TIME", the digit for minutes starts to flash.
- Press "TIME" again, the digit for seconds starts to flash.
- Set the distillation time by pressing "UP" and "DOWN".
- Start the distillation by pressing "START".

Digits stop flashing after a certain time or after starting the distillation.

When pressing "UP" and "DOWN", the time is first counted slowly, then faster.

The distillation time can be set in a range of 1 second to 99 minutes 59 seconds.

6.3 Steam generator status

6.3.1 Heating

A constant colon (:) and "HHHH" in the TIME-display as long as "START" is pressed indicates, that the steam generator is heating.

A flashing colon (:) and a signal sound for 1 second indicates, that the steam generator is ready.

6.3.2 Standby mode (after 30 minutes)

The TIME-display shows (----).

Press "START" to cancel the standby mode.

6.4 Switching ON/OFF checklist

To switch on and preheat the instrument, proceed as follows:

- Check the filling level of the supply tanks.
- Open the main water tap.
- Switch on the instrument and wait until the steam generator is ready.
- Insert an empty sample tube and an empty receiving vessel.
- Close the protective door.
- Set the distillation time to 2 minutes (see section "Setting the distillation time") and the steam to 100 % (see section "Setting the steam power").
- Start the distillation by pressing "START".

To switch off the instrument, proceed as follows:

- Fill 30 mL distilled water into the sample tube.
- Fill 50 mL distilled water into the receiving vessel.
- Switch off the instrument.
- Close the main water tap.

6.5 Carrying out a Kjeldahl distillation

To carry out a distillation, proceed as follows:

- Switch on the instrument and wait until the steam generator is ready.
- Insert the sample tube containing the sample diluted in water. The dilution with water prevents a too violent reaction when subsequently adding the sodium hydroxide solution. The sample must be diluted in a ratio of approximately 1 part of acid to 2 parts of water.
- Prepare a conical flask or a similar receptacle with a volume of about 250 mL as receiving vessel. Fill boric acid solution 4 % and 2-3 drops of Sher indicator in the receiving vessel. Alternative: Select suitable chemicals for the back titration.
- Add sodium hydroxide solution by pressing "REAGENT": Recommended alkali concentration: 32 %. Add alkali to the sample in a ratio of about 1 part of acid to 3 parts of sodium hydroxide solution. The volume of the added sodium hydroxide solution is measured on the scale behind the sample tube. The added volume selected must produce a clear shift in color to brown or blue.
- Set the required distillation time.
- Start the distillation by pressing "START".

NOTE

After distillation or after "STOP", the last distillation time can be recalled by pressing "START" or will automatically be recalled when exchanging the sample tube.

7 Maintenance

This chapter gives instructions on all maintenance work to be performed in order to keep the instrument in good working condition.



WARNING

Electrical hazard:

- *Prior to all maintenance work on the instrument switch off the power supply and remove all sources of flammable vapor.*



WARNING

All maintenance and repair work requiring the opening or removal of instrument covers may only be carried out by trained personnel and with the tools provided for this purpose.



WARNING

Potentially hot service door or interior behind the service door during operation (surface temperatures at times exceed 60 °C). Danger of burns.

- *Always let the instrument cool down before opening the service door.*



ATTENTION

Always wear personal protective equipment such as protective eye goggles, protective clothing and gloves when maintaining the instrument.



Check the instrument for proper operation after any repair work.

7.1 Daily maintenance

7.1.1 Cleaning the instrument from inside

To ensure proper instrument functioning regular cleaning is vital. Thus the generation of caustic substances within the instrument and the degradation of glassware is avoided. To clean the inside of the instrument, distill 100 mL of distilled water for a period of 2 minutes.

7.1.2 Cleaning the housing

Check the housing for defects (switches, plugs) and clean it with a damp cloth.



ATTENTION

Never use solvents as cleaning agents as these might damage the instrument.

- *As the housing is made of polyurethane and covered with an acid-resistant coating, any acid drops must be wiped away immediately with a damp cloth.*

7.1.3 Cleaning the glass parts

The glass parts can be taken out and cleaned with commercially available cleaning agents or in an ultrasonic bath. After the glass parts have been cleaned and fully dried, check each part visually for cracks, scratches and for any parts or sections that might have splintered off. Take out and replace any damaged glass parts.

7.1.4 Preparing the instrument for a standstill overnight

To prepare the instrument for a longer standstill (e.g. overnight), fill 50 mL distilled water into the receiving vessel and 30 mL of distilled water into the sample tube.

7.2 Weekly maintenance

7.2.1 Cleaning the splash protector and the rubber bung seal

Unmount the splash protector and remove the rubber bung seal.

Rinse the splash protector with water to remove sample residues.

We recommend to replace the splash protector after approximately 5000 determinations, depending on the kind of application and frequency of maintenance.

To prolong the lifetime of the seal, rinse it with water, especially if working with crystalline products. Afterwards, dry it with a soft cloth, remount it and put the splash protector back in place.



ATTENTION

When removing and reinstalling the seal, make sure not to damage it. Always move it perpendicularly to the axis of the glass parts and ensure no damage occurs to the sealing lip.

Never apply grease to the seal and never touch it with sharp objects, otherwise it will get damaged.

7.3 Monthly maintenance

7.3.1 Checking the distillate amount

To check the distillate amount, wait until the steam generator is ready, i.e. the instrument is warmed up. Then run a single sample with an empty tube and an empty receiving vessel with the following parameters:

Table 7-1: Checking the distillate amount

Parameter	Setting
Check distillate amount:	Distillation and titration
Sample tube:	empty
Water:	0 mL
NaOH:	0 mL
Distillation time:	5:00

After the check is finished, measure the distillate amount by means of a measuring flask. With the above parameters it should be **about** 150 mL.

7.4 Half-yearly maintenance

7.4.1 Replacing the NaOH tube

We recommend to replace the NaOH tube every six months. The other tubes need to be replaced as and when required.

7.5 Yearly maintenance

7.5.1 Replacing the rubber bung seal

The seal is subject to wear and tear, thus you should check it regularly. We recommend to replace it once a year.

7.5.2 Replacing the NaOH pump

We recommend to replace the NaOH pump once a year.

7.6 Customer service

Only authorised service personnel are allowed to perform repair work on the instrument. These persons have a comprehensive technical training and knowledge of possible dangers which might arise from the instrument.

Addresses of official BUCHI customer service offices are given on the BUCHI website under: www.buchi.com. If malfunctions occur on your instrument or you have technical questions or application problems, contact one of these offices.

The customer service offers the following:

- Spare part delivery
- Repairs
- Technical advice

8 Troubleshooting

This chapter helps to resume operation after a minor problem has occurred with the instrument. It lists possible occurrences, their probable cause and suggests how to remedy the problem.

The troubleshooting table below lists possible malfunctions and errors of the instrument. The operator is enabled to correct some of those problems or errors by him/herself. For this, appropriate corrective measures are listed in the column "Corrective measure".

The elimination of more complicated malfunctions or errors is usually performed by a BUCHI technical engineer who has access to the official service manuals. In this case, please refer to your local BUCHI customer service agent.

8.1 Malfunctions and their remedy

Table 8-1: General malfunctions and their remedy

Error number / Error indication	Possible cause	Corrective measure
E 30	Service door open.	Close service door.
E 31	Protective door open.	Close protective door.
E 32	Sample tube missing.	Insert a sample tube.
E 40	Steam generator overheat.	Switch off the instrument immediately and contact the BUCHI customer service.
E 40 - E 47	Electronic problem.	Contact the BUCHI customer service.
E 50 - E 56	Steam generator problem.	Water feeding problem. Control the water volume in the tank. Control the tube connections.
E 70 - E 72	Keyboard problem.	Switch off the instrument.
E 74 - E 76		Contact the BUCHI customer service.
Signal sound in a 10 seconds interval		
"HHHH" in the TIME display	Steam generator is heating, not ready for distillation.	Heating takes approx. 3 minutes. A flashing colon (:) indicates that the steam generator is ready.

9 Shutdown, storage, transport and disposal

This chapter instructs how to shut down the instrument, how to pack it for storage or transport, and specifies the storage and shipping conditions.

9.1 Preparing the instrument for transport

Take out the power cord and remove all water/reagent tubing. Rinse the sodium hydroxide solution tube with distilled water. Clean the instrument thoroughly, so that all chemical residues are removed completely.

To empty the steam generator, proceed as follows:

- Turn off the instrument and disconnect the power cord.



WARNING

The steam generator gets very hot during operation. Danger of being burned.

- *Always let the steam generator cool down for at least 30 minutes after having switched it off before handling it.*
- Open the service door.
- Attach an appropriate silicone tube to the drain cock.
- Place a receiving vessel with a volume of 500 mL below the end of the tube.
- Slowly open the stop-cock with a screw driver and empty the steam generator completely.

9.2 Storage and transport

Store and transport the instrument in its original packaging.

9.3 Disposal

To dispose of the instrument in an environmentally friendly manner, a list of materials is given in chapter 3. This helps to ensure that the components are separated and recycled correctly. Please follow valid regional and local laws concerning disposal.

10 Spare parts

This chapter lists spare parts, accessories, and options including their ordering information.

Order the spare parts from BUCHI. Always state the product designation and the part number when ordering spare parts.

Use only genuine BUCHI consumables and genuine spare parts for maintenance and repair to assure good system performance and reliability. Any modifications to the spare parts used are only allowed with the prior written permission of the manufacturer.

10.1 Spare parts K-350

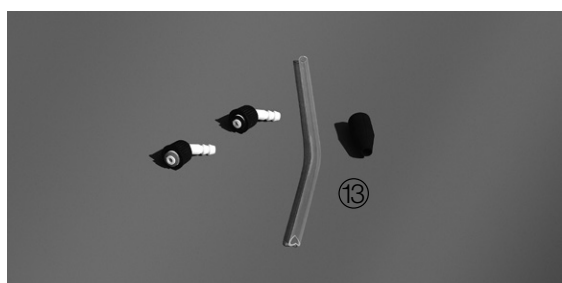
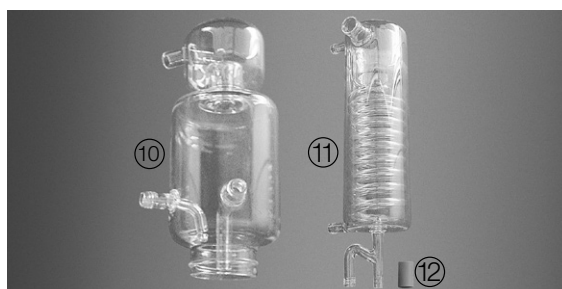


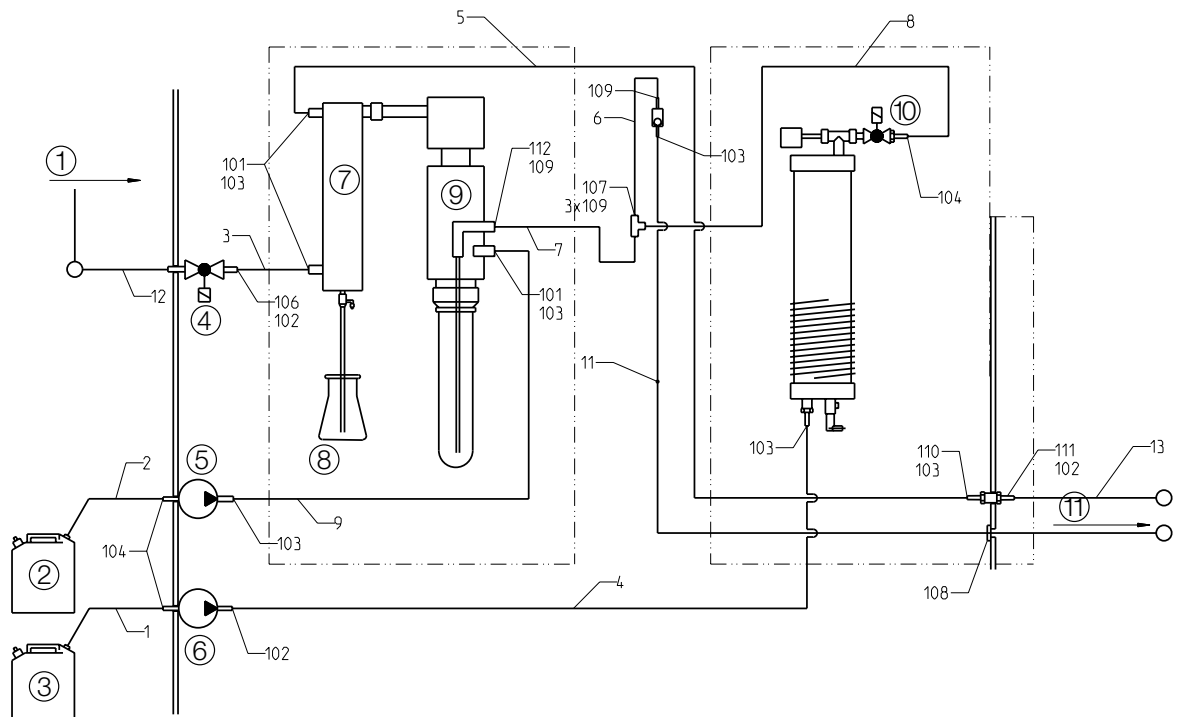
Table 10-1: Spare parts K-350

Product	Order number
① Set of clamps \varnothing 7.6 / \varnothing 11.9 / \varnothing 9.6 / \varnothing 10.7 / \varnothing 12.8 (5 pieces each)	43586
② SVL 22 screw cap	03577
③ SVL 22 sealing	02073
④ Outlet tube for distillate, PTFE	43569
⑤ Set of hose connectors, bent EPDM sealing (4 pieces)	43129
⑥ Set of hose connectors, straight, FPM sealing (4 pieces)	40296
⑦ Set of sealings, FPM (10 pieces)	40040
⑧ Gasket, complete (splash protector)	43068
⑨ Set of connectors cooling water outlet (1 piece of each)	43538
⑩ Splash protector, glass	43332
Splash protector, polypropylene	43590
⑪ Condenser	43320
⑫ Check valve, complete	43356
⑬ Set of accessories for splash protector K-350 and K-355	43585

**Table 10-1: Spare parts K-350 (cont.)**

Product	Order number
⑭ Drip tray	43302
Caps for 20 l tanks, large (2 pieces)	43478

10.2 Hosing connection scheme



- | | |
|---|--------------------|
| ① Inlet | ⑦ Cooler |
| ② NaOH tank | ⑧ Receiving vessel |
| ③ H ₂ O tank | ⑨ Splash protector |
| ④ Valve cooling water in | ⑩ Valve steam |
| ⑤ Pump NaOH | ⑪ Output |
| ⑥ Pump H ₂ O steam generator | |

Fig. 10.1: Hosing connection scheme

Table 10-2: Tubes and components Distillation Unit K-350

Position	Order number	Pcs	Description
1 - 2	43555	1	Solaflex tube Ø 10/5, L = 3500
3	43153	1	Unisil Ø 6×2, L = 640
4	43151	1	Unisil Ø 6×2, L = 370
5	43154	1	Unisil Ø 6×2, L = 920
6	43027	1	Tersil tube Ø 12/6, L = 175
7	43147	1	Tersil tube Ø 12/6, L = 360
8	43145	1	Tersil tube Ø 12/6, L = 65
9	43029	1	EPDM 6.35/1.58, L = 530
11	43940	1	Silicone tube Ø 9/6, L = 1500
12	37780	1	Cooling water tube complete, L = 1500
13	43940	1	Silicone tube Ø 9/6, L = 1500
101	43139	3	Connectors GL-14, bent, EPDM
102	27738	2	Hose clamps Ø 9.6, black
103	43202	5	Hose clamps Ø 10.7, green
104	43841	5	Hose clamps Ø 11.9, black
105	43519	1	Reduction piece
106	43207	1	Tube spout
107	43204	1	T-piece PVDF
108	43560	1	Tube holder
109	43297	5	Hose clamps Ø 12.8, white
110	43534	1	Screw-on spout D6, G1/8"
111	43386	1	Screw-in spout D6, G1/8"
112	40297	1	Connector, bent, green

11 Declarations and requirements

11.1 FCC requirements (for USA and Canada)

English:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to both Part 15 of the FCC Rules and the radio interference regulations of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Français:

Cet appareil a été testé et s'est avéré conforme aux limites prévues pour les appareils numériques de classe A et à la partie 15 des réglementations FCC ainsi qu'à la réglementation des interférences radio du Canadian Department of Communications. Ces limites sont destinées à fournir une protection adéquate contre les interférences néfastes lorsque l'appareil est utilisé dans un environnement commercial.

Cet appareil génère, utilise et peut irradier une énergie à fréquence radioélectrique, il est en outre susceptible d'engendrer des interférences avec les communications radio, s'il n'est pas installé et utilisé conformément aux instructions du mode d'emploi. L'utilisation de cet appareil dans les zones résidentielles peut causer des interférences néfastes, auquel cas l'exploitant sera amené à prendre les dispositions utiles pour palier aux interférences à ses propres frais.

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