

Document No.:

Issue:

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Date:

Program: - KOZLODUY NPP

Equipment: -Small Vacuum Cleaner ATP V01



DRL - No.: -

Project No.:

Customer No.:

Action	Name	Signature	Company
Prepared by	Peiffer P.		Gradel sàrl
Checked by	Collard J-C.		Gradel sàrl
Authorized by	Maack C.		Gradel sàrl

GRADEL sàrl
 6, Z.A. Triangle Vert
 L-5691 Ellange
 phone 00352 39 00 44 1
 fax 00352 39 88 57
www.gradel.lu



Technical Proposal

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Document Change Record

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1	<input type="text"/>	All	Peiffer	First issue

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Applicable Documents

This document shall be read in conjunction with documents listed hereafter, which forms part of this document to the extent specified herein. In case of a conflict between any provisions of this document and the provisions of the documents listed hereafter these shall be notified to GRADEL for resolution.

Abbreviation	Title	Reference	Issue
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Applicable standards

Directives:

Abbreviation	Title	Reference
AS1	Machinery Directive "2006/42/CE"	2006/42/CE

Harmonized European Standards:

Abbreviation	Title	Reference
AS2	Safety of machinery – General principles for design	EN ISO 12100

Referenced Documents

Following documents are mentioned in this document:

Abbreviation	Title	Reference	Issue

Abbreviations

Abbreviation	Description
SFP	Spent Fuel Pool
WFSF	Wet Spent Fuel Storage Facility

1. Purpose

This technical proposal describes the small vacuum cleaner “Object Trap V01” propose for the subject of “catching foreign objects into the reactor vessel”.

The following equipment is subject of the delivery:

- 1 device for catching of foreign objects underwater, complete with 5 spare filters bags

2. General equipment and material characteristics

2.1. Equipment classification

The equipment subject to delivery is non-safety related (it is not classified under safety class).

There are no specific requirements for the seismic category of the delivered equipment.

The equipment is designed for underwater operation (demineralized water with pH~5.7)

The depth for using the equipment is as follows:

- Object trap until 30 m under water

The temperature for using the equipment:

continuous working: 35 °C max

for punctual working limited to 30 minutes allowed at max 50°C

Material properties

The equipment is made of stainless steel and aluminum, allowing its decontamination.

All plastic materials are selected with no soluble halogens

Work conditions at environment with ionizing radiation

The equipment is accepting its serviceability under activity of the process fluid up to 3.7×10^4 Bq/l.

Requirements for shelf life and life cycle

We guarantee 10 years of life cycle

Guarantee

A warranty period of 2 years is given for normal usage. Normal wear, consumables or non-respect of procedures are out of the guarantee. Guarantee period starts at delivery to the NPP, and latest 2 month after information of readiness to delivery.

2.2. Product requirements

Decontamination:

The stainless-steel surfaces are as smooth as possible for the purpose of easy decontamination with denatured alcohol or solutions of acids and bases with concentration up to 5%.

All welded structures are passivated at final.

Welds are closed, in order to avoid entry of contaminated areas.

FME (Foreign Material Exclusion)

All parts are secured by design and fastener and screws are secured with Nordlock washers, or other mechanical standard items. In exceptions and if not avoidable Loctite glue might be used.

2.3. Production requirements

Gradel has internal procedures relying on its quality management system.

Remark:

All documents and the buttons on the control panel are in English.

2.4. Quality management

Gradel is certified according the following standards

- ISO 9001:2015
- ISO 14001:2015
- OHSAS 18001:2007
- KTA 1401
- EN 1090 EXC 4

3. Technical description

3.1. Object Trap V01

The object trap is designed especially for sucking up parts and debris, foreign material from the pool floor and into the reactor.

The equipment is modular and options can be added later at any time.

The options which are supplied in the standard version are described here below.



Compositions of equipment:

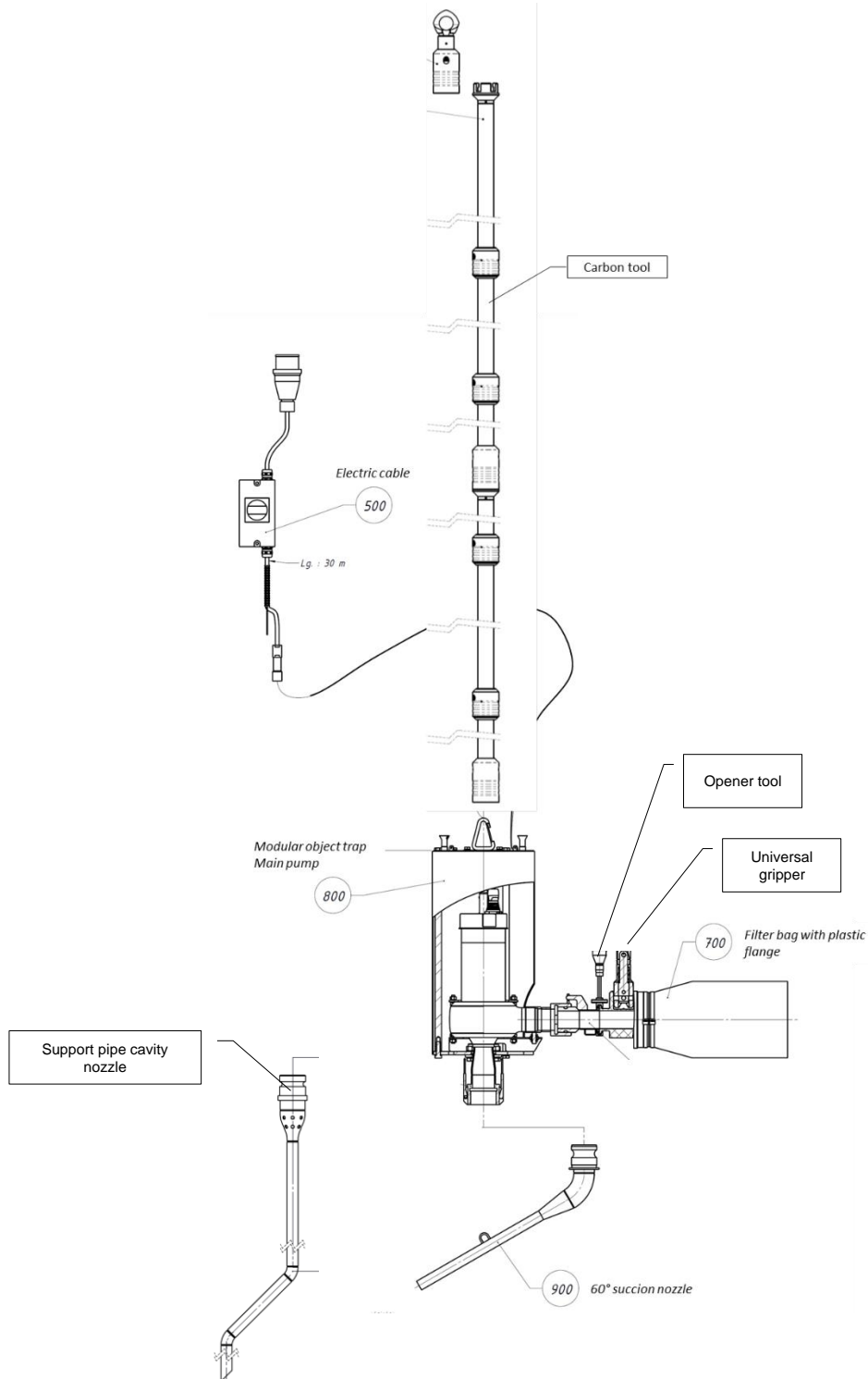
- Modular object trap
- Light connection for filter bag
- Filter bag + plastic flange Horizontal or Vertical
- Handling equipment for carbon pole OMUL
- Angled nozzle 60 °
- Support pipe cavity Nozzle
- Waterproof connector for electric cable.



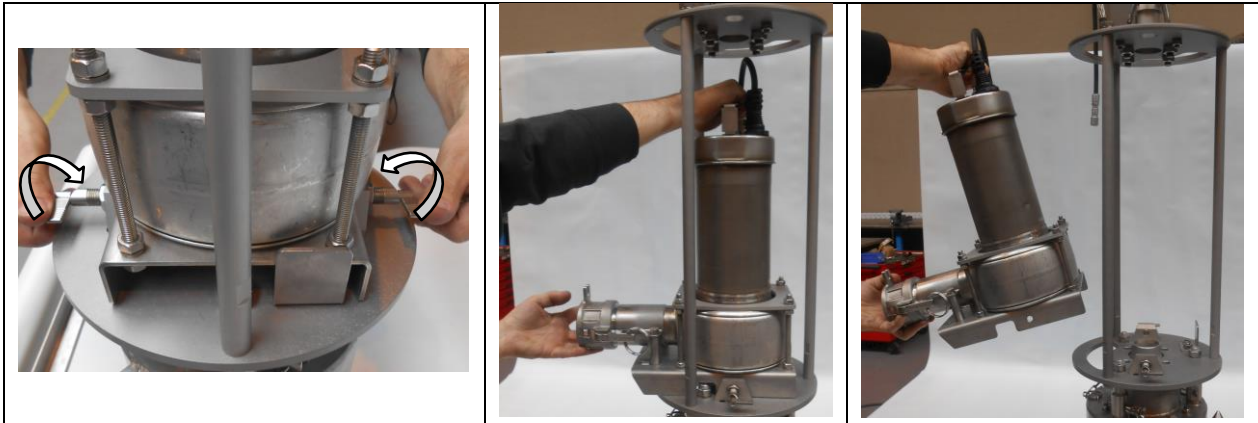
Technical characteristics:

- Overall dimensions: $\pm \text{Ø}254\text{mm} \times 1000\text{mm}$
- Height: $\pm 0,85\text{m}$
- Weight: $\pm 26 \text{ kg}$
- Flow rate: 24 to 28 m³/h.
- Maximum depth: 30 meters.

Overview



Quick pump unlocking without tools: in less than 30 seconds



Electric cable.

- Single phase 230 V - 50Hz - 8A - 1,75kW
- With adapted plug.
- On / off case.
- Waterproof connector.
- Length of the power cable (center box side): $\pm 20m$
- Length of the power cable (pump side): $\pm 30m$



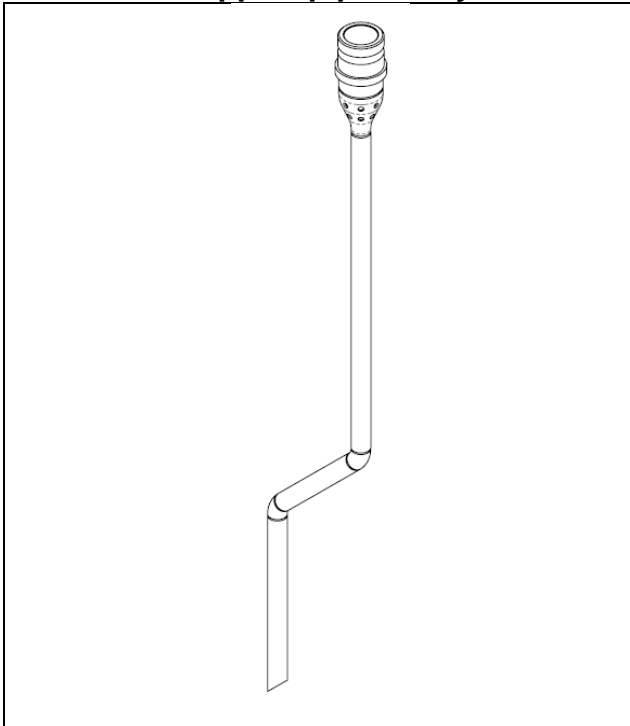
Nozzle 60°

This stainless-steel nozzle makes it possible to aspirate foreign materials located on the reactor pool, baffles or on the Fuel Assembly. Its bent and flattened shape allows it to be versatile and reach any surface. It is equipped with a quick coupling.



Length: 450 mm
Weight: 2 kg

Nozzle for support pipe cavity



Length: 1100 mm can be adjusted
Weight: 3 kg

The nozzle will be design, based on an existing model, to catch foreign object in the bottom of support pipe cavity.

Ref: 5-8062-r0

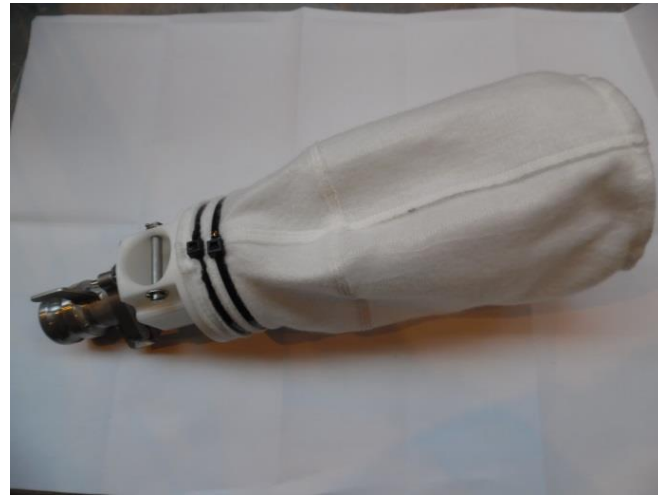
Lifting module for carbon pole.



Fitted to be used with the carbon pole OMUL.

Filter bag with plastic flange

Position Horizontal



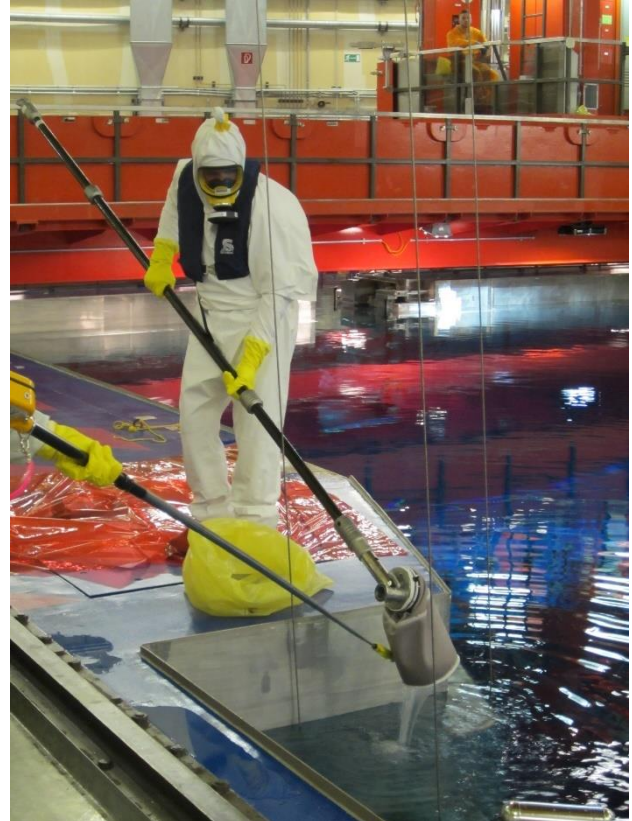
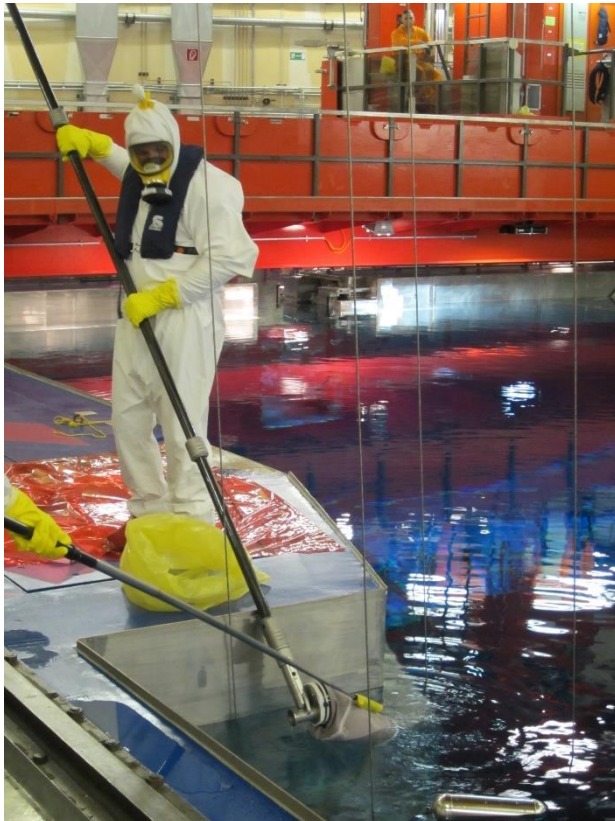
The plastic flange can be handled under water and remotely with carbon pole tools.

Aluminium Storages box.

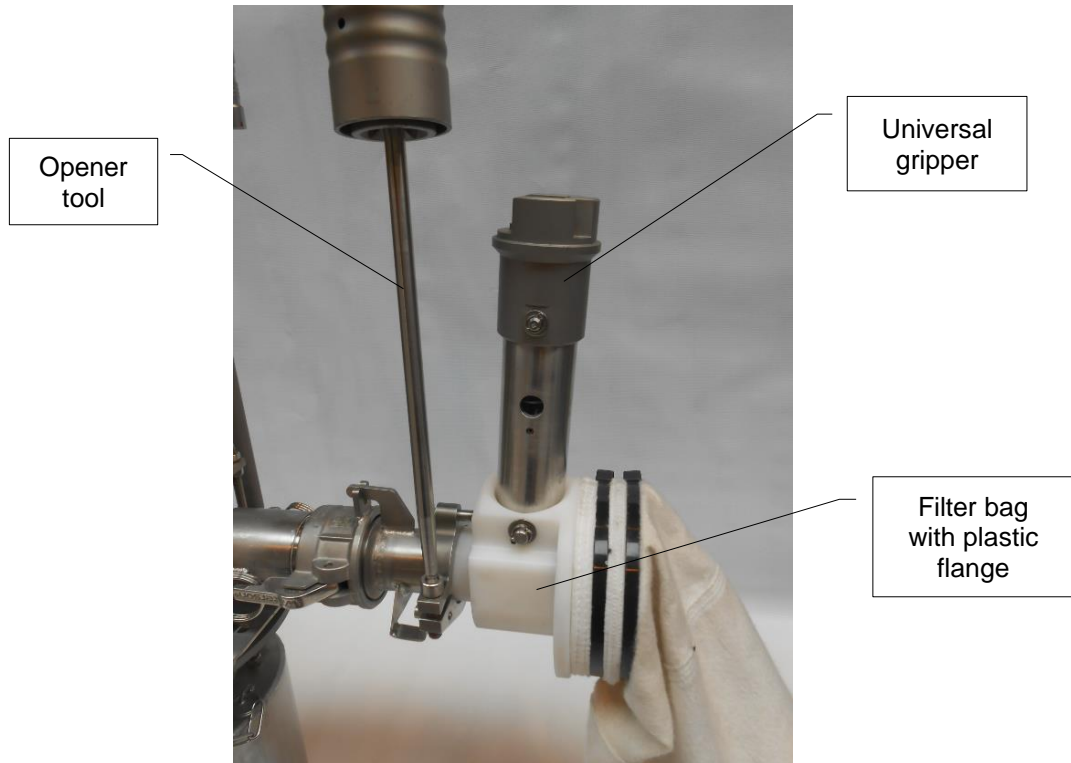


Accessories needed in addition of OMUL carbon pole to operate the filter bag underwater.

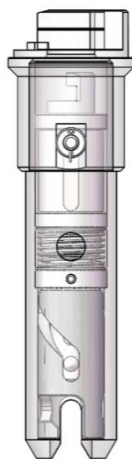
You have the possibility, in case of high doses rate into the filter bag, to manipulate underwater the filter with the carbon pole:



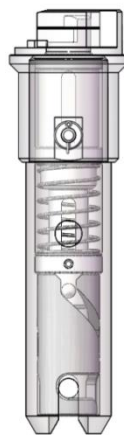
To realize this manipulation, you need to have the Universal gripper and the opener tool:



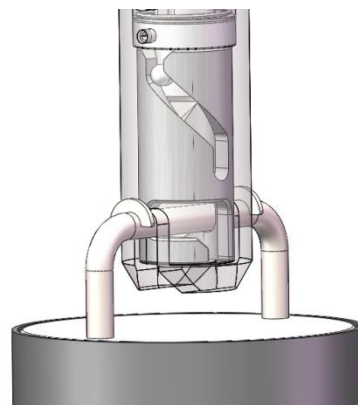
Universal gripper details



Gripper open

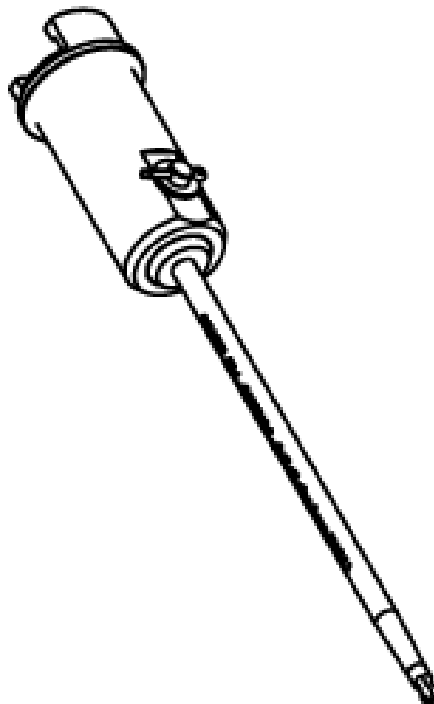
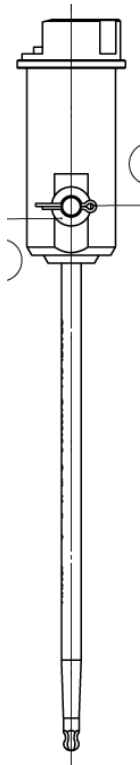



Gripper closed





Opener tool details:



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4. References

Gradel has references in most NPP's in Europe:

Object trap V01	> 80 in operation in France Belgium, Germany (EDF, SRA SAVAC, ENDEL, WESTINGHOUSE, ORANO, FRAMATOME, TUNZINI, ELECTRABEL, RWE, VATTENFALL, PREUSSEN ELEKTRA
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Gradel is since > 50 years in Nuclear business.
The customers below are trusting us since many years.:

