

Designed and  
Manufactured  
in Denmark



OligoMaker • Copenhagen  
2023



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**OligoMaker** DNA/RNA Synthesizer  
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## INTRODUCTION

### A NEW Standard in DNA/RNA Synthesis

OligoMaker is the intelligent solution for a flexible DNA/RNA synthesizer. We have designed the synthesizer in order to get 5 different synthesizers in the same instrument.

Customers are now able to design their own DNA/RNA synthesizer according to the specific requirements in their laboratory.

### Amidite Positions

The OligoMaker is equipped with 6 amidite positions (4 regular monomers plus 2 for modified monomers). OligoMaker can be equipped with additional amidite positions - up to 14 in total.

### Extra Oxidizer Position (Optional)

Extra oxidizer position is an option for faster synthesis or for thio synthesis.

### Intelligent Purge and Draining System

In order to avoid air and moisture, the chamber above the columns is purged with an inert gas, before and after the columns are drained by a vacuum system. The use of gas is very low compared to other instruments using pressure to drain the columns.

### High Quality Production

OligoMaker is designed to produce very high quality oligos. The software is designed in order to synthesize variable length of oligos in a parallel system.

### Easy Handling of the Hardware

Reagent reservoirs, reaction plate and controls are all in the front. Simply place the reaction plate in the instrument and start the synthesis.

### Simple User Interface

The software is designed to be simple and easy to use. Runs are created in Excel sheet on your computer and transferred to OligoMaker using your network connection or a standard USB memory stick.



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## CASE STORIES FROM AROUND THE WORLD

### DNA/RNA synthesis – OligoMaker

In the following we will present 8 different case stories to inspire you on how to design and benefit from the OligoMaker synthesizers



#### **Pharmaceutical company (USA)**

1 x OligoMaker X12 synthesizer is installed in a lab for research only.



#### **High Throughput lab (China)**

6 x OligoMaker 192 synthesizers installed at the same commercial lab in China. The synthesizers are used for synthesis of small scale unmodified DNA/RNA oligos. Two synthesizers are equipped with 8 amidite positions (4 for regular DNA monomers and 4 for RNA monomers). One synthesizer is equipped with 10 amidite position (4 for regular DNA monomers, 4 for RNA monomers and 2 modifiers).



#### **Pharmaceutical company (Europe)**

1 x OligoMaker 48 equipped with 8 amidite positions (4 for regular DNA monomers and 4 for other backbone monomers). Up to 1uM scale oligos with a special backbone structure are synthesized for in-house use only.



#### **Start-up DNA synthesis lab (Middle East)**

1 x OligoMaker 48 equipped with 9 amidite positions (4 for regular DNA monomers and 5 for modifiers). Today the synthesis lab provides a wide range of oligos and probes to local customers all synthesized on the OligoMaker. A training workshop and purification protocols was provided in addition to the synthesizer.



#### **Pharmaceutical company (Europe)**

1 x OligoMaker 1536 with 4 regular DNA monomers synthesizes 1536 x 40-mers within 22h used for gene synthesis.



## CASE STORIES FROM AROUND THE WORLD (continued)



### High Throughput lab (Europe)

10 x OligoMaker 48 installed in a commercial DNA synthesis lab in Europe. All synthesizers are equipped with 14 amidite positions (4 for regular DNA monomers and 10 for modifiers). The synthesizers are used for modified oligos only. The synthesizers are integrated in the IT-infrastructure of the company.



### Academic research institute (South America)

1 x OligoMaker 96 equipped with 6 amidite positions (4 for regular DNA monomers and 2 for modifiers). Small scale regular and modified DNA oligos are synthesized for in-house research only.

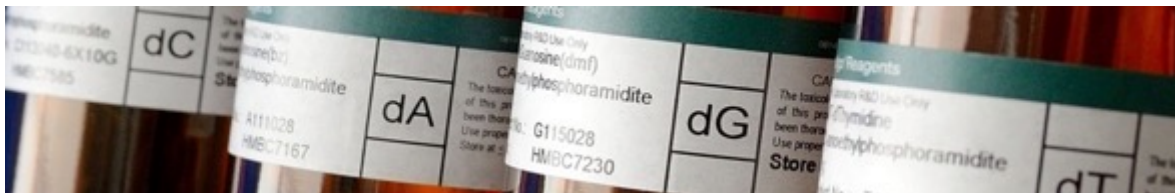


### Diagnostic lab (Africa)

1 x OligoMaker X12 equipped with 6 amidite positions (4 for regular DNA monomers and 2 for modifiers) was installed at a government diagnostic. The synthesizer will be used for standard primers as well as for dual labelled probes for in-house real time PCR. The synthesizer was financed by international development aid.







## FEATURES

### Columns

OligoMaker uses standard 3900 style columns. The columns could be open columns with loose CPG, closed columns with bottom and top filter or CPG Frits.

### Minimal Maintenance

The maintenance of the instrument is simple and fast. To replace a tube or a valve is easy, since they are placed in the front of the instrument. To replace a valve, one screw has to be loosened. The operation takes two minutes. Obviously the instrument must be cleaned outside, also the end of the tubes needs to be cleaned before each synthesis run.



### Installation / Video tutorials

The OligoMaker X12 will be delivered with videos on how to:

- Unboxing
- Installation
- Operate
- Daily maintenance
- Troubleshooting and service

For the OligoMaker 48, 96 and 192 see p. 15



### Capacity

OligoMaker X12 can synthesize up to 12 20-mer oligos in parallel within about 1h.

OligoMaker 48 can synthesize up to 48 20-mer oligos in parallel within 2h.

OligoMaker 96 can synthesize up to 96 20-mer oligos in parallel within 3h.

OligoMaker 192 can synthesize up to 192 20-mer oligos in parallel within 4h

OligoMaker X192 can synthesize up to 192 20-mer oligos in parallel within 4h

OligoMaker 768 can synthesize up to 768 20-mer oligos in parallel within 10h

OligoMaker 1536 can synthesize up to 1536 20-mer oligos in parallel within 14h

### Synthesis Scales

OligoMaker can synthesize in 5nmol, 10nmol, 50nmol, 200nmol and 1 $\mu$ mol scale.

### Low gas Consumption

Standard Argon or Nitrogen is used. The gas consumption is very low.

### Mixed Bases Synthesis

Use the standard IUPAC-IUB rules for OligoMaker to synthesize mixed bases automatically (degenerated oligos):

A	Adenine
C	Cytosine
G	Guanine
T (or U)	Thymine (or Uracil)
R	A or G
Y	C or T
S	G or C
W	A or T
K	G or T
M	A or C
B	C or G or T
D	A or G or T
H	A or C or T
V	A or C or G
N	any base



### **Minor Bases**

The OligoMaker is equipped with 6 amidite positions (4 regular monomers plus 2 for minor bases or dye amidites). OligoMaker can be equipped with additional amidite positions - up to 14 in total. Extra bottles are named 1, 2, 3, 4, etc.

### **Extra Oxidizer (Thio) Position**

Extra oxidizer (thio) position is an option.

Small letters are used when a thio-oxidation is wanted: a, c, g, t (or u) etc.

If an amidite is used from bottle No. 1, 2, 3 or 4, then use i, j, u or p, respectively. x, z, and q are available.

### **Extra Speed**

Extra Deblock position is an option. This will speed up the time for the Deblock step in the synthesis and will reduce the cycle time significantly.

### **RNA**

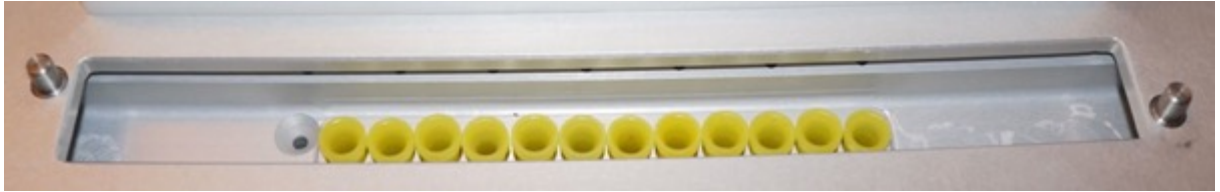
OligoMaker is used daily in a big oligo house in China for synthesizing RNA Oligos.

### **LNA**

OligoMaker is used daily in a pharmaceutical lab for synthesizing DNA/LNA Oligos







## OligoMaker X12



**OligoMaker X12** is a new DNA/RNA synthesizer designed for research labs, but is also recommended as a second minor synthesizer in high throughput labs

**OligoMaker X12** synthesizes up to 12 oligos (20-mer) in about 1h

**OligoMaker X12** is primarily designed for manufacturing labelled oligos, but is also ideal for synthesizing long oligos

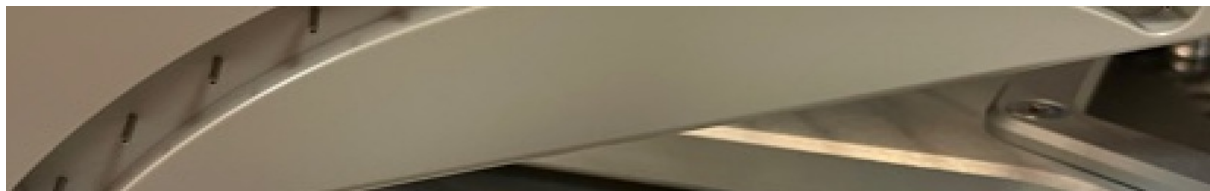
The synthesizer is delivered with 6 amidite positions, but is available with up to 14 amidite positions, and a second oxidizer position.

The valves are placed directly above the columns, and the consumption of reagents is one of the lowest on the market

Hardware and software are identical to the OligoMaker 48, 96 and 192.

The X12 is price and cost efficient.

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## OligoMaker 48



**OligoMaker 48/6** synthesizes 48 oligos (20-mer) in about 2 hours or 10 oligos in about 90 min.

Reaction Plate with 48 columns and the manifold with 1 x 48 columns ready for the purification steps.

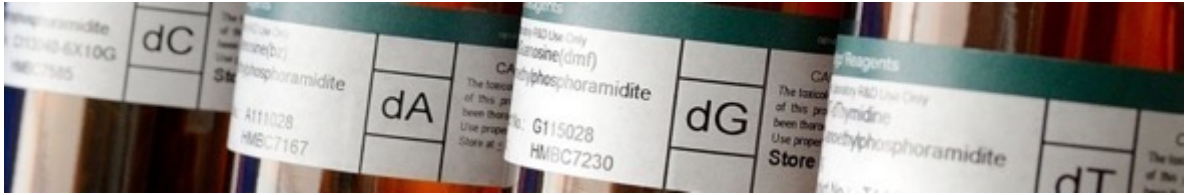
1-48 oligos can be loaded and synthesized.

OligoMaker 48/6 is a fast cost-effective 48-channel oligonucleotide synthesizer.

OligoMaker 48/6 can be up-graded to make 96 or 192 oligos in parallel.

OligoMaker 48/6 is our most selling model, flexible and with minimum of spill of special amidite solutions.

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## OligoMaker 96



**OligoMaker 96** synthesizes 96 oligos (20-mer) in about 3 hours.

Reaction Plate with 96 columns and the manifold with 96 columns ready for the purification steps.

1-96 oligos can be loaded and synthesized.

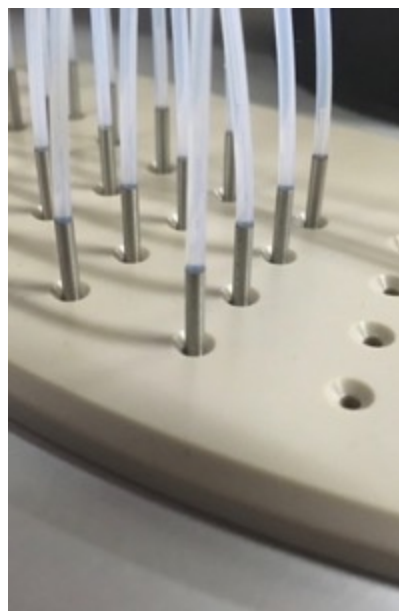
The picture shown is the OligoMaker 96/15 with 14 amidite positions.

OligoMaker 96 can be up-graded to OligoMaker 192.





## OligoMaker 192



### OligoMaker 192

192 oligos (20-mer) in 3-4 hours.

Reaction Plate with 192 columns and the manifold with 2 x 96 columns ready for the purification steps.

1-192 oligos can be loaded and synthesized in parallel.

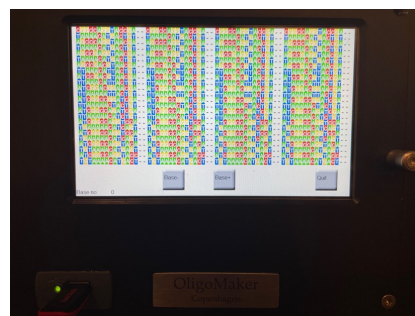


## OligoMaker X192



**OligoMaker X192/6** synthesizes 192 oligos (20-mer) in 3-4 hours. Reaction Plates 2 x 96 plate or columns (titre plate format)

## OligoMaker 768 and OligoMaker 1536



**OligoMaker 768 and OligoMaker 1536** (screen) synthesizes 2 x 364 or 4 x 364 primers over night in one run





## SPECIFICATIONS:

### Reagent Gas System

The inert gas supplied to the reagent bottles is regulated by 2 different regulators in the instrument. One regulates the pressure on the amidite and activator bottles, and the other regulates the pressure on all other bottles. Each regulator has a pressure gauge to indicate the pressure to that reagent.

### Reagent Priming

In the Prime mode you can prime each reagent individually, and at the same time visually check all reagent nozzles. Alternatively, you can prime all reagents with a single touch.

### Amidite Positions

The OligoMaker is equipped with 6 amidite positions (4 regular monomers plus 2 for modified monomers). OligoMaker can be equipped with additional amidite positions - up to 14 in total.

### Mixed Bases Synthesis

Use the standard IUPAC-IUB rules for OligoMaker to synthesize mixed bases automatically (degenerated oligos).

The software can also handle Mixed Bases in RNA synthesis.



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### Hardware and Software

To make a synthesis run on OligoMaker, you need a PC or a Mac computer. Use Microsoft Excel to transfer your sequence data from your PC or Mac to the OligoMaker. Transfer of sequence data can be executed using a network connection or a USB memory stick. (PC, Mac and Excel is not included).

OligoMaker has a pre-installed software, which is operated by a touch screen. All synthesis protocols are supplied on a USB memory stick, and in a printed version. The software and the synthesis protocols are included free of charge with your OligoMaker.



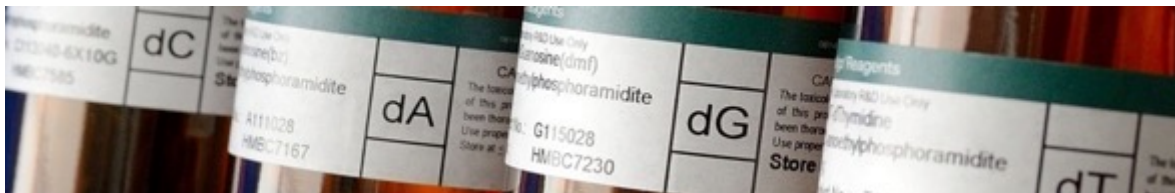
### Protocol Editor

Our synthesis protocol includes a flexible protocol editor, which allows the operator to modify the included protocols and save them under a new name or write protocols from scratch. The protocol editing can be done in Excel. Protocols are included for different synthesis scales. It is easy to edit special protocols for different synthesis scale and sequence lengths.

The protocols are designed for use with the standard Cyanoethyl phosphoramidite chemistry. The flexibility allows you to write protocols. As an example, a slow coupling phosphoramidites can be given an extended coupling time or an additional coupling. Additional or longer reaction time can be given to all reagents, if necessary.

### Synthesizer Control

The Synthesizer is operated and controlled by the built-in software. The operations are controlled on a touch screen with a simple user interface.



### **Power Failure**

OligoMaker can be supplied with an optional UPS (uninterruptedly power supply), which is capable of operating the instrument for up to 30 minutes. The operator should set the run on "pause". When the power returns you can continue the synthesis.

### **Valve Failure**

If a valve fails, and the reagent is running out from the leaking valve, the excess of the reagent will drain automatically, and there will be no flood in the instrument.

### **Documentation**

The instrument includes an operator manual which covers the hardware, maintenance, control software, operation and parts. In addition, all documentation, the operating system, the drive system and the valve control system is supplied on a USB memory stick.

### **CE Marking on OligoMaker**

From 2021.

OligoMaker has a sound pressure level below 70 dB.

### **On Site Requirements**

- A ventilated hood or similar
- Connection to power (110/220/240 volts)
- Connection to Nitrogen / Argon cylinder (at least 3 atm.). A valve should be nearby for possible shut down of gas.
- Mac or PC computer

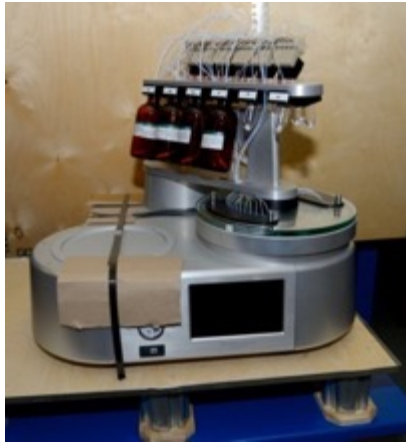


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### Transportation

OligoMaker will be delivered to the customer on a pallet in a wooden box (60 x 80 x 75 cm, 90 kg), W x L x H). Unpacking must be done by professionals..



### Optional: Training

A two days work-shop (OligoMaker synthesizers) on location can be offered at TAG Copenhagen with your purchase of an OligoMaker DNA/RNA synthesizer. A one day visit in the lab of Oligimaker is free when you buy an OligoMaker synthesizer.

The work-shop at TAG Copenhagen includes:

- Installation in your lab
- Training in how to operate the DNA/RNA synthesizer
- How to edit the synthesis protocol and make primers and probes
- Daily maintenance
- Troubleshooting and service



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### Chemical Consumption 40nmol scale

Amidite: 0,05ml (1mg)

Activator: 0,06ml

Cap A: 0,06ml

Cap B: 0,06ml

Ox: 0,1ml

Deb: 0,15ml

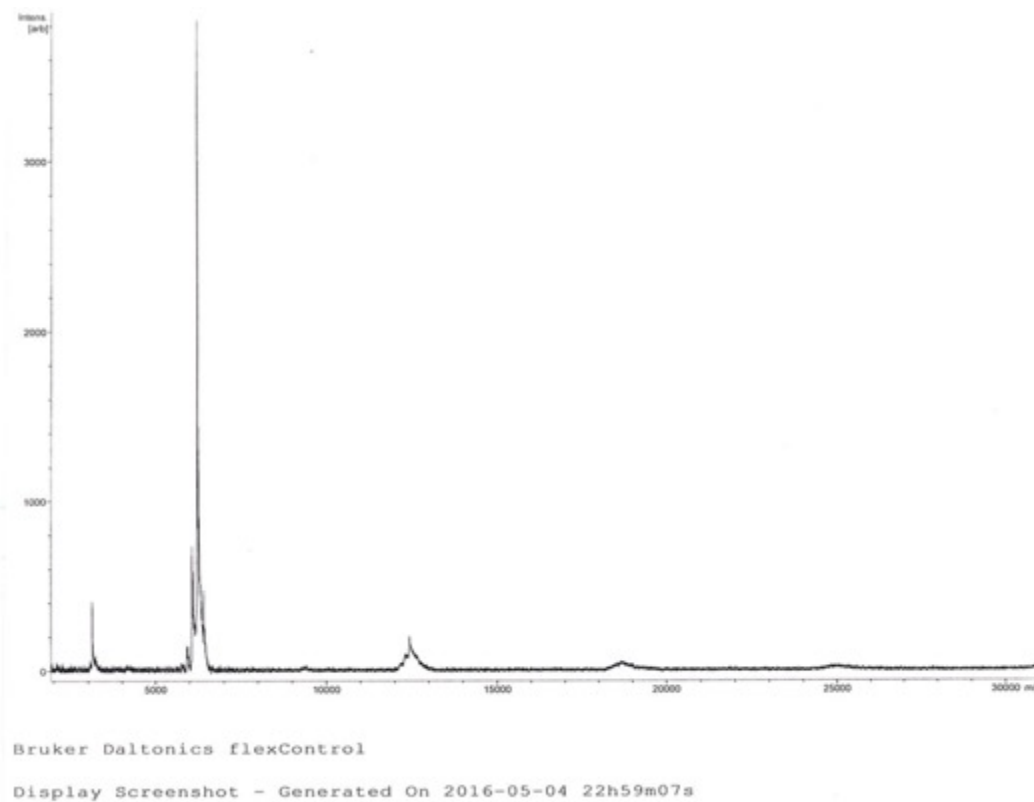
Acetonitrile: 0,45ml

Waste total 0,90ml

All amounts are indicated for each synthesis cycle

### QC - MALDI-TOF Mass Spectrometry

Crude sample analyzed, position D2 on a titre plate.







## Accessories

Compatible with most other high throughput systems.

### Cleavage & Deprotection

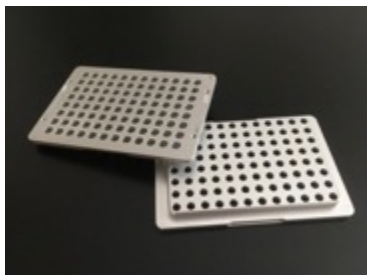
We offer devices that can assist with rack for cleavage and deprotection for robotic systems. All are in microplate format and made from anodized aluminum.

These devices are not included with OligoMaker but can be purchased separately.

OM-96-001-VM Vacuum Manifold Complete Set

OM-96-005-VM Vacuum Manifold 96-rack (CPG or Universal columns)

OM-96-020-DP Deprotection Box 96



### RPC-purification

Device and RPC-columns for purification of crude oligos.

Device and RPC-columns are not included with OligoMaker but can be purchased separately. The columns are filled with special Polystyrene for repeated use.

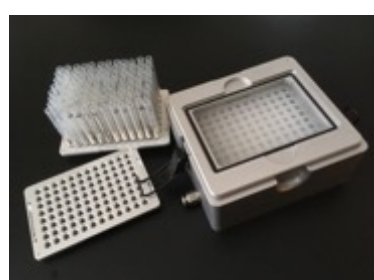
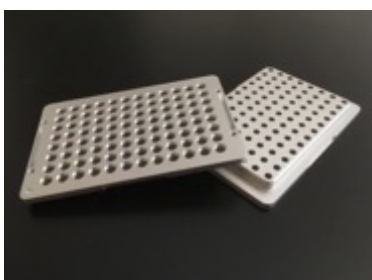
Protocol is with purchase of RPC-columns.

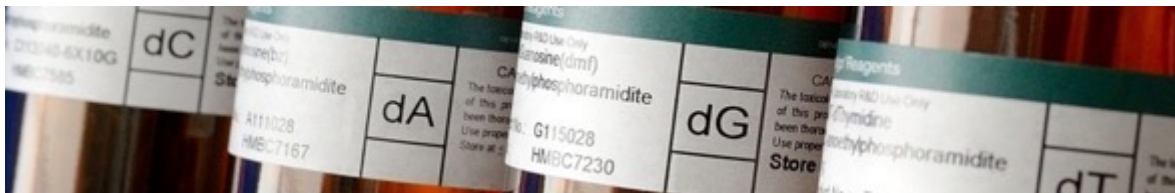
OM-96-002-RPC included RPC Manifold 96 Complete Set (excl. columns)

OM-96-006-RPC RPC Manifold 96-rack (RPC columns)

OM-96-010-RPC RPC-columns 96 10 pcs

OM-96-100-RPC RPC-columns 96 100 pcs





## Price List

OligoMaker X12/6 Call/email for details

OligoMaker 48/6 Call/email for details

OligoMaker 92/6 Call/email for details

OligoMaker 192/6 Call/email for details

OligoMaker X192/6 Call/email for details

OligoMaker 768 Call/email for details

OligoMaker 1536 Call/email for details

The smaller models have included positions for 6 amidites, two activator, one oxidizer, separate delivery system of Cap A and Cap B, one Deblock reagent and 2 separate delivery system of acetonitrile.

Often, we include shipping.

Please note that prices given does not include VAT, taxes, import duties or other local fees.

OligoMaker ApS	
DNA/RNA Synthesizers etc.	
Spare Parts	
Parts from OligoMaker ApS will normally be in stock for shipping	
OM-1/16-0.5-5	PTFP Tube 1/16" ID 0.5mm 5m
OM-1/8-1-5	PTFP Tube 1/8" ID 1mm 5m
OM-Va-Bürkert	Reagent valve (Bürkert)
OM-18-400	Bottle Holder
OM-20-400	Bottle Holder
OM-22-400	Bottle Holder
OM-45-400-2	Bottle Holder 2 outputs
OM-45-400-3	Bottle Holder 3 outputs
OM-O-ring-18 NBR	O-ring bottle holder for OM-18-400
OM-O-ring-22 NBR	O-ring bottle holder for OM-22-400
OM-O-ring-28 NBR	O-ring bottle holder for OM-28-400
OM-O-ring-45 EP	O-ring bottle neck 45-400
OM-O-ring-45 NBR	O-ring bottle neck 45-400
OM-O-ring-45 Kalrez	O-ring bottle neck 45-400
OM-O-ring-I	O-ring inner (drain)

## Documentation

The instrument includes an operator manual, the operating system, the drive system and the valve control system. In addition, all documentation regarding a test run and MS analysis are included.



**For customers in China please contact:**

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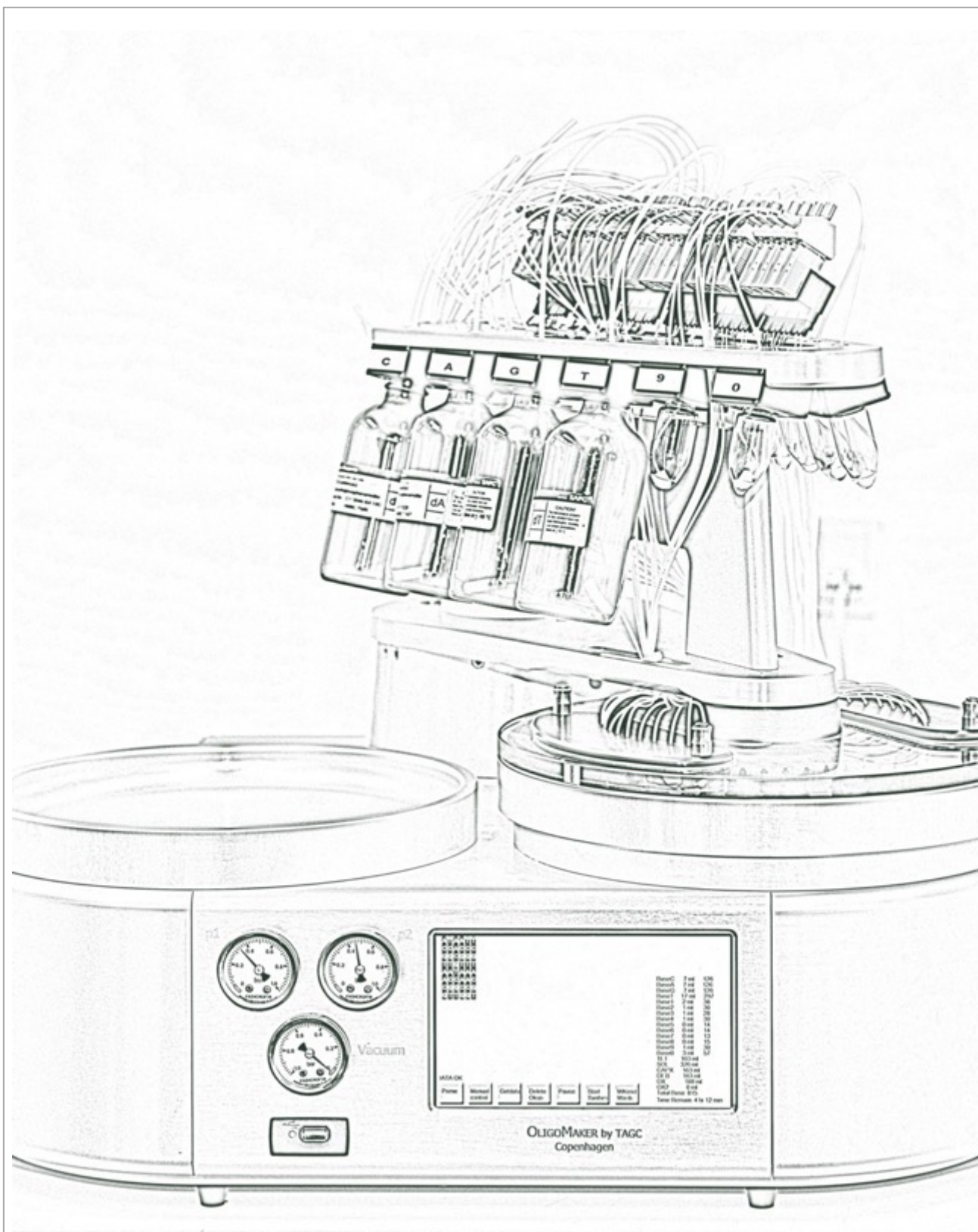
**For customers in Japan please contact:**

Sowa Trading Co., Inc.  
Contact: Susumu Kuwashima, President  
TEL: +81-3-3862-2700  
FAX: +81-3-3862-6300  
E-mail: [kuwashima.ss@sowa-trading.co.jp](mailto:kuwashima.ss@sowa-trading.co.jp)  
[www.sowa-trading.co.jp/](http://www.sowa-trading.co.jp/)

**For all other regions please contact OligoMaker ApS directly in Copenhagen.**



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