

# Market Model Oslo Børs Equities

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Version 2.2

07.09.2009

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### Revision History

Version	Date	Sign	Section	Change Description
1.0	20.04.09			Initial version for member consultation
2.0	15.06.09	KJ	1	Removed the "draft version" wording
			3	Added TG for Manual trading. Added recommendation to use Trader ID.
			5	Removed inconsistency between table and text re Warrants and Fund Units: The table is correct.
			6.1	"Named order" is currently not applicable for Oslo Børs
			8.4	Removed Member ID
			8.5	Member IDs are included with all trades – also in the OBX segment. End-of-Day aggregated volume statistics per Member ID is removed.
			10	Removed Named order order type
2.1	19.06.09	KJ	8.2	Included reference to Appendix 3 – Trade Types
			8.3	Trade amendment / cancellation may only be done on the trade execution/reporting day.
			11	Some updates to the comparison
			12	Trade type table is updated
2.2	04.09.09	KJ	4	Replaced illustration of market structure (segments and sectors). Removed static tick size for "ultra liquid". Added one additional sector (OBW2 – Financial certificates) in the Warrants segment. Renamed "Primary Capital Certificates" to "Equity Certificates"
			2	Definitions of Static and Dynamic reference prices are included
			6.5	New sub-section 6.5.1 about "Fat Finger Control" inserted.
			6.6.2	Clarification about Clearing Type and Settlement Venue, Settlement Account is mandatory
			6.8	Reference to section 7 corrected
			7	Definitions of Static and Dynamic reference prices are moved to section 2
			9.1	Clarification of transparency re. Iceberg orders

			App 1	New tick sizes for OBX. Tables reformatted.
			App 3	Trade Types: No delayed type (OK) for OBWR, OBFU. Type DR changed to DT.

## 1 Introduction

This document describes the main features of the market model for the Oslo Børs Equities market as it is proposed to be implemented in the TradElect trading system. The regulated market Oslo Axess is also covered.

### 1.1 Other relevant documents

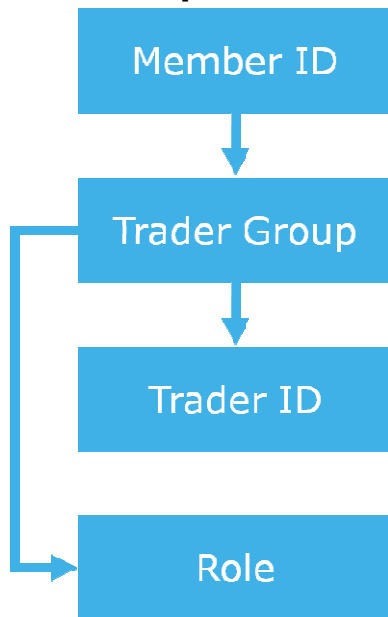
- [1] Current technical specifications for TradElect and Infolect can be retrieved via our web site [http://www.obvps.no/obvps\\_eng/Frontpage/Delta/TradElect-for-cash-markets/Technical-documentation](http://www.obvps.no/obvps_eng/Frontpage/Delta/TradElect-for-cash-markets/Technical-documentation)
- [2] The MiFID Level 2 regulation may be retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:241:0001:0025:EN:PDF>

## 2 Definitions

Some terms which will be used throughout the document:

EMS		Exchange Market Size – will be set for each security to a number of shares which is compatible with an approximate consideration of <ul style="list-style-type: none"><li>- NOK500 000 for shares included in the OBX segment</li><li>- NOK200 000 for other shares</li></ul> The EMS will be reviewed quarterly.
ADT		Average Daily Turnover – calculated as defined in ref [2] (Art. 33)
MES		Minimum Execution Size for an order. Refer to section <b>6 Orders</b> for details.
BBO		Best Bid and Offer
Dynamic Reference Price		The price of the last automatic execution (from an auction or from continuous trading), or previous day's closing price
Static Reference Price		The most recent of <ul style="list-style-type: none"><li>- Previous day's closing price</li><li>- Uncrossing price from an auction, or – if there is no uncrossing price – the price of the first automatic execution after the auction.</li></ul> Please note that the reference prices may be overridden manually; e.g. as a result of corporate actions or price movements.

### 3 Participant structure



A *Member ID* will be assigned to each member. The Member ID will be unique in the TradElect system. For members who already are connected to other TradElect markets (e.g. LSE) an additional, Oslo Børs specific Member ID and member mnemonic will be assigned.

A member will have one or more *Trader groups*. All authorizations are set at this level. This means that a member may assign e.g. one Trader group to trade equities only and another to trade fixed-income only.

Each member will have to set up their own structure of Trader groups to suit their needs. However, Oslo Børs will require that some specific types of trading activity is identified by special Trader groups for that purpose. This includes

- Manual trading
- Order-routing activity
- DMA solutions
- Algorithmic trading

One member may have more than one group for each type of activity. (This will substitute the current arrangement of specific user ids for order-routing and algorithmic trading).

A *Role* is a defined set of activities that any Trader group assigned to that role is able to undertake; e.g.

- The ability to enter orders and the use of specific order types
- The ability to enter trade reports and the use of specific trade types
- The ability to enter quotes
- Additional validation; e.g. minimum order size or maximum spreads

The detailed configuration of Trader Groups and Roles has to be agreed between each member and Oslo Børs.

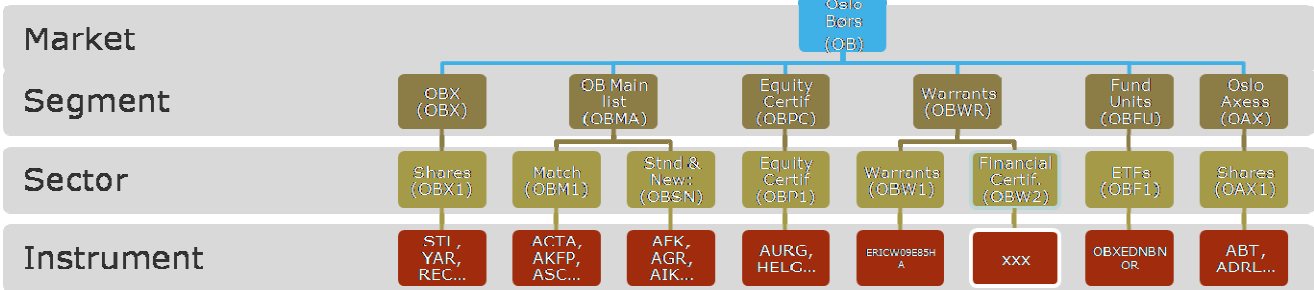
A Trader group consists of one or more *Trader IDs*. One Trader ID may be included in more than one Trader group. The use of Trader ID is optional. However, it is strongly recommended that the members include Trader ID in orders and trades, because it makes it easier for i.a. Oslo Børs Market surveillance to contact the right person directly when needed.

### 4 Market structure

In general, the market structure in TradElect consists of four levels:

- The *Market* defines the geographical elements of the trading environment; e.g. business calendar and time zone. A market may have many segments connected to it. Oslo Børs’ trading will be in the market “OB”.
- A *Segment* is a set of sectors where common features apply to the securities; e.g. tick size and other high level specifications of the trading model.
- A *Sector* is a set of securities with common behavior; e.g. price monitoring thresholds.
- A *Security* is the tradeable instrument.

The Oslo Børs Equity Market in TradElect will have the following structure:



Below, each segment is described.

Segment	Sector(s)	Description
OBX	OBX1	This segment includes the constituents of the OBX index – i.e. the most traded stocks at Oslo Børs. The tick sizes are dynamic, see Appendix 1 for details.
OBMA	OBM1 OBSN	The OBMA segment includes the securities in liquidity categories OB Match, OB Standard and OB New. The tick sizes are dynamic, see Appendix 1 for details.  The OB Standard and OB New categories are both included in one common sector (OBSN).
OBPC	OBP1	Equity Certificates. The tick sizes are dynamic, see Appendix 1 for details. Currently only one sector.

Segment	Sector(s)	Description
OBWR	OBW1 OBW2	Warrants. The tick sizes are dynamic, see Appendix 1 for details. The OBW1 sector includes Warrants, The OBW2 sector includes Financial certificates.
OBFU	OBF1	Fund Units. The tick sizes are dynamic, see Appendix 1 for details. Currently only one sector, containing ETFs.
OAX	OAX1	The Oslo Axess listed securities are included in the OAX segment. This does not imply any change in Oslo Axess' status as a regulated market. The tick sizes are dynamic, see Appendix 1 for details.

For all sectors (except Warrants - OBW1 and OBW2) price monitoring thresholds will be defined. Price monitoring is further described later in this document.

Issuance instruments will be in the same sector as the underlying instrument.

## 5 The trading day

The trading day will follow the current model, with continuous trading from 09:00 to 17:20. The current "staggered" opening and closing behaviour is replaced by an uncrossing which will occur for all securities within a 30 second window. Note that the actual opening/closing time for a specific security may change due to *Price Monitoring Extensions (PME)* and/or *Market Order Extensions (MOE)*.

PME, MOE and other specifics about the auctions are included later in this document.

(Times in CET)

Segment	OBX	OBMA	OBPC	OBWR	OBFU	OAX
Start trade reporting/publishing service	08:15	08:15	08:15	08:15	08:15	08:15
Start order entry/maintenance	08:45	08:45	08:45	08:45	08:45	08:45
Opening auction	09:00	09:00	09:00	09:00	09:00	09:00
Intraday auctions	Subject to Price monitoring / Trading halts					
End of continuous trading	17:20	17:20	17:20	17:20	17:20	17:20
Closing auction	17:25	17:25	17:25	17:25	17:25	17:25
Stop order maintenance	18:15	18:15	18:15	18:15	18:15	18:15
Stop trade reporting/publishing service	18:15	18:15	18:15	18:15	18:15	18:15

Auctions will take place

- At market opening (all segments); and
- Intraday, if triggered by Price Monitoring, or to restart trading after a trading halt; and
- At market close

## 6 Orders

This section describes characteristics of orders in the Oslo Børs equities markets from a market perspective. Further details are included in the Technical Specification documents.

### 6.1 Market mechanism / Order types

The Oslo Børs equity markets will support the following order types:

Order type	Description
Limit order	A limit order is stored and displayed in the order book with a limit price and a full volume – unless it is executed in full or partially at order entry. Limit orders are always anonymous.
Market order	A market order has no specific price attached to it and will execute at the best available price(s) in the market. During continuous trading it will never persist in the order book. During auctions it will persist until the uncross, at which point it is either executed or deleted.
Iceberg order	<p>An iceberg order has always a price limit. It has two volumes:</p> <ul style="list-style-type: none"> <li>• A “maximum displayed amount” which defines the volume to be displayed in the order book at entry and when the volume is replenished;</li> <li>• A “total amount” which defines the maximum volume of the order.</li> </ul> <p>When the “maximum displayed amount” has been executed, a new “maximum displayed amount” is displayed and the remaining “total amount” is reduced accordingly. Each time a new “maximum displayed amount” is displayed, the order will have a new time priority.</p> <p>The minimum size of the “maximum displayed amount” is set to 1*EMS.</p>
Named order	A named order will work as a limit order, except that the member’s ID will be displayed with the public order flow. <i>(Currently not applicable for Oslo Børs)</i>
Hidden limit order	A hidden limit order is similar to a limit order (it must have a price limit), but it is never displayed in any public order flow. The order must be of a certain minimum value (consideration).

Order type	Description
Hidden pegged order	<p>A hidden pegged order's price is pegged to one of</p> <ul style="list-style-type: none"> <li>• Best bid price</li> <li>• Best offer price</li> <li>• Mid price</li> </ul> <p>The peg to best bid and offer prices may include a differential in a number of ticks from the best bid and offer prices.</p> <p>A pegged order is not included in auctions.</p>
Hidden limit order with Minimum Execution Size (MES)	<p>Hidden limit orders may include an additional attribute to set the minimum volume at which the order will execute. Note that the MES condition does not apply in auctions, i.e. an MES order may execute a volume that is smaller than the MES.</p>

For hidden orders, note that a hidden order which is partially matched will still be a hidden order, even if the order's size is reduced to less than the minimum size of a hidden order.

## 6.2 Order validity

An order's validity defines when the order shall be available in the order book. There are three different types of order validity:

- Execution based validity
- Time based validity
- Period based validity

Each of the available validity settings is described in the below table:

Order validity	Description
Execution based:	
<ul style="list-style-type: none"> <li>• ENE (Execute and eliminate)</li> </ul>	The system will attempt to execute as much as possible of the order's volume in the order book, price limit permitting. Any unexecuted volume is cancelled.
<ul style="list-style-type: none"> <li>• FOK (Fill or kill)</li> </ul>	The order is either fully executed, or it is not executed at all, but immediately cancelled.
Time based:	
<ul style="list-style-type: none"> <li>• GTC (Good till cancelled)</li> </ul>	The order will be executed as much as possible, and any unexecuted volume will reside in the order book for a maximum of 90 days, or until it is executed or cancelled.
<ul style="list-style-type: none"> <li>• GTT (Good till time)</li> </ul>	The order will be executed as much as possible, and any unexecuted volume will reside in the order until the specified date and time (maximum 90 days), or until it is executed or cancelled.
Period based:	
<ul style="list-style-type: none"> <li>• ATC (At the close)</li> </ul>	The order will be inserted into the order book when the closing auction starts. When the closing auction ends, the order is deleted.
<ul style="list-style-type: none"> <li>• ATO (At the open)</li> </ul>	The order will be inserted into the order book when the opening auction starts. When the opening auction ends (before continuous trading), the order is deleted.

Order validity	Description
<ul style="list-style-type: none"> <li>GFA (Good for auction)</li> </ul>	The order will be inserted into the order book when the next auction starts – irrespective of the type of auction (open, close, AESP or other). When the auction ends, the order is deleted.
<ul style="list-style-type: none"> <li>GFD (Good for day)</li> </ul>	The order will be executed as much as possible, and any unexecuted volume will reside in the order book until the closing period, or until it is executed or cancelled.
<ul style="list-style-type: none"> <li>GFX (Good for intra-day auction)</li> </ul>	The order will be inserted into the order book when the next scheduled intra-day auction starts. When the auction ends, the order is deleted. <i>(Currently not applicable for Oslo Børs)</i>

### 6.3 Parked orders

When using a period-based validity type and entering an order prior to the applicable period, the order is “parked” outside the order book and is not executable or publicly available. However, the member may modify the order.

When the appropriate period starts and the parked order is inserted into the order book, it will have a time priority as if it was inserted into the order book by the member at period start. The order will have a “later” time priority than orders which already were active in the order book, and a “newer” time priority than any orders arriving in the order book during the period in question. The relative time priority between parked orders is not changed.

### 6.4 Order size

The Lot size is 1 for all securities, and the minimum order size is 1. The size must be an integer number i.e. fractions are not allowed.

There are some exceptions to the minimum size for orders:

*Hidden* (incl. *Hidden limit*, *Hidden pegged* and *Hidden limit with MES*) orders must be “large in scale” i.e. the order value (consideration) must be more than a minimum value defined relative to the instrument’s average daily turnover (ADT). This minimum value corresponds with the definition of *Large in scale* in ref [2]

The peak size (i.e. the first, visible portion) of an *Iceberg* order must be greater than the minimum peak size which is defined relative to the Exchange Market Size (EMS).

### 6.5 Order price

All order prices will be in NOK.

The price of an order must be in a multiple of the security’s tick size. However, it should be noted that a trade resulting from matched orders may have a price between tick sizes, e.g. if the passive order was pegged to the bid-offer mid price.

The planned tick sizes are included in **Appendix 1 – Tick sizes**. The values are based on today’s tick size implementation. A review of this strategy may be made prior to system implementation.

### **6.5.1 "Fat Finger Control"**

The "fat finger control" functionality compares each price from incoming orders with a static reference price. If the difference is more than a defined tolerance the order will be rejected.

At the start of each trading day the system checks overnight orders, and if there are any orders outside the allowed tolerances, those orders are deleted and corresponding order expiry messages disseminated. This process is carried out before the market opens for order entry.

The Static Reference Price is defined in section 2 Definitions

In general, the price tolerances will be set to +/- 50% for most equity instruments except for Warrants (Segment OBWR), which will not have these limits. Some instruments will have different limits, eg instruments which are traded at very low prices ("penny-stocks").

Please note that the limits may be changed at any time during a trading day subject to Oslo Børs' assessment.

## **6.6 Other information connected with an order**

### **6.6.1 Dealing capacity**

For each order it must be indicated in which capacity the participant is dealing; i.e. *Agency* or *Principal*.

### **6.6.2 Settlement Account and Settlement Venue**

With the current (i.e. non-CCP) settlement procedures, the values of the *Settlement Account* and the *Clearing Type* (in some documentation referred to as *Settlement Venue*) are not used by the trading system. *Clearing Type* will be set to NCL (No Clearing).

Settlement Account is a mandatory field for orders and trades and the following options are available: H (House), C (Client) and S (Standing).

### **6.6.3 Client reference**

The *Client reference* is mandatory when dealing in Agency capacity, and is used to specify a reference to the client on whose behalf the member inserted the order.

## **6.7 Order Priority**

When the TradElect system executes orders it will prioritize the orders as follows:

1. Price ("Market" orders have highest priority)
2. Counterparty (i.e. orders from the same member (and internalisation group) as the aggressive order have higher priority, aka "preferencing")
3. Visibility (i.e. visible orders (incl. iceberg peaks) have higher priority than hidden orders at the same price. Each iceberg peak refresh will also have higher priority than hidden orders at the same price).

#### 4. Time

Order modification may impact the order's priority:

Change	Impact on the order's priority
Increase the order size	The order loses time priority
Decrease the order size	No impact
Change the order price	A new time priority is assigned to the order. The order is considered to be aggressive if it matches, i.e. it is processed like a new order.
Automatic price refresh (pegged orders)	A new time priority is assigned to the order. However, the time priority relative to other orders pegged to the same reference price is retained.
Date and time validity, participant reference, client reference	No impact on the order's priority.

For *Iceberg* orders, any size changes are applied to the hidden volume and do not impact the priority of the peak volume. If a size decrease is more than the hidden volume, the peak size is reduced; if the size decrease is equal to the total volume, the order is removed.

If the MES is reduced for an existing MES order, the order retains its time priority. If the MES is increased then the order will be assigned a new (lower) time priority. In cases where an MES order has been partially matched and the remainder of the order is less than the *Large in size* value, any modifications will be rejected.

#### 6.8 Order execution – continuous trading

During continuous trading the order matching process will run in the following manner:

- Step 1: Trigger Event- the matching process is triggered by an order event - the entry, deletion or modification of an order - that will require a change or changes to the order book. During the matching process the order book is locked until all updates and executions have completed.
- Step 2: Update Order Book- depending on the event that has caused the matching process, one or more orders may need to be updated. For example, in the event of an order entry which creates a new best bid price all orders pegged to the best bid and mid price will be updated. All updates to the order book, including parking, injection and re-pricing of orders are performed with execution disabled before execution is attempted.
- Step 3: Filter Order Book- the updates may result in a crossed order book indicating that executions could occur. Before any execution takes place the book is filtered for orders that should not be considered for execution - orders that cannot execute due to an MES constraint will be excluded at this point.
- Step 4: Matching- if after filtering the order book remains crossed, execution(s) will occur. *Passive price determination* will continue to be used where the order which triggered the matching process is the only order eligible for execution on

that side of the book. A *continuous trading uncrossing* algorithm will apply for price determination in all other scenarios.

If crossed orders with MES still exist after an iteration of the above process which has resulted in one or more executions, the filter and matching steps will subsequently be repeated - this is because the change to the order book resulting from the executions may release further crossed orders with MES to execute. The reiteration of the filter and matching steps will continue until no further executions occur. During each iteration of the filter and matching steps it is possible that different trade prices will be determined.

However, no interim BBO will be determined nor will internal pegs be updated until all iterations are complete.

The orders will be matched in accordance with their order priority.

If the trade price is outside the price movement tolerances, an automatic execution suspension period ("AESP") may be triggered. When an AESP is triggered

- If the incoming order is of a persistent order type and validity, the unmatched volume will be added to the order book and take part in the AESP auction
- If the incoming order is of type execute and eliminate (ENE) any unmatched volume will be deleted.

If an incoming fill or kill (FOK) order would have resulted in trades outside the price movement tolerances, no AESP is triggered and the order is deleted without any executions.

More information about the AESP is included in section 7 Price Monitoring.

### **6.8.1 Passive price determination**

In scenarios in which passive price determination is used the price of the passive order will determine the execution price.

However, involving hidden passive orders with a MES could result in a determined execution price outside the visible BBO without a new resultant BBO being created. In order to bind executions to within the visible BBO, additional logic is applied in scenarios where the resulting trade price would be at or outside the BBO.

- If the determined price is equal to or outside (i.e. lower than) the resultant visible best bid, the price will be adjusted to be the best bid plus half a tick
- If the determined price is equal to or outside (i.e. higher than) the resultant visible best offer, the price will be adjusted to be the best offer minus half a tick

### **6.8.2 Continuous trading uncrossing**

In circumstances where more than one order on the side of the book that triggered the matching can execute, the *continuous trading uncrossing* algorithm will apply and the price will be determined in the following manner.

First the algorithm will determine a target execution price. This will be:

- The visible true mid price on the book (prior to the trigger event).
- If there is no visible mid because the BBO is incomplete the target price will be half a tick inside the available price. *For example, if there is a visible bid but no offer, the target price will be at best bid price + (0.5) ticks. If there is a visible offer but no bid, the target price will be at best offer price - (0.5) ticks.*
- If there is no bid or offer a reference price will be used. If the security has traded that day this will be the last traded price. If the security has not traded that day the dynamic base price will be used

Second, the algorithm will determine whether or not the target price is within the range of prices which maximise executable volume. If the target price is a price which maximises executable volume then the target price will be the trade price. If not, the trade price will be the closest price to the target price within the range of prices which maximise executable volume.

- If the target price is higher than the highest price that maximizes executable volume then the trade price will be the highest price which maximises executable volume
- If the target price is lower than the lowest price which maximizes executable volume then the trade price will be the lowest price which maximises executable volume

## **6.9 Order execution – auctions**

An auction consists of

- An auction call period
- If necessary, one or more auction extension periods
  - Up to two price monitoring extensions; and/or
  - One market order extension
- The uncrossing, which executes orders at the calculated price

### **6.9.1 Auction call period**

During the auction call period orders may be inserted, deleted and modified, but no executions will occur before at the end – the uncrossing. If there are crossing orders an indicative execution price (equilibrium price) will be calculated so that it

- maximizes the executable volume; and
- if more than one execution price would result in the same executable volume, minimizes the surplus volume at the execution price; and
- if more than one execution price would result in the same surplus volume at the execution price, reflects the balance of pressure on the order book; and
- if the balance of pressure on the order book is even, reflects the reference price in the security; and
- if there is no reference price, is the lowest price.

The equilibrium price and any visible orders are disseminated when changes occur.

*Iceberg* orders and *hidden* (incl. *hidden limit* and *hidden with MES*) orders are included in the calculation of the execution price. Note that even if MES orders are included in the auction, the MES constraint is not taken into account, i.e. a smaller portion of the order than the MES may be executed in the uncross. However, when continuous trading commences after the auction, the MES constraint is re-applied.

*Pegged* orders will not participate in the auction – they will be parked during the auction period, and re-injected when continuous trading commences.

The different auctions are configured differently in terms of duration of auction call periods and the maximum number of extension periods:

Auction Type	Call Period	Max no of extensions		Duration of each extension
		Price Mon	Market Order	
Opening	15 min	1	1	1 min
AESP	3 min	1	1	1 min
Resumption after Trading Halt	3 min	1	1	1 min
Closing	5 min	2	1	1 min

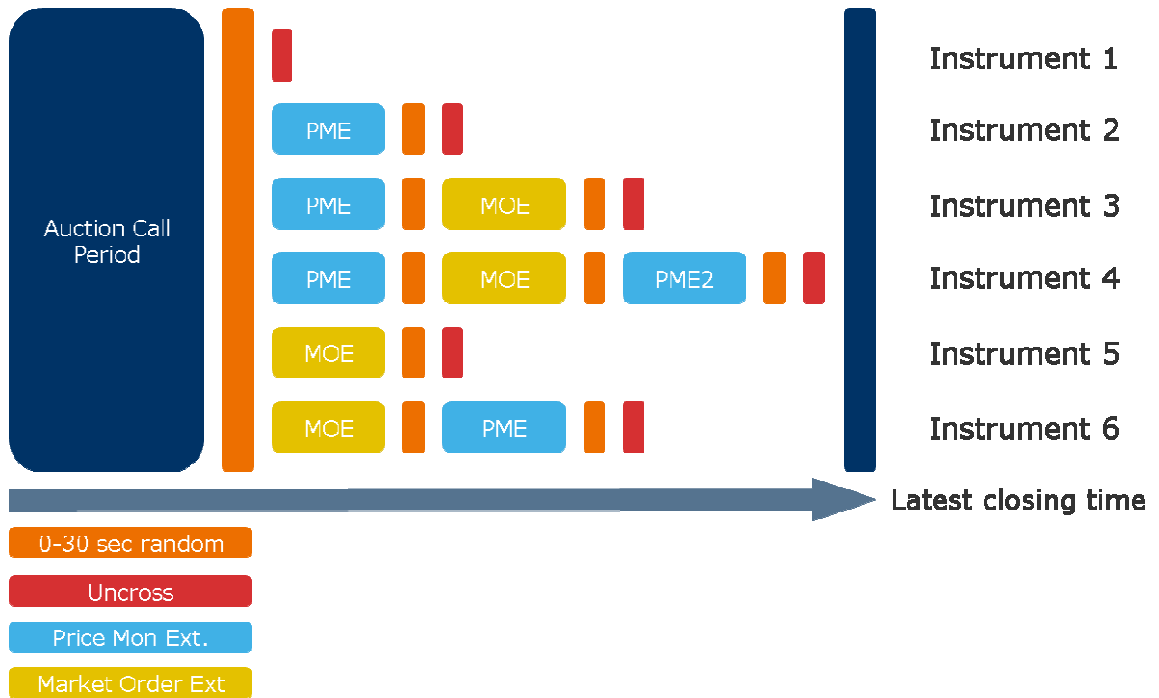
### 6.9.2 Auction extension periods

An auction extension period may be triggered for one security before it uncrosses. The extension period implies that the auction period is extended with an amount of time (typically 1 minute) so that the market's attention may be drawn to the security and react on price level or opportunities with available market orders.

If the calculated indicative execution price at the end of the auction period is more than a certain percentage away from the reference price, a *price monitoring extension* (PME) may be triggered.

If there are market orders that would remain unexecuted at the end of the auction period, a *market order extension* (MOE) may be triggered.

The auction extension periods may occur as indicated in the figure below:



### 6.9.3 Uncrossing

The uncrossing will take place at a random time within a 30 second interval. For the opening and closing calls, the sequence of the instruments will be random.

The orders are matched in accordance with their priority.

## 7 Price Monitoring

The price monitoring functionality compares each price from automatic executions that are about to happen with a dynamic and/or a static reference price. If the difference is more than a defined tolerance, an auction (*automatic execution suspension period* - "AESP") will be initiated automatically, or an ongoing auction will be extended (*price monitoring extension* - "PME").

An AESP auction will follow the procedure described in the **Order execution – auctions** section.

The reference prices may be overridden manually; e.g. as a result of corporate actions.

The price monitoring tolerances will be set in accordance with the current guidelines. However, the tolerances may be changed at any time subject to Oslo Børs' assessment.

## 8 Trades

### 8.1 Automatic trades

When orders are executed by TradElect, trades are automatically created, trade details are disseminated to the involved parties, and public information is published in Infolect.

Trades from auction uncrossing are identified by trade type "UT", while trades from continuous trading are identified by trade type "AT".

### 8.2 Trade registration – Manual trades

Trades in Oslo Børs/Oslo Axess listed securities executed away from the order book (i.e. *manual trades*) can be reported via TradElect. Each reported manual trade must include information about

- Counterpart ID: The Member ID of the counterpart, or - if the counterpart is not a member – a "generic" ID (e.g. NONMEMBER (*exact id to be confirmed*)).
- Date and time of the trade
- Buy or Sell
- Price and Size of the trade
- Trade type: Several options are available as listed in **Appendix 3 – Trade types**. Note that deferred publication of trades is managed by the use of trade type. More detailed descriptions of when to use which trade type will be made available in connection with publication of the revised member rules.
- Dealing Capacity of the Member: *Agency* or *Principal*

The deferred publication régime follows the MiFID regulation, where maximum deferral time is dependent on the trade's consideration and the ADT of the security.

Manual trades are published in Infolect.

The trade types for manual trades have not yet been defined, but an outline is included in Appendix 3.

### **8.3 Trade amendment / cancellation**

Trade amendment / cancellation may only take place on the day of the trade report / trade execution.

#### **8.3.1 Manual trades**

When submitting an amendment the process is:

- Cancel the original trade report by submitting a cancellation message using the original trade code
- If correcting, submit a new trade report containing the corrected details.

#### **8.3.2 Automatic trades**

Cancellation of automatic trades can only be done with the assistance of Oslo Børs Market Surveillance. A detailed procedure will be issued.

## 9 Market information - Transparency

### 9.1 Orders

For all securities, all visible orders residing in the order book will be updated and published continuously. This applies even during the auction call periods – there will be no change of transparency (e.g. Market-by-Order -> Market-by-Level) between the different trading periods.

Hidden orders – including the hidden part of iceberg orders – will never be published. However, during auction calls the indicative uncrossing price and size message will include in the *Uncrossing Volume* the matchable volume of any iceberg order(s) and not just the peak(s).

During the auction call periods, the indicative execution price (aka “equilibrium price”) is published.

For each visible order, the system publishes

- Security
- Buy/sell
- Price
- Volume (current peak for iceberg orders)
- Public order id

### 9.2 Trades

Trades which are created from automatic order execution are always published in real time. The same applies for manual trades, unless deferred publication is requested and the trade’s consideration is sufficient for the publication to be deferred.

For all trades, the following information will be published:

- Security
- Price
- Volume
- Trade Type
- Trade date and time
- Member ID buy
- Member ID sell

### 9.3 Other information

In addition to information related to orders and trades, Oslo Børs will publish through the system

- All indices calculated by Oslo Børs in real time (including e.g. OBX, OSEBX)
- OBDN News – Company announcements which the issuers publish through Oslo Børs’ Distribution Network (OBDN) service. Announcements which are published by Oslo Børs (e.g. *Mandatory notification of trade, Listing of securities, Notification of large shareholdings*) are also included.

## 10 Appendix 1 – Tick sizes

### 10.1 Equities – Shares included in OBX index

	Share price		Tick size	Tick as % of price	
	Lower limit	Upper limit		Max.	Min.
Band 1	-	0.4999	0.0001	-	0.02%
Band 2	0.5	0.9995	0.0005	0.10%	0.05%
Band 3	1	4.9990	0.001	0.10%	0.02%
Band 4	5	9.995	0.005	0.10%	0.05%
Band 5	10	49.990	0.01	0.10%	0.02%
Band 6	50	99.95	0.05	0.10%	0.05%
Band 7	100	499.90	0.1	0.10%	0.02%
Band 8	500	999.50	0.5	0.10%	0.05%
Band 9	1,000	4,999.00	1	0.10%	0.02%
Band 10	5,000	9,995.00	5	0.10%	0.05%
Band 11...	10,000	-	10	0.10%	-

### 10.2 Other shares

	Share price		Tick size
	Lower limit	Upper limit	
Band 1	-	9.99	0.01
Band 2	10.00	14.95	0.05
Band 3	15.00	49.90	0.10
Band 4	50.00	99.75	0.25
Band 5	100.00	249.50	0.50
Band 6	250.00	-	1.00

### 10.3 ETFs

	Share price		Tick size
	Lower limit	Upper limit	
Band 1	0,01	4,99	0,01
Band 2	5	99,95	0,05
Band 3	100	249,90	0,10
Band 4	250	499,75	0,25
Band 5	500	4999,50	0,50
Band 6	5000	-	1,00

## 11 Appendix 2 – Comparison SAXESS vs TradElect functionality (Equities)

High-level summary of differences:

Area	TradElect	SAXESS
Participant Structure	<ul style="list-style-type: none"> <li>- Member</li> <li>- Trader Group and the concept of roles</li> <li>- Trader ID is optional</li> </ul> <p>Access is granted at Trader Group level. Order routing / Algorithmic trading identified by Trader Group</p>	<ul style="list-style-type: none"> <li>- Member</li> <li>- Trader ID</li> </ul> <p>Access is granted at the Member level. Order routing / Algorithmic trading identified by Trader ID</p>
Market Structure	<ul style="list-style-type: none"> <li>- Market</li> <li>- Segment</li> <li>- Sector</li> <li>- Security</li> </ul> <p>Notes: Oslo Axess is implemented as a segment under Oslo Børs – not a separate exchange Primary Capital Cert. are included as a separate segment (OBPC) Rights will be listed in the same segment as the “underlying”</p>	<ul style="list-style-type: none"> <li>- Exchange</li> <li>- Market</li> <li>- Submarket</li> <li>- Submarket list</li> <li>- Orderbook</li> </ul>
Opening (closing) auction	<ul style="list-style-type: none"> <li>- All instruments open (close) during 30 seconds; random sequence</li> <li>- Extension if unmatched market orders or price monitoring is triggered</li> <li>- Transparency is Market-by-Order at all times</li> </ul>	<ul style="list-style-type: none"> <li>- Staggered opening (closing) during 13 (7) minutes.</li> <li>- Fixed sequence</li> <li>- Transparency is Market-by-Level during auction, but crossing prices are not shown. Transparency changes to Market-by-Order after auction</li> </ul>
Stop order maintenance	18:15	18:00
Stop trade reporting/publishing	18:15	17:20 OTC: 18:00
Order types	Limit Market Iceberg  Hidden Pegged	Limit Iceberg Named (limited) Hidden

<b>Area</b>	<b>TradElect</b>	<b>SAXESS</b>
Order validity	GTT – Good till date and time	Good till date <i>or</i> good till time (=today)
Order volume condition (for hidden orders only)	Minimum Execution Size (MES)	All or Nothing
Order size	Lot size = 1 always	<ul style="list-style-type: none"> <li>- Defined lot sizes</li> <li>- Different handling of small orders</li> </ul>
Capacity	<ul style="list-style-type: none"> <li>- Agency</li> <li>- Principal</li> </ul>	Owner category: <ul style="list-style-type: none"> <li>- Client</li> <li>- Own account</li> <li>- Issuer's holding</li> <li>- Market Maker</li> <li>- Stabilisation</li> </ul>
Manual trades	<ul style="list-style-type: none"> <li>- No publishing service for non-listed stocks</li> <li>- Single-sided reporting</li> <li>- Different trade types</li> </ul>	<ul style="list-style-type: none"> <li>- OTC publishing</li> <li>- Dual-sided reporting</li> </ul>

## 12 Appendix 3 – Trade types

Trade Type	Name	Venue	Orderbook or Manual	Publish	Segments OBX, OBMA, OBPC, OAX	Segments OBFU, OBWR
<b>AT</b>	Automatic trade	XOSL/ XOAS(*)	Orderbook	Immediate	Y	Y
<b>UT</b>	Uncrossing trade	XOSL/ XOAS(*)	Orderbook	Immediate	Y	Y
<b>NT</b>	Negotiated trade	XOSL/ XOAS(*)	Manual	Immediate	Y	
<b>NK</b>	Negotiated trade – delayed publ. requested	XOSL/ XOAS(*)	Manual	Delayed if meets size requirement	Y	
<b>O</b>	Ordinary trade	XOSL/ XOAS(*)	Manual	Immediate	Y	Y
<b>OK</b>	Ordinary trade – delayed publ. requested	XOSL/ XOAS(*)	Manual	Delayed if meets size requirement	Y	
<b>NM</b>	Not to Mark	XOSL/ XOAS(*)	Manual	No	Y	Y
<b>DT</b>	Derivative Related	XOSL/ XOAS(*)	Manual	Immediate	Y	
<b>VW</b>	VWAP Trade	XOSL/ XOAS(*)	Manual	Immediate	Y	
<b>OT</b>	OTC trade	XOFF	Manual	Immediate	Y	
<b>TK</b>	OTC trade – delayed publ. requested	XOFF	Manual	Delayed if meets size requirement	Y	
<b>SI</b>	SI Trade	SI	Manual	Immediate	Y	
<b>SK</b>	SI Trade – delayed publ. requested	SI	Manual	Delayed if meets size requirement	Y	

(\*) Venue is set to XOAS for OAX segment. For other segments, venue is XOSL