

# Product guide

# BT movit

*S-series*

TSE300



**TOYOTA**

MATERIAL HANDLING

stronger together

***This Product guide covers the following models:***

Model	Spec sheet part number
TSE300	746800-040

***Document revision history:***

Edition date	Changes
February, 2012	Next generation Order picking trucks

Part number: 749837-040

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Edition: September, 2011

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# Reading instructions

This product guide is designed as a point of reference. In some cases, information is available in two different chapters. This applies especially to the Sales arguments and Product details chapters describing the various features and benefits of the truck. To determine which chapter provides the desired information, please use the following content descriptions.

The various chapters of this product guide cover the following:

- **Product range information:** Provides a general overview of all truck versions in the series.
- **Operating environment:** This chapter describes typical customers and truck applications.
- **Product details:** This chapter offers detailed descriptions of truck features and truck components. It also includes a list of features and benefits.
- **Technical information:** This chapter presents truck specifications and dimensional drawings .
- **Options:** This is a list of truck options together with a description of their features and benefits.
- **Appendix:** Contains an environmental declaration, a description of environmental work and quality commitment within BT as well as a copy of the company's ISO certification.



# Product range information

This Sales Guide provides support to all BT personnel that sell or market the BT Movit TSE300. This document highlights the following points:

- Functionality of the BT Movit TSE300 together with benefits and advantages from the customer's perspective.
- Technical product information including dimensions and performance data.
- Truck options and accessories.

The relevant product manager at the Department for Market Support and Product Planning at BT Products in Mjölby, Sweden, is responsible for the content of this document.

**Machine type**

TSE = Towing Stand-on Electric

**Capacity**

300 = 3000 kg

**Feature**

## TSE300

The TSE300 drive motor uses separate excitation, which provides faster acceleration. Furthermore, the 2.9 kW drive motor increases the performance even more. On top of this, the three-wheel design provides higher drive wheel pressure, which translates into improved traction and increased brake capacity.

Towing in combination with order picking involves frequent starts and stops, while transport over long distances is rare. This implies that acceleration is a key factor.

It is a well-known fact that order picking means frequently stepping in and out of the truck. Operators commonly repeat this cycle a couple of hundred times every day, which is why it is very important to design the truck

with that in mind. The TSE300 has a spacious platform (450 mm), which provides easy access. Furthermore, the instep height is low (130 mm).



- Suitable for intensive towing of loads up to 3000 kg.
- Excellent in combination with order picking.
- The three-wheel configuration provides increased drive wheel pressure. This is important both for traction and brake performance.
- Tow device is within easy reach from the operator's position.
- Low instep.
- Full-width batteries from 465 Ah to 620 Ah are available.
- For multi-shift applications, batteries can be replaced either by lifting or side shifting.
- Max. travel speed is 12 km/h without load and 9 km/h with a 3000 kg load.
- Electric servo steering is standard.

# Operating environment

Tow trucks are frequently used anywhere where goods are being moved in a continuous flow, especially over long distances. Typical applications are industries operating “Just in Time supply” chains for incoming goods as well as for feeding an assembly line. Tow trucks can also be found in warehouses and spare part storages where they are used for order picking.

Typical market segments are industrial and logistic companies. Some examples are car and white goods industries and third party logistics.





# Product details

## E-MAN steering concept

The E-man steering and controls system calls for high level of Safety, Productivity and Driveability.



### Feature

Easy to use controls.

### Benefits

It is easy to learn and understand the controls for truck movements and steering.

### Feature

One hand operation.



### Benefit

Easy and ergonomic operation in all directions. You can use left, right or both hands for the operation.

### Feature

Lateral steering unit adjustment (option).

### Benefit

Perfect and easy to use when required driving while walking alongside the truck. When driving in the fork direction it is easy for the operator to have the whole body within the truck profile which gives a much more relaxed and safe driving.



**Feature**

Drive wheel automatically straightens up when alighting.

**Benefit**

This means you always know that the drive wheel is.

**Feature**

Geared steering angle, 60° rotation of the E-man control unit moves the steered wheel 100°.

**Benefit**

No part of the operator's body need be outside the truck's profile during operation.

**Feature**

Automatic speed reduction when cornering.

**Benefit**

Automatic speed reduction in cornering helps to ensure that people, infrastructure and loads are safe.

**Feature**

Walk alongside the truck

**Benefit**

No need to jump on the truck for every truck movement.

**Benefit**

Time saving higher productivity.

**Feature**

Max travel speed 4 km/h when walking along the truck.

**Benefit**

Keeping a high safety level for the operator also when walking with the truck. Can be programmed to a slower speed than 4 km/h (0 – 4 km/h).

**Feature**

More than 30 degree turning of the E-man when walking along the truck stops the truck.

**Benefit**

This will eliminate the risk of foot injures on the operator.

## Sideways adjustable steering (option)

The E-man system has a smart feature allowing the operator with a simple operation to move the steering unit laterally across the battery cover. There are three fixed positions to choose from: centre, left and right. Any of the three positions allows full truck performance as long as the operator is standing on the platform.

### Feature

Lateral movements of the E-man handle to the right or to the left.

### Benefit

Perfect to use when required driving while walking alongside the truck.

### Benefit

Driving in the fork direction is much more relaxed and safe keeping the whole body within the truck profile.

### Feature

Full truck performance in all three positions as long as the operator is standing on the platform.

### Benefit

High productivity and driveability in operation.

## Motor and Power pack

The BT Movit T-series feature BT Powerdrive and use AC drive motors and DC pump motors for best cost and performance optimization.

### Feature

The drive motor is permanently mounted, and the motor does not move when the drive wheel turns.



### Benefit

This reduces wear on cables and allows a compact truck design since the space usually used to allow cable twisting has been eliminated.

### Feature

AC drive motor.

### Benefit

No use of carbon brushes that wear out and the service requirement is reduced.

## BT Powerdrive system

The BT Powerdrive system on the BT Movit T-series is a unique combination of contactless controls, CAN bus communication (CAN = Controller Area Network) and AC drive motor.



### **Feature**

Contactless controls.

### **Benefit**

High reliability and reduced downtime thanks to the reduced number of moving parts and wear points.

### **Feature**

CAN bus communication – digital communication between different system parts.

### **Benefit**

Provides quick, reliable information with few cables.

### **Feature**

Easy to program the operator truck parameters.

### **Benefit**

The truck can be adapted to the operator's level of experience and preferences in terms of speed, acceleration and motor braking. Resulting in improved safety and increased productivity.

### **Feature**

Fast acceleration and braking.

### **Benefit**

Maximum control of truck travels because the truck instantly reacts to operator commands.

### **Feature**

Regeneration of energy back to the battery. The regenerative braking is automatically activated whenever the operator releases the speed control or alights from the truck.

### **Benefit**

Up to 5-10% of the energy can be returned back to the battery when using the motor braking with reduced stress and wear on the drive wheel.

## Brakes

### Feature

Reversing brake. The motor brake is easily applied when the operator moves the speed control past the neutral position to reverse the truck

### Benefit

Controlled slowing down of the truck.

### Benefit

Regenerative braking.

### Feature

Neutral brake. The motor brake is engaged when the operator releases the speed control in the centre position.

### Benefit

The neutral brake power can be adjusted using the operator's truck parameters.

### Benefit

Controlled slowing down of the truck.

### Benefit

Regenerative braking.

### Feature

Lighting during driving. If the operator jumps off the truck while it is moving, the motor brake is automatically applied and when after a while even the mechanical brake is activated.

### Benefit

The brake power can be adjusted using the operator's truck parameters.

### Benefit

Controlled slowing down of the truck.

### Benefit

Regenerative braking.

### Benefit

Parking brake is always applied automatically.

### **Feature**

Braking with the handle. The mechanical brake is engaged by pushing up the steering handle to its top position (see picture). Please note this is the only position in which the brake is applied, it is not applied if the lever is pressed down.

### **Benefit**

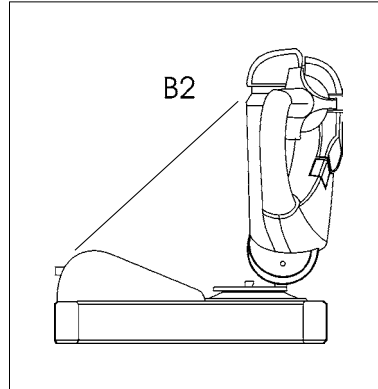
Easy to use in an emergency situation to come to a quick stop.

### **Feature**

Jumping off the truck.

### **Benefit**

In the event that an operator jumps off the truck while the truck is still moving, the truck will gently and safely brake to a complete stop.



## **Easy to service**

### **Feature**

Minimum amount of components with few wear parts.

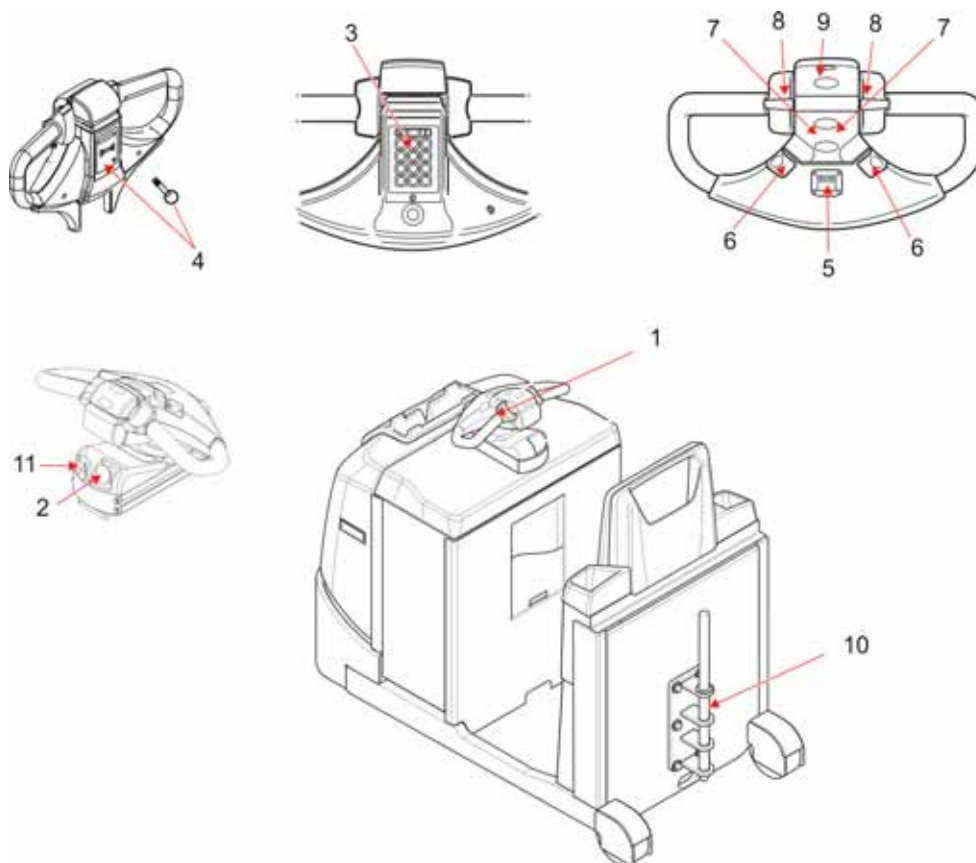
### **Benefit**

Fast, easy service and maintenance for maximum uptime.



## Operator controls

### TSE300



- |    |   |
|----|---|
| 1  | Steering unit and brake control                               |
| 2  | Emergency switch  |
| 3  | Operation keys  |
| 4  | ID-unit (Option)  |
| 5  | Display   |
| 6  | Horn  |
| 7  | Fork lifting/lowering control                                 |
| 8  | Travel direction selector and speed control lever             |
| 9  | Control for lifting and lowering the operator platform        |
| 10 | Towing device   |
| 11 | Release button for lateral movement of steering unit (option) |

## Starting the truck

### Feature

The steering handle can be fitted with two different start-up systems, keypad or ID unit.

### Benefit

Will easy fit different company preferences.

### Keypad

A PIN code is used to start the truck.

### Feature

Factory standard is keypad using PIN 1, PIN 2 or PIN 3 to start the truck.

### Benefit

No key is needed.

### Benefit

Easy to start.



### Benefit

Different operator parameter settings can be programmed to each PIN for easy change between different application environment or different operator preferences.

### Feature

Up to 100 different PIN codes can be used to start the truck. Programming of PIN codes with help of a Service Technician.

### Benefit

Ensures that only authorized operators can start the truck by using a personal code.

### Benefit

Each PIN can be linked to different operator parameter settings.

### Benefit

Up to ten different operator parameter settings can be stored in truck memory.

## ID unit

### Feature

As an alternative to the keypad, an ID unit can be specified. Each truck supplied with an ID unit comes with two ID keys, which are used to start the truck. A truck can be specified for a specific operator or a specific department.



### Benefit

Some companies prefer a physical key, in case an ID key, for truck access in order to keep track of who is using the trucks.

### Benefit

Easy to hand out an ID key when external operators need to temporarily use the truck.



### Benefit

Easy to use system.

### Benefit

Different operator parameter settings can be programmed to each ID key.



### Benefit

Ensures that only authorized operators can start the truck by using a personal ID key.

### Benefit

Up to ten different operator parameter settings can be stored in truck memory.

### Feature

It is possible to connect as many ID keys as desired to the same truck, and the same ID key can be used to start several trucks.

### Benefit

Flexible system useful also for fleet users.

### Feature

This solution requires a ID key programmer and PC-installed.

### Benefit

Each customer can easily add, program and re-program ID keys.

### ***Informative display and programming***

Thanks to the state-of-the-art electronics incorporated in BT Powerdrive, it is easy to alter specific truck settings. The operator parameters and the clock can be adjusted by the operator without any tool or instrument. It is also possible to check the machine-specific register settings, however, these cannot be reprogrammed. Please consult Operator's Manual (OM) or the Repair Manual (RM) for more details on parameters and error codes.

### ***Operator parameters***

The BT Movit truck is highly manoeuvrable and offer individual setting of performance parameter for the operators. Operator parameters can be re-programmed by the operator without help of any tool or instrument.

The trucks also have a machine register in which settings only can be changed by a service technician. Please refer to the Repair manual for detailed information.



## Programming

Complete the following sequence to program the adjustable operator parameters:

- Use the operating keys to enter the code for the operator whose parameters should be adjusted.
- Press the horn button once.
- Use the speed control lever to scroll until PAr is shown in the display
- Press the horn button once to confirm.
- Use the speed control lever to scroll to the desired parameter.
- Press the horn button once. The symbol starts to blink.
- Use the speed control lever to scroll to the desired parameter value.
- Press the horn button once to confirm.
- Exit the programming mode by pressing the “O” key.

## Operators parameters

No	Type	Unit	Min./Max.	Remarks
1	High speed, fork direction	%	30-100	In increments of 5
2	High speed, drive wheel direction	%	30-100	High-speed range until 12 km/h. Operator present on platform. 30: Lowest speed 100: Highest speed in increments of 5
3	Acceleration	%	10-100	10: Slow acceleration 100: Fast acceleration in increments of 5
4	Automatic braking	%	40-100	Braking when speed control lever is released to neutral position or when switching the travel direction. 40: Slow braking 100: Fast braking in increments of 5
5	Speed, man up lift higher than 0,5m	%	0-100	Slow speed range until 4 km/h
6	Slow speed	%	40-100	Speed when walking next to truck. Max 4 km/h. 40: Low speed 100: High speed in increments of 5
7	Brake platform	%	60-100	Brake engages when operator jumps off while truck is moving. In increments of 5

### **Feature**

It is possible to adapt the settings for speed, acceleration and braking characteristics to the operator's level of experience and/or preferences. Or adapt it to the specific application. The truck can store up to ten different settings.

### **Benefit**

Performance can be adopted for maximum productivity depending on the operator's experience level.

### **Benefit**

Damage caused by inexperienced operators can be reduced.

### **Benefit**

The truck performance can be adapted to application where it is operating. E.g. depending on the type of load, working environment, pedestrians etc.

## ***Operating time display (H)***

The BT Powerdrive system features five different hour meters:

A = Key time

b = Travel time

C = Drive motor time

d = Pump motor time

S = Time until next service

The A hour meter displays for how many hours power has been switched on. The b hour meter displays the sum of hour meters c and d. The s hour meter shows the time remaining until the next service intervention.

By default, the b hour meter is displayed for a short while when the truck is started. During operation is the battery discharge information shown.

### **Benefit**

The operator has always access to valuable information regarding the truck.

## Warning and error codes

### Feature

If an error occurs, the display automatically shows the seriousness of the fault and lit the tool-LED up. The figures shown in the display indicates the level seriousness of the fault. Please consult the Operator's Manual or Repair Manual for more detailed information.

### Benefit

Easy to indentify a fault reason on the truck.

### Benefit

Important information in the communication with the Service organisation.





# Technical information

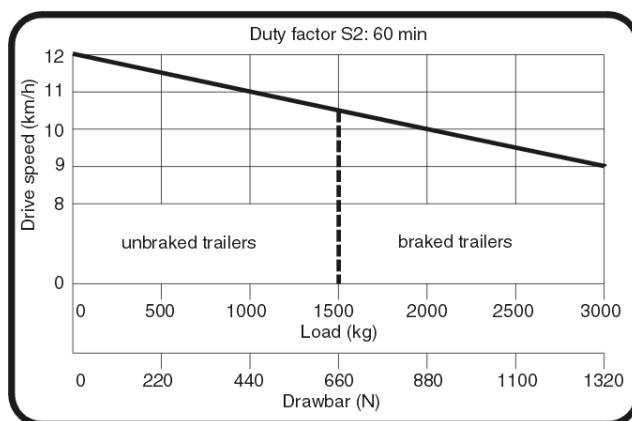
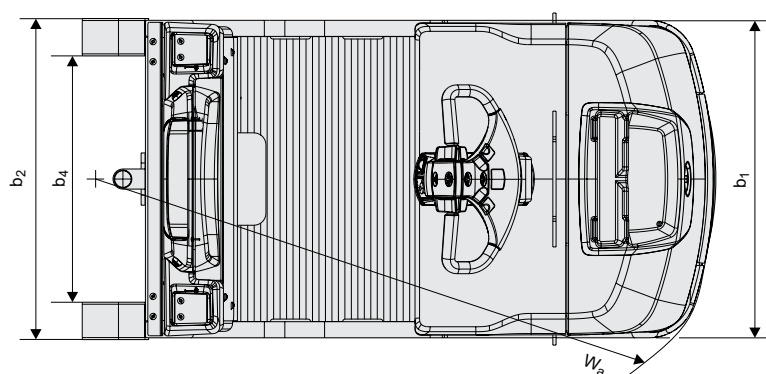
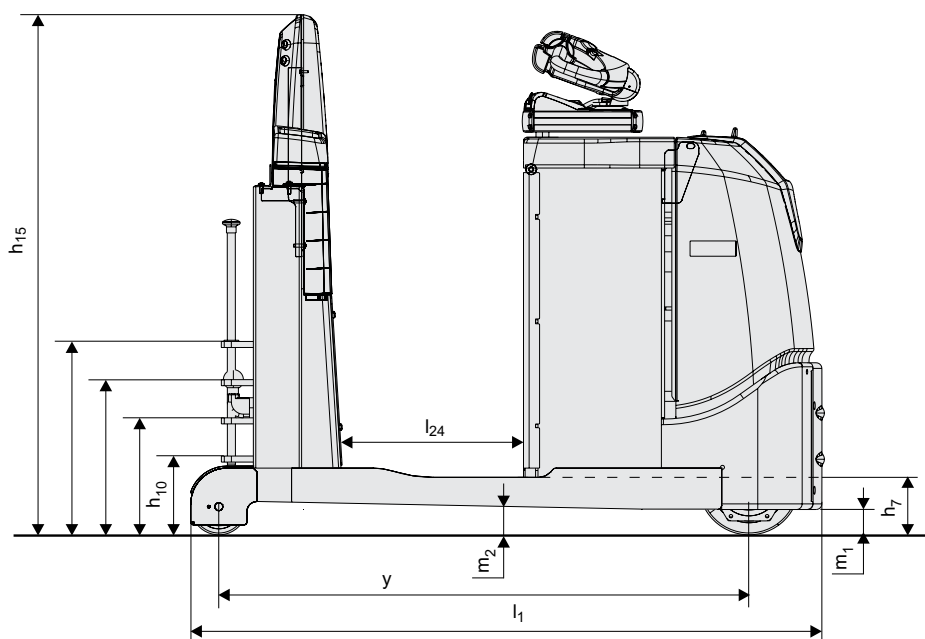
## Truck specifications

Truck specifications					TSE300
Identification	1.1	Manufacturer			BT
	1.2	Model			TSE300
	1.3	Drive			Electric
	1.4	Operator type			Stand on
	1.5	Load capacity/rated load	Q	kg	3000
	1.7	Rated drawbar pull	F	N	1320
	1.9	Wheelbase	y	mm	1319
Weight	2.1	Service weight without battery		kg	1206 <sup>1)</sup>
	2.3	Axle load, without load, drive/support arm wheels		kg	1043/734
Wheels	3.1	Drive/support arm wheels			Vulkollan
	3.2	Wheel size, front		mm	Ø 250x100
	3.3	Wheel size, rear		mm	Ø 150x75
Dimensions	4.2.1	Overall height	$h_{15}$	mm	1284
	4.8	Stand height	$h_7$	mm	130
	4.12	Coupling height			
		towing pin	$h_{10}$	mm	188/283/378/473
		towing ball	$h_{10}$	mm	298/393/488/583
	4.19	Overall length	$l_1$	mm	1571
	4.21	Overall width	$b_1/b_2$	mm	790/799
	4.26	Distance between support arms	$b_4$	mm	613
	4.32	Ground clearance, centre of wheelbase	$m_1/m_2$	mm	63/71
Performance data	4.35	Turning radius	$W_a$	mm	1508
	4.44	Clear width driver compartment entrance	$l_{24}$	mm	450
	5.1	Travel speed, with/without load		km/h	9,0/12,0
Electric motor	5.7	Gradeability, with/without load		%	6/13
	5.10	Service brake			1 stage electromagnetic
	6.1	Drive motor rating S2 60 min		kW	2,9
	6.4	Battery voltage, nominal capacity $K_s$		V/Ah	24/310-620
Other	6.5	Battery weight, min./max.		kg	338/501
	6.6	Energy consumption acc to VDI cycle <sup>2)</sup>		kWh/h	
Other	8.1	Type of drive control			BT Powerdrive
	8.4	Sound level at the driver's ear according to EN 12 053			

1) With small battery, add 125 kg counterweight

2) Contact your supplier for information.

## Dimensional drawings



## Battery and chargers

### Choosing the correct battery

A couple of different factors affect the choice of battery. Physical limitations are the size of the battery compartment together with the battery weight. Type of operation and the level of intensity are other factors to consider.

#### Max. battery sizes

Large L x W x H (mm)
296 x 790 x 775

- Full width batteries, width 790 mm. Battery capacity is 450 Ah up to 600 Ah.



*Table of possible full-width batteries*

Battery compartment	Supplier	Capacity Ah	Voltage V	Weight battery Kg	Size L x W xH mm
Small	Hawker	465	24	356	211x789x782
	Exide	465	24	347	209x787x780
Large	Hawker	620	24	490	296x789x782
	Exide	620	24	463	294x788x780

Battery locking on top of the battery

Height from floor to the upper edge of the rollers = 171 mm

## Charger alternatives

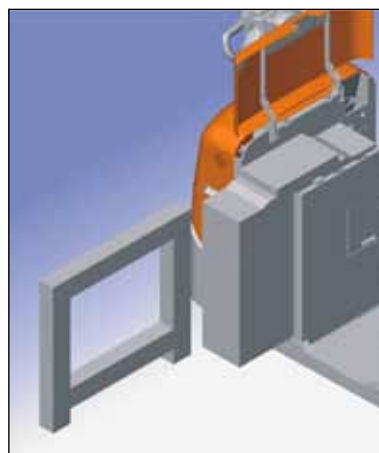
An automatic charger provides the best charging conditions for the battery and a longer service life for the battery. Optimum charging, with a charging time of 10-12 hours, gives the relationship between battery size and charging current (see table below). Please use the table as a guideline. For more detailed information, please contact your local supplier of batteries and chargers.

Battery capacity range, Ah	Charger current, A
150 - 300	30 - 60
300 - 450	60 - 80
450 - 600	80 -110

The graph on the next page depicts estimated charging durations. In this example we have used TMH's wall mounted chargers.

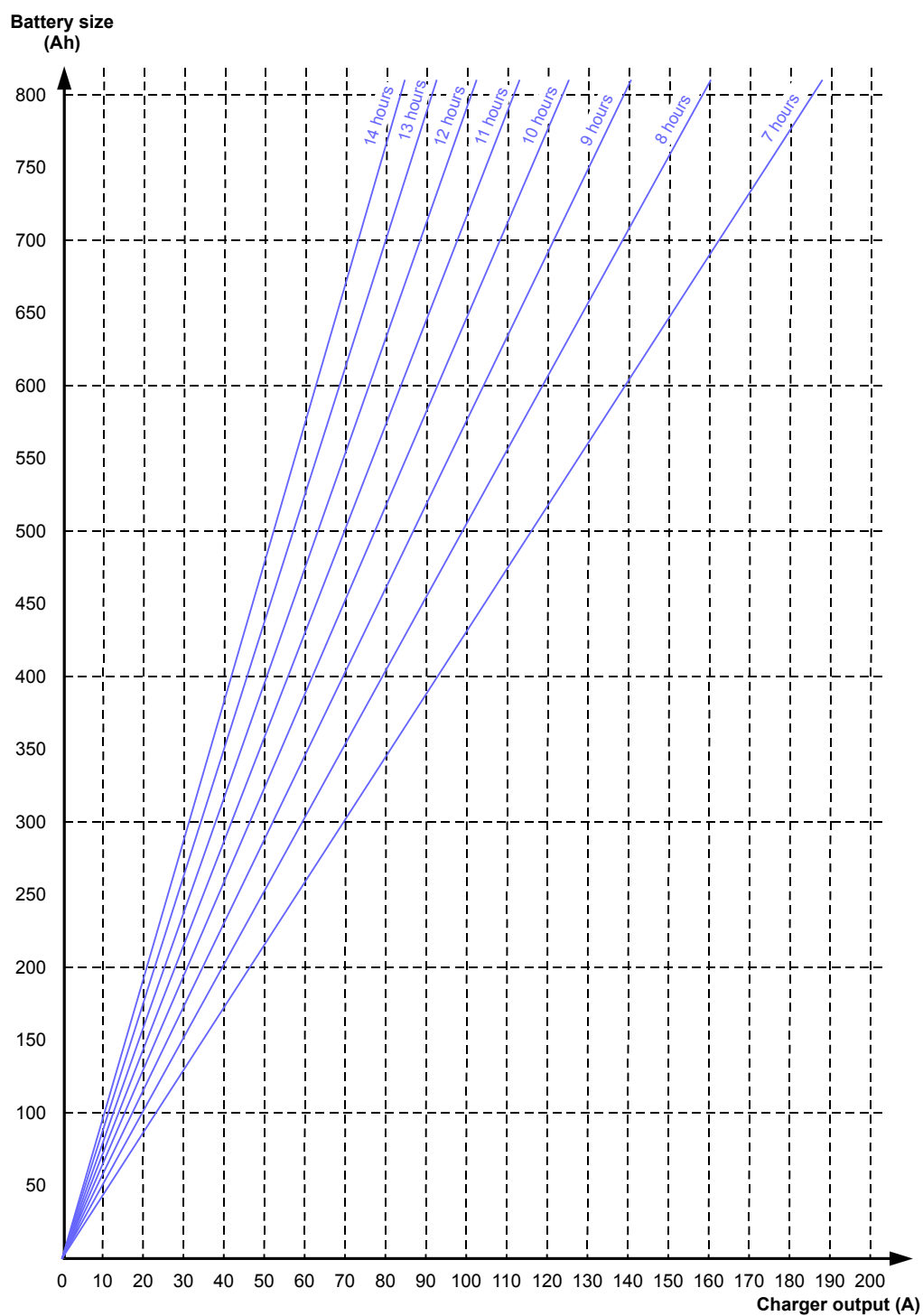
## Counter weight

Minimum weight in battery compartment should be 475 kg. Maximum weight 530 kg. If you choose a small battery size, a 125 kg counter weight will be mounted in the battery compartment.



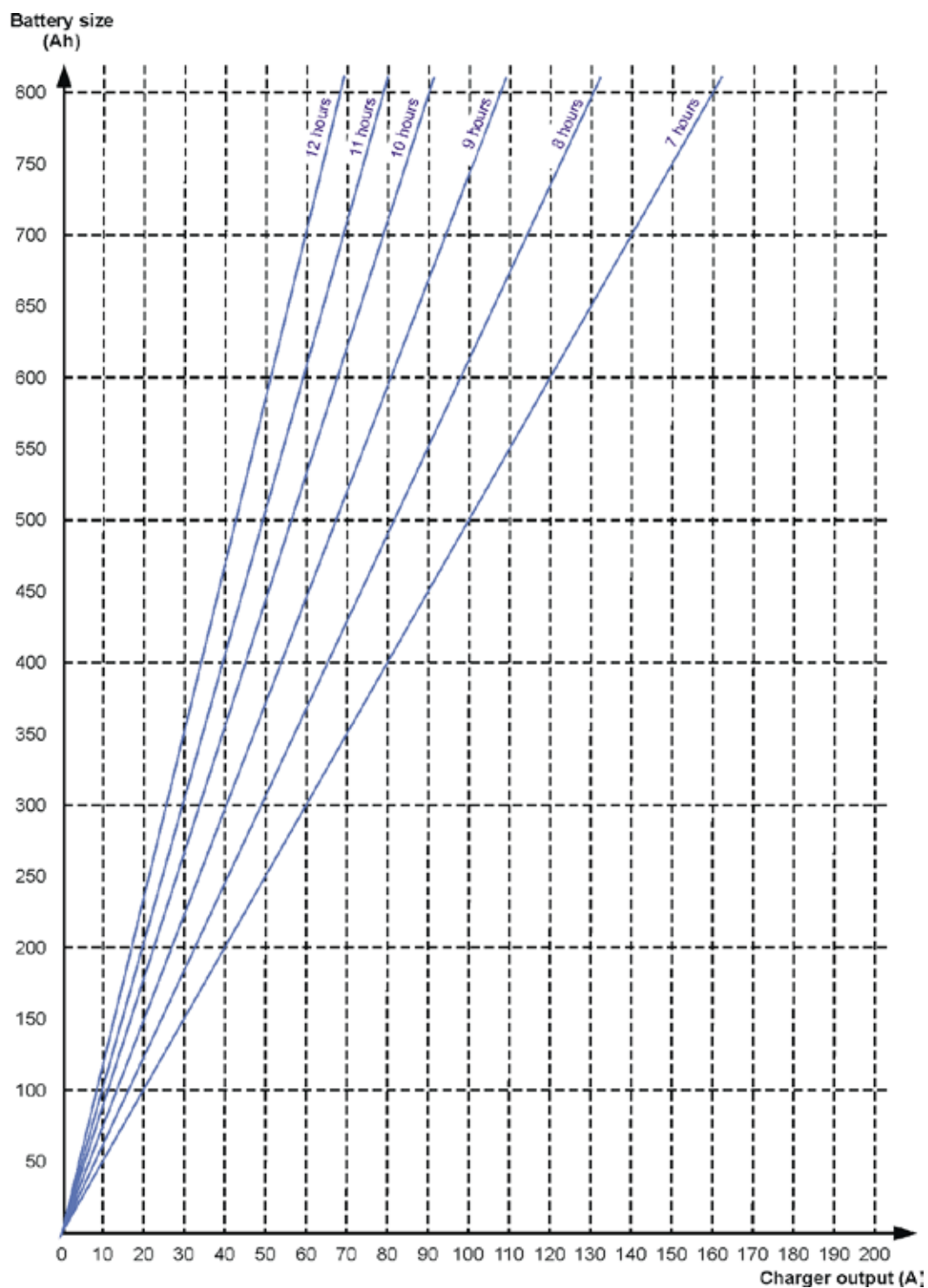
**STC charger with Wa characteristics**

Note: This graph is only valid for open batteries (lead/acid) and not for valve regulated batteries.



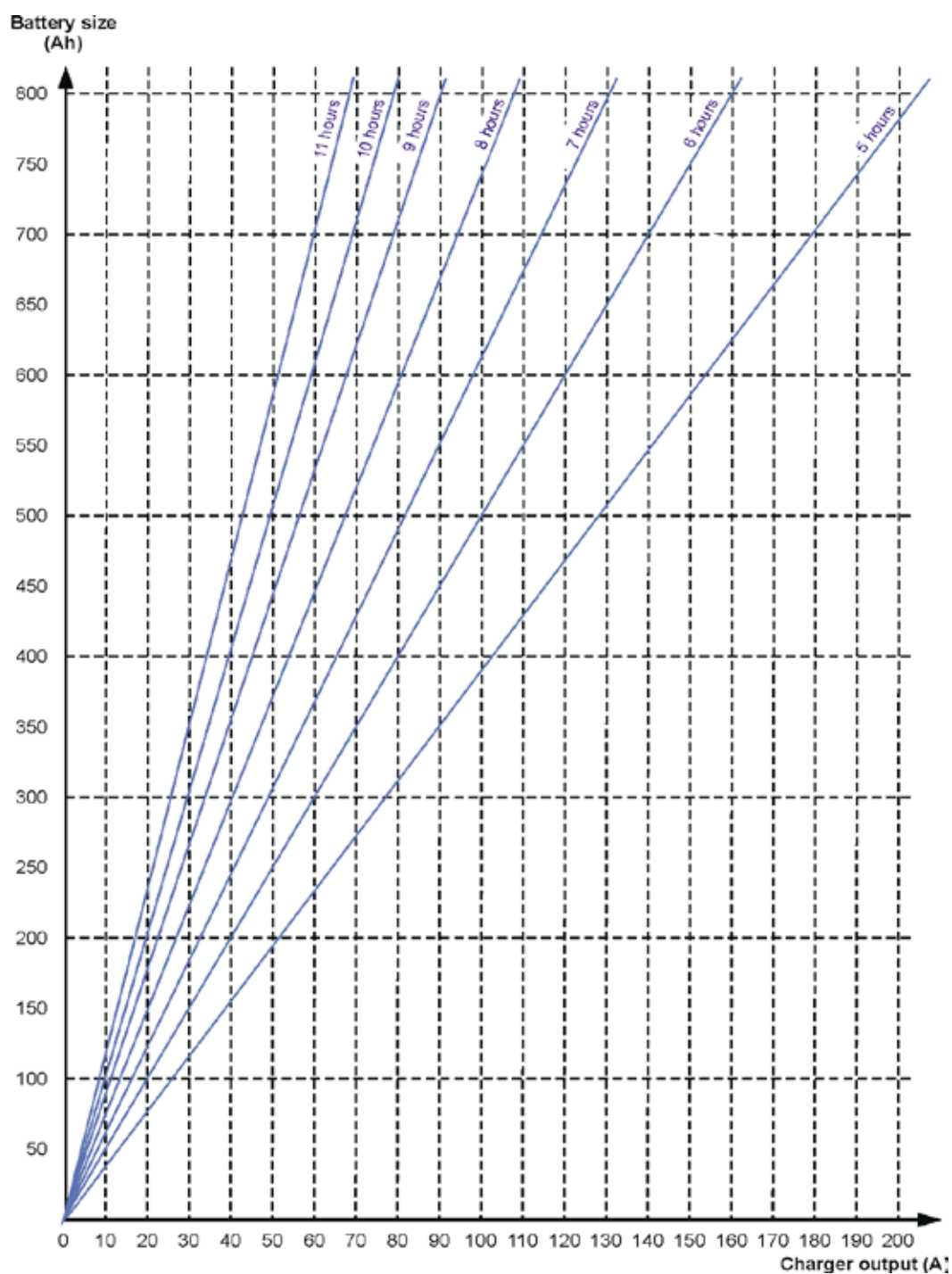
### MTM charger with IUI (constant current) characteristics

Note: This graph is only valid for open batteries (lead/acid) and not for valve regulated batteries.



**MTM charger with IUI (constant current) characteristics and acid circulation**

Note: This graph is only valid for open batteries (lead/acid) and not for valve regulated batteries.



# Options

## Sideways adjustable steering



The E-man system has a smart feature allowing the operator with a simple operation to move the steering unit laterally across the battery cover. There are three fixed positions to choose from: centre, left and right. Any of the three positions allows full truck performance as long as the operator is standing on the platform.

### **Feature**

Lateral movements of the E-man handle to the right or to the left.

### **Benefit**

Perfect to use when required driving while walking alongside the truck.

### **Benefit**

Driving in the fork direction is much more relaxed and safe keeping the whole body within the truck profile.

### **Feature**

Full truck performance in all three positions as long as the operator is standing on the platform.

### **Benefit**

High productivity and driveability in operation.

## E-bar universal bracket

An integrated universal bracket that can accommodate a computer terminal, a PC, scanner or other equipment required on board the truck.



### Feature

E-bar.

### Benefit

To house peripheral equipment.

### Benefit

Peripheral equipment is close at hand and at the same time properly fastened.

### Benefit

Accessories are easily accessible from the operating position.

### Benefit

Accessories can be fixed with standard brackets.

### Benefit

The brackets can be used on all BT-trucks with Ebar.

### Benefit

Easy to move equipment between trucks.

### Benefit

Well proven and robust design.

## Keyboard mounting kit

Complete kit for fitting a keyboard to the E-bar.

### Feature

Complete keyboard mounting kit.

### Benefit

Fit for purpose solution for easy installation.

### Benefit

Adjustable to suit each individual drivers need.

## PC/terminal mounting kit

Complete kit for fitting PC/TC to the Ebar.

### Feature

Terminal/PC mounting kit.

### Benefit

Fit for purpose solution for easy installation.

### Benefit

Adjustable to suit each individual operator's need.

### Feature

Robust ball connections with rubber cushioning.

### Benefit

Reduces vibrations and protects the fitted equipment. Essential for computer hard disks.

## 12V or 24V power outlet

### Feature

Power outlet integrated in the E-bar for 12V or 24V incl DC/DC converter (100W).

### Benefit

Stabilized current in close connection to PC and other electrical equipment mounted on the E-bar.



## Long and short connection, ball joint for E-bar

### Feature

Flexible and versatile.

### Benefit

Fits any kind of equipment and is easy to adjust.



## Battery rollers

Battery rollers enable easy replacement of the battery since it can be pulled out sideways. In the standard configuration, the battery rests on a level surface, in which case it needs to be lifted out by crane for replacement.

## Locking of battery rollers

The rollers can be locked to prevent unauthorized removal.

## Shrink film holder

- Shrink film holder mounted on one side of the backrest.
- Shrink film holder mounted on the E-bar.
- Shrink film holder mounted with a strong magnet.



## Writing table

- A magnetic board has a paper clip that holds A4 sized paper sheets in place.
- A writing table with a paper clip to be mounted directly on the E-bar.
- A writing table with a paper clip to be mounted via a ball joint on the E-bar for easy adjustment.



## Rubber bumper

### Feature

The front of the truck includes a rubber bumper.

### Benefit

Softer collisions and fewer damages in tight areas.



## Vibration damped floor

(Frequency-adapted Suspension)

To improve operator comfort when travelling across bumps and uneven floors. This feature protects the operator from unpleasant vibrations.



## Foldable seat

Increases operator comfort, especially during long horizontal transports. The seat is adjustable in height to suit different operators.



## Battery replacement table

This table can accommodate two batteries set on rollers for swift battery replacement from the side.



## Long battery cable

This extended cable is handy for connecting the truck and the battery. It makes it possible to move the truck to the charged battery on the battery replacement table.



## Extra battery cables

Cables for a spare battery. These extra cables are useful when there is more than one battery for one truck. They simplify lateral replacement of the battery and makes replacement quicker and easier.



## Connector with cable for charger

To be installed if using an old or locally supplied charger. Included when the charger is delivered from Mjölby together with the truck.

### Feature

Connector mounted to the cable.

### Benefit

High quality connection. Safe installation.

## Small item holder

### Feature

Small item holder fitted on E-bar.

### Benefit

Small storage space for items like box cutters, marking, pens etc.



## Truck log systems

### ***Toyota I-site***

Toyota I-site is a truck log and fleet management system that provides possibilities to monitor truck usage and operator performance. Toyota I-site is offered a monthly fee basis where we provide a continual process of analysis and consultancy to customers and give them access to our knowledge and skills to help us build customer relations.

Toyota I-site is primarily based on two internally developed systems:

- Easy Management Reports that obtain data from Movex
- Toyota Wireless Information System that obtains data from the truck

Both systems are designed primarily to deliver customer benefits, but they also generate a number of internal benefits to help us operate more efficiently.

***Note! The system can be used without Movex update, but this requires a large amount of manual data updating.***

Further information about Toyota I-site is available from your local specialist.

### ***Toyota Wireless Information System (T.W.I.S)***

T.W.I.S is a part of Toyota I-site that is available in two versions:

- T.W.I.S including DHU (Data Handling Unit) and antenna
- T.W.I.S including DHU, antenna and shock sensor

The DHU collects data from the truck and transfers this data at user-determined intervals to a central server where data can be accessed by logging on to an Internet web site. Communication is done via GSM 900/1800 networks and a SIM card is included in the DHU unit.

### **Benefit**

No hardware installation is required at the customer site.

Reports can be viewed showing for instance:

- Truck utilization
- Operator utilization
- Battery consumption and charging behaviour
- Hour meter readings

If the shock sensor is included in the system, information about collisions and impacts can be viewed.

By monitoring truck usage and operator performance, customers can improve operations and reduce cost.

Access to different levels of information can be set for different users/functions in the company.

Usage hours, error codes and other truck related information can be collected remotely for the benefit of the TMHE organisation.

### **Shock sensor**

When T.W.I.S is combined with a shock sensor the following collision data can be viewed:

- Operator involved in collision
- Severity of collision
- Error codes generated by the collision
- When the collision occurred and for how long the truck had been in use before the collision

There are three possible behaviours of the truck when a collision is recorded:

- The truck continues to operate as usual
- The truck switches to turtle mode; to return to normal operation the truck must be restarted
- The truck switches to turtle mode; to return to normal operation the truck must be restarted with a special ID-key or a special PIN code.

Shock sensitivity and desired behaviour can be set for each individual truck.

**NOTE!** *The shock sensor used for T.W.I.S can also be used as a standalone unit. When used without T.W.I.S, the collision and impact information is shown in the display and more detailed information can also be viewed by the service engineer via the service key.*

### **Benefit**

The shock sensor monitors careless driving behaviour and constitutes a tool to take action and improve safety on the site. This will in turn lead to a reduction in damages on trucks, goods and racking. The shock sensor information can also be used to address operator training needs



# Appendix

## Environmental work within BT

The BT trucks are produced at manufacturing sites where environmental issues are in focus. Waste management and reduction of hazardous chemicals used in production are natural parts of the everyday environmental work. We have been ISO 14001 certified since 1997, and in our continuous environmental work we put effort into reducing energy consumption at all levels, while we work with preventive actions to reduce pollution risks and risk of biological danger.

The paint systems used for BT trucks have been changed and there has been a dramatic reduction of solvent emissions by employing new paint-shop technology (powder painting) at the production sites.

Not only the production, but also the environmental impact of the trucks is focused on. The trucks contents of substances of concern to the environment are analysed. In this area we are working with environmental demands on our suppliers.

Environmental care is not only limited to reduction of pollution from factories and efficiency in use of raw materials, it also covers awareness of individual designers when they choose components, materials and take part in decisions on new production methods. Our products are developed without materials from the black list\*, while the grey list\* materials are reduced to a minimum and we continuously endeavour to completely eliminate them when possible.

For several trucks, environmental declarations are available. The declarations are made according to ISO 14001:2004. They provide information about the environmental impact of the trucks during manufacturing, usage and scrapping.

\* The "black and grey" list was first defined by Volvo, and BT has adopted this definition with the approval of Volvo.

## Focus on quality within BT

The Toyota Way is based on the Guiding Principles at Toyota. Its five core values express the beliefs and values used in the daily work:



### ***Challenge***

To maintain a long-term vision and meet all challenges with the courage and creativity needed to realise that vision.

### ***Kaizen***

“Continuous improvement. As no process can ever be declared perfect, there is always room for improvement.”

### ***Genchi Genbutsu***

“Going to the source to find the facts to make correct decisions build consensus and achieve goals.”

### ***Respect***

Toyota respects others, makes every effort to understand others, accepts responsibility and does its best to build mutual trust.

### ***Teamwork***

Toyota stimulates personal and professional growth, shares opportunities for development and maximises individual and team performance.

Toyota production system (TPS) is a production philosophy based on the Toyota Way that provides a common base for thoughts and methods. Daily quality meetings in production are one part that leads to involvement of employees on all levels in the work with continuous improvements. This means going to the source to correct things that cause problems in order to find short-term and long-term solutions to improve the production process, methods and product quality.

Product quality is of course an essential part of having satisfied customers and the foundation to product quality is laid already in the development phase. At BT we follow the process in each development project to find and take actions on possible risks; both on product and project level.

Products and components are tested and evaluated throughout the development process both in lab environments and field tests. As a complement to calculations structural tests as well as life time tests are performed.

Apart from the functional testing and control made on all products before delivery, product quality is continuously monitored during manufacturing through welding audits on components and product audits on completed trucks.

We have had an ISO 9000 certification since 1994.

## Certificates





**BUREAU VERITAS**  
Certification

**Certification**  
Awarded to  
**BT Products AB**  
Mjölby, Sweden

Bureau Veritas Certification certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standard detailed below

Standard

**SS-EN ISO 14001: 2004**

Scope of supply

Development, manufacture and sales of trucks for material handling.

Original Approval Date: 24 November 1997 (Previously certified by other accredited certification body)  
Original Approval Date: 21 September 2010 (Bureau Veritas Certification)

Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until: 30 November 2012  
To check this certificate validity please call +46 31 60 65 00  
Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation

  
Jan-Mof Marberg, Technical Manager Bureau Veritas Certification Sverige AB  
Date: 21 September 2010  
Certificate Number: 10000424

Bureau Veritas Certification Sverige AB, Fåhlingsgatan 13, 412 50 GÖTEBORG, Sverige



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