



MOBILE HARBOUR CRANE SPREADERS

A Tradition of Innovation

BROMMA



» **BROMMA HAS A DOMINANT POSITION IN MOBILE HARBOUR** crane spreaders for a simple reason: in terminals where reliability is essential, Broma spreaders have an unmatched reputation for reliability.

THE WORLD LEADER IN MOBILE HARBOUR CRANE SPREADERS

Wherever mobile or jib cranes are found, Bromma spreaders can usually be found there as well. Container terminals throughout the world, whether in fast growing emerging economies, or high-throughput developed economies, have common goals when it comes to equipment selection: reliability, efficiency, and productivity. This is why Bromma for many decades has been the world leader in spreaders, and why Bromma mobile harbor crane spreaders are the spreader of choice, with a global market share of approximately 70%. Bromma's partnerships with the leading mobile harbor crane OEMs, as well as with end user terminals, are long and deep. At Bromma we seek to listen to our partners, and this has led to the development of a broad family of mobile harbor crane spreader solutions.

Bromma has a dominant position in mobile harbor crane spreaders for a simple reason: in terminals where reliability is essential, Bromma spreaders have an unmatched reputation for reliability. Bromma spreaders show up for work every day, in the world's most demanding container terminals, and perform at a high level of productivity. When reliability is crucial, Bromma is the obvious choice. Bromma's family of mobile harbor crane spreaders includes single-lift options such as the EH5U spreader [capable of handling 20' or 40' containers]; the EH12U singlelift lightweight spreader; and the MSX45 spreader [also capable of handling 45' containers.] For terminals seeking higher productivity from each lift, Bromma offers a twinlift mobile harbor crane spreader EH170U [capable of handling two 20' containers].

Whatever the lifting requirements and container mix at your terminal, Bromma has the right spreader for you.

Feature-Rich Design

No spreader company has more real-world experience in container handling than Bromma, and in mobile harbour crane spreaders this has led to feature-rich design. Bromma MHC spreaders offer tower and gravity point adjustment, so that unevenly loaded containers can be picked up horizontally, which is especially important when loading or unloading in the guides of the ship's cells. A sliding assembly allows the gravity lifting point to be adjusted by 1.2 metres in both directions. When a container is released, the tower automatically returns to the centre position. Spreaders can also be equipped with a leveling device which prevents the crane operator from moving the tower in the wrong direction when adjusting the gravity point. Plus, a versatile six side-flipper arm configuration provides the crane operator with an improved ability to locate the containers and the side-flipper installation mounted on an inclined base eliminates the interference with cell guides when flippers are in the upper position.

Intelligent design has led to spreaders that have a high lifting capacity [41 metric ton in single-lift; 50 metric ton in twin-lift] while maintaining a low nominal tare weight. In addition, intelligent design leads to extended durability. On a Bromma spreader, main frame and flipper shock protection systems are designed to ensure the long term structural integrity of the spreader. To reduce shock on the main frame, a rubber damper system is between the main frame and the sliding telescopic beam. The telescopic drive system is equipped with a high grade shock absorption system to protect the structure and facilitate movement in the telescopic system. Finally, a rubber mounted landing buffer in the flipper system reduces shock if the flippers are hit in their upper position, extending the lifetime of the flipper arm. The telescopic system, electrical equipment and cable chain system are also well protected in the main frame. The Bromma advantage in spreader engineering and design is an important reason why Bromma is the first name in MHC and rail-mounted jib crane spreaders.

Lower Downtime, Increased Uptime

The optional purpose-designed Bromma SCS⁴ control and communications technology monitors spreader performance, reduces downtime events (through simplified wiring and fewer connections) and shortens downtime duration (through faster fault diagnosis) when faults occur. The latest generation of this technology, SCS⁴, is easy to use and simple to understand, due to an on-board touch-screen display. It also features the industry's first generation of spreader prognostics, an "early warning system" for future spreader faults. Spreader prognostics mean that terminals can now not only fix problems faster, but prevent faults (and downtime) from occurring. By delivering specific fault information [monitoring and recording each individual sensor and switch, instead of monitoring a fault group], the SCS⁴ touch-screen display provides technicians with very specific intelligence. Bromma Services believes this technology can reduce spreader downtime by 20% or more.

Bromma SCS⁴ is designed with the necessary ruggedness to survive high impact container handling and an operating protocol capable of smooth performance even in "dirty" terminal electrical environments. It easily interfaces with the crane PLC and is highly efficient in terms of cores, with cost reduction in cable and the crane cable reel as a result. The Bromma advantage in spreader technology is an important reason why Bromma spreaders move containers today in 97 out of the world's top 100 container ports.

- » **A SPREADER FLEET OF LESS RELIABLE SPREADERS IS A MORE** expensive spreader fleet. Less reliable spreaders lead to more capital being tied up in spreader spares – capital that could be invested in terminal growth producing initiatives.
- » **BROMMA SPREADERS ARE DESIGNED FOR THE TERRAIN** of the terminal, and remain productive, reliable and durable under conditions that are never ideal.
- » **IN THE END, BROMMA SPREADERS WILL MEAN A HIGHER RETURN** on your mobile harbour crane investment.

Building MHC Spreaders To Survive Real-World Container Handling

Bromma understands the familiar terrain of container handling – the tough physical environment in which terminals operate. High heat and humidity, driving rain, sleet or snow, blowing sand, wind-borne salt – such conditions would test any equipment, but in addition to this, spreaders are beat up constantly. Yet Bromma spreaders are designed for the terrain of the terminal, and remain productive, reliable and durable under conditions that are never ideal. Core commitments at Bromma, such as design simplicity, quality control, manufacturing integrity, and leading technology, are at the heart of minimizing spreader downtime, and helping terminals achieve faster ship turns and the fullest possible utilization of terminal berth capacity.

In addition, Bromma has the resources to invest for production success. Bromma develops its own testing systems, and its own production rigs, because Bromma understands that few physical environments are as challenging as container handling. Bromma spreaders are built to thrive in real-world container handling.

Designing With Details In Mind

Engineering excellence means careful attention to the little things in spreader design. The continuous improvement engineering philosophy of Bromma has led to mobile harbour crane spreaders that are engineered for higher performance. ISO floating twist locks have a floating capacity of 6 mm and both electrical interlock and mechanical blockading. The telescopic motion is controlled by proximity switches for a further simplified setting. MHC spreaders are prepared for installation of the Bromma TTDS (Twin Twenty Detection System), with the attachment already included in the standard configuration. Finally, all components are readily accessible and simplified design means fewer mechanical components, fewer spare parts and reduced maintenance.

Bromma Services: Solutions Where You Need It, When You Need It

Bromma mobile harbour yard crane spreaders are backed by the spreader industry's strongest service organization. At Bromma our mission is not only to provide the equipment terminals need, but the service and support you need. We stand behind our products across their lifecycle, and we never walk away from a problem. We also have exceptional resources – a sizeable organization, and a global reach – to support your spreaders in the field.

Bromma Services solutions include everything from quick availability of spare parts [spare parts shipped from depots around the world] to a full spectrum of preventive and corrective maintenance services. Bromma information services also include knowledge products derived from our advanced, pioneering SCS technology.

The Bromma mission begins with listening to our customers. Exceptional service and support is something our customers expect, and it is something we are committed to deliver.

Environmental Leadership In MHC Spreaders

In recent years environmental concerns have taken on increasing importance at terminals around the world. By achieving an excellent weight-to-lifting capacity ratio, Bromma spreaders reduce energy costs. Lower spreader weight means lower annual crane energy costs. As a Scandinavian company, Bromma has a history of environmental awareness, and Bromma R&D has for many years made engineering choices, in part, based on environmental concerns. Bromma is committed to making engineering choices that demonstrate environmental leadership in spreaders.

A Greater Return On Your Mobile Harbour Investment

Bromma sells more telescopic MHC spreaders each year – than all of its competitors combined. The reason? In the end, what sets Bromma apart from competitors is a major difference in lifetime value. A spreader fleet made up of less reliable spreaders is a more expensive spreader fleet. Less reliable spreaders require more service time and expense. They lead to more capital being invested in spreader spares – capital that could be re-allocated to terminal growth producing initiatives. Less reliable spreaders compromise the competitive position of your terminal, and put a ceiling on terminal revenue. They can weaken a terminal's relationships with its customers, and slow growth. In the end, operational performance determines which terminals compete and win, and which flatten or decline.

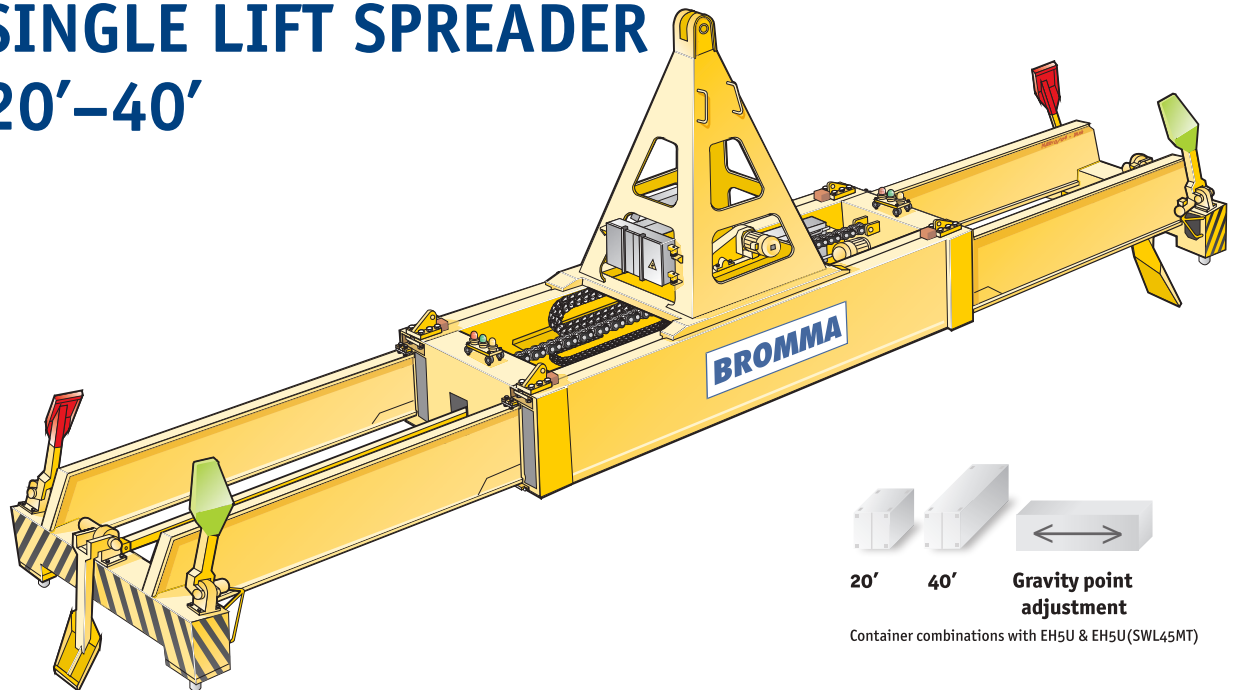
What determines true spreader value? Spreader value is not calculated simply by looking at initial spreader price, but by the performance and operating costs of a spreader over a lifetime – lifetime energy costs, lifetime service and maintenance costs, and most importantly, spreader reliability and productivity. This is why mobile harbour crane spreader fleet planning must be based on the full spectrum of value – cost to purchase, but also cost to operate –lifetime energy and maintenance costs, fleet durability, and spreader productivity.

Growing terminals need business partners who understand the metrics of performance and the necessity of achieving high capital return on investment. Bromma supports the success and growth of our terminal partners, through our focus on spreaders, our resources [Bromma builds nearly 2,000 spreaders per year] and the enterprise values at Bromma which are consistent with success.

In the end, Bromma spreaders will mean a higher return on your mobile harbour crane investment. This is why Bromma is the first name in mobile harbour crane spreaders.



EH5U & EH5U(SWL45MT), SINGLE LIFT SPREADER 20'–40'



20' 40' Gravity point adjustment
Container combinations with EH5U & EH5U(SWL45MT)

- » **TOWER DESIGN WITH ± 1.2 M** gravity point adjustment
- » **HIGH LIFTING CAPACITY**
- » **ADJUSTABLE FOR 20'** and 40' containers

- » **SIX SIDE-FLIPPER ARM CONFIGURATION**
- » **BROMMA STANDARD ISO** floating twistlock
- » **PROXIMITY SWITCHES FOR POSITIONING** of telescopic motion

- » **FLIPPER INSTALLATION FOR BETTER** protection of the flipper arm in cell guides
- » **SHOCK ABSORPTION BETWEEN** telescopic beam and main frame
- » **FULFILLS DESIGN CRITERIA AMONG** EN13001, DIN 15018 H2B4, FEM 1.001 and British Standard BS2573

The Bromma EH5U spreader is a single lift mobile harbour crane spreader with high lifting capacity combined with low weight. This means better performance with no impact on the load curve or the travelling of the crane. The EH5U comes with the Bromma standard ISO floating twistlocks with a floating capacity of 6 mm and both electrical interlock and mechanical blockading.

The telescopic motion is controlled by proximity switches for a further simplified setting, and the spreader is prepared for installation of the Bromma TTDS (Twin Twenty Detection System). To handle unevenly loaded containers, a sliding tower assembly allows the gravity lifting point to be adjusted by 1.2 meters in both directions. When a container is released, the tower will automatically return to the centre position.

A versatile six side flipper arm configuration provides the crane operator with the improved ability to locate the containers. The side-flipper installation mounted on an inclined base eliminates the interference with cell guides when flippers are in the upper position.

The electrical components and the cable chain system are well protected inside the tower. The hydraulic units are protected inside each end beam. The unit consists of a built-in tank, variable displacement piston pump, motor, valves and filter.

The spreader is made of high quality steel. It is designed in accordance with EN13001. All components can be easily assembled, adjusted, removed and are accessible for inspection and maintenance.

Technical Data EH5U & EH5U(SWL45MT)

» LIFTING CAPACITY

(According to EN13001)

- > EH5U
 - 41 metric tons evenly loaded
 - 41 metric tons $\pm 10\%$ eccentric load
- > EH5U (SWL45MT)
 - 45 metric tons evenly loaded
 - 45 metric tons $\pm 10\%$ eccentric load

» LIFTING LUGS

4 x 10 metric tons in the main frame and end beams

» WEIGHT

- > EH5U
 - About 9.0 metric tons (without extra equipment)
- > EH5U (SWL 45MT)
 - About 9.3 metric tons (without extra equipment)

» GRAVITY POINT ADJUSTMENT

± 1200 mm in 20 sec.

» TELESCOPIC MOTION

From 20' to 40' in approx. 30 sec.

» FLIPPER ARM SPEED

180° in 3–5 sec.

» TWISTLOCK ROTATION

ISO floating 90° in approx. 1 sec.

» HYDRAULICS

System pressure 100 bar
Piston pump pressure compensated
Maximum flow 2 x 15 l/min

» POWER SUPPLY

400/230 VAC 50 Hz
or otherwise as agreed

» MAX POWER CONSUMPTION

12.9 kW

» ELECTRICAL CABINET

Stainless steel IP66

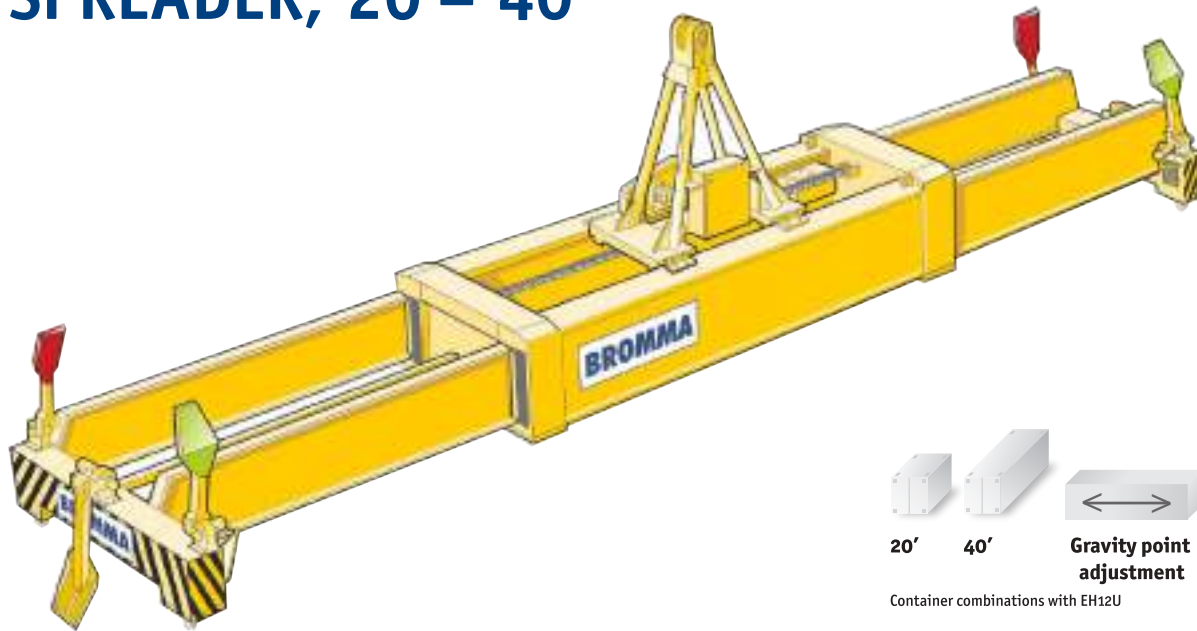
» CONTROL VOLTAGE

24 VDC

» SURFACE CONDITIONING

Sand-blasted SA 2.5
50–90um 2-component zinc epoxy
100um 2-component MIO pigmented
70um- Polyurethane

EH12U, SINGLE LIFT LIGHT WEIGHT SPREADER, 20'– 40'



- » **TOWER DESIGN WITH ± 1.2 M** gravity point adjustment
- » **LIFTING CAPACITY,** 35 metric ton, with low tare weight
- » **ADJUSTABLE FOR 20', 30' (OPTION)** and 40' containers

- » **SIX SIDE-FLIPPER ARM CONFIGURATION**
- » **BROMMA STANDARD ISO** floating twistlock
- » **LIGHTWEIGHT FOR USE ON CRANES** rated to lift less weight
- » **PROXIMITY SWITCHES FOR POSITIONING** of telescopic motion

- » **FLIPPER INSTALLATION FOR BETTER** protection of the flipper arm in cell guides
- » **SHOCK ABSORPTION BETWEEN** telescopic beam and main frame
- » **FULFILLS DESIGN CRITERIA AMONG** EN13001, DIN 15018 H2B3, FEM 1.001 and British Standard BS2573

The Bromma EH12U spreader is a single lift mobile harbour crane spreader with lifting capacity of 35 metric tons evenly loaded, combined with low weight. This means better performance with no impact on the load curve or the travelling of the crane. EH12U is a lightweight version of EH5U, ideal for use on cranes rated to lift less weight.

The EH12U comes with the Bromma standard ISO floating twistlocks with a floating capacity of 6 mm and both electrical interlock and mechanical blockading. The telescopic motion is controlled by proximity switches for a further simplified setting, and the spreader is prepared for installation of the Bromma TTDS (Twin Twenty Detection System).

To handle unevenly loaded containers, a sliding tower assembly allows the gravity lifting point to be adjusted by 1.2 meters in both directions. When a container is released, the tower will automatically return to the

centre position.

A versatile six side flipper arm configuration provides the crane operator with the improved ability to locate the containers. The side-flipper installation mounted on an inclined base eliminates the interference with cell guides when flippers are in the upper position.

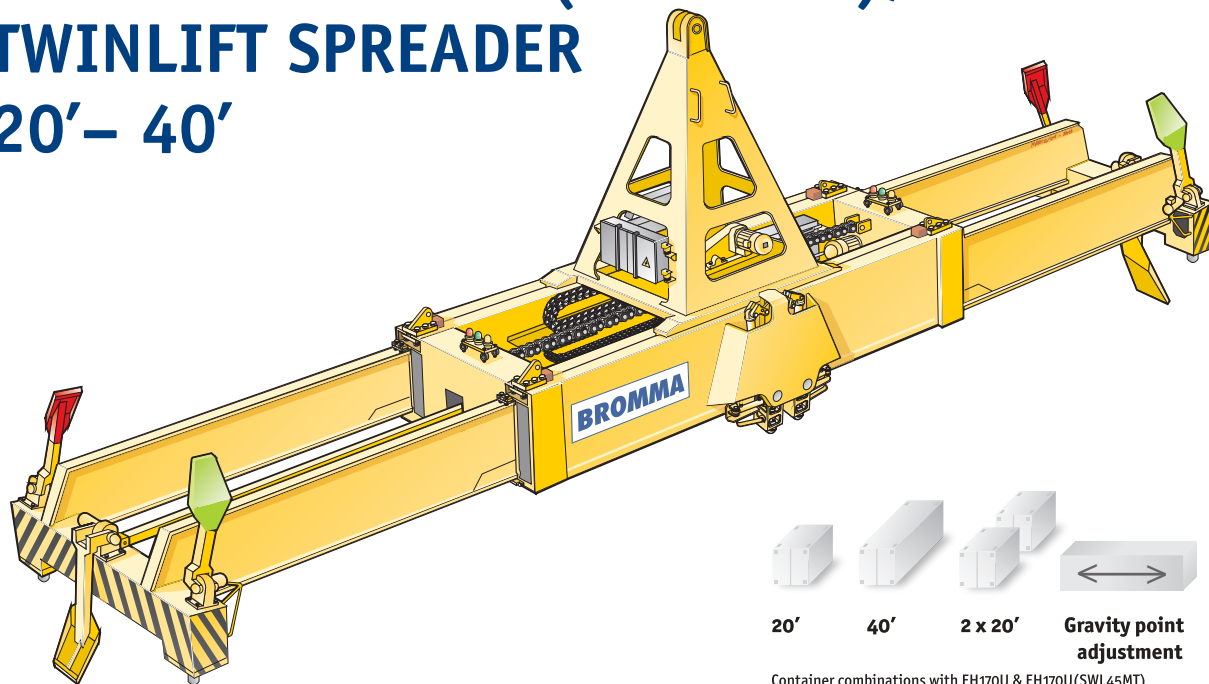
The electrical components and the cable chain system are well protected inside the tower. The hydraulic units are protected inside each end beam. The unit consists of a built-in tank, variable displacement piston pump, motor, valves and filter. The spreader is made of high quality steel. It is designed in accordance with EN13001. All components can be easily assembled, adjusted, removed and are accessible for inspection and maintenance.

Technical Data EH12U

- | | | | |
|--|---|--|--|
| <ul style="list-style-type: none"> » LIFTING CAPACITY
<i>(According to EN13001)</i>
35 metric tons evenly loaded
30.5 metric tons $\pm 10\%$ eccentric load » LIFTING LUGS
4 x 8.75 metric tons in the main frame and end beams » WEIGHT
About 7.8 metric tons
<i>(without extra equipment)</i> | <ul style="list-style-type: none"> » GRAVITY POINT ADJUSTMENT
± 1200 mm in 20 sec. » TELESCOPIC MOTION
From 20' to 40' in approx. 30 sec. » FLIPPER ARM SPEED
180° in 5 sec. » TWISTLOCK ROTATION
ISO floating 90° in approx. 1.5 sec. | <ul style="list-style-type: none"> » HYDRAULICS
System pressure 100 bar
Piston pump pressure compensated
Maximum flow 40 l/min » POWER SUPPLY
400/230 VAC 50 Hz
or otherwise as agreed » MAX POWER CONSUMPTION
7.5 kW at 50 Hz/9.0 kW at 60 Hz | <ul style="list-style-type: none"> » ELECTRICAL CABINET
Stainless steel IP66 » CONTROL VOLTAGE
24 VDC » SURFACE CONDITIONING
Sand-blasted SA 2.5
50-90um 2-component zinc epoxy
100um 2-component MIO epoxy
70um- Polyurethane |
|--|---|--|--|



EH170U & EH170U (SWL45MT), TWINLIFT SPREADER 20' – 40'



20' 40' 2 x 20' Gravity point adjustment
Container combinations with EH170U & EH170U (SWL45MT)

- » **TOWER DESIGN WITH ±1.2 M** gravity point adjustment
- » **HIGH LIFTING CAPACITY,**
- » **SIX SIDE-FLIPPER ARM CONFIGURATION**

- » **ADJUSTABLE FOR 20', 30' (OPTION), 40'** or two 20' containers
- » **BROMMA STANDARD ISO** floating twistlock
- » **PROXIMITY SWITCHES FOR POSITIONING** of telescopic motion

- » **FLIPPER INSTALLATION FOR BETTER** protection of the flipper arm in cell guides
- » **SHOCK ABSORPTION BETWEEN** telescopic beam and main frame
- » **FULFILS DESIGN CRITERIA AMONG** EN13001, DIN 15018 H2B4, FEM 1.001 and British Standard BS2573

The Bromma EH170U spreader is a twinlift mobile harbour crane spreader with high lifting capacity combined with low weight. This means better performance with no impact on the load curve or the travelling of the crane. The EH170U comes with the Bromma standard ISO floating twistlocks with a floating capacity of 6 mm and both electrical interlock and mechanical blockading.

The telescopic motion is controlled by proximity switches for a further simplified setting, and the spreader is prepared for installation of the Bromma TTDS (Twin Twenty Detection System). To handle unevenly loaded containers, a sliding tower assembly allows the gravity lifting point to be adjusted by 1.2 meters in both directions. When a container is released, the tower will automatically return to the centre position.

A versatile six side flipper arm configuration provides the crane operator with the improved ability to locate the containers. The side-flipper installation mounted on an inclined base eliminates the interference with cell guides when flippers are in the upper position.

The electrical components and the cable chain system are well protected inside the tower. One hydraulic unit is placed inside each end beam. Each unit consists of a built-in tank, variable displacement piston pump, motor, valves and filter. A third hydraulic unit for twin boxes is placed in the main frame. The spreader is made of high quality steel. It is designed in accordance with EN13001. All components can be easily assembled, adjusted, removed and are accessible for inspection and maintenance.

Technical Data EH170U & EH170U (SWL45MT)

» LIFTING CAPACITY

(According to EN13001)

> EH170U

- 41 metric tons evenly loaded
- 41 metric tons ±10% eccentric load

2 x 25 metric tons in twin mode

> EH170 (SWL45MT)

- 45 metric tons evenly loaded
- 45 metric tons ±10% eccentric load

2 x 32.5 metric tons in twin mode

» LIFTING LUGS

4 x 10 metric tons in the main beam and end beams

» WEIGHT

> EH170U

About 10.7 metric tons (without extra equipment)

> EH170U (SWL45MT)

About 11 metric tons (without extra equipment)

» GRAVITY POINT ADJUSTMENT

± 1200 mm in 20 sec.

» TELESCOPIC MOTION

From 20' to 40' in approx. 30 sec.

» FLIPPER ARM SPEED

180° in 3-5 sec.

» TWISTLOCK ROTATION

ISO floating 90° in approx. 1.5 sec.

» HYDRAULICS

System pressure 100 bar
Piston pump pressure compensated
Maximum flow 3 x 15 l/min

» POWER SUPPLY

400/230 VAC 50 Hz
or otherwise as agreed

» MAX POWER CONSUMPTION

15.9 kW

» ELECTRICAL CABINET

Stainless steel IP66

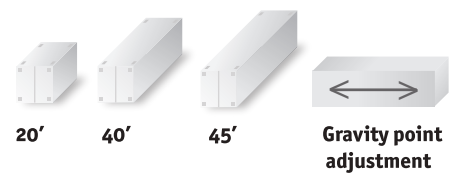
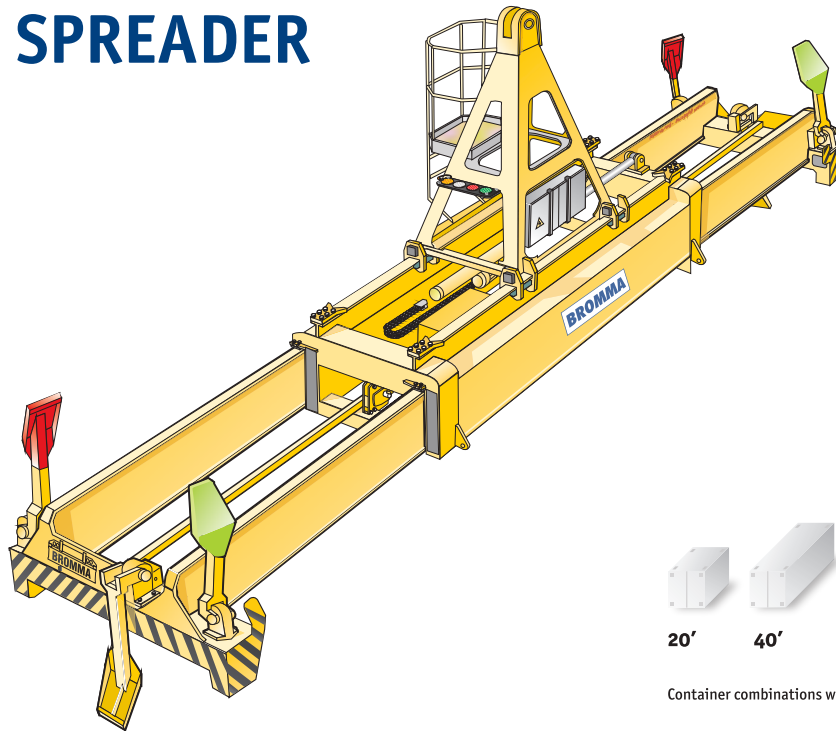
» CONTROL VOLTAGE

24 VDC

» SURFACE CONDITIONING

Sand-blasted SA 2.5
50-90um 2-component zinc epoxy
100um 2-component MIO epoxy
70um- Polyurethane

MSX45, 20'–45' SINGLE LIFT SPREADER



Container combinations with MSX45

- » **TOWER DESIGN WITH ± 1.25 M** gravity point adjustment
- » **HIGH LIFTING CAPACITY**

- » **ADJUSTABLE FOR 20', 30' (OPTION), 40' and 45' containers**

- » **SIX SIDE-FLIPPER ARM CONFIGURATION**

- » **BROMMA STANDARD ISO** floating twistlock
- » **ENCODER FOR POSITIONING** of telescopic motion

- » **FLIPPER INSTALLATION FOR BETTER** protection of the flipper arm in cell guides
- » **SHOCK ABSORPTION BETWEEN** telescopic beam and main frame
- » **FULFILLS DESIGN CRITERIA AMONG** EN13001, DIN 15018 H2 B4, FEM 1.001 and British standard BS2573

The Bromma MSX45 spreader is a single lift mobile harbour crane spreader with high lifting capacity combined with low weight. This means better performance with no impact on the load curve or the travelling of the crane. The MSX45 extends from 20 foot to 45 foot with an intermediate stop at 40 foot. Six powerful hydraulically operated flipper arms are mounted at the ends and sides of the spreader to provide efficient gathering on to a container even when the spreader is rotating.

The main frame of the spreader is connected to the crane through a sliding tower assembly. This enables the center of gravity lifting point to be moved a maximum of 1.25 meters towards each end of the spreader, so that unevenly loaded containers can be picked up horizontally. After unlocking an unevenly loaded container, the sliding tower assembly automatically returns to the central position.

The telescoping system is driven by means of a hydraulic motor connected to an endless chain, which is fitted with a block of springs to absorb shock loads. The flexibility in the system allows small changes in spreader length when handling distorted containers. The electrical components and the cable chain system are well protected inside the tower. The hydraulic unit is entirely enclosed within the main frame. The unit consists of a variable displacement piston pump, tank, motor, valves and filter.

The optional safety platform on the tower for easy access to mains power plug and lifting shaft minimizes the risk of injuries. The spreader is made of high quality steel. It is designed in accordance with EN13001. All components can be easily assembled, adjusted, removed and are accessible for inspection and maintenance. Structures are proof-tested at the plant with a minimum 50% overload.

Technical Data MSX45

» LIFTING CAPACITY

(According to EN13001)
41 metric tons evenly loaded
41 metric tons $\pm 10\%$ eccentric load

» LIFTING LUGS

4 x 10 metric tons in the main frame and end beams

» WEIGHT

About 9.6 metric tons
(without extra equipment)

» GRAVITY POINT ADJUSTMENT

± 1250 mm in 20 sec.

» TELESCOPIC MOTION

From 20' to 45' in approx. 25 sec.

» FLIPPER ARM SPEED

180° in 3-5 sec.

» TWISTLOCK ROTATION

ISO floating 90° in approx. 1 sec.

» HYDRAULICS

System pressure 100/ 160 bar
Piston pump pressure compensated
Maximum flow 60 l/min
Shock valve setting telescoping 110 bar

» POWER SUPPLY

400/230 VAC 50 Hz
or otherwise as agreed

» MAX POWER CONSUMPTION

7.5 kW

» ELECTRICAL CABINET

Stainless steel IP66

» CONTROL VOLTAGE

24 VDC

» SURFACE CONDITIONING

Sand-blasted SA 2.5
50-90um 2-component zinc epoxy
100um 2-component MIO pigmented
70um- Polyurethane



