

YTS45 Marathon™ Yard Crane Spreader



The spreader shown is equipped with extra accessories

The Bromma YTS45 Marathon is a heavy-duty yard crane spreader equipped with retractable twinlift unit for handling two 20 foot containers at the same time, or one 40 or 45 foot container. The twinlift spreader can move two fully loaded 20 foot containers from a spacing of 0 to 1 metre while they are locked onto the twistlocks and 1.6 metres under 2 x 25 tonnes load. Low noise level and robust design are some other advantages.

The telescopic spreader is of a rectangular frame construction enabling easy location on containers. As a standard, the spreader is equipped with 4 x 10 tonnes lifting lugs in the corners of the end beams for heavy lifts and for handling damaged containers.

All motions of the spreader are controlled from the driver's cab and there are provisions made for signals in the cab indicating the position of the twistlocks and landing pin status. Control

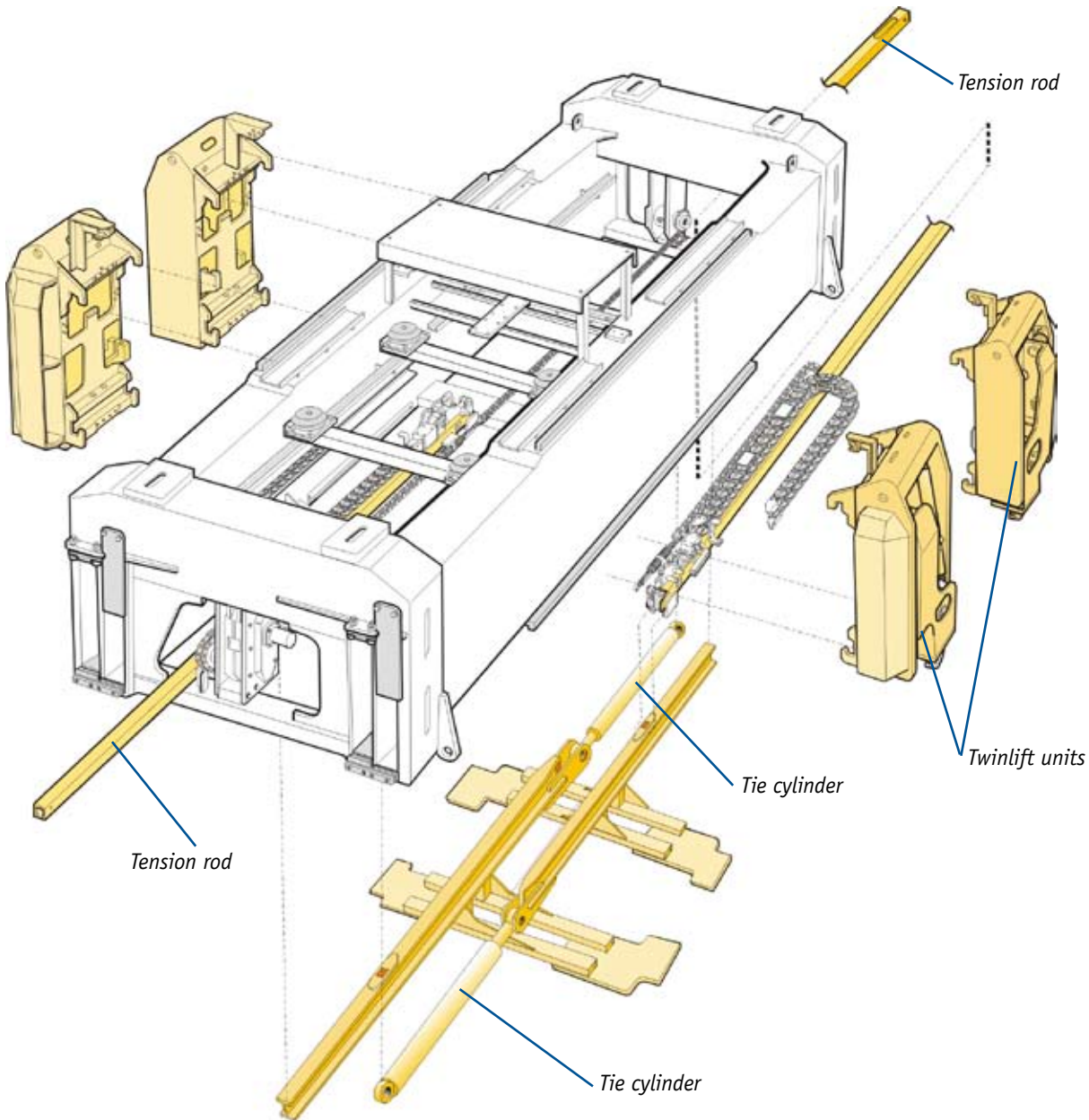
valves for twistlock and guide arms are mounted at the end beams to simplify maintenance and to minimize the number of hydraulic hoses in the cable chain system.

The electrical components and the cable chain system are well protected inside the main frame. The hydraulic power pack is entirely enclosed within the main frame to ensure maximum protection. The complete hydraulic unit is shock mounted in one sturdy frame with protective covers.

Made of high quality steel, the standard YTS45 Marathon spreader provides high lifting capacity with a low nominal tare weight thanks to the box design of the telescoping beams and the main frame. The spreader is designed in accordance with DIN 15018 H₂B₄. All components can be easily assembled, adjusted, removed and are accessible for inspection and maintenance.

MAJOR FEATURES

- Retractable twinlift
- High lifting capacity
- Recessed end beams allow handling of lashing frames and hatch covers
- Robust and well proven design
- Long economic life
- Bolted side guides
- Fulfils design criteria among DIN 15018 H₂B₄, FEM 1.001 and British Standard BS 2573



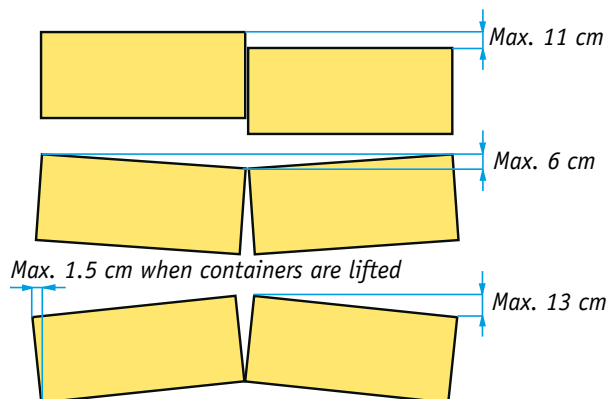
The twinlift unit mounted at the centre of the main frame consists of four individual housings with locking devices. Each twistlock house is raised and lowered with a separate cylinder, but works simultaneously, i.e. the twinlift units are either up or down. The spacing movement can be done at anytime in the crane cycle that means there is no stopping time to change the container spacing.

The twinlift spreader can move two fully loaded 20 foot containers from a spacing of 0 to 1 metre while they are locked onto the twistlocks and 1.6 metres under 2 x 25 tonnes load. The movement is performed by sturdy cylinders connected to the tension rods, well protected inside the spreader's main frame. No holes are required in high-stress structural areas.

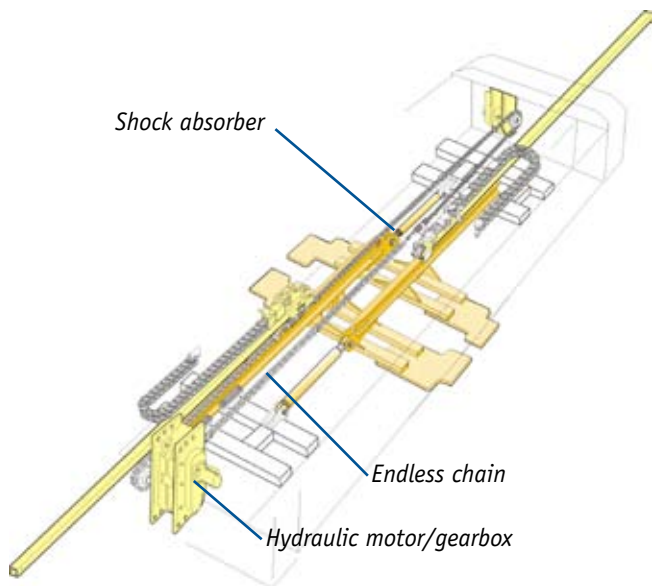
When the twin boxes are linked to the tension rods, two sturdy cylinders in the main frame helps to pull apart or

slide together the two 20 foot containers. The tension rod is linked to the twin box pair by the latch.

The twinlift system is designed in such a way that certain irregularities between the two 20 foot containers are accepted as shown below.



TELESCOPING SYSTEM



The telescoping system is driven by means of a hydraulic motor and a reduction gear box connected to an endless chain. The endless chain is fitted with a Bromma design

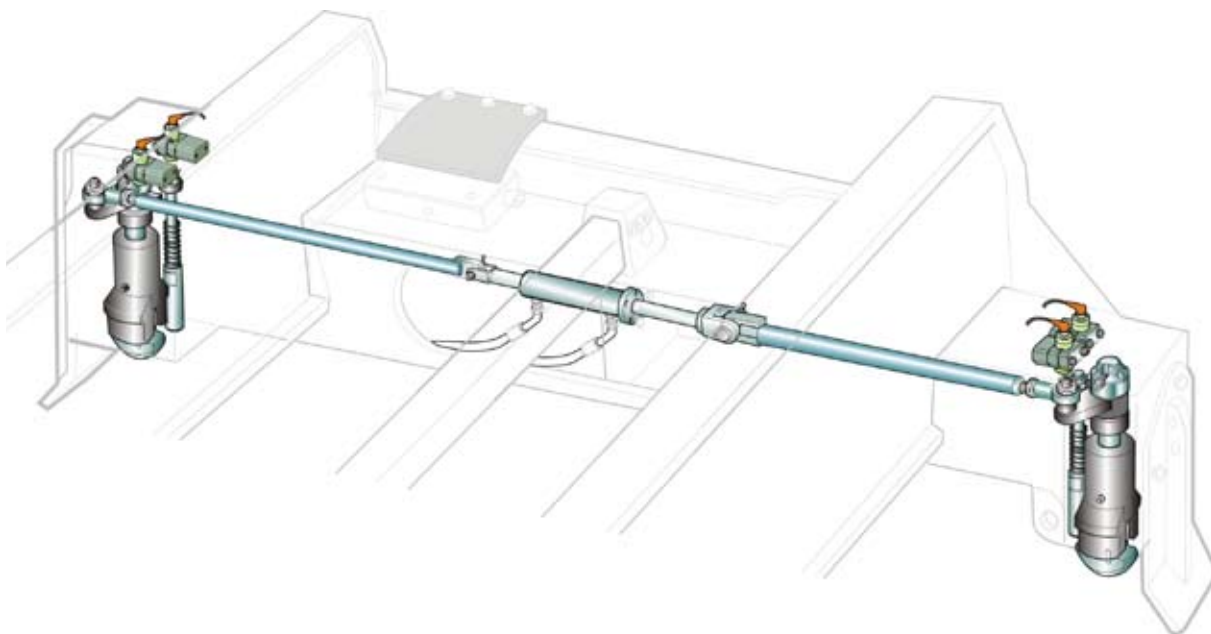
shock absorber at both ends. The shock absorber is designed to dampen the effects of impact on the spreader structure and components due to loads imposed to the spreader ends. The telescopic beams are running on sliding pads.

The telescoping system's ability of absorbing extreme loads mechanically provides the end user with a highly reliable spreader with increased life even under extreme load conditions.

The flexibility in the system allows for changes in spreader length up to ± 15 mm when handling distorted containers.

This system stops accurately in all positions. It is durable and strong but has low weight, is easy to maintain and has long service intervals. The telescoping positions are controlled by an absolute encoder placed on the pedestal bearing.

TWISTLOCK SYSTEM



The spreader is latched onto containers by means of hydraulically operated floating ISO twistlocks.

The double acting cylinder operates the two twistlocks mounted at the end beams. Proximity switches are used for locking, unlocking and landing pin function. Sensors indicate if the two twistlocks are closed or open and also their positions. Each twistlock has a separate sensor indicating landing. The floating range is ± 6 mm in all directions. Each twistlock will incorporate a mechanical interlock to prohibit

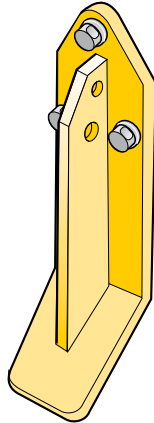
unlock operation when under load. The twistlock pins are proof load tested to 37 tonnes.

LED type signal lights are placed on each end of the spreader's main frame (optional), showing the driver when:

- the twistlocks are open,
- the spreader is properly engaged in the corner castings,
- all twistlocks are properly locked in the corner castings.
- the spreader is in twin mode (blue light).

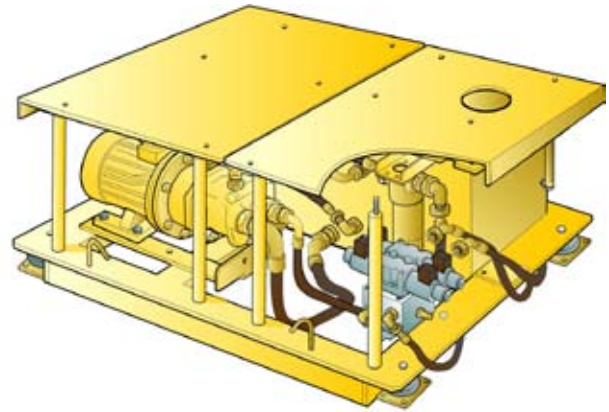
Corresponding signals are provided to the crane cabin.

GUIDE ARMS



The spreader is equipped with four fixed guide arms to guide the spreader onto the container. These are located one at each end of the long side of the spreader. The guide arms are fastened by means of bolts and nuts on a slotted adaptor. The bolts can be slid out of the slot if sheared off. Several guide arm combinations are available.

HYDRAULIC POWER PACK



The complete hydraulic unit consists of a tank, a pump, an electrical motor, valves and a filter, altogether shock mounted in a sturdy frame with protection covers.

The foot and flange mounted three phase cage induction electric motor corresponds to the major worldwide standards. The motor gives 7.5 kW at 50 Hz and 9 kW at 60 Hz and the protection grade is IP 55 (suitable for most climates).

To achieve maximum durability a robust piston pump is used. The pump has low noise level and is easy to service.

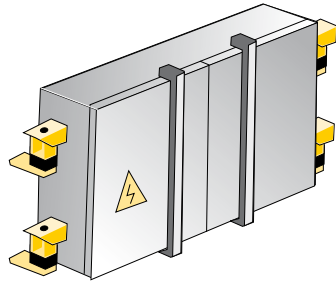
The oil tank has an open design and is easy to clean and inspect. The tank holds 150 litres and the oil level is clearly shown in the sight glass.

The hydraulic oil is filtered through an externally mounted 10 micron absolute rated line filter. Additionally, another 10 micron absolute rated return line filter is mounted inside the oil tank. The hydraulic oil meets the requirements of ISO code 17/15/13 cleanliness classification.

The power pack is designed to work under various conditions and the oil type has to be chosen according to local demands.

Oil is distributed to hydraulic valves on the main frame to control the telescoping. Oil is also distributed to the end beams via hoses that are well protected inside the cable chains and tension rods. The hydraulic valves for twist-locks are placed in the end beams.

ELECTRICAL SYSTEM



The power required to operate the spreader's electrical components is obtained from the crane. All electrical components on the spreader are designed to withstand loads imposed during container handling operations and suitable for a marine environment.

The spreader is supplied with CANopen slave units based on a standard field bus system. This enhances the possibility of monitoring each I/O point and reduces the number of cables needed and the replacement time for connecting sensors and actuators to the controls.



CANopen box

The electrical components are mounted in a stainless steel cabinet, IP65. All cables are well protected in cable chains.

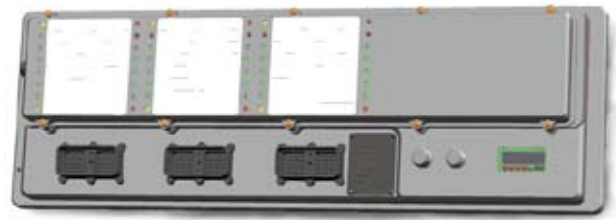
For reliability reasons Bromma recommends the use of 24 VDC on all controls.

The electrical safety features to protect and ensure proper handling of containers are as follows:

- Spreader cannot be hoisted unless all four twistlocks are fully "Locked" or "Unlocked". (Provided the crane controls have a hoist permit safety circuit.)
- Spreader twistlocks can only be "Locked" or "Unlocked" when all four corners are properly seated on a container or hatch cover.

As a monitoring and diagnostic system, Bromma recommends the use of the SCS² Spreader Communications System. However, a PLC system or a relay based system can also be used.

MONITORING AND DIAGNOSTIC SYSTEM SCS²

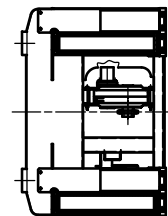
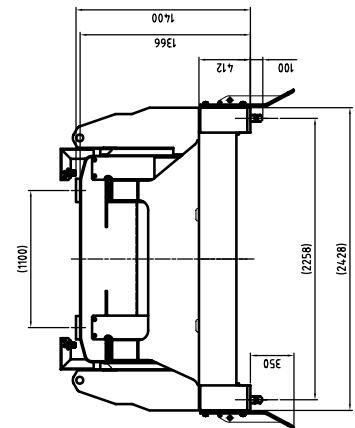
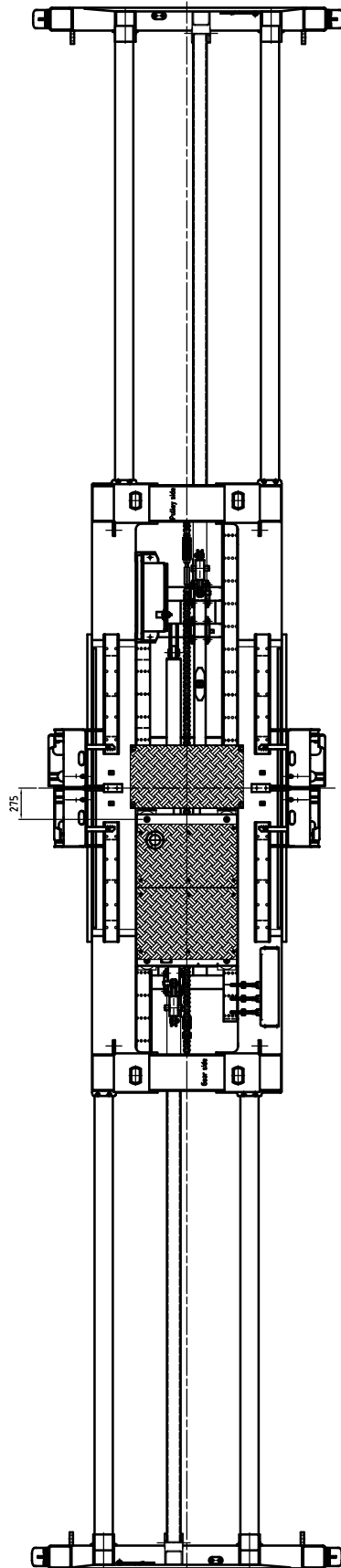
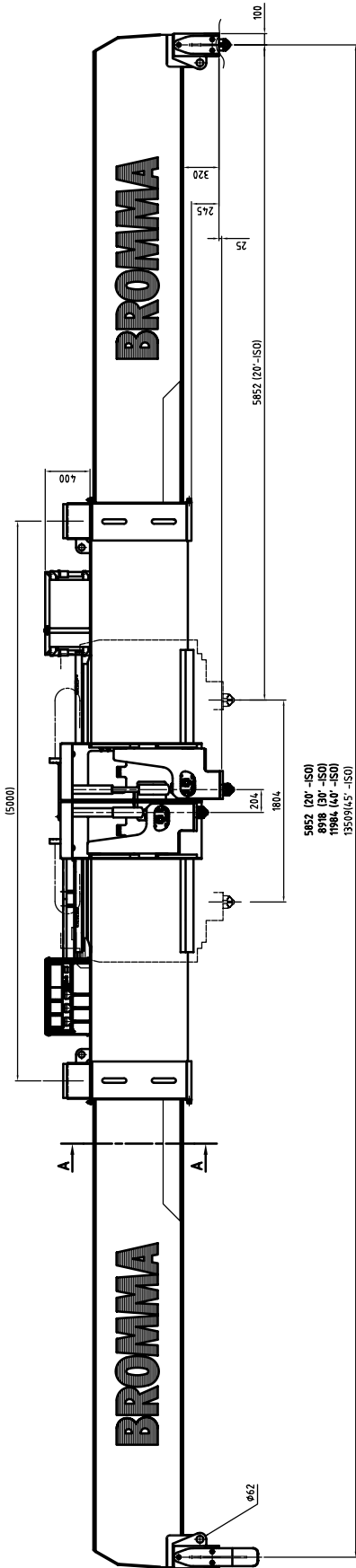



For monitoring and diagnosing the YTS45 spreader, Bromma recommends the SCS² Spreader Communications System. It is comprised of physical nodes for the crane and spreader, a crane-spreader communications protocol, sensors and switches, as well as two kinds of software. The SCS² can connect to a wide variety of host controllers including PLCs, DCS and PC-based control systems.

The SCS² system delivers advanced monitoring and diagnostic information, which means that service staff can react faster to fault events. Instead of investigating possible sources of fault events one by one, the SCS² gives service technicians specific, precise information, enabling them to quickly solve the problems occurred.

The SCS² system simplifies handling of the spreader and prevents fault events. It also eliminates or minimizes junction boxes, terminal strips, terminal ends, relays, and DIN rails – areas where wire breakage is common. Conventional wiring is reduced.

DIMENSIONAL DRAWINGS – YTS45



TECHNICAL DATA YTS45	
	
Lifting capacity: (According to DIN 15018 H ₂ B ₄)	<p>One container 51 tonnes (50 LT) ±10% eccentric loading</p> <p>Twinlift of two 20' containers 2 x 32.5 tonnes (32 LT) evenly loaded</p> <p>Lifting lugs 4 x 10 tonnes in the main frame and end beams</p>
Separating capacity:	<p>0–1600 mm up to 2 x 25 tonnes 20' containers</p> <p>0–1000 mm up to 2 x 32.5 tonnes 20' containers</p>
Weight:	10.5 tonnes (without extra equipment)
Telescopic motion:	From 20' to 45' in approximately 30 seconds
Guide arms:	Fixed
Twistlock rotation:	90° in approximately 1.5 second
Twinlift unit up/down:	Approximately 8 seconds
Twin expand/retract:	Approximately 30 seconds
Hydraulics:	<p>System pressure approximately 120 bar</p> <p>Piston pump pressure compensated</p>
Power supply:	400/230 VAC 50 Hz or otherwise as agreed
Max power consumption:	7.5 kW
Control voltage:	24 VDC
Electrical cabinet:	Stainless steel IP65
Surface conditioning:	<p>Sand-blasted SA 2.5</p> <p>50 microns 2-component zinc epoxy</p> <p>70 microns 2-component MIO epoxy</p> <p>40 microns 2-component acrylic epoxy</p> <p>40 microns 2-component acrylic epoxy</p>
Design criteria:	DIN 15018 H ₂ B ₄ ; FEM 1.001; British Standard BS 2573
Manuals:	Full service and repair manual supplied
Warranty:	1 year

For nearest contact and latest information on Bromma products and services, visit the Bromma website at www.bromma.com

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