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PRODUCT INFORMATION

EH170U Twinlift Mobile Harbour Crane Spreader

The spreader shown is equipped with extra accessories

The Bromma EH170U spreader is a twinlift mobile harbour crane spreader with high lifting capacity of 41 tonnes in single lift and 50 tonnes in twin lift 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 and the side-flipper installation mounted on an inclined base eliminates the interference with cell guides when flippers are in the upper position.

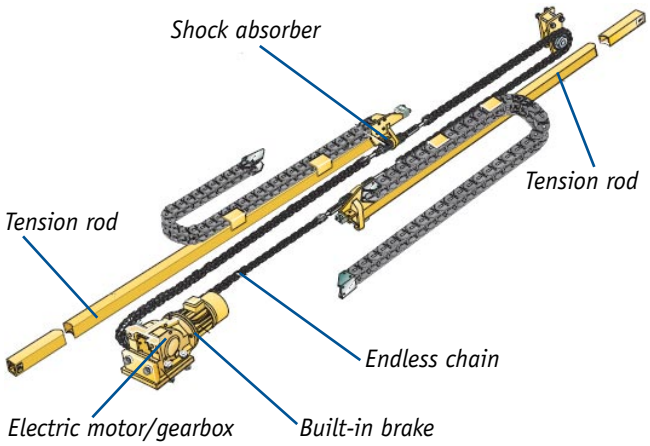
The electrical components and the cable chain system are well protected inside the tower. Two hydraulic units are placed inside each end beam. Each unit consists of a built-in tank, variable displacement piston pump, motor, valves and filter. A third hydraulic unit for twin boxes is placed in the main frame.

The spreader is made of high quality steel. It is designed in accordance with DIN 15018 H_2B_4. All components can be easily assembled, adjusted, removed and are accessible for inspection and maintenance.

MAJOR FEATURES

- **Tower design with ±1.2 m gravity point adjustment**
- **High lifting capacity, 41 tonnes in single lift and 50 tonnes in twin lift, with low tare weight**
- **Adjustable for 20', 40' or two 20' 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**
- **Fulfils design criteria among DIN 15018 H_2B_4, FEM 1.001 and British Standard BS 2573**

Telescoping System



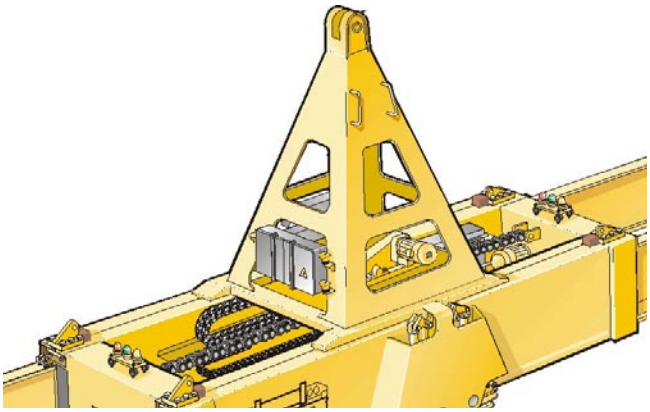
The telescoping system is driven by means of an electric motor and a reduction gearbox connected to an endless chain. The endless chain is fitted with a Bromma design shock absorber at both ends. The shock absorber is designed to dampen the effects of impact on the spreader structure and components due 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 (or proximity sensors, option) placed on the pedestal bearing.

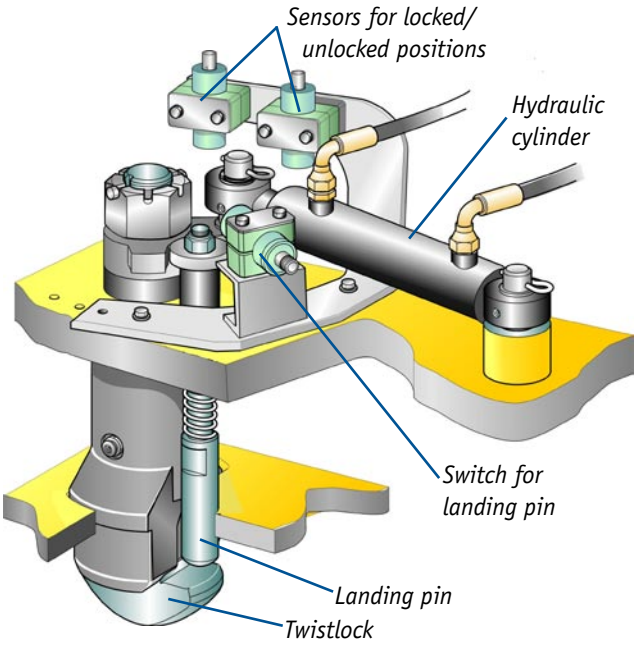
Gravity Point Adjustment



On the spreader main frame a tower, driven by an electric motor and gearbox, is sliding on robalon plates allowing smooth operation. This enables the centre of gravity lifting point to be moved a maximum of 1.2 meters towards each end of the spreader so that unevenly loaded containers can be picked up horizontally, which is particularly important when loading or unloading in the guides in ships' cells.

The gravity point adjustment is calculated to compensate a ±10% eccentric load of a fully loaded 40 foot container.

Twistlock System



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

Each twistlock is operated with a separate hydraulic cylinder. The cylinder rotates the twistlock, and two sensors indicate the position of the twistlock – Locked or Unlocked.

A spring loaded landing pin near each twistlock is pushed up into the twistlock housing when the spreader is landed

on the container. When the spreader is properly landed on a container, the landing pin will activate a proximity switch. The twistlocks can only be turned when all the coners of the spreader are landed.

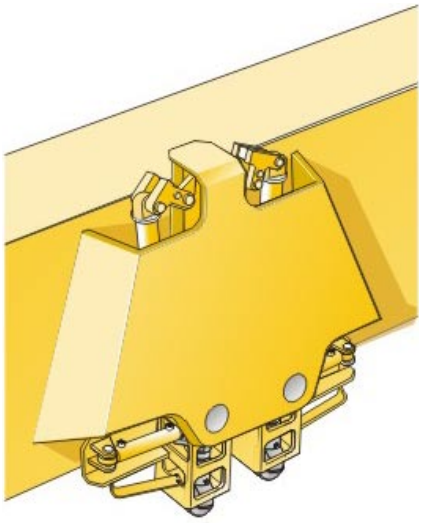
The floating range is ±6 mm in all directions. Each twistlock will incorporate a mechanical interlock to prohibit unlock operation when under load. The twistlock pins are proof load tested to 37 tonnes.

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

a) the twistlocks are open,
b) the spreader is properly engaged in the corner castings,
c) all twistlocks are properly locked in the corner castings.
d) the spreader is in twin mode.
e) the tower is in the mid position.

Corresponding signals are provided to the crane cabin.

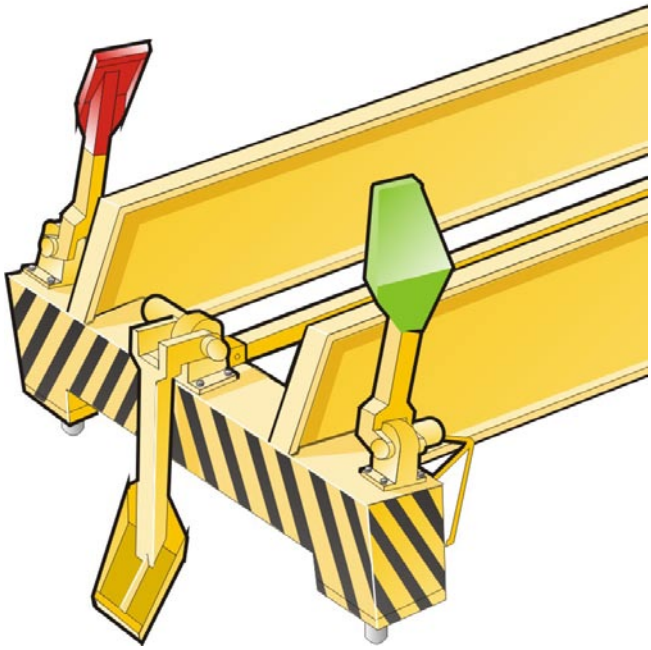
Twinlift Unit



The twinlift unit mounted at the centre of the main frame consists of four individual housings with locking devices. Each twistlock is operated with separate cylinder and switch system for lock/unlock and landing pin function. Each twistlock house is moved with a separate cylinder, but works simultaneously. (All twinlift twistlocks up or down).

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

Flipper Arms



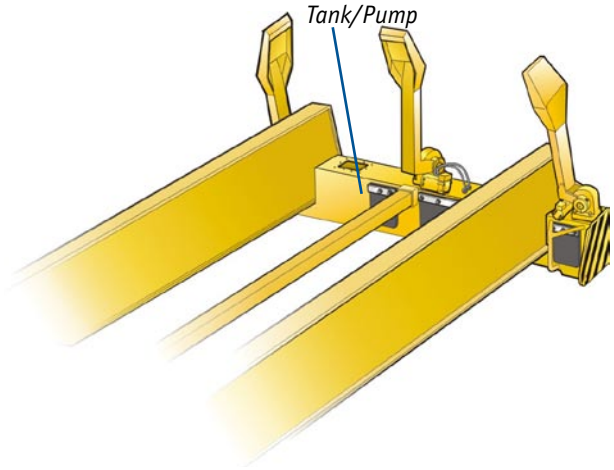
Six retractable aligning arms, flippers (two at each longside and one at each gable end) are fitted to the spreader. They are of a strong construction and driven by a powerful hydraulic motor which enables easy and fast location of the spreader onto containers.

The opening torque for each arm is about 2,000 Nm and they provide a gathering capacity of about 23 cm. The arms are always under pressure and each arm is provided with a shock relief valve, which opens at pressure that surpasses the working pressure with approximately 40 bars. As soon as shockload ends the arms return to vertical position.

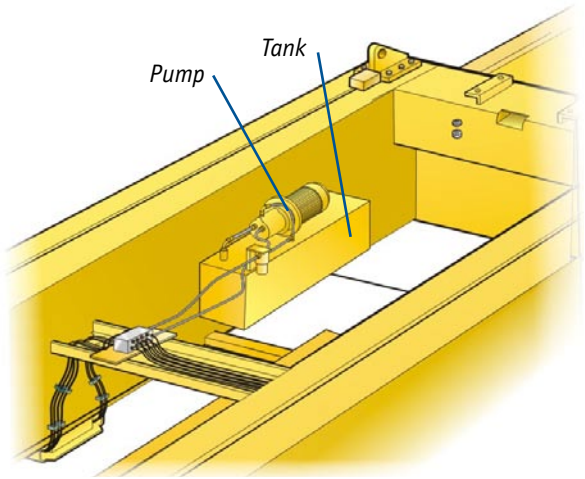
The arms can be operated individually, in pairs or all at the same time.

Hydraulic Units

There are three hydraulic units, one in each end beam for the flippers and end beam twistlocks, and one in the main frame for the twinlift twistlocks.



The two hydraulic units in the end beams are protected inside each end beam. The unit consists of a built-in tank, variable displacement piston pump, motor valves and filter. The filter cap is fitted with a pressure relief valve plus or minus 0.14 bar to allow expansion and contraction of air inside the tank.



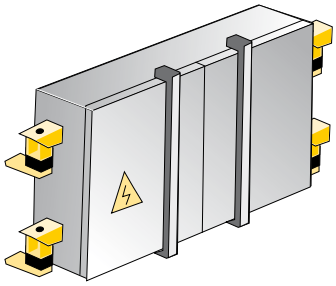
The hydraulic unit in the main frame consists of a tank, a robust piston pump, an electrical motor, valves and a filter, altogether shock mounted.

The hydraulic components used are designed to work at over 200 bar, but normal working pressure is 100 bar. The hydraulic valves for flipper movements are solenoid operated and can be tested by hand operating.

The hydraulic oil is filtered through an externally mounted 10 micron absolute rated pressure filter.

Each oil tank holds 50 litres and the oil level is clearly shown in the sight glass. The hydraulic oil meets the requirements of ISO code 17/15/13 cleanliness classification.

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. The electrical cabinet is mounted on heavy-duty rubber shock absorbers and is well protected being placed on the tower. Relays, transformers, circuit breakers, timers, hour counters and sockets are mounted in this cabinet. 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.
- The spreader has a blockading system to prevent telescoping if the twistlocks are locked or if the four blockading pins are in the 'up' position.

As a monitoring and diagnostic system, Bromma recommends the use of the SCS^2 Spreader Communications System. However, a PLC system or a relay based system can also be used.

Monitoring and Diagnostic System SCS^2

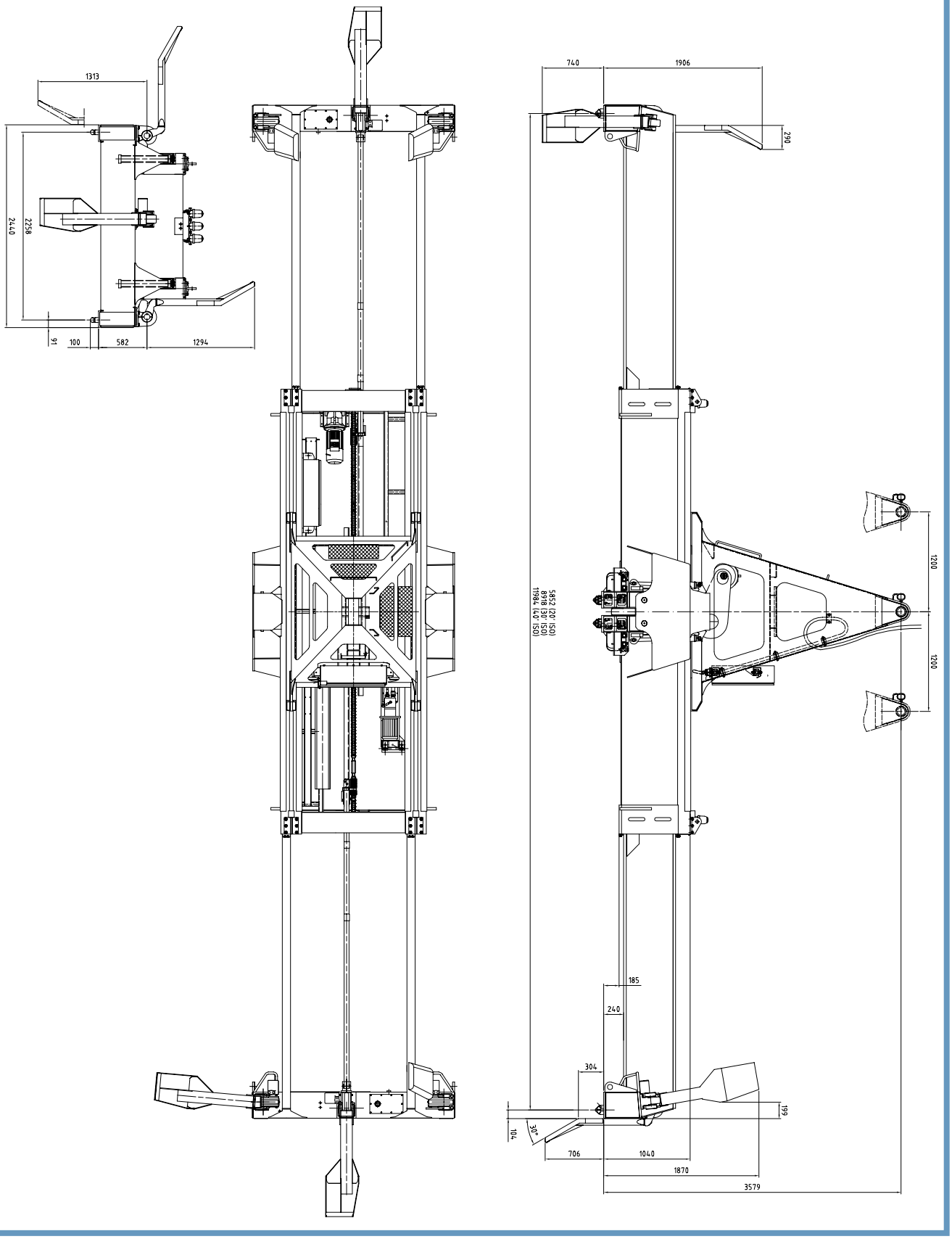
For monitoring and diagnosing the EH170U mobile harbour crane spreader, Bromma recommends the SCS^2 Spreader Communications System. It is comprised of physical nodes for the crane and spreader, a crane-spreader communications protocol, sensors and switches, as well as two kinds of software. The SCS^2 can connect to a wide variety of host controllers including PLCs, DCS and PC-based control systems.

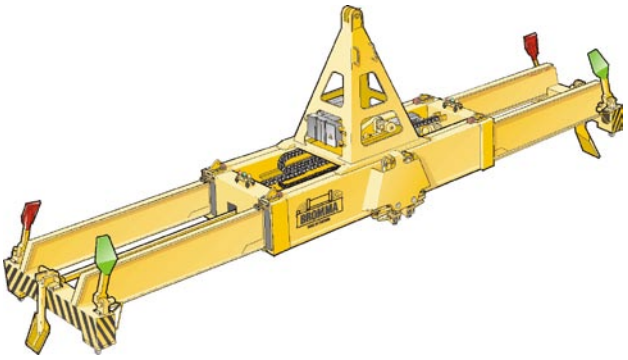
The SCS^2 system delivers advanced monitoring and diagnostic information, which means that service staff can react faster to fault events. Instead of investigating possible sources of fault events one by one, the SCS^2 gives service technicians specific, precise information, enabling them to quickly solve the problems occurred.

The SCS^2 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.

The SCS^2 system comes as standard with the Bromma mobile harbour crane spreaders.

Dimensional Drawings – EH170U



TECHNICAL DATA	EH170U
	
Lifting capacity: (According to DIN 15018 H_2B_4)	Twistlocks 41 tonnes evenly loaded Twistlocks 41 tonnes ±10% eccentric load Twistlocks 2 x 25 tonnes in twin mode Lifting lugs 4 x 10 tonnes in the main beam and end beams
Weight:	10.7 tonnes (without extra equipment)
Gravity point adjustment:	±1.2 meters in 20 seconds
Telescopic motion:	From 20′ to 40′ in approximately 30 seconds
Flipper arm speed:	180° in 3–5 seconds
Twistlock rotation:	ISO floating 90° in approximately 1.5 seconds
Hydraulics:	System pressure 100 bar Piston pump pressure compensated Maximum flow 50 l/min
Power supply:	400/230 VAC 50 Hz or otherwise as agreed
Max power consumption:	15.9 kW
Electrical cabinet:	Stainless steel IP65
Control voltage:	24 VDC

TECHNICAL DATA	EH170U
Surface conditioning:	Sand-blasted SA 2.5 50 microns 2-component zinc epoxy 70 microns 2-component MIO epoxy 40 microns 2-component acrylic epoxy 40 microns 2-component acrylic epoxy
Design criteria:	DIN 15018 H_2B_4; FEM 1.001; British Standard BS 2573
Manuals:	Full service and repair manual supplied
Warranty:	1 year

This specification is subject to alterations without prior notice.

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