

ROTO 3850 - XG



The supremacy of ideas.

# ROTO

**38.16 S**

**38.16**

**38.14 S**

**38.14**

**50.10 S**







# VERSATILITY AND EFFICIENCY

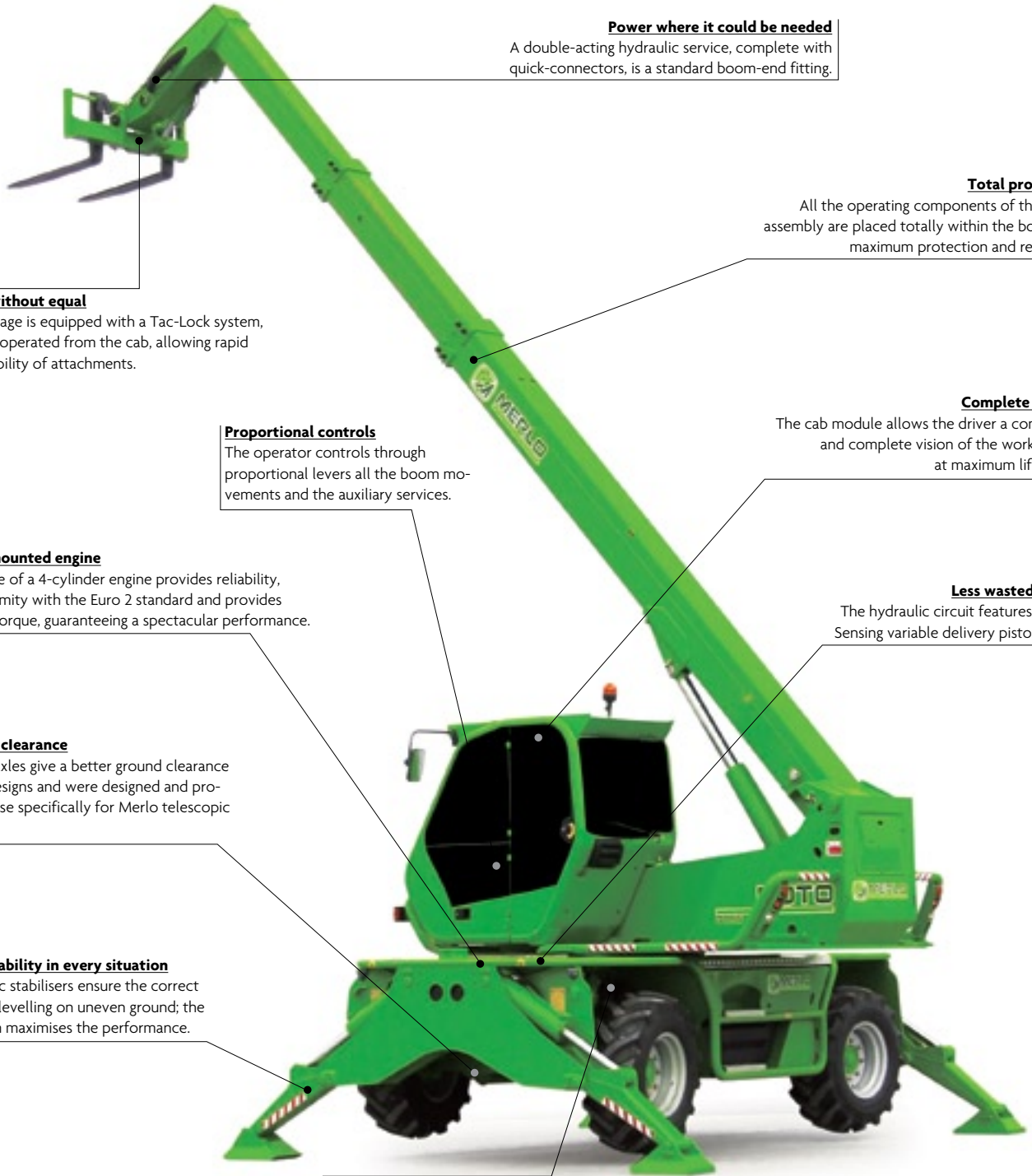


## **High-tech excellence**

The new ROTO Compact series slewing handlers reinforce the supremacy of Merlo's technology and give a glimpse of the future. Innumerable design features increase operating flexibility and produce an extraordinary on-site performance, assuring every user of a winning solution, whatever the application.

The advanced safety devices, the Load-Sensing hydraulic system and the hydropneumatic suspension add up to another incomparable solution from Merlo. It's part of a continuing drive to make machines rich in technology, the results of continuous research and innovation, with the guarantee of more than 40 years experience.

# EXCLUSIVE FEATURES



### **Power where it could be needed**

A double-acting hydraulic service, complete with quick-connectors, is a standard boom-end fitting.

### **Total protection**

All the operating components of the boom assembly are placed totally within the boom, for maximum protection and reliability.

### **Versatility without equal**

The fork carriage is equipped with a Tac-Lock system, hydraulically operated from the cab, allowing rapid interchangeability of attachments.

### **Proportional controls**

The operator controls through proportional levers all the boom movements and the auxiliary services.

### **Complete control**

The cab module allows the driver a continuous and complete vision of the working area at maximum lift height.

### **Side mounted engine**

The use of a 4-cylinder engine provides reliability, conformity with the Euro 2 standard and provides more torque, guaranteeing a spectacular performance.

### **Less wasted energy**

The hydraulic circuit features a Load-Sensing variable delivery piston pump.

### **High ground clearance**

'Portal' type axles give a better ground clearance than other designs and were designed and produced in-house specifically for Merlo telescopic handlers.

### **Maximum stability in every situation**

Four hydraulic stabilisers ensure the correct position and levelling on uneven ground; the safety system maximises the performance.

### **Hydropneumatic suspension (S models)**

A high technology choice which guarantees ride comfort and best operation when working on tyres.

The Roto continues Merlo's legendary 360° visibility around the machine, particularly of both front and rear working areas.

The main structure of the machine is surrounded by the 'Ring of Steel' - a solid 70 mm diameter steel bar - which is a structural part of the chassis, and protects against site damage.

For Merlo, specialisation means applying research into innovative solutions in all the small detailed aspects of production: a production concept that has created a winning machine.





The new ROTO Compact models offer a load capacity up to 5000 kg and a working height of 16 meters. These exclusive features ensure maximum performance and comfort levels in even the most demanding operating environments.

**Safety without compromise**

The on-board safety system ensures an automatic and continuous assessment of machine stability in every operating condition, leaving the operator free to concentrate on other parts of the job.

**Ergonomic controls and clear instrumentation**

All the controls are easily reached and operate intuitively. The instrument panel affords an immediate and easy check of all the machine's essential operating parameters.

**High level comfort**

Award-winning operating comfort. The operator has the biggest cab in the market and an exclusive hydro-pneumatic suspension system for the axles (S models), particularly effective at high travel speeds.

**Amazing manoeuvrability**

Integrated design of all components leads to incomparable compactness. The ease of handling and precise positioning, together with a lively engine, give exceptional manoeuvrability.

**Excellent service access**

The positioning of the engine, transmission and the hydraulic system make routine servicing very easy, with excellent access. Also, service engineers can work in safety from ground level.

**Plastic fuel tank**

The fuel tank is formed from plastic, which is more resistant to damage than metal, and easier to service.



**ROTO compact models offer much more**

- Deluxe cab
- 415° upperstructure slew
- 4-cylinder Euro 2 turbo engine, 74.9 kW (102 HP)
- Load-Sensing hydraulic system
- Hydro-pneumatic suspension (S models)
- Electronically managed hydrostatic transmission
- Independent stabilisers
- 40 kph travel speed (S models)



The four stabilisers legs when retracted lie within the width of the machine.



Boom sections slide on adjustable low-friction pads.



The 'disappearing' boom ensures an excellent 360° visibility.



# THE WINNING CONCEPT



## **Comfortable and spacious cab - An exclusive workplace**

The cab, stylish and designed for maximum comfort and safety, summarises technology in the workplace.

Steering wheel and seat are adjustable to ensure the best driving position, the driving controls are designed to be operated without the driver needing to remove the hand from the wheel and the cab layout is a model of the latest ergonomic design and functionality.

- ❶ Main instrument panel
- ❷ Finger-Touch forward/reverse selector
- ❸ Slow/fast speed selector
- ❹ Multifunction joystick
- ❺ Lighting control

## **The new cab, a new standard to beat**

- 995 mm internal width
- Innovative and functional design
- 360° visibility
- Structure conforms to ISO 3449 (FOPS) and ISO 3471 (ROPS)
- Ergonomic controls and intuitive motion
- Multifunction joystick control
- Window seals of slimmer profile to increase glass area
- Manual air conditioner (optional)

## **Easy entry**

Cab entry through the fully-opening door is facilitated by wide, self-cleaning steps and a flat, obstacle free floor.

The speed change is electrically controlled with switch conveniently located at the side of the steering wheel.

The machine stability light indicator showing boom angle is positioned at operator eye-level to ensure the best possible visibility.

The Finger-Touch direction control lever allows the driver to select between forward and reverse without taking his hand from the steering wheel.





### **Independent stabilisers**

Four independently operated hydraulic stabiliser legs assure the necessary stability for working on any terrain. Levelling is performed by simultaneous operation of two stabilisers on each of the sides of the machine, so that either lateral or longitudinal angle is separately adjustable. The four stabiliser legs when retracted lie within the width of the machine.

### **Hydro-pneumatic suspension - Another Merlo exclusive**

The levelling hydro-pneumatic suspension (S models) assures maximum comfort for the driver by eliminating pitching when travelling at maximum speed.

Three modes of operation provide for a wide range of applications:

- In 'automatic' mode the intelligent reaction of this unique suspension to ground conditions is ideal for travel over rough terrain and for high speed travel on the roads.
- 'Manual' mode permits the driver to vary the setting of the suspension units to level the machine on uneven ground. Correction of up to  $\pm 9^\circ$  ( $\pm 16\%$ ) laterally and  $\pm 5^\circ$  ( $\pm 9\%$ ) longitudinally is available.
- For operating on-tyres, the suspension can be 'blocked', locking the suspension units and providing the best stability.

### **Telescopic boom**

The telescopic boom is made up of two sections of high-yield steel formed in a U shape, which are longitudinally welded together on the neutral axis.

Advanced research into ever more efficient solutions has led to the development of a hydraulic extension system which simultaneously controls the movement of all boom sections.

All the components of the mechanism, the hydraulic piping and electric lines are mounted within the boom assembly, to guarantee their best protection against damage.



The electro-mechanical joystick gives the operator full control of boom and upperstructure in one lever.



Controls for the stabilisers and suspension (S models) have been regrouped into a wide lateral console.



The generous glazed area of the cab ensures a truly panoramic view. Front and rear windows can be opened for natural ventilation.



# TECHNICAL ADVANTAGES

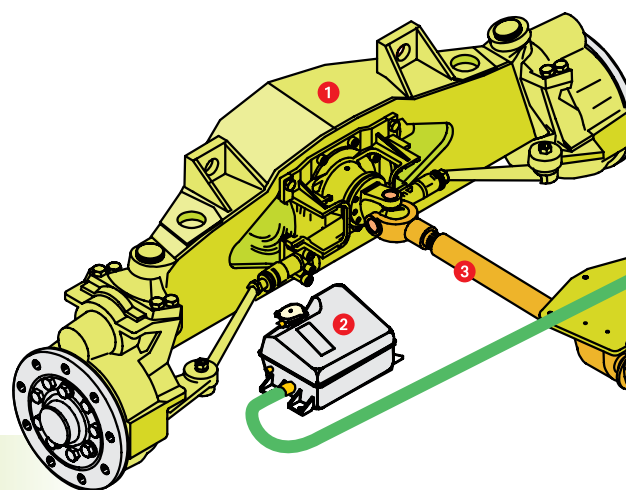


## Side mounted engine

The engine is a 4-cylinder turbo Deutz unit which complies with the Euro 2 emission control standard. Liquid cooled, it develops 74.9 kW (102 HP) at 2400 rpm.

Not surprisingly, with the high level of power and torque available, the speed and the performance have to be experienced to be believed!

The engine is fitted to the right side of the chassis for easy access and safe service intervention from ground level.



- ❶ Axle
- ❷ Hydrostatic oil tank
- ❸ Propshaft
- ❹ Hydraulic motor
- ❺ Heat-exchanger
- ❻ Diesel engine
- ❼ Hydraulic pump
- ❽ Hoses





### **Total safety**

The stability control system includes a key-operated function that activates an automatic lockout if the movements of the boom approach preset stability limits. The operator is also notified with audible and visual warning signals.

### **The latest high-tech hydrostatic transmission**

The use of this type of transmission continues to be a winner. This system has many advantages and a broad possibility of control at high power levels.

### **Protected circuit**

A separate, closed high pressure circuit is used for the transmission, minimising the possibility of contamination.

### **Improved braking effect**

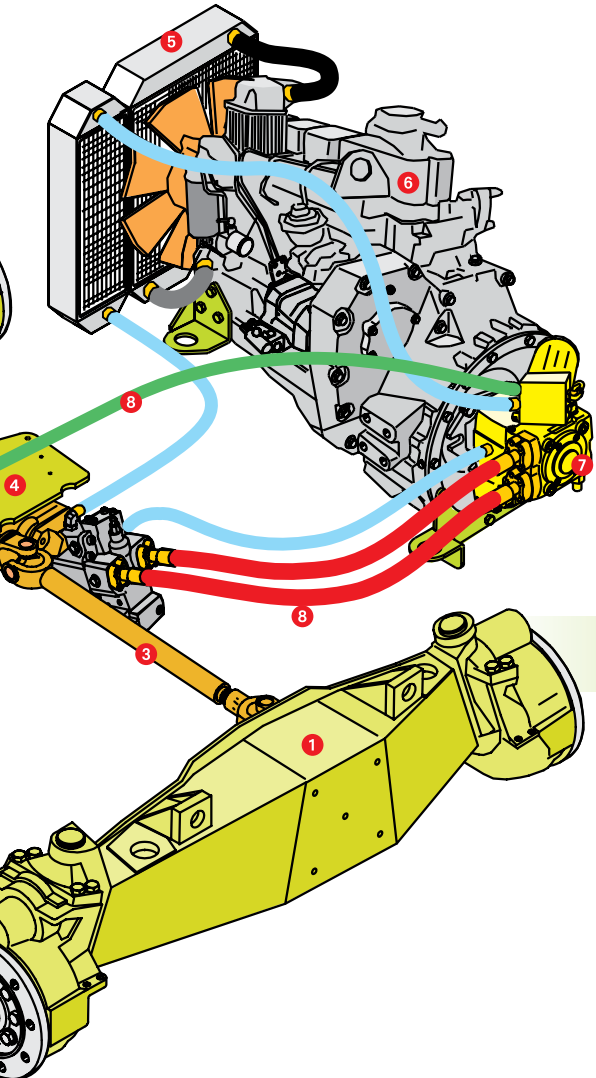
Because of the transmission's improved dynamic braking, use of the service brakes is minimised reducing periodic maintenance costs.

### **Maximum practicality**

An infinite speed adjustment is available simply through the accelerator pedal, rather than using the gears of a conventional transmission, freeing the driver to concentrate on the job.

### **Ease of control**

The forward/reverse lever can be easily operated without taking a hand from the steering wheel (the Finger-Touch system) and speed control is achieved purely with the accelerator.

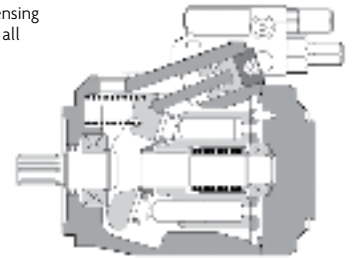


### **Load-Sensing hydraulic system**

This device acts to vary the hydraulic oil flow delivery automatically adapting it to the needs of the hydraulic service elements being used. The delivery is always equal to that requested by the joystick stroke so that power dissipation is reduced to the minimum. Making it highly cost effective in terms of reduced consumption rates and greater component duration.

The maximum operating capacity is 108 lpm and the working pressure is 210 bar.

The axial piston pump with Load-Sensing control ensures a rapid response to all operator requirements.



### **Braking system**

The hydraulic service brakes are 4 large diameter dry discs with floating callipers, operated with servo assistance, mounted internally on the output shafts of each differential. Dual hydraulic circuits are provided for additional safety.

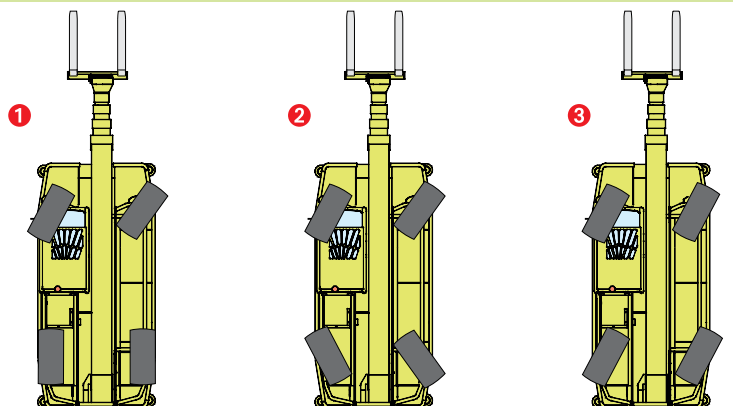
The independent disc parking brake is fitted to the main transmission drive shaft. A 'fail-safe' design, it is automatically operated when the engine stops.

The operator is also able to apply the brake whenever required.

### **Three steering modes**

The four drive wheels are steered with hydraulic assistance. Three steering modes are available, with automatic resynchronisation should the wheels become unsynchronised. The adoption of low maintenance spherical bearings assures maximum reliability.

- 1 Front wheel steer (for road use).
- 2 Four wheel steer (provides minimum steer radius).
- 3 Crab steer (provides sideways motion whilst retaining the longitudinal alignment of the machine).



# FEATURES AND PERFORMANCE

## Cab

- Conforms to ISO 3449 (FOPS) and ISO 3471 (ROPS).
- '5 x 1' proportional joystick.

## Boom

- Telescopic assembly constructed of high yield steel, sliding upon anti friction wear pads.
- The hydraulic components are internally mounted within the boom structure for maximum protection.

## Fork carriage

- Hydraulic operation of the Tac-Lock gives control of attachment locking from the cab.
- A single double-acting hydraulic service is provided at the boom end, together with quick couplings.

## Forks

- Floating type: 1200 mm long, 130 x 50 mm section.
- Fork spacing manually adjustable between 450 mm and 1050 mm.

## Stabilisers

- Independently controlled with automatic lock when the boom exceeds the pre-set safety angle.

## Steering

- All four wheels steer, and have an automatic resynchronisation system in case of misalignment, as well as selection of 3 steer modes.

## Engine

- 4-cylinder water cooled turbo Deutz engine, compliant with Euro 2 emission regulations, direct injected and rated at 74.9 kW (102 HP) at 2400 rpm (97/68/CE).

## Transmission

- Hydrostatic with variable flow piston pump with electronic management.
- Automatic and continuously variable speed from 0 to 40 kph simply by using the accelerator pedal.
- Electrically operated two speed range change gearbox.
- Finger-Touch system means it is possible to change direction even whilst the machine is moving, without the driver moving his hand from the steering wheel.

- Permanent four wheel drive.
- Portal axles for increased ground clearance.

## Suspension (S models)

- Hydro-pneumatic type on both axles.

## Braking system

- Service brakes: hydraulic disc brakes on all 4 wheels, acting upon the half shafts at the differential.
- Automatic parking brake; locking disc brake on main transmission drive shaft, hydraulically released.

## Hydraulic system

- Load-Sensing variable delivery axial piston pump.
- Maximum flow rate: 108 lpm.
- System pressure: 210 bar.

## Electrical system

- 12 V system with 100 Ah battery and 90 A alternator.
- Road lighting including rotating beacon.

## Service capacities

- Hydraulic system: 120 l
- Fuel: 150 l
- Hydrostatic oil: 12 l
- Engine oil: 8.5 l
- Engine coolant: 12 l

## Tyres

- 405/70-20 PR

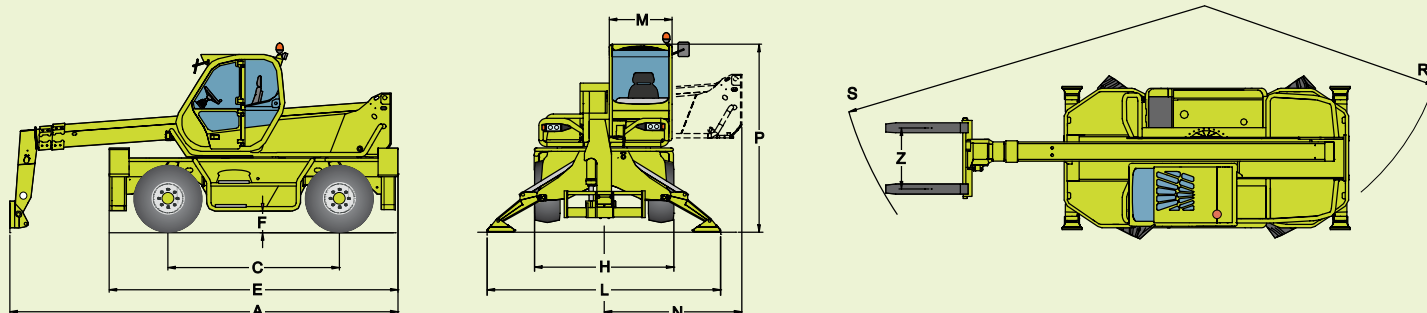
## Options

- 18-19,5 16 PR tyres.
- Rear axle differential lock.
- Four working lights on the cab (two front lights and two rear).
- Air conditioning.
- Windscreen wiper on the roof window.
- Manual battery isolator.
- Roof and front window mounted sun blinds.

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<b>Weight</b>							<b>Dimensions</b>							
Total empty weight (with forks)	kg	12080	11730	11920	11570	11780	A	mm	6240	6240	5565	5565	5340	
<b>Performance</b>							C	mm	2760	2760	2760	2760	2760	
Maximum lift capacity	kg	3800	3800	3800	3800	5000	E	mm	4645	4645	4645	4645	4645	
Maximum lift height	m	15.7	15.7	13.8	13.8	10.4	F <sup>(1)</sup>	mm	350	350	350	350	350	
Maximum reach	m	13	13	11	11	7.6	H	mm	2240	2240	2240	2240	2240	
Lift height with maximum capacity	m	9.8	9.8	9.7	9.7	9.1	L	mm	3750	3750	3750	3750	3750	
Reach with maximum capacity	m	5.5	5.5	5.5	5.5	4.8	M <sup>(2)</sup>	mm	995	995	995	995	995	
Capacity at maximum lift height	kg	2500	2500	2500	2500	4000	N	mm	2220	2220	2220	2220	2220	
Capacity at maximum reach	kg	700	700	1100	1100	2000	P	mm	2850	2850	2850	2850	2850	
Upperstructure rotation	deg	415	415	415	415	415	R	mm	3920	3920	3920	3920	3920	
Low emission (Euro 2) engine		4-cylinder turbo						S	mm	6000	6000	5380	5380	5230
Power at 2400 rpm (97/68/CE)	kW/HP	74.9/102						Z	mm	850	850	850	850	850
<b>Speed</b>														
1 <sup>st</sup> gear	km/h	16	7	16	7	16								
2 <sup>nd</sup> gear (autolimited)	km/h	40	25	40	25	40								

<sup>(1)</sup> ±65 mm. Measured at suspension mid-point (S models).

<sup>(2)</sup> Internal usable width.









### **Help is always nearby**

Day after day, choosing a Merlo product brings the advantages of the most advanced technology and the practicality of safe and comfortable equipment, of which the very best can be expected.

Merlo Service ensures a close and continuing bond with the customer, provided by a worldwide network of more than 500 Service Centres guaranteeing experienced and trained technical assistance close at hand.

### **Building professionalism**

Evidently, carelessness and a lack of respect for the basic principles of safety are often the causes of accidents with lifting equipment, often through the lack of an adequate training scheme. The close link between training and safety is a part of everyone's experience and must be continually updated as part of our professional development, a role for which the new Merlo Research and Training Centre is admirably suited.



**MERLO S.P.A.**

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