



Linde Material Handling

Linde



Automated Transporting Solution

G-MATIC HP 10

Capacity 1.0t | Series 8928

Autonomous transport miracle

- Autonomous transport solution for medium to long distances in mixed operations
- Load capacity 1000 kg and maximum speed of 8 km/h for fast transfer of loads
- Natural feature navigation for optimal orientation without additional infrastructure
- Independent avoidance of obstacles and flexible load pick-up for trouble-free process flows
- Cloud-based software control for effortless implementation and optimum adjustment

TECHNICAL DATA (According to VDI 2198)

| | | | | |
|-----------------|----------------|--|--------------------|--------------------|
| Characteristics | 1.1 | Manufacturer | | Linde MH |
| | 1.2 | Model | | C-MATIC HP 10 |
| | 1.2.a | Series | | 8928-01 |
| | 1.3. | Power Unit | | Battery |
| | 1.4 | Operation | | Automated |
| | 1.5 | Load capacity / Load | Q (t) | 1.0 |
| Weights | 1.8 | Axle centre to fork face | x (mm) | 390 |
| | 2.1 | Service weight | (kg) | 170 ¹⁾ |
| Wheels / Tyres | 3.1 | Tyres rubber, SE, pneumatic, polyurethane | | Vulkolan |
| | 3.4 | Auxiliary wheels (dimensions) | (mm) | 160 × 45 |
| | 3.5 | Wheels, number front/rear (x = driven) | (∅) | 2x +2 |
| | 3.6 | Track width, front | b10 (mm) | 584 |
| Dimensions | 4.4 | Lift | h3 (mm) | 40 |
| | 4.15 | Height, lowered | h13 (mm) | 222 ²⁾ |
| | 4.16 | Loading platform, length | l3 (mm) | 1021 ³⁾ |
| | 4.18 | Loading platform, width | b9 (mm) | 619 ⁴⁾ |
| | 4.19 | Overall length | l1 (mm) | 1440 |
| | 4.21 | Overall width | b1 (mm) | 634 |
| | 4.33 | Load dimension b12 × l6 | b12 × l6 (mm) | 860 × 1260 |
| | 4.34 | Aisle width with predetermined load dimensions | Ast (mm) | 2948 ⁵⁾ |
| 4.35 | Turning radius | Wa (mm) | 1592 ⁶⁾ | |
| Performance | 5.1 | Travel speed, with/without load | (km/h) | 2.2 |
| | 5.2 | Lifting speed, with/without load | (m/s) | 0.0203 |
| | 5.3 | Lowering speed, with/without load | (m/s) | 0.0203 |
| Drive | 6.4 | Battery voltage/rated capacity (5 h) | (V)/(Ah) o. (kWh) | 48 /120 |
| Others | 10.7 | Sound pressure level LpAZ (at the driver's seat) | (dB(A)) | < 70 |

1) Adaptor plate weight +45 kg

2) Adaptor plate +158 mm

3) Adaptor plate l3=1200

4) Adaptor plate b9=606

5) Including a=200 mm (min.) operating aisle clearance

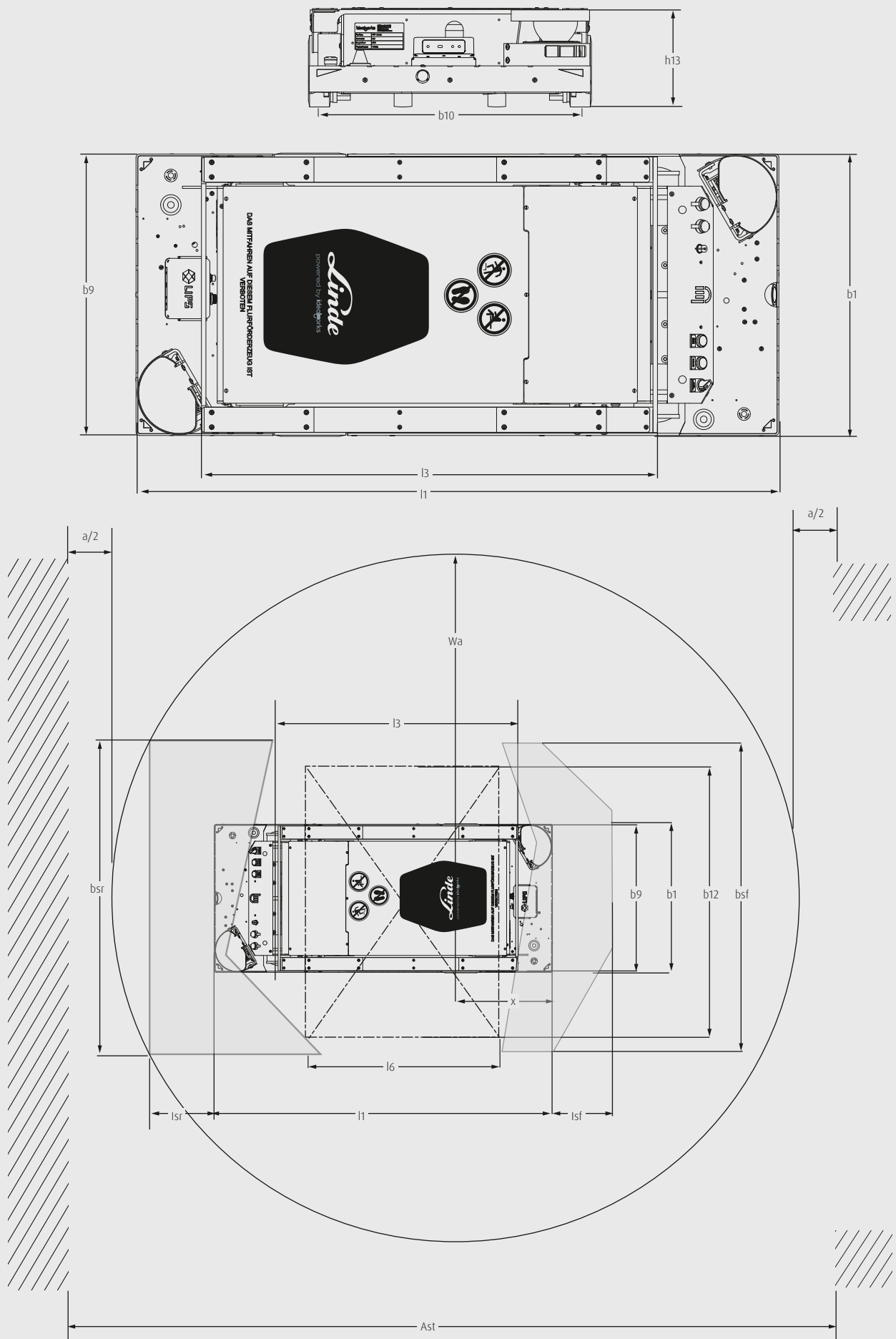
High tolerance (+/-300 mm & +/-15°) 90° pick-up Ast=3669 mm

With adaptor plate Ast=2857 mm

6) With adaptor plate and EPAL1 or EPAL3

(loaded 800, 1000 × 1200) Wa=1327 mm

C-MATIC HP 10



Safety field dimensions front min. 185 x 1650 mm (l_{sf} x b_{sf}) and rear min. 185 x 1650 mm (l_{sr} x b_{sr})
 $Ast = 2 * Wa + a$, with $a = 200$ mm

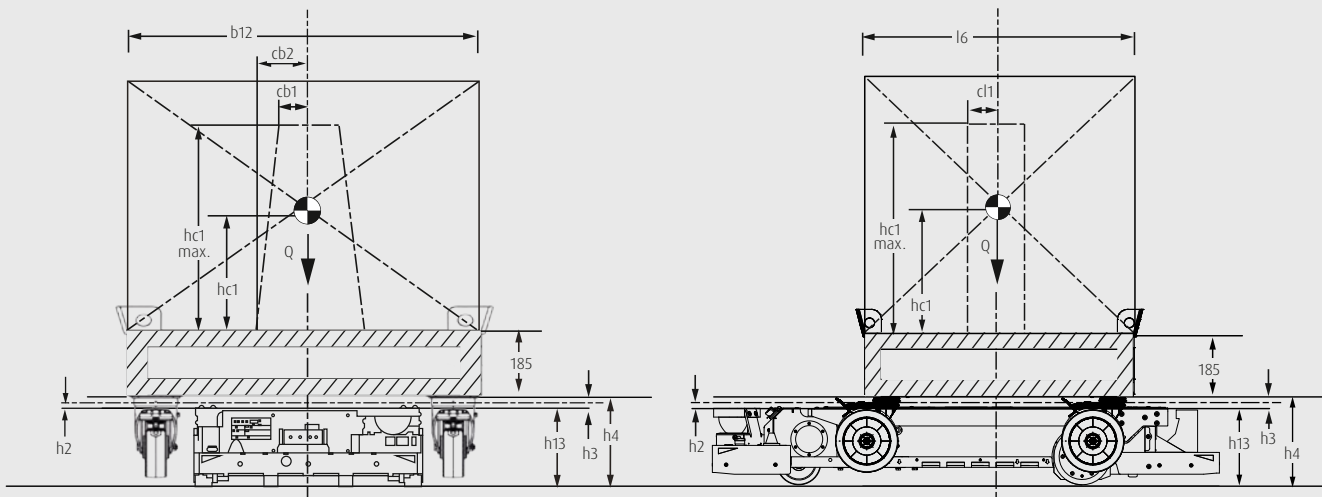
APPLICATION VARIANTS

| Applications | Load carrier dimensions | Max. capacity | Overall height (lift lowered) | Lift | Overall height, max. extended |
|-------------------------|--|---------------|-------------------------------|---------------------|-------------------------------|
| | $l_6 \times b_{12}$ [x m ²] (mm) | Q (kg) | h ₁₃ (mm) | h ₃ (mm) | h ₄ (mm) |
| Trolley transport | 1260 × 860 × 235 | 1000 | 222 | 40 | 262 |
| Direct pallet transport | 1200 × 800 1200 × 1000 | 1000 | 380 | 40 | 420 |

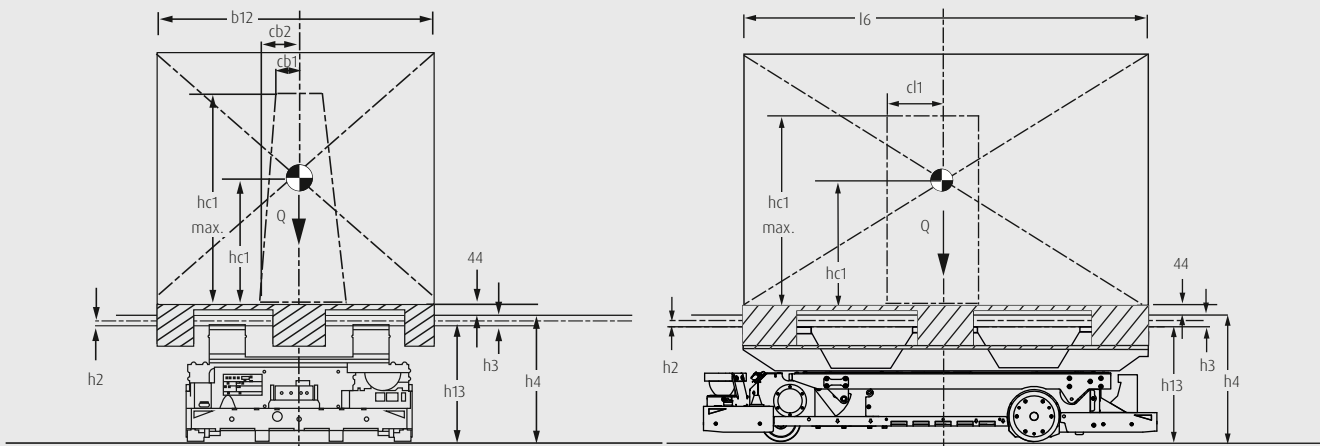
| Vehicle variants | Entry height | Max height of CoG ¹⁾ | Max. displacement of CoG in main driving direction (l) | Max. displacement of CoG lateral to main driving direction (b) | |
|---|---|---------------------------------|--|--|----------------------|
| | h ₁₃ + h ₂ ²⁾ (mm) | hc ₁ (mm) | cl ₁ (mm) | cb ₁ (mm) | cb ₂ (mm) |
| Platform for trolley transport | 235 | 800 | 30 | 60 | 80 |
| Adaptor plate for direct pallet transport | 400 | 800 | 30 | 60 | 80 |

1) h₂ = free lift 2) CoG = Centre of Gravity

TROLLEY TRANSPORT

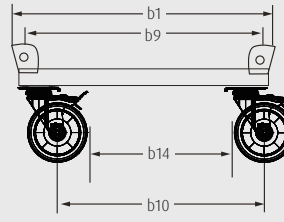
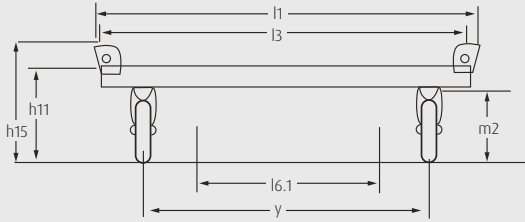


PALLET TRANSPORT



ADDITIONAL EQUIPMENT (TECHNICAL REQUIREMENTS)

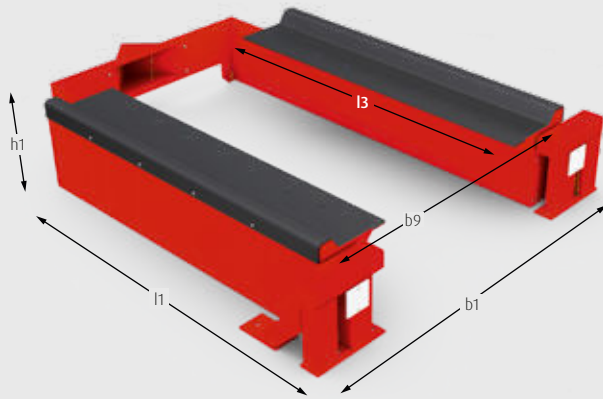
TROLLEY TRANSPORT



| Characteristics | Trolley |
|------------------------------|------------------|
| Dimensions l1 × b1 × m2 (mm) | 810 × 1210 × 235 |
| Load dimension b9 × l3 (mm) | 800 × 1200 |
| Min. inner entry l6.1 (mm) | > 660 |

- Stable trolley transport is ensured
- Made for high tolerances on pick-up locations

PALLET TRANSPORT



Pick-and-drop station



C-MATIC HP with adaptor plate

| Characteristics | C-MATIC HP 10 EPAL1 pallet length | C-MATIC HP 10 EPAL3 pallet length |
|------------------------------------|--------------------------------------|--------------------------------------|
| Dimensions l1 × b1 × h1 (mm) | 1610 × 1134 × 325 | 1762 × 1235 × 235 |
| Pallet supporting surface h11 (mm) | 280 | 280 |
| Load dimension l3 × b9 (mm) | 1200 × 800 | 1200 × 1000 |
| Max. load capacity (kg) | 1000 | 1000 |

- Stable pallet transport is ensured via pick-and-drop station
- Made for pallet transport with short-side leading

AUTOMATIC CHARGING STATION

Fully automated charging

- Designed solution includes charging station
- Intermediate charging possible during operating breaks
- Charging of several vehicles via one station
- Vehicle can also be charged while loaded



CHARGER

| Model | | 48V 40A 1.9 kW | |
|----------|-----------------------|-----------------------|-----------------|
| Basic | Plug Type | Type F (EU) or G (UK) | |
| Physical | Dimension b × l × h | (mm) | 830 × 788 × 288 |
| | Weight | (kg) | 40 |
| | Length of power line | (m) | 2.5 |
| Input | Rated voltage | (V) | 230 |
| | Mains fuse protection | (A) | 16 |
| | Power | (W) | 3680 |
| | Grid frequency | (Hz) | 50/60 |
| Output | Power | (W) | 1920 |
| | Voltage | (V) | 48 |
| | Current | (A) | 40 |
| Others | Ambient temperature | (°C) | +5/+30 |
| | Storage temperature | (°C) | +5/+30 |

STANDARD AND OPTIONAL EQUIPMENT

| Model | | C-MATIC HP 10 with loading platform | C-MATIC HP 10 with adaptor plate |
|----------------|--|---|--|
| Digitalisation | Intelligent routing algorithms | ● | ● |
| | Intelligent charging logic | ● | ● |
| | Standard interfaces to existing WMS, ERP, etc. | ○ | ○ |
| | Standard interfaces with infrastructure: doors, conveyors, etc. | ○ | ○ |
| Safety | Control buttons (On, Off, Reset) | ● | ● |
| | Personal safety around the robot with two diagonal safety scanners | ● | ● |
| | Safety field switch between platform raised and lowered | ● | ● |
| | Two diagonally positioned emergency stops | ● | ● |
| | Audio-communication | ● | ● |
| Lighting | Robot status light | ● | ● |
| | Direction indicators when turning | ● | ● |
| | BlueSpot in front and rear direction | ● | ● |
| | Indirect blue line on floor | ● | ● |
| Load Handling | Multi-colour status column at the rear of the robot | ○ | ○ |
| | Load pick-up with high tolerances for manual positioning on marked floor | ● | – |
| | Natural feature navigation based on SLAM technology | ● | ● |
| | Camera-based load recognition | ● | – |
| | Longside leading trolley transport with load dimensions of 1200 × 800 mm | ● | – |
| | Trolley transport with customised load dimensions <1600 × 1600 mm | ○ | – |
| Environment | Short-side leading pallet transport with EPAL1 and EPAL3 pallets | – | ● |
| | Wifi communication | ● | ● |
| Energy | Ambient temperature +5/+40°C | ● | ● |
| | Li-ION battery | ● | ● |
| | Automatic opportunity charging connectors | ● | ● |
| | Automatic charging station | ○ | ○ |
| Service | Energy charging status information based on flashlights in each corner | ● | ● |
| | Plug for remote hand control unit | ● | ● |
| | Hand control unit | ○ | ○ |
| Driving | Can be transported on ISO forks | ● | ● |
| | Differential drive with dual forward wheel drive | ● | ● |
| | High performance obstacle avoidance feature | ● | ● |

● Standard equipment ○ Optional equipment – Not available

CHARACTERISTICS



Safety around the vehicle



Flexible load handling



Easy access to main components



Focus on customer processes as standard

Safety

- Laser scanner for reliable detection of the complete vehicle environment
- Immediate reaction to people, vehicles or obstacles to avoid collisions
- Stable load pick-up when transporting pallets and rolling racks for safe transport of goods
- Ideal combination of flexibility, productivity and maximum safety
- Emergency stop switch on both sides for additional protection in everyday warehouse life

Handling

- Infrastructure-free SLAM technology for optimum use in automated mixed operation
- Independent bypassing of obstacles for stable and trouble-free material flow
- High tolerance load pick-up for reliable transport of pallets and roller racks
- Cloud-based control software for fast implementation and effortless vehicle management
- Powerful Li-ION battery and self-charging function for 24/7 operation

Service

- Robust technology and low maintenance requirements for maximum availability
- Easily accessible components for rapid maintenance
- Fault diagnosis via service laptop or remote maintenance function for low service costs
- Extensive Linde MH service network for repairs and maintenance around the clock

Sales and realisation

- Project-specific concept design including dynamic simulation and proof of concept on site if necessary
- Combination of manual handling processes and degree of automation can be optimised to fit the customer needs
- One face to the customer for the whole process from first contact to the lifecycle phase
- Intelligent, scalable software solutions to provide customers best control of their processes
- Project management and commissioning according to Linde MH standards with unified tools and templates in the entire network

Presented by:

Subject to modification in the interest of progress. Illustrations and technical details could include options and are not binding for actual constructions. All dimensions subject to usual tolerances.



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