

**techünert**



**ESCALATOR PASSENGERSTAIR**

## Company Profile

**techünert** engages in the development, engineering and manufacturing of Airport Ground Support Equipment (GSE).

For more than 30 years we have been a reliable partner of virtually all major german airports. Through constantly expanding international co-operations our products are now in operation at many airports in Europe and all over the world.

**techünert** was the first company in Europe to entirely develop and manufacture a Rescuestair vehicle for airport firedepartments, which is suited for aircrafts of a size such as the Airbus A380.

All products can be adapted to specific requirements in a flexible and customer-oriented way, all the way to the development of new special-purpose vehicles entirely from scratch.

Our range of products comprises a wide spectrum of GSE:

- Passengerstairs
  - towed stairs
  - stairs with auxiliary drive
  - selfpropelled stairs
  - Escalator stairs
  - Rescuestairs
- Water service vehicles
- Toilet service vehicles
- Containerdollies
- Luggagetrailers
- Luggageloaders / Conveyorbelt-loaders
- Aircraft docking systems
- VIP- / Handicapped passenger vehicles

Among our services are also:

- Development
- Engineering
- Manufacturing
- Maintenance
- Repair / After-sales service
- Sparepart service

[www.tec-huenert.de](http://www.tec-huenert.de)

[www.rescuestair.com](http://www.rescuestair.com) Company Profile

## CHASSIS

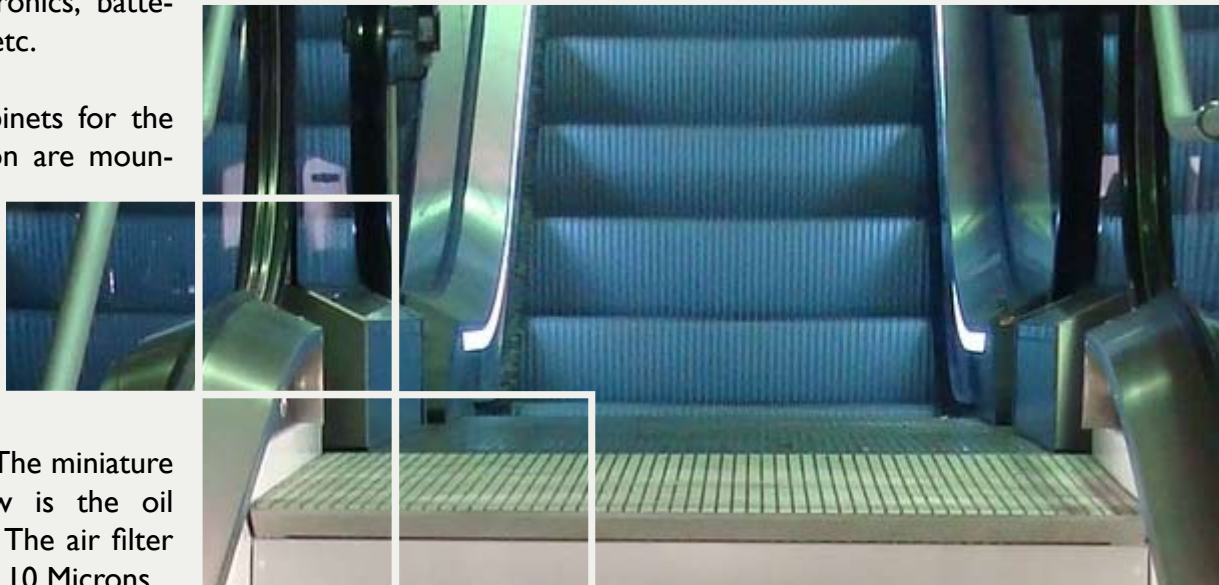
The chassis, in-house produced, is made of main chassis beams and right-angle hollow profiles as cross beams, welded together. There is a bearing for the holding of the escalator. A revolving steel-sheet edge profile is attached on the outside to hold a DELTA buffer.

In front of the cabin a solid bumper of square tubes is mounted. The outer parts are screwable two-sided and are used to hold the rearview mirror and the headlights with the blinker lights.

On the front, below the bumper, and on the rear, at the main beam, a socket pin coupling is used as a tow coupling.

The front wheels and rear wheels as well as the rear itself are covered with sheet metal. Between the axles, at the right and left side, two voluminous cabinets contain components such as hydraulics, electronics, batteries, diesel tank etc.

The electric cabinets for the escalator function are mounted in the left hindmost cabinet. Behind the right front cabinet door is a hydraulic oil reservoir with a volume of 70l. The miniature measuring screw is the oil measuring point. The air filter unit has a size of 10 Microns.



The easy-to-access hydraulic oil return magnet fine filter (10 Microns) has a mechanical pollution indicator. The operating temperature of +60°C is also not exceeded at an external temperature of 30°C.

The gauge-glass at the container is the oil level indicator.

Next to the oil canister there is the valve block with the hydraulic magnet valves and a manual hydraulic pump for emergency operation.

In the rear right cabinet there are two 12V/88 Ah batteries and an electrical cabinet for the relay and the vehicle control.

## AXLES

The front axle is a hydraulically steered knuckle axle with hydraulic disc brakes. The axle is screwed to the chassis.

The rear axle is a stub axle with a hydraulic wheel hub drive.

## TYRES

The stair is equipped with pneumatic tyres of type 8.25R15 and rims of type 6.5-15.

## DRIVE

The stair is equipped serially with a liquid-cooled four-spark diesel engine.

TYPE= KHD (Deutz) –TCD2012

The power transmission is effected by a regulated hydraulic pump flanged on to the diesel engine and by the hydraulic engines on the rear axis stubs. The direction of motion is controlled by a shifting lever in the driver's cabin.

Two different speeds are available.

1. Motion level 0 – 30 km/h
2. Motion level 0 – max. 6 km/h (automatic safety switching on hoisted stair)



## BRAKE

The brake is built as a two circuit braking system. Via the brake pedal a hydraulic braking valve is activated, which doses the necessary braking force. Emergency braking is ensured via a pressure accumulator.

A spring-operated brake is used as a fixing brake, which is activated via a manual braking valve and by the pressure of the operation hydraulics. In case of outage of the hydraulic drive the spring-operated brake can be disengaged by a hand pump.

The operating controls of the fixing brake are arranged to the right of the driver's seat.

## HYDRAULIC AGGREGATE

The hydraulic systems are divided into motion hydrostatic and operation hydraulics.

There is an adjustment pump for the drive operation and the combined fixed displacement pump as well as a pressure accumulator for the operation hydraulics and the steering and braking system. Both pumps are flanged to the diesel engine in a tandem arrangement. The necessary hydraulic valves are controlled electrically. For emergency operation the hydraulic valves are equipped with lock buttons; the hydraulic pressure is generated by a manual pump. An additional electric pump is also provided for emergency operation

The hydraulic cylinders are equipped with unlockable return valves.

Two vertically operating hydraulic cylinders are attached, each at the rear and the front of the chassis. The control of the cylinders is designed, in order to allow the stairs to be supported in the front. For the inverted function the rear is lowered first. On emergency operation the supporting cylinders are to be operated by the manual pump.

Each supporting cylinder has end switches. Thus it is ensured that the drive operation is only possible after all cylinders have been retracted.

### **DRIVER'S CABIN**

The open one-person driver's cabin is floor-mounted ahead of the front axle and fitted on dampers.

The driver seat is damped hydraulically.

All control elements are clearly arranged and easy to reach and divided according to their driver operation and stair control elements. The controls and instruments are fitted as nondazzling. The pedal arrangement is ergonomic, with a distance of 70 mm.

Mounted instruments are fuel indicator and operation hour counter.

The following elements are light indicators: Charging control, preheating control, engine oil pressure, engine temperature, fixing brake, braking force, blinking control, long distance light, air filter control, blinking control, control light for the electric acceleration, brake facing abrasion and drive engine "slow".

### **ELECTRICAL SYSTEM OF THE ENGINE**

The nominal voltage of the system is 24V. There are two 12V/88Ah batteries, rechargeable via the engine generator.

A starting repeat lock and an ignition lock E30 are also available.

In the lamp bracket ahead of the driver cabin there are two H4-headlights

with dimmed light and parking light as well as integrated blinkers. In the rear chassis casing on both sides a combined lamp with blinking, braking and rear light as well as the backup light are fitted. The chassis body has laterally mounted yellow lights.

The control is distributed to several fused electric circuits. All control elements are mounted in an IP65 protection class steel casing on the right side behind the cover of the cabinet. All lines are protected and marked. Inductive proximity switch are used as end switches.

### **ESCALATOR – ASSEMBLY**

The ascending angle of the stair is adjustable continuously from 32° to max. 36°.

Height: 4.300 mm up to 4.800 mm

Many widebody-aircrafts can be serviced with the vehicle, e.g.:

A300-600, A300-B2, A310-200, A330, A340-200, A340-300, B747, B777

Dependant on the state of loading also B767-200, B767-300, DC10, IL86, IL96 and others



Transportation height: 4.400 mm

Escalator drive: Electrical, 3x380 Volt 50 Hz (external energy supply)

The platform front is spring-mounted, slidable lengthwise and the aircraft body can be adjusted to an angle of  $\pm 10^\circ$ . Pressure springs ensure the exhaust stroke and the necessary contact pressure. The leading edge of the platform has rubber bumpers. The platform has a sliding rail with catching system on both sides.

The end of the platform is a bumper tube allowing a tight contact to the aircraft body.

## REAR LIFT

The electric hydraulic rear elevator covers the difference between driving surface and the lower escalator platform. An antislip aluminium-alloy profile is used as a standing base.

## SAFETY SYSTEM

If the escalator is lifted for docking, the motion speed will be limited from 30km/h down to 6km/h.

When the chassis is jacked up, the traction drive is locked and no movement is possible.

In order to prevent an uncontrolled entering of the stair, automatic blocking bands are attached on the top and the bottom of the stair (black/yellow with imprint „Stop“) and equipped with an end switch.

The end switches ensure that if a band is opened all stair function, including the driving, are locked. On breakdown of an end switch a key switch in the middle console in the driver cabin can be used to avoid the locking for emergency operation.



## EMERGENCY OPERATION / BACKUP SYSTEMS

In case of a malfunction the system provides back-up systems to operate all vital functions manually. All hydraulic functions on the chassis can be activated and operated by a manual pump. Also an electro-hydraulically driven pump is provided for emergency operation.

The emergency function of the escalator is controlled mechanically by a crank handle.

## Alternative Energien

- Blockheizkraftwerke
- Pyrolyse

## Maschinenbau

- Maschinen
- Anlagen
- Vorrichtungen

## Flugzeugtechnik

- Seitenleitwerk
- Flugzeugstrukturteile
- Sektionsmontage
- Rohrleitungsplanung
- Wassertankanlagen
- Nasenteil u. Rumpf

## Fahrzeugtechnik

- Sitze/Interieur
- Flurförderfahrzeuge
- Karosserie- und
- Dachdichtungssysteme
- Schaltungen/Lenkungen
- Formteile
- u. v. m.

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