

# EQUIPMENT FOR ROAD SAFETY TRAINING CENTRES

System Solutions for Industry

**HP Pneumatics**

**Water- and Special- Fluid Hydraulics**

**Equipment for Road Safety Training Centres**

**Fire Fighting Systems for Transformers**

**Live Line Washing Systems for Insulators**

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### *HP Pneumatic (Drucklufttechnik)*

VDEW empfohlene Druckluftsysteme und Komponenten bis 350 bar

### *HP Pneumatic*

Electrical Industry (VDEW) recommended systems and components up to 350 bar



### *Wasser- und Sonderhydraulik*

Edelstahl-Cartridgeventile und Vorsteuerungen bis 350 bar (800 bar), Nennweiten 2 bis 250 mm Entzunderungsventile, Druck- und Wegeventile, Sprühventile zur partiellen Walzenkühlung.



### *Water- and Special-Fluid Hydraulics*

Stainless steel cartridges and pilot valves up to 350 bar (optional 800 bar), size 2 to 250 mm (08-10 inch).

Descaling valves, directional, check, flow and pressure control functions, spray valves for roll coolant systems.



### *Technik für Fahrsicherheitszentren*

Innovative Technik zur Simulation kritischer Situationen im Straßenverkehr: Schleuderplatten, Fahrbahnbewässerungen, Wasserhindernissysteme

### *Equipment for Road Safety Training Centers*

To simulate critical traffic situations.  
Vehicle skidding devices, water film systems, water obstacles

### *Feuerlöschsysteme für Transformatoren*

Fremdenergie-unabhängige Wassersprühsysteme

### *Fire Fighting Systems for Transformers*

Water spraying systems for operation independent from an external power supply

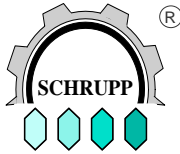


### *Isolatorenreinigungssysteme*

Stationäre Wassersprühsysteme zur Reinigung unter Spannung

### *Insulator Cleaning Systems*

Water spraying systems for stationary live electrical line cleaning



## DRIVING CENTER EQUIPMENT



The HL Hydraulik water technology enables road safety training centers to simulate critical situations encountered by drivers during various realistic street and weather conditions. The training helps teach the driver to handle these situations.

A combination of event center and safety driving center have the flexibility to test and demonstrate the newest functions of assistance systems, to familiarize the driver with the car's technology, learn safety and have fun testing and driving a car like you have no chance on a normal road.

We supply individual components for planners and operators, that can be combined as needed for the requirements and size of the exercise area.

We assist in planning of water technology and advise on the design of the training surface.

Some aspects of our water technology suit especially small applications because the products can also be installed by the operator or a local company.

During product development special attention has been placed on high reliability at low operational costs.

The entire water technology is designed for use in a closed water cycle.

Since large volumes of water are distributed into the air (water obstacles) or onto the road surface (roadway irrigation), this approach is in most cases the more economic option for future operating costs.

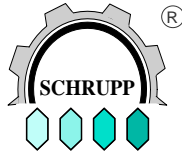
Our delivery program contains:

**WATER OBSTACLES**

**ROADWAY IRRIGATION SYSTEMS**

**VEHICLE SKIDDING DEVICES**





## **DRIVING CENTER EQUIPMENT**

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## DRIVING CENTER EQUIPMENT

### 1. Water obstacles

There are two different nozzle types available since 2012:



Type 1:  
Obstacle heights of  
2,00m to 2,50m



Type 2:  
Obstacle heights of  
2,60m to 3,20m

Type 1 is optimized for car usage, Type 2 for truck usage.

The basic configuration of the water obstacles is the same for both types, so that switching between the two obstacle heights is possible at any time.

## DRIVING CENTER EQUIPMENT

### 1.1 Basic construction of a water obstacle:

Each 1m of water obstacle contains four nozzles and is supplied with water by one pump.  
(0.75 KW/m operational power)

This enables the creation of individual spray patterns for each 1m of obstacles.

Concrete Case for water obstacle



“Hanging” design



Obstacle cover



the individual parts before assembly



## DRIVING CENTER EQUIPMENT

### 1.2 Economic feasibility is our specialty.



- Most of the used water is re-captured.
- The pumps have less than 1.5KW power consumption and require only 0.75 KW input during operation.
- Only the pumps that are required for the actual pattern consume electric energy.
- Our "low-pressure-system" requires, compared to "high-pressure-system", significant lower pump capacities in the central water supply.

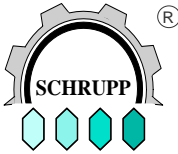
DRIVING DIRECTION 

### 1.3 Final assembly pattern of a water obstacle

including roadway irrigation and detachable electric supply.







## **DRIVING CENTER EQUIPMENT**

### **2. Roadway irrigation**

#### **2.1 General advantages of low-pressure technique**

- Running water will not freeze – winter usage is supported that way
- The flexibility to choose between different irrigation directions.
- cross irrigation  
water is applied crossways the driving direction and is flowing along or against direction of drive
- longitudinal irrigation  
water is applied parallel to the driving direction, at the edge of the road or near the dynamic surface, and crosses the dynamic surface at a 90° angle.
  
- The irrigation outlets can be driven over without any driving disturbances.
- Insensitive against dirt, due to large (8mm) irrigation outlets.
- With consideration of a required down-grade the irrigation can be settled at each point of the track. (outskirts, in the asphalt, curved, alongside, etc.)
- Expandable, if the center “grows“
- Winterproofed without trace heating system or other technical utilities.
- Working pressure of the irrigations: 0.2 - 0.5 bar
- Insensitive to de-icing salt.
- Easy to clean.
- Resistent to breakdown (except total electric blackout)
- Easy to operate and maintain.

## DRIVING CENTER EQUIPMENT

### 2.2 Hilltop irrigation of the roadway

At the beginning of a vehicle dynamic area it is possible to supply the irrigation with water from the central water system or a following water obstacle. Supply from a water obstacle is realized by our own pumps.

The irrigation pattern is variable by water pressure and number of nozzles, and will be set for each surface individually.

e.g. setting for large amount of water

or for regular passenger car operation with minimal vision interference



Driving direction →

Due to the low outlet height both settings secure, that neither the drivers windshield is sprinkled, nor will the driver be distracted by visual interferences in the driving area.

Our water technique uses the the down-grade of the road for road irrigation.

The advantage exists in the few places where water is applied.

An excellent accessibilty for maintenance is granted by the irrigation draining into standard concrete cassettes.

This draining technique approved especially for gradient routes and short dynamic surfaces.

#### 2.2.1 Principle operation of hilltop-irrigation

Nozzles entrain water out of a flooded cassette. The surge of water, that generates on short distances a broad expanse of water, flows thereafter over the surface that is intended to be wetted. The water is applied to the complete driving range by nozzles diverted into 25 - 50cm intervals. Individual adaptions to the given circumstances are possible.

## DRIVING CENTER EQUIPMENT

### 2.3 Irrigation out of Water Obstacles

The water supply is carried out by our own pump, directly out of the water obstacle case..

The desired water amount is adjusted by a flow restrictor.



Mounted roadway irrigation – distinct stream only



The water distribution gets optimized continuously



## DRIVING CENTER EQUIPMENT

### 2.3.1 Operation of Post-Irrigation

A clear waterstream is generated by nozzles. This stream enables a very thorough roadway irrigation. The water is distributed to the complete road surface (if desired and needed) by nozzles divided in approx. 25 cm gaps.

### 2.4 Road-circle irrigation

The aim was to irrigate a circle from the outside inwards.  
Robust, efficient and without visual disability.

Installed warm-, or cold-grouted  
in the bearing layer until 2005

Since 2006 installed under the asphalt with  
a homogeneous asphalt surface.



Since 2006 the irrigation-system may be installed in segments, which can be controlled individually (1/4-, 1/2- or full-circle-irrigation).

Inner- and outer-lane-irrigation enables a diverse usage, in that motorcycles can use the dry outer-lane e.g. for curve exercises, even though cars had practiced braking in wet and slippery curves in the inner-lane shortly before.

The subdivision into segments also enables the system to alternate between wet and dry surfaces in the inner- or outer-lane circle.

The asphalt covered technique enables a road-circle irrigation, which is winterproofed and insensitive against the driving operation. Inspection chambers allow the cleaning of the irrigation system.

## DRIVING CENTER EQUIPMENT

Installation of the road-circle segments “in and under” the asphalt



### 2.5 Longitudinal roadway irrigation

Our longitudinal roadway and road-circle irrigation is based upon the same technique and complies with the same specifications.

- Insensitive against the driving operations and winter hardness.
- No visual distraction for the exercise participants.
- No visual obstruction through sprayed water on the front shield.
- Very uniform water distribution on the dynamic surface.
- Low water consumption.

Both systems can be supplied with water by a central pump, out of a near water obstacle or by a independent supply area with our provided pumps.

Installation of the irrigation system:



**DRIVING CENTER EQUIPMENT**

**3. Skidding devices for every application and claim**

We offer vehicle skidding devices for passenger cars, middle size trucks and heavy trucks. We entered a cooperation, to provide this technique as mature and professional as our other products. Our partner has built up a good reputation over several years in the automotive industry. He has introduced his experience in the production of inspection and testing devices into the development of skidding devices.

**3.1 The passenger car skidding device – 3.0 metric tons axle load, dynamic**

The skidding device is approved for vehicles with a max. axle load of 3.0 metric tons. It contains the following:

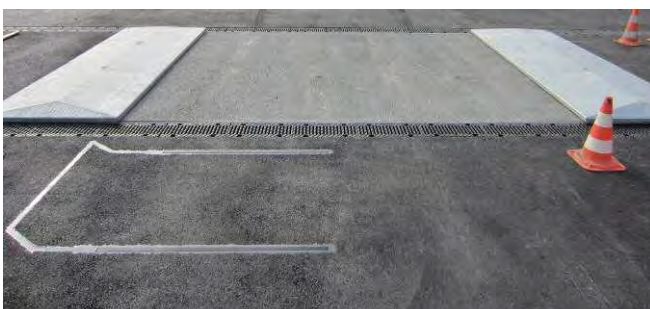
- Galvanized, moving plate 4.80 x 2.96m.
- Galvanized frame without floor and with lateral steel formwork (6.00 x 3.00 x 1.15m deep).
- Complete hydraulics under the plate.
- Switch box with operating devices.
- External speed indicator, 2 digits, 25cm height

Frame, plate and hydraulics are delivered completely assembled. The switch box and the speed indicator are assembled separately at site. The installation requires one day. The initiation after the pit-filling requires only a few hours.

Installation of the device



The sensors and the lateral coverage

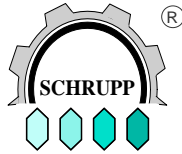


Complete hydraulics under the plate



Operator panel





## DRIVING CENTER EQUIPMENT

### 3.1.1 Technical data

#### Loads and dimensions

Max. Axle load	3.0 t (metric)	optional 7.5t traversable, without dynamic
Max. Vehicle weight	6.0 t (metric)	optional 15.0t traversable, without dynamic
Device depth	2.96 m	
Drive through width	3.75 m	optional 4.50m (semitrailer tractor)

#### Dynamic

Velocity	22 – 99km/h	Range optional adjustable!
Max. Acceleration	2 g	
Max. Velocity	2.5 m/s	
Max. Vehicle offset	0.45 m	
Stroke	0.9 m	
Amount of skidding	5.0 1/min	

#### Electrical data

Electrical connection	3 x 400 V	
Connecting line	4.0 kW	motor
	0.5 kW	control
No heating necessary!		

#### Hydraulic

Tank volume	100 Litres
Working pressure	170 bars
Accumulator	20 Litres

The plate is designed for largely maintenance free operation. Each time that it is initiated, the system conducts a check-up of all components and indicates their status on a display. The check-up takes about 30 sec.

In front of the device (in driving direction), two sensors are implemented in the asphalt. The sensors record the overrun of the tires and the computer-control of the system determines the speed and the wheelbase of the car using the recorded data. Using a single proportional valve, the hydraulic system executes an exact movement, regarding the speed, wheelbase and the selected level of difficulty. There are 4 levels of difficulty selectable. The impulse can be executed either to the left or the right side. The impulse can also be chosen to be alternating. This can either be selected or controlled by a random generator.

The device can execute an impulse every 12 sec with an input power of 4 kW only. The device activates at an overrun speed of 22 km/h up to 99.9 km/h. It is possible to set an individual limit for the max. /min. speed.

The vehicles may travel at a speed of even up to 60 km/h, depending on the constitution of the following sliding-surface. This velocity requires however a large run-out.

## DRIVING CENTER EQUIPMENT

### 3.2 The truck skidding device – 10.0 & 30.0 metric tons, dynamic

#### 3.2.1 BUS & Truck device, 1-axle to slide, 10.0 metric tons per axle

The skidding device is approved for vehicles up to an axle load of 10.0 tons (metric).  
It contains the following:

- Galvanized, moving plate 6.80 x 4.42m
- Galvanized side panels with the dimensions (8.90 x 4.46 x 1.25m deep)
- Complete hydraulics under the plate
- Control panel with operating devices
- External speed indicator, 2-digits, 25cm height

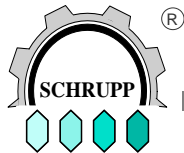
Installation, adjustment of the Halfen-reinforcements with templates



Suitable for passenger-cars also!







## DRIVING CENTER EQUIPMENT

### 3.2.2 Technical Data

#### Loads and dimensions

Max. Axle load	10.0	t (metric)
Device depth	4.46	m
Drive through width	5.20	m

#### Dynamic

Velocity	22 – 99 km/h	Range optional adjustable!
Max. Acceleration	2 g	
Max. Velocity	3.6 m/s	
Max. Vehicle offset	0.9 m	
Stroke	1.8 m	
Amount of skidding	5.0 1/min	

#### Electrical data

Electrical connection	3 x 400 V	
Connecting line	30.0 kW	pump-engine
	0.5 kW	partial-flow filter pump-engine
	1.0 kW	control
	No heating necessary!	

#### Hydraulic

Tank volume	400	Litres
Working pressure	170	bars
Accumulator	120	Litres

The technical description accords to the description of the passenger car device.

The device may also be used for passenger cars.

If device is used by passenger cars, the vehicles may travel at up to a velocity of 80 km/h, depending on the constitution of the following sliding-surface. This velocity requires however a large run-out.

## DRIVING CENTER EQUIPMENT

### 3.2.3 Heavy Trucks or special-purpose vehicles / 30.0 metric tons

The device is approved for vehicles with an axle load of up to 30.0 t (metric), three axles in a row with 10t per axle (metric) are allowed.

The device contains the following:

- Galvanized, moving plate 7.60 x 4.76m
- Galvanized side panels with the dimensions (10.00 x 4.80 x 1.25m deep)
- Complete hydraulics under the plate
- Control panel with operating devices
- External speed indicator, 2-digits, 25cm height

The construction is executed in three steps:

1. Delivery and support in alignment of the Halfen-reinforcement. The reinforcement is for the bottom-plate which is required for the mounting of our structures. (The bottom plate is casted by customer).
2. Delivery and construction of the side panels. The height of the side panels need to be adjusted on the later road level.  
(In case of concrete panels the mounting of a frame on the completed concrete walls is executed only.)
3. Installation and initiation of the system after the completion of the asphalt surface.

Installation and alignment of the Halfen-reinforcements are executed similarly to the 10t (metric) device. Construction of the steel side panels, In case of concrete panels the mounting of a frame on the completed concrete walls is executed only



## DRIVING CENTER EQUIPMENT

Installation of the bearing structure and the hydraulics



### 3.2.4 Technical data

#### Loads and dimensions

Max. Axle load	10.0 t (metric)	up to 3 axles simultaneously
Max. Load on the device	30.0 t (metric)	
Device depth	4.76 m	
Drive through width	5.70 m	

#### Dynamic

Velocity	22 – 99 km/h	Range optional adjustable!
Max. Acceleration	2 g	
Max. Velocity	4.0 m/s	
Max. Vehicle offset	1.12 m	
Stroke	2 m	
Amount of skidding	5.0 1/min	

#### Electrical data

Electrical connection	3 x 400 V	
Connecting line	37.0 kW	pump-engine
	0.75 kW	partial-flow filter pump-engine
	1.0 kW	control
	No heating necessary!	

## DRIVING CENTER EQUIPMENT

### Hydraulic

Tank volume	800	Litres
Working pressure	170	bars
Accumulator	2x80	Litres

The technical description applies to the description of the passenger car device.

The device may also be used for passenger cars.

If device is used by passenger cars, the vehicles may even travel at up to a velocity of 80 km/h, depending on the constitution of the following sliding-surface. This velocity requires however a large run-out.

### 3.3 The passenger car skidding device “PLUS” – 8.0 metric tons axle load, dynamic

The skidding device is approved for vehicles with a max. axle load of 8.0 metric tons.

The “Special” of the Car-plus is its bigger dimensions and a tuning of the original hydraulic of the car device. This device work up to 4.0 to (metric) with its 100% power and between 4.1 to 8.0 tons (metric) the power soften linear to the active weight.

This feature combines an optimum between economical wishes and maximum option for the training.

It contains the following:

- Galvanized, moving plate 6.10 x 3.56m.
- Galvanized frame without floor and with lateral steel formwork (7.00 x 3.60 x 1.15m deep).
- Complete hydraulics under the plate.
- Switch box with operating devices.
- External speed indicator, 2 digits, 25cm height

Frame, plate and hydraulics are delivered completely assembled. The switch box and the speed indicator are assembled separately at site. The installation requires one day.

The initiation after the pit-filling requires only a few hours.

Installation of the device

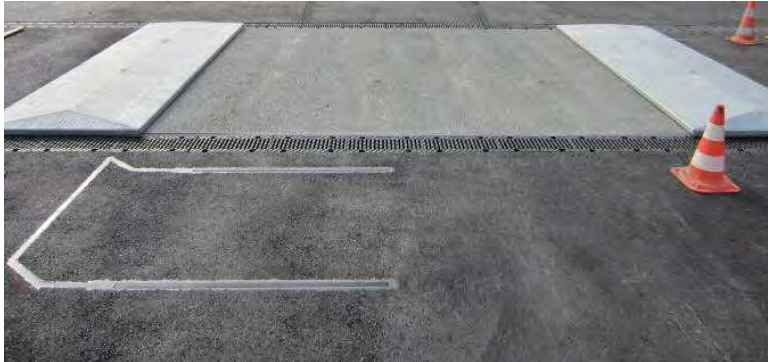


Complete hydraulics under the plate

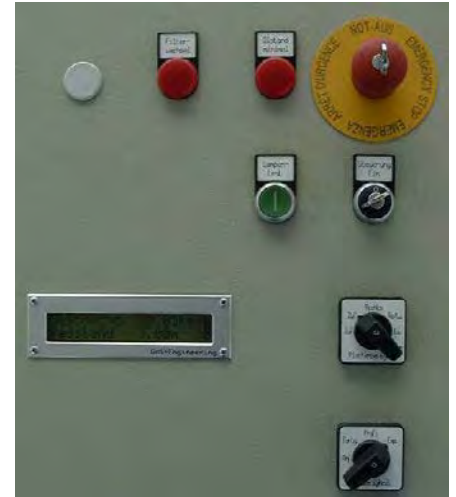


## DRIVING CENTER EQUIPMENT

The sensors and the lateral coverage



Operator panel



### 3.3.1 Technical data

#### Loads and dimensions

Max. Axle load	8.0 t (metric)	
Max. Vehicle weight	16.0 t (metric)	
Device depth	3.56 m	
Drive through width	4.50 m	optional 4.50m (semitrailer tractor)

#### Dynamic

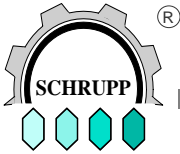
Velocity	22 – 99km/h	Range optional adjustable!
Max. Acceleration	2 g	
Max. Velocity	2.5 m/s	
Max. Vehicle offset	0.6 m	
Stroke	1.5 m	
Amount of skidding	5.0 1/min	

#### Electrical data

Electrical connection	3 x 400 V	
Connecting line	15 kW	motor
	0.5 kW	control
	No heating necessary!	

#### Hydraulic

Tank volume	200 Litres
Working pressure	170 bars
Accumulator	60 Litres



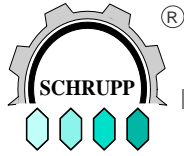
## **DRIVING CENTER EQUIPMENT**

The technical description applies to the description of the passenger car device.

The device may also be used for passenger cars.

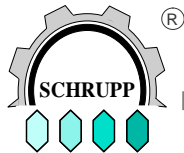
If device is used by passenger cars, the vehicles may even travel at up to a velocity **of 70 km/h**, depending on the constitution of the following sliding-surface. This velocity requires however a large run-out.

We would be glad to provide you with further information about the skidding devices, as preliminary Information.



**DRIVING CENTER EQUIPMENT**





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