

FRIKE – Automated Cone Laying Machine

FALCON ACLM

TABLE OF CONTENTS

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
frike

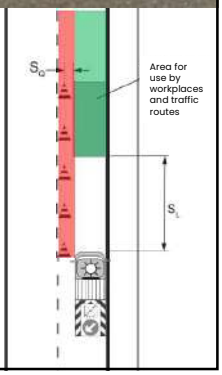
2

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



PROBLEM ANALYSIS

- Situation: Placement and Collection of Traffic Cones
  - Typically manual or semi-automatic process
- Challenges (**Safety**):
  - **Fatal risks;** zero tolerance for accidents
  - Moving traffic
  - Distracted road users
  - Excessive speeds
  - Workers' focus on tasks, not necessarily on traffic
  - Human fatigue leading to slower response times, whereas machines do not tire
  - SQ from ASR A5.2 requirements cannot be met under current conditions

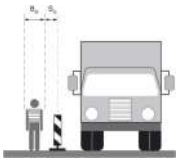


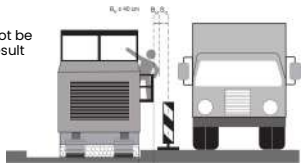
01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



ASR A5.2

- Section 4.3; (1)
  - « Except for the setup and dismantling of traffic control devices, no workplaces or traffic paths are allowed within the lateral safety distance (SQ).»
    - Working within the SQ is permitted, but only for a short duration. However, this should be avoided whenever possible.
- Section 4.3; (3)
  - «If the minimum dimensions from Tables 1 and 2 cannot be met, protective measures must be established as a result of a risk assessment»
    - **One protective measure is the traffic cone setter.**





01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

5



01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

6



- Enhancing **Workplace Safety** for Operational Personnel
  - Through the fully automated traffic cone setter itself
  - During the placement and retrieval of traffic cones
- **Maximum Traffic Safety**
  - No disruption to traffic
  - The machine operates smoothly and steadily. Incoming traffic is not surprised or unsettled by abrupt or rapid movements
  - The traffic cone is gently pushed to the centerline
- Lower **Operating Costs**
- **Focused effort**
  - Reduced time spent on signaling
  - More time for essential tasks: maintenance work

→ **«Overall, safer working conditions for both parties.»**

Verkehrstechnik
Technique du trafic
Traffic Control Engineering

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

7



SOLUTION

- Fully automated operation
- All processes are automatic and fully mechanized
- A single operator can carry out a lane closure safely, efficiently, and cost-effectively
- Personnel costs can be optimized while increasing safety simultaneously
- Traffic cones can be placed and removed fully automatically across the entire width of the lane, allowing lane removal to also be fully automated

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
frike

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

8



01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



- No exposed or moving parts outside the vehicle profile in the traffic area, ensuring maximum traffic and workplace safety
- Maximum occupational safety, no need to leave the cab
  - Value of a statistical life (WSL) = €1.65 million*
- LED headlights and infrared imaging for nighttime use

*Quelle: Technische Universität Darmstadt, Hannes Spengler, August 2004

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



- Ø 8 traffic cones per minute (including reloading interruptions)
- Rule of thumb: Speed [km/h] = distance [m] / 2
- One of the fastest fully automatic traffic cone setters on the market

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



- Operation via 12.1" touchscreen control panel in the cabin
- Visual process monitoring with 4 cameras
- The most commonly used aid is still the side mirror
- Fully automatic operation with just one operator

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fr8ke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

Operation



Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fr8ke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

13



FLEXIBEL

- Different Working Modes
  - Set
  - Pick up
  - Track reduction
  - Deactivation of individual magazines in very narrow conditions
- 51 pre-programmed cone positions over a track width of 3,500 mm
- Individual signaling
- Flexible mounting on a small truck
  - Interface: 6x mounting screws; 3x control panel plugs
- Floating support structure, ideal for use on uneven road surfaces and varying installation heights

Verkehrstechnik
Technique du trafic
Traffic Control Engineering

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

14



ROBUST

- Can be used in all weather conditions (except during heavy snowfall)
- The only machine to have passed the “National Highways” entry endurance tests in England
  - 12,500 traffic cones placed on the airfield
  - 12,500 traffic cones in 40 night missions
- 3rd generation
- Developed and tested since 2015, with experience from over 150,000 deployed and collected traffic cones across hundreds of kilometers of lane closures

Verkehrstechnik
Technique du trafic
Traffic Control Engineering

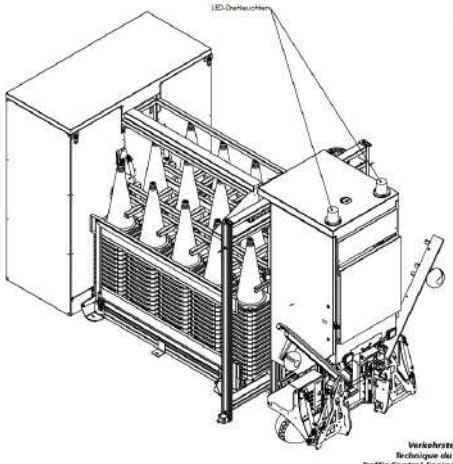
01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

Models

	Number of traffic cones	Vehicle weight
Model XXS	75	5t
Model XS	150	5t
Model S	**225**	**7t**
Model M	360	10t – 12t
Model L	450	18t

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

Technical Data
Model S



01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

17



TECHNICAL DATA

Dimensions (LxWxH):	4'208mm x 2'214mm x 2'521mm
Rear overhang:	1'146mm (Retractable on request)
Weight without traffic cones:	Ca. 2'200kg
Weight with traffic cones:	Ca. 3'460kg
Power supply Machine:	48VDC / 190Ah Machines Battery
Operating time:	900 cycles = 2x put down & pick up all traffic cones

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

18

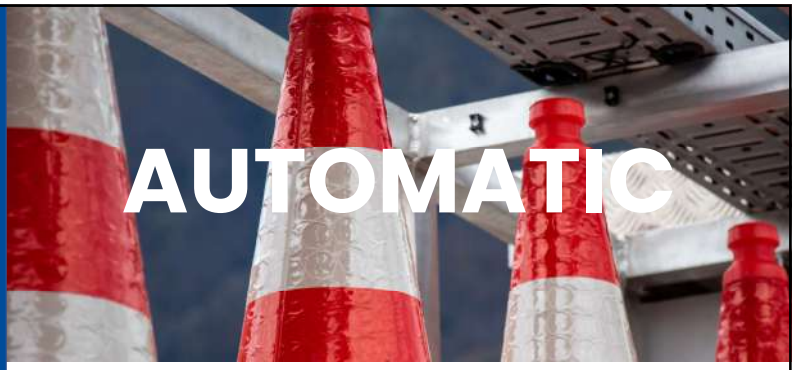


SPEED

Discard:	8 Cones/Minute
Pick up:	7 Cones/Minute
Average speed:(including reload interruption)	18m ~ 8.6km/h 36m ~ 17.3km/h 50m ~ 24.0km/h Rule: Distance / 2

- Distance between traffic cones can be freely adjusted, ranging from 3m to 100m
- Automatic triggering based on the vehicle's speedometer signal
- Manual triggering possible at any time (override priority)

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



AUTOMATIC

- Automatic tracking of traffic cones
- The machine manages the magazine independently
- Automatic reloading mode
  - Reloading from the outside into the central magazine (manual reloading)
- The magazine can be deactivated

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany



WORKING MODES

- Fully automatic placement of traffic cones according to the defined distance when driving forwards
- Continuous collection of traffic cones when reversing within the secured area in accordance with VSS/RSA
- Manual individual activation
- Fully automatic placement and collection of traffic cones when the lane is reduced from left to right or vice versa

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

21

TL-Cone
FALCON 75

Dimension Base (LxW):	400mm x 400mm
Height:	773mm
Weight:	5.6kg
Weight category:	III / W3
Film type:	B (equivalent to RA2B / HIG)
Stack division:	55mm
Standards:	DIN EN 13422 BASt TL-Cone (02 3S 05) VSS 40 876
Advantages:	• Maximum stabilityNo sticking due to centering ring



Verkehrstechnik Technique du trafic Traffic Control Engineering

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

22



CARRIER VEHICLE

- Assembly Height: 900mm - 1,300mm (lower bridge heights possible by arrangement)
- Total Weight: Minimum 7t
- Available Payload: Minimum 3.5t
- Largest Possible Center Distance
- For Bridge Installation: Minimum 2,000m wide bridge
- Loading Area: Minimum 3,700mm long (access to the technical zone from the front)

Verkehrstechnik Technique du trafic Traffic Control Engineering

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

Carrier vehicle

Examples





Description	MAN TGL 7.160 4x2 BL CH	Mitsubishi FUSO Canter 7C18AMT 4x2	Iveco Daily 70C21HA8
Main wheel base:	3'600mm	4'300mm	3'750mm – 5'100mm
Overall weight:	7'500kg	7'490kg	7'200kg
Max. payload:	3'648kg	4'713kg	4'650kg
Front-axle load:	3'400kg	3'100kg	2'500kg
Rear-axle load:	5'200kg	5'990kg	5'350kg

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

Assembly options



Bolted or lashed to the bridge as a payload



Permanently installed directly on chassis with pneumatic underride guard



Auf On tipper body / swap body / Wechselbrücke



Hook device

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

25

Vehicle combination with trailer





Verkehrstechnik
Technique du trafic
Traffic Control Engineering
frike

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

26

Accessories Signalisation

VZ3



Full matrix RGB LED panel



Schablonen LED-Tafel



Leuchtpfeil am Heck mit & ohne Weitwarn-blitzleuchten



Seitliche Blitzleuchten

VZ3 Hier Englische Bezeichnungen einfügen
Valeria Zürcher; 20.01.2025

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

27

Accessories
Tarpaulins/sliding top





- Particularly suitable for outdoor locations

Verkehrstechnik Technique du trafic Traffic Control Engineering fröke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

28

Accessories
Sliding frame



ACLM in Working Position with Sliding Frame
(Same position as without the sliding frame)



ACLM in Working Position with Sliding Frame
(Overhang only 500mm instead of 1150mm)

Verkehrstechnik Technique du trafic Traffic Control Engineering fröke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

29

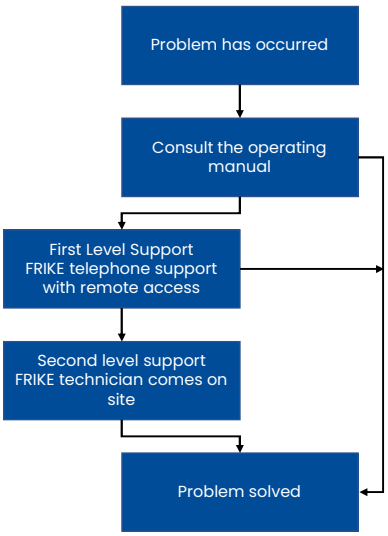
Accessories
Hook device



01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

30

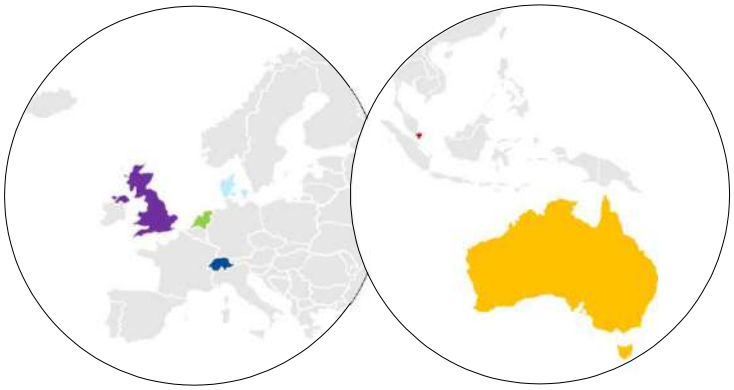
Service & Support



01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

31

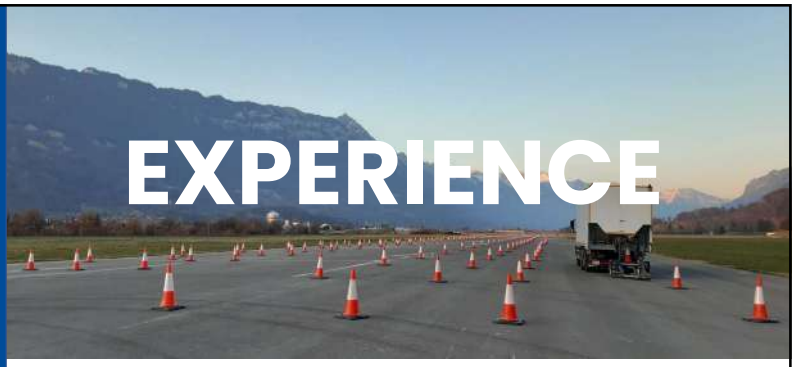
References



- 6 Switzerland
- 5 UK
- 1 Netherlands
- 1 Denmark
- 1 Singapore
- 2 Australia

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

32



- Over 300,000 Traffic Cones Placed Worldwide
- Record machine: 60,000 traffic cones in one year with a single machine
- With a cone spacing of 18 meters, this covers a distance of 5,400 kilometers
- This is equivalent to the distance from Frankfurt to the USA (state of Maine)
- With each cone weighing 5 kg, this totals 3,000 tons — the equivalent of 10 A380 jumbo jets

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fr8ke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

33

SWITZERLAND



Kanton Bern
Canton de Berne

NSNW

Kanton Zürich
Baudirektion
Tiefbauamt

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fröke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

34

UK



HIGHWAY CARE
Balfour Beatty

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fröke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

35

SINGAPORE



SAMWOH

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fröke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

36

NETHERLANDS



EBO VAN WEEL

wilchem
milieu- en incidentmanagement

Verkehrstechnik
Technique du trafic
Traffic Control Engineering
fröke

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

37

DENMARK



terranor

Verkehrstechnik Technique du trafic Traffic Control Engineering frike

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

38

AUSTRALIA



1x Model L



1x Model S

A1 ROADLINES PTY LTD

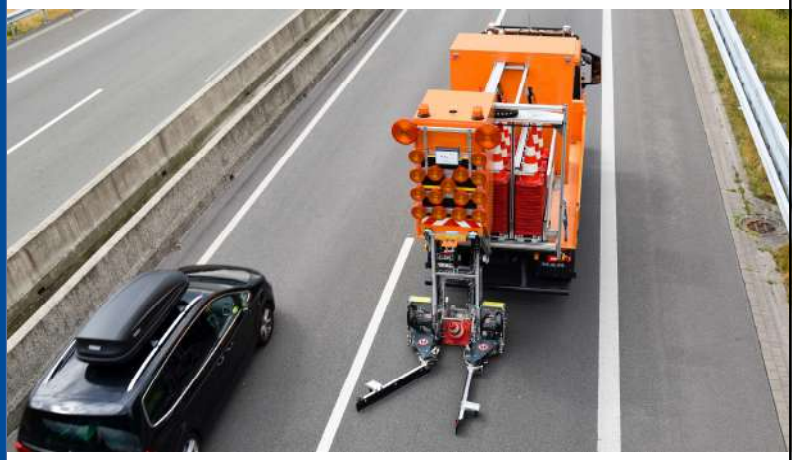
Verkehrstechnik Technique du trafic Traffic Control Engineering frike

01 Problem analysis
02 Goal
03 Solution
04 Characteristics
05 Models
06 Technical data
07 Carrier vehicle
08 Assembly options
09 Accessories
10 Service & Support
11 References
12 Application in Germany

39



GERMANY



Verkehrstechnik
Technique du trafic
Traffic Control Engineering

Version 5, Oktober 2024

Creating Safety Together

More Information

info@frike.ch

+41 44 869 23 44

www.frike.ch

Verkehrstechnik
Technique du trafic
Traffic Control Engineering