

Meersbloem Melden 16  
9700 Oudenaarde - Belgium  
T : + 32 55 31 83 35  
F : + 32 55 31 43 88  
[www.vergokan.com](http://www.vergokan.com)

## Use of the specification text:

- The sign '#' marks a choice. Only one option can be selected. All the text that follows the mark and is marked in red comes with that same option.
- All Vergokan brand names are marked in orange.
- titles marked in green indicate the possibility of multiple choices/options. These are mentioned by information.
- *Eventual remarks are marked in blue*

## 3 Cable ladders Vergokan

### Introduction

Cable ladders are manufactured from steel sheet.

Cable ladders are to be installed according to the specifications in the AREI (Belgian regulations for Electrical Installations).

All Vergokan products are manufactured in accordance with the ISO 9001 Quality System.

All Vergokan products are CE Certified.

Cable ladders are classified according to norm EN 61537.

Large spans are possible depending on the type of cable ladder.

### 3.1 Type of cable ladder

#### 3.1.1 Description of the system and dimensions

The cable ladder consists of prefabricated elements

# The cable ladder type **KL** is factory assembled from two perforated L shape side walls with inward return flanges. The rungs are C-profiles that are clinch welded every 300mm to the bottom rail of the side walls. The positioning of the rungs at the base of the side wall of the ladder, guarantees a maximum useable inner height.

# The cable ladder type **KS** is factory assembled from two tubular side walls. The rungs are C-profiles that are welded every 250mm to the lower end of the side tubes and placed alternately upwards and downwards. The positioning of the rungs at the base of the side wall of the ladder, guarantees a maximum useable interior height.

# The cable ladder type **KSR, KLIE, KLIEZ 150, KLIS** is factory assembled from two tubular side walls. The rungs are tubular profiles that are crimped every 250mm into the lower end of the side

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tubes. The positioning of the rungs at the base of the side wall of the ladder, guarantees a maximum useable inner height.

# The cable ladder type **KLIG**, **KLIGZ** is factory assembled from two S- shaped side walls. The rungs are perforated C-profiles that are clinch welded every 250mm, alternately upwards and downwards, in the bottom profile of the side walls. The positioning of the rungs at the base of the side wall of the ladder, guarantees a maximum useable inner height.

The choice of the type of cable ladder depends on the number of cables and the load, in compliance with the Vergokan Specifications.

### 3.1.2 Perforations

# Cable ladder, type **KL** is supplied with longitudinal perforations of 7 x 25mm in the side walls. The rungs are non perforated.

# Cable ladder type **KLIG**, **KLIGZ** is supplied with longitudinal perforations of 14 x 28mm in the side walls and perforated rungs.

# Cable ladder type **KS** is supplied with perforated rungs.

### 3.1.3 Cable ladder dimensions

# Cable ladder type **KL** has a total height of  
#60mm and a useable inner height of 45mm.  
#85mm and a useable inner height of 70mm.  
#110mm and a useable inner height of 95mm.

# Cable ladder type **KS** has a total height of 60mm and a useable inner height of 45mm.  
# Cable ladder type **KSR** has a total height of 60mm and a useable inner height of 33mm.  
# Cable ladder type **KLIE**, **KLIEZ** has a total height of 80mm and a useable inner height of 55mm.  
# Cable ladder type **KLIS** has a total height of 100mm and a useable inner height of 95mm  
# Cable ladder type **KLIG**, (**KLIGZ 150** - only for side wall height 150) has a total height of  
#100mm and a useable inner height of 77mm  
#150mm and a useable inner height of 127mm  
#200 mm and a useable inner height of 177mm

# Cable ladder type # **KL**, # **KS**, # **KSR**, # **KLIE**, # **KLIEZ**, # **KLIS** has a total width of #200, #300, #400, #500, #600mm depending on the number of cables and the load.

# Cable ladder type **KLIG**, **KLIGZ 150** has a total width of  
#212, #312, #412, #512, #612mm depending on the number of cables and the load.

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### 3.1.4 Compartments

# Cable ladders shall have a single compartment for LV or ELV cables.

# Cable ladders shall have two compartments to separate LV cables from ELV cables or data cables. The compartments are formed by installation of an L-shaped partition type SLOS of the same height as the useable inner height of the cable ladder and attached by means of

# for cable ladder type # KL, # KLI, #KLI 150 with sliding nuts type # GM 6 (for type KL), # GM 41 M 6 (for type KLI, KLI 150) and round head bolt type RB  
# for cable ladder type # KS with bolts and nuts type VM  
# for cable ladder type # KSR, # KLIE, #KLIEZ, # KLIS with fixing clamp type BKID 25 which clamps the partition to the rungs.

### 3.1.5 Accessories

All accessories are factory assembled and delivered as such and are of equal origin and quality to the cable ladder.

# These accessories are attached to the cable ladder by means of bolts and nuts type;  
# # V 60\*200, # V 85\*200, # V 110\*200 depending on the height of the ladder type KL.  
# SSU for ladders type KS, KSR.  
# LVIE for ladders type KLIE, KLIEZ.  
# LVIS for ladders type KLIS.

# The ends of the accessories slide into the ladder type KLI, KLI 150 and are attached to it using bolts and nuts.

### 3.1.6 Covers

The cable ladders are closed with covers which are attached to the cable ladders with special clips. The type of cover and clips depends on the type of ladder. Two clips should be fitted per metre.

# ladder type KL, requires a cover type D and clips DCL.  
# ladder type # KS, # KLIE, #KLIEZ, # KLIS requires a cover type DI and fixing clamp type # DAVIDKV (for KS), # DKI (for KLIE, KLIEZ), # DKIS (for KLIS).  
# ladder type KLI, KLI 150, requires a cover type DIG and fixing clamp type DKIG.

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Covers with a width greater than 400 mm are manufactured with diagonal reinforcements.

### 3.1.7 Joining of the cable ladders

Cable ladders are attached to one another with a joiner fixed with bolts and nuts adapted to the type of cable ladder;

- # # V 60\*200, # V 85\*200, # V 110\*200 depending on the height of the ladder type KL.
- # SSU for ladders type KS, KSR.
- # LVIE for ladders type KLIE, KLIEZ.
- # LVIS for ladders type KLIS.
- # LVIG for ladders type KLIIG, KLIIGZ 150, with a free span smaller than 6m.
- # LVIGS for ladders type KLIIG, KLIIGZ 150, with a free span from 6m and more.

## 3.2 Mounting of the Cable ladder

The Cable ladder system is:

- # Hung from # structural ceiling, # steel structure on threaded rod suspended by means of:
  - # Ceiling bracket type FL, PB, SDBG and adjustable for light inclining roof construction type PBR
  - # double suspension type DR, were cables are bundled (Pulled?).
- # Suspended from structural ceilings using ceiling profiles type HSLECL, HSLDCL, HSME, HSMU 50, HSMD, HSIZ, for inclining roof constructions type SKP, SKIPN and wall brackets type WS, KCL, WKS, WK, WKM, WKZ, HKI, HKIZ and adjustable brackets type WKSS  
*For combination brackets and ceiling profiles - please consult Vergokan documentation - Chapter 5*
- # Mounted on wall brackets type WS, KCL, WKS, WK, WKM, WKZ, HKI, HKIZ and adjustable brackets type WKSS
- # Mounted against the wall with wall support brackets type AB 35\*110 (for KL), VK 2 (for KS), ABIE (forKLIE).
- # Mounted against the wall on multifunctional brackets type VS 41.

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### 3.3 Materials and surface treatments

The cable ladders are fabricated from steel and treated against corrosion that is suitable for their function and the environment in which they are installed.

# Cable ladder type **KL**, **KLIGZ** is fabricated from continuously hot dipped pre-galvanised steel sheet, otherwise called Sendzimir galvanised. The galvanisation complies with norms EN 10 143 and EN 10 346.

# The cable ladders (**all but KL and KLIGZ**) are fabricated from steel sheet. After fabrication, they are hot dip galvanised, complying with norm EN ISO 1461. During this process, after a series of preparatory treatments of the steel in which impurities are removed from the metal, the cable ladder is immersed in a heated bath of pure liquid zinc.

# The cable ladders are fabricated from steel sheet and coated according to norm EN ISO 12944 with a thermosetting powder coating (GSB ST663 certified). During this process, after a series of chemical preparatory treatments of the steel, the powder is applied to the steel electro statically by means of air guns with a high negative voltage. Afterwards the coating is cured in a muffle oven.

# The cable ladders are fabricated from steel sheet and treated with a duplex coating complying with the Belgian Practice Guideline for duplex BPR 1197. This means that after the hot dip galvanising (complying with norm EN ISO 1461) the ladders are coated according to norm EN ISO 12944 with a thermosetting powder coating (GSB ST663 certified). In order to be suitable for coating, the hot dipped galvanised steel is, immediately after galvanizing, treated to remove impurities and imperfections. After this, the galvanized steel receives a preliminary treatment to prepare for coating, involving removal of the zinc salts by immersing the steel in a chemical bath.

After preliminary treatment, the powder is applied electro statically by means of air guns with high negative voltage. Afterwards the coating is cured in a muffle oven.

# The cable ladders type **INOXKBSI**, **INOXKG**, are fabricated from stainless steel type  
# AISI Inox 316 L / V4A.  
# AISI Inox 304 / V2A.

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## 4 Vergokan uniform cable ladder range

### Introduction

Vergokan cable ladders are manufactured from steel sheet.  
Cable ladders are to be installed according to the specifications in the AREI (Belgian regulations for Electrical Installations).  
All Vergokan products are manufactured in accordance with the ISO 9001 Quality System.  
All Vergokan products are CE Certified.  
Cable ladders are classified according to norm EN 61537.  
Wide spans are possible depending on the type of cable ladder.

### 4.1 Type of cable ladder

#### 4.1.1 Description of the system

The cable ladder is factory assembled from two profiled S- shaped side walls and C-shaped rungs with return flanges.  
The rungs are fixed in the bottom profile of the side walls every 250mm with the openings facing alternately upwards and downwards.  
The rungs are attached to the side profiles by inserting their ends through the side walls and bending them open. (to order the rungs can be placed at any distance between 100 and 300mm in steps of 50mm).  
The positioning of the rungs at the base of the side wall of the ladder, guarantees a maximum useable inner height.

The choice of the cable ladder type depends on the number of cables and the load, in compliance with the Vergokan Specifications.

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## 4.1.2 Perforations

# The ladder type **KLLI 60**, **KLL 85**, **KLL 110** is supplied with longitudinal perforations of 7 x 25mm in the side walls. The rungs are supplied with 7 x 25mm perforations in the bottom and 5 x 17mm perforations in the sides.

# The heavy ladders type **KLM**, **KLZ**, **KLW** are supplied with longitudinal perforations of 14 x 28mm in the side walls. The rungs are supplied with 14 x 28mm perforations in the bottom and 5 x 17mm perforations in the sides.

## 4.1.3 Cable ladder dimensions

# Ladder type # **KLLI 60**, # **KLL 85**, # **KLL 110** is manufactured from side profiles with dimensions as detailed below and C-rungs of 30x15 mm manufactured from 1.00mm steel.

# The side profiles of the ladder type **KLLI 60** are manufactured from 1.00mm steel and have a total height of 60mm. The useable inner height is 44mm.

# The side profiles of the ladder type **KLL 85** are manufactured from 1.00mm steel and have a total height of 85mm. The useable inner height is 69mm.

# The side profiles of the ladder type **KLL 110** are manufactured from 1.25mm steel and have a total height of 110mm. The useable inner height is 94mm.

# Ladders type # **KLM**, # **KLZ**, # **KLW** are manufactured from side profiles with dimensions as detailed below and C-rungs of 41 x 21 mm manufactured from 1.25mm steel.

# The side profiles of the ladder type **KLM** are manufactured from 1.50mm steel and have a total height of 125mm. The useable inner height is 102mm.

# The side profiles of the ladder type **KLZ** are manufactured from 1.75mm steel and have a total height of 150mm. The useable inner height is 127mm.

# The side profiles of the ladder type **KLW** are manufactured from 2.00mm steel and have a total height of 200mm. The useable inner height is 177mm.

The ladders have a total length of

# 3m (by default for **KLLI 60**, **KLL 85**, **KLL 110** and to order for types **KLM**, **KLZ**, **KLW**),

# 6m (by default for **KLM**, **KLZ**, **KLW** and to order for types **KLLI60**, **KLL85** and **KLL110**),

# 9m (to order for types **KLM**, **KLZ**, **KLW**)

The ladders have a width of

# for cable ladders type # **KLLI 60**, # **KLL 85**, # **KLL 110**;

# 150 mm (only type **KLLI 60**), # 200, # 300, # 400, # 500, # 600 mm (# 700 – 1200 mm, in steps of 100 mm to order) depending on the amount of cables and the load.

# for cable ladders type # **KLM**, # **KLZ**, # **KLW** ;

# 212, # 312, # 412, # 512, # 612 mm (# 712 – 1212 mm, in steps of 100 mm to order) depending on the amount of cables and the load..

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## 4.1.4 Compartments

# Cable ladders shall have a single compartment for LV or ELV cables.

# Cable ladders shall have two compartments to separate LV cables from ELV cables or data cables. The compartments are formed by installation of an L-shaped partition type SLOS of the same height as the useable inner height of the cable ladder and attached by means of

# for type KLLI 60, KLL 85, KLL 110 ;

# sliding nuts type GM 6

# bolts and nuts type VM

# for type KLM, KLZ, KLW: sliding nuts type GM 41 M 6

## 4.1.5 Accessories

All accessories (such as horizontal bends, cross-overs, T-pieces, inside and outside rising bends, flexible bends etc) are factory assembled and delivered as such and are of equal origin and quality as the cable ladder.

They are attached to the cable ladders by means of an integrated joiner.

Depending on the containment route, accessories such as vertical drop-outs, horizontal connectors, vertical and horizontal hinges, reducers, stand-off brackets, etc shall be used.

Ladders can be fixed direct to the wall using a stand-off bracket or by means of bracket clamps onto wall brackets or channel, depending on the application.

## 4.1.6 Covers

The cable ladders are closed with covers which are attached with clips. The cover is fixed # flush, # raised for ventilation

# type KLLDK (flush)

# type KLLABD (raised for ladder type KLLI 60, KLL 85, KLL 110),

# type KLMZWABD (raised for ladder type KLM, KLZ, KLW).

Two clips should be fitted per metre.

Covers with a width greater than 400 mm are manufactured with diagonal reinforcements.



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## 4.1.7 Joining of the cable ladders

Cable ladders are attached to one another with

# an integrated joiner for ladders type KLLI 60

# a joiner specific to the type of ladder fixed with bolts and nuts;

# length 200mm for cable ladders # type KLLI 60 that have been cut, # type KLL 85

# length 400mm for cable ladders type KLL110.

# length 600mm for cable ladders type # KLM, # KLZ.

# length 900mm for cable ladders type KLW.

## 4.2 Mounting of the Cable ladder

The Cable ladder system is:

# Hung from # structural ceiling, # steel structure on threaded rod suspended by means of:

# Ceiling bracket type FL, PB, SDBG and adjustable for lightweight inclined roof constructions type PBR

# trapeze suspension type DR, where cables are to be pulled

# Suspended from structural ceilings using ceiling profiles type HSLECL, HSLDCL, HSME, HSMU 50, HSMD, HSIZ, for inclining roof constructions type SKP, SKIPN and wall brackets type WS, KCL, WKS, WK, WKM, WKZ, HKI, HKIZ and adjustable brackets type WKSS

*For combination brackets and ceiling profiles - please consult Vergokan documentation - Chapter 5*

# Mounted on wall brackets type WS, KCL, WKS, WK, WKM, WKZ, HKI, HKIZ and adjustable brackets type WKSS

# Mounted flat against a wall with wall support brackets type AB 35\*110 (for KLL(I)), with wall support brackets type KLMZWAB (for KLM, KLW, KLZ), on multifunctional brackets type VS 41 or on profiles type DR, MP.

## 4.3 Materials and surface treatments

The cable ladders are fabricated from steel and treated against corrosion that is suitable for their function and the environment in which they are installed.

# The cable ladders are fabricated from continuously hot dipped pre-galvanised steel sheet, otherwise called Sendzimir galvanised. The galvanisation complies with norms EN 10 143 and EN 10 346.

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# The cable ladders are fabricated from steel sheet. After fabrication, they are hot dip galvanised, complying with norm EN ISO 1461. During this process, after a series of preparatory treatments of the steel in which impurities are removed from the metal, the cable ladder is immersed in a heated bath of pure liquid zinc.

# The cable ladders are fabricated from steel sheet and coated according to norm EN ISO 12944 with a thermosetting powder coating (GSB ST663 certified). During this process, after a series of chemical preparatory treatments of the steel, the powder is applied to the steel electro statically by means of air guns with a high negative voltage. Afterwards the coating is cured in a muffle oven.

# The cable ladders are fabricated from steel sheet and treated with a duplex coating complying with the Belgian Practice Guideline for duplex BPR 1197. This means that after the hot dip galvanising (complying with norm EN ISO 1461) the ladders are coated according to norm EN ISO 12944 with a thermosetting powder coating (GSB ST663 certified).

In order to be suitable for coating, the hot dipped galvanised steel is, immediately after galvanizing, treated to remove impurities and imperfections.

After this, the galvanized steel receives a preliminary treatment to it prepare for coating, involving removal of the zinc salts by immersing the steel in a chemical bath.

After preliminary treatment, the powder is applied electro statically by means of air guns with high negative voltage. Afterwards the coating is cured in a muffle oven.

# The cable ladders type **INOXKBSI**, **INOXKG**, are fabricated from stainless steel type  
# AISI Inox 316 L / V4A.  
# AISI Inox 304 / V2A.

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