

PENKO Engineering B.V.

Your Partner for Fully Engineered Factory Solutions



Manual:
Excitation Trim Junction Box KVD



PENKO

an ETC Company

IMPORTANT SAFETY INFORMATION

READ THIS PAGE FIRST!

PENKO Engineering B.V. manufactures and tests its products to meet all applicable national and international standards. It is vital that this instrument is correctly installed, used, and maintained to ensure it continues to operate to its optimum specification.

The following instructions must be adhered to and incorporated into your safety program when installing, using, and maintaining PENKO products. Failure to follow the recommended instructions can affect the system's safety and may increase the risk of serious personal injury, property damage, damage to this instrument and may invalidate the product's warranty.

- Read the instructions fully prior to installing, operating, or servicing the product. If this Instruction Manual is not the correct manual for the PENKO product you are using, call 0031(0)318-525630 for a replacement copy. Keep this Instruction Manual in a safe place for future reference.

- If you do not fully understand these instructions, contact your PENKO representative for clarification.

- Pay careful attention to all warnings, cautions, and instructions marked on and supplied with the product.

- Inform and educate your personnel about the correct installation, operation, and maintenance procedures for this product.

- Install your equipment as specified in the installation instructions of the appropriate Instruction Manual and as per applicable local and national codes. Connect all products to the proper electrical sources.

- To ensure correct performance, use qualified personnel to install, operate, update, program, and maintain the product.

- When replacement parts are required, ensure that qualified technicians use replacement parts specified by PENKO. Unauthorized components and procedures can affect the product's performance and may affect the continued safe operation of your processes. The use of non-specified 'look-alike' substitution parts may result in the risk of fire, electrical hazards, or improper operation.

- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.

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Introduction

The KVD is a junction box for connecting up to 4 loadcells to an indicator.

1 Overview

- Summing 2, 3 or 4 load cells.
- PCB with connectors and trim capability.
- 4 potentiometers for corner trim applications. (only for non-EX versions)
- Strain relief cable fittings.
- Protection IP 65.
- Optional: Suitable for “ EX “ areas.
- Enclosure: Reinforced fiberglass polyester.
- Dimensions (L x W x H) 160x75x55 mm (cable fittings not included).
- Color grey. (EX version Black)




2 Connections

Inputs	Up to 4 load cells. Cable diameter $\geq 5\text{mm}$ $\leq 8\text{mm}$	
Output	One cable gland, Cable diameter $\geq 5\text{mm}$ $\leq 8\text{mm}$	
Cable glands	IP66, 4 x M16 to the load cells, 1 x M16 to the indicator.	
Terminal blocks	Terminal 1	+ Excitation + Sense
	Terminal 2	- Excitation - Sense
	Terminal 3	+ Signal
	Terminal 4	- Signal
	Terminal 5	Shield/Earth
Trim potentiometer	0 - 20 Ohm, 25 turn precision potentiometer ¹ .	
Protection	IP 65. Inside -O- ring type sealing.	
Enclosure	Reinforced fiberglass polyester.	
Dimensions	W x H x D - 160 x 75 x 55 .(cable fittings not included)	
Option: (On request)	Aluminum, stainless steel or suitable for “EX” areas.	

¹The trim potentiometers are only functioning when the -0- Ohm resistors are removed.

3 EX application

This applies only to the EX version of the KVD. This version can be identified by the black housing and blue cable glands and the following marking:

 II 2D Ex tD A21 IP65 T85°C
 II 2G Ex ia IIC T6
 II 2D Ex ia IIIC T6(Ta:-20° to 40°C)

Type : KVD Production Year: 2015
 Simple Apparatus. Max: 24V/660mA
 Do not open while energized
 PENKO Engineering B.V. Schutterweg 35,
 6718XC Ede, The Netherlands

When used in an Ex-tD A21 application the internal connections provide no power dissipation. Protection is provided by the approved housing and cable glands.

For intrinsically safe application the KVD is classified as a **simple apparatus** and contains no active components or protection circuitry. The 0 Ohm resistors may not be removed.

Maximum voltage and current inside the hazardous area must to be limited using barriers or an ATEX EX-ia certified indicator. The installation must conform to IEC60079-14:2013. We recommend the following MTL barriers.

Barrier Type	Max. voltage	Resistance	Max. current	Fuse rating
MTL 7761Pac	9 Volt	350 Ohm	26 mA	50 mA
MTL 7766Pac	12 Volt	75 Ohm	157 mA	100 mA

This application is described by MTL in document EPS7700 rev6 140410.

Exceeding the maximum barrier current can destroy the fuse. When MTL761P/MTL766P are used then the entire barrier will need replacement.

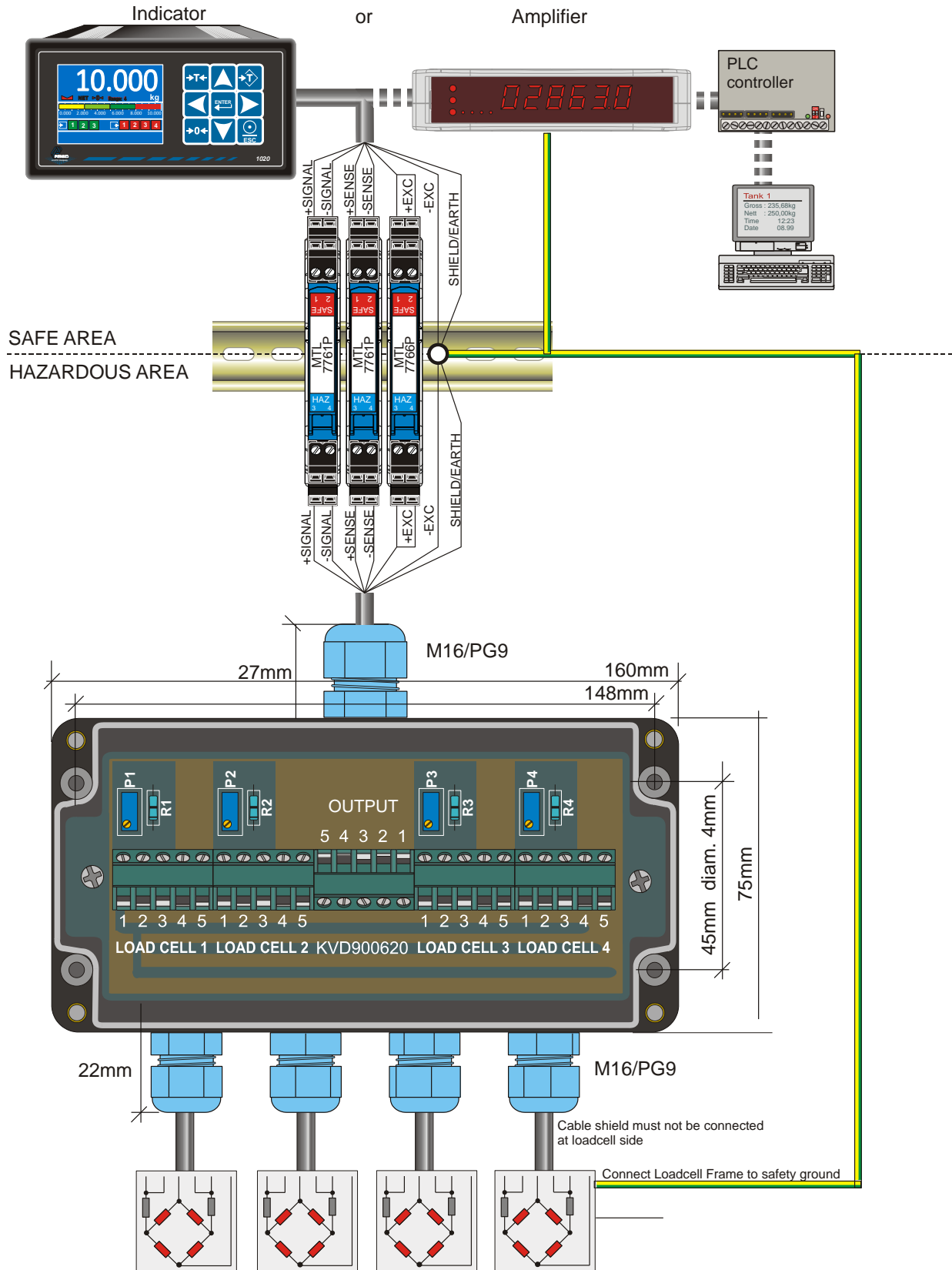
3.1.1 Barrier calculation

Highest total voltage = 2*U_{max} MTL7766Pac = 24V

Highest total current = 4* MTL 7761Pac + 2* MTL 7766Pac = 4*26mA + 2* 157mA = 418mA.

Allowed cable specification according to IEC60079-11:

IIB	IIC
C0 = 930nF Lo=0.8mH Max 1km cable	Not allowed



- When installing and operating explosion proof electrical equipment the recognized EN conditions and stipulations concerning electrical equipment in hazardous areas must be considered. The entire installation must conform to IEC60079-14:2013.
- The KVD can be used in hazardous area zones 1,2,21 and 22.
- The KVD is not certified for ATEX Zone 0 and 20. Use only in accordance with the EX marking. Observe the intended temperature class and explosion group.
- The user has to consider all demands as per particulars given in EN 61241-0 and EN 61241-1, especially to excessive dust deposits.
- No modifications to the KVD are allowed.
- The junction box should not be opened inside the hazardous area while power is applied.
- Unused cable glands should be closed off to ensure IP65 protection is maintained.
- Ensure that the barrier assembly is clearly marked with replacement types.
- Safe and hazardous cables must be separated by >50mm (separate trunking). Intrinsically safe cabling must be clearly recognizable by labeling or using blue colored cables
- For EX applications a Maximum 'hazardous' cable length of 100m is assumed. Longer cables can be used, but a careful analysis of total inductance and capacitance must be carried out to ensure a safe installation.)
- The cable screen must be continuous from barrier through to actual load cell screen(s) with NO OTHER CONNECTIONS.
- The indicator to barrier section of load cell cable screen must be 'earthed' at one end only. It should be connected to the indicator's metallic enclosure. If the indicator shares the barrier enclosure, connect the load cell cable screen to the barrier busbar instead.
- A separate $\geq 1.5\text{mm}^2$ min cable, Green/Yellow, *must be connected* to the Indicator loadcell ground. It is wired directly to the Barrier Earth Bar.
- Normally, an indicator will be situated in the same enclosure as the barriers and its power supply. In this case, the power supply 0v and indicator 0v must be bonded to the barrier busbar. If the indicator is remote from the barrier box, its supply must be allowed to 'float' and it must have a separate $\geq 1.5\text{mm}^2$ min cable, Green/Yellow, between indicator 0v and the barrier busbar.
- The SENSE and SIGNAL inputs have an effectively infinite input impedance so the 761P creates no temperature specification degradation. When using the 1020 or SGM7xx indicators the excitation voltage is 5 volts. Actual cell excitation voltages are:
 - 1 x 350W cell: 4.4v
 - 2 x 350W cells: 3.9v
 - 3 x 350W cells: 3.55v
 - 4 x 350W cells: 3.26v
- For EX-I applications the loadcell must have an dielectric isolation of 500Vac in respect to earth. Otherwise bonding conductors $>4\text{mm}^2$ can be used according to 16.2.3



- 1 **DECLARATION OF CONFORMITY, TYPE-EXAMINATION CERTIFICATE**
- 2 Equipment Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC
- 3 Certificate No: Simple apparatus. No EC Type certification needed
- 4 Equipment: Load Cell Junction Box KVD
- 5 Manufacturer: PENKO Engineering B.V.
- 6 Address: Schutterweg 35
6718XC EDE
The Netherlands
- 7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- 9 When used in a hazardous area, the junction box complies to the following standards:

EN 60079-0 : 2006	Electrical apparatus for explosive gas atmospheres – Part 0: General requirements
EN 60079-11 : 2007	Explosive atmospheres – Part 11 : Equipment protection by increased safety "i"
EN 61241-0 : 2006	Electrical apparatus for use in the presence of combustible dust – Part 0: General requirements
EN 61241-1 : 2004	Electrical apparatus for use in the presence of combustible dust – Part 1 : Protection by enclosures "tD"
- 12 The marking of the equipment shall include the following:

II 2 D Ex tD A21 IP65 T85°C
 or
 II 2 G Ex ia IIC T6
 II 2 D Ex ia IIIC T6

13 Description of the variation to the equipment

The Loadcell junction box is classified as a simple apparatus. It contains no active components or protection devices and draws no current. For loadcell connections up to 24V DC /660mA total input and output there is no heat dissipation. The junction box operates at maximum voltages under normal operating conditions on no more than 24Vdc which is outside the parameters defined in article 1 73/23/EEC

Environmental protection is provided by :
 Rolec polyKOM PK... housing with EC-Type Examination Certificate number KEMA 02ATEX2055U or
 Bopla Rose Polyester-KE 26. ... housing wit ET-Type examination Certificate number PTB 01 ATEX 1061U

May 28, 2015
 W.G.Bijkerk
 Manager Research and Development

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About PENKO

Our design expertise include systems for manufacturing plants, bulk weighing, check weighing, force measuring and process control. For over 35 years, PENKO Engineering B.V. has been at the forefront of development and production of high-accuracy, high-speed weighing systems and our solutions continue to help cut costs, increase ROI and drive profits for some of the largest global brands, such as Cargill, Sara Lee, Heinz, Kraft Foods and Unilever to name but a few.

Whether you are looking for a simple stand-alone weighing system or a high-speed weighing and dosing controller for a complex automated production line, PENKO has a comprehensive range of standard solutions you can rely on.

Certifications

PENKO sets high standards for its products and product performance which are tested, certified and approved by independent expert and government organizations to ensure they meet – and even – exceed metrology industry guidelines. A library of testing certificates is available for reference on:

http://penko.com/nl/publications_certificates.html



PENKO Professional Services

PENKO is committed to ensuring every system is installed, tested, programmed, commissioned and operational to client specifications. Our engineers, at our weighing center in Ede, Netherlands, as well as our distributors around the world, strive to solve most weighing-system issues within the same day. On a monthly basis PENKO offers free training classes to anyone interested in exploring modern, high-speed weighing instruments and solutions. A schedule of training sessions is found on: www.penko.com/training

PENKO Alliances

PENKO's worldwide network: Australia, Belgium, Brazil, China, Denmark, Germany, Egypt, Finland, France, India, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Syria, Turkey, United Kingdom, South Africa, Slovakia Sweden and Switzerland, Singapore. A complete overview you will find on: www.penko.com/dealers

