

ACCOMPANYING DOCUMENTS

PD 022/07/2013

OUTDOOR DISCONNECTORS

TYPE **QAD 3**

3 kV DC; 2500; 3000; 4000; 4500 A

ISO 9001:2009
ISO 14001:2005

ivep[®]

GENERAL

The QAD 3 and QADZ 3 outdoor disconnectors for use in railway traction applications, are light-weight and reliable switching devices of simple design posing only a minimum requirements on maintenance. The QAD 3 disconnector provides for a safe disconnection of the corresponding part of the traction line. The QADZ 3 disconnector with earthing switch provides for a clearly visible disconnection and earthing of the respective traction line sections.

ASSEMBLING THE DISCONNECTOR

The disconnectors are fixed to a carrying rail using two M 16x40 and two M 16x70 screws. The rail does include fixing holes. When assembling the disconnector its frame has to abut along its bottom surface against the carrying rail. The screw connection needs to be secured against loosening with either two nuts or with split washers, and needs also to have washers to DIN 125 (ČSN 02 1702) standard installed.

The QAD 3 and QADZ 3 disconnectors include an M 12 earth-terminal screw through which the switching device is connected to the earthing system. The disconnectors can be mounted on lattice-type, concrete or steel power poles, or other type of supporting frame. After having been fixed to the carrying rail the disconnector's control lever is linked via pull-rods to the drive mechanism. The QAD 3 and QADZ 3 disconnectors may be driven with hand operated or motor operated drive unit with a stroke of 140 mm, featuring the necessary power output to generate forces to control the switch.

MODE OF CONNECTING THE CONDUCTORS

The disconnector lead-ins incorporate screws with IVEP-type terminals serving to connect copper wires of 4 x 180 mm² cross section, at maximum, the strands of which may be brought in vertical plane from two mutually perpendicular directions.

The connecting flag contacts with railway terminals make it possible to connect copper wires of a cross section of 8x120 mm², which can pass through to the terminals along a plane horizontal in two mutually perpendicular directions. The disconnectors can also be connected via a Cu100x10 bar, or cables terminated with cable lugs.

The basic design of the QAD 3 and QADZ 3 traction disconnectors is shown in pictures hereunder.

When assembling the disconnectors the isolating distances specified for railway traction equipment have to be adhered.

ADJUSTMENT OF THE DISCONNECTORS

The disconnectors are delivered in completely assembled and adjusted condition. After mounting them on the pole and establishing a connection to the drive unit, it is to be checked whether the knife contacts reach properly their end positions in the mating parts. In either of its end positions (ON, OFF) the disconnector has to reach the mechanical stops. This means that in ON switching state the control lever leans on the stop screw inside of the disconnector frame, in OFF switching state the lever with its bottom edge leans on a mechanical stop at the outer side of the carrying frame.

Check whether either of the horn pairs touch each other until the moment is reached, in which the horns become disconnected. Also the disconnection of the horns have to take place only after the main contacts have become electrically isolated. A reliable contact between the horns may be achieved by bending the horns each to the other, with an overlap of approx. 5 mm.

MAINTENANCE INSTRUCTIONS

The QAD 3 and QADZ 3 disconnectors are switching devices in a low-maintenance design. The maintenance works are to be carried out once in 10 years of operation, consisting in visual inspection and cleaning of the contact surfaces, springs, insulators and the carrying structure. The contacts of the main current-carrying path shall be greased with the BARIERTA L 55/1 grease, made by Klüber

Lubrikation (Germany). It is recommended to carry out regular visual checks, in time intervals specified for other types of railway equipment.

After any emergency tripping of the disconnecter which occurs on electric circuit under load in the effort to protect human life or prevent potential loss of assets, **it is always necessary afterwards to examine the disconnecter!**

OPERATING INSTRUCTIONS FOR THE DISCONNECTORS

The disconnectors are operated in an ordinary manner prescribed for the control of disconnectors.

ASSEMBLY, OPERATING AND MAINTENANCE INSTRUCTIONS FOR DISCONNECTORS MOUNTED ON PREHEATING EQUIPMENT

The QADZ 3.2500.11 disconnectors with earthing switch can be utilized on a preheating equipment of a train set, however in such a case other special requirements have to be adhered:

When mounting the disconnecter on a preheating equipment:

- 1) the disconnecter is allowed to switch off electric currents of predominantly active load, up until 100 A. Electric currents of other nature and of higher values are not allowed to be switched off. Otherwise the disconnecter might be damaged and the operating personnel become endangered.
- 2) The disconnecter must be mounted onto the top of pole. The lead-ins from the incoming side and the outgoing cables have to be brought from both sides horizontally to the incoming terminals in a way to maintain an adequate distance from the arcing horns.
- 3) In this operation mode the disconnecter can be driven only via a special hand operated drive with three locked switching positions, i.e. the ON - intermediate position - OFF. The drive mechanism needs to be equipped with a mechanical stop to secure the disconnecter's locked intermediate position. Electric arc arising during switching off a loaded circuit becomes quenched on the horns in this intermediate position. The mechanical stop on the drive unit must be located at a level corresponding to approx. 100 to 105 mm when moving from the drive's ON upper position to the OFF down position.
- 4) The adjustment of disconnecter when using the same mounted on preheating equipment is to be carried out with special care. In particular the correct adjustment of arcing horns is of importance, in a way described in "DISCONNECTOR ADJUSTMENT" section.
- 5) The operation of the QADZ 3.2500.11 disconnecter used for the preheating of train sets and controlled only by manual drive mechanism, is to follow the requirements of ČSN 33 2000-4-41 standard.

The operator of disconnecter has to be equipped with the following personal protective equipment

1. hard hat
2. safety goggles (transparent, non-dioptical goggles)
3. protective gloves for working on electrical equipment
4. arc flash coveralls
5. firm footwear with rubber sole

How to proceed when switching the disconnecter ON, using manual drive

Usually the disconnecter is switched ON starting from OFF position, without stopping in the intermediate position.

How to proceed when switching the disconnecter OFF, using manual drive

The operator, equipped with the specified PPE, grasps the manual drive handle and with a rapid flick turns the handle from its upper position (disconnecter ON position) into the fixed intermediate position,

until stop. He/she will now satisfy himself/herself visually that electric arc between contacts extinguished. The time lag of staying in the intermediate position should extend to 8 to 10 seconds. He/she shall now **remove** the mechanical stop for the drive's intermediate position. He/she **finishes** the handling process by turning the handle down to the fixed position. At this moment the knife contacts of the earthing switch will be inserted into the fixed contact at the disconnecter outlet, and the disconnecter is now connected to the earth.

Note:

If the electric arc will not extinguish within 10 seconds, the disconnecter is once more to be returned into ON position and the above procedure be repeated.

In no case the operator should continue switching the disconnecter in earthed position. If so, the earthing knife contacts will switch the electric circuit into short-circuit, the contact material will partially melt down and the operator runs the risk that the whole earthing system will weld together.

- 6) Disconnecters used for train set preheating must be subjected to inspection following every 1000 switching cycles. Should the arcing horns bear marks of erosion, the horns shall be replaced and such a refurbished disconnecter may resume its operation.
- The replacement of arcing horns is done by loosening 2 screws on every of the horns, insertion of a new horn below the backplate and re-tightening of the M10 screws. The adjustment of the horns is to be done in a way to provide for their proper functioning in respect of the movement of the main contacts, by bending them over manually. The disconnection of the arcing horns may take place only after the main contacts become disconnected. Proper contact in between the arcing horns is ensured by their spring pre-loading.

WARNINGS REGARDING THE ASSEMBLY OF QAD 3 AND QADZ 3 DISCONNECTORS

- 1) The disconnecter should never be lifted by grasping it at the arcing horns!
- 2) In the course of adjustment of the drive the disconnecter must reach the mechanical stops, i.e. in **ON switching state** the control handle leans on the stop screw in the disconnecter frame, in **OFF switching state** the bottom edge of the handle leans on the mechanical stop.
- 3) During the assembly and adjustments the manufacturer's instructions have to be followed.

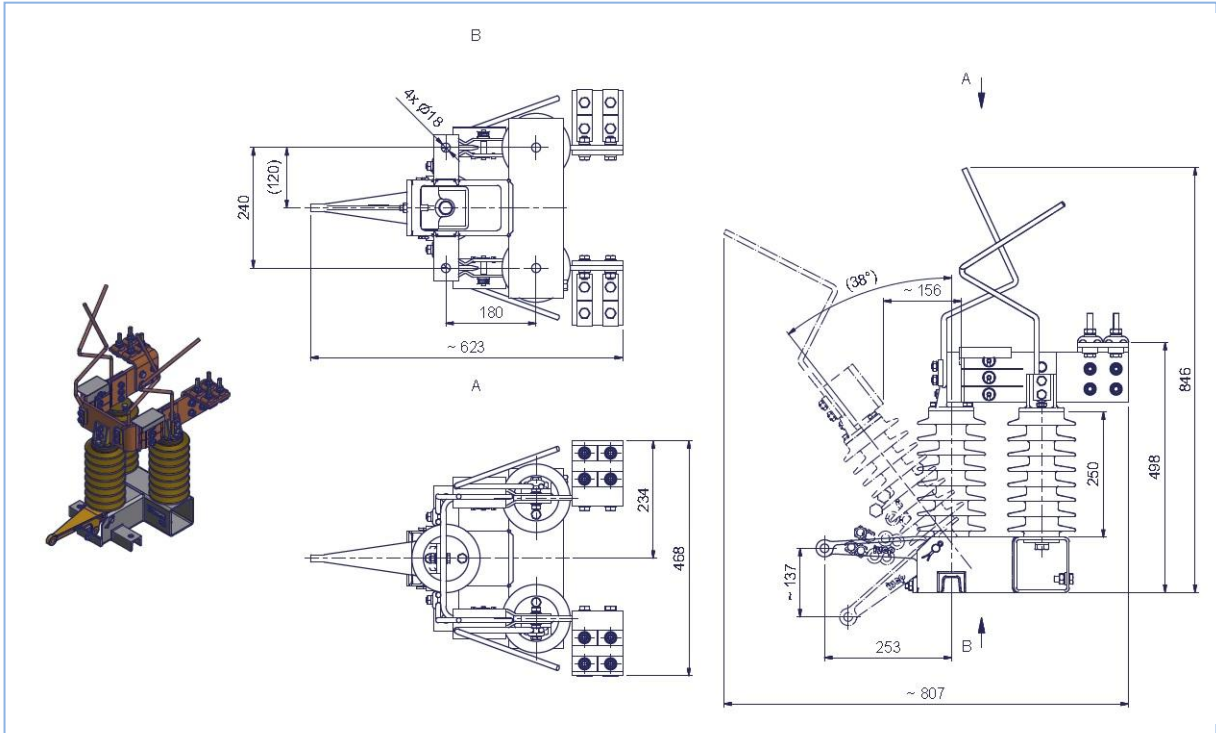
PACKAGING, STORAGE, TRANSPORT

The disconnecters are delivered attached on wooden pallets. During transport it is necessary to ensure that the pallets be fixed onto the transport means in a way to prevent a potential damage to the disconnecter, in particular its insulators and the arcing horns. In any handling operations, whatsoever, during the transport, storage or assembly, **it is forbidden to grasp the disconnecter on the arcing horns**. This might put its breaking capacity at risk.

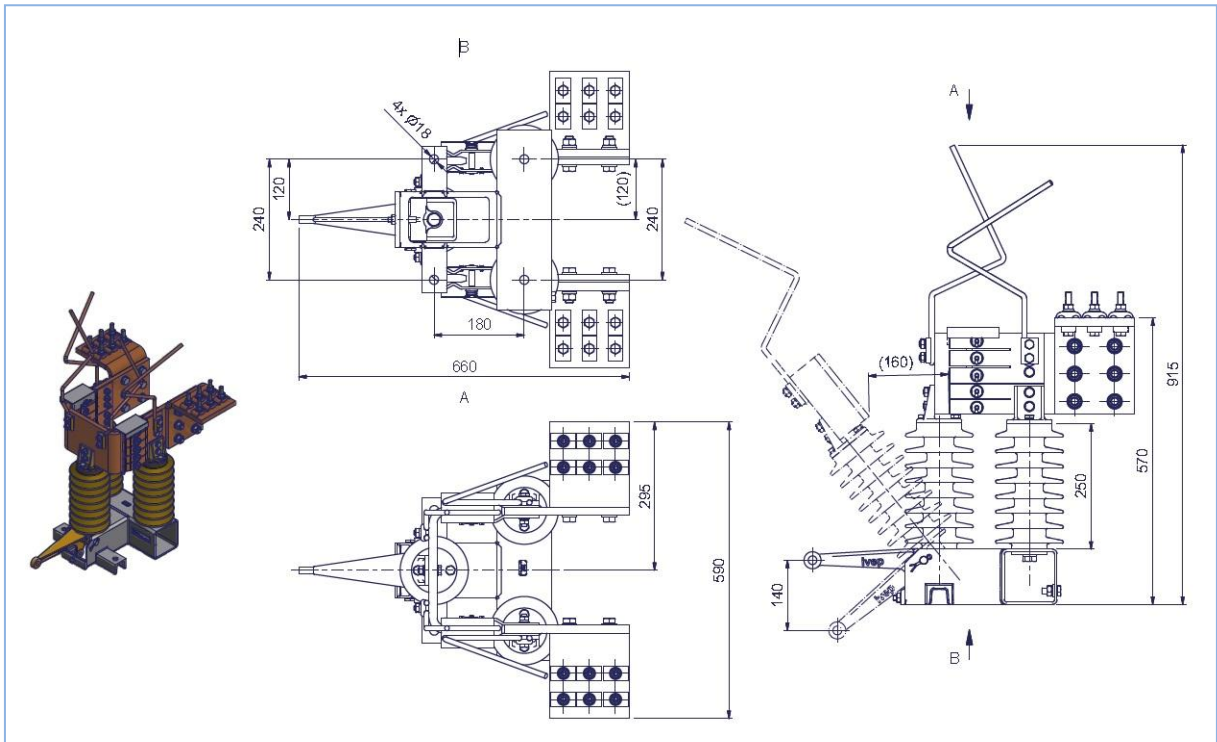
The disconnecters can be stored unprotected from weather events, however, handling operations that might impair the mechanical condition of the switching device (also its surface finish) have to be prevented.

Any tampering of the switching device through unauthorized personnel is to be prevented.

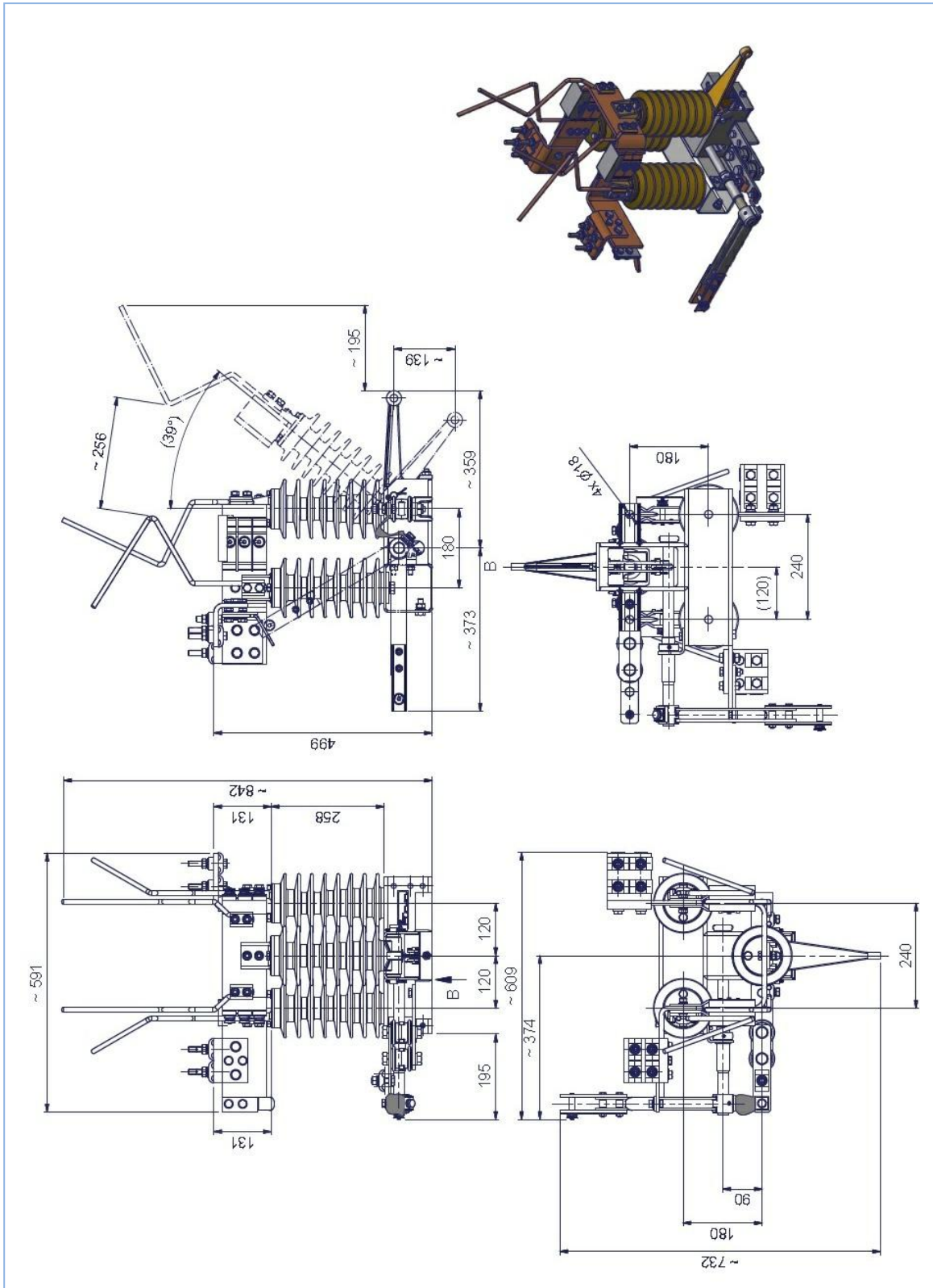
DISCONNECTOR TYPE QAD 3 3000.20/1.LA.RA



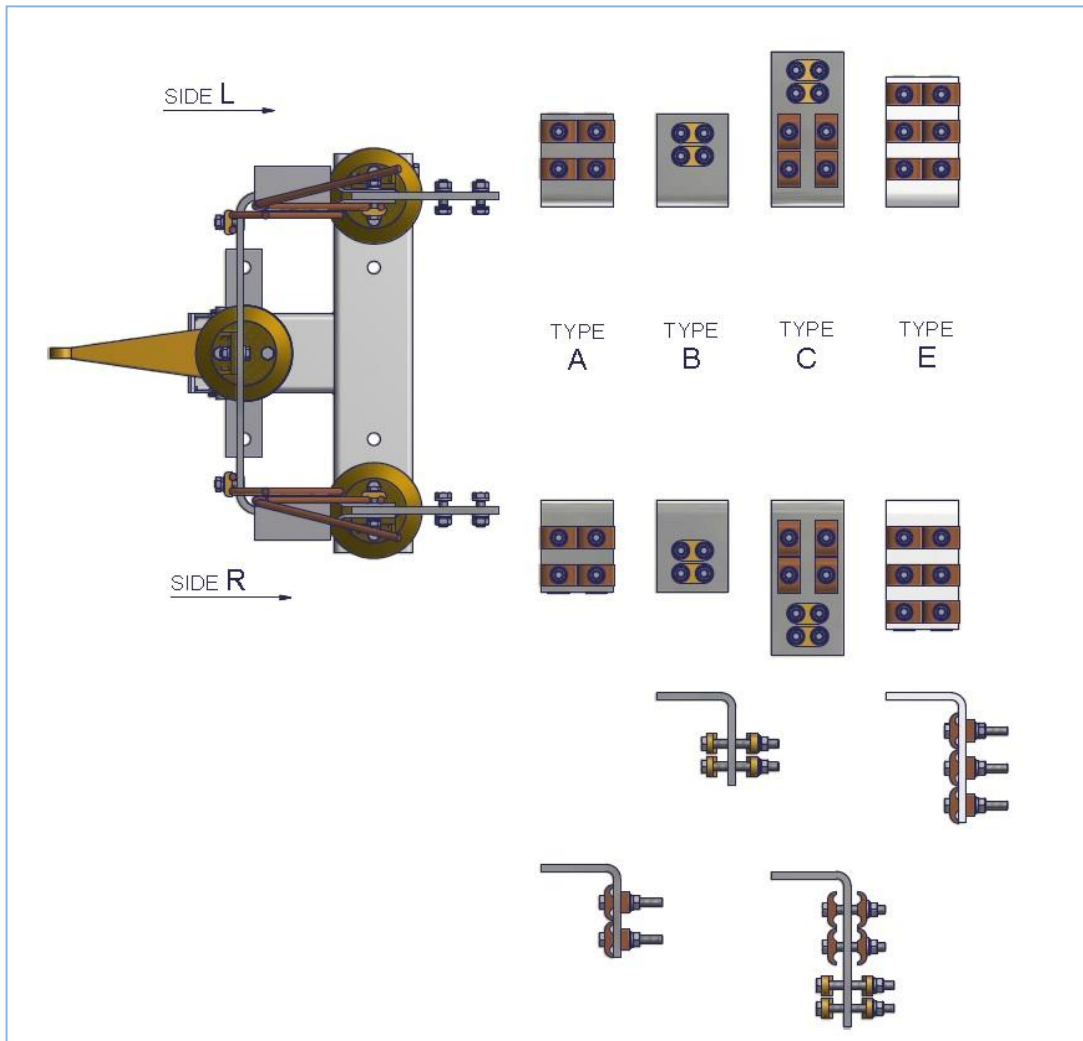
DISCONNECTOR TYPE QAD 3 4500.20/1.LA.RA; RATED CURRENT: 4500 A



DISCONNECTOR WITH EARTHING SWITCH, TYPE QADZ 3 3000...L

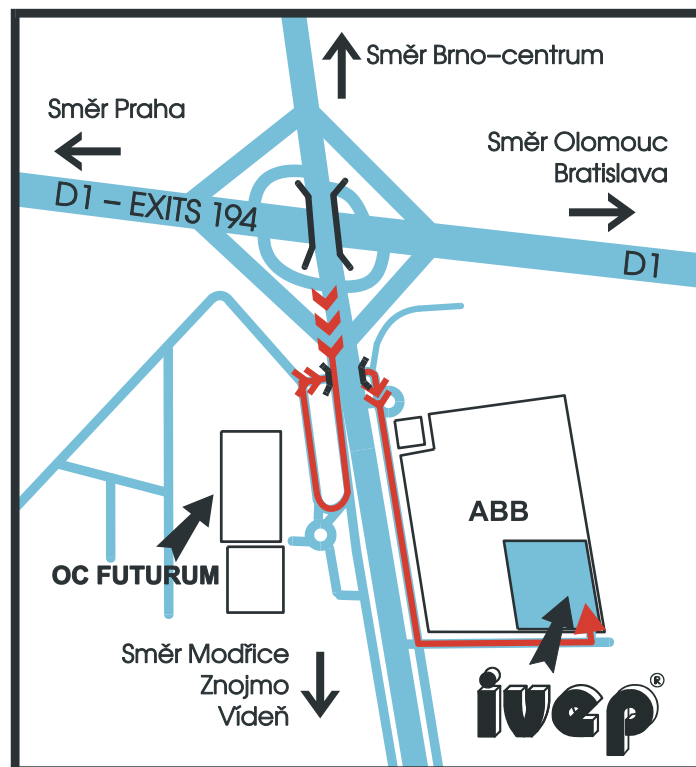


CONNECTING FLAG CONTACTS - VARIOUS DESIGN OPTIONS



V důsledku nepřetržitého procesu dalšího vývoje mohou být míry, hmotnostní údaje, vyobrazení a popisy v tomto prospektu upravovány. V zájmu uspokojování potřeb zákazníků si výrobce vyhrazuje právo změn.

Due to continuous development of the products some dimensions, weights, drawings and descriptions may differ from that shown in this data sheet. In order to satisfy the ever increasing needs of the customers the manufacturer reserves the right to provide modifications to the product described, without previous notice.



Vyrábí a dodává:
Manufactured and supplied by:

IVEP, a.s.
Vídeňská 117a, 619 00 Brno, Czech Republic

Tel.: +420 547136 654 e-mail: marketing@ivep.cz
Fax: +420 547136 402 [http:// www.ivep.cz](http://www.ivep.cz)

