



# KATALOG CATALOGUE

D0108.C.01

## ELECTRIC MOTOR DRIVE MECHANISM

for a switching device used outdoors on traction current  
lines (Austrian Railways)

ISO 9001:2009  
ISO 14001:2005  
OHSAS 18001:2008

# TYPE SUP-A



## USE

The SUP-A type electric motor drive mechanism is intended to be used in dependent machinery systems to control switching devices mounted outdoors, such as medium voltage disconnectors, switch disconnectors and earthing switches. It can be used as a means for local, remote and emergency control of the switching device. The values of output torque provide for adequate switching reliability, even in heavy duty operating conditions. The drive mechanism features a simple and reliable design with only minor demands on maintenance.

The drive mechanism is designed in a way to achieve the switching device's end positions with adequate reliability while sending out positive signals about the ON and OFF switching positions.

## STANDARDS AND REGULATIONS

The SUP electric motor drive mechanism meets the requirements of the following standards: ČSN EN 62271-103; ČSN EN 62271-102; ČSN EN 62271-1; ČSN EN 61439-1

## MAIN TECHNICAL PARAMETERS

Type of used cabinet	SUS 1 (IVEP, a.s. manufacturer)
Protection degree (of closed drive mechanism)	IP 55
Covering of inner doors	IP 30
Mechanical toughness	IK 07
Protection against direct touch	connecting all metal parts together
Weight (depending on the type and equipment level)	approx. 60 kg
Output torque – rated value	76 Nm
Output torque – highest value	240 Nm
Min. forces in rod	2150 N
Max. forces in rod	10000 N
Cycle duration	breaking operation: 1.5 s making operation: 1.5 s
Working angle	185° (adjusted at the manufacturer's shop)
Minimum control impulse	0.15
Range of control voltages	0.85 to 1.1 x Un
Rated insulation voltage Ui	300V, 50Hz
Rated voltage Un	230V, 50Hz
Rated withstand impulse voltage Uimp	1,5kV
Motor drive control voltage	230V AC, 50Hz
Motor drive power supply voltage	230V AC, 50Hz
Motor type	DAGU, 220V DC, 300W
Rated cabinet current Inc	4A
Rated suspended short-circuit current Icc	10kA (external protection)
Ambient temperature	- 25°C to + 40°C (without heating)
Maximum ambient humidity	50%
Mechanical service life	20000 C-O cycles operations or 3 to 5 years
Input opening for the insertion of cables	2 x M 32x1,5; 2 x M 25x1,5
Cross section of connecting conductor	1 connecting conductor
solid wire	0.5...4 mm <sup>2</sup>
stranded wire	1.5...4 mm <sup>2</sup>
stranded wire with ferrule	0.5...2.5 mm <sup>2</sup>
Tightening torque of connecting terminals	0.4...0.6 Nm (M2.5)
Mounting possibility	wall or pole mounting

## OPERATING CONDITIONS

The electric motor drive mechanisms are envisaged to be used in common outdoor and indoor operating environments as defined by the ČSN EN 60694 standard, part 2.

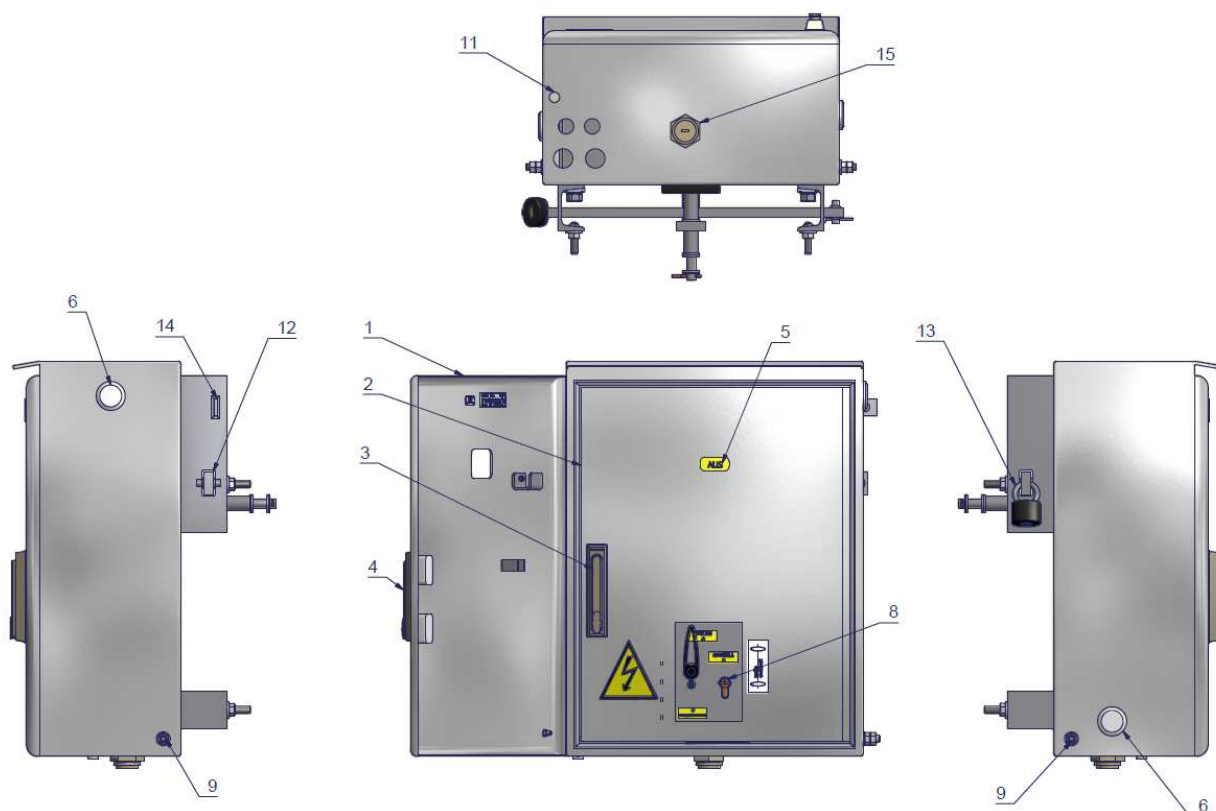
## DESCRIPTION, FUNCTION

The SUP -A-HF 50-80... electric motor drive mechanism consists of subassemblies such as the cabinet and a panel with the drive unit (see Fig. 1). The figure shows a drive mechanism with opened external door.

The external door does not incorporate any locking mechanism and its purpose is only to protect the drive mechanism from atmospheric influences. The internal door (panel) comprises the switching position indicator and the changeover lever for setting the respective operating modes, completed with a locking mechanism. The lever can be secured in any switching position with a key, to prevent it from tampering.

**Fig. 1**

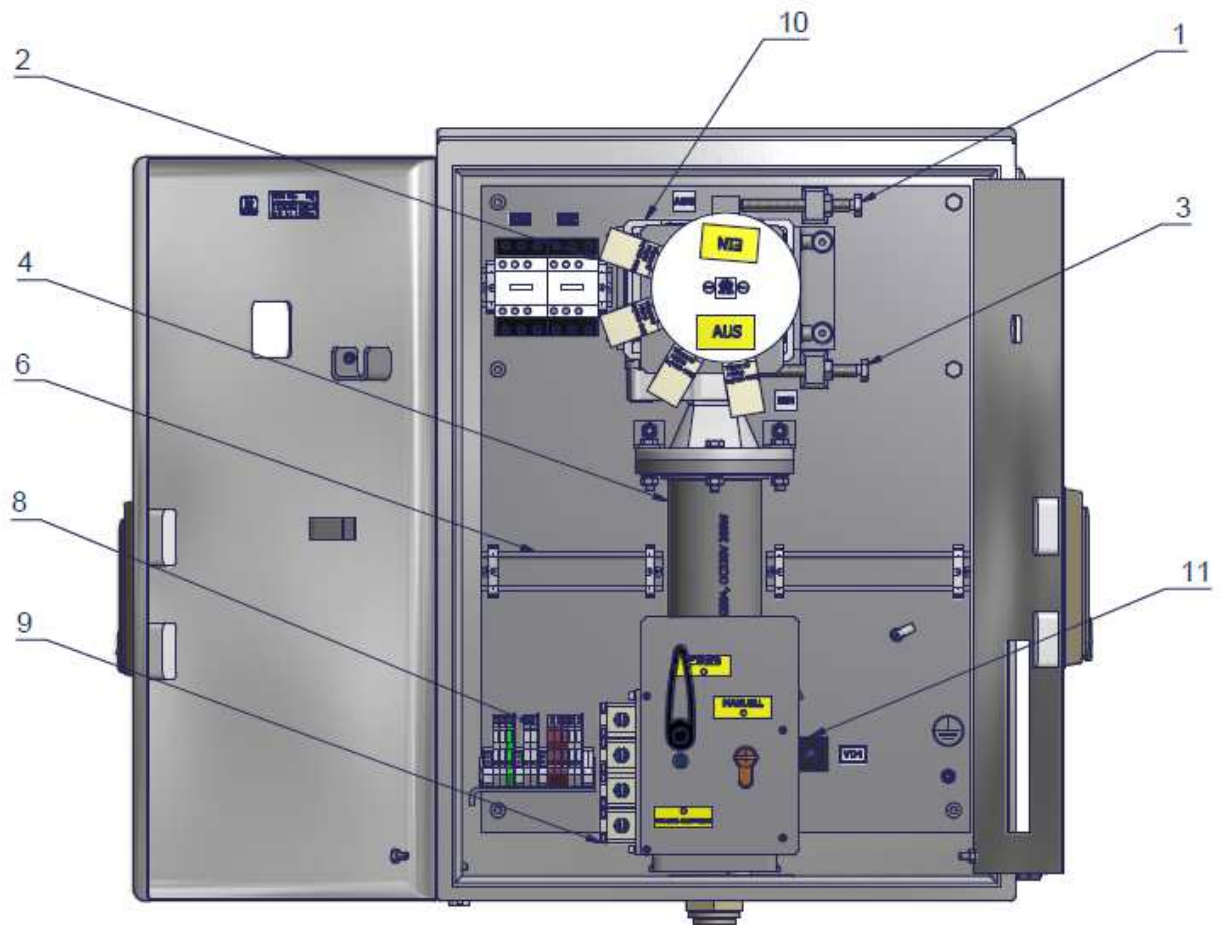
Cabinet of drive mechanism, with opened outside door



- |   |  |    |                             |
|---|--|----|-----------------------------|
| 1 | Cabinet of drive mechanism – external door | 10 | Entry for control cables    |
| 2 | Cabinet of drive mechanism – internal door | 11 | Draining plug               |
| 3 | Internal door handle – with lock           | 12 | Blocking rod                |
| 4 | External door handle – with lock           | 13 | Padlock                     |
| 5 | Indicator of drive switching position      | 14 | Eye for blocking rod        |
| 6 | Venting louvers                            | 15 | Entry for emergency control |
| 7 | Lever to control the drive operation modes |    |                             |
| 8 | Control lever lock                         |    |                             |
| 9 | Earthing screw (terminal)                  |    |                             |

**Fig. 1**

Cabinet of drive mechanism, with opened internal door



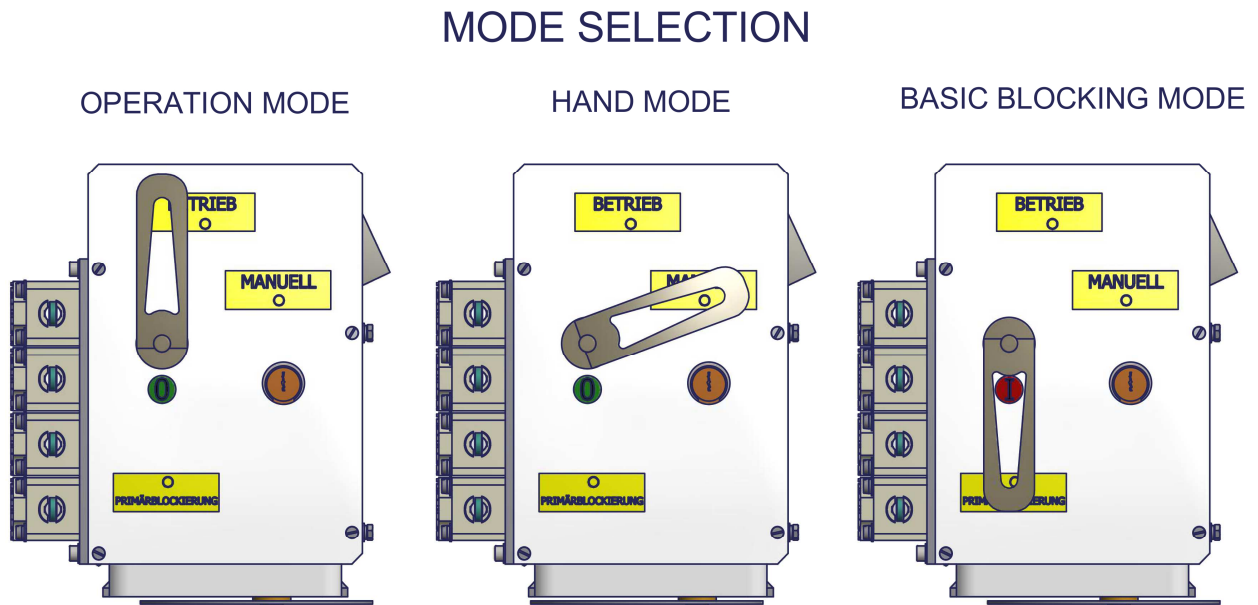
- |  |                                      |
|--|--------------------------------------|
| 1 Mechanical stop – OFF switching position         | 7 Auxiliary terminal board           |
| 2 End switches for control of motor and indication | 8 X1 and X2 Main terminal boards     |
| 3 Mechanical stop – ON switching position          | 9 End switches of internal door      |
| 4 Electric motor                                   | 10 Gearbox                           |
| 5 Contactors of electric motor                     | 11 Rectifier                         |
| 6 Removable free DIN rail approx..150mm lengthy    | 12 Blocking and changeover mechanism |

The wiring diagram of the electric motor drive mechanism is shown in the appendix (Fig. 5). With manual handle of the drive operation mode changeover switch (Fig. 2) in position BETRIEB (= OPERATION) the drive mechanism can be remotely controlled in all its functions. In the MANUELL (=MANUAL) position the sliding block guide of the blocking mechanism is displaced which makes it possible to insert the operating handle of emergency manual control into the drive cabinet from the bottom. The insertion of the handle disables the remotely controlled motor-actuated operation of the switching device as a means to protect the operating staff.

In the PRIMÄRBLOCKIERUNG (= ELECTRICAL AND MECHANICAL CONTROL BLOCKING) position of the changeover switch the power connection to the electric motor is broken and, at the same time, the shaft is blocked mechanically.

Fig. 2

Changeover switch of the drive mechanism operation mode



#### MANUAL EMERGENCY CONTROL

In emergency situations the drive mechanism can be operated manually using a manual handle slipped in over the hexagonal end of the motor shaft after the removal of a cover on the bottom side of the drive (Fig. 1, item 15), and after putting the changeover switch into "MANUAL" position. When slipping the handle an end switch in the power circuit of the motor becomes opened still before the hexagonal shaft end has been reached by the handle, which is a protective measure to protect the staff in case of faulty handling.

**Caution!** The system of emergency manual control of the drive mechanism **under load** serves only to control the switching device in emergency situations. It is not allowed to finish the handling process in an interim position and, if such happens, it is necessary to complete the handling process as soon as possible, using the highest possible speed of the movement. Devices **without load** can be operated with any arbitrary speed, and the movement can be stopped at any moment chosen. The operating staff is strongly discouraged to use the system of emergency control for switching the device ON and OFF under load.

**MODE SELECTION**

OPERATION MODE

HAND MODE

BASIC BLOCKING MODE

INPUT FOR EMERGENCY CONTROL WITH LIMIT SWITCHES SQ4

DEWATERING PLUG

BLOCKING ROD WITH PADLOCK

2x FREE DIN RAIL

LIMIT SWITCHES SQ31, SQ32, SQ33, SQ34 FOR DOOR SIGNALLING

RECTIFIER

WEIGHT: 60 kg

Outdoor motor drive for QAD disconnectors  
Motor: 220V DC 300W  
Gearbox HF 50 80

Technical drawing of the IVEP HF50-80 S4.2 B... motor drive unit, showing front, side, and top views with dimensions and component labels.

**Dimensions:**

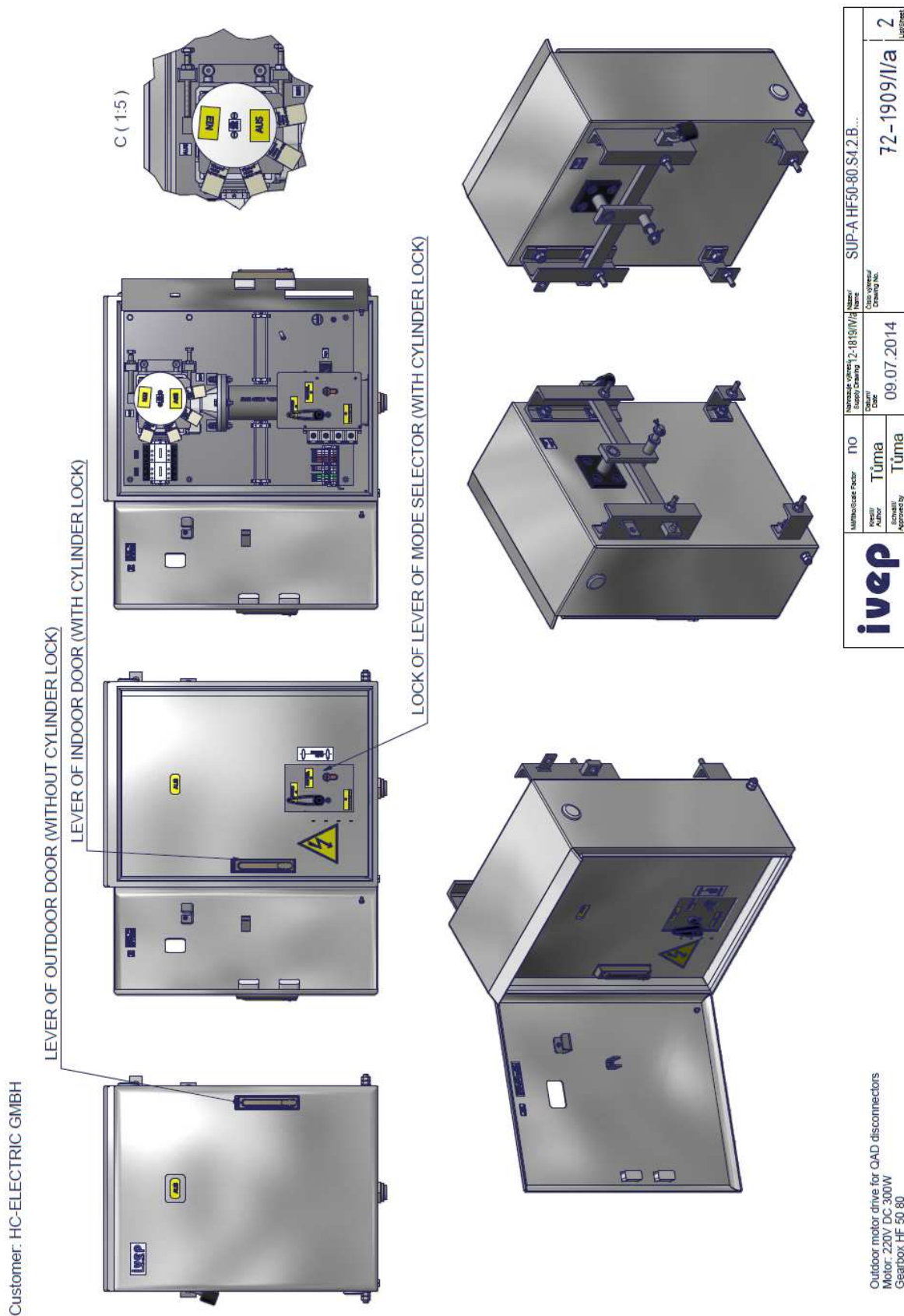
- Front view: 680 (width), 510 (height), 568 (total height), 700 (depth).
- Side view: 373 (width), 265 (height), 373 (total height), 80 (depth).
- Top view: 373 (width), 510 (depth), 568 (total depth), 700 (total width).

**Labels:**

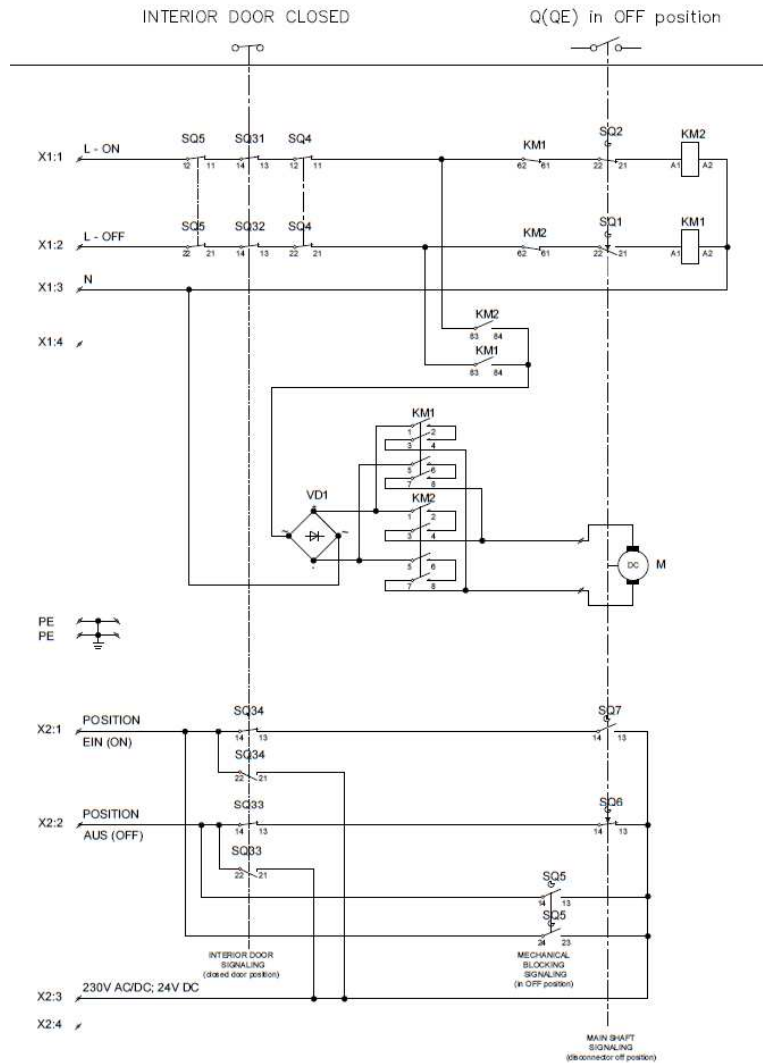
- MODE SELECTION: OPERATION MODE, HAND MODE, BASIC BLOCKING MODE.
- INPUT FOR EMERGENCY CONTROL WITH LIMIT SWITCHES SQ4.
- DEWATERING PLUG.
- BLOCKING ROD WITH PADLOCK.
- 2x FREE DIN RAIL.
- LIMIT SWITCHES SQ31, SQ32, SQ33, SQ34 FOR DOOR SIGNALLING.
- RECTIFIER.
- WEIGHT: 60 kg.
- Outdoor motor drive for QAD disconnectors.
- Motor: 220V DC 300W.
- Gearbox HF 50 80.



**FIG. 4 – SWITCH DISCONNECTOR WITH THE SUP ELECTRIC MOTOR DRIVE MECHANISM ASSEMBLED STATE**



**FIG. 5 – WIRING DIAGRAM OF THE SUP DRIVE MECHANISM**



M motor 220V DC 300W  
KM1, KM2 contactors (control voltage 230V AC)

SQ1 Limit switch (FR515: 1NO 1NC) – OFF POSITION  
SQ2 Limit switch (FR515: 1NO 1NC) – ON POSITION  
SQ3,1–4 Limit switches (FR515: 1NO 1NC) – DOORS SIGNAL  
SQ4 Limit switch (FR1117: 2NC) – EMERGENCY CONTROL SIGNAL  
SQ5 Limit switch (FR215: 2NO 2NC) – REVIEW POSITION SIGNAL  
SQ6 Limit switch (FR515: 1NO 1NC) – POSITION SIGNAL OFF POSITION  
SQ7 Limit switch (FR515: 1NO 1NC) – POSITION SIGNAL ON POSITION

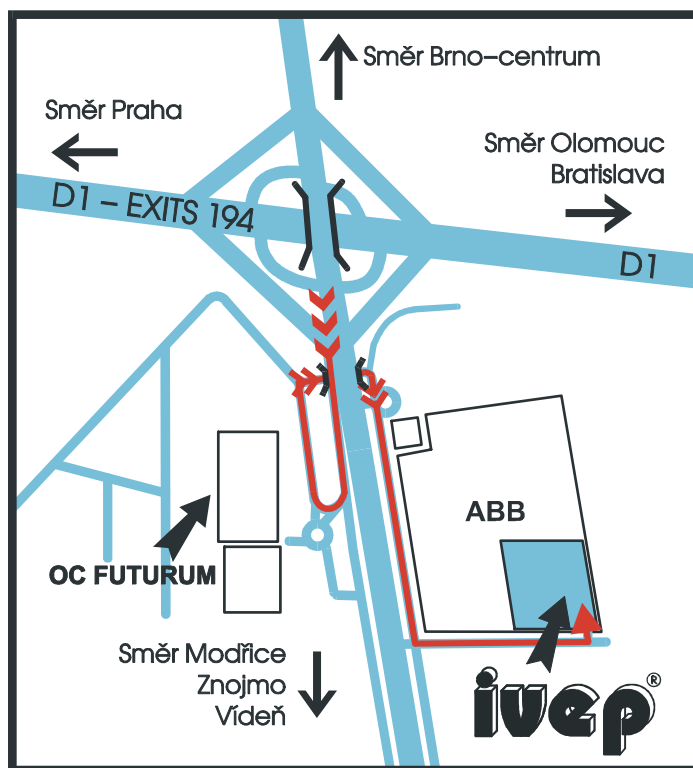
VD1 RECTIFIER (KBPC2506 – usm. mostek 250V/600V I=25A)  
X1 TERMINAL BLOCK 2x WK 4 E/U, 1x WK4 E SL/U  
X2 TERMINAL BLOCK 2x WK 4 E/U  
X4 ASSEMBLING AUXILIARY TERMINAL BLOCK 3x WK4 E/U/VB, 2x WK 4 E/U

X4:1  
X4:2  
X4:3  
X4:4  
X4:5  
X4:6  
X4:7  
X4:8  
X4:9  
X4:10

SQ1, SQ6 - pressed down in position AUS  
SQ2, SQ7 - pressed down in position EIN  
SQ4 (FR1117) - pressed down in position MANUELL and PRIMÄRBLOCKIERUNG  
SQ5 (FR215) - pressed down only in position PRIMÄRBLOCKIERUNG

DOUBLE WIRES	WIRCH FÜR	NÄHE	NÄHE	DATE	DATE
PRELIM	PRELIM	RECHNUNG	RECHNUNG	18.10.2014	72-1275/II/b
Stufj	Time				1





*Směr = direction*

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