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Charging stand

NSP 25

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1 Introduction

Charging stand NSP25 is a device used for charging traction accumulators of electric bus or for tempering accumulators when temperature is low.

The stand only serves to supply electrical power to the vehicle. The regulation of charging of the battery cells and temperature control is ensured by the control circuits of the vehicle. It is not possible to charge at the same time during tempering as the vehicle's charging systems are switched off.

The input voltage is a 3 × 400Vac network. Maximum supply current is 63A, in tempering mode it is max.16A. Charging stand contains electricity meter, which can monitor power consumption of electricity supplied to the charged vehicle.

2 Description

2.1 General description

In the basic working position the charging stand is designed to provide optimum access to controls and covers. During transport, the stand may lie on the back. There are legs at the top to prevent damage. For transport over short distances there are wheels at the bottom. The whole cabinet is made of aluminum sheet.

Power supply of the charging stand is solved with a cable coming out of the grommet in the side cover. Under the upper cover there is an access to circuit breakers and residual current device, under the lower cover there is a space with an output cable terminated with a special plug designed to power electric vehicles. The plug contains 5 contacts of mains power supply 3 × 400Vac and also two signal contacts, CP (control) and PP (communication).

Control and signaling elements are located on a removable panel. Part of the electrical equipment is a residual current device (30mA), which means this device does not have to be part of the supply. The rack is tempered at negative ambient temperatures. Temperature is monitored by thermostat A4.

According to the standard ČSN EN 61851-1 ed.2 it is necessary that to connect the charging stand to the mains permanently without the possibility of disconnection by any connector when charging current is higher than 32A.

2.2. Description of control and signaling elements and function

White light: DEVICE IS ON

Lights when the charging stand is connected to the mains withou any influence of other control elements. Residual current device and 1-phase circuit breakers has to be ON.

Red light: FAILURE

Lights when at least one of charging or tempering circuit breakers is OFF. If the charging stand is connected to the mains and signal light FAILURE and DEVICE IS ON do not light, the residual current device has to be checked.

LED ring:

The ring is situated around white light (DEVICE IS ON). The colour of LED during charging indicates the charge status of vehicle according to label on the charging stand.

Green light: control conductor OK

Lights when the ground connection check is OK. This check is provided by KSU10, which is part of the NSP25 charging stand, and must also be part of the vehicle. The CHARGE switch has to be ON.

Switch: CHARGING

When turned ON, the ground connection is checked and then the charging contactor goes ON. If the contactor is ON, the blue light is ON. When turned OFF, the charging is interrupted.

Switch: TEMPERING

When turned ON, the charging contactor goes ON. If the contactor is ON, the blue light is ON. If the charging is ON, the tempering starts after finishing of charging. The tempering is interrupted if the charging switch goes ON.

It is forbidden to remove the charging plug from the vehicle socket during charging or tempering. On some vehicles, the charging socket includes a mechanical locking element for the plug. Attempting to remove the plug while charging or tempering may damage the charging socket.

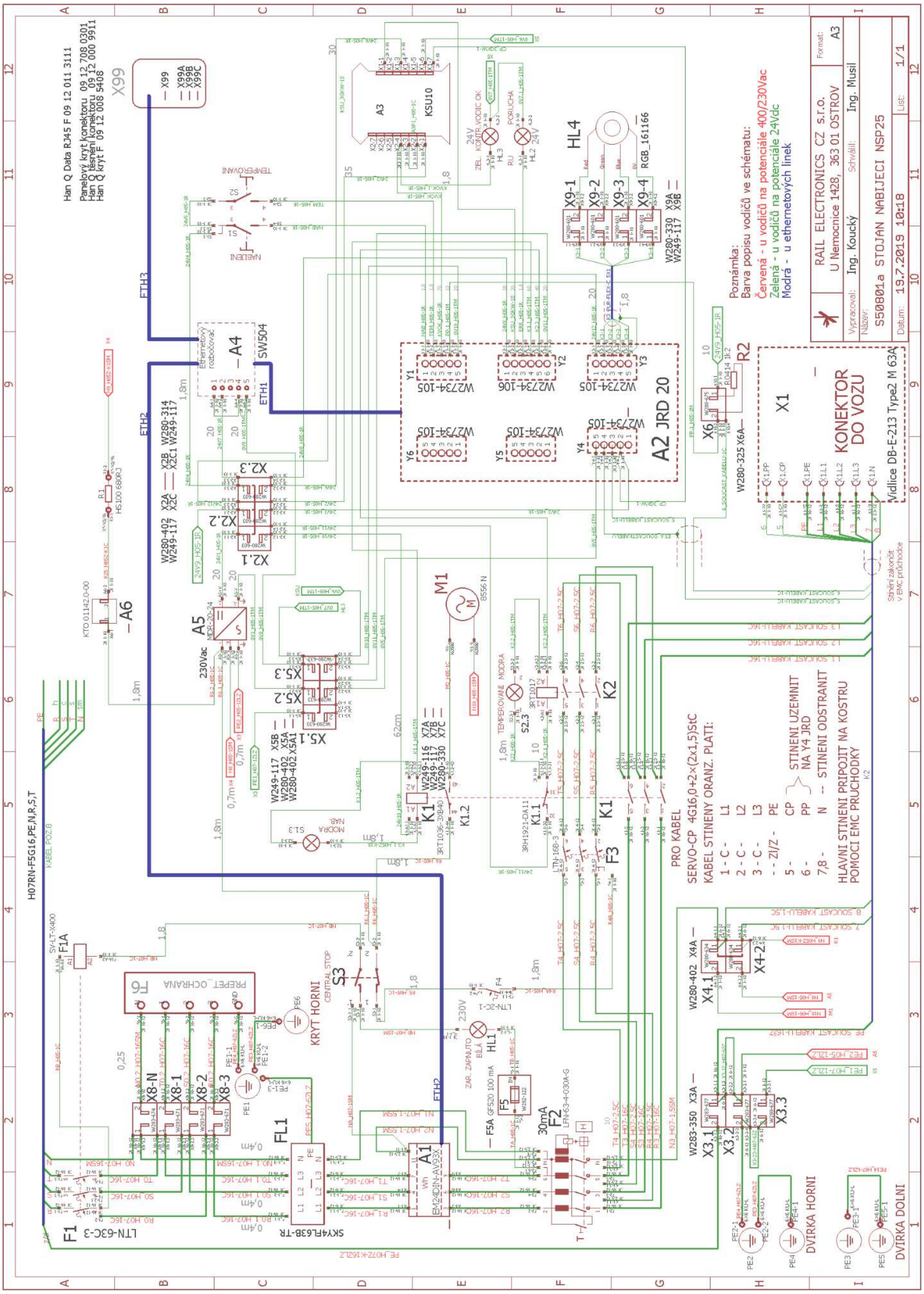
Switch: CENTRAL STOP

When goes ON, the charging or tempering is interrupted or cannot be started. It is necessary to pull the switch for its releasing.

Connector: ETHERNET

Enables data connection of charging stand. It is possible to obtain information about energy delivered to vehicle.

3 Schema



4 Technical condition

Parameters		Condition, note
input / output voltage AC: - nominal - working range	 3× 400 Vac 50Hz 3× 360 - 440 Vac	
Input / output current max.: - charging - tempering	 3× 63 Aac 3× 16 Aac	
Control voltage: input output	 100–240Vac, 0,55A, 50/60Hz 21,6–26,4 Vdc	Power supply 24 Vdc 1A
Connector – input voltage:	device designed for permanent connection to the mains	
Connector – to vehicle:	3×400Vac/63A+N+PE 1× CP (control conductor) 1× PP (communication conductor)	Connector Lapp Group 480Vac/63A IP44 30V 2A max. 30V 2A max.
Ethernet connection:	RJ45	
Cooling:	In-build fan	
Noise:	Minimal noise during vorking	
Climatic condition - operating temp. range - storage temp. range - altitude	 -40°C to +40°C -40°C to +55°C 1200 m	
Protection:	IP 44	
Outer dimensions:	460 × 425 × 1010 mm	w × l × h
Weight:	27 kg	+ 9 kg output cable

5 Maintenance

There are these types of maintenance performed on charging stand – checking, cleaning and electrical inspection.

5.1 Maintenance period

Mintenance	Period
Checking	before every use
Cleaning	according to need
Electrical inspection	It is given by a standard for electrical inspections of electrical devices during use valid in the country in which the charging stand is used. In Czech Republic it is the standard ČSN 33 1600 (Electrical inspection of electrical devices during use), the period is once every 6 months. It is also necessary to do an electrical inspection after repairing the charging stand.

5.2 Checking

The checking consists of visual inspection and running test.

5.2.1 Visual inspection

Check the charging stand from the outside.

Covers, handles, controls and others must not be damaged in order to reduce protection against electric shock.

The movable connections must not have damaged, swollen or excessively hardened insulation. At the entrance to the appliance, the inlet must be fitted with a protective sleeve and secured against being pulled out. The fork, the sleeve and the movable socket or inlet must not be damaged.

A permanently connected electrical supply must be inseparably connected to the plug.

The registration or other marking enabling the appliance to be clearly identified must not be missing or damaged.

If defects are detected, the charging stand is disabled and visibly marked. This must be reported to the operator. It is possible to put it back into operation after the repair with proof of safe state of electrical inspection.

5.2.2 Running test

The charging stand is connected to the rated voltage. It must be verified that the safety elements perform reliably (without their operation being made harder by excessive mechanical resistances).

Determine whether the appliance is working as described above.

5.3 Cleaning

Clean the outside of the device with a dry cotton cloth without removing the covers while unplugging the device.

5.4 Electrical inspection

The electrical inspection of the device is given by the standard for inspections and inspections of electrical appliances during use valid in the country in which the charging stand is used. In Czech Republic it is the standard ČSN 33 1600 (Electrical inspection of electrical devices during use).