

2 Important Instructions for Commissioning the System

2.1 Safety Instructions for Handling the System

- 1** Never feed external voltages into the output jacks of the Control Unit and the Universal Power Supply!
- 2** Outputs may not be bridged with each other!
- 3** Mount the correct machine feet first before you push the experimental machine onto the Brake Unit!
- 4** Only operate the experimental machine with the coupling cover mounted and the clamping device fixed!
- 5** For experimental machines with two shafts, mount the additional Shaft Cover from hps (Type 2719.1)!
- 6** Connect the thermal contacts of the experimental machine to the Control Unit first before every commissioning!
If an experimental machine has no thermal contacts, the use of a motor circuit breaker is recommended (see chapter 2.2)!
- 7** The PE conductors of Control Unit, Universal Power Supply, Brake Unit and experimental machine must always be connected with each other!
Brake Unit and Control Unit may only be operated together if the connecting leads P1 and P2 are connected. This ensures that the Brake Unit is connected to the PE conductor of the Control Unit!
- 8** In the event of overheating the frequency converter in the Control Unit switches off, i. e. experimental machines with series-wound behaviour can increase their speed unhindered. Since the Universal Power Supply has no automatic cut-out, the thermal cut-out process must be monitored continuously and the Universal Power Supply must be switched off manually!
- 9** Always switch on the Control Unit before the Universal Power Supply during system commissioning!
The cut-out process must take place in reverse order!
- 10** The coupling at the shaft end of the brake machine is adjusted and fixed. It may only be removed for repairs!
- 11** Only set up experiments with the Control Unit switched off and the Universal Power Supply switched off!
- 12** Only use the safety leads provided to set up the experiments!
- 13** Observe the torque attenuator of the Control Unit. See chapter 2.4!
- 14** If DC machines and universal motors exhibit strong deviations in their specified rated data, try operating them in the opposite direction of rotation. The machine may not run symmetrically. This can be corrected for example by aligning the brush rocker. Tolerances will always exist however!

2.2 Use of a Motor Circuit Breaker

Motor circuit breakers protect three-phase current motors from a mains voltage reduction and failure of an outer conductor in the event of an overload. The motor circuit breaker breaks the circuit when one of the above mentioned errors occurs.

A motor circuit breaker should only be used when the experimental machine has no thermal contacts. We recommend you to use a motor circuit breaker of the hps series 2231. All electric machines from hps have thermal contacts.

A motor circuit breaker is set respectively to the specified rated current of the motor. However, this has the disadvantage that the characteristic recording is limited to the rated torque. The experiments in the manual can then only be conducted conditionally.

Fig. 2.2.1 shows the connection of a motor circuit breaker (Type 2231.x) in connection with the Control Unit (Type 2730), Universal Power Supply (Type 2740) and Brake Unit (Type 2719) to a three-phase induction motor with squirrel-cage rotor (e. g. Type 2707).

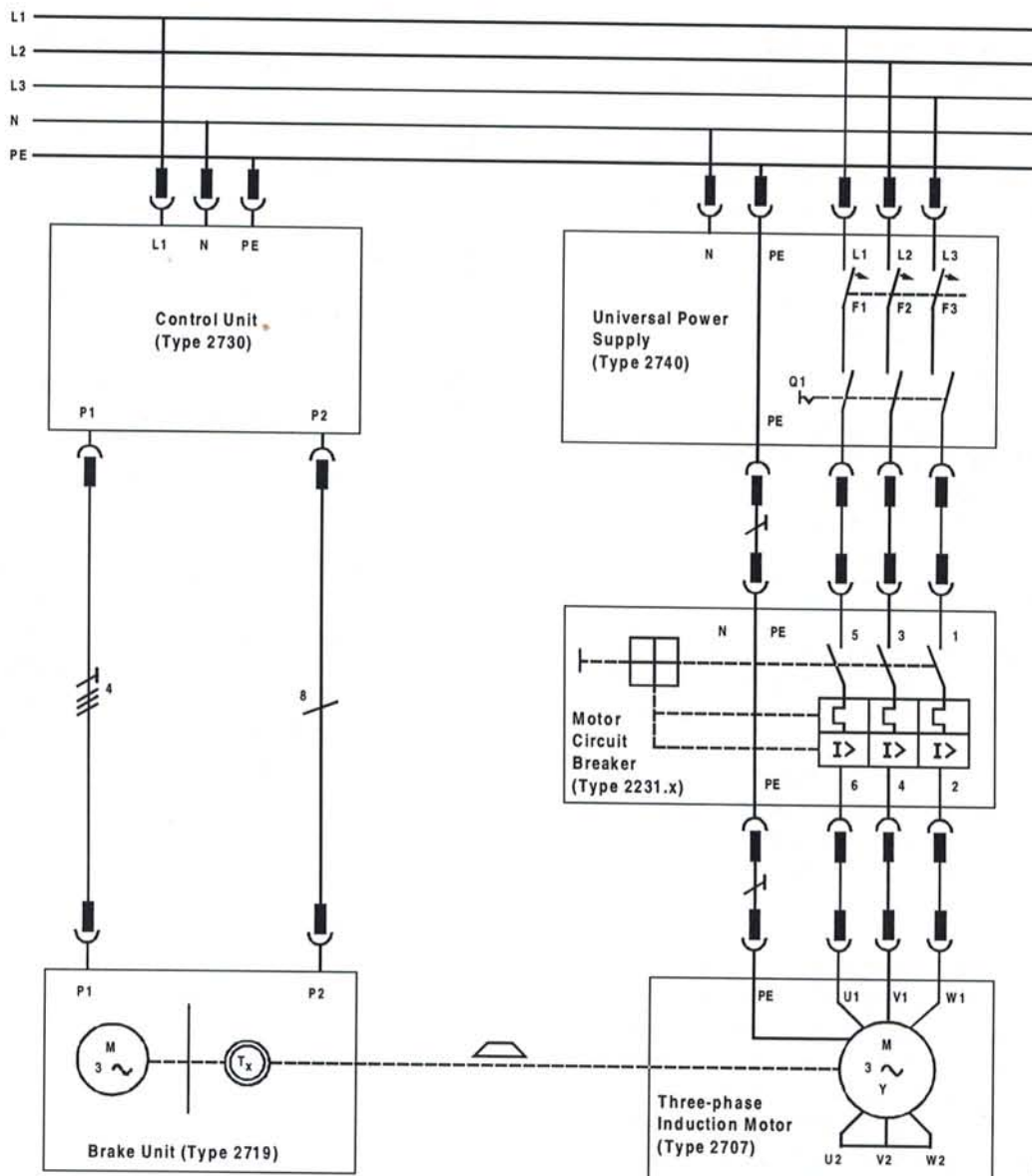


Fig. 2.2.1

2.3 Characteristic Recording with an XY Recorder

The torque characteristic $M = f(n)$ or the speed characteristic $n = f(M)$ can be recorded graphically by means of the Control Unit and an XY recorder.

To do this the operation-mode switch of the Control Unit is set to AUTO (automatic mode). The XY recorder is connected as described in Fig. 2.3.1. The PEN LIFT function can be used as an NCC or NOC depending on the contact of the recorder. Characteristic recording is started by pressing the AUTOMATIC key. At the same time the set maximum speed n_{\max} is reduced to about 0 V by a ramp function.

The contacts of the pen-lift control may be loaded with max. 1250 VA (300 V DC / 250 V AC, 5 A).

ATTENTION!

For DC machines no automatic mode is possible on account of the braking to a torque of $M = 0$ and the resultant overloading of the machine. Connection of an XY recorder is therefore prohibited!

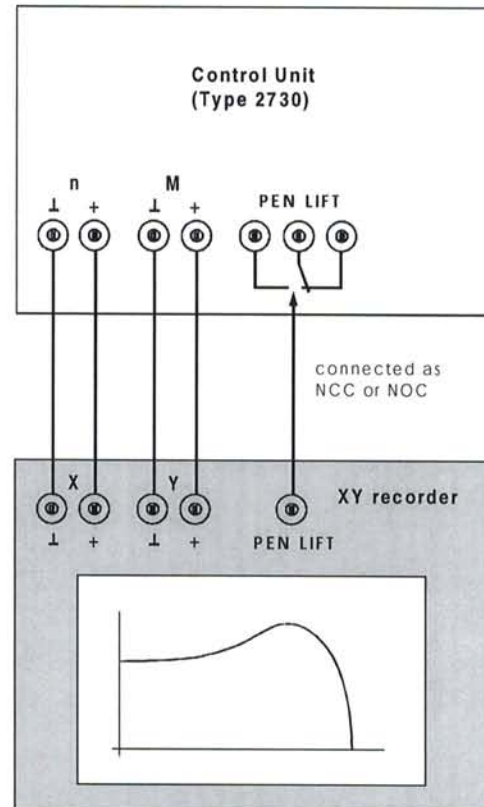


Fig. 2.3.1

2.4 The Torque Attenuator of the Control Unit

In the Control Unit (Type 2730) as of series 0175/01, an additional switch and a potentiometer are installed to reduce the brake machine torque. This is achieved by reducing the motor voltage of the brake machine. This method is applied in motors with a very stable speed/torque behaviour such as in the synchronous motor and shunt-wound motor.

If a brake unit (e. g. Type 2719) is used together with the Control Unit as a load for a controlled drive, a load can be switched on or off with this switch.

The switch should always be switched to the „int“ position for internal if no interface is connected. The „Interface“ switch position enables the brake machine to be switched off during operation (load shedding). The potentiometer has no effect on the brake machine torque at the right stop. If the potentiometer is turned to the left, the torque can be reduced at will (down to $M = 0$).

If an interface is connected, the load shedding can be controlled by means of a PC.