



Features

- The commonly-used control components of chilled water unit are mounted on the panel layout for easy learning.
- Three-phase motor is used in place of compressor. The learner can proceed their hands-on practicing step by step from basics like interlocking circuit, motor start-up and control circuit of forward / reverse rotation, to the advanced exercises such as the complete control circuit of reciprocating/ screw type chilled water unit, etc..
- The pressure component used on this trainer is triggered by direct vapor-pressurizing so the system can be close to the real one. On the contrary, the traditional components used for teaching in the past that have to be actuated by bolt or screwdriver can be discarded.
- The input vapor-pressure, which is divided into 3 mimic pressures like low-pressure, high-pressure and oil pressure, can be used and adjusted separately so the learner would have clearer understanding of functionality of each component accordingly.
- The E.O.C.R is built in inner circuit system to ensure the security and avoid the damage of equipment due to wiring error.
- The equipment is equipped with 3 magnetic switches, 3 auxiliary relays, 14 indicators, 2 timing relays, 3 different types switches and digital voltage / current meters. Moreover, the learner can use these components to take a lot of practices of low-voltage power control circuit and to test their own designed circuit.

Specifications

- Source
 - Voltage: 3 ϕ AC 220V
 - Frequency: 50Hz/60Hz
 - Pressure source: 10Kg/c m2
- Motor
 - Power source: 3 ϕ AC220V, 50Hz/60Hz
 - Revolution: 1750rpm
 - Output: 60Watt
 - Rated current: 0.4A
- Current Transformer
 - ACC. Class: 1.0
 - Frequency: 50Hz/60Hz
 - PRI. Current: 10A
 - SEC. Current: 5A
 - Through: 2T
- Electronic Over-Current Relay(EOCR)
 - Current setting: 0.5A~6A
 - Over time: 1 sec ~ 50sec
 - Delay time: 0.2 sec ~10sec
 - Contact: 2-SPST
- Phase & Voltage Protection Relay(PVPR)
 - Power: 1 ϕ AC 220V, 50Hz/60Hz
 - Reset time: open delay 0.5 sec, close delay 3 sec
 - Output contact capacity: AC250V, 5A (P.F. = 1)
- Low Pressure Switch(LPS)
 - Automatic reset type
 - Pressure range: -0.06 MPa ~ 0.3MPa
 - Differential pressure:
 - Min.: 0.035 Mpa
 - Max : 0.2 Mpa
- Dual Pressure Switch(HLPS)
 - Manual reset type
 - Low side pressure range: -50 cmHg ~ 6cmHg
 - High side pressure range: 8 Kg/cm2 ~ 30Kg/cm
- Oil Protection Switch(OPS)
 - Pressure range: 0.5 Kg/cm2 ~ 3.5Kg/cm2
 - Differential: 0.5Kg/cm2
 - Electrical range: AC125V/250V, 3.5A
 - Timer specification:
 - Delay time: 90sec
 - Timer voltage: AC 110V/220V
 - Switch: SPDT
- Freeze Up Switch(FU)
 - Manual rest type
 - Temperature range: -15 °C ~15°C
 - Electrical range: AC 125V/250V, 3.5A
 - Switch: SPDT
- Thermostat (TH)
 - Temperature range: -10 °C ~ 50°C
 - Electrical range: AC 250V, 5A
 - Switch: SPDT
- Flow Switch (CHFS / CDFS)
 - Full load ampere: AC 240V, 2.5A
 - Locked rotor ampere: AC 240V, 15A
 - Non-inductive ampere : AC 240V, 15A
- Solenoid Valve(SV)
 - Electrical range: AC 220V/50Hz/7W, AC 220V/60Hz/6W
- Dimension: 1180(W) × 690(D) × 1880(H)mm \pm 10%

Experiments

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- 1. Knowledge of electric components**
Various commonly-used electric components are introduced in detail for teaching purpose including micro circuit breaker, PVPR, timing relay, auxiliary relay, magnetic contactor, thermal relay, current transformer, and voltage / current switch with 3 ϕ power.
- 2. Knowledge of protective equipment**
Offering not only the function description and instruction of the pressure protective switch that is commonly-used in chilled water unit is offered, but also the instruction manual and operational concept about the HLP, OLP, anti-freeze switch, and temperature switch, etc. The learner can understand the complete protection measures of chilled water unit.
- 3. Y- Δ manual lower-voltage start control circuit of 3 ϕ induction motor**
Students can realize the advantages of lower-voltage during practice and experience the speed change of motor by manual switch. Besides, students would be more familiar with the usage of relays by adopting other electric components.
- 4. Y-Y / Y- Δ circuit of chilled water unit**
Students can manipulate the Y-Y starting control circuit of small and middle size chilled water unit as well as the lower-voltage starting circuit used in units above 7.5HP. They would be more familiar with the usage condition of various protective switches.
- 5. Circuit of chilled water unit**
The practice for circuit of chilled water unit is almost the same as that of the system in industry. Students would grasp full control concepts about chilled water unit by using the electric components and protective switches.
- 6. 6. Pressure auto-start, manual-start switch circuit, chain circuit practice**
Students would gradually familiarize themselves with the usage of components during the practice of basic chain circuit and switch circuit. Moreover, they can look into these circuits through designing and testing the circuit by the manual or pressure-triggered switch.
- 7. Forward / reverse rotation control circuit of 3 ϕ induction motor, automatic forward / reverse rotation cycle control Circuit**
With the practice of motor control circuit, students become skilled in motor usage and each electric component ; moreover, users can utilize this equipment to verify their own designed circuit.

Remark :
System Transformer (EM-3340-3B) must be purchased at extra charge if 3 ϕ 220V power is not available in the Lab.



EM-3340-3B

K&H MFG. CO., LTD.

5F, No. 8, Sec. 4 Tzu-Chiang Rd., San Chung City 241,
Taipei Hsien, Taiwan R.O.C.

<http://www.kandh.com.tw> E-Mail: education@kandh.com.tw

Fax: 886-2-2287-3066, 2287-9704 Tel: 886-2-2286-0700, 2286-7786

RAPAS kft

1184 Budapest Üllői út 315.

Tel: 06 1 294 2900 Email: rapaskft@digikabel.hu Internet:

www.oktatasi-eszkoz.hu