VALIADIS
HELLENIC MOTORS

KQR series

KQR series

Liquid resistance starters

General introduction

KQR series liquid resistor starter is a new generator starting control device that further improve the starting performance of the large and medium size wound rotor motors. Through connecting liquid resistor in the rotor winding of controlled motor, the starter automatic starts, steplessly, continue working in scheduled time to change the starting current make the motor start smoothly under the condition of perfect starting current. The motor, equipment and power line are protected effectively. Compared to other types starter, this kind of starter have advantage of higher automation, lesser starting current, energy saving and small impact on electric and mechanical etc. features. Especially suitable for the over loading starting. The starter can also start smoothly although at a lower power line voltage, which decrease the capacity of transformer. It is the best starting control device for those over loading equipment such as ball mill, crusher, elevator, compressor, fan, pump etc.

Performance and features

1. The performance is better than others type starters.
2. Small starting current, which is less 1.3 times of rated current.
3. It can start continuously for 5-10 times.
4. Starting is smooth, mechanical stress impact is little. Motors and driving machineries can be protected effectively.
5. The equipment can be start in lower voltage: 6kV motors and 380V motors can be smoothly started at the voltage 5.5kV and 340V accordingly.
6. The simple and reliable structure. Automatic operation, easy install and maintenance.

KQR series

Liquid resistance starters

Explanation for models

KQR - _ / _

Rated power of motors controlled (KW)

Rated current (kA) of starter

Products code

Service condition

1. Ambient temperature: 0~+40~C.
2. Relative humidity: no more than 90%.
3. Altitude: no more than 4000m.
4. Installation site: Vertical inclination shall be no more than 5 degree. No fire hazard, explosion risk, conductive dust, corrosive gas and strong vibration exist.

Technical Parameters

1. Power of motors controlled: 45~10000KW
2. Rotor current of motors controlled: 200~2000A
3. Rotor voltage of motors controlled: 200~2200V
4. Normal working temperature of liquid(~C)~0~70~C
5. Number of starts: 5~10 times

Specification	Motor power (kW)	Starting time (s)	Starting temperature rise (°C/time)
KQR - 0.2	≤200	15	5
KQR - 0.4	≤400		5
KQR - 0.6	≤600	15~25	5
KQR - 1	≤1000		5
KQR - 2	≤2000	20~40	8
KQR - 3	≤3000		10
KQR - 4	≤4000	25~60	10
KQR - 5	≤5000		10
KQR - _ / _	›5000	Special designed according to technical requirements	

6. Starting current: Is ≤ 1.3In~In is motor rated current~
7. Power supply voltage: 3 phase 380V/420/50Hz

Working principle

KQR series liquid resistor starter is use special liquid as resistor, introduce a plate electrode in liquid resistor special designed as electrode to connect the winding of motor rotor. As motor starts, a small power servo motor will move the plate electrode to make the liquid resistor (were connected in rotor winding) decreases steplessly to realize the motor smoothly start under lower current.

Installation

Installation and connecting:

1) The starter should be installed on the cement base with drain. And the equipment shall be vertical to the installation ground. Cabinet should be fixed stably with channel steel on the installation ground. And there should be an electrical trench under the cabinet.
2) Connecting motor rotor cable with cabinet and the interlocking control line as the wiring diagram and working principle. The cable should bear enough current.
3) Checking the connection and ensure the fastening.
4) Checking the resistance between liquid resistor plates electrodes to earth not to be less than 5MΩ.

Confect resistance liquid:

a. Inject carbonate sodium powder ~ 2,5 kg in each trough and add pure water in each trough make the liquid level of 3 troughs, to be 15mm below trough cover.
b. Starting lift motor make the plate move several times to mix well the resistance liquid, by setting the red knob switch to =0= and test positions.
3. Trial running
Observe the starting current if less 1.3 In. If so, the starter can put into use. If not so, the concentration of the resistance liquid should be adjusted according to the part of “operation and maintenance”

Connections instructions:

a. Install and connect feeder 3 phase line plus N (neutral) 4x2,5 mm² and connect it accordingly to L1, L2, L3 and N on the panel.(see relevant drawing). Connect also earth wire.

b. Connect rotor cable at least 3x300mm² at lowest possible distance to the bar terminals of short circuiting contactor KM2 at the rear of the panel.
c. Preliminary trial of starter itself not connected still to main motor.

Feed the panel 3x380V and N
Try switch with red knob on test and 0 positions (0 position = upwards, test position = downwards-short circuiting).

If movements are opposite, reverse feeders on L1 and L2 in order to achieve correct electrode movement. Timer is adjusted to 20-23 secs.

Operation instructions:

Motor ready to start:

KQR liquid starter's red knob switch on 0 position (electrodes upwards)

Starting:

Close main motor's high voltage switch.

At the same time turn red knob switch of KQR liquid starter at test position which is the run position. At this position the electrodes will start moving downwards in order to reach short circuiting position via the contractor KM2

Starting operation is completed and the motor is operating normally.

Stopping the motor:

Disconnect main motor's high voltage switch.

When the motor stops, turn red knob switch of KQR starter to 0 position, where the electrodes will start moving upwards reaching starting position being ready for the next start of the motor.

Usage and maintenance

If "power on" lighting , and "allow starting" light off, you should check if the liquid level is well and if the relevant switch and contactor working. The starter will not allow start before "allow starting" light on.

No matter what reasons need to stop the starter, you just put the "stop" switch. Don't allow put off starter power when the main motor working.

In general, the start cabinet can automatically close - down in any fault. So, the start can be repaired in time. But the user should pay special attention to check periodically (half year) the position switch SA1 and SA2 and resistor liquid level. The resistance liquid or water must be added in time if the liquid level is so low (lower than 5+mm up to cover). The protection action must be taken to protect the insulation when add the water or resistance liquid. The resistance liquid should be changed periodically (4-5 years) and clear the electrode plate and insulated cabinet case. The dilute hydrochloric acid is suggested to remove the oxide on the electrode plate. After rinsing the plate and cabinet case, use PVC anti-corrosive glue to daub the case inside face several times. Please don't disassemble the case for cleaning.

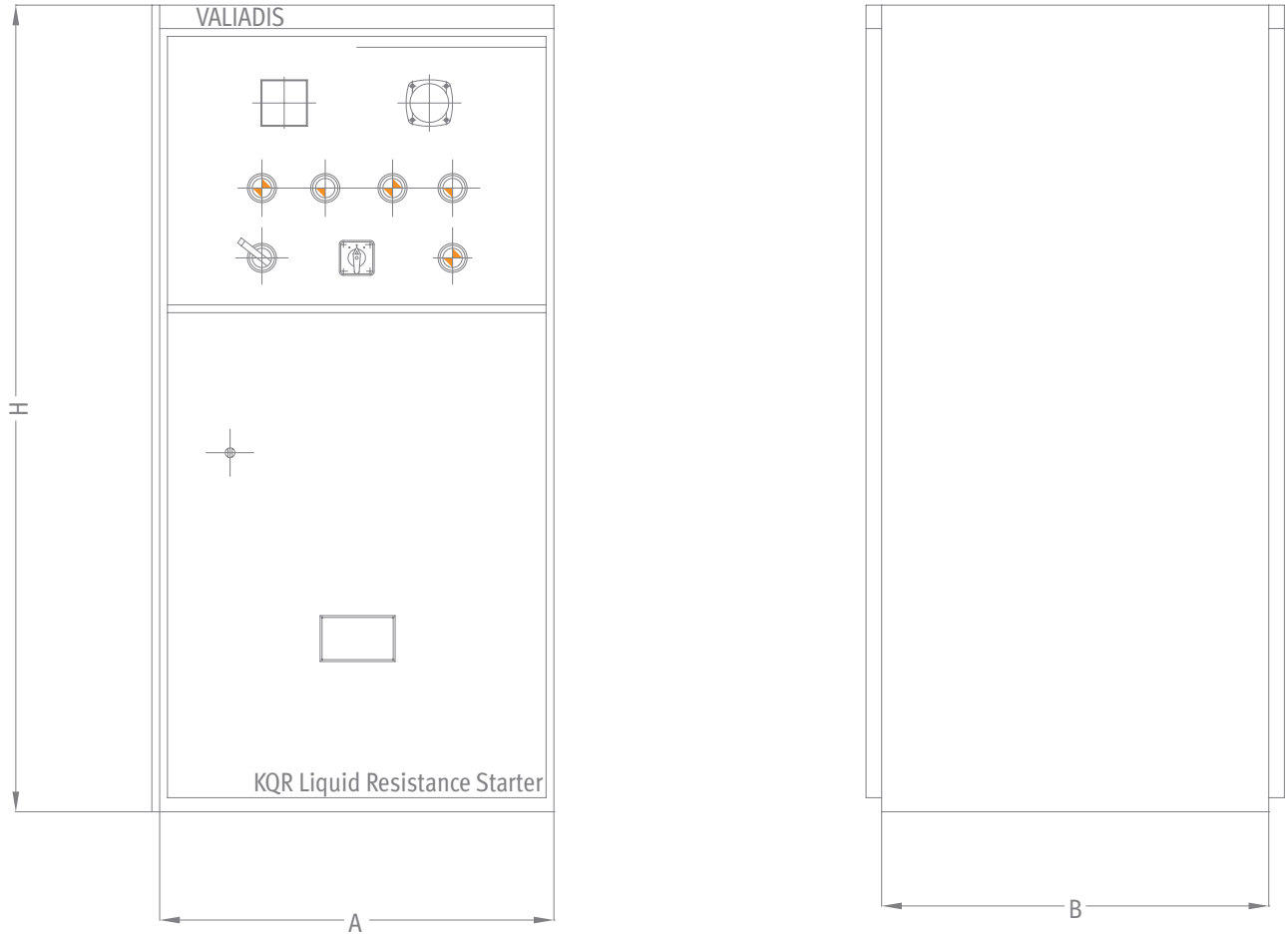
If the main motor running current is so small or the starter starts with high temperature in liquid (over 60°C~) contactor point KM2 should be check and guarantee the contact is good. If the start current is so big, that means the liquid resistance is smaller, should add water.

Ordering instructions

Please providing following information when you place the order:

1. The motor specification, rated power, stator voltage, stator current, rotor voltage and rotor current etc.
2. Features of the equipment driven by the motor.
3. And special requirement, please consult with our company.

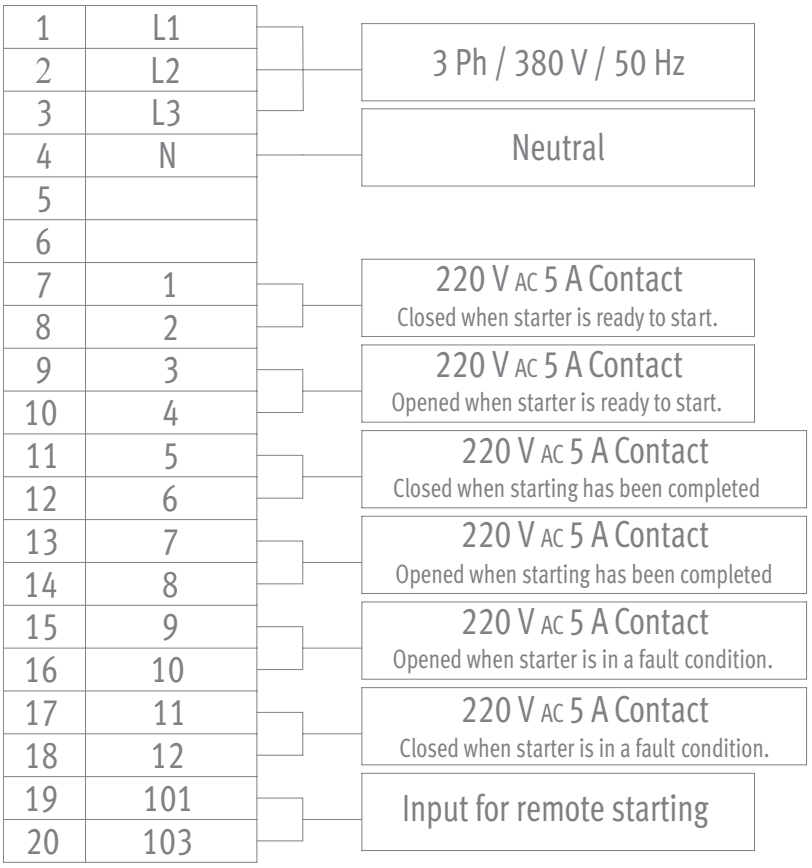
KQR series
Dimension sheet



TYPE	Dimensions in mm		
	A	B	H
KQR-0.2	800	800	1800
KQR-0.4	800	800	1800
KQR-0.6	800	800	2000
KQR-1	1000	900	2000
KQR-2	1200	960	2000
KQR-3	1350	1500	2000
KQR-4	1850	1500	2000
KQR-5	2000	1500	2000

KQR series
Liquid resistance starters

Power Suply & Digital Inputs - outputs.



VALIADIS
HELLENIC MOTORS

ATHENS: 18, Gr. Lambraki Str., 141 23 Likovrisi – tel: +30 2102817217, fax : +30 2102814277
THESSALONIKI: Industrial Area of Sindos., O.T. 48B, 15th Str., 570 22
tel :+30 2310796646 – fax: +30 2310796645
e-mail: valiadis@valiadis.gr – https://www.valiadis.gr
ROMANIA: 1, Aleea Meseriasilor, Bloc C93, Etaj 2, Ap. 16, Sector 6, 061647-Bucharest
tel: +40 214135902 – e-mail: romania@valiadis.gr – https://www.ac-motors.eu