TRACTION CHOPPER AND POWER MODULE TYPE “SYSTEM-MOS”

The brand SYSTEM-MOS has been chosen by Elektrosistem for a new line of control units characterised by a completely new power technology able to guarantee functionality, operator’s safety as they are manufactured in conformity with the EEC standard No. 86/663 of 22-12-86 and a reliability never reached by the older “bipolar transistor technology”.

Assembled as “power modules”, that is complete with contactors, these control units introduce a new concept of electronic drive units for lift trucks.

For the operators facing every day the technical problems of this sector, this line represents without doubt a very good solution.

FUNCTIONALITY

The philosophy of the power module has recently developed among the foreign producers of chopper equipment, as it offers many economic and technical advantages, such as:

a) economy of the regulation system obtained by means of the integration of the electromechanical part with the electronic one, with the consequent elimination of wiring harness, and therefore of assembly and storage costs.

b) functionality of the power module system thanks to the rigorous space organization, the total elimination of electric connection by cable that very often causes loss of power and electromagnetic interference, the elimination of overheating and malfunctioning problems (difficult to locate) and, last but not least, the neat aesthetics that makes modules inspection easy.

RELIABILITY

The System-Mos “power module” is totally protected against battery polarity reversal and is extremely resistant to adverse working conditions and to human errors as no harness is necessary. It can stand motor short circuits in a continuous way and does not get overheated thanks to a thermal self-control system that acts on the max. overload current without limiting the vehicle’s running. During maintenance and repair of a power module even contactors are controlled as they are part of the unit and therefore subjected to the same guarantee terms of the electronic part.

On the contrary, a simple replacement of the controller could not solve the problem if the malfunctioning is due to contactors. The “power module” enables the operator to solve technical problems even by phone, as it represents a great proportion of the entire power apparatus of an electrical vehicle and can be easily replaced even by non-specialised personnel. It can be easily isolated from the auxiliary unit by means of a check connector that simulating all functions, enables immediate detection of existing problems.

OPERATOR’S SAFETY

Special attention has been paid to the “Safety system” that is controlled by a “Supervisor” checking the condition of all parts and acting in case of inconveniences of the electronic system. When the electronic system is enabled, the supervisor checks the different clusters making up the logic unit and in case of anomalies blocks all operations, avoiding dangerous conditions for the operator. Possible short circuits existing or caused at the ends of running contactor coils are neutralised by the electronic circuit controlling contactors that transfers the information to the supervisor in order to block all controls until the anomaly...
condition is removed. The actual efficiency of the safety supervisor can be checked by the operator without any danger (see EEC standard 86-663 par. 9.7.3.5.5). Another very important function for the operator’s safety is the emergency dynamic braking. This function has been included in the “System-Mos” line and can be used to carry out a strong braking when the dead man protection (generally present on transpallets) is enabled, or as alternative to the anti-rollback function, to avoid back up movements of the lift truck during start on the climb. The power module type “System-Mos” offers many other advantages, such as: soft acceleration (that can be adjusted from the outside), possibility to use a unidirectional potentiometer (with no need to carry out adjustment) or a bidirectional potentiometer with electric centring of rest position, “EPS” system (by Elektrosistem) enabling a constant current braking with a very efficient operation dynamic of the vehicle, etc...

The “System-Mos” line is available from 220A to 550A, with battery voltages that ranging from 12V to 80V make these choppers a product connecting the small power line (ETC...M) with the thyristor high power line (PWF and PULSAR). The System-Mos choppers are therefore suitable for medium power vehicles such as transpallets, small lift trucks, floor washers and sweepers and can control series excited DC motors with 2, 3 and 4 terminals.

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POWER MODULE TECHNICAL SPECIFICATIONS

POWER MODULE = CHOPPER complete with CONTACTORS for Forward and Backward Running for 3 and 4 Terminal Motors

<table>
<thead>
<tr>
<th>Models</th>
<th>SYSTEM-MOS 22</th>
<th>SYSTEM-MOS 250</th>
<th>SYSTEM-MOS 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>12-24-36V</td>
<td>48V</td>
<td>12-24-36V</td>
</tr>
<tr>
<td>Current supplied for 1’</td>
<td>220A</td>
<td>250A</td>
<td>350A</td>
</tr>
<tr>
<td>Current supplied for 1 hour</td>
<td>120A</td>
<td>160A</td>
<td>210A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>240A</td>
<td>275A</td>
<td>385A</td>
</tr>
</tbody>
</table>

MAIN FEATURES

# Soft starting by means of acceleration slope that can be adjusted from the outside.
# Limiter of max. current applied to the motor that can be adjusted from the outside.
# Automatic limiter of short circuit current.
# Thermal limiter with proportional action.
# Braking system type “EPS”.
# Emergency electric braking.
# Internal supply type SWITCHED-MODE.
# Electric centring of bidirectional potentiometers.
# Possibility to use a unidirectional potentiometer with no need of adjustment.
# Display of different operation conditions by means of green and red LEDs.
# Total protection against battery polarity reversal.
# Safety supervisor circuit with automatic reset, including:
  a) Check of logic undersupply
  b) Check of short circuit on contactors driver
  c) Check of mechanical failure of accelerator pedal
  d) Check of power part malfunctioning
  e) Check of short circuit or interruption of the speed adjusting potentiometer.
CHOPPER TECHNICAL SPECIFICATIONS

Voltage 24-80 VDC
Allowed variation 67±125 %
Operation frequency 0÷350 Hz
Ambient temperature from -20 to +40 °C
Relative humidity at 25 °C 90 %

Thermal limiter action 80 °C
Max. voltage supplied at 12VB 88 %
Max. voltage supplied at 24 and 36VB 94 %
Max. voltage supplied over 48VB > 97 %
Insulation of mechanical parts 2VB + 1000 V

Models
MOS 22
MOS 30 with Filter*
MOS 35
Voltage 24-36V 24-80V 24-36V
Current supplied for 1' 220A 300A 24-36V
Current supplied for 1 hour 120A 170A 210A
Short circuit current 240A 320A 380A

* Available even without filter to be applied on SCR control units.
N.B. 12V model only on request.

MECHANICAL CLEARANCES

N.B. The data in brackets refer to the control unit type MOS 22.
CHOPPER TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Models</th>
<th>MOS-355</th>
<th>MOS-55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>24-80V</td>
<td>24-80V</td>
</tr>
<tr>
<td>Current supplied for 1'</td>
<td>350 A</td>
<td>550 A</td>
</tr>
<tr>
<td>Current supplied for 1 hour</td>
<td>210 A</td>
<td>300 A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>385 A</td>
<td>600 A</td>
</tr>
</tbody>
</table>

N.B. 12V model only on request.

MECHANICAL CLEARANCES

![Mechanical Clearances Diagram]

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