Electronic control circuits for electromagnetic vibrator feeders

new edition

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PRODUCTS MODIFICATION

All products are identified with the following model: (in case of lack of mode specification, the field will by identified with the mark X)

- **typology product**: R3FXX, R5FXX, VIBC5, TC95A
- **type**: A-circuit, Z-box
- **power supply**: 1-115V / 2-230V, 3-400V / 4-230/400V, 5-till to 500V, 6-400V three phase, 7-400V 3 phase+neuter
- **personalization**: STD-standard, ABC-customer code, execution
Electronic Control Circuits For Electromagnetic Vibrators

Company Profile

M.P. Elettronica boasts of more than 20 years experience in the design and marketing of electronic control systems and circuits (all stabilized) for vibratory units and electromagnetic linear vibratory feeders in widely differing configurations. Our innovative technical solutions and implementation of customized application systems have enabled us to establish a leading position in the specific sector of electromagnetic vibration. Our production ranges from the 3A control system to that of 70A in both the standard stabilized version (series “RC”) and the super stabilized version (the vibratory feeder vibrates with the same amplitude against a variation of +/- 20% in the mains voltage) with automatic controls 0/10V - 0/20ma (series “CV”) and series CVS amplitude stabilized with vibration sensor SIND2 which fully stabilizes the vibrations of the vibratory feeder regardless of its load conditions. All circuits are available in the version for 3000/6000 vibrations per minute (1500 - 750 V/m upon request), supply voltages 48/110/230/400V-till 600V 50/60Hz (or other voltages upon request), start-up ramp, auxiliary ON-OFF input and MIN/MAX regulation, mains filter. ( CE/EMC mark).

Circuits are also available for inductive, capacitive and optical (type PRX92-PRX99) sensors signalling the “overflow” of linear vibratory feeders for the stopping and timed switching on of cylindrical vibratory feeders, as well as complete controls (Series RC/CV99/CV6 +PRX99) for integrated hopper systems, cylindrical and linear vibratory feeders with relative sensors. And a variable frequency digital control circuit FQ1DIG with sensor SIND3 and FQ1 (6A)- FQ2 (3A), unique of its kind, allows optimizing operation of the vibratory feeder by searching for its resonance frequency (maximum performance), thereby eliminating its lengthy and difficult mechanical calibration. At last is also available a circuit code ALIM01 that, with SIND2 sensor, monitoring electromagnetic and mechanical vibrators with Alarms.

Customized versions are possible for each of our circuits whether open (IP00) or boxed (IP65-NEMA 4/4X) subject to verification with current European Standards. Legislative obligations to apply the european standards for the certification of conformity “CE” of electronic products in general have involved us in extensive work of verification, testing and application of said standards. Thanks to the great reliability of our circuits, designed and produced by us with relative certification, our vast experience and highly professional level of our organization, we have steadily gained larger and larger market shares. In this specific sector we have a total production of thousands of control units.

We maintain a consistent level of research and commitment to ensure a continuous development and extension of circuits applied to electromagnetic vibration.

Special Executions on request

Inox Box - IP66 (NEMA 4/4X) - Driving module for multiple vibrators - Double speed -Double output - Customized versions and labels - Voltage from 24Vac to 600Vac - Driving vibrators 1500 V/m - 750 V/m - Controllers with feedback for mills

Internet: www.mpelettronica.com

M P Elettronica S.r.L is a firm certificated

UNI EN ISO 9001:2000

QLITY SYSTEM
The series "RC" circuits (R3FC-R3FC/S-R5FC) have been especially designed for controlling the amplitude of vibration in industrial electromagnetic vibrators.

Of modern conception, the system is based on an integrated circuit which guarantees perfect synchronization of the Triac firing pulse with the wave from of the working voltage under all conditions, with "overload" control. The controllers also include a suitable circuit for soft start with provision for choosing the ramp time (0.2 sec./2 sec.) and for temperature compensation of the phase angle. Appropriately over-dimensioned power stages are provided to handle any overloads without interruption, whether operating at 50 or 60 Hz.

Highly linear range of adjustment, as well as provision for setting the maximum and minimum vibration limits complete the list of main features embodied in the series "RC" controllers. Vibration regulation is through an external potentiometers (see enclosed wiring diagram) and ON-OFF type control with external low power contact for weighing and batching system (also for high currents) and ON/OFF signal voltage.

The controllers can be supplied either in our standard configuration or else in a new circuit configuration or customized box, with no alteration of the electrical reliability characteristics. Furthermore we should be willing to provide our customers with technical service on a continuous basis for improved utilization of the product, and the creation of new accessory products.

The series "RC" circuits are supplied already set in standard version. However access may be made to the PC board for re-adjustments of the minimum and maximum limits. When ordering, please state the required model and working voltage. In the box R3F-R5F is possible to insert PRX92/PRX99 circuit for electronic and mechanical sensor to complete controls to integrated hopper - bowl feeder - linear feeder.

**ELECTRICAL CHARACTERISTICS**

- **TENSION OF FEEDING:** 230V +/- 5% 50/60Hz
- **CONSUMPTION:** 1.5W max
- **CURRENT MAX:** 2.5 A - 3.15A - 6.3A (RMS)
- **FUSES:** double (2.5A/3.15A/6.3A) F 250V 5x20 H 1500 A
- **LOAD MIN.:** 50 mA (RMS)
- **POTENTIOMETER OF REG.:** 100K linear
- **FREQUENCY OF VIBRATION:** 3000/6000 cycles to minute (50Hz)
- **TIME OF RAMP:** 0.2 sec. or 2 sec. (modifiable)
- **REGULATION MIN.:** 80V +/- 30%
- **REGULATION MAX.:** 220V - 30%

**AVAILABLE VERSIONS**

<table>
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<tr>
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<th>Box</th>
<th>Colour</th>
<th>Dimensions</th>
<th>Code</th>
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<td>Fire-retardant plastic</td>
<td>RAL 7035</td>
<td>100 x 100 x 53</td>
<td>PV R3FCX Z2 STD</td>
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<tr>
<td>R3FC</td>
<td>League aluminum</td>
<td>RAL 7035</td>
<td>100 x 100 x 53</td>
<td>PV R3FCX Z2 STM</td>
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<tr>
<td>R3FSC</td>
<td>League aluminum</td>
<td>RAL 7035</td>
<td>110 x 135 x 60</td>
<td>PV R3FSC Z2 STM</td>
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<tr>
<td>R5FC</td>
<td>Fire-retardant plastic</td>
<td>RAL 7035</td>
<td>165 x 130 x 70</td>
<td>PV R5FCX Z2 STD</td>
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<tr>
<td>R5FC+PRX92</td>
<td>Fire-retardant plastic</td>
<td>RAL 7035</td>
<td>165 x 130 x 70</td>
<td>PV R5PRX Z2 STD</td>
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<tr>
<td>R5FC</td>
<td>League aluminum</td>
<td>RAL 7035</td>
<td>145 x 130 x 60</td>
<td>PV R5FCX Z2 STM</td>
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NOTE:

When change from 3000 to 6000 (vibration at minute) or from 6000 to 3000 to control MIN vibration.

NOTE:

If you are used only the electronic circuit (IP00) insert it and cable it in a container that could guarantee an excellent safety degree respecting the Normative European in force and isolate the terminals of the potentiometer with the little rubbers in endowment. Each responsibility from a wrong use of the electronic circuit is declined.

SKETCH AND CHARACTERISTICS TECHNIQUES SUBJECT TO MODIFICATIONS WITHOUT WARNING.

Description: CONTROL CIRCUIT R3FC (STABILIZED)
IMPORTANT:
If You are used the electronic circuit (IP00) insert it and cable it in a container that could guarantee an excellent safety degree respecting the Normative European in force and isolate the terminals of the potenziometer with the little rubbers in endowment. Each responsibility from a wrong use of the electronic circuit is declined.

SKETCH AND CHARACTERISTICS TECHNIQUES SUBJECT TO MODIFICATIONS WITHOUT WARNING.

Description: CONTROL CIRCUIT R3FSC STABILIZED

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<td>E. PEDRAZZI</td>
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Electronic Controller for Electromagnetic Vibrator

“RV6 - RV6S”
with optional circuit PRX07 for sensor NPN/PNP

**GENERAL**

Stabilized professional controller, compact, economic, current till 6.3A RMS or in metallic box IP66, only circuit or circuit with support DIN35 with external potentiometer.

(Optional circuit PRX07 for sensor NPN/PNP)

**GENERAL CHARACTERISTICS**

- Voltage (115V) 230V or 400V, 50-60 Hz - 3000/6000 Vib/Min - Automatic input 0-10V - Multiple On/Off input - Slow/FAST ramp -
- Reg. vibration min/max Man/Automatic - Line input with Schuko plug -
- Vibrator output with connector.
- Output electro valve air blow. Output 24Vca - max 200mA

**APPLICATIONS**

- Regulation of linear and small vibrators circular till 6.3A with automatic input (PLC)

**OPTIONS**

- Box IP65 (NEMA 4/4X) - INOX box - Personalized label -
- Double speed - Connector for vibrator. Circuit PRX07 for NPN/PNP (RV6S)

**ELECTRICAL CHARACTERISTICS**

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**TENSION OF FEEDING:** (115) 230V or 400V +/- 20% 50/60Hz

**CONSUMPTION:** 1.5W max

**CURRENT MAX:** 6.3A (RMS)

**LOAD MIN:** 50 mA (RMS)

**FREQUENCY OF VIBRATION:** 3000/6000 cycles to minute (50Hz)

**TIME OF RAMP:** 0.1 sec. o 1 sec. (modifiable)

**REGULATION MIN.:** 80V +/- 30% (230V) 140V +/- 30% (400V)

**REGULATION MAX:** 200V - 30% (230V) 380V-30% (400V)

**On/Off:** free contact-voltage signal 0-24Vcc

**INPUT CONSUMPTION AUTOM. 010V:** 0-10V 1mA max

**INPUT IMPEDANCE 0-10V:** 50Kohm-50ohm

**DEGREE OF PROTECTION:** IP66 in box (NEMA4-4X)

**TEMPERATURE OF STORAGE:** -10 °C / + 80 °C

**TEMPERATURE OF OPERATION:** 0 °C / + 45 °C

**EUROPEAN NORMS:** EMC CE

**GUARANTEE:** 1 year (from date on circuit)
**CIRCUIT PRX07**

**ELECTRICAL CHARACTERISTICS**

- **Voltage:** 230 Vca +/- 5% 50/60Hz
- **Consumption:** 1,5W max
- **Type of Sensor:** optoisolated NO/NC NPN/PNP
- **Voltage Sensor:** 18 Vcc
- **Energization Delay (T1):** 0-10 sec. reg.
- **De-energization Delay (T2):** 0-10 sec. reg.
- **Temperature Of Storage:** -10 °C / + 80 °C
- **Temperature of Operation:** 0 °C / + 45 °C
- **Range of relative humidity:** 80% sino a 31°C
- **Altitude:** till 2000 meters
- **Guarantee:** 1 Year (from date on circuit)

**NOTE:** Max current for all loads - 250 mA

**Diagram:**

- **INPUT SENSOR:** 10÷30V
- **FREE VOLTAGE CONTACT**
- **LED T1 (YELLOW)**
- **TRASF. 5VA**
- **RELAY 1**
- **LED T2 (GREEN)**
- **AIR BLOW 24VCC**

**DIM. 60X96**

- **T1 = DELAY ON**
- **T2 = DELAY OFF**

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**CIRCUIT RV6**

**ELECTRICAL CHARACTERISTICS**

- **Voltage:** 400-230V (115V) +/- 10% 50/60Hz
- **Consumption:** 2W max
- **Current max:** 6,3A (RMS)
- **Frequency of vibration:** 3000/6000 V/min. (50Hz)
- **Fuses:** double 6,3A F 250V 5x20 H 1500 A (EN 627-2 CEI)
- **Load Min:** 50 mA (RMS)
- **Reg. Min. man/aut:** 80V +/- 30%
- **Regolazione max man/aut:** 200V - 30%
- **Time of Ramp:** 0,2 sec. o 2 sec. (by jumper)
- **Ingresso On-Off:** doppio:contatto pulito/0-24V cc
- **Pot. of Reg:** 100K linear
- **Automatic Input:** 0-10V
- **Input Impedance 0-10V:** 50Kohm
- **Input Consumption Autom. 0-10V:** 1 mA max
- **Temperature of Storage:** -10 °C / + 80 °C
- **Temperature di funzionamento:** 0 °C / + 45 °C
- **Temperature of Operation:** 80% sino a 31°C
- **Altitude:** till 2000 m.
- **Degree of Protection:** IP66 in box (NEMA 4 -4X)
- **Guarantee:** 1 Year (from date on circuit)

**Diagram:**

- **INPUT ON/OFF FREE VOLTAGE**
- **START SLOW**
- **FILTRO EMC**
- **6000 V/MIN.**
- **3000 V/MIN.**
- **ON REQUEST IS POSSIBLE TO USE AMPLITUDE SENSOR SIND2**
Electronic Circuit For Time Delayed Vibrator Stop

"PRX92" Circuit

GENERAL

The PRX92 electronic vibrator stop circuit can be used to stop round electromagnetic vibrators or electromagnetic vibratory hoppers through mechanical, inductive, capacitive or optical (photocells) sensors with NPN or PNP outputs. The circuit also features 2 timed delays from 0-6 sec or 0-12 sec, which are adjustable, for stop and start of the vibrator.

DEFINITION T1/T2

(Case with hopper/automatic distributor/mechanical sensors)

T1: When the contact of the mechanical sensors is closed (= automatic distributor empty = no components) T1 is the delay time for ON condition of the hopper discharging into the automatic distributor.

T2: When the contact of the mechanical sensors is open (=automatic distributor full=component present) T2 is the delay time for OFF condition of the hopper discharging into the automatic distributor.

N.B.: This applies also in the case of signalling the overflow of a vibratory channel coupled with an automatic distributor by means of the electronic sensors (e.g. photocells).

ELECTRICAL CHARACTERISTICS

| SUPPLY VOLTAGE: 230 VCA +/- 5% 50/60 Hz | DE-ENERGIZATION DELAY (T2): 0-6 SEC. O 0-12 SEC. REG. |
| CONSUMPTION: 1,5W max | OUTPUT FOR VIBRATOR STOP: 2 NO/NC 10A 250VCA MAX |
| FUSES: 0,2A F 250V 5x20 H1500A | POSITION OF ASSEMBLAGE: horizontal or vertical |
| INPUTS FOR SENSORS: OPTOISOLATED NO/NC NPN/PNP | TEMPERATURE OF STORAGE: -10 °C / + 80 °C |
| TYPE OF SENSORS: MECHAN. INDUCTIVE. CAPACITIVE OR OPTICAL | TEMPERATURE OF OPERATION: 0 °C / + 45 °C |
| SUPPLY VOLTAGE FOR SENSORS: 12 VCC | RANGE OF RELATIVE HUMIDITY: 80% till to 31°C |
| ENERGIZATION DELAY (T1): 0-6 SEC. O 0-12 SEC. REG. | ALTITUDE : till to 2000 meters |

APPLICATIONS

The PRX92 electronic vibrator stop circuit can be used in various configurations, such as:

1) For controlling overflow of a vibratory chute at the output of a round vibrator.
2) For controlling the loading in a round vibrator from a hopper by means of mechanical level indicators.
3) For energizing readout photocells instead of the mechanical device used as level sensor.

Hence it is possible to couple our PC boards of the R and CV series, for commanding and automating a complete feeder system.

Thanks to the remarkable compactness and the great reliability guaranteed by galvanic and opto-isolation of the inputs, the PRX92 proves to be a valid help in all those cases where it is required to automate component loading and selection cycles with the aid of mechanical and electronic sensors

AVAILABLE VERSIONS

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<tr>
<th>Circuit</th>
<th>Description</th>
<th>Dimensions</th>
<th>Code</th>
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<tbody>
<tr>
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<td>Circuit for sensor with trimmers</td>
<td>95 x 65 x 35</td>
<td>PV PRX92 A2 STD</td>
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<tr>
<td>PRX92/PEX</td>
<td>Circuit for sensor with external potentiometers</td>
<td>95 x 65 x 35</td>
<td>PV PRX92 A2 PEX</td>
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</table>
**Description:** PRX92 SCHEME OF CONNECTION

1. **NPN Sensor**
   - Out Q - 12 Vcc
   - (presence piece = start cycle T1/T2)

2. **NPN Sensor**
   - Out Qneg. - 12 Vcc
   - (absence piece = start cycle T1/T2)

3. **PNP Sensor**
   - Out Q - 12 Vcc
   - (presence piece = start cycle T1/T2)

4. **PNP Sensor**
   - Out Qneg. - 12 Vcc
   - (absence piece = start cycle T1/T2)

5. **MECHANICAL LEVEL SENSOR**
   - (absence piece = contact close = start cycle T1/T2)

6. **NPN Sensor**
   - Out Q - 12 Vcc
   - (absence piece = start cycle T1/T2)

7. **PNP Sensor**
   - Out Q - 12 Vcc
   - (absence piece = start cycle T1/T2)

8. **NPN Sensor**
   - Out Qneg. - 12 Vcc
   - (presence piece = start cycle T1/T2)

9. **PNP Sensor**
   - Out Qneg. - 12 Vcc
   - (presence piece = start cycle T1/T2)

**Mechanical Level Sensor**
- (absence piece = contact close = start cycle T1/T2)

**Trimmer (or potentiometer)**
- 1 Mohm reg. T1
- 1 Mohm reg. T2

**Fuse**
- 5x20 0.1A F

**Line**
- (1-2) 220V
- 110V (optional)

**Output**
- 250V 10A

**Dimension:** 104 x 73
The universal interface electronic circuit PRX99 for electronic sensors (NPN-PNP, optics, inductives, capacitives, NO-NC) allows to feed and manage a sensor that can be used in automatic feeding systems made with electromagnetic vibrators (sensor inside the linear Vibrator or circular Vibrator, to control the "overflow" and to regulate the correct flow or selection). The circuit has a separate control for the timer delay for activation and deactivation of the vibrator and for the low flow alarm. The circuit keeps the times separate during functioning and therefore makes it impossible for them to be modified by either the shape of the pieces or any irregular flow of said pieces on the selection convey. Input and 24V output lines and Air Blow are protected by fuses. The Air Blow starts with the vibrator and continues working for a further 2 seconds after the vibrator has stopped.

Every function is monitored by a signalling Led (Led yellow - T1, Led Green - T2, Led Red - Allarm) and power contacts without voltage are available at the output for possible connection of similar circuits or accessories. The total usage must be below the 5VA supplied by the standard transformer (voltages up to 10VA upon request). This means that the available voltage is a total of 200mA, i.e. the sum of the absorption of the circuit (approx. 50mA), of the sensor 10-30V dc fed by 18V, of the Electro-valve Air Blow and any other possible module connected to the output approx 24Vca, must be within such limit.

**DEFINITION T1/T2 ALARM**

(Case with hopper/automatic distributor/mechanical sensors

T1: When the contact of the mechanical sensors is closed (= automatic distributor empy = no components) T1 is the delay time for ON condition of the hopper discharging into the automatic distributor.

T2: When the contact of the mechanical sensors is open (=automatic distributor full=component present) T2 is the delay time for OFF condition of the hopper discharging into the automatic distributor.

**SPECIAL APPLICATION**: To work with linear/bowl feeder/hopper

The PRX99 circuit mechanically connected to the R5FC, CV99 or all other vibrator controlling circuits, allows to implement a material loading and selection process ruled by vibrators (hopper, circular, linear) and divided into several phases all completely independent in all their main function (feeding the vibrators; managing the sensors NPN/PNP, their times and air blows; low flow alarm visible thanks to the self-feeding alarm light).

**ELECTRICAL CHARACTERISTICS**

- **SUPPLY VOLTAGE**: 230 Vca +/- 5% 50/60 Hz
- **CONSUMPTION**: 1.5W max
- **FUSES**: 0.2A F 250V 5x20 H1500A
- **INPUTS FOR SENSORS**: OPTOISOLATED NO/NC NPN/PNP
- **TYPE OF SENSORS**: MECHAN. INDUCTIVE. CAPACITIVE OR OPTICAL
- **SUPPLY VOLTAGE FOR SENSORS**: 12 Vcc
- **ENERGIZATION DELAY (T1)**: 0-6 SEC. O 0-12 SEC. REG.
- **DE-ENERGIZATION DELAY (T2)**: 0-6 SEC. O 0-12 SEC. REG.
- **ALARM DELAY**: 30 SEC.
- **OUTPUT FOR VIBRATOR STOP**: 2 NO/NC 10A 250Vca MAX
- **POSITION OF ASSEMBLAGE**: horizontal or vertical
- **TEMPERATURE OF STORAGE**: -10 °C / + 80 °C
- **TEMPERATURE OF OPERATION**: 0 °C / + 45 °C
- **RANGE OF RELATIVE HUMIDITY**: 80% till to 31°C
- **ALTITUDE**: till to 2000 meters
- **DELAY EV AIR BLOW**: 2 SEC.

**AVAILABLE VERSIONS**

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Description</th>
<th>Dimensions</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRX99</td>
<td>Circuit for sensor with trimmers</td>
<td>95 x 65 x 35</td>
<td>PV PRX99 A2 STD</td>
</tr>
<tr>
<td>PRX99/PEX</td>
<td>Circuit for sensor with external potentiometers</td>
<td>95 x 65 x 35</td>
<td>PV PRX99 A2 PEX</td>
</tr>
</tbody>
</table>
Description: INTERFACE CIRCUIT FOR SENSOR PRX99 WITH ALLARMS

**F3** Fuses 0.2A F 5x20 output 24Vca

**F2** Fuses 0.2A F 5x20 (sensor)

**CONN3** qualification input OUT 24Vca (0.1A MAX)

**CONN4** OUT ALLARM (absence pieces)

**LED T1** (YELLOW) REG. T2 REG. ALARM (absence pieces)

**CONN1** TRASF.5VA STANDARD (10VA OPTIONAL)

**CONN2**

**FUSE OF LINE 0.2A F 5X20 NO 400V**

**F1**

**LINE 230V** (115 E 400V OPTIONAL)

**FUSE OF LINE 0.2A F 5X20 NO 400V**

**OUT 24Vca** (0.1A MAX)

**LED T2** (GREEN) LED ALLARM (RED)

**REG. T1**

**MECHANICAL SENSOR**

**TO USE CONTACTS WITHOUT VOLTAGE**

**T1 = Delay ON**

**T2 = Delay OFF**

**ELECTRO-VALVE AIR BLOW 24Vcc (delay 2 sec.)**

**SETUP FOR SETTINGS TYPE SENSOR**

see description

**sensor PNP o NPN 10-30Vdc**

**OFF** (closed when not used)

**ON**
**GENERAL**

Stabilized circuit RS96 has been especially designed for regulating the intensity of vibration and stabilized amplitude in industrial vibratory feeders.

Of modern conception, the system uses an integrated module which guarantees **perfect synchronization** of the triac firing pulse with the wave form of the working voltage under all conditions.

The system is also includes a special circuit for soft start, with provision for selecting the ramp time by relative jumper (standard 1 sec.) as well as **temperature compensation** of the phase angle. An appropriately over-dimensioned power stage is provided for handing any overloads without interruptions, whether operating at 50Hz or 60Hz.

All input galvanically isolated from power supply, a highly **linear** range of adjustment, manual and automatic input (0-10V/0-20mA optional), together with provision for setting the maximum and minimum vibration limits with **professional trimmers** complete the list of main features offered by stabilized controller RS96.

Vibration regulation is through an external **professional** potentiometer. It is also possible to use and on ON-OFF/input for weighing and batching systems.

The controller RS96 thanks to their total reliability combined with great versatility, can be used to drive any type of industrial electromagnetic vibrator, whether small or medium. The unit is supplied either in open version (without case) or in boxes version (IP55/65-NEMA 4/4x).

**ELECTRICAL CHARACTERISTICS**

- **TENSION OF FEEDING**: 230V (115V) +/- 5% 50/60Hz
- **STABILIZATION**: +/-20%
- **CONSUMPTION**: 2W max
- **CURRENT MAX**: 6,3 (RMS)
- **FUSES CV5**: double 6,3A F 250V 5X20 H1500A
- **LOAD MIN.**: 50 mA (RMS)
- **POTENTIOMETER OR REG.**: 10Kohm linear
- **FREQUENCY OF VIBRATION**: 3000/6000 V/m (50Hz)3600/7200(60Hz)
- **TIME OF RAMP**: 0,2 sec. or 2 sec. (by jumper)
- **REGULATION MIN. MAIN/AUT**: 80V+/- 30%
- **REGULATION MAX. MAIN/AUT**: 200V - 30%
- **INPUT ON-OFF**: contact without voltage/ voltage sign/10-30Vcc
- **AUTOMATIC INPUT**: 0-10V/0-20mA
- **AUTOMATIC INPUT CONSUMPTION 0-10V**: 1 mA max
- **INPUT IMPEDANCE 0-10V**: 50Kohm
- **INPUT IMPEDANCE 4-20mA**: 50ohm
- **DEGREE OF POLLUTION**: 2
- **POSITION OF ASSEMBLAGE**: horizontal or vertical
- **DEGREE OF PROTECTION**: IP55 in box - IP65 NEMA 4/4X
- **TEMPERATURE OF STORAGE**: -15 °C / + 80 °C
- **TEMPERATURE OF OPERATION**: -5 °C / + 45 °C
- **RANGE OF RELATIVE HUMIDITY**: 80% till to 31°C
- **INSTALLATION CLASS**: II
- **ALTITUDE**: till to 2000 meters
- **EUROPEAN NORMS**: EMC CE
- **GUARANTEE**: 1 year (from date on circuit)

**AVAILABLE VERSIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Box</th>
<th>Colour</th>
<th>Dimensions</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS96</td>
<td>Alluminium</td>
<td>RAL 7035</td>
<td>164X100X67</td>
<td>PV RS96X Z2 STD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS96</td>
<td>Control Circuit</td>
<td>115x95x45</td>
</tr>
</tbody>
</table>
NOTE:
If you use only the electronic circuit (IP00) insert it and cable it in a container that could guarantee an excellent safety degree respecting the Normative European in force and you must isolate the terminals of the potentiometer with the rubbers in endowment. Each responsibility from a wrong use of the electronic circuit is declined.
Stabilized Electronic Control Circuits For Electromagnetic Vibrator

"CV" Series

GENERAL

The circuits in this series, besides their stability to temperature and their reliability, also have the characteristic of being able to compensate for any variations in the mains power supply voltage (more +/- 20%), thereby ensuring constant amplitude of the vibrations independently of the fluctuations which the mains voltage is subject to throughout the twenty four hours in the day.

This advantage is specially important each time the flow the components out from the vibrator must be kept as constant as possible in order not to run the risk of impairing the correct operation of the equipment downstream to the vibrator.

In fact the CV series circuits (CV6/CV10/CV20/CV40-CV70/CV100 on request) supply the vibrator terminals with voltage such as to ensure constant amplitude of vibration.

This advantage remains the same regardless of the type of power supply voltage (230/400V or 115V, 415V, 440V, 480V upon request).

In addition to the features described above, this circuit has the following characteristics:

1) Potentiometer for manual setting and galvanically isolated inputs 0/10V and 0/20mA for automatic operation.
2) Operation at 50 (and 60) Hz and 3000 (3600)V/m and 6000 (7200) V/m.
3) Provision for operating as nr. 2 ON-OFF (contact or signal voltage) type with soft start for using photocells or proximity switches without need for power contacts.
4) Provision for manual operation (through linear 100K potentiometer) or automatic operation through inputs 0/10V and/or 0/20mA.
5) Power output with double isolated SCR (from CV20 to CV70); in the event of failure of one SCR the other one can be used (see DTCVMOD).

With reference to draw DTCV6/DTCVXY note that the circuit can operate coupled to a photocells or proximity switch with output not under voltage in loading or batching system.

It is also possible to implement very brief ON-OFF cycles without impairing the ramp start charateristics.

The series CV control circuits, thanks to their total reliability combined with great versatility, can be used to drive any type of industrial electromagnetic vibrator, whether small, medium or high power. The unit is supplied either in open version (without case, IP00) or in boxes version (IP55/65-NEMA 4/4x). On request, is available a contact that signal the Vibrator ON.

ELECTRICAL CHARACTERISTICS

| TENSION OF FEEDING: 230V or 400V +/- 20% 50/60Hz |
| **CONSUMPTION:** 1,5W max (CV6)-3,5 max (CV10-CV70) |
| **CURRENT MAX:** 5/10/20/40/70 A RMS |
| FUSES CV6/CV8: double 6A F 500V 6,3X32 H1500A |
| double 8A F 500V 6,3X32 H1500A |
| FUSES CV10/40: double 10/20A F 660V 10X38 H100000A |
| double 40A F 500V 14X51 H120000A |
| **PROTECTION FUSE CV10/40:** 6,3x32 500mA 500V |
| **LOAD MIN.:** 50 mA (RMS) |
| **POTENTIOMETER OF REG.:** 100Kohm linear |
| **FREQUENCY OF VIBRATION CV6/8:** 3000/6000 V/m (50Hz) |
| **FREQ. OF VIBRATION CV10/70:** 3000 / 6000 V/m (50Hz) |
| **TIME OF RAMP:** fast ramp 0,1 sec. / slow ramp 1 sec. |
| **REGULATION MIN.:** 80V +/- 30% (230V) 140V +/- 30% (400V) |
| **REGULATION MAX:** 200V - 30% (230V) 350V-30% (400V) |
| **AUTOMATIC INPUT CONSUMPTION 0-10V:** 1 mA max |
| **INPUT IMPEDANCE 0-10V:** 50Kohm |
| **INPUT ON/OFF:** contact / 0-24 Vcc |
| **DEGREE OF PROTECTION:** 2 |
| **POSITION OF ASSEMBLAGE:** horizontal or vertical |
| **DEGREE OF PROTECTION:** IP55 in box - IP65-NEMA4-4X |
| **TEMPERATURE OF STORAGE:** -15 °C / + 80 °C |
| **TEMPERATURE OF OPERATION:** -5 °C / + 45 °C |
| **RANGE OF RELATIVE HUMIDITY:** 80% till to 31°C |
| **INSTALLATION CLASS:** II |
| **ALTITUDE:** till to 2000 meters |
| **EUROPEAN NORMS:** EMC CE |
| **GUARANTEE:** 1 year (from date on circuit) |
### AVAILABLE VERSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIRCUIT</td>
<td>CV6/8F 230V-6A(8A)</td>
<td>PV CV6(8)FX A2 STD</td>
</tr>
<tr>
<td>CIRCUIT for DIN 35</td>
<td>CV6/8F 230V-6A(8A)</td>
<td>PV CV6(8)FX A2 DIN</td>
</tr>
<tr>
<td>CIRCUIT baseplate + plexiglass</td>
<td>CV6/8F 230V-6A(8A)</td>
<td>PV CV6(8)FX A2 SBP</td>
</tr>
<tr>
<td>BOX</td>
<td>CV68/F 230V-6A(8A)</td>
<td>PV CV6(8)FX Z2 STD</td>
</tr>
<tr>
<td>BOX PLASTIC</td>
<td>CV6/8F 230V-6A(8A)</td>
<td>PV CV6(8)FX Z2 STP</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV6/8F 400V-6A(8A)</td>
<td>PV CV6(8)FX A3 STD</td>
</tr>
<tr>
<td>CIRCUIT for DIN 35</td>
<td>CV6/8F 400V-6A(8A)</td>
<td>PV CV6(8)FX A3 DIN</td>
</tr>
<tr>
<td>CIRCUIT baseplate + plexiglass</td>
<td>CV6/8F 400V-6A(8A)</td>
<td>PV CV6(8)FX A3 SBP</td>
</tr>
<tr>
<td>BOX</td>
<td>CV68/F 400V-6A(8A)</td>
<td>PV CV6(8)FX Z3 STD</td>
</tr>
<tr>
<td>BOX PLASTIC</td>
<td>CV6/8F 400V-6A(8A)</td>
<td>PV CV6(8)FX Z3 STP</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV10/F 230V/400V-10A</td>
<td>PV CV10F A4 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV10/F 230V/400V-10A</td>
<td>PV CV10F Z4 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV10/F FINO 500V-10A</td>
<td>PV CV10F A5 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV10/F FINO 500V-10A</td>
<td>PV CV10F Z5 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV20/F 230V/400V-10A</td>
<td>PV CV20F A4 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV20/F 230V/400V-20A</td>
<td>PV CV20F Z4 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV20/F FINO 500V-20A</td>
<td>PV CV20F A5 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV20/F FINO 500V-20A</td>
<td>PV CV20F Z5 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV40/F 230V/400V-40A</td>
<td>PV CV40F A4 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV40/F 230V/400V-40A</td>
<td>PV CV40F Z4 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV40/F FINO 500V-40A</td>
<td>PV CV40F A5 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV40/F FINO 500V-40A</td>
<td>PV CV40F Z5 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV70/F 230/400V-70A</td>
<td>PV CV70F A4 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV70/F 230/400V-70A</td>
<td>PV CV70F Z4 STD</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>CV100/1 230/400V-100A</td>
<td>PV CV100 A4 STD</td>
</tr>
<tr>
<td>BOX</td>
<td>CV100/1 230/400V-100A</td>
<td>PV CV100 Z4 STD</td>
</tr>
</tbody>
</table>

**Note:** It is possible to supply all versions with double speed n. 2 potentiometers, to add after the last figures the code ‘S2V’ or for the double output ‘S2U’ (PV CV10F A4 STD S2V).
Contact Free Voltage

Max Manual

Min Manual

6000 V/m

3000 V/m

Version 8A-CV8

Height Max 9mm

Fuses 8A or 6.3A

6.3 X 32

0-24 Vdc (ON/OFF with signal voltage)

Dimensions and Measure Boring

<table>
<thead>
<tr>
<th>Description: CIRCUIT CV6/F-CV8/F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODE</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>DT CV6F-CV8F</td>
</tr>
</tbody>
</table>
Measure (mm) circuits from CV10 to CV100 (IP00)

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Dimension</th>
<th>Boring measure</th>
<th>Dim. Connectors</th>
<th>Fuse Dim./Ampere</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 10/F</td>
<td>170 230 100</td>
<td>145 205</td>
<td>4 mmq 10.3x38 10A</td>
<td></td>
</tr>
<tr>
<td>CV 20/F</td>
<td>170 320 100</td>
<td>145 295</td>
<td>10 mmq 10.3x38 20A</td>
<td></td>
</tr>
<tr>
<td>CV 40/F</td>
<td>243 320 100</td>
<td>219 295</td>
<td>16 mmq 14x51 40A</td>
<td></td>
</tr>
<tr>
<td>CV 70/F</td>
<td>280 380 130</td>
<td>255 355</td>
<td>25 mmq 22x58 70A</td>
<td></td>
</tr>
<tr>
<td>CV100/F</td>
<td>280 380 130</td>
<td>255 355</td>
<td>25 mmq 22x58 100A</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: If you use only the electronic circuit (IP00), insert it and cable it in a case that the potentiometer's terminal and will isolate the terminals of the potentiometer with a wrong use of the electronic circuit is declined.

SKETCH AND CHARACTERISTICS TECHNIQUES SUBJECT TO MODIFICATIONS WITHOUT WARNING.
SCHEME OF CONNECTION VALID FOR:
CV10/F, CV20/F, CV40/F, CV70/F, CV100/F
For the CV5 enter with the potentiometer/s on the connector 10/11/12.
OPTIONAL MODULE FOR 2 VIBROTORS (CIRCUIT CVXY/F)

VIBRATOR 1

CONNECTORS

VIBRATOR 2

NOTE: TO TURN THE WIRES IF THE VIBRATOR DO NOT WORK

1. Move wire 1 from A1-K2 to K1
2. Move wire 2 from A2 to A1-K2
3. Move wire 3 from G2 to G1

Utilizzo normale : K2 - A2 - G2
(Normal Utilize)

NOTE: Valid: su CV20, CV40, CV70 e CV100

In caso di rottura si utilizza : K1 - A1 - G1
In case of breakage to utilize : K1 - A1 - G1
- Spostare filo 1 da A1-K2 a K1
- Spostare filo 2 da A2 a A1-K2
- Spostare filo 3 da G2 a G1
- Move wire 1 from A1-K2 to K1
- Move wire 2 from A2 to A1-K2
- Move wire 3 from G2 to G1
FIRE-RETARDANT PLASTIC (PVC) BOX, LIGHT GREY RAL7035, PROTECTION CLASS IP55.

max height : 68mm
### Dimension boxes from CV6 to CV100 (IP55)

<table>
<thead>
<tr>
<th>BOX</th>
<th>A</th>
<th>B</th>
<th>h</th>
<th>G</th>
<th>F</th>
<th>Φ I</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 06/F</td>
<td>130</td>
<td>250</td>
<td>111</td>
<td>140</td>
<td>170</td>
<td>8.5</td>
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<tr>
<td>CV 10/F</td>
<td>202</td>
<td>262</td>
<td>140</td>
<td>230</td>
<td>181</td>
<td>10</td>
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<tr>
<td>CV 20/F</td>
<td>202</td>
<td>352</td>
<td>140</td>
<td>265</td>
<td>196</td>
<td>10</td>
</tr>
<tr>
<td>CV 40/F</td>
<td>300</td>
<td>400</td>
<td>140</td>
<td>325</td>
<td>315</td>
<td>10</td>
</tr>
<tr>
<td>CV 70/F</td>
<td>312</td>
<td>412</td>
<td>140</td>
<td>328</td>
<td>240</td>
<td>13</td>
</tr>
<tr>
<td>CV100/F</td>
<td>372</td>
<td>462</td>
<td>235</td>
<td>400</td>
<td>240</td>
<td>13</td>
</tr>
</tbody>
</table>

**NOTE:**
Valid dimension also for the version to double potentiometer.
Stabilized Electronic Control Circuits For Electromagnetic Vibrator With Vibration Sensor

“CV” S Series

GENERAL

The electronic command circuits series CV6/F and CVXY/F are now also available with a vibration sensor (SIND1 or SIND2). This allows to stabilise not only the line voltage variations, but also the variations of charge and flexibility of the spring.

The circuits maintain the functioning characteristics and the dimensions typical of the series without the sensor (SERIES CVXY/F please refer to the section on the catalogue STCV REV.01e and the related technical drawings as integral part to this schedule). These circuits are very easy to use. Once the sensor has been set (see explanation pictures - DTINSEN) and connected to the circuits, one only needs to use the trimmer regulating the sensitivity, to adapt the functioning to vibrators having very different amplitude of vibration between them. This is so as to obtain a sufficiently wide regulation through the potentiometer (automatic signal 0-10V and 0-20A).

The circuits are supplied with a standard calibration. If the circuit is optimized with an empty vibrator, then the working point must be set adequately below the line voltage, so that, once weighted down with the load, the circuit can keep the vibration stable supplying a higher exit voltage. If the optimisation is carried out with a fully loaded vibrator, then the voltage on the vibrator will only reduce as either channel or bucket empties. This is why the working point can be fixed close to the line voltage.

The circuits belonging to the CVXY/FS series are supplied with such response times that can hardly ever cause any problem. If, however, both the vibrator and the circuit still do not find a stable functioning condition, this would mean that the vibrator is way below the normal working point can be fixed close to the line voltage. The vibration or amplitude sensor is available in two versions: SIND1 or SIND2. In these circumstances, it is advisable to harden the whole thing, by either mechanically modifying the vibrator or by inserting more springs.

The circuits belonging to the CVXY/FS series, fitted with our own sensor SIND1 and SIND2, are in fact able to considerably improve the functioning of either the vibrator or the installation, but cannot totally eliminate the planning errors made. A well made project, on the other hand will be able to benefit from further using the above mentioned circuits, which have been purposely studied and implemented to optimize and best control any electronic vibrator in any given functioning condition.

NOTES ON THE SENSOR:

The vibration or amplitude sensor is available in two versions:

SIND1 this version is ideal for heavy duty usage with a container of pressed molten aluminium and connecting cable protected by a metal spiral wire of a standard length of 2.5 meters.

SIND2 this version is ideal for a general industrial usage (reduced costs), with an unprotected cable and a resinated container with a hollow fixing flange.

ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TENSION OF FEEDING</td>
<td>230V or 400V +/- 20% 50/60Hz</td>
</tr>
<tr>
<td>CONSUMPTION</td>
<td>1,5W max (CV5)–3,5 max(CV10-CV70)</td>
</tr>
<tr>
<td>CURRENT MAX</td>
<td>5/10/20/40/70 A RMS</td>
</tr>
<tr>
<td>FUSES CV6/CV8</td>
<td>double 6A F 500V 6,3x32 H1500A</td>
</tr>
<tr>
<td></td>
<td>double 8A F 500V 6,3x32 H1500A</td>
</tr>
<tr>
<td>FUSES CV10/40</td>
<td>double 10/20A F 660V 10X38 H100000A</td>
</tr>
<tr>
<td></td>
<td>double 40A F 500V 14X51 H120000A</td>
</tr>
<tr>
<td>PROTECTION Fuse CV10/40</td>
<td>6,3x32 500mA 500V</td>
</tr>
<tr>
<td>LOAD MIN.</td>
<td>50 mA (RMS)</td>
</tr>
<tr>
<td>POTENTIOMETER of REG.</td>
<td>100Kohm linear</td>
</tr>
<tr>
<td>FREQUENCY OF VIBRATION CV6/8</td>
<td>3000/6000 V/m (50Hz)</td>
</tr>
<tr>
<td>FREQ. of VIBRATION CV10/70</td>
<td>3000 / 6000 V/m (50Hz)</td>
</tr>
<tr>
<td>TIME of RAMP</td>
<td>fast ramp 0,1 sec. / slow ramp 1 sec.</td>
</tr>
<tr>
<td>REGULATION MIN.</td>
<td>80V/+/- 30% (230V) 140V/+/- 30% (400V)</td>
</tr>
<tr>
<td>REGULATION MAX</td>
<td>200V - 30% (230V) 350V-30% (400V)</td>
</tr>
<tr>
<td>AUTOMATIC INPUT CONSUMPTION 0-10V</td>
<td>1 mA max</td>
</tr>
<tr>
<td>INPUT IMPEDANCE 0-10V</td>
<td>50Kohm / 0-20mA</td>
</tr>
<tr>
<td>INPUT ON/OFF</td>
<td>contact / 0-24 Vcc</td>
</tr>
<tr>
<td>DEGREE OF POLLUTION</td>
<td>2</td>
</tr>
<tr>
<td>POSITION OF ASSEMBLAGE</td>
<td>horizontal or vertical</td>
</tr>
<tr>
<td>DEGREE OF PROTECTION</td>
<td>IP54 in box (IP00 only circuit)</td>
</tr>
<tr>
<td>TEMPERATURE OF STORAGE</td>
<td>-15 °C / + 80 °C</td>
</tr>
<tr>
<td>TEMPERATURE OF OPERATION</td>
<td>-5 °C / + 45 °C</td>
</tr>
<tr>
<td>RANGE OF RELATIVE HUMIDITY</td>
<td>80% till to 31°C</td>
</tr>
<tr>
<td>INSTALLATION CLASS</td>
<td>II</td>
</tr>
<tr>
<td>ALTITUDE</td>
<td>till to 2000 meters</td>
</tr>
<tr>
<td>EUROPEAN NORMS</td>
<td>EMC CE</td>
</tr>
<tr>
<td>GUARANTEE</td>
<td>1 year (from date on circuit)</td>
</tr>
</tbody>
</table>
Stabilized Electronic Control Circuits For Electromagnetic Vibrator With Vibration Sensor

“CV” S Series

AVAILABLE VERSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIRCUIT CV6/8FS</td>
<td>230V-6A(8A)</td>
<td>PV CV6(8)FX A2 SSD</td>
</tr>
<tr>
<td>CIRCUIT for DIN 35</td>
<td>CV6/8FS 230V-6A(8A)</td>
<td>PV CV6(8)FX A2 DSN</td>
</tr>
<tr>
<td>CIRCUIT baseplate + plexiglass CV6/8FS</td>
<td>230V-6A(8A)</td>
<td>PV CV6(8)FX A2 BSP</td>
</tr>
<tr>
<td>BOX CV6/8FS</td>
<td>230V-6A(8A)</td>
<td>PV CV6(8)FX Z2 SSD</td>
</tr>
<tr>
<td>BOX PLASTIC CV6/8FS</td>
<td>230V-6A(8A)</td>
<td>PV CV6(8)FX Z2 SSP</td>
</tr>
<tr>
<td>CIRCUIT CV6/8FS</td>
<td>400V-6A(8A)</td>
<td>PV CV6(8)FX A3 SSD</td>
</tr>
<tr>
<td>CIRCUIT for DIN 35</td>
<td>CV6/8FS 400V-6A(8A)</td>
<td>PV CV6(8)FX A3 DSN</td>
</tr>
<tr>
<td>CIRCUIT baseplate + plexiglass CV6/8FS</td>
<td>400V-6A(8A)</td>
<td>PV CV6(8)FX A3 SSP</td>
</tr>
<tr>
<td>BOX CV6/8FS</td>
<td>400V-6A(8A)</td>
<td>PV CV6(8)FX Z3 SSD</td>
</tr>
<tr>
<td>BOX PLASTIC CV6/8FS</td>
<td>400V-6A(8A)</td>
<td>PV CV6(8)FX Z3 SSP</td>
</tr>
<tr>
<td>CIRCUIT CV10 FS</td>
<td>230V/400V-10A</td>
<td>PV CV10F A4 SSD</td>
</tr>
<tr>
<td>BOX CV10/FS</td>
<td>230V/400V-10A</td>
<td>PV CV10F Z4 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV10/FS</td>
<td>FINO 500V-10A</td>
<td>PV CV10F A5 SSD</td>
</tr>
<tr>
<td>BOX CV10/FS</td>
<td>FINO 500V-10A</td>
<td>PV CV10F Z5 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV20/FS</td>
<td>230V/400V-10A</td>
<td>PV CV20F A4 SSD</td>
</tr>
<tr>
<td>BOX CV20/FS</td>
<td>230V/400V-20A</td>
<td>PV CV20F Z4 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV20/FS</td>
<td>FINO 500V-20A</td>
<td>PV CV20F A5 SSD</td>
</tr>
<tr>
<td>BOX CV20/FS</td>
<td>FINO 500V-20A</td>
<td>PV CV20F Z5 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV40/FS</td>
<td>230V/400V-40A</td>
<td>PV CV40F A4 SSD</td>
</tr>
<tr>
<td>BOX CV40/FS</td>
<td>230V/400V-40A</td>
<td>PV CV40F Z4 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV40/FS</td>
<td>FINO 500V-40A</td>
<td>PV CV40F A5 SSD</td>
</tr>
<tr>
<td>BOX CV40/FS</td>
<td>FINO 500V-40A</td>
<td>PV CV40F Z5 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV70/FS</td>
<td>230/400V-70A</td>
<td>PV CV70F A4 SSD</td>
</tr>
<tr>
<td>BOX CV70/FS</td>
<td>230/400V-70A</td>
<td>PV CV70F Z4 SSD</td>
</tr>
<tr>
<td>CIRCUIT CV100/1</td>
<td>230/400V-100A</td>
<td>PV CV100 A4 SSD</td>
</tr>
<tr>
<td>BOX CV100/1</td>
<td>230/400V-100A</td>
<td>PV CV100 Z4 SSD</td>
</tr>
</tbody>
</table>

Note: Is possible to supply all versions with double speed n. 2 potentiometers, to add after the last figures the code ‘S2V’ or for the double output to add ‘S2U’ (ex. PV CV10F A4 SSD S2V).
DIMENSIONS AND MEASURE BORING

<table>
<thead>
<tr>
<th>Type of Circuit</th>
<th>Max Height</th>
<th>Dimension Circuit</th>
<th>Measure Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit for DIN 35</td>
<td>55 mm</td>
<td>140 x 145 mm</td>
<td>99 x 129 mm</td>
</tr>
<tr>
<td>Circuit with base plate and cover</td>
<td>60 mm</td>
<td>115 x 145 mm</td>
<td>99 x 129 mm</td>
</tr>
<tr>
<td>Only Circuit</td>
<td>45 mm</td>
<td>145 x 112 mm</td>
<td>99 x 129 mm</td>
</tr>
</tbody>
</table>

Description: CIRCUIT CV6FS- CV8/FS
Description: CONTROL CIRCUIT CVXYS HIGH STABILIZED (WITH AMPLITUDE SENSOR)

MEASURE (mm) CIRCUITS FROM CV 10 TO CV 100 (IP00)

<table>
<thead>
<tr>
<th>Circuit IP00 (*)</th>
<th>DIMENSION</th>
<th>BORING MEASURE</th>
<th>DIM. CONNECTORS</th>
<th>FUSE DIM./AMPERE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>h</td>
<td>J</td>
</tr>
<tr>
<td>CV 10/F</td>
<td>170</td>
<td>230</td>
<td>100</td>
<td>145</td>
</tr>
<tr>
<td>CV 20/F</td>
<td>170</td>
<td>320</td>
<td>100</td>
<td>145</td>
</tr>
<tr>
<td>CV 40/F</td>
<td>243</td>
<td>320</td>
<td>100</td>
<td>219</td>
</tr>
<tr>
<td>CV 70/F</td>
<td>280</td>
<td>380</td>
<td>130</td>
<td>255</td>
</tr>
<tr>
<td>CV 100/F</td>
<td>280</td>
<td>380</td>
<td>130</td>
<td>255</td>
</tr>
</tbody>
</table>

NOTE: FOR SUPERIOR SUPPLY VOLTAGES - UPON REQUEST (EX.440V,460V,480V etc.)

If you use only the electronic circuit (IP00) insert it and cable it in a container that could guarantee an excellent safety degree respecting the Normative European in force and you must isolate the terminals of the potenziosimeter from a wrong use of the electronic circuit.

Each responsability from a wrong use of the electronic is declined.

SKETCH AND CHARACTERISTICS TECHNIQUES SUBJECT TO MODIFICATIONS WITHOUT WARNING.

M P

ELETTRONICA

DTCVXYS 01 10/10/01 E. PEDRAZZI 1/1
Description: VIBRATION SENSOR SIND1-SIND2

The sensor is set in a manner such that the sensitive part is disposed according to the sense of the vibration in such a way as to provide the least possible amount of vibration in the sensor. In this way, the demands constructive of such vibrator are in fact possible, other solutions provided that satisfy the conditions in said precedence.

SKETCH AND CHARACTERISTIC TECHNIQUES SUBJECT TO MODIFICATIONS WITHOUT WARNING
IN CASE OF BREAKAGE:

- Move wire 1 from A1-K2 to K1
- Move wire 2 from A2 to A1-K2
- Move wire 3 from G2 to G1

NORMAL USE:

- K2 - A2 - G2

DESCRIPTION:
Optional module for 2 vibrators (CIRCUIT CVXY/F)
And SCR power module

HOW TO UTILIZE THE SECOND SECTION OF THE POWER MODULE IN THE CASE OF BREAKAGE THE FIRST:

- In caso di rottura si utilizza: K1 - A1 - G1
- In case of breakage to utilize: K1 - A1 - G1
- Spostare filo 1 da A1-K2 a K1
- Spostare filo 2 da A2 a A1-K2
- Spostare filo 3 da G2 a G1

NOTE:
- Valid for CV20, CV40, CV70, and CV100
- Only CV20, CV40, CV70, and CV100
Stabilized Electronic Control Circuits For Electromagnetic Vibrator

**“VBS06” Circuit**

**GENERAL**

Stabilized circuit VBS 06 has been especially designed for regulating the intensity of vibration in industrial vibratory feeders.

Of modern conception, the system uses an integrated module which guarantees **perfect synchronization** of the triac firing pulse with the waveform of the working voltage under all conditions.

The system is also includes a special circuit for soft start, with provision for selecting the ramp time by relative jumper (standard 1 sec.) as well as **temperature compensation** of the phase angle.

An appropriately over-dimensioned power stage is provided for handling any overloads without interruptions, whether operating at 50Hz or 60Hz.

A highly **linear** range of adjustment together with provision for setting the maximum and minimum vibration limits complete the list of main features offered by stabilized controller VBS 06.

Vibration regulation is through an external potentiometer. It is also possible to use two or more potentiometers and on ON-OFF type control either with external non-power contact or with the presence/absence of d.c. voltage (0-30V) for **weighing** and **batching systems**.

Upon request, the circuit can be arranged for mounting on DIN35 guide (code PV VBS6D A2 STD).

**ELECTRICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Supply Voltage</th>
<th>230V +/- 5% 50/60Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stabilization</td>
<td>+/-20%</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>2W max</td>
</tr>
<tr>
<td>Current Max</td>
<td>6,3A (RMS)</td>
</tr>
<tr>
<td>Fuses</td>
<td>doppio 6,3A F 250V 5x20 H 1500 A (EN 627-2 CEI)</td>
</tr>
<tr>
<td>Min. Load</td>
<td>100 mA (RMS)</td>
</tr>
<tr>
<td>Potentiometer of Reg.</td>
<td>100K linear</td>
</tr>
<tr>
<td>Frequency of Vibration</td>
<td>3000/6000 V/min. (50Hz)</td>
</tr>
<tr>
<td>Time of Ramp</td>
<td>0,2 sec. or 2 sec. (modifiable)</td>
</tr>
<tr>
<td>Regulation Min.</td>
<td>80V +/- 30%</td>
</tr>
<tr>
<td>Regulation Max.</td>
<td>200V - 30%</td>
</tr>
<tr>
<td>Input On-Off</td>
<td>contact without voltage/ 0-30V cc</td>
</tr>
<tr>
<td>Degree of Pollution</td>
<td>2</td>
</tr>
<tr>
<td>Position of Assemblage</td>
<td>horizontal or vertical</td>
</tr>
<tr>
<td>Degree of Protection</td>
<td>IP54 in box (only circuit IP00)</td>
</tr>
<tr>
<td>Temperature of Storage</td>
<td>-15 °C / + 80 °C</td>
</tr>
<tr>
<td>Temperature of Operation</td>
<td>-5 °C / + 45 °C</td>
</tr>
<tr>
<td>Range of Relative Humidity</td>
<td>80% sino a 31°C</td>
</tr>
<tr>
<td>Installation Class</td>
<td>II</td>
</tr>
<tr>
<td>Altitude</td>
<td>till to 2000 meters</td>
</tr>
<tr>
<td>European Norms</td>
<td>EMC CE</td>
</tr>
<tr>
<td>Guarantee</td>
<td>1 year (from date on circuit)</td>
</tr>
</tbody>
</table>

**AVAILABLE VERSIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Box</th>
<th>Colour</th>
<th>Dimensions</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBS06</td>
<td>Fire-retardant plastic</td>
<td>RAL 7035</td>
<td>165 x 130 x 70</td>
<td>PV VBS06 Z2 STD</td>
</tr>
<tr>
<td>VBS06</td>
<td>League aluminum</td>
<td>Light Grey</td>
<td>145 x 130 x 60</td>
<td>PV VBS06 Z2 STM</td>
</tr>
<tr>
<td>VBS06/D</td>
<td>Control Circuit</td>
<td></td>
<td>150 x 100 x 45</td>
<td>PV VBS06 A2 STD</td>
</tr>
<tr>
<td>VBS06/D</td>
<td>Control Circuit</td>
<td></td>
<td>120 x 120 x 45</td>
<td>PV VBS6D A2 STD</td>
</tr>
</tbody>
</table>
NOTE: The electronic circuit may be supplied with code vbs06/d, also with support for assembly on the Omega DIN 35 bar.

If you are used only the electronic circuit (IP00) insert it and in a container that could guarantee an excellent safety degree respecting the Normative European in force and isolate the terminals of the potentiometer with the little rubbers in endowment. Each responsibility from a wrong use of the electronic circuit is declined. Sketch and characteristics techniques subject to modification without warning.
GENERAL

Stabilized circuit CV99 has been especially designed for regulating the intensity of vibration and stabilized amplitude in industrial vibratory feeders.

Of modern conception, the system uses an integrated module which guarantees perfect synchronization of the triac firing pulse with the wave form of the working voltage under all conditions.

The system is also includes a special circuit for soft start, with provision for selecting the ramp time by relative jumper (standard 1 sec.) as well as temperature compensation of the phase angle. An appropriately over-dimensioned power stage is provided for handling any overloads without interruptions, whether operating at 50Hz or 60Hz.

All input galvanically isolated from power supply, a highly linear range of adjustment, manual and automatic input (0-10V/0-20mA optional), together with provision for setting the maximum and minimum vibration limits with professional trimmers complete the list of main features offered by stabilized controller CV99.

Vibration regulation is through an external professional anti-vibration potentiometer with micro-click. It is also possible to use two or more potentiometers and on ON-OFF 3 type control either with external non-power contact or with the presence/absence of d.c. voltage (0-30V) for weighing and batching systems.

In the box CV99 is possible to insert PX99 circuit for electronic and mechanical sensor with 3 delay (delay ON / delay OFF/ delay no flow ALLARM - 0/12 sec).

ELECTRICAL CHARACTERISTICS

| TENSION OF FEEDING: 230V (115V) +/- 5% 50/60Hz |
| STABILIZATION: +/-20% |
| CONSUMPTION: 2W max |
| CURRENT MAX: 6,3 or 8A (RMS) |
| FUSES : double 6,3A F 250V 5X20 H1500A |
| LOAD MIN.: 50 mA (RMS) |
| POTENTIOMETER OR REG.: 100Kohm linear |
| FREQUENCY OF VIBRATION: 3000/6000 V/m (50Hz) |
| TIME OF RAMP: 0,2 sec. or 2 sec. (modifiable) |
| REGULATION MIN. MAN/AUT: 80V+/- 30% |
| REGULATION MAX. MAN/AUT: 200V - 30% |
| INPUT ON-OFF: contact without voltage/10-30Vcc |
| AUTOMATIC INPUT: 0-10V/0-20mA |

| AUTOMATIC INPUT CONSUMPTION 0-10V: 1 mA max |
| INPUT IMPEDANCE 0-10V: 50Kohm |
| INPUT IMPEDANCE 4-20mA: 50ohm |
| DEGREE OF POLLUTION: 2 |
| POSITION OF ASSEMBLAGE: horizontal or vertical |
| DEGREE OF PROTECTION: IP54 in box (IP00 only circuit) |
| TEMPERATURE OF STORAGE: -15 °C / + 80 °C |
| TEMPERATURE OF OPERATION: -5 °C / + 45 °C |
| RANGE OF RELATIVE HUMIDITY: 80% till to 31°C |
| INSTALLATION CLASS: II |
| ALTITUDE: till to 2000 meters |
| EUROPEAN NORMS: EMC CE |
| GUARANTEE: 1 year (from date on circuit) |

AVAILABLE VERSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Box</th>
<th>Colour</th>
<th>Dimensions</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV99</td>
<td>Alluminium</td>
<td>RAL 7035</td>
<td>200 x 100 x 90</td>
<td>PV CV99X Z2 STD</td>
</tr>
<tr>
<td>CV99+PRX99</td>
<td>Alluminium</td>
<td>RAL 7035</td>
<td>200 x 100 x 90</td>
<td>PV C99PX Z2 STD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV99</td>
<td>Control Circuit</td>
<td>PV CV99X A2 STD</td>
</tr>
<tr>
<td>PRX99</td>
<td>Control Circuit for sensor 3 delay</td>
<td>PV PRX99 A2 STD</td>
</tr>
</tbody>
</table>
NOTE:
If you are used only the electronic circuit (IP00) insert it and cable it in a container that could guarantee an excellent safety degree respecting the Normative European in force and isolate the terminals of the potentiometer with the little rubbers in endowment.
Each responsibility from a wrong use of the electronic circuit is declined.
GENERAL

Is possible to use Module (controller in box with or without circuit PRX99 for NPN/PNP sensor) for automatic driving of a system consisting of: a vibratory hopper or three phase motor-driven elevator, cylindrical vibratory feeder, linear vibratory feeder or conveyor belt.

The system is based on the following main Modules:

1) Two or more Modules type R5FC/CV6/CV8/RV6 which serves for variation of the intensity in vibration of the linear and cylindrical vibratory feeders, plus the vibratory hopper. Are available the following predispositions:
   - regulation of the MIN and MAX 3000 or 6000 vib/min; ramp slow/fast;
   - supply voltage 115/230/400V 50-60Hz.
   - The max current available is 6A RMS (8A with circuit CV8).

2) One or two circuits type PRX99 (inside controller) which allow direct interfacing of photocells or mechanical level probes, with supply voltage of 10-30Vdc and PNP or NPN output (NO or NC) or else a contact not under voltage. One of these circuits is normally installed on the linear vibratory feeder and controls the cylindrical vibratory feeder in order to avoid risk of overflow of the linear feeder.

The second circuit is installed in the bowl feeder in order to safeguard against loading too high a number of pieces in the loading hopper when the latter is commanded.

The sensor on the linear feeder also controls the hopper. Each PRX99 circuit has provision for setting delay times regarding enabling of the output (T1) and disabling of the output (T2). It also supplies a "no piece present" Alarm signal upon elapsing of a certain time (likewise adjustable - Tallarm 0-15 sec.). This modular system stands up again very economic in the his uses.

3) A Module MTR01 3 - phase motor - driven feeders, with circuit PRX99 for NPN/PNP sensor and qualification input.

ELECTRICAL CHARACTERISTICS

- **SUPPLY VOLTAGE**: 230V +/- 5% 50/60Hz
- **CURRENT MAX**: 6,3A (RMS) 8A (on request)
- **FUSES**: 6,3A F 250V 5x20 H 1500 A (EN 627-2 CEI)
- **MIN. LOAD**: 50 mA (RMS)
- **FREQUENCY OF VIBRATION**: 3000/6000 V/min. (50Hz)
- **TIME OF RAMP**: 0,2 sec. or 2 sec. (modifiable)
- **REGULATION MIN.**: 80V +/- 30%
- **REGULATION MAX.**: 200V - 30%
- **DELAY T1/T2**: 0-10 sec.
- **ALARM TIME**: 0-15 sec.
- **SENSOR INPUT**: optoisolated NPN/PNP
- **DEGREE OF POLLUTION**: 2
- **POSITION OF ASSEMBLAGE**: horizontal or vertical
- **DEGREE OF PROTECTION**: IP54 in box (only circuit IP00)
- **TEMPERATURE OF STORAGE**: -15 °C / + 80 °C
- **TEMPERATURE OF OPERATION**: -5 °C / + 45 °C
- **RANGE OF RELATIVE HUMIDITY**: 80% sino a 31°C
- **INSTALLATION CLASS**: II
- **ALTITUDE**: till to 2000 meters
- **EUROPEAN NORMS**: EMC CE
Module for electromagnetic vibrators (linear - circular - hopper or elevator)

Versions (examples)

(can use circuits R5FC - R3FSC - CV99 - CV6-CV8 - RV6 with circuit PRX99 for NPN/PNP sensor)

**Type 01**: Control circuit for vibratory Hopper, cylindrical vibratory feeder, Linear vibratory feeder with level sensor NPN/PNP in the Cylindrical vibratory feeder and overflow sensor NPN/PNP on the Linear vibratory feeder (both timed)
A Module for Linear feeder - a Module for Bowl feeder with circuit PRX99 - a Module for hopper with circuit PRX99.

**Type 02**: Control circuit for Cylindrical and Linear vibratory feeders with overflow sensor NPN/PNP on the Linear vibratory feeder
A Module for Linear feeder - a Module for Bowl feeder with circuit PRX99.

**Type 03**: Control circuit for three phase motor-driven Elevator (MTR01), Cylindrical vibratory feeder and Linear vibratory feeder with level and overflow sensors NPN/PNP (both timed)
A Module for Linear feeder - a Module for Bowl feeder with circuit PRX99 - a Module (MTR01) for Elevator with circuit PRX99.

**Type 04**: Control circuit vibratory Hopper, Cylindrical vibratory feeder and belt conveyor (MTR01) with mechanical or electronic level sensor NPN/PNP on the Cylindrical vibratory and overflow sensor NPN/PNP on the belt conveyor (both timed)
A Module MTR01 for belt conveyor - a Module for bowl feeder with PRX99 circuit - a Module for hopper with PRX99 circuit.

**Type 05**: Control circuit for two Cylindrical vibratory feeders that join in a Linear vibratory with double canal, with timed overflow sensors NPN/PNP on the Linear vibratory.
A Module for Linear - a Module for Bowl feeder 1 with PRX99 circuit - a Module for Bowl feeder 2 with PRX99 circuit.

**Type 06**: Control circuit (MTR01) for three phase motor-driven Elevator, Cylindrical vibratory feeder with level sensor NPN/PNP on the Cylindrical vibratory.
A Module for Bowl feeder - a Module MTR01 for Motor Elevator with PRX99 circuit.
Description: INTERFACE CIRCUIT FOR SENSOR PRX99 WITH ALLARMS

- **F3 Fuses 0.2A F 5x20 output 24Vca**
- **T1 = Delay ON**
- **T2 = Delay OFF**
- **Reg. T2**
- **Reg. T1**
- **Reg. Alarm (absence pieces)**
- **FOR SETTING TYPE SENSOR see description**
- **Reg. T1**
- **Reg. T2**
- **Reg. Alarm (absence pieces)**
- **LED T1 (YELLOW)**
- **LED T2 (GREEN)**
- **LED ALLARM (RED)**
- **ELECTRO-VALVE AIR BLOW 24Vcc (delay 2 sec.)**
- **STOP VIBRATOR**
- **RESET OFF VIBRATOR**
- **OUT 24Vca (0.1A MAX)**
- **OUT 24Vca**
- **ON/OFF VIBRATOR**
- **MECHANICAL SENSOR**
- **LINE 230V (115E 400V OPTIONAL)**
- **FUSE OF LINE 0.2A F 5x20 NO 400V**
- **F2 Fuses 0.2A F 5x20 (sensor)**
- **SENSE SENSOR PNP o NPN 10-30Vdc**

**TO USE CONTACTS WITHOUT VOLTAGE**

**EXAMPLE**

- **T1 = Delay ON**
- **T2 = Delay OFF**
**3 - PHASE MOTOR-DRIVEN FEEDER**

**"MTR01"**

**GENERAL**

3 PHASE MOTOR-DRIVEN FEEDER AND INPUT SENSOR NPN/PNP 3 DELAY (ON/OFF - ALLARM ABSENCE PIECES). QUALIFICATION INPUT FOR MULTIPLE ELECTROMAGNETIC SYSTEM (LINEAR-BOWL FEEDER HOPPER).

**GENERAL CHARACTERISTICS**

- **VOLTAGE**: 400V 3 PHASE - INPUT SENSOR NPN/PNP - DELAY ON/OFF MAX 10 SEC. - DELAY AND ALLARM ABSENCE PIECES (RED LED) - SUPPLY EV AIR BLOW (24Vcc) WITH DELAY (2 SEC.)
- **POWER SUPPLY**: 24Vca - 0.1A MAX. - MOTOR-THERMAL OVERLOAD RELAY 1-1.6A - IP65

**APPLICATIONS**

3 PHASE MOTOR-DRIVEN FEEDER WITH NPN/PNP SENSOR ON/OFF DELAY AND ALLARM DELAY

**OPTIONS**

- LABEL CUSTOM - DIN35 VERSION

**ELECTRICAL CHARACTERISTICS**

- **SUPPLY VOLTAGE**: 3x400V +/-10% 50/60 Hz
- **CONSUMPTION**: 1.5W Max
- **FUSES**: 0.2A F 250V 5X20 H1500A
- **VOLTAGE MOTOR**: 3x400V
- **PROTECTION MOTOR**: THERMAL OVERLOAD RELAY 1/1.6A
- **INPUTS FOR SENSORS**: OPTOISOLATED NO/NC NPN/PNP
- **TYPE OF SENSORS**: MECHAN. INDUCTIVE, CAPACITIVE OR OPTICAL
- **SUPPLY VOLTAGE FOR SENSORS**: 12 Vcc
- **ENERGIZATION DELAY (T1)**: 0-12 Sec. Reg.
- **DE-ENERGIZATION DELAY (T2)**: 0-12 Sec. Reg.
- **OUTPUT FOR VIBRATOR STOP**: 2 No/Nc 10A 250Vca Max
- **TEMPERATURE OF STORAGE**: -10 °C /+80 °C
- **TEMPERATURE OF OPERATION**: 0 °C /+ 45 °C
- **DE-ENERGIZATION DELAY (T2)**: 0-30 SEC
- **SUPPLY VOLTAGE EV AIR BLOW**: 24Vcc
- **DELAY VOLTAGE EV AIR BLOW**: 2 SEC.
- **DEGREE OF PROTECTION**: IP65 in box
- **RANGE OF RELATIVE HUMIDITY**: 80% TILL TO 31 °C
- **ALTITUDE**: TILL TO 2000 METERS
- **GUARANTEE**: 1 YEAR (FROM DATE ON CIRCUIT)

**AVAILABLE VERSIONS**

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<th>Type</th>
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Description: 3 - PHASE MOTOR - DRIVEN FEEDER

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<td>00</td>
<td>10/07</td>
<td>E. PEDRAZZI</td>
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Variable Frequency/Amplitude Control Circuit

**FQ1/FQ2**

**GENERAL**

The variable frequency control stabilized circuit FQ1 (6.3A RMS) and FQ2 (3.15A RMS), unique of its kind, allows optimizing operation of the vibratory feeder by searching for its resonance frequency (maximum performance), thereby eliminating its lengthy and difficult mechanical calibration.

In fact, each vibratory feeder exhibits mechanical properties such that, above all when the required performance levels are at the limit, it is only necessary to shift the frequency of the supply voltage by even just a few fractions of hertz to modify the intensity of vibration by an appreciable amount. Furthermore it is possible for the mechanical properties to undergo a drift phenomenon due either to ageing of the materials or to raising of the temperature.

Thanks to the FQ1 and FQ2 circuit it is possible to follow these variations manually and therefore obtain maximum performance at any moment (to use for vibratory feeder coil at 200V max).

Another field of application of the FQ1 and FQ2 circuit concerns vibratory feeders targeted towards the American market running on 60 Hz or European market 50 Hz.

By using this circuit, this customer need only stock vibratory feeders designed for a frequency of 50 Hz or 60 Hz. For the purpose of operation of circuit FQ1 and FQ2, it does not matter whether the line voltage has a frequency of 50 or 60 Hz, because only the frequency set by potentiometer PT1 will reach the vibratory feeder.

Potentiometer PT2, instead, serves for varying the amplitude of vibration by acting on the output voltage. Yet a further field of application of circuit FQ1 and FQ2 could be that of handling very small or very large parts, of limited weight, for which suitable vibratory feeders have to be developed with higher or very low frequencies. An important feature of this control is its easy use with high technical performance levels and an optimum quality-price ratio.

**NOTE:** The circuit exhibits peak voltage exceeding 300V, therefore it is compulsory to discharge the voltage each time it is necessary to adjust the circuit by opening the casing. The circuit is provided with an automatic system which, after de-energizing, discharges the capacitors so that after 5 seconds, there is a residual voltage less than 60V (in accordance with CEI regulations). The regulation section, including the calibration trimmers, adjustment potentiometers, the ON/OFF contact and electronics connected to these items, is isolated galvanically from the high voltage power stage. When PINS 3 and 5 of Conn. 2 are short circuited through a contact not under voltage, the circuit annuls the voltage on the vibratory feeder. The FQ1 and FQ2 circuit is provided with an interference filter conforming to "CE" standards. After making the connections and energizing the circuit, it is recommended to search for the resonance frequency of the vibratory feeder before bringing the vibratory feeder up to maximum amplitude. The frequency of vibration can be measured through appropriate terminals of CONN.2. Bear in mind that the waveform ranges from 0 to 12 Vcc while the frequency meter should have an input impedance of at least 10 Kohm. The case version has a plexiglas guard on the amplitude/frequency control to avoid risk of undesirable variations by unauthorized personnel.

**ELECTRICAL CHARACTERISTICS**

- **TENSION OF FEEDING:** 230V (115 on request) +/- 5% 50/60Hz
- **CONSUMPTION:** 2.5W max
- **CURRENT MAX:** 6.3A (RMS) - FQ1/3.15A (RMS)-FQ2
- **FUSES:** double 3.15/6.3A F 250V 5x20 H 1500 A
- **LOAD MIN:** 50 mA (RMS)
- **POTENTIOMETERS OF REG.:** 10K/22K linear
- **FREQUENCY OF VIBRATION:** 3000/6000 V/min. (50-100Hz)
- **TIME OF RAMP:** 1 sec.
- **REGULATION VOLTAGE:** 50-200V 50 Hz (60 Hz on request)
- **FREQ. OF REG.** 100 +/- 20Hz (6000V/m)-50 +/- 20Hz (3000V/m)
- **DEGREE OF POLLUTION:** 2
- **AUTOMATIC INPUT:** 0/10V
- **DEGREE OF PROTECTION:** IP54 in box (only circuit IP00)
- **TEMPERATURE OF STORAGE:** -15 °C / + 80 °C
- **TEMPERATURE OF OPERATION:** -5 °C / + 45 °C
- **RANGE OF RELATIVE HUMIDITY:** 80% till to 31°C
- **Installation Class:** II
- **Altitude:** till to 2000 meters
- **European Norms:** EMC CE
- **Guarantee:** 1 year (from date on circuit)

**AVAILABLE VERSIONS**

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<td>165 x 140 x 80</td>
<td>PV FQ2XX Z2 STD</td>
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CIRCUIT REGULATION AMPLITUDE/FREQUENCY FQ1

NOTE: MAXIMUM PERFORMANCE: TO USE FOR VIBRATOR COIL AT 200V MAX.

PT1 > POTENTIOMETER 10K FREQUENCY
PT2 > POTENTIOMETER 22K AMPLITUDE

12V CENTER FREQUENCY (STANDARD 50Hz)
ON REQUEST 60Hz

50Hz
100Hz
(3000)
(6000)

FUSE: 5X20 3.15A F H1500A

ENGLISH
Electronic Controller for Electromagnetic Vibrator

“FQ1-DIG/FQ1-LCD”

GENERAL

MICROPROCESSOR DIGITAL PROFESSIONAL controller with visualized frequency and amplitude - Delay 10 sec max on/off vibrator with sensor PNP or relay contact.

GENERAL CHARACTERISTICS

VOLTAGE (110V) 230V, 50-60 Hz - 3000/6000 Vib/Min -
Input ON/OFF - Soft/fast ramp - Digital Regulation
Amplitude/frequency min/max - Digital menu - Line input with Schuko plug - Vibrator output with connector.

APPLICATIONS

Digital regulation of linear and bowl feeder till 6,3 Amps -
The FQ1 DIG allows optimizing operation of the Vibratory feeder by searching for its resonance frequency (max performance) thereby eliminating its lengthy and difficult mechanical calibration.

OPTIONS

Personalized label - Connector for vibrator.

ELECTRICAL CHARACTERISTICS

Tension of Feeding: 115/230V +/- 5% 50/60Hz
Consumption: 2,5W max
Current Max: 6,3A (RMS)
Load Min: 50 mA (RMS)
Frequency of Vibration: 3000/6000 cycles to minute (50Hz)
Time of Ramp: 1 sec.
Regulation Min.: 80V +/- 30%
Regulation Max: 200V - 30%
On/Off: free contact
Degree of Protection: IP55 in box (IP65-NEMA4-4X)
Adjust Frequency: 30 Hz/120 Hz
Temperature of Operation: -5 °C / + 45 °C
European Norms: EMC CE
Guarantee: 1 year (from date on circuit)

AVAILABLE VERSIONS

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<th>Price €</th>
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<td>240 x 200 x 120</td>
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<td>FQ1LCD</td>
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<td>PV FQ1LC Z2 STD</td>
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Description: ELECTRONIC CIRCUIT FQ1 DIG MAIN BOARD

DIM: 200X240X50

FIXING HOLES: 150X225

FLAT CABLE: MAX 0.5 METER

DIAM: 6mm

0-10V input
0 20mA input

1-3 = VIBRATOR
4-6 = LINE
11-12 = SENSOR PNP + 24VCC
9-11 = MECHANICAL SENSOR NO
7-8 = QUALIFICATION INPUT NC=ON/NO=OFF

2-5-18 = GND
13-14 = STATUS RELAY
15-16 = CONTACT RL2/SENSOR2
17-18 = INPUT 0/10V-0/20mA with R500
10 = INPUT SENSOR 2 PNP
9 = INPUT SENSOR 1 PNP

VIB VIB LINE LINE
ON OFF SENSOR 1 PNP + 24 ON/OFF STATUS RELAY SENSOR 2 PNP

RL2

RL1

Input R 500

0 20mA input

FLAT CABLE

DIM: 6mm

DIAM: 6mm

DIAM: 6mm

FLAT CABLE

GND GND

0-10V

0 20mA input

DIAM: 6mm

DIAM: 6mm

Description: ELECTRONIC CIRCUIT FQ1 DIG MAIN BOARD

CODE REV DATE DRAFTSMAN SHEET
DTFQ1 MAINBOARD 01 04/06 E. PEDRAZZI 1/1
**GENERAL**

**MICROPROCESSOR DIGITAL PROFESSIONAL CONTROLLER WITH VISUALIZED FREQUENCY AND AMPLITUDE** - **DELAY 8 SEC MAX ON/OFF VIBRATOR WITH SENSOR NPN/PNP OR RELAY CONTACT.**

**AUTOMATIC INPUT FROM PLC 0/10V-0/20mA.**

**GENERAL CHARACTERISTICS**

- **VOLTAGE (110V) 230V, 50-60 Hz - 3000/6000 Vib/Min** -
- **DOUBLE INPUT ON/OFF** - **SOFT/FAST RAMP** - **MANUAL REGULATION AMPLITUDE/FREQUENCY (39/70Hz - 90/130Hz) MIN/MAX** - **LIMITATION MAX OUTPUT CURRENT**
- **LINE INPUT WITH SCHUKO PLUG** - **VIBRATOR OUTPUT WITH CONNECTOR.**

**APPLICATIONS**

- **DIGITAL REGULATION OF LINEAR AND BOWL FEEDER TILL 6.3 AMPS** -
- **THE FQ1 DIG ALLOWS OPTIMIZING OPERATION OF THE VIBRATORY FEEDER BY SEARCHING FOR ITS RESONANCE FREQUENCY (MAX PERFORMANCE)**
- **THEREBY ELIMINATING ITS LENGTHY AND DIFFICULT MECHANICAL CALIBRATION.**

**OPTIONS**

- **PERSONALIZED LABEL** - **CONNECTOR FOR VIBRATOR** - **FREQUENCY METER**

**ELECTRICAL CHARACTERISTICS**

- **TENSION OF FEEDING: 115/230V +/- 5% 50/60Hz**
- **CONSUMPTION: 2.5W max**
- **CURRENT MAX: 6.3A (RMS)**
- **LOAD MIN: 50 mA (RMS)**
- **FREQUENCY OF VIBRATION: 39/70Hz - 90/130Hz**
- **TIME OF RAMP: 1 sec.**
- **INPUT SENSOR: NPN/PNP OR FREE VOLTAGE CONTACT**
- **AUTOMATIC INPUT: 0-10V/0-20mA (WITH 470 OHM)**
- **ON/OFF: FREE CONTACT**
- **DELAY ON/OFF: 0/8 SEC**
- **DEGREE OF PROTECTION: IP65 in box (NEMA4-4X)**
- **TEMPERATURE OF STORAGE: -15°C. / + 80°C.**
- **TEMPERATURE OF OPERATION: -5 °C / + 45 °C**
- **Altitude: TILL TO 2000 METERS**
- **EUROPEAN NORMS: EMC CE**
- **GUARANTEE: 1 year (from date on circuit)**

**AVAILABLE VERSIONS**

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<tr>
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Electronic monitoring circuit for electromagnetic and mechanical vibrators with amplitude sensor

**ALIM 01**

**GENERAL INFORMATION**
The ALM01 circuit feeds the amplitude sensor SIND1 or SIND2 and makes it therefore possible to manage its reaction to the vibration so that any anomalous functioning can be detected (a too high or insufficient vibration). It is possible to regulate the level where the intervention will be required through a trimmer (T1 and T3). Moreover, thanks to the T1 trimmer it is possible to adapt the circuit to different types of vibrations. When the maximum vibration level is exceeded, the red Led indicator switches itself on (LD1) and the relay RL1 also goes off (such alarm can be kept in auto retention by closing the contacts number 4 and 5 of the connector number 3; the system is reset by opening said contacts again). When the vibration is too low the green Led (LD2) switches itself off and the RL2 net stops being excited. The circuit is designed to function with tensions of 230v; if required, however, it can also be designed for tensions of 400V/115V. The whole of the control section is isolated from the electrical network. An (optional) instrument capable of indicating vibrations can be connected to contacts 4 and 5 of the connector. This output V 0-10 can also be used for other purposes.

**USAGE INSTRUCTIONS**
Connect the amplitude sensor SIND1 to terminal 1 (+/green cable) and 2 (S/ yellow cable) and 3 (-/brown cable) of connector 2. Feed the circuit and bring the vibrator up to the maximum level of vibrations. Adjust trimmer T1 until the tension at terminal 4 and 5 of connector number 2, as measured with the voltmeter, reaches 10V +/- 100mV (should the maximum vibration of 10V not be achievable, move bridge Y1 on High Gain), and check again that the tension is 10V +/- 100mV. By adjusting trimmer T2, you should notice that, at a certain point, led LD1 (red) either switches itself on or turns itself off, if it was already on. Position the trimmer so that the led is switch off but near enough to the ignition level. Bring the vibrator at the minimum vibration level. By adjusting trimmer T3 you will find an area where, by rotating in both directions, the green led LD2 will switch on and off. Position the trimmer so that the green led is switched on but near enough to the area where it switches itself off. Connect the (optional) indicating instrument, respecting the +/- priorities, to be able to visualise the width of the vibrations in %.

**ELECTRICAL CHARACTERISTICS**

**SUPPLY VOLTAGE:** 230V (400V opzional) 50/60 Hz

**POWER CONSUMPTION:** 1 watt

**FUSES:** 1A F 250V 5x20 H 1500A

**ALLARM MAX (RL1):** contact NO/NC 10A 250Vca max

**ALLARM OK VIB:** contact NO/NC 10A 250Vca max

**ALTITUDE:** till to 2000 meters.

**DEGREE OF POLLUTION:** 2

**RANGE OF RELAT.HUMID.:** 80% till to 31 °C

**INSTALLATION CLASS:** II

**DEGREE PROTECTION:** IP 54

**TEMP. OF OPERATION:** -5 °C / + 45 °C

**TEMP. OF STORAGE:** -15 °C / + 80 °C

**EUROPEAN NORMS:** EMC CE

**GUARANTEE:** 1 year (from date on circuit)

**VIBRAZION MAX:** Led red ON

**VIBRAZION MIN:** Led green OFF

**AVAILABLE VERSIONS**

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<td>60 x 25 x 15</td>
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The sensor is put in manner such that the sensitive part is disposed according to the sense of the vibration in such position from hear again totally of the vibration. In compatible way with the demands constructive of each vibrator are in fact possible other solutions provided that satisfy the conditions in said precedence.