IMPORTANT NOTES

❑ RECEPTION

• V2 soft-starters are carefully tested and perfectly packed before leaving the factory.

• In case of transport damage, notify it to transport agency and to POWER ELECTRONICS (+34 96 136 65 57), not later than 24hrs from delivery date.

❑ UNPACKING

• Make sure model and serial number of the soft starter are the same in the box, delivery note and unit.

• Position 1: V2 soft starter.


❑ SAFETY

• It is electrician's responsibility to ensure the configuration and installation of the V2 meets the requirements of any site specific, local and national electrical regulations.

• The V2 operates from HIGH VOLTAGE, HIGH ENERGY ELECTRICAL SUPPLIES. Always isolate before servicing.

• Service only by qualified personnel. For any question or enquiry please contact POWER ELECTRONICS Technical Department or with your local distributor.

• The V2 contains static sensitive printed circuit boards. Use static safe procedures when handling these boards.
## REVISIONS

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2009</td>
<td>J</td>
<td>Drawings for IP54 with internal bypass.</td>
</tr>
<tr>
<td>September 2006</td>
<td>I</td>
<td>Installation regulations.</td>
</tr>
<tr>
<td>June 2005</td>
<td>H</td>
<td>General update.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New power and control wiring.</td>
</tr>
<tr>
<td>March 2004</td>
<td>G</td>
<td>Add new dimensions for 60 and 75A (IP54)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change DT0048D (Page 11).</td>
</tr>
<tr>
<td>March 2003</td>
<td>F</td>
<td>IP54 new range release.</td>
</tr>
<tr>
<td>October 2002</td>
<td>D</td>
<td>Jumper 7: Default value Freewheel Stop.</td>
</tr>
<tr>
<td>July 2002</td>
<td>B</td>
<td>PCB Change. 00016B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Modify the jumper 9.</td>
</tr>
</tbody>
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1. MOUNTING AND WIRING.

1.1 ENVIRONMENTAL CONDITIONS

1.1.1 IP00 MODEL
The maximum V2 ambient/working temperature is 40°C. It is possible to be operated up to higher temperature of 50°C, by over sizing the soft starter 2% per extra degree.

Example: Motor 15kW, 380V, 30A
Working temperature 50°C.

**Soft-Starter required:** At 40°C the soft starter required should be a V2030 (30Amps), but at 50°C the soft starter should be oversized a 2% per extra °C. Thus,

Temperature: 10°C; 2% x 10°C means a 20% oversize:
\[ I_{motor} \times 20\% = 30 \times 1.2 = 36 \text{ Amp} \]

Then the soft starter required is a V2045 (@50°C).

1.1.2 IP54 MODEL
The maximum V2 ambient/working temperature is 50°C.

1.2 IEC PROTECTION
The V2 soft-starter ingress protection is IP00 and IP54.

1.3 MOUNTING
To improve heat dissipation, it is recommended to mount the soft starter over a metal plate. Minimum safe 30mm side distance and 150mm top and button distance is to be kept between soft starters.
Do not install V2 above any heat source, unless heat airflow is driven out of the cabinet.

![Fig. 1: Vertical mounting.](image)
1.3.1 IP00 MODEL
The V2 IP00 soft starter is designed to be mounted vertically inside an electrical cabinet with forced air-cooling.

1.3.2 IP54 MODEL
IP54 Model can be mounted within a sealed cabinet if its internal temperature does not exceed 50ºC and limiting the number of starts according to its technical specifications.

1.4 POWER LOSS DISSIPATION
1.4.1 IP00 MODEL
The V2 has a power loss of 3 watt per amp, this means that a V2045 has a power loss of 135 Watts at full load.

1) Without forced cooling:
Practical example:
- Ambient temperature is 30ºC.
- Maximum working temperature of the V2 is 40ºC.
- Power losses of the soft starter are 3 watts per amp at full load and 6 watts per amp during the start (only with more than 6 starts per hour).
- If the V2017 is going to be drawing constantly 15A, our power loss must be:

\[ P = I_m \times \text{Loss} = 15 \times 3 = 45 \text{ watts} \]

This is the worst case assuming a duty cycle of 100% at full load (45W). You have also to take the losses of switches, contactors, relays into account (20Watts).

\[ P_{\text{loss}} = 45 + 20 = 65 \text{ watts} \]

The heat transfer coefficient of metals and polyester must be known:
- Polyester: 3.5 W / m²K°
- Metal: 5.5 W / m²K°

The total surface required without forced cooling should be:

\[ \text{Area} = \frac{P_{\text{loss}}}{k \times (T_r - T_a)} \]
\[ \text{Area} = \frac{65}{5.5 \times (40 - 30)} = 1.181 \text{m²} \]

Chosen an 800 x 600 x 400 cabinet, the total area of dissipation is:

\[ \text{Area} = \text{Door} + 2 \times \text{(side)} + \text{Top Covers} \]
\[ \text{Area} = (0.8 \times 0.6) + 2(0.8 \times 0.4) + (0.6 \times 0.4) = 1.36 \text{m²} \]

The area of the cabinet is high enough to dissipate the total power loss.

NOTE: When you place cabinets in parallel, just take one side (for the total area) into account for thermal calculations.

2) With forced cooling:
The power loss dissipated is the same as without forced cooling, but now you have to calculate the air flow required to get the desired differential temperature between the inside and the outside of the cabinet.

We have a V2017 working at 30ºC ambient temperature. We want the air inside the cabinet less than 40ºC.
\[ P_{\text{Loss}} = \text{Total power loss dissipated.} \]
\[ T_r = \text{Maximum temperature inside the cabinet.} \]
\[ T_a = \text{Ambient temperature.} \]
\[ \varnothing = \text{Airflow required in m}^3/\text{min.} \]

\[ \varnothing = \frac{P_{\text{Loss}}}{20 \times (T_r - T_a)} \]
\[ \varnothing = \frac{65}{20 \times (40-30)} \, 0.325 \, \text{m}^3/\text{min} \]

**NOTE:** Using filters at the air intake/exhaust of the cabinet should protect the V2 from dust.

### 1.4.2 IP54 MODEL

IP54 range V2 do not need forced cooling as no heat is produced during nominal operation, only start and stop heat is dissipated, thus number of starts is limited to 6 per hour and provided 50ºC as maximum working temperature.

### 1.5 POWER WIRING

Most electrical wiring regulations require a mains isolator on solid-state equipment. The V2 soft-starter falls to this category. This is to ensure there is an air break in the circuit, as semiconductors cannot be relied upon to be safe isolation. There are many choices, the most common are using a magnethermic protection with a trip coil, and the other is placing a contactor.

Magnetic protection is required to protect the V2 soft-starter from damage due to a short circuit within the V2 or on the output cabling or motor. When a faster protection was needed, it is recommended ultra fast fuses. The fuses should be mounted as close to the V2 soft-starter as possible. Power factor correction capacitors must not be connected after the fuses or on the output of the V2.

The V2 protects the motor with electronic overload sensing, so an external overload relay is not necessary. If multiple motors are connected separate, overloads are required for each motor.

An isolator can be fitted after the V2 but is recommended for off load use only. A motor isolator is not necessary for the operation of the V2 soft-starter but site standards or electrical wiring regulations may require an isolator near the motor.

If a contactor is to be fitted, an output relay of the soft starter can energize it on receiving the start signal.
POWER WIRING FOR IP00 MODELS

Fig. 2: V2 Power wiring configuration.

Note: Minimum recommended protection 1A for F1.
It is absolutely necessary that the installer guarantees the correct observance of the law and the regulations that are in force in those countries or areas where this device is going to be installed.
POWER WIRING FOR IP54 MODELS – BYPASS BUILT-IN

Fig. 2b: V2 Power wiring configuration for IP54 with internal bypass.

Note: Minimum recommended protection 1A for F1.
It is absolutely necessary that the installer guarantees the correct observance of the law and the regulations that are in force in those countries or areas where this device is going to be installed.
Internal Bypass Relays for IP54 models built-in.
1. 6 CONTROL WIRING

**NOTE:** Wiring distance.
Control wiring shouldn’t run in parallel with power input or output cables to the motor. Space at least 300mm away, and cross at right angles.

**Control terminals:**
The control terminals do need to be screened when running in parallel with power cables. (Terminals 7 to 13)

**Start/Stop wiring:**
Wiring options with push buttons or selector (switch) according to Selection 4.2.

---

**Fig. 3: V2 Control Wiring.**

---

1. 7 CHECKS BEFORE COMMISSIONING

1. Check for foreign objects in the V2 cabinet that may be left from installation.

2. Check the control board main supply (T1-T2, 230Vca +/-10%) is connected.

3. Check the mains connection is connected to terminals L1, L2, L3 and the motor is connected to terminals U, V, W. Confirm the mains supply is within V2 specifications and motor nameplate matches to V2 rated nameplate.

4. Check control wiring and ensure the installation is electrically safe and it is safe to run the motor.
2. ELECTRICAL SPECIFICATIONS.

INPUT
Input voltage: 230-400V (~3 phases), ±10%
Supply frequency: 47-62 Hz
Control Voltage: 230V +/-10%, others under demand

OUTPUT
Output voltage: 0 -100% Supply Voltage
Output frequency: 47-60 Hz
Efficiency (at full load): > 99%

ENVIRONMENTAL CONDITIONS
Ambient temperature: Operating: 0 to +40°C
Storage: -10°C to +70°C
Altitude losses: >1000m 1% each 100m, maximum 3000m
Humidity: 95%@ 40°C non-condensation
Protection degree: IP00
Cooling: Natural

PROTECTIONS
Input phase loss
Starting current limit
Rotor locked
Motor overload (thermal model)
Underload
Phase unbalance

V2 PROTECTIONS
General fault
V2 over temperature

SETTINGS
Initial torque
Acceleration ramp
Deceleration ramp
Overload: 0.8 to 1.2 In
Overload curve
Underload: 0.2 to 0.6 In
Underload curve
Current limit: 1 to 5 In

NOTE: V2 IP54 number of starts per hour is limited to 5

OUTPUT SIGNALS
2 changeover relays (5A 230Vac non inductive)
· Fault: It opens in case of any fault condition
· Instantaneous: Its position changes when starting and stopping

LED’S INDICATIONS
LED 1 Run
LED 2 Ready
LED 3 Overload warning / Underload fault
LED 4 Overload Fault
LED 5 Over temperature
LED 6 General fault
3. DIMENSIONS AND STANDARD RATINGS.

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>A</th>
<th>220V KW</th>
<th>380V KW</th>
<th>DIMENSIONS (mm)</th>
<th>IP PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2009</td>
<td>9</td>
<td>2.2</td>
<td>4</td>
<td>350x157x132</td>
<td>IP00</td>
</tr>
<tr>
<td>V2017</td>
<td>17</td>
<td>4</td>
<td>7.5</td>
<td>350x157x132</td>
<td>IP00</td>
</tr>
<tr>
<td>V2030</td>
<td>30</td>
<td>9</td>
<td>15</td>
<td>350x157x132</td>
<td>IP00</td>
</tr>
<tr>
<td>V2045</td>
<td>45</td>
<td>15</td>
<td>22</td>
<td>350x157x132</td>
<td>IP00</td>
</tr>
<tr>
<td>V2060*</td>
<td>60</td>
<td>18.5</td>
<td>30</td>
<td>350x157x132</td>
<td>IP00</td>
</tr>
<tr>
<td>V2075*</td>
<td>75</td>
<td>22</td>
<td>37</td>
<td>350x157x132</td>
<td>IP00</td>
</tr>
<tr>
<td>V2009B*</td>
<td>9</td>
<td>2.2</td>
<td>4</td>
<td>350x157x132</td>
<td>IP54</td>
</tr>
<tr>
<td>V2017B*</td>
<td>17</td>
<td>4</td>
<td>7.5</td>
<td>350x157x132</td>
<td>IP54</td>
</tr>
<tr>
<td>V2030B*</td>
<td>30</td>
<td>9</td>
<td>15</td>
<td>350x157x132</td>
<td>IP54</td>
</tr>
<tr>
<td>V2045B*</td>
<td>45</td>
<td>15</td>
<td>22</td>
<td>350x157x132</td>
<td>IP54</td>
</tr>
<tr>
<td>V2060B*</td>
<td>60</td>
<td>18.5</td>
<td>30</td>
<td>410x157x132</td>
<td>IP54</td>
</tr>
<tr>
<td>V2075B*</td>
<td>75</td>
<td>22</td>
<td>37</td>
<td>410x157x132</td>
<td>IP54</td>
</tr>
</tbody>
</table>

* All types signed with "*" do have an integrated BYPASS function. The Motor protection is operating all the time.

Table 1: V2 standard ratings.
4. CONTROL INPUTS.

The next figure provides the electrical specification of all V2 control inputs. Each input is individually described below.

4.1 CONTROL TERMINALS

4.2 TERMINAL DESCRIPTIONS

Control voltage terminals.
Input terminal for control board voltage supply (230V +/-10%). Other voltage rates are also available on demand.
Between 1 and 2 there is an empty terminal with no use to secure electrical isolation.

Terminals 1-6 Output relays
Fault: It switches in case of any fault condition.
Instantaneous: It switches when starting/ stopping.

NOTE: Maximum current per contact 5A at 230V.
Terminals 7-9: Inputs
Start/stop pushbutton configuration:

```
+-----------------+      +-----------------+
|                  |      |                  |
|  Stop            |      |  Start           |
|                  |      |                  |
|  Start           |      |                  |

Fig. 7: 3-wire configuration.
```

**NOTE:** Terminals 10 - 11 only reset.

Start/stop switch configuration:

```
+-----------------+      +-----------------+
|                  |      |                  |
|  Start/Stop      |      |                  |
|                  |      |                  |
|                  |      |                  |

Fig. 8: Start/stop contact configuration.
```

**NOTE:** Terminals 10 - 11 stop/reset.

Terminals 10-11: Inputs
Remote reset configuration

```
+-----------------+      +-----------------+
|                  |      |                  |
|  Reset           |      |                  |
|                  |      |                  |
|                  |      |                  |

Fig. 9: Reset configuration.
```

**NOTE:** If reset is not using terminals 10 and 11 must be linked.

Terminals 12-13: Inputs
Start pulse pushbutton configuration.
For variable load applications (different material mixing, etc.), where sometimes a higher torque is required, a torque pulse pushbutton inputs are provided.

```
+-----------------+      +-----------------+
|                  |      |                  |
|  Start Pulse     |      |                  |
|                  |      |                  |
|                  |      |                  |

Fig. 10: Start pulse configuration.
5. LEDS INDICATIONS.

LED 1  READY STATUS
It shows 230V is applied to control board.

LED 2  RUN STATUS
It blinks during acceleration and deceleration ramp.
It is steadily on after acceleration ramp when running at nominal current.

LED 3  OVERLOAD WARNING & UNDERLOAD FAULT
Blinking light: UNDERLOAD FAULT
Description  Motor Underload.
Possible Cause  Motor working with no load.

Fig. 11: Led and potentiometer PCB
Wrong setting of Underload conditions.

**Action**
- In case of pump application, check there is no air inside the pipe network and that the pump suction is not obstructed.
- Increase Underload potentiometer.

**Steady light:** OVERLOAD WARNING

**Description**
- Motor overload warning before the soft-starter will trip on overload fault.

**LED 4** OVERLOAD FAULT

**Description**
- Adjusted motor overload has reached an unacceptable level.

**Trip is produced during start:**

**Possible Cause**
- Motor overload due to mechanical or load problems and wrong settings.

**Action**
- Check mechanical conditions.
- Check there is not a power input supply voltage drop lower than a 10%.
- Increase acceleration ramp (high inertia applications).
- Increase Overload curve potentiometer.
- Increase current limit.

**Trip is produced at nominal speed:**

**Possible Cause**
- Wrong Overload potentiometer setting or load conditions change.

**Action**
- Check working conditions of motor.
- Check load.
- Increases overload potentiometer.

**LED 5** V2 OVER TEMPERATURE

**Description**
- Heat sink too hot (>85°C).

**Sense level**
- (> 85°C).

**Possible Cause**
- Insufficient cooling.
- Fan failure.
- Ambient temperature too high, >40°C for IP00 model and >50°C for IP54 model.
- The actual current is higher than the nominal.

**Action**
- Check the ambient temperature during normal operation doesn't exceed 40°C for IP00 model and 50°C for IP54.
- Check that actual motor current is the same or smaller than the V2 nominal current.

**LED 6** GENERAL FAULT

**Description**
- Phase or PCB fault.

**Possible Cause**
- Phase loss.
- Phase unbalance.
- Thyristor fault.

**Action**
- Check supply, all cables, motor.
- If the problem persists, call to POWER ELECTRONICS or an authorized distributor.
6. POWER PCB JUMPER CONFIGURATION.

The Soft-starter could be damaged by setting the jumpers during operation. For safety reasons, the jumpers are located underneath the potentiometer and LED PCB. This PCB must be removed only when control and power supply is off.

JUMPER’S FUNCTION

<table>
<thead>
<tr>
<th>JP1-JP6</th>
<th>MOTOR SUPPLY VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Rated (Nameplate) Motor Voltage</td>
</tr>
<tr>
<td>Default Value</td>
<td>400V (No jumper required)</td>
</tr>
<tr>
<td>Function</td>
<td>Adjust nominal motor voltage.</td>
</tr>
<tr>
<td>Adjust</td>
<td>Position 1: 400V</td>
</tr>
<tr>
<td></td>
<td>Position 2: 230V (to introduce 6 jumpers according to drawing).</td>
</tr>
<tr>
<td></td>
<td>Add or remove 6 jumpers (2 per phase) according to input voltage at the soft starter input. Make sure this value is related to rated (Nameplate) motor voltage.</td>
</tr>
</tbody>
</table>

Fig. 12: Power PCB Jumper drawing.
**JP7**

**FREEWHEEL STOP**

**Description**  
Enable/disable deceleration ramp.

**Default value**  
Position 1: Freewheel stop

**Function**  
Set the type of stop required. The stop could be controlled through a ramp down voltage or uncontrolled where the stop depends on the load torque (freewheel stop).

**Adjust**  
Position 2: Deceleration ramp is enabled.

**JP8**

**SUPPLY FREQUENCY**

**Description**  
Supply frequency

**Default value**  
Position 1: 50Hz

**Function**  
Set the mains frequency.

**Adjust**  
Where the mains frequency is known as 50Hz, leave as default. Where the mains frequency is 60Hz set jumper to Position 2.
**JP8**

**Description**
Underload current.

**Default Value**
Position 1: Underload protection disabled.

**Function**
Set underload protection.

**Adjust**
Position 1 (default): Underload protection is disabled.
Position 2: Underload protection is enabled.

---

**JP9**

**UNDERLOAD PROTECTION**

**Description**
Underload current.

**Default Value**
Position 1: Underload protection disabled.

**Function**
Set underload protection.

**Adjust**
Position 1 (default): Underload protection is disabled.
Position 2: Underload protection is enabled.

---

**Fig. 15:** JP8: Supply frequency selection jumper.

**Fig. 16:** JP9: Underload current selection jumper.
7. POTENTIOMETER COMMISSIONING

The commissioning process described bellow is only an orientating guide. Each application has its own load characteristics and regulation may change from one to another. It is recommended to carry out several settings until optimum result is achieved.

NOTE: Potentiometers spinning angle is ¾ of turn approximately. To spin further this range can damage the potentiometer.

Fig. 17: Normal start potentiometer configuration.

POT 1 INITIAL TORQUE
Description Initial Torque
Range 30 to 99%
Unit % of rated Motor torque
Function Establish the initial torque to be applied to the motor at the beginning of the ramp up.
Adjust It is recommended to begin with a low initial torque value, normally default. Observe motor rotation immediately after start command. If the motor doesn't spin, machine torque requirement may be bigger, and it should be necessary to increase it until the motor spins normally. If very high current is noticed at the very beginning of starting process, it could be due to a too high initial torque, it must be decreased until a proper value is achieved.
Applications For submerged pumps, generally it's needed a torque between 40% and 45%. For hard applications like mills or crushers, the required torque is normally between 40% and 50%.

Fig. 18: Initial torque.
**POT2  ACCELERATION TIME**

<table>
<thead>
<tr>
<th>Description</th>
<th>Acceleration Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0 to 15</td>
</tr>
<tr>
<td>Unit</td>
<td>Seconds</td>
</tr>
<tr>
<td>Function</td>
<td>Establish the time motor will go from 0 to nominal speed; if no current limit occurs which will cause a longer acceleration time.</td>
</tr>
<tr>
<td>Adjust</td>
<td>Depending on the application, time will be different in order to make sure no current limit will take place during acceleration, in such a case acceleration time or acceleration current limit increase will be necessary.</td>
</tr>
<tr>
<td>Applications</td>
<td>In submerged pumps, the usual acceleration time is between 4 and 8 seconds.</td>
</tr>
</tbody>
</table>

**NOTE:** These values are generic adjustments. Each application requires an individualized adjust to optimize the correct performance.

---

**POT3  DECELERATION TIME**

<table>
<thead>
<tr>
<th>Description</th>
<th>Deceleration Time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0 to 45</td>
</tr>
<tr>
<td>Unit</td>
<td>Seconds</td>
</tr>
<tr>
<td>Function</td>
<td>Establish the time for the controlled stop.</td>
</tr>
<tr>
<td>Adjust</td>
<td>Begin with a short time (10 or 15 seconds) and increase it until desired stop is achieved.</td>
</tr>
</tbody>
</table>

---

**POT4  OVERLOAD**

<table>
<thead>
<tr>
<th>Description</th>
<th>Overload motor current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0.8 to 1.2xInom, where Inom equal nominal current of the soft starter.</td>
</tr>
<tr>
<td>Unit</td>
<td>Amps</td>
</tr>
<tr>
<td>Function</td>
<td>This parameter sets the overload motor current protection at nominal conditions. The time for this protection to trip depends on the actual current drawn by the motor and overload curve Potentiometer.</td>
</tr>
<tr>
<td>Adjust</td>
<td>Look at the rated (nameplate) motor current and set this value. To do so, turn overload potentiometer from right to left when motor is already working until overload warning led turns on steadily. Then turn it clockwise until this led turns off. In this position overload, protection will be exactly motor operating current.</td>
</tr>
</tbody>
</table>

---

**POT5  OVERLOAD CURVE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Overload curve.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>Min.-Max.</td>
</tr>
<tr>
<td>Min: Fastest curve.</td>
<td></td>
</tr>
<tr>
<td>Max: Slowest curve.</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td>The overload curve determines the response time under overloads conditions. There is a nonlinear relation between the overload potentiometer and this potentiometer in order to set the time required for tripping on OVERLOAD. If Min. setting is made then the response time since an overload condition has occurred is almost immediate, but if it is Max. then takes more time until the soft starter trips on OVERLOAD.</td>
</tr>
<tr>
<td>Adjust</td>
<td>If you need a fast response under overload conditions, please select Min. If you need a slow response, then select Max. For normal operation, leave this value as medium setting.</td>
</tr>
</tbody>
</table>
This drawing shows response time under different overload conditions:

---

**POT6 UNDERLOAD**

**Description:** Underload current.

**Range:** 0.2 to 0.6 x In, where In is the nominal current of the soft starter.

**Unit:** Amps

**Function:** Underload current determines the current below a motor must not work.

**Adjust:** Usually leave as 60% of the nominal current of the motor. Minimum Underload setting is 0.2x nominal current, medium is 0.4x nominal current, and maximum position is 0.6x nominal current.

**Applications:** This protection helps to detect mechanical problems such as broken shafts, belts, ... 
when this occurs, the motor is running on no load conditions. 
Working with pumps this protection helps us to detect no load pump operation, due to a lack of water or pump input pipe water leakage.

---

**POT7 UNDERLOAD CURVE**

**Description:** Underload curve.

**Range:** Min.-Max.

Min: Fastest curve.
Max: Slowest curve.

**Function:** This parameter sets the maximum operation time under underload conditions before tripping. See overload POT5.

**Adjust:** Depends on the application, but should be set to trip as soon as a condition occurs.

**Applications:** Pumps, fans.

---

Fig. 19: Overload curve.
### POT8  CURRENT LIMIT

**Description**: Current limit at acceleration/deceleration  
**Range**: 0 a 5x nominal current of the soft starter.  
**Unit**: Amps  
**Function**: Maximum current a motor can draw during the acceleration/deceleration.  
**Adjust**: Set the maximum current a motor can draw during the acceleration/deceleration of the motor. Typically set to 2.5~3x nominal current of the motor.  
Avoid using values below 2 times the motor's rated current as resulting motor torque is generally insufficient to successfully start the load below this level; as well as the soft starter would trip on Overload.

#### HARD START SETTING

![Hard start potentiometer configuration](DT0041D)

*Fig. 20: Hard start potentiometer configuration.*
8. APPLICATIONS.

HARD START POTENTIOMETER CONFIGURATION.

![Hard start potentiometer configuration diagram](DT0041D)

**Fig. 21: Hard start potentiometer configuration.**

CONTROL TERMINALS

![Control terminals diagram](DT0068C)

**Fig. 22: V2 Control Terminals.**
POWER WIRING

Fig. 23: V2 Power wiring configuration.

Note: Minimum recommended protection 1A for F1.

FANS AND PUMPS POTENTIOMETER CONFIGURATION.

Fig. 24: Fans and Pumps potentiometer configuration.

NOTE: For pumping systems please check fig. 14 and 16 to configure Jumpers 7 and 9 as deceleration ramp and underload activation.
DECLARATION OF CONFORMITY CE

The Company:

Name: POWER ELECTRONICS ESPAÑA, S.L.
Address: C/ Leonardo Da Vinci, 24-26, 46980 Paterna (Valencia) Spain
Telephone: +34 96 136 65 57
Fax: +34 96 131 82 01

Declares under its own responsibility, that the product:

Electronic Softstarters for A.C. motors

Brand: Power Electronics
Model name: V2 Series

Is in conformity with the following European Directives:

<table>
<thead>
<tr>
<th>References</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006/95/CE</td>
<td>Electrical Material intended to be used with certain limits of voltage</td>
</tr>
<tr>
<td>2004/108/CE</td>
<td>Electromagnetic Compatibility</td>
</tr>
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</table>

References of the harmonized technical norms applied under the Low Voltage Directive:

<table>
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<tr>
<th>References</th>
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References of the harmonized technical norms applied under the Electromagnetic Compatibility Directive:

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<th>References</th>
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</table>

Paterna, January 17th 2008

David Salvo
Executive Director
24 Hours Technical Assistance 365 days a year
902 40 20 70

■ HEAD OFFICE

SPAIN
C/ Leonardo da Vinci, 24 - 26, Parque Tecnológico · 46980 · Paterna · VALENCIA · SPAIN
Tel. 902 40 20 70 · (+34) 96 136 65 57 · Fax. (+34) 96 131 82 01

■ INTERNATIONAL

AUSTRALIA
Power Electronics Australia Pty Ltd
U6, 30-34 Octal St, Yatala, BRISBANE, QUEENSLAND 4207 · P.O. Box 3166
Browns Plains · Queensland 4118 · AUSTRALIA
Tel. (+61) 7 3386 1993 · Fax. (+61) 7 3386 1997

BRAZIL
Power Electronics Brazil Ltda
Av. Guido Caloi, 1985-Galpão 09
CEP 05802-140 · SÃO PAULO · SP

CHILE
Power Electronics Chile Ltda
Los Productores #4439 · Huechuraba
SANTIAGO · CHILE
Tel. (+56) (2) 244 0308 · 0327 · 0335
Fax. (+56) (2) 244 0395

CHINA
Power Electronics Beijing
Room 509, Yiheng Building No. 28 East
Road, Beisanhuan
100013 · Chaoyang District
BEIJING · R.P. CHINA
Tel. (+86 10) 6437 9196 / 97
Fax (+86 10) 6437 9181

GERMANY
Power Electronics Deutschland GmbH
Dieselstrasse, 77 · D-90441 · NÜRNBERG · GERMANY
Tel. (+49) 911 99 43 99 0 · Fax (+49) 911 99 43 99 8

INDIA
Power Electronics India
No. 26, 3rd Cross, Vishwanathapuram
625014 MADURAI · INDIA
Tel. (+91) 452 434 7348 · Fax (+91) 452 434 7348

KOREA
Power Electronics Asia HQ Co.
Room #305, SK Hub Primo Building 953-1, Dokok-dong, Gangnam-gu
SEOUL · 135-270 KOREA
Tel. (+82) 2 3462 4656 · Fax (+82) 2 3462 4657

MEXICO
P.E. Internacional México S de RL
Calle Cerrada José Vasconcellos, 9, Colonia Tlalnepantla
03100 · MEXICO DF