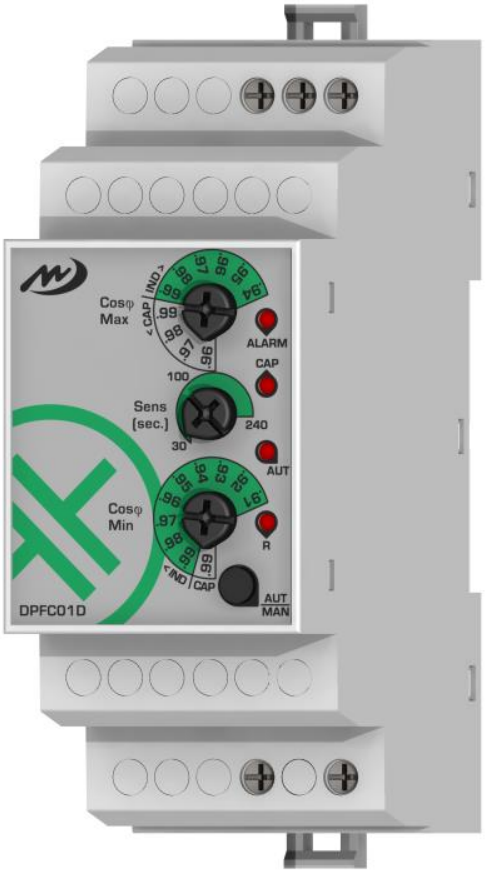
TECHNICAL MANUAL OF INSTALLATION

DPFC01D



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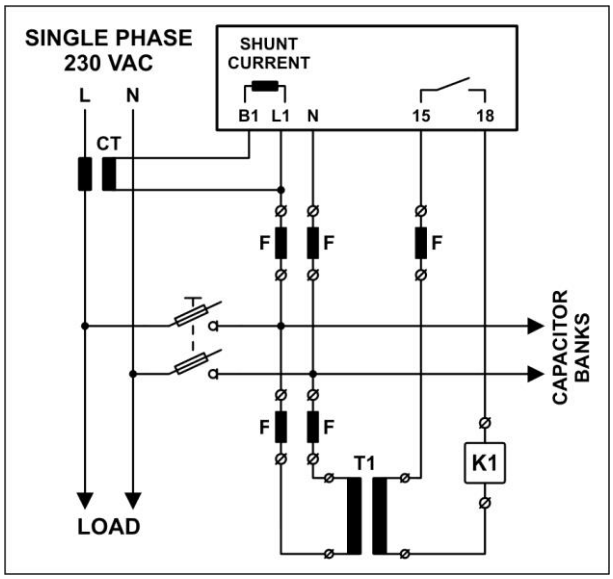
DESCRIPTION

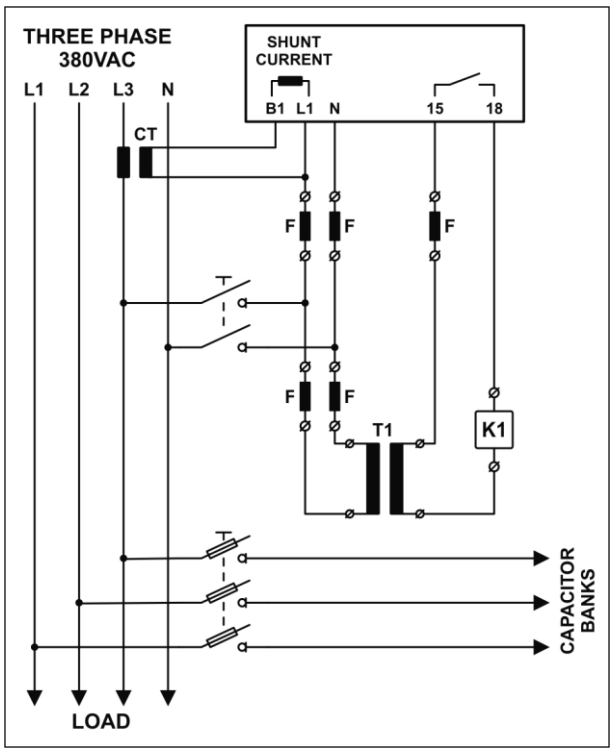
The Digital Power Factor Controller type DPFC01D is a Single-Phase device with one output relay used to switch-on the capacitor bank when the power factor of installation is bellow the set value desired.
The device uses a microprocessor technology and a software to calculate the Cosφ of the installation.
The device can operate in MAN or AUT mode and is suitable for Single or Three-Phase systems.

ELECTRICAL CONNECTION DIAGRAM

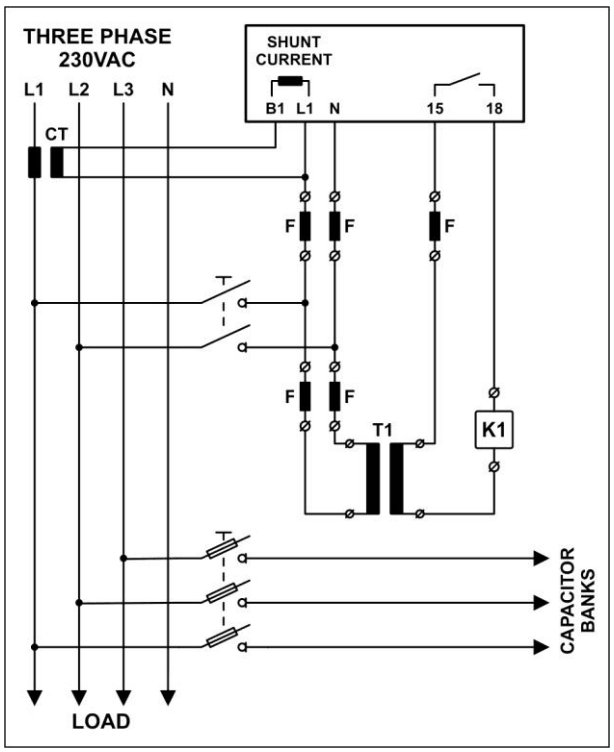
The device was developed for supply voltage of 230V∼ 50/60Hz.
For other supply voltages, please contact our sales department.



Single-Phase 230V∼ 1PH (L+N)



Three-Phase 3x400V∼ 1PH
(L1 or L2 or L3+N)



Three-Phase 3x230V∼ 3PH (L1+L2)

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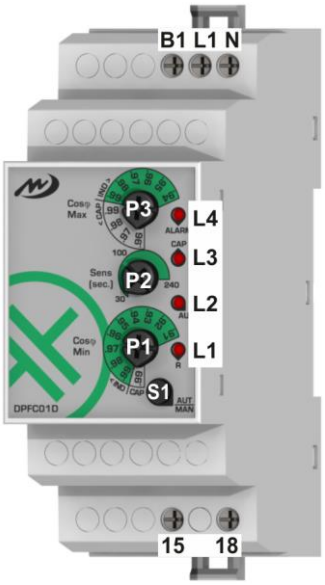
PROGRAMMING COSφ AND SENSITIVITY



a) Cosφ Setting

P1 - Cosφ - MIN			*P3 - Cosφ - MAX*		
STEP	***Cosφ***	***Load***	***STEP***	***Cosφ***	***Load***
10	0.91	IND	***10***	0.94	IND
9	0.92	IND	***9***	0.95	IND
8	0.93	IND	***8***	0.96	IND
7	0.94	IND	***7***	0.97	IND
6	0.95	IND	***6***	0.98	IND
5	0.96	IND	***5***	0.99	IND
4	0.97	IND	***4***	0.99	CAP
3	0.98	IND	***3***	0.98	CAP
2	0.99	IND	***2***	0.97	CAP
1	0.99	CAP	***1***	0.96	CAP

b) Sensitivity

The sensitivity (P2) is the time delay of the device to switch on or off the output relay according Cosφ settings in potentiometers P1 and P3.

Potentiometer P2
- Minimun 30s
- Maximun 240s

c) Capacitor under compensation

With the capacitor OFF, after the delay sensitivity time, if the Cosφ of the installation is below the min Cosφ, the device will switch on the output relay.

If,with the capacitor connected and after a delay sensitivity time, the Cosφ measured is not above the min Cosφ, the ALARM Led (L4) will blink with intermittence.

To correct the alarm carry out the following steps:

- Verify the calculation to determine the correct capacitor to be connected on the installation.

- Verify the setting of Cosφ min on the device.

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d) Capacitor Overcompensation

With the capacitor connected (relay output ON), after the delay sensitivity time, if the Cosφ of the installation is above the Cosφ Max, the device will switch OFF the output relay and disconnect the capacitor on the line.
If, with the capacitor connected and after the delay sensitivity time, the Cosφ measure is not above the Cosφ Max the ALARM Led (L4) will blink with an intermittence.

To correct the alarm carry out the following steps:

- Verify the calculation to determine the correct capacitor to be connected on the installation.
- Verify the setting of Cosφ Min on the device.

OPERATION MODE

The device can be used in Automatic or Manual mode.
The selection of the operation is chosen by pressing the button S1.
Press the button S1 for 2s to pass from Manual to Auto or viceversa.
L1 led indicates the operation mode.
When it is ON the device is in Manual operation, when is OFF the device is in Auto mode.

- Automatic operation

The device measures the Cosφ of the installation and switch on and off the output relay to connect or disconnect the capacitor.
When the output relay is ON, the R Led (L1) is ON, the relay is energized and the contact is closed.
When the AUT Led (L2) blinks, the capacitor is about to be switched in or out, according to the delay time set by P2 knob.

- Manual operation

Pressing the button S1 for 1s, the device switches on and off the output relay.
When the output relay is ON, the R Led (L1) is ON, the relay is energized and the contact closed.
Pressing the button S1, if the AUT Led (L2) blinks, this indicates that the device awaits the end of the capacitor discharge time (that is set at 60s) before to activate the output relay.

SET SINGLE-PHASE OR THREE-PHASE

In order to switch from Single-Phase to Three-Phase (or reverse) follow this procedures:

- Switch off the controller.
- Push the AUT/MAN button.
- Switch on the controller while keeping the button pressed for 10s until ALL THE LEDs will light together for 1s.
- Switch off the controller.

How to tell if the controller is in Single-Phase or Three-Phase:

- SINGLE-PHASE: the leds will blink in sequence for 2s (from the top one to the bottom one).
- THREE-PHASE: the leds will blink ALL TOGETHER for 3 times and them will blink in sequence for 2s as described above.

!!! WARNING !!!

*IF YOU SELECT WRONG MODE THE **COSφ** CALCULATION WILL BE WRONG*

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ALARMS TABLE

FUNCTIONS and ALARMS	LED INDICATION
Power ON – Single-Phase	All Led blinks in sequence for 2s
Power ON – Single-Phase	All Led blinks together for 3 times, next blinks in sequence for 2s
Frequency Set 50Hz	Automatic recognized after applying the supply voltage to the unit.
Frequency Set 60Hz	Automatic recognized after applying the supply voltage to the unit.
Maximum Voltage 253V~ after 10s	ALARM Led (L4) blinks with intermittence of 700ms.
Minimum Voltage 195V~ after 5s	ALARM Led (L4) blinks with intermittence of 700ms.
Maximum I >110% Ie (5,5A) after 120s	ALARM Led (L4) blinks with intermittence of 333ms.
Minimum I <2,5% Ie (125mA) after 5s	ALARM Led (L4) blinks with intermittence of 333ms.
Load Type	CAP Led (L3) ON if the load is capacitive, OFF of the load is inductive.
Capacitor Overcompensation After 120s	ALARM Led (L4) blinks with intermittence of ON=150ms OFF=1250ms.
Capacitor Undercompensation After 60s	ALARM Led (L4) blinks with intermittence of 1,4s ON and OFF.
Manual or Automatic Operation	AUT Led (L2) OFF in Manual Mode, ON in Automatic Mode.
Minimum Current in Automatic Mode	In<2,5% Ie (125mA) after 5s the alarm Low current blinks intermittence of 333ms and after 120s the relay turns OFF.
Minimum Current in Manual Mode	In<2,5% Ie (125mA) after 5s the alarm Low current blinks intermittence of 333ms and the output relay remains ON.
Maximum Current in Automatic Mode	In>110% (5,5A) after 120s the alarm Low current blinks intermittence of 333ms and the output relay remains ON.
Maximum Current in Manual Mode	In>110% (5,5A) after 120s the alarm Low current blinks intermittence of 333ms and the relay remains ON.
Minimum Voltage in Automatic Mode	Ue<195V~ the output relays remains ON and after 5s the alarm blinks intermittence of 700ms.
Minimum Voltage in Manual Mode	Ue<195V~ the output relays remains ON and after 5s the alarm blinks intermittence of 700ms.
Maximum Voltage in Automatic Mode	Ue>253V~ the output relays turns OFF after 10s, the alarm blinks intermittence of 700ms.
Maximum Voltage in Manual Mode	Ue>253V~ the output relays turns OFF after 10s, the alarm blinks intermittence of 700ms.
Wrong Cosφ Settings	ALARM Led (L4) and CAP Led (L3) blinks with intermittence of 250ms.
Frequency Out of Range	ALARM Led (L4) and CAP Led (L3) blinks with intermittence of 333ms. (Only on startup)
EEPROM Fault	All Led blinks with intermittence of 500ms.

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Supply Circuit	
Supply Voltage	230V~
Operating Limits	-15%…+10% Ue
Rated Frequency	50 or 60Hz
Power Consumption L/N - 230V~	3 VA
Immunity Time for Microbreakings	<6ms
Current Input	
Rated Current	5A
Operating Limits	0.125…5.5A
Overload Capacity	1.1 Ie
Overload Peak	10 Ie for 1s
Power Consumption	0.27VA
Reading and Control Range	
Voltage Reading Limits	253V~
Current Reading Limits	0.125…5.5A
Type of Current and Voltage Readings	Real Effective Value - RMS
Cosφ Adjustment	0.85 Inductive / 0.95 Capacitive
Tripping Sensitivity	30…240 s/step
Re-connection Time of the Same Step	60s fixed
Relay Outputs	
Number of Outputs	1
Contact Arrangement	1NOC
Contacts Capacity	5A - 250V~ (AC1)
Insulating Cat./Rated Voltage VDE0110	C/250, B/400
Maximum Switching Voltage	250V~
Enclosure and Connections	
Type of Terminal	Rising Clamp
Enclosure Version	2 Module DIN mount
Degree of Protection	IP41 Front - IP20 terminals
Standard Conformity	IEC 60255-5_IEC 60255-6 IEC 60068-2-61_IEC 60068-2-6 IEN50081-1_EN50082-2
Weight	140g

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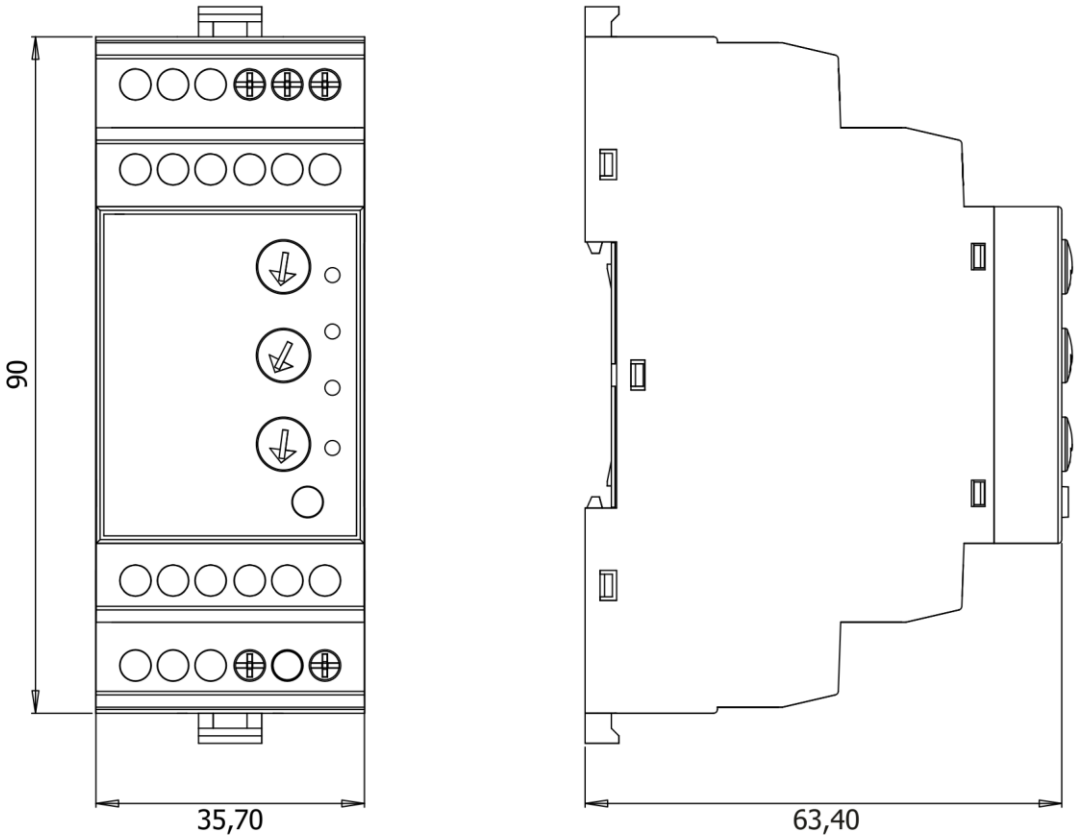
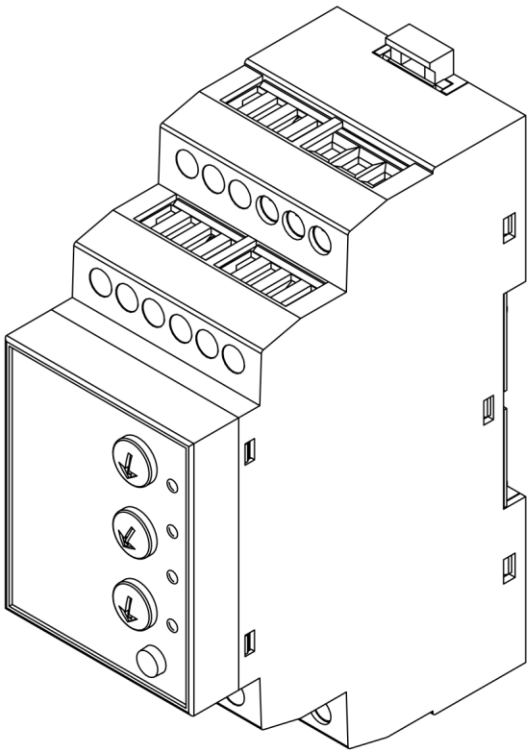
DIMENSIONS





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