

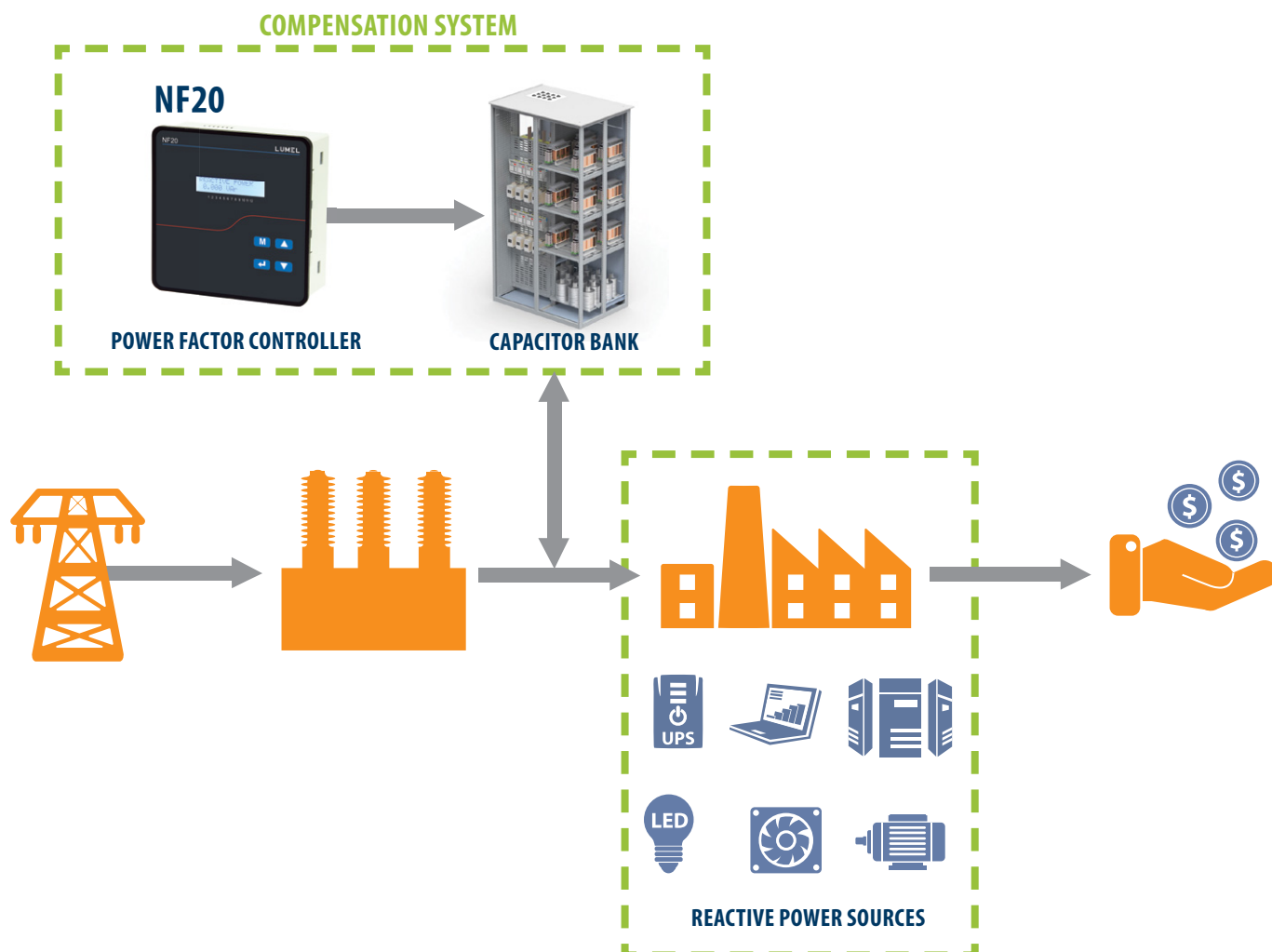


NF20 - POWER FACTOR CONTROLLER

- Programmable Switch In Time, Switch Off Time and Discharge Time.
- Alarm message and relay.
- Monitoring of the individual capacitor power values.
- Programmable individual banks kvar value.
- Operation Time of Capacitor.
- Capacitor switching count helps in increasing life of capacitor banks.
- LCD display with 2x16 characters for ease of readability.
- Relay steps : 4, 6 or 8 switching output available.
- Measurement around 73 (Modbus) electrical parameters (40 displayed on display).
- True RMS measurement up to 31st harmonics.
- Wide voltage measuring input: 30 to 550V AC (L-L / L-N) with accuracy of 0.5%.
- Four-quadrant operation.
- Interface RS485 Modbus for monitoring the PFC parameters remotely (optional).
- Wide Auxiliary supply: 110 to 550 V AC/DC.



EXAMPLE OF APPLICATION



MEASUREMENT AND VISUALIZATION OF POWER NETWORK PARAMETERS

- voltages (L-L, L-N)
- current
- power factor, bank status
- active/ reactive/ apparent power
- difference kVAR to target power factor
- frequency
- THD_U, THD_I
- harmonics for current and phase voltage up to 31st
- active energy (import/export)
- reactive energy (inductive/capacitive)
- apparent energy
- active/ reactive/ apparent demand power
- Run Hour
- On Hour
- number of interruptions
- system fault (window 1/ window 2)
- date/ time
- system warning
- demand active power (import/export)
- min, max voltage
- min, max current
- min, max frequency
- min, max temperature
- max THD_U
- max THD_I
- max active power (import/export)
- max reactive power (capacitive/inductive)
- max apparent power
- energy demand (capacitive/inductive)
- bank switching count (number of banks configured)
- bank operation time (number of banks configured)
- bank value (number of banks configured)
- test run menu

TECHNICAL DATA

CONTROL PARAMETERS

Number of outputs	max. up to 8 outputs for controller execution 96x96 mm max. up to 12 outputs for controller execution 144x144 mm
Alarm output	1x (max. 250V/1000 W a.c.)
Target PF range	0.8 Ld to 0.8 Lg
Switching Threshold	30 to 100 %
Switch-in-time (Connecting Time)	10 to 1800 Sec
Switch-off-time (Disconnecting Time)	10 to 1800 Sec
Discharge time	60 to 1800 Sec

EXTERNAL FEATURES

Read-out field	graphic display LCD 2 x 16 characters; display update rate ≈ 1 sec.	
External dimensions	for 3 different executions acc. ordering code:	mounting hole:
	• 96 x 96 x 51 mm (without extension modules); • 96 x 96 x 75 mm (with extension modules); • 144 x 144 x 56 mm	• 92 ^{+0.8} x 92 ^{+0.8} mm • 92 ^{+0.8} x 92 ^{+0.8} mm • 138 x 138 mm
Weight	• 0.35 kg (controller execution 96 x 96 mm) • 0.5 kg (controller execution 144 x 144 mm)	
Protection grade	from front side: IP54	from terminal side: IP20

MEASUREMENT

INPUT VOLTAGE

Nominal input voltage (AC RMS)	240 V
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INPUT CURRENT

Nominal input current	1 A/ 5A AC RMS
System CT secondary values	1A & 5A programmable
System CT primary values	From 1A up to 9999A
Max continuous input current	120% of rated value

OPERATING MEASURING RANGES

Voltage	30 - 550 V AC
Current	2 mA measuring starting current , 10 mA operating current , Max 6 Amp
Frequency	40...70 Hz

ACCURACY

Voltage	± 0.5% of Nominal value
Current	± 0.5% of Nominal value
Frequency	± 0.15% of mid frequency
Active Power	± 1.0 % of Nominal value
Reactive Power	± 1.0 % of Nominal value
Apparent Power	± 1.0 % of Nominal value
Active energy (kWh)	± 1.0 % of Nominal value
Reactive energy (kVarh)	± 2.0 %
Apparent energy (kVAh)	± 1.0 % of Nominal value
Total Harmonic Distortion	± 4.0 %

RATED OPERATING CONDITIONS

SUPPLY VOLTAGE

AC supply voltage range	110 V AC to 550 V AC
AC supply frequency range	40 to 70 Hz

VA BURDEN

Nominal input voltage burden	< 0.2 VA approx. per phase
Nominal input current burden	< 0.6 VA approx. per phase
Auxiliary Supply burden	< 10 VA approx

OVERLOAD WITHSTAND

Voltage	2 x rated value for 1 second, repeated 10 times at 10 second intervals
Current	20 x for 1 second, repeated 5 times at 5 min

ENVIRONMENTAL

Operating temperature	-10 to +60°C
Storage temperature	-20 to +65°C
Relative humidity	0... 90% non condensing
Warm up time	Minimum 3 minute
Shock	15g in 3 planes
Vibration	10... 55 Hz, 0.15mm amplitude

REFERENCE CONDITIONS FOR ACCURACY

Reference temperature	23°C +/- 2°C
Input waveform	Sinusoidal (distortion factor 0.005)
Input frequency	50 or 60 Hz ±2%
Auxiliary supply voltage	Rated Value ±1%
Auxiliary supply frequency	Rated Value ±1%
Voltage Range	50... 100% of Nominal Value 60... 100% of Nominal Value for THD
Current Range	10... 100% of Nominal Value 20... 100% of Nominal Value for THD
Power	cos φ / sin φ = 1 for Active / Reactive Power & Energy 10... 100% of Nominal Current & 50... 100% of Nominal Voltage.

INFLUENCE OF VARIATIONS

Temperature coefficient (for rated value range of use (0... 50°C))	0.05%/°C for Voltage (50... 120% of rated value) and 0.05%/°C for Current (10... 120% of rated value)
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APPLICABLE STANDARDS

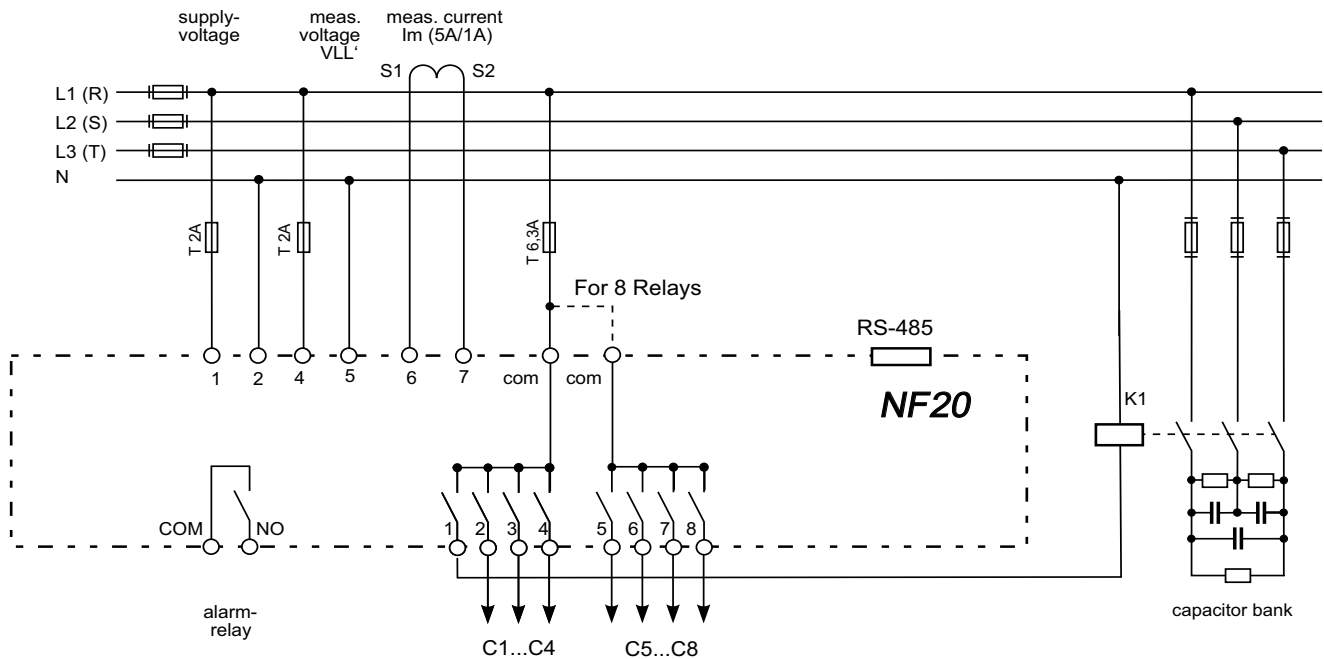
EMC	IEC 61326-1:2012, Table 2
Accuracy	IEC 62053-21
Safety	IEC 61010-1-2010
IP for water & dust	IEC60529
Pollution degree	2
Installation category	III
High Voltage Test	2.2 kV AC, 50Hz for 1 minute between all electrical circuits

DIGITAL INTERFACE

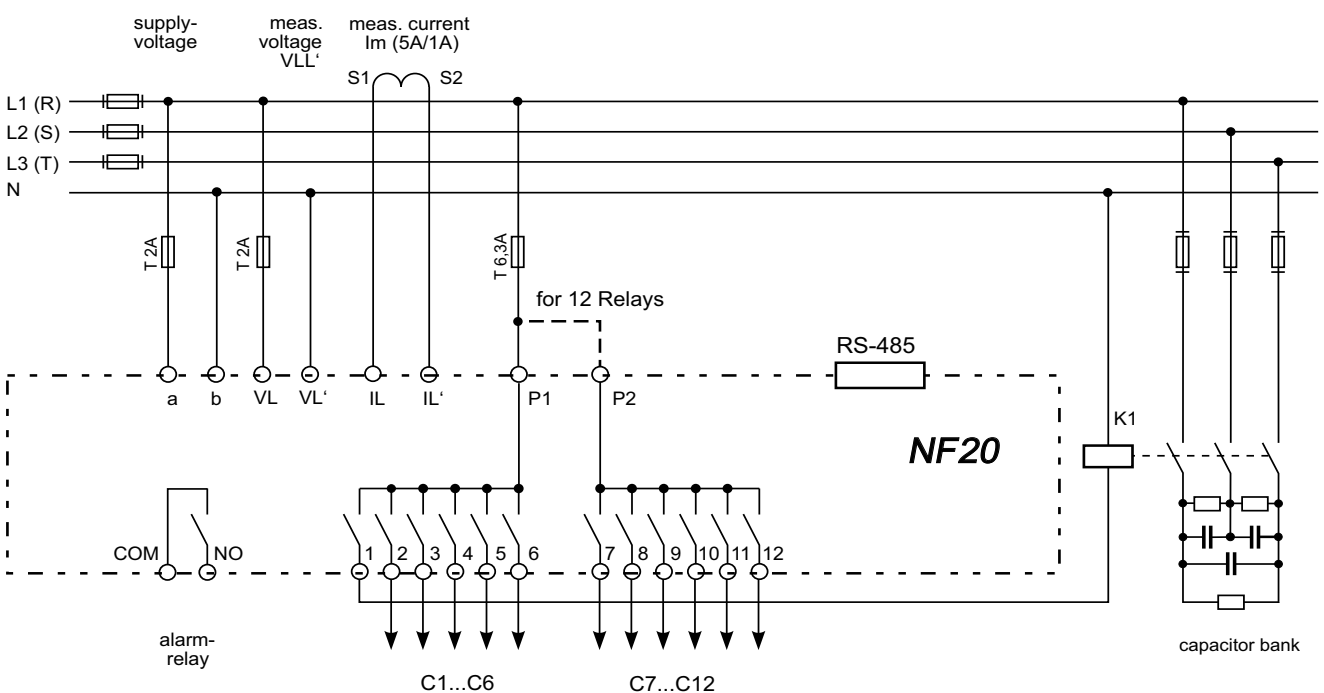
Interface type	Transmission protocol		Remarks
RS-485	Modbus RTU 8N2,8E1,8O1,8N1	Address 1..247	baud rate: 4.8, 9.6, 19.2 38.4, 57.6, 115.2 kbit/s

CONNECTION DIAGRAMS

a) controller execution 96x96 mm



b) controller execution 144x144mm



ORDERING CODE

Power factor controller NF20 -	A	1	H	X	X	X	X	X	000	X	X
Size:											
96 x 96	A										
Input Voltage:											
240V; 50/60Hz		1									
Power Supply:											
110-550VAC			H								
Relay Output:											
4 Relay O/P				4							
6 Relay O/P ¹				6							
8 Relay O/P				8							
Alarm Output:											
With Alarm Output				A							
Without Alarm Output ¹				Z							
RS-485 Modbus:											
With RS-485 ²					R						
Without RS-485					Z						
Real Time Clock (RTC):											
With RTC						R					
Without RTC						Z					
Adaptor Plate:											
Without Adaptor Plate								0			
With Adaptor Plate								1			
Version:											
Standard									000		
Language:											
Polish										P	
English										E	
Acceptance tests:											
without additional quality requirements											0
with an extra quality inspection certificate											1
with a calibration certificate											2

¹ Limited availability, needs to be agreed with the manufacturer

² Interface RS-485 available only for the controller with 8 relay outputs

controller execution 96x96 mm



ORDERING CODE

Power factor controller NF20 -	B	1	H	X	A	X	X	0	000	X	X
Size:											
144 x 144	B										
Input Voltage:											
240V; 50/60Hz		1									
Power Supply:											
110-550VAC			H								
Relay Output:											
6 Relay O/P				6							
8 Relay O/P ¹				8							
12 Relay O/P				A							
Alarm Output:											
With Alarm Output				A							
RS-485 Modbus:											
With RS-485 ²					R						
Without RS-485					Z						
Real Time Clock (RTC):											
With RTC						R					
Without RTC						Z					
Adaptor Plate:											
Without Adaptor Plate							0				
Version:									000		
Language:											
Polish										P	
English											E
Acceptance tests:											
without additional quality requirements											0
with an extra quality inspection certificate											1
with a calibration certificate											2

controller execution 144x144 mm



¹ Limited availability, needs to be agreed with the manufacturer

² Interface RS-485 available only for the controller with 12 relay outputs

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NF20-19_en