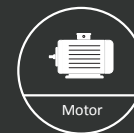
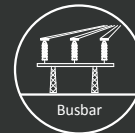




Fast commissioning

FPC 200



Family of multifunctional numerical relays

■ **FPC 200** is a family of current and voltage digital protection relays with easy to use interface meant for variety of solutions in industry and power distribution.

■ Its robust design enables it to be placed in **demanding industrial environments**.

■ Setting can be done completely through **user friendly local display unit**. User experience is enhanced through new edition of interface software **MiQen** featuring real-time display of measurements, statuses and event recorder.

■ **Transferring settings** between different devices has never been easier thanks to special front panel **USB port**. Same settings are simply transferred from one device to another using USB stick which can also be used to **save fault recordings, counters and update firmware**.

■ FPC 200 can be **expanded using external module EX408** for up to **8** temperature sensors.

■ FPC 200 is a member of NEO3000® Substation system and can be integrated to any other new or existing substation or automation.

Feeder, busbar, motor or transformer protection

Designed for industrial usage

3 CT + 1 CTs or 4 VT up to 600 V AC inputs

Up to 10 digital inputs and 8 relay outputs

3 analog outputs

Fault and event recording

Multifunctional front USB port

Local and remote control

User-friendly MiQen PC software included

FPC 200

Family of multifunctional numerical relays

Technical characteristics

Device power supply			Communication – RS232		
Rated voltage	DC or AC/DC	24 V-60 V 100 V-250 V, 50 Hz, 60 Hz	Connector		rear, DB9F
Permissible tolerance		-20 % to +10 %	Transfer speed		1200 bit/s-115,200 bit/s
Power consumption		≤ 7 VA, typical 3 VA (without external modules)	Range		approx. 15 m (according to EIA-232)
Voltage loss hold up time		100 ms (100 % drop)	Galvanic isolation	AC	3,5 kV, 50 Hz
Permanent memory type		EEPROM, FLASH	Communication – Fiber Optic		
Permanent registers storing time		permanently	Connector		rear, ST
Galvanic isolation	AC	3,5 kV, 50 Hz, 1 min	Cable		multi-mode, 62,5/125 μm, 50/125 μm, 100/140 μm, 200 μm
AC current inputs			Wavelength		820 nm
Nominal current	I _n	1 A/5 A (defined by software setting)	Transfer speed		1200 bit/s-115,200 bit/s
Nominal frequency		50 Hz/60 Hz	Range		approx. 1700 m
Measuring range	phase inputs sensitive (earth) input	up to 55 I _n up to 2 I _n	Transmitter optical power		-15 dBm
Overvoltage category		CAT III 300 V	Receiver sensitivity		-34 dBm
Consumption		≤ 0,1 VA (I _n), ≤ 0,1 VA (20 I _n)	Allowed optical loss		≤ 6,8 dB (62,5/125 μm, 1700 m, -15 dBm/-34 dBm)
Thermal overload	Continuous 10 s 1 s	4 I _n (20 A) 15 I _n (75 A) 100 I _n (500 A)	Communication – EXT (for extended modules only)		
Galvanic isolation	AC	3,5 kV, 50 Hz	Connector		rear, RJ45
AC voltage inputs			Galvanic isolation	AC	0,5 kV, 50 Hz
Nominal voltage	U _n	60 V-500 V (defined by software setting)	Communication – USB		
Nominal frequency		50 Hz/60 Hz	Connector		front, type A
Measuring range		up to 600 V	Supported type		1.0, 2.0
Overvoltage category		CAT III 600 V	Supported storage size		≤ 32 GB
Input impedance		660 kΩ	Supported file system		FAT32
Consumption	up to 250 V 250 V-500 V	≤ 0,1 VA ≤ 0,4 VA	Transfer rate		≈ 1,2 Mbit/s
Maximum input voltage	Continuous	600 V, 50 Hz-60 Hz	Bridgeable distance		< 6 m
Galvanic isolation	AC	4,35 kV, 50 Hz	Mechanical characteristics		
Digital inputs			Dimension (W x H x D)		150 x 176 x 125 mm
Nominal voltage	DC AC	24 V-250 V 230 V, 50 Hz-60 Hz	Weight		2080 g
Maximum input voltage	DC AC	275 V 275 V, 50 Hz-60 Hz	Material	Housing	Stainless steel
Minimum reliable activation voltage	DC AC	19,2 V 80 V, 50 Hz-60 Hz	IP protection level	Front Rear	IP 54 IP 40
Galvanic isolation	AC	3,5 kV, 50 Hz	Environment		
Input current	AC/DC	< 1 mA	Degree of pollution	IEC 60255-27	2
Digital (relay) outputs			Maximum altitude above sea level		2000 m (6561.68 ft)
Switching capacity	AC DC 30 V DC 48 V DC 110 V DC 220 V	8 A, UL: 10 A, 15 A (max. 4 s) 8 A (resistive load) 2 A (resistive load) 0,4 A (resistive load) 0,28 A (resistive load)	Operation temperature range		-25 °C to +70 °C
Limiting making current breaking capacity		15 A; max. 4 s, duty factor 10 %; max. 2000 VA	Measuring & protection tolerances		
Number of switching cycles		electrical 100 k, mechanical 1 M	Current		
Maximum switching voltage	AC/DC	250 V, 50 Hz-60 Hz	Accuracy - measurements	phase inputs	± 0,5 % I _n (0,1 I _n ≤ I ≤ 4 I _n ; 50 Hz; 25 °C) ± 3 % I _m (4 I _n ≤ I ≤ 55 I _n ; 50 Hz; 25 °C)
Maximum number of simultaneously activated relays		8	Accuracy - protections	phase inputs sensitive (earth) input	± 3 % I _n (0,1 I _n ≤ I ≤ 4 I _n ; 50 Hz; 25 °C) ± 3 % I _m (4 I _n ≤ I ≤ 55 I _n ; 50 Hz; 25 °C) ± 0,1 % I _n (0,001 I _n ≤ I ≤ 2 I _n ; 50 Hz; 25 °C)
Power supply burden of each active relay		0,5 W	Accuracy - harmonics amplitude		± 0,2 % I _n (0,01 I _n ≤ I ≤ 0,5 I _n)
Protection		dustproof	Temperature stability	Amplitude	± 0,1 % I _n / 10 °C
Galvanic isolation	AC	3,5 kV, 50 Hz	Voltage		
Communication – RS485			Accuracy		± 0,1 % U _n (1 V ≤ U ≤ 250 V; 50 Hz; 25 °C) ± 0,5 % U _m (250 V ≤ U ≤ 600 V; 50 Hz; 25 °C) U _(m_min) = 0,4 V; 50 Hz; 25 °C
Connector		rear, screw connector	Temperature stability		± 0,25 % / 10 °C
Cable		120 Ω STP or UTP (twisted pair)	Frequency		
Transfer speed		1200 bit/s-115,200 bit/s	Accuracy - measurements	Current inputs Voltage inputs Current reference Voltage reference	0,02 Hz (0,1 I _n ≤ I ≤ 4 I _n ; 50 Hz; 25 °C) 0,02 Hz (0,1 U _n ≤ U ≤ 4 U _n ; 50 Hz; 25 °C) 0,02 Hz (20 Hz ≤ f ≤ 80 Hz; I _n ; 25 °C) 0,02 Hz (20 Hz ≤ f ≤ 80 Hz; U _n ; 25 °C)
Range		approx. 1200 m (according to EIA-485)	Accuracy - protections	Phase inputs	0,02 Hz (0,1 U _n ≤ U ≤ 4 U _n ; 50 Hz; 25 °C)
Galvanic isolation	AC	3,5 kV, 50 Hz	Temperature stability		± 0,005 Hz / 10 °C

FPC 200

Family of multifunctional numerical relays

Type tests

Electromagnetic Compatibility	Standard	Level/Class	Environmental Tolerances	Standard	Level/Class
Emission			Operation		
Conducted Disturbance Emission	IEC 60255-26 CISPR 22 EN 55022 IEC 61000-6-4	A A	Cold operation	IEC 60255-27 IEC 60255-1 IEC 60068-2-1	Ad
Radiated emission (below 1 GHz)	IEC 60255-26 CISPR 11 EN 55022 IEC 61000-6-4	A A	Dry heat operation	IEC 60255-27 IEC 60255-1 IEC 60068-2-1	Bd
Radiated emission (above 1 GHz)	IEC 60255-26 CISPR 22 EN 55022 IEC 61000-6-4	A A	Damp heat (static)	IEC 60255-27 IEC 60255-1 IEC 60068-2-78	55°C 93% R.H.
Immunity			Cyclic temperature with humidity (damp heat cyclic)	IEC 60255-27 IEC 60255-1 IEC 60068-2-30	
Electrostatic Discharge	IEC 60255-26 IEC 61000-4-2	Level 4	Relative humidity	IEC 60068-2-30	95%
Radiated immunity	IEC 60255-26 IEC 61000-4-3 ENV 50204 (GSM)	3 3	Absolute humidity	IEC 60068-2-30	
Fast transient / burst immunity	IEC 60225-26 IEC 61000-4-4	4	Temperature gradient (change of temperature)	IEC 60068-2-14	-25°C .. 70°C
Surge immunity	IEC 60255-26 IEC 61000-4-5	3,4	Storage (must be stored in its original packing)		
Conducted immunity	IEC 60255-26 IEC 61000-4-6	3	Exposure to Cold	IEC 60255-27 IEC 60255-1 IEC 60068-2-1	-25°C
Power frequency magnetic field immunity	IEC 60255-26 IEC 61000-4-8	4	Dry heat storage	IEC 60255-27 IEC 60255-1 IEC 60068-2-2	70°C
Pulse magnetic field immunity	IEC 61000-4-9	5	Safety	Standard	Level/Class
Damped oscillatory magnetic field immunity	IEC 61000-4-10	4	Electrical		
Oscillatory transient immunity – Ring wave	IEC 61000-4-12	4	Insulation resistance	IEC 60255-27	100 MΩ
Oscillatory transient immunity – Slow damped oscillatory wave	IEC 60255-26 IEC 61000-4-18 ANSI/IEEE Std C37.90.1	3	Impulse voltage	IEC 60255-27	5 kV
Voltage dips	IEC 60255-26 IEC 61000-4-11 IEC 61000-4-29		Power frequency dielectric withstand	IEC 60255-27	3,5 kV 50 Hz
Voltage interruptions	IEC 60255-26 IEC 61000-4-11 IEC 61000-4-29		Enclosure		
Ripple	IEC 60255-26 IEC 61000-4-17		Dust/water ingress	IEC 60255-27 IEC 60529	
Mechanical durability	Standard	Level/Class			
Energized					
Seismic	IEC 60255-27 IEC 60255-21-3 IEC 60068-2-6	Class 1			
Sinusoidal vibration response	IEC 60255-27 IEC 60255-21-1 IEC 60068-2-6	Class 1			
Shock response	IEC 60255-27 IEC 60255-21-2 IEC 60068-2-27	Class 1			
De-energized					
Sinusoidal vibration endurance	IEC 60255-27 IEC 60255-21-1 IEC 60068-2-6	Class 1			
Shock withstand	IEC 60255-27 IEC 60255-21-2 IEC 60068-2-27	Class 1			
Bump	IEC 60255-27 IEC 60255-21-2 IEC 60068-2-27	Class 1			

Ordering code

FPC200 F3 - 1 H 1 A - A 0

Software type

- Feeder protection with Breaker failure protection
- Busbar protection with ROCOF protection
- Motor protection with Restricted Earth Fault
- Transformer protection with Restricted Earth Fault

Housing layout

Small housing (W) 150 mm, (H) 176 mm, (D) 125 mm - flush mount

Auxiliary supply voltage

- High (AC/DC 100 V-250 V)
- Low (24 V - 60 V DC)

AC analog inputs configuration

- 3CT + 1CTsens. (1 A/5 A*) with fixed connector
- 3CT + 1CTsens. (1 A/5 A*) with removable connector
- 3CT + 1CTsens. (1 / 5 A*) with short circuit connector
- 4VT (60 V-250 V) with removable connector

Digital IO options

- 6 Outputs
- 10 Inputs (DC 24 V-250 V, AC 230 V) and 8 Outputs

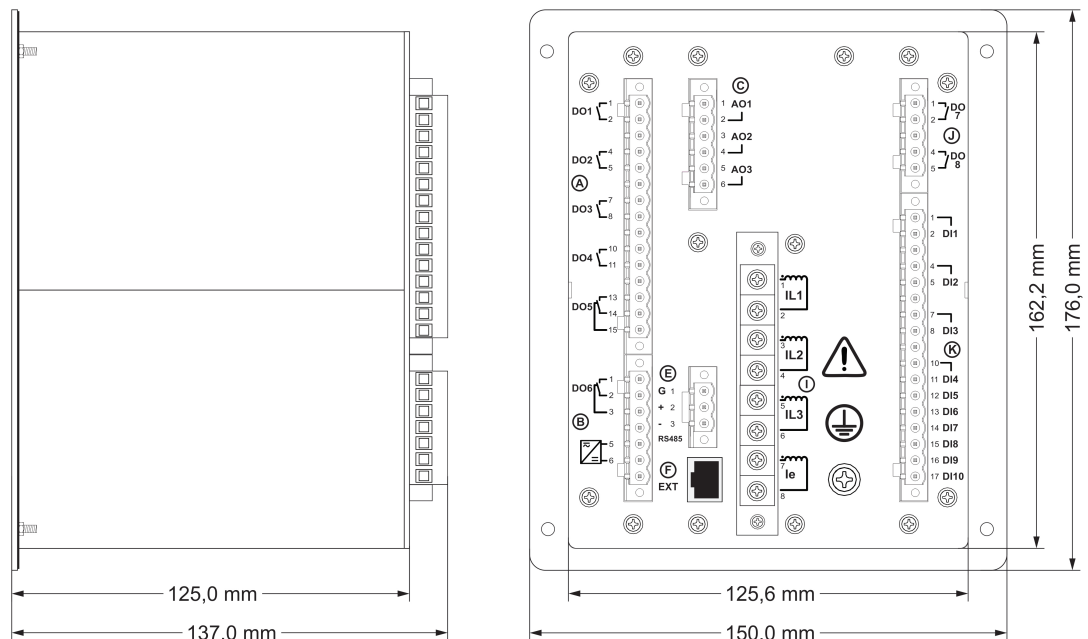
Communication

- None
- Modbus RTU (2-wire RS485 with 3-pin screw connector)
- Modbus RTU (RS232 with DB9 Female connector)
- Modbus RTU (Fiber Optic with ST connector)

Product options

- None
- 3 Analog outputs

* defined by software setting



FPC 200

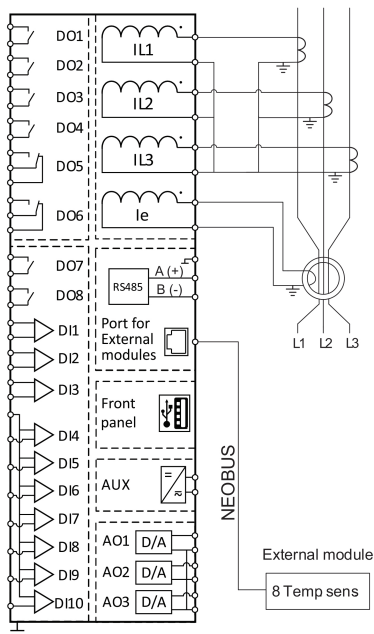
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Current application:

F3 - Feeder protection

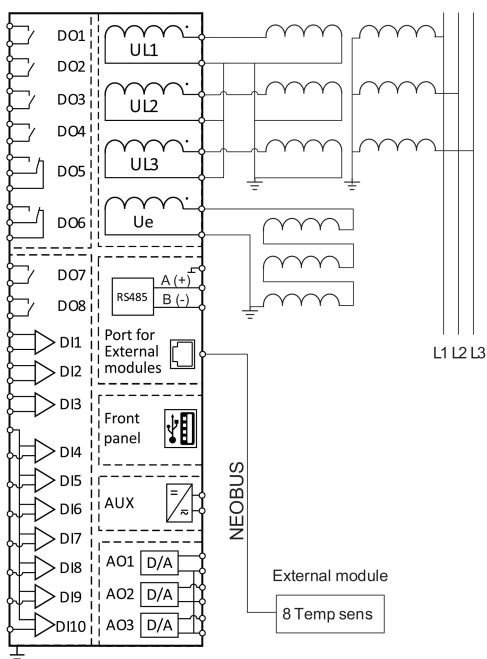
M3 - Motor protection

T3 - Transformer protection



Voltage application

B2 - Busbar protection



Product type comparison	F3	B2	M3	T3
Current protection				
Overcurrent IDMT with inrush restraint and Cold Load Pick-up	50/51	4	4	4
Earth fault overcurrent IDMT with inrush restraint and Cold Load Pick-up	50/51 N/G	4	4	4
Restricted earth-fault	64REF			2
Negative sequence/unbalance overcurrent/phase reversal	46/46R	2	2	2
Phase undercurrent	37		1	
Voltage protection				
Phase-to-phase undervoltage	27	2		
Remanent undervoltage	27R	1		
Positive sequence undervoltage	27D	2		
Phase-to-phase overvoltage	59	2		
Overvoltage earth/Residual overvoltage	59N	2		
Overfrequency	81H	2		
Underfrequency	81L	2		
Rate of change of frequency (df/dt)	81R	1		
Power and machine protection and diagnostic				
3 phase thermal overload (feeders, cables, tr. opt.)	49F	✓		✓
3 phase thermal overload (motors, generators, transformers)	49M/G/T		✓	
Temperature monitoring (up to 8 sensors)*	38/49T		✓	✓
Locked rotor, excessive starting time	48/51LR/14		✓	
Starts per hour	66		✓	
Thermostat / Buchholz switch	26/63			✓
External trip		2	2	2
Automation and diagnostic				
Circuit breaker control and monitoring	94/69	✓	✓	✓
Circuit breaker failure	50BF	✓	✓	✓
Trip circuit supervision (TCS)	74	✓	✓	✓
Auto-reclosure	79	✓		
Lockout relay	86/94	✓	✓	✓
User signals with basic logic		✓	✓	✓
Machine control, Running hours				✓
Metering				
Phase current, RMS, THD, Harmonics, Residual current 3I ₀		✓		✓
Earth current sensitive		Opt.		Opt.
Ph. & PPV voltages, RMS, THD, Harmonics			✓	
Frequency		✓	✓	✓
Communication				
Modbus			Optional	
IEC 60870-5-103			Optional	
Other communication protocols (IEC 60870-5-101, IEC 60870-5-104, IEC 61850 MMS)			On request	
mA/10V Analog output			Optional (3)	
Conformity to standards				
IEC 60529 - Degree of protection			IP 52	
External modules				
EX 408 (8 x PT100, 2 or 3 wires, powered from FPC)			Optional	

✓ included, Opt. optional, 1-4 number of functions
* With optional external temperature module EX 408

For more information:

www.iskra.eu

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