

ARKENS PR

Multipurpose digital protection relay
IEC 61850 - Station Bus



A multipurpose, accurate and scalable protection relay

This cost-effective protective device is used to perform advanced protection, control and monitoring for medium and high voltage applications. **ARKENS PR** offers enhanced features such as diagnostics, advanced communications and security as well.

Relay Selection Table Feeder

FEEDER		PR F210	PR F220
Features			
	Standard current inputs 1/5 A	3	3
	Sensitive current inputs 1/5 A	1	1
	VT inputs	4	4
	Contact Inputs (maximum)	24	24
	Contact Outputs (maximum)	24	24
Main functions			
21FL	Fault Locator	•	•
25	Check synchronizing	•	•
27	Undervoltage	•	•
32N	Wattmetric earth fault	•	•
32P	Directional power	•	•
32Q	Reverse power	•	•
46	Negative sequence overcurrent	•	•
46BC	Broken conductor	•	•
49	Thermal overload	•	•
50	Instantaneous time overcurrent	•	•
50BF	Circuit Breaker Failure	•	•
50G	Ground instantaneous time over-current (measured)	•	•
50N	Neutral instantaneous time over-current (calculated)	•	•
50SOTF	Switch onto Fault	•	•
51	IDMT or DT overcurrent	•	•
51G	Ground IDMT or DT overcurrent (measured)	•	•
51N	Neutral/Earth IDMT or DT overcurrent (calculated)	•	•
51V	Voltage Restrained overcurrent	•	•
59	Overvoltage	•	•
59N	Residual overvoltage	•	•
67	Directional phase overcurrent	•	•
67G	Directional ground overcurrent (measured)	•	•
67N	Directional neutral overcurrent (calculated)	•	•
68	Second harmonic blocking	•	•
74TC	Trip circuit supervision	•	•
79	Autorecloser (number of shots)	4	4
81O	Overfrequency	•	•
81Rf	Rate of change of frequency	-	•
81U	Underfrequency	•	•
86	Latching output contact	•	•
87N	Restricted Earth Fault	•	•
VTS	VT supervision	•	•
CTS	CT supervision	•	•
/	CB monitoring	•	•
/	Logical discrimination	•	•
/	Setting Group	2	2



Relay Selection Table Line

LINE		PR L301	PR L302	PR L311	PR L312	PR L401	PR L402	PR L411	PR L412
Features									
	Standard current inputs 1/5 A	3	3	3	3	6	18	6	18
	Sensitive current inputs 1/5 A	1	1	1	1	2	6	2	6
	VT inputs	4	4	4	4	8	24	8	24
	Contact Inputs (maximum)	24	24	24	24	24	24	24	24
	Contact Outputs (maximum)	48	48	72	72	48	48	48	48
Main functions									
	Trip Modes (three-pole / single-pole)	3p	1&3p	3p	1&3p	1&3p	1&3p	1&3p	1&3p
21	Distance Protection Phase Quad (number of zones)	5	5	5	5	-	-	-	-
21N	Distance Protection Ground Quad (number of zones)	5	5	5	5	-	-	-	-
87L	Line Differential (up to 3 Terminals)	-	-	-	-	●	-	●	-
87L	Line Differential (up to 6 Terminals)	-	-	-	-	-	●	-	●
79	Autorecloser (three-pole / single-pole)	-	-	3p	1&3p	-	-	1&3p	1&3p
Secondary functions									
21FL	Fault Locator	●	●	●	●	●	●	●	●
25	Check synchronizing	●	●	●	●	●	●	●	●
27	Undervoltage	●	●	●	●	●	●	●	●
32N	Wattmetric earth fault	●	●	●	●	●	●	●	●
32P	Directional power	●	●	●	●	●	●	●	●
32Q	Reverse power	●	●	●	●	●	●	●	●
46	Negative sequence overcurrent	●	●	●	●	●	●	●	●
46BC	Broken conductor	●	●	●	●	●	●	●	●
49	Thermal overload	●	●	●	●	●	●	●	●
50	Instantaneous time overcurrent	●	●	●	●	●	●	●	●
50BF	Circuit Breaker Failure	●	●	●	●	●	●	●	●
50G	Neutral/Earth instantaneous time overcurrent (measured)	●	●	●	●	●	●	●	●
50N	Neutral/Earth instantaneous time overcurrent (calculated)	●	●	●	●	●	●	●	●
51	IDMT or DT overcurrent	●	●	●	●	●	●	●	●
51G	Neutral/Earth IDMT or DT overcurrent (measured)	●	●	●	●	●	●	●	●
51N	Neutral/Earth IDMT or DT overcurrent (calculated)	●	●	●	●	●	●	●	●
59	Overvoltage	●	●	●	●	●	●	●	●
59N	Residual overvoltage	●	●	●	●	●	●	●	●
67	Directional phase overcurrent	●	●	●	●	●	●	●	●
67G	Ground fault directional (measured)	●	●	●	●	●	●	●	●
67N	Ground fault directional (calculated)	●	●	●	●	●	●	●	●
68	Power Swing Blocking	●	●	●	●	●	●	●	●
68 2H	Second harmonic blocking	●	●	●	●	●	●	●	●
74TC	Trip circuit supervision	●	●	●	●	●	●	●	●
78	Out-of-step tripping	●	●	●	●	●	●	●	●
81O	Overfrequency	●	●	●	●	●	●	●	●
81U	Underfrequency	●	●	●	●	●	●	●	●
85	Teleprotection scheme	●	●	●	●	●	●	●	●
86	Latching output contact	●	●	●	●	●	●	●	●
CTS	CT supervision	●	●	●	●	●	●	●	●
VTS	VT supervision	●	●	●	●	●	●	●	●
/	Logical discrimination	●	●	●	●	●	●	●	●
/	Setting Group	4	4	4	4	4	4	4	4

Relay Selection Table Transformer

TRANSFORMER		PR T010	PR T200	PR T210	PR T401	PR T411
Features						
	Standard current inputs 1/5 A	3	6	6	6	6
	Sensitive current inputs 1/5 A	-	4	4	4	4
	VT inputs	4	4	4	4	4
	Contact Inputs (maximum)	24	48	48	48	48
	Contact Outputs (maximum)	24	24	24	24	24
Main functions						
87T	Transformer Differential (number of windings)	-	-	-	2	2
87G / 87N / 64REF	Restricted Earth Fault	-	-	-	●	●
90	Voltage Regulation (OLTC)	●	-	●	-	●
Secondary functions						
24	Over-excitation (V/f)	-	●	●	●	●
27	Undervoltage	-	●	●	●	●
46	Negative sequence overcurrent	-	●	●	●	●
49T	Thermal overload	-	●	●	●	●
50	Definite time overcurrent	-	●	●	●	●
50BF	Circuit Breaker Failure	-	●	●	●	●
50G	Ground definite time over-current (measured)	-	●	●	●	●
50N	Neutral/Earth definite time over-current (calculated)	-	●	●	●	●
51	IDMT overcurrent	-	●	●	●	●
51G	Ground IDMT overcurrent (measured)	-	●	●	●	●
51N	Neutral/Earth IDMT overcurrent (calculated)	-	●	●	●	●
59	Overvoltage	-	●	●	●	●
59N	Residual overvoltage	-	●	●	●	●
67	Directional phase overcurrent	-	●	●	●	●
67G	Ground fault directional (measured)	-	●	●	●	●
67N	Ground fault directional (calculated)	-	●	●	●	●
68	Harmonic Restraint	-	●	●	●	●
74TC	Trip circuit supervision	-	●	●	●	●
81O	Over frequency	-	●	●	●	●
81U	Under frequency	-	●	●	●	●
86	Latching output contact	-	●	●	●	●
VTS	VT supervision	-	●	●	●	●
CTS	CT supervision	-	●	●	●	●
/	CB monitoring	-	●	●	●	●
/	Tap changer monitoring	●	-	●	-	●
/	Setting Group	2	2	2	2	2



Monitoring and measurement:

- Current: Magnitude, Phase, Frequency
- Voltage: Magnitude, Phase, Frequency
- Symmetrical components
- Power: P, Q, S
- Current transformer supervision
- Voltage transformer supervision
- Disturbance Recorder: up to 10 analog signals and 64 digital signals @ 3200 Hz

General Features

Intuitive front panel user interface
16 multicolor

320 x 240 LCD screen resolution:

- Mimic diagram fully configurable
- Event log & alarm acknowledgment
- Access rights management
- Measurement / Metering
- I/O cards status
- Control mode
- Settings configuration mode

16 multicolor target LEDs
including 14 configurable

RJ45 Maintenance Port
Max Bitrate 100 Mb / s

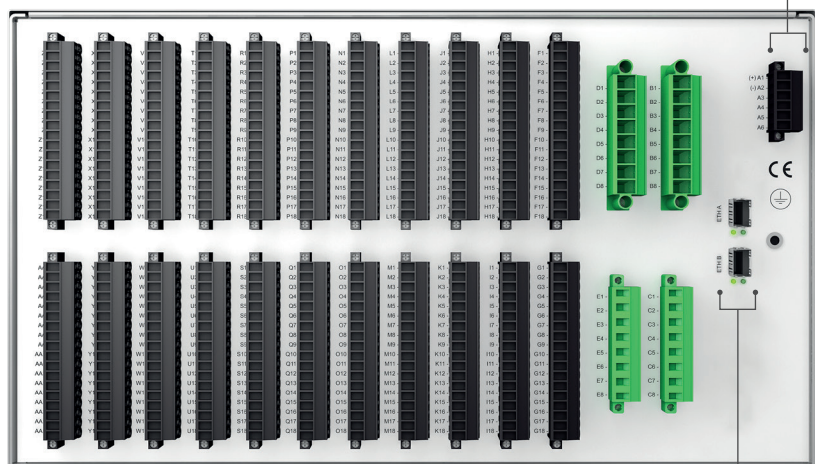


Navigation push buttons

4 programmable function
pushbuttons & LEDs

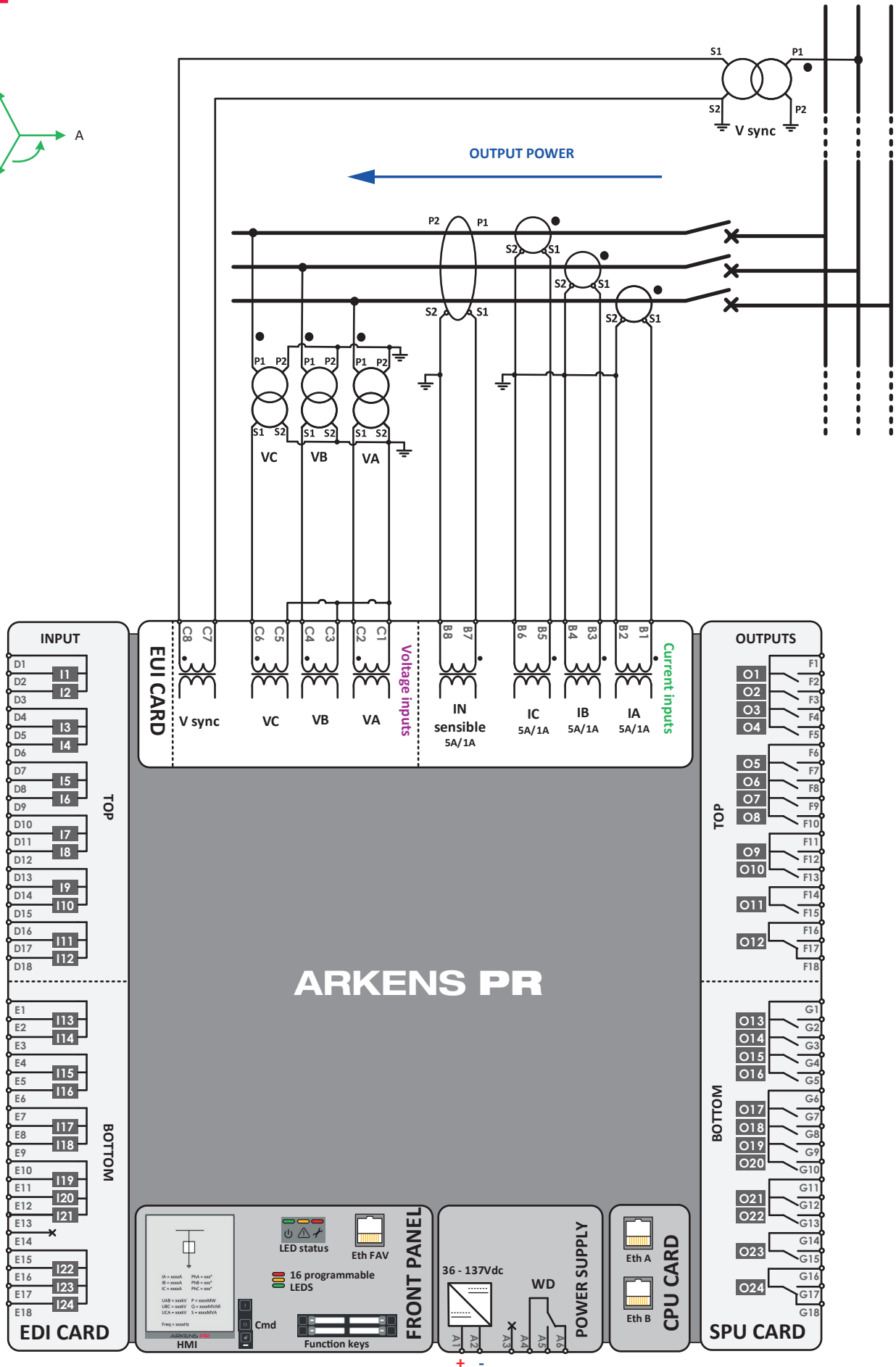
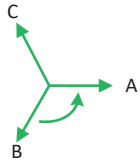
13 available slots for 84TE
version model

Power supply: 36 V to 137 VDC
Maximum interruption time without resetting: 50 ms
Ripple in the DC auxiliary voltage supply: Max 12 % of the DC value

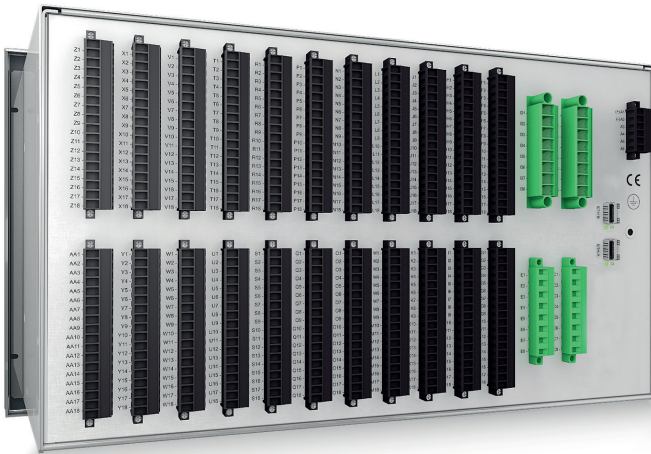


SYF Card : Modular Ethernet ports SFP type
GOOSE MMS : IEC 61850-8-1 Ed 2.1 / PRP : IEC 62439-3 / SNMP / NTP
Bitrates : 10 - 100 - 1,000 Mb / s

Wiring Diagram



Interface cards features



SPU DIGITAL OUTPUT CARD

24 binary outputs
 8 A (30 Vdc) / 8 A (250 Vac)
 Max 250 A / 30 ms

SPR HIGH SPEED OUTPUT CARD

4 High Speed relays (operating time < 2 ms)
 17 Fast relays (operating time < 5 ms)
 3 Low Power relays
 10 A (48 Vdc) / 4 A (127 Vdc) (except LP relays)
 Max 250 A / 30 ms (except LP relays)

EUI MEASUREMENT CARD

Standard current input: 3 x 1 A / 5 A, sensitive current input 1 x 1 A / 5 A, Voltage input x 4

VOLTAGE	RANGE	ACCURACY (1)
Range 1	0 Veff to 28 Veff	< 1 % or 50 mV
Range 2	28 Veff to 104 Veff	0.50 %
Range 2'	50 Veff to 80 Veff	0.25 %
Range 3	104 Veff to 140 Veff	1 %

CURRENT 1/5A	RANGE	ACCURACY (1)
Range 1	0 Aeff to 1 Aeff	<2 % or 5 mA
Range 2	1 Aeff to 7,5 Aeff	0.50 %
Range 3	7,5 Aeff to 150 Aeff	1 %

SENSITIVE CURRENT	RANGE	ACCURACY (1)
Range 1	0 Aeff to 100m Aeff	< 2% or 1 mA
Range 2	100 mAeff to 1 Aeff	0.50 %
Range 3	1 Aeff to 15 Aeff	1 %

EDI / EDC BINARY INPUT CARD

24 binary inputs
 Maximum input voltage: 200 Vdc
 Selectable thresholds by software configuration:

- 48 V configuration: 11 V < threshold < 34 V
- 127 V configuration: 29 V < threshold < 79 V

 Recognition time < 1 ms
 Filtering (1 to 10 ms) and oscillatory detection (2 to 99 changes between 1 to 60 s)
 Hysteresis > 0.5 V
 In case of EDC card, 3 input are dedicated to capacitive divider (neon indicators)

EII MEASUREMENT CARD

3 PHASE 150Aeff, 3 PHASE 15Aeff AND -20 /+20 MA CURRENT LOOP

CURRENT 1/5A	RANGE	ACCURACY (1)
Range 1	0 Aeff to 1 Aeff	< 2 % or 5 mA
Range 2	1 Aeff to 7.5 Aeff	0.50 %
Range 3	7.5 Aeff to 150 Aeff	1 %

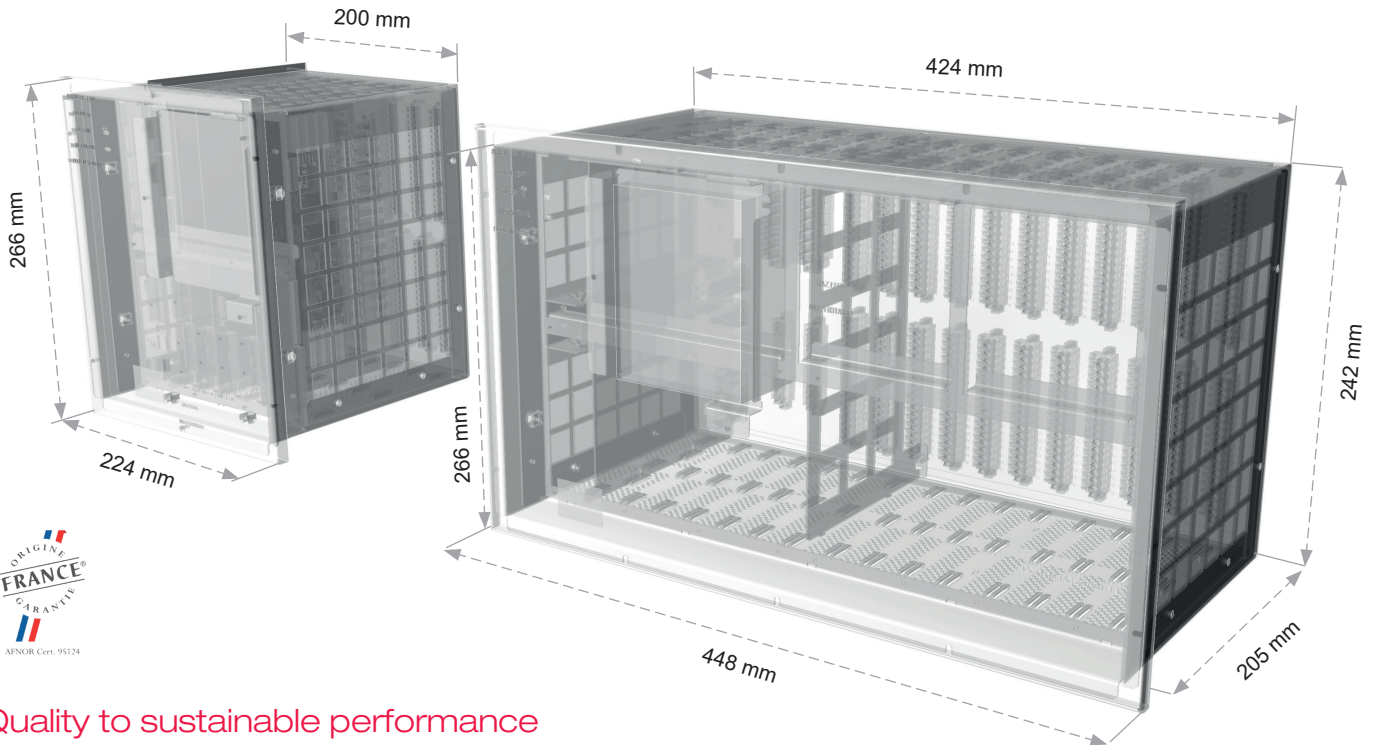
SENSITIVE CURRENT	RANGE	ACCURACY (1)
Range 1	0 Aeff to 100 mAeff	< 2 % or 1 mA
Range 2	100 mAeff to 1 Aeff	0.50 %
Range 3	1 Aeff to 15 Aeff	1 %

BOUCLE DE COURANT	PLAGE	ACCURACY (1)
Range 1	-20 mA to 20 mA	50 µA

(1) in % of injected value

Mechanical features

FEATURES	ARKENS PR 6U - 42 TE	ARKENS PR 6U - 84 TE
Front panel dimensions	L 224 mm x H 266 mm	L 448 mm x H 266 mm
Housing dimensions	L 200 mm x H 242 mm	L 424 mm x H 242 mm
Depth	205 mm	205 mm
Protection ingress	Front Panel: IP 52 - Others: IP 32	
Shock protection	IK 07	
Weight	7-8 kg	12-14 kg



Quality to sustainable performance

- Our specific design and production process allow us to reduce the impact of our products and systems on the environment (RoHS, Reach, etc.).
- Our products are tested at each manufacturing stage to guarantee a zero fault quality.
- We control the obsolescence of the components in order to design sustainable equipments.

Compliance with standards

- IEC 60255-26
- IEC 61000-6-2
- IEC 61000-6-4
- IEC 61000-4-2
- IEC 61000-4-3
- IEC 61000-4-4
- IEC 61000-4-5
- IEC 61000-4-6
- IEC 61000-4-8
- IEC 61000-4-11
- IEC 61000-4-16
- IEC 61000-4-17
- IEC 61000-4-18
- IEC 61000-4-29
- CISPR 11
- CISPR 22
- IEC 60255-5
- NF EN 60068-2-6
- IEC 60255-21-1
- IEC 60255-21-2
- IEC 60255-21-3
- NF EN 60068-2-2
- NF EN 60068-2-1
- NF EN 60068-2-30
- NF EN 60068-2-14



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