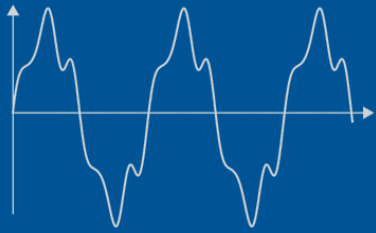
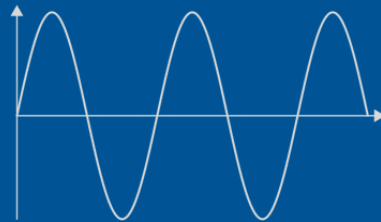




Industrial Controls and Drives
India Pvt. Ltd. (ICDIPL)



HYBRID POWER FACTOR CORRECTION PANEL



 www.icdipl.net

 sales@icdipl.net

ABOUT HPFC PANELS

ICD Hybrid Power Factor Correction Panel (HPFC) offers advanced active technology, replacing traditional APFC systems with benefits like step-less reactive power compensation and precise correction. Its correct selection ensures ultrafast compensation within required harmonic limits, maintaining unity power factor, reducing KVAH energy, and cutting peak demand costs, leading to Zero Penalty and substantial cost savings.



PRODUCT FEATURES

- Predictive maintenance – Inbuilt working hours Management of capacitors in our control board
- Ulter fast smooth operation
- Both Power factor and harmonics management achieved
- Industrial standards have proven 3 Levels of topology
- Scalable design when load increases in future industry expansion
- Custom build design based on project requirements.



TECHNICAL SPECIFICATION

- Reference Standards IEEE 519-2022 harmonic standard.
- Power Factor Setting (-1 to +1)
- Harmonic Filtering: 3rd to 50th Order with individual harmonic selection
- Compensation: close loop / open loop.
- Operational Voltage – 415 V, +10% - 15% VAC
- Rated Frequency – 50 Hz +/-5%
- Degree of Protection – IP 4X/ 41/42
- Rated short-time withstand current – 50kA, 65kA at 415V
- Doors, Covers & Frames are very well gasket with Neoprene / PU-Foam type gaskets
- Cubical is well-ventilated with the use of an exhaust fan with louvers.
- Remote Monitoring: Ethernet-based / Modbus RTU etc.
- Operator interface: Touch screen Display / Dedicated controller with operator activity log.
- Provision of Installation of Gas Flooding System.
- Hybrid PFC has an Active Power Filter coupled with heavy-duty APP-type detuned capacitor banks.
- Reactive Compensation
- Harmonic Mitigation
- Neutral Compensation (3P/4W)
- Load Unbalance



Comparison

Parameters	Hybrid PFC System	APFC	AHF
PERFORMANCE			
Technology	IGBT-based with detuned AC capacitor	Capacitors	
Speed	<0.2 milli second	> 50 milli second	
Efficiency	>99%	93%	
Current Injection	Stepless current compensation	stepped kVAR compensation	
Effectiveness	Effective with high fluctuation load	Ineffective with fluctuating load	Yes
Leading/ Lagging PF	Both Leading & Lagging PF	Lagging PF compensation only	
Load Balancing	Negative sequence current injection to balance grid current.	No load balancing	Yes
Harmonic mitigation	Harmonic compensation	No harmonic compensation	Yes
Neutral Compensation	possible with 4 wire system	Not possible	Yes
MAINTENANCE			
Maintenance Requirement	Modular design for easy maintenance	Easy Maintenance	
Average Life	8 -10 years	2to3 Yrs (Recurring cost of capacitors)	
RETURN ON INVESTMENT			
Overall system efficiency	High	Low	High
Space	0.7 X	X	
Capital cost investment	1.4 X	X	
	Low operating cost	Regarding the cost of capacitors	
Return On Investment	Improved PF	Ineffective with fluctuating loads	
	Better voltage profile	introduce voltage transients	
	Reduced failure	Can increase failure harmonics	



APPLICATIONS / USAGE CASES



Fast Fluctuating load industries



Steel plant and Steel rolling mills



HVAC plant and Chiller Panel



Automobile and Auto Ancillary Sector



Heavy Process industries



Metals and Minerals Plants



Higher Quantity VFD Drive Panel industries



IT/ITES Facility and Data Center




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 044 2378 0053

 sales@icdipl.net

 www.icdipl.net

 33, Mettukppan Road, Maduravaoyl,
Chennai - 600 095, Tamil Nadu India