



Automatic Power Factor Controllers - Featurewise Comparisons:

Revision 3.0 Dated: 28th Jan. 2017.

Sr. No.	Feature	APFC-07	APFC-03	TPFC-03	SPF-56	TPF-56	SPF-56 HT	Added Information
Measurement: 4-Quadrant Mode.								
1	Supply Voltage Measurement Range (Line-to-Line)	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	Phase-to-Neutral Values are as Phase-to-Phase Value Divided by Square-Root of 3
2	Voltage measurement system (Line-to-Neutral Voltage will be = [(Line-to-Line)/SquareRoot of 3])	One channel - Line to Line OR Line-Neutral	One channel - Line to Line OR Line-Neutral	One channel - Line to Line OR Line-Neutral	Three channel - 3-phase 3-wire OR 3-phase 4-wire	Three channel - 3-phase 3-wire OR 3-phase 4-wire	Three channel - 3-phase 3-wire OR 3-phase 4-wire	APFC-07, APF-03 & TPFC-03 have Common Input Terminals for Aux. Input Supply and Voltage Feedback Measurement. Other Units have independent Terminals.
3	Voltage Spike / Transient protection	By MOV	By MOV	By MOV	By MOV	By MOV	By MOV	MOVs are of tight tolerance for improved clamping of transients.
4	Measurement Feedback Voltage Isolation	High impedance resistance > 100KΩ	High impedance resistance > 100KΩ	High impedance resistance > 100KΩ	High impedance resistance > 100KΩ	High impedance resistance > 100KΩ	High impedance resistance > 50KΩ	
5	Measurement Voltage AND / OR Aux. Input Supply Total Max. Burden	< 10 VA per phase	< 10 VA per phase	< 10 VA per phase	< 0.5 VA per phase	< 0.5 VA per phase	< 0.5 VA per phase	As Aux supply and measurement is through common terminals, in AFC-07, APFC-3 and TPFC-03..
6	Load Current Feedback Measurement Method	One Channel - 5Amp or 1Amp CT secondary	One Channel - 5Amp or 1Amp CT secondary	One Channel - 5Amp or 1Amp CT secondary	Three Channel - 5Amp or 1Amp CT secondary	Three Channel - 5Amp or 1Amp CT secondary	Three Channel - 5Amp or 1Amp CT secondary	Separate terminals for 5Amp and 1Amp rated current input selection.
7	Load Current Measurement System	In any one phase	In any one phase	In any one phase	In all three phases	In all three phases	In all three phases	
8	Load Current Feedback Isolation.	Internal CT isolation	Internal CT isolation	Internal CT isolation	Internal CT isolation	Internal CT isolation	Internal CT isolation	Screw-Terminals to avoid lose contacts.
9	Load-Over-Current handling capacity	4 X rated current for 1 Second.	4 X rated current for 1 Second.	4 X rated current for 1 Second.	4 X rated current for 1 Second.	4 X rated current for 1 Second.	4 X rated current for 1 Second.	
10	Load Current channel supply burden	< 0.5 VA per phase	< 0.5 VA per phase	< 0.5 VA per phase	< 0.5 VA per phase	< 0.5 VA per phase	< 0.5 VA per phase	
11	Load Current Maximum permissible Form Factor	2.1	2.1	2.1	2.1	2.1	2.1	This is important to be able to handle Harmonics in the Load Current Waveform.
12	Minimum Current measurement limit	2% of rated current	2% of rated current	2% of rated current	2% of rated current	2% of rated current	2% of rated current	
13	Power / Energy Measurement accuracy	Active Power- Cl 1 Reactive Power- Cl 2 In measured phase	Active Power- Cl 1 Reactive Power- Cl 2 In measured phase	Active Power- Cl 1 Reactive Power- Cl 2 In measured phase	Active Power- Cl 1 Reactive Power- Cl 2 In all 3 phases	Active Power- Cl 1 Reactive Power- Cl 2 In all 3 phases	Active Power- Cl 1 Reactive Power- Cl 2 In all 3 phases	As specified in IEC-62053 part 21 & 23, at Standard Ambient Room Temperature.
14	Power Values measured	KW, KVAR, KVA, PF	KW, KVAR, KVA, PF	KW, KVAR, KVA, PF	KW, KVAR, KVA, PF	KW, KVAR, KVA, PF	MW, MVAR, MVA, PF	
15	Applicable maximum system rating	5000KVA	5000KVA	5000KVA	5000KVA	5000KVA	50MVA	This is supply system sourcing capacity.
16	Energy Values measured (Refer IS 14697 for definitions)	Not Applicable	Not Applicable	Not Applicable	KWH, KVARH(Import), KVARH(export), KVAH	KWH, KVARH(Import), KVARH(export), KVAH	MWH, MVARH(Import), MVARH(export), MVAH	All for class 1 IEC 62053-21 and for class 2 IEC 62053-23 in measured phases, at Standard Ambient Room Temperature.

Sr. No.	Feature	APFC-07	APFC-03	TPFC-03	SPF-56	TPF-56	SPF-56 HT	Added Information
Measurement:								
17	Compensated Capacitive reactive power & energy measurement	C-KVAR	C-KVAR	C-KVAR	C-KVAR & C-KVARH	C-KVAR & C-KVARH	C-MVAR & C-MVARH	
18	Capacitor Individual stage values	Provided	Provided	Provided	Provided	Provided	Provided	On line monitoring of individual capacitor step values in VAR term.
19	Supply frequency range measured		45Hz to 65Hz	45Hz to 65Hz	45Hz to 65Hz	45Hz to 65Hz	45Hz to 65Hz	Practical Utility: 47 to 53 Hz or 57 to 63 Hz
20	Per Phase Voltage Harmonics Measurement	%THD-F of measured phase voltage.	%THD-F of measured phase voltage.	%THD-F of measured phase voltage.	%THD-F & Odd harmonics upto 15th are measured.	%THD-F & Odd harmonics upto 15th are measured.	%THD-F & Odd harmonics upto 15th are measured.	
21	Per Phase & Neutral Current Harmonics Measurement (Neutral Current, only in case of Three-Phase Load Current Measurements)	%THD-F of measured phase current.	%THD-F of measured phase current.	%THD-F of measured phase current.	%THD-F & Odd harmonics upto 15th are measured.	%THD-F & Odd harmonics upto 15th are measured.	%THD-F & Odd harmonics upto 15th are measured.	
22	Utilization measurement of Capacitor Banks	Based on number of switching operations	Based on number of switching operations	Based on number of switching and ON time of cap banks	Based on number of switching operations	Based on number of switching and ON time of cap banks	Based on number of switching operations	Ref. additional Comments for Point 34
23	Peak maximum values measured for user defined interval	-	Per phase Voltage, Current (with Neutral), W, VAR, VA, frequency	Per phase Voltage, Current (with Neutral), W, VAR, VA, frequency	Per phase Voltage, Current (with Neutral), W, VAR, VA, frequency	Per phase Voltage, Current (with Neutral), W, VAR, VA, frequency	Per phase Voltage, Current (with Neutral), W, VAR, VA, frequency	
24	Controller Temperature inside housing	Provided	Provided	Provided	Provided	Provided	Provided	
25	Real time clock & NV-RAM back up battery voltage monitoring.	-Not Applicable-	-Not Applicable-	-Not Applicable-	Provided	Provided	Provided	Units without data logging does not have this facility
Reactive Power Compensation:								
26	VAR based compensation (not PF based compensation)	Provided	Provided	Provided	Provided	Provided	Provided	Based on fundamental frequency Reactive Power
27	4-quadrant power operation with compensation	Provided	Provided	Provided	Provided	Provided	Provided	With Auto-Synchronization, only 2 Quadrant operation.
28	Maximum Number of Capacitor bank steps, as per the Ordered Model.	4, 6, & 8 steps	4, 8, 12 & 16 steps	8 & 16 steps	8, 12 & 16 steps	8 & 16 steps	8 & 16 steps	
29	Automatic C/K ratio adjustment	Provided	Provided	Provided	Provided	Provided	Provided	
30	Target PF setting.	Single target PF with zero action band above 1.5 X smallest cap bank KVAR.	Single target PF with zero action band above 1.5 X smallest cap bank KVAR.	Single target PF with zero action band above 1.5 X smallest cap bank KVAR.	Upper & Lower target PF & 1.5 X smallest cap bank KVAR, maximum out of these is zero action band	Upper & Lower target PF & 1.5 X smallest cap bank KVAR, maximum out of these is zero action band	Upper & Lower target PF & 1.5 X smallest cap bank MVAR, maximum out of these is zero action band	For details, refer the user manual of the product.
31	Dual PF settings for Mains & DG set as alternatice supply sources	-	Provided	Provided	Provided	Provided	Provided	Through Aux. Digital Input command interconnection.
32	External PT ratio selection for measurement feedback from PT	Provided	-Not Provided-	-Not Provided-	Provided with distribution transformer ratio input	Provided with distribution transformer ratio input	Provided	For details, refer the user manual of the product.

Sr. No.	Feature	APFC-07	APFC-03	TPFC-03	SPF-56	TPF-56	SPF-56 HT	Added Information
Reactive Power Compensation:								
33	Automatic Detection of Capacitor Bank Sizes.	-Not Provided-	Provided as part of Auto-Setup	-Not Provided-	Provided as part of Auto-Setup	-Not Provided-	-Not Provided-	Thyristor switching type due to high speed load change is recommended with only user setting.
34	Equal size Banks - Utilization	-Not Provided-	Equal utilization provided	Equal utilization provided	Equal utilization provided	Equal utilization provided	Equal utilization provided	Equal Utilization measurement is different with contactor switched type and solid state switch type. Refer point 22 above.
35	Declaring specific capacitor banks as fixed	-Not Provided-	Provided	Provided	Provided	Provided	Provided	
36	Capacitor Bank sizes range	1 kVAR to 1999 kVAR	1KVAR to 999KVAR	1KVAR to 999KVAR	1KVAR to 999KVAR	1KVAR to 999KVAR	50KVAR to 9999KVAR	
37	Reactive Power correction time	User adjustable from 60 Sec to 600 Sec	User adjustable from 1sec to 180sec	User adjustable in terms of supply cycles from 1 to 999.	User adjustable from 1sec to 180sec	User adjustable in terms of supply cycles from 1 to 999.	User adjustable from 1min to 120min	
38	Capacitor Banks Discharge time	User adjustable from 60 Sec to 600 Sec	User adjustable from 1sec to 240sec	-Not Applicable-	User adjustable from 1sec to 240sec	-Not Applicable-	User adjustable from 1min to 120min	
Fault Detection, Indication status & Protection Features:								
38	Under Voltage Capacitor Bank disconnect	User settable 70% to 99% of rated value	User settable 70% to 99% of rated value	User settable 70% to 99% of rated value	User settable 70% to 99% of rated value	User settable 70% to 99% of rated value	User settable 70% to 99% of rated value	
39	Over Voltage Capacitor Bank disconnect	User settable 120% to 101% of rated value	User settable 120% to 101% of rated value	User settable 120% to 101% of rated value	User settable 120% to 101% of rated value	User settable 120% to 101% of rated value	User settable 120% to 101% of rated value	
40	Over Frequency Cap. Bank disconnect	for 50Hz system 53Hz for 60Hz system 63Hz	for 50Hz system 53Hz for 60Hz system 63Hz	for 50Hz system 53Hz for 60Hz system 63Hz	for 50Hz system 53Hz for 60Hz system 63Hz	for 50Hz system 53Hz for 60Hz system 63Hz	for 50Hz system 53Hz for 60Hz system 63Hz	
41	Under frequency Cap. Bank disconnect	for 50Hz system 47Hz for 60Hz system 57Hz	for 50Hz system 47Hz for 60Hz system 57Hz	for 50Hz system 47Hz for 60Hz system 57Hz	for 50Hz system 47Hz for 60Hz system 57Hz	for 50Hz system 47Hz for 60Hz system 57Hz	for 50Hz system 47Hz for 60Hz system 57Hz	
42	Control Under-Voltage for switches actuation coil or due to Neutral floating	-Not Provided	-Not Provided	-Not Provided	Provided at 160Vac supply voltage value	-Not Provided	-Not Provided	This fault is declared as CF - Control voltage fault.
43	Over Temperature fault	Internally Factory Set	User settable 25 to 70Deg.C.	User settable 25 to 70Deg.C.	User settable 25 to 70Deg.C.	User settable 25 to 70Deg.C.	User settable 25 to 70Deg.C.	
44	Under Load fault Cap. Bank disconnect		User settable for any phase under Watt. 1% to 30% of rated VA.	User settable for any phase under Watt. 1% to 30% of rated VA.	User settable for any phase under Watt. 1% to 30% of rated VA.	User settable for any phase under Watt. 1% to 30% of rated VA.	User settable for any phase under Watt. 1% to 30% of rated VA.	
45	Voltage THD-F% increase Cap. Bank disconnect	Provided. Value user settable 1% to 8%	Provided. Value user settable 1% to 8%	Provided. Value user settable 1% to 8%	Provided. Value user settable 1% to 8%	Provided. Value user settable 1% to 8%	Provided. Value user settable 1% to 8%	
46	Load Current THD-F% increase Cap. Bank disconnect	Provided. Value user settable 5% to 50%	Provided. Value user settable 5% to 50%	Provided. Value user settable 5% to 50%	Provided. Value user settable 5% to 50%	Provided. Value user settable 5% to 50%	Provided. Value user settable 5% to 50%	For lower loading below 20% of rated value, the limit value is automatically increased X 3.

Sr. No.	Feature	APFC-07	APFC-03	TPFC-03	SPF-56	TPF-56	SPF-56 HT	Added Information
Fault Detection, Indication status & Protection Features:								
47	Supply System Over-Current		Indicative only. User settable 101% to 130%	Indicative only. User settable 101% to 130%	Indicative only. User settable 101% to 130%	Indicative only. User settable 101% to 130%	Indicative only. User settable 101% to 130%	
48	Specific Capacitor bank Unhealthy value detection and disconnect		Provided	Provided	Provided	Provided	Provided	Can be disabled by user setting
49	RTC + NV RAM back up battery Under Voltage warning.	-Not Applicable	-Not Applicable	-Not Applicable	Provided	Provided	Provided	
50	RTC + NV RAM back up battery faulty with stoppage of data log	-Not Applicable	-Not Applicable	-Not Applicable	Provided	Provided	Provided	
51	Self monitoring of PF controller internal hardware health status "I am OK" indication.	Provided	Provided	Provided	Provided	Provided	Provided	
52	Self monitoring of Internal NV RAM storage memory for healthiness and auto recovery.	-Not Applicable	-Not Applicable	-Not Applicable	Provided	Provided	Provided	
53	Supply Voltage transients protection through MOV for measurement & auxiliary supply.	Provided	Provided	Provided	Provided	Provided	Provided	
54	Provision for externally replacable fuses for Cap switching Relay contacts.	Provided	Provided	-Not Applicable.	Provided	-Not Applicable.	Provided	
55	Provision for externally replacable fuse for Auxiliary supply.	-Not Applicable	Provided	Provided	Provided	Provided	Provided	
Type Tests Compliance:								
56	EMC - Electro-Magnetic Compatibility as per IEC-61000-4-2,3,4,5,6,8,11	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	
57	EMI - Electro-Magnetic Compatibility as per CISPR-11	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	
58	Operating Temperature	0 to +55 Deg. C.	0 to +55 Deg. C.	0 to +55 Deg. C.	0 to +55 Deg. C.	0 to +55 Deg. C.	0 to +55 Deg. C.	
59	Storage Temperature	0 to +70 Deg. C.	0 to +70 Deg. C.	0 to +70 Deg. C.	0 to +70 Deg. C.	0 to +70 Deg. C.	0 to +70 Deg. C.	
60	Acceptable Relative Humidity range (Non-Condensing)	10% RH to 95%RH	10% RH to 95%RH	10% RH to 95%RH	10% RH to 95%RH	10% RH to 95%RH	10% RH to 95%RH	Non-Condensing R.H. is essential.
61	Mechanical protection class as IP-54 from front facia and IP-21 on back side	Provided	Provided	Provided	Provided	Provided	Provided	
62	ROHS - Compliance	Optionally provided	Optionally provided	Optionally provided	Optionally provided	Optionally provided	Optionally provided	
63	Voltage, Current, Power Energy Accuracy compliance	IS-14697 & IEC-62053 part 21 & 23	IS-14697 & IEC-62053 part 21 & 23	IS-14697 & IEC-62053 part 21 & 23	IS-14697 & IEC-62053 part 21 & 23	IS-14697 & IEC-62053 part 21 & 23	IS-14697 & IEC-62053 part 21 & 23	In measurement phases only, at Standard Ambient Room Temperature.

Sr. No.	Feature	APFC-07	APFC-03	TPFC-03	SPF-56	TPF-56	SPF-56 HT	Added Information
Data Logging & communication Features:								
64	Data Logging Feature	-Not Available	-Not Available	-Not Available.	Provided	Provided	Provided	
65	Data Logging Memory size				Suitable for 1hr data log for 4months period	Suitable for 1hr data log for 4months period	Suitable for 1hr data log for 4months period	
66	Interval data logging facility				Interval period can be user defined.			
67	Faults / Events logging facility				Past 500 fault / event	Past 500 fault / event	Past 500 fault / event	
68	Power Down event recording				Provided	Provided	Provided	
69	RTC accuracy				<1 min in 1month	<1 min in 1month	<1 min in 1month	RTC synchronisation with data communication
70	Communication Ports - RS-232, RS-485 (Half Duplex)	-Not Available.	-Not Available.	-Not Available.	2 communication ports RS-232 & RS-485(HD)	2 communication ports RS-232 & RS-485(HD)	2 communication ports RS-232 & RS-485(HD)	Pl. refer to User Manuals for details.
71	GSM/GPRS Modem compatibility	-Not Available.	-Not Available.	-Not Available.	Provided	Provided	Provided	
72	Provision for separate data downloading facility through portable unit	-Not Available.	-Not Available.	-Not Available.	Provided	Provided	Provided	
73	MOD-BUS-RTU protocol communication facility	-Not Available.	-Not Available.	-Not Available.	Provided	Provided	Provided	
74	PC end software support software for data view and analysis	-Not Available.	-Not Available.	-Not Available.	Provided	Provided	Provided	
75	Logged data Cloud based network support	-Not Available.	-Not Available.	-Not Available.	Provided	Provided	Provided	
Other Auxiliary & Support Features:								
76	Digital Inputs	None	1 no input	1 no input	1 no. input	1 no. input	1 no. input	
77	Digital Outputs	None	2 nos output	2 nos output	1 no. output	1 no. output	1 no. output	
78	Auxiliary supply Voltage range	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	100 Vac to 500 Vac	Wide I/P Range SMPS.
79	Automatic Synchronization with auto CT polarity detection.	Not provided	Provided	Not provided	Provided	Not provided	Not provided	
80	Manual (TEST) mode	Provided	Provided	Provided	Provided	Provided	Provided	
81	Display - LCD / LED	Custom LCD Display	LCD- Back Lit. 16 X 2	LCD- Back Lit. 16 X 2	LCD- Back Lit. 16 X 2	LCD- Back Lit. 16 X 2	LCD- Back Lit. 16 X 2	Auto-Off and On for LCD Back-Light.
82	User friendly 7 keyboard support.	Provided	Provided	Provided	Provided	Provided	Provided	
83	Output commands Relay Contact or Transistor rating / capacity.	250Vac 0.5Amp inductive	250Vac 0.5Amp inductive	12/24Vdc Transistor output 10mA.	250Vac 0.5Amp inductive	12/24Vdc Transistor output 10mA.	250Vac 0.5Amp inductive	Transistor Outputs are of "Current-Sourcing" Types.
Mechanical:								
84	Mounting	2 side clamps	2 side sliding clamps	2 side sliding clamps	4 side sliding clamps	4 side sliding clamps	4 side sliding clamps	
85	Front facia dimensions	96 mm x 96 mm	144mm X 144mm	144mm X 144mm	144mm X 144mm	144mm X 144mm	144mm X 144mm	Per DIN Standard for Panel-Mount Unit
86	Panel cutout size	92 mm x 92 mm	138mm X 138mm	138mm X 138mm	138mm X 138mm	138mm X 138mm	138mm X 138mm	
87	Material for housing	Standard Plastic	Fire retardant ABS	Fire retardant ABS	Fire retardant ABS	Fire retardant ABS	Fire retardant ABS	
Revision: 3.0 Dated: 28th Jan. 2017, Saturday.			Contacts: sales@taspowertek.com; marketing@taspowertek.com, kkshukla@taspowertek.com; tushar@taspowertek.com					