CETS

Designed for Reliability Manufactured to Last



Cost Effective Solution for

- Disturbance Control
- Harmonic Measurements
- Power & Energy Monitoring



CE

PMC-550J-H

Disturbance Controller for Lift, Escalator and Conveyor

PMC-550J-H is CET's latest offer to provide Smart Disturbance Control, UV protection, Power & Energy monitoring as well as Harmonic measurements for elevators and escalators for today's Smart City applications in a single integrated device.

- Reduce Down Time
- Shorten Restoration Time
- Minimize Operating Cost
- HKBEC Compliance

Feature Highlights

- Smart Disturbance Control logic
- Enhanced Power Supply with ride-through capability for Voltage Dips
- Harmonic Measurements up to 31st order
- Max. Demands for This Month and Last Month
- High-accuracy Power/Energy measurements
- 64 events time-stamped to 1 ms resolution
- 8xDI, 5xDO and optional AO (4-20mA) for monitoring and control
- RS-485 port, Modbus-RTU protocol
- Metal housing for improved heat dissipation and EMC performance
- Dot-Matrix LCD display



Features Summary

Disturbance Monitoring & Control
- UV Protection
- Auto-restart process with Digital Inputs
- Auto-restart process through optional Current Transducer

Basic Measurements
- VLL and Current per phase
- Total kW, kvar
- kWh, kvarh Import/Export
- Max. Demands for This Month and Last Month
- Frequency
- Optional Neutral (In) & Residual Current (Ir)

PQ and Harmonic Monitoring
- Current Unbalance and Phase Angles
- Displacement PF
- THDV & THDI, Ind. Harmonics up 31st order (Compliance with HKBEC THD measurement req.)

Input & Output Channels
- 8xDigital Inputs
- 5xDigital Outputs
  Contact Rating:
  - DO1 - 250V AC/30V DC, 8A
  - DO2 to DO5 - 250V AC/30V DC, 5A
- 1xAnalogue Output (Optional)
  Output range: (4-20)mA

SOE Log
- 64 events time-stamped to 1 ms
- DI status changes, DO operations
- Control events & action times

Communication
- 1xRS-485, Modbus Protocol

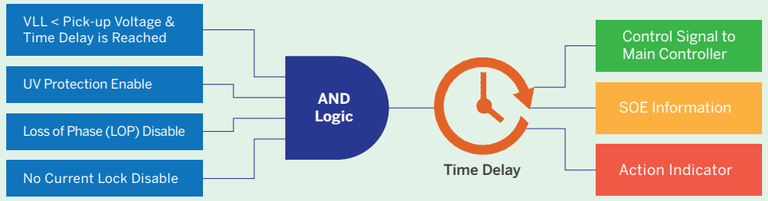
Ia = 1223.804A 346°	This time max demand	
Ib = 1221.791A 226°	S = 0.102kVA	
Ic = 1222.709A 107°	17/03/30 09:30:00:000	
3I0 = 0.126A		
Uab = 402.324V	Ia THD = 20.00%	
Ubc = 402.359V	Ib THD = 21.00%	
Uca = 402.853V	Ic THD = 22.10%	
f = 49.98Hz		
P = 826.19kW	Uab THD = 3.00%	
Q = 64.74kvar	Ubc THD = 4.10%	
S = 828kVA	Uca THD = 3.50%	
PF = 0.973		



Typical Applications

1. UV Protection

When there is a reduction of motor's supply voltage, the produced torque will decrease proportionately. The UV protection is designed to trip the motor to protect it from being damaged when the line voltage is less than the pick-up value for a duration longer than the preset time delay. With its built-in ride-through capability, the PMC-550J-H can sustain normal operation during a voltage dip event for up to 30 seconds and is designed to replace the traditional Phase Monitoring (PM) relay to avoid unnecessary machine stoppage due to relay contact drop-out during a PQ event. Therefore, the PMC-550J-H helps to reduce down time as well as maintenance and operating costs.

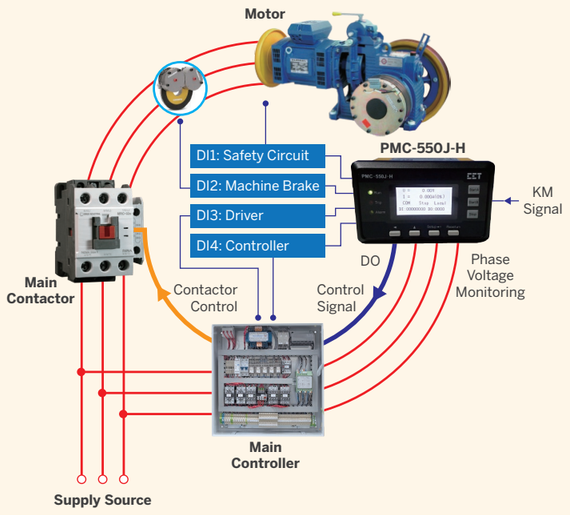


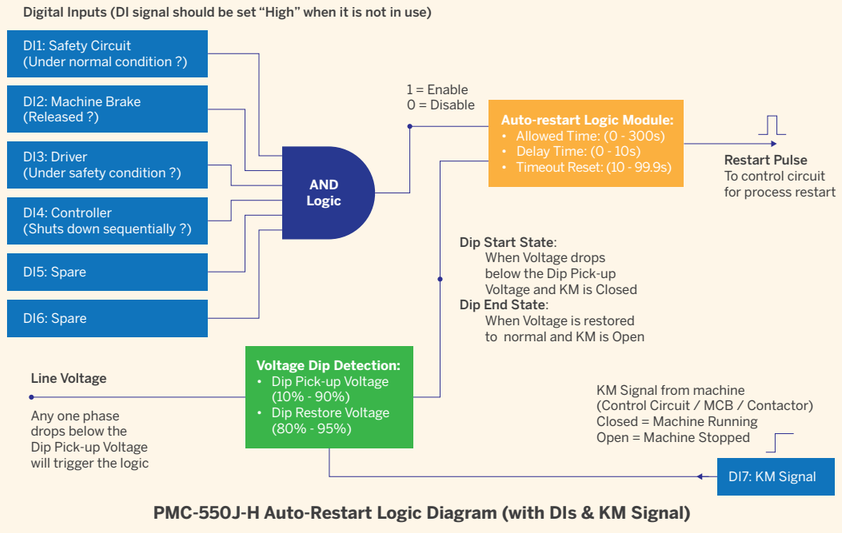
UV Protection Logic Diagram

UV Protection Setup Instruction
- The primary and secondary nominal voltage should be set correctly according to the system voltage.
- The UV protection feature should be set ON.
- Set the required Pick-up Voltage and Delay Time such that a voltage dip below the Pick-up Voltage that lasts longer than the Delay Time will initiate a Trip command.
- Configure the Digital Output to "Trip-alarm" mode.
- Assign the logical output signal to a Digital Output and set the required pulse width (e.g. Setup => Digital outputs => Pulse Width => 1s).
- Set "No. I lock" = OFF and "LOP" = OFF if these 2 functions are not in use.

2. Auto-restart Process with Digital Inputs

The PMC-550J-H is designed to provide built-in logic for an Auto-restart process after a voltage interruption is detected where the machine is forced to stop for safety reason when the voltage interruption exceeds the threshold settings. When the supply voltage is restored, the machine status such as the Completion of Shutdown Process, Control Logic Condition, Safety Circuit Condition, and Machine Brake Condition can be detected through the PMC-550J-H's Digital Inputs to validate the conditions for initializing the Auto-restart process, which will result in shortened restoration time and the reduction of manpower as well as operating costs.





PMC-550J-H Auto-Restart Logic Diagram (with DIs & KM Signal)

Disturbance Start and End Determination
- **Dip Start State:** When Line Voltage drops below the Dip Pick-up Voltage and the KM signal is "CLOSED", Auto-restart logic begins.
- **Dip End State:** When Line Voltage is restored to normal and the KM signal is "OPEN" after the Delay Time (machine is stopped), the Auto-restart logic continues to monitor the Digital Inputs until the Reset Timeout is reached. If the KM signal is still "CLOSED" (machine is running), no action is taken and the Auto-restart logic is re-initialized.

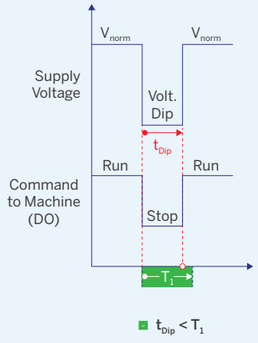
External Status Monitoring through DIs
- **If the output of the AND Gate is "1"** within the Reset Timeout duration, the Auto-restart logic will send a Restart Pulse.
  After sending the Restart Pulse, the Auto-restart logic will continue to monitor the KM signal until the Reset Timeout is reached.
  The SOE records "Restart Succeeded" when the KM is "CLOSED". The Auto-restart logic is then re-initialized.
  The SOE records "Restart Failed" when the KM is "OPEN" after the Reset Timeout has been reached. The Auto-restart logic is then re-initialized.
- **If the output of the AND Gate is "0"** after the Reset Timeout has been reached, the SOE records "Restart Timeout", and then the Auto-restart logic is re-initialized.

Maximum Allowable Time for Logic
- **Allowed Time > 0:** If the overall monitoring and logic process takes longer than the Allowed Time setting, the SOE records "Max Time Exceeded" and then the Auto-restart logic is re-initialized.
- **Allowed Time = 0:** The allowed time is infinite. The device will keep monitoring for a long duration power outage and react according to the Auto-restart logic. In order to maintain the logic operation for this application, the device should be powered by a UPS.

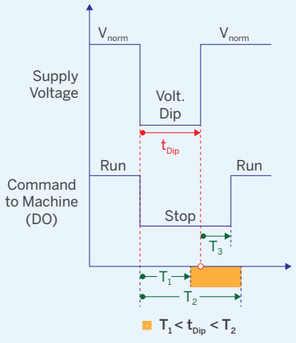
3. Auto-restart Process with Optional Current Transducer

This process works together with optional Current Transducer for motor current detection to determine the motor status. The Auto-restart will only be initialized when the motor is confirmed to be in OFF state. 3 possible scenarios will be handled by the PMC-550J-H when the supply voltage drops below the pick-up voltage.

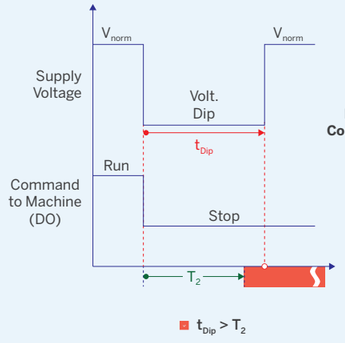
Scenario 1
If the Voltage Dip duration is shorter than the Quick Restart Time (T_1), then a restart command will be sent immediately.

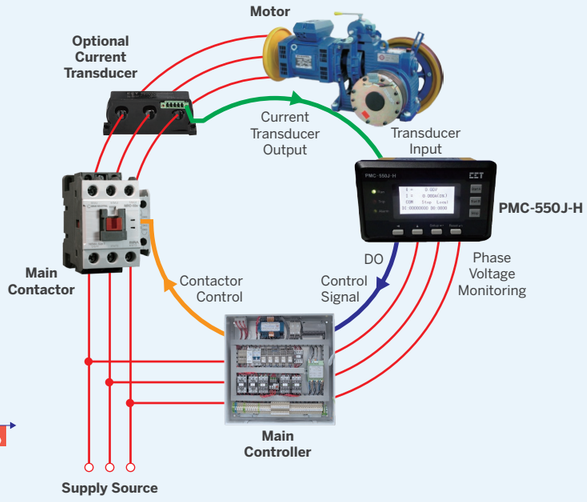


Scenario 2
If the Voltage Dip duration is longer than the Quick Restart Time (T_1) but within the Maximum Allowable Restart Time Limit (T_2), then a restart command will be sent after a time delay (T_3).

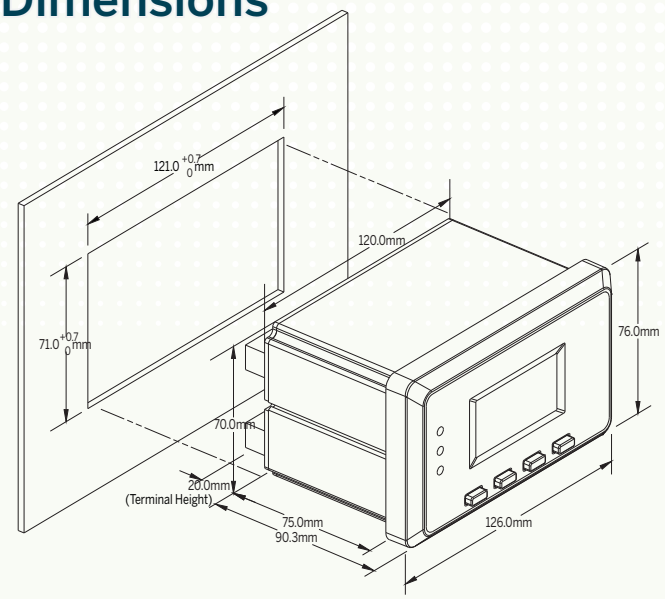


Scenario 3
If the Voltage Dip duration is longer than the Maximum Allowable Restart Time Limit (T_2), then NO restart command will be sent.





Dimensions



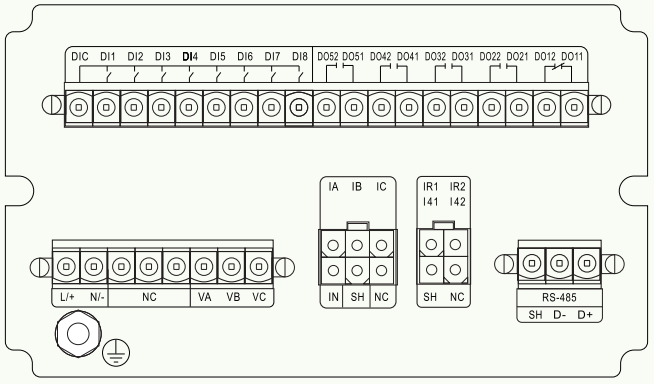
Technical Specifications

Power Supply	
Standard	88-264V AC/DC
Optional	Enhanced Power Supply (Ride-Through Capability)
Burden	<5W

Voltage Inputs	
Standard (Vn)	380VLL, 690VLL
Range	10V to 456V for 380VLL 10V to 828V for 690VLL
Overload	1.2xVn continuous, 1.4xVn for 10s
Burden	<0.75VA per phase
Frequency	50/60Hz

Current Inputs		
Standard (Ie)	Plug-in Current Sensor: PMC-MTA	800A/400A/300A/ 100A/25A/5A/1A
Range	0.05 to 1.2Ie	
Overload	2xIe continuous, 10xIe for 10s, 40xIe for 1s	

DI & DO	
DI1 - DI8	Voltage Free, Dry Contact, 24VDC Internally Wetted
DO1	Normally Closed, 8A @ 250VAC or 30VDC
DO2	Normally Open/Closed, 5A @ 250VAC or 30VDC
DO3 - DO5	Normally Open, 5A @ 250VAC or 30VDC



Electromagnetic Compatibility	
Burst Immunity	IEC 60255-22-1 Level III
Electrostatic Discharge	IEC 60255-22-2 Level IV
Radiated Fields	IEC 60255-22-2 Level IV
Fast Transients	IEC 60255-22-4 Level A
Surges	IEC 60255-22-5 Level IV
Conducted Disturbances	IEC 60255-22-6 Level III
Magnetic Fields	IEC 60255-22-7 Level A
Electromagnetic Emission	IEC 60255-25

Insulation Compatibility	
Dielectric Test	2kV @ 1 minute, IEC 60255-5
Insulation Resistance	>100MΩ
Impulse Voltage	5kV, 1.2/50μs

Mechanical Tests	
Vibration Test (Response/Endurance)	IEC 255-21-1:1988 Level I
Shock Test (Response/Endurance)	IEC 255-21-2 Level I
Bump Test (Response/Endurance)	IEC 255-21-2 Level I

MTA - Optional Current Transducers



PMC-MTA

MTA Model	Rated kW	Rated Current	Hole Ø
PMC-MTA-1A	< 0.4kW	0.2A - 1.0A	10mm
PMC-MTA-5A	0.4 - 2.2kW	1.0A - 5.0A	10mm
PMC-MTA-25A	2.2 - 12.5kW	5.0A - 25.0A	20mm
PMC-MTA-100A	12.5 - 50.0kW	25.0A - 100.0A	30mm
PMC-MTA-300A	50.0 - 150kW	100.0A - 300.0A	30mm
PMC-MTA-400A-T	120 - 200kW	240.0A - 400.0A	55mm
PMC-MTA-800A-T	160 - 400kW	320.0A - 800.0A	75mm

Ordering Information

Product Code											Description
PMC-550J-H											Disturbance Controller for Lift, Escalator & Conveyor
Language	E										English
	C										Chinese
Input Voltage			3								220-240V/380-415V
			6								380-400V/660-690V
Power Supply				2							88-264V AC/DC
				A*							88-264V AC/DC, Enhanced Power Supply
System Frequency					5						50Hz
					6						60Hz
I/O						A					8DI+5DO
						B*					8DI+4DO+1AO
						C*					6DI+5DO+1AO
Comm.							A				1xRS-485 Port
							C*				1xPROFIBUS-DP Port
Extra Function								A			I Residual Protection (Comm. Option A only)
								B			Zero-Sequence Current Protection, 1A or 5A (Comm. Option A only)
								X			No (Comm. Option C* only)
DO2 Type									A		Normally Open
									B		Normally Closed
PMC-550J-H	E	XW	3	A	5	A	A	B	A		PMC-550J-H-EXW3A5AABA (Standard Model)

* Additional charges apply

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