



**DESIGN QUALIFICATION  
PROTOCOL CUM REPORT  
FOR  
CARTON PACKING MACHINE**

<b>DATE OF QUALIFICATION</b>	
<b>SUPERSEDE PROTOCOL No.</b>	<b>NIL</b>



**DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

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QUALITY ASSURANCE DEPARTMENT

**DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

**1.0 PROTOCOL PRE – APPROVAL:**

**PREPARED BY:**

DESIGNATION	NAME	SIGNATURE	DATE
OFFICER/EXECUTIVE (QUALITY ASSURANCE)			

**REVIEWED BY:**

DESIGNATION	NAME	SIGNATURE	DATE
OPERATING MANAGER (QUALITY ASSURANCE)			
HEAD (ENGINEERING)			
HEAD (PRODUCTION)			

**APPROVED BY:**

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (QUALITY ASSURANCE)			



## **DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

### **2.0 OBJECTIVE:**

- To prepare the Design Qualification on the basis of URS, Purchase Order and information given by Supplier.
- The purpose of Design qualification is to ensure that all Critical Aspects of Process/Product requirement, cGMP and Safety have been considered in designing the equipment and is properly documented.

### **3.0 SCOPE:**

- The Scope of this Qualification Document is limited to the Design Qualification of Carton Packing Machine (Make: **ACG Pampac**).
- The equipment shall be operated under the dust free environment and conditions as per the cGMP requirements.
- The drawings and P & ID's provided by Vendor shall be verified during Design Qualification.

### **4.0 PROJECT REQUIREMENTS:**

To confirm that safe delivery of the equipment from the supplier site. To ensure that no unauthorized or unrecorded design modification shall take place.

If at any point in time, any change is desired in the mutually agreed design, change control procedure shall be followed and documented.



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**5.0 RESPONSIBILITY:**

The Validation Group, comprising of a representative from each of the following departments, shall be responsible for the overall compliance of this Protocol cum Report:

<b>DEPARTMENTS</b>	<b>RESPONSIBILITIES</b>
<b>Quality Assurance</b>	<ul style="list-style-type: none"><li>• Preparation, Review, Authorized and Compilation of the Design Qualification Protocol cum Report.</li><li>• Assist in the verification of Critical Process Parameters, Drawings as per the Specification.</li><li>• Review of Qualification Protocol cum Report after Execution.</li><li>• Co-ordination with Production and Engineering to carryout Design Qualification.</li><li>• Monitoring of Design Qualification Activity.</li></ul>
<b>Production</b>	<ul style="list-style-type: none"><li>• Review of the Design Qualification Protocol cum Report.</li><li>• Assist in the verification of Critical Process Parameters, Drawings as per the Specification.</li><li>• Review of Qualification Protocol cum Report after Execution.</li></ul>
<b>Engineering</b>	<ul style="list-style-type: none"><li>• Review of the Design Qualification Protocol cum Report.</li><li>• Assist in the Preparation of the Protocol cum Report.</li><li>• To co-ordinate and support the Activity.</li><li>• To assist in Verification of Critical Process Parameter, Drawings as per the Specification i.e.<ul style="list-style-type: none"><li>➤ GA Drawing.</li><li>➤ Specification of the sub-components/bought out items, their Make, Model, Quantity and backup records/ brochures.</li><li>➤ Details of utilities.</li><li>➤ Identification of components for calibration.</li><li>➤ Material of construction of all components.</li><li>➤ Brief Process Description.</li><li>➤ Safety Features and Alarms.</li></ul></li><li>• Review of Design Qualification Protocol cum Report after Execution.</li></ul>



## **DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

### **6.0 BRIEF EQUIPMENT DESCRIPTION:**

HI Cart plus is Continuous Motion cartoning Packing machine, Suitable for automatic Cartoning of Product Like Ampoule Bottle Tubes and blister . the Type of Machine meets the Need of The high Volume Production , Giving an Output of up to 180 Carton /minutes Depending upon Application .the Machine Performed following Function .

- Receive unit Product From upstream machine on Product Chain.
- Storing of pre Broken Carton in flat form in the Carton Magazine.
- Picking Up The carton from Carton Magazine with rotary Pick up System.
- Opening / erecting the Carton
- Rear Side Flaps Folding Before Product Pushing
- Loading Product
- Both side Carton Closing ( Front & Rear sides)
- Discharge Either to a Bin or to downstream Machine

#### **The machine consists of following Main Functional Areas:**

**A. Product Chain:** Product Chain transports the Product from Receipt area to the Pushing Area. Product in Feed occurs.

- On a Pair of Roller Supported , Double Transport Chains
- Guided in Plastic Plates.
- With adjusted Product Pockets

Individual Product Pocket can be adapted to the Product Size with an adjustment of Chain. Length of the Chain Extension is depends on application , Upstream integration and Room Layout

#### **Product Chain Extension:**

The product chain Extension is additional extension for the Product Chain. the Extension Provides Additional Space Between Transfer and Cartoning Machine for Customer Specific use i.e. For Manual Product Insertion Into the Product Chain.



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### B. Carton Chain:

The Carton Chain Transport open Carton from carton Landing to Carton Closing. Following Process take Place on the Carton Chain:

- Transfer and final Erection of the Cartons.
- Insertion of the Product and Leaflet.
- Folding of the side Flaps – front and Rear sides.
- Printing /embossing of the Flap.
- Carton Closing.

The Individual Chain Pocket can be adapted to the Carton Size with an Adjustment of Chain.

**Note:** Range of Carton Depending on Chain Configuration selected while order Finalization. Machine will be Based on the Customer Need Defined during order Finalization.

### C. Carton Loading Magazine :

The carton Magazine Hold Various Size of Carton .Magazine Parts can be adjusted Easily to Accommodation Various Sizes of Carton With the Help of Numeric scales. For each Type each size/ Type of Carton , Values Can be This Conveyor is Drive Intermittently, Though Unidirectional Bearing and Pneumatic Cylinder . A Pressure plate with a dead Weight put Constant Pressure on the Carton Stack . two Plunger Cylinder hold the Cartons During Carton Pick up. Two Cylinder are Provided, one another on the Bottom.

**D. Carton Pick up & Transfer System:** The carton are Picked up with pickup arms from the carton Magazine and Then Place it the Carton holder. Pick and Place is done by Vacuum , which is Generated either by air venture or Vacuum pump . Suction cups Mounted at the end of Sucker arm do Main pick up Function .these are Rubber Cups, flexible Enough with Cushioning Action makes Carton Pick up easy up arms driven Through the Main Motor and shaft, Oscillating Movement for pick up arms generated through Linkage in Connection with main Shaft. , Carton Vacuum Can be enabled or disabled from Main Screen of HMI.

An Integrated Carton Pre Breaking system Is provided along with the Carton Pick up System this unit open /from Carton Before Placing it on the Carton Chain Various Gears along with belt drive Rotates Rotary Pick unit . this Unit rotate Continuously . Sucker arms are mounted on Bracket, which in Turn Mounted on Rotary Pickup unit Through Small Gears.



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There are Three Vacuum & air Control Valve used in the Unit. Two Valve are Connected to the Vacuum Lines of the Sucker and one to the Pre- Breaker.

In Run Mode, Whenever the Product is not Present in any Pocket of the Product Chain or the Leaflet is not Released for some Pocket, the Signal is Sent to the Vacuum & air control Valve by a Sensor. Then the Valve for the Corresponding Sucker Operates, the Vacuum Is Vacuum is Not off and carton is Picked for the product Pocket in which the Product or Leaflet is not Present.

The Valve for the Pre Breakers Operation is Mode .the Position of the Sucker arm for which the vacuum in the Pre Breaker is to be Made on and off are Set.

Thus the operation the Position comes, making the Vacuum in the Pre Breaker On at the start of Pre Pre Braking and Cutting it OFF at the end of Pre Breaking.

Carton pre Breaking unit is Provided to Pre Break the Carton Before Placing them on the Carton Chain .

**E. Carton Positioning :** The Carton Position unit Consist of a Carton Toward the product Chain From Rear side of the Machine.

The Carton is pushed Forward in the Forward:

- The Carton Partially pushed Forward
- The Carton Pushed Forward Unit Flaps come in the Contact with the Outer surface of the Cell angle along with Their Full Length.

The side Flap Opener Opens the Side Flaps of the carton for Smooth Insertion of the Product from Product Chain Side.

**F. Rear Side Flaps Closing:** The Side Flap Closing Takes Places Between Carton Loading on the Carton Chain and product Pushing . Stationary Guide Close Left Side Flap and Folding Finger closes the Right Side Flap , Folding Finger is Moveable and Driven Through the Same Drives of Carton Positioning.

**G. Product Pushing system:** The Product Pushing system is Provided to Push the Carton. It Consist of Product Pusher That Push the Product and Leaflet into the Carton . Pushing Takes Places when Product and Carton Comes to the Insertion point.

Folded Leaflet Gets Release by the Leaflet Clamp at this Station and then Inserted into the Carton with the product.

Pusher assembly Consist of a Pusher With rod and pre Pusher . if Product gets Stuck in Between , due to some Reason , It Operates the Overload Safety switch that Stop the Machine .





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**H. Carton Closing :** After Slide Flaps Closing Carton system to Main Flap Closing station . front and Rear Flap Closing Takes Place Simultaneously in 3 step.

Flap Position for Closing is done by Creasing guide and guide Rod. These are arranged to blend locking flap with main flap.

**Pre- closing:** Pre closing and completed closing is done by tuck in closers. In pre closing , tuck in closer pushes the locking flap to lock the carton.

**Complete closing :** Pre closing and completed closing is done by tuck in closers. In pre closing , tuck in closer pushes the locking flap over the side flap to lock the carton

### **I. Carton Discharge**

The closed carton from the carton chain are transferred to the discharge belt. Discharge belt continuously carry these carton to the next point which may be either Collection bin or Line conveyor.

Discharge belt assembly includes two flat belts , driven through the main drive. Speed of both the belts is synchronized and slightly higher than the carton chain speed.

### **J. Empty Carton Rejection System**

This system is provided to detect and reject the empty carton from the discharge conveyor. A sensor is provided to detect the presence of the product in the carton .If the product is not available in carton , the sensor gives signal to the control system, and it operates an ejection lever, which is operated by a pneumatic cylinder. The rejected carton will then collected in a separate bin.

### **K. Printing Station**

This station has batch code embossing provision. A metallic roller holds embossing letters for coding on the carton flap. Carton flap is passed through the metallic roller and pressure roller to get the impressions of letters on the carton flap.



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**L. Pre- folded Leaflet Transfer System**

This attachment is provided to transfer the folded leaflet into the carton.

Pre folded leaflets are stored in magazine. The leaflets are picked up by the sucker arm and then transferred to the transfer belts. Belts carry these leaflets up to leaflet clamps with rotary turret. Then clamps along with chain carry these leaflets to the pusher station for insertion in the carton.



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**7.0 EQUIPMENT SPECIFICATION:**

Equipment Specifications are based on User Requirement Specification. The manufacturer of equipment ensures complies with User Requirement Specification.

**8.0 CRITICAL VARIABLES TO BE MET:**

**8.1 PROCESS/PRODUCT PARAMETERS:**

CRITICAL VARIABLES	ACCEPTANCE CRITERIA	REFERENCE
<b>Application:</b> Carton Packing Machine suitable for automatic products Packing.	Should be continuous and automatic	Process Requirement
<b>Working:</b> The machine works on vacuum and pressure principle.	Autocartoning of material should be highly accurate.	Process Requirement
<b>Electrical Control Panel</b>	The system should have Electrical Control Panel.	Design Requirement

**8.2 UTILITY REQUIREMENTS/LOCATION SUITABILITY:**

CRITICAL VARIABLES	ACCEPTANCE CRITERIA	REFERENCE
<b>Electrical Supply</b>	Voltage : 415 V Phase : 3 Phase Frequency : 50 Hz $\pm$ 10%. Power consumption : 6 kW max	GMP Requirement
<b>Room Condition</b>	Temperature NMT 25 °C RH : NMT 55 %	Process Requirement
<b>Compressed Air Consumption</b>	02 CFM for Carton ( with Vacuum Pump) 06CFM for Leaflet ( with Vacuum Venturi )	Process Requirement
<b>Incoming Cable</b>	5 core x 4 mm <sup>2</sup> Copper Cable	Process Requirement
<b>Air Pressure</b>	6 Bar	Process Requirement



**DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

**8.3 TECHNICAL SPECIFICATIONS/KEY DESIGN FEATURES:**

CRITICAL VARIABLES		ACCEPTANCE CRITERIA		REFERENCE
<b>Machine Specification</b>				
Machine Type		Continuous motion ,automatic carton packing machine		Design Requirements
Model		HICART PLUS		Design Requirements
Machine Number		HI630001336-10		Design Requirements
Output		Upto 180 cartons/min ,out put of the machine depends on the type of product to be packed, type and size of carton, leaflet/booklet and quality of carton and leaflet/booklets.		Design Requirements
Machine Weight ( Net)		2250 kg		Design Requirements
Machine Weight ( Gross)		3200Kg.		Design Requirements
Carton Size		Minimum	Maximum	
	Length	65mm	180mm	Design Requirements
	Width	20mm	75mm	Design Requirements
	Height	20mm	65mm	Design Requirements
Leaflet size (pre Folded)		Minimum	Maximum	
	Length	110mm	180mm	Design Requirements
	Folded width	20mm	35mm	Design Requirements
Leaflet Paper		45 to 60 GSM (Gram per square meter)		Design Requirements
Noise Level		80 db ( approx)		Design Requirements
Recommended Temperature Range		18 – 30 ° C		Design Requirements
Recommended Humidity		45- 60 % RH		Design Requirements
<b>Mechanical components</b>				
Vacuum Pump				
Make		Beaker		Design Requirements
Model		VT 4.40		Design Requirements



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CRITICAL VARIABLES	ACCEPTANCE CRITERIA	REFERENCE
<b>Main Motor</b>		
Make	Rotomotive ( 90 L-4)	Design Requirements
Model	Rating : 3 Phase , 415 V , 1.5 Kw , 3.5 A, 1400RPM	Design Requirements
<b>Gear Box for Main motor</b>		
Make	Rotomotive	Design Requirements
Model	ROBUS 21 ( Ratio = 1:10)	Design Requirements
<b>Servo Motor for Carton Positioning and Rear Flap</b>		
Make	Mitsubishi Electric	Design Requirements
Model	HG –KN23 Input : 3AC .119V, 1.3 A Output : 0.91 Kg , 3000 RPM, 200 W	Design Requirements
<b>Gear box carton Positioning and Rear Flap</b>		
Make	Shimpo- Nidec	Design Requirements
Model	EVB-060-8-K4-14BK14	Design Requirements
<b>Carton Chain Cluch</b>		
Make	Comintec	Design Requirements
Model	1.90 DSR/FAMS	Design Requirements
<b>Gear Box in front Truck in Unit</b>		
Make	KMT	Design Requirements
Model	1:2 90-5332	Design Requirements
<b>Gear Box in Rear Truck in Unit</b>		
Make	KMT	Design Requirements
Model	1:2 90-5332	Design Requirements
<b>Leaflet Transfer System</b>		
<b>Gear Box Leaflet Drive</b>		
Make	KMT	Design Requirements
Model	1:1-120-5330	Design Requirements
<b>Gear Box Leaflet Drive</b>		
Make	KMT	Design Requirements
Model	1:4-120-5331	Design Requirements
<b>ELECTRONIC COMPONENT</b>		



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<b>CRITICAL VARIABLES</b>	<b>ACCEPTANCE CRITERIA</b>	<b>REFERENCE</b>
<b>HMI</b>		
Make	Weintek Labs.	Design Requirements
Model	MT 8071 IE	Design Requirements
<b>Power Supply</b>		
Make	Omron	Design Requirements
Model	S8VK-C12024	Design Requirements
<b>PLC For Machine</b>		
Make	Mitsubishi Electric	Design Requirements
Model	FX 2N -16EX	Design Requirements
<b>PLC Card For Input</b>		
Make	Mitsubishi Electric	Design Requirements
Model	FX2N-16EX.	Design Requirements
<b>PLC Card For Output</b>		
Make	Mitsubishi Electric	Design Requirements
Model	FX2N-16EYT	Design Requirements
<b>Single Phase Preventer</b>		
Make	Omron	Design Requirements
Model	K8AK-PM	Design Requirements
<b>Tower Lamp</b>		
Make	Schnedier	Design Requirements
Model	XVGB3S	Design Requirements
<b>Encoder</b>		
Make	Kubler	Design Requirements
Model	8.5000.835A.3600.0050	Design Requirements
<b>Drive for Main Motor</b>		
Make	Danfoss	Design Requirements
Model	(VLT Micro Drive)	Design Requirements
Specification	Rating 1.5 kw, 2.0 HP	Design Requirements
<b>Servo Drive For Carton Positioning And Rear Flap Servo Motor</b>		
Make	Mitsubishi Electric	Design Requirements



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CRITICAL VARIABLES	ACCEPTANCE CRITERIA	REFERENCE
Model	MR-JE-20A	Design Requirements
<b>Pneumatic Component</b>		
<b>Air pressure switch</b>		
Make	Festo	Design Requirements
Model	SPAN-PIOR-G18M-PN-PN-L1	Design Requirements
<b>Carton holding Actuator on , Magazine</b>		
Make	Festo	Design Requirements
Model	DSR-16-180-P	Design Requirements
<b>Pusher Diverter Actuator</b>		
Make	Festo	Design Requirements
Model	DSR-12-180-P	Design Requirements
<b>Pneumatic Cylinder For Empty Carton rejection</b>		
Make	Festo	Design Requirements
Model	DSN-12-100-P	Design Requirements
<b>Pneumatic Cylinder Carton Top Support Cylinder (02 Nos.)</b>		
Make	Festo	Design Requirements
Model	DSBC-32-100-PPVA-N3	Design Requirements
<b>Vacuum Venturi For Leaflet Pickup</b>		
Make	Festo	Design Requirements
Model	VN-20-H-T6-PQ4-VQ5-RO2-M	Design Requirements
<b>Sensor</b>		
<b>Main motor home position check</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB5-180GM50-E2	Design Requirements
<b>Carton Low Level Check in Magazine</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB4-12GM50-E2	Design Requirements
<b>Leaflet Low level Check</b>		
Make	IFM	Design Requirements
Model	OJ5148	Design Requirements
<b>Leaflet Check Sensor</b>		



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<b>CRITICAL VARIABLES</b>	<b>ACCEPTANCE CRITERIA</b>	<b>REFERENCE</b>
Make	IFM	Design Requirements
Model	OJ5148	Design Requirements
<b>Handwheel Out Check</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB4-12GM50-E2	Design Requirements
<b>Carton Check</b>		
Make	IFM	Design Requirements
Model	OJ5148	Design Requirements
<b>Product Pusher Loading Safety</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB4-12GM50-E2	Design Requirements
<b>Sucker Arm Home Position Check</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB5-18GM50-E2	Design Requirements
<b>Half Product Insertion Check</b>		
Make	IFM	Design Requirements
Model	OJ5148	Design Requirements
<b>Empty Carton Rejection Check</b>		
Make	IFM	Design Requirements
Model	KB5004	Design Requirements
<b>Carton Chain Clutch</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB4-12GM50-E2	Design Requirements
<b>Carton Rear pusher home position check</b>		
Make	Pepperl & Fuch	Design Requirements
Model	NBB4-12GM50-E2	Design Requirements
<b>Guard Switches (04 Nos.)</b>		
Make	Telemecanique	Design Requirements
Model	XCJ-110	Design Requirements





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**8.4 MATERIAL OF CONSTRUCTION:**

S.No.	Parts Name	Material of construction
1.	Chain	MS
2.	Pockets Wall	Plastic
3.	Pusher	MS Hardened rods
4.	Drive and guide assembly	MS
5.	Magazine assembly	SS304, MS, EN9
6.	Carton chain and Flap folding assembly	MS, SS304 and alluminum
7.	Tuck in assembly	MS, SS304 and EN8
8.	Carton discharge assembly	MS, PU, SS304 and aluminum
9.	Interconnection assembly	PU belt and Aluminum section



**DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

**8.5 SAFETY FEATURES & ALARM :**

Description of Test	Message Displayed on HMI	Result of the Test
Emergency Switch pressed on HMI	Emergency Stop at Console	Machine should stop immediately
Emergency switch pressed on Discharge end	Emergency stop at discharge end	Machine should stop immediately
Emergency switch pressed on Infeed end	Emergency stop at infeed	Machine should stop immediately
Low Air Pressure	Air Pressure Below as per Set Limit	The Machine Should not start unless set air Pressure is Available
Carton Vacuum Off	Carton Vacuum Key is Off	Machine should not start
Leaflet Vacuum Key Off from HMI	Leaflet Vacuum off	Machine should not start
Hand wheel Out	Hand wheel out	Machine should not start
Product Not sensed	Product not sensed by sensor	The Leaflet will not picked up
Leaflet not Sensed	Leaflet not sensed by sensor	The Machine Should Stop as per Preset Count.
Carton Not sensed	Carton not sensed by sensor	Product Pusher will Get Diverted
Product as per set count in HMI not present	No Continuous Product	The Machine should stop as per set count
Leaflet as per set count in HMI not present	No Continuous leaflet	The Machine should stop as per set count
Cartons as per set count in HMI not present	No Continuous Cartons	The Machine should stop as per set count
Low Level carton	Carton Level is Low	Machine Should stop as per set count
Leaflet Low Level	Leaflet Low Level detected by Sensor	The Machine Should Stop as per Preset Count.
Half product insertion	Product is not Completely Pushed in the Carton	Machine should Stop immediately
Carton Chain Cluch Overload	Carton Chain Clutch Overload	Machine should Stop immediately



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Description of Test	Message Displayed on HMI	Result of the Test
Pusher Loading Safety	Loading Safety at Pusher	The Machine should Stop Immediately
Guard Open	Should be properly balanced and leveled.	Machine should Stop

**8.6 VENDOR SELECTION:**

Critical variables	Acceptance criteria	Reference
Selection of Vendor for supplying the Carton Packing Machine.	Selection of Vendor is done on the basis of review of vendor.  Criteria for review should include vendor background (general/financial), technical know how, quality standards, inspection of site, costing, feedback from market (customers already using the equipment)	Process Requirement

**Checked By**  
**Engineering**  
**Sign/Date:** .....

**Verified By**  
**Quality Assurance**  
**Sign/Date:** .....

**Inference:**

.....  
.....  
.....

**Reviewed By**  
**Manager QA**  
**Sign/Date:** .....



**DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

**9.0 DOCUMENTS TO BE ATTACHED:**

- Any other relevant documents.

**10.0 REVIEW (INCLUSIVE OF FOLLOW UP ACTION, IF ANY):**

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**11.0 ANY CHANGES MADE AGAINST FORMALLY AGREED PARAMETERS:**

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**12.0 RECOMMENDATION:**

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.....  
.....



**DESIGN QUALIFICATION PROTOCOL CUM REPORT FOR CARTON PACKING MACHINE**

**13.0 ABBREVIATIONS:**

cGMP	:	Current Good Manufacturing Practice
DQ	:	Design Qualification
GA	:	General Arrangement
CPM	:	Carton Packing Machine
HMI	:	Human Machine interface
LB	:	L Block
Kg	:	Kilogram
MCB	:	Miniature circuit breaker
MOC	:	Material of Construction
NMT	:	Not more than
P & ID	:	Piping and Instrumentation Diagram
PO	:	Purchase Order
RH	:	Relative Humidity
SS	:	Stainless Steel
URS	:	User requirement specification



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**14.0 REVIEWED BY:**

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (ENGINEERING)			

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (PRODUCTION)			

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (QUALITY ASSURANCE)			