ITC INDIA

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ELECTRICAL LABORATORY- TEST REPORT

Safety of Machinery –Electrical Equipment of The Machines
Part 1: General Requirements

Test Report N°.....
Date of issue..... 28-10-2013
Sample date in..... 01-10-2013
Date of performance..... 01-10-2013 to 01-10-2013
Applicant.....
Customer.....

Sample description..... Control Panel for Decanter Machine
Customer reference..... N/A

Trade mark / Manufacturer..

Model / Type / Reference.... Type 2 Touch VFD PANEL DECANTER

Ratings..... 380-415V, 50/60 Hz, 30/7.5KW, 100A

Test method(s)..... BS EN 60204-1:2009

Overall verdict

Pass ☒
Fail ☐

BS EN 60204-1			
Clauses	Requirement – Test	Results – Remarks	Verdict
5.	**INCOMING SUPPLY CONDUCTOR TERMINATIONS AND DEVICES FOR DISCONNECTING AND SWITCHING OFF**		
5.1	**Incoming supply conductor terminations**		
	The electrical equipment of the machine shall have only one incoming supply connection	Single Incoming Supply	P
	Unless a plug is supplied it is recommended that the supply conductors are terminated at the supply disconnecting devices		N/A
	Neutral conductor "N" should be indicated in the technical documentation and label "N" is provided at neutral conductor		P
	There shall be no connection between neutral conductor and protective bonding circuit or combined PEN-terminals.		P
	All terminals of incoming supply shall be clearly marked	(Clear Indication for Supply Voltage Provided)	P
5.2	**Terminal for connection to external protective Earthing system**		
	Terminal for connection of external protective conductor provided and marked with "PE" or with graphical symbol ⏚ or by use of bicolor combination GREEN/YELLOW	Bolt provided for PE terminal & graphical symbol ⏚ applied	P
	Cross section of incoming PE conductor shall be according to table 1	In Compliance	P
5.3	**Supply disconnecting device**		
5.3.1	A supply disconnecting device shall be provided for each incoming supply to the machine.	MCCB provided for incoming supply	P
5.3.2	**The supply disconnecting device shall be one of the following:**		
	a) A switch-disconnector with or without fuses		N/A
	b) A disconnector with or without fuses, which has an auxiliary contact that in all cases causes switching device to break the load circuit.		N/A
	c) circuit breaker suitable for isolation	MCCB provided	P
	d) any other switching device in accordance with an IEC product standard for that device and which meets the isolation requirements of IEC 60947-1 as well as a utilization category		N/A
	e) Plug/socket combination for flexible cable supply		N/A

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5.3.3	**When supply disconnecting device is one of type from 5.3.2 a) to d) it shall fulfill all of the following requirements**		
	Isolates the electrical equipment from the supply and have one OFF and one ON position only & 'O' & 'I' marked	In compliance	P
	Switch shall have external operating means e.g. handle.		P
	Colour black or gray preferred	Black colour used	P
	Position indication which cannot indicates the OFF-position until all contacts are actually open	In OFF position the main supply is disconnected	P
	Locking means provided to lock in OFF-Position		P
	For Plug/Socket type		
	Have the sufficient switching capability		N/A
5.3.4	**Operating means**		
	Operating means shall be located between 0.6m and 1.9m above service level	In compliance	P
5.3.5	**Following circuits need not disconnected by supply disconnecting device.**		
	Lighting circuits during maintenance or repair		N/A
	Plug/socket-outlets exclusively used for maintenance or repair		N/A
	Under voltage protection circuits used for automatic tripping only at power supply failure		N/A
	Control circuits for interlocking purpose		N/A
	It is recommended that such circuits be provided with their own disconnecting devices		N/A
	Where such a circuit is not disconnected by supply disconnecting device		
	• Permanent warning label shall be appropriately placed		N/A
5.4	**Devices for switching off for prevention of unexpected start-up**		
	Means shall be provided to prevent unexpected start up	The control panel is provided with a key lock combination & the ON/OFF switch	P
	Suitable placed	In compliance	P
	Readily identifiable	In compliance	P
	Devices used for isolation function can be used for this purpose such as Disconnectors ,withdraw able fuse links		P

	Opening the enclosures possible only under one of the following conditions:		
	a) Use of a key or a tool. Special requirement for enclosed electrical operating area may apply. All parts that are still connected and can be touched shall be IP2X or IPXXB protected.	A key/tool is required to open the electric panel	P
	b) disconnections of live parts inside enclosure before enclosure can be opened		N/A
	A special device or tool as prescribed by the supplier can be used to defeat the interlock provided that:		N/A
	- Opening of disconnector possible at all times while interlock is defeated and lock the disconnecting device in the off position or - Prevent unauthorized closure of disconnecting device.		N/A
	- Upon closing the door, interlock is automatically restored		N/A
	- All live parts shall be IP2X or IPXXB		N/A
	If more then one door allows access to live parts, care must be taken, at implementation of this sub clauses		N/A
	All parts that are still live after switching off the disconnecting devices shall be at least IP2X or IPXXB .Such parts shall be marked with warning symbols	Warning symbols provided	P
c)	Opening without the use of a key or a tool and without disconnection of live parts shall be possible only when all live parts are protected against direct contact to at least IP2X or IPXXB. Where barriers provide this protection, either they shall require a tool for their removal or all live parts protected by them shall be automatically disconnected when the barrier is removed.		N/A
6.2.3	**Protection by insulation of live parts**		
	Live parts shall be completely covered with insulation, Insulation can be removed only by destruction, Insulation capable to with stand mechanical, chemical, electrical and thermal stress occurring under normal service conditions Paint, varnish lacquer etc. not used as insulation	All live parts are completely covered with insulation	P
6.2.4	**Protection of residual voltage:**		
	Live parts with residual voltage greater than 60V after the supply voltage has been disconnected shall be discharged to 60V within 5s after disconnection Except components with storage charge of 60 μ C		N/A
	Where this specified rate of discharge would interfere with the proper functioning of the equipment, a durable warning notice		N/A

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	improper method of operation, that are anticipated		
	Detailed information provided on methods for equipment programming, program verification and additional safety procedures		N/A
17.8	**Maintenance manual**		N/A
	Technical documentation shall contain a maintenance manual, detailing proper procedures for adjustment, servicing or preventive inspection and repair		N/A
	Recommendations regarding maintenance or service records are part of it.		N/A
	Methods for the verification of proper operation provided.		N/A
17.9	**Parts list**		N/A
	The parts list shall comprises as a minimum information for ordering of spares or replacement parts		N/A
	The parts list shall show for each item		N/A
	• Reference designation used in documentation and type designation		N/A
	• supplier and alternative sources where applicable		N/A
	• general characteristics where appropriate		N/A
18	**VERIFICATION**		
18.1	Verification, that electrical equipment is in compliance with the technical documentation		N/A
18.2	**Verification of conditions for protection by automatic disconnection of supply**		
	Verification of conditions for protection by automatic disconnection of supply shall be verified by tests		
	• To be done by the manufacturer of the machine		P
	• To be done on site when the machine is installed		P
	The disconnecting time should be as per Table A.1 of annex A		N/A
	• Ground bond test with 10A and 24V and resistance should be less then 0.1Ω	 Measured Resistance is 23.1mΩ	P

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18.3	**Insulation Resistance test**		
	Insulation resistance measured with 500V DC between power circuit conductors and PE circuit is to be 1 MΩ. Test made on individual sections of complete electrical installation	 Measured resistance value is 2MΩ	P
18.4	**Voltage test**		
	Electrical equipment should withstands a test voltage applied twice the rated equipment or 1000V whichever is higher for 1 sec.	 No voltage break down and no flashover occur	P
18.5	**Protection against residual voltage**		
	Tests for protection against residual voltages are performed to ensure compliance with Cl. 6.2.4		N/A
18.6	**Functional tests**		
	The functions of electrical equipment shall be tested		P

BS EN 60204-1			
Clauses	Requirement – Test	Results – Remarks	Verdict

Test Results:

Sr. No	TEST CONDUCTED	TEST CONDITIONS	TEST REQUIREMENTS	RESULTS
01	HIGH VOLTAGE TEST	Test voltage: 1KV/50 Hz Test Duration: 1second Test Part: Between conductors of all circuits & protective bonding circuit.	Shall withstand without breakdown	P
02	INSULATION RESISTANCE TEST	Test Voltage: 500V D.C Test part: Between power circuit conductors & protective bonding	Shall not be Less than 1 MOhm	P (Rmeas→2MΩ)
03	EARTH CONTACT RESISTANCE TEST	Test Current: 10A/24V Test Part: Between protective earth terminals and body that is part of the protective bonding circuit.	Calculated Earth Contact Resistance from current & drop in voltage shall not exceed 0.1 ohm	P (Rmeas→ 23.1mΩ)
		Test Current: 10A/24V Test Part: Between protective earth terminals and door that is part of the protective bonding circuit.		P (Rmeas→24.1mΩ)

REMARKS:

1. All the tests conducted as per the standard specification.
2. The test results pertain to the sample submitted for testing.
3. Abbreviations used:

Info - Information, Mfr. – Manufacturer, NM – Not Mentioned, IP- Ingress Protection, Cl. – Clause, Temp. – Temperature, Ckt. – Circuit, amb. – Ambient, Sr. No. – Serial number, N/A-Not applicable, P-Pass

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