

Test Report:	No. 900520
Report date:	16.09.2026
Manufacturer:	Danfoss (Tianjin) Ltd No. 9 Quanhui Road, Wuqing Development Zone, Tianjin, 301700
Product name (trade mark/model/type/article) of sample(s):	Valves
Standard(s) establishing requirements and/or test methods, information on amendments:	TR CU 010/2011 "On Safety of Machinery and Equipment"
The test results in this report apply only to the submitted sample(s). Reproduction or reprinting of the test report without permission of the testing laboratory is not permitted.	

Test conditions:	
Air temperature, °C	20 ± 5
Relative air humidity, %	30 ÷ 80
Atmospheric pressure, kPa	84 ÷ 115

Test results

TR CU 010/2011 "On Safety of Machinery and Equipment"

GOST 12.2.003		
Clause	Requirements / tests	Result
2	GENERAL SAFETY REQUIREMENTS	—
2.1.	Requirements for the design and its individual parts	—
2.1.1.	Materials used in the design of production equipment shall not have dangerous or harmful effects on people under all specified operating modes and intended service conditions, or create fire and explosion hazards.	Pass
2.1.2.	The design of production equipment shall prevent, in all intended operating modes, loads on parts and assemblies that may cause failure and present a hazard to operators.	Pass
2.1.3.	The design of production equipment and its individual parts shall prevent falling, overturning or unintentional displacement under all intended operating and installation conditions.	Pass
2.1.4.	The design of production equipment shall prevent the falling or ejection of objects (such as tools, blanks, machined parts or chips) that may endanger operators, as well as the ejection of lubricating, cooling or other working fluids.	Pass
2.1.5	Moving parts of production equipment that may cause injury shall be guarded or positioned to prevent contact by the operator, or other protective means (such as two-hand control) shall be used to prevent injury.	Pass
2.1.6.	The design of clamping, gripping, lifting and loading devices, or their drives, shall prevent hazards in the event of complete or partial unintended loss of power and shall prevent unintended change of state when power is restored.	Pass
2.1.7	Structural elements of production equipment shall not have sharp corners, edges, burrs or rough surfaces presenting injury hazards, unless such features are required by their functional purpose.	Pass
2.1.8.	Parts of production equipment (including hydraulic, steam and pneumatic pipelines, safety valves, cables, etc.) whose mechanical damage may create a hazard shall be protected by guards or located to prevent accidental damage by operators or maintenance equipment.	Pass

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Clause	Requirements / tests	Result
2.1.9.	The design of production equipment shall prevent unintended loosening or disconnection of fasteners of assemblies and parts, and movement of moving parts beyond the limits provided by the design, where this may create a hazardous situation.	Pass
2.1.10.	Production equipment shall be fire- and explosion-safe under the intended operating conditions.	Pass
2.1.11	The design of electrically powered production equipment shall include devices or means to ensure electrical safety.	Pass
2.1.11.1	Production equipment shall be designed to prevent the accumulation of static electricity charges at levels hazardous to the operator and to prevent fire and explosion.	Pass
2.1.13	Production equipment that is a source of noise, ultrasound or vibration shall be designed so that, under intended operating conditions and modes, noise, ultrasound and vibration do not exceed the permissible levels established by standards.	Pass
2.1.14	Production equipment whose operation is accompanied by the release of harmful substances (including fire- and explosion-hazardous substances) and/or harmful microorganisms shall include built-in removal devices or allow connection of external removal devices.	Pass
2.1.15.	Production equipment shall be designed so that exposure of operators to harmful radiation is eliminated or limited to safe levels. When laser devices are used, it is necessary to:	—
	prevent unintended radiation;	N/A
	shield laser devices so as to eliminate any hazard to operators health.	N/A
2.1.16	The design and/or placement of production equipment shall prevent contact of combustible parts with fire- and explosion-hazardous substances where such contact may cause fire or explosion, and shall prevent operator contact with hot or excessively cold parts or close proximity to such parts where injury, overheating or overcooling may result.	N/A
2.1.17	The design of production equipment shall eliminate hazards caused by splashing of hot processed materials and/or substances used during operation.	Pass
2.1.18	Production equipment shall be equipped with local lighting where its absence may cause eye strain or other hazards.	N/A

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2.1.19	The design of production equipment shall prevent errors during installation that may create a hazard.	Pass
2.1.19.1	Pipelines, hoses, wires, cables and other connecting parts and assemblies shall be marked in accordance with installation diagrams.	Pass
2.2.	Requirements for workplaces	—
2.2.1	The design of the workplace, its dimensions and arrangement of elements (controls, information displays, auxiliary equipment, etc.) shall ensure safety during intended use, maintenance, repair and cleaning of the production equipment and comply with ergonomic requirements.	Pass
2.2.2	The dimensions of the workplace and arrangement of its elements shall allow operations to be performed in comfortable working postures without restricting operator movement.	Pass
2.2.3.	When designing the workplace, provision shall be made for work in a seated position or alternating seated and standing positions, where the operations do not require constant movement of the operator.	Pass
2.3.	Requirements for the control system	—
2.3.1.	The control system shall ensure reliable and safe operation in all intended operating modes of the production equipment and under all external influences specified by the operating conditions.	Pass
2.3.2	The production equipment control system shall include means for emergency braking and emergency stop (shutdown) where their use can reduce or prevent a hazard.	Pass
2.3.3	Depending on the complexity of control and monitoring of the equipment operating mode, the control system shall include means for automatic normalization of the operating mode or automatic stop where a mode disturbance may create a hazardous situation.	Pass
	The control system shall include alarms and other information means warning of malfunctions of production equipment that may lead to hazardous situations.	Pass
	The design and location of warning devices for hazardous situations shall ensure clear, reliable and rapid perception of information.	Pass
2.3.4	The control system of a technological complex shall prevent hazards arising from the joint operation of all units of production equipment included in the complex, as well as in the event of failure of any unit.	Pass

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2.3.5.	The control system of an individual unit of production equipment included in a technological complex shall have devices enabling, where necessary (for example until maintenance is completed), the start of the technological complex to be blocked and its operation to be stopped.	Pass
2.3.6	The central control panel of a technological complex shall be equipped with alarms, a mimic diagram or other means of displaying information on malfunction of all units forming the complex, and with emergency stop (shutdown) means for the whole complex and for individual units, provided stopping individual units does not aggravate the emergency situation.	Pass
2.3.7.	The central control panel shall be located or equipped so that the operator can verify that no persons are in hazardous zones of the technological complex, or the control system shall be designed so that the presence of persons in a hazardous zone prevents operation of the complex, and each start shall be preceded by a warning signal of sufficient duration for a person in the hazardous zone to leave it or prevent operation.	Pass
2.3.8.	Command devices of the control system (hereinafter: controls) shall be:	—
	1) easily accessible and clearly identifiable, and, where necessary, marked by inscriptions, symbols or other means;	Pass
	2) designed and located to prevent inadvertent actuation and ensure reliable, confident and unambiguous operation, including when personal protective equipment is used;	Pass
	3) positioned with regard to required actuation forces, sequence and frequency of use, and importance of functions;	Pass
	4) designed so that their shape, dimensions and contact surfaces correspond to the method of gripping or pressing by the operator;	Pass
	5) located outside the hazardous zone, except for controls whose function requires the operator to be in the hazardous zone; in such cases additional safety measures shall be taken (for example reducing the speed of moving parts).	Pass
2.3.9.	Starting production equipment, and restarting it after a stop regardless of the cause, shall be possible only by operating the start control.	Pass
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	This requirement does not apply to restarting production equipment operating in automatic mode where restart after a stop is provided for by that mode.	N/A
	If the control system has several controls for starting the equipment or its individual parts and incorrect sequence of their use may create hazardous situations, the control system shall include devices preventing such situations.	N/A
2.3.10	After actuation, the emergency stop control shall remain in the stop position until reset by the operator; resetting it shall not start the production equipment.	Pass
	The emergency stop control shall be red and shall differ in shape and size from other controls.	Pass
2.3.11	Where the control system includes an operating mode selector, each selector position shall correspond to only one mode (for example adjustment, inspection, etc.) and shall be reliably fixed in each position where lack of fixation may create a hazardous situation.	Pass
	Where increased operator protection is required in certain operating modes, the selector in such positions shall:	—
	disable automatic control;	Pass
	allow movement of structural elements only while the operator continuously actuates the motion control;	Pass
	stop associated equipment if its operation may create an additional hazard;	Pass
	prevent operation of equipment parts not involved in the selected mode;	Pass
	reduce the speeds of moving parts involved in the selected mode.	Pass
2.3.12	Complete or partial interruption of the power supply and subsequent restoration, as well as damage to the power control circuit, shall not create hazardous situations, including:	Pass
	unintended start upon restoration;	Pass
	failure to execute an already issued stop command;	Pass
	falling or ejection of moving parts of production equipment and objects fixed to them (such as workpieces, tools, etc.);	Pass
	reduction in the effectiveness of protective devices.	Pass
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2.4	Requirements for protective means incorporated in the design and signalling devices	—
2.4.1	The design of protective means shall allow checking that they perform their intended function before and/or during operation of the production equipment.	Pass
2.4.2	Protective means shall continuously perform their intended function during operation of the production equipment or when a hazardous situation occurs.	Pass
2.4.3	The action of protective means shall not cease before the corresponding dangerous or harmful production factor has ceased.	Pass
2.4.4	Failure of one protective means or its element shall not stop the normal functioning of other protective means.	Pass
2.4.5	Production equipment incorporating protective means that must be switched on before operation and/or switched off after operation shall have devices ensuring this sequence.	Pass
2.4.6.	The design and location of protective means shall not limit the technological capabilities of production equipment and shall ensure ease of operation and maintenance.	Pass
	If the design of protective means cannot ensure all technological capabilities of the equipment, operator protection shall take priority.	Pass
2.4.7	The shape, dimensions, strength and rigidity of a protective guard and its position relative to guarded parts shall prevent impact on the operator from guarded parts and possible ejections (such as tools or machined parts).	Pass
2.4.8	The design of the protective guard shall:	—
	1) prevent unintended movement from the position providing operator protection;	Pass
	2) allow movement from the protective position only by use of a tool, or block operation of the equipment when the guard is in a position that does not provide its protective functions;	Pass
	3) allow the operator to perform intended actions, including observation of guarded parts where necessary;	Pass
	4) not create additional hazardous situations;	Pass
	5) not reduce labour productivity.	Pass
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2.4.9	Warning devices indicating danger shall be designed and located so that their signals are clearly visible and audible in the production environment to all persons exposed to danger.	Pass
2.4.10	Hazardous parts of production equipment shall be painted in signal colours and marked with the appropriate safety sign in accordance with applicable standards.	Pass
2.5	Design requirements contributing to safety during installation, transportation, storage and repair	—
2.5.1	Where lifting equipment is required during installation, transportation, storage or repair, the production equipment and its individual parts shall indicate the lifting attachment points and the lifting mass.	Pass
2.5.2	Lifting attachment points shall be selected with regard to the centre of gravity of the equipment or its parts so as to prevent damage during lifting and moving and ensure convenient and safe access to them.	Pass
2.5.3	The design of production equipment and its parts shall allow reliable securing on a transport vehicle or in packaging.	Pass
2.5.4.	Assemblies of production equipment that may move unintentionally during loading/unloading, transportation or storage shall have devices for securing them in a defined position.	Pass
2.5.5.	Production equipment and parts intended to be moved manually shall be equipped with devices (such as handles) for movement or have a shape convenient for hand grip.	N/A

Conclusion:

The submitted test samples comply with the requirements of TR CU 010/2011 "On Safety of Machinery and Equipment"



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