



ICS ice cleaning systems s.r.o.
Robotnícka 2192
01701 Považská Bystrica
Slovakia

+421 42 4261 135
support@ics-dryice.com
www.ics-dryice.com

Version : 24-01

Operator manual

Blasting machine IC-410

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1 Introduction and copyright

This operating manual explains the safe and defect-free usage of the IC-410 dry ice blasting equipment. Every person operating this equipment must have fully read and understood the instructions given in this manual before putting the equipment into operation. Please keep this manual safe and always at hand.

Failure to observe the procedures specified herein may lead to serious consequences both on the equipment and on its operators. The operator has to strictly observe the working procedures described herein. Any changes made to these work procedures have to be approved in writing by ICS Ice Cleaning Systems s.r.o.

The manufacturer of the equipment is not held responsible for damages caused to the system or generated by the system in the following cases:

- Improper handling.
- Failure to follow the operating instructions.
- Repairs by unauthorized personnel.
- Installation and replacement of non-original ICS parts.
- Inappropriate use.
- Operation by non-instructed personnel.

Any change in the operating procedure requires the written consent of the manufacturer of the IC-410:

ICS ice cleaning systems s.r.o.
Robotnícka 2192,
01701 Považská Bystrica
Slovakia

Phone: +421 (0)42 42 61 135

E-mail: info@ics-dryice.com

Copyright

The copyright to these operating instructions manual belongs to ICS Ice Cleaning Systems s.r.o.

This operating manual is intended for the operating and supervisory personnel. It contains regulations, illustrations and instructions, whose usage, fully or partially, by third parties is completely prohibited without an express written permission in this respect.




The illustrations are different equipment variants.

1.1 System identification

Machine identification plate location



EU identification plate

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Name:	Dry ice blasting machine	Type:	IC-410-S
Ser. number:		Manuf. date:	
AC volts:	230V AC / 50 Hz	Weight:	124 kg
Amps:	4 A	Pressure max:	16 bar
SSCR:	10 kA	MADE IN SLOVAKIA	

UL identification plate

  <small>web: www.ics-dryice.com tel: +421 42 4261 135 email: info@ics-dryice.com</small>  <small>ICS ice cleaning systems, s.r.o., Robotnícka 2192, 017 01, Považská Bystrica, Slovakia</small>			
Name:	Dry ice blasting machine	Type:	IC-410-S
Ser. number:		Manuf. date:	
AC volts:	110V AC / 60 Hz	Weight:	275 lb
Amps:	4 A	Pressure max:	230 psi
SSCR:	10 kA	MADE IN SLOVAKIA	

2 Safety instructions

The safety measures mentioned here are important for the health of users and persons involved, as well as for the risk-free use of the system.

Security and Risk

The IC-410 is designed to comply with the EC Declaration of Conformity for Machinery. Therefore, using the machine does not pose a risk to the operator when the instructions in this manual are followed.

It is important that the operator follows the safety signs posted on the machine and the safety regulations described in this manual and that the operator reads and understands the contents of this manual before starting up the machine.

The user is obligated to operate the IC-410 only in perfect condition.

Unauthorized modifications and alterations affecting the security of the IC-410 are not permitted.

2.1 General safety guidelines

Danger

- Intentional Misuse of Dry Ice May Be Harmful or Fatal.
- Dry ice is a skin and eye irritant. Avoid contact with skin, mouth, eyes, and clothing. May cause severe frostbite or burns.
- Dry ice is harmful if eaten or swallowed. If eaten, seek medical help immediately.
- Dry ice changes to CO₂ gas as it sublimates (melts). Do not use or store in a confined space.
- Do not place dry ice in airtight containers. Airtight containers may explode as dry ice converts to CO₂ gas.

CO₂ concentration

Risk of suffocation on account of carbon dioxide. Dry ice pellets are CO₂ in a solid form. At normal atmospheric pressure, CO₂ can only exist in a solid form at a temperature of -79°C/-110°F or lower. When CO₂ is used as a blasting medium, it becomes heated and changes into a gaseous form. As CO₂ has a higher specific gravity than ordinary atmospheric air, inhaled air will contain CO₂ – especially if the blasting process takes place in small or partly closed rooms. In such conditions there is a risk of the oxygen content of inhaled air being replaced by CO₂. Therefore, it is essential to make sure the room is well ventilated when dry ice blasting!

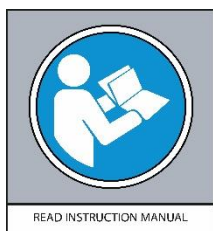
- low CO₂ concentrations (3-5%) result in headaches and rapid breathing,
- CO₂ concentrations of (7-10%) produce headaches and nausea, and may lead to unconsciousness,
- higher CO₂ concentrations lead to unconsciousness and in the worst case – suffocation.

As stated above, high CO₂ concentrations can displace oxygen and result in unconsciousness. Therefore, avoid using the dry ice blasting machine in spaces/rooms where ventilation is limited.

CO₂ detector

The presence of a CO₂ detector is recommended in areas of limited ventilation such as rooms, closed tanks, etc. The CO₂ detector must be installed to interrupt the blasting process before the CO₂ concentration exceeds a prescribed limit.

2.2 Symbols on the machine



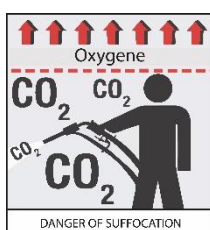
READ INSTRUCTION
MANUAL



DANGER OF INJURY
THROUGH CO2



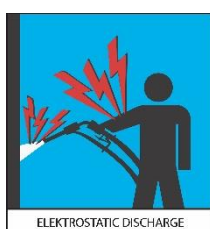
USE EYE AND EAR
PROTECTION



DANGER OF SUFFOCATION



WEAR GLOVES



ELECTROSTATIC DISCHARGE



WEAR LONG SLEEVED
INDUSTRIAL CLOTHES



DANGER OF INJURY
ICE TEMPERATURE -79 C

Note

If an immediate interruption of the blasting is necessary in case of emergency, press the

EMERGENCY switch!



2.3 Static Electricity

Dry ice can cause electrostatic discharges. However, the equipment is bonded to the ground to minimize electrostatic discharge, and the warning sign is meant to instruct the operator to avoid placing the equipment in rooms containing explosive gasses. It is recommended to use a plastic shovel in the dry ice container.



Serious discharge of static electricity can occur. Always make sure that objects to be cleaned are adequately earthed/grounded and that this earthing/grounding remains stable throughout the whole cleaning process. The dry ice blasting machine is earthed/grounded, from machine cabinet to blasting gun, and through the main electricity connection on the rear side of the machine – provided that the machine has been set up and connected as described under STARTING MACHINE.

The user should always wear safety footwear class S2 or higher in order to protect himself from the static charge.

Dangers can arise from the machine if it is used improperly by untrained personnel. All users must be aware of these safety points. Improper handling of the machine and / or dry ice can threaten health and life, or at least cause serious damage.

Persons having a pacemaker are **not allowed** to work with the dry ice blasting machine.



Explosive Hazard

Attention!

The machine must never be used in surroundings where there is a **danger of explosion**. Despite optimum earthing/grounding of both machine and cleaning object, static electricity can be generated and create a spark.



3 Process description

3.1 Dry ice cleaning advantages

There is one major difference between dry ice cleaning and any other conventional cleaning method: The surfaces of machines and systems are not attacked during the cleaning process.

How does dry ice blasting work?

Dry ice blasting is basically similar to sand blasting. The jet medium here are dry ice pellets - that sublime immediately when they hit the surface and return in the atmosphere as CO₂ gas. In the dry ice blaster, the pellets are dosed into a compressed air stream, accelerated to more than 150 m/s, and blasted through a jet hose with gun and nozzle onto the parts to be cleaned.

Dry ice cleaning removes:

- Paint/varnish
- Oil
- Grease
- Bitumen
- Dirt
- Bonding agents/parting agents
- Chewing gum
- Resin
- Ink
- Glue
- Tar
- Wax
- Silicone/rubber residues
- Graffiti
- and much more

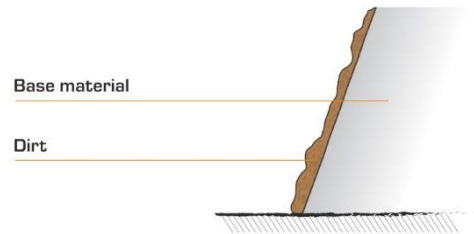


3.2 Process description

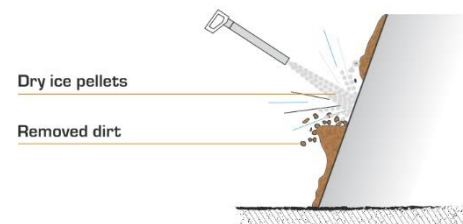
The dry ice blasting equipment IC-410 operates with granules of dry ice pellets ($\varnothing 3 \text{ mm}$), produced through the pressing of the CO_2 snow. The pellets are blasted on the surface to be cleaned. The dirt from the surface is frozen through thermal shock and it breaks because of the different expansion coefficients. The CO_2 granulate sublimates in the moment of impact from solid to gaseous state. Only the initial dirt remains behind.

The dry ice pellets in the hopper ($\varnothing 3 \text{ mm}$) will be mixed using a compressed air operated dosing system, transported through the hose and accelerated through the blasting nozzle, the pellets can reach the speed of sound (depending on pressure and blasting nozzle).

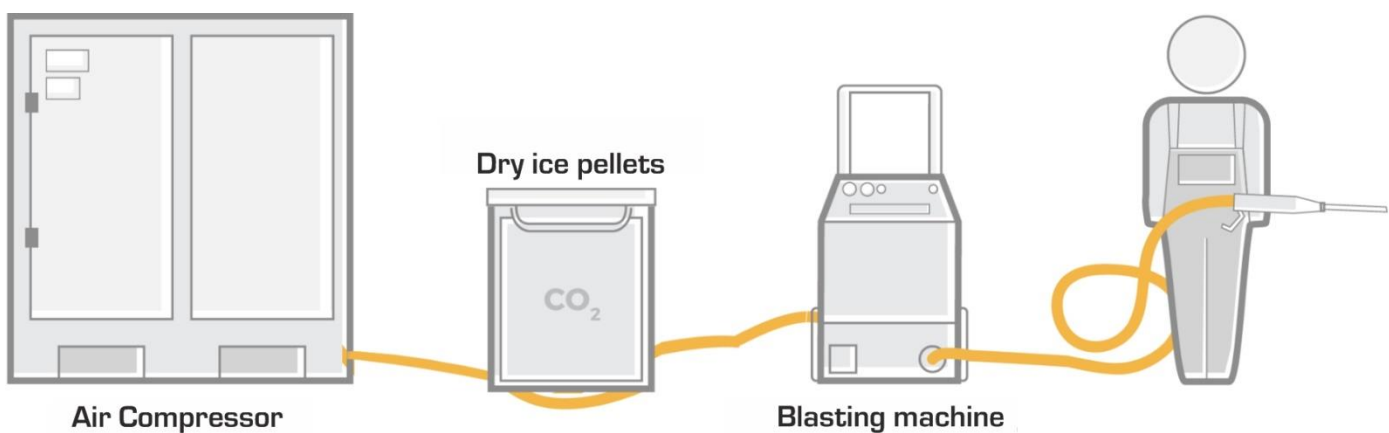
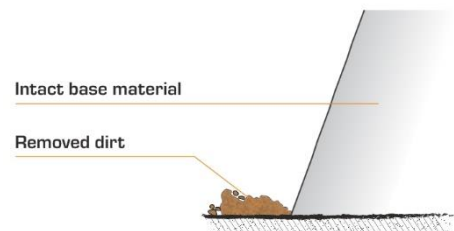
BEFORE CLEANING



DURING THE CLEANING PROCESS



AFTER CLEANING



4 Machine technical data

Technical data

Electrical connection		
Supply voltage	V	110- 230 VAC /N/PE
Nominal apparent power	W	300
Frequency	Hz	50
Cos ϕ		0,8
Short-Circuit Current Rating (SSCR)	kA	10
Leakage current, typ.	mA	7,5
Residual current device (RCD)	mA	30
Dimensions IC-410		
Width	mm /inch	540 /21
Depth	mm /inch	854 /34
Height	mm /inch	980 /38
Weight	kg /lb	124 /265
Contents of dry ice container	kg /lb	25 /55
Sound pressure level (EN 60704-1)	dB(A)	90 to 120
Compressed air		
Pressure supply min. - max.	bar /Psi	1-16 / 15- 230
Compressed air consumption	Nm ³ /min:	15 depend on nozzle

5 Setup and function

5.1 Unpacking the machine

The standard machine package will include:

- 7 m blast hose
- Personal protective equipment
- Blast gun IG-10-E
- Round nozzle RN-10-10
- Flex case II. PLUS
- LED light for gun IG-10-02
- 10 m compressed air hose ¾"
- Ice shovel (2kg /4,4lb capacity)

This machine has been assembled and tested as one unit prior to shipment. Follow the steps below to inspect and unpack the machine from the shipping container.

1. Examine the shipping container for any damages that may have occurred during transport.
2. Remove the machine. Recycle boxes and packaging.
3. Examine the machine for any external damage that may have occurred during transport.

Refer to the packing slip for a list of the components shipped with the machine. Contact ICS ice cleaning systems s.r.o. if any damage has occurred to the shipping container or the machine.

Only trained and /or certified personnel should operate or rig the machine for shipment or move.

5.2 Transport and storage

The following instructions are for proper transport of the machine. Follow all instructions as illustrated to avoid damaging the machine. It is recommended that only trained and qualified personnel use and move the machine.

- The handling handles on the machine for manual handling are marked in blue.

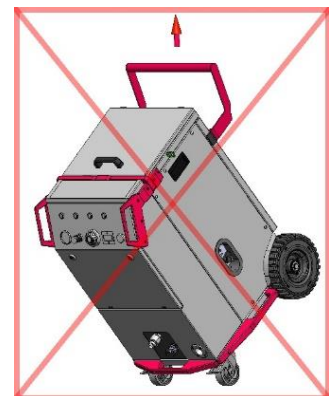


- Lifting the machine is allowed only according to the displayed image. A pair of transport bolts is used for lifting. Strapping the machine for long periods of time is not advised.



- It is forbidden to lift the device other than as shown in the picture.

Do not lift the machine using the front handlebar, upper handlebar, or the lower bumper as there will be no stability which could cause damage to equipment or harm to personnel.



5.3 Machine illustrations and labels

Front view



No	Name
1	Transportation holders
2	Control panel
3	Electrical cabinet
4	Back wheels
5	Front lockable wheels

Back view



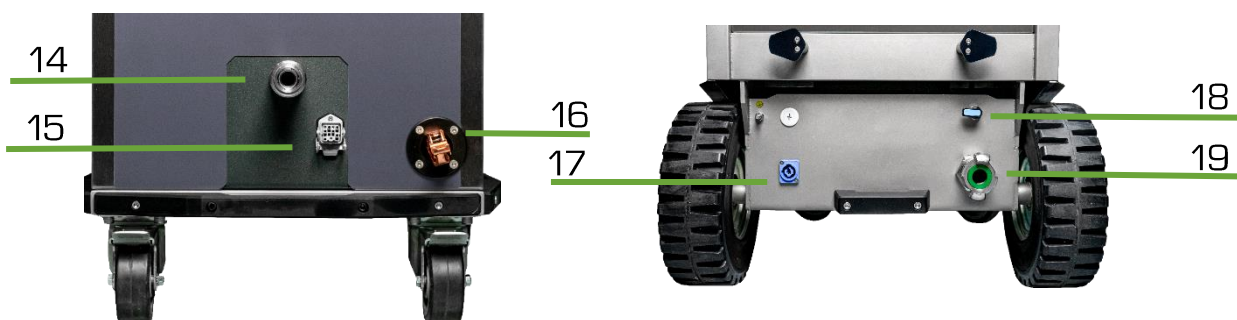
No	Name
6	Back manipulation handle
7	Front manipulation handle
8	Ground conductor, loose
9	Back foot manipulation handle

Side view



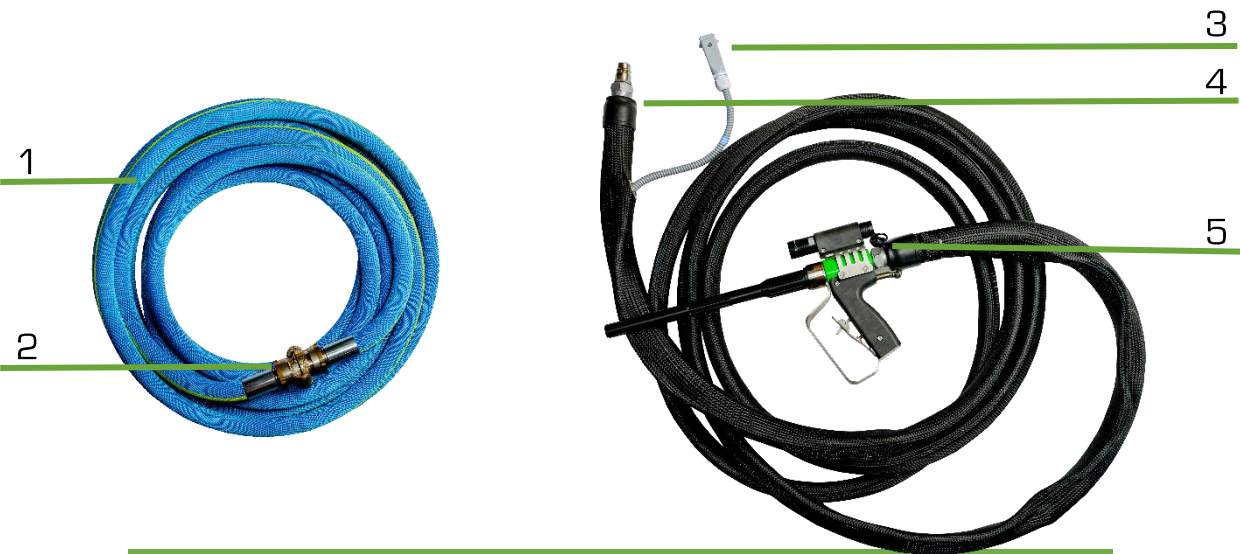
No	Name
10	Tiltable hooks for accessories
11	Removable side cover
12	Scrambler fine adjustment
13	Side holder

Front and back connection plate



No	Name
14	Blast hose connection point
15	Applicator Cord connection
16	Static Ground Reel
17	Inlet air connection
18	Emergency pressure air release valve
19	Air Supply Hose connection

5.4 Connection hoses



No	Name
1	Inlet air hose
2	Claw coupling
3	Signal cable to dry ice blasting machine
4	Hose coupling to dry ice blasting machine
5	Dry ice blasting gun

Dry ice blasting gun



No	Name
6	LED light
7	Signal cables coupling
8	Ergonomic handle
9	Two step trigger
10	Hand safety cover

5.5 Control panel label



No	Name
1	Scrambler On /Off
2	Machine On /Off
3	Reset emergency stop
4	Main switch
5	Early control sticker
6	Blasting pressure manometer
7	Blasting pressure regulator
8	Dry ice consumption adjustment
9	Dry ice consumption display
10	Emergency stop

5.6 Starting machine

1. Make sure the machine is on a level, horizontal surface, and that the wheel brakes are applied.
2. Connect the compressed air hose using **the claw coupling by rotating** the hose coupling in a clockwise direction until it snaps into place two times.
3. Insert the plug of the power cord and turn it to the right until it locks by itself. Insert the grounded plug in a suitable socket.
4. Connect the signal cable at both ends of the blasting hose with the sockets on the front of the machine and the blasting gun.

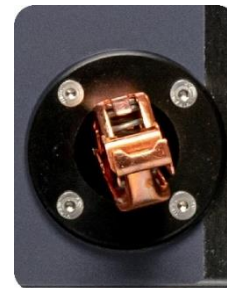
CORRECT ORDER IS IMPORTANT!

FIRST connect the blasting hose couplings, then the signal cable.

5. Check carefully to ensure that the dosing unit is dry and clean at the hopper outlet.

6. Open the external compressed air supply (slowly).

7. Machine is equipped with a Static ground Cable which is mounted on the front of the machine. Connect the Static Ground Cable to the item being blast cleaned or to an electrically conductive supporting structure of the material.



8. Control panel procedure:

Push "Main Switch" button.



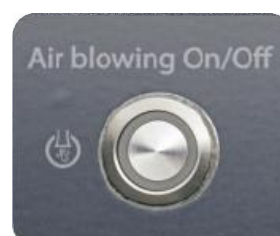
Release E-stop button then push "Reset" button.



Push "Machine On /Off" button
Wait 3 seconds to system initialization.



The blasting function can be initiated by pressing the
"Air blowing on /off" button.



Adjust Blasting pressure with manometer.



Adjust Pellets consumption over knob.



9. Lift the lock pin and activate the trigger on the blasting gun for a few seconds to allow air to flow through the system. This checks for moisture in the airstream and proper operation of the dosing disc, vibrator, and regulator.

Please note:

Before activating the blasting gun switch, the operator must be in a safe and stable working position. Depending on the jet pressure, the recoil on the jet gun also changes. At the highest jet pressure with the largest nozzle diameter, the recoil force can amount to 10 kg / 22 lbs, which is why it is ensured that the operator does not lose balance.

10. Place dry ice into the hopper and start the dry ice cleaning process.



5.7 Shutting down the machine

1. Empty the dry ice from the hopper.
2. Close the compressed air source.
3. Actuate the gun to release the residual compressed air.
4. Actuate the Off button.
5. Turn off the main switch.
6. Disconnect the power supply cable.
7. Detach the power plug and the air hose from the equipment.
8. Disconnect the hose package and roll it up.

6 Troubleshooting and maintenance

6.1 Preventive maintenance

Thanks to its practical structure, the IC-410 equipment only requires a very low maintenance.

For the IC-410 maintenance works should be performed on a regular basis at every 1,000 operating hours, and at least once a year. See the yearly control sticker.

We recommend concluding a maintenance contract with ICS Ice Cleaning Systems or with an ICS authorised partner.

6.1.1 Daily maintenance

1. Check the power supply cable and signal cable.
2. Pay special attention to places on the blasting hoses where kinks may have occurred during operation.

If any kind of damage to the blasting hose or the machine itself is noted, such damage must be repaired either by an ICS technician or by the owner's qualified personnel who has been trained by ICS in the repair and maintenance of dry ice blasting machines and accessories. Beyond the necessary knowledge, the person concerned must have appropriate tools and equipment, as well as the auxiliary materials required, at his disposal.

6.1.2 1000 hours maintenance

1. General visual inspection of body, weld joints, chassis, tires, screw seat .
2. If necessary, complete exterior and interior cleaning.
3. Checking the functioning of the inlet pressure regulator and pilot pressure regulator.
4. Cleaning control air filter; replacing filter.
5. Checking the pneumatic control elements, checking for leaks and replacing the shock absorber.
6. Complete electrical inspection, including contactors, voltage converter, frequency inverter, electric motor, firm seating of elements and terminals.
7. Checking the entire ice dosing system for signs of wear, if it is functional and leak-proof.
8. Checking the functioning and firm seating of the vibrator

9. Checking the ice loosening system, including the electro-pneumatic control, for signs of wear, if it is functional and safe for use.
10. Checking the hose package for signs of wear, if it is functional and leak-proof (pressing)
11. Checking the connecting elements, connectors and pneumatic couplings for signs of damage, if they are functional and safe for use.
12. Checking the blast gun if it is functional and safe for use.
13. Checking the existing blasting nozzles for signs of wear and cracks.
14. Pressure and safety test.
15. Functional test.
16. Blasting test.
17. Replacing the inspection and maintenance plates.

6.2 Faults

Problem	Description	Corrective action
The equipment cannot be started	The Reset button is lit despite actuation.	Unlock the Emergency Stop button by pulling it. Check the hopper grid for firm seating.
The equipment does not start	Nothing happens after the gun has been actuated.	Check whether the control line is blocked.
No air comes out from the gun	The equipment is running, but it does not blow out air.	Check the compressed air supply and the connection of the equipment and adjust the desired blast pressure at the equipment.
No ice comes out	After actuating the gun, only air and no ice comes out.	Place ice in the hopper. Set a minimum quantity of 10 kg/h.
The equipment is running, but no ice comes out	Ice is falling down on the lower part of the equipment	Blast pressure, amount of ice and the blasting tube are not optimally combined with one another and adjusted to each other.

7 Repair and Warranty

Please bear in mind that the works, including the inspection and maintenance works, especially at the safety devices, can be carried out only by an ICS technician or by a person who received special training for equipment and accessories of ICS Ice Cleaning Systems s.r.o. and who can present evidence in this respect.

The potential repairs necessary during the warranty period have to be agreed upon beforehand with ICS Ice Cleaning Systems.

The spare parts which fall in the warranty period are replaced either at our location or are sent to you. The transportation costs, travel costs and costs related to the stay, as well as those for the disassembly and reassembly fall on the client.

For the evaluation of the warranty, the component or the equipment shall be sent to ICS Ice Cleaning Systems.

Warranty conditions

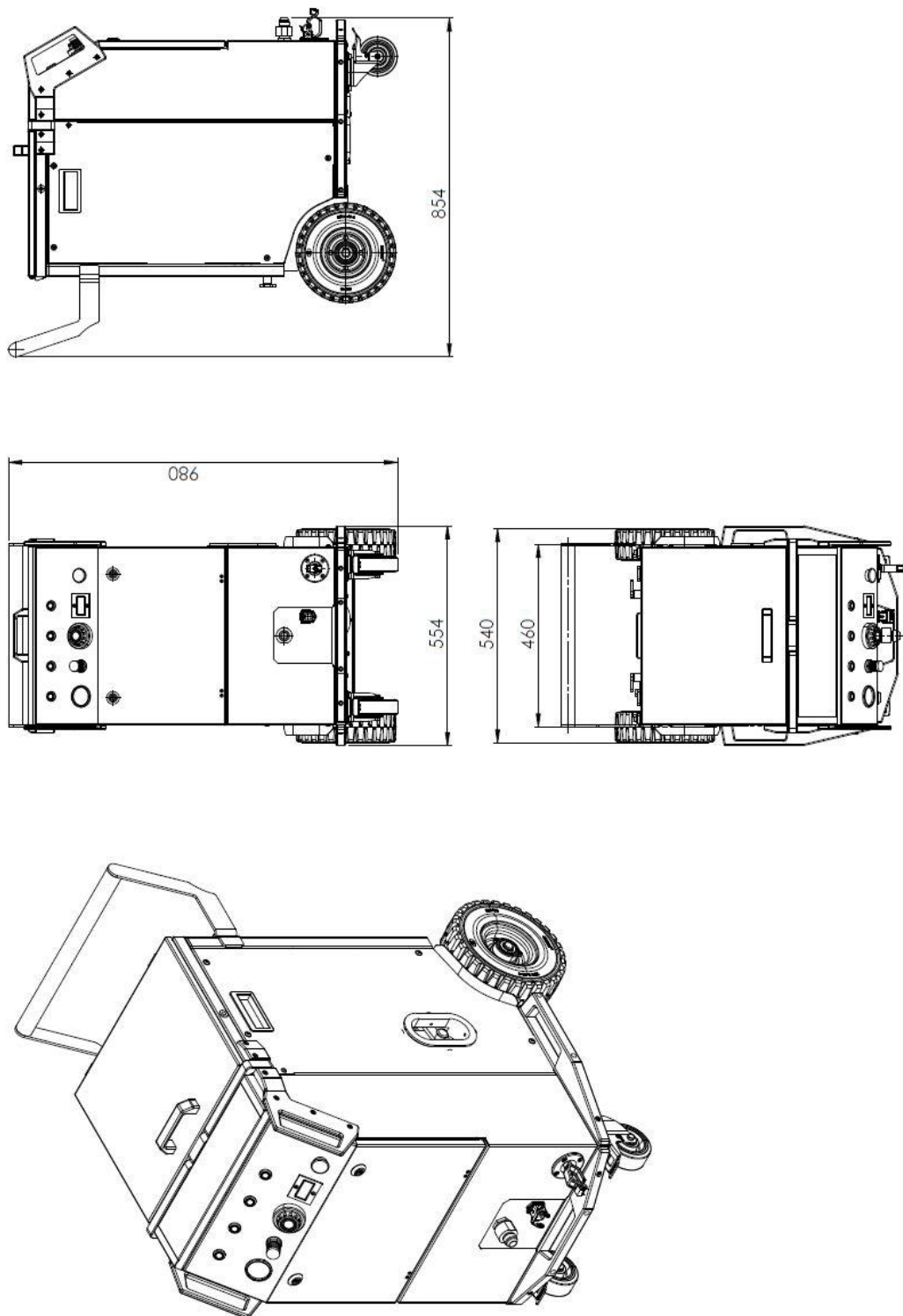
The warranty becomes void in the following cases:

- incorrect handling of the IC-410 equipment.
- using non-original spare parts.
- works at the IC-410 equipment carried out by unauthorised persons.
- using materials different than dry ice.
- noncompliance with the requirements regarding compressed air quality.

Carrying out unauthorised changes to the IC-410 equipment is prohibited!

8 Technical schematics

8.1 Dimensional drawing



8.2 Electrical schematics

0	1	2	3	4	5	6	7	8	9	
ICSform_IC-410-S										
<div><div><div><div><div><div>ICS</div><div>dry ice cleaning systems</div></div></div><div><div>ICS Ice Cleaning Systems s.r.o.</div><div>Robotnicka 2192, Povazska Bystrica 01701 Phone +421 (0)42 42 61 135</div></div></div></div></div>										
<div><div>Company / customer</div><div>Project description</div><div>Job number</div><div>Commission</div></div>					<div><div>IC-410-S blasting machine</div><div>Blasting machine IC-410-S</div><div>IC-410-S_VER3</div></div>					<div><div><div><div><div><div>IC-410-S</div><div>dry ice cleaning systems</div></div></div><div><div>IC-410-S</div><div>dry ice cleaning systems</div></div></div><div><div>IC-410-S</div><div>dry ice cleaning systems</div></div></div><div><div>IC-410-S</div><div>dry ice cleaning systems</div></div></div>

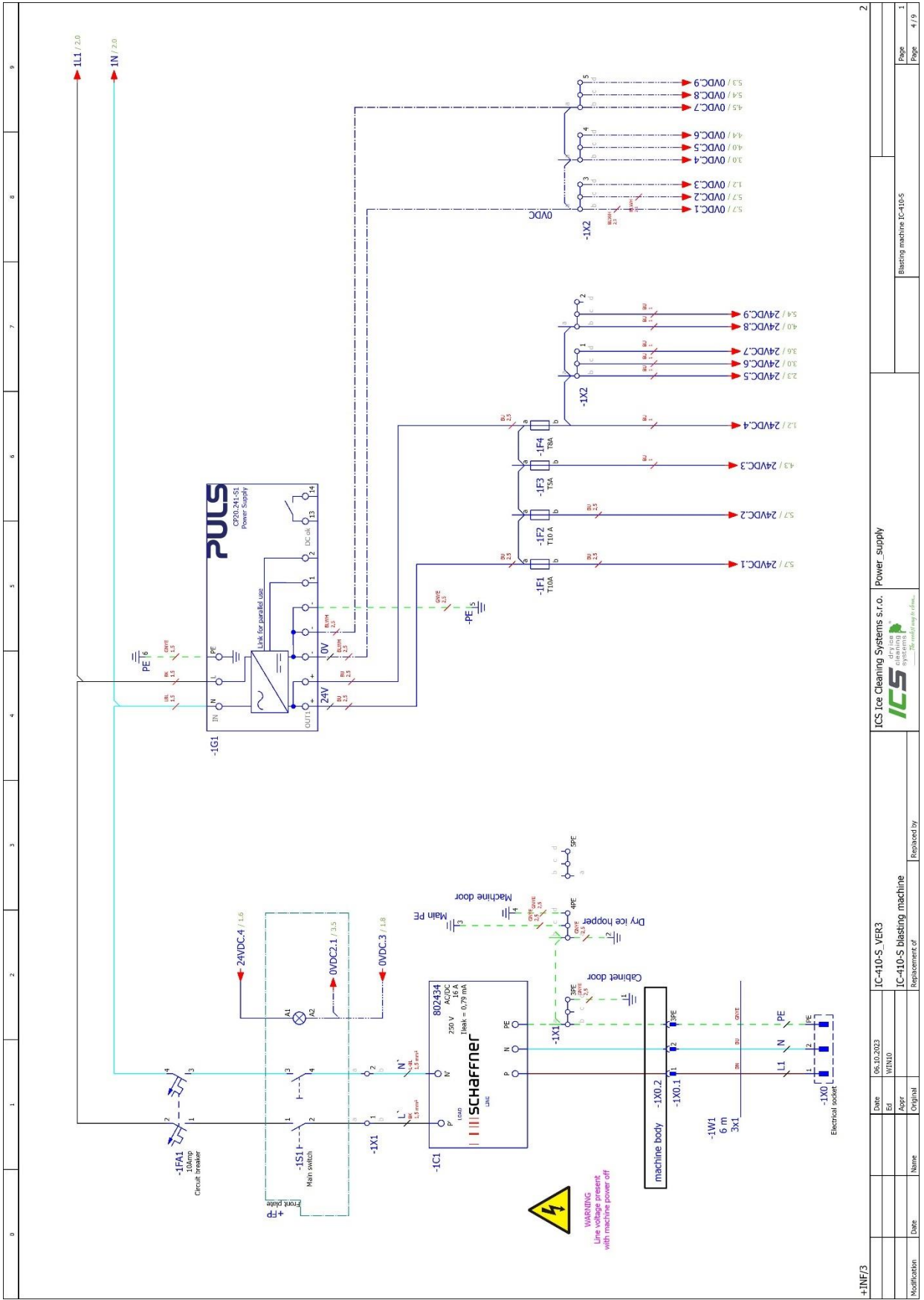
+ OM = On the machine
 + FP = Front plate
 + MP = Mounting plate
 + BH = Blasting hose

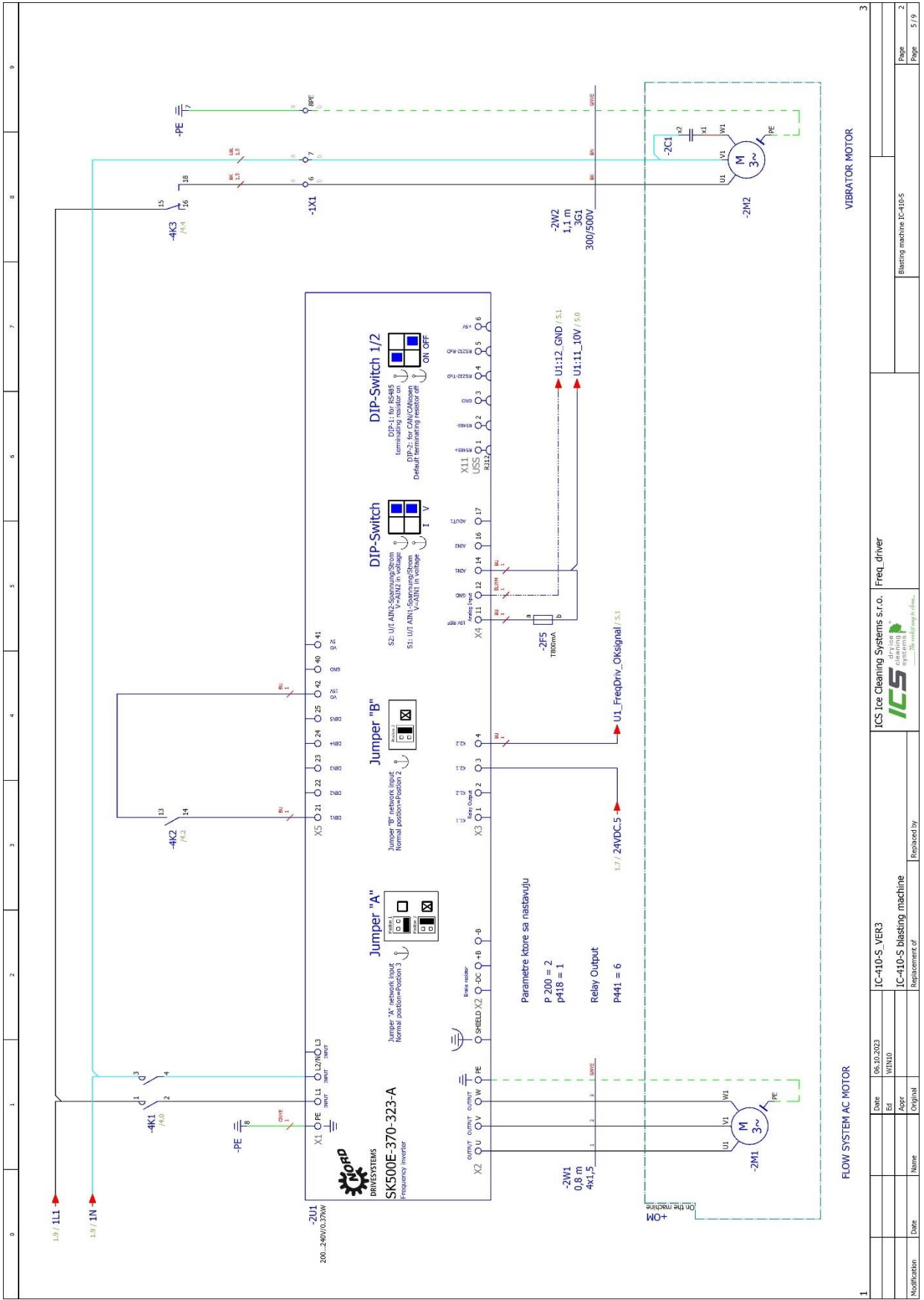
On the machine

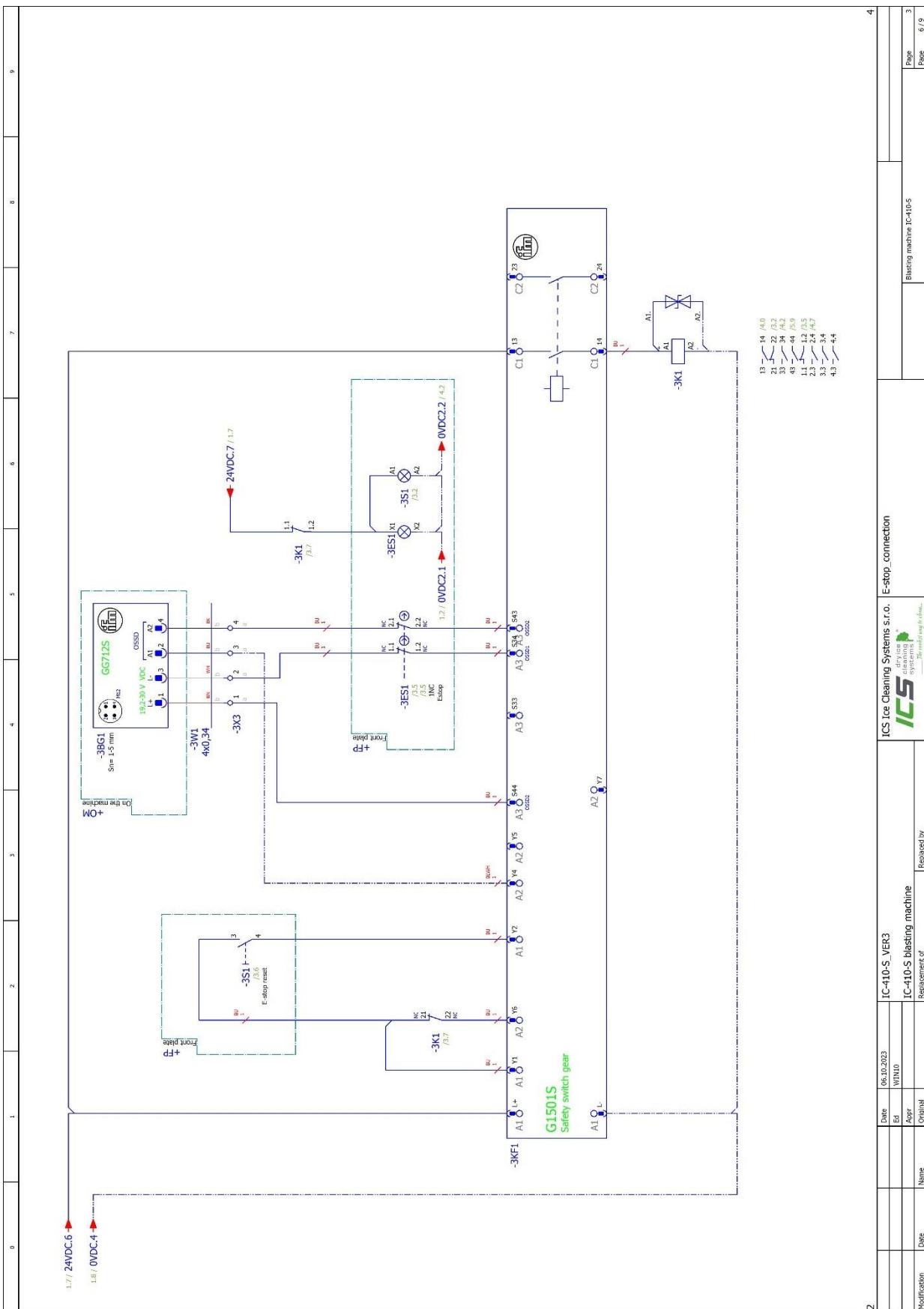
On the machine

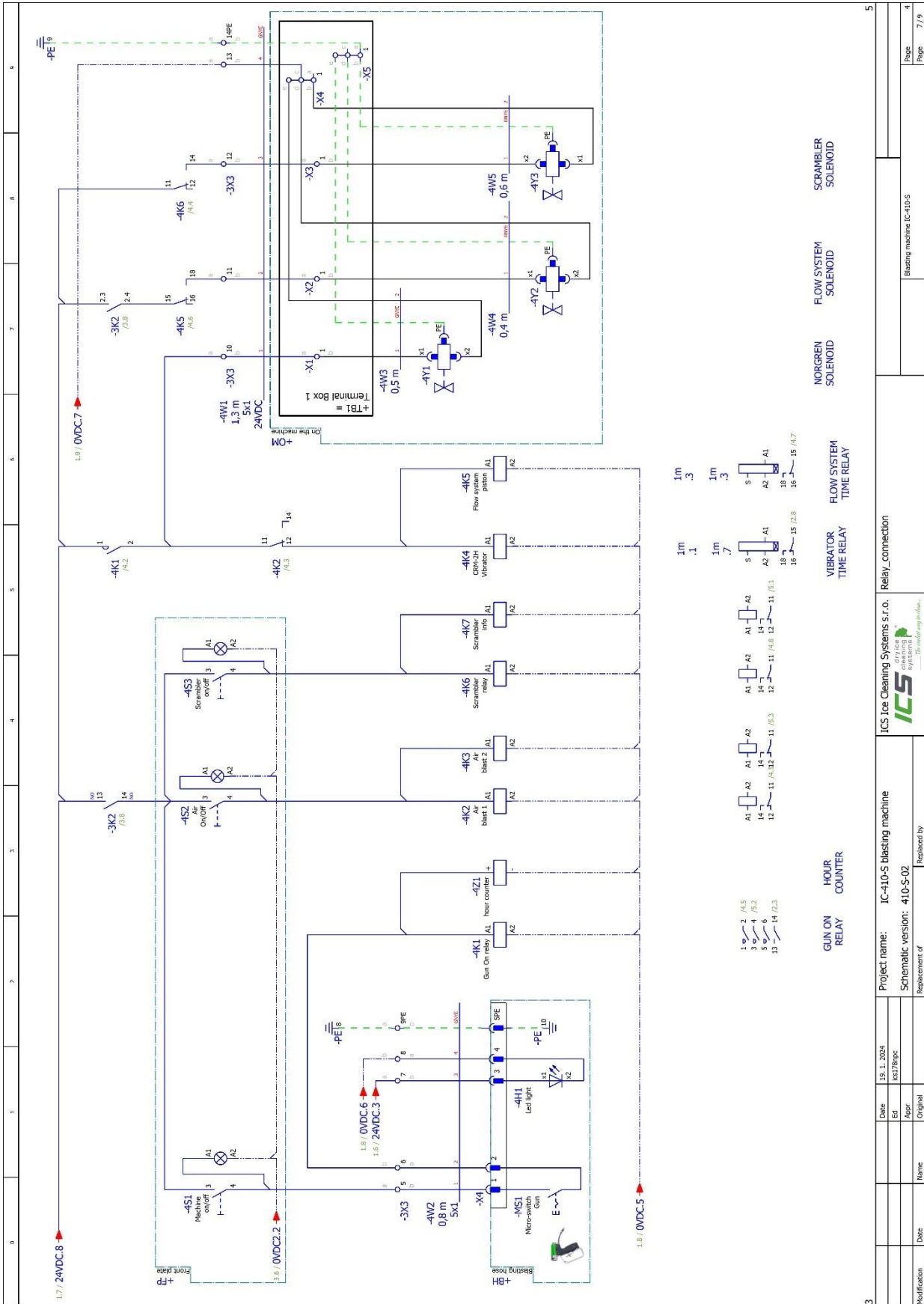
Power supply socket
-1X0.2

Machine layout









Spare parts list electrical

ID:	Name	Article. No.	Schematic pos.
-X0	Power socket	52033	1.1
-1C1	Power line filter	52030	1.1
-1S1	Main switch button	52061	1.1
-1FA	Circuit breaker	52020	1.1
-1G1	Power supply	52179	1.4
-1F1	5x20mm Cartridge Fuses T10A	N/A	1.5
-1F2	5x20mm Cartridge Fuses T10A	N/A	1.5
-1F3	5x20mm Cartridge Fuses T5A	N/A	1.6
-1F4	5x20mm Cartridge Fuses T8A	N/A	1.6
-2U1	Frequency driver	52016	2.0
-2F5	5x20mm Cartridge Fuses T800mA	N/A	2.5
-2M1	Feeding system motor	52155	2.1
-2M2	Vibrator motor	52106	2.8
-3KF1	Safety relay	52180	3.1
-3BG1	Safety induction sensor	52186	3.4
-3W1	M12 connector cable	52143	3.4
-3ES1	NC contact	52146	3.5
-3ES1.	LED module	52147	3.5
-3S1	Emergency stop button	52064	3.5
-3K1	Power contactor	52182	3.7
-4S1	Machine On / Off button	52063	4.0
-4S2	Scrambler On / Off button	52063	4.1
-4K1	Power contactor	52048	4.1
-4K2	Power contactor	52048	4.2
-4K3	Asymmetric cyler Vibrator	52184	4.4
-4K4	Asymmetric cyler Flow	52184	4.5
-4K5	Interlock relay	52187	4.1
-4K6	Interlock relay	52187	4.2
-4Z1	Machine hour counter	52003	4.5
-H1	LED light	52177	4.3
-MS1	Gun micro switch	52081	4.2
-5A1	Dry ice consumption display	52000	5.5
-5U1	DC motor driver flow system	52112	5.5
-5U2	DC motor driver scrambler system	52112	5.5
-5M1	Flow system motor	52158	5.9
-5M2	Scrambler system motor	52078	5.9

Spare parts list pneumatic

ID:	Name	Article. No.	Schematic pos.
-F1	Air filter	51011	6.1
-V1	Air release valve	51103	6.0
-V2	Pressure regulator	51122	6.3
-VM1	Manometer	51123	6.3
-S1	Blasting air solenoid	52019	6.4
-V4	Pilot air regulator	51016	6.5
-V3	Pressure regulator	51013	6.2
-S2	Flow system solenoid	52188	6.4
-S3	Scrambler system solenoid	52188	6.4
-MM	Flow system solenoid	51072	6.8
-GP1	Scrambler system 0-90 position	52058	6.8

9 Liquidation

Disposal of the machine

Have the machine disposed of at an authorized disposal center or at collection center. Before disposing of the machine, it is necessary to remove and separate the following materials and send them to separate collection in accordance with applicable regulations on environmental protection:

- stainless steel parts
- plastic parts
- electrical and electronic components*

[*] Mainly for the disposal of electrical and electronic components, please contact local dealer.



10 Certificates

10.1 Certificate STN EN ISO 9001:2016

ZERTIFIKAT ♦ CERTIFICATE ♦ 認証証書 ♦ CERTIFICADO ♦ CERTIFICAT





CERTIFICATE

TÜV SÜD Slovakia s.r.o.
Certification Body for Management Systems
 Accredited by SNAS
 Certificate on accreditation No. Q-011
 certifies that



ICS ice cleaning systems s. r. o.
Robotnícka 2192
SK – 017 01 Považská Bystrica
IČO: 45 570 370

has established and applies
 a Quality Management System for

Development, manufacture, sale and service of machines for dry ice
 blasting. Development, manufacture, sale and service of machines
 for the production of dry ice. Production of dry ice.
 Industrial cleaning with dry ice.

An audit was performed, Report No. **1587/30/22/Q/AS/R2**
 Proof has been furnished that the requirements
 according to

STN EN ISO 9001:2016

are fulfilled. The certificate is valid from **2022-07-28** until **2025-05-18**
 Certificate Registration No. **Q 1587-3**
 Date of recertification audit: **13.06.2022**





Bratislava, 2022-07-28
 TÜV SÜD Slovakia s.r.o.
 Certification Body for Management Systems
 Member of Group TÜV SÜD
 Jašíkova 6, 821 03 Bratislava

F-Q-019/2/5

10.2 ES DECLARATION OF CONFORMITY

in compliance with the Machine Directive 2006/42/EC dated 17 May 2006, Annex II A

We hereby declare that the machine specified below complies in its design and construction and in the version marketed by us with the basic safety and health requirements of the EC Directive 2006/42/EC. Any changes to the machine unauthorized by us shall invalidate this declaration.

Product: Dry Ice Blasting Machine
Manuf. Date: 2023
Type: IC-410 / IC-410-S / IC-430
Serial number: 41024045

Manufacture:

ICS ice cleaning systems, s.r.o.
Robotnícka 2192
Považská Bystrica, Slovakia
Tel.: +421 42 4261 135
Email: info@ics-dryice.sk
Web: www.ics-dryice.sk

It is declared the compliance with other directives /regulations applicable to the product:

- ✓ DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on machinery, and amending Directive 95/16/EC.
- ✓ DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
- ✓ DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the harmonization of the laws of the Member States relating to electromagnetic compatibility.

Applied harmonized standards in particular:

- ✓ ISO 12 100-1:2003 Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology
- ✓ EN ISO 13849-1 Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)
- ✓ EN 60204-1:2019 Safety of machinery. Electrical equipment of machines. Part 1: General requirements
- ✓ EN 61439-1:2012 Low-voltage switchgear and control-gear assemblies. Part 1: General rules
- ✓ EN ISO 4414. Pneumatic fluid power — General rules and safety requirements for systems and their components

Representative for the technical documentation: Ing. Ľudovít Bakala PhD., Robotnícka 2192, Považská Bystrica, Slovakia

Place: Považská Bystrica, Slovakia,

Date: 19. 09. 2023


Peter Gabriš
Executive manager

