OPERATING INSTRUCTIONS

Dynacut

Minimum quantity lubrication device MSA

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Foreword

Dear customer.

We thank you for your trust in our product.

By purchasing a DYNACUT-MSA minimum quantity lubrication system for external lubrication, you have opted for an environmentally friendly and economical technology decided. Ours high-quality minimum quantity lubrication systems have been designed for use on modern machine tools. DYNACUT minimum quantity lubrication systems for external lubrication are built according to the generally accepted rules of technology and comply with the applicable occupational health and safety and accident prevention regulations. Nevertheless, their use may result in hazards that result in physical damage to the user or third parties or impairment of the machine tool or other property.

In order to ensure trouble-free operation and avoid dangers, we ask you to read these operating instructions carefully and to observe the instructions contained therein.

Dynacut UG (haftungsbeschränkt)

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1) Notes on the operating instructions

Texts marked with this symbol indicate special dangers or indicate work that is being handled with particular caution
must.

This operating manual contains a general description of the system as well as instructions for installation and operation. The special nature of the system is also discussed.

Use the table of contents to find the information you need quickly and securely.

This operating manual is part of the system and must be handed over to the new operator when the system is sold.

2) Intended use

The DYNACUT-MSA minimum quantity lubrication system must only be used in accordance with the intended purpose and in accordance with the instructions provided for the device.
used and deployed.

In particular, we would like to point out that hazardous substances of any kind, especially substances classified as hazardous according to EC Directive 67/548/EEC Article 2, paragraph 2, as well as liquids such as chlorinated hydrocarbons, solutions with alcohol contents, gasoline containing benzene, nitro paints and nitro thinner (solvent mixtures for nitro paints from hydrocarbons and esters) and concentrated acids are not included in DYNACUT minimum quantity lubrication systems and components and may be conveyed and/or distributed with them.

The minimum quantity lubrication system described here is intended exclusively for external lubrication of machining and forming processes. In external lubrication, the lubricant is transported directly to the friction point between the tool and the workpiece via spray nozzles attached to the machine tool. Depending on the type of processing, one or more spray nozzles can be used per tool.

The DYNACUT-MSA minimum quantity lubrication system can be used both for the original equipment of machine tools and for the retrofitting of machine tools with an existing coolant supply.

Any other or further use shall be deemed not to be in accordance with its intended purpose. Dynacut UG is not liable for any damage resulting from this.

The lubricants suitable for use in DYNACUT minimum quantity lubrication systems for external lubrication have their chemical and physical properties specially adapted to the high requirements of the technology used here. For this reason,

For this reason, only lubricants suitable for minimum quantity lubrication may be used.

We do not assume any liability for damage caused by the improper use of lubricants or by the use of lubricants other than those suitable for minimum quantity lubrication.

3) Safety

Please observe the following safety instructions to ensure the trouble-free operation of the minimum quantity lubrication system and to avoid damage.

The spraying of lubricants or substances other than those approved for minimum quantity lubrication with DYNACUT minimum quantity lubrication systems is not permitted.

Before all work on the system, such as cleaning or refilling lubricant etc., the system must be disconnected from the compressed air supply and depressurized. The system must also be disconnected from the electrical power supply.

People or animals must not be sprayed with aerosol. The aerosol must not get into the eyes and must not be inhaled directly under any circumstances.

We would like to point out that the spraying of mineral oils or substances containing mineral oil in particular can lead to damage to health.

Any kind of fire, e.g. in the form of open flames, sparks, smoldering cigarettes, etc., must not come near the spray jet. The aerosol must not be sprayed on hot surfaces.

It is essential to observe the generally applicable rules and safety regulations for working with machines and equipment carrying compressed air and electrical voltage.

The system may only be used in a technically perfect condition, as well as in accordance with its intended purpose, safety and hazard awareness in compliance with the operating instructions.

The existing safety devices must not be damaged, decommissioned or rendered unusable or replaced by parts other than those expressly approved by Dynacut UG.

In the event of a fault, the system should be disconnected from the compressed air and power supply as quickly as possible, e.g. by operating the quick coupling on the compressed air connection and pulling the mains plug.

The unauthorized modification of the system and the use of unauthorized spare parts and aids are not permitted.

Disused systems must be rendered unusable and then disposed of properly.

4) Description

Principle of minimum quantity lubrication (MQL)

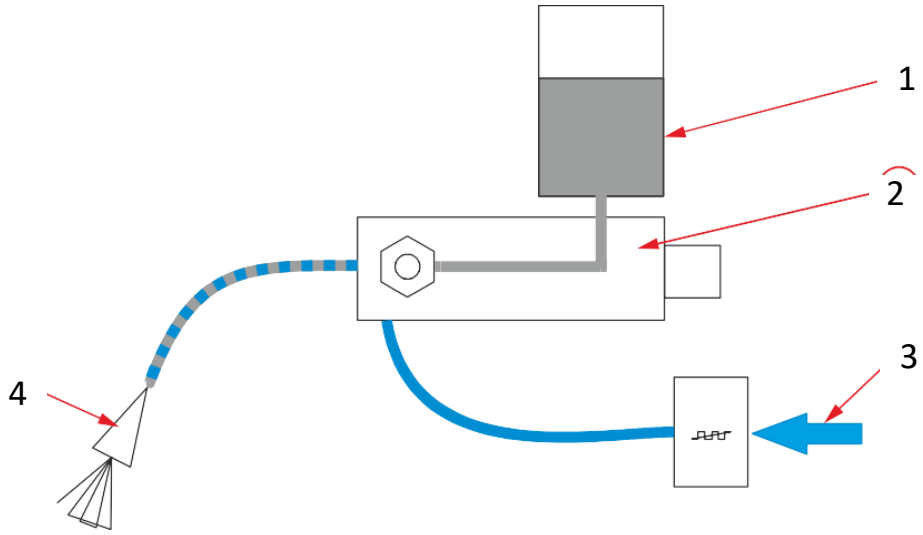
Minimum quantity lubrication is a loss or consumption lubrication, i.e. the lubricant used is almost completely consumed during machining, so that there is no need for treatment in the cycle. The actual lubrication task at the point of action between the tool and the workpiece is performed by finely dispersed oil droplets, the so-called aerosol, in an air stream. With minimum quantity lubrication, effective lubrication of machining processes can be realized using the smallest amounts of lubricant. The time-consuming cleaning and disposal of large quantities of lubricants and cooling lubricants is thus eliminated or reduced to a minimum.

5) Aerosol generation

The DYNACUT-MSA minimum quantity lubrication system described here produces a very homogeneous aerosol in relation to the size and distribution of the oil droplets, as the lubricant is atomized in a controlled manner. The functional principle of the spray nozzles makes it possible to generate aerosols with a droplet size of approx. 15 – 35 µm.

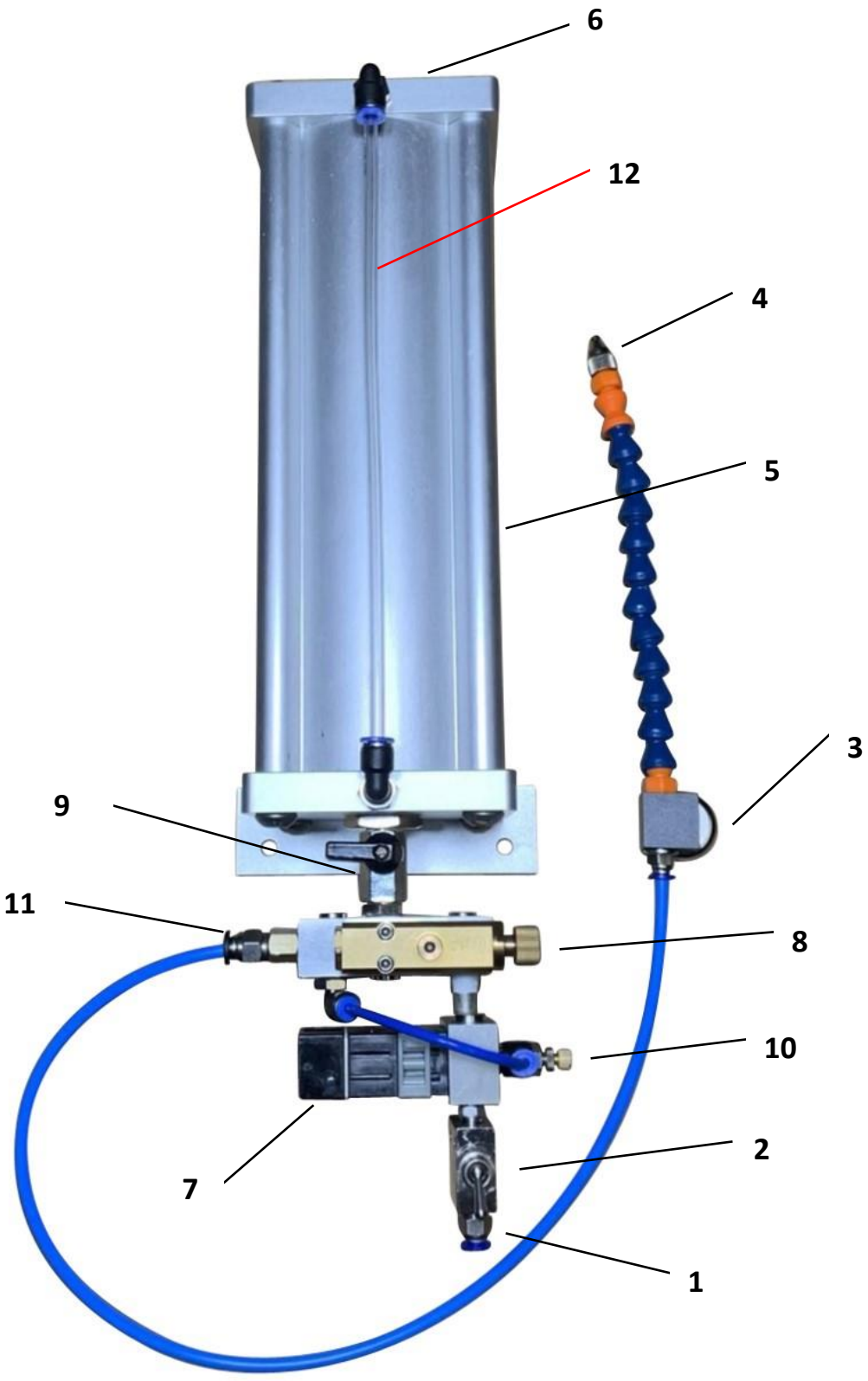
6) Description

Lubricant is dispensed by a clocking pump (2) from a lubricant reservoir
(1) Conveyed by a capillary tube to the nozzles. By means of air (3), the lubricant is finely atomized at the nozzles (4) and applied to the tool.



7) Components

Minimum quantity lubrication device with pneumatic pump



Pos.	Component	Function
	Connector	Connection of the air supply
2	Ball valve	Turn on the device
3	Magnetic Holder	Attachment of the nozzle to a metallic surface
4	Droplet nozzle	Lubricant atomization
5	Oil tank	Lubricant stock
6	Fuel cap	Lubricant filling
7	Clock	Delivery of air pulses to the dosing pump
8	Knob	Adjustment of the flow rate
9	Ball valve	Opening the lubrication supply
10	Needle valve	The valve regulates the amount of air flowing out of the nozzle.
11	Gland	Oil and air supply to the nozzle
12	PVC Hose	Oil level control

8) Specifications

Dimensions and weights

Dimensions (L x D x H)		161 x 165 x 400 mm
Weight (empty)	≤ 10 kg	

Information on power and media supply

Electrically optional	
Power supply standard	24 V DC
Power supply alternative	230 V AC
Electrical power depending on model	3 VA
Pneumatic standard	
Compressed air connection	max. 6 bar

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Further technical data

Frequency generator	
Pneumatic	5 – 100 strokes/min

Lubrication pump	
Displacement	0.12 mm³ to 39.00 mm³ per piston stroke
Viscosity Lubricant	600 cSt.

Lubrication tank	
Content	2.0 ltr.
Level monitoring	Option

Operating and storage environment

Permissible environmental conditions	
Ambient temperature	0...+40°C
Installation location	Dry, frost-free
Atmosphere	Industrial environment, non-explosive

Protective devices

Operational phase	Personal protective equipment
Normal	• Gloves
Cleaning	• Gloves
Maintenance and repair	• Protective gloves, safety shoes

9) Preparation for use

Transport and storage

Storage

Store the appliance only in dry, frost-free rooms with a corrosion-free atmosphere.

Permissible environmental conditions	
Ambient temperature	0...+30°C
Relative humidity	max. 50%
Installation location	Interior, Flush, Dry, Vibration Free
Atmosphere	Non-corrosive, non-explosive, non-flammable

10) Lineup

The minimum quantity lubrication system was to be installed in the immediate vicinity of the processing machine. We recommend mounting the system directly on the machine housing.

Do not mount the system in a place where it will be exposed to strong oscillations or vibrations.

The system must not be placed near a heat source. Also unsuitable is a place that is exposed to rapid and strong temperature fluctuations.

For proper operation, the system must be mounted vertically.

Furthermore, make sure that it is well accessible for the purpose of maintenance or to be able to refill lubricant.

Fastening with screws

Fasten the device with 2 screws through the holes (1) in the bracket. Ensure reliable hold of the device.

Attachment with magnets (on ferrous surfaces)

Attachment with magnets is only possible if the device is not moved during operation.
Select the appropriate magnet.
Attach the magnet through the middle hole in the bracket. Attach the device to a suitable ferrous surface. Align the device horizontally.
Ensure reliable hold of the device

11) Electrical connection

Connection with 24 V DC (option)

Adapt the connection cable to local conditions. Lay connecting cables in suitable cable protection devices.

Connect 24 V DC cable to the supply voltage

Connection with 110/230 V AC (option)

⚠ DANGER!	
	**Danger from electrical voltage!** Before working on the electrical installation: De-energize the supply! Carry out work on the electrical installation by a qualified electrician!

Pneumatic connection

ATTENTION!
Property damage caused by oily compressed air! Oily compressed air can contaminate or damage components.

The connection for the compressed air is located on the lower right side as standard on all minimum quantity lubrication devices.

Control

Our minimum quantity lubrication device can be controlled in various ways:

- Solenoid valve (option)
- Ball valve (standard)
- Roller lever valve (option)
- Manual Slide Valve (Option)
- Foot pedal (option)
- Connecting the compressed air (standard)

12) Commissioning and settings

Fill in lubricant

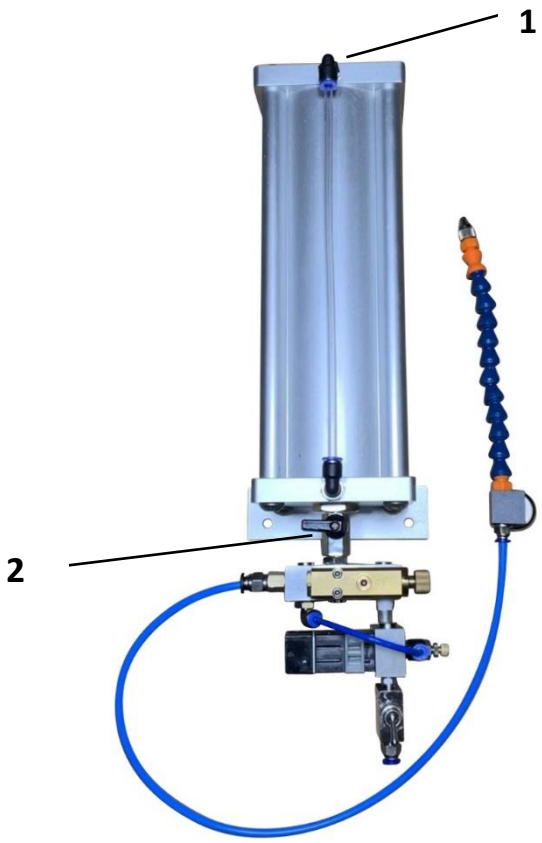
⚠ WARNING!

Risk of fire, explosion or injury due to unsuitable lubricants or coolants!

Use only approved non-oxidizing lubricants that cannot create an explosive atmosphere.
Filling should only be carried out by trained personnel

Open filler neck (1) on lubricant reservoir. Fill in lubricant.
Lubricant supply (2) Open ball valve on the container.

The minimum quantity lubrication device is ready for operation.

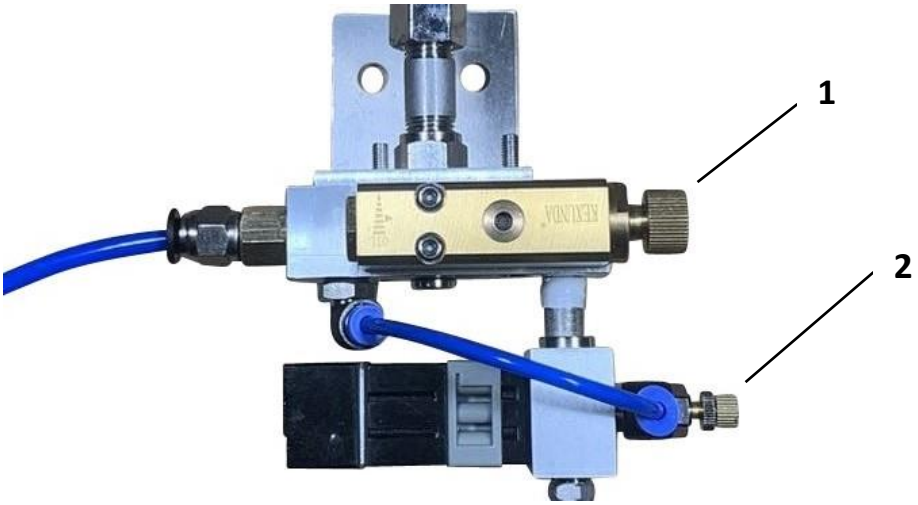


ATTENTIO

Property damage due to unsuitable lubricants or coolants!

Lubricants that are not suitable for minimum quantity lubrication can destroy the seals.

Adjusting the pump volume



Adjusting the Lubricant Volume

Reduce lubricant volume: Turn the adjustment screw (1) clockwise. Increase lubricant volume: Turn the adjustment screw (1) counterclockwise. Set the default: Turn the adjustment screw (1) all the way to the right, then open it 2.5 turns. During the first start-up or when the container has been pumped empty, open the adjustment screw (1) completely and pump until oil comes out of the nozzle.

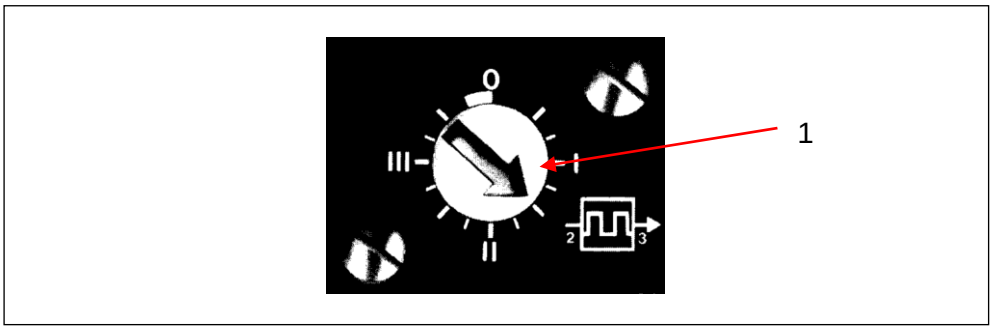
Adjust air volume

The throttle valve regulates the amount of air that carries the lubricant droplets at the nozzle outlet.
Reduce air supply: Turn throttle valve (2) clockwise.
Increase air supply: Turn the throttle valve (2) counterclockwise.

Setting the Frequency Generator

The frequency generator gives an air pulse to the oil pump so that the set lubricant volume is conveyed.
The air impulse moves the pump piston forward. After bleeding, a spring moves the pump piston back to the starting position.

Pneumatic Frequency Generator



Reduce cycle time: Turn the adjustment screw (1) clockwise.
Increase cycle time: Turn the adjustment screw counterclockwise.
Set the default: Turn the adjustment screw to 1.5.
Switch off the frequency generator: Turn the adjustment screw to 0.

13) Normal

In normal operation, the minimum quantity lubrication device is operated according to the installed control.

The ball valve on the lubricant reservoir must be opened.

Refill lubricant

Refilling is possible during ongoing operation.

14) Maintenance

DYNACUT minimum quantity lubrication systems are low-maintenance. However, to ensure proper functioning and avoid hazards in the first place, you should check all connections and connections regularly.

15) Cleaning

Cleaning outside:

If necessary, the minimum quantity lubrication system can be cleaned with mild, material-compatible (non-alkaline, no soap) cleaning agents.

For safety reasons, we recommend disconnecting the minimum quantity lubrication system from the compressed air and electrical power supply. During cleaning, keep the hoses connected as much as possible and close any openings so that no cleaning agents can penetrate the inside of the minimum quantity lubrication systems.

Cleaning inside:

During normal operation and when using mutually compatible lubricants, internal cleaning is not necessary. If an incorrect or dirty lubricant has been accidentally filled, the inside of the lubricant reservoir must be cleaned.

16) Maintenance

Safety measures during maintenance

Maintenance plan

Interval	Component/Component	Activity
	(Magnetic)Fortification	Examine
	Nozzles	Check, replace if necessary
	Hoses, connecting cables	Check, replace if necessary
	Area below the device	Checking for leaked lubricant, leak detection and sealing if necessary

Fault table

Error	Possible cause	Possible activities
No lubricant film on the tool cutting edge	Compressed air interrupted	Check compressed air supply
	Hoses or lines defective	Check hoses and lines
	Dosing pump closed	Check the dosing pump setting. Readjust the dosing pump if necessary
	Dosing pump defective	Check the dosing pump, replace it if necessary
	Air bubbles in the lubricant reservoir	Venting the container
Frequency generator does not clock	Frequency is set to "0"	Check and adjust frequency
	Compressed air interrupted	Check compressed air supply
	Hoses defective	Check hoses

17) Decommissioning

Temporary shutdown

For a temporary shutdown of the minimum quantity lubrication system, disconnect the entire system from the compressed air and electrical power supply and close the ball valve on the lubricant reservoir.

Final decommissioning

If you want to shut down the minimum quantity lubrication system permanently, please observe the legal regulations for the disposal of oil-containing components.

Fluids	
Lubricant	dispose of as hazardous waste in an environmentally friendly manner
Cleaning media	dispose of as hazardous waste in an environmentally friendly manner
Devices	
Cables, electrical components	Dispose of as electronic waste
Mechanical components	Dispose of by type

Declaration of conformity within the meaning of the Low Voltage Directive 2006/95/EC Original Declaration of Conformity	Dynacut UG

Manufacturer:	Dynacut UG (haftungsbeschränkt) Barbarastraße 16 48734 Reken Deutschland

Product:	Minimalmengenschmiersystem Dynacut MSA

We hereby declare that the above product complies with all relevant provisions of the following guidelines:

Low Voltage Directive 2006/95/EC:2006-12-12 EMC

Directive 2004/108/EC:2004-12-15

The following harmonised standards have been applied:

EN 60204-1:2006/AC:2010 Safety of machinery - Electrical equipment of machinery - Part 1: General requirements

EN 61000-6-2:2005/AC:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial sectors

EN 61000-6-4:2007/A1:2011 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission of interference for industrial sectors

EN ISO 4414:2010 Fluid power - General rules and safety requirements for pneumatic systems and their components

Year of CE marking: 22

(the last two digits)

Reken, den 04.05.2022