

Operating and maintenance instruction

Translated version

Walform machine M-WF385Xplus 400V

Walform machine M-WF385Xconnect 400V

Electronically controlled - CE compliant



Keep for future use!

Status: 01/2023_A

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1. Identification

Marking of your Walform machine

Type: ☐ M-WF385Xplus
☐ M-WF385Xconnect
Machine No.: 8XXX
Year of construction: 2023
Order number: ☐ WAL626385
☐ WAL636385

Manufacturer:

Danfoss Power Solutions II GmbH

Hauptstraße 150

53797 Lohmar

The operator must:

- Be commissioned, qualified and instructed!
- Know the risks
- Have read and understood these operating instructions

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EC Declaration of Conformity

in keeping with the EC Machinery Directive 2006/42/EC, Annex II 1. A

Translated version

Manufacturer

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Werk Lohmar
Hauptstraße 150
DE - 53797 Lohmar

Person established in the Community authorized to compile the relevant technical documentation

Engineering department
Danfoss Power Solutions II GmbH
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Description and identification of the machine

Product	Walform tube end forming machine
Type	☐ M-WF385Xplus ☐ M-WF385Xconnect
Machine number	8XXX
Model	☐ WAL626385 ☐ WAL636385
Function	This Walform machine is designed for forming hydraulic tube ends in diameters from 6 to 42 mm (Walform WD, Walform M and WalformPlus tube fitting system).

It is expressly declared that the machine complies with all relevant provisions of the following EC directives or regulations:

2006/42/EC Directive	2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery and amending Directive 95/16/EC (recast) (1) Published in L 157/24, 09.06.2006
2014/30/EU Directive	2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (recast) Published in 2014/L 96/79 of 29.03.2014.

Reference of the harmonized standards applied in accordance with Article 7(2):

EN ISO 12100:2010-11	Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)
EN ISO 4413:2010	Fluid power - General rules and safety requirements for hydraulic systems and their components (ISO 4413:2010)
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016, modified).
EN ISO 13849-1:2015	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)

Reference of the harmonized standards applied in accordance with Article 7(2):

EN ISO 13849-2:2012	Safety of machinery - Safety-related parts of control systems - Part 2: Validation (ISO 13849-2:2012)
EN ISO 13850:2015	Safety of machinery - Emergency stop - Principles for design (ISO 13850:2015)
EN ISO 13851:2019	Safety of machinery - Two-hand control devices - Functional aspects and design principles (ISO 13851:2019)
EN ISO 14120:2015	Safety of machinery - Guards - General requirements for the design, construction and selection of fixed and movable guards (ISO 14120:2015)

Lohmar, 07.02.2023

Place, Date

Signature
Tom Nakonz
Plant Manager

2. Safety and user instructions

The operating instructions must always be kept at the place of use of the machine and must be freely accessible to operators and maintenance personnel.

2.1. Presentation of safety instructions

Safety instructions are identified by a pictogram and a signal word. The signal word describes the severity of the impending risk.

DANGER	Imminent risk to the life and health of persons (serious injury or death).	
CAUTION	Possibly dangerous situation (minor injuries or property damage).	
IMPORTANT	Obligation to a special behavior or activity for the safe handling of the machine.	

Specific warning symbols

Warning of electrical voltage



Warning of hand injuries



Warning of hot surfaces



Warning of lifted loads



2.2. Personal protective equipment (PPE)

When operating the machine, it is essential to wear personal protective equipment (PPE) to minimize hazards for the operating personnel.

The following protective equipment must always be worn during all work:

Sign	Meaning
	Safety shoes with steel toecaps must always be worn to protect against heavy falling parts.

2.3. Intended use

The machine is designed exclusively for forming hydraulic tube ends in diameters from 6 to 42 mm (tube fitting system Walform-WD, Walform-M and WalformPlus).

Two modes of operation are possible:

- Manual operation (moving to the insertion position by two-hand operation)
- Automatic mode (automatic movement to the insertion position by light barrier control)

The forming process can be initiated via pushbuttons on the front of the machine or via an optionally available foot switch. In both cases, the operator holds the workpiece with at least one hand during the forming process.

The machine is operated exclusively by an operator who has no physical limitations of the upper limbs and no uncorrected visual impairment. The machine is intended to be operated by a person who is in an upright position. The operator has been assigned to operate the machine, has been instructed, knows the risks of the machine and has read and understood the operating instructions.

Intended use also includes:

- the observance of all instructions in this operating manual
- the compliance with the inspection and maintenance operations

This Walform machine may only be operated with original Danfoss tools.

IMPORTANT

Only use the machine for its intended purpose and only use it if it is in perfect working order!

This is the only way to ensure the operational safety of the machine!



2.4. Reasonably foreseeable misapplication

Any use other than that specified under "Intended use" or which goes beyond that use is considered improper use!

For damage from improper use:

- the operator bears sole responsibility,
- the manufacturer assumes no liability whatsoever.

IMPORTANT

Risks to the operator may occur if the machine is not used as intended. Uses that are not intended include:

- Forming of tubes other than those listed in the technical description.
- Forming of solid material or of plastic tubes.
- Insertion of tools (clamping jaw and reshaper) that do not match the tube diameter.
- Manipulation of tools
- Combination of a clamping jaw and a reshaper with different size.
- Operation in explosive atmosphere.
- Exceeding the technical values specified for normal operation.



In case of unauthorized conversions and modifications of the machine, any liability and warranty by the manufacturer expires!

Therefore, do not make any changes or additions to the machine without the consultation and written consent of the manufacturer.

2.5. Duty of care

Duty of the operator

The operator is obligated to only allow persons to work on the machine who are

- familiar with the basic regulations on occupational safety and accident prevention,
- have been instructed in the work on the machine,
- have read and understood these operating instructions.

The requirements of the EC Directive on the use of work equipment 2007/30/EC must be complied with.

Duties and qualification of the personnel

All persons assigned to work on the machine undertake:

- to observe the basic regulations on occupational safety and accident prevention,
- to read and observe the safety chapter and the safety instructions in these operating instructions.
- to make sure that there are no other persons in the immediate vicinity of the operator!
- to wear the personal protective equipment (safety shoes / safety goggles / protective gloves)!
- to familiarize themselves with the control and operating elements.

If in doubt, ask experts or Danfoss customer service.

DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!



Failure to comply with these instructions will make you liable for any consequential damage to third parties and will release Danfoss Power Solutions II GmbH from any obligation to pay compensation.

2.6. Residual risks per life stage

Even when the machine is used as intended, the following residual risks may still occur despite compliance with all relevant safety regulations due to the design dictated by the intended use of the machine.

In all phases of life

Description of hazard: Danger due to loss of stability of the machine.

DANGER The operator must place the machine on a stable table or workbench. The table or workbench must be able to safely support the machine. Alternatively, the original Danfoss tool cabinet may be used.



Description of hazard: Since the machine can be used by the operator for piecework over a longer period of time, damage to the locomotor system can occur if an unfavorable working position is taken.

IMPORTANT The working environment and the working height must be designed in such a way that the operator is not exposed to excessive stress.

Description of hazard: Danger due to failure of the control system. Failure to execute a control command.

CAUTION Protective devices must not be manipulated or overridden.

Transportation

Description of hazard: If the operator wants to transport the machine, he can crush his upper or lower limbs if the machine falls down. Also note the off-center center of gravity of the machine.



DANGER The machine may only be lifted by the load lifting devices provided for this purpose. The centre of gravity is located at the front left in the area of the forming cylinder (see chapter 4.1).

Manual mode

Description of hazard: Possibility of fatal hazards due to voltages up to 400 V in case of direct or indirect contact with voltage-carrying parts.

DANGER When operating the system, all control cabinets and enclosures must be securely closed.

Description of hazard: When moving from the tool change position to the tube insertion position, fingers may be crushed between the clamping jaw segments.



DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health can be the result!

Description of hazard: The tubes are pulled into the machine by approx. 3 mm after each forming process. There is a possibility of fingers being crushed if short tube bends or short tubes which have already been formed are formed. The fingers can be crushed between the union nut and the machine head or between the tube bend and the tool holder.

CAUTION When forming short tube sections or tube bends, the operator must not put his fingers between the union nut or the tube bend and the tool holder.

Description of hazard: The tubes can be pulled approx. 20 mm into the machine after opening the clamping jaws. There is a possibility of fingers being crushed if short tube bends or short tubes which have already been formed are formed. Fingers are then crushed between the union nut and the machine head or between the tube bend and the tool holder. This pinching only occurs if the tubes are not aligned with the machine axis and become trapped in the cylindrical locating bore.

Misapplications that may support the behavior:

- Worn tools (e.g. rough inner contour in the reshaper tool)
- Manipulated tools
- Insufficient deburring of the tubes
- Wrong wall thickness, together with internal supports

Other factors that may support the behavior:

- Coatings of the tube surface (e.g. Zistaplex)
- Short, bent tubes (higher risk of misidentification)
- Tube material (cold welding for stainless steel tubes)



DANGER When forming short tube sections or tube bends, the operator must not put his fingers between the union nut or the tube bend and the tool holder.
Before each forming operation, the tube condition must be checked. The tools must be checked daily and the emergency stop switch must be used in case of danger.

Description of hazard: In the tube insertion position, a finger could be inserted into the tool holder instead of a tube and the clamping or forming process could be started. This could result in fingers being crushed in the clamping area of the clamping jaws and possibly to bumping due to the movement of the forming cylinder.



DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!

Description of hazard: If the tool holder has not been mounted correctly (thread not fully engaged), the tool holder can be ejected due to the high forces.

DANGER The correctly mounted condition of the tool holder must be checked before each forming process. The tool holder is correctly mounted when the tool holder is locked. In addition, the undamaged condition of the mechanical stop must be checked.

Automatic mode

Description of hazard: Possibility of fatal hazards due to voltages up to 400 V in case of direct or indirect contact with voltage-carrying parts.

DANGER When operating the system, all control cabinets and enclosures must be securely closed.



Description of hazard: When moving from the tool change position to the tube insertion position, fingers may be crushed between the clamping jaw segments.

DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health can be the result!

Description of hazards: The tubes are drawn into the machine by approx. 3 mm after each forming process. There is a possibility of fingers being crushed if short tube bends or short tubes which have already been formed are formed.

The fingers can be crushed between the union nut and the machine head or between the tube bend and the tool holder.

CAUTION When forming short tube sections or tube bends, the operator must not put his fingers between the union nut or the tube bend and the tool holder.

Description of hazard: The tubes can be pulled approx. 20 mm into the machine after opening the clamping jaws. There is a possibility of fingers being crushed if short tube bends or short tubes which have already been formed are formed. Fingers are then crushed between the union nut and the machine head or between the tube bend and the tool holder. This pinching only occurs if the tubes are not aligned with the machine axis and become trapped in the cylindrical locating bore.



Misapplications that may support the behavior:

- Worn tools (e.g. rough inner contour in the reshaper tool)
- Manipulated tools
- Insufficient deburring of the tubes
- Wrong wall thickness, together with internal supports

Other factors that may support the behavior:

- Coatings of the tube surface (e.g. Zistaplex)
- Short, bent tubes (higher risk of misidentification)
- Tube material (cold welding for stainless steel tubes)

DANGER When forming short tube sections or tube bends, the operator must not put his fingers between the union nut or the tube bend and the tool holder.

Before each forming operation, the tube condition must be checked. The tools must be checked daily and the emergency stop switch must be used in case of danger.



Description of hazard: In the tube insertion position, a finger could be inserted into the tool holder instead of a tube and the clamping or forming process could be started. This could result in fingers being crushed in the clamping area of the clamping jaws and possibly to bumping due to the movement of the forming cylinder.

DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!

Description of hazard: If the tool holder has not been mounted correctly (thread not fully engaged), the tool holder can be ejected due to the high forces.

DANGER The correctly mounted condition of the tool holder must be checked before each forming process. The tool holder is correctly mounted when the tool holder is locked. In addition, the undamaged condition of the mechanical stop must be checked.

Retrofitting

Description of hazard: If the operator moves the tool holder into the mount with one hand, the operator can crush the fingers of the other hand between the tool holder and the mount.

CAUTION The tool holder must be guided slowly into the mount with both hands. Otherwise there is a risk of crushing.



Description of hazard: Possibility of fatal hazards due to voltages up to 400 V in case of direct or indirect contact with voltage-carrying parts.

DANGER When operating the system, all control cabinets and enclosures must be securely closed.

Description of hazard: If the tool holder is not properly locked, it can hit the employee in the stomach when forming tubes.

CAUTION The operator must lock the tool holder after a tool change.

Description of hazard: When changing the tools, it is possible that the tool falls down during disassembly or due to incorrect assembly and injures the employee's foot.

CAUTION Make sure that the tools are inserted correctly.



Troubleshooting and fault elimination

Description of hazard: Danger due to hydraulic oil spraying out.

CAUTION For all work on the machine, the regulations of the employer's liability insurance association and legal regulations must be observed.

Description of hazard: Possibility of fatal hazards due to voltages up to 400 V in case of direct or indirect contact with voltage-carrying parts.

DANGER Troubleshooting on the machine may only be carried out by qualified personnel. All work on the electrical control system must be carried out in compliance with the regulations of the law and of the employers' liability insurance association.

Description of hazard: Crushing of fingers in the clamping area of the clamping jaws during the clamping process is possible. In tube insertion position, a finger could be inserted into the tool holder instead of a tube and the clamping or forming process could be triggered.

DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!



Description of hazard: Description of hazard: When moving from the tool change position to the tube insertion position, crushing of the fingers between the clamping jaw segments is possible.

DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!

Description of hazard: Danger due to unpredictable movement of the machine.

CAUTION Troubleshooting may only be performed by instructed personnel.

Description of hazard: There is a danger of getting burned by touching the hot surfaces of the machine (especially in the area of the hydraulic components).

DANGER Protective gloves must be worn while troubleshooting the machine.



Maintenance

Description of hazard: Possibility of fatal hazards due to voltages up to 400 V in case of direct or indirect contact with voltage-carrying parts.

DANGER Maintenance of the machine may only be carried out by qualified personnel.

Disassembly, decommissioning and disposal

Description of hazard: Danger due to hydraulic oil spraying out.

CAUTION The disassembly of the machine may only be carried out without energy.



Description of hazard: Possibility of fatal hazards due to voltages up to 400 V in case of direct or indirect contact with voltage-carrying parts.

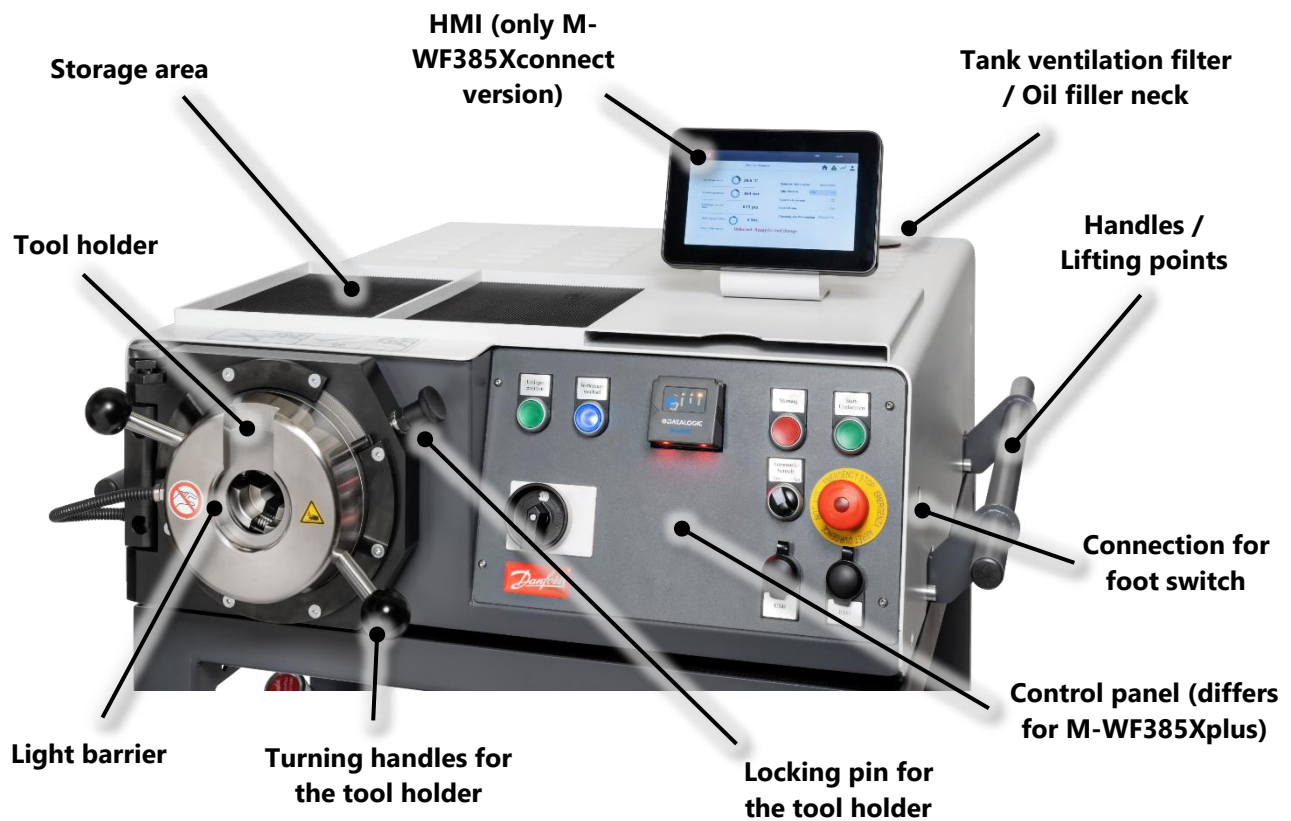
DANGER When dismantling the machine, it must not be connected to the power supply.

2.7. Workplaces of the operating personnel

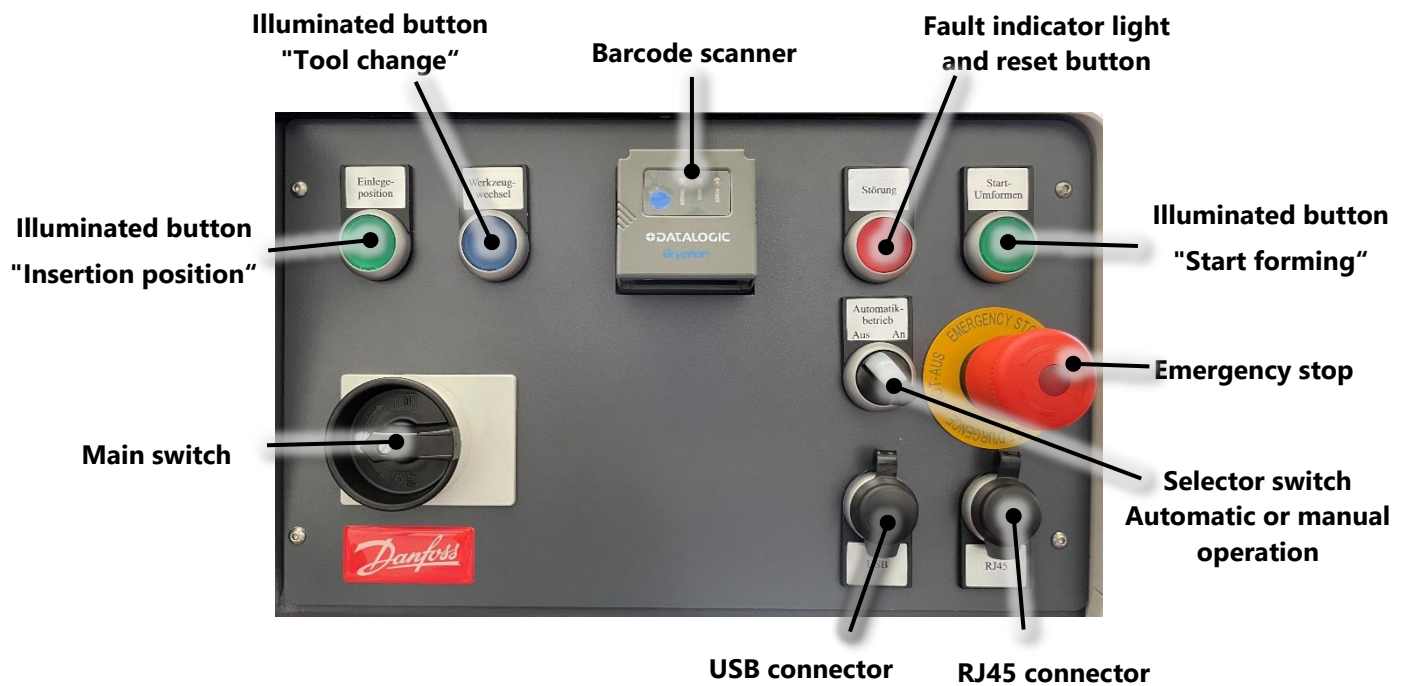
The machine is intended exclusively for operation by one person. In normal operation, the operator's workplace is located directly in front of the machine. The foot switch for triggering the forming process must be located outside the machine's danger zone.

3. Machine description

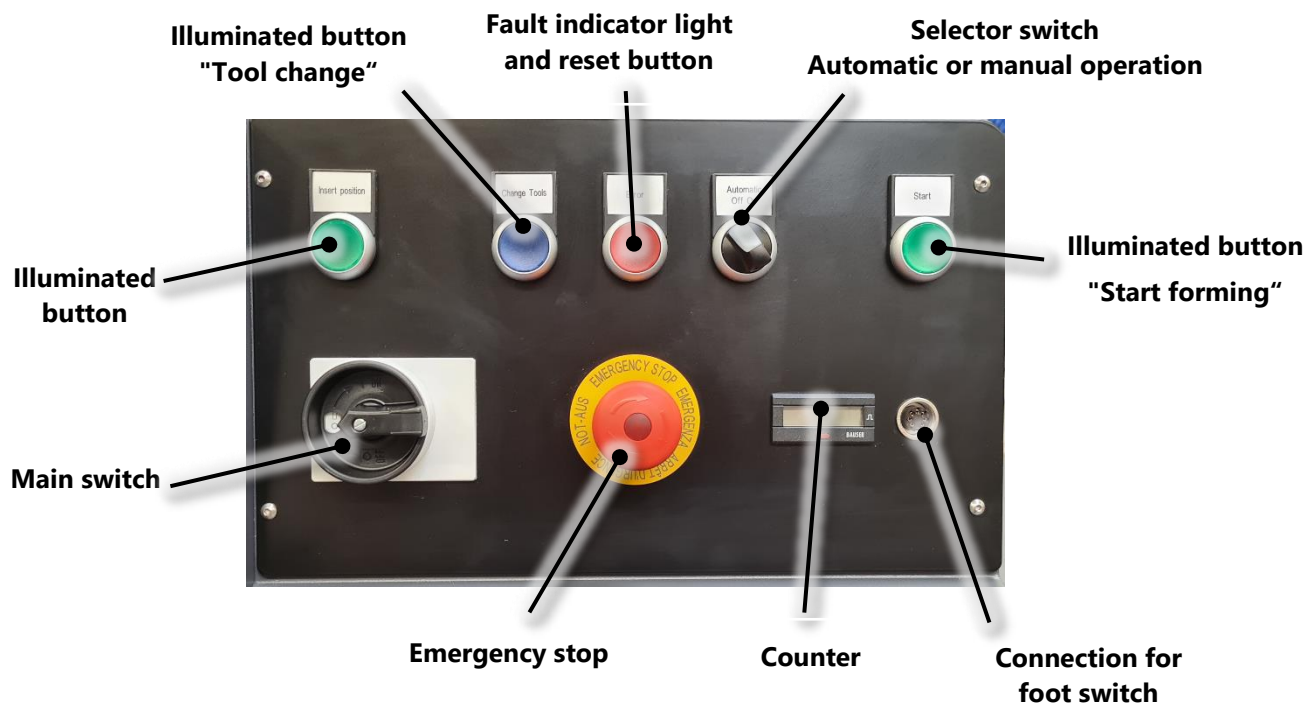
3.1. Operating and monitoring elements



M-WF385Xconnect machine



M-WF385Xplus machine



3.2. Technical data

Forming power

Steel tube	St 37.4 from 6x1mm to 38x6mm resp. 42x4mm
Stainless steel tube	1.4571 from 6x1mm to 38x5mm resp. 42x3mm

Dimensions and weight

Weight	280 kg (M-WF385Xplus) / 284 kg (M-WF385Xconnect)
Depth	99.0 cm
Width	85,0 cm
Without handles	67,5 cm
Height	27,5 cm (M-WF385Xplus) 43,0 cm (M-WF385Xconnect)

Electrical connection

Voltage	3/400 V AC PE /50/60 Hz
Fuse protection	16 A
Nominal power	3.3 KW
Rated current at 50 Hz	7,2 A
Rated current at 60 Hz	6,9 A
Plug	5-pole CEE plug

Hydraulics

Pump	2-stage
Oil	HLP-D 32
Quantity	5.8 liters
Pressure: max.	650 bar

Emission

Noise level	<83 dBA
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Environmental conditions

Ambient temperature	5°C to 45°C
Humidity	90%, non-condensing

4. Transport and Installation

4.1. Transportation

The tank ventilation filter must be closed before each transport. The tank ventilation filter is located under the plastic cover at the rear right. To close it, turn the upper part clockwise (CLOSE arrow) until the 0 marker is above the reference pointer.



IMPORTANT

The machine must only be shipped with the tank ventilation filter closed.



If possible, use the original packaging to avoid transport damage.

Only use suitable lifting gear to lift the machine, with the handles serving as load handling attachments.



Centre of gravity

CAUTION

The center of gravity of the machine is located at the front left (see illustration).



IMPORTANT

The machine may only be transported with the tool holder closed. Otherwise, undesired shifts in the center of gravity may occur due to independent opening.



4.2. Positioning

The workspace

- must ensure a safe and straight stand of the machine (284 kg)
- Must ensure a user-friendly working height
- must be free from chips
- must not have an explosive atmosphere, risk of ignition due to sparking!

IMPORTANT

The machine may only be operated in closed and dry rooms without direct sunlight.



Tidiness and cleanliness protect you from injury, malfunction and damage. Protect the inside of the housing from liquid. Cleaning agents, oil or rain can cause malfunctions and damage to the electrical system.

4.3. Carry out electrical connection

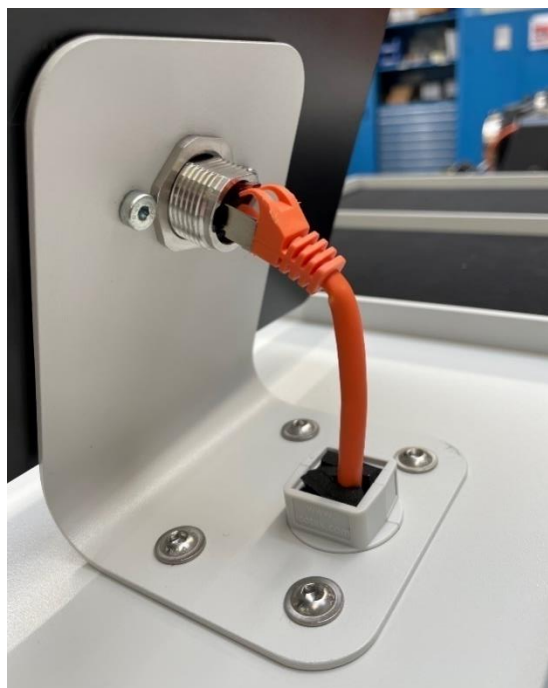
The machine is supplied as standard with a 3 meter long connection cable with a 16A CEE plug. The machine has a phase sequence relay that automatically detects the phase position and ensures a clockwise rotating field.

IMPORTANT Before energizing the machine, the supply voltage should be checked for compliance with the voltage of the machine.



4.4. HMI installation (only for M-WF385Xconnect)

Assemble HMI mounting stand on top of the cover using screws provided along with machine. Mount HMI display on the stand and tightened the nut to complete display assembly. Connect LAN cable provided on cover to RJ45 port on the HMI, as shown below.



4.5. First start-up

Before starting up the Walform machine, the tank ventilation filter must be opened. The tank ventilation filter is located under the plastic cover at the rear right. To open, turn the upper part of the screw counterclockwise (OPEN arrow) until marker ridge 1 is above the reference pointer.

The screw plug is only in the sealing position for transport reasons to prevent the oil from leaking.



IMPORTANT

The machine may only be operated with the tank ventilation filter open.



5. Operate

The operating steps of this forming machine are indicated by illuminated buttons. An illuminated button indicates that this button can be pressed. Pressing it executes the associated function. A flashing button indicates that a further work step must be carried out for this function, e.g. tool change or tube insertion.

The emergency stop button is used to stop the machine in an emergency. After pressing the emergency stop button, the forming cylinder and the clamping cylinder are moved to the rear end position. The machine is then stopped and the energy supply is interrupted. By moving to the rear end position, any trapped limbs are relieved and released.

IMPORTANT

Pressing the emergency stop button immediately interrupts the current forming process. This can result in faulty conversions which must not be used any further.



After the emergency stop button has been actuated, the machine can only be restarted by unlocking the emergency stop button and actuating the main switch.

DANGER

Be sure that all hazards have been eliminated and that all safety devices are in place and functioning before restarting.



The machine M-WF385Xplus is equipped with a double counter. After switching on, the total number of performed transformations is displayed for ten seconds. This counter cannot be reset. After ten seconds, the number of forming operations performed since the last time the reset key was pressed is displayed. This counter can be reset to zero by pressing the red reset key.

The machine M-WF385Xconnect provides a counter in the dashboard of the HMI instead of a mechanical counter on the control panel. On the dashboard, three of four counters can be reset as needed. One is a cumulative counter which cannot be reset.

5.1. Start-up

Before using this machine, you must familiarize yourself with the control and operating elements.

Before initial start-up, the screw plug on the oil reservoir must be set to the seal position, otherwise damage may occur during operation of the machine (chapter 4.5).

5.2. Switch on / tool change

- a) Set the **main switch** to the "**I ON**" position to switch on the machine.

After switching on, the machine automatically performs a lamp test. For this purpose, all the illuminated buttons and the malfunction lamp light up for two seconds.

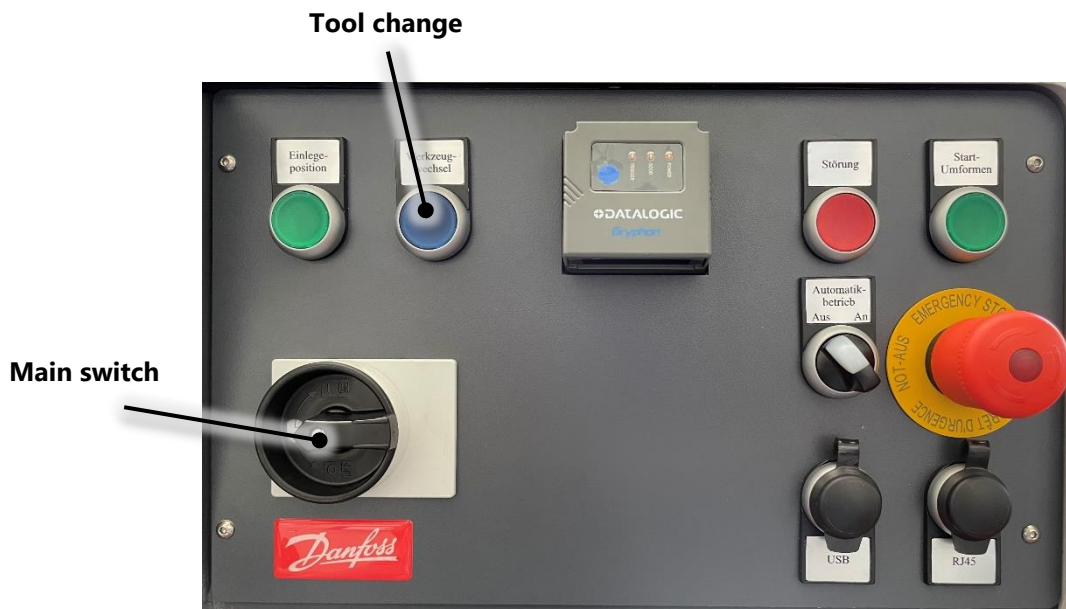
In addition, the fan for the built-in oil cooler is switched on for approx. five seconds. This allows the function to be determined.

The "Tool change" button then lights up, indicating that the machine is ready for operation.

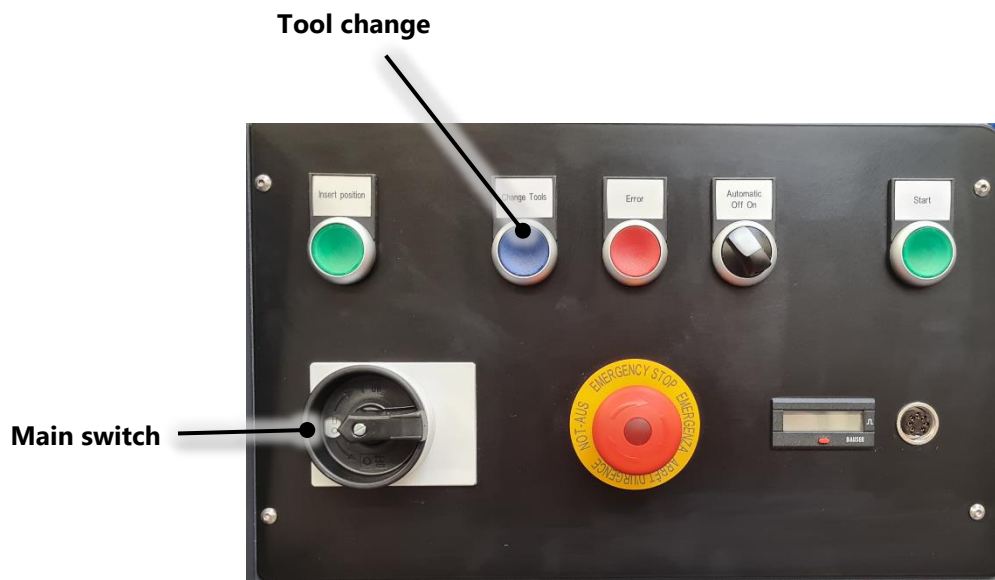
On the M-WF385Xconnect machine, the HMI system also starts up after the machine is switched on. As soon as the dashboard is displayed, the machine is ready for operation.

- b) Press the **"Tool change"** button to bring the machine into the tool change position.

M-WF385Xconnect machine



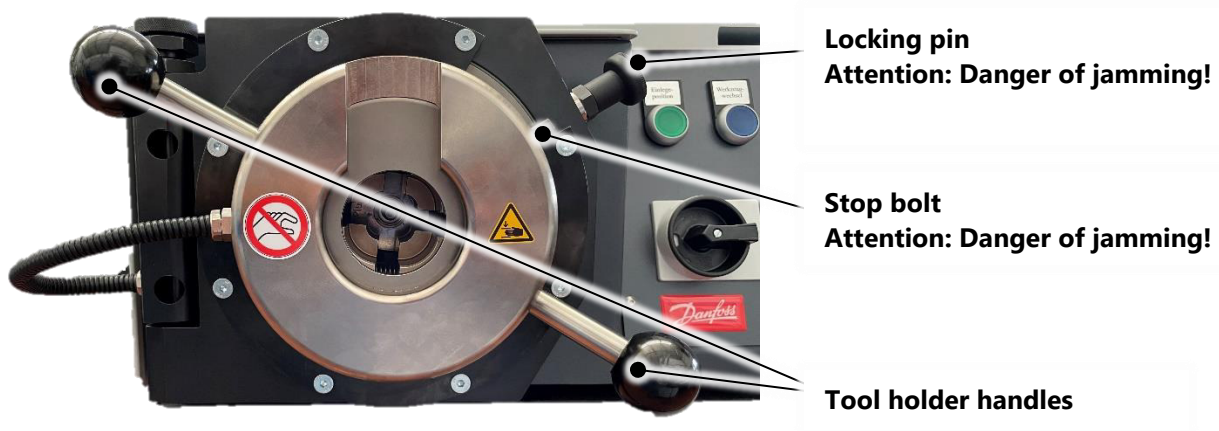
M-WF385Xplus machine



The tool change position is indicated by the flashing "Tool change" button.

- c) To open the tool holder, pull out the locking pin and turn the two tool holder handles counterclockwise. Then the tool holder must be pulled out forward by the handles and swiveled to the side.

CAUTION There is a danger of jamming in the area of the hinge and the stop bolt!



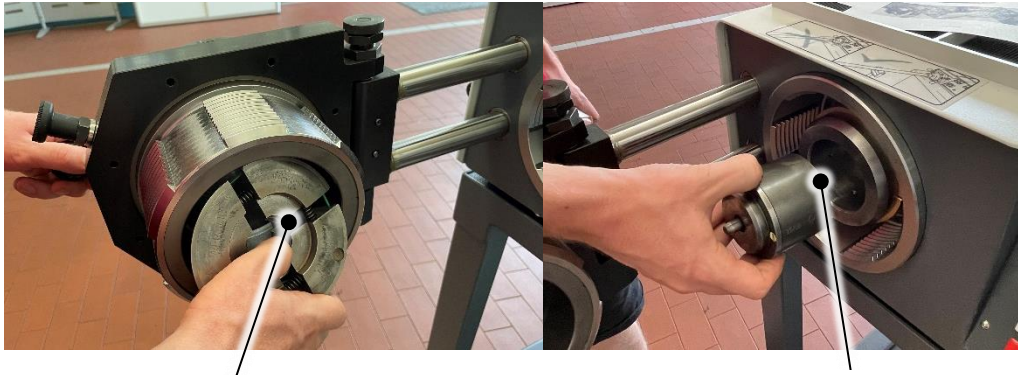
IMPORTANT Before inserting a clamping jaw, make sure that it and the mounting space are free of dirt and chips. If necessary, lightly grease the tool holder (see 8.2).



- d) Insert the clamping jaw into the tool holder with slight pressure until a noticeable stop is felt. Screw in the mold connection piece hand-tight using the assembly tool.

CAUTION There are sharp edges on the clamping jaws in the clamping area!





Clamping jaw

Reshaper

IMPORTANT

The clamping jaw and the forming nozzle always form a unit for each size. The wrong combination of clamping jaw and mold socket can lead to damage.



- e) Swivel the tool holder back and push it into the holder. Pull out the release pin and turn both tool holder handles clockwise until the locking pin engages again.

CAUTION

There is a danger of jamming in the area of the hinge and the stop bolt!



After closing the tool holder, the illuminated button "Tool change" goes out.

- f) Now the tube forming (5.3)/(5.4) can be started.

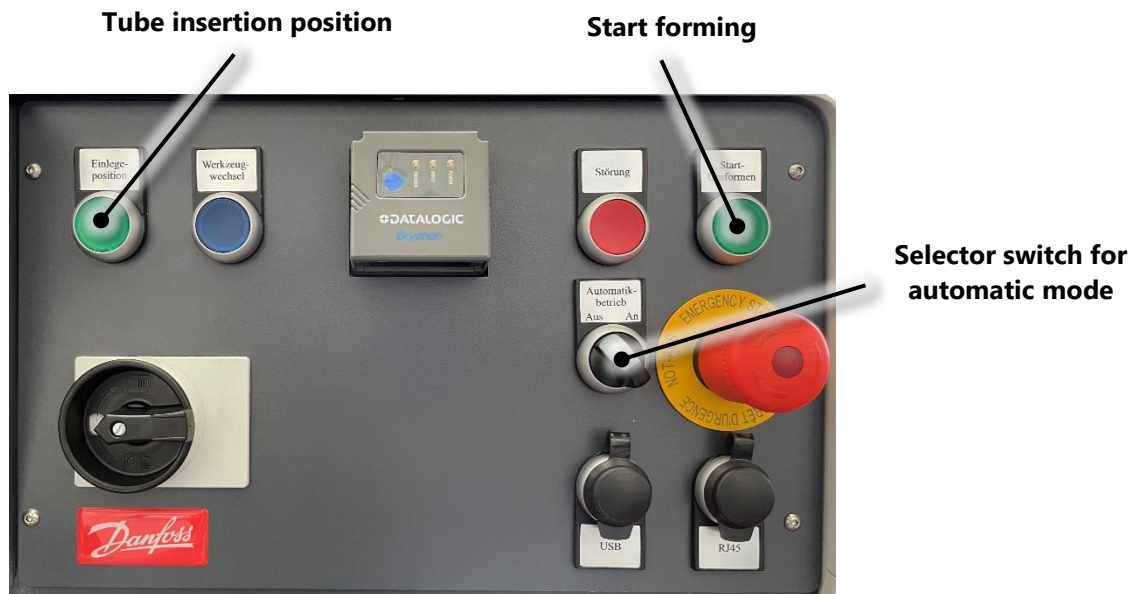
5.3. Tube forming in automatic mode

After inserting the forming tools (5.2), the tube forming process can be started.

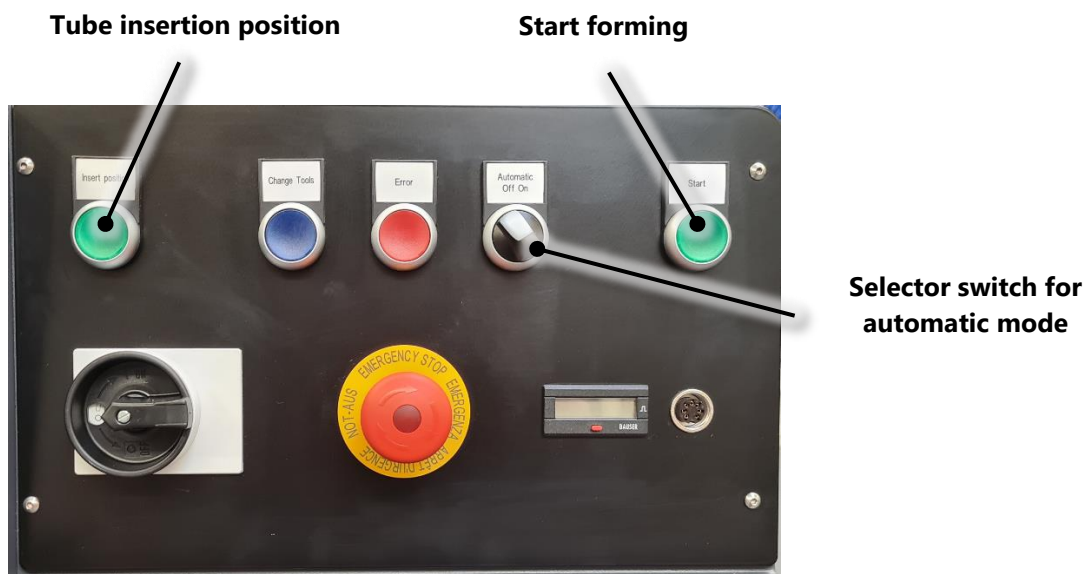
- a) For conversion in automatic mode, the **"Automatic mode"** selector switch must be set to the **"On"** position.
- b) By **simultaneously pressing and holding** the two illuminated keys **"Insertion position"** and **"Start forming"**, the machine moves to the tube insertion position.

In the tube insertion position, the "Insertion position" illuminated button goes out and the "Start forming" illuminated button starts to flash.

M-WF385Xconnect machine



M-WF385Xplus machine



- c) Push the union nut onto the tube.
- d) Insert the tube horizontally into the forming head as far as it will go and hold it!

IMPORTANT Tube axis and tool axis must match - long tubes must be additionally supported.



After the tube has been inserted, the "Start forming" key lights up continuously to indicate that the tube is ready for forming.

- e) **Press the "Start forming" button** (optionally press the foot switch).
The forming process now runs automatically.

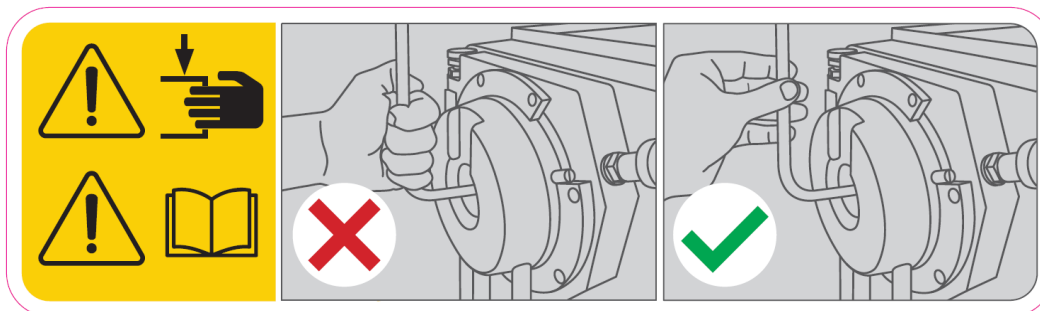
DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!



IMPORTANT The tube must be held in place during the entire process.



DANGER When forming short tube sections or tube bends, the employee must not put his fingers between the union nut or tube bend and the tool holder. The tubes are drawn into the machine approx. 2.5 mm deep when the clamping jaws are released!



- f) Pull out the formed tube and check it according to the corresponding assembly instructions.

After the tube has been removed, the machine automatically moves back to the tube insertion position.

This process runs automatically. While the machine is moving to the tube insertion position, no object may be inserted into the forming head. Otherwise, the machine is automatically stopped, which is indicated by the red error lamp lighting up.

DANGER It is strictly prohibited to reach into the closed tool holder!
Crushing and permanent damage to health may result!



- g) After reaching the tube insertion position, you can start the next forming operation or move to the die change position by pressing the "Die change" key.

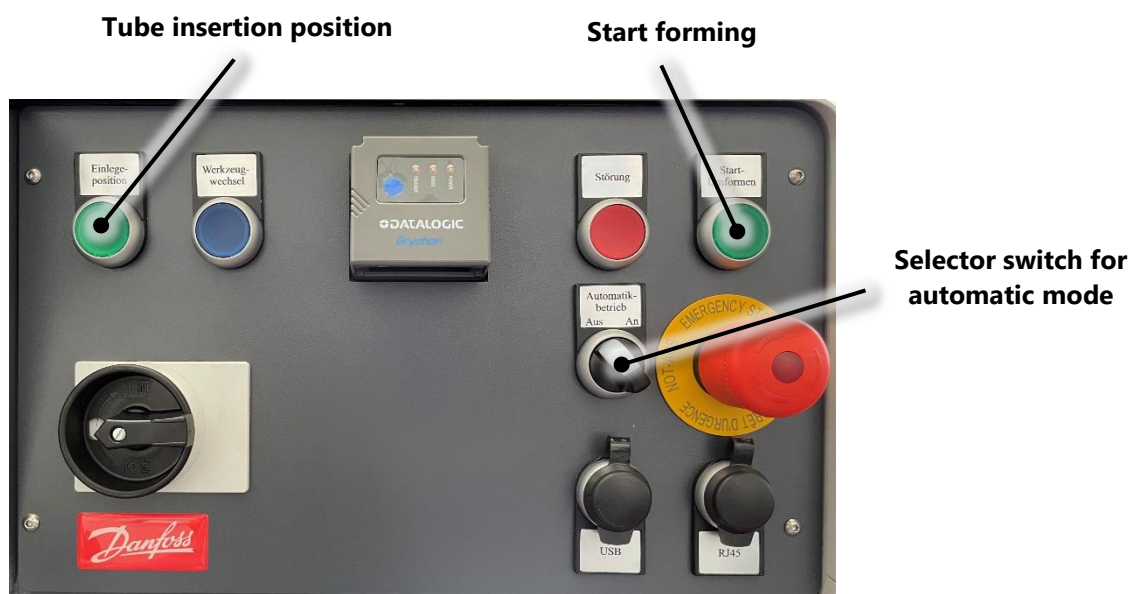
5.4. Tube forming in manual mode

After inserting the forming tools (5.2), the tube forming process can be started.

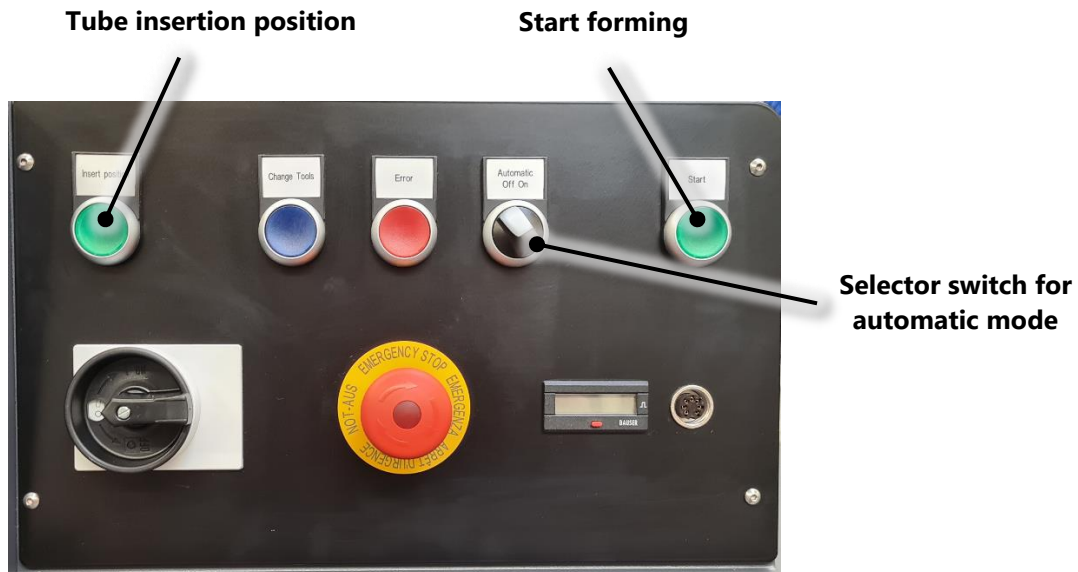
- a) For conversion in manual mode, the **"Automatic mode"** selector switch must be set to the **"Off"** position.
- b) By **simultaneously pressing and holding the two illuminated keys "Insertion position" and "Start forming"**, the machine moves to the tube insertion position.

In the tube insertion position, the illuminated button "Insertion position" goes out.

M-WF385Xconnect machine



M-WF385Xplus machine



- c) Push the union nut onto the tube.
- d) Insert the tube horizontally into the forming head as far as it will go and hold it!

IMPORTANT Tube axis and tool axis must match - long tubes must be additionally supported.



- e) **Press the "Start forming" button** (optionally press the foot switch).
The forming process now runs automatically.

DANGER It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!

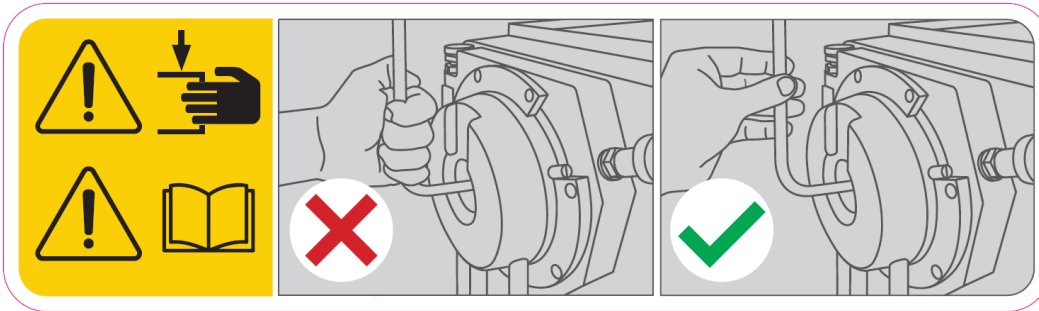


IMPORTANT The tube must be held in place during the entire process.



DANGER When forming short tube sections or tube bends, the employee must not put his fingers between the union nut or tube bend and the tool holder. The tubes are drawn into the machine approx. 2.5 mm deep when the clamping jaws are released!





- f) Pull out the formed tube and check it according to the corresponding assembly instructions.

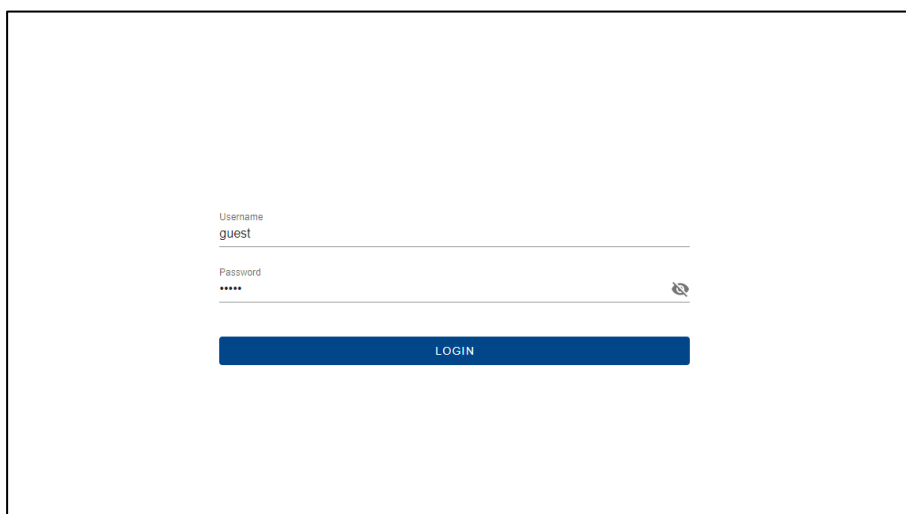
After removing the tube, the machine stops in the die change position. Now the tools can be changed or moved to the tube insertion position by simultaneously pressing and holding the two illuminated buttons "Insertion position" and "Start forming".

5.5. Dashboard access (for M-WF385Xconnect)

The integrated HMI display on the machine is preconfigured to the controller and does not require an additional configuration setting. The machine also does not require an internet connection to access the local dashboard on the display. The dashboard can be accessed by either of below two options.

5.5.1. Option 1- Dashboard on integrated HMI

After the HMI installation as per section 4.4 is done, the dashboard can be visualized on the HMI by using the login credentials given below.



Admin:

- Username: admin
- Password: admin

Guest:

- Username: guest
- password: guest

You will be logged in automatically as guest user after switching on the machine.

The credentials can be changed in the user settings after the first login. After successful login, the user will be directed to the home page of the dashboard.

5.5.2. Option 2 - Dashboard on any external device

The dashboard can be accessed on the web interface by typing the given IP address / URL in web browser on any external device. To access the dashboard, the machine and the external device shall be directly connected to the same network (through LAN or WiFi).

IP address: <http://192.168.0.2>

URL: <http://danfoss-edge/>

Admin:

- Username: admin
- Password: admin

Guest:

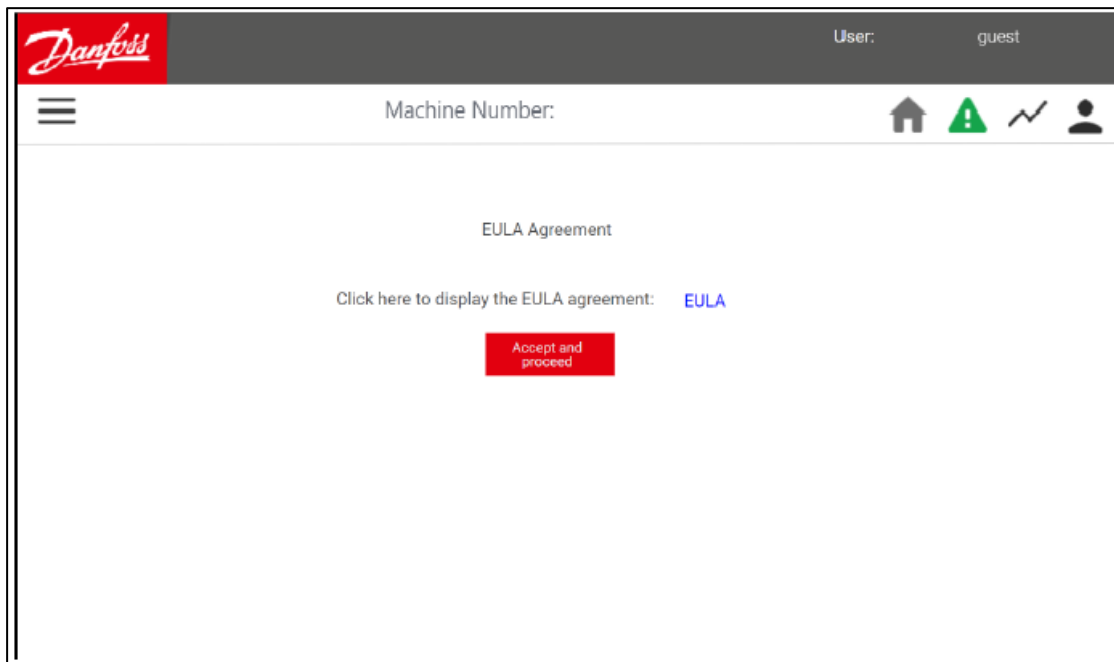
- Username: guest
- password: guest

You will be logged in automatically as guest user after switching on the machine.

* the URL <http://danfoss-edge> only works if the device is directly connected to the same network. There may be no routing between device and computer.

5.5.3. EULA

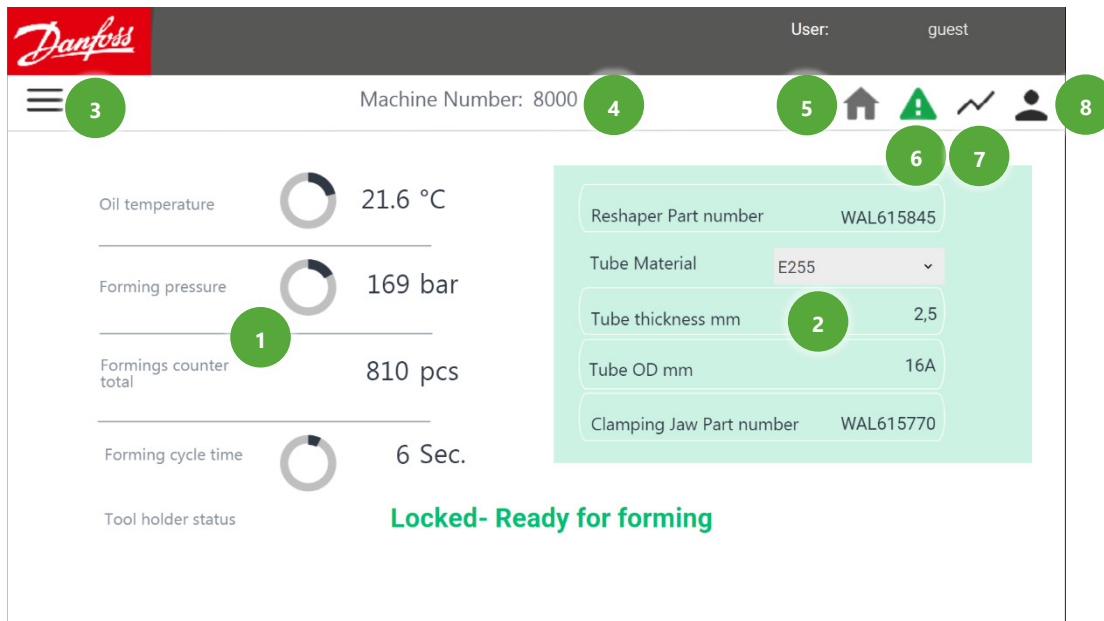
After starting the machine for the very first time, the user will be welcomed by the "EULA Agreement". The user shall click on "Accept and proceed" to accept the EULA and start using the dashboard. The user can access details of license agreement by clicking on the "EULA" link.



5.6. Dashboard details (for M-WF385Xconnect)

5.6.1. Home screen

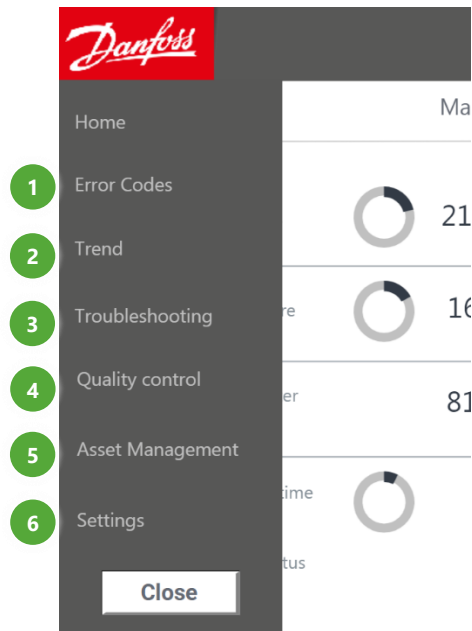
Several machine parameters are indicated on the dashboard for operator's information and to monitor machine health. Details are as described below:



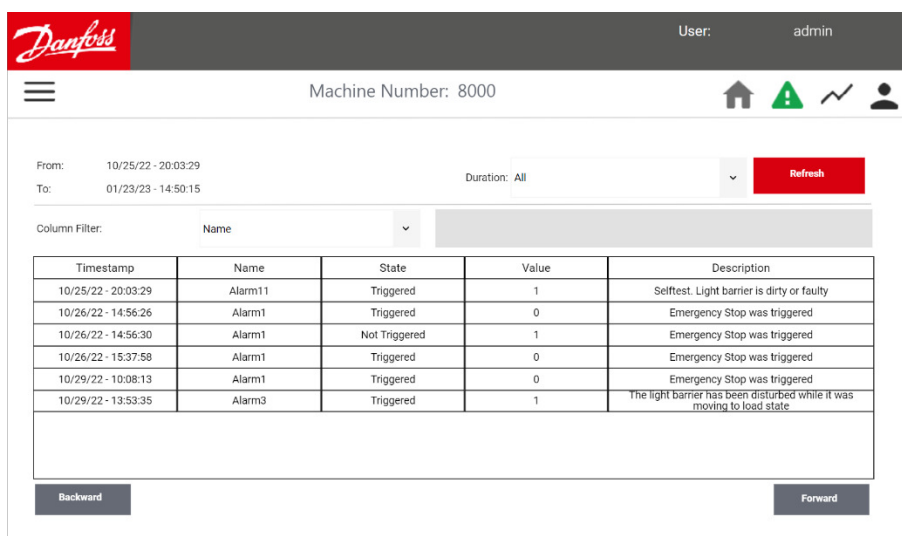
- 1) This left side section of the dashboard indicates parameters related to the last tube forming operation performed. Detailed view of each parameter can be accessed by touching it.
- 2) Right side section shows information regarding tooling and respective tube parameters to help ensure right tooling is used. Information is auto populated after reshaper tool is scanned using barcode scanner.
- 3) Menu section
- 4) The machine number is an unique ID assigned by the Danfoss Admin and cannot be edited by the user.
- 5) Navigate to the dashboard
- 6) Navigate to the Alarm section.
Alarm: If red, it indicates that there is an alarm in the controller and it can be viewed by touching the icon. If there is no active alarm but the icon is still red, it can be that the alarm reason is already solved but the controller is still in error mode (e.g. if the emergency stop button has been pressed). In this case, please restart the machine.
- 7) Navigate to the trend page.
- 8) Switch user.

5.6.2. Main Menu

Navigate through the main menu to access the respective section on the dashboard.

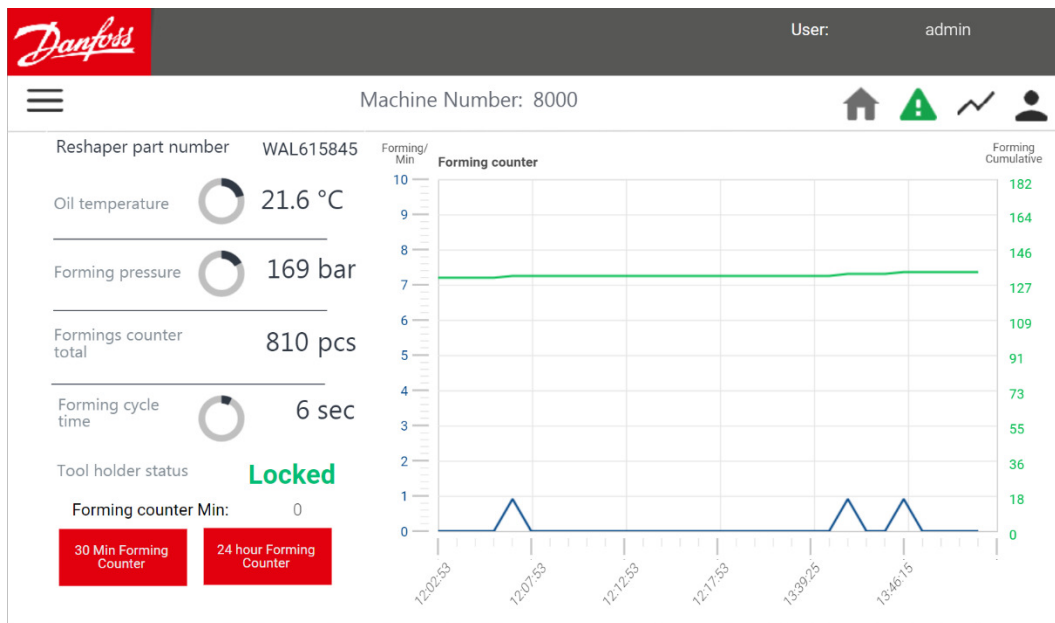


- 1) Navigate to the Error codes section to view active and resolved Alarms. Every alarm message will be stored in the alarm widget. If an error message appears a pop-up message will appear and show the steps to solve the problem.

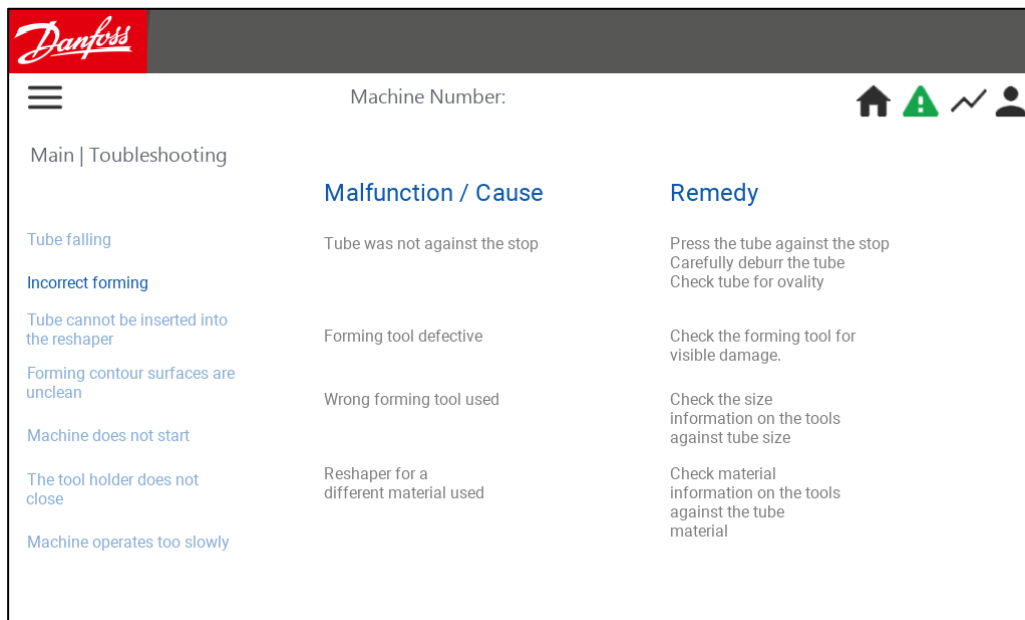


Timestamp	Name	State	Value	Description
10/25/22 - 20:03:29	Alarm11	Triggered	1	Selftest. Light barrier is dirty or faulty
10/26/22 - 14:56:26	Alarm1	Triggered	0	Emergency Stop was triggered
10/26/22 - 14:56:30	Alarm1	Not Triggered	1	Emergency Stop was triggered
10/26/22 - 15:37:58	Alarm1	Triggered	0	Emergency Stop was triggered
10/29/22 - 10:08:13	Alarm1	Triggered	0	Emergency Stop was triggered
10/29/22 - 13:53:35	Alarm3	Triggered	1	The light barrier has been disturbed while it was moving to load state

- 2) Navigate to the trend section to view graphical representation of respective parameters.

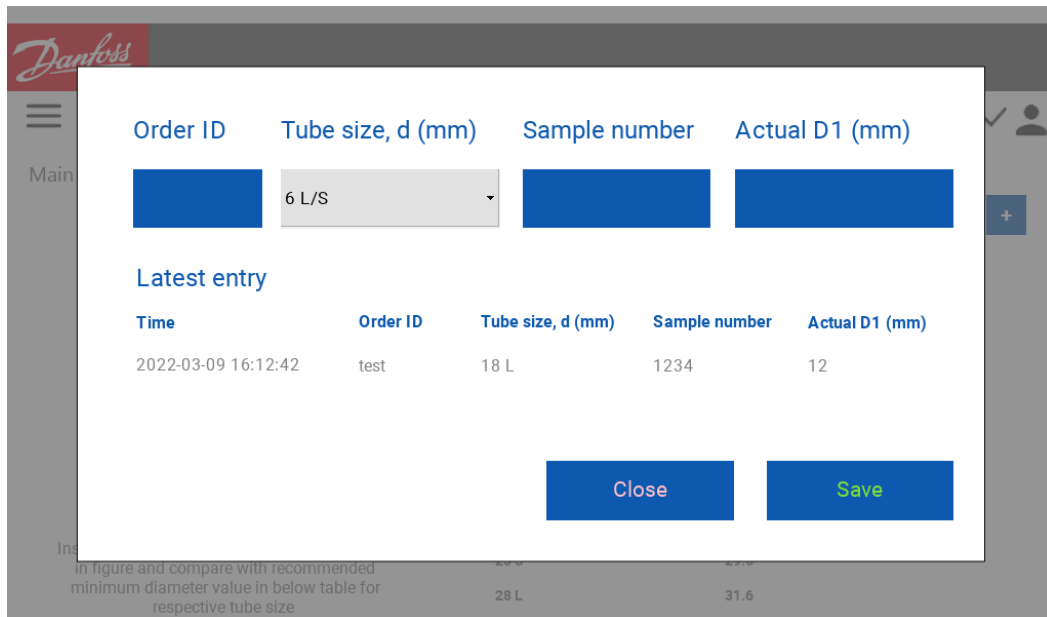


- 3) Navigate Troubleshooting section to view the remedy in case of a machine malfunction.



Main Troubleshooting	Malfunction / Cause	Remedy
Tube falling	Tube was not against the stop	Press the tube against the stop Carefully deburr the tube Check tube for ovality
Incorrect forming		
Tube cannot be inserted into the reshaper	Forming tool defective	Check the forming tool for visible damage.
Forming contour surfaces are unclear	Wrong forming tool used	Check the size information on the tools against tube size
Machine does not start		
The tool holder does not close	Reshaper for a different material used	Check material information on the tools against the tube material
Machine operates too slowly		

- 4) Navigate to the quality control section to verify the tube forming quality and record batch inspection details. The entries will be stored in a csv-file, which can be exported to a USB stick.



Order ID	Tube size, d (mm)	Sample number	Actual D1 (mm)
	6 L/S		

Latest entry

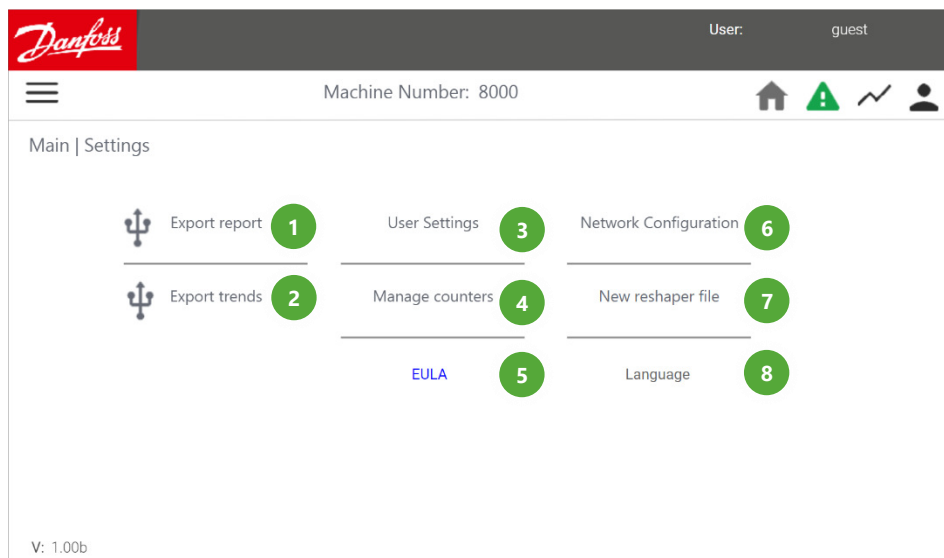
Time	Order ID	Tube size, d (mm)	Sample number	Actual D1 (mm)
2022-03-09 16:12:42	test	18 L	1234	12

Close Save

- 5) Navigate to the asset management.
- 6) Navigate to the settings menu for modification / configuration of several fields.

5.6.3. Settings

Several parameters of the dashboard can be configured in the settings section.

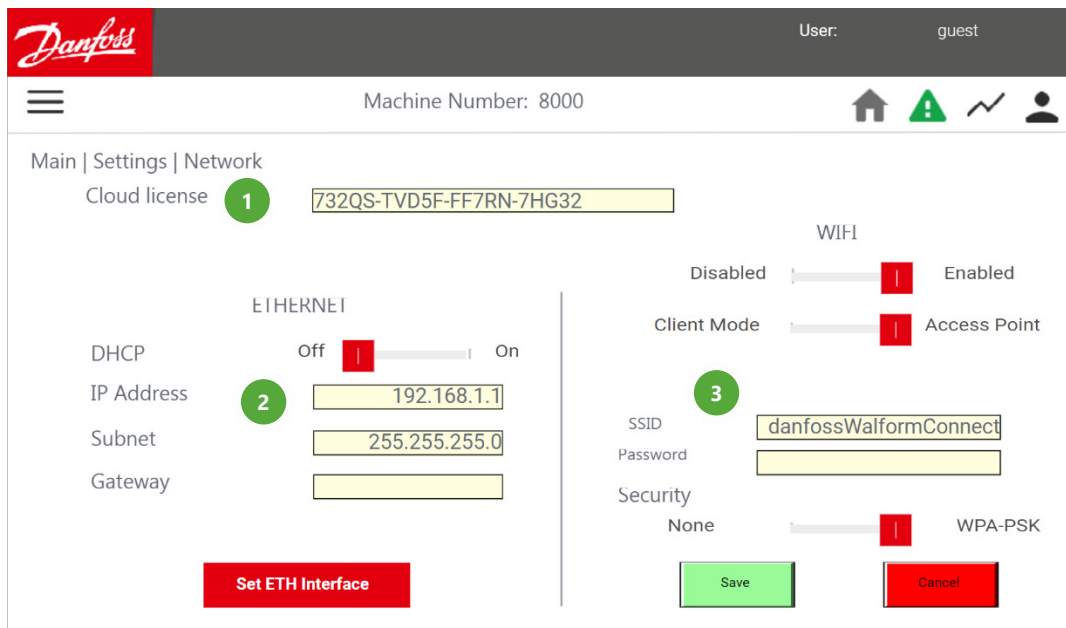


- 1) Export custom reports in csv or pdf format.
- 2) Save reports/trends on a USB drive.
Please make sure that a writable USB stick is plugged in your edge device. Click the icon to store the log to your USB device. After that you'll find a CSV file on your USB stick called 'output.csv'.

Warning: If there is already a file called output.csv on your USB stick, it will be overwritten!

- 3) User settings for creating new users or changing password. "Change Password" is only possible if you are logged in as your own created user. The standard system users can't change their password. Only the admin user is allowed to create new user. Using the "Available User" DropDown you can see all available users on the machine.
- 4) Configure and reset counters as needed.
- 5) Open the EULA
- 6) Configure network settings to establish internet connection with Walform machine using LAN cable or wireless network.
- 7) Load new 'resaper_cross_reference.csv'
Copy the new resaper file to your USB stick and name it: 're-shaper_cross_reference.csv'. Then plug the USB stick in the edge device.
- 8) Set the system-language.

5.6.4. Network configuration



The screenshot displays the Danfoss network configuration web interface. At the top, the Danfoss logo is on the left, and the user is logged in as 'guest' on the right. Below the header, the 'Machine Number' is 8000. The main navigation bar includes 'Main', 'Settings', and 'Network'. The 'Network' section is active, showing 'Cloud license' (1) with the value '732QS-TVD5F-FF7RN-7HG32'. Under 'ETHERNET', the 'DHCP' toggle is set to 'Off' (2), and the 'IP Address' is '192.168.1.1'. The 'Subnet' is '255.255.255.0' and the 'Gateway' is empty. A red 'Set ETH Interface' button is at the bottom left. On the right, the 'WIFI' section shows 'Disabled' and 'Enabled' toggles, with 'Client Mode' set to 'Access Point'. The 'SSID' (3) is 'danfossWalformConnect', and the 'Security' is set to 'WPA-PSK'. 'Save' and 'Cancel' buttons are at the bottom right.

- 1) Cloud License: Here you can enter the cloud license, which will be provided by Danfoss.
- 2) Ethernet / LAN:
 - a. DHCP: Setting up the ethernet port to obtain an IP address via DHCP.
 - b. Otherwise you can set up the ethernet port with a fixed IP address, subnet mask and gateway address. The option DHCP needs to be "Off" for this set up.

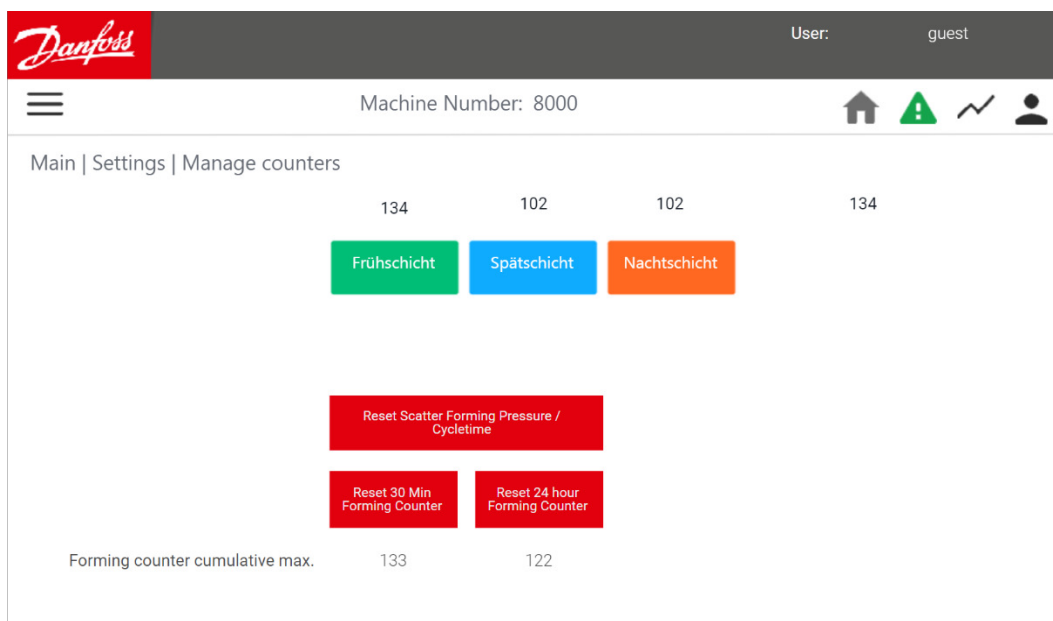
- c. Confirm the setup with clicking on "Set ETH Interface".
- 3) Wi-Fi:
 - a. User can enable or disable the WIFI interface. In case of enable, one can choose between "Client Mode" (connecting to an available WIFI) or "Access Point" (the Walform machine will act as the access point) mode.
 - b. Using "Client": You can search for available networks, clicking the button on the right side of the Client DropDown list. Or you can manually enter the SSID and password in the dedicated fields.
 - c. Using "Access Point": You can set up the SSID and password which will be used for the machine, using the fields.
 - d. Confirm the setup with clicking on "Save" button.

5.6.5. Manage counters

The user has up to three different counters available, which can be set up independent from each other.

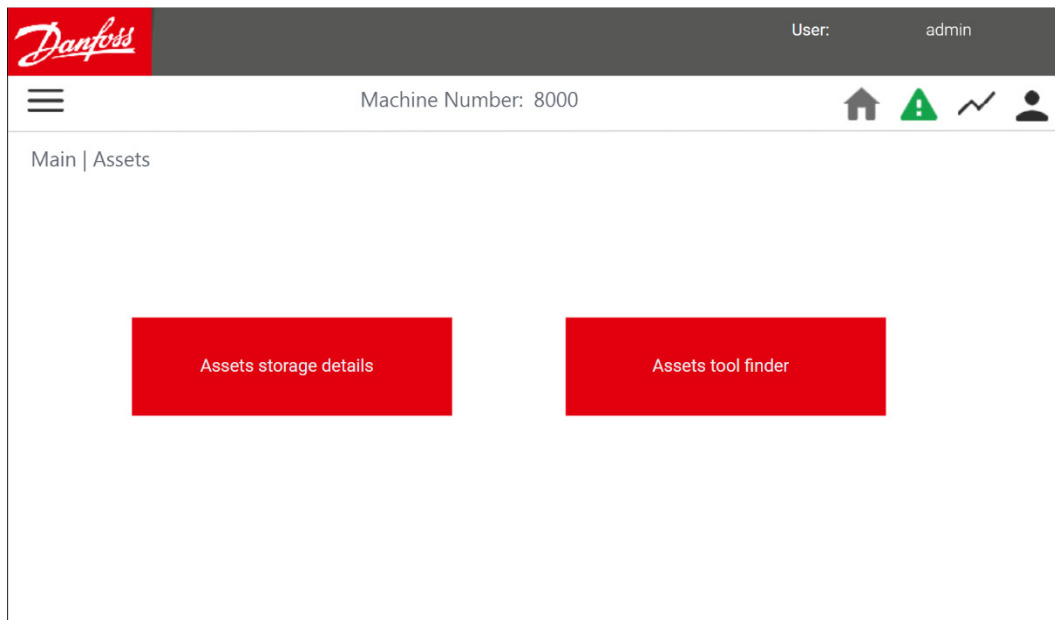
The admin user can set up the name for the three counters (green; blue; orange).

Using "Reset 30 Min Forming Counter" and/or "Reset 24 hour Forming Counter" the scatter diagrams for the forming counters on page "Trend" can be deleted.



5.6.6. Asset Management

To support handling of assets, a storage database and a tool finder feature is available.

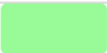
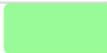
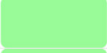
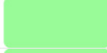
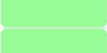
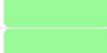


The columns "Reshape part number" and "Clamping Jaw part number" will be prefilled automatically.

The "Storage location" and the "Quantity" can be entered manually.

Clicking on "Add to reshaper inventory" will add 1 item to quantity to "Reshaper part number". Clicking on "Add to clamping jaw inventory" will add 1 item to quantity to "Clamping Jaw part number". The user can increase quantity to add more tooling to inventory.

By clicking on the quantity, it can be adjusted individually.

 User: admin							
Machine Number: 8000     							
Main Assets Storage details							
Reshaper part number	Quantity	Storage location	Clamping Jaw part number	Quantity	Storage location	Add to reshaper inventory	Add clamping jaw inventory
WAL625272	2		WAL625294	1			
WAL625273	1		WAL625295	2			
WAL625274	3		WAL625296	1			
WAL625275	5		WAL625297	1			
WAL625276	1		WAL625298	2			
WAL615820	1		WAL615765	0			
WAL615821	5		WAL615766	3			

In the tool finder section, using the three parameter "Tube Material", "Tube thickness" and "Tube OD", which needs to be entered via DropDown menus manually, you are able to search automatically for your reshaper part number and the dedicated clamping jaw part number.

 User: admin	
Machine Number: 8000     	
Main Assets Tool finder	
Tube Material E255;E355 ▾	Reshaper part number: WAL615831
Tube thickness 2,5 ▾	Clamping jaw part number: WAL615768
Tube OD 12 ▾	

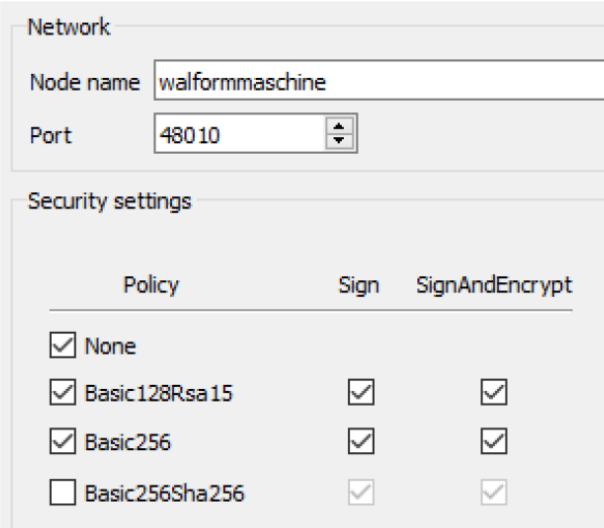
5.7. OPC UA set-up

To connect this machine to an ERP system, the walform machine provides an OPC UA server with the possibility to monitor the most crucial values. The user can also provide dedicated orders to the machine:

Name	Type	Access
Unique machine ID	String (255)	R
System (oil) temperature	Real	R
Tool holder status	Byte	R
Tooling	String (30)	R
Forming counter (persistence)	Double	R
Forming cycle time (ms)	Real	R
Error code	Word	R
Order Completed	Bool	R/W
Order Number	String (255)	R/W
Order Quantity	Double	R/W

In addition, the user also has the possibility to read the dedicated forming counters.

The server is reachable either using the node name, or the IP address of the machine and port 48010.



The screenshot shows a configuration window for the OPC UA server. It is divided into two main sections: 'Network' and 'Security settings'.

Network section:

- Node name:** A text field containing 'walformmaschine'.
- Port:** A dropdown menu set to '48010'.

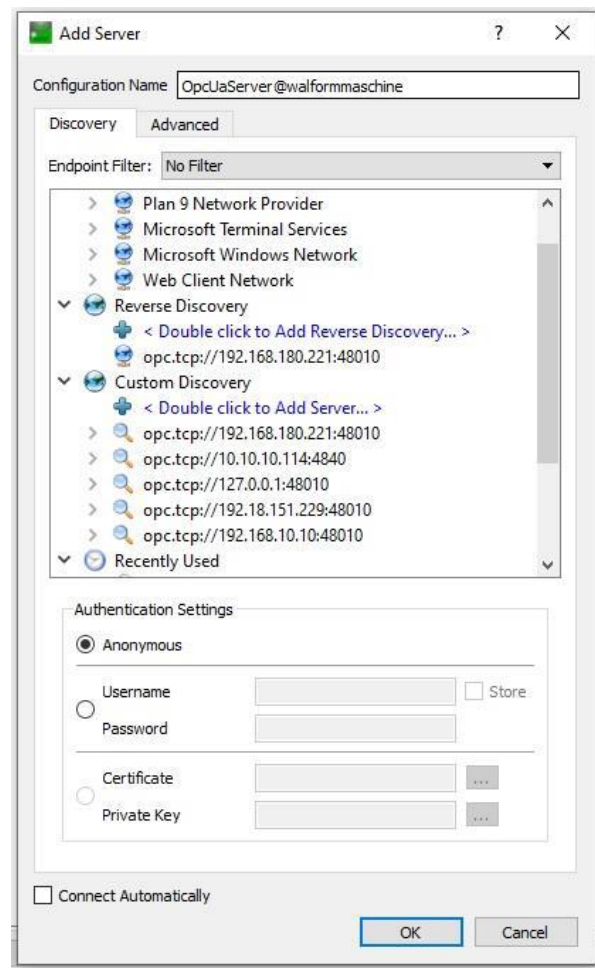
Security settings section:

This section contains a table with three columns: 'Policy', 'Sign', and 'SignAndEncrypt'. Each row represents a security policy with checkboxes for each column.

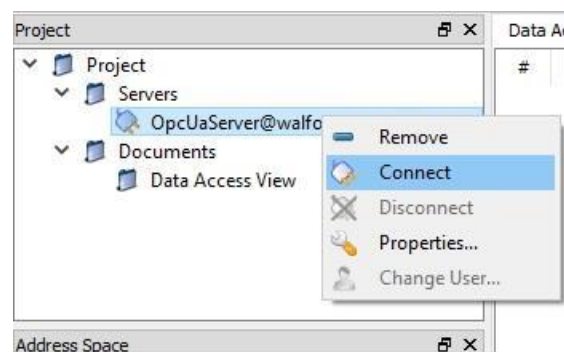
Policy	Sign	SignAndEncrypt
☒ None		
☒ Basic128Rsa15	☒	☒
☒ Basic256	☒	☒
☐ Basic256Sha256	☒	☒

Connecting using a OPC UA client

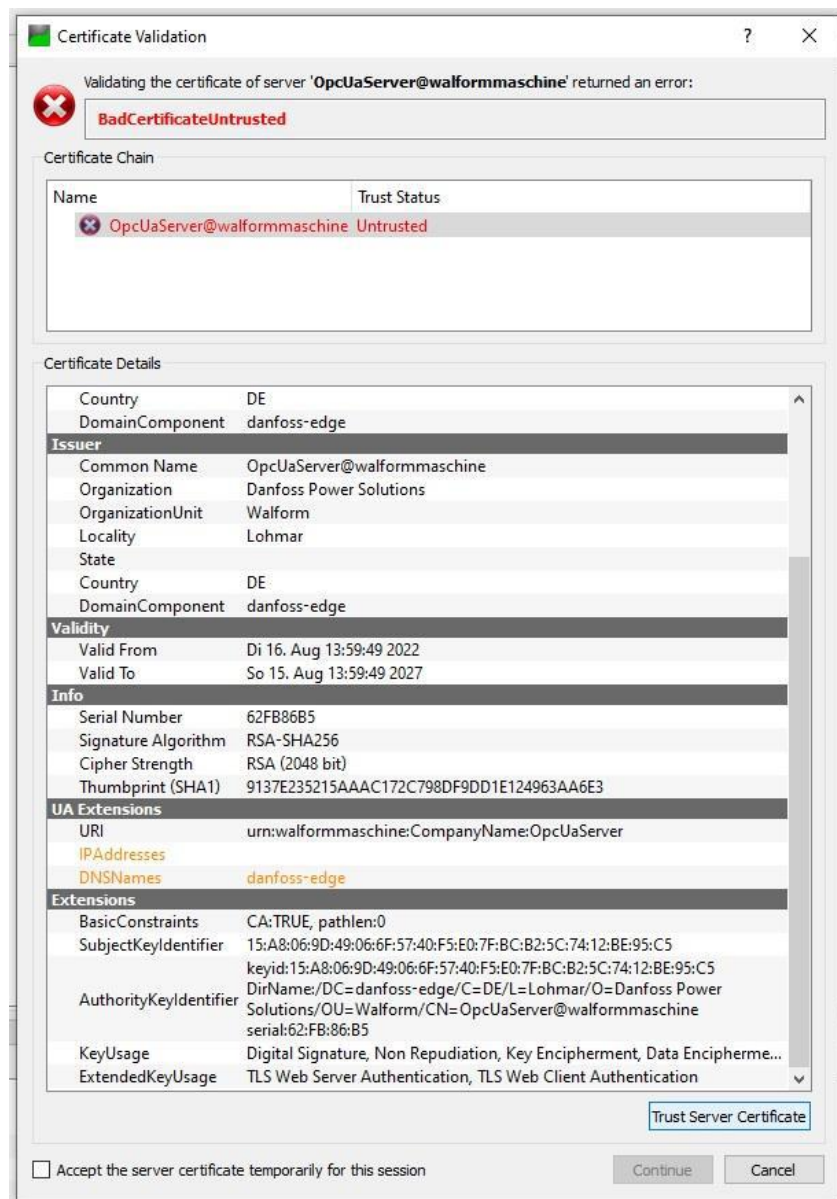
We are going to use as an example client "UaExpert" to display the possibilities. The client provides the possibility to discover and add a server.



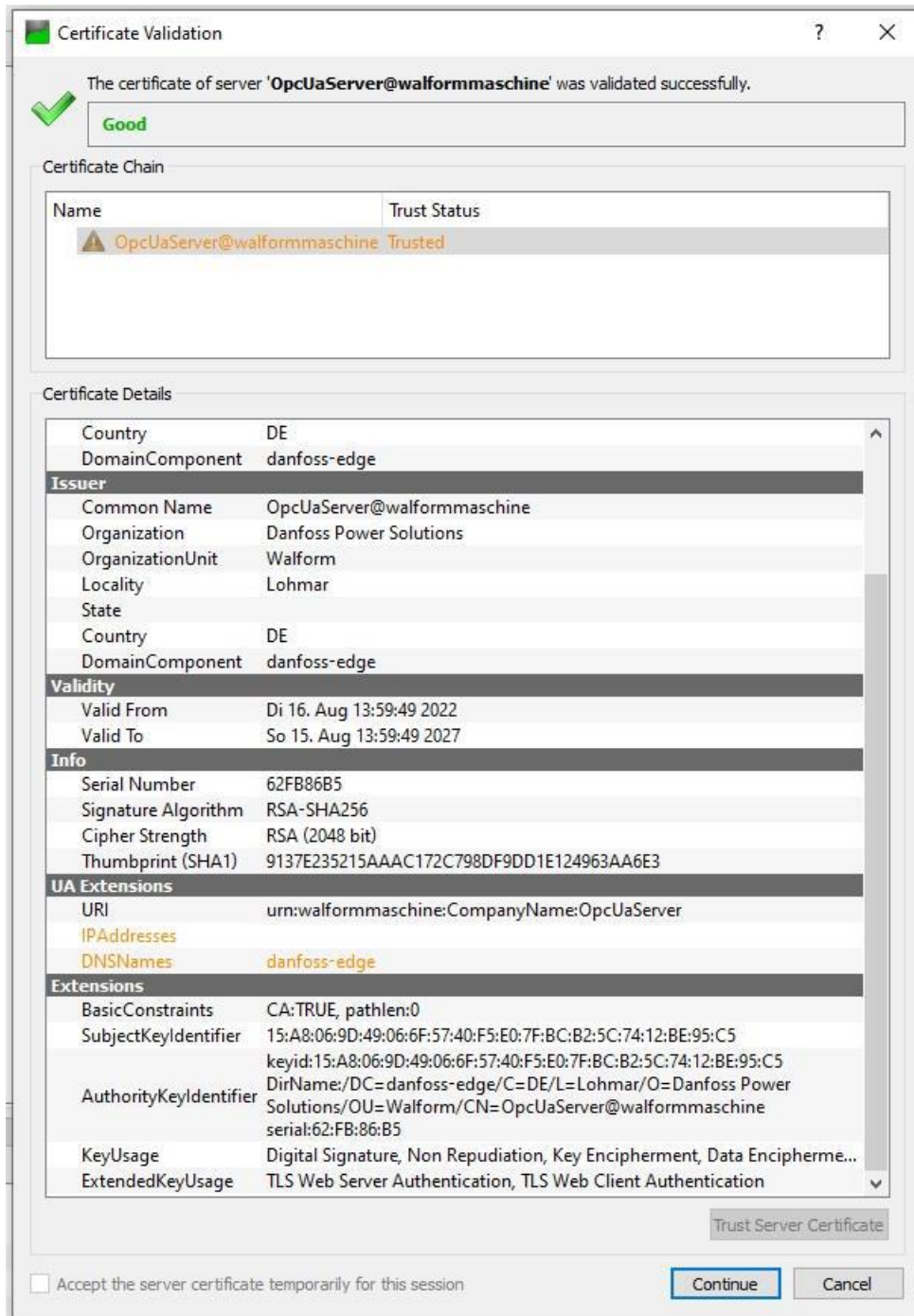
After choosing the server you can connect to it.



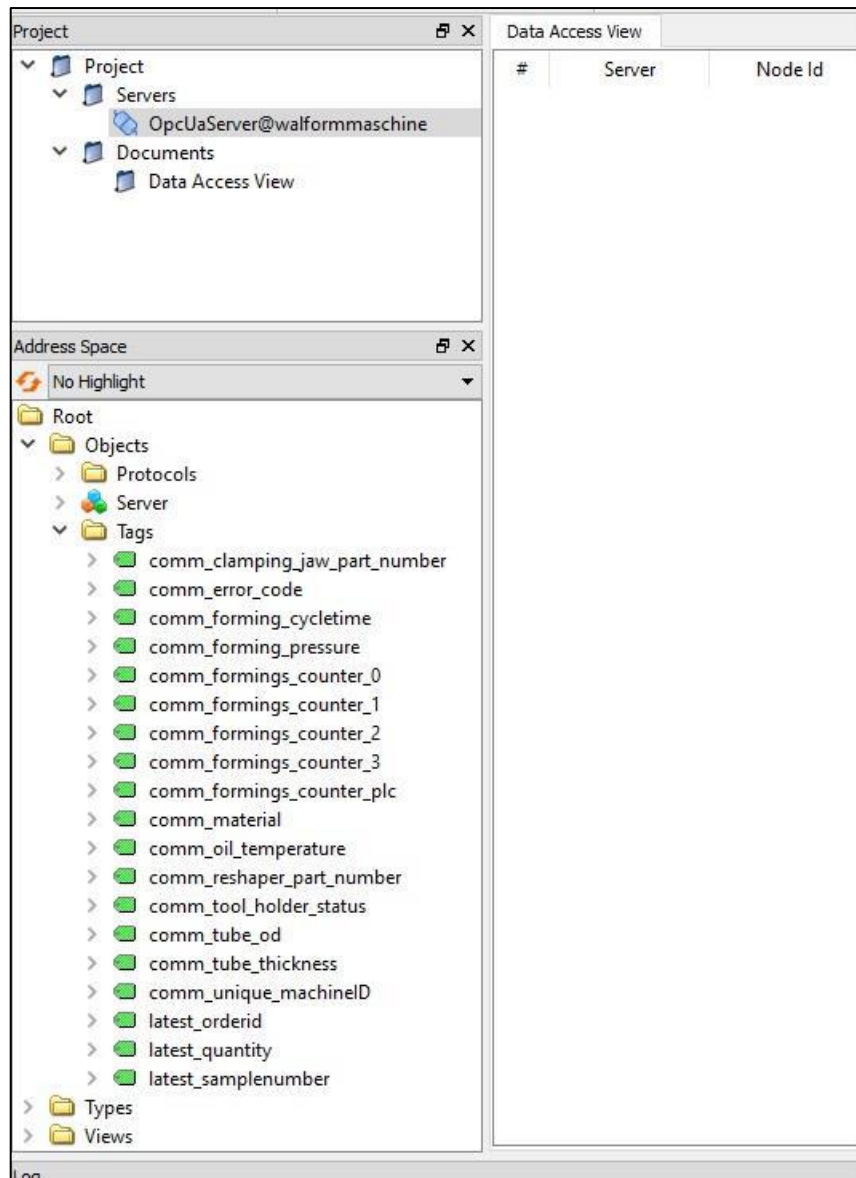
As the server provides self-signed certificates you will be prompted to accept the certificate.



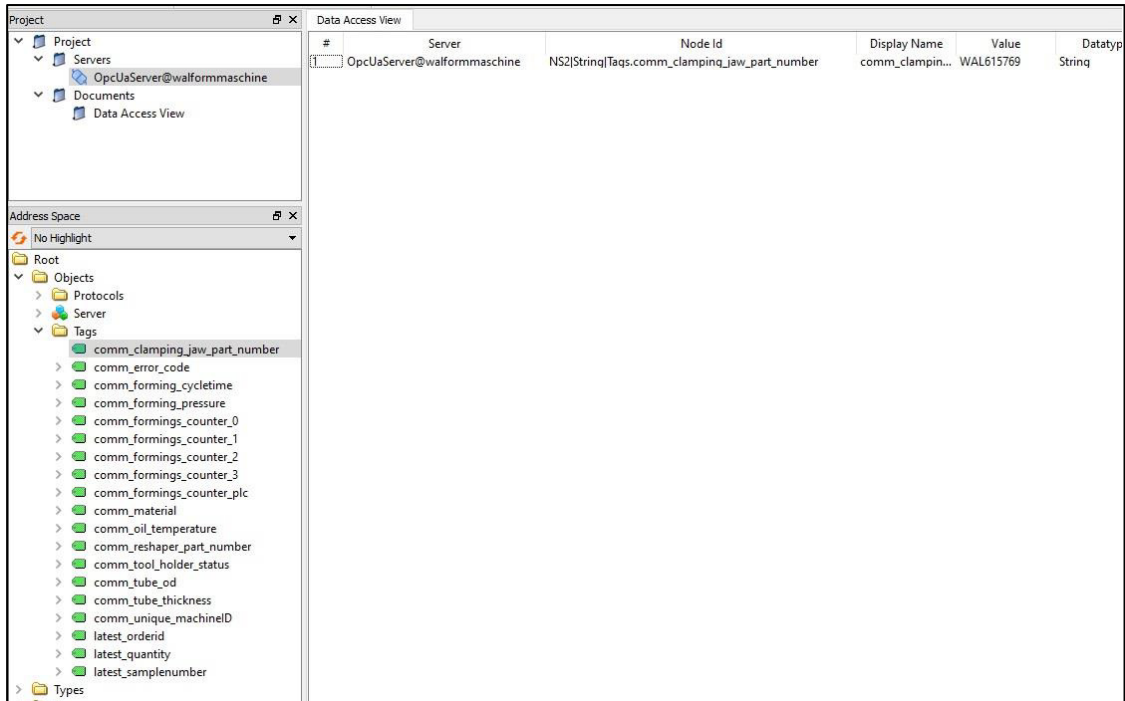
"Trust Server certificate" will make sure, that the server is trusted as an authority.



After the connection is established, you can browse for the mentioned tags in the introduction of this chapter.

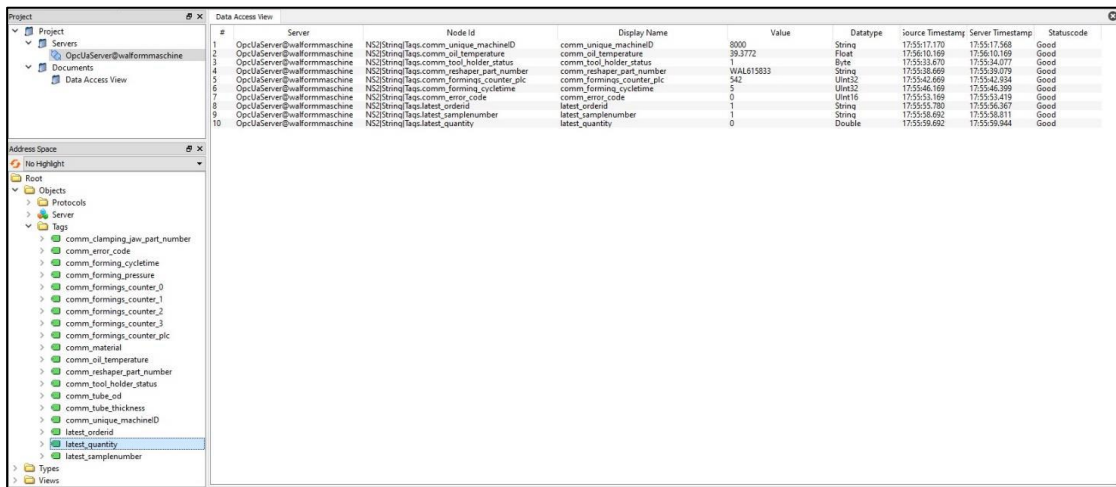


Via drag and drop you can choose the value (tag) you want to display and move it to the "Data access view" in the middle of the screen.



#	Server	Node Id	Display Name	Value	Datatype
1	OpcUaServer@walformmaschine	NS2[String]Tags.comm_clamping_jaw_part_number	comm_clampin...	WAL615769	String

The values are provided either by the machine, or can also be set up via the OPC UA client.



#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Timestamp	Statuscode
1	OpcUaServer@walformmaschine	NS2[String]Tags.comm_unique_machineID	comm_unique_machineID	8000	String	17:55:17.170	17:55:17.568	Good
2	OpcUaServer@walformmaschine	NS2[String]Tags.comm_oil_temperature	comm_oil_temperature	39.3772	Float	17:56:10.169	17:56:10.169	Good
3	OpcUaServer@walformmaschine	NS2[String]Tags.comm_tool_holder_status	comm_tool_holder_status	1	Byte	17:55:34.670	17:55:34.077	Good
4	OpcUaServer@walformmaschine	NS2[String]Tags.comm_resaper_part_number	comm_resaper_part_number	WAL615833	String	17:55:36.669	17:55:36.079	Good
5	OpcUaServer@walformmaschine	NS2[String]Tags.comm_formings_counter_plc	comm_formings_counter_plc	542	UInt32	17:55:42.669	17:55:42.954	Good
6	OpcUaServer@walformmaschine	NS2[String]Tags.comm_formings_cycletime	comm_formings_cycletime	5	UInt32	17:55:46.169	17:55:46.399	Good
7	OpcUaServer@walformmaschine	NS2[String]Tags.comm_error_code	comm_error_code	0	UInt16	17:55:53.189	17:55:53.419	Good
8	OpcUaServer@walformmaschine	NS2[String]Tags.latest_orderid	latest_orderid	1	String	17:55:55.780	17:55:56.307	Good
9	OpcUaServer@walformmaschine	NS2[String]Tags.latest_samplernumber	latest_samplernumber	1	String	17:55:58.692	17:55:58.811	Good
10	OpcUaServer@walformmaschine	NS2[String]Tags.latest_quantity	latest_quantity	0	Double	17:55:58.692	17:55:58.944	Good

5.8. Switch off the machine

Move the machine to the tool change position, set the **main switch** to the "**O OFF**" position and disconnect the power cord.

6. Forming

Since this machine can be used for different bolting systems (Walform-WD, Walform-M, WalformPlus), different technical specifications apply depending on the bolting system.

Please refer to the current Danfoss bolting catalog for information on the following items:

- Tube selection
- Tube preparation
- Control of the finished formed tube
- Assembly of the screw connection
- Pressure and temperature load capacity

IMPORTANT

Incorrectly shaped tube ends impair the functional safety of the fitting and must not be used.



Walform bolting system

7. Interference

Our Danfoss Power Solutions II GmbH service hotline will be happy to assist you with any malfunctions that may occur:

Tel +49 2246 / 100 - 9187 or -9176

Fax +49 2246 / 100 - 9307

Outside normal business hours:

Hotline +49 172 / 2085471

7.1. Fault messages

All fault messages are output by different flashing codes of the "Fault" indicator lamp.

Code	Malfunction / Remedy
Flashing 0.2s (5/s)	The maximum oil temperature of 70°C has been exceeded. - Allow the machine to cool down when switched on. If the oil temperature falls below the maximum temperature, the malfunction indicator lamp goes out automatically and the machine is ready for operation again. - Check if the fan for the internal oil cooler is running. - Check oil level.
Flashing 1s (60/min)	One of the two proximity switches that monitor the locking of the tool holder is defective or the tool holder was not closed quickly. - Check whether the tool holder is properly closed. - Switch off the machine for at least 5 seconds. - Contact service hotline.

Code	Malfunction / Remedy
Flashing 1s (60/min)	The proximity switch for detecting the tube insertion position is defective. - Switch off the machine for at least 5 seconds. - Contact service hotline.
Flashing 4s (15/min)	The photoelectric sensor has detected an object in the forming head while the machine is moving to the mold change position. - Switch off the machine for at least 5 seconds. - Remove object from the forming head - Switch on the machine. - Contact service hotline
Flashing 4s (15/min)	The photoelectric sensor is dirty and interprets this as an object in the forming head. - Switch off the machine for at least 5 seconds. - Clean the light barrier with a dry brush. Suck out light barrier. Wipe the light barrier with a damp cloth (light soapy water). - Switch on the machine. - Contact service hotline
Flashing 0.2s (5/s) and emergency stop illuminated	The emergency stop button was confirmed - Eliminate danger. - Switch off the machine for at least 5 seconds. - Unlock the emergency stop button by turning it. - Switch the machine on again.
Permanent light	Phase error/current loss - Not all three phases were provided (even after power failure). - Check external power supply, correct if necessary. - Switch on the machine (leave it switched on) Wait for 20 minutes or, after waiting for at least 2 minutes, press the error light (reset button) for approx. 2-3 seconds.

Code	Malfunction / Remedy
Flashing in time (1200ms on, 300ms off)	Defects in the forming process - Forming pressure is not reached - Error in the electronic control - Internal leakage in hydraulic power unit - External leakage at a valve - Oil shortage

IMPORTANT

The light barrier must be cleaned particularly gently. Do not use solvents or compressed air. No liquid may enter the inside of the housing!

**IMPORTANT**

When a fault occurs, safety functions may be disabled. The safety instructions according to chap. 2 must be observed.

**DANGER**

It is strictly prohibited to reach into the closed tool holder! Crushing and permanent damage to health may result!



7.2. Self-recoverable faults

Error	Malfunction / Cause	Remedy
Tube slips	Clamping jaw dirty.	Clean the clamping jaw (see 9.2).
	Clamping jaw damaged.	Replace clamping jaw.
	Tube OD too small.	Tube tolerances not according to DIN 2391.
	Tube surface unsuitable.	Remove paint, rust, etc.
Conversion faulty	Tube has not touched the stop.	Press the tube against the stop. Carefully deburr the tube end. Check tube for ovality.
	Forming tools defective.	Check forming tools for visible damage.

Error	Malfunction / Cause	Remedy
	Incorrect forming tools used.	Compare size specifications on the tools with tube dimensions.
	Forming punch used for other material.	Compare the material specification on the tools with the tube material.
Tube cannot be inserted into forming punch	Tube OD too large.	Use correct tube size Tube tolerances not according to DIN 2391.
	Incorrect forming punch and/or tube wall thickness.	Compare size specifications on the tools with tube dimensions.
	Tube not completely deburred.	Deburr tube end and remove chips.
	Tube end oval.	Check tube overall for ovality.
	Forming stamp dirty.	Clean the forming punch.
Surfaces of the forming contour are unclean	Tools damaged or material welded on.	Check forming tools for visible damage or material welds.
Machine does not start	See 7.1 Fault messages.	See 7.1 Fault messages.
Tool holder does not close	Tool holder was opened in tube insertion position.	Remove clamping jaw, close tool holder and press tool change key.
Machine works too slowly	Oil too cold below 5°C.	Observe information on ambient conditions.
	Oil level is too low.	Check oil level.

For all other errors or malfunctions, please contact our service hotline.

IMPORTANT

The machine hood is for safety purposes and may therefore only be opened by the manufacturer or on special instruction. Unauthorized opening of the housing voids our warranty and liability.



Use only ORIGINAL PARTS and ACCESSORIES, as this is the only way we can guarantee that the components will work together properly.

8. Maintenance

For all maintenance and repair work, the main switch must be switched to "0 Off" and secured against being switched on again!

CAUTION All work on the electrical control system must be carried out in compliance with the statutory regulations and the regulations of the employers' liability insurance association.



8.1. Maintenance and service plan

When	What	Where	Like	Who
daily	Check tools for wear and cleanliness		Visual inspection	Machine operator
daily	Check the optical system of the light barrier for cleanliness and clean if necessary.	Light barrier optics	Visual inspection	Machine operator
daily	Inspection for externally visible damage	Whole machine	Visual inspection	Machine operator
daily	Checking the safety and hazard information	At the molding head	Visual inspection	Machine operator
After approx. 100 transformations	Clean and lightly grease the tool holder	Tool area	See 8.2	Machine operator
After approx. 100 transformations	Clean tools		See 9.2	Machine operator
weekly	Cleaning the machine	Whole machine	With dry cloth or light soapy water	Machine operator

When	What	Where	Like	Who
weekly	Check electrical equipment	Pushbuttons, indicator lights, cable and plug connections	Visual inspection	Instructed specialist
weekly	Check oil level!	Level indicator right side of machine	Visual inspection	Machine operator
As needed	Oil change			Danfoss Service

IMPORTANT: The light barrier must be cleaned particularly gently:

- Clean the light barrier with a dry brush.
- Suck out light barrier.
- Wipe the light barrier with a damp cloth (light soapy water).



Do not use solvents or compressed air. No liquid may enter the inside of the housing!

8.2. Cleaning and greasing the tool holder

To reduce tool wear, light greasing of the friction surfaces is recommended if necessary or after about 100 forming operations.

Before greasing, thoroughly clean the friction surfaces.

A clear sign of insufficient lubrication and high tool wear is "cracking" during the forming process. This "cracking" is caused by a jerk sliding at the contact surfaces between the clamping jaw and the tool holder of the machine.

Procedure:

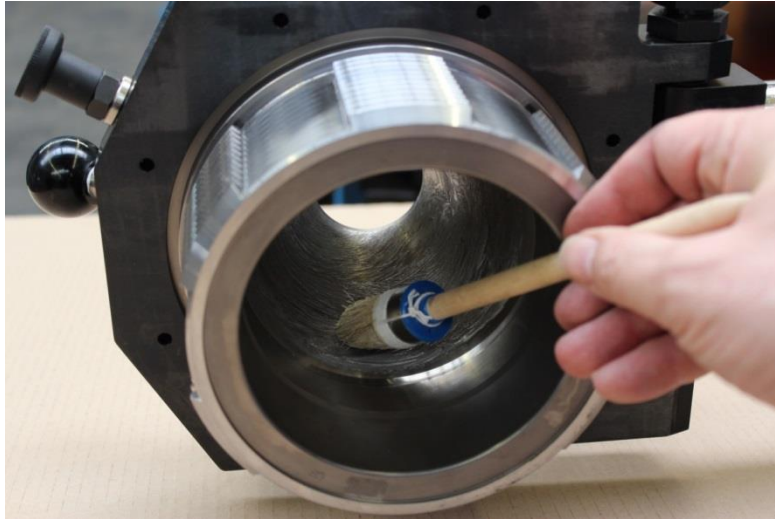
- Switch off machine
- Open tool holder and remove clamping jaws (see 5.2)
- Clean the conical tool holder and the face of the clamping piston with a suitable cleaning agent.

IMPORTANT: The light barrier must be protected from cleaning agents during cleaning. For this purpose, it is advisable to cover

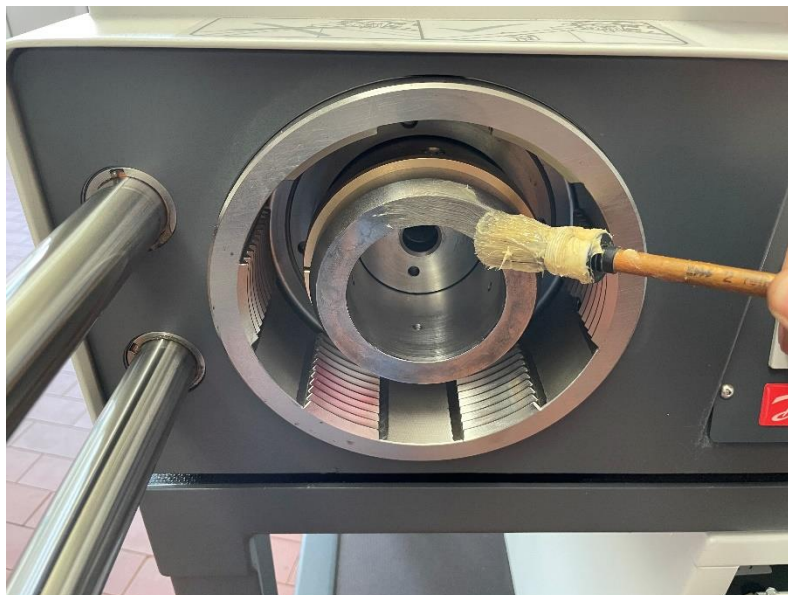


the light barriers with a lint-free cloth. No liquid may enter the inside of the housing!

- Grease the inside of the tool holder and the face of the clamping piston with a suitable grease.
We recommend the use of Danfoss ABF grease. The grease should be applied as thinly as possible.



Greasing the conical tool holder
with Danfoss ABF grease



Grease the face of the clamping cylinder with
DANFOSS ABF Grease

IMPORTANT The safety instructions of the ABF grease or the corresponding safety instructions of the lubricant manufacturer must be observed!



- At the same time as cleaning and greasing the tool holder and the face of the clamping piston, the clamping jaws should also be cleaned (see 9.2). The clamping jaws themselves do not need to be greased.

Danfoss ABF Anti-Bloc Grease

Tube of 100g Order no.: WAL624320

Can of 1000g Order no.: WAL371741



Can Danfoss ABF Grease

IMPORTANT This M-WF385Xplus machine must only be operated with original Danfoss tools and accessories!



9. Tools and accessories

9.1. Tools

For an overview of the possible tools, please refer to the current Danfoss bolting catalog.



Reshaper with internal support for one tube dimension

Clamping jaw for a tube outer diameter

9.2. Cleaning and assembly of the clamping jaw

After about 100 forming operations or in case of heavy soiling, we recommend cleaning the clamping jaws. For this purpose, the clamping jaw is disassembled into its individual parts and then cleaned with the aid of a wire brush or similar.

The clamping jaw consists of four clamping jaw segments, four guide pins, eight compression springs and two O-rings.

Disassembly:

- Place the clamping jaw with the large face on a table.
- Remove the two O-rings from the retaining grooves (attention individual segments are now loose).
- Remove the clamping segments (make sure that no compression spring is lost).

- The guide pins have a tight fit in a clamping segment and therefore do not have to be removed.

Cleaning:

- Clean all surfaces of the clamping segments with a light soap solution or other suitable cleaning agents.
- The clamping teeth can be cleaned using a wire brush or similar. Check whether the chuck teeth are damaged.

Testing:

- Check all components for possible damage and replace them if necessary.

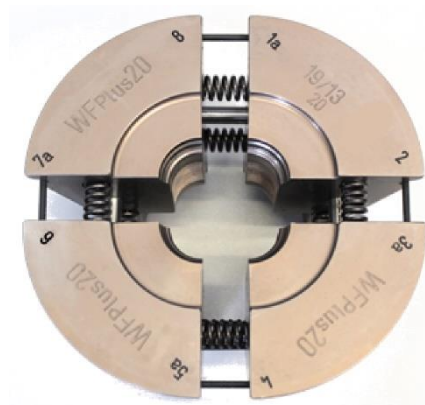
Assembly:

Assembly is performed in reverse order to disassembly.

- The clamping segments must be mounted in the following order: **1a - 2 - 3a - 4 - 5a - 6 - 7a - 8** (The letter "a" may vary).
- The clamping segments are arranged so that the number combination can be read clockwise.
- All pressure springs and guide pins must be inserted correctly in the holes provided.
- The O-rings must be properly located in the grooves and hold all four segments together.

IMPORTANT

Clamping jaws assembled in the wrong order can lead to an insufficient forming result or to tool damage!



Correctly assembled clamping jaw

9.3. Standard accessories

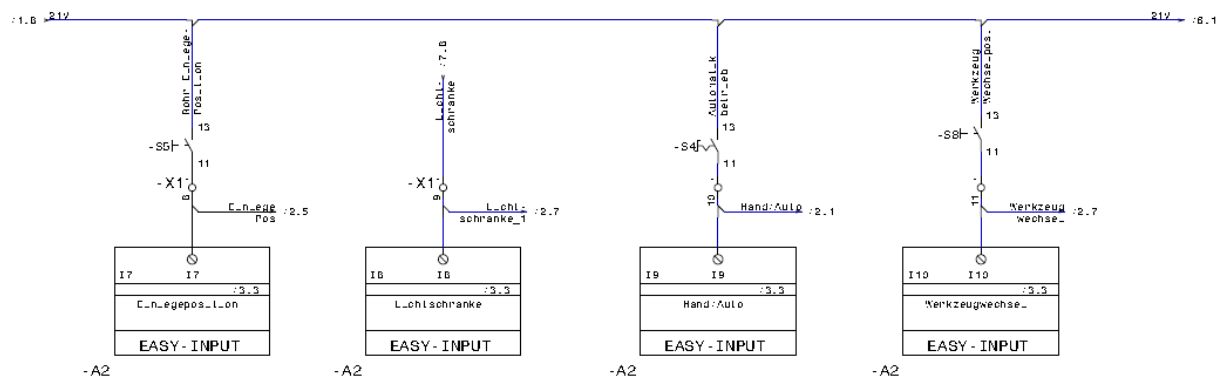
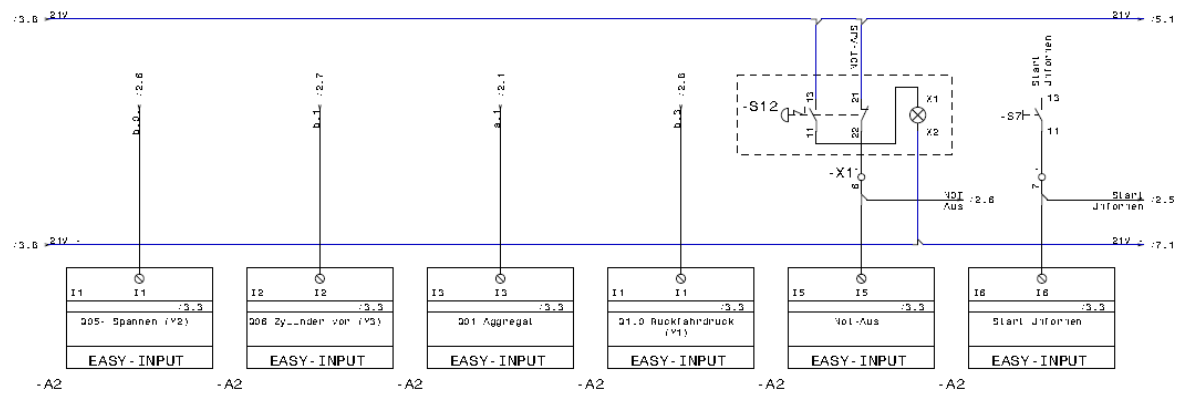
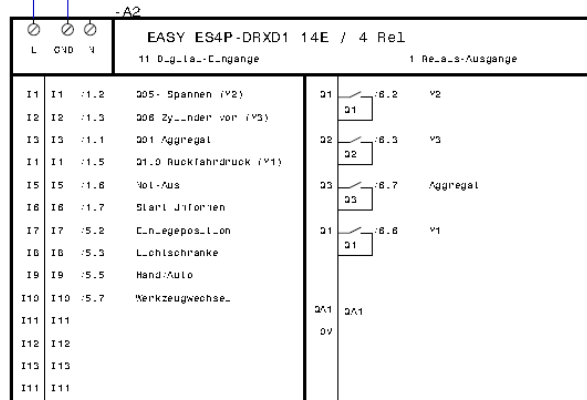
- Removal tool for the mold spout
- Operating instructions
- Special packing

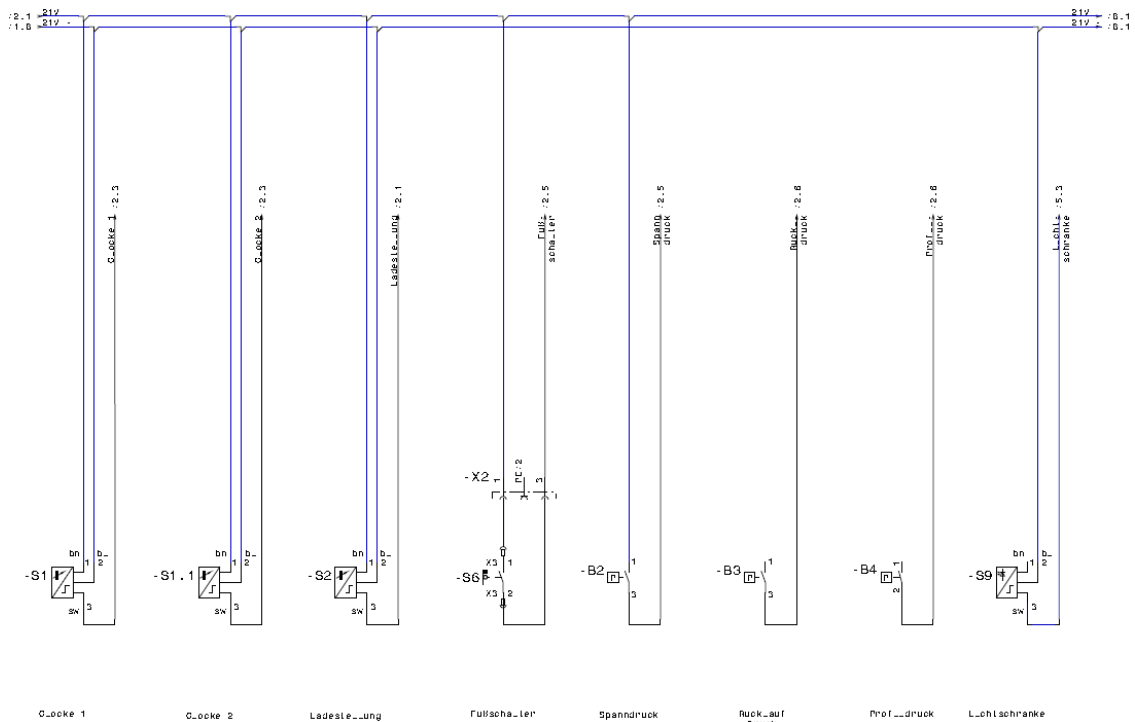
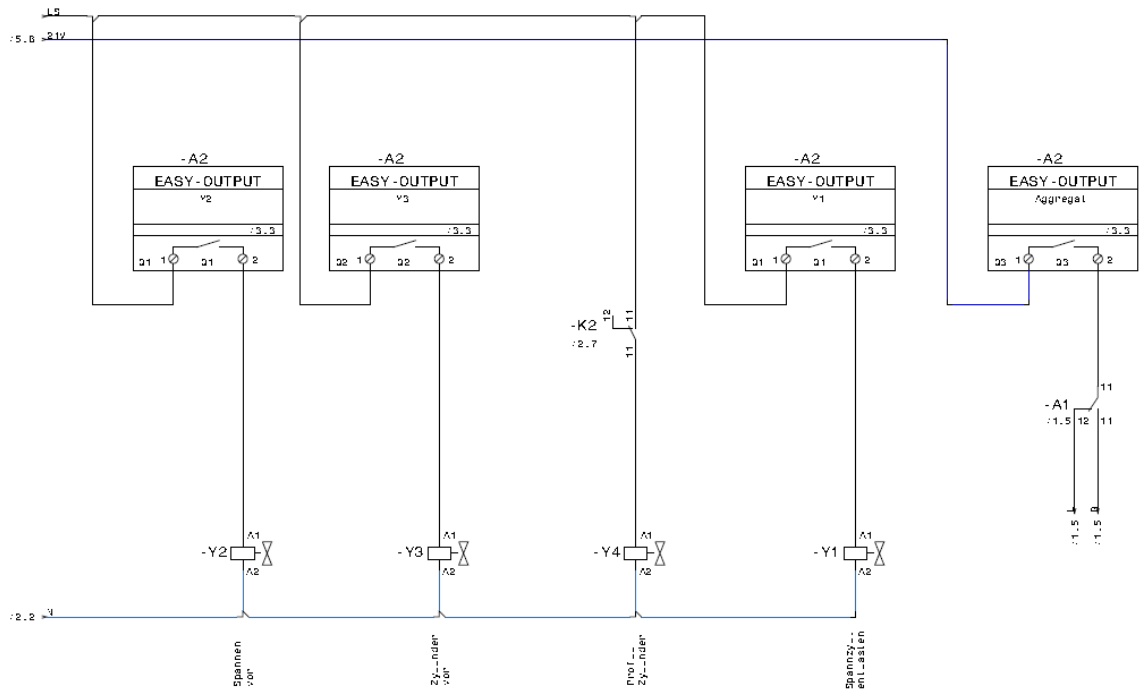
9.4. Optional accessories

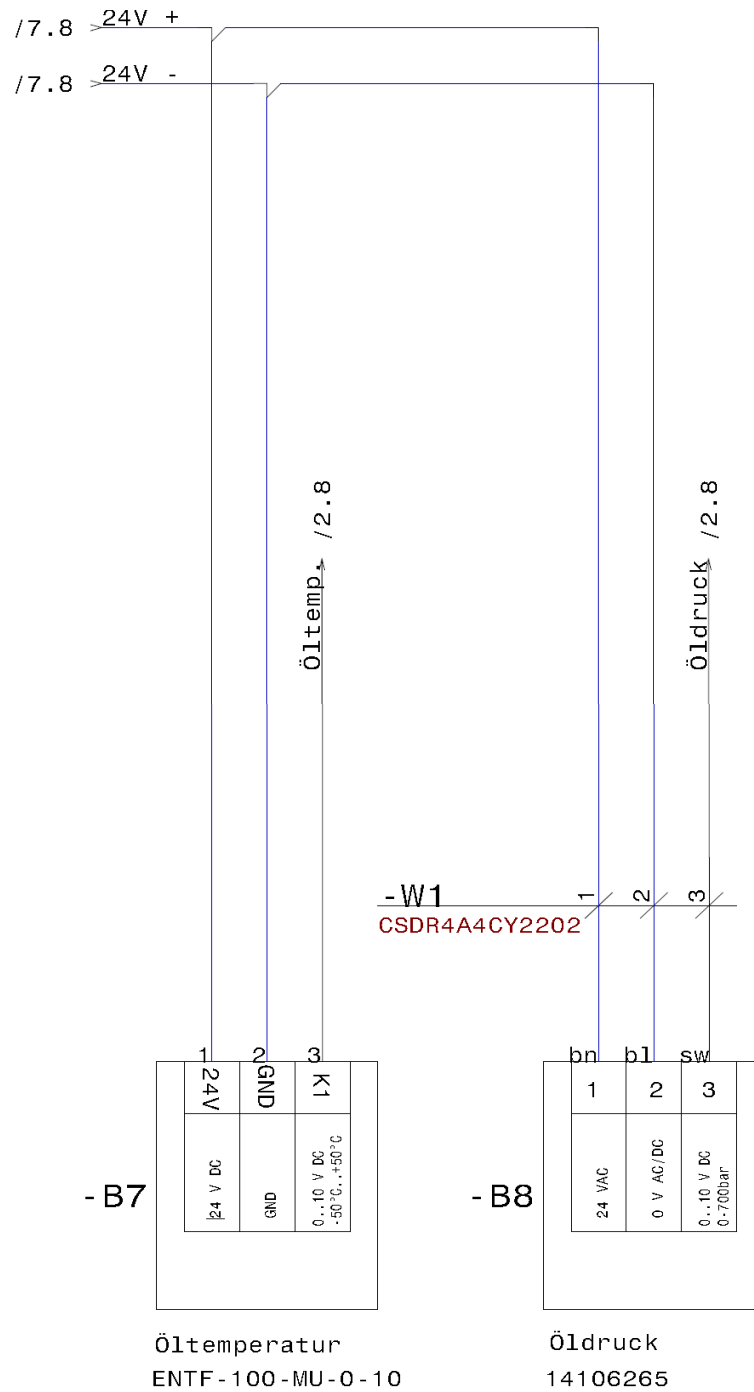
- Foot switch
- Danfoss ABF grease
- Tool trolley



Machine (M-WF385Xconnect) with tool trolley







CAUTION All work on the electrical control system must be carried out in compliance with the statutory regulations and the regulations of the employers' liability insurance association.



10.2. Electrical circuit diagram (M-WF385Xconnect)

