Authorised Specialists and Operators

# manual

## Installation and Operating Instructions

**HSC1140-INOX Gas / 52701-DE-B** **English**

# Declaration of Conformity

| | |
|---|---|
| Manufacturer: | **Ehrle GmbH** |
| Address: | **Industriestraße 3**<br>**D – 89165 Dietenheim** |
| Product:<br>Stationary, Hot Water, High Pressure Cleaner | **HSC1140-INOX Gas** |
| The product given above is in conformity with the European Directives: | GAD 2009 / 142 / EC<br>MD 2006 / 42 / EC<br>LVD 2006 / 95 / EC<br>EMC 2004 / 108 / EC |
| This product is used like follows marked: | CE EAC<br>**CE-0085** |

Illertissen, 01.02.2018

Development

Christoph Nöldner

Head of Development

Reiner Ehrle

CEO

## Table of Content

Table of content

# 1 User information

## 1.1 General

**General information**

For a comprehensive advice and information on the High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas please contact the EHRLE Customer Service.

With the purchase of a Stationary EHRLE High Pressure Cleaner you are the owner of a quality product, which is characterised by:

- user-friendliness,
- reliability,
- environmental friendliness.

These installation and operating instructions are part of the stationary hot water high pressure cleaner and must be kept at the operating site and available at all times.

For the stationary hot water high pressure cleaner, the manual contains information on

- installation
- adjustment of system and operating parameters
- operation
- maintenance
- repair.

## 1.2 Functional system concept

The stationary hot water high pressure cleaners are designed for two separate operating levels with different access rights:

- **Level 1 for system operators** with access to
  - controls and indicator elements inside the cabinet via the lockable door
  - three main switches at the cabinet door front.

  The control elements in the cabinet are used to set operating parameters such as
  - operating pressure
  - water temperature
  - detergent quantity.
- **Level 2 for operating personnel** with exclusive access to the three main switches on the cabinet door front. On the cabinet door front, the three main switches can be switched on/off:
  - system operation
  - hot water mode
  - admixture of detergents.

## 1.3 Terminology

The terminology „High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas“ is replaced by the short general term „system“ or „high pressure cleaner“ in the manual.

If a clear reference to a subject is required in the description parts, the terminology „High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas“ is used.

For the terminology „Installation and Operating Instructions“, the short general term „Manual“ is used in the description sections wherever possible.

## 1.4 Meaning of the emphasis

The emphasis used in this manual have the following meanings:

**WARNING**

Warning precedes operating procedures, instructions, etc., which, if not strictly observed, could result in personal injury or loss of life. Warning precedes also, when device misuse could result in personal injury or loss of life.

**CAUTION**

Caution precedes operating procedures, instructions, etc., which, if not strictly observed, could result in damage to the high pressure cleaner. Caution precedes also, when device misuse could result in damage to the high pressure cleaner.

This symbol indicates additional information.

## 1.5 Meaning of the symbols

| Symbol | Meaning |
|---|---|
|  | **WARNING**<br>**Follow instructions!**<br>Non-observance or neglecting of prescribed instructions, incorrect operation or misuse of the system may endanger life and limb of persons. |
|  | **WARNING**<br>**Danger of explosion due to escaping gas.**<br>An ignition source can cause a gas-air mixture or solvent vapours to explode and cause fatal injury to persons.<br>Improperly carried out work on the burner can lead to gas leakage and explosion. Do not add solvents to the high pressure jet. Observe all safety instructions and work instructions. |
|  | **WARNING**<br>**Danger of death due to electric shock.**<br>Switch off the high pressure cleaner and disconnect it from the power supply before starting installation, maintenance and repair work. Protect the system against unintentional restarting.<br>Touching live parts can lead to life-threatening injuries. |
|  | **WARNING**<br>**Danger of burns.**<br>During operation, the cleaning objects, the hot water emerging from the trigger gun, surfaces of system components, assemblies or parts can become hot. Touching hot surfaces or hot water can cause burns or scalding on the skin surface. Make sure that the hot surfaces and the water from the trigger gun have cooled down before starting maintenance and repair work. |
|  | **WARNING**<br>**Toxic substances.**<br>Inhalation, contact and/or ingestion of toxic substances through the food chain may endanger the health of persons and can lead to death. Observe the relevant safety regulations when handling toxic substances. |

| Symbol | Meaning |
|---|---|
|  | **WARNING**<br>**Danger with heavy loads.**<br>A person is not allowed to lift and move loads more than 23 kg. Otherwise the health of persons may be endangered (e.g. overload of the spinal column, injuries from falling loads).<br>For loads of more than 23 kg, use suitable lifting equipment (e.g. forklift truck, lift truck). |
|  | **CAUTION**<br>**Observe instructions for installation, system adjustment, operation, maintenance and repair.**<br>Non-observance or neglecting prescribed instructions, incorrect operation or misuse of the system may result in damage to system parts, assemblies or components. |
|  | **General Information**<br>General additional information. |
|  | **Information on recycling**<br>General information on recycling. |
|  | **Information on disposal**<br>General information on the proper and environmentally sound disposal of materials and consumables. |
|  | **Information on hearing protection**<br>General information on hearing protection. |
| ▶ | Calls for a direct action. |
| ✓ | Result after an action. |
| • | Enumeration |

## 1.6 Target groups

This installation and operating manual contains information and instructions for:

- Authorised, instructed and trained operating personnel for carrying out cleaning work.
- Authorized, qualified and trained personnel for the installation, operation, maintenance, repair and adjustment of the system.

## 1.7 Warranty and Liability

The EHRLE High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas may only be used for its intended purpose.

Intended use includes:

- Operation only by authorized, instructed and trained operating personnel.
- Installation, operation, maintenance, repair and adjustment of the system only by authorized, trained and qualified personnel. For installation, maintenance, repair and adjustment of the system, the relevant specialist personnel can be consulted and commissioned by the EHRLE Customer Service.
- The information and instructions contained in this installation and operating manual must be observed.
- If the safety and protective devices are faulty, the system must not be put into operation.
- The system may only be operated with fully functional safety and protective devices. In the event of functional failures during operation, the system must be taken out of operation immediately.
- Faulty, insufficient or defective systems must not be put into operation. Before commissioning, carry out a visual inspection for faulty, defective or defective
  - System parts, assemblies or components
  - Electrical cables
  - High pressure hoses.
- The system must be switched off immediately and taken out of operation if defects, faults or deficiencies occur on
  - System parts, assemblies or components
  - Electrical cables
  - High pressure hoses.
- No constructive changes may be made to the system.
- The system may only be operated in the configuration certified by the manufacturer. Operation with subsequently installed modules, components or additional devices is not permitted and may endanger life and limb of persons or lead to damage to the system.
- Only original parts from the manufacturer or consumables approved by the manufacturer may be used for maintenance and repair work.

- Only fuels approved by the manufacturer and operating materials (engine oil, cleaning agents, etc.) may be used to operate the system.

Any warranty and liability claims for personal injury and damage to the system are void if the system is not used for its intended purpose.

## 1.8 Environmental protection

**Note on recycling**

The packaging materials are recyclable. Please do not throw the packaging into the household waste, but recycle it.

**Note on disposal**

Old appliances contain valuable recyclable materials which should be recycled. Batteries, oil and similar materials must not be discharged into the environment. For this reason, please dispose of old appliances using suitable collection systems.

Dispose of used materials in an appropriate and environmentally friendly manner. Observe the local regulations.

According to environmental regulations, waste water containing mineral oil, fuels for hot water heating or lubricants such as oils and greases must not enter the soil, water or sewerage system.

Do not allow engine oil, fuel oil or petrol to escape into the environment. Protect the soil and dispose of used oil in an environmentally friendly manner.

Engine cleaning or underbody washing of all types of vehicles may only be carried out at washing stations equipped with oil separators in accordance with environmental regulations (environmental protection).

# 2 Safety and security

## 2.1 General safety information

Observe the respective national regulations of the legislator for liquid sprayers.

Observe the relevant national regulations of the legislator on accident prevention. Liquid sprayers must be inspected regularly and the result of the inspection must be recorded in writing.

The heating equipment of the system is a combustion system. Firing systems must be regularly inspected in accordance with the respective national regulations of the legislator.

If the system is operated in rooms, the exhaust gases must be safely discharged (flue gas pipe without draught interrupter). Furthermore, a sufficient supply of fresh air must be ensured.

Observe the safety instructions provided with the cleaning agents used (usually on the packaging label).

Keep cleaning agents out of the reach of unauthorized persons. Risk of poisoning or caustic burns from cleaning agents! Observe the instructions on the cleaning agents.

Perform prescribed adjustment, maintenance and inspection work in due time (see Section 8, Maintenance).

Safety-relevant defects must be rectified immediately. Keep all signs on the system legible.

## 2.2 Access for persons to the system

The cabinet door for access to the interior of the cabinet must be kept locked. Only authorised persons may have access to the inside of the cabinet.

Ensure that access to the system is only possible for the following persons:

- Operating personnel authorised, instructed and trained by the system operator and specially trained for general cleaning tasks. Operation is limited to the three main switches on the front of the cabinet door.
- Authorised, qualified and specially trained personnel for the installation, operation, maintenance, repair and adjustment of the system. Access to the key for the cabinet door in order to be able to carry out appropriate measures inside the cabinet.

Keep the key for the cabinet access door in a place accessible only to authorised personnel.

## 2.3 Safety instructions for cleaning operation for system operators and operating personnel

During cleaning work, the personnel at the workplace must wear the necessary protective clothing. This includes waterproof protective suits, rubber boots, protective goggles, headgear, ear protection if necessary, etc.

No cleaning work may be carried out in the presence of persons without sufficient protective clothing.

Before switching on, carry out a visual inspection of the system parts from the outside for damage (high pressure hose, electrical or mechanical parts). Systems with damaged system parts, assemblies or components must not be put into operation.

The water jet leaving the trigger gun must not be directed at

- persons
- animals
- live electrical installations (building mains connections, sockets, electrical wiring, etc.)
- live electrical installations, machines, devices, assemblies or components
- system, machinery or equipment in operation.

Under the influence of the high pressure jet, parts can be separated from the cleaning object and thrown away. Persons can be injured as a result.

Never aim the high pressure jet at fragile or loose objects.

When cleaning tyres and their valves, keep a minimum distance of 30 cm from the high pressure nozzle. Otherwise damage may occur.

Before cleaning the High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas itself, take the system out of operation and disconnect it from the electrical mains connection. Secure the system against unintentional or unauthorised restarting (e.g. lock main switch, warning sign indicating work on the system, etc.).

Never operate the system unattended.

During hot water operation, parts of the cabinet interior, water-carrying parts (e.g. non-insulated pipes, metal parts of the trigger gun and jet pipe) and cleaning objects become hot and can cause burns if touched. Keep the cabinet door closed during operation. Before touching heated system parts, water-carrying parts or cleaning objects, wait until they have cooled down.

Do not close or block the exhaust opening of gas-fired high pressure cleaners, do not bend over it or reach into it during operation. The escaping exhaust gases are very hot and must not be inhaled. The exhaust gases and system components become very hot and can lead to severe burns.

Do not inhale the exhaust gases. Inhalation of exhaust fumes may endanger life and limb of persons.

For high pressure cleaners operated in rooms, a safe discharge of the flue gases must be ensured. It must also be ensured that sufficient ventilation is available (combustion air).

Asbestos-containing and other materials containing substances hazardous to health must not be sprayed off.

**Information on hearing protection**

If the sound levels exceed the permissible values, the personnel and persons in the area of exposure must wear hearing protection.

The sound level for EHRLE high pressure cleaners under maximum load is 82 dB (A). A high sound level can cause hearing loss over a longer period of time. If the noise produced by the application of the emerging high pressure jet to noise-enhancing objects exceeds the permissible values, the operating personnel and any persons affected must wear hearing protection.

Do not operate the system if electrical lines or other safety-relevant parts (pressure relief valve, high pressure hose, trigger gun, etc.) are defective.

## 2.4 Safety instructions for gas-fired systems

### 2.4.1 General information about the gas burner type

The High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas is equipped with a gas burner of the company

- Weishaupt, gas burner type WG5

  or

- Baltur, gas burner type BPM90

The technical manual „Installation and Operating Instructions“ of Weishaupt or Baltur is included in the scope of delivery of every gas-heated stationary hot water high pressure cleaner and must be observed.

The gas-fired high pressure cleaners are subject to certification by the DVGW (Deutscher Verein des Gas- und Wasserfaches).

| | |
|---|---|
| The CE number is: | CE-0085AR0179 |
| SVGW Certificate No. | 09-034-8 SVGW/VKF |

### 2.4.2 Note on combustion air

The combustion air must be free of aggressive substances (e.g. halogens). If the combustion air in the installation room is contaminated, increased cleaning and maintenance is required. In this case, operate the system independently of the room air.

If the system is operated in a closed room, the installation room must comply with local regulations.

Improper use may cause:

- endanger life and limb of the user or third parties,
- affect the installation or other tangible assets.

### 2.4.3 Behaviour in case of gas odour

With gas odour:

- ▶ Immediately refrain from any operation or switching on/off of infrastructure equipment (supply voltage switches or circuit breakers for internal building infrastructure, light switches, etc.).
- ▶ Immediately refrain from operating or switching on/off any electrical device (e.g. work lamps for illuminating a work area for maintenance and repair, fan heaters, etc.) or electronic device (e.g. mobile telephones, laptops, etc.).
- ▶ Do not remove any plugged in mains plugs from the sockets.
- ▶ Open windows and doors to ensure sufficient air exchange.
- ▶ Close the gas ball valve.
- ▶ Warn house inhabitants (do not activate doorbell).
- ▶ Leave building.
- ▶ Notify from outside the building, heating company or gas supplier.

### 2.4.4 Behaviour with exhaust gas odour

With exhaust odour:

- ▶ Switch off the system and take it out of operation.
- ▶ Open windows and doors to ensure sufficient air exchange.
- ▶ Notify customer service.

### 2.4.5 Gas supply regulations, guidelines and rules

Before installing the gas-fired system, coordination with the gas supply company and the district chimney sweep master is required.

During installation, the regulations of building law, trade law and immission control must be observed.

For the gas supply observe:

- The gas-fired system may only be installed by a specialist company in accordance with the relevant national regulations.
- Observe local regulations and guidelines during installation (e.g. DVGW-TRGI, Worksheet G 600; TRF Volume 1 and Volume 2).

- The installation of the gas pipes, as well as the gas-side connection of the system, may only be carried out by a specialist company approved in the gas and water trade.
- Only the gas supplier or a contracted installer may carry out adjustment, maintenance or repair work on gas installations in buildings and premises.
- Line systems must be subjected to a load and leak test or a serviceability test in accordance with the operating pressure (e.g. DVGW-TRGI, Worksheet G 600).
- Depending on the type and quality of the gas, gas supply must be carried out in such a way that no liquid substances are formed (e.g. condensate). For liquid gas, observe evaporation pressure and evaporation temperature.
- When planning a chimney, the locally valid guidelines must be observed
- Only use tested sealing materials and observe the processing instructions.
- When switching to a different type of gas, reset the condensing boiler system. The changeover between liquid and natural gas requires a conversion.
- Carry out leak test after every maintenance and troubleshooting.

## 2.5 Accident prevention regulations

Observe the applicable national regulations of the legislator on accident prevention.

## 2.6 Lifting and moving loads

The High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas weighs 300 kg (with packaging 317 kg).

Lifting and moving loads is permitted for one person up to 23 kg. If the load exceeds 23 kg (e.g. system units, assemblies) use suitable lifting equipment (e.g. forklift, lift trucks).

Observe the international standard „ISO 11228-1 Ergonomie - Manuelles Handhaben von Lasten - Teil 1 Heben und Tragen 05/2003“.

## 2.7 Periodic inspections

The periodic inspections are listed in Section 8 (Maintenance).

## 2.8 Guidelines for liquid sprayers

High pressure cleaners must be inspected by an expert in accordance with the „Guidelines for liquid sprayers“, if necessary or at least every 12 months. The result of the test must be recorded in writing.

In the appendix of this manual there is a test sheet (proof of customer service) to record the tests carried out.

EHRLE service technicians are experts and can be consulted and commissioned by EHRLE service for this prescribed inspection.

## 2.9 Federal Immission Control Act

The heating device is a combustion system which, according to the first regulation for the implementation of the Federal Immission Control Act, must be checked once a year by your responsible district chimney sweep for compliance with the ejection limit values.

The first check must be carried out within the first four weeks after commissioning. The operator of the high pressure cleaner must initiate the measurement.

## 2.10 Safety regulations Electrical connection

When working on electrically live parts:

- Observe accident prevention regulations DGUV V3 (previously BGV A3) and local regulations,
- Use tools according to DIN EN 60900.

## 2.11 Design changes to the system

Design changes to the high pressure cleaner are not permitted.

When operating a system which has been modified or changed in design, the system will not be used for its intended purpose. If the system is not used for its intended purpose, no liability or warranty will be accepted (see Section 1.7, Warranty and Liability).

## 2.12 Safety devices

Safety devices serve to protect the user and must not be suspended or circumvented in their function.

The high pressure cleaner has the following safety devices listed below:

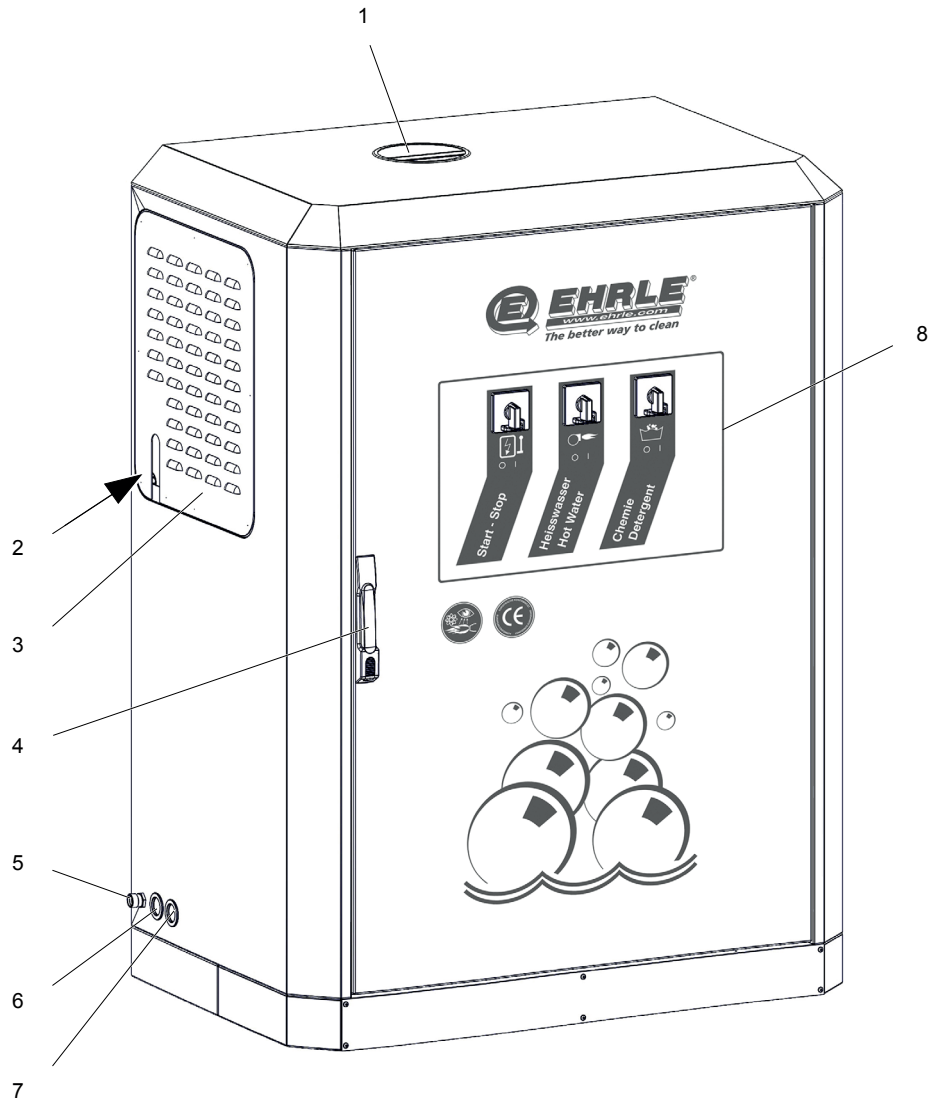
- Various pressure switches:
  System functions are switched on or off (safety functions) based on type of construction and intended use.
- Low-water cut-off:
  The system does not switch on, respectively in case of operation off, if the water level in the float container is insufficient.
- Unloader valve and non-return valve:
  The first serves to adjust the operating pressure and the second valve keeps the pump head depressurised when the trigger gun is deactivated.

- Safety valve:
  Opens when a preset pressure is exceeded and diverts the water stream.
- Thermostat and overload protection switch:
  Releases when the pump current load is too high, the system is switched off.
- TSS system with pump-off delay:
  After deactivating the trigger gun, the pump continues operation for approx. 30 s in the pressureless bypass mode (avoidance of too high pressure build-up in the pump); after 30 s the high pressure cleaner automatically switches into the stand-by mode.
- Total Switch-off:
  Automatically switches the high pressure cleaner off in the event of prolonged interruption of operation or unused trigger gun for more than 20 minutes.
- Leakage recognition:
  Switches off the high pressure cleaner automatically after detection of a leakage
  - at the high pressure hose
  - with the trigger gun or
  - in the system.
- Optical flame monitoring:
  Switches off the heating after the flame in the combustion chamber has extinguished.
- Mechanical arrest for trigger gun of the trigger gun:
  Prevents unintentional or unconscious activating the trigger gun.

# 3 Product description

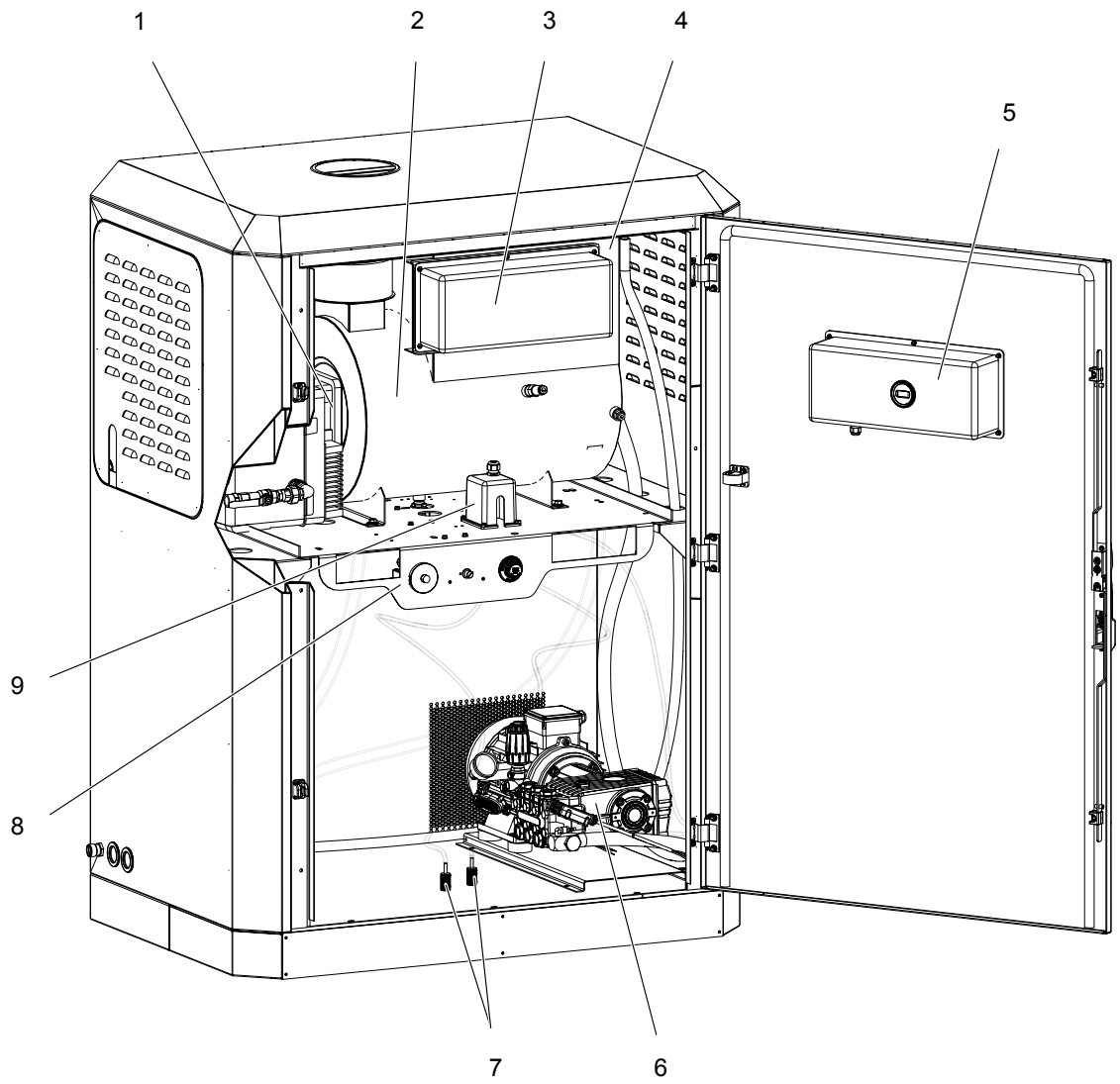
## 3.1 System views

The two following figures show a general example for the High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas.




1 Exhaust pipe feed-through
2 Shut-off fitting Gas supply at gas burner
3 Cover Maintenance opening
4 Door latch with lock
5 Water connection
6 High pressure pipe feed-through
7 Feed-through electrical connection
8 Control panel, cabinet door front

Fig. 3 - 1 High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas, total view




| | | | |
|---|---|---|---|
| 1 | Gas burner | 6 | Pump unit with driving motor |
| 2 | Boiler | 7 | Filter for suction hose detergents |
| 3 | Electrical terminal strip and Electronics with protective cover | 8 | Panel with control elements (temperature, Manual reset, chemical control valve) |
| 4 | Float container | 9 | Chemical pump |
| 5 | Protective cover (terminal contacts) | | |

Fig. 3 - 2 High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas, Cabinet interior (door opened)

## 3.2 Serial number

The serial number on the nameplate uniquely identifies the product. It is required for Ehrle customer service.

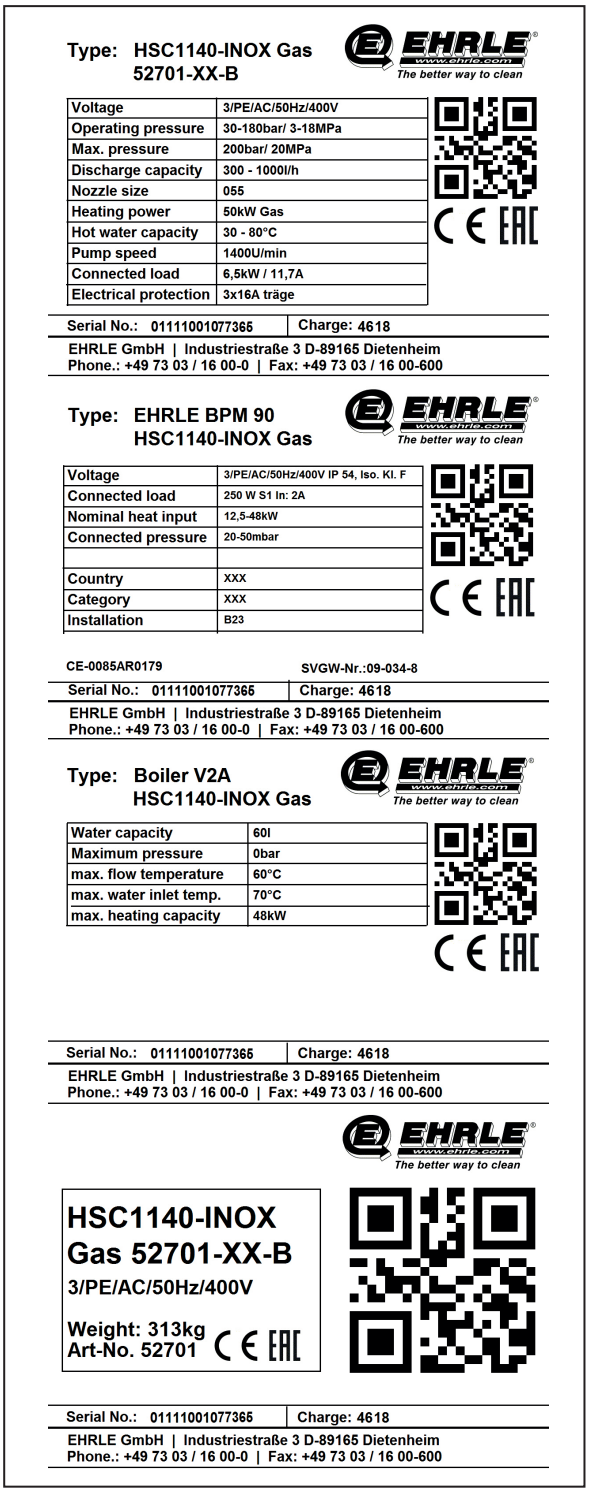



Fig. 3 - 3 Nameplate for HSC1140-INOX Gas

Ser. Nr. _____

## 3.3 Technical data

### 3.3.1 Technical data of the system

| Designation | Technical value | Unit |
|---|---|---|
| **Performance data** | | |
| Operating pressure water (with standard nozzle) | 3 ... 18 (30 ... 180) | MPa (bar) |
| Max. operating overpressure (safety valve) | 20 (200) | MPa (bar) |
| Water flow rate (continuously adjustable ) | 300 ... 1000 (5 ... 16,6) | l/h (l/min) |
| Detergent suction (continuously adjustable ) | 0-50 (0 ... 0,8) | l/h (l/min) |
| Pump speed | 1400 | rpm |
| Heating power | 50 | kW |
| **Water connection** | | |
| Inlet flow rate (min.) | 1100 (18,3) | l/h (l/min) |
| Inlet pressure (min.) | 0,1 (1) | MPa (bar) |
| Inlet pressure (max.) | 0,6 (6) | MPa (bar) |
| **Electrical connection** | | |
| Voltage | 3 / 400 - 415 | V |
| Frequency | 50 | Hz |
| Current | 11,7 A | A |
| Connected power | 6,5 | kW |
| Electrical protection (slow blow) | 3 x16 | A |
| Protection type | IPX5 | - |
| Protection category | I | - |
| Maximum permissible mains impedance | (0,381+j 0,238) | Ohm |
| Electrical supply cable | H07 - RNF 5 x 1,5 | $mm^2$ |
| **Temperature** | | |
| Inlet temperature (max.) | 30 - 70 | °C |
| Max. operating temperature hot water | 98 | °C |
| Max. temperature safety thermostat | 110 | °C |
| Temperature increase at max. water flow rate | 60 ... 65 | °C |

Table 3 - 1 Technical data for HSC1140-INOX Gas

| Designation | Technical value | Unit |
|---|---|---|
| Gross heating capacity | 75 | kW |
| Chimney draft | 0,01 ... 0,04 | kPa |
| **Gas connection values** | | |
| Natural gas E (G 20) | 7,2 | $m^3/h$ |
| Natural gas LL (G 25) | 8,2 | $m^3/h$ |
| Nominal supply pressure (natural gas) | 1,8 ... 5 | kPa |
| Propane | - | kg/h |
| Nominal supply pressure (Propane) | - | kPa |
| **Environmental data** | | |
| Standard Degree of utilisation | 97 | % |
| Standard emission factor NOX (natural gas G 25) | < 40 | mg/kWh |
| Standard emission factor CO (natural gas G 25) | < 40 | mg/kWh |
| **Values for chimney dimensioning** | | |
| Overpressure ability (min.) | 0,05 | kPa |
| Pull requirement | 0 | kPa |
| Exhaust gas mass flow - full load | 130 | kg/h |
| $CO^2$ (natural gas) | 9,5 | % |
| $CO^2$ (natural gas) | - | % |
| Exhaust gas temperature max. | 190/150 | °C |
| Combustion air/air supply | Max. length: 10 m with two 90° bends (minimum diameter 100 mm). Length: 10 m with two 90° bends (minimum diameter 100 mm). According to local regulations from the installation room or fresh air from outside. | |
| **Condensate drain** | | |
| **Condensate drain** (max.) | 4 (via siphon in sewerage) | l/h |
| Minimal water column, siphon | 300 | mm |

Table 3 - 1 Technical data for HSC1140-INOX Gas

| Designation | Technical value | Unit |
|---|---|---|
| **Licensing EN 60335-2-79** | | |
| Device category Europe | I 2E (r),<br>I 2ELL,<br>I 2H,<br>I 2L,<br>I2 HE | - |
| Device type | B23 | - |
| **Dimensions and mass** | | |
| Length (with packaging) | 1220 (1250) | mm |
| Width (with packaging) | 755 (815) | mm |
| Height (with packaging) | 1625 (1755) | mm |
| Mass (with packaging) | 300 (317) | kg |

Table 3 - 1 Technical data for HSC1140-INOX Gas

### 3.3.2 Selection of spray nozzles

| Contamination | Nozzle | Spraying angle | Part No. | Pressure [MPa] |
|---|---|---|---|---|
| heavy | 050 (blue) | 25° | 25050 | max. 20 |

Table 3 - 2 List of spray nozzles

# 4 Installation

**WARNING**

**Ensure correct installation.**

The installation of the system may only be carried out by qualified and trained personnel.


**WARNING**

**Danger with heavy loads.**

The High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas weighs 300 kg (with packaging 317 kg).

A person is not allowed to lift and move loads (e.g. system units, assemblies) more than 23 kg. Otherwise the health of persons may be endangered (e.g. overload of the spinal column, injuries from falling loads).

For loads of more than 23 kg, use suitable lifting equipment (e.g. forklift, lift truck).

**General Information**

For detailed advice and information on the installation of the High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas, please contact EHRLE customer service.

If required, EHRLE Customer Service can commission qualified personnel to carry out a wide variety of installation work.

Depending on the system configuration, the High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas is equipped with a gas burner of the company

- Weishaupt, gas burner type WG5

  or

- Baltur, gas burner type BPM90

For installation and operation of the system, observe the information in the installation and operating instructions of the respective manufacturer.

For lifting and moving loads exceeding 23 kg (e.g. system units, assemblies) use suitable lifting equipment (e.g. forklift, lift truck).

## 4.1 Selection of the operating location

**WARNING**

**Select a suitable and permissible operating location for the system.**

The local regulations concerning the installation and operation of the system must be observed.

The standard version systems must not be installed and operated in rooms or areas subject to fire or explosion hazards.

For use at filling stations or similar hazardous areas, reference is made to the hazardous areas in accordance with the „Technical Rules for Flammable Liquids“ (TRGF).

For special applications, e.g. in rooms subject to fire and explosion hazards, only electrically heated high pressure cleaners with the corresponding EEx protection class may be used.

**WARNING**

**Observe the regulations for combustion and gas-fired systems.**

If gas-fired systems are installed in closed rooms, proper discharge of the combustion gases and adequate ventilation must be provided.

The heating equipment of the system is subject to the guidelines for combustion systems. When installing them, the locally applicable regulations must be observed.

For the installation and operation of the gas-fired system, please observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90), depending on the system configuration.

When selecting a location, ensure that the following system components are easily accessible for operation, maintenance, repair and adjustment work (for dimensions, see Fig. 4 - 1):

- Lateral maintenance cover
- Connections for system supply
  - supply voltage
  - water pipe
  - gas pipe
- The swivel area of the cabinet door must be completely free
- Flue gas pipes
- Washing station equipment such as trigger gun and high pressure hose

Screw the system cabinet firmly to the floor at the location.

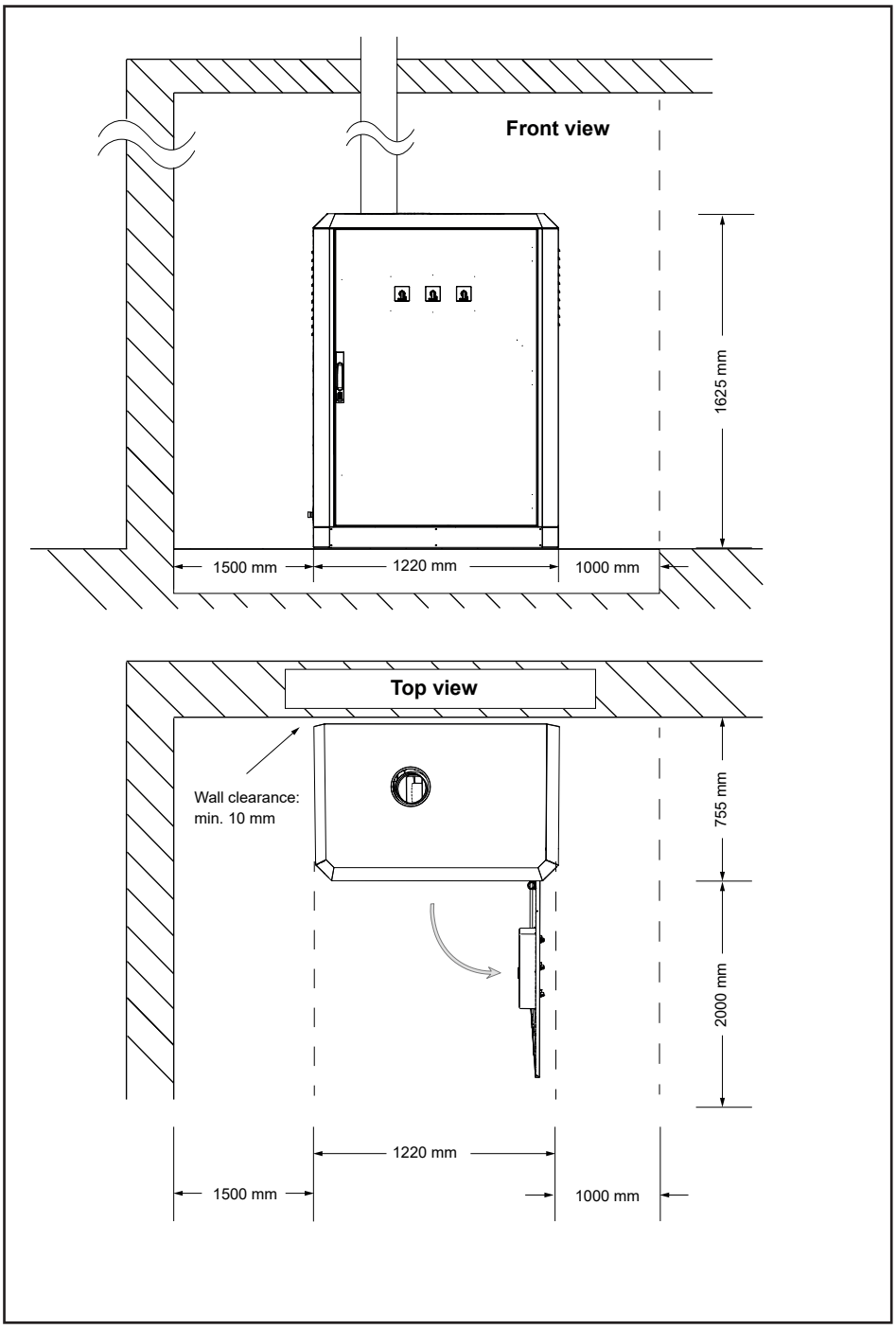



Fig. 4 - 1 Required dimensions for system operating location

## 4.2 Operating location inside buildings for type B23

Type B23 is a gas appliance with an exhaust system that takes the combustion air from the installation room.

Type B23 is a gas appliance without flow protection, in which all parts of the flue gas path under overpressure are flushed with combustion air. The B23 installation makes it possible to connect the unit to a conventional single-pass chimney in accordance with DIN 18160 and to operate it depending on the room air. A prerequisite is that the chimney is suitable for connecting condensing boilers (e.g. by renovating the chimney by pulling in a stainless steel pipe).

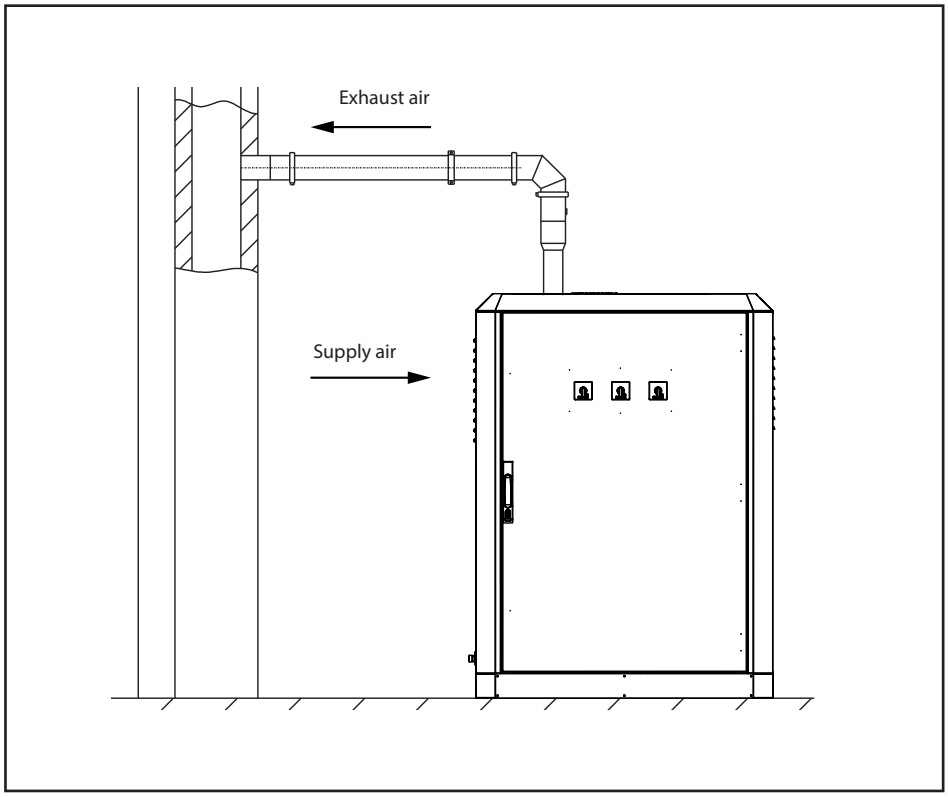



Fig. 4 - 2 Installation location within buildings (example for installation location independent of room air)

## 4.3 Installation material

**General Information**

The following figure with table listing the material is a general example for a system configuration.

For comprehensive advice and information on customer-specific planning, configuration and installation of the system, EHRLE can be consulted at any time via the customer service department.

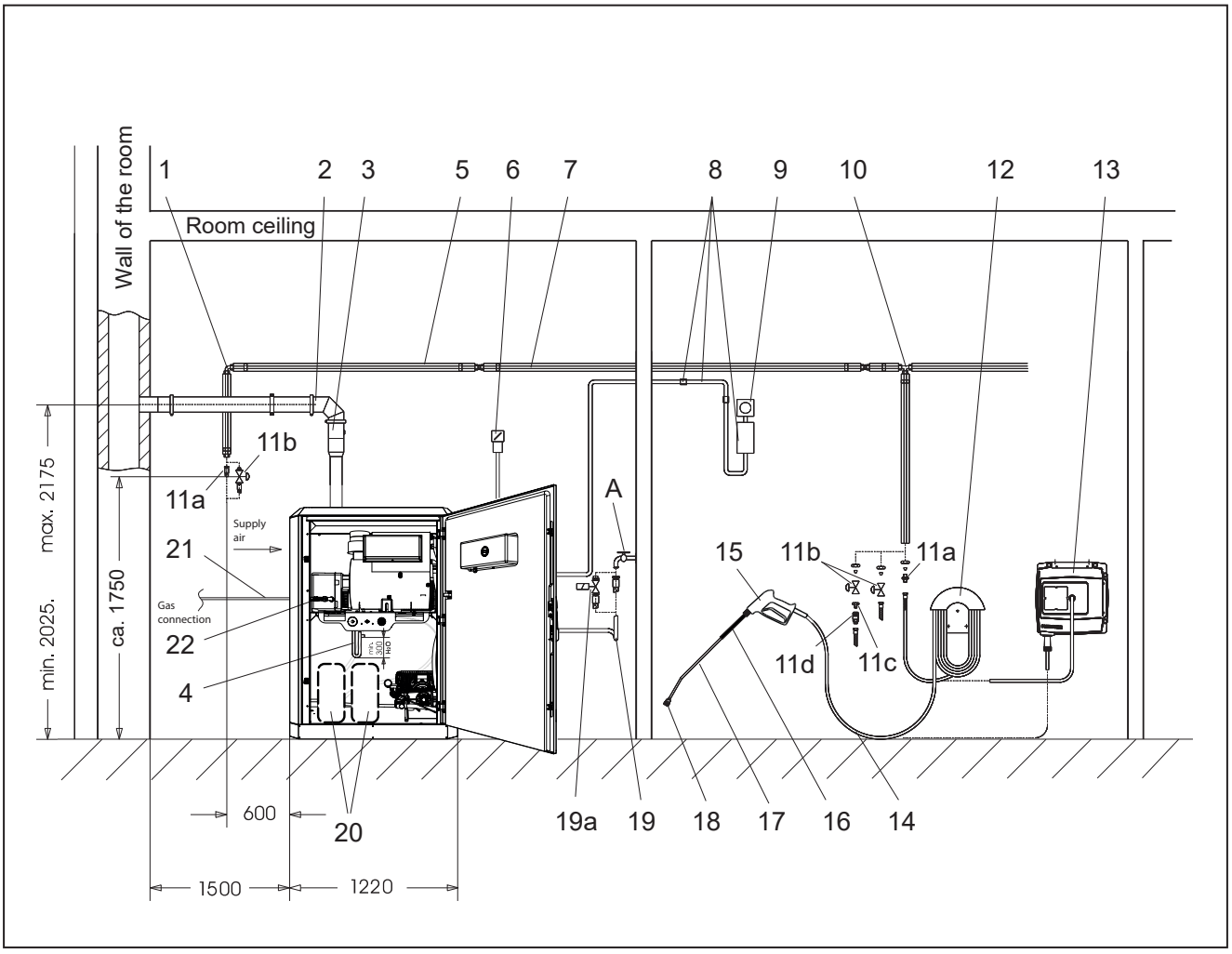



Fig. 4 - 3 Installation material for installation site inside buildings, general example

| Position | Installation material |
|---|---|
| 1 | Elbow screw fitting |
| 2 | Chimney system |
| 3 | Chimney transition piece |
| 4 | Siphon for chimney condensate |
| 5 | Thermal insulation |
| 6 | Main switch |
| 7 | HD Piping kit |
| 8 | Remote control parts kit |
| 9 | Kit of parts emergency stop switch |
| 10 | T-fitting |
| 11a | HD connection M22x1.5 brass or stainless steel |
| 11b | Stopcock NW 8, galvanized steel or stainless steel |
| 11c | Quick coupling fixed part |
| 11d | Quick coupling loose part |
| 12 | Hose holder |
| 13 | Hose reel |
| 14 | High pressure hose |
| 15 | Trigger gun |
| 16 | Spray lance holder |
| 17 | Spray lance |
| 18 | Nozzle mouthpiece |
| 19 | Water hose |
| 19a | Solenoid valve water inlet |
| 20 | Detergent tank 2 x 25 l |
| 21 | Gas hose R1“ |
| 22 | Gas stopcock R1“ |

Table 4 - 1 List of installation material, general example

## 4.4 Installation of flue gas pipes for gas-fired

**WARNING**

**Ensure proper installation of flue gas pipes.**

The flue gas pipes may only be laid by trained and qualified personnel.

Incorrectly installed flue gas pipes can endanger life and limb of persons.

For the dimensioning and installation of the flue gas pipes of the gas-fired system depending on the system configuration, please observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90).

Taking into account the data given above, a minimum effective chimney height of at least 4 m results with an inner chimney diameter of 150 mm.

For the installation of a fireplace, all components can be provided by the manufacturer as optional accessories.

The manufacturer recommends the installation of a sliding chimney nozzle. This socket allows the central control unit to pull out the drawer unit without dismantling the chimney. In addition, the sliding socket is provided with test openings for the chimney sweep.

To lay the flue gas pipes for the stationary High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas, please observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90), depending on the system configuration.

## 4.5 Installation of gas connection

**WARNING**

**Ensure that the gas connection is properly installed.**

To install the gas connection depending on the system configuration, refer to the technical manual supplied by the manufacturer (Weishaupt gas burner WG5 or Baltur gas burner BPM90).

The gas connection may only be installed by trained and qualified personnel of an approved specialist company for gas installations (DVGW approved).

Improperly installed gas connection can endanger life and limb of persons.

Only the type of gas (natural gas, liquid gas) specified on the burner nameplate may be used as fuel. The use of other fuels impairs the operational safety of the high pressure cleaner.

**WARNING**

**Danger from rigidly laid gas lines.**

A flexible metal hose (DVGW) must be installed between the rigid gas line and the burner. Otherwise, vibrations of the pump may cause damage and endanger life and limb of persons.

**CAUTION**

**Ensure that the gas hose is properly installed.**

When screwing in the flexible gas hose to the burner, the connection nipple must be held in place with a SW 36 open-end wrench. The connection nipple must not twist in relation to the burner housing. The threaded connection must be sealed with DVGW-approved sealants.

Gas hose which has not been installed properly can endanger life and limb of persons.

After connection, the joint must be checked for leaks with DVGW-approved leak detection spray.

For the installation of the gas connection for the High Pressure Cleaner, Hot Water, Stationary, HSC1140-INOX Gas, depending on the system configuration, observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90).

The gas connection may only be installed by trained and qualified personnel of an approved specialist company for gas installations (DVGW approved).

## 4.6 Installation of the electrical connection

**WARNING**

**Ensure that the electrical connection is properly installed.**

The installation work for the electrical connection of the system must only be carried out by trained and qualified personnel.

Observe the IEC-regulations for electrical cable laying.

All live parts in the intended working area for cleaning work, e.g. equipment, cables, sockets etc. must be protected against water jets in accordance with safety regulations.

Only connect the system to voltage sources earthed in accordance with the safety regulations.

The connection plugs must not lie on the floor and must always be dry. Do not touch the connectors with wet hands.

Improper installation of the electrical connection can endanger life and limb of persons.

**General Information**

For the installation of the cabinet, the direction of rotation of the motors does not have to be taken into account.

Have the electrical connection carried out by trained and qualified personnel. Ensure compliance with the provisions of IEC 60364-1.

The electrical mains connection (building connection) for the supply voltage of the system must be designed for trouble-free constant operation (see Section 3.3, Technical Data).

The electrical mains connection of the building must correspond to the electrical values given on the type plate of the system (see Section 3.3, Technical Data).

The following components of the building power supply must be installed at an easily accessible installation site:

- Socket for the plug of the power supply cable of the system
- Building power supply on/off switch
- Fuses or circuit breakers for the building power supply.

**General Information**

The circuit diagrams are part of the scope of delivery of each high pressure cleaner supplied.

Install the electrical connections according to the system-specific wiring diagram.

**WARNING**

**Danger of electric shock.**

Do not connect the system to the building power supply until all installation work has been completed.

For connection to the building network, proceed according to the instructions in section 5 (Commissioning). Otherwise, the life and limb of persons may be endangered.

Do not connect the system to the electrical mains supply (building connection) until commissioning in accordance with the instructions in section 5.2 (First switching on after installation).

## 4.7 Establishing the water connection

**CAUTION**

**Dirty water can damage the high pressure cleaner.**

Only operate the high pressure cleaner with clear and unpolluted water. The water inlet temperature to the high pressure cleaner must not exceed 30 °C.

The building water connection (tap water network) for the water supply of the high pressure cleaner must be designed for trouble-free constant operation (see Section 3.3, Technical Data).

The water connection for the high pressure cleaner must ensure a water supply of 1500 l/h under a flow pressure between 1 bar and 6 bar.

The regulations of the relevant water supply company must be observed! According to EN 61 770, the system must not be directly connected to the public drinking water supply. However, according to DVGW (Deutscher Verband des Gas- und Wasserfaches - German Gas and Water Association), short-term connection is permissible if a backflow preventer with a pipe ventilator is installed in the supply line. An indirect connection to the public drinking water supply is also permissible by means of a free outlet. The water supply must comply with EN 61 770, e.g. by using a tank with a float valve. Direct connection to a pipe network not intended for drinking water supply is permissible.

The environmental, waste and water protection regulations must be observed by the system operator!

**General Information**

In addition to the shut-off valve, the manufacturer recommends installing the solenoid valve (special accessory with order no. 2117) between the water supply network (shut-off valve) and the water inlet hose.

The solenoid valve prevents uncontrolled water leakage in the event of unnoticed damage in the water inlet.

Equip the water connection of the tap water network with a shut-off valve.

Connect the high pressure cleaner to the water connection via a movable pressure hose (at least 3/4“).

## 4.8 Assembly of the condensation water drain hose

**CAUTION**

**Install the condensation hose properly.**

Ensure that the end of the condensation hose is installed with the specified clearance to the floor. Failure to do so may cause the condensation to build up and damage the system.

The condensation hose is connected to the boiler and drains the condensation water through the bottom plate to the free drain. The condensation hose must not have a fixed connection with the sewer system. The condensate must be able to drain freely.

To install the condensate drain hose, proceed as follows:

- ▶ Cut the hose to length. Ensure that the recommended ground clearance at the end of the hose is maintained.
- ▶ Push the hose on top of the drain nozzle and fasten it with a hose clip.

## 4.9 Assembly of washing station equipment

**CAUTION**

**Ensure that the high pressure hose is handled properly.**

Do not

- run vehicles over the high pressure hose,
- pull it excessively, twist or bend it,
- run it over sharp-edged objects.

Otherwise the high pressure hose may be damaged.

**CAUTION**

**Ensure pressure-tight screw connection of the washing station equipment.**

Leakage on screw connections of the trigger gun, pressure hose- or hose drum connection lead to increased wear and may damage system parts.

Rectify leackages immediately

When assembling the Washing station equipment, make sure that the individual parts are pressure-tight.

To install the wash station equipment, proceed as follows:

- Connect the high pressure hose (example see 14, Fig. 4-3) with the trigger gun (15, Fig. 4-3).
- Connect the other high pressure hose adapter to the high pressure hose connection of the high pressure cleaner.
- Attach the high pressure nozzle (18, fig. 4-3) to the spray lance (17, fig. 4-3).

## 4.10 Set up internal cleaning detergent container

**WARNING**

**Only use approved detergents.**

Only detergents approved by EHRLE may be used.

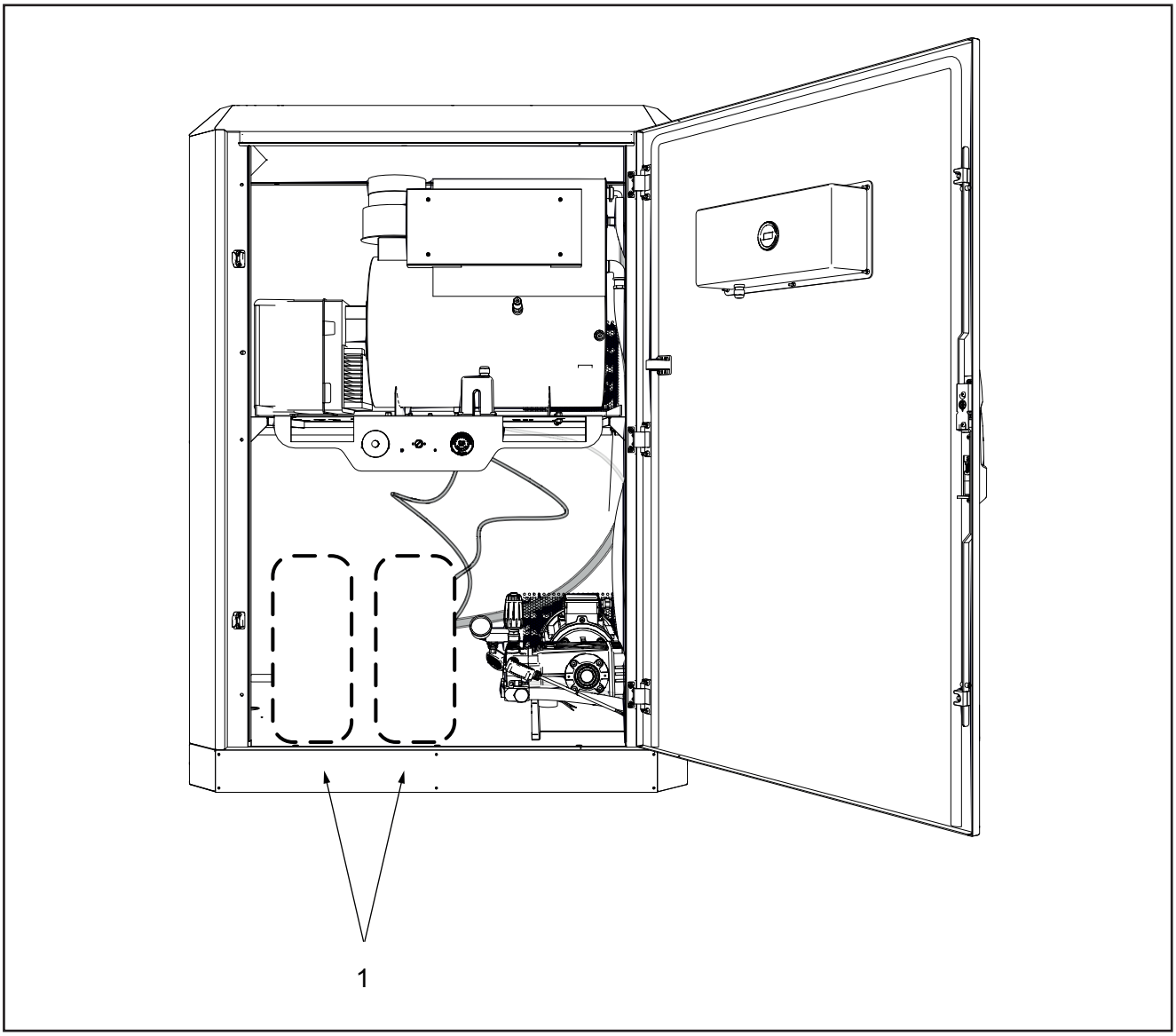
The use of inadmissible cleaning agents can impair the operational safety of the high pressure cleaner. This may endanger life and limb of persons.

**General Information**

The supply of chemicals and cleaning agents is controlled by standard built-in solenoid valves. This prevents uncontrolled overflow of the cleaning agent into the float container or back into the cleaning detergent container.

Inside the cabinet, two plastic containers with a capacity of 25 l each can be set up for the supply of detergent.

Place the two plastic containers inside the cabinet at the location provided by the manufacturer (see Fig. 4 - 4).




1 Planned position for two detergent containers (chemical)

Fig. 4 - 4 Installation location for two detergent containers inside the cabinet

# 5 Commissioning

**WARNING**

**Initial commissioning after installation must be carried out professionally.**

The measures prior to initial commissioning may only be carried out by trained and qualified personnel.

## 5.1 Activities prior to initial commissioning

Proceed as follows for all system types before initial commissioning:

- Check the oil level on the dipstick of the high pressure pump and top up to the „max.“ mark if necessary.

**Specification for gas-fired systems:**

- Only the type of gas (natural gas, liquid gas) specified on the burner nameplate may be used as fuel.

**WARNING**

**Ensure that the exhaust pipes are properly installed.**

Only operate the high pressure cleaner with a properly installed flue pipe.

The sliding chimney nozzle must be pushed onto the flue pipe before initial operation. Otherwise the life and limb of persons may be endangered.

- Check the sliding chimney nozzle before the initial start-up whether it is pushed on, if necessary push on the exhaust pipe.
- Only start up the system with the exhaust pipe installed.
- During the initial commissioning and four weeks afterwards, carry out an exhaust gas immission measurement and readjust the burner if necessary (for setting values see section 5.3, Burner setting values for gas-fired systems).

## 5.2 First switching-on after installation

**WARNING**

**Danger of electric shock.**

In the event of accidents (e.g. due to life-threatening voltages) involving persons or to prevent accidents, switch off the system (see Section 6.3.1, EMERGENCY STOP - Switching off in the event of danger).

The water jet emerging from the trigger gun must not be directed at live electrical components or systems (machines, devices, lines, sockets, etc.).

Before cleaning, disconnect the electrical systems, modules or components from the power supply.

For operation of the gas-fired system, depending on the system configuration, observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90).

**WARNING**

**Risk of burns from hot surfaces or water.**

During operation, the surfaces of system parts, assemblies or components can become hot (e.g. non-insulated pipes, metal parts of the rigger gun and spray lance, heated water, etc.). Contact with hot surfaces or hot water can cause skin burns or scalding in persons.

Ensure that the system parts, assemblies or components as well as cleaning objects have cooled down before starting operating, maintenance or repair work.

**WARNING**

**Danger of poisoning by escaping exhaust gas.**

The exhaust gas from the exhaust pipe must not be inhaled. Inhalation of exhaust gas can lead to dizziness, nausea and death.

For the initial commissioning of the system proceed as follows:

- ▶ If necessary, set the following three main switches (see Figs. 6 - 1) to position 0 on the cabinet door front.
  - ○ Start - Stop
  - ○ Hot water
  - ○ Detergent
- ▶ Open the water supply from the tap water network via the shut-off tap.
- ▶ Open shut-off valve for gas supply.
- ▶ Connect the system with the power supply cable to the electrical mains connection of the building.
- ▶ Switch on the power supply via the circuit breaker on the building side.
- ▶ If necessary, unlock and open the cabinet door with the key.

- First set the thermostat (6, fig. 6 - 3) inside the cabinet to the „Off“ position to set the water temperature.

**WARNING**

**Before activating, hold the trigger gun and the spray lance tightly.**

After activation of the trigger gun the emerging water jet exerts a jerky recoil force (see also Fig. 6 - 5).

This may result in unintentional jerking away from the selected cleaning object or the trigger gun slipping out of the hand, endangering the life and limb of persons.

- Unlock and pull the trigger lever (3, Fig. 6-2) of the trigger gun.
- Set the main switch Start - Stop to position I on the cabinet door front. The high pressure cleaner starts. The pump first delivers air from the high pressure nozzle. After a short time, water then escapes.

**WARNING**

**Risk of scalding due to hot water.**

The hot water escaping from the high pressure jet must not come into contact with persons. Otherwise scalding to persons may occur.

- Set the Thermostat (6, fig. 6 - 3) inside the cabinet to the desired temperature.
- Set the main switch Hot Water to position I on the front of the cabinet door.
- Set the unloader valve (2, Fig. 6 - 3) inside the cabinet to the desired operating pressure. The operating pressure can be read off the pressure gauge (3, Fig. 6 - 3) while the trigger gun is activated. By turning the unloader valve (see Figs. 6 - 4), the water quantity on the high pressure pump can be reduced continuously to the lowest value. The quantity regulation causes a lower operating pressure at the spray nozzle and a rise in temperature up to 98° C according to the unloader valve setting.
- If the trigger lever on the trigger gun is released, the high pressure cleaner switches to pressureless circulation operation. After 5-160 sec. (adjustable) circulation mode switches the system to stand-by mode. When the lever on the trigger gun is pulled again, the motor and the pump restart automatically.

**General Information**

If the system remains in stand-by mode for 20 minutes, the electronic control switches the high pressure cleaner off as programmed.

To resume operation, move the Start-Stop main switch to position 0 and then back to operating position I.

- Check burner settings by qualified personnel according to Section 5.3, Burner setting values for Gas Heated Systems and adjust if necessary:
- For safety reasons after completion of cleaning work
  - Lock the trigger lever of the trigger gun against unintentional switching on using the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch (5, Fig. 6-2).
  - Switch off the system via the main Start - Stop switch on the cabinet door front (move switch to position 0).

**General Information**

For the addition of detergents to the high pressure jet, see Section 6.4, Use of Detergents (Chemistry).

Only qualified personnel authorised by the system operator can set and specify the quantity of cleaning agent to be added inside the cabinet via the detergent control valve.

The admixing of the cleaning agent can only be switched on/off at the front of the cabinet door.



## 5.3 Burner setting values for gas-fired systems

**WARNING**

**Use only approved fuels.**

Only use fuels approved by the manufacturer. The use of other fuels impairs the operational safety of the system and may endanger life and limb of persons.

**WARNING**

**Adjust gas burner properly.**

For the burner setting of the gas-fired system depending on the system configuration, observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90).

Check the combustion values of the gas burner at the connected chimney. The measured flue gas values must be within the limits listed below.

**Indications for the burner setting**

| | |
|---|---|
| Fuel: | Natural gas H (Hu 10.4 kW/m³) |
| Gas pressure: | 20 ... 25 mm WS flow pressure |
| Air compression: | medium compression |

**The following exhaust gas values must be achieved:**

| | |
|---|---|
| Exhaust gas differential temperature: | 150 ... 170 °K |
| Carbon dioxide content: | 10.0 ... 11.0 CO2 in % |
| Carbon monoxide: | 25 ... 50 ppm |
| Soot number: | 0 according to Bacharach scale |
| Exhaust gas loss: | 8 ... 11 % |

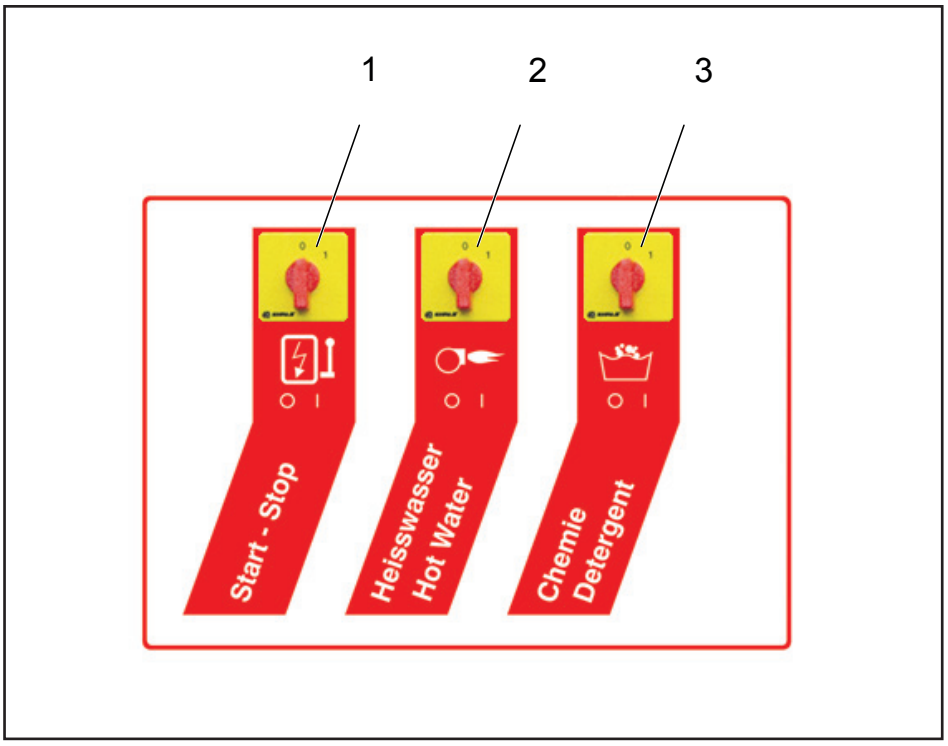
If the above limit values are not complied with, the gas burner must be adjusted by trained and qualified personnel.

# 6 Operation

## 6.1 System indicator and control elements

### 6.1.1 Control elements on the cabinet door front

The following figure shows the control elements on the front of the cabinet door.



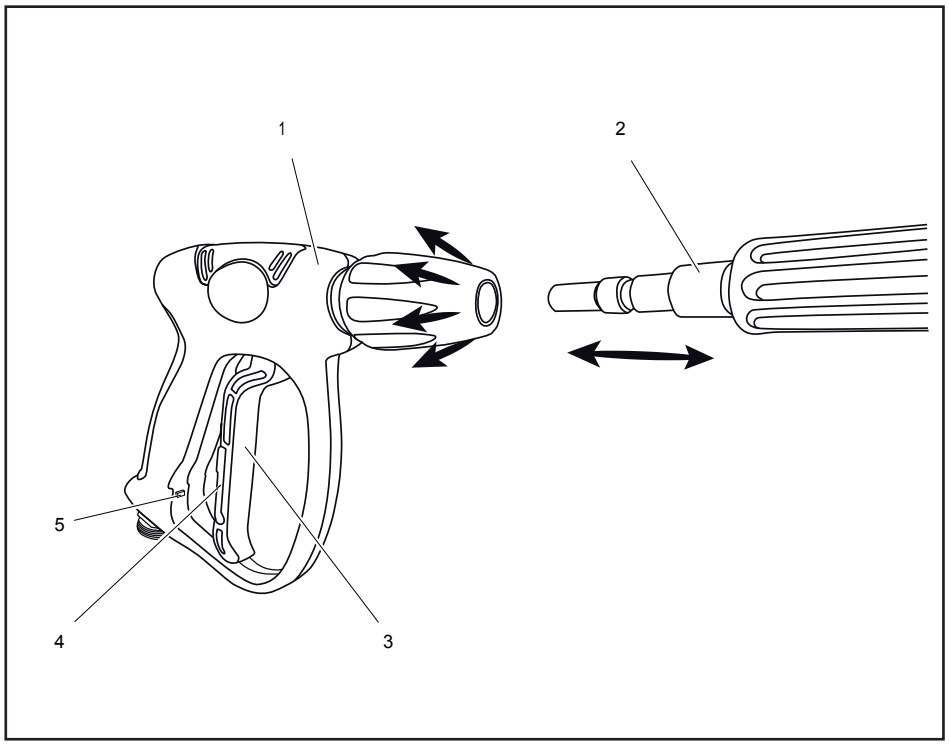

1 Main switch Start - Stop
2 Main switch Hot Water On - Off
3 Main switch Detergent On - Off

Fig. 6 - 1 Control elements, cabinet door front

### 6.1.2 Control elements of the trigger gun

The following figure shows the control elements of the trigger gun.

To assemble (disassemble) the spray lance to the (from) the trigger gun see arrows in the figure below.

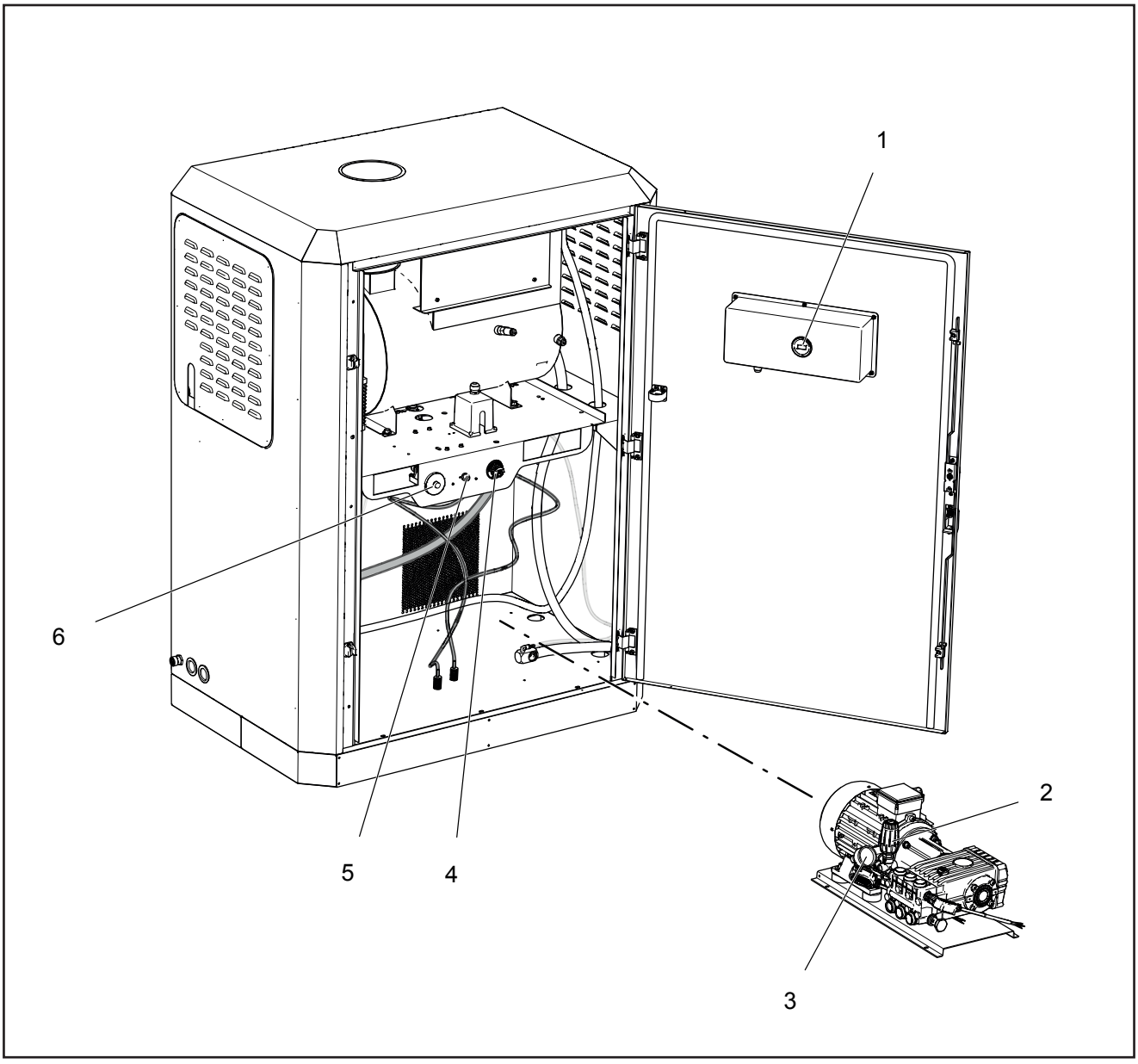



1 Trigger gun
2 Spray lance
3 Trigger lever
4 Locking lever (safety device)
5 Notch for locking lever (safety arresting)

Fig. 6 - 2 Control elements of the trigger gun

### 6.1.3 Indicator and control elements in the cabinet

The following figure shows the control and indicator elements inside the cabinet.




| | | | |
|---|---|---|---|
| 1 | Operating hours counter | 5 | Manual reset (after Maximum thermostat 95 °C released) |
| 2 | Unloader valve (pressure setting) | 6 | Thermostat (water temperature adjustment) |
| 3 | Pressure gauge | | |
| 4 | Detergent control valve | | |

Fig. 6 - 3 High pressure cleaner HSC1140-INOX Gas, indicator and control elements (cabinet interior)

## 6.2 Measures for system operators before operation

**WARNING**

**Perform measures by the system operator in a professional manner.**

The measures for system operators prior to operation may only be carried out by authorized, trained and qualified personnel.

Before operation or at periodic intervals (see Section 8, Maintenance), proceed as follows for all system types:

- Check the oil level on the dipstick of the high pressure pump and top up to the „max.“ mark if necessary.

**Specification for gas-fired systems**

**WARNING**

**Ensure that the exhaust pipes are properly installed.**

Only operate the high pressure cleaner with a properly installed flue pipe.

The sliding chimney nozzle must be pushed onto the flue pipe before initial operation.

Otherwise the life and limb of persons may be endangered.

Before the high pressure cleaner is put into operation by authorized specialist personnel at the system operator level, proceed as follows:

- Check the sliding chimney nozzle before commissioning and then at periodic intervals (see Section 8, Maintenance) to ensure that it is correctly pushed on, if necessary push on the flue pipe.
- Check the flue pipe for damage before commissioning and at regular intervals thereafter (see Section 8, Maintenance). Do not put systems with damaged exhaust pipes into operation or switch off the system immediately in case of operation.
- At periodic intervals (see Section 8, Maintenance) carry out an exhaust gas immission measurement and readjust the burner if necessary (for setting values, see Section 5.3, Burner Setting Values for Gas Heated Systems).

## 6.3 Notes on operation for specialist and operating personnel

**WARNING**

**Ensure proper operation.**

The system may only be adjusted and operated by qualified, trained personnel authorized by the system operator.

**WARNING**

**Danger of electric shock.**

In the event of accidents (e.g. due to life-threatening voltages) involving persons or to prevent accidents, switch off the system (see Section 6.3.1, EMERGENCY STOP - Switching off in the event of danger).

The water jet emerging from the trigger gun must not be directed at live electrical components or systems (machines, devices, lines, sockets, etc.).

Before cleaning, disconnect the cleaning objects such as electrical systems, assemblies or components from the power supply.

**WARNING**

**Ensure that the high pressure jet is used correctly.**

The water jet coming out of the trigger gun must not be directed at persons or animals.

In the event of accidents (e.g. danger to persons, injured persons in the work area) or to prevent accidents, switch off the system (see Section 6.3.1, EMERGENCY STOP - Switching off in the event of danger).

**WARNING**

**Risk of burns from hot surfaces or water.**

During operation, the surfaces of system parts, assemblies or components can become hot (e.g. non-insulated pipes, metal parts of the trigger gun and spray lance, heated water, etc.). Contact with hot surfaces or hot water can cause skin burns or scalding in persons.

Ensure that the system parts, assemblies or components as well as cleaning objects have cooled down before starting operating, maintenance or repair work.

**WARNING**

**Danger of poisoning by escaping exhaust gas.**

The exhaust gas from the exhaust pipe must not be inhaled. Inhalation of exhaust gas can lead to dizziness, nausea and death.

The design of the system distinguishes between two levels of access:

- **Level 1:**
  Skilled personnel authorized by the system operator to set system parameters and operation (see Section 6.3.2, System Setup and Operation for Skilled Personnel):
  - Access to the control and indicator elements inside the cabinet via a lockable door.
  - Adjustment of the desired operating parameters via the control elements inside the cabinet for:
    - Operating pressure
    - Water temperature
    - Quantity of water
    - Detergent additive.
  - Control elements (three main switches) on the front of the cabinet door.

- **Level 2:**
  Operating personnel for carrying out cleaning work (see Section 6.3.3, Operation for Operating Personnel) with access for:
  - Control elements (three main switches) on the cabinet door front for selecting the operating modes:
    - Start - Stop: On - Off
    - Hot water: On - Off
    - Detergent: On - Off

### 6.3.1 EMERGENCY STOP - switch-off in case of danger

**WARNING**

**In case of electrical accidents, never directly touch persons exposed life-threatening voltages.**

In the event of accidents with persons at life-threatening voltages, immediately switch off the supply voltage to the high pressure cleaner or disconnect the power supply cable from the infrastructure mains plug.

Never touch the exposed person who has been involved in an accident directly. First aiders are also endangered by electric shock if they touch the person directly, in wet areas or over wet objects.

In extreme emergencies, without touching the injured person, use a dry garment, wooden slat or other insulating material to separate the person and power source.

In case of accidents with persons or for accident prevention during system operation, perform an EMERGENCY STOP switch-off as follows:

▶ If necessary, if persons are still exposed to electric shock, switch off the power supply to the system via the circuit breaker (building connection) or disconnect the power supply cable from the mains socket.

▶ Switch off the main switch Start - Stop (1, fig. 6 - 1) on the cabinet door front (bring it to position 0).

- If necessary, activate the trigger gun until the high pressure cleaner is depressurised.
- Close shut-off valve for gas supply if necessary.
- Close shut-off valve for water supply (water mains) if necessary.

### 6.3.2 System setting and operation for skilled personnel

**General Information**

Only qualified personnel authorised by the system operator may make settings inside the cabinet. This requires access to the key for opening the cabinet door.

For operation and system setting by authorized personnel, proceed as follows:

- If necessary, set the following three main switches (see Fig. 6 - 1) on the cabinet door front to position 0.
  - Start - Stop
  - Hot water
  - Detergent
- If necessary, open the shut-off valve of the tap water network.
- If necessary, open shut-off valve for gas supply.
- If necessary, connect the system to the electrical mains connection of the building using the power supply cable.
- If necessary, switch on the power supply via the circuit breaker on the building side.
- Unlock and open the cabinet door with the key.
- Inside the cabinet, set the thermostat (6, fig. 6 - 3) for setting the water temperature to the „Off“ position.

**WARNING**

**Before activating, hold the trigger gun and the spray lance tightly.**

After activation of the trigger gun the emerging water jet exerts a jerky recoil force (see also Fig. 6 - 5).

This may result in unintentional jerking away from the selected cleaning object or the trigger gun slipping out of the hand, endangering the life and limb of persons.

- Unlock and pull the trigger lever (3, Fig. 6-2) of the trigger gun.
- Set the main switch Start - Stop to position I on the cabinet door front. The high pressure cleaner starts. The pump first delivers air from the high pressure nozzle. After a short time, water then escapes.

**WARNING**

**Risk of scalding due to hot water.**

The hot water escaping from the high pressure jet must not come into contact with persons. Otherwise scalding may occur in persons.

- Set the unloader valve (2, Fig. 6 - 3) inside the cabinet to the desired operating pressure. The operating pressure can be read off the manometer (3, Fig. 6 - 3) while the trigger gun is open. Turning the unloader valve clockwise increases the operating pressure and increases the flow rate (see also Fig. 6 - 4). Turning it counterclockwise causes a low operating pressure and a lower flow rate.

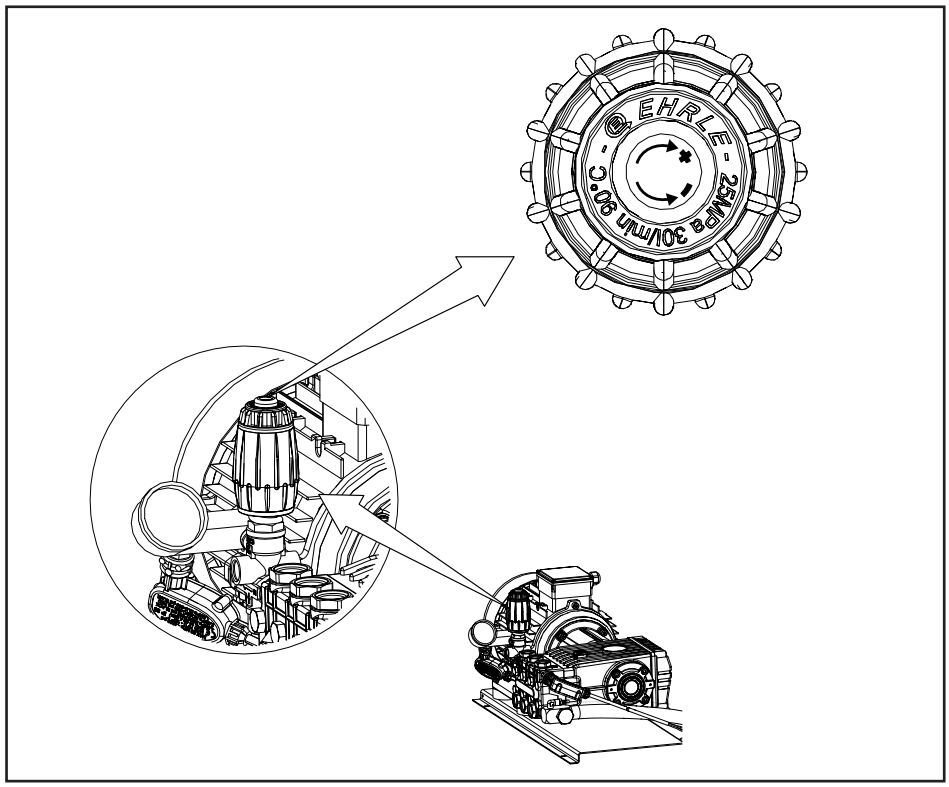



Fig. 6 - 4 Adjustment of the operating pressure at the unloader valve

- The temperature setting for hot water is made on the thermostat (up to max 98 ° C).
- The use of hot water can be switched on/off at the cabinet door front via the main switch Hot water (switch positions 0/I).
- If the trigger lever on the trigger gun is released, the high pressure cleaner switches to pressureless bypass operation. After 5-160 sec. (adjustable) bypass mode switches the system to stand-by mode. When the lever on the trigger gun is pulled again, the motor and the pump restart automatically.

**General Information**

If the system remains in stand-by mode for 20 minutes, the electronic control switches the high pressure cleaner off as programmed.

To resume operation, set the Start-Stop main switch to position 0 and then back to operating position I.

- Inside the cabinet, the detergent control valve (4, Fig. 6 - 3) can be set to add a desired quantity of detergent to the high pressure jet. Observe section 6.4 (Use of cleaning agents, chemicals).
- The cleaning agent admixture can be switched on/off (switch positions 0/I) at the main switch Detergent on the cabinet door front.
- The cabinet door must be closed during cleaning work.
- For safety reasons after completion of cleaning work
  - Lock the trigger lever of the trigger gun against unintentional switching on using the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch for the locking lever (5, Fig. 6-2).
  - Switch off the system via the main Start - Stop switch on the cabinet door front (set switch to position 0).

### 6.3.3 System operation for operating personnel

**General Information**

Operation of the system by operating personnel is limited to switching on/off the three main switches on the front of the cabinet door.

For cleaning operation by the operating personnel, proceed as follows:

- If necessary, open the shut-off valve of the tap water network.

**WARNING**

**Before activating, hold the trigger gun and the spray lance tightly.**

After activation of the trigger gun the emerging water jet exerts a jerky recoil force (see also Fig. 6 - 5).

This may result in unintentional jerking away from the selected cleaning object or the trigger gun slipping out of the hand, endangering the life and limb of persons.

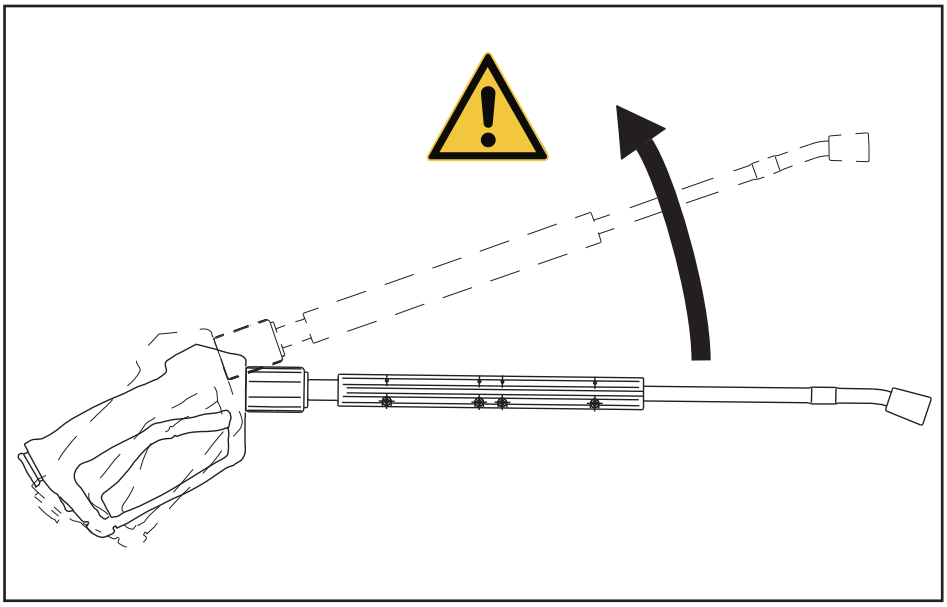


Fig. 6 - 5 Recoil force when switching on the trigger gun

- Unlock and pull the trigger lever (3, Fig. 6-2) of the trigger gun.
- Set the main switch Start - Stop (1, fig. 6 - 1) on the front of the cabinet door to position I. The high pressure cleaner starts. The pump first delivers air from the high pressure nozzle. After a short time, water then escapes.
- If the trigger lever on the trigger gun is released, the high pressure cleaner switches to pressureless bypass operation. After 5-160 sec. (adjustable) bypass mode switches the system to stand-by mode. When the lever on the trigger gun is pulled again, the motor and the pump restart automatically.

**General Information**

If the system remains in stand-by mode for 20 minutes, the electronic control switches the high pressure cleaner off as programmed.

To resume operation, set the main switch Start - Stop to position 0 and then back to operating position I.

**WARNING**

**Risk of scalding due to hot water.**

The hot water escaping from the high pressure jet must not come into contact with persons. Otherwise scalding may occur in persons.

- On the front of the cabinet door, the two main switches listed below can be used to switch on/off
  - Hot water (2, Fig. 6 - 1):
    The heated water comes out of the high pressure nozzle at a temperature preset by the system operator.

- Detergent (3, Fig. 6 - 1):
  The addition of a preset quantity of cleaning agent to the high pressure jet can be switched on/off.
  For the use of cleaning agents, observe the instructions, see section 6.4 (Use of cleaning agents, chemicals).

▶ For safety reasons after completion of cleaning work:

- Lock the trigger lever of the trigger gun against unintentional switching on using the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch for the locking lever (5, Fig. 6-2)
- Switch off the system via the main Start - Stop switch on the cabinet door front (set switch to position 0).

## 6.4 Use of detergents (chemistry)

For cleaning work with the high pressure cleaner, a cleaning agent (chemical) can be added to the high pressure jet.

Access for setting the detergent quantity and filling the detergent tanks in the cabinet is restricted to qualified personnel authorised by the system operator.

**WARNING**

**Only use permitted detergents.**

Only use cleaning detergents approved by EHRLE. The use of inadmissible detergents can endanger the operational safety of the system and thus the life and limb of persons.

There is a risk of poisoning or caustic burns with cleaning agents. Observe the manufacturer's instructions. Keep cleaning agents out of the reach of unauthorized persons.

Observe specifications for neutral additive pH value 7 ... 9. Observe the instructions of the additive manufacturer, e.g. protective equipment, waste water regulations.

**WARNING**

**Risk of explosion due to use of inadmissible detergents.**

Never aspirate solvent-containing liquids such as paint thinners, petrol, oil or similar liquids.

Observe the specifications of the additive manufacturers!

The spray of solvents is highly flammable, explosive and toxic.

**CAUTION**

**Chemical dry run or inadmissible detergents can damage the system.**

Only open the chemical control valve when the inlet hose for the detergents in the cleaning tank is fully inserted and the tank is sufficiently filled with detergent.

Intake air causes damage to seals and pumps.

In order to protect the environment, we recommend using detergents sparingly.

Observe the dosage recommendations on the container labels of the detergents.

An up-to-date list of approved detergents or chemical additives can be requested from EHRLE.

For the use of cleaning agents, two detergent containers (25 l capacity each) can be installed inside the cabinet in the space provided (see Fig. 4 - 4).

### 6.4.1 Adjust the amount of detergent to be added

The cabinet door must be unlocked and opened with the key by authorised specialist personnel. Proceed as follows to set the amount of detergent to be added:

- ▶ Check the detergent tank for filling, top up with approved detergent if necessary.
- ▶ Initially set the Detergent control valve (4, Fig. 6 - 3) to position „0“.
- ▶ Open the detergent control valve from position „0“ according to the desired quantity of detergent.

**General Information**

The more the detergent control valve is opened, the more amount of detergent is sucked in. Depending on the application, set the dosage via the chemical control valve.

### 6.4.2 Add detergent

For cleaning with detergents proceed as follows:

- ▶ Switch on the main switch Detergent (3, Fig. 6 - 1) at the front of the cabinet door (set switch to position I).
- ▶ To remove the dirt, spray on the detergent sparingly and let it work for approx. 1 to 5 minutes.
- ▶ Then spray the loosened dirt with the high pressure jet.
- ▶ After using detergents, rinse the high pressure cleaner for at least 30 seconds.

# 7 Decommissioning

## 7.1 Temporary decommissioning by operating personnel

After completion of cleaning works proceed as follows for a temporary decommissioning:

- If detergent has been added, set the Detergent main switch (3, Fig. 6 - 1) to position 0. Then rinse the high pressure cleaner for at least 30 seconds.
- After hot water operation, set the main switch for hot water (2, Fig. 6 - 1) to position 0. The high pressure cleaner must be operated with cold water for at least two minutes with the trigger gun open for cooling.
- Pull the lever of the trigger gun until the high pressure cleaner is depressurized.

**WARNING**

**Lock the lever of the trigger gun after completion of cleaning work.**

After deactivating the trigger gun, lock the trigger lever (3, Fig. 6-2) against unintentional switching on by means of the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch for the locking lever (5, Fig. 6-2).

Unintentional activation of the trigger gun after restarting the system can endanger life and limb of persons.

- Lock the trigger lever of the trigger gun against unintentional switching on using the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch for the locking lever (5, Fig. 6-2).
- Set the main switch Start - Stop (1, fig. 6 - 1) on the cabinet door front to position 0.
- If necessary, close the shut-off valve on the building side of the tap water network.
- If necessary, switch off the power supply via the circuit breaker on the building side.
- If necessary, disconnect the mains cable of the system from the mains connection of the building.

## 7.2 Temporary decommissioning by qualified personnel

After completion of cleaning works proceed as follows for a temporary decommissioning:

- If detergent has been added, set the Detergent main switch (3, Fig. 6 - 1) to position 0. Then rinse the high pressure cleaner for at least 30 seconds.

- After hot water operation, set the main switch for hot water (2, Fig. 6 - 1) to position 0. The high pressure cleaner must be operated with cold water for at least two minutes with the trigger gun open for cooling.
- Pull the trigger lever of the trigger gun until the high pressure cleaner is depressurized.

**WARNING**

**Lock the lever of the trigger gun after completion of cleaning work.**

After deactivating the trigger gun, lock the trigger lever (3, Fig. 6-2) against unintentional switching on by means of the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch for the locking lever (5, Fig. 6-2).

Unintentional activation of the trigger gun after restarting the system can endanger life and limb of persons.

- Lock the trigger lever of the trigger gun against unintentional switching on using the locking lever (4, Fig. 6-2). Ensure that the locking lever is positioned in the notch for the locking lever (5, Fig. 6-2).
- Set the main switch Start - Stop (1, fig. 6 - 1) on the cabinet door front to position 0.
- If necessary, unlock and open the cabinet door with the key.
- If necessary, move the following control elements inside the cabinet to switch-off position 0:
  - Thermostat (6, fig. 6 - 3)
  - Detergent control valve (4, Fig. 6 - 3)
- If necessary, leave the unloader valve (2, fig. 6 - 3) as it is.
- If necessary, close the shut-off valve on the building side of the tap water network.
- Close shut-off valve for gas supply if necessary.
- For maintenance and repair work or longer decommissioning, switch off the power supply to the system via the circuit breaker of the mains connection on site. Protect against unauthorized or unintentional reconnection (e.g. attach warning signs, lock lockable circuit breakers or main switches).
- Disconnect the power supply cable of the system from the mains connection of the building.

# 8 Maintenance

**WARNING**

**Carry out maintenance measures professionally.**

Maintenance of the system may only be carried out by trained and qualified personnel.

Before carrying out any maintenance work, take the system out of operation and disconnect it from the building's electrical supply.

## 8.1 General Information

The maintenance measures must be carried out professionally and regularly and mean for the system:

- Guarantee of operational safety
- Achieving a long service life
- Maintaining the performance.

## 8.2 EHRLE Maintenance and Inspection Contract

The company EHRLE offers with the sale of the system a maintenance contract or especially a safety inspection agreement. The maintenance contract includes:

- Maintenance and repair work
- Security inspection agreement.

The security inspection agreement includes the inspection according to

- Guidelines for Liquid Sprayers (see Section 2.8).
- Federal Immission Control Act (see Section 2.9, Federal Immission Control Act).

## 8.3 Maintenance work

Components which show increased wear or whose design duration has been exceeded or is exceeded before the next maintenance must be replaced as a precaution (see section 9.2).

The following table contains the periodical maintenance work for the stationary hot water high pressure cleaner HSC1140-INOX Gas.

| Period | Component | Measure | Authorized personnel |
|---|---|---|---|
| Daily | Trigger gun | Check if trigger gun closes tightly; check function of mechanical locking to prevent unintentional switch-on; replace defective trigger gun. | Trained operator |
| | all high pressure hoses (inside / outside system cabinet) | Check the high pressure hoses see section 8.3.5. | Skilled worker (with access to cabinet interior) |
| | Electrical plugs and cables (inside / outside system cabinet) | Check connecting cable with mains plug for damage. Replace damaged connecting cable immediately by an authorized customer service/electrical specialist. | Customer Service/ Electrical Specialist |
| Weekly or after 40 operating hours. | Check the oil condition in the oil tank at the pump | If the oil is milky, change the oil according to section 8.3.3. | Skilled worker (with access to cabinet interior) |
| | Check the oil level in the oil tank on the pump | Check pump oil level, top up oil if necessary (see section 8.3.3) | Skilled worker (with access to cabinet interior) |
| | Water inlet filter | Check filter for dirt and clean if necessary, see section 8.3.2. | Trained operator |
| | Filter from detergent hose | Check filter for dirt and clean if necessary. | Skilled worker (with access to cabinet interior) |
| | Detergent tank | Check detergent tank for sufficient filling. | Skilled worker (with access to cabinet interior) |
| | Drain hose for condensed water | Check for ground clearance, water retention and contamination, ensure free water drainage if necessary. | Skilled worker (with access to cabinet interior) |
| | Drain hose from boiler | Water retention and soiling, if necessary ensure free water drainage. | Skilled worker (with access to cabinet interior) |
| Monthly | Sliding chimney nozzle | Check if pushed correctly. | Skilled worker (access to cabinet interior) |
| | Exhaust pipe | Check for damages. | Skilled worker (access to cabinet interior) |

Table 8 - 1 List of periodical maintenance work

| Period | Component | Measure | Authorized personnel |
|---|---|---|---|
| Monthly or after 200 operating hours | High pressure pump | Check pump for leakage. If more than 3 drops per minute call customer service. | Skilled worker (with access to cabinet interior) |
| Every six months or if required | Spray nozzle | Replace spray nozzle. | Trained operator |
| | Check all piping in the entire system for internal deposits | Operate system with spray lance without high pressure nozzle. If the operating pressure at the pressure gauge exceeds 3 MPa, the system must be descaled. The same applies if an operating pressure of more than 0.7-1 MPa is detected during operation without a high pressure line (water exits freely at the high pressure outlet), decalcification see section 8.3.4. | Specialist (with access to cabinet interior) with instruction on decalcification |
| | Filter in the low-water cut-off | Check filter for dirt and clean if necessary. | Skilled worker (with access to cabinet interior) |
| After 500-700 operating hours | Glow igniter, ionisation electrode | Replace glow igniter or ionisation electrode. | Customer service |
| Every six months or after 1000 operating hours | High pressure pump | Change the oil according to section 8.3.3. | Skilled worker (access inside the cabinet) |
| | Check the entire system for dirt, damage and function | Visual inspection of the system, check high pressure connections for leaks, check overflow valve for leaks, check high pressure hose, check pressure tank, decalcify heating coil, clean / replace ionisation electrode, adjust burner. | Customer service |
| Annually | Safety check for the entire system | Carry out a safety check in accordance with the respective national regulations of the legislator for liquid sprayers. | Qualified expert |
| | | Testing in accordance with the Federal Immission Control Act. | Qualified expert |

Table 8 - 1 List of periodical maintenance work

### 8.3.1 Antifreeze

**General Information**

For locations of stationary hot water high pressure cleaners with environmental conditions below freezing point, EHRLE offers detailed advice.

Special versions of systems allow operation in locations with ambient conditions at temperatures as low as -20 °C .

If the system is exposed to temperatures below freezing point during prolonged shutdown or decommissioning (e.g. temporary storage location in warehouse), frost protection must be provided (see both following subsections).

#### 8.3.1.1 Drain water from high pressure cleaner

Proceed as follows:

- ▶ Unscrew the water supply hose and the high pressure hose.
- ▶ Run the high pressure cleaner for max. 1 minute until the pump and pipes are empty.
- ▶ Open the drain tap on the boiler.

#### 8.3.1.2 Rinse high pressure cleaner with antifreeze agent

**General Information**

Observe the handling instructions of the antifreeze manufacturer.

Proceed as follows:

- ▶ Fill the float container with commercially available antifreeze up to the top.
- ▶ Place the collecting container under the high pressure outlet.
- ▶ Switch on the high pressure cleaner and operate until the low-water cut-off in the float container responds and the system switches off.
- ▶ Fill boiler bottom and siphon with antifreeze agent

Also provides corrosion protection.

### 8.3.2 Cleaning the filter in the water inlet

To clean the filter, proceed as follows:

- ▶ Close water inlet.
- ▶ Unscrew the water inlet hose from the unit.
- ▶ Use a screwdriver to push the filter out of the connection.
- ▶ Cleaning the filter
- ▶ Reassemble in reverse order.

### 8.3.3 Oil change

Use the following type of oil to change the oil in the gear unit of the high pressure pump:

- Engine oil SAE 15 W/40.

To change the oil in the gearbox of the high pressure pump, proceed as follows:

- ▶ Remove the oil dipstick.
- ▶ Extract the oil (observe environmental protection when handling waste oil).
- ▶ Fill oil up to the „MAX“ mark on the oil dipstick.

### 8.3.4 Decalcification of the high pressure cleaner

If the high pressure cleaner is calcified, the pipe resistance increases and the overflow valve feeds part of the water into the pump circuit.

The pipe resistance can be checked by letting the water freely flow out of the high pressure hose without a spray nozzle and determining the pressure on the manometer:

- If the pipe resistance exceeds 25 bar, decalcification must be carried out.

**WARNING**

**Non-compliance with application and accident prevention regulations can endanger life and limb of persons.**

The application and accident prevention regulations, especially VBG 1, §§ 4, 14, -4 -47 must be observed (e.g. wearing gloves and safety glasses).

According to legal regulations, only tested limescale solvents with a test mark may be used for descaling.

The gases produced during descaling are flammable. Do not smoke! Ensure good ventilation! Wear respiratory protection if necessary.

Proceed as follows to decalcify the high pressure cleaner:

- ▶ Close the shut-off tap on the building side at the water connection (water supply network).
- ▶ Switch on high pressure cleaner until float container is vacuumed empty.

- ▶ Fill the float container with 3 ltr. decalcifying acid.
- ▶ Reopen the shut-off tap on the building side at the water connection.
- ▶ Unscrew high pressure nozzle and decalcify separately.
- ▶ Insert the spray lance into an empty container (capacity approx. 20 l) and switch on the high pressure cleaner. As soon as turbid liquid emerges from the trigger gun, switch off the high pressure cleaner and wait 20 minutes.
- ▶ Then operate the high pressure cleaner until clear water emerges. Check the operating pressure. If the operating pressure recorded in the test report (part of the scope of delivery) is reached, decalcification is complete. Otherwise, the descaling process must be repeated. If the high pressure pipe is firmly piped, it can also be decalcified.

### 8.3.5 Checking the high pressure hoses

**WARNING**

**Operation with worn, damaged or repaired high pressure hoses can endanger life and limb of persons.**

Ensure that high pressure hoses are removed immediately in the case of:

- Signs of wear
- Signs indicating repairs to the high pressure hose
- Overaging and low durability.

Bursting or leaky high pressure hoses can cause hot, high pressure water or steam to escape. This can endanger life and limb of persons.

Before each commissioning of the high pressure cleaners, carry out a visual inspection of the high pressure hoses for damage. Every high pressure hose must comply with the safety regulations and be marked with:

- Permissible operating pressure
- Permissible operating temperature
- Date of manufacture
- Manufacturer.

Replace the high pressure hose at the slightest sign of damage. Only use spare parts recommended by the manufacturer (see spare parts catalogue).

# 9 Troubleshooting

**WARNING**

**Carry out troubleshooting and rectification properly.**

Troubleshooting of the system may only be carried out by trained and qualified personnel.

Before troubleshooting inside the system, take the system out of operation and disconnect it from the electrical supply of the building.

For troubleshooting and repair of the gas burner, depending on system configuration observe the installation and operating instructions of Weishaupt (gas burner WG5) or Baltur (gas burner BPM90).

## 9.1 Troubleshooting table

The following table lists possible causes of failures.

Clean the contaminated parts (filter, high pressure nozzle etc.) to eliminate the fault. Replace defective parts. Information on this can be found in section 9.2 (Replacing components and Parts).

| Error | Possible cause | Remedying | Authorized personnel |
|---|---|---|---|
| System cannot be switched on | Check that the power supply cable is plugged in. | Connecting the power supply cable to the building power supply | Trained operator |
| | Building supply circuit breaker has tripped. | Switch the circuit breaker on again. | Trained operator |
| | Check if power supply cable is defective. | Replace defective power supply cable. | Customer service / electrician |
| | Circuit breaker trips again after repeated switching on. | If building power supply is OK, system defective; disconnect power supply cable and contact customer service. | Customer service |
| | Water level in float container too low. | Locate the cause of the low water level (water inlet blocked, too low or too low due to contamination, dirty filter in the water inlet, dirty filter in the low-water cut-off etc.). | Skilled worker (with access to cabinet interior) / customer service |
| | System control circuits or components defective | Replace defective components. | Customer service |
| System switched off during operation | Error in system control circuits or short-term overload. | Press Reset button;<br>Notify customer service, regardless of whether operation can be continued. | Skilled worker (with access to cabinet interior) / customer service |
| | Motor of high pressure cleaner overheated. | Allow motor to cool down, main switch in position 0, then switch system on again. | Skilled worker (with access to cabinet interior) |
| | Fuse F2 defective. | Switch off the power supply to the system and disconnect the power supply cable from the mains supply; unscrew the protective cover from the electrical terminal strip with electronics (3, Fig. 3 - 2) and check fuse F2. | Skilled worker (with access to cabinet interior) / customer service |
| | System control circuits or components defective. | Replace defective components. | Customer service |

Table 9 - 1 Troubleshooting table

| Error | Possible cause | Remedying | Authorized personnel |
|---|---|---|---|
| System has switched off in stand-by mode | System was in stand-by mode for 20 minutes. Electronic control has switched off high pressure cleaner according to program. | To resume operation, turn the Start-Stop main switch to position 0 and then back to operating position I. | Trained operator |
| No pressure build-up with high pressure cleaners | High pressure nozzle dirty or defective. | Clean or replace high pressure nozzle | Trained operator |
| | Filter in water inlet dirty | Clean the filter, see section 8.3.2. | Trained operator |
| | Water inflow volume is too low. | Ensure sufficient water inflow volume | Skilled worker (with access to cabinet interior) |
| | One or more supply lines of the pump are clogged. | Remove the blockage in the supply line. | Skilled worker (with access to cabinet interior) |
| | One or more supply lines of the pump are leaking. | Replace leaking supply lines. | Customer service |
| | Detergent control valve is leaking. | Leaking detergent replace control valve. | Customer service |
| | Unloader valve is contaminated. | Cleaning the unloader valve. | Skilled worker (with access to cabinet interior) |
| | Unloader valve is defective. | Replace defective unloader valve | Customer service |
| | High pressure pump valves are dirty or defective. | Clean or replace valves. | Customer service |
| | Cuffs of the high pressure pump are dirty or defective. | Clean or replace cuffs. | Customer service |
| No water heating (main switch hot water in position I) | Thermostat in „Off“ position. | Set thermostat for desired water temperature. | Skilled worker (with access to cabinet interior) |

Table 9 - 1 Troubleshooting table

| Error | Possible cause | Remedying | Authorized personnel |
|---|---|---|---|
| No water heating (main switch hot water in position I) (continued) | Fuse F3 defective. | Switch off the power supply to the system and disconnect the power supply cable from the mains supply; unscrew the protective cover from the electrical terminal strip with electronics (3, Fig. 3 - 2) and check fuse F3. | Skilled worker (with access to cabinet interior) |
| | Operating pressure below 25 bar | Check causes for operating pressure below 25 bar | Skilled worker (with access to cabinet interior) |
| | System components or system control circuits defective (pressure switch, flow monitor, ETRONIC control unit, etc.). | Replace defective components. | Customer service |
| | Gas burner does not work or is defective. | Depending on the system configuration, see technical manual „Installation and operating instructions“ of Weishaupt (Weishaupt gas burner WG5) or Baltur (Baltur gas burner BPM90). | Weishaupt or Baltur customer service. |
| No detergent admixture (main switch chemistry in position I) | Fuse F3 defective. | Switch off the power supply to the system and disconnect the power supply cable from the mains supply; unscrew the protective cover from the electrical terminal strip with electronics (3, Fig. 3 - 2) and check fuse F3. | Skilled worker (with access to cabinet interior) / customer service |
| | Modules of the detergent admixture defective. | Replace defective modules. | Customer service |

Table 9 - 1 Troubleshooting table

## 9.2 Replacement of components and parts

Replace the defective parts or components according to the illustrations in the spare parts catalogue (see section 10).

When replacing only use spare parts recommended by the manufacturer (see spare parts catalogue in appendix).

# 10 Spare parts

## 10.1 System cabinet (exterior view)

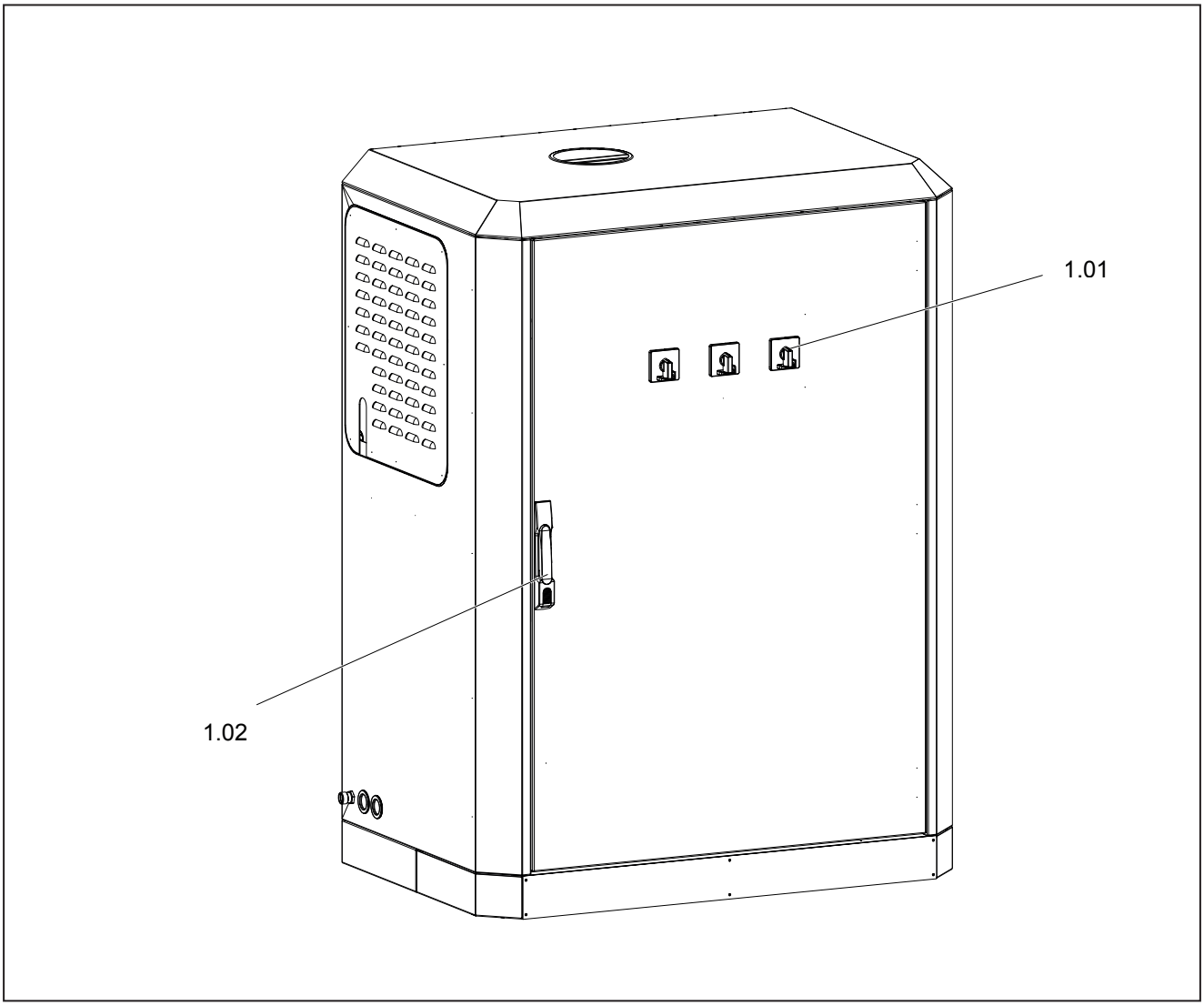



Fig. 10 - 1 System cabinet (spare parts view front of cabinet)

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 1.01 | Main Switch B2N A1-F35-X-XG9 | 204602 |
| 1.02 | Handle with press button 2400-U4 | 39971 |

Table 10 - 1 System cabinet, spare parts front side of cabinet

## 10.2 System cabinet (interior)

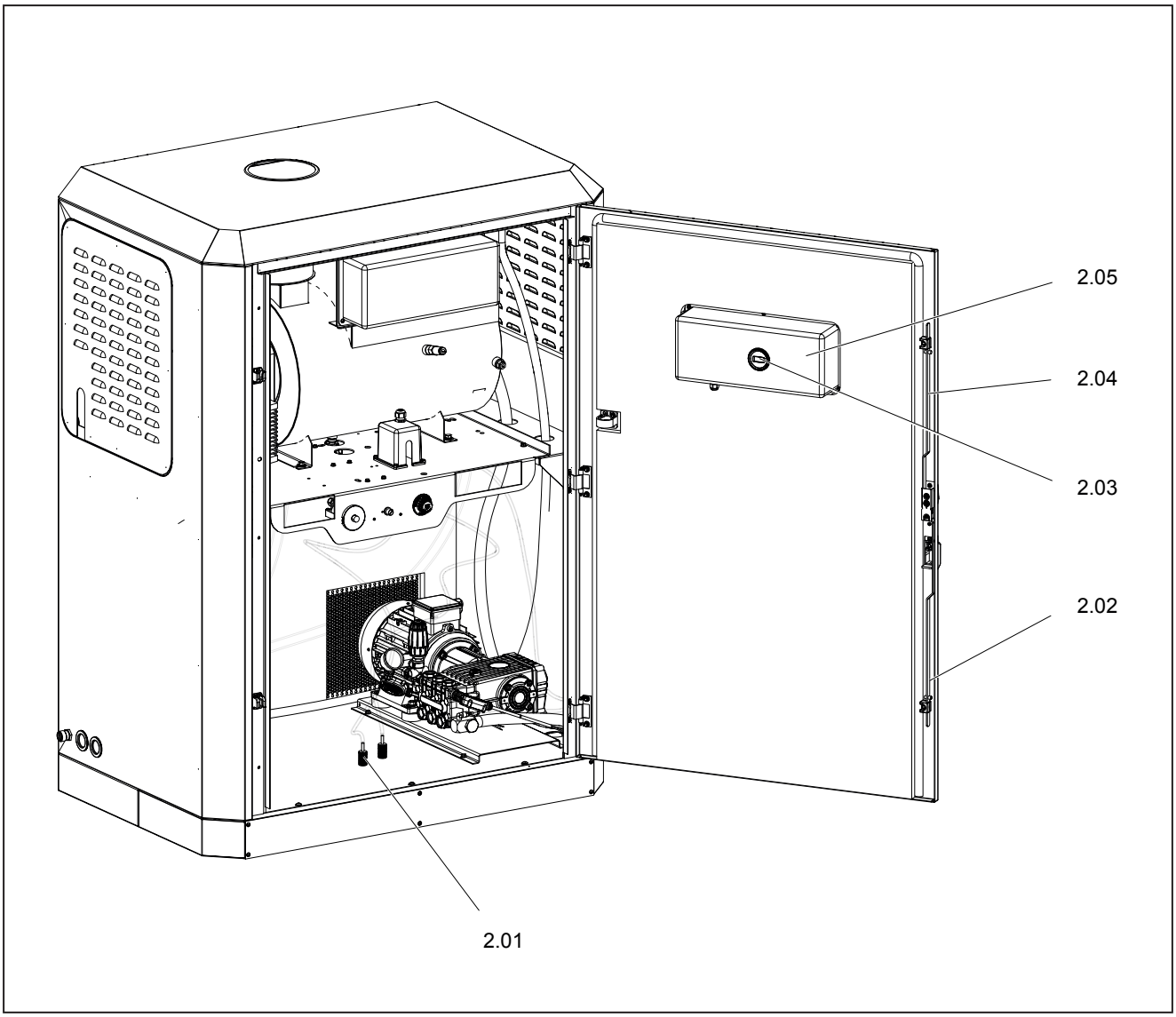



Fig. 10 - 2 System cabinet (interior)

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 2.01 | Chemical suctionhose filter / - | 2056 |
| 2.02 | Barrier down Art.No. 1121-SU089 1-2 / Vacuum HSC ST 584 mm | 583604 |
| 2.03 | Service-Hour-Meter electrical HMR 24V/50Hz / AC/DC PM NA BP | 275201 |
| 2.04 | Barrier above Art.No. 1121-SU0892-2 /Vacuum/HSC ST 465 mm | 583506 |
| 2.05 | Electric box 430x190x100 / PP Talkum red | 5787 |

Table 10 - 2 System cabinet, interior spare parts

## 10.3 Components on the chassis middle section

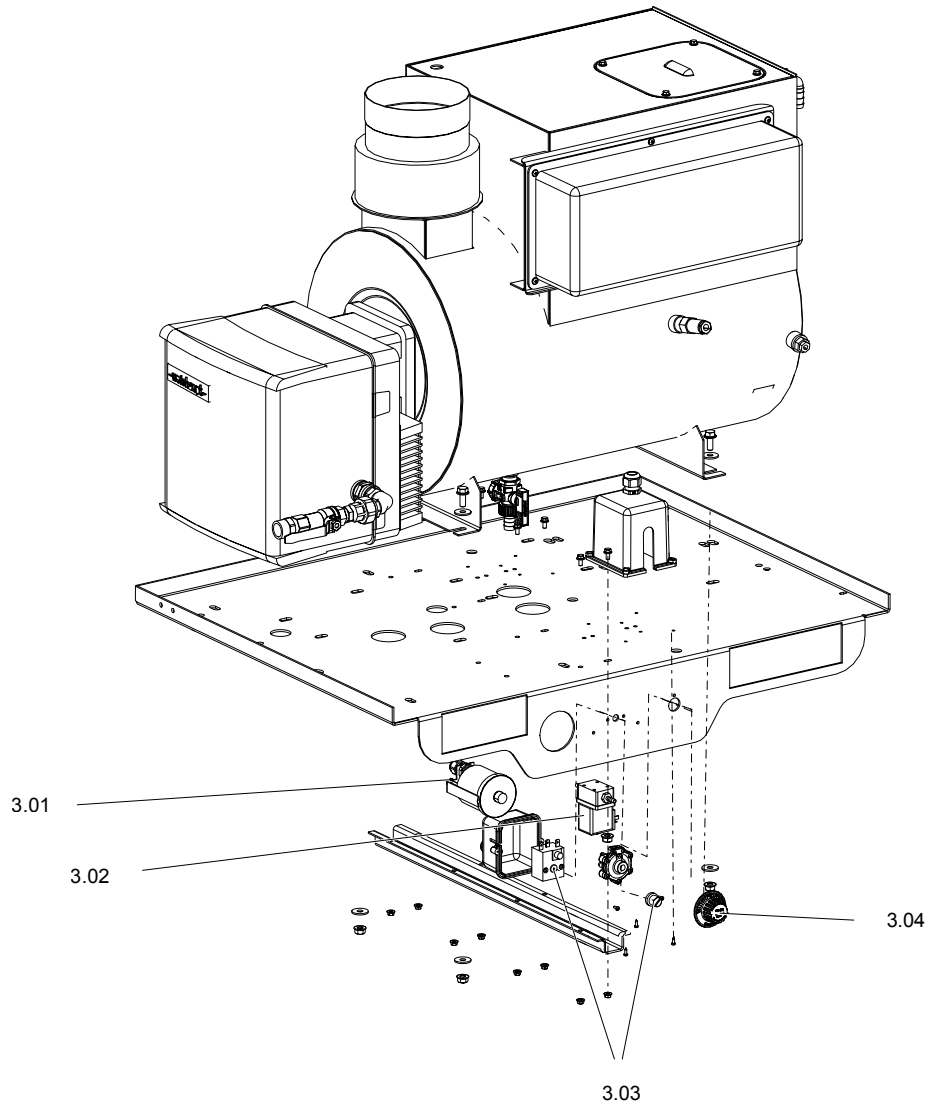



Fig. 10 - 3 Components on chassis middle section, exploded view

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 3.01 | Thermostat 0-120°C / Fixed stop at 80°C | 2249 |
| 3.02 | Magnetic-valve DN4 1/4“ 0-2bar EPDM MS / 2/2 NC directacting AC230V/8W | 537301 |
| 3.03 | Maximum Thermostat 300°C +0/-16 / with mechanical ON-delay | 23731 |
| 3.04 | Chemical metric valve 2-way ST66 red / - | 2014 |

Table 10 - 3 Components on the chassis middle section, spare parts list

## 10.4 Gas burner with boiler system

### 10.4.1 System version with Weishaupt gas burner

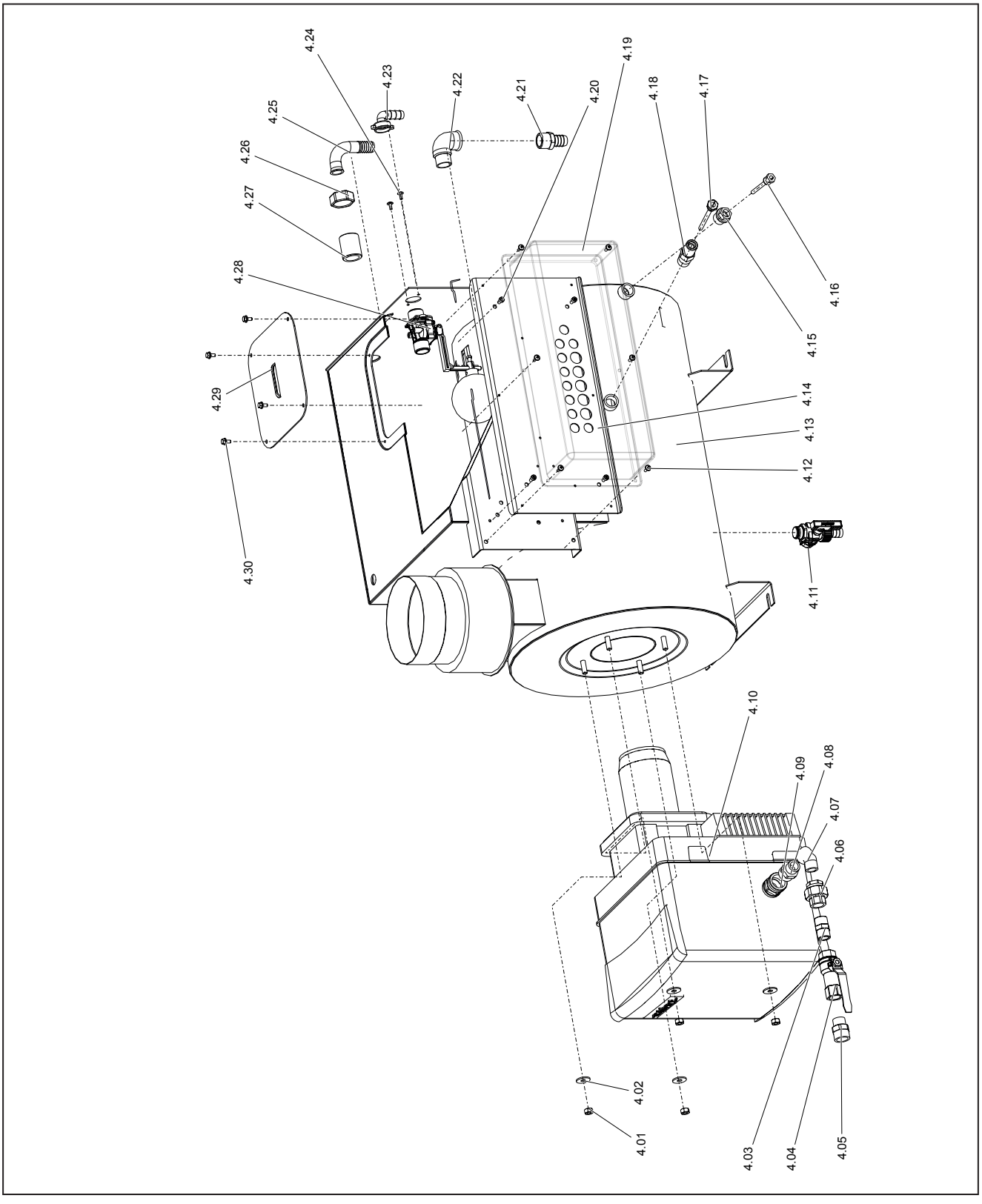



Fig. 10 - 4 Weishaupt gas burner with boiler system, exploded view

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 4.01 | Hexagon nut / DIN934 DIN-EN-ISO 4032 M8 stainless steel | 27121 |
| 4.02 | Washer DIN 9021 DIN-EN-ISO 7093 / Ø1=8,4mm Ø2=24mm stainless steel | 38711 |
| 4.03 | Hexagonal nipple 1/2“ x 1/2“ M“ / red brass no. 3280 | 579809 |
| 4.04 | Ball valve brass for gas 1/2“ F.F. / with thermal fuse | 537907 |
| 4.05 | Fitting-Reducing nipple red bress / 3/4“x1/2“ M | 579807 |
| 4.06 | Pipe fitting 2x1/2“ F / red brass no. 3330 flat sealing | 579810 |
| 4.07 | Angle 1/2“ IG/AB / red brass no. 3092 | 579808 |
| 4.08 | Fitting-Reducing nipple red bress / 3/4“x1/2“ M | 579807 |
| 4.09 | Fitting-Coupling red brass / 3/4“ F Nr. 3270 | 579812 |
| 4.10 | Gas burner WG5N/1-A 12,5-50 kW with plug / version LN AC 50Hz 230V N- DE | 298702 |
| 4.11 | Ball Valve KFE brass - nickel plated Simplex PN 16 / 1/2“ M | 5084 |
| 4.12 | Flange button head screw with inside hexagon / DIN-EN-ISO 7380-2 M4x12 stainless steel | 384551 |
| 4.13 | Bending sheet 1.4301 welded Boiler gas 50kW | 800279 |
| 4.14 | Bending sheet 1.0330 DC01 ZE electric circuit board sheet metal | 800257 |
| 4.15 | Thermostat screw G 1/2“ Brass / - | 576402 |
| 4.16 | Thermostat 0-120°C / fixed stop 80°C | 2249 |
| 4.17 | Maximum Thermostat 300°C +0/-16 / with mechanical ON-delay | 23731 |
| 4.18 | Distance piece maximum-thermostat 75mm / - | 57642 |
| 4.19 | Electric box 430x190x100 / PP Talkum red | 5787 |
| 4.20 | Hexagon socket head cap screw / DIN 912 DIN-EN-ISO 4762 M5x10 zinc plated | 38562 |
| 4.21 | Hose nipple brass hex / 3/4“ F. 20mm | 3688 |
| 4.22 | Elbow brass 3/4“ IG - 3/4“F / - | 380501 |
| 4.23 | Elbow Coupling 90° 2 pcs.. 1/2“x3/4“ / Plastic | 2677 |
| 4.24 | Hexagon socket button head screw / DIN-EN-ISO 7380-2 M4x10 stainless steel | 384509 |
| 4.25 | Flat Nipple elbow 90° stst DN20 / for union nut R1“ | 5710 |
| 4.26 | Union nut brass nickelplated DN25 R1“ / - | 5362 |
| 4.27 | Fitting-Double nipple brass / 1“x40 M/M | 5311 |
| 4.28 | Floatvalve Ehrle DN10 with VA-ball / for HSC-Gas, HSC Electric, SW, SWP, JW, ML, 1WP | 100069 |
| 4.29 | Laser sheet metal 1.4301 float box cover | 800288 |
| 4.30 | Hexagon head screw serrated with flange / like DIN 6921 M5x10 stainless steel | 286212 |

Table 10 - 4 Weishaupt gas burner with boiler system, spare parts list

## 10.4.2 System version with Baltur gas burner

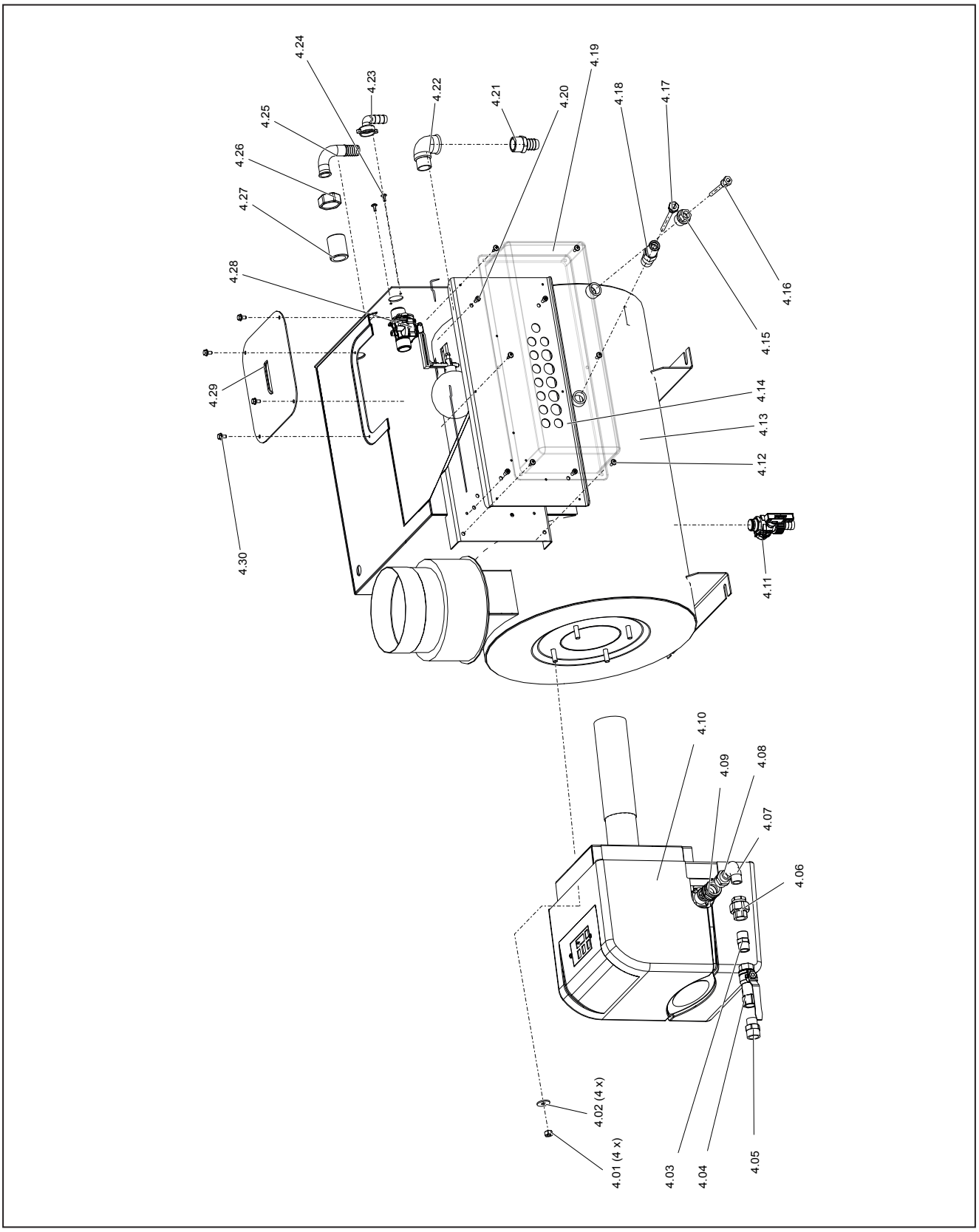



Fig. 10 - 5 Baltur gas burner with boiler system, exploded view

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 4.01 | Hexagon nut / DIN934 DIN-EN-ISO 4032 M8 stainless steel | 27121 |
| 4.02 | Washer DIN 9021 DIN-EN-ISO 7093 / Ø1=8,4mm Ø2=24mm stainless steel | 38711 |
| 4.03 | Hexagonal nipple 1/2“ x 1/2“ M“ / red brass no. 3280 | 579809 |
| 4.04 | Ball valve brass for gas 1/2“ F.F. / with thermal fuse | 537907 |
| 4.05 | Fitting-Reducing nipple red bress / 3/4“x1/2“ M | 579807 |
| 4.06 | Pipe fitting 2x1/2“ F / red brass no. 3330 flat sealing | 579810 |
| 4.07 | Angle 1/2“ F/M / red brass no. 3092 | 579808 |
| 4.08 | Fitting-Reducing nipple red bress / 3/4“x1/2“ M | 579807 |
| 4.09 | Fitting-Coupling red brass / 3/4“ F Nr. 3270 | 579812 |
| 4.10 | Gas burner BPM90 20-85 kW Gas: N / 0-10V modulation AC230V/50Hz | 289915 |
| 4.11 | Ball Valve KFE brass nickel plated Simplex PN 16 / 1/2“ M | 5084 |
| 4.12 | Flange button head screw with inside hexagon / DIN-EN-ISO 7380-2 M4x12 stainless steel | 384551 |
| 4.13 | Bending sheet 1.4301 welded Boiler gas 50kW | 800279 |
| 4.14 | Bending sheet 1.0330 DC01 ZE electric circuit board sheet metal | 800257 |
| 4.15 | Thermostat screw G 1/2“ Brass / - | 576402 |
| 4.16 | Thermostat 0-120°C / fixed stop 80°C | 2249 |
| 4.17 | Maximum Thermostat 300°C +0/-16 / with mechanical ON-delay | 23731 |
| 4.18 | Distance piece maximum-thermostat 75mm / - | 57642 |
| 4.19 | Electric box 430x190x100 / PP Talkum red | 5787 |
| 4.20 | Hexagon socket head cap screw / DIN 912 DIN-EN-ISO 4762 M5x10 zinc plated | 38562 |
| 4.21 | Hose nipple brass hex / 3/4“ F. 20mm | 3688 |
| 4.22 | Elbow brass 3/4“ M - 3/4“F / - | 380501 |
| 4.23 | Elbow Coupling 90° 2 pcs. 1/2“x3/4“ / Plastic | 2677 |
| 4.24 | Hexagon socket button head screw / DIN-EN-ISO 7380-2 M4x10 stainless steel | 384509 |
| 4.25 | Flat Nipple elbow 90° stst DN20 / for union nut R1“ | 5710 |
| 4.26 | Union nut brass nickelplated DN25 R1“ / - | 5362 |
| 4.27 | Fitting-Double nipple brass / 1“x40 M/M | 5311 |
| 4.28 | Floatvalve Ehrle DN10 with VA-ball / for HSC-Gas, HSC Electric, SW, SWP, JW, ML, 1WP | 100069 |
| 4.29 | Laser sheet metal 1.4301 float box cover | 800288 |
| 4.30 | Hexagon head screw serrated with flange / like DIN 6921 M5x10 stainless steel | 286212 |

Table 10 - 5 Baltur gas burner with boiler system, spare parts list

## 10.5 Drive unit Motor and pump

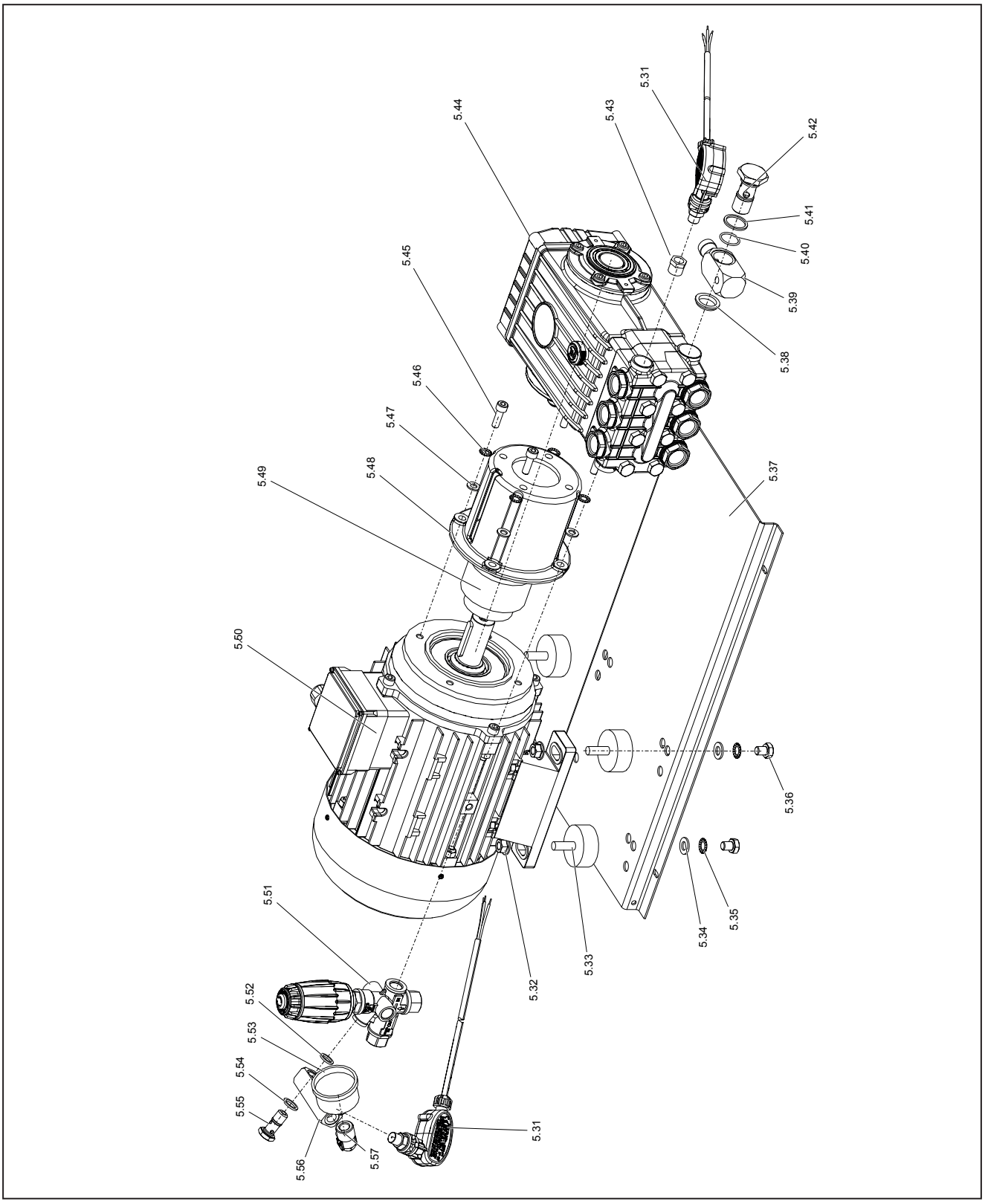



Fig. 10 - 6 Drive unit motor and pump, exploded view

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 5.31 | Pressure switch brass 1/4“M 25bar / 250V 15A 90°C 3,0m cable | 1263202 |
| 5.32 | Hexagon flange nut serrated /<br>like DIN 6923 DIN-EN 1661 M10 stainless steel | 386309 |
| 5.33 | Buffer Rubber-metal 50/20 Typ B / M10x28 / M10 NK 40-45 Shore | 2139 |
| 5.34 | Washer type A DIN 125 DIN-EN-ISO 7089 / Ø1=10,5mm Ø2=20mm stainless steel | 27161 |
| 5.35 | Serrated lock washer type A DIN 6798 / Ø1=10,5mm Ø2=18mm stainless steel | 38702 |
| 5.36 | Hexagon head screw with full thread /<br>DIN 933 DIN-EN-ISO 4017 M10x12 stainless steel | 271401 |
| 5.37 | Bending sheet 1.4301 HD pump console | 800281 |
| 5.38 | Gasket for Hollow Screw 15/3-071/RF 12 / A3C | 3751 |
| 5.39 | Manifold block suction Manifold block suction | 800367 |
| 5.40 | O-Ring 21,0x2,0 NBR 70 Shore / - | 346603 |
| 5.41 | Sealing-Ring Copper 24x29x2,0mm / DIN 7603 Price/pack (1 pack= 10 pcs.) | 3691 |
| 5.42 | Hollow Screw /<br>15/3-071/RF 12 A3C | 3750 |
| 5.43 | Reducer brass nickelplated conical / Mod. 2530 3/8“x1/4“ M/F | 2781 |
| 5.44 | HP-Pump IP E3B2015 SSL HT Ø20<br>15l/min 200bar 1450rpm Teflon-seals | 361424 |
| 5.45 | Hexagon socket head cap screw /<br>DIN 912 DIN-EN-ISO 4762 M8x25 zinc plated | 384602 |
| 5.46 | Serrated lock washer type A DIN 6798 / Ø1=8,4mm Ø2=24mm zinc plated | 2799 |
| 5.47 | Washer type A DIN 125 DIN-EN-ISO 7089 /<br>Ø1=8,4mm Ø2=16mm zinc plated | 2705 |
| 5.48 | HP-Pump IP flange IP ZF 151 / - | 2809 |
| 5.49 | HP-Pump coupling IP elastic ZG 151 / - | 2810 |
| 5.50 | Electric-Motor 3AC230/400V 50Hz 6,3kW BG112 1500rpm /<br>B3/B14 shaft Ø28mm | 355601 |
| 5.51 | Unloader-Valve VRT3 3/8“ standard 250bar/40l/min c/w | 352604 |
| 5.52 | Sealing-Ring form A gl. massive / 13 x 18 x 2,0mm copper | 5441 |
| 5.53 | Pressure-gauge 0-400bar gly. Ø50 1/4“M / connection back centric, INOX-case | 277704 |
| 5.54 | Sealing-Ring Copper 15x20x2,0mm / Form A, gl. massive | 5442 |
| 5.55 | Hollow Screw /<br>for Srew-Union 1/4“ 15-071/L10 A3C zinc-plated | 5443 |
| 5.56 | Manifold block for Unloader 84mm / with 3 drills, brass 2.0402 | 5440 |
| 5.57 | Fitting-Elbow 90° brass / 1/4“ F/M | 2742 |

Table 10 - 6 Drive unit motor and pump, spare parts list

## 10.6 Trigger gun with spray lance

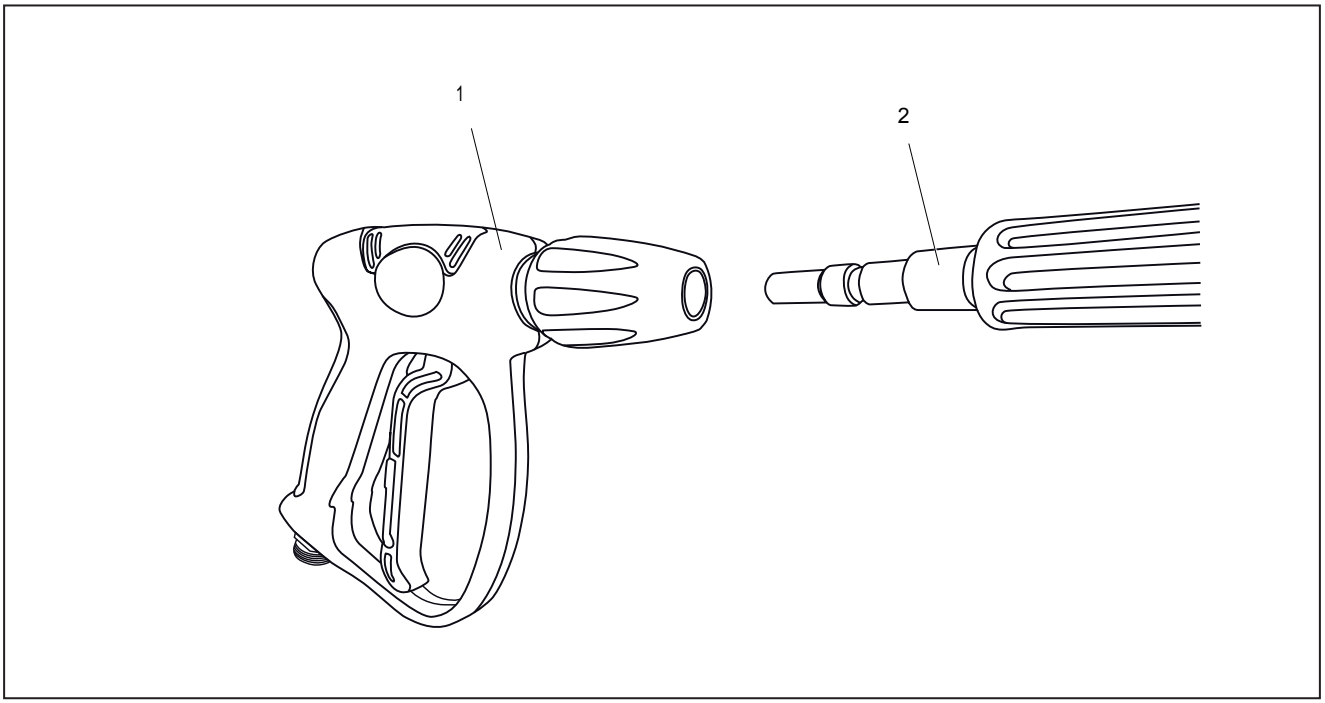



Fig. 10 - 7 Trigger gun with nozzle, spare parts

| Pos. | Designation 1 / Designation 2 | Article No. |
|---|---|---|
| 1 | Trigger gun standard 280bar 30l/min /<br>150°C with quick-coupling red, M22x1,5 | 330010 |
| 2 | Spraylance stainless steel 900mm 15° angled /<br>KEW quick-coupling, nozzle protection red 1/4“F | 900044 |

Table 10 - 7 Trigger gun with spray lance, Spare Parts List

# 11 Circuit diagram

## 11.1 HSC1140-INOX Gas

If necessary, observe the circuit diagram enclosed with the special version.

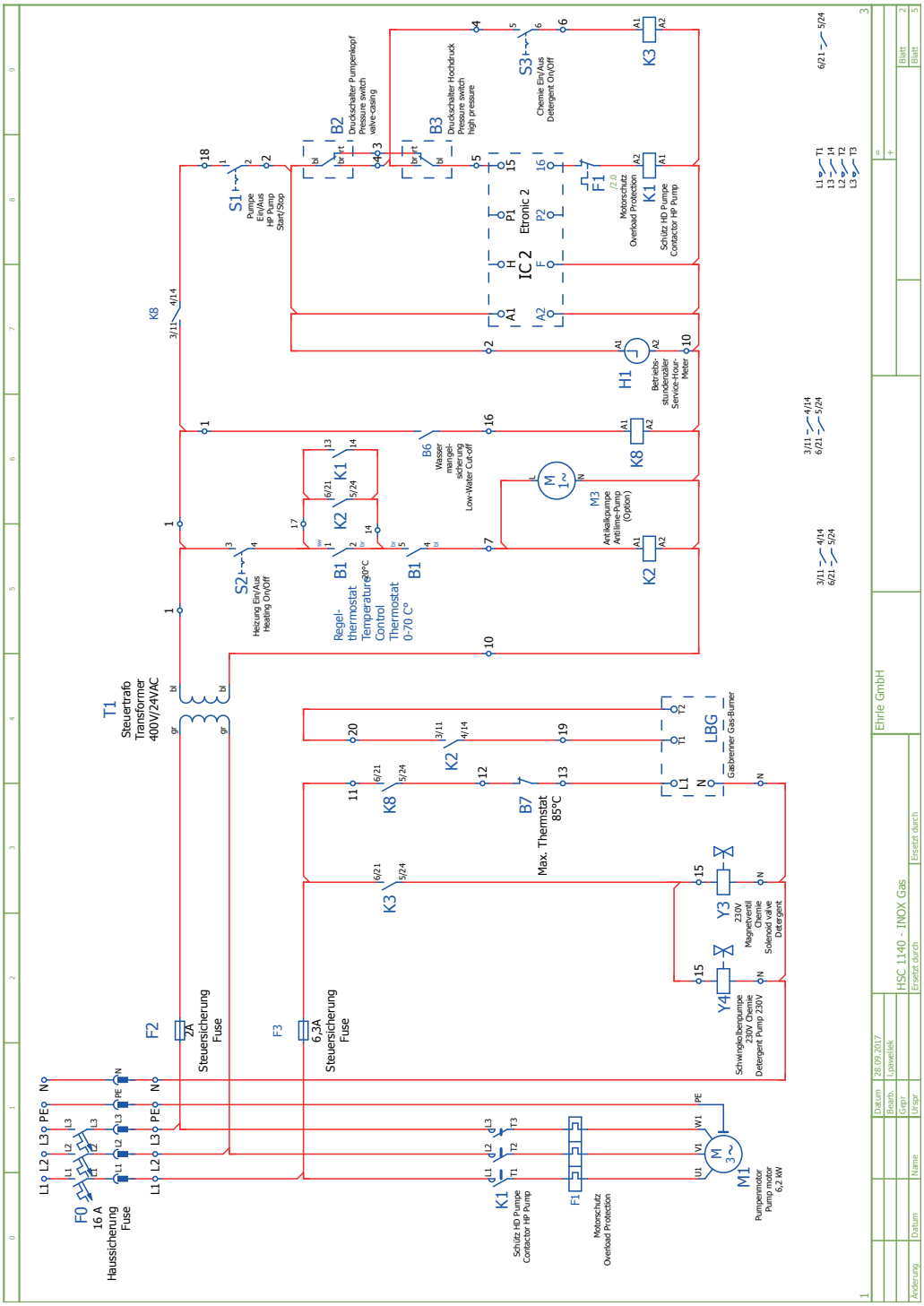



Fig. 11 - 1 HSC1140-INOX Gas, Circuit diagram

| Pos. | Symbol (BMK) abbr. designation | Designation 1 / Designation 2 | Article No. |
|---|---|---|---|
| 01 | B1 | Thermostat 0-120°C with 20°C Hysteresis / limited 70°C | 5434 |
| 02 | B2 | Pressure switch MICRO brass 3/8“M 25bar / 250V 15A 90°C 1,25m cable | 5741 |
| 03 | B3 | Pressure switch MICRO brass 1/4“ M 25bar / 250V 15A 90°C 1,15m cable | 5750 |
| 04 | B6 | Low-Water Cut-Off c/w. nut / 1,15m PVC cable and flow-switch | 2748 |
| 05 | B7 | Maximum Thermostat 95°C with mechanical On-delay | 24372 |
| 06 | F1 | Overload-Protection 3 poles 15,5 A / - | 214512 |
| 07 | F2 | Fuse-holder ZSI 2,5 / - | 38331 |
| 08 | F2 | Fuse 250V 2A slow-blowing / 5x20mm | 3723 |
| 09 | F3 | Fuse 250V 6,3A slow-blowing / 5x20mm | 372300 |
| 10 | F3 | Fuse-holder ZSI 2,5 / - | 38331 |
| 11 | H1 | Service-Hour-Meter electrical HMR 24V/50Hz / AC/DC PM NA BP | 275201 |
| 12 | IC2 | Controlboard Etronic 2 24VAC / - | 35092 |
| 13 | K1 | Contactor KLIBO 7,5 kW 24V/50-60Hz / 3S/1HS | 23162 |
| 14 | K2 | Relay 2 Changer, 8A, AC24V / LED varisator and bracket | 50565 |
| 15 | K3 | Relay 2 Changer, 8A, AC24V / LED varisator and bracket | 50565 |
| 16 | K8 | Relay 2 Changer, 8A, AC24V / LED varisator and bracket | 50565 |
| 17 | M1 | Electric-Motor 3AC230/400V 50Hz 6,3kW MEC112 1500rpm / B3/B14 Schaft Ø28mm | 355601 |
| 18 | S1 | Main Switch B2N A1-F35-X-XG9 / On-Off 0-1 | 204602 |
| 19 | S2 | Main Switch B2N A1-F35-X-XG9 / On-Off 0-1 | 204602 |
| 20 | S3 | Main Switch B2N A1-F35-X-XG9 / On-Off 0-1 | 204602 |
| 21 | T1 | Transformer Prim. 400V AC / Sek. 24V AC, 1,25A/30VA | 264801 |
| 22 | Y3 | Magnetic-valve DN4 1/4“ 0-2bar EPDM brass 2/2 NC directacting AC230V / 8W | 537301 |
| 23 | Y4 | Pump CEME 508 / LA, 230V, 50Hz | 593500 |

Table 11 - 1 Electrical components and assemblies

## Proof of customer service

| System type | Manufacture no.: | Commissioning on: |
|---|---|---|

Inspection carried out on:

Findings:

Signature

Inspection carried out on:

Findings:

Signature

Inspection carried out on:

Findings:

Signature

Inspection carried out on:

Findings:

Signature

**EHRLE GmbH • D-89165 Dietenheim / Germany**

EHRLE service near to you? Adresses, phone numbers etc. you will find under www.ehrle.com



# Our product range at a glance: reliable technology and fast, professional service

**KD 3x3 Series**
Mobile Cold Water
High Pressure Cleaners
for professional users
10 - 14 l / min, 165 - 210 bar

**KD 4x4 Series**
Mobile Cold Water High Pressure
Cleaners for professional users
16 - 30 l / min, 120 - 310 bar

**KDB/KDD Series**
Mobile Cold Water High Pressure
Cleaners with petrol or diesel
engine for professional users
16 - 17 l / min, 180 - 300 bar

**HD Etronic I Series**
Mobile Hot Water High Pressure
Cleaners for professional users,
oil-heated 10 l / min, 180 - 200 bar

**HD Etronic II Series**
Mobile Hot Water High Pressure
Cleaners for professional users,
oil-heated
12 - 20 l / min, 165 - 250 bar

**HDE Series**
Mobile Hot Water High Pressure
Cleaners for professional users,
electrically heated
12 l / min, 150 bar

**HDB/HDD Series**
Mobile Hot Water High Pressure
Cleaners with petrol or diesel engine
for professional users,
16 - 17 l / min, 200 - 300 bar

**KS Series**
Stationary Cold Water High
Pressure Cleaners for
professional users,
12 - 16 l / min, 140 - 200 bar

**KSM Series**
Stationary Cold Water Multi-Sta-
tion pump units for professional
users 1.800 - 5.400 l / h, 200 bar

**HSC/HSC-ST Series**
Stationary Hot Water High Pressure
Cleaners for professional users, oil-
heated, for indoor and outdoor use
12 - 20 l / min, 150 - 200 ba

**ENT Series**
Wet And Dry Vacuum Cleaner with
plastic container
for professional users
3.200 l / min

**ENTS Series**
Wet And Dry Vacuum Cleaner with
plastic container for professional
users
7000 - 10.500 l / min