Operating instructions

Manual application unit with radio control

Type HR (Extrusion)
Type HS (Spray)

H1057XE.02 (Release 09-05)

BÜHNEN

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1 Specific security advice

1.1 Possible Dangers

Danger of burns

due to hot metal parts, hot melt material, and hot melt material vapors.

Therefore, always wear heat protection gloves.

1.2 Intended use

The manual application unit is used to apply regulated amounts of hot melt materials (thermoplastic materials such as hot melt adhesives, waxes, etc.) in extrusion form (Type HR) or as a spray (Type HS).

When processing reactive hot melt adhesives, such as polyurethane (PU) hot melt adhesives, we recommend placing the nozzle in a paraffin oil bath during longer work breaks.

Attention!

The manual application units of the types HR and HS are only permitted for operation with heatable hoses of the type BÜHNEN HP ….

Separation from and connection to heatable hoses may only be implemented by electrically competent personnel.

1.3 Notes on safe operation

- Never point the operational manual application unit towards yourself or at other persons.

Danger!

Before every maintenance or repair work on the heatable hose, remove the mains plug from the tank system.

Otherwise, an adjacent radio control could accidentally activate the pump during the maintenance or repair work.

Danger of burning caused by hot melt adhesive!

Specific security advice

2 Technical Data

Designation	Version HR for extrusion application	Version HS for spray application
Parts No.	WCH 1147-F	WCH 1148-F
Supply voltage	230 VAC/50…60 Hz	
Weight	approx. 850 g	approx. 970 g
Heating capacity	120 W	
Type of protection (in acc. with DIN IEC 34 T5)	IP42	
Protection class (in acc. with DIN VDE 0720)	I (Protective earth)	
Max. operating temperature	210 °C	
Type of heating	High-performance heating cartridge	
Temperature sensor	Pt100	
Overtemperature protection	Overtemperature fuse, trigger temperature 260 °C	
Heatable hoses	HP 2400/2.4 m HP 3000/3.0 m HP 4500/4.5 m	HP 2401/2.4 m HP 3001/3.0 m HP 4501/4.5 m
Max. adhesive pressure	40 bar	
Max. spray air pressure	-	3.0 bar
Nozzle	Extrusion nozzle with UNF 3/8” thread	Spray nozzle set, consisting of: air cap, retainer ring, swirl nozzle
Available nozzles	0.8/1.0/1.2/1.5/2.0/3.0 mm	0.8/1.0/1.5/2.0 mm
Adapter for extrusion application		FDH 0423

2.1 Product identification

These operating instructions apply to all manual applications units with the following illustrated type plate.

The type plate is located on the side of the grip casing.

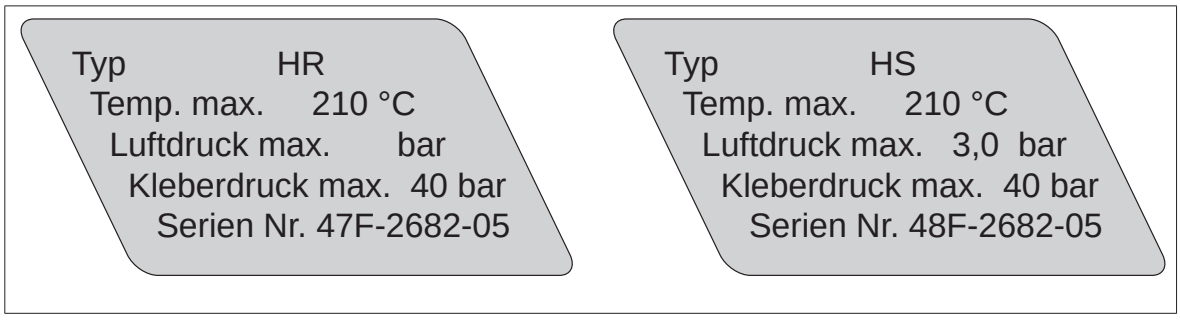


Figure 2.1/1 Type plate on unit (examples, HR version left, HS version right)

2.2 Circuit diagram

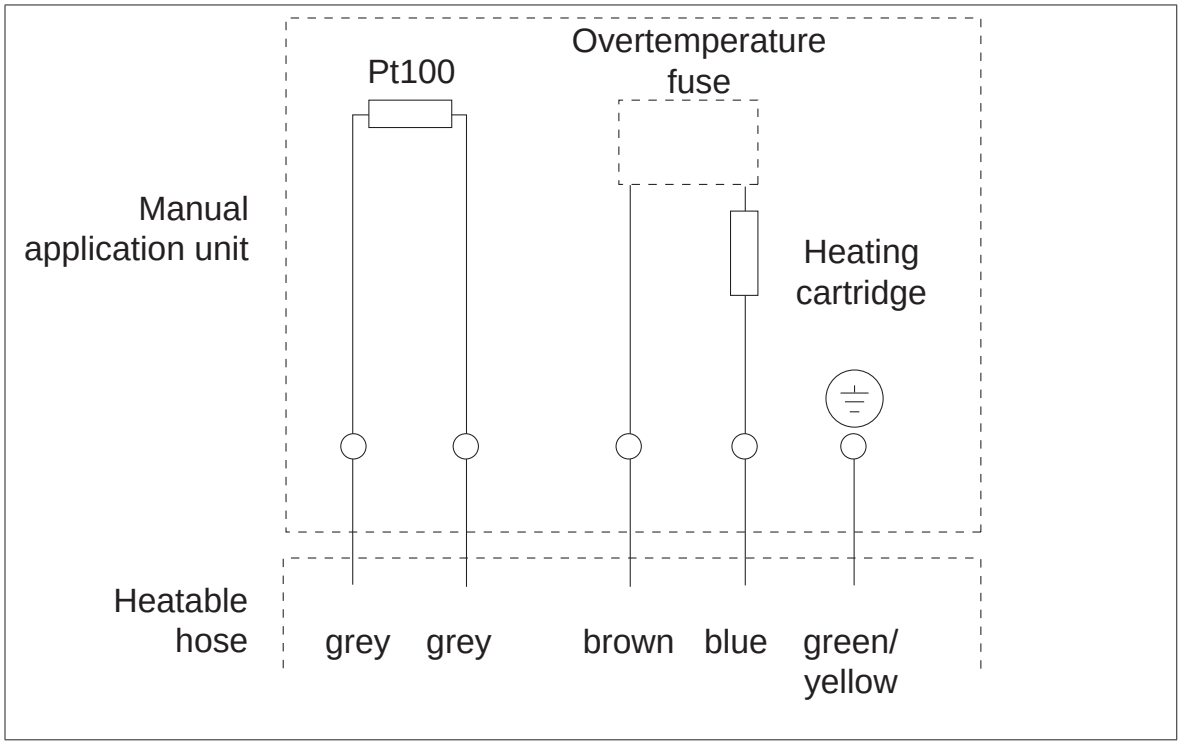


Figure 2.2/1 Circuit diagram

3 Construction and Function

3.1 Construction Type HR (Extrusion Version)

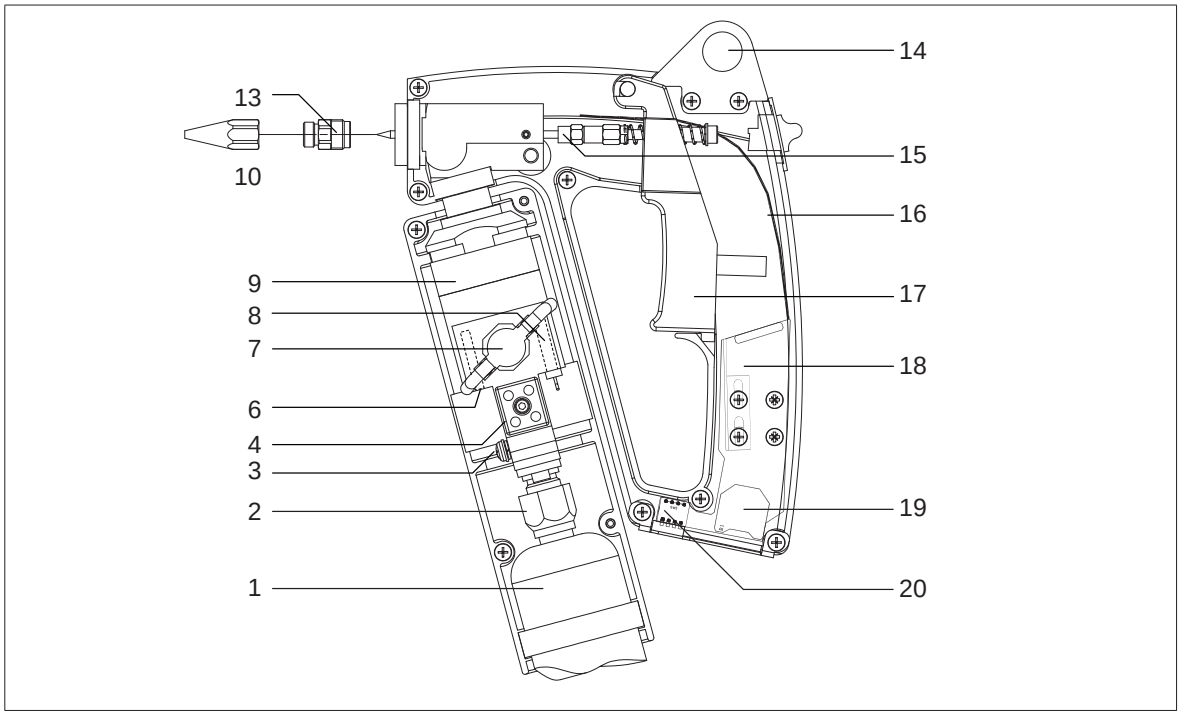


Figure 3.1/1 Mechanical construction of manual application unit Type HR

Ser. No.	Designation
1	Heatable hose, type HP Standard
2	Connection fittings
3	Protective earth terminal
4	Connection terminal
6	Temperature sensor
7	Overtemperature circuit-breaker
8	Heating cartridge
9	Heating cylinder
10	Nozzle UNF 3/8
13	Nozzle holder
14	Suspension eye
15	Nozzle needle
16	Transmitting antenna
17	Trigger
18	Transmitter
19	Battery holder with lithium battery
20	Coding switch for unit address

3.2 Construction Type HS (Spray Version)

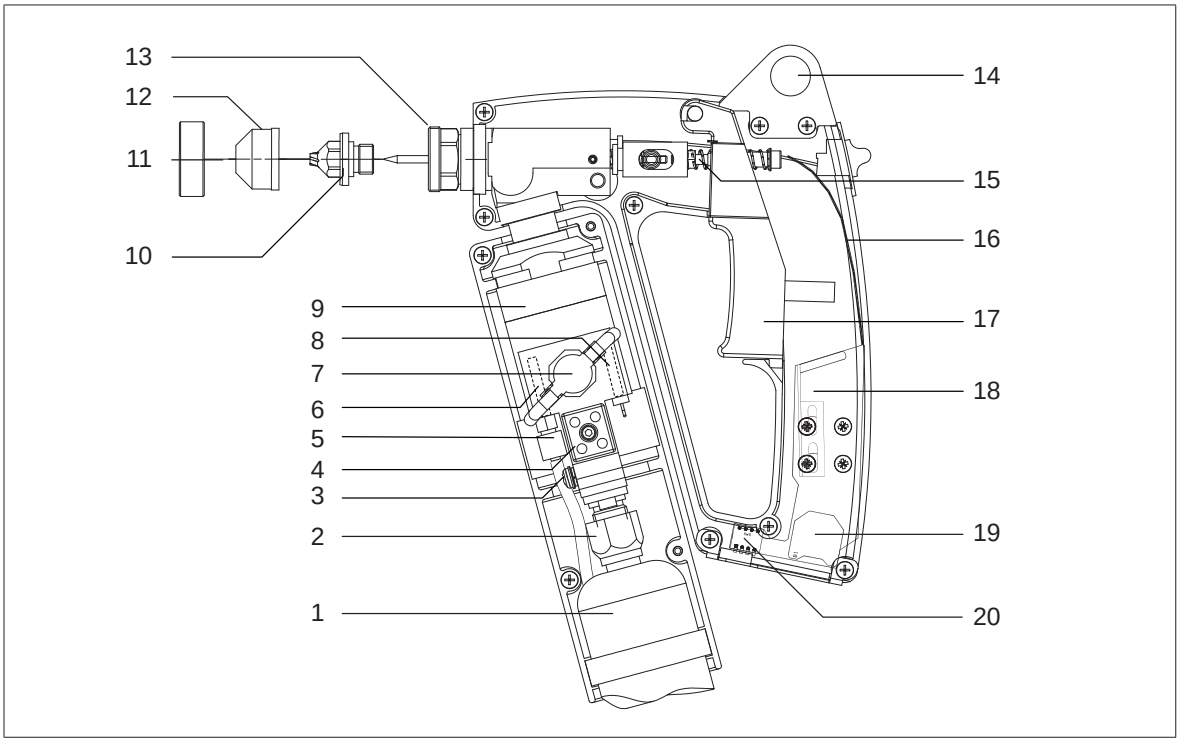


Figure 3.2/1 Mechanical construction of manual application unit Type HS

Ser. No.	Designation
1	Heatable hose, type HP Standard
2	Connection fittings
3	Protective earth terminal
4	Connection terminal temperature sensor
5	Spray air hose with connection
6	Temperature sensor
7	Overtemperature circuit-breaker
8	Heating cartridge
9	Heating cylinder
10	Swirl nozzle
11	Retainer ring
12	Air cap
13	Spray adapter
14	Suspension eye
15	Nozzle needle
16	Transmitting antenna
17	Trigger
18	Transmitter
19	Battery holder with lithium battery
20	Coding switch for unit address

3.3 Function

The manual application unit consists of a rigid part permanently connected with the heatable hose and a rotating part.

The part connected with the heatable hose contains

- the heater,
- the temperature sensor,
- the overtemperature circuit-breaker, and
- all electrical connections.

The rotating part has

- the nozzle system,
- the trigger,
- the transmitter,
- the replaceable battery (lithium cell) as power supply for the transmitting electronics and
- the coding switch to set the unit address.

The hot melt material flows through the connection fitting (2) of the heatable hose into the heating cylinder (9) that is heated by the heating cartridge (8).

The hot melt material flows into the nozzle head from there. In its idle state, the nozzle needle (15) closes the nozzle holder (13), or, the swirl nozzle.

When the trigger is activated, the nozzle needle opens the nozzle holder/swirl nozzle and the hot melt material is discharged. The transmitter is activated at the same time and transmits the activation of the trigger to the basic unit so that the pump can be controlled as needed. A non-contacting and therefore wear-free magnet activates the transmitter.

The temperature of the heating element is constantly monitored by the temperature sensor (6) and transferred to the control electronics in the basic unit. The control electronics use the information to control the heating cartridge.

If the temperature of the heating cylinder exceeds 260 °C (e.g. if the control electronics are defective), the overtemperature circuit-breaker (7) will interrupt the power supply of the heating element for safety reasons.

3.4 Special features

General

- The rotating part can be turned endlessly (360°) around the stationary part.
- No annoying lines in the outer area of the manual application unit due to radio transmission of the triggering signal.

Type HS (Spray version)

- The spray air is pre-heated in the heating hose/cylinder (1 resp. 9) and is discharged time-shifted (preliminary and secondary air). This ensures an optimal, drip-free spraying pattern.
- The spray application can be converted to extrusion application at any time by using an adapter.

4 Initial operation

Attention!

Initial operation may only be implemented by competent personnel.

4.1 Installation

The HR/HS type manual application unit is permanently connected with a heatable hose upon delivery.

After the heatable hose has been assembled to the basic unit, the manual application unit is immediately operational without requiring additional measures.

4.2 Setting the temperature

The temperature of the hot melt material is set using the control electronics of the tank system.

Info

Please do not set the temperature higher than the processing temperature prescribed/ recommended by the manufacturer.

This prevents thermal damage to the hot melt adhesive.

The manual application unit has its own heater only used to retain the temperature of the hot melt material. It is not possible to additionally heat up the hot melt material in the manual application unit. In normal operation, the hot melt material flows through the heating element too quickly for that.

Technical Data

5 Operation

Attention!

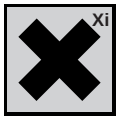
Operation may only be implemented by competent personnel.

5.1 General notes

Wear safety gloves!

Danger of burn injuries due to hot metal parts, in the area of the heat insulation (2), and due to the discharged hot melt material.

To avoid burning yourself while operating the manual application unit, always wear heat protection gloves.



Danger of mucous membrane irritation due to vapors!

Even during prescribed processing, hot melt adhesives give off vapors that can have an annoying odorous effect.

Therefore, only operate the tank system in well ventilated rooms.
Observe the processing bulletin and the safety data sheet of the hot melt adhesive manufacturer.

While operating the manual application unit, always comply with the following notes:

- Hang up the manual application unit by the suspension eye (14) when interrupting work.
- Immediately turn off the tank system if the function is disrupted. Have qualified personnel check the tank system.

5.2 Discharging the hot melt material

To discharge the hot melt material, carry out the following work steps:

1. Make sure that the tank system with all components has been thoroughly heated (approx. 30 min after turning on).
2. Make sure that the triggering safeguard is always in the bottom position (yellow marking not visible).
3. Activate the trigger (17).
4. Regulate the discharge amount by activating the trigger for longer/shorter periods. The discharge amount can be additionally varied by
   - selecting another nozzle,
   - moving the nozzle more slowly or more quickly over the work piece,
   - changing the processing temperature, or
   - changing the operating pressure (max. 55 bar).

5.3 Setting the spray pattern (HS version only)

The spray pattern depends on the operating pressure of the tank system and the setting of the spray air pressure.

Determine the optimum setting by turning the adjusting wheel at the spray air adapter kit and repeated trials.

To set the adjusting wheel, carry out the following work steps:

- Unlock the adjusting wheel by pulling it up as far as it will go.
- Implement the desired setting.
- Lock the adjusting wheel against unintentional re-adjustment by pressing it back down in the initial position.

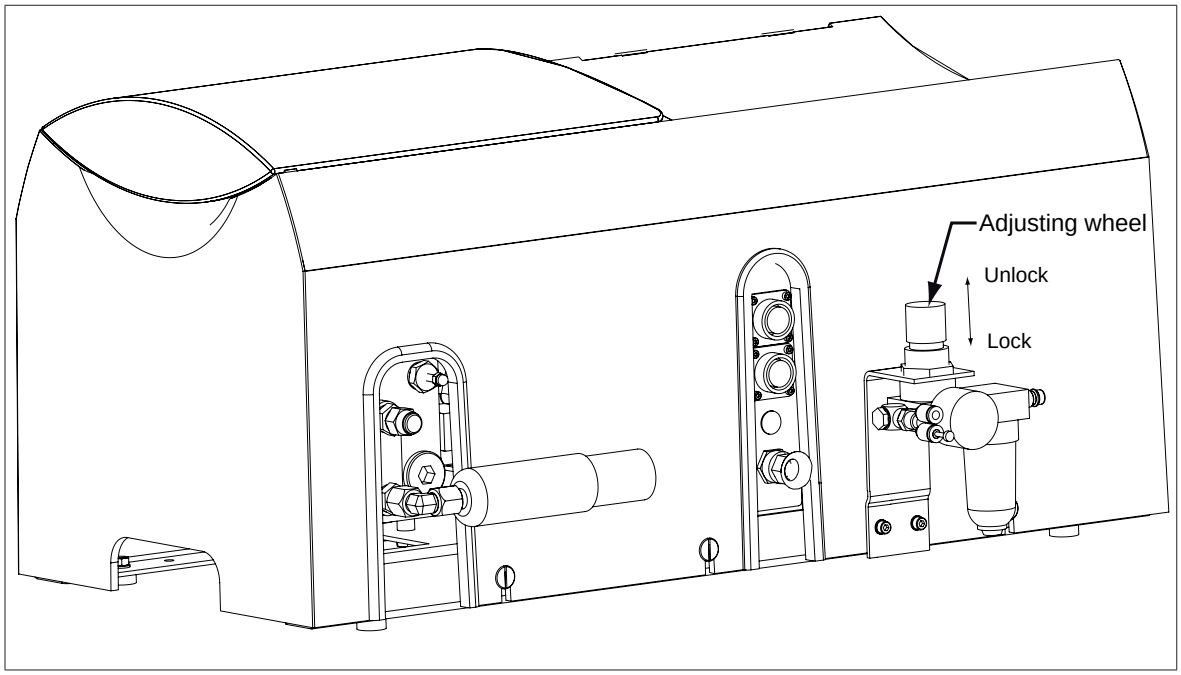


Figure 5.3/1 Adjusting wheel for spray air setting (HS version)

6 Set-up / Retrofit

Attention!

Setting up and retrofitting works may only be implemented by competent personnel.

6.1 Replacing the nozzle

Wear safety gloves!

Danger of burns due to hot metal parts and due to discharged hot melt material. To avoid burning yourself while setting up/retrofitting the manual application unit, always wear heat protection gloves.

6.1.1 Nozzle UNF 3/8 (HR version)

Required tool: 1 open-end wrench size 11
1 box wrench size 11, offset

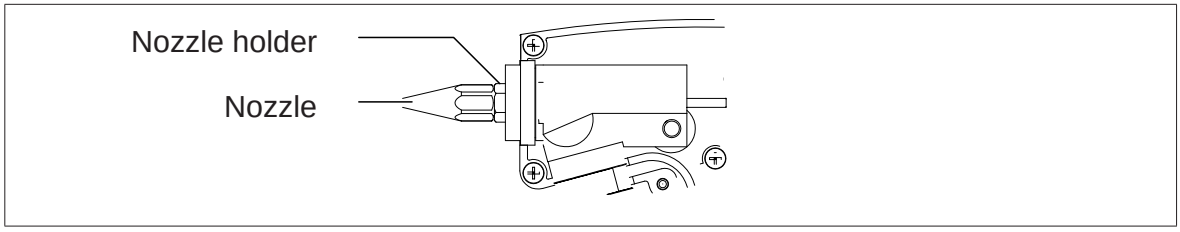


Figure 6.1.1/1 Replacing the nozzle (HR version)

To replace the nozzle, carry out the following work steps:

1. Heat up the manual application unit to approx. 100 °C.
2. **Turn off the tank system and disconnect the mains plug.**
3. Secure the nozzle holder with box wrench size 11.
4. Unscrew the nozzle with open-end wrench size 11.
5. Screw on the new nozzle by hand first.
   Wait about 2 minutes until the new nozzle has been thoroughly heated.
6. Tighten the new nozzle **without using force**.

6.1.2 Swirl nozzle (HS version)

Required tool: 1 open-end wrench size 13
1 open-end wrench size 22

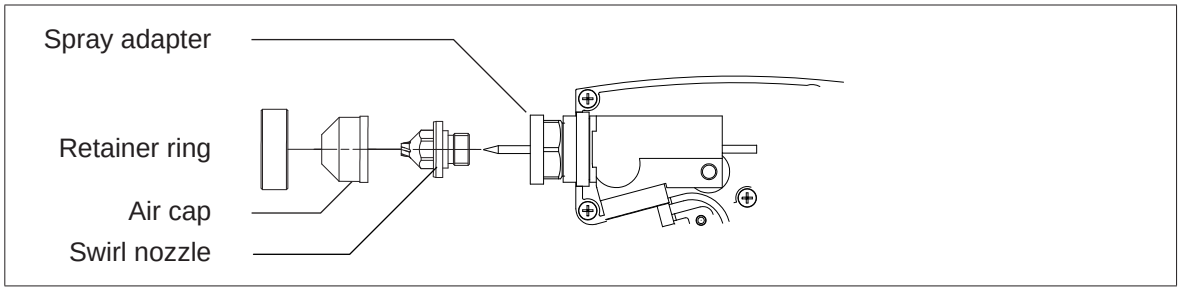


Figure 6.1.2/1 Replacing the swirl nozzle (HS version)

To replace the swirl nozzle, carry out the following work steps:

1. Heat up the manual application unit to approx. 100 °C.
2. **Turn off the tank system and disconnect the mains plug.**
3. Unscrew the retainer ring.

4. Remove the air cap.
5. Unscrew the swirl nozzle.
6. Screw on the new swirl nozzle by hand first.
   Wait about 2 minutes until the new swirl nozzle has been thoroughly heated.
7. Tighten the new swirl nozzle **without using force**.
8. Replace the air cap.
9. Tighten the retainer ring **without using force**.

6.2 Assembling/dismantling the heatable hoses

Wear safety gloves!

Danger of burns due to hot metal parts and due to discharged hot melt material. To avoid burning yourself while assembling/dismantling the heated hose, always wear heat protection gloves.

Danger of electric shock!

Disconnect the power plug from the tank system before carrying out the following work:

Connecting and terminated electrical connections may only be implemented by competent electricians.

Required tools:

1 open-end wrench size 17
1 open-end wrench size 19
1 Phillips screwdriver
1 slotted screwdriver

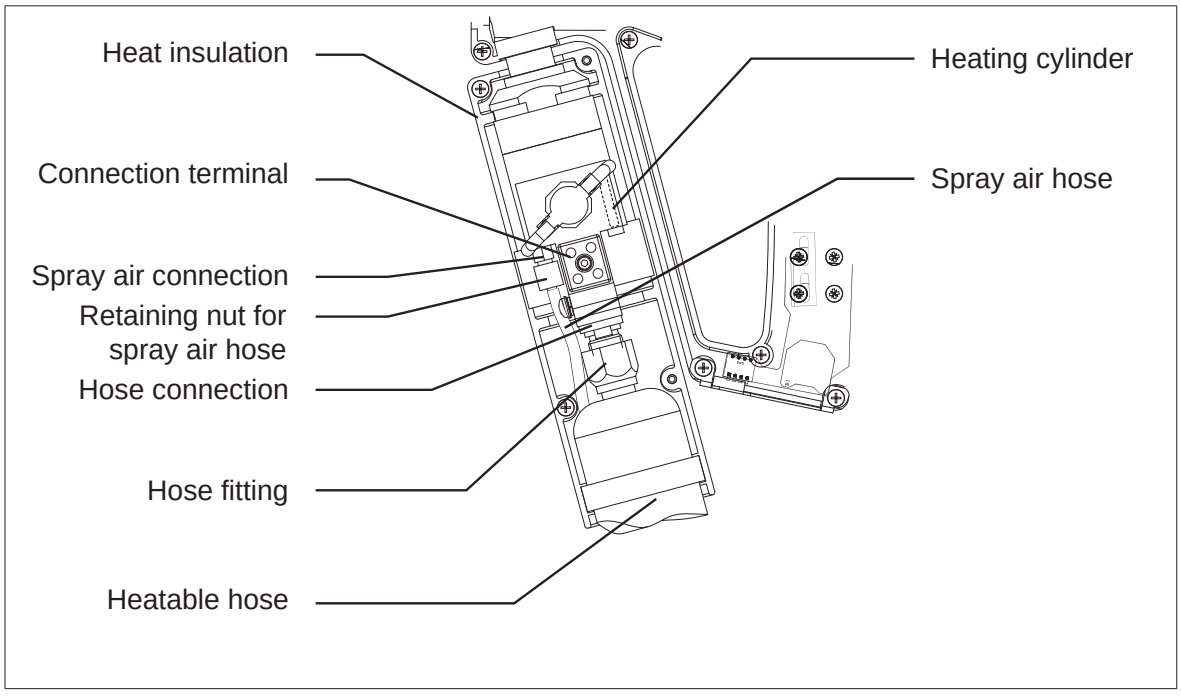


Figure 6.2/1 Hose connection in detail (using HS version as an example)

To dismantle the heatable hose, carry out the following work steps:

1. Heat up the heatable hose and the manual application unit to approx. 100 °C.
2. Turn off the pump of the tank system.
3. Activate the trigger on the manual application unit to release the system pressure.
4. **Disconnect the power plug from the tank system**.

5. **Only for HS version:**
   Remove the spray air hose from the spray air adapter kit of the tank system.
6. Release the fastening screws (4 pieces) of the heat insulation with the Phillips screwdriver. Remove the heat insulation consisting of 2 half-shells.
7. Release the electrical connections on the hose side as follows:
   • 2 conductors at connection terminal for heater (brown, blue)
   • 2 conductors at connection terminal for temperature sensor (2 x gray)
   • 1 conductor at screwed connection of protective conductor (green/yellow)
8. **Only for HS version:**
   Release the union nut of the spray air hose.
9. Release the nut of the heatable hose with open-end wrench size 17.
   Secure the connection to the heating cylinder with open-end wrench size 19.
10. Remove the hose from the heating cylinder. Keep on hand a rag or similar to be able to wipe up discharged hot melt material right away before it can drip into the housing of the manual application unit.
    For version HS, remove the spray air hose together with the heatable hose.

Info

Assembling the heatable hose occurs in reverse order. Tighten the hose fitting only by hand first. Permit the heatable hose and the manual application unit to heat up to approx. 100 °C before finally tightening the screws.

While tightening the hose fitting, make sure that the spray hose does not become twisted.

Refer to the circuit diagram in Chap. 2.2 when connecting the electrical lines.

When replacing the half shells, make sure that the flat portion of the arresting bars on the inside of the half shell are seated properly on the corresponding counter pieces at the heating cylinder.

6.3 Setting the preliminary/secondary air

Danger of electric shock!

Disconnect the power plug from the tank system before carrying out the following work:

Connecting and terminating electrical connections may only be implemented by competent electricians.

Required tools: 1 Phillips screwdriver
1 Allen wrench size 2.5

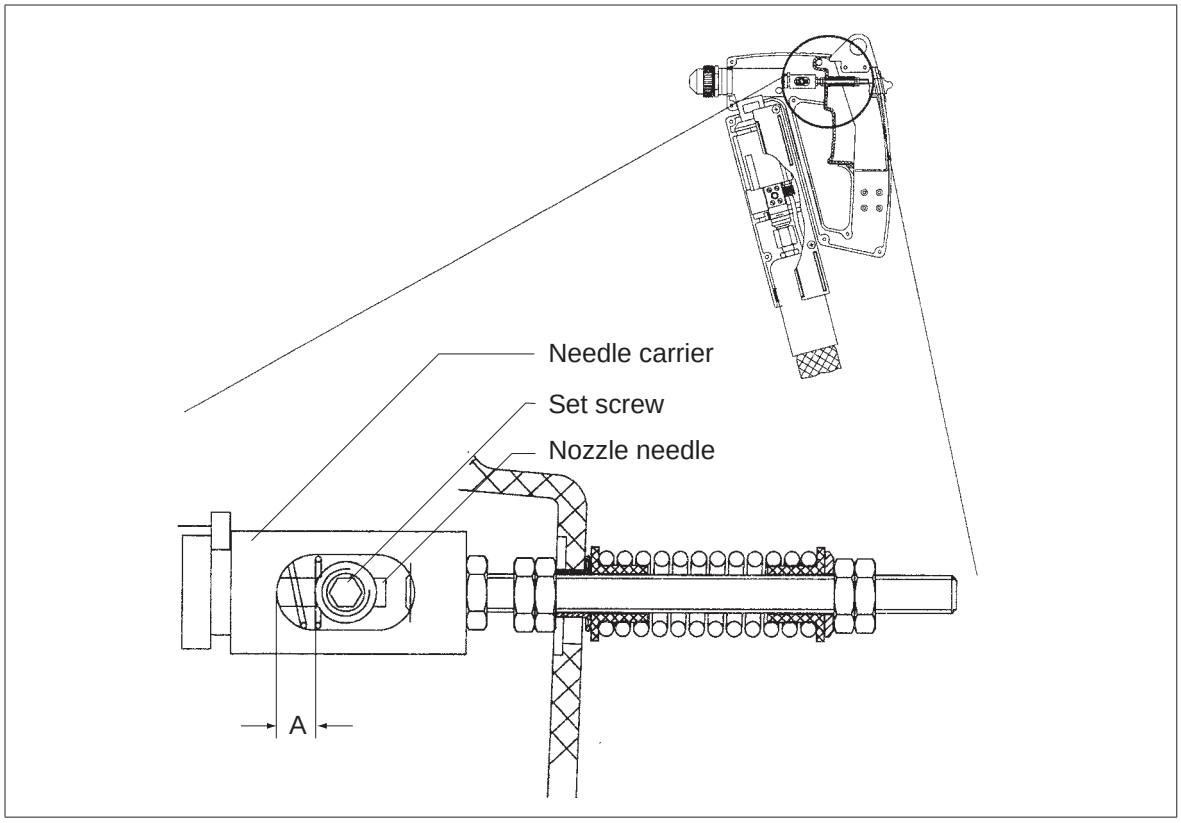


Figure 6.3/1 Setting the preliminary/secondary air

The preliminary/secondary air provides a drip-free spray pattern. It has been pre-set by the factory. These factory settings should only be changed in exceptional cases.

When converting to extrusion application (see Chap. 9.1.1), the preliminary/secondary air must be shut off. This simultaneously increases the needle stroke.

Setting preliminary/secondary air (Measure A)	
Factory default	A = 1.5 mm
For converting to extrusion application	A = 0.2 mm

To set the preliminary/secondary air, carry out the following work steps:

1. Dismantle the grip casing of the manual application unit (8 Phillip head screws).
2. Release the set screw with the Allen wrench size 2.5.
3. Twist the needle carrier to change the preliminary/secondary air to the desired measure.
   In doing so, make sure that the nozzle needle does not twist along.
4. Lightly retighten the set screw.
5. Assemble the grip casing.

6.4 Setting the switching code

Required tools: 1 Phillips screwdriver
1 small slotted screwdriver

Triggering the pump in the basic unit is controlled by a transmitter in the hand unit. So that the basic unit only responds to the manual application units that are connected to this basic unit, the transmitter and basic unit must be set to the same switch code.

This switch code can be set using four small switches (“dip switches”) that can be accessed after removing a cover in the lower part of the hand grip.

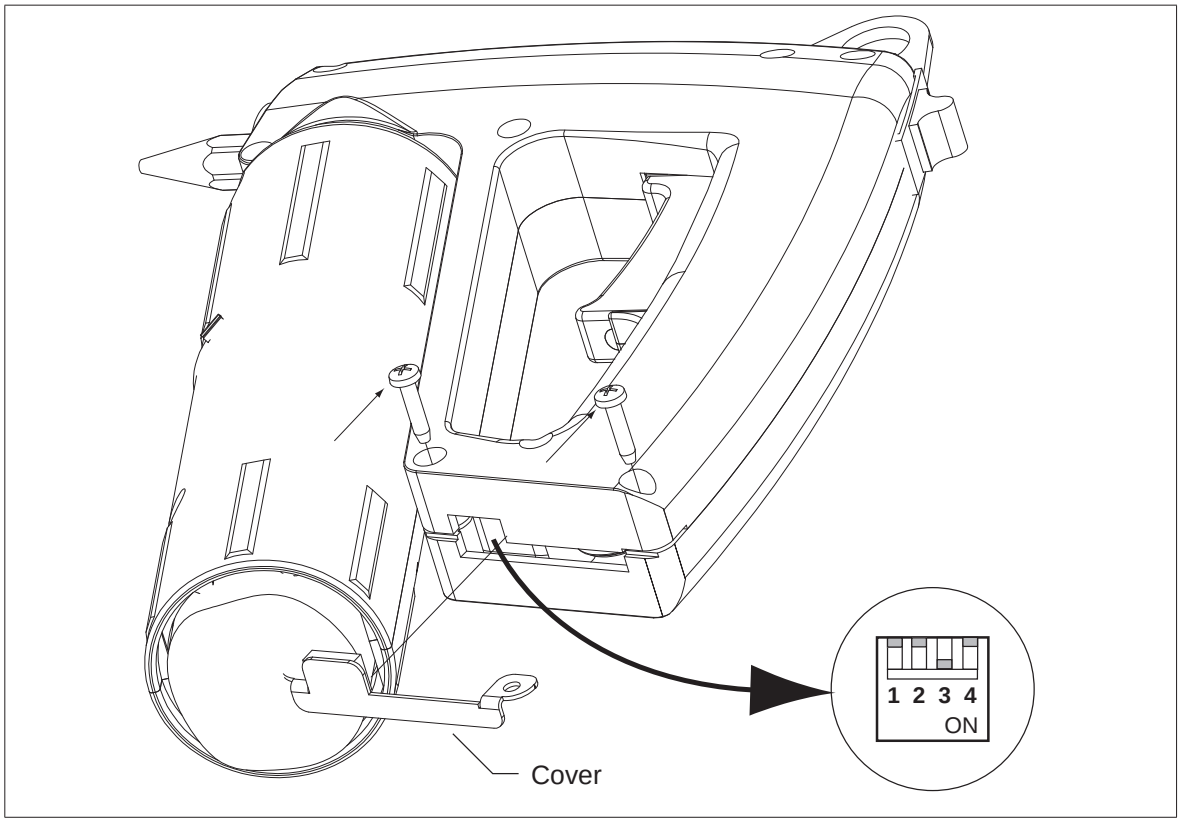
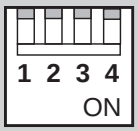
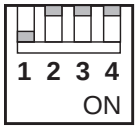
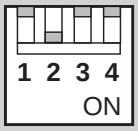
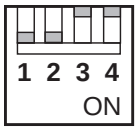
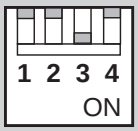
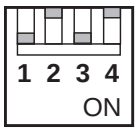
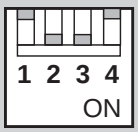
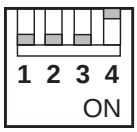
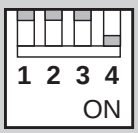
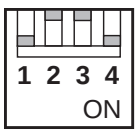
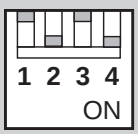


Figure 6.4/1 Position of switches for setting the switch code

To set the switch code, carry out the following work steps:

1. Release and remove the Phillips head screws as illustrated in Figure 6.4/1.
2. Remove the cover.
3. The switches in the left part of the grip underside are now accessible. Set the desired switch code (see table on the next page). Use the small screwdriver to activate the switches.
4. Reinsert the cover.
5. Screw both Phillips head screws back in.

Switch code	Switch setting
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

7 Maintenance / Servicing

Attention!

Maintenance works may only be implemented by competent personnel.

7.1 Maintenance intervals

Interval	Activity
Daily	Check the manual application unit for leak tightness, the existence of all parts, and for firm seat of plug and screw connections.
	Remove hot melt material residues and other incrustations.

7.2 Cleaning

Attention!

Do not use any aggressive solvent or combustible cleaning agents to clean the manual application unit. Such substances can cause damage.

- Using a suitable tool (e.g. cloth, soft brush, wood spatula), mechanically remove hot melt material residue and other pollution.
- If the nozzle is clogged, insert a needle or wire with matching diameter into the (heated) nozzle hole.
- The manual application unit can also be cleaned by rinsing it with a suitable cleaning agent (see operating instructions of the basic unit).

Info

Have your hot melt manufacturer advise you about suitable cleaning agents.
Observe the processing spec sheet and the safety data sheet of the hot melt adhesive.

7.3 Replacing the transmitter battery

Required tools: 1 Phillips screwdriver

Required material: 1 lithium battery 3V, type CR 2032

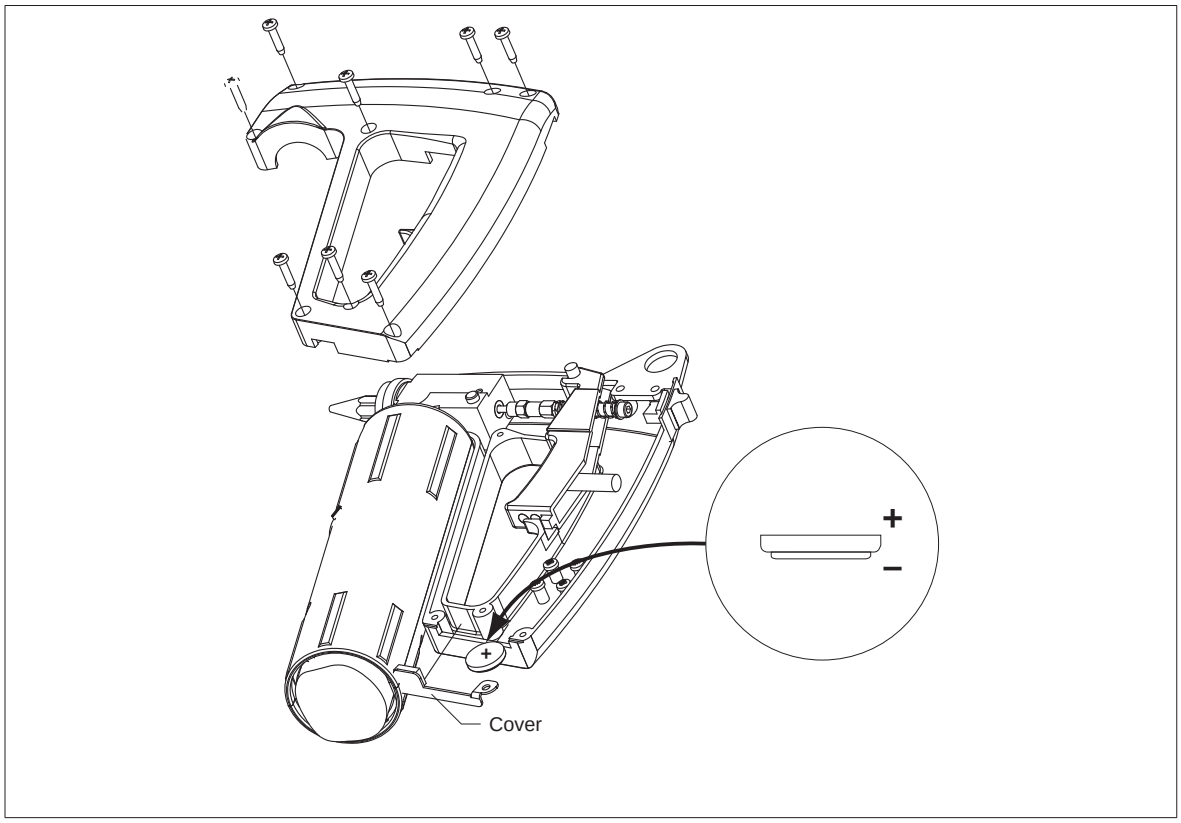


Figure 7.3/1 Replacing the transmitter battery

To replace the transmitter battery, carry out the following work steps:

1. Release and remove the Phillips head screws as illustrated in Figure 7.3/1.
2. Remove the cover.
3. Pull the battery out of the end of the grip as illustrated.
4. Slide the new battery into the end of the grip.

   Please observe correct polarity of the battery (see Figure 7.3/1)!
5. Reinsert the cover.
6. Screw both Phillips head screws back in.
7. Dispose of the drained battery in an environment-friendly manner. Comply with the local laws and regulations.

Li

8 What happens if…

For occurring malfunctions and faults, first check

- the power supply and all electrical connections
- whether the main switch and the pump switched have been turned on
- whether the temperature values for the utilized hot melt adhesive have been set correctly

If defects occur, a protective circuit protects the manual application unit in any case from being heated to temperatures exceeding 260 °C.

Attention!

Never bypass the overtemperature fuse in the manual application unit!

Fault	Possible cause	Remedy
Temperature fluctuates strongly or application unit does not heat	Defective temperature sensor	Replace
	Defective control unit	Replace
	Overtemperature fuse was triggered	Let manual application unit cool off. Determine cause.
	Heating cartridge defective	Replace
	No power supply from the tank system	Check the tank system and/or the heatable hose.
No hot melt material is discharged.	Depleted transmitter battery	Check whether the tank system pumps will start when the trigger is activated. If not: Replace transmitter battery (see Chap. 7.3)
No or insufficient hot melt material is discharged	Hot melt tank is empty	Fill up
	Hot melt material viscosity is too high	Observe processing notes of hot melt material manufacturer
	Clogged nozzle	Clean (see also Chap. 7.2)
	Hot melt material transport from tank system defective	Check the tank system and/or the heatable hose.

What happens if…

9 Accessories

9.1 Adapter for extrusion application (for HS version only)

By installing this adapter (order no. FDH 0423) extrusion application is possible with the Spray version (HS) manual application unit as well.

The adapter is designed for nozzles with UNF 3/8" threads.

9.1.1 Converting to extrusion application

Wear safety gloves!

Danger of burns due to hot metal parts and due to discharged hot melt material. To avoid burning yourself while assembling the adapter, always wear heat protection gloves.

Required tools: 1 open-end wrench size 13
1 open-end wrench size 22

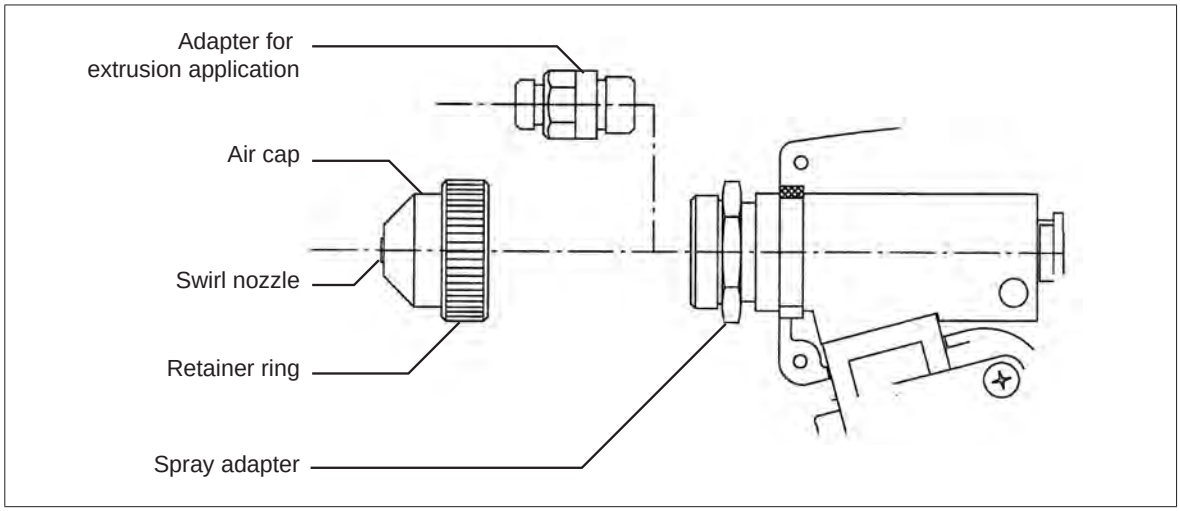


Figure 9.1.1/1 Assembling the adapter for extrusion application

To assemble the adapter, carry out the following work steps:

1. Heat up the manual application unit to approx. 100 °C.
2. Turn off the pump of the tank system.
3. Activate the trigger on the manual application unit to release the system pressure.
4. **Disconnect the power plug from the tank system.**
5. Remove the spray air hose from the spray air adapter kit of the tank system.
6. Secure the spray adapter with the open-end wrench size 22.
7. Remove the air cap.
8. Unscrew the swirl nozzle.
9. Screw on the adapter for extrusion application by hand first.
   Let the adapter thoroughly heat for about 2 minutes.
10. Tighten the adapter **without using force**.
11. Screw on the desired nozzle to the adapter by hand first.
    Let the nozzle also thoroughly heat for about 2 minutes.
12. Tighten the nozzle **without using force**.
13. Turn off the preliminary/secondary air (see Chap. 6.3).
14. Set the spray air pressure on the spray air adapter kit of the tank system to “0.“

10 Repairs

Repairs other than those described in these operating instructions may only be implemented by competent persons commissioned by the manufacturer or otherwise competent persons under utilization of original BÜHNEN spare parts.

11 Warranty

The unit was developed and manufactured according to the latest state of technology. The first purchaser receives warranty on function, material, and processing according to statutory regulations. Normal wear and tear is excepted.

The warranty is void if improper handling, use of violence, repairs by third parties and the installation of spare parts other than the original has been determined.

The warranty extends to servicing or replacing according to our choice. Warranty beyond our scope of delivery is excluded, as we do not have any influence on the competent and expert use of the unit.

Please observe our terms and conditions!

12 Disposal

Take the unit, packaging, and accessories to an environmentally friendly recycling center (in accordance with Directive 2002/96/EG of the European Parliament and the Council of January 27, 2003).

13 Declaration of Conformity

Declaration of Conformity

We, **Bühnen GmbH & Co KG.**

D-28277 Bremen

declare in sole responsibility that the product

Manual application unit with radion control

Type HR/HS

to which this declaration refers, conforms to the following standards or normative documents in its delivery state:

Geräte- und Produktsicherheitsgesetz (GPSG)

DIN EN ISO 12100-1, 2

DIN EN 55011

DIN EN 61000-4 -2/3/4/6/8

DIN EN 60204-1

in accordance with the provisions of the directives

73/23/EEC, **89/336/EEC, 98/37/EC** and **2001/95/EC**

Bremen, August 2005

Hermann Kruse
Director Design & Development

14 Spare Parts List

14.1 Extrusion version (HR)

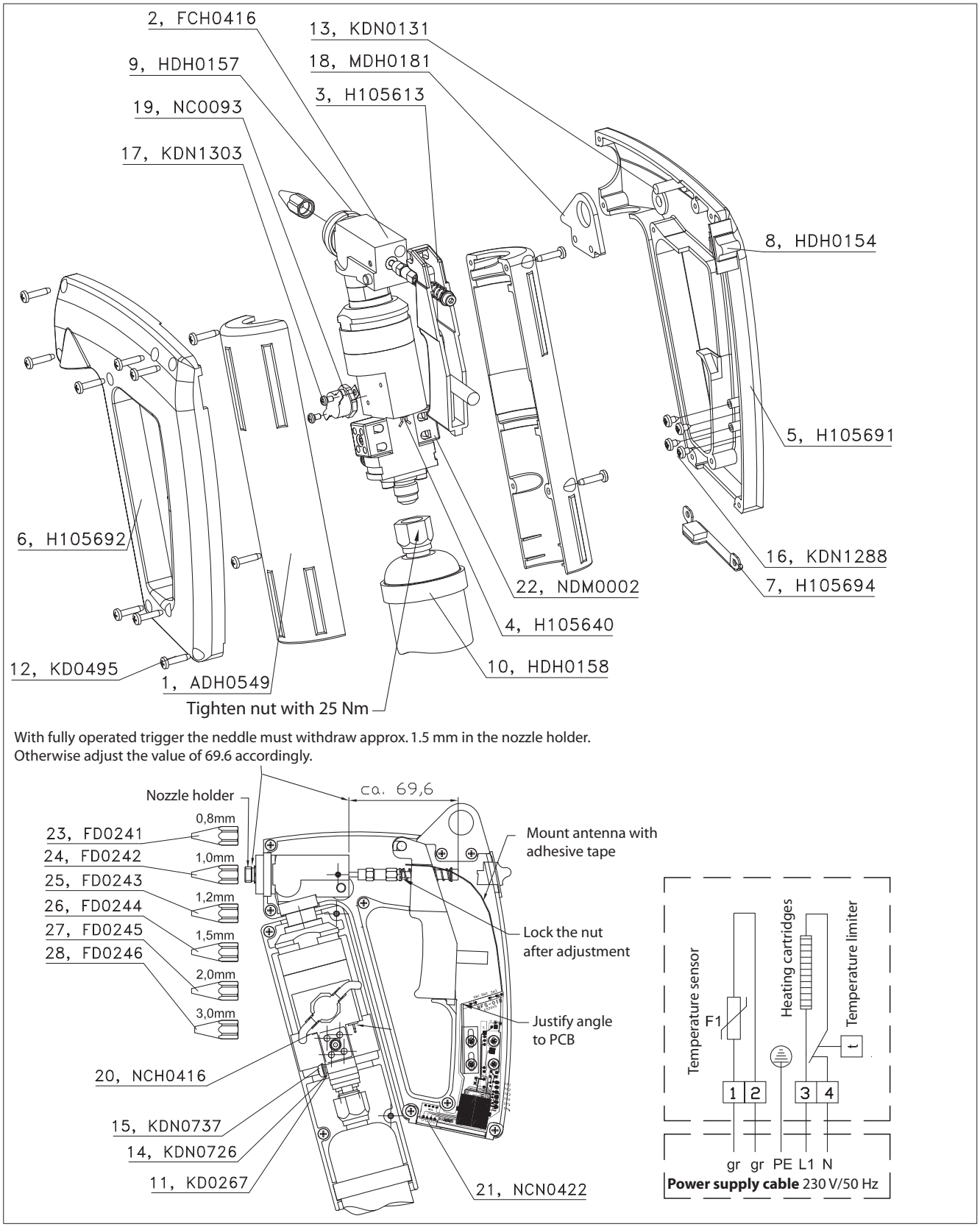


Figure 14/1 Spare parts, manual application unit, Extrusion Version

Spare parts, manual application unit (Extrusion Version)

Item	Order No.	Quantity	Designation
1	ADH0549	2	Heat insulation half shell
2	FCH0416	1	Nozzle head with heating cylinder
3	H105613	1	Trigger with magnet
4	H105640	1	Heating cartridge with cable
5	H105691	1	Grip casing right
6	H105692	1	Grip casing left
7	H105694	1	Cover with foamed material
8	HDH0154	1	Lock slider
9	HDH0157	1	Spacer ring
10	HDH0158	1	Support ring
11	KD0267	1	Spring ring
12	KD0495	12	Plastite screw
13	KDN0131	1	Parallel pin
14	KDN0726	1	Washer
15	KDN0737	1	Schraube
16	KDN1288	4	Blechschraube DIN 7981
17	KDN1303	2	Screw
18	MDH0181	1	Plate
19	NC0093	1	Temperature controller
20	NCH0416	1	Temperature sensor
21	NCN0422	1	Radio transmitter for hand-operated pistol
22	NDM0002	2	Terminal block
23	FD0241	1	Nozzle, long 0,8 mm
24	FD0242	1	Nozzle, long 1,0 mm
25	FD0243	1	Nozzle, long 1,2 mm
26	FD0244	1	Nozzle, long 1,5 mm
27	FD0245	1	Nozzle, long2,0 mm
28	FD0246	1	Nozzle, long 3,0 mm

14.2 Spray Version (HS)

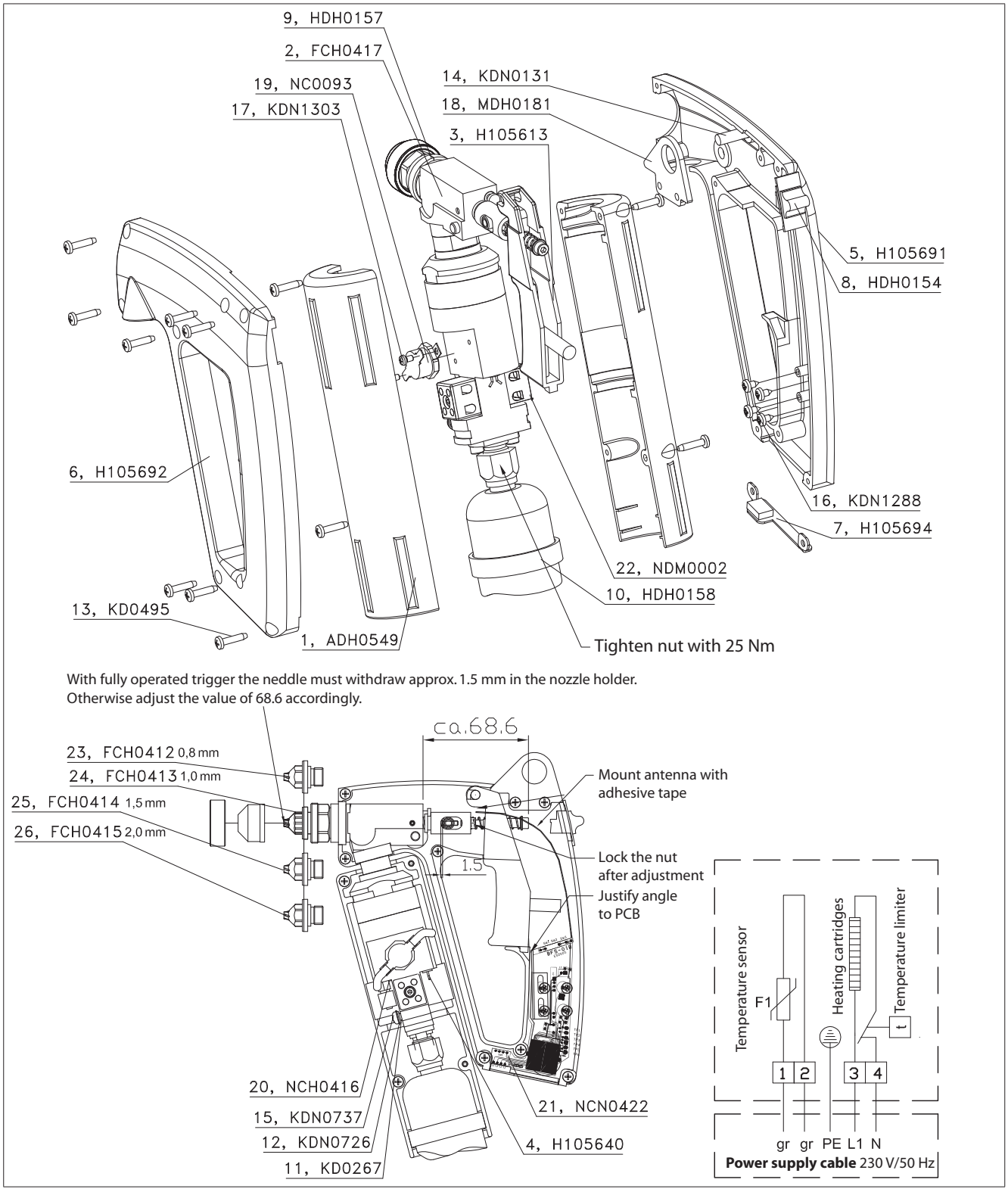


Figure 14.2/1 Spare parts, manual application unit, Spray Version

Spare parts, manual application unit (Spray Version)

Item	Order No.	Quantity	Designation
1	ADH0549	2	Heat insulation half shell
2	FCH0417	1	Nozzle head with heating cylinder
3	H105613	1	Trigger with magnet
4	H105640	1	Heating cartridge with cable
5	H105691	1	Grip casing right
6	H105692	1	Grip casing left
7	H105694	1	Cover with foamed material
8	HDH0154	1	Lock slider
9	HDH0157	1	Spacer ring
10	HDH0158	1	Support ring
11	KD0267	1	Spring ring
12	KDN0726	1	Washer
13	KD0495	12	Plastite screw
14	KDN0131	1	Parallel pin
15	KDN0737	1	Schraube
16	KDN1288	4	Blechschraube DIN 7981
17	KDN1303	2	Screw
18	MDH0181	1	Plate
19	NC0093	1	Temperature controller
20	NCH0416	1	Temperature sensor
21	NCN0422	1	Radio transmitter for hand-operated pistol
22	NDM0002	2	Terminal block
23	FCH0412	1	Spraying nozzle set
24	FCH0413	1	Spraying nozzle set
25	FCH0414	1	Spraying nozzle set
26	FCH0415	1	Spraying nozzle set

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