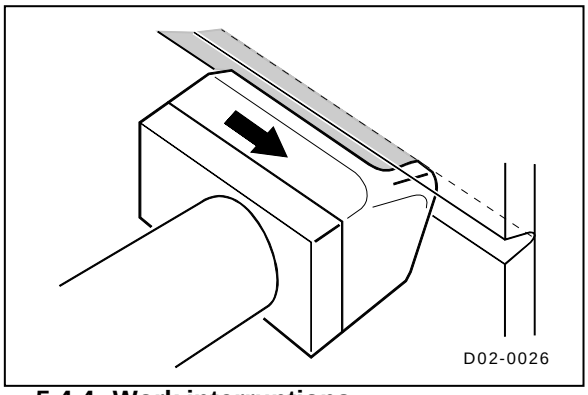
5.4.3 Welding direction / rate

- The pressure of the discharging extrudate causes the welding shoe (and hence, the hand extruder) to move in welding direction.
- See DVS Guideline for the welding rate.

FIG. D02-0026



5.4.4 Work interruptions

- ⚠ Observe section “Safety“.

  Do not leave the hand extruder unattended.

  Make sure to maintain the air supply.

- When interrupting the welding job, switch off the drive unit and deposit the hand extruder on the stand as shown in Fig. “A“ below and then mount the hot air hood.

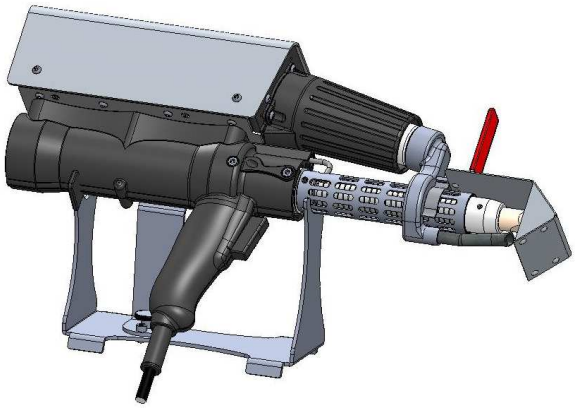


FIGURE “A“

- When using PVC welding rod, we recommend not to switch off the unit during work interruptions. In the case of prolonged interruptions, clean the unit by feeding PP rod until all the PVC material has been discharged.
- Caution! When displacing the PVC with PP rod, set the material to PP on the control unit.

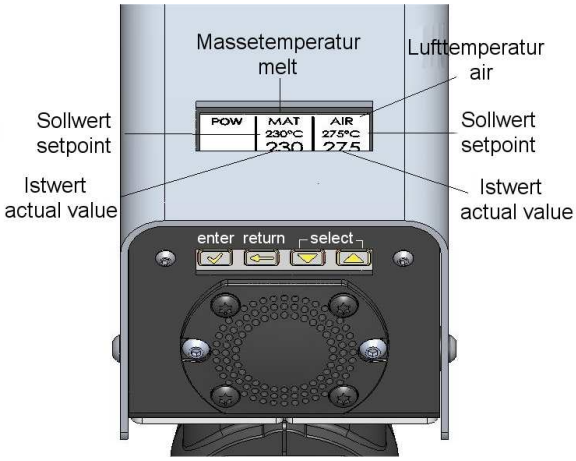
5.4.5 Shutoff

⚠ Observe section “Safety“.

- After completion of the welding job, switch off the drive unit and deposit the hand extruder as shown in Fig. “A” (for illustrations, see preceding section).

⚠ Do not leave the hand extruder unattended.

5.4.5.1 Hand extruder with integrated air supply, type MM-Xtruder



- ⚠ Maintain the air supply after switching off the hand extruder until the unit has completely cooled down!
- Pull mains connector.

⚠ **Never use water or another coolant to accelerate the cooling process!**

5.4.5.1 Hand extruder, type MM-Xtruder

- Press “return” button to switch off the heating circuits.
- Allow extruder to cool for 10 minutes.
- Pull mains connector of hand extruder.
- ⚠ Do not switch off the hand extruder until after the unit has completely cooled down!

⚠ **Never use water or another coolant to accelerate the cooling process !**

5.4.6 Transport/Storage

Make sure to observe the instructions under section “Transport/Storage”.

5.5 Set temperatures on temperature controller

The default settings for the melt and air temperatures of the MM-Xtruder are shown in the following temperature chart (these values have been determined with the aid of reference materials).

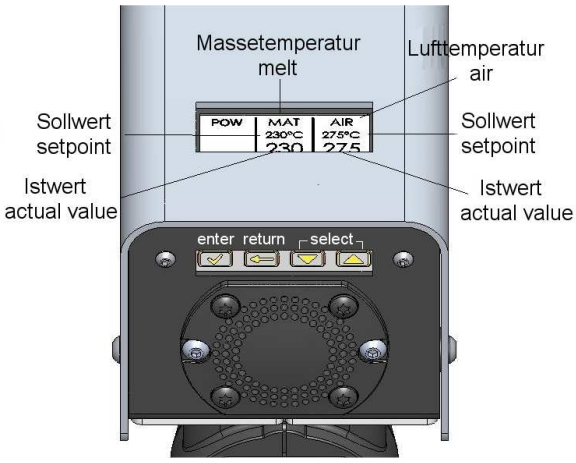
Temperature chart for MM-Xtruder

Material	Melt temperature	Air temperature
PP	210 – 240℃	250 – 300℃
PE	210 – 230℃	250 – 300℃
PVC-U	180 – 200℃	300 – 360℃
PVC-C	195 – 205 ℃	300 – 360℃
PVDF	240 – 260℃	280 – 350℃

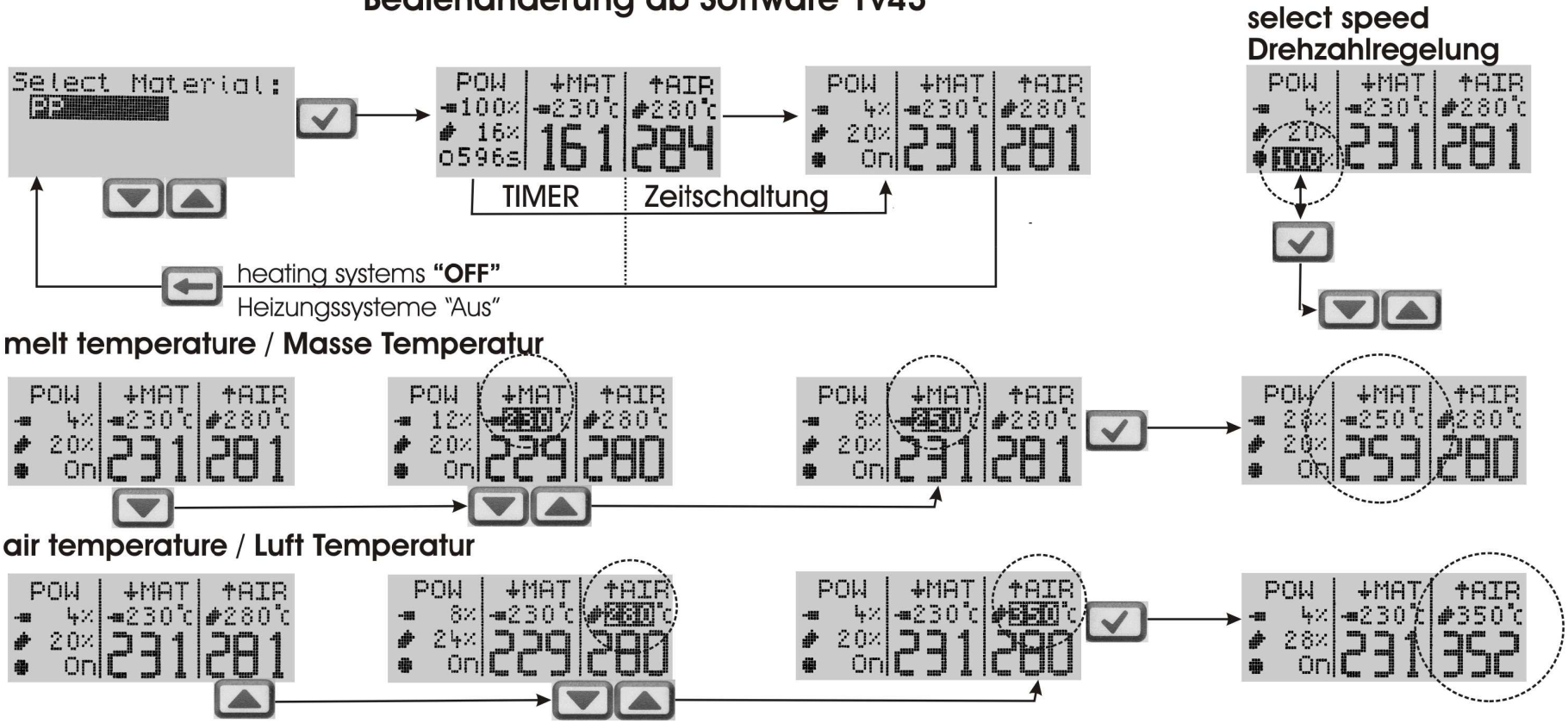
If other temperatures and materials are needed the corresponding settings can be made on the temperature controller.

5.5 Set temperatures

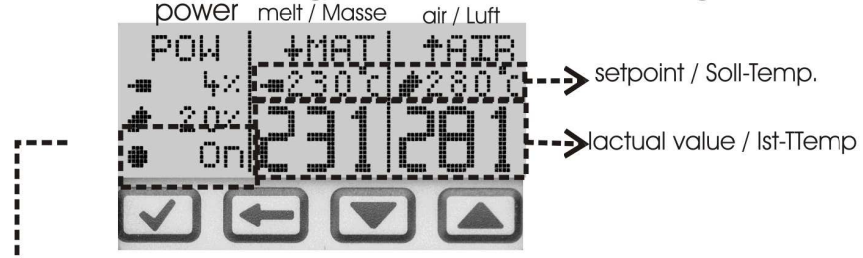
See the user instructions overleaf



Operation changes from Software update 1v43 onwards
Bedienänderung ab Software 1v43

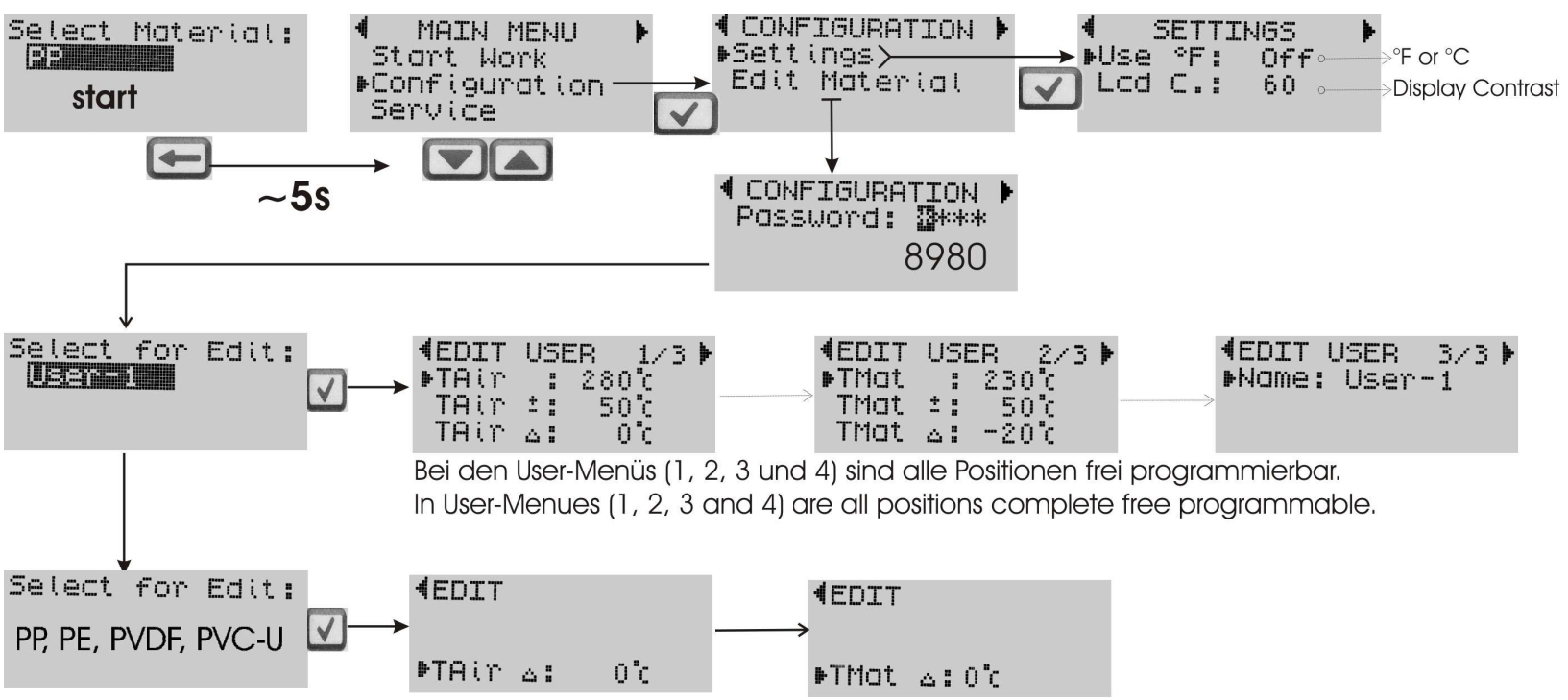


Display design / Display Beschreibung



on / off and speed control
Ein / Aus und Drehzahlregelung für Antrieb

ENTER push-button and !push-button for Select Speed	Bestätigungstaste und Taste zur Änderung der Motordrehzahl
RETURN push-button and !push-button for switch off heating systems!	Zurücktaste und Ausschalten der Heizsysteme
DOWN push-butten (Menue) and SELECT MELT for change the melt-temperature	Runter - Taste zur Änderung der Massetemperatur
UP push-butten (Menue) and Select AIR for change the air-temperature	Hoch - Taste zur Änderung der Lufttemperatur



Bei den User-Menüs (1, 2, 3 und 4) sind alle Positionen frei programmierbar.
In User-Menues (1, 2, 3 and 4) are all positions complete free programmable.

Bei den Hauptmenüs (PP, PE, PVDF und PVC-U) können nur die Abgleichwerte verändert werden!
In the main-menues (PP, PE, PVDF and PVC-U) only the setoff's changeable.

▶TAir △: 0°C Abgleich der Luft und Masse Temperaturen / Calibration from air and melt temperature:

Messung der Temperatur mit externem Thermometer ist:
- zu kalt, den Abgleich in den PLUS Bereich verschieben!
- zu warm, den Abgleich in den MINUS Bereich verschieben!

measuring of temperature with external Temperature probe
- too cold, shift comparsion into PLUS area!
- too hot, shift comparision into MINUS area!

Notizen / Abgleiche user 1 - 4

notes / configuration user 1 - 4

TAir	TAir ±	TAir △	TMat	TMat ±	TMat △	Name: User

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6 Maintenance / Inspection

Pull mains connector before carrying out any maintenance and repair work on the hand extruder.

Maintenance and repair work on electrical tools may only be carried out by qualified electricians.

The hand extruder with the hot air hood must have cooled down to safe-to-touch temperature.

Observe the instructions in section “Safety”.

Maintenance and repair work may only be carried out by qualified personnel or by our service staff.

To ensure the proper function of the hand extruder over its entire service life for its intended service, we recommend:

- to have all maintenance, inspection and mounting work carried out by authorized and qualified personnel who are familiar with the operating instructions,
- to always shut off the unit before carrying out any work on it,
- to remount and reactivate all safety and protective devices immediately after completion of the maintenance/repair work.

During maintenance and repair work, make sure that the hand extruder and its individual components are firmly positioned.

In addition to the operating instructions and the national and local accident prevention regulations applicable at the place of use, the acknowledged technical rules for safe and proper working practices must be observed.

Any working practices posing a safety risk are prohibited.

Activities other than those described in this section may only be performed at the Manufacturer’s workshops!

6.1 Maintenance / inspection of hand extruder, type MM-Xtruder

- CAUTION After approx. 500 operating hours, the hand extruder including drive unit must be thoroughly cleaned and subjected to an inspection. This work may only be performed at the Manufacturer’s workshops.
- CAUTION Cables, switches, plug-in connections must be inspected by qualified staff every three months (requirement according to VBG4); the inspection results must be documented.
- Use original spare parts only.

6.2 Dismantling

Prior to dismantling the hand extruder, pull the mains connector.

The hand extruder must be at ambient temperature.

Damaged mains connection cables must be completely replaced. “Mended“ power cables pose a hazard to life und limb. Cable replacement is to be carried out by qualified electricians only.

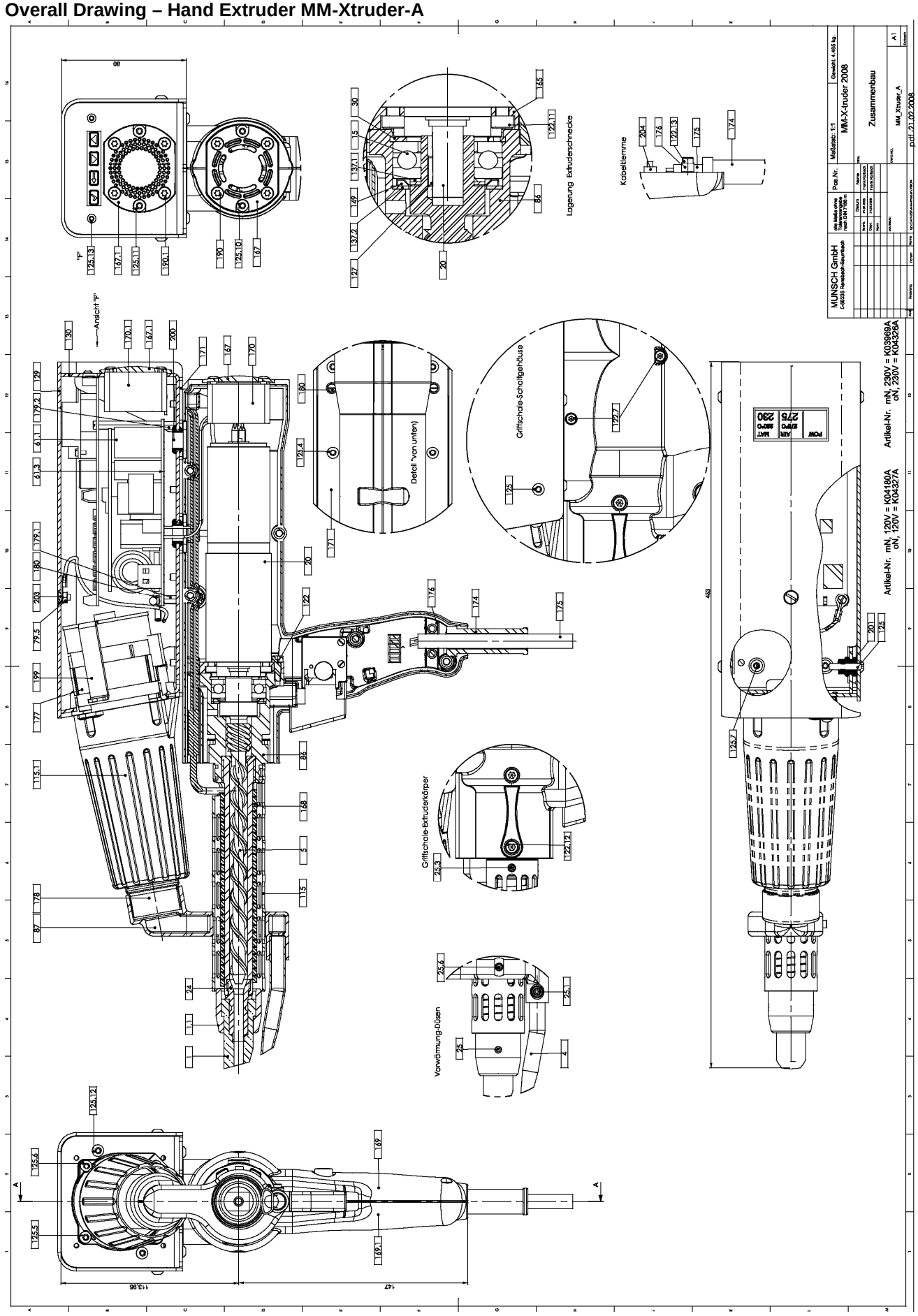
The safety precautions described under sections ”Safety“ and “Malfunctions, Causes and Remedies” must be strictly adhered to.

For dismantling and assembly, the associated overall drawing must be strictly observed.

6.2.1 Hand extruder, type MM-Xtruder

Overall drawing no. BA.MM-Xtruder-A.Rev-04
Parts List - MM-Xtruder-A
230 V = K03969A, K04326A
115 V = K04180A, K04327A

Overall Drawing – Hand Extruder MM-Xtruder-A



Hand Extruder MM-Xtruder

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Parts List - MM-Xtruder K03969A, K04326A, K04180A, K04327A

		Hand Extruder, type MM-Xtruder; 230 V, 120V mN, oN		
CAD	**Qty.**	**Unit**	**Ident No.**	**Designation**
004.00	1,00	pc.	K03898	Preheat nozzle 18 x 4; MM
004.00	1,00	pc.	K04076	Preheat nozzle 12 x 4; MM
004.00	1,00	pc.	K0421 3	Preheat nozzle 10 x 4; MM
005.00	1,00	pc.	K03879	Extruder screw; MM
015.00	1,00	pc.	K02669	Axial deep-groove ball bearing; 51203
020.00	1,00	pc.	K03890	Drive unit; 40 / 42 MM
024.00	1,00	pc.	K03883	Nozzle; 40-6 MM
025.10	1,00	pc.	K03955	Set screw; M 5 x 6
025.30	2,00	pc.	K03955	Set screw; M 5 x 6
025.60	1,00	pc.	K03955	Set screw; M 5 x 6
030.00	1,00	pc.	K00657	Circlip; I 35 x 1,5
061.10	1,00	pc.	K04808 (K04809)	Melt/air temperature controller; 230 V, (120V) with integral motor LP MM
061.30	1,00	pc.	K04253	Insulating foil for MM-Xtruder; 0.25mm
086.00	1,00	pc.	K03880	Extruder body; MM
087.00	1,00	pc.	K03891	Integrated air unit mount; 10° MM
115.00	1,00	pc.	K03886	Heat guard heating coil; MM
115.10	1,00	pc.	K03906	Heat guard air preheater; injection-moulded part MM
122.00	3,00	pc.	K03477	Allan screw ; M 4 x 12
122.11	4,00	pc.	K01454	Allan screw ; M 4 x 8
122.12	4,00	pc.	K03957	Allan screw ; M 5 x 5
122.13	2,00	pc.	K03477	Allan screw ; M 4 x 12
122.70	5,00	pc.	K00656	Allan screw ; M 4 x 16
124.10	1,00	pc.	K04110	Switch EBM 13; without speed control
125.00	4,00	pc.	K04595	Hexagon socket mushroom head screw; M 4 x 20 , ISO 7380 ULS
125.10	2,00	pc.	K03411	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
125.11	2,00	pc.	K03411	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
125.12	2,00	pc.	K03411	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
125.13	2,00	pc.	K04023	Hexagon socket mushroom head screw; M 3 x6 , ISO 7380 ULS
125.40	8,00	pc.	K0341 1	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
125.50	2,00	pc.	K0341 1	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
125.60	2,00	pc.	K0341 1	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
125.70	6,00	pc.	K0341 1	Hexagon socket mushroom head screw; M 4 x 8 , ISO 7380 ULS
127.00	1,00	pc.	K03309	Straight pin; 3 m6 x 10
129.00	1,00	pc.	K04786	Switchbox cover; anodized, mN MM
130.00	1,00	pc.	K0471 9	Switchbox lower part; black, fine-structured MM
137.10	2,00	pc.	K03959	Feather shim; 24 x 17 x 1
137.20	1,00	pc.	K03958	Feather shim; 25 x 35 x 1
149.00	1,00	pc.	K03960	Nilos ring; 6003 Z AV
165.00	1,00	pc.	K03881	Drive flange; MM
166.00	1,00	pc.	K03882	Melting chamber; MM
167.00	1,00	pc.	K03887	Fan grille; injection-moulded part MM
167.10	1,00	pc.	K04738	Controller fan grille; injection-moulded part MM

Parts List - MM-Xtruder K03969A, K04326A, K04180A, K04327A

Article		Hand extruder, type MM-Extruder; 230 V, 120V mN, oN		
CAD	**Qty.**	**Unit**	**Ident No.**	**Designation**
168.00	1,00	pc.	K03889	Heating coil; 18x125 MM
169.00	1,00	pc.	K03892	Handle – left; injection-moulded part MM
169.10	1,00	pc.	K04738	Controller fan grille; injection-moulded part MM
170.00	1,00	pc.	K03894	Axial fan; 40 x 40 x 25 MM
170.10	1,00	pc.	K03894	Axial fan; 40 x 40 x 25 MM
171.00	2,00	pc.	K04721	Switch box connector; MM
173.00	1,00	pc.	K04259	Front plastic covering of display; for K-controller MM
174.00	1,00	pc.	K04137	Anti-kink sleeve 9-11; 5200 2020 MM
175.00	1,00	pc.	K04135	Cable, complete; 230V 3x1, 5mm² 5m long MM
176.00	1,00	pc.	K04136	Strain-relief clip; type B MM
177.00	1,00	pc.	K03964, K04244	Motor unit, 230V, (120V); Preheater MM
178.00	1,00	pc.	K04318, K04319	Complete heating system; 230 V – 2100W, (120V- 1600W)
178.10	1,00	pc.	K04258	Front plastic covering for keys; for K-controller MM
179.10	2,00	pc.	K04072	Spacer sleeve; M 3 x 8 lgew / lgew
179.20	2,00	pc.	K04074	Spacer sleeve; M 3 x 8 lgew / Agew
180.00	6,00	pc.	K03283	Slotted fillister head screw; M 3 x 5
190.00	4,00	pc.	K04256	Screw, PT; 4,0 x 10 mm, WN 1452, Torx
190.10	4,00	pc.	K04256	Screw, PT; 4,0 x 10 mm, WN 1452, Torx
199.00	1,00	pc.	K04722	Bracket for motor fan; MM
200.00	2,00	pc.	K04736	Cable sleeve; A10 - D2
201.00	4,00	pc.	K04737	Rubber-metal element; T-Flex Q4
203.00	1,00	pc.	K02632	Countersunk screw; M 4 x 10
204.00	3,00	pc.	K04739	Terminal strip; 1,5 - 2,5

7 Malfunctions, Causes and Remedies

7.1 Trouble-shooting

The following table lists potential operating upsets of the hand extruder, possible causes and their remedies (fault diagnosis chart).

Should malfunctions occur which are not covered here or which cannot be traced back to the cause stated, please contact MUNSCH Kunststoff-Schweißtechnik GmbH.

Malfunction	Fault No.
Drive motor does not start	4, 5, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 21
Drive motor switches off	5, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 21
No welding rod feed	1, 16, 17, 20
No extrudate conveyed out of welding shoe	1, 16
Extrudate output decreases during operation	1, 14, 16
No air supply	13
Integrated air supply system without function	22, 5
No hot air	2, 3, 4, 5, 18, 22
Hot air temperature below setpoint temperature	2, 3, 4, 8, 10, 14, 18, 22
Melt temperature below setpoint temperature	2, 3, 9, 11, 14
Extruder does not heat up	2, 3, 12, 22
Temperature above preset range	2, 3, 18, 19
Control fluctuates	3, 13, 19
Controller fault signal: OEAIR	2,10,19
Controller fault signal: OVERLD	22
Controller fault signal: OVHT	23
Controller fault signal: E:	9
Controller fault signal: Fan-ERROR	19,10
Controller signal: off	5,6,7,8,21

7.2 Fault diagnosis

Fault No.	Possible causes	Remedy
1	Smaller or too small a welding rod diameter	Use a larger welding rod diameter, if necessary
2	Temperature sensor defective	[1]
3	Temperature controller defective	[1]
4	Cable connections defective	Check cable connections [1]
5	Hot air temperature below start interlock temperature	Allow hand extruder to heat up

1) Consult MUNSCH Kunststoff-Schweißtechnik GmbH

Fault No.	Possible causes	Remedy
6	Melt temperature below start interlock temperature	Allow hand extruder to heat up
7	Preheat time for hot air too short	Allow hand extruder to heat up
8	Preheat time for melt too short	Allow hand extruder to heat up
9	Heating tape defective	1)
10	Air supply not constant	- In the case of integrated air supply system: 1)
11	Wrong rated voltage	**Rated voltage > permissible voltage** Check mains voltage **Rated voltage < permissible voltage** Check mains voltage 1)
12	Extension cable heats up	- Unroll cable reel - Check cable cross-section (see also section “Safety”)
13	Extruder nozzle plugged with foreign matter	Clean extruder ⚠ **Extruder nozzle – left-hand thread**
14	Drive unit defective	1)
15	Electronic control defective	1)
16	Controller programming error	1)
17	Welding rod feed	Remove welding rod ⚠ Observe instructions in section “Maintenance”! Observe instructions for hand extruder operation!
18	Carbon brushes of drive unit worn out	Replace carbon brushes 1)
19	Hot air supply system defective	
20	No mains voltage	Check voltage supply
21	Heating circuit not activated	
22	Drive operates at overload	Heat up hand extruder, melt temperature too low
23	Temperature set on electronic controller too high	Allow unit to cool down

1) Consult MUNSCH Kunststoff-Schweißtechnik GmbH

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8 Technical Data

Type designation	**MM-Xtruder**
Welding materials	PP, PE, PVC, PVDF and other thermoplastics
Welding rate, approx.	∅ 3 mm: 0.6 kg/h PP ∅ 3 mm: 0.6 kg/h PE
Welding rod	Welding rod ∅ 3
Application range	Wall thicknesses 1-10 mm and film/sheeting welds
Weight	3.4 kg
Drive	230 V (115V) AC speed-controlled
Extruder heating system	875 W (220 W)
Air heater	2100 W (1600 W)
Air supply	Integrated air supply (Autoair)
Control of melt temperature	Temperature controller with concurrent momentary value and setpoint display
Control of air temperature	Temperature controller with concurrent momentary value and setpoint display
Cold start protection	Start temperature interlock and startup timer for melt and preheat air

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Warranty

1 The Manufacturer warrants freedom from defects in materials and workmanship and state-of-the-art performance of the purchased article for a period of six (6) months from the date of delivery.

2 The Purchaser shall check the article delivered for completeness and freedom from defects immediately after receipt.

3 The Purchaser shall be entitled to the making good of defects and any resulting damage to other parts of the purchased article (remedial work).
The procedure for claims under this warranty shall be as follows:

3.1 The Purchaser may assert claims under this warranty either with his dealer or with a company authorized by the Manufacturer to provide services for the purchased article. The Purchaser shall give written notice of defects to the respective company immediately after such defects have been identified or shall have such defects registered by the respective company.

3.2 Defects shall be promptly remedied in accordance with the technical requirements by either replacement or repair of the defective parts, the cost of the remedial work being for the account of the Manufacturer.Replaced parts shall become the property of the Manufacturer.
If, as a result of the remedial work, additional maintenance measures are prescribed by the Manufacturer, the resulting costs including the costs of materials and lubricants shall be for the Manufacturer's account.

3.3 For replacement parts installed within the scope of the remedial work, a warranty will be provided under the purchase contract, the warranty period for such parts ending on expiry of the warranty period of the object purchased.

3.4 For the warranty to become effective, this warranty certificate must be produced for each repair.

4 If the defect cannot be remedied or if the Purchaser cannot be reasonably expected to accept any further attempts at making good the defect, the Purchaser may demand annulment (cancellation of the contract) or a price reduction (reduction of compensation) in lieu of remedial work. In such a case, the Purchaser shall not be entitled to any replacement.

5 Manufacturer's warranty obligations shall not be affected by a change in ownership of the purchased article.

6 Any damage incurred through the following acts or omissions of Purchaser shall be **expressly excluded** from this warranty:

6.1 Purchaser's failure to report a defect pursuant to subsection 3.1 or to promptly provide an opportunity to remedy the defect following Manufacturer's request, or

6.2 improper handling or overload operation of the purchased article, or

6.3 prior repair, maintenance and servicing of the purchased article by a company not authorized by the Manufacturer, if the Purchaser can be reasonable expected to have known that such company was not authorized, or

6.4 the installation of parts into the purchased article without having obtained Manufacturer's prior approval for such parts or the modification of the purchased article in a way not approved by the Manufacturer, or

6.5 Purchaser's failure to observe the instructions given in the user's manual accompanying the purchased article (e.g. operation, maintenance and care), or

6.6 Purchaser having removed the serial number or made it illegible.

7 Natural wear and tear shall be expressly excluded from the warranty.

8 Accidents, force majeure or other circumstances beyond the control of the Manufacturer, in particular damage caused by lightning, overvoltage, water, fire, etc. shall be excluded from the warranty.

9 All rights under this warranty shall become null and void on expiry of the warranty term pursuant to Section 1. For claims asserted within the warranty term but no settled by its expiry, the warranty shall remain effective until the respective defect has been remedied. The period of limitation shall be suspended for such claim.