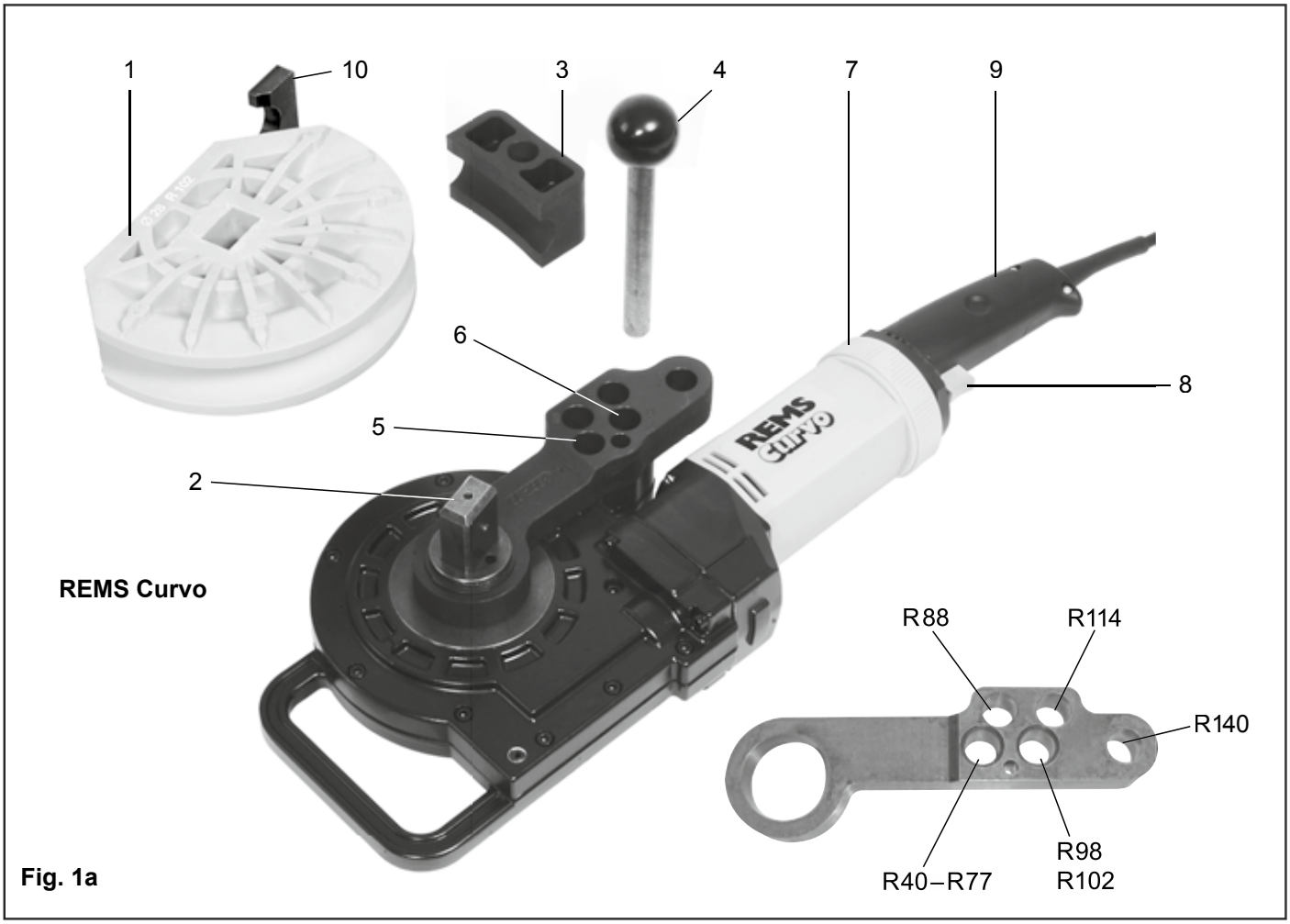
KE KELIT®
INNOVATIVE PIPE SYSTEMS

REMS
for Professionals

Instruction Manual

REMS Curvo
REMS Curvo 50
REMS Akku-Curvo
REMS Sinus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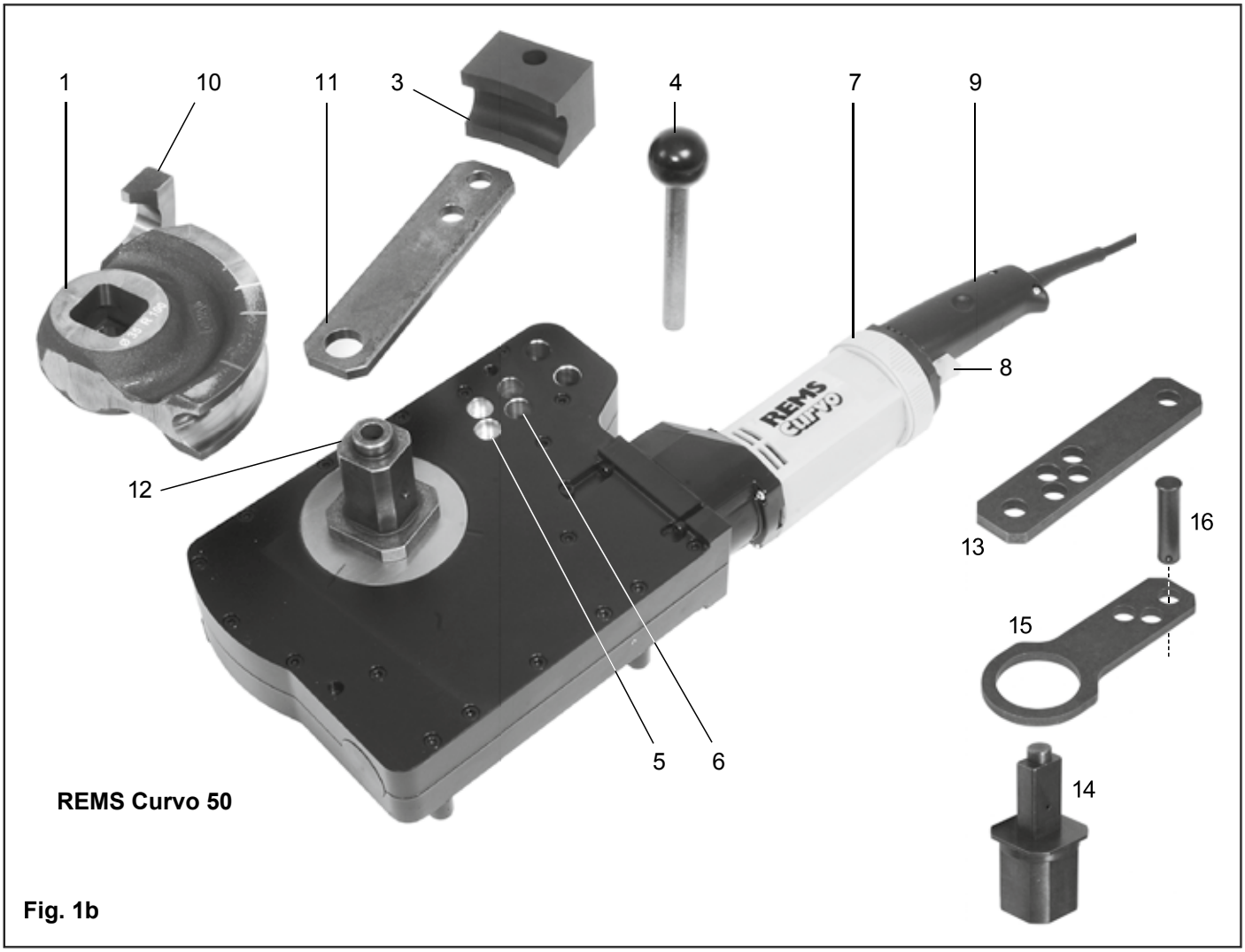
REMS Curvo
R88
R114
R140
R98
R102
R40–R77

Fig. 1a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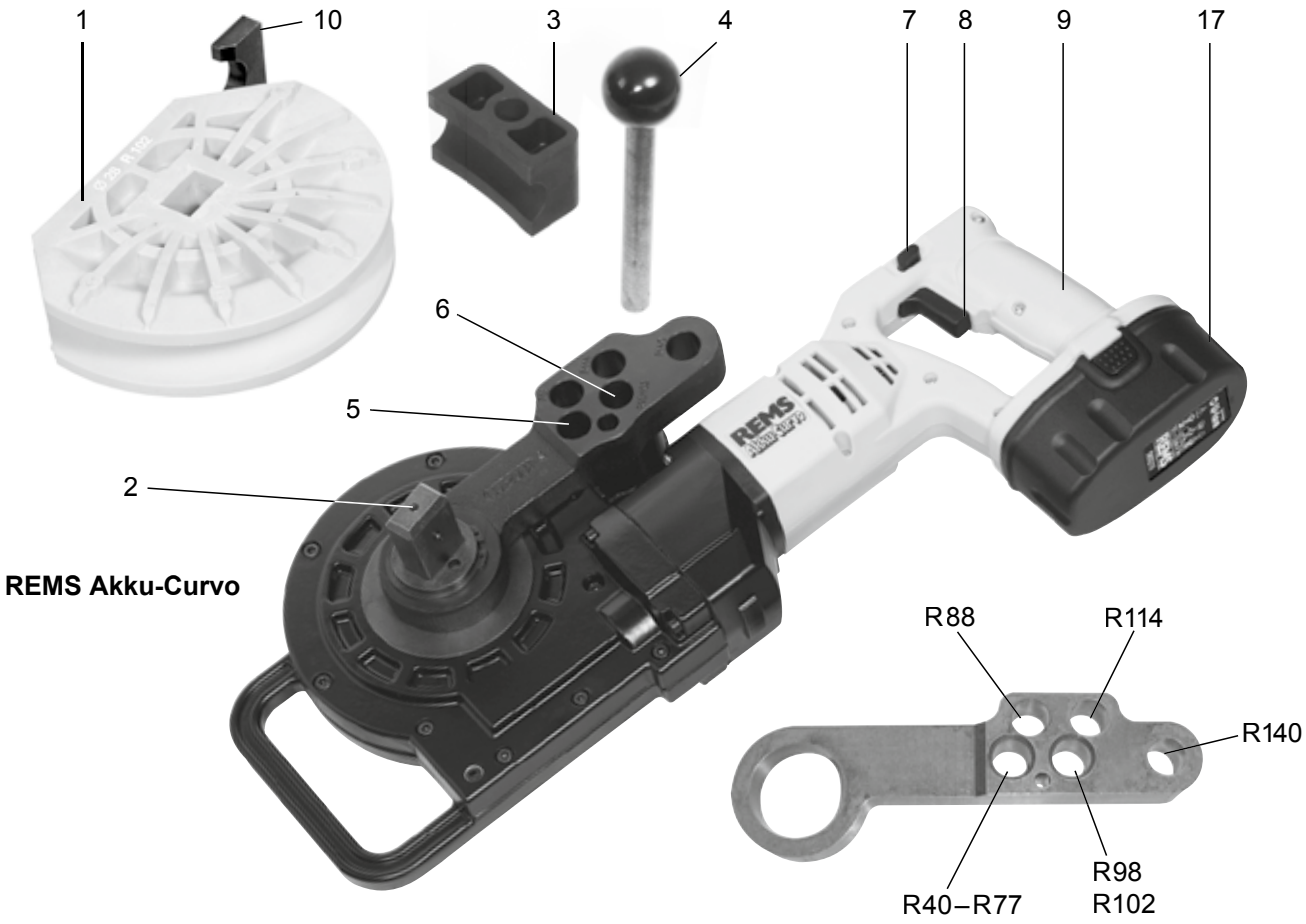
REMS Curvo 50

Fig. 1b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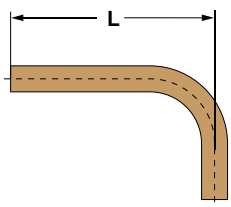
REMS Akku-Curvo
R88
R114
R140
R98
R102
R40–R77

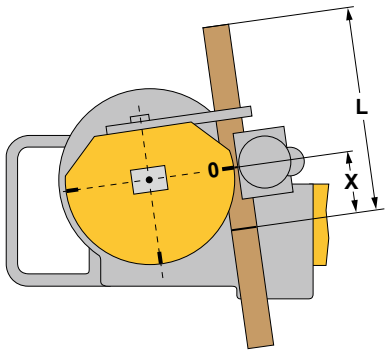
Fig. 1c

Fig. 2

Biegesegment und Gleitstück für Rohre Ø mm/Zoll	R mm	X mm 90°	X mm 45°	→ REMS Sinus								→ REMS Curvo								→ REMS Akku-Curvo								→ REMS Curvo 50								Art.-Nr.
				Cu	Cu-U	St 10312	St 10305-U	St 10305	St 10255	St 50086	V	Cu	Cu 12735	Cu-U	St 10312	St 10305-U	St 10305	St 10255	St 50086	V	Cu	Cu 12735	Cu-U	St 10312	St 10305-U	St 10305	St 10255	St 50086	V	Cu	Cu 12735	Cu-U	St 10312	St 1127	St 10305-U	St 10305	St 10255	St 50086	V	
10	40	45	20	●				●				●					●				●					●				▲					▲				581400
12	45	49	22	●		●		●				●			●		●				●			●		●				▲			▲			▲				581410
14, 10 U, ¼" (DN 6)	50	53	23	●	●			●			●	●		●			●	●		●	●		●			●	●		●	▲		▲				▲	▲		▲	581420
15, 12 U	55	56	25	●		●	●	●				●			●	●	●				●			●	●	●				▲			▲		▲	▲				581430
16, 12 U	60	62	28	●	●			●		●	●	●		●			●		●	●	●		●			●		●	●	▲		▲				▲		▲	▲	581440
17, 15 U	56	60	27				●				●					●				●				●				●						▲					▲	581110
18, 14 U, 15 U, ⅜" (DN 10)	70	75	33	●	●	●		●			●	●		●	●		●	●		●	●			●	●	●		●	●	▲		▲	▲			▲	▲		▲	581450
20, 16 U, 18 U	75	80	36	●	●		●			●	●	●		●			●		●	●	●		●		●			●	●	▲		▲			▲			▲	▲	581080
21,3, ½" (s = 1,6/2,0/2,6)	103	110	50																														■			■				581480
22, 18 U, ½" (DN 15)	77	81	36	●	●			●				●		●	●		●	●			●		●	●		●	●			▲		▲	▲			▲	▲			581460
22, 18 U, ½" (DN 15)	88	91	41									●		●	●		●				●		●	●		●				▲		▲	▲			▲				581470
24, 22 U	75	85	38									●				●					●				●					▲				▲						581130
25	98	103	46								●	●					●		●	●	●					●		●	●	▲					▲			▲	▲	581180
26	98	108	49								●						●			●						●			●						▲				▲	581270
26,9, ¾" (s = 1,6/2,0/2,6)	102	108	49																														■			■				581490
28[1]	102[3]	108	49								●									●										▲										581070
28, ¾" (DN 20)[2]	102	110	50								●			●		●	●				●			●		●				▲			▲			▲	▲			581260
28, ¾" (DN 20)[2]	115	120	54								●			●		●	●				●			●		●				▲			▲			▲	▲			581310
30, 28 U	98	105	47								●				●									●						▲				▲						581150
32	98	110	50								●								●										●										▲	581280
32	114	121	54									●						●	●										●	▲								▲	▲	581320
1" (DN 25)	100	105	47																																	■				581520
33,7, 1" (s = 1,6/2,0/2,6)	100	105	47																														■			■				581520
35	100	105	47																											■			■			■				581500
35	140	150	68								●																			▲			▲							581350
40	140	148	67																●										▲										▲	581330
42	140	155	70																											■			■			■				581510
1¼" (DN 32)	140	150	68																																	■				581530
42,4, 1¼" (s = 2,0/2,6)	140	150	68																														■			■				581530
50	135	143	64																																				■	581540
⅜" (9,5 mm)	43	48	22	●								●	●								●	●								▲	▲									581200
½" (12,7 mm)	52	60	27	●								●	●								●	●								▲	▲									581210
⅝" (15,9 mm)	63	70	32	●								●	●								●	●								▲	▲									581220
¾" (19,1 mm)	75	82	37	●								●	●								●	●								▲	▲									581230
⅞" (22,2 mm)	98	107	48	●								●	●								●	●								▲	▲									581240
1" (25,4 mm)	101	112	50									●									●									▲										581370
1⅛" (28,6 mm)	102	110	44									●	●								●	●								▲	▲									581260
1⅛" (28,6 mm)	115	117	53									●									●									▲										581380
1¼" (31,8 mm)	114	123	55									●																		▲	▲									581320
1¼" (31,8 mm)	133	145	65									●																		▲										581390
1⅜" (34,9 mm)	100	105	47																			■																		581500
1⅜" (34,9 mm)	140	150	68									●	●																	▲	▲									581350
1⅝" (41,3 mm)	140	155	70																			■	▲																	581510

R mm — Biegeradius mm der neutralen Achse des Bogens (DVGW GW 392)
X mm — Korrekturmaß mm für einen 90°- bzw. 45°-Bogen
s mm — Wanddicke
[1] harte, halbharte Kupferrohre, auch dünnwandig, EN 1057
[2] harte Kupferrohre EN 1057
[3] Gemäß DVGW-Arbeitsblatt GW 392 für harte und halbharte Kupferrohre Ø 28 mm Mindestbiegeradius 114 mm erforderlich. Wanddicke ≥ 0,9 mm.
▲ Vierkantmitnehmer 10 – 40, Abstützung 10 – 40 (Art.-Nr. 582120) erforderlich.
■ Vierkantmitnehmer 35 – 50, Abstützung 35 – 50 (Art.-Nr. 582110) erforderlich.
Cu: harte, halbharte, weiche Kupferrohre, auch dünnwandig, EN 1057
Cu 12735: Kupferrohre K65 für die Kälte- und Klimatechnik nach EN 12735-1, EN 12449
St 10312: nichtrostende Stahlrohre der Pressfitting-Systeme EN 10312, Reihe 2, EN 10088, EN 10217-7
St 1127: nichtrostende Stahlrohre EN ISO 1127, EN 10217-7
St 10305-U: ummantelte weiche C-Stahlrohre der Pressfitting-Systeme EN 10305-3
St 10305: weiche Präzisionsstahlrohre EN 10305-1, EN 10305-2, EN 10305-3, C-Stahlrohre EN 10305-3
St 10255: Stahlrohre (Gewinderohre) EN 10255
St 50086: Elektroinstallationsrohre EN 50086
U: ummantelt
V: Verbundrohre der Pressfitting-Systeme





Translation of the Original Instruction Manual

Fig. 1 – 2

1	Bending former	10	Driver
2	Square driver	11	Support 35 – 50
3	Back former	12	Square driver 35 – 50
4	Insert bolt	13	Support 10 – 40
5	Left-hand locating hole	14	Square driver 10 – 40
6	Right-hand locating hole	15	Support bottom
7	Setting ring/slide	16	Locating pin
8	Safety inching switch	17	Battery
9	Motor handle		

Fig. 3

① Bending former and back former for pipe Ø mm/inch

R mm	Bending radius mm at the neutral axis of the bend (DVGW GW 392).
X mm	Correction dimension mm
s mm	Wall thickness
[1)]	hard, semi-hard copper pipes, also thin-walled, EN 1057
[2)]	hard copper pipes EN 1057
[3)]	According to DVGW work sheet GW 392 for hard and semi-hard copper pipes Ø 28 mm minimum bending radius 114 mm necessary. Wall thickness ≥ 0.9 mm.
▲	Square driver 10 – 40, support 10 – 40 (Art. No. 582120) necessary.
■	Square driver 35 – 50, support 35 – 50 (Art. No. 582110) necessary.
Cu:	hard, half-hard, soft copper pipes, also thin-walled, EN 1057
Cu 12735:	Copper pipes K65 for refrigeration and air conditioning technology in accordance with EN 12735-1, EN 12449
St 10312:	stainless steel pipes of the press fitting systems EN 10312, series 2, EN 10088, EN 10217-7
St 1127:	stainless steel pipes EN ISO 1127, EN 10217-7
St 10305-U:	coated, soft carbon steel pipes of the press fitting systems EN 10305-3
St 10305:	soft precision steel pipes EN 10305-1, EN 10305-2, EN 10305-3, C-steel pipes EN 10305-3
St 10255:	Steel pipes (threaded pipes) EN 10255
St 50086:	Electrical installation pipes DIN EN 50086
U:	jacketed
V:	multilayer composite pipes of the pressfitting systems

General Safety Instructions

⚠ WARNING

Read all the safety notes, instructions, illustrations and technical data which come with this power tool. *Failure to heed the following instructions can lead to electric shock, fire and/or severe injuries.*

Save all warnings and instructions for future reference.

The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

1) Work area safety

a) Keep work area clean and well lit. *Cluttered or dark areas invite accidents.*

b) Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. *Power tools create sparks which may ignite the dust or fumes.*

c) Keep children and bystanders away while operating a power tool. *Distractions can cause you to lose control.*

2) Electrical safety

a) Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools. *Unmodified plugs and matching outlets will reduce risk of electric shock.*

b) Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators. *There is an increased risk of electric shock if your body is earthed or grounded.*

c) Do not expose power tools to rain or wet conditions. *Water entering a power tool will increase the risk of electric shock.*

d) Do not misuse the connecting cable to carry or hang up the power tool or to pull the plug out of the socket. Keep the connecting cable away from heat, oil, sharp edges or moving tool parts. *Damaged or knotted cables increase the risk of electric shock.*

e) When operating a power tool outdoors, use an extension cord suitable for outdoor use. *Use of a cord suitable for outdoor use reduces the risk of electric shock.*

f) If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply. *Use of an RCD reduces the risk of electric shock.*

3) Personal safety

a) Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. *A moment of inattention while operating power tools may result in serious personal injury.*

b) Use personal protective equipment. Always wear eye protection. *Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.*

c) Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool. *Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.*

d) Remove any adjusting key or wrench before turning the power tool on. *A wrench or a key left attached to a rotating part of the power tool may result in personal injury.*

e) Do not overreach. Keep proper footing and balance at all times. *This enables better control of the power tool in unexpected situations.*

f) Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts. *Loose clothes, jewellery or long hair can be caught in moving parts.*

g) If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. *Use of dust collection can reduce dust-related hazards.*

h) Do not take your safety for granted and ignore the safety rules for power tools even if you are very familiar with the power tool after frequent use. *Careless handling can lead to severe injury within split seconds.*

4) Power tool use and care

a) Do not force the power tool. Use the correct power tool for your application. *The correct power tool will do the job better and safer at the rate for which it was designed.*

b) Do not use the power tool if the switch does not turn it on and off. *Any power tool that cannot be controlled with the switch is dangerous and must be repaired.*

c) Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools. *Such preventive safety measures reduce the risk of starting the power tool accidentally.*

d) Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. *Power tools are dangerous in the hands of untrained users.*

e) Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. *Many accidents are caused by poorly maintained power tools.*

f) Keep cutting tools sharp and clean. *Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.*

g) Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed. *Use of the power tool for operations different from those intended could result in a hazardous situation.*

h) Keep handles and gripping surfaces dry, clean and free from oil and grease. *Slippery handles and gripping surfaces prevent safe handling and control of the power tool in unforeseeable situations.*

5) Battery tool use and care

a) Recharge only with the charger specified by the manufacturer. *A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.*

b) Use power tools only with specifically designated battery packs. *Use of any other battery packs may create a risk of injury and fire.*

c) When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects, that can make a connection from one terminal to another. *Shorting the battery terminals together may cause burns or a fire.*

d) Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. *Liquid ejected from the battery may cause irritation or burns.*

e) Do not use a damaged or modified battery. *Damaged or modified batteries can behave unexpectedly and lead to fires, explosions or injuries.*

f) Do not expose a battery for fire or high temperatures. *Fire or temperatures above 130 °C (265 °F) can cause an explosion.*

g) Follow all the instructions for charging and never charge the battery or the cordless tool outside the temperature range specified in the operating instructions. *Incorrect charging or charging outside the permitted temperature range can destroy the battery and increase the fire risk.*

6) Service

a) Have your power tool repaired only by qualified technical personnel and only with genuine spare parts. *This ensures that the safety of the device is maintained.*

b) Never service damaged batteries. *All maintenance of batteries should only be carried out by the manufacturer or authorised customer service points.*

Safety instructions for electric pipe bending machines

⚠ WARNING

Read all the safety notes, instructions, illustrations and technical data which come with this power tool. *Failure to heed the following instructions can lead to electric shock, fire and/or severe injuries.*

Save all warnings and instructions for future reference.

- **Do not use the power tool if it is damaged.** *There is a danger of accident.*
- **Do not reach between the pipe and the bending former during bending.** *There is a risk of injury.*
- **Protect persons accompanying the work against the moving pipe during bending.** *Danger of injury.*
- **Be careful when bending with REMS pipe bending machines. These develop a high bending force.** *Danger of injury from improper use.*
- **Never let the power tool operate unattended. Switch off the power tool during longer work breaks, pull out the mains plug/battery.** *Electrical devices can cause hazards which lead to material damage or injury when left unattended.*

- **Only allow trained persons to use the power tool.** *Apprentices may only use the power tool when they are over 16, when this is necessary for their training and when they are supervised by a trained operative.*
- **Children and persons who, due to their physical, sensory or mental abilities or lack of experience and knowledge are unable to operate the power tool safely may not use this power tool without supervision or instruction by a responsible person.** *Otherwise there is a risk of operating errors and injuries.*
- **Check the power cable of the power tool and extension leads regularly for damage.** *Have these renewed by qualified experts or an authorised REMS customer service workshop in case of damage.*
- **Only use approved and appropriately marked extension leads with a sufficient cable cross-section.** *Use extension leads up to a length of 10 m with cable cross-section 1.5 mm², from 10–30 m with cable cross-section 2.5 mm².*
- **REMS bending spray in spray cans contains environmentally friendly but highly inflammable propellant gas (butane). Aerosol cans are pressurised; do not open by force. Protect them against direct sunlight and temperatures above 50°C.** *The aerosol cans can burst, risk of injury.*

Safety Instructions for Batteries

⚠ WARNING

Read all the safety notes, instructions, illustrations and technical data which come with this power tool. *Failure to heed the following instructions can lead to electric shock, fire and/or severe injuries.*

Save all warnings and instructions for future reference.

- **Only use the battery in REMS power tools.** *Only then is the battery safe from dangerous overloading.*
- **Only use original REMS batteries with the voltage specified on the rating plate.** *Using other batteries can lead to injuries and risk of fire due to exploding batteries.*
- **Use the REMS battery and the rapid charger only in the specified operating temperature range.**
- **Only recharge REMS batteries in the REMS rapid charger** *There is a risk of fire if an unsuitable battery charger is used.*
- **Charge the REMS battery to full capacity with the rapid charger before using for the first time.** *Batteries are delivered partly charged.*
- **Never charge batteries unattended.** *Battery chargers and batteries can cause hazards which lead to material damage and/or injury when charged unattended.*
- **Insert the REMS battery into the battery compartment straight and without force.** *There is a risk of bending the battery contacts and damaging the battery.*
- **Protect the batteries against heat, sunlight, fire, moisture and wet.** *There is a risk of explosion and fire.*
- **Do not use the batteries in areas where there is a risk of explosion and in the vicinity of inflammable gases, solvents, dust, fumes, liquids for example.** *There is a risk of explosion and fire.*
- **Do not open the battery or modify its construction.** *There is a risk of explosion and fire due to short-circuiting.*
- **Do not use batteries with damaged housings or damaged contacts.** *Damage to or improper use of the battery can cause fumes to escape. The fumes can irritate the respiratory tracts. Let in fresh air and consult a doctor in case of symptoms.*
- **Fluid can leak from the battery when used improperly. Do not touch the fluid.** *Leaking fluid can cause skin irritation and burns. Rinse off immediately with water in case of contact. Also consult a doctor if the fluid gets into the eyes.*
- **Observe the safety instructions on the battery and the rapid charger.**
- **Keep the unused battery away from paper clips, coins, keys, nails, screws or other small metal objects which could cause bridging of the contacts.** *There is a risk of explosion and fire due to short-circuiting.*
- **Remove the battery before stowing/storing the power tool for long periods of time.** *Protect the battery contacts against short-circuiting, e.g. with a cap. This reduces the risk of fluids escaping from the batteries.*
- **Do not throw defective batteries in the normal household waste.** *Hand the defective batteries over to an authorised REMS contract service workshop or a recognised disposal company. Observe the national regulations. See also page 6. Disposal.*
- **Keep batteries out of reach of children.** *Batteries can be life threatening if swallowed, seek medical assistance immediately.*
- **Avoid contact with leaking batteries.** *Leaking fluid can cause skin irritation and burns. Rinse off immediately with water in case of contact. Also consult a doctor if the fluid gets into the eyes.*
- **Take the batteries out of the power tool when they are empty.** *This reduces the risk of fluids escaping from the batteries.*
- **Never recharge the non-rechargeable batteries, open them, throw them on fires or create a short-circuit.** *The batteries can cause fires and burst. There is a risk of injury.*

Explanation of symbols

⚠ WARNING	Danger with a medium degree of risk which could result in death or severe injury (irreversible) if not heeded.
⚠ CAUTION	Danger with a low degree of risk which could result in minor injury (reversible) if not heeded.
NOTICE	Material damage, no safety note! No danger of injury.
	Read the operating manual before starting
	Use ear protection
	Power tool complies with protection class II
	Environmentally friendly disposal
CE	CE conformity mark

1. Technical Data

Use for the intended purpose

⚠ WARNING

REMS Curvo and REMS Akku-Curvo are intended for the purpose of cold draw bending of pipes up to 180°.
REMS Curvo 50 is intended for cold draw bending of pipes up to 90°.
All other uses are not for the intended purpose and are prohibited.

1.1. Scope of Supply

REMS Curvo:	Electric pipe bending machine, insert bolts, bending formers and back formers according to ordered set, instruction manual, steel case.
REMS Curvo 50:	Electric pipe bending machine, square driver 35–50, support 35–50, insert bolt, instruction manual, transport crate.
REMS Akku-Curvo:	Cordless pipe bending machine, Li-Ion battery, rapid charger Li-Ion/Ni-Cd, insert bolt, bending formers and back formers according to ordered set, instruction manual, steel case.

1.2. Article numbers

REMS Curvo drive unit	580000
REMS Curvo 50 drive unit	580100
REMS Akku-Curvo Li-Ion drive unit	580002
Square driver 35–50, support 35–50 (REMS Curvo 50)	582110
Square driver 10–40, support 10–40 (REMS Curvo 50)	582120
Insert bolt	582036
Rapid charger Li-Ion/Ni-Cd (REMS Akku-Curvo)	571560
Li-Ion 18 V, 3.0 Ah battery (REMS Akku-Curvo)	565225
REMS bending spray, 400 ml	140120
Machine holder 3B	586100
Machine holder WB	586150
Steel case (REMS Curvo)	586000
Steel case (REMS Akku-Curvo)	586015
Transport crate (REMS Curvo 50)	590160
Steel case (bending former and back former of REMS Curvo 50)	586012
REMS CleanM	140119
Bending formers and back formers	see Fig. 3

1.3. Applications

No cracks or wrinkles shall occur during professional cold bending. Pipe qualities and sizes which do not guarantee this are not suited to be bent with REMS Curvo, REMS Curvo 50 and REMS Akku-Curvo.

Hard copper pipes are cold bendable up to Ø 18 mm according to DIN EN 1057, minimum radii must be complied with. Bending formers and back formers for larger bending radii can be supplied.

REMS Curvo

- Hard, half-hard, soft copper pipes, also thin walled, Ø 10–35 mm, Ø ⅜–1⅜".
- Soft, jacketed copper pipe, also thin walled, Ø 10–18 mm.
- Thick-walled copper pipes K65 for refrigeration and air conditioning technology EN 12735-1 Ø ⅜–1⅜".
- Stainless steel pipes of the pressfitting systems Ø 12–28 mm.
- C6 steel pipes, also jacketed, of the pressfitting systems Ø 12–28 mm.
- Soft precision steel pipes Ø 10–28 mm.
- Steel pipes DIN EN 10255 (DIN 2440) Ø ¼"–¾".
- Electrical installation pipes DIN EN 50086 Ø 16–32 mm.
- Composite pipes Ø 14–40 mm.

Largest bending angle 180°

REMS Curvo 50

- Steel pipes as per DIN EN 10255 (DIN 2440) Ø ¼"–1¼".
- Stainless steel pipes EN ISO 1127, EN 10217-7 Ø ½–1¼", s ≤ 2.6 mm.
- Hard, half-hard and soft copper tubes Ø 10–42 mm.
- Thin walled copper tubes Ø 10–35 mm.
- Thick-walled copper pipes K65 for refrigeration and air conditioning technology EN 12735-1 Ø ⅜–1⅜".
- Stainless steel tubes of pressfitting systems Ø 12–42 mm.
- (Jacketed) C-steel pipes of the pressfitting systems Ø 12–42 (28) mm.
- Composite tubes Ø 14–50 mm.
- Soft precision steel pipes Ø 10–28 mm.
- Electrical installation pipes DIN EN 50086 Ø 16–32 mm.

Largest bending angle 90°

REMS Akku-Curvo

- Hard, half-hard, soft copper pipes, also thin walled, Ø 10–28 mm, Ø ⅜–1⅛".
- Soft, jacketed copper pipe, also thin walled, Ø 10–18 mm.
- Thick-walled copper pipes K65 for refrigeration and air conditioning technology EN 12735-1 Ø ⅜–1⅛".
- Stainless steel pipes of the pressfitting systems Ø 12–28 mm.
- C6 steel pipes, also jacketed, of the pressfitting systems Ø 12–28 mm.
- Soft precision steel pipes Ø 10–28 mm.
- Steel pipes DIN EN 10255 (DIN 2440) Ø ¼–½".
- Electrical installation pipes DIN EN 50086 Ø 16–25 mm.
- Composite pipes Ø 14–32 mm

Largest bending angle 180°

Operating temperature range

REMS Curvo, REMS Curvo 50, REMS Akku-Curvo	–10 °C – +60 °C (14 °F – +140 °F)
Battery	–10 °C – +60 °C (14 °F – +140 °F)
Rapid charger	0 °C – +40 °C (32 °F – +113 °F)

	Curvo	Curvo 50	Akku-Curvo
1.4. Speed			
Speed infinitely adjustable	0…4 min^{-1}	0…1 min^{-1}	0…3,33 min^{-1}
1.5. Electrical data			
REMS Curvo, REMS Curvo 50	230 V~; 50–60 Hz; 1000 W or 110 V~; 50–60 Hz; 1000 W Intermittent service S3 15% (AB 2/14 min), double-insulated, interference-suppressed. Protection class IP 20.		
REMS Akku-Curvo	18 V ⎓; 3.0 Ah		
Rapid charger	Input	230 V~; 50–60 Hz; 65 W Protection class II.	
	Output	10.8–18 V ⎓ all-insulated, interference-suppressed	
	Input	110 V~; 50–60 Hz; 65 W	
	Output	10.8–18 V ⎓ all-insulated, interference-suppressed	
1.6. Dimensions (mm)	**Curvo**	**Curvo 50**	**Akku-Curvo**
L×W×H:	585×215×140 (23"×8½"×5½")	640×240×95 (25"×9½"×3¾")	540×280×140 (21¼"×11"×5½")
1.7. Weights			
Drive unit	8.3 kg (18.3 lb)	16.9 kg (37.3 lb)	8.6 kg (with batt.) (19.0 lb)
Bending former	0.2…3.8 kg (0.4…8.4 lb)	4.44…7.8 kg (9.7…17.2 lb)	0,2…2.6 kg (0.4…5.7 lb)
Back former	0.1…0.2 kg (0.2…0.4 lb)	0.2…0.4 kg (0.4…0.9 lb)	0.1…0.2 kg (0.2…0.4 lb)
Insert bolt	0.4 kg (0.9 lb)	0.4 kg (0.9 lb)	0.4 kg (0.9 lb)
REMS battery Li-Ion 18 V, 3.2 Ah			0.7 kg (1.5 lb)
1.8. Noise information			
Emission at workplace	93 dB (A)	92 dB (A)	81 dB (A)
Sound pressure level	L_{pA} = 86 dB (A)	88 dB (A)	75 dB (A)
Sound power level	L_{wA} = 97 dB (A)	88 dB (A)	88 dB (A)
Uncertainty	K = 3 dB (A)		
1.9. Vibrations			
Weighted effective value of acceleration	< 2.5 m/s² K = 1,5 m/s²	2.5 m/s²	2.5 m/s²

The indicated weighted effective value of acceleration has been measured against standard test procedures and can be used by way of comparison with another device. The indicated weighted effective value of acceleration can also be used as a preliminary evaluation of the exposure.

⚠ CAUTION

The indicated weighted effective value of acceleration can differ during operation from the indicated value, dependent on the manner in which the device is used. Dependent upon the actual conditions of use (periodic duty) it may be necessary to establish safety precautions for the protection of the operator.

2. Preparations for Use

2.1. Electrical connection

⚠ WARNING

Caution: Mains voltage present! Before connecting the electric pipe bending machine or the rapid charger, check whether the voltage given on the rating plate corresponds to the mains voltage. On building sites, in a wet environment, indoors and outdoors or under similar installation conditions, only operate the electric pipe bending machine on the mains with a fault current protected switch (FI breaker) which interrupts the power supply as soon as the leakage current to earth exceeds 30 mA for 200 ms.

Rechargeable batteries

NOTICE

Always hold the battery (17) upright when inserting it in the drive unit or the rapid charger. If inserted at an angle it can cause damage to the contacts and result in a short circuit which damages the battery.

Total discharging by undervoltage

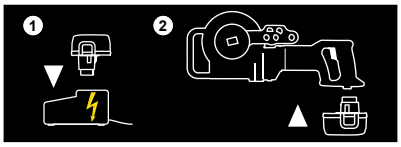
The Li-Ion batteries may not drop below a minimum voltage because otherwise the battery could be damaged by "total discharge". The cells of the REMS Li-Ion battery are delivered pre-charged to approx. 40 %. Therefore the Li-Ion batteries must be charged before use and recharged regularly. Failure to observe this regulation of the cell manufacturer can lead to damage to the Li-Ion battery by total discharging.

Total discharging due to storage

If a relatively low charged Li-Ion battery is stored, self discharging can lead to total discharge damage of the battery after longer storage. Li-Ion batteries must therefore be charged before storing and recharged every six months at the latest and charged again before use.

NOTICE

Charge the battery before use. Recharge Li-Ion batteries regularly to avoid their total discharge. The rechargeable battery will be damaged by total discharge.



Only use a REMS rapid charger for charging. New Li-Ion batteries and Li-Ion batteries which have not been used for a long time only reach full capacity after several charges. Non-rechargeable batteries may not be charged.

Rapid charger Li-Ion/Ni-Cd (Art. No. 571560)

The left control lamp lights up and remains green when the mains plug is plugged in. If a battery is inserted in the rapid charger, the green control lamp flashes to indicate that the battery is charging. The green light stops flashing and remains on to signal that the battery is fully charged. If the red control lamp flashes, the battery is defective. If the red control lamp comes on and remains on, this indicates that the temperature of the rapid charger and / or the battery is outside the permissible range of 0°C to +40°C.

NOTICE

The rapid chargers are not suitable for outdooruse.

2.2. Selecting the bending tools

REMS Curvo (Fig. 1a), REMS Akku-Curvo (Fig. 1c)

Put a bending former (1) corresponding to the pipe size onto the square driver (2). The mounting is designed such that the bending former can only be fully fitted in one direction. Keep the back former (3) and the insert bolt (4) corresponding to the pipe size at the ready.

REMS Curvo 50 (Fig. 1b), Ø 35 – 50

Put a bending former (1) corresponding to the pipe size onto the square driver 35–50 (12). The mounting is designed such that the bending former can only be fully fitted in one direction. Keep the back former (3), the support 35–50 (11) and the insert bolt (4) corresponding to the pipe size at the ready.

REMS Curvo 50 (Fig. 1b), Ø 10 – 40

Insert square driver 35–50 (12) and square driver 10–40 (14) into the drive unit. Put a bending former (Fig. 1a (1)) corresponding to the pipe size onto the square driver 10–40 (14). The mounting is designed such that the bending former can only be fully fitted in one direction. Keep the back former (3), the support 10–40 (13) and the insert bolt (4) corresponding to the pipe size at the ready.

NOTICE

In REMS Curvo 50 the support 35–50 (11) or support 10–40 (13) respectively should be attached above the back formers and bending formers for all sizes. Up to and including sizes 24 R75 (¾" R75) the support should also be attached below (15). This is hung in on one side to the square collar of the square driver 10–40 (14) and on the other side with the locating pin (16) in the outermost bore hole of the support at the bottom (15) marked out in the housing (see 3.1.).

The drive unit gets damaged when bending without this support at the bottom!

3. Operation

Use ear protection

3.1. Working procedure

Turn/slide setting ring/slide (7) to »L« (reverse). Press the safety inching switch (8) whilst gripping the motor handle (9). The bending former turns clockwise into its starting position against a fixed stop. Release the safety inching switch if possible **before** reaching the fixed stop so that this starts up in run out, i.e. the built-in slip clutch is not unnecessarily loaded. Turn/slide setting ring/slide

(7) to »R« (forward). Place pipe into bending former so that the pipe end protrudes at least 10 mm beyond the driver (10). With the pipe sizes 22 – 50 mm, the pipe must be pressed into the radius of the bending former. Apply the corresponding back former (3) and push the insert bolt (4) into the appropriate hole on the device.

NOTICE

In REMS Curvo 50 the support 35 – 50 (11) or support 10 – 40 (13) respectively should be attached above the back formers and bending formers for all sizes. Up to and including sizes 24 R75 (¾" R75) the support should also be attached below (15). This is hung in on one side to the square collar of the square driver 10 – 40 (14) and on the other side with the locating pin (16) in the outermost bore hole of the support at the bottom (15) marked out in the housing.

When bending without this support at the bottom the drive unit gets damaged!

Ensure here that the insert bolt (4) for the sizes up to 22 mm goes into the left-hand locating hole (5) and from size 28 mm into the right-hand locating hole (6).

Operate the safety inching switch (8) to bend the pipe. Towards the end of the desired bend, only press the switch lightly. The end point can then be approached slowly and therefore precisely. A scale is provided on each bending former which together with the marking/outer edge of the back former allows precise bending up to 180°/ Curvo 50 up to 90°. Be aware that various materials spring back differently. If a 180°/ Curvo 50: 90° bend is produced and the end position is reached, the slip clutch comes into action again. Release the safety inching switch **immediately**. Turn/slide setting ring/slide (7) to »L« (reverse). Allow the bending former to run back a few degrees until the pipe is unclamped by lightly pressing the safetyinching switch (8). Pull out the insert bolt (4) and remove the bent pipe. When bending on site, the bending former too can be taken off for easier removal of the bent pipe. Only allow the bending former to return to its starting position **after** removal of the pipe as otherwise the produced bend might be damaged. When bending stainless steel pipes of pressfitting systems, it must be ensured that the marking on the pipe made by the driver (10) does not lie in the sealing area of the pressing joint.

3.2. Bending to measure

If a bend is to be in a certain place on the pipe, a length correction must be made according to the pipe size. The correction dimension X specified in Fig. 2 must be considered for a 90° bend/ 90° bend. The nominal dimension L must be shortened by the value X here. If, for example, a 90° bend with pipe size 22 with bending radius 77 the dimension L is to be = 400 mm, the mark must be made on the pipe at 319 mm. This mark must then be placed at the 0 mark on the bending former as shown in Fig. 2.

3.3. Unit support REMS Curvo, REMS Akku-Curvo

A height-adjustable machine holder 3B (Art. No. 586100) or height-adjustable machine holder WB (Art. No. 586150) for fixing to a workbench is available as an accessory.

3.4. Bending lubricant

REMS bending spray (Art. No. 140120) ensures a continuous film of lubricant for reduced force and even bending. High pressure-resistant, acid-free Without HFC and therefore not harmful to the ozone layer.

3.5. Low Discharge Protection

REMS Akku-Curvo is equipped with low discharge protection for the battery. This switches off the power tool as soon as the battery needs to be recharged. In this case remove the battery and charge with the REMS rapid charger.

4. Maintenance

Notwithstanding the maintenance described below, it is recommended to send in the electric pipe bender, rapid charger and battery to an authorised REMS contract customer service workshop for inspection and periodic testing of electrical devices at least once a year. In Germany, such periodic testing of electrical devices should be performed in accordance with DIN VDE 0701-0702 and also prescribed for mobile electrical equipment according to the accident prevention rules DGUV, regulation 3 "Electrical Systems and Equipment". In addition, the respective national safety provisions, rules and regulations valid for the application site must be considered and observed.

4.1. Maintenance

⚠ WARNING

Pull out the mains plug or remove the battery before maintenance work!

Clean the power tool regularly especially when it has not been in use for a long time. Keep the bending contours of the bending former (1) and back former (3) clean. Clean plastic parts (e.g. housing) only with REMS CleanM machine cleaner (Art. No. 140119) or a mild soap and a damp cloth. Do not use household cleaners. These often contain chemicals which can damage the plastic parts. Never use petrol, turpentine, thinner or similar products for cleaning. Make sure that liquids never get onto or inside the power tool. Never immerse the power tool in liquid.

4.2. Inspection / maintenance

⚠ WARNING

Remove the mains plug or remove the battery before maintenance and repair work! This work may only be performed by qualified personnel.

The gear runs in a life-long grease filling and therefore needs no lubrication. The REMS pipe bending machines with universal motor have carbon brushes. These are subject to wear and must therefore by checked and changed by qualified specialists or an authorised REMS customer service workshop from time to time. In the battery-operated drive units, the carbon brushes of the motor are subject to wear. These cannot be replaced; the DC motor must be replaced.

5. Faults

5.1. Fault: Bending former sticks during bending although the motor is running.

Cause:

- Pipe with too great wall thickness bent.
- Slip clutch worn.
- Carbon brushes worn.
- Battery flat or defective (REMS Akku-Curvo).

Remedy:

- Only use approved pipes.
- Have the slip clutch replaced by qualified personnel or an authorised REMS customer service workshop.
- Have the carbon brushes or DC motor changed by qualified personnel or an authorised REMS customer service workshop.
- Charge the battery with the Li-Ion/Ni-Cd rapid charger or change the battery.

5.2. Fault: Bend is out of round.

Cause:

- Wrong bending former/back former.
- Worn back former.
- Damaged pipe.

Remedy:

- Use the appropriate bending former/back former for the pipe.
- Change back former.
- Only use undamaged pipes.

5.3. Fault: Pipe slips out of the driver (10) during bending.

Cause:

- Driver bent or worn.
- Pipe does not protrude far enough out of the driver.

Remedy:

- Change bending former (1).
- Place pipe in the bending former so that the pipe end protrudes at least 10 mm beyond the driver.

5.4. Fault: Device does not start.

Cause:

- Mains lead defective.
- Device defective.
- Carbon brushes worn.
- Battery flat or defective (REMS Akku-Curvo).

Remedy:

- Have the mains lead changed by qualified personnel or an authorised REMS customer service workshop.
- Have the device repaired/serviced by qualified personnel or an authorised REMS customer service workshop.
- Have the carbon brushes changed by qualified personnel or an authorised REMS customer service workshop.
- Charge the battery with the Li-Ion/Ni-Cd rapid charger or change the battery.

6. Disposal

The drive units, batteries and rapid chargers may not be thrown in the household waste when they are finished with. They must be disposed of according to the legal regulations. Lithium batteries and battery packs of all battery systems may only be disposed of in the discharged state, all contacts of incompletely discharged lithium batteries and battery packs must be covered with insulating tape.

7. Manufacturer's Warranty

The warranty period shall be 12 months from delivery of the new product to the first user. The date of delivery shall be documented by the submission of the original purchase documents, which must include the date of purchase and the designation of the product. All functional defects occurring within the warranty period, which are clearly the consequence of defects in production or materials, will be remedied free of charge. The remedy of defects shall not extend or renew the warranty period for the product. Damage attributable to natural wear and tear, incorrect treatment or misuse, failure to observe the operational instructions, unsuitable operating materials, excessive demand, use for unauthorized purposes, interventions by the customer or a third party or other reasons, for which REMS is not responsible, shall be excluded from the warranty

Services under the warranty may only be provided by customer service stations authorized for this purpose by REMS. Complaints will only be accepted if the product is returned to a customer service station authorized by REMS without prior interference in an unassembled condition. Replaced products and parts shall become the property of REMS.

The user shall be responsible for the cost of shipping and returning the product.

The legal rights of the user, in particular the right to make claims against the seller under the warranty terms, shall not be affected. This manufacturer's warranty only applies for new products which are purchased in the European Union, in Norway or in Switzerland.

This warranty is subject to German law with the exclusion of the United Nations Convention on Contracts for the International Sales of Goods (CISG).

8. Spare parts lists

For spare parts lists, see www.rems.de → Downloads → Parts lists.

REMS Sinus

REMS Curvo before commissioning!

⚠ CAUTION

Keep proper footing while bending larger pipe sizes with REMS Sinus. During a possible break of the pipe the back pressure gives way immediately. Risk of injury!

Use for the intended purpose

⚠ WARNING

REMS Sinus is intended for cold draw bending of pipes up to 180°. All other uses are not for the intended purpose and are therefore prohibited.

Scope of Supply
Manual pipe bending machine, insert bolt, bending formers and back formers according to ordered set, REMS bending spray, instruction manual, steel case.

Article numbers

REMS Sinus	154000
REMS bending spray, 400 ml	140120
Insert bolt	582036
Steel case (REMS Sinus)	154160
REMS CleanM	140119
Bending formers and back formers	see Fig. 3

Dimensions L × W × H	735 × 155 × 140 mm (28.9" × 6.1" × 5.5")
Weight	4.9 kg (10.8 lb)

Applications
No cracks or wrinkles shall occur during professional cold bending. Pipe qualities and sizes which do not guarantee this are not suited to be bent with REMS Sinus.

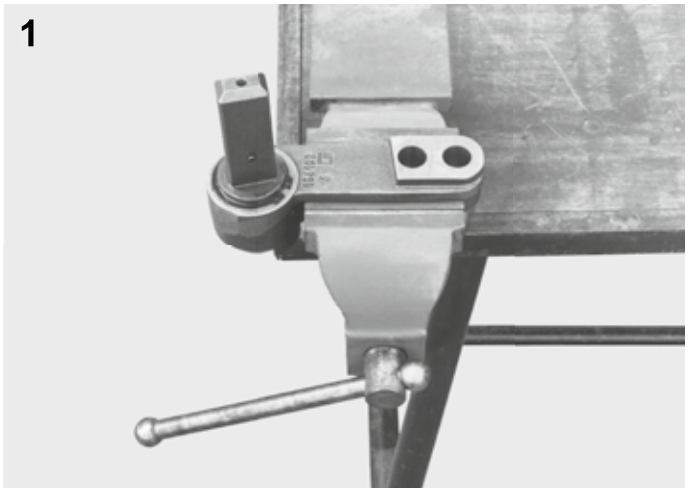
- Hard, half-hard, soft copper pipes, also thin walled, Ø 10–22 mm, Ø ⅜–⅞".
- Soft, jacketed copper pipe, also thin walled, Ø 10–18 mm.
- Stainless steel pipes, jacketed C-steel pipe of the pressfitting systems Ø 12–18 mm.
- C-steel pipes of the pressfitting systems Ø 12–22 mm.
- Soft precision steel pipes Ø 10–20 mm.
- Electrical installation pipes DIN EN 50086 Ø 16–20 mm.
- Composite pipes Ø 14–32 mm.

Largest bending angle	180°

Guarantee conditions see REMS Curvo.

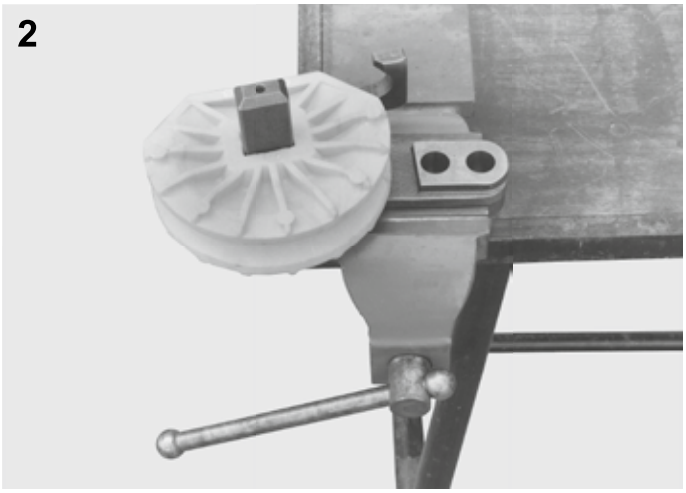
Operation with vice

1



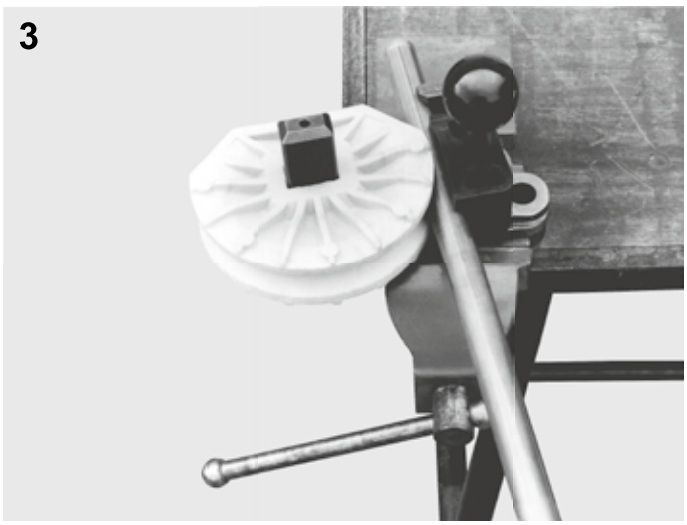
Securely clamp bender drive in vice and move spindle in starting position.

2



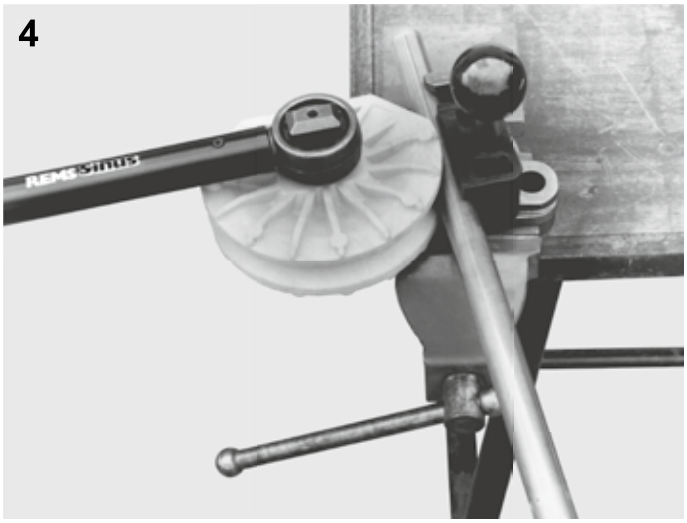
Insert selected bending former into the spindle.

3



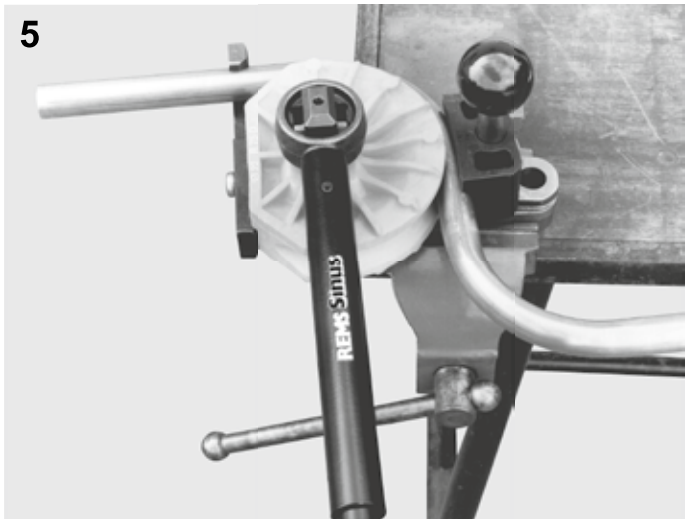
Put the pipe into the bending former and push slightly into the groove. Fit selected back former onto the pipe, lock with insert bolt.

4



Put lever with square seat into the spindle in a proper position.

5



Turn lever anticlockwise until the required bending angle has been reached.

After completion of bend, turn the lever a little backwards, pull insert bolt, remove back former, take out bend from former.

Operation as 2-hand-bender:

Screw additional lever into the bender drive, then continue as described in fig. 2 – 5.