ZUWA

Pumpen und Spritzgeräte

Operating Instructions
Flushing and Filling Station

FLUSH PRO MC 60/30 | FLUSH PRO MC 90/55 | FLUSH PRO MC 90/120

Original Operating Instructions

FLUSH PRO MC 60/30 | FLUSH PRO MC 90/55 | FLUSH PRO MC 90/120

1. Declaration of conformity

The product complies with the requirements of the applicable European directives. The conformity was declared. The documents to which the declaration relates and the original declaration of conformity are available at the manufacturer.

2. Introduction

Intended use

The filling unit is designed for filling, flushing and venting thermal solar systems and heat pump systems and also closed systems for heating and cooling with initial pressure below 4 bars. Any other use or extended use is considered to be improper. The manufacturer is not liable for any resulting damage.

Notes on the documentation

This manual provides important information for a safe and correct operation of the filling stations FLUSH PRO MC 60/90 MC 90/55 MC 90/120.
The manual is designed for qualified personnel who are trained and specialised in installing heating systems. Service and maintenance works must only be carried out by approved specialists.

Subject to technical modifications

The continuous development and improvement of our products may cause minor modifications of technical data and illustrations.

2.1 Legend

	Danger: immediate danger of death and severe injury
	Danger: danger of death from electric shock
	Danger: danger of scald burn
	Danger of environmental and material damage
	Information, note

2.2 General safety instructions

Store these instructions in such a way that they are accessible at all times for operating personnel!

In addition to these operating instructions the following documents of related components and of the pumping media should be applicated:

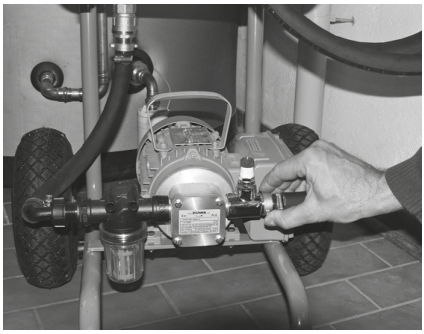
► technical specifications
► material safety data sheets
► operating instructions

	The manufacturer shall not be held liable for damage resulting from non-adherence to the operating instructions.
 **Danger**	**Danger of death due to electric shock** • Prior to work on the pump, always disconnect the drive from the power supply.
 **Danger**	**Danger of death due to explosion** • Do not pump any liquids with a flash point of less than 55 °C. • Do not pump petrol or solvents.
 **Danger**	**Danger of scald burn due to high media temperature** • Fill the system only when cold. **Danger of burn due to hot motor casing** • Do not block neither suction nor pressure hose more than 1 minute to avoid overheating of the motor.
 **Warning**	**Danger of injury due to splashing liquid** • Connect the hoses tightly to the pump.
 **Caution**	**Material damage due to dry running** • Never allow the pump to run dry for more than 1 minute. **Material damage due to tilting of the cart on uneven ground** • Operate the filling unit only on even ground. **Danger of environmental damage due to hazardous pumped media** • Collect escaping pumped media and dispose of according to the locally applicable regulations. **Material damage due to improper storage** • Prior to extended periods of pump down time clean pump to avoid adhesions and damage to the impeller. • Store pump under frost-protected conditions.

3. Transportation an unpacking

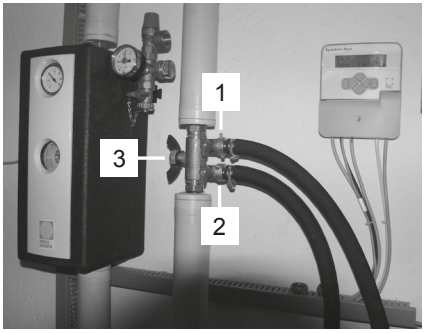
► After unpacking, immediately check the filling unit for completeness and damage.
► Immediately report any transit damage to the supplying company.
► Dispose of packaging material according to the respective local regulations.

1. Mounting and commissioning

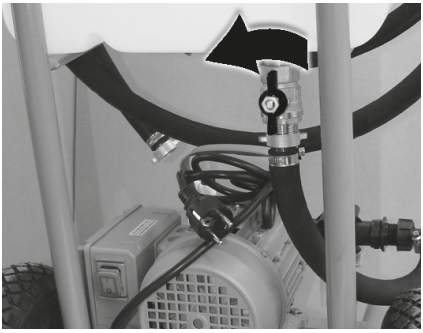


1. Connect filling hose to pump outlet.

2. Connect return hose to tank.



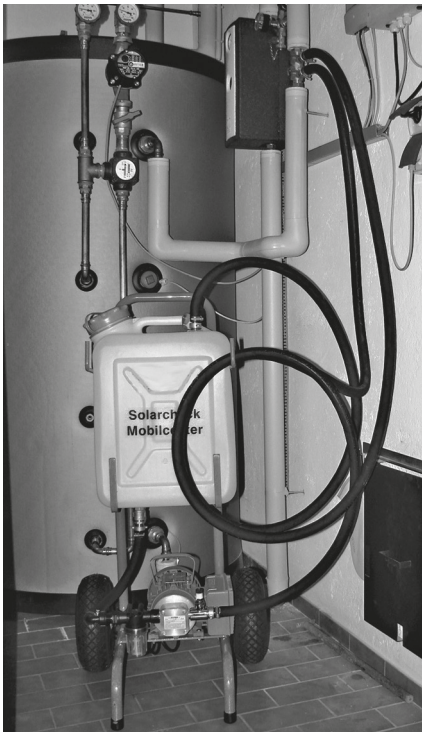
3. Connect filling hose (1) and return hose (2) to the fill/vent valves and open valves. Close stop valve (3).



4. Fill tank and open ball valve.

5. Insert cable of pump motor into socket.

6. Switch on pump.



7. Open tank lid to ensure the circulation of the air.

Caution: Monitor fluid level in the tank and, if necessary, refill heat transfer fluid to prevent air entering the circuit.

8. Flush the circuit with the fluid. Check at the vision panel of the filter or through the tank opening if there are still air bubbles in the heat transfer fluid. Continue flushing until there is no air remaining in the fluid.

Other procedures of filling can be performed for different types of closed systems, including those procedures when direct filling from tanks with heat transfer fluid, supplied from the manufacturer, is required.

1. End of operation

After filling and flushing the system:

► Switch off pump.
► Close fill and vent valve (1+2) at the circuit.
► Open stop valve (3) between fill and vent valve.

Caution: Collect escaping pumped media in a container.

The pressure that is generated between pump outlet and fill valve when flushing the pipe can be released by opening the filter at the pump inlet. It will be easier then to unscrew the filling hose from the fill valve.

► Unscrew the filter casing and flush remaining liquid.
► Unscrew the filling hose from the fill valve.
► Unscrew return hose from vent valve.
► Screw open hose ends together with the provided connecting piece in order to avoid dripping or escaping of fluid during transport.

Note that there is no filter at FLUSH PRO MC 90/55 and MC 90/120

2. Maintenance

 **Danger**	**Danger of death due to electric shock** • Prior to work on the pump, always disconnect the drive from the power supply.
 **Caution**	**Danger of environmental damage due to hazardous pumped media** • Collect escaping pumped media and dispose of according to the locally applicable regulations.

6.1 Connections

• Check regularly if hose couplings are tight.

6.2 Cleaning the filter (FLUSH PRO MC 60/30 only)

The fine filter on the suction side of the pump filters out sold and weld residues. Check the vision panel at the filter regularly and clean the filter when you see dirt deposits on the strainer.

• Screw off the filter casing, remove the strainer and clean both with rinsing water or compressed air.

6.3 Disassembling the pump

1. Disconnect line connections
2. Unscrew bolts on the pump side
3. Remove cover and side disc
4. Pull housing with impeller and rear side disc off the shaft

6.4 Replacing components

Impeller

To change the impeller we recommend to use a special tool. See chapter 8, Accessories.

• Push impeller out of the casing

• Insert a new impeller. Observe direction of impeller wings (see adjacent illustration): Impeller wings must be bent to the opposite side of the rotating direction.

Lateral discs

• Turn around or replace

Seals

• Replace O-rings and push firmly into the recesses

Replacing shaft gasket:

1. Remove retaining ring with suitable pliers
2. Push out bearing and shaft gasket
3. Push in new shaft gasket and bearing
4. Insert retaining rings

6.5 Assembling the pump

Assembly of the pump is the reverse of disassembly – see exploded drawing.

1. Connect lateral disc with punched hole to the rear of the casing
2. Push casing with impeller and second lateral disc onto the shaft
3. Insert and tighten bolts
4. Attach lines

The lateral discs and O-rings must lie precisely in the recesses to ensure that the O-rings are not pinched.

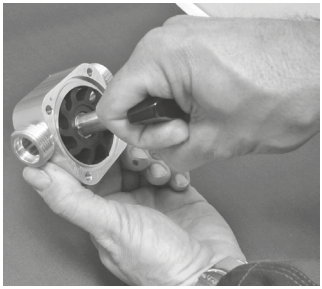
1. Troubleshooting

Fault	Pissible cause	Remedy
Pump does not take in liquid	Intake line is not leaktight	Seal connection or line
	Impeller worn or damaged	Replace impeller
	Suction line or foot valve is blocked	Clean suction line or foot valve
	Pressure line closed or blocked	Open fittings on the pressure side or clean pressure line
	Ball valve at the tank outlet closed or tank empty	Open ball valve or fill tank
Pump does not build up pressure	Impeller or lateral discs are worn	Replace impeller or lateral discs
	Filter clogged	Clean filter (see chapter 6, Maintenance)
	Ball valve at the tank outlet closed	Open ball valve
Liquid escapes from the pump	Shaft gasket or O-ring is missing or defective	Check whether part is in place and insert or replace defective component
Pump does not start	Impeller blocked	Fill pump with the medium to be pumped
	Impeller clogged up or macerated	Use an impeller appropriate to the medium
	Motor defective	Have motor checked by specialist personnel and have repaired if necessary

1. Accessories

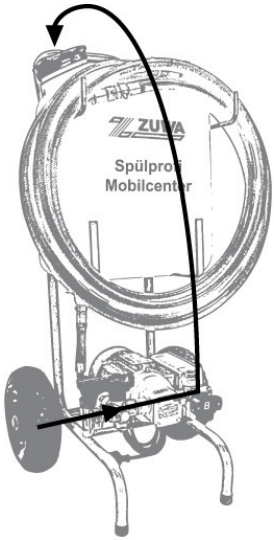
• Kit for filling ground loops including two 150 litres tanks, hose extension and additional stop valves
• Remote control with 10 metres cable
• Tool for changing the impeller
• A useful tool to install the impeller easily into the casing. Suitable for all ZUWA impellers.
Order No.: 110 124 00

tool for changing the impeller



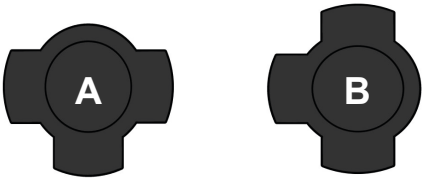
1. Setting of the Multifunctional Valves

The multifunctional valves at pump inlet and outlet provide two ports on each side of the pump. Thus enables the device to perform different functions and to adjust different lines for the fluid, which are described below:

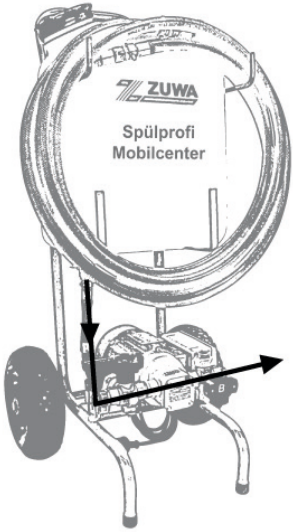


1. Prime fluid from external tanks* and deliver it into the internal tank

Setting of the multifunctional valves:

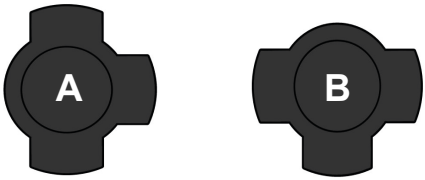


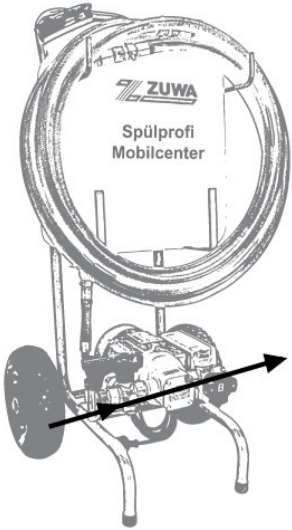
* available as accessory (article No. 105012)



2. Prime fluid from internal tank and deliver it externally / into the installation

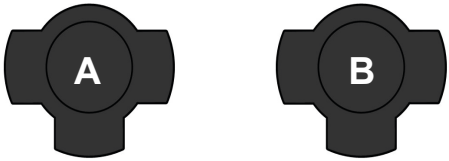
Setting of the multifunctional valves:

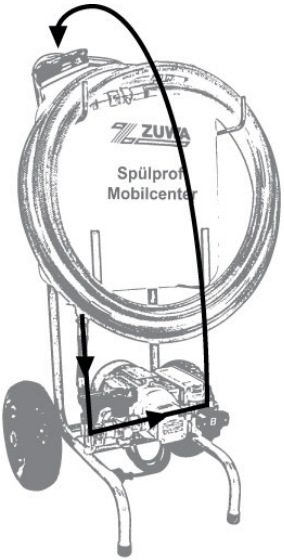




3. Prime fluid from external tanks and deliver it externally / into the installation

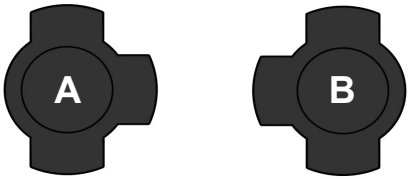
Setting of the multifunctional valves:





4. Circulate fluid between internal tank and pump (e. g. for mixing heat transfer fluid)

Setting of the multifunctional valves:



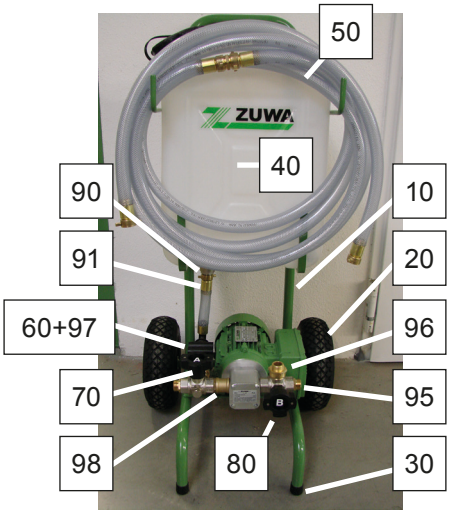
!
Caution

Control the setting of the multifunctional valves before switching on the pump to prevent unforeseen leaking of fluid.

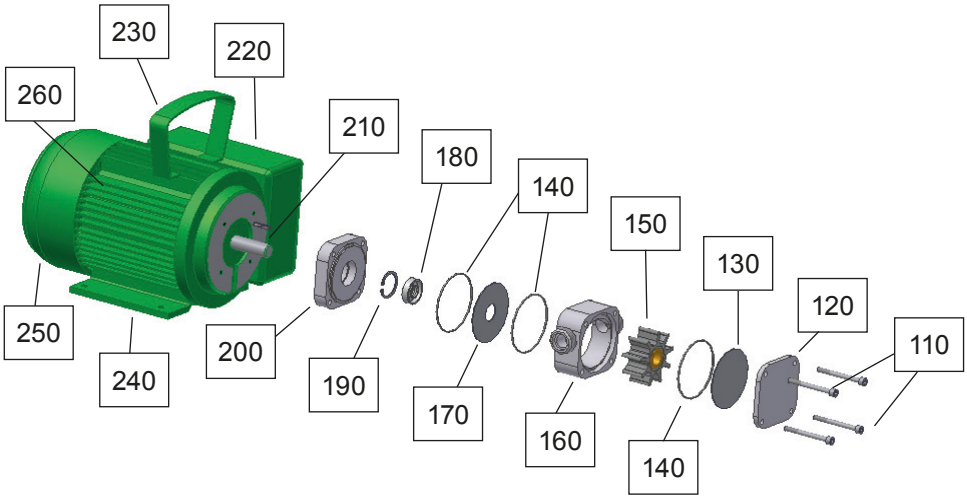
1. Technical data

FLUSH PRO	MC 60/30	MC 90/55	MC 90/120
Voltage	230 V		
Frequency	50 Hz		
Maximum power consumption	550W	1100W	1100W
Maximum fluid temperature	90°C	60°C	60°C
Approved pumping media	water, heat transfer medium		
Maximum operating pressure	5 bar		
Maximum flow rate with heat transfer fluid	60l/min	90l/min	90l/min
Diameter return hose / pressure hose			
Tank content	30 L	55 L	120 L
Dimensions (height / width / depth)			
Weight without packaging (empty tank)			
External tanks content	2 x 150 L		
Dimensions external tanks			
Motor protection class	IP 55		

1. Parts list Flush Pro MC 60/30



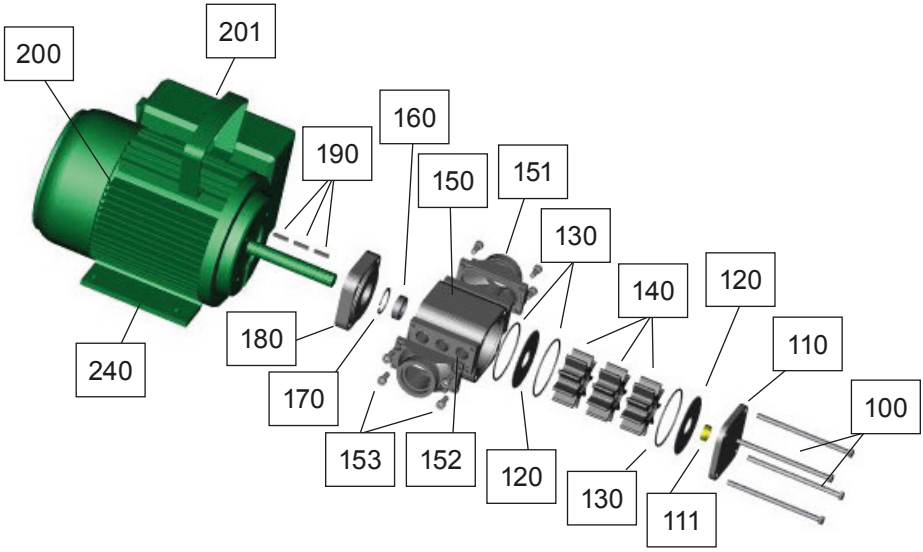
Pos.:	Part/Designation	Art. No.	Count
10	Chassis	13405110BT	1
20	Inflatable wheel	80120	2
30	Rubber pads	80543	2
40	Replacement tank for Solarcheck Mobilcenter	80107	1
50	Hose extension 3 m PVC 19 x 3.5 complete	131124	2
60	Filter pressure line ¾“	8105042	1
70	Multifunctional valve ¾”	80280	2
80	Drain valve ⅜” nickle plated pivotable	132232	1
90	Hose connection 19 R ¾”, grommet ¾”	131213SA	1
91	Low pressure nozzle	131335	7
92	Bow-shaped hose connection ¾” ext. thread	8011202	1
93	O-ring 26-3	80011	2
94	Reducer plug 1” int. x ¾ “ ext. thread PVC	8059203	1
95	Threaded nipple brass ¾” x ¾” ext. thread	131215	3
96	Threaded nipple brass 1” int. x ¾” ext. thread	131062	1
97	Screw thread brass	80069	1
98	Screw socket R ¾” int. thread	131246	1
99	Threaded nipple brass ¾” x ¾” ext. thread	131215	1



Pos.:	Part/Designation	Art. No.	Count
110	Hexagon screw M5 x 55	70031	4
120	Front plate	11012002	1
130	Lateral disc – stainless steel	11012009	1
140	O-ring 56-2 NBR	80003	3
150	Impeller Perbunan large / Polyamid bush	11012912	1
160	Casing UNISTAR-B connection in/out ¾“	110130081	1
170	Lateral disc stainless steel with hole	11012709	1
180	Rotary shaft seal NBR 14 x 26 x 7	80537	1
190	Locking ring I 26 x 1,2	70284	1
200	Rear plate	12000502	1
210	Fitting key A 3 x 3 x 36	70317	1
220	Control box	80628	1
230	Handle for CEG motor	14000202	1
240	Motor base	FUSS00071	1
250	Fan cover for CEG motor	80621	1
260	Motor 230 V; 0,37 kW; 2800 rpm	80606MF	1

1. Parts list Flush Pro MC 90/55

Pos.:	Part/Designation	Art. No.	Count
10	Chassis	13405110BT	1
20	Inflatable wheel	80120	2
30	Tank 55 L	80543	1
31	Sieve for tank 55 L	80107	1
32	Ball valve 1“ x 1” ext. thread	131124	1
40	Multifunctional valve 1”	8105042	2
41	Reducer plug ½” x ⅜ “	80280	1
42	Drain valve ⅜”	132232	1
50	Threaded nipple 1¼ “ int. x 1” ext. thread	131213SA	5
51	Threaded nipple 1 “ ext. x 1” ext. thread	131335	4
60	Hose PVC 25 x 4 transparent, 2 x 3 m	8011202	1
61	Hose connection 25 R 1”	80011	7
62	Low pressure nozzle fastening H25-34.5	8059203	7
63	Elbow 90° brass	131215	4
70	Flow meter K 24	131062	1
80	Pressure gauge glycerine filled, 0 – 10 bar (FLUSH PRO 90M only)	80069	1
90	Kit for filling large loops including two 150 litres tanks, hose extension and additional stop valves (optional)	131246	1



Pos.:	Part/Designation	Art. No.	Count
100	Hexagon screw M5 x 55	70037	4
110	Front plate	11012002GL	1
111	Slide bush	141606	1
120	Lateral disc – stainless steel with hole	11012709	2
130	O-ring 56-2 NBR	80003	3
140	Impeller Perbunan with polyamid bush	11012909	3
150	Casing UNISTAR-C	11013601	1
151	Flange 1 ¼" ext. thread	11013602	2
152	O-ring 50-2 NBR	80005	2
153	Socket head cap screw M5 x 12	70329	8
160	Rotary shaft seal NBR 14 x 26 x 7	80537	1
170	Locking ring I 26 x 1,2	70284	1
180	Rear plate	12000502	1
190	Fitting key A 3 x 3 x 36	70315	3
200	Motor 230 V; 1,1 kW; 2800 rpm UNISTAR-C	5551MK6011	1
201	Control box	806362	1
240	Motor base	806366	2