

Descriptive Technical Documentation

- Model-dependent -

DTD no. 512-6161

Model(s): PW 6161, PW 6201

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A Warning and Safety Instructions

1 General information

These machines should not be installed or operated in any area where there is a risk of explosion.

Note

Service and repair work should only be carried out by suitably qualified persons in accordance with all appropriate local and national safety regulations.

Before any service work is commenced, the machine must be disconnected from the mains.

Service and repair work should only be carried out by suitably qualified persons in accordance with all appropriate local and national safety regulations. Servicing, modification, testing and maintenance of electrical appliances should only be carried out in accordance with all appropriate legal requirements, accident prevention regulations and valid standards. All regulations of the appropriate utility supply companies and standards relating to safety (not limited to electrical safety) are to be complied with.

In addition all local and national safety regulations regarding gas units must be complied with.

Note

Service and repair work on gas machines should only be carried out by suitably qualified persons in accordance with all appropriate local and national safety regulations. Ensure all special regulations applying to gas installations are also complied with.

Before any service work is commenced, the machine must be disconnected from the gas mains.

Danger!

The warnings and instructions on detergent and disinfectant containers must be followed closely. **The operator is responsible for ensuring that all containers are clearly marked** with suitable warnings when detergents and disinfectants are transferred from large containers into smaller ones for use at the installation site.

B Modification History

When?	Who?	What?
29.11.2004	Norbert Polenz	Initial compilation

C Technical Data

Technical data – PW 6161, version June 2004

PW 6161							
Heating			Electric	Gas ⁶⁾	High-pressure steam (indirect)	High-pressure steam (direct)	Low-pressure steam (direct)
Capacity (dry laundry)			16 kg / Fill ratio 1 : 10				
Packaging dimensions							
	Width - Normal/Sea	[mm]	1060/..	../..	1060/..	1060/..	1060/..
	Depth - Normal/Sea	[mm]	1186/..	../..	1186/..	1186/..	1186/..
	Height - Normal/Sea	[mm]	1606/..	../..	1606/..	1606/..	1606/..
Gross weight - Normal/Sea		[kg]	../..	../..	../..	../..	../..
Machine dimensions							
	Width	[mm]	924	924	924	924	924
	Depth	[mm]	1007	–	1007	1007	1007
	Height	[mm]	1400	1400	1400	1400	1400
Net weight		[kg]	454	–	454	454	454
Net weight incl. dispenser rack		[kg]					
Max. floor load in operation							
	Force	[N]	5469	–	5469	5469	5469
	Frequency	[Hz]	19.2	–	19.2	19.2	19.2
Total rated load (EL)							
	3N AC 380 - 415 V 50 Hz	[kW]	17.0	3.0	3.0	3.0	3.0
Heater rating							
	3N AC 380 - 415 V 50 Hz	[kW] or (kg / h)	15.0 ¹⁾	(34)	(37)	–	(13)
Motor rating - Drive motor		[W]	3300	3300	3300	3300	3300
Motor rating							
	Drain pump	[W]					
	Circulation pump	[W]		400	–	–	
Fuse rating ²⁾							
	3N AC 380 - 415 V 50 - 60 Hz	[A]	3 x 25				
	3 AC 220 - 240 V 50 - 60 Hz	[A]	3 x 50				
	3N AC 380 - 415 V 50 Hz	[A]		3 x 16 ⁵⁾	3 x 16	3 x 16	3 x 16
	3 AC 440 V 50 - 60 Hz	[A]	3 x 25				
Connection cable EL ³⁾							

PW 6161							
Heating			Electric	Gas ⁶⁾	High-pressure steam (indirect)	High-pressure steam (direct)	Low-pressure steam (direct)
	3N AC 380 - 415 V 50 - 60 Hz	[mm ²]	5 x 4.0				
	3 AC 220 - 240 V 50 - 60 Hz	[mm ²]	4 x 10.0				
	3N AC 380 - 415 V 50 Hz	[mm ²]		5 x 1.5 ⁵⁾	5 x 1.5	5 x 1.5	5 x 1.5
	3 AC 440 V 50 - 60 Hz	[mm ²]	5 x 4.0				
Water supply							
	Cold		2 x Pressure hose DN 10 (mm dia.) with threaded union 3/4", 1.5 m long				
	Cold hard						
	Hot ≤ 70°C		1 x Pressure hose DN 10 (mm dia.) with threaded union 3/4", 1.5 m long				
	Intake rate, max.		Cold water 2 x 16 l/min; hot water 1 x 16 l/min; Cold hard (optional) 2 x 16 l/min				
Drain connection							
	Drain valve		Plastic pipe DN 70 (mm dia.)				
	Drain pump						
Intake rate, max.							
	Cold	[l/min]	2 x 16				
	Cold hard	[l/min]	Optional 2 x 16				
	Hot	[l/min]	1 x 16				
Drainage rate, max.							
	Drain valve	[l/min]	200				
	Drain pump	[l/min]					
Steam/Gas connection							
	High-pressure steam		-	-	1/2"	1/2"	-
	Condensate		-	-	1/2"	-	-
	Low-pressure steam		-	-	-	-	1/2"
	Gas		-	1/2"	-	-	-
	Exhaust gas		-	DN 150 (mm dia.)	-	-	-
Drum							
	Diameter	[mm]	678				
	Depth	[mm]	440				
	Volume	[l]	159				
	Door opening diameter	[mm]	370				
Drum speed							
	Wash	[rpm]	45				
	Pre-spin	[rpm]					
	Spin	[rpm]	1150				
Drum linear speed							
	Wash	[m/s]	1.6				
	Pre-spin	[m/s]					
	Spin	[m/s]	40.8				

PW 6161						
Heating		Electric	Gas ⁶⁾	High-pressure steam (indirect)	High-pressure steam (direct)	Low-pressure steam (direct)
G-force						
	Wash	0.67				
	Pre-spin					
	Spin	500				
Residual moisture in accordance with DIN 11902 ⁴⁾		[%]	Approx. 46 after 7 min final spin (2 min at 1150 rpm)			
Flow pressure requirement						
	Min.	[kPa]	100			
	Max.	[kPa]	1000			
Largest removable part		Suds container: Dia. 782 mm x 568 mm				
Removal/ Installation time, approx.		[h]	3.0 / 4.0			
Material						
	Plinth	Galvanised sheet steel				
	Drum	Stainless steel 1.4016				
	Suds container	Stainless steel 1.4301				
	Front casing	Stainless steel 1.4301				
	Lid	Stove-finished, galvanised sheet steel, blue				
	Rear panel	Galvanised sheet steel				
	Side panels	Stove-finished, galvanised sheet steel, blue				
Kinetic energy		[Nm]	6667			
Heat dissipation rate		[MJ/h]				
Noise power level						
	Wash	[dB(A) re 1 pW]	65.5			
	Spin	[dB(A) re 1 pW]	87.4			

Table 1: Data sheet – W 6161, version June 2004

¹⁾ Convertible to 10 kW or - kW

²⁾ German operating classification: gL

³⁾ Minimum cross-sectional area in accordance with VDE 0100 Part 430 / Group 2

⁴⁾ Cottons: Standard load in accordance with DIN EN 60456, EI, gas and high-pressure steam

⁵⁾ 50 Hz only

⁶⁾ Natural gas / Liquid gas conversion kit available.

Hot water connection recommended with gas-heated and low-pressure steam-heated machines!

Technical data – PW 6201 (20 kg machine), version June 2004

PW 6201							
Heating			Electric	Gas ⁶⁾	High-pressure steam (indirect)	High-pressure steam (direct)	Low-pressure steam (direct)
Capacity (dry laundry)			20 kg / Fill ratio 1: 10				
Packaging dimensions							
	Width - Normal/Sea	[mm]	1060/..	../..	1060/..	1060/..	1060/..
	Depth - Normal/Sea	[mm]	1296/..	../..	1296/..	1296/..	1296/..
	Height - Normal/Sea	[mm]	1606/..	../..	1606/..	1606/..	1606/..
Gross weight - Normal/Sea		[kg]	../..	../..	../..	../..	../..
Machine dimensions							
	Width	[mm]	924	...	924	924	924
	Depth	[mm]	1132	...	1132	1132	1132
	Height	[mm]	1400	...	1400	1400	1400
Net weight		[kg]	495		495	495	495
Net weight incl. dispenser rack		[kg]	../..	../..	../..	../..	../..
Max. floor load in operation							
	Force	[N]	6076		6076	6076	6076
	Frequency	[Hz]	18.3		18.3	18.3	18.3
Total rated load (EL)							
	3N AC 380 - 415 V 50 Hz	[kW]	21.0	4.4	4.4	4.4	4.4
Heater rating							
	3N AC 380 - 415 V 50 Hz	[kW] or [kg/h]	18.0 ¹⁾	(34)	(50)	...	(13)
Motor rating - Drive motor		[W]	4300	4300	4300	4300	4300
Motor rating							
	Drain pump	[W]					
	Circulation pump	[W]		400	–	–	
Fuse rating ²⁾							
	3N AC 380 - 415 V 50 - 60 Hz	[A]	3 x 35				
	3 AC 220 - 240 V 50 - 60 Hz	[A]	3 x 50				
	3N AC 380 - 415 V 50 Hz	[A]		3 x 16 ⁵⁾	3 x 16	3 x 16	3 x 16
	3 AC 440 V 50 - 60 Hz	[A]	3 x 35				
Connection cable EL ³⁾							
	3N AC 380 - 415 V 50 - 60 Hz	[mm ²]	5 x 6.0				
	3 AC 220 - 240 V 50 - 60 Hz	[mm ²]	4 x 10.0				
	3N AC 380 - 415 V 50 Hz	[mm ²]		5 x 1.5 ⁵⁾	5 x 1.5	5 x 1.5	5 x 1.5

PW 6201							
Heating			Electric	Gas ⁶⁾	High-pressure steam (indirect)	High-pressure steam (direct)	Low-pressure steam (direct)
	3 AC 440 V 50 - 60 Hz	[mm ²]	5 x 6.0				
Water supply							
	Cold		2 x Pressure hose DN 10 (mm dia.) with threaded union 3/4", 1.5 m long				
	Cold hard						
	Hot ≤ 70°C		1 x Pressure hose DN 10 (mm dia.) with threaded union 3/4", 1.5 m long				
	Intake rate, max.		Cold water 2 x 16 l/min; hot water 1 x 16 l/min; Cold hard (optional) 2 x 16 l/min				
Drain connection							
	Drain valve		Plastic pipe DN 70 (mm dia.)				
	Drain pump						
Intake rate, max.							
	Cold	[l/min]	2 x 16				
	Cold hard	[l/min]	Optional 2 x 16				
	Hot	[l/min]	1 x 16				
Drainage rate, max.							
	Drain valve	[l/min]	200				
		[l/min]					
Steam/Gas connection							
	High-pressure steam		–	–	1/2"	1/2"	–
	Condensate		–	–	1/2"	–	–
	Low-pressure steam		–	–	–	–	1/2"
	Gas		–	1/2"	–	–	–
	Exhaust gas		–	DN 150 (mm dia.)	–	–	–
Drum							
	Diameter	[mm]	678				
	Depth	[mm]	550				
	Volume	[l]	199				
	Door opening diameter	[mm]	370				
Drum speed							
	Wash	[rpm]	45				
	Pre-spin	[rpm]					
	Spin	[rpm]	1100				
Drum linear speed							
	Wash	[m/s]	1.6				
	Pre-spin	[m/s]					
	Spin	[m/s]	39				
G-force							
	Wash		0.67				
	Pre-spin						
	Spin		460				
Residual moisture in accordance with DIN 11902 ⁴⁾		[%]	Approx. 47 after 7 min final spin (2 min at 1100 rpm)				

PW 6201						
Heating		Electric	Gas ⁶⁾	High-pressure steam (indirect)	High-pressure steam (direct)	Low-pressure steam (direct)
Flow pressure requirement						
	Min.	[kPa]	100			
	Max.	[kPa]	1000			
Largest removable part			Suds container: Dia. 782 mm x 678 mm			
Removal/ Installation time, approx.		[h]	3.0 / 4.0			
Material						
	Plinth	Galvanised sheet steel				
	Drum	Stainless steel 1.4016				
	Suds container	Stainless steel 1.4301				
	Front casing	Stainless steel 1.4301				
	Lid	Stove-finished, galvanised sheet steel, blue				
	Rear panel	Galvanised sheet steel				
	Side panels	Stove-finished, galvanised sheet steel, blue				
Kinetic energy		[Nm]	7625			
Heat dissipation rate		[MJ/h]				
Noise power level						
	Wash	[dB(A) re 1 pW]	62.1			
	Spin		82.6			

Table 2: Data sheet – W 6201, version June 2004

- ¹⁾ Convertible to 10 kW or - kW
- ²⁾ German operating classification: gL
- ³⁾ Minimum cross-sectional area in accordance with VDE 0100 Part 430 / Group 2
- ⁴⁾ Cottons: Standard load in accordance with DIN EN 60456; EI, gas and high-pressure steam
- ⁵⁾ 50 Hz only
- ⁶⁾ Natural gas / Liquid gas conversion kit available.

Hot water connection recommended with gas-heated and low-pressure steam-heated machines!

Consumption data – PW 6161 (16 kg machine), version June 2004

PW 6161											
Heating		Electric		Gas ³⁾		High-pressure steam (indirect) ¹⁾		High-pressure steam (direct)		Low-pressure steam (direct)	
Temperature increase rate, low water level	[°C/min]	3.0		1.8		8		10		0.9	
Approx. consumption/wash cycle in accordance with DIN 11902		Cold water	Hot water, 70°C	Cold water	Hot water, 70°C	Cold water	Hot water, 70°C	Cold water	Hot water, 70°C	Cold water	Hot water, 70°C
90°C programme ²⁾ – Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
90°C programme – Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										
90°C programme - Duration	[min]										
90°C programme with cool down - Energy consumption	Heating [kWh]	6.4									
	Other electrical parts [kWh]										
90°C programme with cool down - Water consumption	Cold [l]	194									
	Cold hard [l]										
	Hot [l]										
90°C programme with cool down - Duration	[min]	64									
90°C programme with 60°C pre-wash - Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
90°C programme with 60°C pre-wash - Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										
90°C programme with 60°C pre-wash - Duration	[min]										
60°C programme ²⁾ – Energy consumption	Heating [kWh]	3.4									
	Other electrical parts [kWh]										
60°C programme – Water consumption	Cold [l]	130									
	Cold hard [l]										
	Hot [l]										
60°C programme – Duration	[min]	48									
60°C programme with cool down - Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
60°C programme with cool down - Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										

PW 6161											
Heating		Electric		Gas ³⁾		High-pressure steam (indirect) ¹⁾		High-pressure steam (direct)		Low-pressure steam (direct)	
60°C programme with cool down - Duration	[min]										
30°C programme ²⁾ - Energy consumption	Heating [kWh]	1.0									
	Other electrical parts [kWh]										
30°C programme - Water consumption	Cold [l]	128									
	Cold hard [l]										
	Hot [l]										
30°C programme - Duration	[min]	42									
For disinfection programmes, the appropriate temperature holding times must be added											

Table 3: Consumption data – PW 6161 (16 kg machine), version June 2004

¹⁾ Figures applicable for high-pressure steam (indirect) = 800 kPa (min. 400 kPa; max. 1000 kPa), high-pressure steam (direct) = max. 400 kPa and low-pressure steam (direct) = min. 50 kPa

²⁾ Electric, gas and high-pressure steam heating: Standard load in accordance with DIN EN 60456, without pre-wash; 3 rinses; without Cool Down

³⁾ Natural gas / Liquid gas conversion kit available.

Hot water connection recommended with gas-heated and low-pressure steam-heated machines!

Consumption data – PW 6201 (20 kg machine), version June 2004

PW 6201											
Heating		Electric		Gas ³⁾		High-pressure steam (indirect) ¹⁾		High-pressure steam (direct)		Low-pressure steam (direct)	
Temperature increase rate, low water level	[°C/min]	3.0		1.8		8		10		0.9	
Approx. consumption/wash cycle in accordance with DIN 11902		Cold water	Hot water, 70°C	Cold water	Hot water, 70°C	Cold water	Hot water, 70°C	Cold water	Hot water, 70°C	Cold water	Hot water, 70°C
90°C programme ²⁾ – Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
90°C programme – Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										
90°C programme - Duration	[min]										
90°C programme with cool down - Energy consumption	Heating [kWh]	7.7									
	Other electrical parts [kWh]										
90°C programme with cool down - Water consumption	Cold [l]	241									
	Cold hard [l]										
	Hot [l]										
90°C programme with cool down - Duration	[min]	64									
90°C programme with 60°C pre-wash - Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
90°C programme with 60°C pre-wash - Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										
90°C programme with 60°C pre-wash - Duration	[min]										
60°C programme ²⁾ – Energy consumption	Heating [kWh]	4.1									
	Other electrical parts [kWh]										
60°C programme – Water consumption	Cold [l]	166									
	Cold hard [l]										
	Hot [l]										
60°C programme – Duration	[min]	48									
60°C programme with cool down - Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
60°C programme with cool down - Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										

PW 6201											
Heating		Electric		Gas ³⁾		High-pressure steam (indirect) ¹⁾		High-pressure steam (direct)		Low-pressure steam (direct)	
60°C programme with cool down - Duration	[min]										
30°C programme ²⁾ - Energy consumption	Heating [kWh]										
	Other electrical parts [kWh]										
30°C programme - Water consumption	Cold [l]										
	Cold hard [l]										
	Hot [l]										
30°C programme - Duration	[min]										
For disinfection programmes, the appropriate temperature holding times must be added											

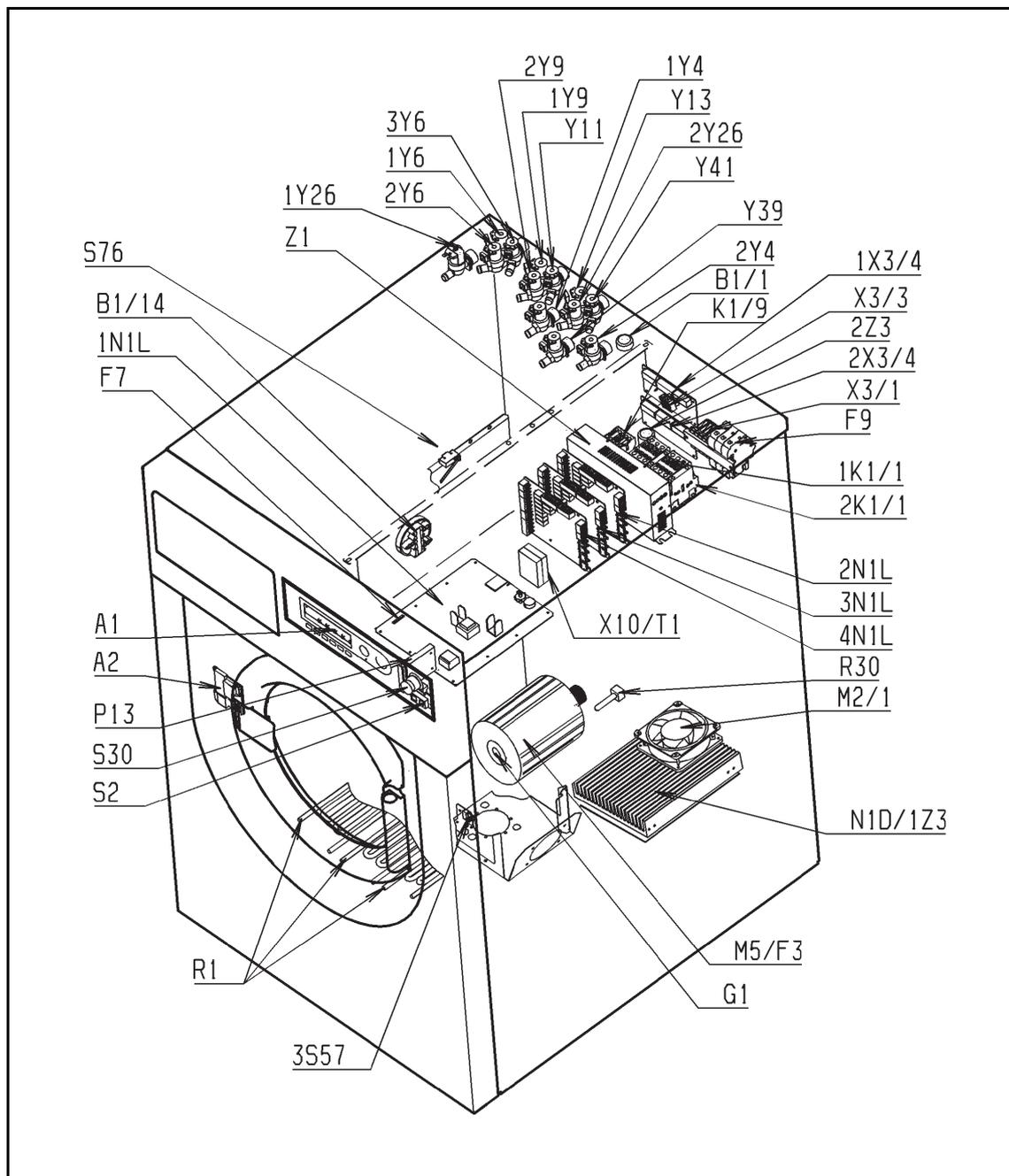
Table 4: Consumption data – PW 6201 (20 kg machine), version June 2004

- ¹⁾ Figures applicable for high-pressure steam (indirect) = 800 kPa (min. 400 kPa; max. 1000 kPa), high-pressure steam (direct) = max. 400 kPa and low-pressure steam (direct) = min. 50 kPa
- ²⁾ Electric, gas and high-pressure steam heating: Standard load in accordance with DIN EN 60456, without pre-wash; 3 rinses; without Cool Down
- ³⁾ Natural gas / Liquid gas conversion kit available.

Hot water connection recommended with gas-heated and low-pressure steam-heated machines!

D Layout of Electrical Components

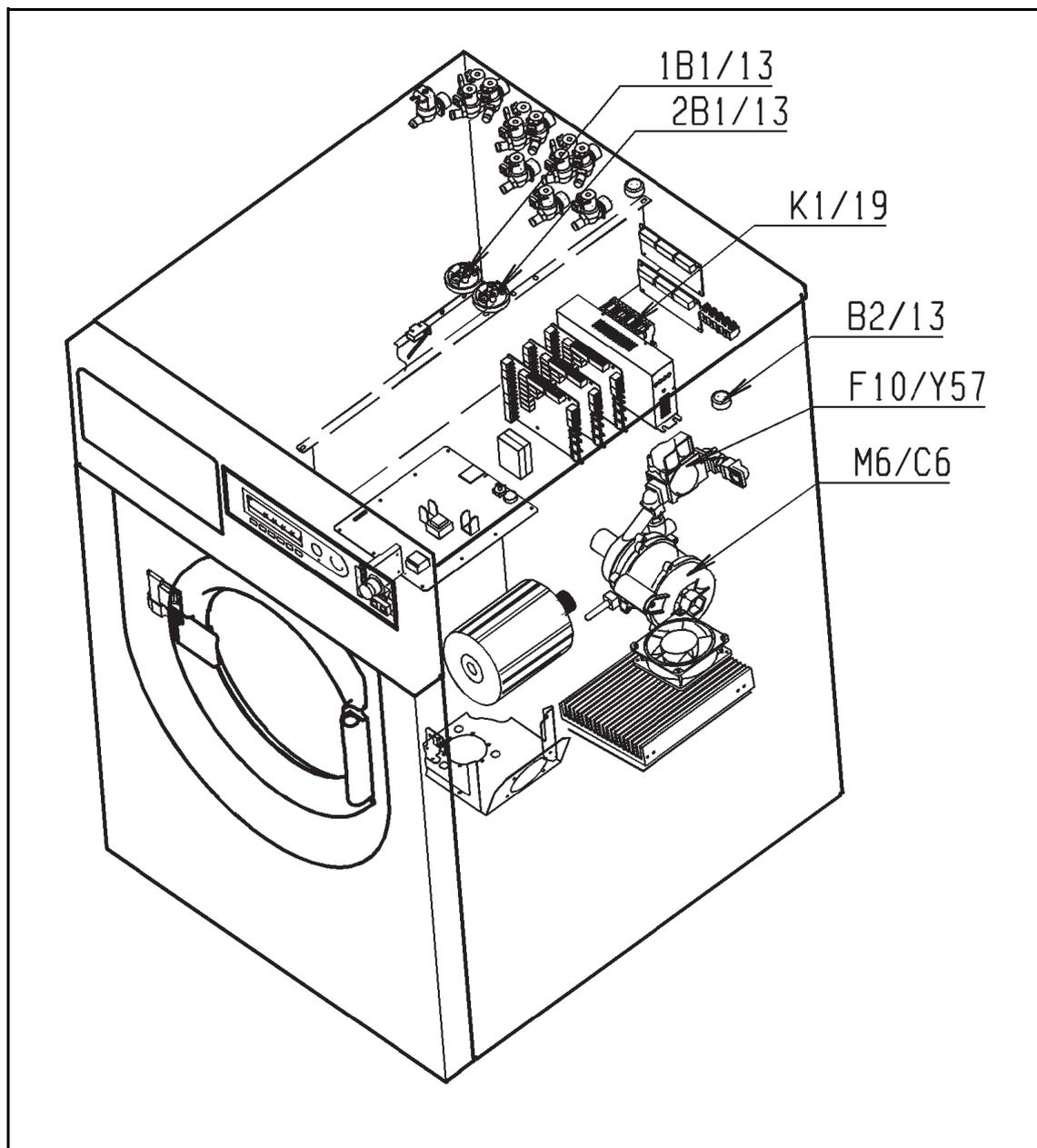
Layout for EL version (with electric heating)



Layout 1

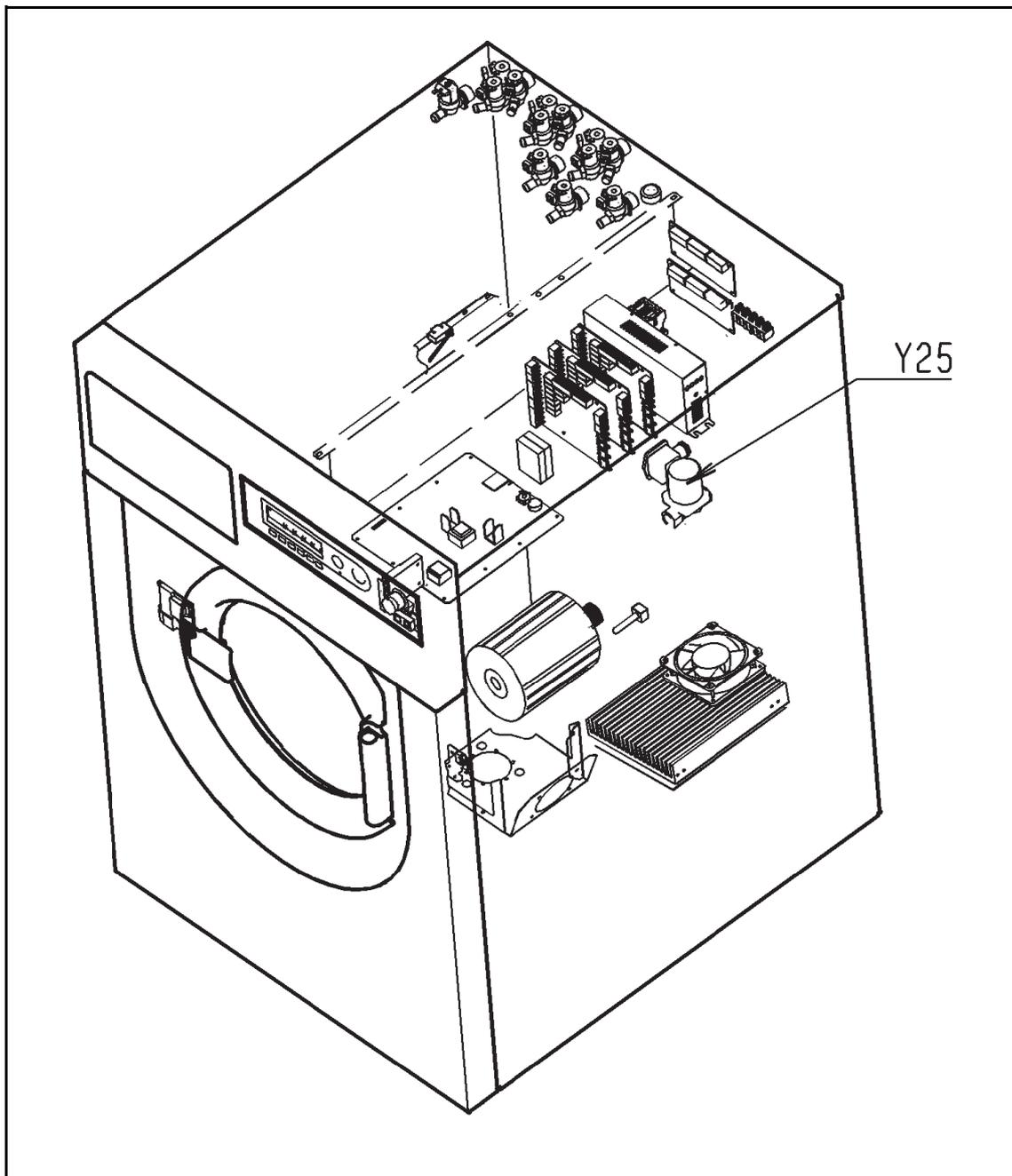
A1	Selection-display module (BAE) EW 230
A2	Door lock
B1/1	Level switch - Water intake
B1/14	Boiling dry protection
F3	Winding protection – Drive motor
F7	Fine-wire fuse
F9	Safety cut-out

G1	Tachogenerator
1K1/1	Relay/Contactor - Heating
2K1/1	Relay/Contactor - Heating
K1/9	Relay/Contactor - Drive
M2/1	Motor - Fan
M5	Motor - Drive
1N1L	Control-power module (SLT) ELP 230
2N1L	Multifunction module (MFM) ELZ 230
3N1L	Multifunction module (MFM) ELZ 230
4N1L	Multifunction module (MFM) ELZ 230
N1D	Frequency converter EFU 230
P13	Chip card reader
R1	Heater element
R30	NTC temperature sensor
S2	Button - On/Off
S30	Switch - Emergency off
3S57	Limit switch – Drain valve
S76	Switch - Imbalance
T1	Transformer
X1/1	Socket - Payment system
X3/1	Mains terminal strip
X3/3	Terminal strip - Peak-load cut-out
1X3/4	Terminal strip - Dispenser system
2X3/4	Terminal strip - Dispenser system
X10	Interface
1Y4	Valve - Cold hard water
2Y4	Valve - Cold hard water
1Y6	Valve - Cold soft water
2Y6	Valve - Cold soft water
3Y6	Valve - Cold soft water
1Y9	Valve - Hot soft water
2Y9	Valve - Hot soft water
Y11	Valve - Hot soft water (direct)
Y13	Valve - Cold soft water (direct)
1Y26	Valve - Drain
2Y26	Valve - Drain
Y39	Valve - Flush (liquid dispensing)
Y41	Valve - Chlorine bleach
Z1	Interference suppression - Filter
1Z3	Interference suppression - Choke
2Z3	Interference suppression - Choke

GAS models, additional components**Layout 2**

1B1/13	Level switch - Pump pressure
2B1/13	Level switch - Pump pressure
B2/13	Temperature regulator - Exhaust
C6	Capacitor - Circulation pump
F10	Ignition monitor
K1/19	Relay/Contactor - Circulation pump
M6	Motor - Circulation pump
Y57	Valve - Gas solenoid valve

D models (with steam heating), additional components



Layout 3

Y25 Valve - Heating (steam)

090 Door

4 Service

4.1 Door cap removal / fitting

- ✚ Remove the front panel, see Front panel removal, 150 4.7.
- ✚ Remove the 9 fixing screws.
- ✚ Remove the door cap.
- ✚ Reassemble by following these instructions in reverse order.

4.2 Door removal / fitting

- ✚ Open the door wide.
- ✚ Remove the 2 screws from the top and bottom of the hinge.

Note

E-shaped spacers are positioned under each 2 screws for adjusting the door. Note the positioning and number of these spacers for refitting the door.

- ✚ Remove the door.
- ✚ Reassemble by following these instructions in reverse order. Take care to fit the correct number of spacers in the correct position.

Note

Check the locking mechanism for correct operation. Check the door for leaks with a high water level in both the cold and hot states. The programmes in the service mode can be used for this.

100 Fascia panel

1 Technical Data

Control component	Abbreviation	Electronic module
Selection-display module	BAE	EW 230
Control-power module	SLT	ELP 230
Multifunction module	MFM	ELZ 230
Distribution connection		EV 230
Frequency converter	EFU	EFU 230

Table 1: Control system parts

2 Function

2.1 Profitronic M washing

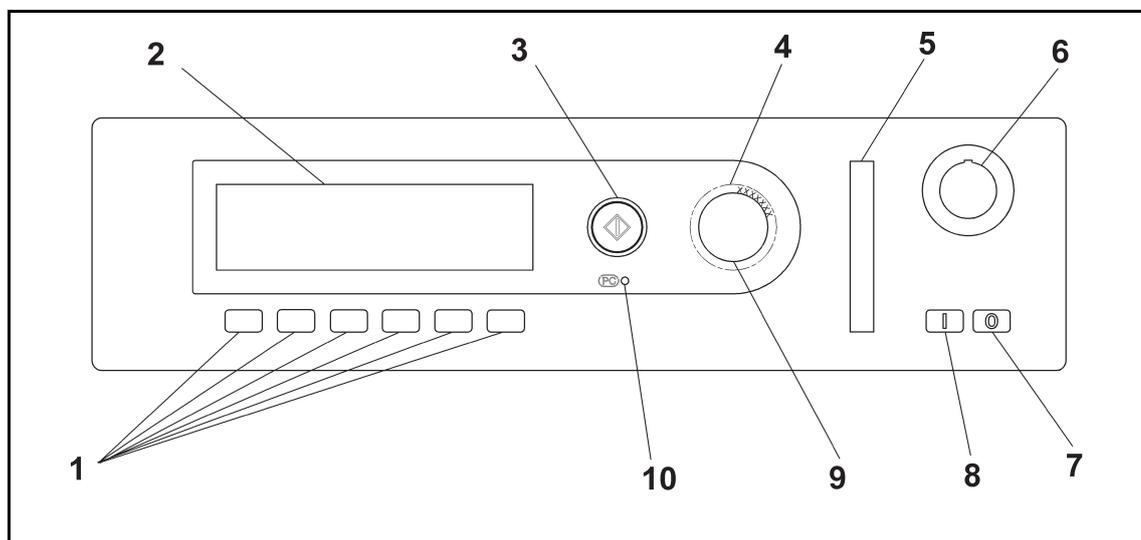


Fig. 1: Profitronic M control

- | | |
|----|---|
| 1 | Multifunction buttons 1 to 6 |
| 2 | Display (64 lines x 220 columns) |
| 3 | Start button |
| 4 | Multifunction selector (outer ring) |
| 5 | Chip card reader slot |
| 6 | Emergency Off switch |
| 7 | Switch – Off |
| 8 | Switch – On |
| 9 | OK button (centre of multifunction selector switch) |
| 10 | Optical interface |

The Profitronic M unit controls and regulates processes in commercial washer-extractors. It can save up to a maximum of 199 programmes in 999 programme positions. The Profitronic M unit has a multifunction selector switch (jogshuttle action) with OK button, a graphic display (64 lines x 220 columns), a start button and 6 multifunction buttons. There are three main operating levels. The normal operator level (customer in a launderette, operator in a laundry) does not have any special access protection. The range of operating possibilities is less than that available in the supervisor level. The supervisor level (laundry manager, application technician, programmer, "boss") is protected via a password or chip card. The range of operating possibilities in this level covers all aspects of operation required in a laundry. The service level (Service Dept. technician, in-house laundry technician) is specially protected against unauthorised access. It can be accessed via either a password, Service Dept. software on a PC or a certain selection procedure at the machine. Various electronic sub-assemblies, an analog pressure sensor, temperature sensors and the frequency converter electronic module for the drive motor are connected to the Profitronic M unit.

11 languages are permanently available in the control. Any one of these languages can be selected.

Language	Availability
German	Permanently available
English (international)	Permanently available
French	Permanently available
Italian	Permanently available
Finnish	Permanently available
Portuguese	Permanently available
Spanish	Permanently available
Danish	Permanently available
Swedish	Permanently available
Dutch	Permanently available
Norwegian	Permanently available
Greek	Alternatively available
Turkish	Alternatively available
English (USA)	Alternatively available

Table 2: Control unit user interface language

Main components of control unit:

- Selection-display module (BAE) EW 230, to operate the control unit, display messages, indicate control state, enable backup copies of saved data and programmes to be made, and for communication with other electronic modules in the machine.
- Control-power module (SLT) ELP 230, to control and regulate processes in the machine, save programmes and for communication with other electronic modules in the machine.
- One or more multifunction modules (MFM) ELZ 230, to provide external links with signal outputs via relays and signal inputs (digital and analog), and for communication with other electronic modules in the machine.
- The control-power module (SLT) also communicates with the frequency converter electronic module EFU 230 which in turn controls and regulates the drive motor.

The procedures required to complete a wash cycle are collected in a complete programme. The control unit can save up to 199 programmes, each with 5 blocks in 999 programme positions.

A programme consists of a header and three programme areas. A programme header has 19 separate divisions which define and fix general programme points, see 100 2.2 Wash programme header. Each of the three programme areas consists of a maximum of 10 programme blocks. Each programme block consists of 35 programme steps and a field for the block name. The smallest practical programme has one area and one block (theoretically 0 areas with 0 blocks is possible). The most complex programme can have 3 areas each with 10 blocks.

2.2 Wash programme header

Structure and arrangement of programme header: The programme header describes the general structure of a wash programme and defines certain fixed parameters.

Example 1: Should the heating be switched off during a programme via the **Peak-load cut-out** input of the machine? Programming options: **Yes** or **No**.

Example 2: What is the charge for this programme when using a payment system? Answer: e.g. 1.25 currency units.

Internal structure of programme header for a Profitronic M washing programme

Item number in table	Item description	Options	Details
1	Programme no.	1 to 999	Allocation of the programme position number, e.g. 123. The default number set as standard at the factory will be the lowest vacant number.
2	Programme name	All available alphanumeric and special characters	Allocation of the programme name. Maximum name length 25 characters, e.g. Cottons 40° C .
3	Material number (Mat. no.)	All numbers	The supervisor/programmer only can read this field. If the supervisor/programmer creates a new programme, this field is filled with Xs ("xxxxxxxx"). The production factory only is able to enter an 8-digit Mat. no. to identify a genuine Miele programme, e.g. "06110050". Whenever an original Miele programme is modified, this number must be deleted immediately!
4	ID No. (Identification number)	All numbers	The supervisor/programmer only can read this field. The control automatically enters the software version number of the control under which the wash programme was created. If the supervisor/programmer modifies the wash programme and saves it, the control overwrites the previous software version number with its own current software version number.
5	Area 1	No, 1 to 10 blocks	Fixes the number of individual blocks in area 1, e.g. none if No is set. If the supervisor/programmer selects at least one block here, a name for the area must be entered. Default factory setting: No .
6	Name of area 1	All available alphanumeric and special characters	Allocation of the name for area 1. Default factory setting: Pre-wash . Maximum name length 20 characters, e.g. Pre-wash cold .
7	Area 2	No, 1 to 10 blocks	Fixes the number of individual blocks in area 2, e.g. 10 blocks if 10 blocks is set. If the supervisor/programmer selects at least one block here, a name for the area must be entered. Default factory setting: No .
8	Name of area 2	All available alphanumeric and special characters	Allocation of the name for area 2. Default factory setting: Main wash . Maximum name length 20 characters, e.g. Main wash 90° C .
9	Area 3	No, 1 to 10 blocks	Fixes the number of individual blocks in area 3, e.g. 4 blocks if 4 blocks is set. If the supervisor/programmer selects at least one block here, a name for the area must be entered. Default factory setting: No .
10	Name of area 3	All available alphanumeric and special characters	Allocation of the name for area 3. Default factory setting: Rinses . Maximum name length 20 characters, e.g. Final rinse cold .

Item number in table	Item description	Options	Details
11	Weigh	No	It is not possible to enter a weight before the start of the programme. The control operates with the rated load for the machine, 100 Table 4. Default factory setting: No .
		Manual	The operator weighs the dry laundry then enters the established weight manually in the machine before the start of the programme.
		Automatic	Using the load module, the weight of the load can be entered automatically in the machine control before the start of the programme.
12	Nominal load	1.0 kg, 1.5 kg, 2.0 kg, 2.5 kg, ... 32 kg in 0.5-kg steps	The coding plug for setting the model automatically limits the possible entry to suit the model in question. The rated load entry can be used as a guide for a reduced load quantity, e.g. 3.5 kg for Minimum iron , see 100 Table 4. Default factory setting: Maximum value in accordance with machine model coding plug.
13	Min. water level	0 mm, 2 mm, 4 mm,... 350 mm in 2-mm steps	Here the programmer sets the minimum water level in the unit in mm wc (mm water column) for all blocks without heating (heating programming option: No). This figure fixes the lowest level that can be selected and can be set between 0 mm to 350 mm in 2-mm steps. bar. Default factory setting: 0 mm .

Item number in table	Item description	Options	Details
14	Fill type	Water height in mm	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here. Default factory setting: Water height in mm , "mm" stands for millimeters of water column (mm wc). If, after creating a programme, the programmer changes the type of fill in the associated programme header from Water height in mm to Water quantity in l or Laundry:Suds ratio in kg/l , the control modifies the level settings in the blocks accordingly. If a change is made from Water height in mm to Auto load adjustment , no modifications are made in the blocks. If a setting is made that is above the maximum permitted water level for the machine, the control automatically limits this to the permitted maximum. If a setting is made that is below the minimum permitted water level or the minimum heating level for the machine, the control, for safety reasons, automatically increases this to the permitted minimum in case heating occurs during the programme. If the control acts in this way, it is shown at the end of the programme via the displays Level limitation or Level increase .
		Auto load adjustment	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here. When Auto load adjustment is set, the laundry load affects the machine response, e.g. water levels, dispensed quantities and the number of rinses. If, after creating a programme, the programmer changes the type of fill in the associated programme header from Auto load adjustment to Water quantity in l or Laundry:Suds ratio in kg/l , the control modifies the level settings in the blocks accordingly. If a change is made from Auto load adjustment to Water height in mm , no modifications are made in the blocks.
		Water quantity in l	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here.
		Laundry:Suds ratio in kg/l	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here.
15	Allow	Yes / No	In the Allow machine state, only approved programmes can be selected. If the programmer selects No here, then in the future, if the machine state is set to Allow , the operator cannot select this programme. In such a case, only programmes with the setting Allow – Yes in the programme header can be selected. Default factory setting: Yes .
16	Lock	Yes / No	This setting in the programme header determines whether the programme will be locked when it is in operation. If it is locked, then one minute after the programme has been started the operator cannot stop or interrupt it with the Finish button and the door can only be opened when the programme has finished. Default factory setting: No .

Item number in table	Item description	Options	Details
17	Peak load	Yes / No	Peak-load cut-out: High load peaks in electrical systems can result in particularly high energy costs. With major installations, the peak-load cut-out feature avoids these extra charges for load peaks. A monitoring system registers current consumption and when this is too high, a cut-out signal is produced. Machine response: The heating is switched off and the programme may possibly be interrupted. When the monitoring system resets the signal, the wash programme continues automatically. This setting in the programme header determines whether the heating will be switched off or not by a peak-load signal being received at the Peak load input. Default factory setting: Yes . If the control registers that the header of the programme in operation permits peak-load cut-out and the programme is currently in a heating stage when a peak-load signal is received, then the heating is switched off, the programme is stopped and the display shows Prog. stopped. Peak load cut-out. Programme will start again automatically . The control also corrects the programme finish time. If a heating stage is not operating, no message is displayed. The peak-load cut-out does not have an overriding time control.
18	Hot water control	Yes / No	With the setting Yes and water intake control set to Automatic , the water inlet valves are operated in a certain way. If possible, the control will attempt to achieve the desired wash cycle temperature during the first water intake by operating the cold and hot water valves alternately. Without the water intake control set to Automatic , the control opens the programmed valves until the desired temperature is reached and then switches to cold water intake only. Default factory setting: No .
19	Price	No / 0.10; 0.20; ...; 9999.90 in 0.10 steps	Here the price of a wash programme is set on models with a payment system. No charge can be set or a price between 0.10 currency units to 9999.90 currency units.

Table 3: Internal structure of programme header for a Profitronic M washing programme

Model, programme and maximum load table

Model	PW 6101	PW 6131	PW 6161	PW 6201
Drum volume	100 l	130 l	160 l	200 l
Cottons 90°C	10.0 kg	13.0 kg	16.0 kg	20.0 kg
Cottons 60°C	10.0 kg	13.0 kg	16.0 kg	20.0 kg
Cottons intensive 60°C	10.0 kg	13.0 kg	16.0 kg	20.0 kg
Cottons 30°C	10.0 kg	13.0 kg	16.0 kg	20.0 kg
Cottons intensive 30°C	10.0 kg	13.0 kg	16.0 kg	20.0 kg
Short programme	10.0 kg	13.0 kg	16.0 kg	20.0 kg
Minimum iron 60°C	5.0 kg	6.6 kg	8.0 kg	10.0 kg
Minimum iron intensive 60°C	5.0 kg	6.6 kg	8.0 kg	10.0 kg
Minimum iron 30°C	5.0 kg	6.6 kg	8.0 kg	10.0 kg
Minimum iron intensive 30°C	5.0 kg	6.6 kg	8.0 kg	10.0 kg
Delicates	2.0 kg	2.6 kg	3.2 kg	4.0 kg
Woolens 30°C	4.0 kg	5.2 kg	6.4 kg	8.0 kg
Hand washable woolens 30°C	4.0 kg	5.2 kg	6.4 kg	8.0 kg

Table 4: Maximum laundry loads (in kilos of dry laundry) in relation to washing machine programme and model

2.3 Programming

In general a Profitronic M washing programme consists of 3 programme areas: programme area 1, programme area 2 and programme area 3 each of which has a maximum of 10 blocks. Each block is individually programmable and consists of 36 programme steps. The smallest practical programme has one area and one block (theoretically 0 areas with 0 blocks is possible). The most complex programme can have 3 areas each with 10 blocks.

Blocks always have the same basic structure. Block programming involves completing the block name field and setting the parameters for the remaining 35 programme steps. In this way the modification or creation of a wash programme is carried out using the building block principle.

Parameter modification of programmes in the specially protected programme positions 1 to 10 (basic programmes) is only possible after the basic programme lock has been suspended.

Block programming – Profitronic M washing control

No.	Programme step	Basic setting	Setting options	Notes
0	Block name	20 blank spaces	All available alphanumeric and special characters	For naming block 1. Maximum name length 20 characters, e.g. Pre-wash .
1	Block activation	No	No	Programme block will be skipped before and during programme
			Permanent	Programme block will always be carried out during programme
			Block +	Programme block will only be carried out when Block + button is activated before the programme is started or during the programme before the block would be started, otherwise block will be skipped
2	Programme stop 1	No	No	No stop during programme
			Yes	Programme always stops at this point. Programme is continued by pressing the  Start button.
3	Programme stop signal 1	No	No	No stop signal at Programme stop signal output
			Yes	When the control reaches a programme stop position, the programme stop signal is applied to the Programme stop signal output. When Start is pressed to continue the programme, the Programme stop signal output is reset. During the programme stop, the programme stop signal remains applied to the Programme stop signal output. When the programme continues, this signal is cancelled. This feature can be used to provide a signal to operate, e.g., a lamp or buzzer (connected via a suitable kit).
4	Heating	No		
5	Free temperature selection	Yes	No	Programmed temperature cannot be modified before programme start
			Yes	Temperatures for the first pre-wash and first main wash can be modified before programme start
6	Temperature	Cold		
7	Hysteresis	Normal		
8	Warm up	Lock symbol		
9	Level 1	Automatic load control: 0 mm		
9	Level 1	Water height: 0 mm		
9	Level 1	Water quantity: 0 l		
9	Level 1	Load/Liquor ratio: 1: 0.0 kg/l		
10	Intake path 1	Automatic		
11	Dispensing type	No		
12	Dispensing phase 1	Lock symbol		
13	Dispensing stop 1	No		
14	Agitation from level	Automatic		
15	Level stop 1	No		

No.	Programme step	Basic setting	Setting options	Notes
16	Wash time 1	No		
17	Thermostop	Lock symbol		
18	Level 2	0 mm		
19	Intake path 2	Automatic		
20	Dispensing phase 2	Lock symbol		
21	Dospensing stop 2	No		
22	Level stop 2	No		
23	Wash time 2	As wash time 1		
24	Cool down	No		
25	Wash time 3	As wash time 1		
26	Programme stop 2	No	No	No stop during programme
			Yes	Programme always stops at this point. Programme is continued by pressing the  Start button.
27	Programme stop signal 2	No	No	No stop signal at Programme stop signal output
			Yes	When the control reaches a programme stop position, the programme stop signal is applied to the Programme stop signal output. When Start is pressed to continue the programme, the Programme stop signal output is reset. During the programme stop, the programme stop signal remains applied to the Programme stop signal output. When the programme continues, this signal is cancelled. This feature can be used to provide a signal to operate, e.g., a lamp or buzzer (connected via a suitable kit).
28	Drainage path 1	No		
29	Drain level 1	0 mm		
30	Wash time 4	As wash time 1		
31	Drainage path 2	Drain		
32	Free spin speed selection	No		
33	Spin	No		
34	Repeat	No		
35	Block end signal ¹⁾	Yes	Yes / No	Provision of a block end signal for a certain time

Table 5: Block programming Profitronic M

¹⁾ With payment system operation, **Yes** must be programmed in the last block of the complete programme to provide a reset signal to the payment system indicating that the programme has finished.

2.4 Minimum heating level

The machine has a protection system to prevent damage due to dry heating (heater elements not under water). If the programmer selects a temperature greater than cold in a block, the control automatically raises the water level if necessary. The minimum level with which heating may take place varies depending on model as shown in the following table:

Model	Minimum water level before heating is switched on	Level at which heating is switched off
PW 6101	50 mm	20 mm
PW 6131	50 mm	20 mm
PW 6161	60 mm	30 mm
PW 6201	60 mm	30 mm

Table 6: Minimum heating level

2.5 Coding machine model, type of heating and imbalance monitoring

The coding plugs on the control-power module (SLT) are divided into 3 areas. The first area (inputs “Cod 1” to “Cod 5”) is used to set the model. The second area (inputs “CodHzg 1” to “CodHzg 3”) is used to set the type of heating. The third area (input “CodKAW”) is used to set whether the ball imbalance option (KAW) is available. The machine can only be operated when valid coding of areas 1 and 2 has been carried out. If one or both of these coding plugs is missing, no programme can be started and a coding plug fault is indicated.

Model	Coding plug connections	Notes
PW 6101	Contact Cod 4 with GND	10 kg machine
PW 6131	Contact Cod 5 with GND	13 kg machine
PW 6161	Contact Cod 1 with Cod 4 with GND	16 kg machine
PW 6201	Contact Cod 1 with Cod 3 with GND	20 kg machine
PW 6241	Contact Cod 1 with Cod 2 with GND	24 kg machine

Table 7: Model coding

Heating	Coding plug connections	Notes
Without heating	Contact CodHzg 6 with 7 with 8 with GND	
Electric heating	Contact CodHzg 6 with GND	
Gas heating	Contact CodHzg 7 with GND	
High-pressure steam, direct	Contact CodHzg 8 with GND	
High-pressure steam, indirect	Contact CodHzg 6 mit 8 mit GND	
Low-pressure steam, direct	Contact CodHzg 6 mit 7 mit GND	

Table 8: Heating type coding

2.6 Service mode (service level) – General information

The service mode can be accessed in two different ways: Either manually directly at the machine via the controls on the selection-display module (BAE), or by using the optical interface to link up with a PC running Service Dept. software. The machine has a special service mode which can be used, for example, by the Service Dept. technician to operate and test the machine. It can also be used to set up the machine (e.g. additional module registration, setting mains voltage) and includes test programmes for fault finding, reading out machine data and fault code memory display.

The service mode can be accessed manually via the standard procedure common to many Miele machines as follows:

- Close the door.
- Switch off the machine.
- Press and hold the  **Start** button while switching the machine on via the mains switch.
- Release the  **Start** button as soon as the display lights up.
- Press and release the  **Start** button twice briefly.
- Then press and hold the  **Start** button for at least 4 s until its illuminated switch surround flashes. Release the  **Start** button.

Successful accessing of the service mode is indicated by rapid flashing (5 Hz) of the  **Start** button illuminated switch surround.

The following indicates how the service mode is detailed in this BTD.

The **Service mode** is divided into 4 different parts:

Service mode (service level)	
1	Service programmes
2	Service information
3	Service settings ¹⁾
4	Delete display message ¹⁾

Table 9: Service mode sub-divisions

¹⁾ Only visible under the following circumstances: 1. NTC1 temperature sensor is disconnected at the control-power module. Or 2. When a personal identification-enabled communication link to the PC service program exists.

There are 2 **service programme** sub-divisions:

Service mode (service level)		
1	Service programme	
	1	Test manually
	2	Test automatically

Table 10: Service programme divisions

Test manually has 10 further sub-divisions:

etc.

etc.

To simplify orientation among the numerous control possibilities, this BTD uses the numbering shown in the above tables, see 100 Table 9, 100 Table 10. This numbering is not shown in the machine display of the selection-display module.

During any test in all service programmes the display of an actual value which varies from the desired value flashes. The technician can then more easily recognise faults or desired values that have not been reached. All service programmes are limited to an overriding safety time of 30 min.

Note

Correct fault registration can only occur if the machine is properly installed and configured.

2.7 Data security in control-power module and selection-display module

After a break in the mains supply, the control can register if saved data (settings, operating data, operating faults, machine history and service settings) in the control-power module (SLT) is different to that saved in the selection-display module (BAE). Reasons for this could be, e.g., exchange of a sub-assembly or a defective sub-assembly. When the mains supply is interrupted, the current date and time is saved to both the control-power module (SLT) and the selection-display module (BAE). Depending on the dates registered, data will be copied from one module to update the other according to the following plan:

SLT	Data copying direction	BAE
No date	--->	No date
Date	--->	No date
More recent date	--->	Older date
No date	<---	Date
Older date	<---	More recent date
Same date	--->	Same date

Table 11: Summary of data copying decision process

2.8 Valve summary - Series PW 6000

Inlet valve summary - PW 6101, PW 6131, PW 6161, PW 6201

Designation on switching plan	Description	Detergent dispenser compartment	Symbol	Designation in software / Documentation
1Y5	Inlet valve - Cold, hard water, direct	–	–	KH, HAW
2Y5	Inlet valve - Cold, hard water, direct	–	–	KH, HAW
1Y6	Inlet valve - Cold water, pre-wash	1	⏏	K1 / KAW1
2Y6	Inlet valve - Cold water, main wash	2	⏏	K2 / KAW2
3Y6	Inlet valve - Cold water, rinses - Fabric conditioner	3, at front	⏏	K3 / KAW3
1Y9	Inlet valve - Hot water, pre-wash	1	⏏	W1 / WAW1
2Y9	Inlet valve - Hot water, main wash	2	⏏	W2 / WAW2
Y11	Inlet valve - Hot water, direct	–	–	WD / WAW3
Y13	Inlet valve - Cold water, direct	–	–	KD / KAW4
Y41	Inlet valve - Cold water, chlorine bleach	3, at rear	⏏	K4 / KAW6
Y39 ¹⁾	Valve - Liquid dispensing	–	–	–

Table 12: Inlet valve summary - PW 6101, PW 6131, PW 6161, PW 6201

¹⁾ Valve Y39 automatically directs water to the dispenser box for liquid dispensing (mixer box, not the detergent dispenser) as soon as the first dispenser pump starts. 30 s after the last dispenser pump has stopped, Y39 is closed automatically. The dispensed agent, mixed with water, then flows directly into the suds container without passing through the main detergent dispenser at the front of the machine.

Summary of other possible valves - PW 6101, PW 6131, PW 6161, PW 6201

Designation on switching plan	Description	Symbol	Designation in software / Documentation
Y25	Valve - Steam heating	–	
1Y26	Valve - Open drain valve		AA / AVT-AUF / WS
2Y26	Valve - Close drain valve		AZ / AVT-ZU / KAW5
3Y26	Valve - Open water recycling (WRG), intake from WRG container into machine	–	K6
4Y26	Valve - Close water recycling (WRG), drainage to on-site drain, not to WRG container	–	WRG
1Y53	Door release magnet	–	–
2Y53	Door release magnet	–	–
Y57	Gas solenoid valve		

Table 13: Summary of other possible valves - PW 6101, PW 6131, PW 6161, PW 6201

3 Fault Repair

3.1 Fault code summary

Cause

See fault code table.

Fault indications in operating level

Machine area	Indication	Notes
General		
Pressure sensor		
	“Warning” symbol PRESSURE SENSOR FAULT! Call the Service Department if restart does not work.	During a programme in operation the control registers impermissible values at the analog pressure sensor input. If the fault is still registered after a restart, no programme can be started.
Drive		
	“Warning” symbol DRIVE SYSTEM FAULT! SAFETY TIME ACTIVE! x min yy s.	Tachogenerator fault before programme start without water in machine with door locked. Tachogenerator fault before programme start with water in machine with door locked after safety time has elapsed, normal display is shown with water in machine.
	DRIVE SYSTEM FAULT! (flashing display in normal programme display)	Flashing display when tachogenerator fault occurs in programme with and without water in machine and with door locked. Or drive motor jammed.
	SAFETY TIME ACTIVE! x min yy s.	Tachogenerator fault during programme stop or at programme end without water in machine. If tachogenerator fault clears during safety time and speed 0 rpm is registered, display reverts to normal.
	“M” symbol DRIVE SYSTEM FAULT! Call the Service Department if restart does not work.	Data transfer interruption between control-power module (SLT) and frequency converter (EFU) after programme start. Programme stops after 15 s. After a further 60 s drive motor stops if it is operating. Or FU contactor contacts fused together so it cannot be switched off.
	“M” symbol DRIVE SYSTEM FAULT! Programme stop. Press the start button. Motor too hot.	Control registers that drive motor winding overheating protection has cut-out. Motor relay K1/9 has been switched off. Control stops programme and gives fault indication. After winding has cooled sufficiently, programme can be restarted via START button. If winding has not cooled sufficiently, programme cannot be restarted and fault indication remains displayed.
Heating		
	“Warning” symbol HEATING SYSTEM FAULT! Programme stop. Press the start button. Programme can only run without heat.	Control has registered an NTC sensor short- or open-circuit after a programme has started. If programme is continued, heating will not take place, actual temperature display will not be shown and when the “Info” button is pressed, fault indication Actual temperature: Fault will be displayed. Or during a programme an auxiliary contact, on machines with electric heating, has caused the heating dry protection to cut-out. Or during a programme heating phase one or both heating contactors have not activated and water has not heated sufficiently within 3 min.
	“Warning” symbol HEATING SYSTEM FAULT! Call the Service Department if restart does not work.	Control has registered an NTC sensor short- or open-circuit after a programme has started. If a disinfection programme is running, the control stops it for safety reasons.

Machine area	Indication	Notes
	“Warning” symbol HEATING SYSTEM FAULT! Switch off the main switch. Call the Service Department.	Control registers that both heating dry protection contactors (1 and 2) have cut-out. Both heating contactor contacts have fused together. Machine is filled via 3 inlet valves to maximum level and the programme in operation is stopped.
Mains supply		
	“Mains break” symbol POWER CUT! Programme stop. Press the start button.	Electronic module has registered a mains supply break > 100 ms. It saves programme state and details of any settings made in programming mode in backup memory. When power is reapplied, data is restored and a power interruption is indicated in display. If Start is pressed, programme continues from stage previously reached.
Door		
	“Key” symbol DOOR LOCK FAULT! Programme stop. Use emergency door release.	Display during programme stop. Control registers that door release is not possible (door release signal 1 and / or 2 not present, door lock defective).
	“Key” symbol DOOR LOCK FAULT! Call the Service Department if restart does not work. Use emergency door release.	Display after programme end or after programme end and mains interruption. Control registers that door release is not possible (door release signal 1 and / or 2 not present, door lock defective).
	“Key” symbol DOOR LOCK FAULT! Call the Service Department if restart does not work.	Display after programme start without door lock. Control registers that necessary door locking is not possible at programme start (e.g. open circuit, defective door lock).
Imbalance		
	“Warning” symbol IMBALANCE FAULT! Call the Service Department if restart does not work.	Control registers too great an imbalance via displacement imbalance switch. If fault is indicated directly after programme start before drum agitation has occurred, imbalance switch may be defective.
Water intake		
	WATER INLET FAULT! Call the Service Department if restart does not work.	Control registers that overflow level has been exceeded (e.g. due to defective inlet valve) and opens the drain valve.
Drainage		
	“Drain” symbol” DRAIN VALVE FAULT! Call the Service Department if restart does not work.	During spinning, control has registered a water level ≥ 50 mm wc and interrupted the spin cycle. After a waiting time of 5 min, if water level remains > 10 mm wc, this fault message is displayed. Drain valve or path may be blocked.

Table 14: Fault indications – Operator level

Remedy

 See appropriate individual description.

4 Service

4.1 Programming mode

Initial requirements

- ✎ A wash programme must not be in operation.
- ✎ The machine must not be in the service mode.

Accessing

- ✎ Switch on the machine.
- ✎ Wait until the **Welcome** start screen is displayed.
- ✎ Press the language selection button (under the flag symbol) to access the main menu.
- ✎ Select **Operating level** and confirm with the **OK** button.
- ✎ Enter the password and confirm with the **OK** button.
- ✎ Select **Programming** and confirm with the **OK** button.

Acknowledgement indicator

Successful accessing of the programming mode is indicated by **Operating level>Programming** in the top line of the display. The options **Set up again**, **Copy**, **Delete** and **Change** are then available.

Options

Internal structure of programme header for a Profitronic M washing programme

Item number in table	Item description	Options	Details
1	Programme no.	1 to 999	Allocation of the programme position number, e.g. 123. The default number set as standard at the factory will be the lowest vacant number.
2	Programme name	All available alphanumeric and special characters	Allocation of the programme name. Maximum name length 25 characters, e.g. Cottons 40° C .
3	Material number (Mat. no.)	All numbers	The supervisor/programmer only can read this field. If the supervisor/programmer creates a new programme, this field is filled with Xs ("xxxxxxxx"). The production factory only is able to enter an 8-digit Mat. no. to identify a genuine Miele programme, e.g. "06110050". Whenever an original Miele programme is modified, this number must be deleted immediately!

Item number in table	Item description	Options	Details
4	ID No. (Identification number)	All numbers	The supervisor/programmer only can read this field. The control automatically enters the software version number of the control under which the wash programme was created. If the supervisor/programmer modifies the wash programme and saves it, the control overwrites the previous software version number with its own current software version number.
5	Area 1	No, 1 to 10 blocks	Fixes the number of individual blocks in area 1, e.g. none if No is set. If the supervisor/programmer selects at least one block here, a name for the area must be entered. Default factory setting: No .
6	Name of area 1	All available alphanumeric and special characters	Allocation of the name for area 1. Default factory setting: Pre-wash . Maximum name length 20 characters, e.g. Pre-wash cold .
7	Area 2	No, 1 to 10 blocks	Fixes the number of individual blocks in area 2, e.g. 10 blocks if 10 blocks is set. If the supervisor/programmer selects at least one block here, a name for the area must be entered. Default factory setting: No .
8	Name of area 2	All available alphanumeric and special characters	Allocation of the name for area 2. Default factory setting: Main wash . Maximum name length 20 characters, e.g. Main wash 90°C .
9	Area 3	No, 1 to 10 blocks	Fixes the number of individual blocks in area 3, e.g. 4 blocks if 4 blocks is set. If the supervisor/programmer selects at least one block here, a name for the area must be entered. Default factory setting: No .
10	Name of area 3	All available alphanumeric and special characters	Allocation of the name for area 3. Default factory setting: Rinses . Maximum name length 20 characters, e.g. Final rinse cold .
11	Weigh	No	It is not possible to enter a weight before the start of the programme. The control operates with the rated load for the machine, 100 Table 4. Also if the control registers a load module, a weight entry cannot be made with this option. Default factory setting: No .
		Manual	The operator weighs the dry laundry then enters the established weight manually in the machine before the start of the programme.
		Automatic	Using the load module, the weight of the load can be entered automatically in the machine control before the start of the programme.
12	Nominal load	1.0 kg, 1.5 kg, 2.0 kg, 2.5 kg, ... 32 kg in 0.5-kg steps	The coding plug for setting the model automatically limits the possible entry to suit the model in question. The rated load entry can be used as a guide for a reduced load quantity, e.g. 3.5 kg for Minimum iron , see 100 Table 4. Default factory setting: Maximum value in accordance with machine model coding plug.
13	Min. water level	0 mm, 2 mm, 4 mm,... 350 mm in 2-mm steps	Here the programmer sets the minimum water level in the unit in mm wc (mm water column) for all blocks without heating (heating programming option: No). This figure fixes the lowest level that can be selected and can be set between 0 mm to 350 mm in 2-mm steps. bar. Default factory setting: 0 mm .

Item number in table	Item description	Options	Details
14	Fill type	Water height in mm	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here. Default factory setting: Water height in mm , "mm" stands for millimeters of water column (mm wc). If, after creating a programme, the programmer changes the type of fill in the associated programme header from Water height in mm to Water quantity in l or Laundry:Suds ratio in kg/l , the control modifies the level settings in the blocks accordingly. If a change is made from Water height in mm to Auto load adjustment , no modifications are made in the blocks. If a setting is made that is above the maximum permitted water level for the machine, the control automatically limits this to the permitted maximum. If a setting is made that is below the minimum permitted water level or the minimum heating level for the machine, the control, for safety reasons, automatically increases this to the permitted minimum in case heating occurs during the programme. If the control acts in this way, it is shown at the end of the programme via the displays Level limitation or Level increase .
		Auto load adjustment	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here. When Auto load adjustment is set, the laundry load affects the machine response, e.g. water levels, dispensed quantities and the number of rinses. If, after creating a programme, the programmer changes the type of fill in the associated programme header from Auto load adjustment to Water quantity in l or Laundry:Suds ratio in kg/l , the control modifies the level settings in the blocks accordingly. If a change is made from Auto load adjustment to Water height in mm , no modifications are made in the blocks.
		Water quantity in l	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here.
		Laundry:Suds ratio in kg/l	Fixes which type of monitoring is used by the control to register the water level when filling the machine. The setting options available later in the wash programme depend on the type of fill programmed here.
15	Allow	Yes / No	In the Allow machine state, only approved programmes can be selected. If the programmer selects No here, then in the future, if the machine state is set to Allow , the operator cannot select this programme. In such a case, only programmes with the setting Allow – Yes in the programme header can be selected. Default factory setting: Yes .
16	Lock	Yes / No	This setting in the programme header determines whether the programme will be locked when it is in operation. If it is locked, then one minute after the programme has been started the operator cannot stop or interrupt it with the Finish button and the door can only be opened when the programme has finished. Default factory setting: No .

Item number in table	Item description	Options	Details
17	Peak load	Yes / No	Peak-load cut-out: High load peaks in electrical systems can result in particularly high energy costs. With major installations, the peak-load cut-out feature avoids these extra charges for load peaks. A monitoring system registers current consumption and when this is too high, a cut-out signal is produced. Machine response: The heating is switched off and the programme may possibly be interrupted. When the monitoring system resets the signal, the wash programme continues automatically. This setting in the programme header determines whether the heating will be switched off or not by a peak-load signal being received at the Peak load input. Default factory setting: Yes . If the control registers that the header of the programme in operation permits peak-load cut-out and the programme is currently in a heating stage when a peak-load signal is received, then the heating is switched off, the programme is stopped and the display shows Programme stop due to peak-load cut-out! Programme will start again automatically . The control also corrects the programme finish time. If a heating stage is not operating, no message is displayed. The peak-load cut-out does not have an overriding time control.
18	Hot water control	Yes / No	With the setting Yes and water intake control set to Automatic , the water inlet valves are operated in a certain way. If possible, the control will attempt to achieve the desired wash cycle temperature during the first water intake by operating the cold and hot water valves alternately. Without the water intake control set to Automatic , the control opens the programmed valves until the desired temperature is reached and then switches to cold water intake only. Default factory setting: No .
19	Price	No / 0.10; 0.20; ...; 9999.90 in 0.10 steps	Here the price of a wash programme is set on models with a payment system. No charge can be set or a price between 0.10 currency units to 9999.90 currency units.

Table 15: Internal structure of programme header for a Profitronic M washing programme

Block structure

No.	Programme step	Basic setting	Setting options	Notes
0	Block name	20 blank spaces	All available alphanumeric and special characters	For naming block 1. Maximum name length 20 characters, e.g. Pre-wash .
1	Block activation	No	No	Programme block will be skipped before and during programme
			Permanent	Programme block will always be carried out during programme
			Block +	Programme block will only be carried out when Block + button is activated before the programme is started or during the programme before the block would be started, otherwise block will be skipped
2	Programme stop 1	No	No	No stop during programme
			Permanent	Programme always stops at this point. Programme is continued by pressing the  Start button.
			Starch stop	For a starch stop in final wash block: If starch stop is programmed, wash time is extended from 1 to 4 min. Programme stop is only possible if starch stop feature has been programmed and starch stop button is pressed before programme start. After starch stop, programme is continued by pressing the  Start button.
			Spin stop	
			Spin stop and starch stop	
3	Programme stop signal 1	No	No	No stop signal at Programme stop signal output
			Yes	When the control reaches a programme stop position, the programme stop signal is applied to the Programme stop signal output. When Start is pressed to continue the programme, the Programme stop signal output is reset. During the programme stop, the programme stop signal remains applied to the Programme stop signal output. When the programme continues, this signal is cancelled. This feature can be used to provide a signal to operate, e.g., a lamp or buzzer (connected via a suitable kit).
4	Heating	No		
5	Free temperature selection	Yes	No	Programmed temperature cannot be modified before programme start
			Yes	Temperatures for the first pre-wash and first main wash can be modified before programme start
6	Temperature	Cold		
7	Hysteresis	Normal		
8	Warm up	Lock symbol		
9	Level 1	Automatic load control: 0 mm		
9	Level 1	Water height: 0 mm		
9	Level 1	Water quantity: 0 l		

No.	Programme step	Basic setting	Setting options	Notes
9	Level 1	Load/Liquor ratio: 1: 0.0 kg/l		
10	Intake path 1	Automatic		
11	Dispensing type	No		
12	Dispensing phase 1	Lock symbol		
13	Dispensing stop 1	No		
14	Agitation from level	Automatic		
15	Level stop 1	No		
16	Wash time 1	No		
17	Thermostop	Lock symbol		
18	Level 2	0 mm		
19	Intake path 2	Automatic		
20	Dispensing phase 2	Lock symbol		
21	Dispensing stop 2	No		
22	Level stop 2	No		
23	Wash time 2	As wash time 1		
24	Cool down	No		
25	Wash time 3	As wash time 1		
26	Programme stop 2	No	No	No stop during programme
			Yes	Programme always stops at this point. Programme is continued by pressing the  Start button.
27	Programme stop signal 2	No	No	No stop signal at Programme stop signal output
			Yes	When the control reaches a programme stop position, the programme stop signal is applied to the Programme stop signal output. When Start is pressed to continue the programme, the Programme stop signal output is reset. During the programme stop, the programme stop signal remains applied to the Programme stop signal output. When the programme continues, this signal is cancelled. This feature can be used to provide a signal to operate, e.g., a lamp or buzzer (connected via a suitable kit).
28	Drainage path 1	No		
29	Drain level 1	0 mm		
30	Wash time 4	As wash time 1		
31	Drainage path 2	Drain		
32	Free spin speed selection	No		
33	Spin	No		
34	Repeat	No		
35	Block end signal ¹⁾	Yes	Yes / No	Provision of a block end signal for a certain time

Table 16: Block programming Profitronic M

¹⁾ With payment system operation, **Yes** must be programmed in the last block of the complete programme to provide a reset signal to the payment system indicating that the programme has finished.

Save and quit

- ✍ The appropriate settings can be saved via the save button (disk symbol).
- ✍ To quit the programming mode, switch off the machine or step back to the appropriate level via the menus.

Quit (without saving)

- ✍ Switch off the machine.

4.2 Service mode summary

Initial requirements

- ✍ Close the door.
- ✍ Switch off the machine.

Accessing

- ✍ Press and hold the  **Start** button.
- ✍ Switch the machine on via the mains switch.
- ✍ Release the  **Start** button as soon as the display lights up.
- ✍ Press and release the  **Start** button twice briefly.
- ✍ Then press and hold the  **Start** button for at least 4 s until its illuminated switch surround flashes. Release the  **Start** button.

Note

The service mode accessing procedure must be completed within 10 s of switching the machine on. If this is not achieved, the service mode accessing process is interrupted and the control reverts to normal operating mode.

Note

A mains interruption during the accessing procedure will cancel the process. The accessing procedure must then be started again from the beginning.

Note

During any test in all service programmes the display of an actual value which varies from the desired value flashes. The technician can then more easily recognise faults or desired values that have not been reached.

Acknowledgement indicator

Successful accessing of the service mode is indicated by rapid flashing (5 Hz) of the  **Start** button illuminated switch surround.

Options

The **Service mode** is divided into 4 different parts:

Service mode (service level)		
	1	Service programme
	2	Service information
	3	Service settings ¹⁾
	4	Delete display message ¹⁾

Table 17: Service mode sub-divisions

¹⁾ Only visible under the following circumstances: 1. NTC1 temperature sensor is disconnected at the control-power module. Or 2. When a personal identification-enabled communication link to the PC service program exists.

There are 2 **service programme** sub-divisions:

Service mode (service level)		
1	Service programme	
	1	Test manually
	2	Test automatically

Table 18: Service programme divisions

Test manually has 10 further sub-divisions:

Service mode (service level)		
1	Service programme	
	1	Test manually
	1	System analyse
	2	Control-power module (component) (ELP 230)
	3	Selection-display module (control element) (EW 230)
	4	Frequency converter (modulator) (EFU 230)
	5	Multifunction module 1 (ELZ 230)
	6	Multifunction module 2 (ELZ 230)
	7	Multifunction module 3 (ELZ 230)
	8	Card reader module
	9	Operating data module
	10	Interface card 6 (multiposition payment system)
	11	Load module
	12	MPG (German medical product law) module
	13	Language

Table 19: Test manually sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Note

All service programmes are limited to an overriding safety time of 30 min.

System analyse has the following sub-divisions:

Service mode (service level)						
1	Service programme					
	1	Test manually				
		1	System analyse			
				Designation	Display	Explanation
				–	E.g.: Analysis in progress	Checks all modules and their sensors to see if they are present. Checks checksums (test sums to verify integrity of data and programmes) operating system, wash programmes, languages, etc.

Table 20: System analyse sub-divisions

If no fault is registered by the system analysis, **Function available** is displayed. For precise details of fault messages, see the appropriate function.

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Control-power module has the following sub-divisions:

Service mode (service level)					
1	Service programme				
	1	Test manually			
		2	Control-power module (component)		
			Designation	Display	Explanation
			Machine type:	E.g. PW 6101 Electric heating	Display of model registered by the control with type of heating
			Heating type		
			ID Number	E.g. 123456789	Display of ELP 230 power module ID number registered by the control
			Door	"Door open" symbol, "Door closed" symbol, "Door locked" symbol, "Door unlocked" symbol	Control indicates state of door contact switch
			Door on clean side	As "Door"	Check of door on clean side for machine with clean and soiled sides
			Water valves	K1, K2, KD, KH, W1, W2, WD, K3, K4, K5, K6	Test of water valves
			Heating		Test of heater rating for selected setting. Desired and actual temperatures or if a fault is detected, an indication is shown in display.
			Drain valve		Drain valve test. Drain valve cleaning. If a fault is detected, an indication is shown in display.
			NTC sensor (probe)		Check of NTC sensors 1 and 2. Registered temperatures or if a fault is detected, an indication is shown in display.
			Heating dry protection (dryer safety contact)		Test of heating contactors for switching on and off by testing the heating contactor auxiliary contacts 1 and 2. If a fault is detected, an indication is shown in display.
			Coin signal		Check of payment system signal: Payment system contact open / closed.
			Programme end signal		Reset / Deletion of programme end signal when button is pressed
			Card inserted		Check of chip card inserted / not inserted switch in card reader
			Imbalance		Test of imbalance switch and SEBAD sensor (second imbalance detection system). If a fault is detected, an indication is shown in display.
			Motor thermostat (thermo-switch)		Shows open or closed state of drive motor thermostat
			Frequency converter (FM) interface		Test of frequency converter interface. Frequency converter software version number registered by control is displayed. If a fault is detected, an indication is shown in display.
			Multifunction module (MFM) interface		Test of multifunction module interface. All MFM module addresses are checked and displayed. If a fault is detected, an indication is shown in display.

Table 21: Control-power module sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Selection-display module has the following sub-divisions:

Service mode (service level)					
1	Service programme				
	1	Test manually			
		3	Selection-display module (control element)		
			Designation	Display	Explanation
			ID Number	E.g. 123456789	Display of EW 230 control module ID number registered by the control
			Display	E.g.: Contrast: 3. Level symbol for display contrast  controls all pixels concurrently.	For contrast modification and to check if all pixels are in order (pixels = picture elements)
			Buttons	OK above the first 5 multifunction buttons.	Control registers switching state of each activated multifunction button
			Multifunction selector	E.g. Please turn the multifunction selector and a symbol for turning either clockwise or anticlockwise	Testing of the multifunction selector (jogshuttle) and the OK button
			Start button	Please press the start button (). Start button OK.	Start button  can be pressed to test itself and illuminated switch surround
			Buzzer	Buzzer is active and display of buzzer symbol above a multifunction button.	When the multifunction button with the buzzer symbol above it is pressed, Buzzer is active is displayed and the buzzer sounds
			Remote start	Remote start and "Contact open" or "Contact closed" symbol	Control registers state of remote start relay contacts

Table 22: Selection-display module sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Frequency converter has the following sub-divisions:

Service mode (service level)					
1	Service programme				
	1	Test manually			
		4	Frequency converter (modulator)		
			Designation	Display	Explanation
			Operating data	Operating hours, number of times machine is switched on/off, energy consumption, average temperature, maximum temperature, model	Display of EFU 230 frequency converter operational data registered by frequency converter control
			Fault counter	Short circuit, high voltage, low voltage, mains interruption, offset fault, overload, temperature, high current, tachogenerator fault	Display of EFU 230 frequency converter faults registered by frequency converter control
			Fault memory	List of last 16 faults registered	
			Motor	Time, Rhythm, Spin speed, V/A values	Display of control data transmitted to motor by frequency converter control
			Tachogenerator		Tachogenerator signal state

Table 23: Frequency converter sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Multifunction module 1 has the following sub-divisions (Multifunction modules 2 and 3 are similarly divided):

Service mode (service level)					
1	Service programme				
	1	Test manually			
		5	Multifunction module 1		
			Designation	Display	Explanation
			Coding	E.g. CodMFM1	Display of coding registered by control, here "Coding multifunction module 1", EZL 230 or fault indication
			Inputs	E.g. Inputs, In1:0, In2:0, In3:0, ... In11:1	Display of multifunction module input states registered by control. 0 : no signal, 1 : signal present.
			Outputs	E.g. Outputs, Out1 to Out5, Out6 to Out9	After selection of appropriate option 1 to 5 or 6 to 9, control sets relay of selected output after corresponding multifunction button is pressed. Warning! Switching the outputs may activate unexpected external functions!
			Analog	E.g. Analog, Analog1 = 0.0 V, Analog2 = 1.5 V	Control checks voltage at both analog inputs of multifunction module and displays them

Table 24: Multifunction module 1 sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Card reader module has the following sub-divisions (control checks chip card module and a chip card):

Service mode (service level)					
1	Service programme				
	1	Test manually			
		8	Card reader module		
			Designation	Display	Explanation
			Card switch	Card switch and "Contact open" or "Contact closed" symbol	Control registers state of card switch relay contacts
			–	E.g. symbol for chip card above a multifunction button	Starts analysis of chip card module. Result or fault indication is then displayed.

Table 25: Card reader module sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Operating data module has the following sub-divisions (control checks operating data module and memory card):

Service mode (service level)					
1	Service programme				
	1	Test manually			
		9	Operating data module		
			Designation	Display	Explanation
			–	E.g. Operating data module and “Start” symbol above a multifunction button	Starts analysis of operating data module. Result or fault indication is then displayed.

Table 26: Operating data module sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Interface card 6 (multiposition payment system) has the following sub-divisions:

Service mode (service level)					
1	Service programme				
	1	Test manually			
		10	Interface card 6		
			Designation	Display	Explanation
			Interface card 6	E.g. Interface card 6 and “Start” symbol above a multifunction button	Starts analysis interface card 6. Result or fault indication is then displayed.

Table 27: Interface card 6 sub-divisions

Load module (module for automatic load registration) has the following sub-divisions:

Service mode (service level)					
1	Service programme				
	1	Test manually			
		11	Load module		
			Designation	Display	Explanation
			Calibration	Press 0 kg multifunction button, Press 25 kg multifunction button	To set automatic weighing process
			Test	Insert test weight	Weighing function constantly displays registered drum load

Table 28: Load module sub-divisions

MPG (German medical product law) module has no function or test points.

Service mode (service level)						
1	Service programme					
	1	Test manually				
		12	MPG module			
			Designation	Display	Explanation	
			

Table 29: MPG (German medical product law) module

Language module has no function or test points.

Service mode (service level)						
1	Service programme					
	1	Test manually				
		13	Language module			
			Designation	Display	Explanation	
			

Table 30: Language module

When **Test automatically** is selected, the automatic test starts with a system analysis. If a fault is registered, the automatic test stops. It can then be quit by pressing the **Back** button or continued by pressing the **OK** button.

Service mode (service level)			
1	Service programme		
	2	Test automatically	
	1	System analyse	
			Selection-display module (EW 230)
			Control-power module (ELP 230)
			All modules
			NTCs
			System check
	2	Door	
			Door contact switch
	3	Control elements	
			Multifunction selector (jogshuttle)
			All buttons
	4	Display	
			Display
	5	Tachogenerator check	
			Tachogenerator signal registration
	6	Drive check without water	
			Drive motor
	7	Minimum heating level	
			Valves, analog pressure sensor
	8	Checking of all water valves	
			Water valves
	9	Drive check with water	
			Drive, tachogenerator, frequency converter, analog pressure sensor
	10	Software for overflow level	
			Drain valve seal, drain valve
			Drain function, drain valve
	11	Water intake to 150 mm wc	
			Heating at full power to increase temperature by 5° C
			Drain valve
			Spin speed

Table 31: Automatic test sequence

Service information has the following sub-divisions:

Service mode (service level)		
2	Service information	
	1	Operating data
	2	Operating faults
	3	Delete operating faults
	4	Machine history

Table 32: Service information sub-divisions

The **Operating data** option gives information about various aspects of the machine such as model, Machine no., ID numbers, modules, operating hours, programme interruptions and the service interval.

Operating data has the following sub-divisions:

Service mode (service level)			
2	Service information		
	1	Operating data	
	1	Machine type	
	2	ID Number SLT (control-power module)	
	3	ID Number BAE (Selection-display module)	
	4	ID Number FU (frequency converter)	
	5	Commissioning date	
	6	Heating type	
	7	Module	
	8	Total time switched on	
	9	Consumption data	
	10	Dosage amount	
	11	Heating active period	
	12	Drive motor active period	
	13	Service interval	
	14	Service interval counter	
	15	Last accident prevention check	
	16	Lube bearing counter	
	17	WRG concept (water recycling)	
	18	User password	

Table 33: Operating data sub-divisions

The **Operating faults** option gives the service technician information about operational faults registered by the control. The control saves the last 100 faults detected. If more than 100 faults are registered, the oldest are overwritten.

Operating faults has the following sub-divisions:

Service mode (service level)			
2	Service information		
	2	Operating faults	
	1	Total number of faults	
	2	Water drain	
	3	Water inlet	
	4	Motor	
	5	Heating	
	6	Dosing	
	7	Pressure monitor	
	8	Card reader module	
	9	Data transfer	
	10	Load module	
	11	Operating data module	

Table 34: Operating faults sub-divisions

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

After the machine has been repaired, the service technician can delete the fault memory.

Delete operating faults has the following sub-division:

Service mode (service level)			
2	Service information		
	3	Delete operating faults	
			No. of deletions

Table 35: Delete operating faults sub-division

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Delete operating faults shows the following information:

Service mode (service level)					
2	Service information				
	3	Delete operating faults			
			No. of deletions		
			Designation	Display	Explanation
			Number:	E.g.: 2	Number of deleted faults registered by control
			Date:	E.g.: Date: 23.01.2004, Time: 14:30 h	List of date and time of faults registered by control to now be deleted. When the Save button (under the disk symbol) is pressed, a confirmation question is activated.

Table 36: Delete operating faults details

- ✎ Press and release the **Save** multifunction button (under the disk symbol). **Delete existing data?** is then displayed.
- ✎ Press and release the **Save** multifunction button (under the disk symbol). The control then deletes the operational faults from the fault memory and transfers details to the machine history. The following is then displayed: **Operating faults deleted.**

The machine history gives the service technician information about all faults and service work registered by the control. The control saves this data in non-volatile electronic memory (flash PROM) on the EW 230 selection-display module. A circular buffer saves 1000 operational faults. If more than 1000 faults occur, the oldest will be overwritten.

Machine history has the following sub-divisions:

Service mode (service level)			
2	Service information		
	4	Machine history	
		1	Total number of faults
		2	Water drain
		3	Water inlet
		4	Motor
		5	Heating
		6	Dosing
		7	Pressure monitor
		8	Card reader module
		9	Data transfer
		10	Load module
		11	Operating data module

Table 37: Machine history sub-divisions:

When the desired item has been selected via the multifunction selector (jogshuttle switch), press the **OK** button. The selected service programme then starts immediately and can be stopped when the **Back** button is pressed.

Service settings has the following sub-divisions:

Service mode (service level)		
3	Service settings	
	1	Basic settings
	2	MFM 1 (Multifunction module 1)
	3	MFM 2 (Multifunction module 2)
	4	MFM 3 (Multifunction module 3)
	5	Sign on module
	6	Sign off module

Table 38: Service settings sub-divisions:

The **Service settings** can be used by the service technician to set up the machine to suit the on-site conditions and the additional modules in use. For example monitoring times, temperatures, payment system functions and energy supply parameters, etc. can be programmed. Some **Service settings** must be made on site as they affect other functions. Example: A laundry operator wishes to record detailed operating data such as energy consumption so he can calculate his costs. When the heater rating and the power of the control and motors is recorded, the energy consumption can be established and made available for further processing.

Basic settings has the following sub-divisions:

Service mode (service level)			
3	Service settings		
	1	Basic settings	
		1	Water drain
		2	Water inlet
		3	Heating
		4	Gas heating
		5	Dosing
		6	Coin box
		7	Water recycling
		8	Service display
		9	Display in accordance with accident prevention legislation
		10	Bearing maintenance display
		11	Button allocation
		12	Commission

Table 39: Basic settings sub-divisions

The setting and programming of the inputs and outputs for programmable multifunction modules are the next step in the **Service settings**. The registration and deregistration (signing on and off) of modules is carried out in the **Service settings**.

Delete display message has the following sub-divisions:

Service mode (service level)		
4	Delete display message	
	1	Service display
	2	Display in accordance with accident prevention legislation
	3	Bearing maintenance display

Table 40: Delete display message sub-divisions

Save and quit

- ✎ Press the **Save** button (under the disk symbol).
- ✎ Switch the machine off to quit the service mode.

Quit (without saving)

- ✎ Switch the machine off to quit the service mode.

4.3 Selection-display module (BAE) removal / fitting

- ✎ Remove the machine lid, see Lid removal / fitting, 150 4.4.
- ✎ Loosen 1 retaining screw/nut (viewed from the rear, at the upper left of the back of the fascia panel).
- ✎ Slide the module locking bar to the left (viewed from the rear) as far as possible. The Module is now released.
- ✎ At the front, tilt the top edge of the module 5 mm outwards away from the machine. Lift the module slightly to release the bottom edge.
- ✎ Carefully remove the module forwards away from the machine and disconnect its connections.
- ✎ Remove the selection-display module (BAE).
- ✎ Reassemble by following these instructions in reverse order.

Note

The module locking bar must be opened by sliding to the right (viewed from the front) as far as possible. When refitting, after connecting the connection cables and with the top edge tilted slightly to the front, locate the bottom groove first on the fascia panel. Take care to lay the cables correctly. Ease the module into the fascia without using excessive force. Align the module and lock it in place.

4.4 Detergent dispenser cover flap removal / fitting

- ✎ Open the flap.
- ✎ Remove the 3 detergent dispenser scoops.
- ✎ Insert a long thin tool, e.g. a suitable screwdriver, in the small opening in the flap on the right near the hinge. Press the sprung hinge bolt back slightly.
- ✎ Release the flap by pulling the right side forwards first and then releasing the left. Take care with the washer, if present, on each hinge bolt. Remove the flap.

Note

Take care with the washer, if present, on each hinge bolt. When refitting, first fit the left side and then fit the right sprung hinge bolt. Ensure the flap is seated correctly.

4.5 Fascia panel removal / fitting

- ✂ Remove the machine lid, see Lid removal / fitting, 150 4.4.
- ✂ Remove the selection-display module, see Selection-display module (BAE) removal / fitting, 100 4.3.
- ✂ Remove the detergent dispenser cover flap, see Detergent dispenser cover flap removal / fitting, 100 4.4.
- ✂ Remove 2 screws on either side of the dispenser flap holder.
- ✂ Remove the 4 fascia fixing screws from the top (1 on the left side panel, 2 in the middle and 1 on the right side panel).
- ✂ Disconnect the earth wire.
- ✂ Remove the fascia panel upwards.

130 Water intake

1 Technical Data

Flow pressure and flow rates.

Permitted flow pressure	[bar]	1 to 10	1 to 10
Valve type		3/4", triple	3/4", triple
Flow rate - Valve block 1	[l/min]	10	-
Flow rate - Valve block 2	[l/min]	16	-
Flow rate - Valve block 3	[l/min]	16	-
Liquid dispensing	[l/min]	-	5.5

Table 1: Water inlet data

2 Function

2.1 Water paths, flow rates, combination for programming

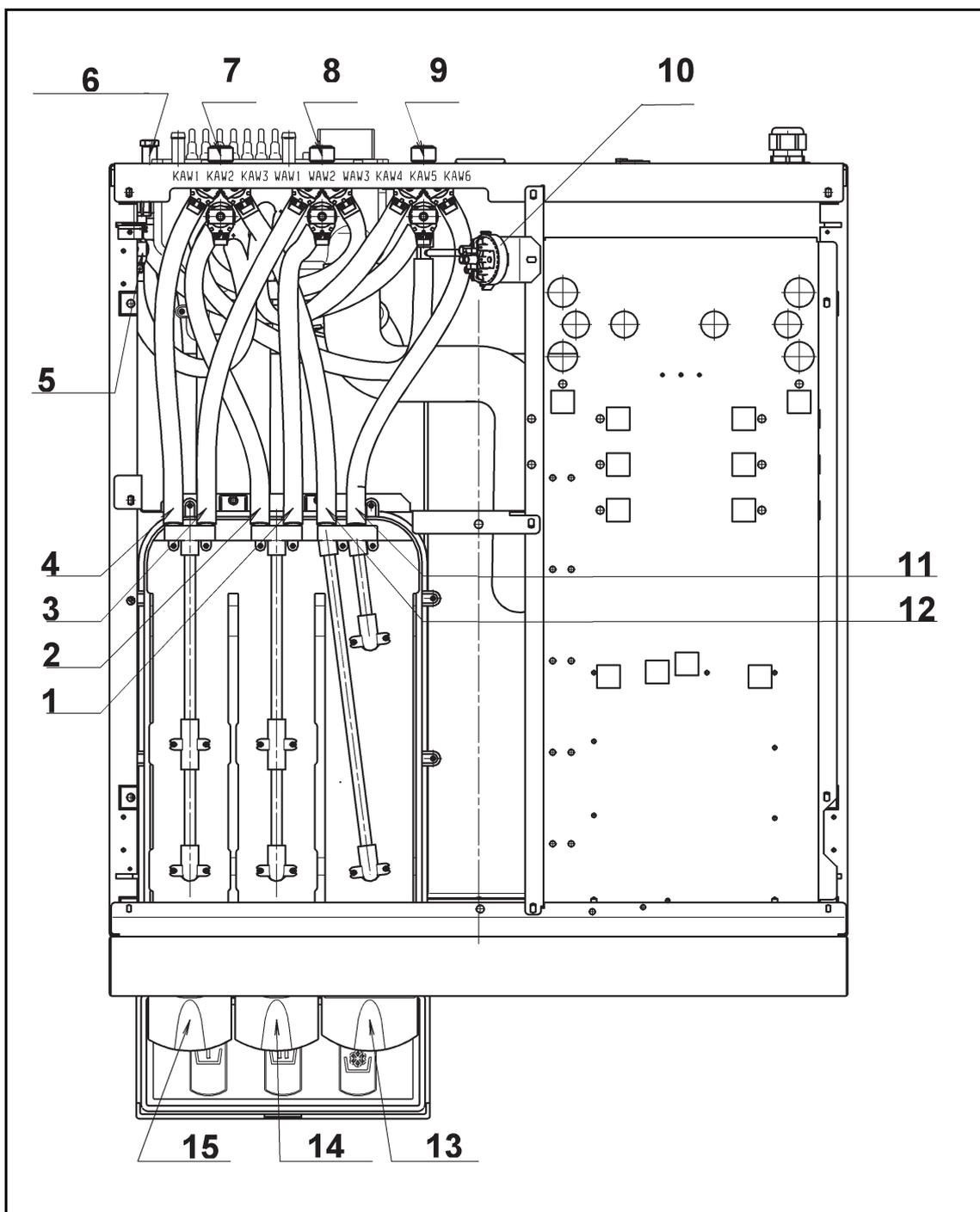


Fig. 1: Water path summary

- 1 2Y9, hot water 2, WAW2, compartment 2, powder detergent
- 2 2Y6, cold water 2, KAW2, compartment 2, powder detergent
- 3 1Y9, hot water 1, WAW1, compartment 1, powder detergent
- 4 1Y6, cold water 1, KAW1, compartment 1, powder detergent
- 5 1Y26, drain valve open, AVT-AUF
- 6 Emergency drain release, affects drain valve
- 7 Valve block 1, cold water, KAW
- 8 Valve block 3, hot water, WAW
- 9 Valve block 2, cold water, KAW, mixer box for liquid dispensing, chlorine bleach, drain valve
- 10 B1/1, level switch, water intake
- 11 Y41, chlorine bleach valve, KAW6, compartment 4, liquid chlorine bleach
- 12 3Y6, fabric conditioner valve, KAW3, compartment 3, liquid fabric conditioner
- 13 Compartment 3, liquid fabric conditioner and liquid chlorine bleach
- 14 Compartment 2, powder detergent, e.g. main wash
- 15 Compartment 1, powder detergent, e.g. pre-wash

Compartments 1 and 2 can each hold a maximum of 1400 ml powder detergent. Compartments 3 and 4 can each hold a maximum of 500 ml liquid detergent.

Emergency drain release by loosening the release bolt with a 17 mm open spanner, see 130 Fig. 1, Pos. 6.

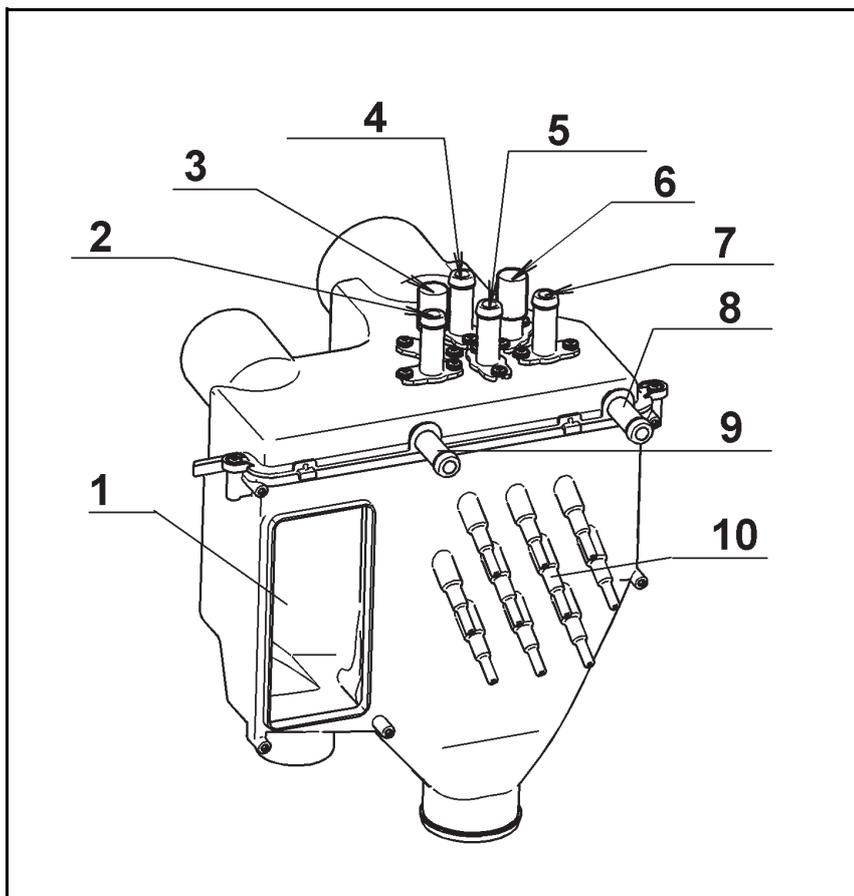


Fig. 2: Mixer box water intake for liquid dispensing

- | | |
|----|---|
| 1 | Control opening, water intake non-return device |
| 2 | Connection KAW 4, cold water, from Y13 |
| 3 | Connection HAW (1), for hard water kit |
| 4 | Connection AVT-AUF, drain open, from 1Y26 |
| 5 | Connection FL-DOS, liquid dispensing, from Y39 |
| 6 | Connection HAW (2), for hard water kit |
| 7 | Connection WAW 3, hot water, from Y11 |
| 8 | Connection - Paste dispensing |
| 9 | Connection - Paste dispensing |
| 10 | Connection 1 to 10, liquid detergent |

The mixer box can be used for the optional connection of hoses from up to 10 liquid dispenser pumps, 2 paste dispensers and a "hard water" conversion kit.

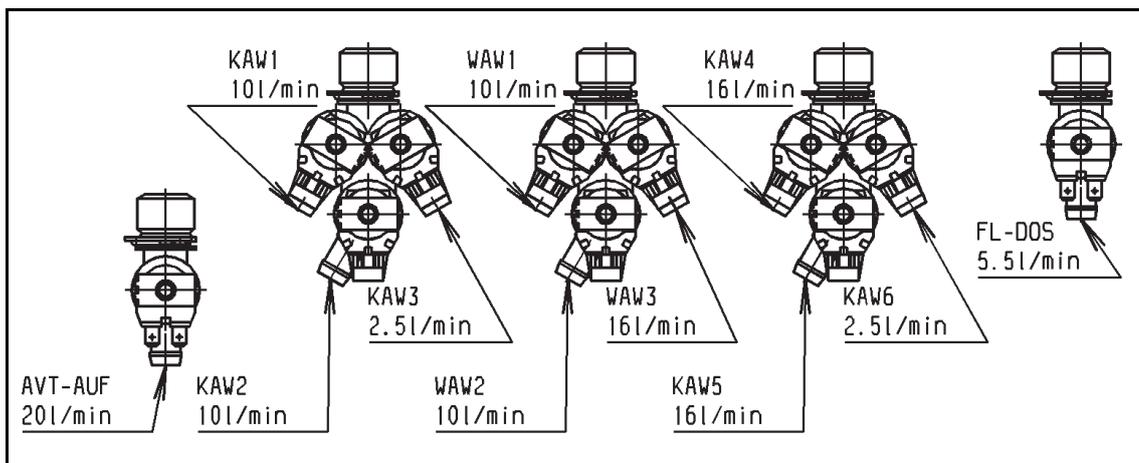


Fig. 3: Valves in valve blocks on machine rear panel

The flow quantities for the valve blocks are limited due to the interaction when two or more valves in a valve block are activated. If more water is required in a certain time period, the activation of different valves in different blocks should be programmed.

Valve block	Quantity limitation at input	Valve block designation	
1, see 130 Fig. 1, Pos. 7	10 l/min	KAW	3/4", triple valve
2, see 130 Fig. 1, Pos. 9	16 l/min	KAW	3/4", triple valve
3, see 130 Fig. 1, Pos. 8	16 l/min	WAW	3/4", triple valve
Liquid dispensing ¹⁾	5.5 l/min	FL-DOS	3/4", triple valve

Table 2: Valve block flow quantity limitations

¹⁾ If fitted

2.2 Valves

Inlet valve summary - PW 6101, PW 6131, PW 6161, PW 6201

Designation on wiring diagram	Description	Detergent dispenser compartment	Symbol	Designation in software / documentation
1Y5	Valve - Water inlet - Cold, hard, direct	–	–	KH, HAW
2Y5	Valve - Water inlet - Cold, hard, direct	–	–	KH, HAW
1Y6	Valve - Water inlet - Cold, pre-wash, max. 10 l/min	Compartment 1	⏏	K1 / KAW1
2Y6	Valve - Water inlet - Cold, main wash, max. 10 l/min	Compartment 2	⏏	K2 / KAW2
3Y6	Valve - Water inlet - Cold, rinse - Fabric conditioner, max. 2.5 l/min	Compartment 3, front	⏏	K3 / KAW3
1Y9	Valve - Water inlet - Hot, pre-wash, max. 10 l/min	Compartment 1	⏏	W1 / WAW1
2Y9	Valve - Water inlet - Hot, main wash, max. 10 l/min	Compartment 2	⏏	W2 / WAW2
Y11	Valve - Water inlet - Hot, direct, max. 16 l/min	–	–	WD / WAW3
Y13	Valve - Water inlet - Cold, direct, max. 16 l/min	–	–	KD / KAW4
Y41	Valve - Water inlet - Cold, chlorine bleach, max. 2.5 l/min	Compartment 3, rear	⏏	K4 / KAW6
Y39 ¹⁾	Valve - Liquid dispensing, 5.5 l/min	–	–	–

Table 3: Inlet valve summary - PW 6101, PW 6131, PW 6161, PW 6201

¹⁾ Valve Y39 automatically directs water to the dispenser box for liquid dispensing (mixer box, not the detergent dispenser) as soon as the first dispenser pump starts. 30 s after the last dispenser pump has stopped, Y39 is closed automatically.

The dispensed agent, mixed with water, then flows directly into the suds container without passing through the main detergent dispenser at the front of the machine.

²⁾ The given figures also depend on other conditions, see 130 Fig. 3 and 130 Table 2.

Summary of other possible valves - PW 6101, PW 6131, PW 6161, PW 6201

Designation on wiring diagram	Description	Symbol	Designation in software / documentation
Y25	Valve - Steam heating	–	
1Y26	Valve - Open drain valve		AA / AVT-AUF / WS
2Y26	Valve - Close drain valve		AZ / AVT-ZU / KAW5
3Y26	Valve - Open water recycling (WRG), intake from WRG container into machine	–	K6
4Y26	Valve - Close water recycling (WRG), drainage to on-site drain, not to WRG container	–	WRG
1Y53	Door release magnet	–	–
2Y53	Door locking magnet	–	–
Y57	Gas solenoid valve		

Table 4: Summary of other possible valves - PW 6101, PW 6131, PW 6161, PW 6201

2.3 Protective functions - Level monitoring

The control monitors the maximum water level in all operating states. The programmer can only program the following maximum levels:

Model	Maximum programmable level [mm]
PW 6101	350
PW 6131	350
PW 6161	350
PW 6201	350

Table 5: Maximum programmable water levels - PW 6101 to PW 6201

If the software registers an overflow, e.g. due to a defective water inlet valve, the control opens the drain valve. This remains open until the programmed level is reached. During drainage, the fault message **Water intake fault** is displayed. If the hardware registers an overflow, e.g. via the analog pressure sensor, then this directly activates the procedure to open the drain valve if, e.g. the control is defective.

Model	“Software overflow” level [mm]	“Hardware overflow” level [mm]
PW 6101	420	500
PW 6131	420	500
PW 6161	420	500
PW 6201	420	500

Table 6: Safety levels - PW 6101 to PW 6201

150 Casing

1 Technical Data

Material - Front panel	Stainless steel 1.4016
Material - Lid, side panels	Galvanised sheet steel, powder coated, blue
Material - Rear panel	Galvanised sheet steel

Table 1

4 Service

4.1 Transport information

- ✂ The machine should only be transported without a pallet if the front and rear panel have been removed, see Front panel removal, 150 4.7 und Rear panel bottom part removal / fitting, 150 4.6.

Warning!

When transporting the machine without a pallet, the following should be noted: It is very likely that damage will be caused to the front and rear panels when the forks from a forklift truck or a palletiser are driven under the machine. Therefore these panels should be removed beforehand.

If the front and rear panels have been removed, do not subject the upper areas of the machine to excessive force as the casing can easily be bent and damaged.

4.2 Transport strut removal

- ✂ Remove the front and rear panels, see Front panel removal, 150 4.7 and Rear panel bottom part removal / fitting, 150 4.6.

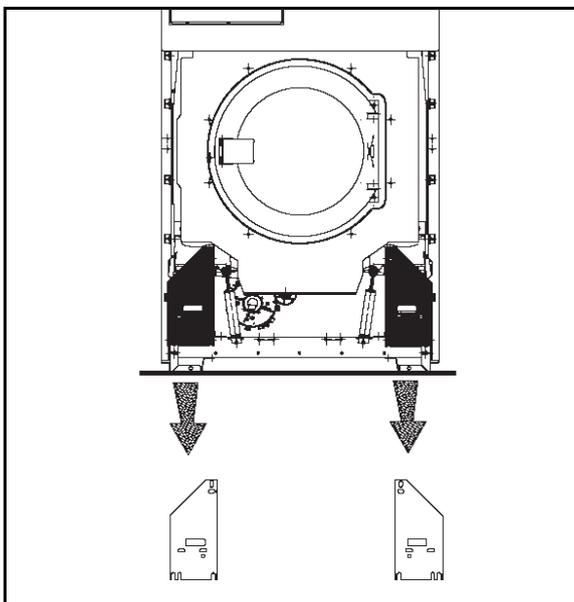


Fig. 1: Front transport struts

- ✂ Remove 3 screws from each front red transport strut.
- ✂ Remove the transport struts.

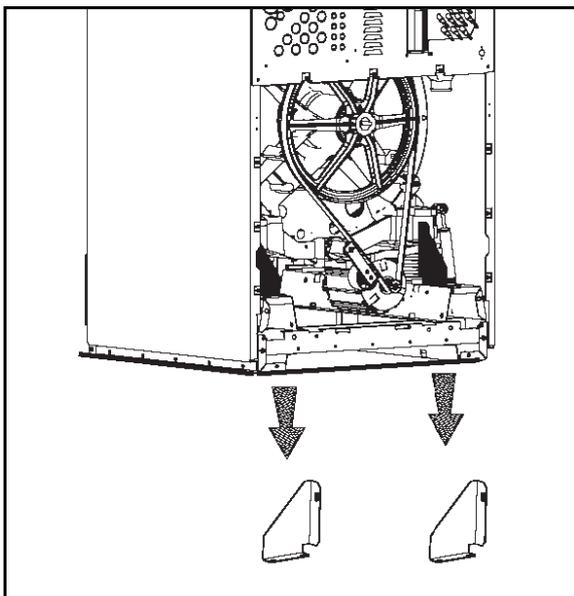
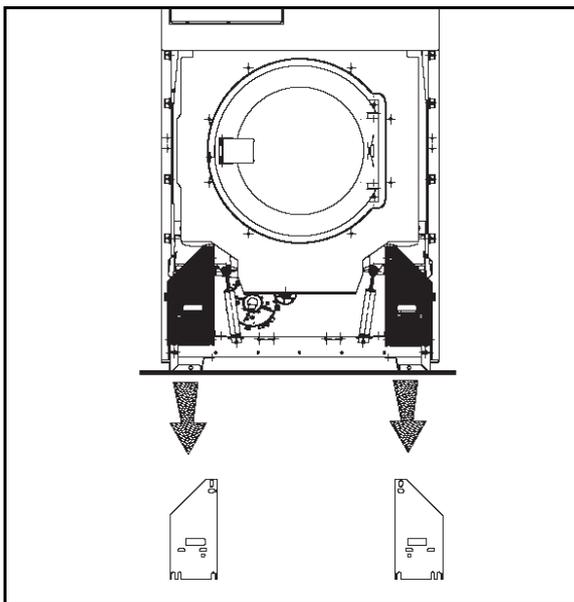


Fig. 2: Rear transport struts

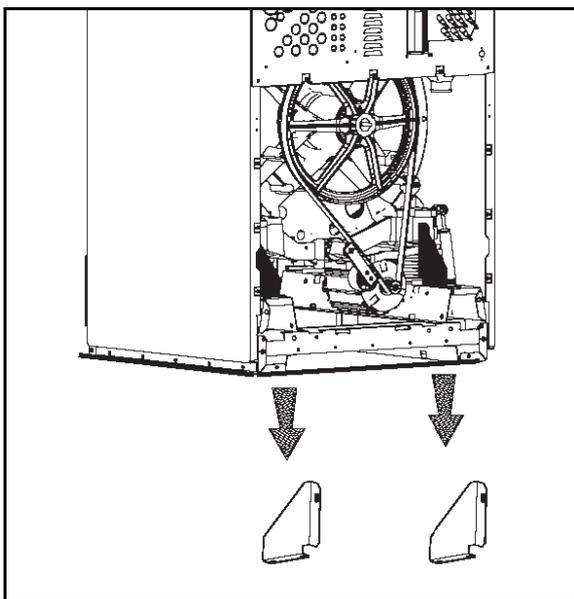
- ✚ Remove 3 screws from each rear red transport strut.
- ✚ Remove the transport struts.
- ✚ Take care to retain the transport struts with their associated screws and pass them to the operator for safe keeping in case the machine needs to be relocated in the future.
- ✚ Reassemble the machine.

4.3 Transport strut fitting

- ✚ Remove the front and rear panels, see Front panel removal, 150 4.7 and Rear panel bottom part removal / fitting, 150 4.6.

**Fig. 3:** Front transport struts

🔧 Fit the front transport struts and secure each one with 3 screws.

**Fig. 4:** Rear transport struts

🔧 Fit the rear transport struts and secure each one with 3 screws.

🔧 Reassemble the machine.

4.4 Lid removal / fitting

- ✚ Remove 1 screw from each side of the lid at the top of the machine.
- ✚ Lift the lid slightly at the front and disconnect its earth connection.
- ✚ Slide the lid slightly to the rear to release its conical retainer guides from the rear panel.
- ✚ Remove the lid upwards.
- ✚ Reassemble by following these instructions in reverse order.

4.5 Rear cover flap for mains connection, dispenser pumps and additional kits removal / fitting

- ✚ Remove 2 screws from the underside of the cover flap.
- ✚ Remove 2 screws from the top of the cover flap (with rounded corners).
- ✚ Remove the cover flap upwards.
- ✚ Reassemble by following these instructions in reverse order. Ensure the cover bulges outwards and that the rounded edges are at the top.

4.6 Rear panel bottom part removal / fitting

- ✚ Remove the 3 screws at the top of the rear panel bottom part.
- ✚ Loosen the 7 screws on the bottom edge of the rear panel bottom part.
- ✚ Loosen the 4 screws on either side of the rear panel bottom part.
- ✚ Slide the rear panel up slightly to release it from its keyhole fastenings.
- ✚ Remove the rear panel bottom part.
- ✚ Reassemble by following these instructions in reverse order.

4.7 Front panel removal

- ✍ Remove 1 screw on each side of the front panel from the underneath of the bottom edge.
- ✍ Pull the bottom edge outwards slightly so releasing it from its conical retainer guides half way up the front.
- ✍ While it is slanted, lower the front panel to release it from its top retainers on the fascia panel. Remove the front panel downwards.

4.8 Front panel fitting

- ✍ Tilt the top edge of the front panel to the rear.
- ✍ Lift the front panel such that its top edge engages with the retainers on the fascia panel. Press the front panel upwards and hold it in position.
- ✍ Ensure the cutouts on the inner side of the front panel engage with the conical retainer guides half way up the front of the machine. Press the front panel against the machine front edge and hold it in position.
- ✍ Refit 1 screw on each side of the front panel on the underneath of the bottom edge.
- ✍ Adjust the front panel as appropriate then tighten the screws.

160 Documents

1 Technical Data

Wiring diagram, wiring diagram legend, switching plan, multifunction module, operating instructions, programming instructions for Profitronic M washing

500 Testing, special documents

1 Technical Data

Log book for testing in accordance with accident prevention legislation.

