SERVICE MANUAL

W75 – W100 – W160 – W230

471 1553-51

Electrolux

Wascator

NOTICE TO SERVICE PERSONNEL

INSTALLATION

Improper installation of Wascomat laundry and wet cleaning equipment can result in personal injury and severe damage to the machine.

REFER INSTALLATION TO QUALIFIED PERSONNEL!

RISK OF ELECTRIC SHOCK

The equipment utilizes high Voltages. Disconnect electric power before servicing.
The use of proper service tools and techniques, and the use of proper repair procedures, is essential to the safety of service personnel and equipment users.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

RISK OF PERSONAL INJURY

This equipment contains moving parts, and some components that may have sharp edges. Improper or careless service procedures may result in serious injury to service personnel.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

ABOUT THIS MANUAL

This manual is intended to provide service guidance to qualified service personnel. Wascomat and its authorized dealers make no determination regarding the qualification of individuals requesting this service manual. The service provider assumes all risks inherent to the servicing of this equipment and any risks that arise as result of the lack of knowledge or ability of any person servicing this equipment.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

NOTE:

Improper installation or servicing of Wascomat equipment will void the manufacturer's warranty!

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Fig. 1

The 70 100, 160 and 230 litre washing machines described in this manual are normal spin machines and differ only in size and washing capacity. The machines are intended for installation in apartment houses, hotels, laundries, industries, hospitals, smaller institutions and other regular users who require machines with high reliability, large washing capacity and easy maintenance.

Because the machines have a washing drum which is solidly mounted in the frame, they require secure anchoring to the foundation.

The spin speed provides a G-factor of about 80.

The machines are supplied equipped in accordance with customer specifications for electric, steam, gas heating or non-heating and can be connected to various combinations of cold, hot and/or cold hard water.

The machines can be supplied with or without coin meter.

The machines are available with two different types of timer:

- Mechanical timer with fixed wash programs. The machine has switches to select different standard programs.
- Electronic timer with fixed wash programs. The machine has switches to select different standard programs. The timer also has a built-in trouble-shooting program which increases possibilities for rational service.

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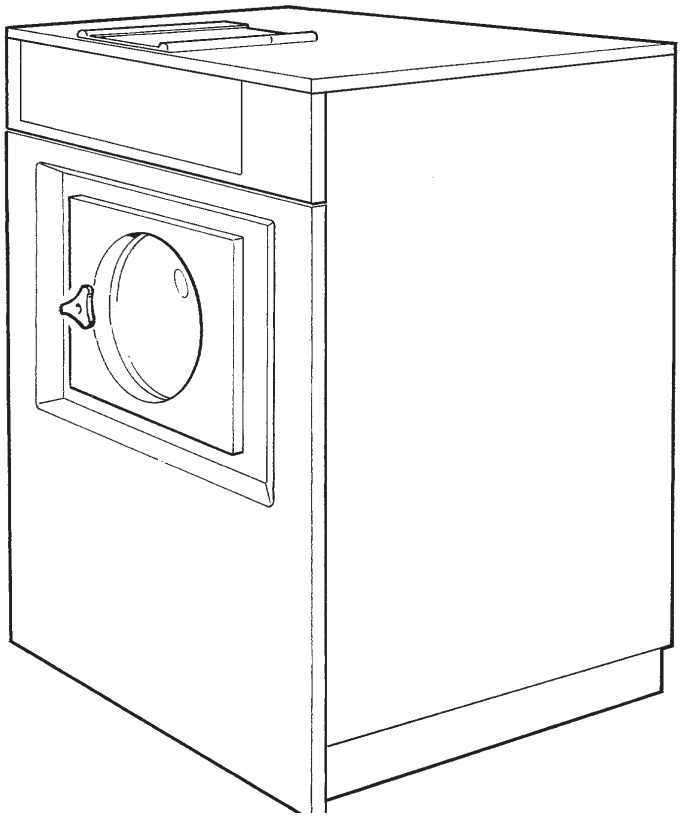

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Safety Regulations

- The machine is designed for water washing only.
- The machine must not be used by children.
- Installation and service work may only be carried out by qualified personnel.
- The machine’s door lock may not be bypassed under any circumstances.
- System leakage, such as a worn door gasket, should be repaired immediately.
- Qualified personnel should study the relevant handbooks and service manuals before any repairs or service are done.
- This machine may not be sprayed with water.

		W 75	W 100	W 160	W230
Dry weight capacity					
at filling factor 1:13		5.4 kg	7.7 kg	12.3 kg	17.7 kg
at filling factor 1:10		7 kg	10 kg	16 kg	23 kg
Drum volume		70 lit	100 lit	160 lit	230 lit
diameter		520 mm	520 mm	620 mm	700 mm
depth		356 mm	473 mm	520 mm	600 mm
Drum speed	wash	52 r/m	52 r/m	52 r/m	45 r/m
	spin	530 r/m	530 r/m	500 r/m	455 r/m
G-factor	wash	0.8	0.8	0.9	0.8
	spin	81	81	87	81
Dimensions	width	660 mm	660 mm	745 mm	825 mm
	depth	649 mm	766 mm	995 mm	1090 mm
	height	1050 mm	1050 mm	1195 mm	1320 mm
Recommended service space					
	side	250 mm	250 mm	250 mm	250 mm
	rear	500 mm	500 mm	500 mm	500 mm
Min. space for moving machine during servicing					
	side	50 mm	50 mm	50 mm	50 mm
	rear	250 mm	250 mm	250 mm	250 mm
Weight	net	107 kg	147 kg	202 kg	265 kg
	gross, crate packed	117 kg	158 kg	220 kg	287 kg
	gross, box packed	144 kg	185 kg	280 kg	352 kg
Transport volume					
	crate packed	0.62 m^3	0.65 m^3	1.1 m^3	1.42 m^3
	box packed	0.77 m^3	0.8 m^3	1.5 m^3	1.8 m^3
Max floor load during spin		1.2±2.6 kN	1.7±3.4 kN	2.4±4.8 kN	3.1±5.2 kN
Frequency (dynamic load)		9 Hz	9 Hz	8.5 Hz	8.5 Hz
Water valves	connection	DN20 3/4	DN20 3/4"	DN20 3/4"	DN20 3/4"
	rec. water pressure	200-600 kPa	200-600 kPa	200-600 kPa	200-600 kPa
	pressure limits	40-1000 kPa	40-1000 kPa	40-1000 kPa	40-1000 kPa
	capacity at 300 kPa	27 l/min	27 l/min	27 l/min	100 l/min
Drain valve	conn. outside diameter	75 mm	75 mm	75 mm	75 mm
	capacity	160 l/min	160 l/min	160 l/min	160 l/min
Steam valve	connection	DN15 1/2"	DN15 1/2"	DN15 1/2"	DN15 1/2"
	rec. steam pressure	300-600			

70 LITERS

Heating alternative	Voltage alternative	Total kW	Fuse A	Cable cross-section mm²
No heating	100 V 1 AC 50 Hz	1,4	20	3 x 4
or	100 V 1 AC 60 Hz	1,3	20	3 x 4
Steam heating	120 V 1 AC 60 Hz	1,2	16	3 x 2,5
	200 V 3 AC 50 Hz	1,1	10	4 x 1,5
	208-240 V 3 AC 60 Hz	1,1	10	4 x 1,5
	220-230 V 1 AC 50 Hz	1,4	16	3 x 2,5
	220-230 V 3 AC 50 Hz	1,2	10	4 x 1,5
	240 V 1 AC 50 Hz	1,4	16	3 x 2,5
	380-400 V 3N AC 50 HZ	1,2	10	5 x 1,5
	415-440 V 3N AC 50 Hz	1,2	10	5 x 1,5
El 3,0 kW	220-240 V 1 AC 50 Hz	3,5	20	3 x 4
	380-400 V 3N AC 50 Hz	3.5	10	5 x 1,5
El 5,4 kW	220-230 V 1 AC 50 Hz	5,8	35	3 x 10
	220-230 V 3 AC 50 Hz	5,8	16	4 x 2,5
	240 V 1 AC 50 Hz	5,8	35	3 x 10
	380-400 V 3N AC 50 Hz	5,8	10	5 x 1,5
	415-440 V 3N AC 50 Hz	5,8	10	5 x 1,5
El 6,0 kW	380-415 V 3N AC 50 Hz	6,5	16	5 x 2,5
El 7,5 kW	220-230 V 3 AC 50 Hz	8,0	25	4 x 6
	220-230 V 3 AC 60 Hz	8,0	25	4 x 6
	240 V 3 AC 60 Hz	8,0	25	4 x 6
	380-400 V 3 AC 50 Hz	8,0	16	4 x 2,5
	380-400 V 3N AC 50 Hz	8,0	16	5 x 2,5
	415-440 V 3 AC 50 Hz	8,0	16	4 x 2,5
	415-440 V 3N AC 50 Hz	8,0	16	5 x 2,5

100 LITERS

Heating alternative	Voltage alternative	Total kW	Fuse A	Cable cross-section mm²
No heating	220 V 3 AC 50 Hz	1,6	10	4 x 1,5
or	415-440 V 3 AC 60 Hz	1,6	10	4 x 1,5
Steam heating	380-440 V 3N AC 50 Hz	1,6	10	5 x 1,5
	415-440 V 3N AC 50 Hz	1,6	10	5 x 1,5
	208-240 V 3 AC 60 Hz	1,6	10	4 x 1,5
	120 V 1 AC 60 Hz	1,1	20	3 x 4
	220-240 V 1 AC 50 Hz	1,7	16	3 x 2,5
El 7,5 kW	220-230 V 3 AC 50 Hz	8,1	25	4 x 6
	380-400 V 3N AC 50 Hz	8,1	16	5 x 25
El 9 kW	415-440 V 3N AC 50 Hz	9,6	16	5 x 2,5
	380-400 V 3 NAC 50 Hz	9,6	16	5 x 2,5

160 LITERS

Heating alternative	Voltage alternative	Total kW	Fuse A	Cable cross-section mm²
No heating	208-240 V 1 AC 60 Hz	2,6	16	3 x 2,5
or	208-240 V 3 AC 60 Hz	2,6	10	4 x 1,5
Steam heating	220-230 V 3 AC 50 Hz	2,6	10	4 x 1,5
	380-440 V 3N AC 50 Hz	2,6	10	5 x 1,5
	415-440 V 3N AC 50 Hz	2,6	10	5 x 1,5
El 12,0 kW	220-230 V 3 AC 50 Hz	12,8	35	4 x 10
	380-400 V 3N AC 50 Hz	12,8	20	5 x 4
	415-440 V 3N AC 50 Hz	12,8	20	5 x 4

230 LITERS

Heating alternative	Voltage alternative	Total kW	Fuse A	Cable cross-section mm²
No heating	208-240 V 3 AV 60 Hz	2,3	10	4 x 1,5
or	220-230 V 3 AC 50 Hz	2,3	10	4 x 1,5
Steam heating	380-400 V 3N AC 50 Hz	2,3	10	5 x 1,5
	415-440 V 3N AC 50 Hz	2,3	10	5 x 1,5
El 18 kW	208-240 V 3 AC 60 Hz	18,9	50	4 x 16
	220-230 V 3 AC 50 Hz	18,9	50	4 x 16
	380-400 V 3N AC 50 Hz	18,9	35	5 x 10
	415-440 V 3N AC 50 Hz	18,9	35	5 x 10

Fig. 1

The inner drum drive shaft is mounted in the outer drum with two ball bearings at the back plate. Two neoprene gaskets make the shaft leak resistant.

The motor is mounted on a rubber-cushioned shaft under the drum.

To prevent transmission of troublesome noises from chassis to the building frame, the motor's belt-tensioning device is also rubber-cushioned.

The drain valve is a membrane valve controlled with the help of the water pressure in the cold water connection.

The door is electrically locked when the machine in running.

Timer, level control, thermostat, motor relays, etc., are located in the automatic control unit which is easily accessible from the top of the machine.

The front plate is available in a selection of finishes (galvanised/ painted or in stainless steel). The side plates are galvanised/ painted, the rear panel is galvanised/unpainted and the top panel is stainless steel.

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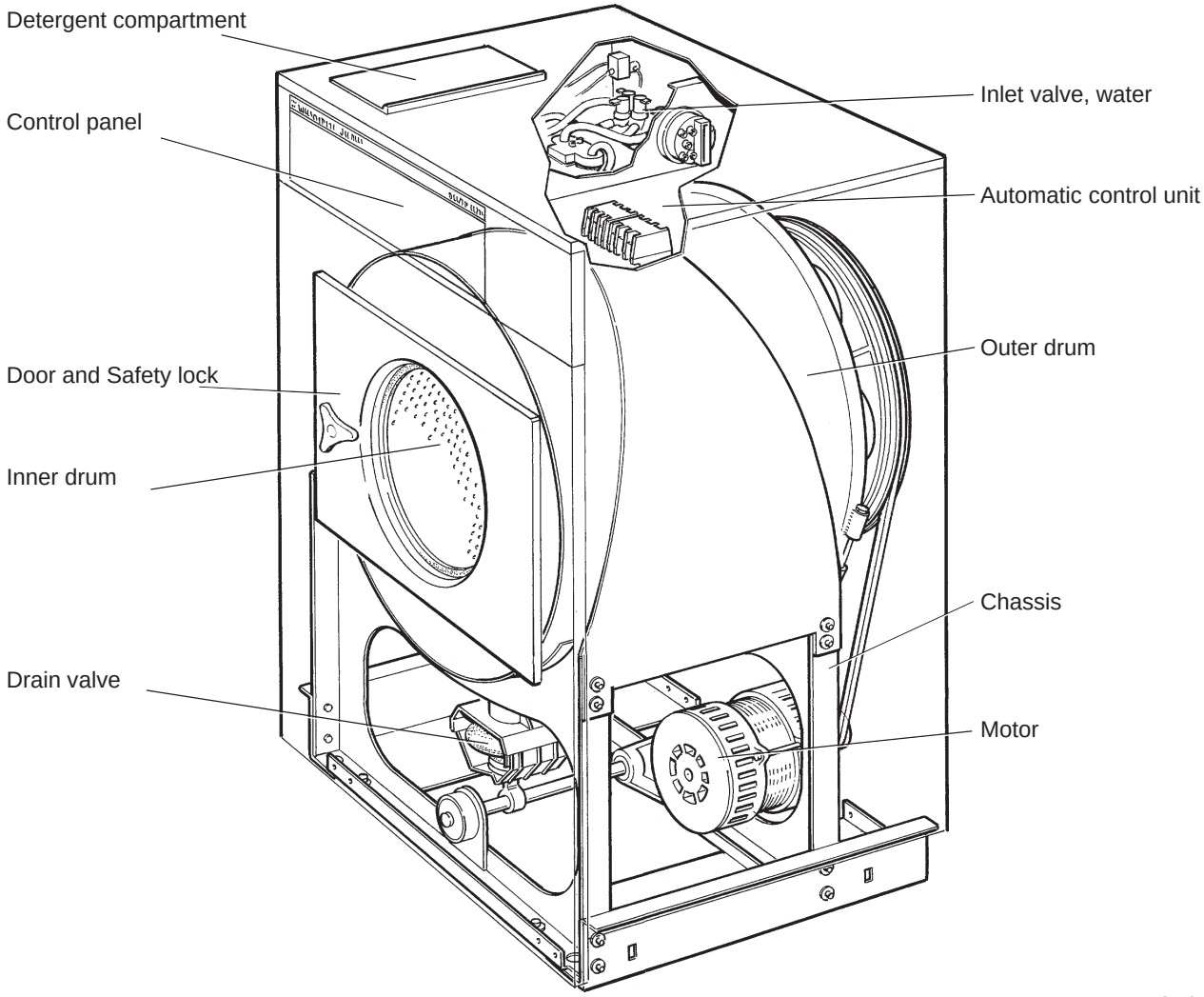
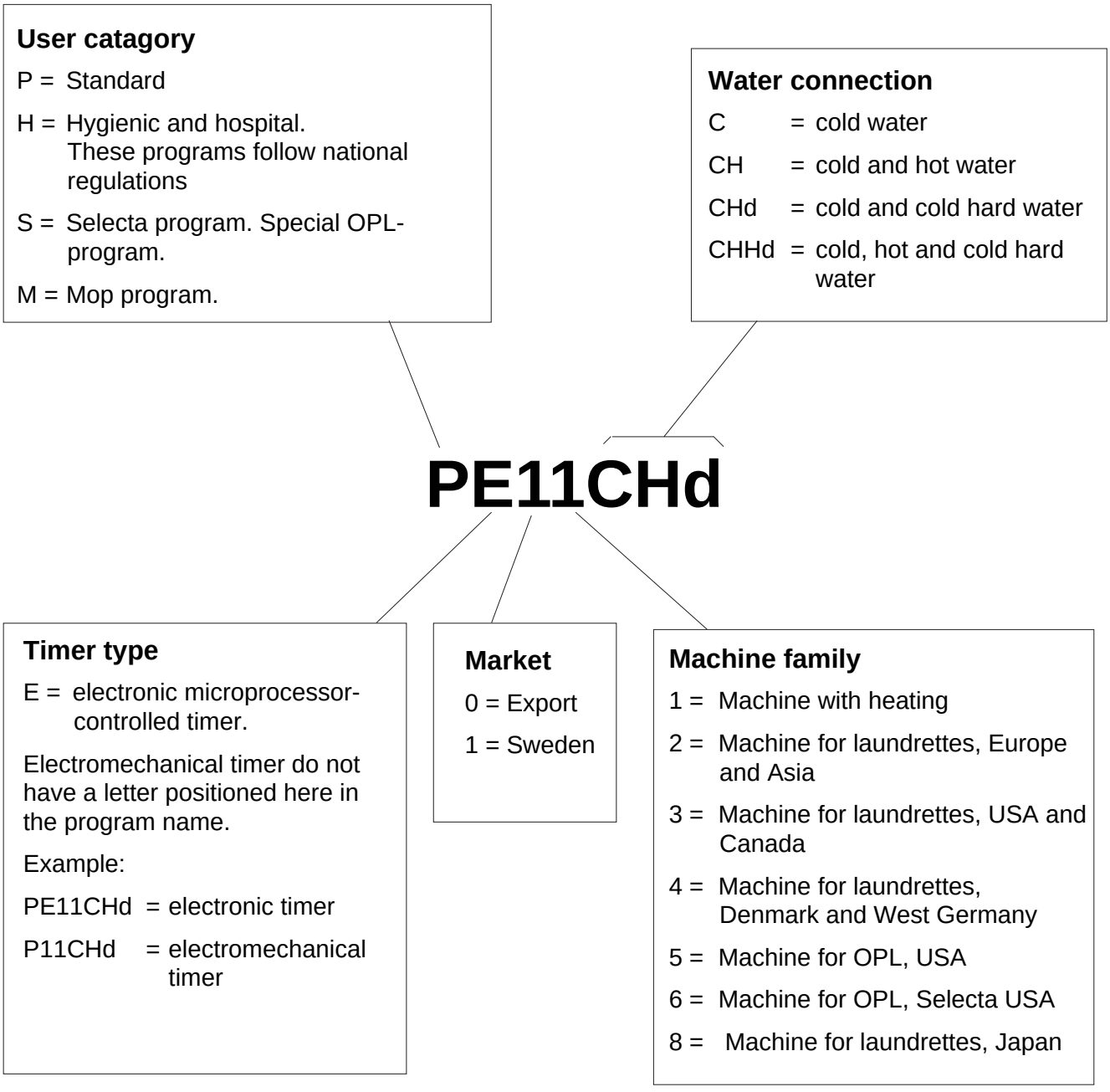


Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE11CHd used in the example above means:

- for standard user
- with electronic timer
- adapted for Sweden
- equipped with heating
- cold and cold hard water connection.

Program description

The wash programs identified by the symbol P11C are described on the following pages. They are the programs designed for a regular user using a heated machine with mechanical timer and intended for cold water connection only.

These machines have eight fixed programs, which are selected by using the knob on the control panel.

Program	Wash type
Normal 95°	white wash
Normal 60°	colour wash
Normal 40°	colour wash
Mild 30°	delicate wash
Wool	separate wool garments
Permanent press 40°	fine wash
Permanent press 60°	coloured
Permanent press 95°	white

By pushing the selector button **HEAVILY SOILED** a prewash and rinse will be added to the three standard programs.

During cool-down, water filling and heating, the timer does not move. This time is not included in the stated program times.

Program P11C

PROGRAM / PROGRAM SEQUENCE	NORMAL 95°						NORMAL 60°						NORMAL 40°						DELICATE 30°						WOOL						PERM. PRESS 40°						PERM. PRESS 60°						PERM. PRESS 95°					
	STANDARD 1						STANDARD 2						STANDARD 3						STANDARD 4						STANDARD 5						STANDARD 6						STANDARD 7						STANDARD 8					
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION
WITHOUT PRE WASH	3	C	-	LL	2	N	3	C	-	LL	2	N	3	C	-	LL	2	N	2	C	30	HL	-	G	3	C	40	HL	-	G	3	C	-	LL	2	N	3	C	-	LL	2	N	3	C	-	LL	2	N
MAIN WASH	12	C	90	LL	2	N	12	C	60	LL	2	N	12	C	40	LL	2	N	2	C	30	HL	-	G	2	C	40	HL	-	G	12	C	40	LL	2	N	12	C	60	LL	2	N	12	C	90	LL	2	N
COOL DOWN		C	56					C	56					-	-	-				-	-	-				-	-	-				-	-	-				C	56								
DRAIN	1					N	1					N	1					N	1					-	1					N	1					N	1					N	1					N
RINSE 1																																																
DRAIN																																																
EXTRACTION																																																
RINSE 2	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	G	1	C	-	HL	-	G	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N
DRAIN	1					N	1					N	1					N	1					-	1					N	1					N	1					N	1					N
EXTRACTION	0.5					E	0.5					E	0.5					E	-					-	0.5					E	0.5					E	0.5					E	0.5					E
RINSE 3	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	G	2	C	-	HL	-	G	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N
DRAIN	1					N	1					N	1					N	1					-	1					N	1					N	1					N	1					N
EXTRACTION	0.5					E	0.5					E	0.5					E	-					-	0.5					E	0.5					E	0.5					E	0.5					E
RINSE 4	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	G	2	C	-	HL	3	G	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N
DRAIN	1					N	1					N	1					N	1					G	1					N	1					N	1					N	1					N
EXTRACTION	1					E	1					E	1					E	1					E	1					E	1					E	1					E	1					E
SHAKE OUT	1.5					N	1.5					N	1.5					N	1.5					-	1.5					N	1.5					N	1.5					N	1.5					N
TOTAL TIME	27.5						27.5						27.5						16.5						16.5						27.5						27.5						27.5					

C = COLD WATER
HL = HIGH LEVEL
LL = LOW LEVEL

D = DISTRIBUTION
E = EXTRACTION
G = GENTLE ACTION 3/12 SEC
N = NORMAL ACTION 12/3 SEC

Program P11C with prewash

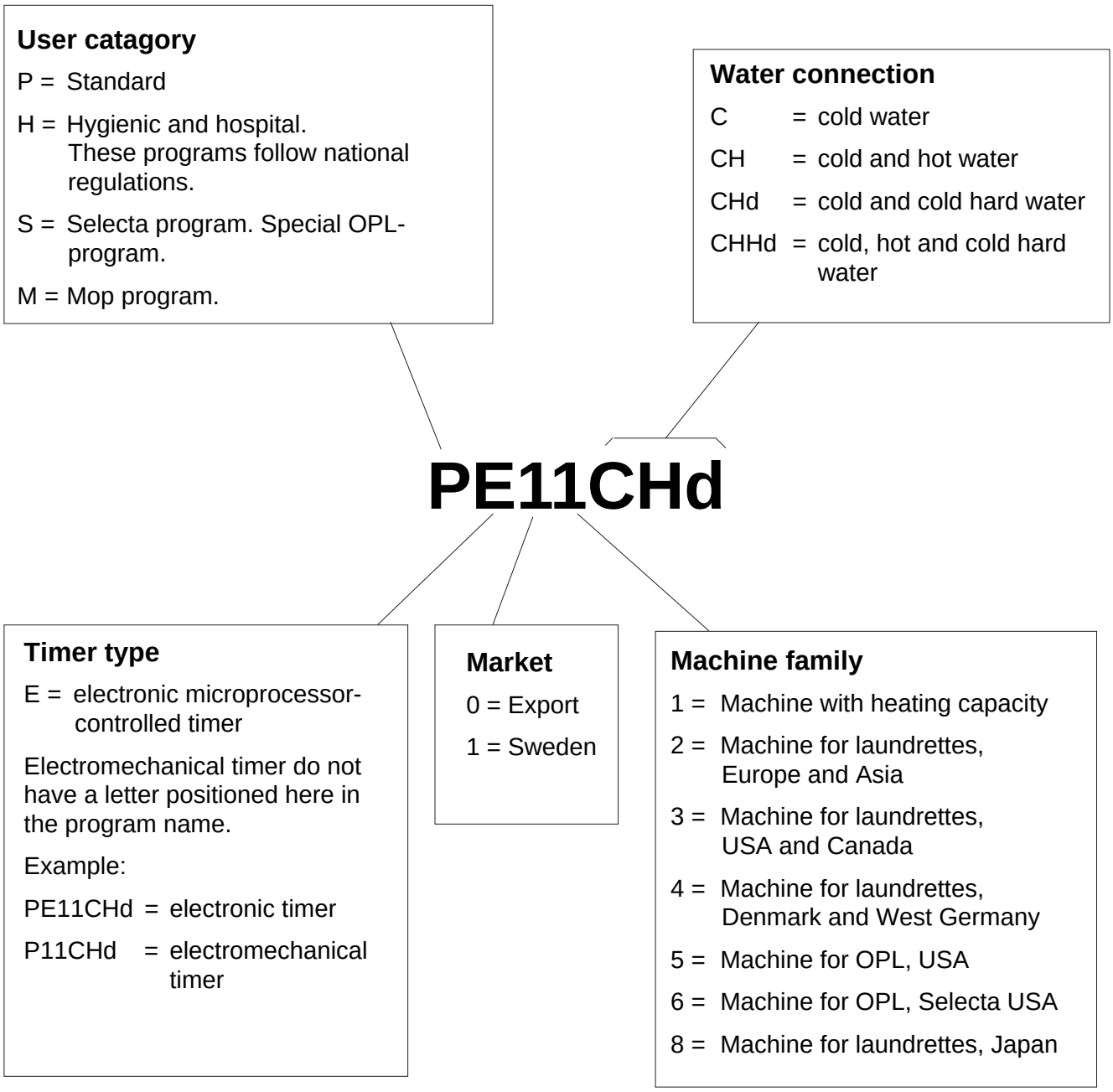
PROGRAM / PROGRAM SEQUENCE	NORMAL 95°							NORMAL 60°							NORMAL 40°							DELICATE 30°							WOOL							PERM. PRESS 40°							PERM. PRESS 60°							PERM. PRESS 95°						
	HEAVY SOILED							HEAVY SOILED							HEAVY SOILED							12							13							14							15							16						
	9							10							11																																										
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	
PRE WASH	6	C	-	LL	1	N		6	C	-	LL	1	N		6	C	-	LL	1	N																																	
DRAIN	0.5					N		0.5					N							N																																	
WITHOUT PRE WASH																						3	C	-	HL	2	G		3	C	-	HL	2	G		3	C	-	LL	2	N		3	C	-	LL	2	N						
MAIN WASH	12	C	90	LL	2	N		12	C	60	LL	2	N		12	C	40	LL	2	N		2	C	30	HL	-	G		2	C	40	HL	-	G		12	C	40	LL	2	N		12	C	90	LL	2	N						
COOL DOWN		C	56						C	56						-	-	-					-	-	-					-	-	-					-	-	-															
DRAIN	1							1							1							1							1							1							1											
RINSE	1	C	-	HL	-	N		1	C	-	HL	-	N		1	C	-	HL	-	N		1	C	-	HL	-	G		1	C	-	HL	-	G		1	C	-	HL	-	N		1	C	-	HL	-	N						
DRAIN	1					N		1					N							N																																	
EXTRACTION																						0.5					E		0.5					E		0.5					E		0.5					E						
RINSE 2	1	C	-	HL	-	N		1	C	-	HL	-	N		1	C	-	HL	-	N		1	C	-	HL	-	G		1	C	-	HL	-	G		1	C	-	HL	-	N		1	C	-	HL	-	N						
DRAIN	1					N		1					N							N																																	
EXTRACTION	0.5					E		0.5					E		0.5					E		-	-	-			E		0.5					E		0.5					E		0.5					E						
RINSE 3	2	C	-	HL	-	N		2	C	-	HL	-	N		2	C	-	HL	-	N		2	C	-	HL	-	G		2	C	-	HL	-	G		2	C	-	HL	-	N		2	C	-	HL	-	N						
DRAIN	1					N		1					N							N																																	
EXTRACTION	0.5					E		0.5					E		0.5					E		-	-	-			E		0.5					E		0.5					E		0.5					E						
RINSE 4	2	C	-	HL	3	N		2	C	-	HL	3	N		2	C	-	HL	3	N		2	C	-	HL	3	G		2	C	-	HL	3	G		2	C	-	HL	3	N		2	C	-	HL	3	N						
DRAIN	1					N		1					N		1					N		1					G		1					G		1					N		1					N						
EXTRACTION	1					E		1					E		1					E		1					E		1					E		1					E		1					E						
SPIN DOWN	1.5					N		1.5					N		1.5					N		1.5							1.5					N		1.5					N		1.5					N						
TOTAL TIME	33							33							33							16.5							16.5							27.5							27.5							27.5						

C = COLD WATER
HL = HIGH LEVEL
LL = LOW LEVEL

D = DISTRIBUTION
E = EXTRACTION
G = GENTLE ACTION 3/12 SEC
N = NORMAL ACTION 12/3 SEC

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE11CHd used in the example above means:

- for standard
- with electronic timer
- adapted for Sweden
- equipped with heating
- cold and cold hard water connection

Program description

The wash programs identified by the sybol P11C are described on the following pages. They are the programs for a regular user in Sweden using a heated machine with mechanical timer and intended for cold water connection only. There are more program variations available for machines with electronic timer.

Machines with wash program PE11C have seven fixed programs which are selected by pushing the program buttons on the panel.

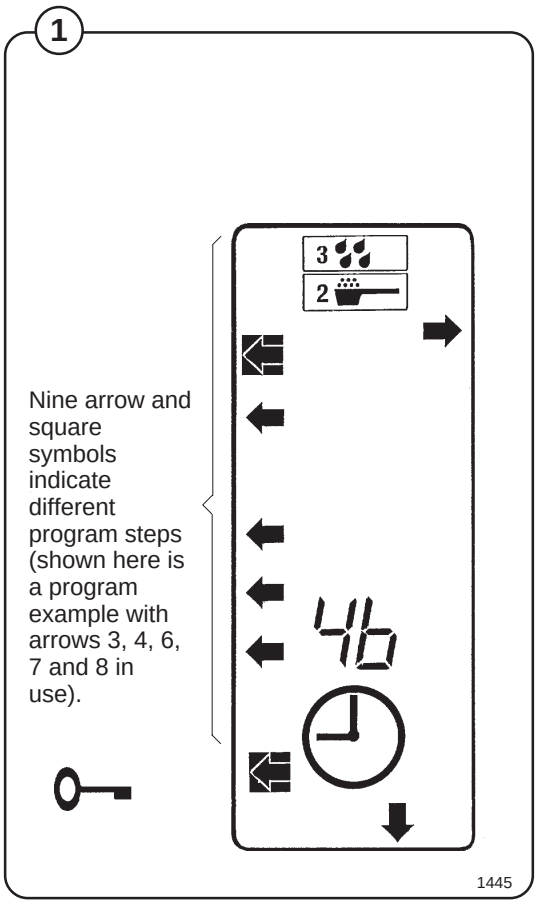
Program	Wash type
Normal 95°	white wash
Normal 60°	colour wash
Normal 40°	colour wash
Mild 30°	delicate wash
Wool	separate wool garments
Permanent press 40°	fine wash
Permanent press 60°	coloured

The programmer has two selector buttons, **HEAVILY SOILED** and **NO SPIN**. By pushing in one or the other or both simultaneously, a total of 28 different program variations are accessible.

During cool-down, water filling and heating, the timer does not move. This program time is not included in the stated program times.

Program indicator

Fig. 1



To the left in the display window, there are ten arrow symbols which can be illuminated. A square surrounding each arrow can also be illuminated. The arrows light up when a program is selected in order to indicate which program step is in progress. During program operation, the squares around the arrows light up when each program step is completed.

In the following program schedule, there are columns titled "PROG. INDIC." for each program. The numbers included in the columns indicate which squares should light. Squares which are already illuminated remain lit throughout the program operation.

Program PE11C

PROGRAM / PROGRAM SEQUENCE		NORMAL 95°					NORMAL 60°					NORMAL 40°					DELICATE 30°					WOOL					PERM. PRESS 40°					PERM. PRESS 60°				
		STANDARD					STANDARD					STANDARD					STANDARD					STANDARD					STANDARD					STANDARD				
		1					2					3					4					5					6					7				
		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT
PRE WASH																																				
DRAIN																																				
WITHOUT PRE WASH		3	C	-	LL	2	3	C	-	LL	2	3	C	-	LL	2	3	C	-	HL	2	3	C	-	HL	2	3	C	-	LL	2	3	C	-	LL	2
MAIN WASH		12	C	85	LL	2	12	C	55	LL	2	12	C	40	LL	2	2	C	30	HL	2	2	C	40	HL	2	10	C	40	LL	2	10	C	55	LL	2
COOL DOWN			C		HL																															
DRAIN		0.5					0.5					0.5					0.5					0.5					0.5					0.5				
RINSE 1																																				
DRAIN																																				
RINSE 2		1.5	C	-	LL	-	1.5	C	-	LL	-	1.5	C	-	LL	-	1	C	-	HL	-	2	C	-	HL	-	1.5	C	-	HL	-	1.5	C	-	HL	-
DRAIN		0.3					0.3					0.3					0.5					0.5					0.3					0.3				
EXTRACTION		0.5					0.5					0.5															0.5					0.5				
RINSE 3		1.5	C	-	HL	-	1.5	C	-	HL	-	1.5	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-	1.5	C	-	HL	-	1.5	C	-	HL	-
DRAIN		0.3					0.3					0.3					0.5					0.5					0.3					0.3				
EXTRACTION		0.5					0.5					0.5															0.5					0.5				
RINSE 4		2	C	-	HL	3	2	C	-	HL	3	2	C	-	HL	3	2	C	-	HL	3	2	C	-	HL	3	2	C	-	HL	3	2	C	-	HL	3
DRAIN		0.3					0.3					0.3					0.5					0.5					0.3					0.3				
EXTRACTION		1					1					1					1					1					1					1				
SPIN DOWN		0.5					0.5					0.5					0.2					0.2					0.5					0.5				
TOTAL TIME		24					24					24					13.2					13.2					22					22				

C = COLD WATER
HL = HIGH LEVEL
LL = LOW LEVEL

D = DISTRIBUTION
E = EXTRACTION
G = GENTLE ACTION 3/12 SEC
N = NORMAL ACTION 12/3 SEC

Program PE11C with "HEAVILY SOILED"

PROGRAM / PROGRAM SEQUENCE	NORMAL 95°							NORMAL 60°							NORMAL 40°							DELICATE 30°							WOOL							PERM. PRESS 40°							PERM. PRESS 60°						
	HEAVY SOILED							HEAVY SOILED							HEAVY SOILED							STANDARD							STANDARD							HEAVY SOILED							HEAVY SOILED						
	8							9							10							11							12							13							14						
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND
PRE WASH	6	C	-	LL	1	N	1	6	C	-	LL	1	N	1	6	C	-	LL	1	N	1	3	C	-	HL	2	G	3								3	C	-	LL	2	N	3							
DRAIN	0.3					N	2	0.3					N	2																																		
WITHOUT PRE WASH																						3	C	-	HL	2	G	3								3	C	-	LL	2	N	3							
MAIN WASH	12	C	90	LL	2	N	3	12	C	60	LL	2	N	3	12	C	40	LL	2	N	3	2	C	30	HL	2	G	3	12	C	40	HL	2	G	3	12	C	40	LL	2	N	3							
COOL DOWN		C		HL																																											
DRAIN	0.5					N	4						N	4	0.5					N	4	0.5						4	0.5						4						N	4						
RINSE 1	1.5	C	-	LL	-	N	5	1.5	C	-	LL	-	N	5	1.5	C	-	LL	-	N	5																											
DRAIN	0.5					N	5	0.5					N	5	0.5					N	5																											
RINSE 2	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6	1	C	-	HL	-	G	6	1	C	-	HL	-	G	6	1.5	C	-	LL	-	N	6							
DRAIN	0.3					N	6	0.3					N	6	0.3					N	6	0.5						6	0.3						6						N	6						
EXTRACTION	0.5					E	6	0.5					E	6	0.5					E	6																											
RINSE 3	1.5	C	-	HL	-	N	7	1.5	C	-	HL	-	N	7	1.5	C	-	HL	-	N	7	2	C	-	HL	-	G	7	1.5	C	-	HL	-	G	7	1.5	C	-	HL	-	N	7	1.5	C	-	HL	-	N	7
DRAIN	0.3					N	7	0.3					N	7	0.3					N	7	0.5						7	0.3						7	0.3					N	7	0.3					N	7
EXTRACTION	0.5					E	7	0.5					E	7	0.5					E	7								0.5						7						E	7	0.5					E	7
RINSE 4	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	G	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8
DRAIN	0.3					N	9	0.3					N	9	0.3					N	9	0.5					G	9	0.3					N	9	0.3					N	9						
EXTRACTION	1					E	9	1					E	9	1					E	9	1					E	9	1					E	9	1					E	9						
SPIN DOWN	0.5					N	9	0.5					N	9	0.5					N	9	0.2					G	9	0.5					N	9	0.5					N	9						
TOTAL TIME	29.3							29.3							29.3							13.2							13.2							24							24						

C = COLD WATER
HL = HIGH LEVEL
LL = LOW LEVEL

D = DISTRIBUTION
E = EXTRACTION
G = GENTLE ACTION 3/12 SEC
N = NORMAL ACTION 12/3 SEC

Program PE11C with "NO SPIN"

PROGRAM / PROGRAM SEQUENCE	NORMAL 95°								NORMAL 60°								NORMAL 40°								DELICATE 30°								WOOL								PERM. PRESS 40°								PERM. PRESS 60°							
	NO EXTRACTION								NO EXTRACTION								NO EXTRACTION								NO EXTRACTION								NO EXTRACTION								NO EXTRACTION								NO EXTRACTION							
	15								16								17								18								19								20								21							
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	
PRE WASH																																																						
DRAIN																																																						
WITHOUT PRE WASH	3	C	-	LL	2	N	3		3	C	-	LL	2	N	3		3	C	-	LL	2	N	3		3	C	-	HL	2	G	3		3	C	-	LL	2	N	3		3	C	-	LL	2	N	3		3	C	-	LL	2	N	3	
MAIN WASH	12	C	85	LL	2	N	3		12	C	55	LL	2	N	3		12	C	40	LL	2	N	3		2	C	30	HL	2	G	3		2	C	40	HL	2	G	3		10	C	40	LL	2	N	3		10	C	55	LL	2	N	3	
COOL DOWN		C		HL		N	4																																														
DRAIN	0.5					N	4		0.5					N	4		0.5					N	4		0.5						4		0.5						4		0.5						4							4	
RINSE 1																																																					
DRAIN																																																					
RINSE 2	1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1	C	-	HL	-	G	6		1	C	-	HL	-	G	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6	
DRAIN	0.3					N	6		0.3					N	6		0.3					N	6		0.5						6		0.5						6		0.3						6							6	
EXTRACTION																																																					
RINSE 3	1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7		2	C	-	HL	-	G	7		2	C	-	HL	-	G	7		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7	
DRAIN	0.3					N	7		0.3					N	7		0.3					N	7		0.5						7								7		0.3						7							7	
EXTRACTION																																																					
RINSE 4	2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	G	8		2	C	-	HL	3	G	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8	
DRAIN	0.3					N	8		0.3					N	8		0.3					N	8		0.5					G	8		0.5					G	8		0.3					N	8		0.3					N	8	
EXTRACTION																																																					
SPIN DOWN																																																					
TOTAL TIME	21.5								21.5								21.5								12								12								19.5								19.5							

C = COLD WATER
HL = HIGH LEVEL
LL = LOW LEVEL

D = DISTRIBUTION
E = EXTRACTION
G = GENTLE ACTION 3/12 SEC
N = NORMAL ACTION 12/3 SEC

Program PE11C with "HEAVILY SOILED" and " NO SPIN"

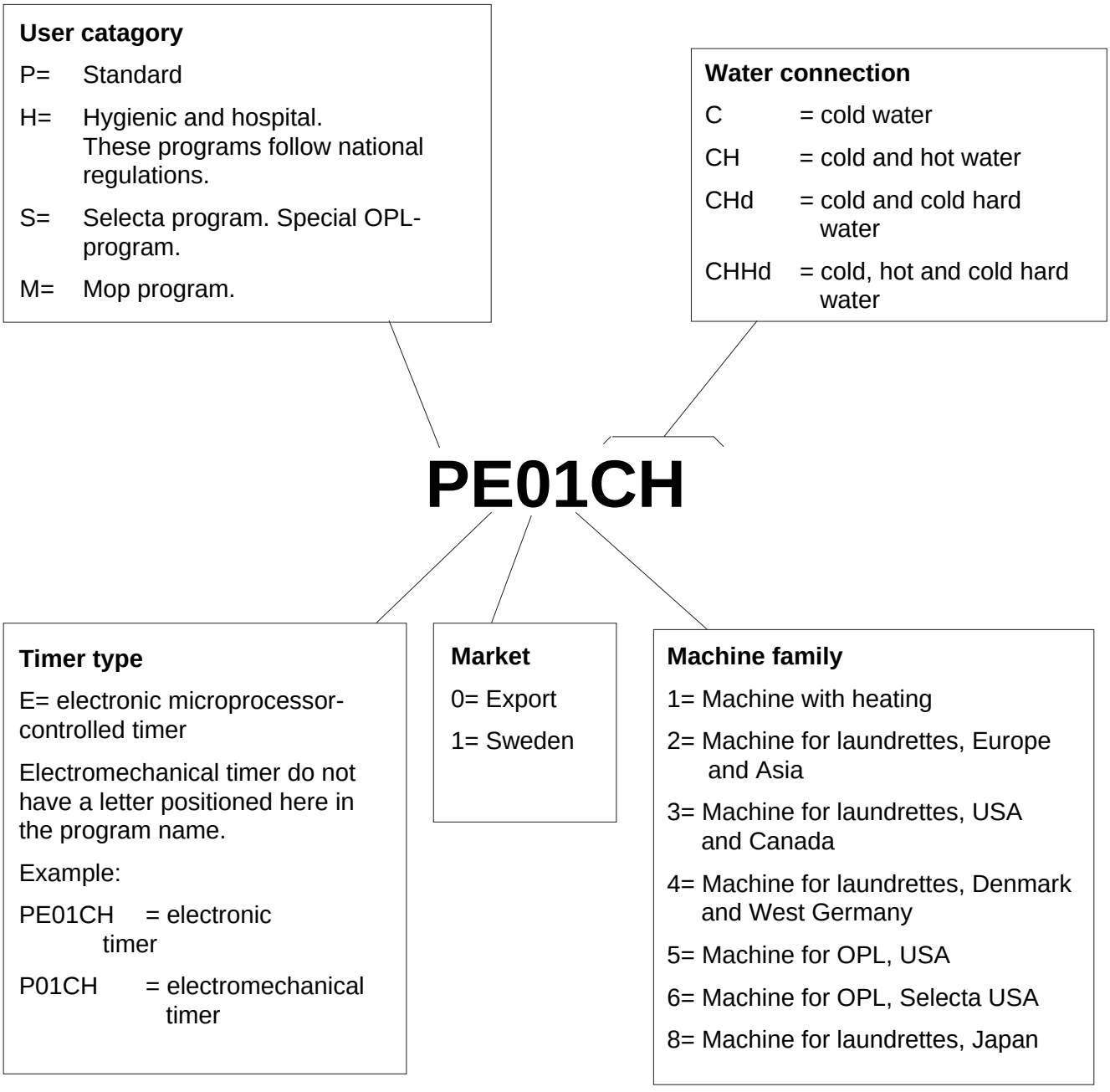
PROGRAM / PROGRAM SEQUENCE	NORMAL 95°								NORMAL 60°								NORMAL 40°								DELICATE 30°								WOOL								PERM. PRESS 40°								PERM. PRESS 60°							
	H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.							
	22								23								24								25								26								27								28							
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	
PRE WASH	6	C	-	LL	1	N	1		6	C	-	LL	1	N	1		6	C	-	LL	1	N	1		3	C	-	HL	2	G	3		3	C	-	HL	2	G	3		3	C	-	LL	2	N	3		3	C	-	LL	2	N	3	
DRAIN	0.3								0.3								0.3								2	C	30	HL	2	G	3		2	C	40	HL	2	G	3		12	C	40	LL	2	N	3		12	C	60	LL	2	N	3	
WITHOUT PRE WASH																									3	C	-	HL	2	G	3		3	C	-	LL	2	N	3		3	C	-	LL	2	N	3		3	C	-	LL	2	N	3	
MAIN WASH	12	C	90	LL	2	N	3		12	C	60	LL	2	N	3		12	C	40	LL	2	N	3		2	C	30	HL	2	G	3		2	C	40	HL	2	G	3		12	C	60	LL	2	N	3		12	C	60	LL	2	N	3	
COOL DOWN		C		HL		N	4																																														
DRAIN	0.5					N	4		0.5								0.5								0.5								0.5								0.5								C	55					
RINSE 1	1.5	C	-	LL	-	N	5		1.5	C	-	LL	-	N	5		1.5	C	-	LL	-	N	5		1	C	-	HL	-	G	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		0.5					N	4	
DRAIN	0.5					N	5		0.5					N	5		0.5					N	5								6		0.5						0.3						6		0.3						6	
RINSE 2	1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1	C	-	HL	-	G	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6									
DRAIN	0.3					N	6		0.3					N	6		0.3					N	6		0.5					6		0.3						6		0.3					N	6									
EXTRACTION																																																						
RINSE 3	1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7		2	C	-	HL	-	G	7		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7									
DRAIN	0.3					N	7		0.3					N	7		0.3					N	7		0.5					7		0.3						7		0.3					N	7									
EXTRACTION																																																						
RINSE 4	2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	G	8		2	C	-	HL	3	G	8		2	C	-	HL	3	N	8									
DRAIN	0.3					N	8		0.3					N	8		0.3					N	8		0.5					G	8		0.3					G	8		0.3					N	8									
EXTRACTION																																																					
SPIN DOWN																																																					
TOTAL TIME	26.8								26.8								26.8								12								12								21.5								21.5							

C = COLD WATER
HL = HIGH LEVEL
LL = LOW LEVEL

D = DISTRIBUTION
E = EXTRACTION
G = GENTLE ACTION 3/12 SEC
N = NORMAL ACTION 12/3 SEC

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE01CH used in the example above means:

- for standard user
- with electronic timer
- equipped with heating
- cold and hot water connection

Program P01CH

CYCLE \ PROGRAM	NORMAL 95°							NORMAL 60°							NORMAL 40°							DELICATE 30°							WOOL 40°							PERM. PRESS 40°							PERM. PRESS 60°							PERM. PRESS 95°						
	STANDARD 1							STANDARD 2							STANDARD 3							STANDARD 4							STANDARD 5							STANDARD 6							STANDARD 7							STANDARD 8						
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	
PRE WASH																																																							
DRAIN																																																						
WITHOUT PRE WASH																						3	C	-	HL	2	G																											
MAIN WASH	12	W	90	LL	2	N		12	W	60	LL	2	N		12	W	40	LL	2	N		2	C	30	HL	-	G		2	C	40	HL	-	G		12	W	40	LL	2	N		12	W	60	LL	2	N		12	W	90	LL	2	N	
COOL DOWN	-	-						-	-						-	-						-	-						-	-							-	-						C	56									
DRAIN	1					N		1					N		1					N		1					-		1					N		1					N		1					N					
RINSE 1																																																					
DRAIN																																																					
EXTRACTION																																																					
RINSE 2	1	C	-	HL	-	N		1	C	-	HL	-	N		1	C	-	HL	-	N		1	C	-	HL	-	G		1	C	-	HL	-	G		1	C	-	HL	-	N		2	C	-	HL	-	N		1	C	-	HL	-	N	
DRAIN	1					N		1					N		1					N		1					-		1					N		1					N		1					N					
EXTRACTION	0.5					E		0.5					E		-					E		-					-		0.5					E		0.5					E		0.5					E					
RINSE 3	2	C	-	HL	-	N		2	C	-	HL	-	N		2	C	-	HL	-	N		2	C	-	HL	-	G		2	C	-	HL	-	G		2	C	-	HL	-	N		2	C	-	HL	-	N		2	C	-	HL	-	N	
DRAIN	1					N		1					N		1					N		1					-		1					N		1					N		1					N					
EXTRACTION	0.5					E		0.5					E		-					E		-					-		0.5					E		0.5					E		0.5					E					
RINSE 4	2	C	-	HL	3	N		2	C	-	HL	3	N		2	C	-	HL	3	N		2	C	-	HL	3	G		2	C	-	HL	3	G		2	C	-	HL	3	N		2	C	-	HL	3	N		2	C	-	HL	3	N	
DRAIN	1					N		1					N		1					N		1					G		1					G		1					N		1					N					
EXTRACTION	4					E		4					E		4					E		1					E		1					E		1					E		1					E					
SHAKE OUT	1.5					N		1.5					N		1.5					N		1.5					-		1.5					N		1.5					N		1.5					N					
TOTAL TIME	27.5							27.5							27.5							16.5							16.5							24.5							24.5							24.5						

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program P01CH with "HEAVY SOILED"

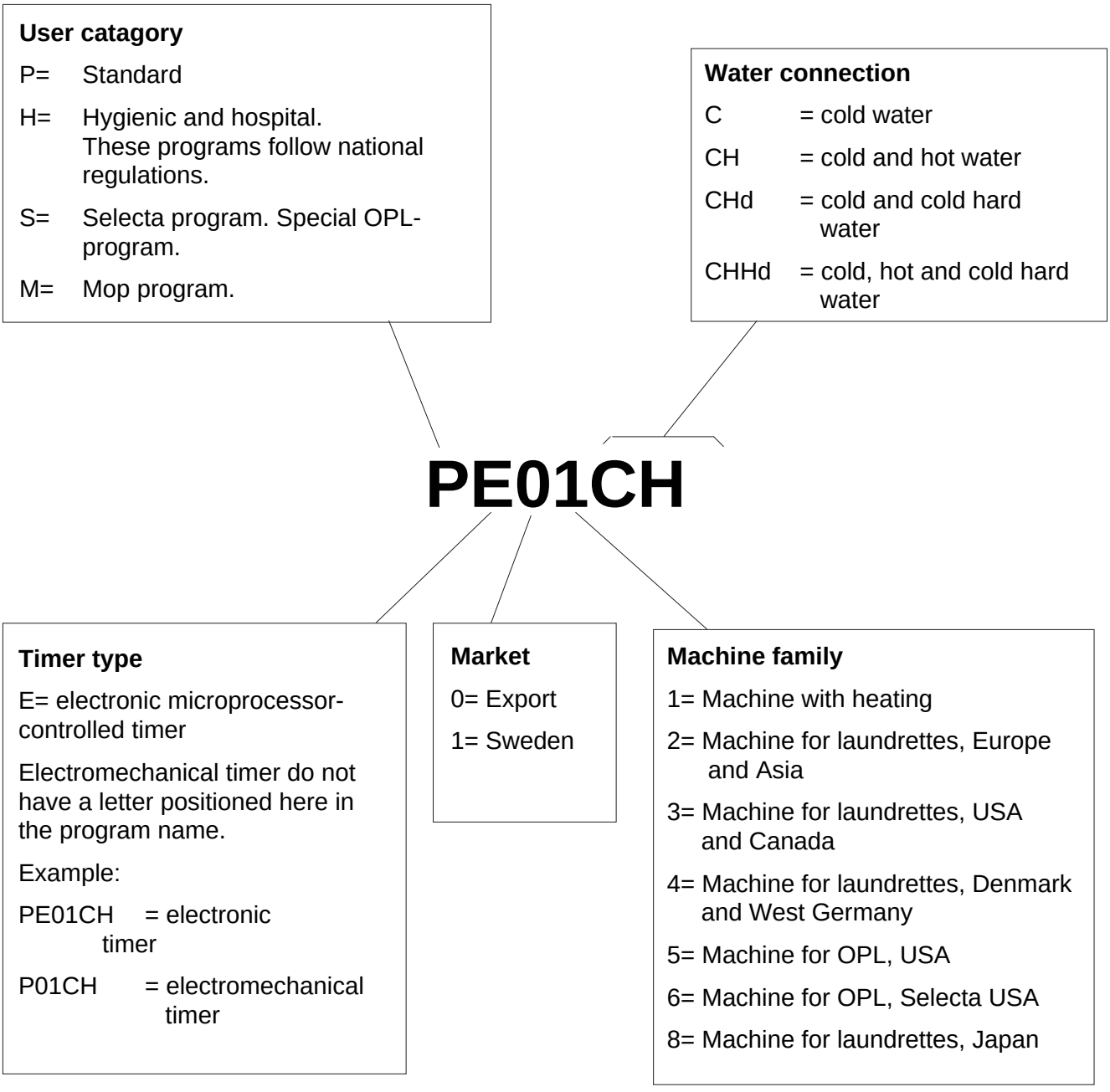
CYCLE \ PROGRAM	NORMAL 95° HEAVY SOILED 9					NORMAL 60° HEAVY SOILED 10					NORMAL 40° HEAVY SOILED 11					DELICATE 30° 12					WOOL 40° 13					PERM. PRESS 40° 14					PERM. PRESS 60° 15					PERM. PRESS 95° 16				
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	TIME	INLET WATER	TEMP	LEVEL	DETERGENT
PRE WASH	6	W	-	LL	1	6	W	-	LL	1	6	W	-	LL	1																							
DRAIN	0.5				N	0.5				N	0.5				N																							
WITHOUT PRE WASH																																						
MAIN WASH	12	H	90	LL	2	12	H	60	LL	2	12	W	40	LL	2	2	C	30	HL	-	2	C	40	HL	-	12	W	40	LL	2	12	W	60	LL	2	12	W	90	LL	2
COOL DOWN	-	-				-	-				-	-				-	-				-	-										C	56				C	56		
DRAIN	1				N	1				N	1				N	1				-	1				-					N	1				N	1			
RINSE 1	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-																								
DRAIN	1					1					1																												
EXTRACTION	-					-					-																												
RINSE 2	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-	1	C	-	HL	-
DRAIN	1					1					N				N	1				-	1				-					N	1				N	1				N
EXTRACTION	0.5					E	0.5				E	0.5				-					-	0.5				E	0.5				E	0.5				E	0.5				E
RINSE 3	2	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-	2	C	-	HL	-
DRAIN	1				N	1				N	1				N	1				G	1				G	1				N	1				N	1				N
EXTRACTION	4				E	4				E	4				E	1				E	1				E	1				E	1				E	1				E
SHAKE OUT	1.5				N	1.5				N	1.5				N	1.5				-	1.5				-	1.5				N	1.5				N	1.5				N
TOTAL TIME	36					36					36					16.5					16.5					24.5					24.5					24.5				

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE01CH used in the example above means:

- for standard user
- with electronic timer
- equipped with heating
- cold and hot water connection

Program PE01CH

PROGRAM / PROGRAM SEQUENCE	NORMAL 95°							NORMAL 60°							NORMAL 40°							DELICATE 30°							WOOL							PERM. PRESS 40°							PERM. PRESS 60°						
	01 STANDARD							02 STANDARD							03 STANDARD							04 STANDARD							05 STANDARD							06 STANDARD							07 STANDARD						
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND
PRE WASH W 1																																																
DRAIN																																																
MAIN WASH W 1																						3	C	-	HL	2	G	3																			
MAIN WASH W 1	14	W	85	LL	4	N	3	14	W	55	LL	4	N	3	16	W	40	LL	4	N	3	2	C	30	HL	2	G	3	2	C	40	HL	2	G	3	10	W	40	LL	2	N	3	10	W	55	LL	2	N	3
COOL DOWN																																																
DRAIN	1					N	4	1					N	4	1					N	4	0.5					-	4	0.5						-	4	0.5						N	4					N	4
RINSE 1																																																
DRAIN																																																
EXTRACTION																																																
RINSE 2	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6	1	C	-	HL	-	G	6	1	C	-	HL	-	G	6	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6
DRAIN	0.3					N	6	0.3					N	6	0.3					N	6	0.5					-	6	0.5						-	6	0.3						N	6					N	6
EXTRACTION	0.5						6	0.5						6	0.5						6															0.5						6							6
RINSE 3	1.5	C	-	HL	-	N	7	1.5	C	-	HL	-	N	7	1.5	C	-	HL	-	N	7	1	C	-	HL	-	G	7	2	C	-	HL	-	G	7	1.5	C	-	HL	-	N	7	1.5	C	-	HL	-	N	7
DRAIN	0.3					N	7	0.3					N	7	0.3					N	7	0.5					-	7	0.3						-	7	0.3						N	7					N	7
EXTRACTION	0.5						7	0.5						7	0.5						7								0.5							7						7							7
RINSE 4	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	G	8	2	C	-	HL	3	G	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8
DRAIN	0.3					N	9	0.3					N	9	0.3					N	9	0.5					G	9	0.5						G	9	0.3						N	9	0.3					N	9
EXTRACTION	4						9	4						9	6						9	1						9	1							9	1						9	1						9
SHAKE OUT	0.5					N	9	0.5					N	9	0.5					N	9	0.2					G	9	0.2						G	9	0.5						N	9	0.5					N	9
FILLING						N							N							N						-								-								N							N	
HEATING						N							N							N						G								G								N							N	
TOTAL TIME	26.4							26.4							30.4							12.2							13.2							18.9							18.9						

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program PE01CH with "HEAVY SOILED"

PROGRAM / PROGRAM SEQUENCE		NORMAL 95°						NORMAL 60°						NORMAL 40°						DELICATE						WOOL						PERM. PRESS 40°					
		HEAVY SOILED						HEAVY SOILED						HEAVY SOILED						STANDARD						STANDARD						HEAVY SOILED					
		08						09						10						11						12						13					
	TIME							TIME						TIME						TIME						TIME						TIME					
		INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND
PRE WASH W 1	6	W	30	LL	1	N	1	6	W	30	LL	1	N	1	6	W	30	LL	1	N	1																
DRAIN	0.5					N	2	0.5				N	2	0.5				N	2						3						2					
MAIN WASH W 1																				3	C	-	HL	2	G	3										
MAIN WASH W 1	16	H	90	LL	4	N	3	16	H	60	LL	4	N	3	16	W	40	LL	4	N	3	2	C	30	HL	2	G	3	16	W	40	LL	2	N	3	14	W	60	LL	2	N	3
COOL DOWN																														C	55			N	4						
DRAIN	1					N	4	1						1				N	4	0.5						4	0.5						N	4	0.5					N	4
RINSE 1	1.5	C	-	LL	-	N	5	1.5	C	-	LL	-	N	5	1.5	C	-	LL	-	N	5								1.5	C	-	LL	-	N	5	1.5	C	-	LL	-	N	5
DRAIN	0.5					N	5	0.5					N	5	0.5				N	5										0.5					N	5	0.5					N	5
EXTRACTION																																										
RINSE 2	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6	1.5	C	-	LL	-	N	6	1	C	-	HL	-	G	6								1.5	C	-	LL	-	N	6
DRAIN	0.3					N	6	0.3					N	6	0.3				N	6	0.5					-	6								0.3					N	6
EXTRACTION	0.5						6	0.5						6	0.5					6							6								0.5						6
RINSE 3	1.5	C	-	HL	-	N	7	1.5	C	-	L	-	N	7	1.5	C	-	HL	-	N	7	2	C	-	LL	-	G	7	2	C	-	HL	-	G	7	1.5	C	-	HL	-	N	7
DRAIN	0.3					N	7	0.3					N	7	0.3				N	7	0.5					-	7								0.3					N	7
EXTRACTION	0.5						7	0.5						7	0.5					7							7								0.5						7
RINSE 4	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	G	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8
DRAIN	0.3					N	9	0.3					N	9	0.3				N	9	0.5					G	9	0.3					N	9	0.3					N	9
EXTRACTION	4						9	4						9	4					9	1						9	1						9	1						9
SHAKE OUT	0.5					N	9	0.5					N	9	0.5				N	9	0.2					G	9	0.5					N	9	0.5					N	9
FILLING						N							N						N							-							N						N	
HEATING						N							N						N							G							N						N	
TOTAL TIME	36.9							36.9						36.9						13.2						13.2						26.9						24.9			

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program PE01CH with "NO EXTRACTION"

PROGRAM / PROGRAM SEQUENCE	NORMAL 95°								NORMAL 60°								NORMAL 40°								DELICATE								WOOL								PERM. PRESS 40°								PERM. PRESS 60°							
	NO EXTRACTION							15	NO EXTRACTION							16	NO EXTRACTION							17	NO EXTRACTION							18	NO EXTRACTION							19	NO EXTRACTION							20	NO EXTRACTION							21
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	
PRE WASH W 1																																																					
DRAIN																																																					
MAIN WASH W 1																	3	C	-	HL	2	G	3																														
MAIN WASH W 1	14	W	85	LL	4	N	3		14	W	55	LL	4	N	3		16	W	40	LL	4	N	3		2	C	30	HL	2	G	3		2	C	40	HL	2	G	3		10	W	40	LL	2	N	3		10	W	55	LL	2	N	3
COOL DOWN																	1						4																														
DRAIN	1					N	4		1					N	4										0.5						4							4														
RINSE 1																																																				
DRAIN																																																				
EXTRACTION																																																				
RINSE 2	1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1	C	-	HL	-	G	6		1	C	-	HL	-	G	6		1.5	C	-	HL	-	N	6		1.5	C	-	HL	-	N	6
DRAIN	0.3					N	6		0.3					N	6		0.3					N	6		0.5					-	6							-	6						N	6						N	6
EXTRACTION																																																				
RINSE 3	1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7		2	C	-	HL	-	G	7		2	C	-	HL	-	G	7		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	7
DRAIN	0.3					N	7		0.3					N	7		0.3					N	7		0.5					-	7							-	7						N	7						N	7
EXTRACTION																																																			
RINSE 4	2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	G	8		2	C	-	HL	3	G	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8
DRAIN	0.3					N	8		0.3					N	8		0.3					N	8		0.5					G	8							G	8						N	8						N	8
EXTRACTION																																																			
SHAKE OUT																																																				
FILLING						N								N								N								-								-							N							N	
HEATING						N								N								N								G								G							N							N	
TOTAL TIME	20.9								20.9								22.9								12.0								12.0								16.4								16.4						

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program PE01CH with "HEAVY SOILED" and "NO EXTRACTION"

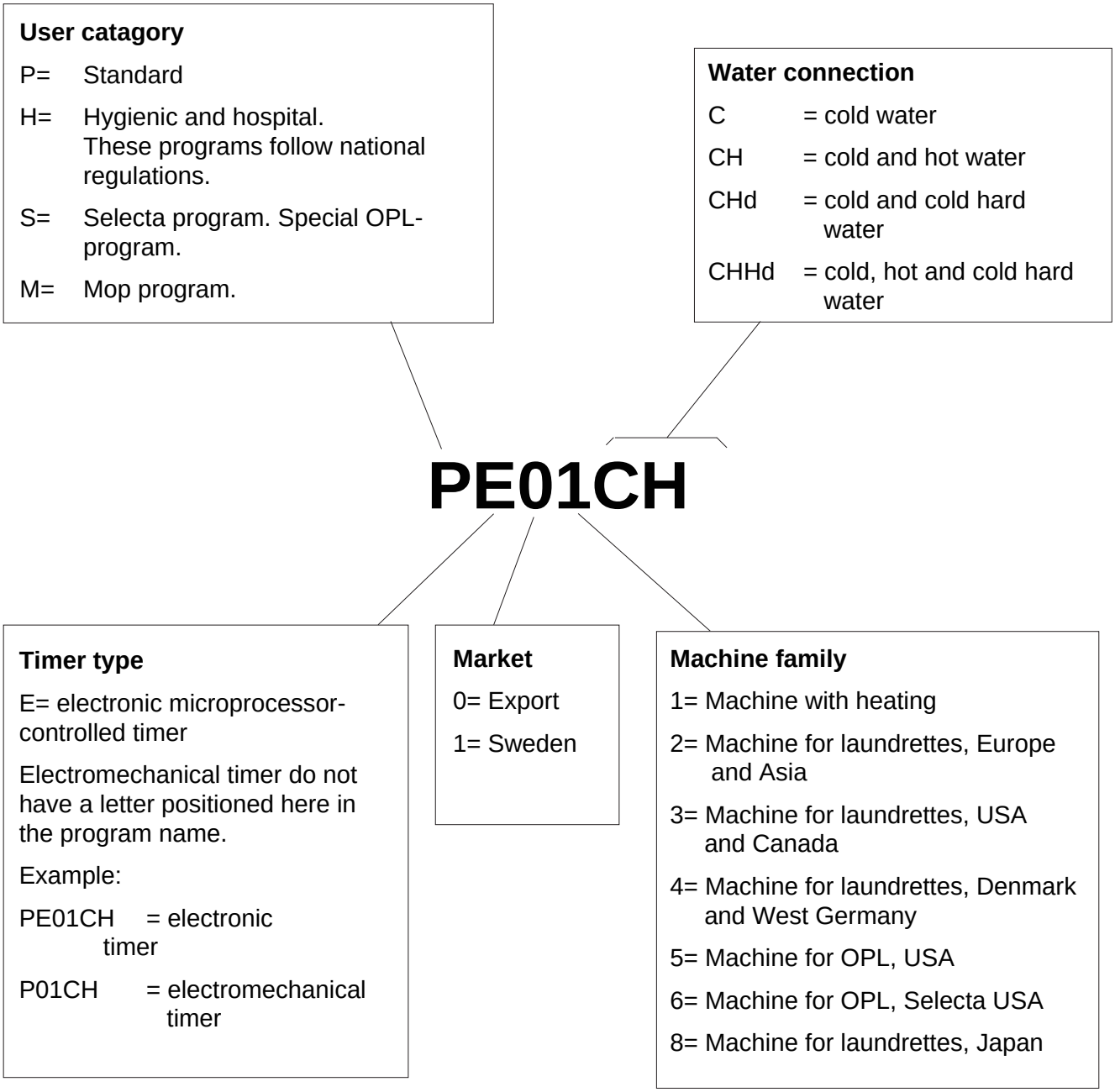
PROGRAM / PROGRAM SEQUENCE	NORMAL 95°								NORMAL 60°								NORMAL 40°								DELICATE								WOOL								PERM. PRESS 40°								PERM. PRESS 60°							
	H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.								NO EXTRACTION								NO EXTRACTION								H. SOIL + NO EXTR.								H. SOIL + NO EXTR.							
	22								23								24								25								26								27								28							
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	
PRE WASH W 1	6	W	30	LL	1	N	1		6	W	30	LL	1	N	1		6	W	30	LL	1	N	1		3	C	-	-	2	G	3		3	C	-	HL	2	G	3		16	W	40	LL	2	N	3		14	W	60	LL	2	N	3
DRAIN	0.5					N	2		0.5					N	2																																							
MAIN WASH W 1																									3	C	-	L	2	G	3		3	C	-	HL	2	G	3		16	W	40	LL	2	N	4				55			N	4
MAIN WASH W 1	16	H	90	LL	4	N	3		16	H	60	LL	4	N	3		16	W	40	LL	4	N	3		2	C	-	HL	2	G	3		2	C	40	HL	2	G	3		16	W	40	LL	2	N	3		14	W	60	LL	2	N	3
COOL DOWN																																																						
DRAIN	1					N	4		1					N	4		1					N	4		0.5					-	4		0.5					-	4		0.5					N	4		0.5					N	4
RINSE 1	1.5	C	-	LL	-	N	5		1.5	C	-	LL	-	N	5		1.5	C	-	LL	-	N	5		1	C	-	HL	-	G	6		1.5	C	-	HL	-	G	6		1.5	C	-	LL	-	N	5		1.5	C	-	LL	-	N	5
DRAIN	0.5					N	5		0.5					N	5		0.5					N	5		0.5					-	6		0.5					-	6		0.5					N	5		0.5					N	5
EXTRACTION																																																					
RINSE 2	1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1.5	C	-	LL	-	N	6		1	C	-	HL	-	G	6		1.5	C	-	HL	-	G	6		1.5	C	-	HL	-	N	7		1.5	C	-	HL	-	N	6
DRAIN	0.3					N	6		0.3					N	6		0.3					N	6		0.5					-	6		0.3					N	6		0.3					N	7		0.3					N	6
EXTRACTION																																																				
RINSE 3	1.5	C	-	HL	-	N	7		1.5	C	-	L	-	N	7		1.5	C	-	HL	-	N	7		2	C	-	HL	3	G	8		2	C	-	HL	3	G	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	7
DRAIN	0.3					N	7		0.3					N	7		0.3					N	7		0.5					-	7		0.3					N	7		0.3					N	8		0.3					N	7
EXTRACTION																																																				
RINSE 4	2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	G	8		2	C	-	HL	3	G	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8
DRAIN	0.3					N	8		0.3					N	8		0.3					N	8		0.5					G	8		0.3					N	8		0.3					N	8		0.3					N	8
EXTRACTION																																																				
SHAKE OUT																																																				
FILLING						N								N								N								-								-								N								N	
HEATING						N								N								N								G								G								N								N	
TOTAL TIME	31.4								31.4								31.4								12								12								24.4								22.4							

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE01CH used in the example above means:

- for standard user
- with electronic timer
- equipped with heating
- cold and hot water connection

Program P01CH with pre wash

CYCLE \ PROGRAM		NORMAL 95°						NORMAL 60°						NORMAL 40°						DELICATE 30°						WOOL 40°						PERM. PRESS 40°						PERM. PRESS 60°						PERM. PRESS 95°					
		STANDARD						STANDARD						STANDARD						STANDARD						STANDARD						STANDARD						STANDARD						STANDARD					
		1						2						3						4						5						6						7						8					
	TIME	3	12	1	0.5	1		3	12	1	0.5	1		3	12	1	0.5	1		3	2	1	-	1		3	2	1	-	1		3	12	1	0.5	1		3	12	1	0.5	1		3	12	1	0.5	1	
	INLET WATER	C	C	-				C	C	-				C	C	-				C	C	-				C	C	-				C	C	-				C	C	-				C	C	-			
	TEMP	-	90	-				-	60	-				-	40	-				-	30	-				-	40	-				-	40	-				-	60	-				-	90	-			
	LEVEL	LL	LL	-				LL	LL	HL				LL	LL	HL				HL	HL	HL				HL	HL	HL				LL	LL	HL				LL	LL	HL				LL	LL	HL			
	DETERGENT	2	2	-				2	2	-				2	2	-				2	-	-				2	-	-				2	2	-				2	2	-				2	2	-			
	ACTION	N	N	N	E	N		N	N	N	E	N		N	N	N	E	N		G	G	G	-	G		G	G	G	-	G		N	N	N	E	N		N	N	N	E	N		N	N	N	E	N	
WITHOUT PRE WASH		3	12	1	0.5	1		3	12	1	0.5	1		3	12	1	0.5	1		3	2	1	-	1		3	2	1	-	1		3	12	1	0.5	1		3	12	1	0.5	1		3	12	1	0.5	1	
MAIN WASH		1						1						1						1	1					1						1						1						1					
COOL DOWN																																																
DRAIN																																																
RINSE 1																																																
DRAIN																																																
EXTRACTION																																																
RINSE 2		1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	G	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N
DRAIN		1					N	1					N	1					N	1					-	1					N	1					N	1					N	1					N
EXTRACTION		0.5					E	0.5					E	0.5					E	-					-	0.5					E	0.5					E	0.5					E	0.5					E
RINSE 3		2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	G	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N
DRAIN		1					N	1					N	1					N	1					-	1					N	1					N	1					N	1					N
EXTRACTION		0.5					E	0.5					E	0.5					E	-					-	0.5					E	0.5					E	0.5					E	0.5					E
RINSE 4		2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	G	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N
DRAIN		1					N	1					N	1					N	1					G	1					N	1					N	1					N	1					N
EXTRACTION		4					E	4					E	4					E	1					E	1					E	1					E	1					E	1					E
SHAKE OUT		1.5					N	1.5					N	1.5					N	1.5					-	1.5					N	1.5					N	1.5					N	1.5					N
TOTAL TIME		30.5						30.5						30.5						16.5						16.5						27.5						27.5						27.5					

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15°C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program P01CH with "HEAVY SOIL"

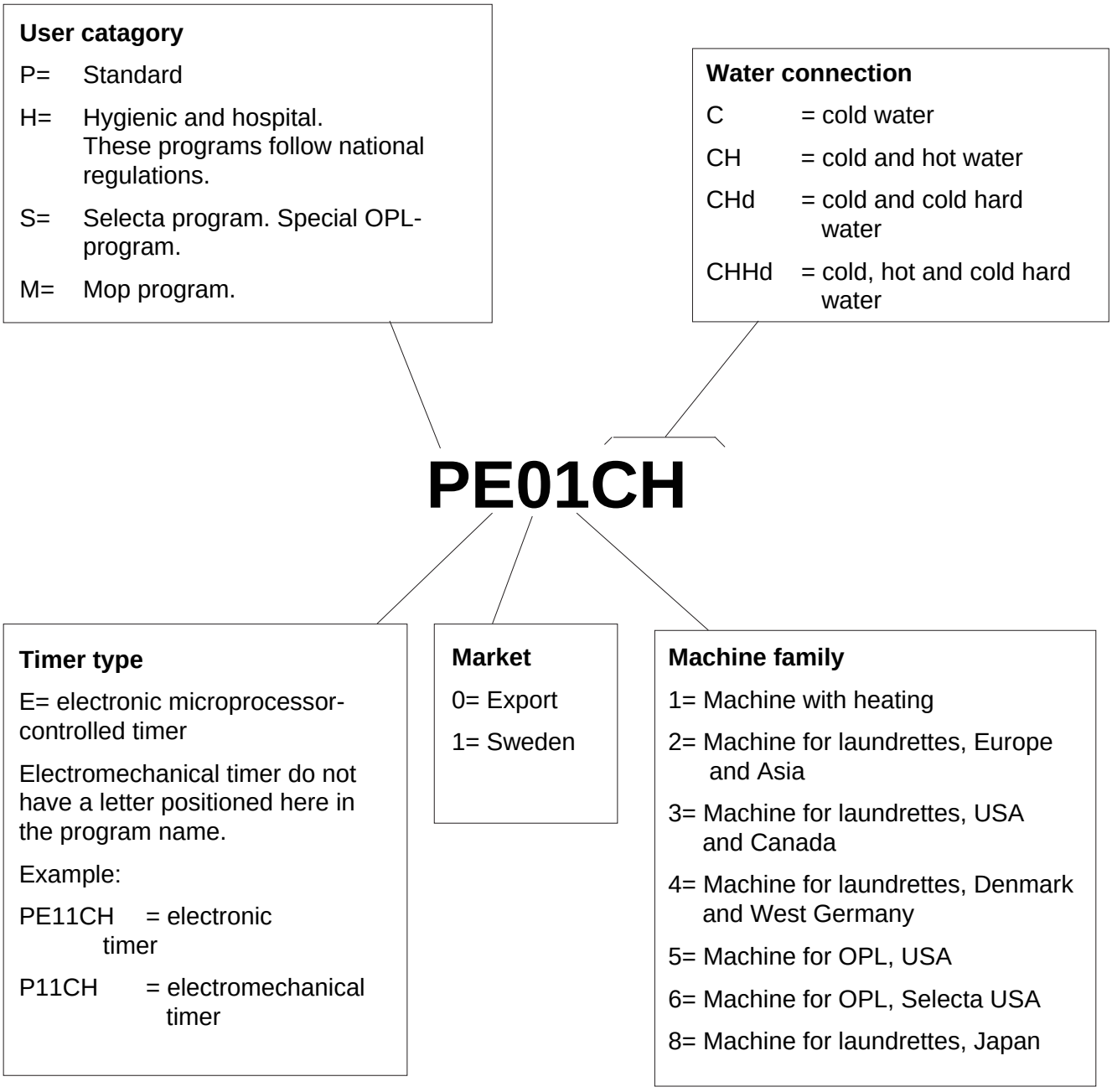
CYCLE \ PROGRAM	NORMAL 95° HEAVY SOILED 9					NORMAL 60° HEAVY SOILED 10					NORMAL 40° HEAVY SOILED 11					DELICATE 30° 12					WOOL 40° 13					PERM. PRESS 40° 14					PERM. PRESS 60° 15					PERM. PRESS 95° 16					
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION
PRE WASH	6	C	-	LL	1	N	6	C	-	LL	1	N	6	C	-	LL	1	N	3	C	-	HL	2	G	2	C	-	HL	3	G	2	C	-	HL	3	G	3	C	-	LL	2	N
DRAIN	0.5					N	0.5					N							1.5					-	1.5					-	1.5					N	1.5					N
WITHOUT PRE WASH																																									
MAIN WASH	12	C	90	LL	2	N	12	C	60	LL	2	N	12	C	40	LL	2	N	2	C	30	HL	-	G	2	C	40	HL	-	G	2	C	40	LL	2	N	12	C	90	LL	2	N
COOL DOWN	-	-					-	-					-	-						-	-					-	-					-	56								
DRAIN	1					N	1					N	1					N	1					-	1					N	1					N	1					N
RINSE 1	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N																								
DRAIN	1					N	1					N						N																							
EXTRACTION	-					-	-					-						-																							
RINSE 2	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	G	2	C	-	HL	-	G	2	C	-	HL	-	N	1	C	-	HL	-	N
DRAIN	1					N	1					N	1					N	1					-	1					-	1					N	1					N
EXTRACTION	0.5					E	0.5					E	0.5					E	-					-	0.5					E	0.5					E	0.5					E
RINSE 3	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	G	2	C	-	HL	-	N	2	C	-	HL	-	N	2	C	-	HL	-	N
DRAIN	1					N	1					N	1					N	1					-	1					N	1					N	1					N
EXTRACTION	0.5					E	0.5					E	0.5					E	-					-	0.5					E	0.5					E	0.5					E
RINSE 4	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	G	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N
DRAIN	1					N	1					N	1					N	1					G	1					N	1					N	1					N
EXTRACTION	4					E	4					E	4					E	1					E	1					E	1					E	1					E
SHAKE OUT	1.5					N	1.5					N	1.5					N	1.5					-	1.5					N	1.5					N	1.5					N
TOTAL TIME	36						36						36						16.5						16.5						27.5						27.5					

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE01CH used in the example above means:

- for standard user
- with electronic timer
- cold and hot water connection

Program P02CH

CYCLE \ PROGRAM		COLD 1					WARM 2					HOT 3					PERM. PRESS 4				
	TIME	3	C	30*	HL	1	G	3	W	30*	HL	1	N	3	W	30*	HL	1	N
PRE WASH																			
DRAIN		1				G	1					N	1					N	1
WITHOUT PRE WASH																			
MAIN WASH		5	W	30*	LL	2	G	5	W	60*	LL	2	N	5	H	90*	LL	2	N
COOL DOWN																			
DRAIN		1				G	1					N	1	5					N	1
RINSE 1																			
DRAIN																			
EXTRACTION																			
RINSE 2		1	C	-	HL	-	G	1	C	-	HL	-	N	1	C	-	HL	-	N
DRAIN		1				G	1	1				N	1	1				N	1
EXTRACTION		0.5				E	0.5	0.5				E	0.5	0.5				E	0.5
RINSE 3		1	C	-	HL	-	G	1	C	-	HL	-	N	1	C	-	HL	-	N
DRAIN		1				G	1	1				N	1					N	1
EXTRACTION		0.5				E	0.5	0.5				E	0.5					E	0.5
RINSE 4		2	C	-	HL	3	G	2	C	-	HL	3	N	2	C	-	HL	3	N
DRAIN		1				G	1	1				N	1	1				N	1
EXTRACTION		4				E	4	4				E	4	4				E	4
SHAKE OUT		1.5				G	1.5	1.5				N	1.5	1.5				N	1.5
TOTAL TIME		23.5					23.5	23.5					23.5	20.5					20.5

CYCLE \ PROGRAM																					
	TIME																				
	INLET WATER																				
	TEMP																				
	LEVEL																				
	DETERGENT																				
	ACTION																				
	TIME																				
	INLET WATER																				
	TEMP																				
	LEVEL																				
	DETERGENT																				
	ACTION																				
	TIME																				
	INLET WATER																				
	TEMP																				
	LEVEL																				
	DETERGENT																				
	ACTION																				

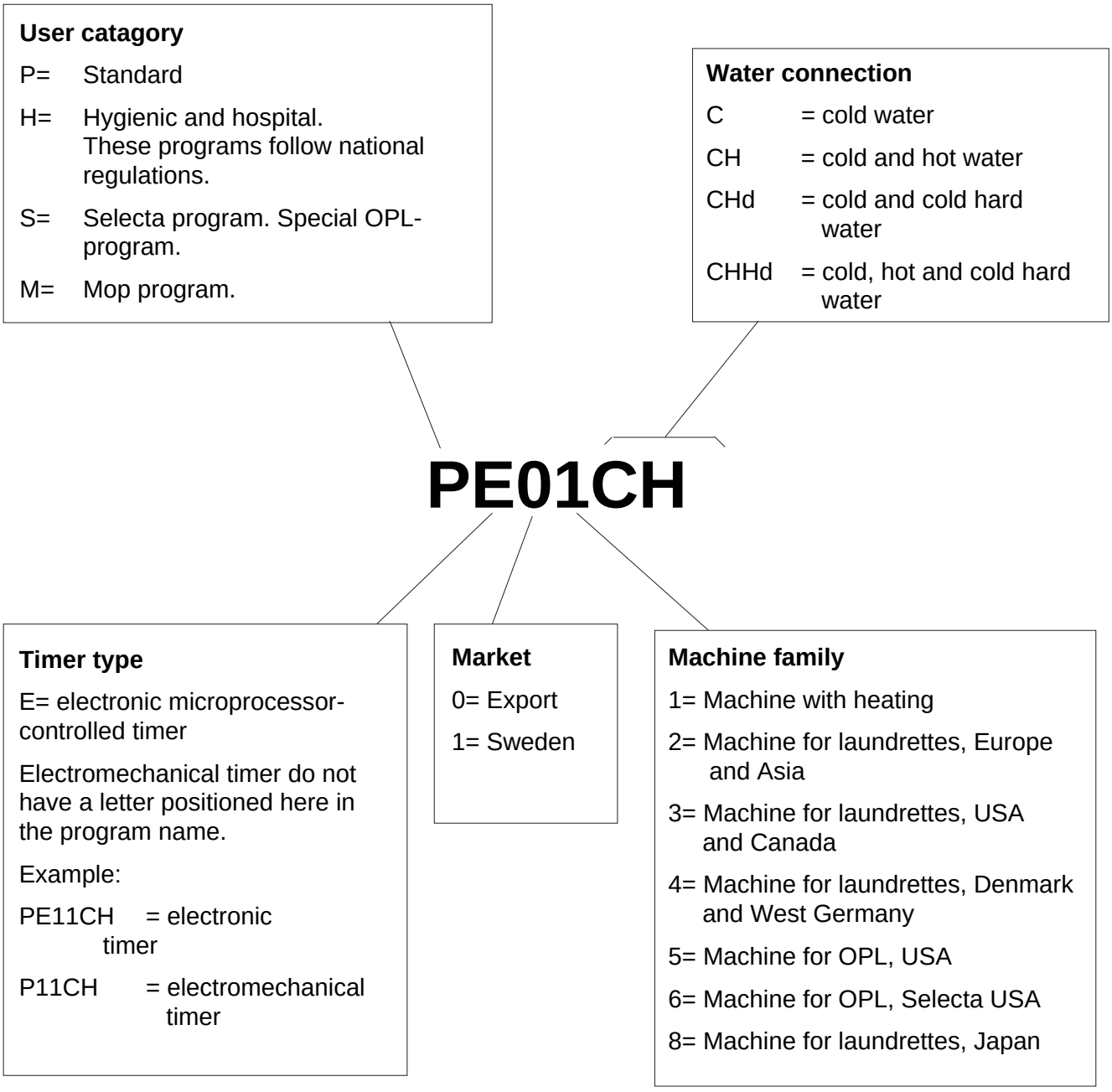
- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

* TEMPERATURES ON STEAM- AND ELECTRICAL HEATED MACHINES.

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol PE01CH used in the example above means:

- for standard user
- with electronic timer
- cold and hot water connection4. Programmes4 13 5Program

Program P03CH

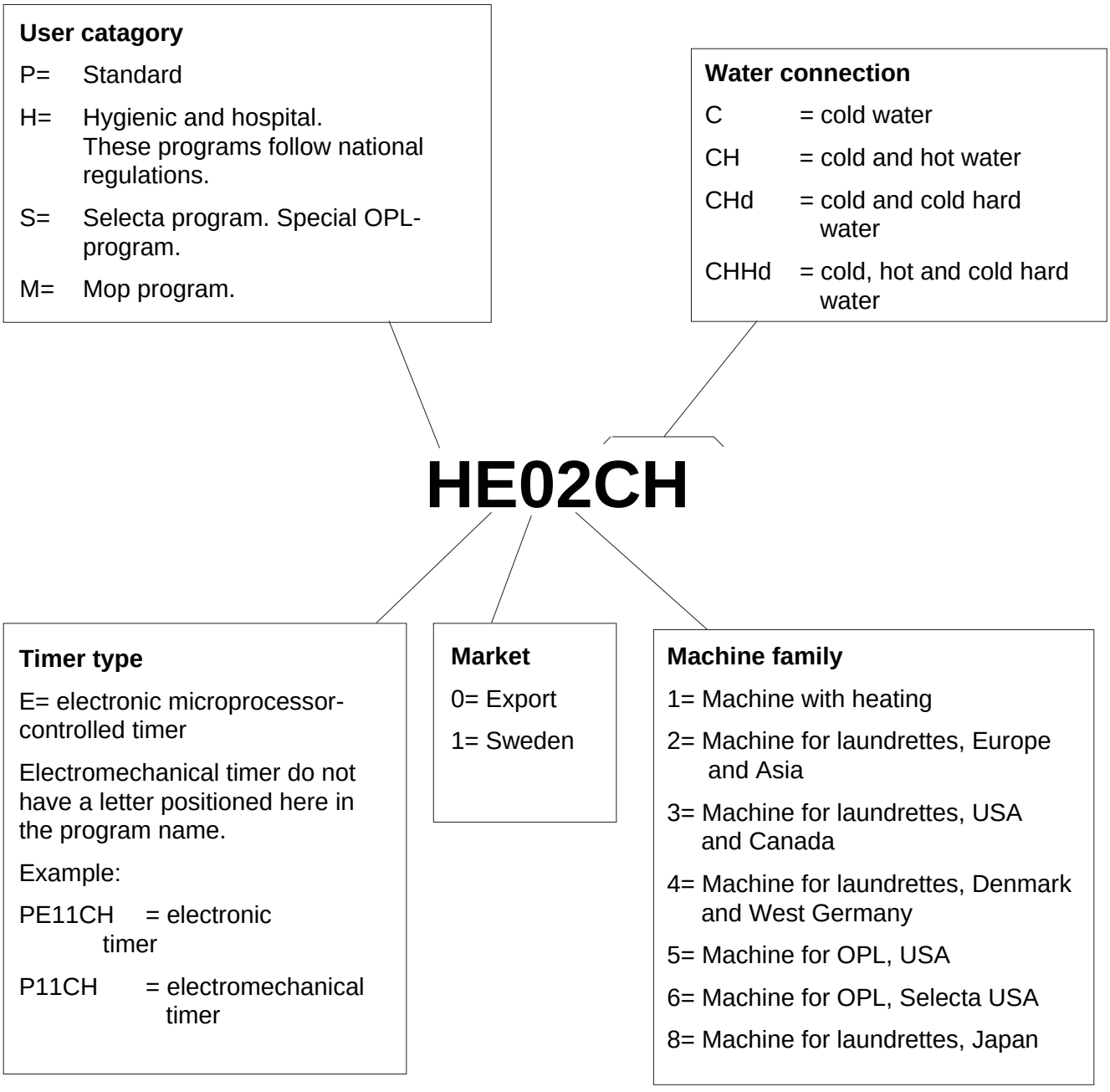
CYCLE \ PROGRAM		COLD 1						WARM 2						HOT 3						PERM. PRESS 4							
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION		
PRE WASH	3	C	-	HL	1	N	3	W	-	HL	1	N	3	W	-	HL	1	N								
DRAIN	1					N	1					N	1					N								
WITHOUT PRE WASH																										
MAIN WASH	6	C	-	HL	2	N	6	W	-	HL	2	N	6	H	-	HL	2	N	6	W	-	HL	2	N		
COOL DOWN	1					N	1					N	1					N	1					N		
DRAIN	-					-	-					-	-					-	-					-		
RINSE 1	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C		HL	-	N		
DRAIN	1					N	1					N	1					N	1					N		
EXTRACTION	0.5					E	0.5					E	0.5					E	0.5					E		
RINSE 2	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C	-	HL	-	N	1	C		HL	-	N		
DRAIN	1					N	1					N	1					N								
EXTRACTION	0.5					E	0.5					E	0.5					E								
RINSE 3	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C	-	HL	3	N	2	C		HL	3	N		
DRAIN	1					N	1					N	1					N	1					N		
EXTRACTION	4					E	4					E	4					E	1					E		
RINSE 4																										
DRAIN																										
EXTRACTION																										
SHAKE OUT	1.5					N	1.5					N	1.5					N	1.5					N		
TOTAL TIME	24.5						24.5						24.5						21.5							

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Identification of wash programs

The wash programs are identified by a combined letter and number symbol. Identification occurs as described in the example below.



The symbol HE02CH used in the example above means:

- for standard user
- with electronic timer
- equipped with heating
- cold and hot water connection

Program HE02CH

PROGRAM / PROGRAM SEQUENCE	HOT 01 STANDARD							WARM 02 STANDARD							COLD 03 STANDARD							POLYCOTTON 50 04 STANDARD							COTTON 71 05 STANDARD							POLYCOTTON 65 06 STANDARD							SLUICE PR. 07 STANDARD						
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND
PRE WASH R1																																												
DRAIN																																												
PRE WASH R1																																												
DRAIN																																												
EXTRACTION																																												
PRE WASH R2																																								C	-	HL		-	N	2
DRAIN																																											N	2
PRE WASH R2																																							C	-	HL		-	N	2
DRAIN																																											N	2
EXTRACTION																																												
PRE WASH W1																						3	W	63					3	W	63	LL	1	N	3								
DRAIN																						1							1					N	3								
MAIN WASH W1	6	H	90	LL	4	N	4	6	H	60	LL	4	N	4	6	C	30	LL	2	G	4	6	W	50	LL	4	N	4	10	H	74	LL	4	N	4	10	W	68	LL	4	N	4
COOL DOWN																																					C	55				N	5
DRAIN	1					N	5						N	5					G	5	1						N	5	1					N	5					N	5
RINSE 1	1	C	-	HL	-	N	6	1	C	-	HL	-	N	6	1	C	-	HL	-	G	6	1	C	-	HL	-	N	6	1	C	-	HL	-	N	6	1	C	-	HL	-	N	6
DRAIN	0.5					N	6	0.5					N	6	0.5					G	6	0.5						N	6	0.5					N	6					N	6
EXTRACTION	0.5					E	6	0.5					E	6	0.5					E	6	0.5						E	6	0.5					E	6					E	6
RINSE 2	2	C	-	HL	-	N	7	2	C	-	HL	-	N	7	2	C	-	HL	-	G	7	2	C	-	HL	-	N	7	2	C	-	HL	-	N	7	2	C	-	HL	-	N	7
DRAIN	0.5					N	7	0.5					N	7	0.5					G	7	0.5						N	7	0.5					N	7					N	7
EXTRACTION	0.5					E	7	0.5					E	7	0.5					E	7	0.5						E	7	0.5					E	7					E	7
RINSE 3	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	G	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8
DRAIN	0.5					N	9	0.5					N	9	0.5					G	9	0.5						N	9	0.5					N	9					N	9
EXTRACTION	5					E	9	5					E	9	2					E	9	2						E	9	5					E	9					E	9
FILLING						N							N							G							N							N						N	
HEATING						N							N							G							N							N						N	
TOTAL TIME	19.5							19.5							16.5							16.5							27.5							24.5							6.0						

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program HE02CH with "SLUICE"

PROGRAM / PROGRAM SEQUENCE	HOT WITH SLUICE 08								WARM WITH SLUICE 09								COLD WITH SLUICE 10								POLYCOTTON 50 WITH SLUICE 11								COTTON 71 WITH SLUICE 12								POLYCOTTON 65 WITH SLUICE 13								SLUICE PR. WITH SLUICE 14							
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND		TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	
PRE WASH R1																																										2	C	-	HL	-	N	1
DRAIN																																									1					N	1
PRE WASH R1	6	H	90	LL	4	N	4		6	H	60	LL	4	N	4		6	C	30	LL	2	G	4		6	W	50	LL	2	N	4		10	H	74	LL	4	N	4		10	W	68	LL	4	N	4
DRAIN																																										C	55				N	5
EXTRACTION	1					N	5		1					N	5		1					G	5		1					N	5		1					N	5							N	5
PRE WASH R2	1	C	-	HL	-	N	6		1	C	-	HL	-	N	6		1	C	-	HL	-	G	6		1	C	-	HL	-	N	6		1	C	-	HL	-	N	6		1	C	-	HL	-	N	6
DRAIN	0.5					N	6		0.5					N	6		0.5					G	6		0.5					N	6		0.5					N	6		0.5					N	6
EXTRACTION	0.5					E	6		0.5					E	6		0.5					E	6		0.5					E	6		0.5					E	6		0.5					E	6
PRE WASH R2	2	C	-	HL	-	N	7		2	C	-	HL	-	N	7		2	C	-	HL	-	G	7		2	C	-	HL	-	N	7		2	C	-	HL	-	N	7		2	C	-	HL	-	N	7
DRAIN	0.5					N	7		0.5					N	7		0.5					G	7		0.5					N	7		0.5					N	7		0.5					N	7
EXTRACTION	0.5					E	7		0.5					E	7		0.5					E	7		0.5					E	7		0.5					E	7		0.5					E	7
RINSE 3	2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	G	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8		2	C	-	HL	3	N	8
DRAIN	0.5					N	9		0.5					N	9		0.5					G	9		0.5					N	9		0.5					N	9		0.5					N	9
EXTRACTION	5					E	9		2					E	9		2					E	9		5					E	9		2					E	9		2					E	9
FILLING						N								N								G								N								N								N	
HEATING						N								N								G								N								N								N	
TOTAL TIME	19.5								19.5								19.5								16.5								35.5								32.5								12.0							

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

Program HE02CH with "PRE WASH"

PROGRAM / PROGRAM SEQUENCE	HOT WITH PRE WASH 15										WARM WITH PRE WASH 16										COLD WITH PRE WASH 17										POLYCOTTON 50 WITH PRE WASH 18										COTTON 71 STANDARD 19										POLYCOTTON 65 STANDARD 20										SLUICE PR. STANDARD 21									
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND
PRE WASH R1																																																					
DRAIN																																																					
PRE WASH R1																																																				
DRAIN																																																					
EXTRACTION																																																				
PRE WASH R2																																																				
DRAIN																																																					
PRE WASH R2																																																				
DRAIN																																																					
EXTRACTION																																																				
PRE WASH W1	3	W	40	LL	1	N	3	3	W	40	LL	1	N	3	3	C	30	LL	1	N	3	3	W	40	LL	1	N	3	3	W	63	LL	1	N	3	3	W	63	LL	1	N	3	3	W	63	LL	1	N	3																		

Program HE02CH with "SLUICE" and "PRE WASH"

PROGRAM / PROGRAM SEQUENCE	HOT							WARM							COLD							POLYCOTTON 50							COTTON 71							POLYCOTTON 65							SLUICE PR.						
	SLUICE + PRE WASH							SLUICE + PRE WASH							SLUICE + PRE WASH							SLUICE + PRE WASH							WITH SLUICE							WITH SLUICE							WITH SLUICE						
	22							23							24							25							26							27							28						
	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND	TIME	INLET WATER	TEMP	LEVEL	DETERGENT	ACTION	PROGIND
PRE WASH R1																																																
DRAIN																																																
PRE WASH R1																													2	C	-	HL	-	N	1	2	C	-	HL	-	N	1	2	C	-	HL	-	N	1
DRAIN																													1					N	1	1					N	1	1					N	1
EXTRACTION																													1					E	1	1					E	1						
PRE WASH R2																																				2	C	-	HL	-	N	2	2	C	-	HL	-	N	2
DRAIN																																				1					N	2	1					N	2
PRE WASH R2	2	C	-	HL	-	N	2	2	C	-	HL	-	N	2	2	C	-	HL	-	N	2	2	C	-	HL	-	N	2	2	C	-	HL	-	N	2	2	C	-	HL	-	N	2	2	C	-	HL	-	N	2
DRAIN	1																												1																			
EXTRACTION																													1																			
PRE WASH W1	3	W	40	LL	1	N	3	3	W	40	LL	1	N	3	3	C	30	LL	1	G	3	3	W	40	LL	1	N	3	3	W	63	LL	1	N	3	3	W	63	LL	1	N	3						
DRAIN	1					N	3	1					N	3	1					G	3	1					N	3	1					N	3													
MAIN WASH W1	6	H	90	LL	4	N	4	6	H	60	LL	4	N	4	6	C	30	LL	2	G	4	6	W	50	LL	2	N	4	10	H	74	LL	4	N	4	10	W	68	LL	4	N	4						
COOL DOWN																																					C	55			N	5							
DRAIN	1					N	5	1					N	5	1					G	5	1					N	5	1					N	5	1					N	5							
RINSE 1	1	C	-	HL	-	N	6	1	C	-	HL	-	N	6	1	C	-	HL	-	G	6	1	C	-	HL	-	N	6	1	C	-	HL	-	N	6	1	C	-	HL	-	N	6						
DRAIN	0.5					N	6	0.5					N	6	0.5					G	6	0.5					N	6	0.5					N	6	0.5					N	6							
EXTRACTION	0.5					E	6	0.5					E	6	0.5					E	6	0.5					E	6	0.5					E	6	0.5					E	6							
RINSE 2	2	C	-	HL	-	N	7	2	C	-	HL	-	N	7	2	C	-	HL	-	G	7	2	C	-	HL	-	N	7	2	C	-	HL	-	N	7	2	C	-	HL	-	N	7						
DRAIN	0.5					N	7	0.5					N	7	0.5					G	7	0.5					N	7	0.5					N	7	0.5					N	7							
EXTRACTION	0.5					E	7	0.5					E	7	0.5					E	7	0.5					E	7	0.5					E	7	0.5					E	7							
RINSE 3	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	G	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8	2	C	-	HL	3	N	8						
DRAIN	0.5					N	9	0.5					N	9	0.5					G	9	0.5					N	9	0.5					N	9	0.5					N	9							
EXTRACTION	5					E	9	5					E	9	2					E	9	2					E	9	5					E	9	2					E	9							
FILLING						N							N							G							N							N							N							N	
HEATING						N							N							G							N							N							N							N	
TOTAL TIME	26.5							26.5							23.5							23.5							35.5							32.5							12.0						

- = NO ACTION
G = GENTLE ACTION
N = NORMAL ACTION
E = EXTRACTION

C = COLD WATER (15° C)
W = WARM WATER (35° C)
H = HOT WATER (65° C)
LL = LOW LEVEL
HL = HIGH LEVEL

For proper and safe machine operation, the maintenance procedures described below should be followed.

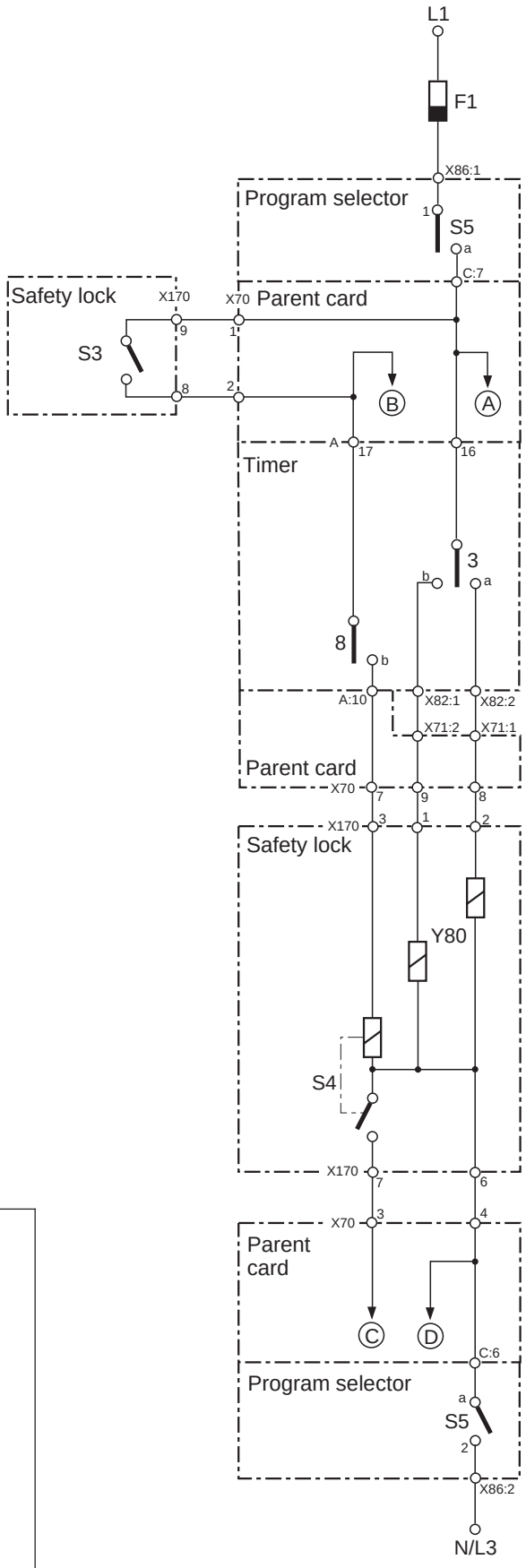
Frequency of maintenance should be based on the machine's degree of use.

Daily

- Check door and safety lock:
  - Open the door and try to start machine. It should not start.
  - Close the door, start machine and try to open the door. It should not be possible to open the door.
  - Make sure the door does not leak.
  - Clean the door seal of any residual detergent.
- Check that the drain valve does not leak during operation.
- Clean detergent dispenser of any residual detergent.

Every three months

- To check the safety lock security function in case of power failure:
  - Start the machine and allow it to operate at least one minute (so that the bimetal spring in the lock mechanism warms up). It should not be possible to open the door during this time.
  - Turn the main supply off. The drain valve should now open and any remaining water flushed out. The door should remain locked approx. 1 minute after the power cut-off.
- Check the machine drain and remove any lint.
- Inspect inside the machine (directly during washing to detect any possible leakage).
  - Turn the main supply off.
  - Remove top cover, rear and front protection panels.
  - Check that hose connections do not leak.
  - Check the V-belts, stretch or replace them when necessary (see Chapter 30. Motor).
  - Check that water does not leak onto the foundation. Such leakage may indicate that the machine's radial packing needs to be replaced.
  - If heating takes an unusually long time, check for lime deposits on the heating element. When necessary remove the deposits with a deliming agent.



(1) Control fuse

(2) Program selector, row 1

(3) Door switch

Ⓐ and Ⓑ : power supply, see other function diagrams

(4) Timer, row 3
a: door solenoid open
b: door solenoid close

(5) Timer, row 8b
Safety lock

(6) Door solenoid open

(7) Door solenoid closed

(8) Coil, delay unit

(9) Switch, delay unit

Ⓒ and Ⓓ : power supply, see other function diagrams

(10) Program selector, row 2

Program selector

Row no.	1	2
0		
NORMAL 95°	■	■
NORMAL 60°	■	■
NORMAL 40°	■	■
MILD 30°	■	■
WOOL 40°	■	■
Perm. press 40°	■	■
Perm. press 60°	■	■
Perm. press 95°	■	■

1435

1413

Start

When a program is completed, the machine stops at program stage 52 and the door can be opened.

The door must be closed for the machine to start. It is only when the door is closed that point Ⓑ receives voltage (see section on "Safety lock and power supply"). When the **START** button is pressed to start a new program, the coil for timer (5) rapid advance receives voltage since row 34 (3) is closed at stages 52-53. At stage 54 the timer stops until the **START** button is released. The timer then rapid advances to stage 1 (row 33 (4) is cloced at stage 54) and the wash program begins. This design prevents accidental excess rapid advance of the timer when starting.

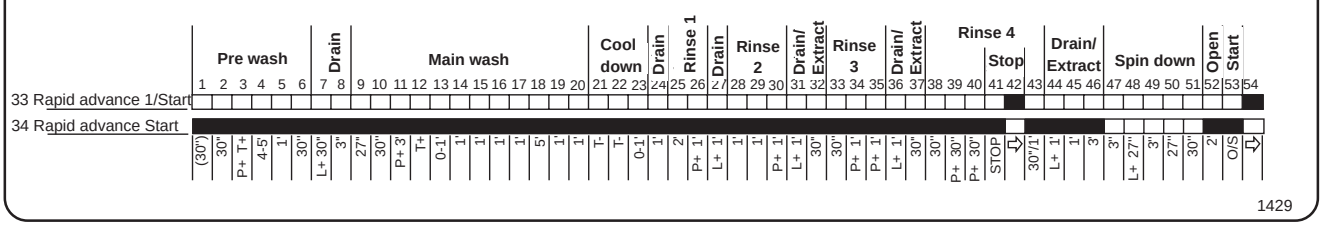
Rapid advance

By holding down the **START** button during program operation, the timer can be rapid advanced past different wash phases. It works like this:

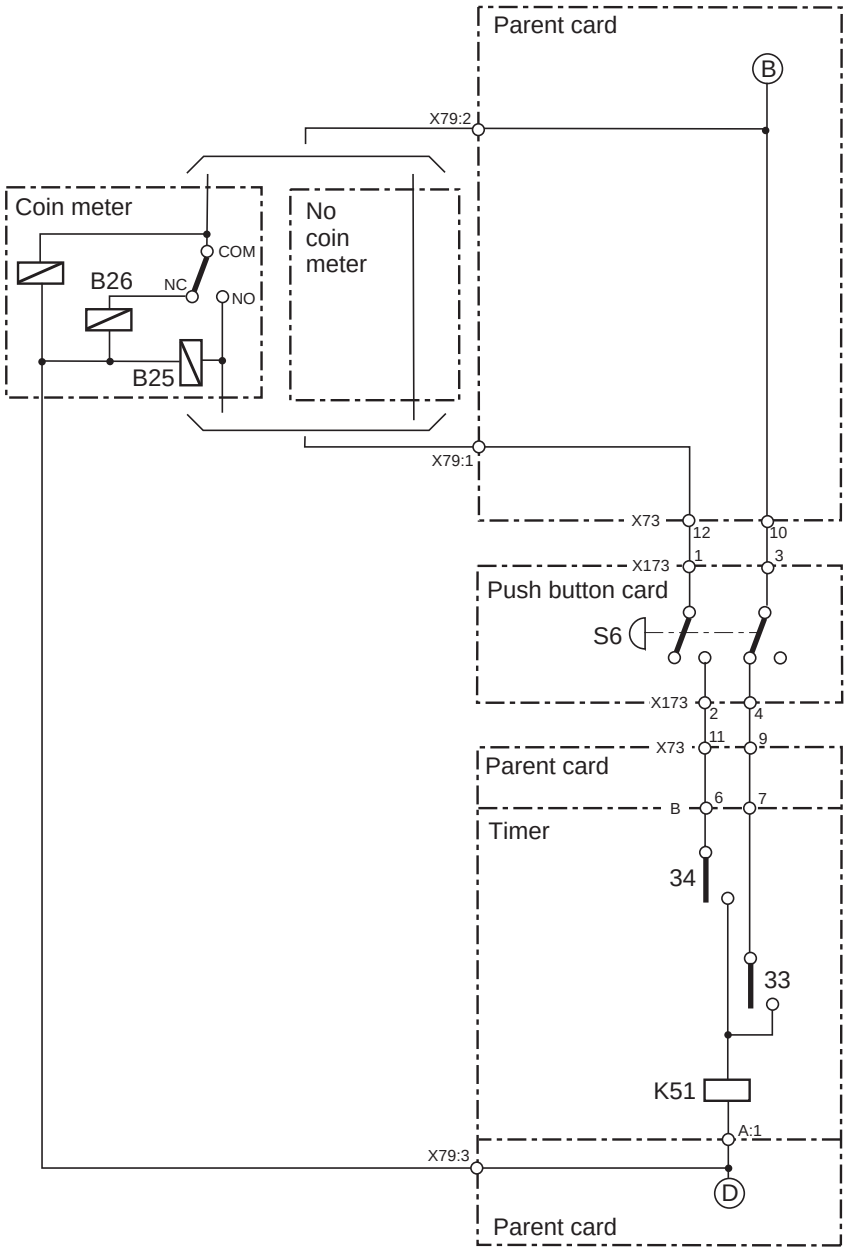
Row 34 (3) is closed between stages 1-41. One can rapid advance past these stages with a single push of a button. When the timer reaches stage 42 the **START** button must be released. This causes the timer to advance to stage 43 since row 33 (4) is closed at stage 42. It is then possible to easily rapid advance exactly to the final spin.

If desired, the timer can be rapid advanced up to and including stage 46 by holding the **START** button down.

Sequence diagram



1429



(B) = Power supply, see function diagram "Safety lock and power supply"

(1) Coin meter
Machines without coin meter have a bridge between X79:1-2

(2) Control switch **START**

(3) Timer, row 34 Rapid advance START

(4) Timer, row 33 Rapid advance 1/START

(5) Coil for timer rapid advance

(D) = Power supply, see function diagram "Safety lock and power supply".

Rapid advance and program selection

Depending on which program is selected and if the **HEAVILY SOILED** button is pressed, the timer is rapid advanced past different program phases. In chapter 4, (Program description, type 10), is a description of how the various programs differ from one another. Rapid advance occurs as follows:

All programs

The timer rapid advances when rows 41 (8) and 35 (5) are closed. This means that the timer rapid advances past prewash and the first rinse in all programs as long as the **HEAVILY SOILED** button is not pressed down.

Normal programs

During the three normal programs, row 16 (3) in the program selector is closed which means that the timer rapid advances in stage 21, when row 43 (9) is closed. This rapid advance is described in the section ”Cool-down, Normal program”.

Mild 30°C, Wool 40°C

During these programs, row 13 (1) in the program selector is closed which means that the timer is rapid advanced when row 40 (7) is closed. During operation, wash time is reduced at intervals during the various program phases.

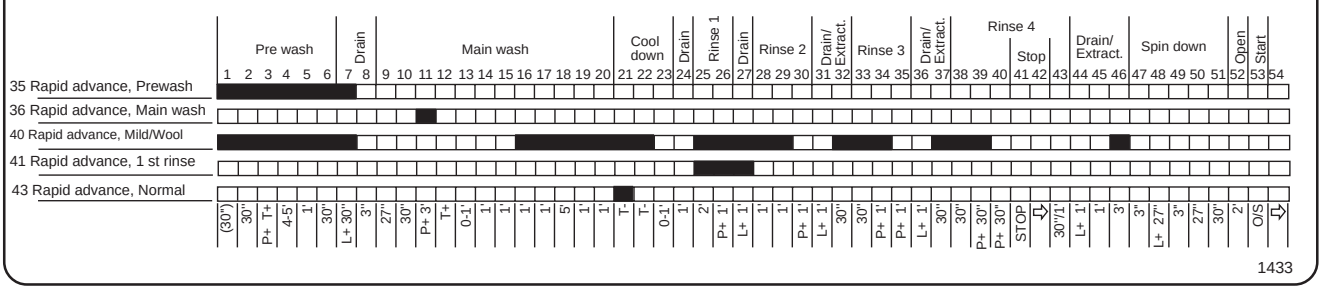
Permanent press programs

During permanent press programs, row 14 (2) in the program selector is closed which means that the timer is rapid advanced when row 41 (8) is closed. It should be possible to rapid advance the timer past the first rinse even when **HEAVILY SOILED** is selected (see ”Heavily soiled” below).

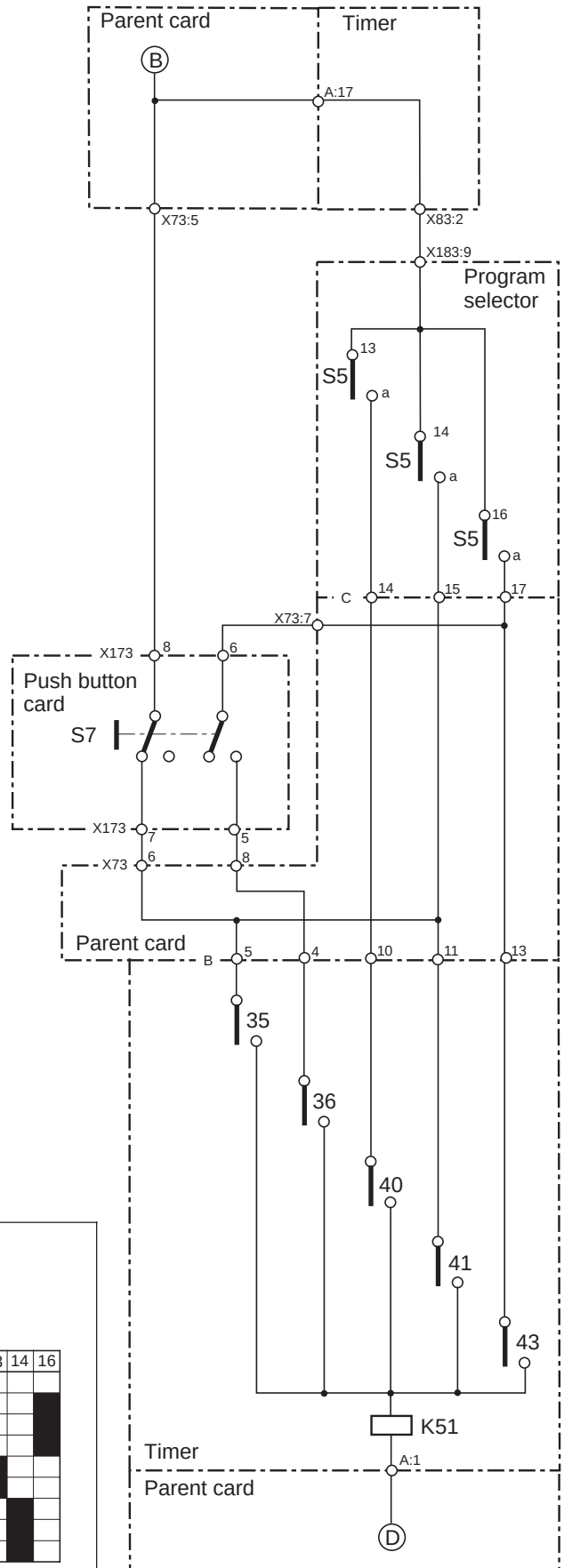
HEAVILY SOILED selected

When this variant is selected, rows 41 (8) and 35 (5) are de-energised. If Normal programs are selected (row 16 in program selector is closed) row 36 (6) receives voltage which means that the timer rapid advances past stage 11 of the main wash cycle. Stage 11 includes a three minute cold water wash before heat is connected to effectively clean away spots, such as blood, which contain protein. For Normal programs with **HEAVILY SOILED** selected, a separate prewash is used, allowing stage 11 to be omitted.

Sequence diagram



1433



B = Power supply, see function diagram "Safety lock and power supply".

(1) Program selector, row 13

(2) Program selector, row 14

(3) Program selector, row 16

(4) Control switch **HEAVILY SOILED**

(5) Timer, row 35
Rapid advance

(6) Timer, row 36
Rapid advance, Main wash

(7) Timer, row 40
Rapid advance, Gentle/Wool

(8) Timer, row 41
Rapid advance, 1 st rinse

(9) Timer, row 43
Rapid advance, Normal

(10) Coil for timer rapid advance.

D = Power supply, see "Safety lock and power supply".

Program selector

Row no.	13	14	16
0			
Normal 95°			■
Normal 60°			■
Normal 40°			■
Mild 30°	■		
Wool 40°	■		
Perm. press 40°		■	
Perm. press 60°		■	
Perm. press 95°		■	

1434

1432

Motor control

For the motor to operate, it is necessary for row 5a (2) or row 7a (1) to be closed, or for the level sensor to be shut off (water level is reached) so that point E receives voltage. The sequence diagram indicates that both rows 5a and 7a are closed during water filling, spin and tumble cycles. For each wash moment when the drum should be filled with water, all rows are open and advance is initiated by the level sensor, point E in the diagram. If for some reason water does not fill into the drum, the motor stops.

Normal speed (12 second rotation - 3 second pause)

Row 9a (5) remains closed when the motor is running at normal speed. Row 24b (7) in the timer is supplied voltage via row 18 (6) in the program selector. The latter row is closed during all programs where the drum rotates at normal speed. Row 24 is located in the timer's built-in reverser, where each stage lasts 3 seconds. The reverser switches over at normal speed: 12 seconds on, 3 seconds off, 12 seconds on, etc. Row 24 controls the connection of contactor K1 which in turn activates the motor wash winding.

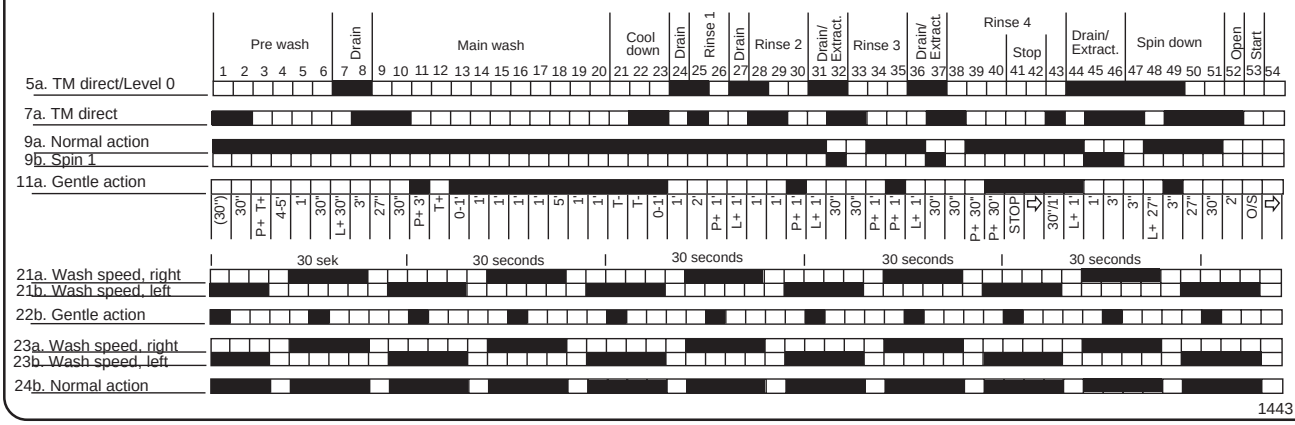
Gentle action (3 second rotation - 12 second pause)

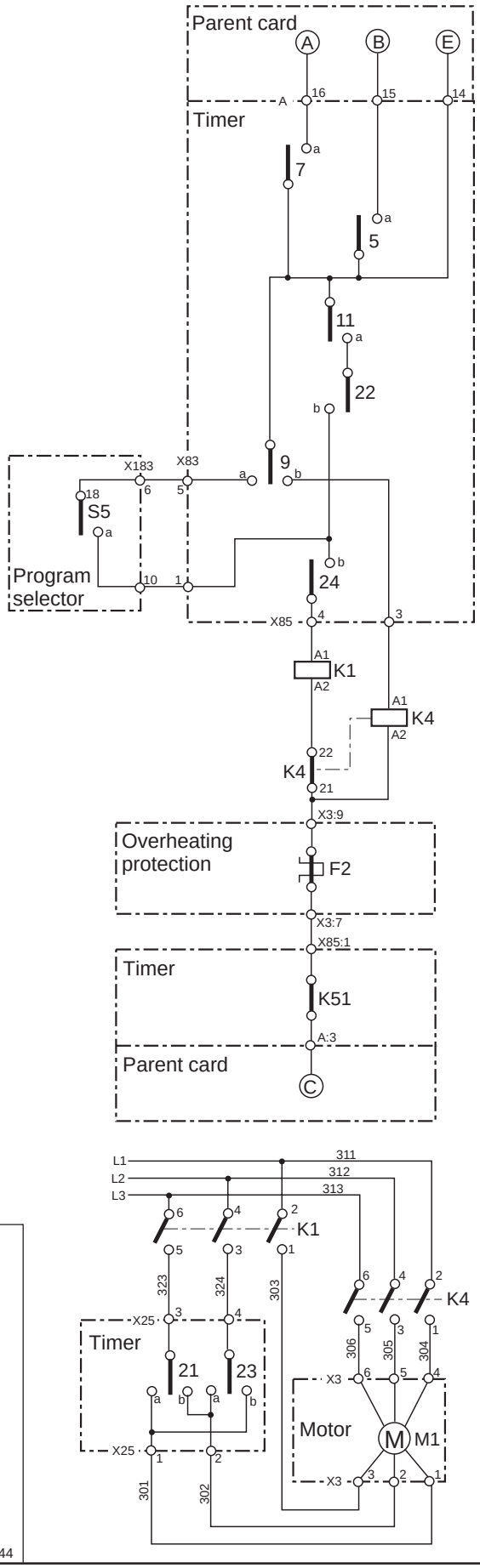
When washing is done at gentle action (Mild 30°C and Wool 40°C programs), row 18 (6) in the program selector is de-energised. Instead, voltage is supplied via rows 11a (3) and 22b (4). Row 11a controls how long the motor will rotate during the program. Row 22b is located in the reverser and switches over at gentle action: 3 seconds on, 12 seconds off, 3 seconds on, etc.

Spin

During the spin cycle, row 9b (5) activates spin contactor K4. As a security measure, K4:22-21 (10) de-energises K1, preventing the wash winding from being connected at the same time as the spin winding.

Sequence diagram





Programmer

Row no.	18
0	
Normal 95°	■
Normal 60°	■
Normal 40°	■
Mild 30°	
Wool 40°	
Perm. press 40°	■
Perm. press 60°	■
Perm. press 95°	■

1444

Ⓐ Ⓑ Ⓔ = Power supply. Points A and B, see function diagram "Safety lock and power supply". Point E, see function diagram "Water filling".

(1) Timer, row 7a
TM direct

(2) Timer, row 5a
Tm direct/Level 0

(3) Timer, row 11a
Gentle action

(4) Timer, row 22b
Gentle action

(5) Timer, row 9
a: Normal action b: Spin 1

(6) Program selector, row 18

(7) Timer, row 24b
Normal action

(8) Contactor coil
Motor, wash speed

(9) Contactor coil
Motor, spin

(10) Contactor
Motor, spin

(11) Overheating protection M1

(12) Relay, timer
rapid advance

Ⓒ = Power supply, see function diagram "Safety lock and power supply".

(13) Contactor K1
Motor, wash speed

(14) Contactor K1
Motor, spin

(15) Timer, rows 21 and 23 wash speed-right, wash speed-left

(16) Motor, wash and spin speed

1442

Water filling

This section describes a machine which only has a cold water connection. The diagrams of other variants (• cold and hot water • cold, hot and cold-hard water • cold and cold-hard water) are included in the machine circuit diagram.

Here is how water fills during the various wash moments:

Prewash

During the prewash cycle, rows 14a (1) and 6b (7) are closed. For Normal and Permanent press programs, row 3 (3) in the program selector is closed which means water fills to the preset low level (the change-over contact 11-12-14 in the level sensor trips at low water level). For Mild 30°C and Wool 40°C programs, row 5 (4) in the program selector is closed. The machine then fills to the preset high level. Voltage travels from the level sensor via row 6b to water valve Y11 (11) which in turn fills detergent compartment 1. Rows 14a (1) and 6b (7) are closed during the entire prewash. If the water level during prewash falls below the level sensor's preset level, water will refill (see chapter 26 on Level Control).

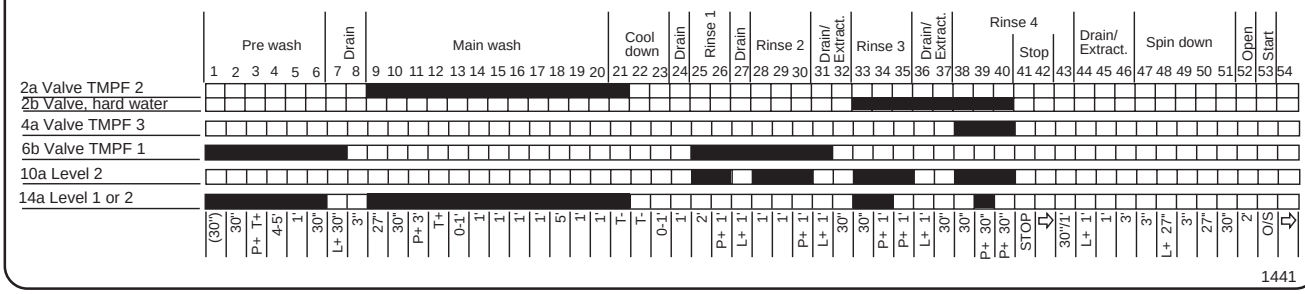
Main wash

During the main wash, rows 14a (1) and 2a (6) are closed. Which level sensor (high or low) is used depends on the selected wash program just as it does for prewash. Voltage travels from the level sensor via row 2a (6) and rows 6 (9) and 7 (10) in the program selector to water valve Y12 (12). This valve then fills detergent compartment 2 with water. The above mentioned rows 6 and 7 are used to select between the various water connections when cold water is not the only option. When only cold water is connected, the rows are connected in parallel when cold and hot water or cold, hot and hard water connected clamp A is cut. Rows 14a (1) and 2a (6) are closed during the entire main wash which means that if the water level during this cycle falls below the level sensor's preset level, water will refill (see chapter 26 on Level Control).

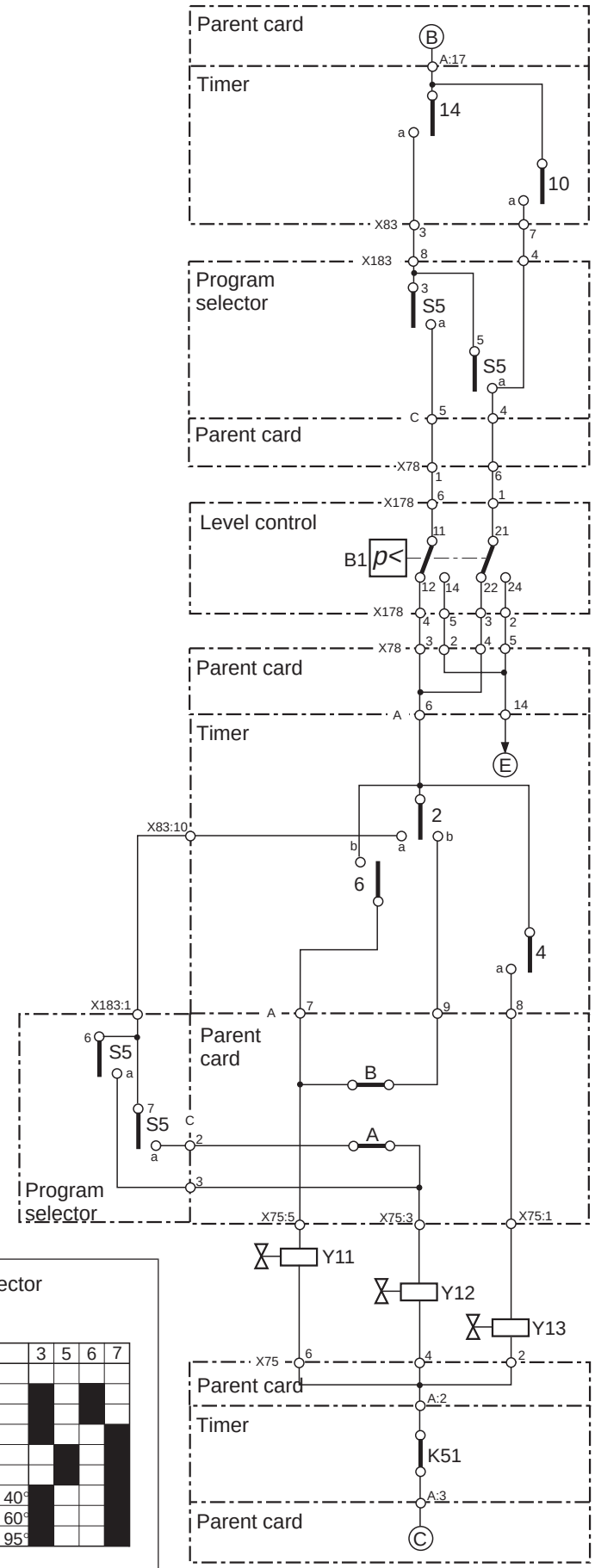
Rinse

During all rinse cycles, row 10a (2) is closed which means that water always fills to high level. During the first two rinses, row 6b (7) is closed and valve Y11 (11) fills detergent compartment 1 with water. During rinse 3 and 4, row 2b (6) is closed instead of 6b. This makes it possible to select cold hard water for these two rinses when other water options are available clamp B is cut. When only cold water is connected, water fills via valve Y11 (11) into compartment 1. For the fourth rinse, row 4a (8) closes as well so that valve Y13 (13) can flush away any conditioner used from compartment 3.

Sequence diagram



1441



Program selector

Row no.	3	5	6	7
0				
Normal 95°	■		■	
Normal 60°	■		■	
Normal 40°	■			■
Mild 30°		■		■
Wool 40°		■		
Perm. press 40°	■			■
Perm. press 60°	■			■
Perm. press 95°	■			■

1440

Ⓑ = Power supply, see function diagram "Safety lock and power supply".

(1) Timer, row 14a
Level 1 or 2

(2) Timer, row 10a
Level 2

(3) Program selector row 3

(4) Program selector row 5

(5) Level control

Ⓔ = supply to heating mechanism and timer motor, see fuction diagram "Heating" and "Timer motor".

(6) Timer, row 2
a: Valve, TMPF 2 b: Valve, hard water

(7) Timer, row 6b
Valve TMPF 1

(8) Timer, row 4a
Valve, TMPF 3

(9) Program selector row 6

(10) Program selector row 7

(11) Water valve, compartment 1, cold water

(12) Water valve, compartment 2, cold water

(13) Water valve, compartment 3, cold water

(14) Relay, timer rapid advance

Ⓒ = Power supply, see function diagram "Safety lock and power supply".

1439

Heating

Contactor K21 (11) controls the heating elements on electrically heated machines. Steam heated machines have steam valve Y5 (11).

Heating cannot take place until the drum is filled with water so that the level control shuts off (see function diagram ”Water filling”). Voltage is then received by the heating function, point (E) to the right in the diagram.

The timer is fitted so that heating can occur during both prewash and main wash cycles (row 1b (10) closes during both prewash and main wash). For program P11, described here, heating is not used during prewash. The timer advances past this program stage as follows:

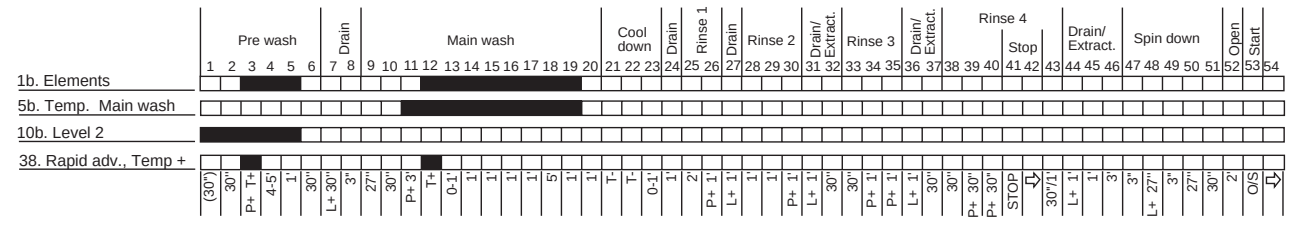
- Row 10b (6) is closed during prewash.
- When the timerr reaches stage 3, it stops (this stop is preset in the programmer) to wait for heating to start, if called for.
- However, in stage three, row 38 (8) closes. The coil for rapid advance (9) receives voltage and advances the timer to stage 4 without heating occurring.

During the main wash, water is heated as follows:

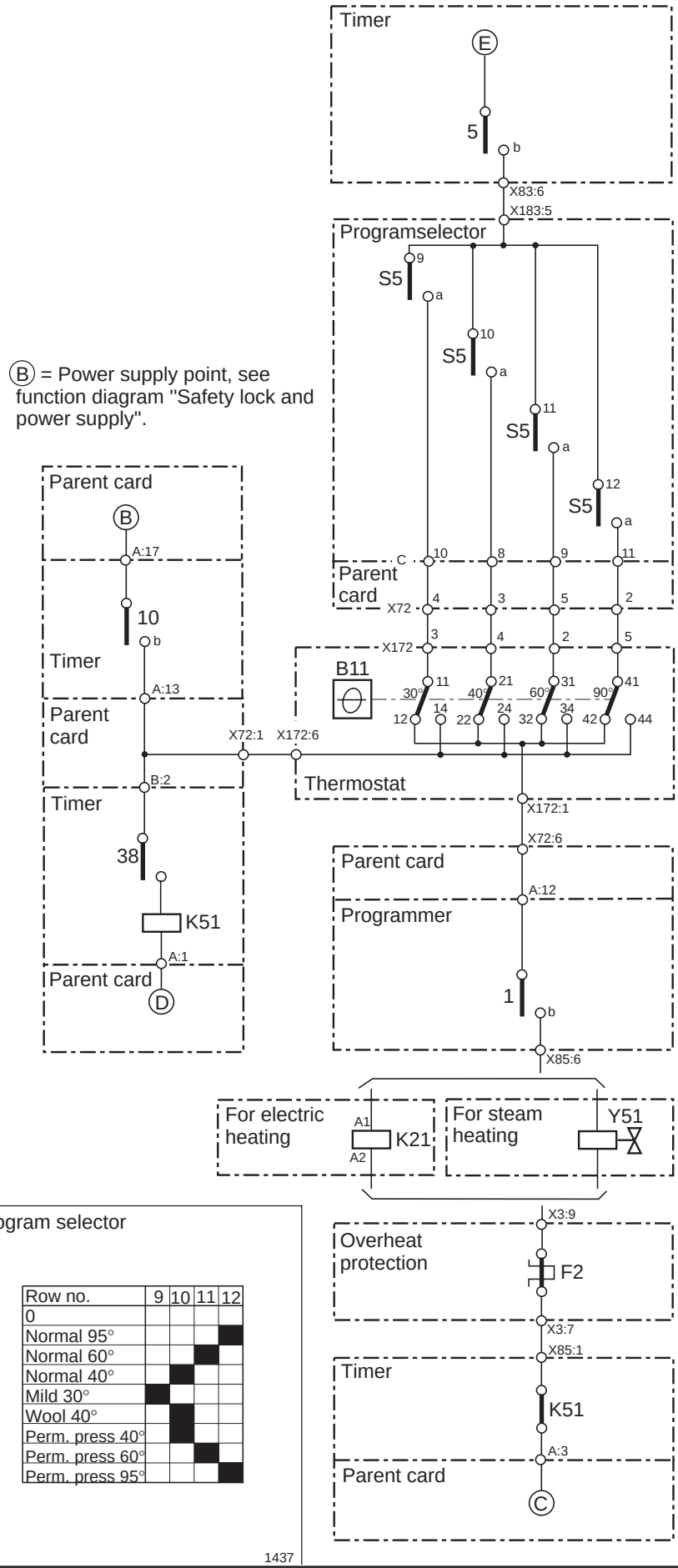
- One of rows 9-12 (2)-(5) in the program selector will close depending on which program is selected. This controls which contact in the thermostat (7) will stop the heating process.
- When the timer reaches stage 12, it stops (this stop is preset in the programmer) to wait for the heating to be completed.
- Since rows 5b (1) and 1b (10) are closed at stage 12, relay K21/valve Y51 (11) receives voltage and heating begins.
- Row 38 (8) is also closed at stage 12 and when the correct temperature is reached (the change-over contact in the thermostat trips) the coil for rapid advance (9) receives voltage resulting in the timer advancing to stage 13.

The thermostat has an hysteresis of approx. 4°C which means the contact returns to its original position when the wash water temperature falls 4°C below the preset value. Rows 5b (1) and 1b (10) are closed during the entire main wash cycle. This results in the water being reheated to the correct temperature if the temperature should fall more than 4°C below the correct level during washing.

Sequence diagram



1438



Program selector

Row no.	9	10	11	12
0				
Normal 95°				■
Normal 60°			■	
Normal 40°		■		
Mild 30°	■			
Wool 40°		■		
Perm. press 40°		■		
Perm. press 60°			■	
Perm. press 95°				■

1437

Ⓑ = Power supply point, see function diagram "Safety lock and power supply".

Ⓔ = Power supply from level sensor, see function diagram "Water filling".

(1) Programmer, row 5b
Temp., main wash

(2) Program selector row 9

(3) Program selector row 10

(4) Program selector row 11

(5) Program selector row 12

(6) Timer row 10b
Level 2

(7) Thermostat

(8) Timer row 38

(9) K51 Coil for timer rapid advance

(10) Timer, row 1b
Element

(11) For electric heating: Contactor
For steam heating: Steam valve

(12) Overheat protection

(13) Relay, timer rapid advance

Ⓒ = Power supply, see function diagram "Safety lock and po supply".

1436

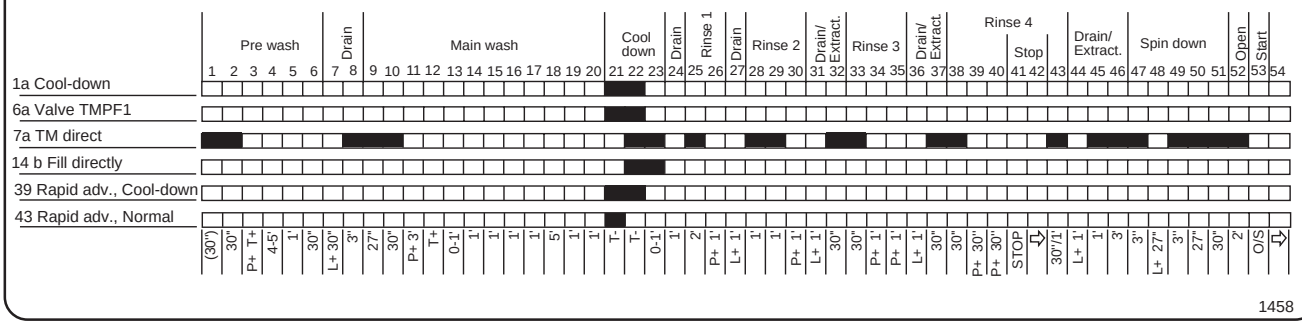
Cool-down, Normal program

Cool-down for Normal programs (60°C and 95°C) consists of water filling the drum until its temperature drops to 56°C, upon which the main wash water drains.

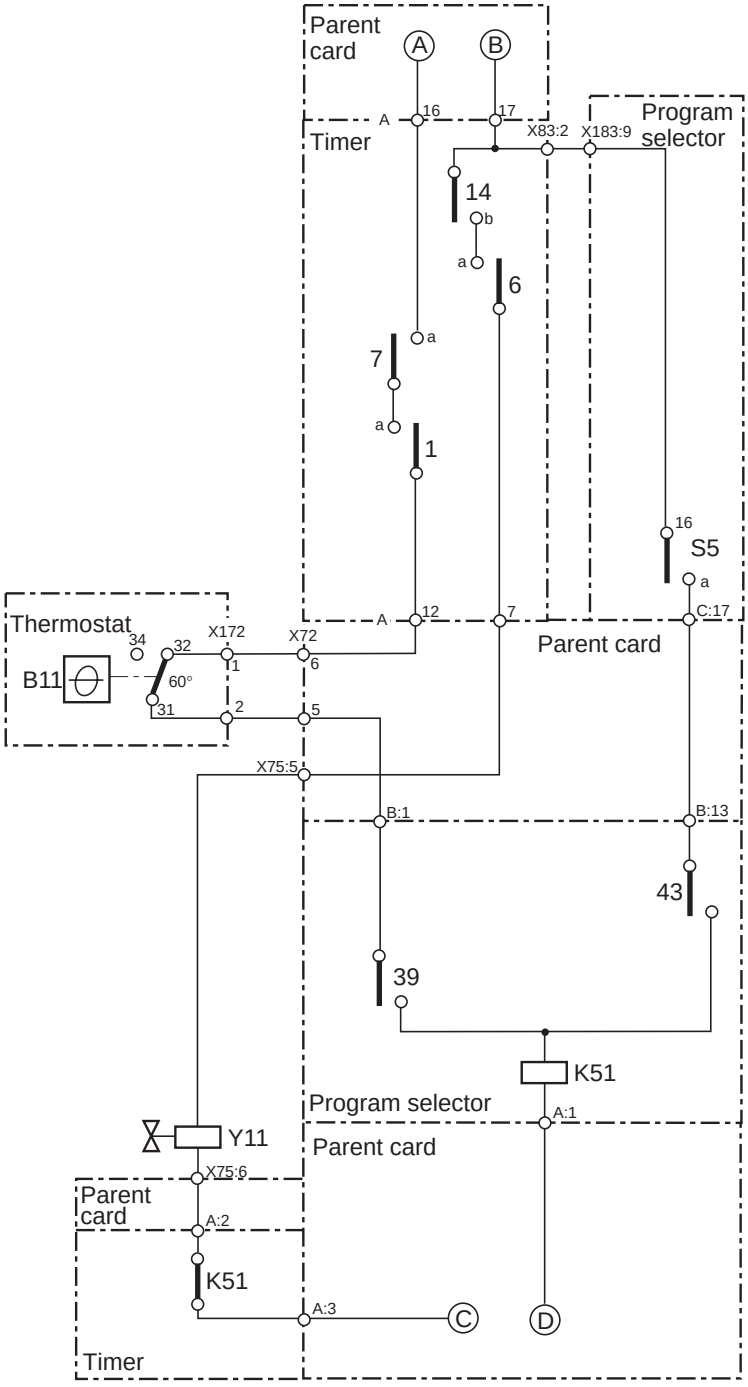
Cool-down functions as follows:

- At program stages 21 and 22, the timer advance stops (this stop is preset in the timer). Stage 21 is used for cool-down in permanent press programs. In Normal programs the timer rapid advances past this stage; the coil for rapid advance (9) receives voltage via row 16 (5) in the program selector and row 43 (7).
- At stage 22, rows 14b (1) and 6a (2) are closed. Water valve Y11 (10) receives voltage, opens and begins to fill detergent compartment 1 with cold water.
- When the temperature drops to 56°C, the thermostat 60°C contact changes over from position 31-34 to 31-32 (the thermostat has an hysteresis of 4° C. See chapter 27, type 10). Since rows 7a (3), 1a (4) and 39 (8) are all closed at program stage 22, the magnet for rapid advance (9) receives voltage and the timer advances to stage 23.
- At stage 23, the water-filled drum rotates 0-1 minutes before the water drains at stage 24 (time can vary since the timer advance is synchronized with the program pause).

Sequence diagram



1458



(A) (B) = Power supply, see function diagram "Safety lock and power supply".

(1) Timer, row 14b
Fill directly

(2) Timer row 6a
Valve TMPF 1

(3) Timer row 7a
TM directly

(4) Timer row 1a
cool-down

(5) Program selector
row 16

(6) Thermostat
change-over contact at 60°

(7) Timer row 43
Rapid advance, Normal

(8) Timer row 39
Rapid advance, Cool-down

(9) K51 Coil for timer rapid advance

(10) Water valve
compartment 1 cold water

(11) Relay, timer rapid advance

(C) (D) = Power supply, see function diagram "Safety lock and power supply".

Programselector

Row no.	16
0	
Normal 95°	■
Normal 60°	■
Normal 40°	■
Mild 30°	
Wool 40°	
Perm. press 40°	
Perm. press 60°	
Perm. press 95°	

1457

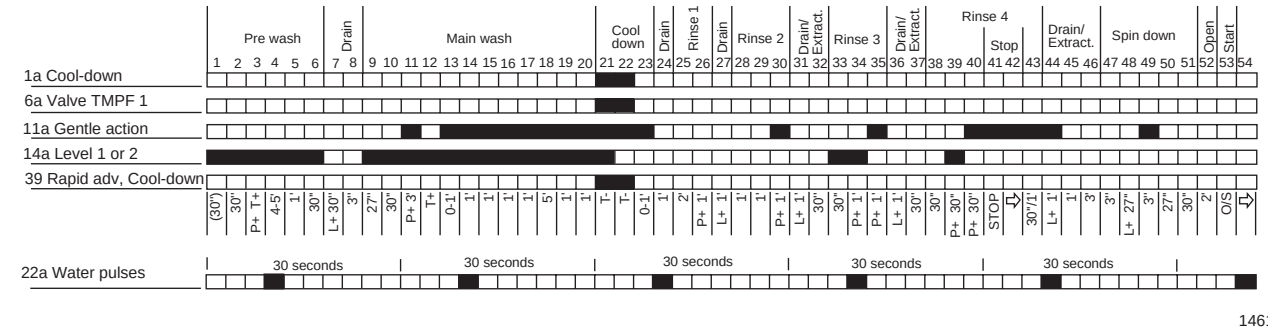
Cool-down, Permanent press program

For cool-down during Permanent press programs (60°C and 95°C), cold water fills the machine until water temperature falls to 56°C. The main wash water then drains. Water fills in pulses for Permanent press programs, while for Normal programs, it fills continually. During the former, the water valve is open for 3 seconds, closed 27 seconds, open 3 seconds, etc.

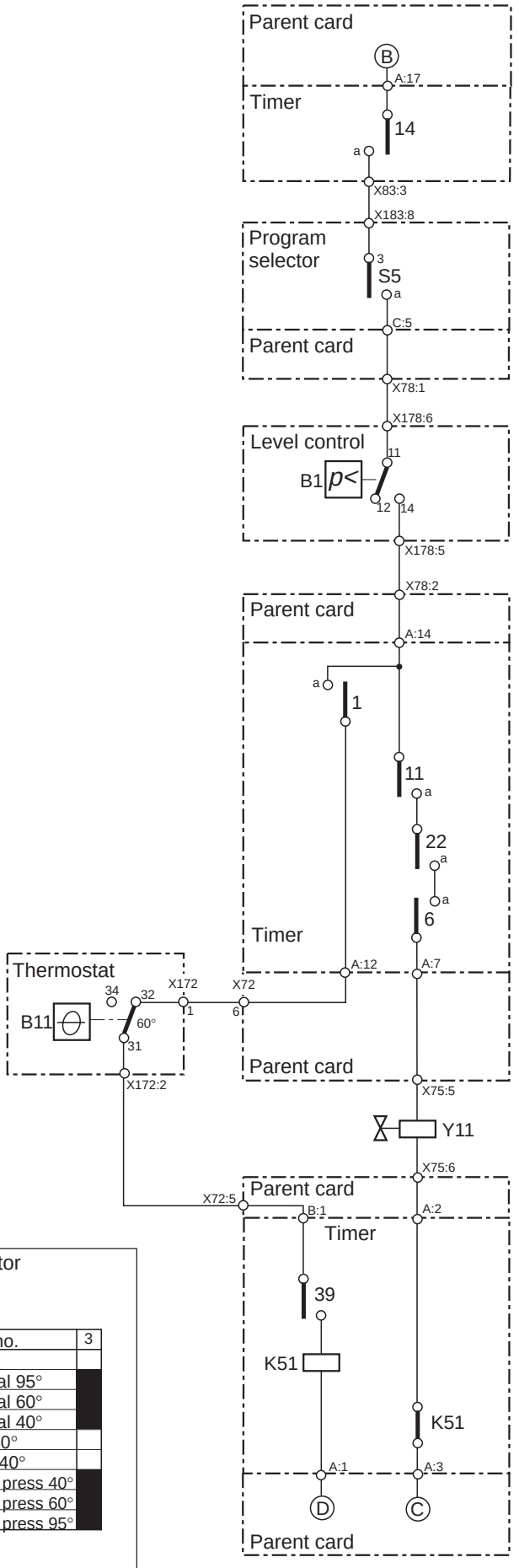
Cool-down at program stage 21 occurs as follows:

- When the timer reaches stage 21, it stops (this stop is preset in the timer).
- At program stage 21, rows 14a (1), 11a (5) and 6a (7) are closed. Row 3 (2) in the program selector is energised during the permanent press programs and the level control (3) is set at position 11-14 (the drum is filled to low level).
- This means that water valve Y11 (9) and row 22a (6) now open and close at the same time — 3 seconds open, 27 seconds closed, 3 seconds open, etc.
- When the temperature falls to 56°C, the thermostat 60°C-contact changes over from position 31-34 to 31-32 (the thermostat has a hysteresis of 4°C, see also chapter 27, type 10). Since rows 1a (4) and 39 (10) are closed at stages 21 and 22, the coil (11) for rapid advance receives voltage causing the timer to rapid advance to stage 23.
- At stage 23, the water-filled drum rotates for 0-1 minutes before the water drains at stage 24 (time can vary since the timer advance is synchronised at stage 23 with the program pause).

Sequence diagram



1461



B = Power supply, see function diagram "Safety lock and power supply'.

(1) Timer, row 14a'
Level 1 or 2

(2) Program selector
row 3

(3) Level control,
low level

(4) Timer, row 1a
Cool-down

(5) Timer row 11a
Gentle action

(6) Timer row 22a
Water pulsing

(7) Timer row 6a
Valve, TMPF 1

(8) Thermostat
change-over contact at 60°C

(9) Water valve
compartment1, cold water

(10) Timer, row 39
Rapid advance, cool-down

(11) Coil for timer
rapid advance

(12) Relay
Timer rapid advance

C D = Power supply, see function diagram "Safety lock and power supply".

1460

Program selector

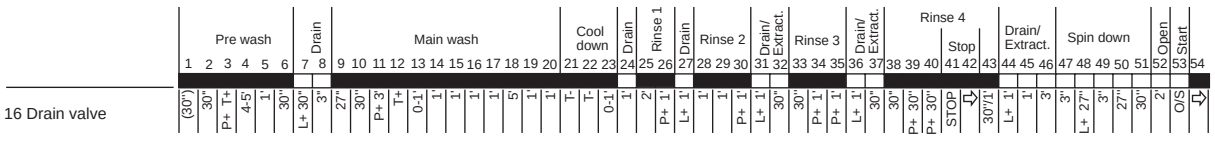
Row no.	3
0	
Normal 95°	■
Normal 60°	■
Normal 40°	■
Mild 30°	
Wool 40°	
Perm. press 40°	■
Perm. press 60°	■
Perm. press 95°	■

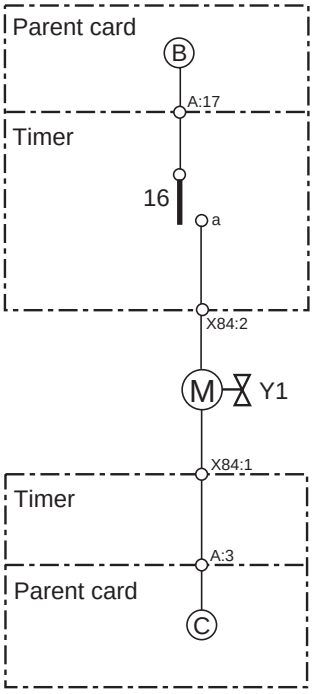
1459

Drain

The drain valve closes when the control valve Y1 (2) is activated (cold water supply must be open).

The valve will not close until the door is locked (this is when point Ⓒ receives voltage, see section ”Safety lock and power supply”). Control valve Y1 is controlled by row 16a (1) which itself is closed when the drain valve (2) should be closed.





(B) = Power supply point, see function diagram ”Safety lock and power supply”.

(1) Timer, row 16
Drain valve

(2) Drain valve

(D) = Power supply point 0 V, see function diagram ”Safety lock and power supply”.

Timer advance

The timer motor advances in the following way:

From timer rows

Rows 5a (3) and 7a (1) are closed during all drain and spin cycles. They are also closed during the first part of wash and rinse cycles when water is filling.

From level control

When water fills to the correct level, the level control's contact changes over and point (E) in the diagram receives voltage (see section on "Water filling"). During those phases when timer rows 5a (3) and 7a (1) are open, the level control controls the advance of the timer motor. As a result, if water does not fill to the correct level, the timer will stop.

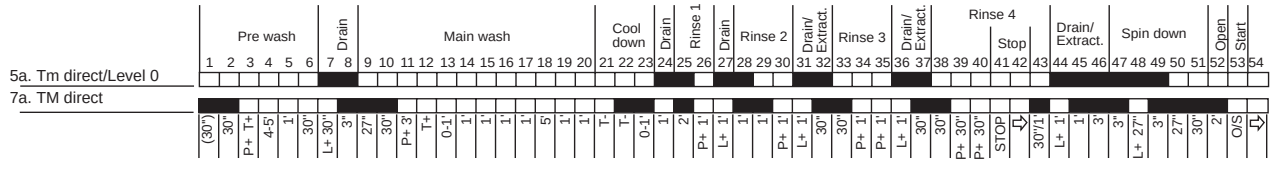
At rapid advance

Contact K51 (2) closes when the program is rapid advanced so that the motor always receives voltage.

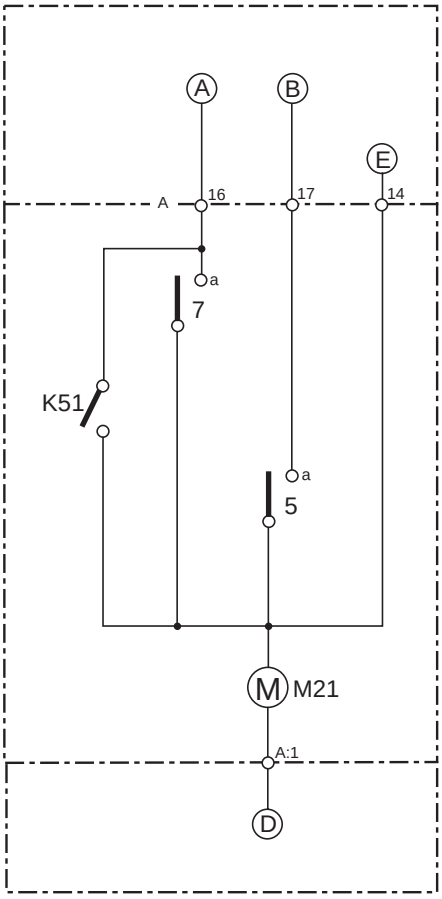
At heating and cool-down

At stages 3, 12 and 21-22, the timer advance switches off internally in the timer even if the motor is still energised. Stages 3 and 12 are used for heating water (see section "Heating"). Stages 21-22 are used for cool-down (see section "Cool-down, Normal program" and "Cool-down, Permanent press").

Sequence diagram



1463



(A) (B) (E) = Power supply. Points A and B, see function diagram ”Safety lock and power supply”. Point E, see function diagram ”Water filling”.

(1) Timer, row 7a
TM direct

(2) Relay, timer rapid advance

(3) Timer, row 5a
TM direct/Level 0

(4) Timer motor

(D) = Power supply, see function diagram ”Safety lock and power supply”.

Trouble shooting

Fault indication

Fig. 1

Fig. 2

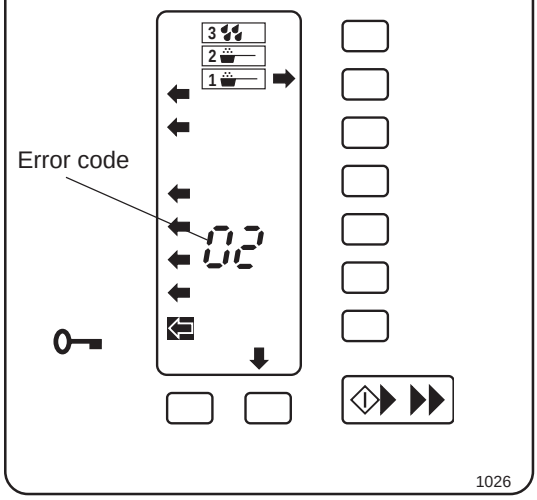
The microprocessor-controlled machines have an automatic trouble shooting program which continuously monitors the main functions. If a fault occurs in service, a nummerical code (see table below) blinks on the control panel display.

When error code 01 or 02 are displayed, a restart can be done after the fault has been put right. When the other codes are displayed, the main switch must be turned off and then on again before the machine can be restarted.

Built-in service program

There is a built-in service program which facilitates function controls and fault tracing. With the program, different switches and sensors, such as the door safety lock and coin meter, can be checked. It is also easy to direct and thereby check the machine parts, such as motor, valves and door safety lcok.

1



2

Error code	Error	Probable remedy/Solution
01	Water level not reached	Is the water shut-off valve open? Push **START** restart.
02	Door lock in operative	Open and close door again. Push **START** for restart.
03	Shortcircuit	Shortcircuit in temperature sensor or in the cable between sensor and circuit board.
04	Water temperature over 98° C	
05	Water in machine before program start	Check drain and level sensor system.
06	Machine memory fault	
07	Machine heats incorrectly	Check heating system and thermostat.
08	Drain time too long	Check drain system.
09	Out-of-balance switch in operative	

Service program setting

- Remove the top panel
- Set the service switch to the service position (the switch is located on the programmer circuit board behind the control panel display window). Fig. 2
- The key set changes to numerical keys with 1-7 as program selector buttons and 8 and 9 as variable selector buttons. The start button is used as on/off switch. Fig. 3

IMPORTANT!

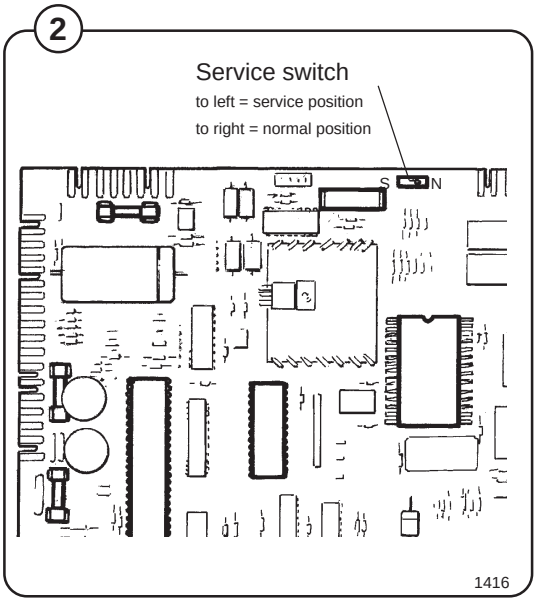
Since there is no 0 key included in the key set, only 11-19, 21-29, etc. are used in the service program.

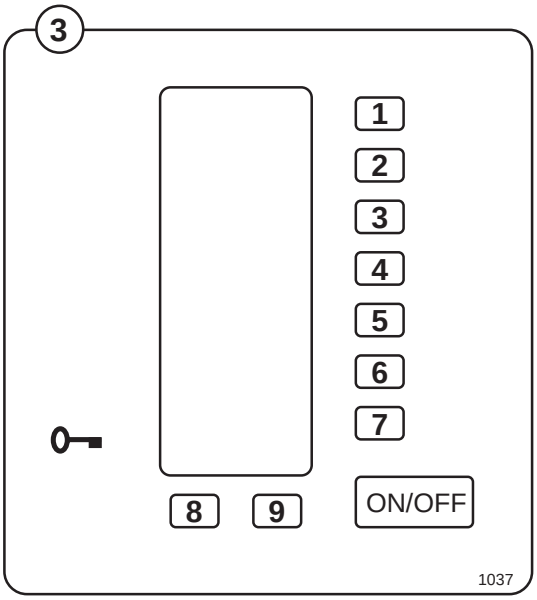
Sensor and switch checks

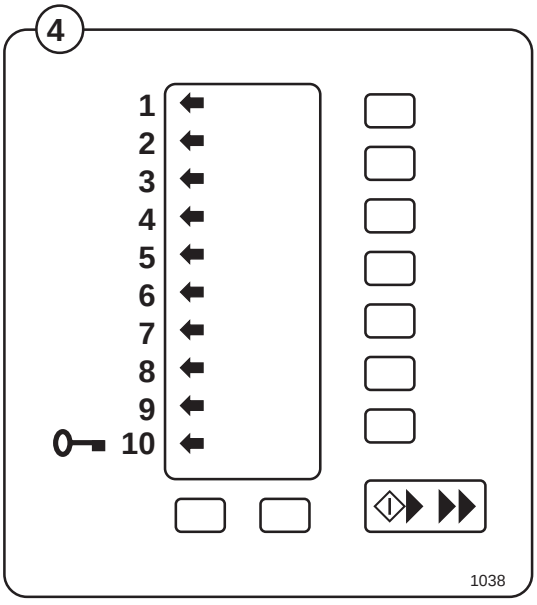
The program indicator displays certain input signals by illuminating the arrows in the display window. For example, arrow no. 5 lights up when the door is closed thereby showing that the door microswitch is functioning correctly. Fig. 4

The table below shows which input signals are displayed with the help of the program indicator.

1	Coin fee program button
2	Coin slot 1
3	Coin slot 2
4	Out-of-balance switch
5	Safety lock
6	Price decrease 1
7	Price decrease 2
8	Free wash
9	-
10	ON/OFF function (applies to functions input with key set, see next chapter).







Function checks

It is possible to test the machine's various functions by inputting a numerical code using the key set. The function chosen can then be turned on and off using the start button. Program indicator no. 10 shows if the function is turned on or off.

The table below lists the functions which can be simulated and which numerical codes apply to each respective function.

Code	Functions
11	Detergent compartment 1
12	Detergent compartment 2
13	Detergent compartment 3
14	Detergent compartment 4
15	Detergent compartment 5
16	Valve connection, hot water
17	Valve connection, cold water
18	Valve connection, hard water
19	Heat (The display window shows the machine temperature and not code "19").
21	Motor, clockwise rotation
22	Motor, counter-clockwise rotation
23	Distribution, counter-clockwise
24	Spin, counter-clockwise
25	Coupling
26	Drain valve
27	Drain
28	Level switch

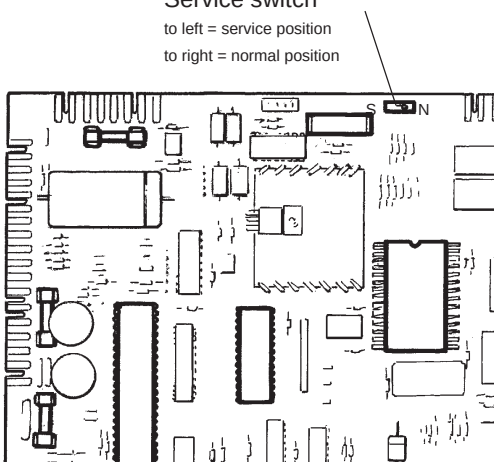
WARNING!

Do not run the motor (codes 21 and 22) immediately after spin. Wait until the drum has stopped to avoid major risk of damaging machine.

N.B.!

When code 19 is pushed in, the temperature is displayed, not the code number.

5



Disconnecting service program

Fig. 5

- Return the service switch on the programmer circuit board to the N position.

General

This chapter describes a machine with the wash program P02CH. The machine has an electromechanical programmer, hot and cold water connection, without heating and wash programs for laundrettes, coin-ops etc.

To facilitate fault-tracing in the machine electronics, the circuit diagram is divided into functional sequences. The following sequences are described in this chapter:

- Power supply and start, machines without coin meter 2
- Power supply and start, machines with coin meter 4
- Power supply and start machine with coin meter and rapid advance 6
- Safety lock 8
- Rapid advance and program selection 10
- Motor control 12
- Water filling 14
- Cool-down 16
- Drain 18
- Programmer advance 20

Power supply and start, machines without coin meter

Some control circuits do not receive voltage until the door and lock switch S3 (3) are closed (point Ⓑ). Others receive voltage even when the door is open (point Ⓐ). These feed points recur in other function diagrams.

The same conditions apply for feed points Ⓒ and Ⓓ . Point Ⓒ does not receive voltage until a switch S4 (9) in the safety lock delay unit is closed (i.e. door is locked). Point Ⓓ receives voltage even when the door is open.

Start

When a program is completed, the machine stops at program stage 53 and the door can be opened.

The door must be closed for the machine to start.

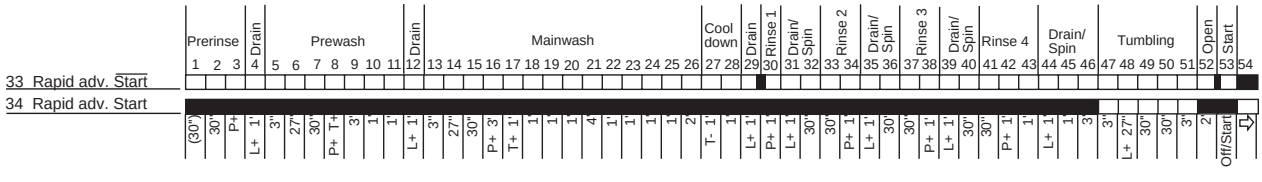
It is only when the door is closed that switch S6 (4) receives voltage. When S6 is pressed to start a new program, the coil for rapid advance (8) receives voltage since row 34 (6) is closed at stage 53.

At stage 54 the timer stops until S6 is released. The timer then advances to stage 1 (row 33 (7) is closed at stage 54) and the wash program begins. This design prevents accidental excess rapid advance of the timer when starting.

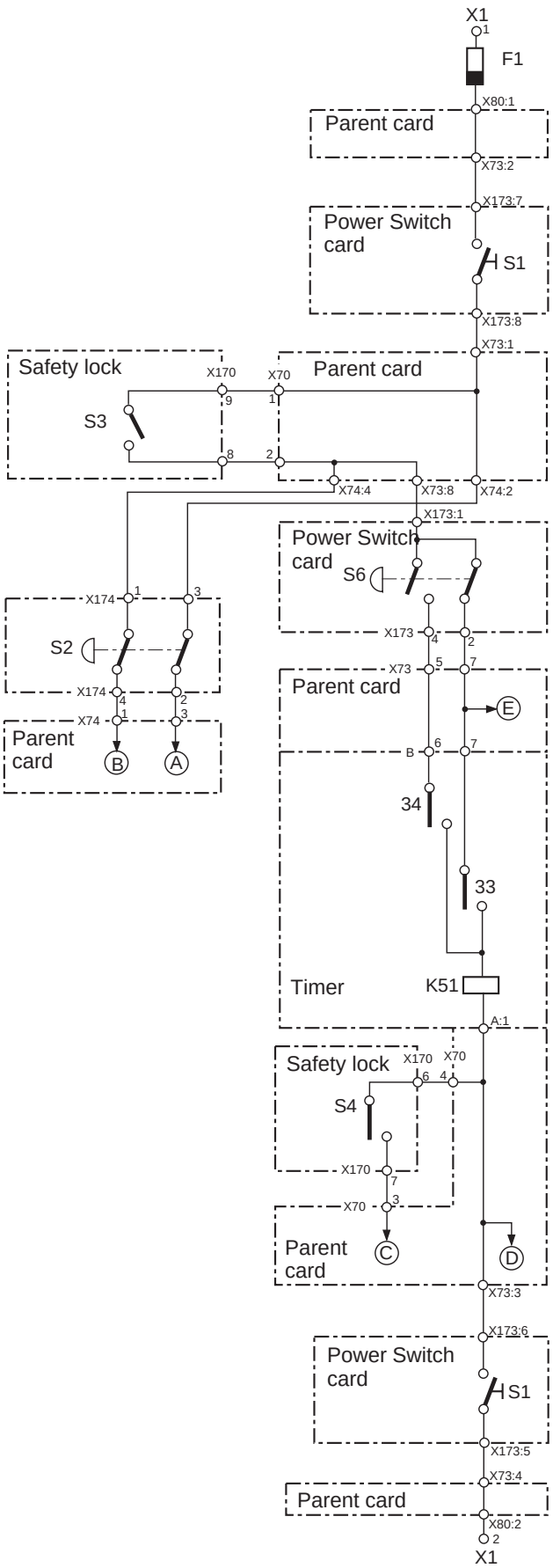
Program advance

By holding down S6 the timer can be advanced past different wash cycles (row 34 is closed in stages 1-46).

Sequence diagram



1552



(1) Fuse

(2) Switch On - Off

(3) Switch Door

(4) Switch Start + K51

(5) Power Switch S2 Emergency Stop

Ⓐ Ⓑ Ⓔ : power supply to other functions

(6) Timer row 34
Rapid advance Start

(7) Timer row 33
Rapid advance Start

(8) Coil for timer advance

(9) Switch Doorlock

Ⓒ and Ⓓ = power supply to other functions

(10) Switch On - Off

1543

Power supply and start, machine with coin meter

Some control circuits do not receive voltage until the door and lock switch S3 (2) are closed (point Ⓑ). Others receive voltage even when the door is open (point Ⓐ). These feed points recur in other function diagrams.

The same conditions apply for feed points Ⓒ and Ⓓ . Point Ⓒ does not receive voltage until a switch S4 (8) in the safety lock delay unit is closed (i.e. the door is locked). Point Ⓓ receives voltage even when the door is open.

Start

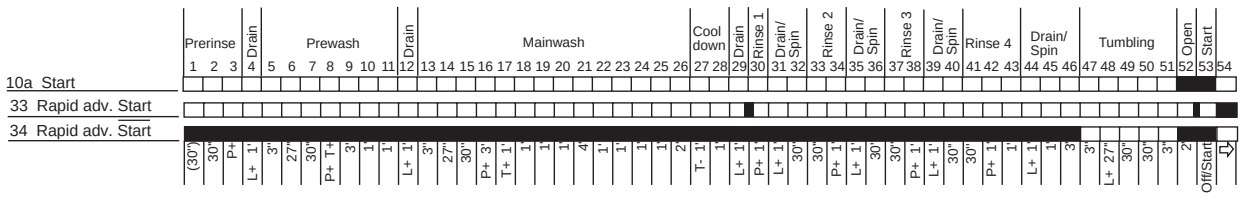
When a program is completed, the machine stops at program stage 53 and the door can be opened.

The door must be closed for the machine to start. It is only when the door is closed that impulsegenerator B21 (5) in the coin meter receives voltage. The coin lock B26 (5) also receives voltage since row 10a (3) is closed at stage 53. This means that the lock in front of the coin slot can be moved and a coin can be inserted.

When the correct amount of coins have been inserted into the coin meter the impulse generator's contact with COM-NO position and the coil for timer (5) receives voltage (row 34 (5) is closed at stage 53).

At stage 54 row 34 is released but the timer advances to stage 1 since row 33 (7) is closed at stage 54. This design feeds the timer forward to stage 1 regardless of how long the impulse generator's contact remains in COM-NO position.

Sequence diagram



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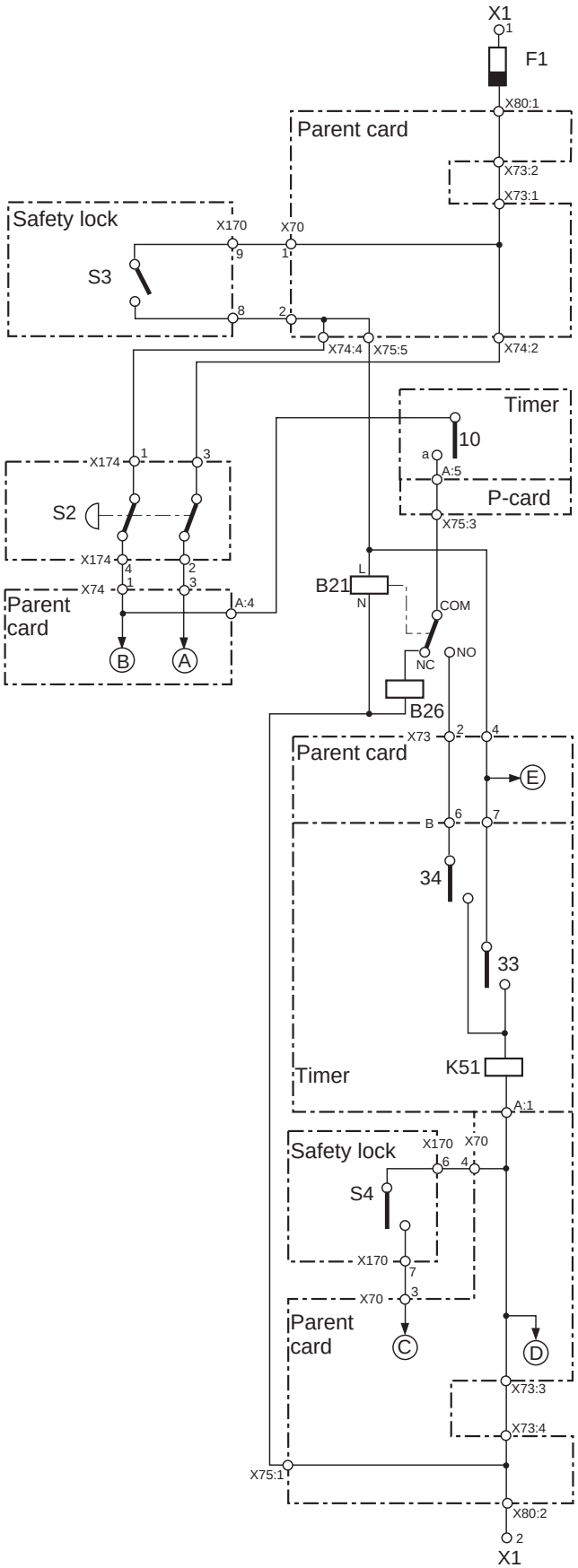


(1) Fuse

(2) Door Switch

(3) Timer row 10 a Start

(4) Switch S2 emergency stop

(5) Coin meter
B21 = Impulse Generator Start
B26 = Coin Lock

Ⓐ Ⓑ Ⓔ : Power supply to other functions

(6) Timer row 34
Rapid advance Start

(7) Timer row 33
Rapid advance Start

(8) Coil for timer advance

(11) Switch Doorlock

Ⓒ and Ⓓ = Power supply to other functions

1427

Power supply and start, machine with coin meter and rapid advance (only France)

Some control circuits do not receive voltage until the door and lock switch S3 (2) are closed (point Ⓑ). Others receive voltage even when the door is open (point Ⓐ). These feed points recur in other function diagrams.

The same conditions apply for feed points Ⓒ and Ⓓ. Point Ⓒ does not receive voltage until a switch S4 (10) in the safety lock delay unit is closed (i.e. the door is locked). Point Ⓓ receives voltage even when the door is open.

Start

When a program is completed, the machine stops at program stage 53 and the door can be opened.

The door must be closed for the machine to start. It is only when the door is closed that the impulse generator B21 (5) in the coin meter receives voltage. The coin lock B26 (5) also receives voltage since row 10a (3) is closed at stage 53. This means that the lock infront of the coin slot can be moved and a coin can be inserted.

When the correct amount of coins have been inserted into the coin meter the impulse generator's contact with

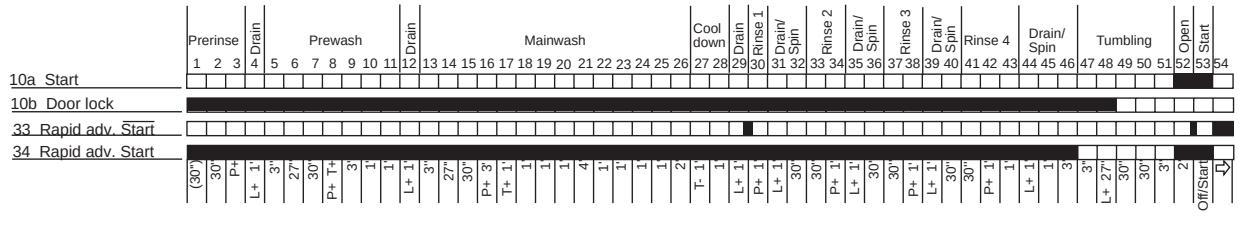
COM-NO position and the magnet for timer (9) receives voltage (row 34 (7) is closed at stage 53).

At stage 54 row 34 is released but the timer advances to stage 1 since row 33 (8) is closed at stage 54. This design feeds the timer forward to stage 1 regardless of how long the impulse generator's contact remains in COM-NO position.

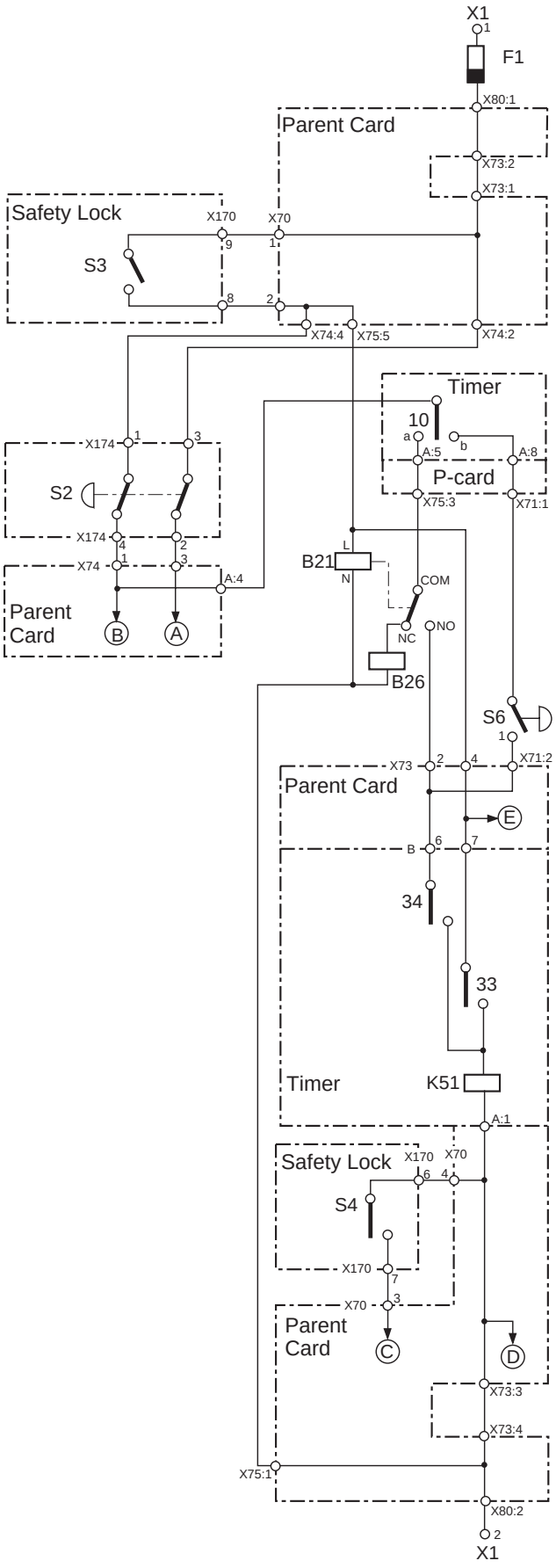
Rapid advance

By holding down S6 (6) during program operation, the timer can be rapid advanced past different wash phases (rows 10b (3) and 34 (7) are both closed at program stages 1 -46).

Sequence diagram



1553



(1) Fuse

(2) Switch Door

(3) Timer row 10
a: Start
b: Door lock

(4) Switcher S2
Emergency stop

(5) Coin meter
B21 = Impulse generator start
B26 = Coin lock

Ⓐ and Ⓑ : Power supply to other functions

(6) Switch Start + K51

Ⓔ = Power supply to function "Rapid advance Program selection"

(7) Timer row 34
Rapid advance Start

(8) Timer row 33
Rapid advance Start

(9) Coil for rapid advance timer

(10) S4 Switch Doorlock

Ⓒ and Ⓓ : Power supply to other functions

1551

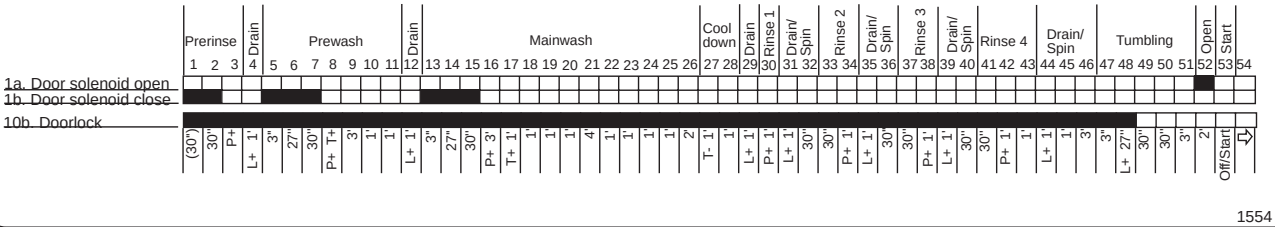
Safety Lock

The machine can not be started until the door is closed. When the start button on the machine is pressed, or the correct number of coins are inserted into the coin meter, the timer advances to stage 1. Row 1b (1) then closes and the solenoid which locks the door (4) receives voltage. When the lock piston has locked the door, the delay unit switch (6) closes and point C receives voltage. It is only then that the drum can begin to revolve and water begin to fill.

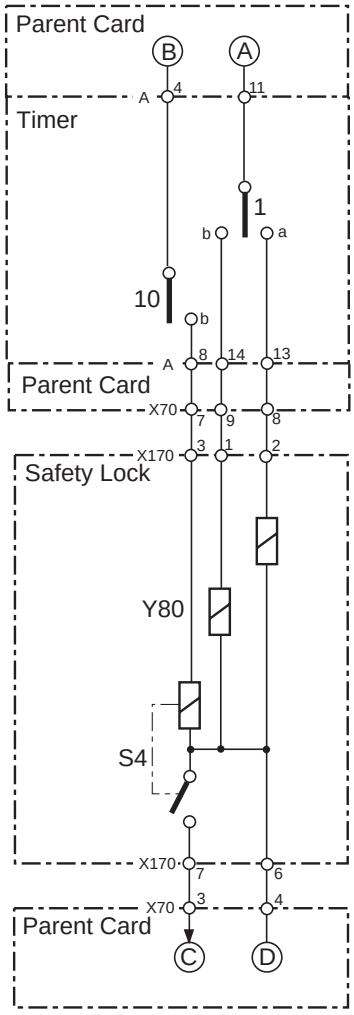
At program stage 1, row 10b (2) closes up which means that the bimetal spring in the delay unit heats up. Once the spring is heated, the delay unit holds the door locked. Row 10b is closed during the entire wash program. In the case of a power failure, it takes approx. 2 minutes for the delay unit spring to cool down and the door to open. This is a security measure that guarantees the drum has ample time to stop and that water can drain (the drain valve opens automatically in the event of a power failure).

During the last phase of the tumble cycle (program stage 49 -51) row 10b (2) opens. When the program is completed (program stage 52), row 1a (1) opens and the solenoid which opens the lock (3) withdraws the lock piston so that the door can be opened immediately. This program stage lasts 2 minutes. During this time and the time allotted to stages 49 -51, the delay unit is able to cool down enough so that the door does not lock when row 1a opens after 2 minutes.

Sequence diagram



1554



Ⓐ and Ⓑ = Power supply, see function diagram "Power supply and start".

(1) Timer row 1
a: Door solenoid open
b: Door solenoid close

(2) Timer row 10 b
Doorlock

(3) Door solenoid open

(4) Door solenoid close

(5) Coil delay unit

(6) S4 Switch delay unit

Ⓒ and Ⓓ = Power supply, see function diagram "Power supply and start".

Program rapid advance and selection

The timer can be used for many different types of program. It is therefore equipped with a number of functions which are not used in program P02. The programmer advances rapidly past different program stages when the built-in coil for rapid advance (11) is activated.

All wash programs

The timer has rapid advance past the following stages in all wash programs.

- Stage 1 -4 Pre-rinse and drain omitted row 45 (4)
- Stage 10 -11 Pre-wash reduced 2 minutes row 37 (7)
- Stage 16 Main wash reduced 3 minutes row 40 (8)
- Stage 18 -20 Main wash reduced 3 minutes row 41 (9)
- Stage 21 -23 Main wash reduced 6 minutes row 42 (10)
- Stage 30 -32 Rinse 1 and Drain/Spin omitted row 44 (3)

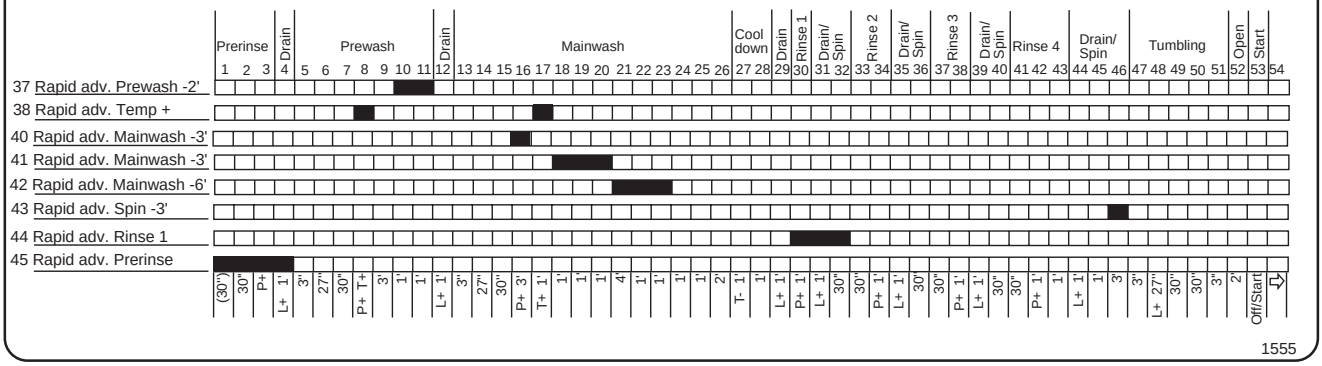
Permanent press programs

During permanent press programs, row 9 (1) in the program selector is closed which means that row 43 (6) rapid advances the timer at stage 46. This reduces the final spin time by 3 minutes.

Machines with heating

If the washing machine is equipped for heating ,the L shackle (2) should be cut-off. This allows for heating at stage 8 during pre-wash and stage 17 during main wash. If the machine is not equipped for heating, the shackle is closed and row 38 (5) rapid advances past both of these program stages.

Sequence diagram



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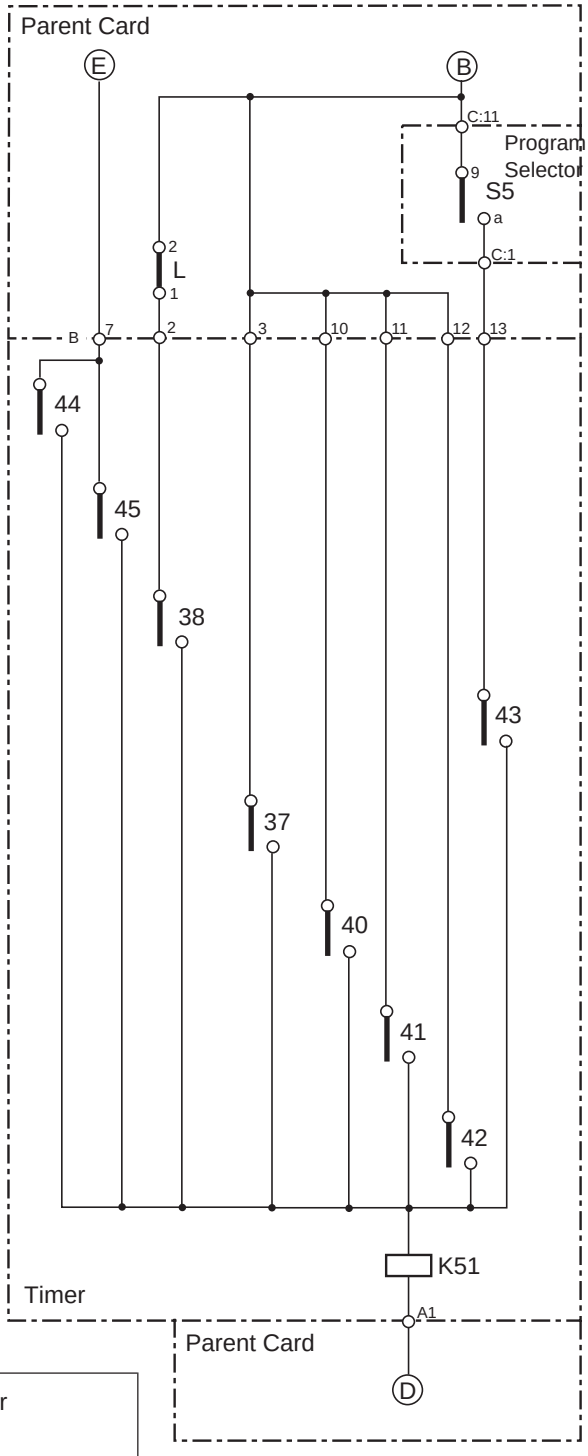


Program Selector

	9
1 Cold	
2 Warm	
3 Hot	
4 Perm. press	■

1556

(B) (E) = Power Supply, see functions diagram "power supply and start"

(1) Program selector row 9

(2) Shackle L
shackle closed : machine without heating
shackle cut-off: machine with heating

(3) Timer row 44
Rapid adv. Rinse 1

(4) Timer row 45
Rapid adv. Prerinse

(5) Timer row 38
Rapid adv. Temp +

(6) Timer row 43
Rapid adv. Spin -3'

(7) Timer row 37
Rapid adv. Prewash -2'

(8) Timer row 40
Rapid adv. Mainwash -3'

(9) Timer row 41
Rapid adv. Mainwash -3'

(10) Timer row 42
Rapid adv. Mainwash -6'

(11) Coil for timer rapid advance

(D) = Power supply, see functions diagram "Power Supply and Start.

1544

Motor control

Normal Action (12 second rotation - 3 second pause)

Row 8 (1) in the program selector is closed during programs ”Warm”, ”Hot” and ”Permanent Press” when the motor is running at normal action. From row 8 the voltage is supplied via row 14b (5) to row 24b (7). This row is located in the timer's built-in reverser, where each stage lasts 3 seconds. Row 24b switches over at normal speed (12 seconds on, 3 seconds off, 12 seconds on etc.) and controls contactor K1 which activates the motor wash winding.

Gentle Action (3 second rotation - 12 second pause)

Row 10 (2) in the program selector is closed and row 8 (1) is de-energised during program ”Cold”. This means that the motor is running at gentle action. From row 10 the voltage is supplied via row 22b (3) which is located in the motor’s built-in reverser. The rows switch over at gentle speed (3 seconds on, 12 seconds off, 3 seconds on etc.). The voltage is then supplied via row 14b (5) and 24b (7) to contactor K1 which activates the motor wash winding. Row 24b does switch over at normal action, but is always closed when 22b closes.

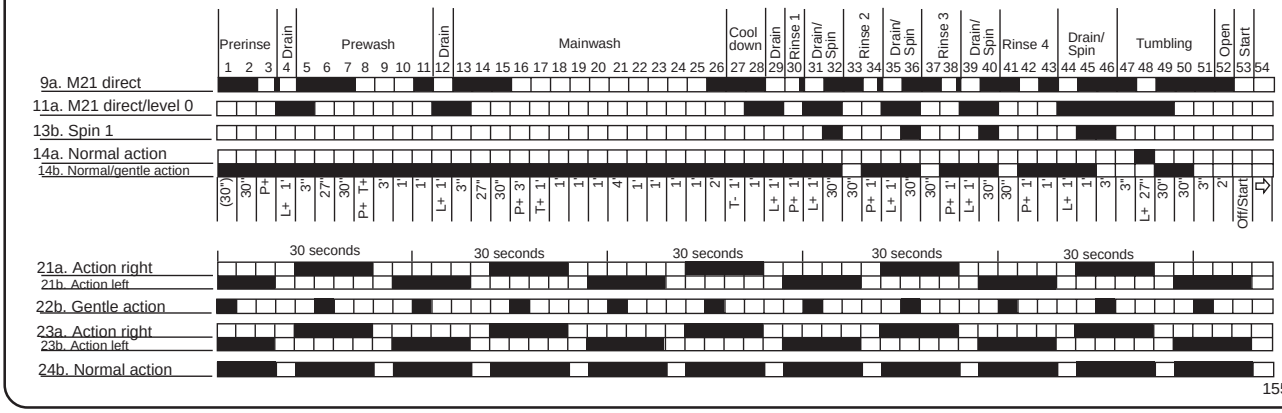
Spin

During the spin cycle, row 13b (6) activates spin contactor K4 (9). At the same time K4:21 -22 (10) de-energises K1, preventing the wash winding from being connected at the same time as the spin winding.

Normal action during tumbling

At stage 48, contactor K1 is supplied via row 14a (5) instead of 14b. The motor runs at normal speed at this stage regardless of which program has been chosen.

Sequence diagram



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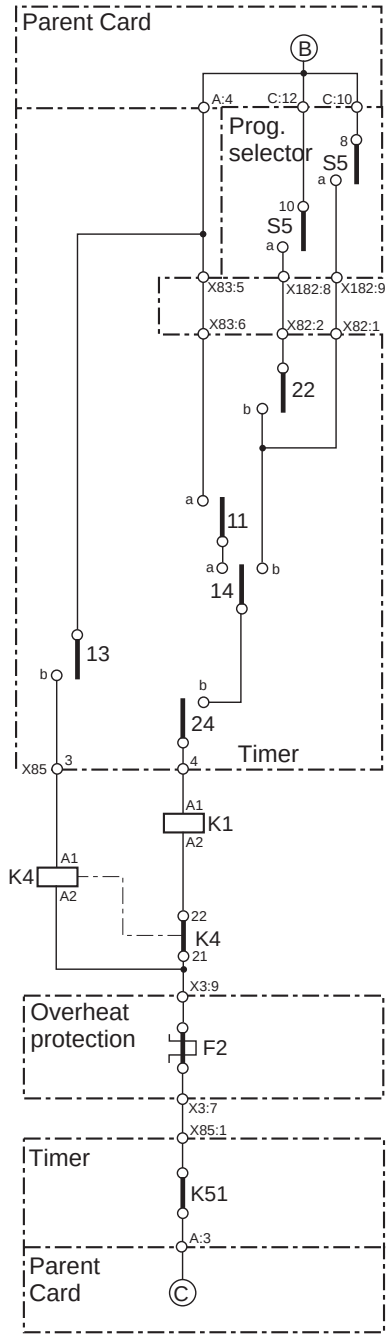


Ⓑ = Power supply, see functions diagram, "power supply and start"

(1) Program selector row 8

(2) Program selector row 10

(3) Timer row 22 b
Gentle action

(4) Timer row 11a
M21 direct / level 0

(5) Timer row 14
a:Normal action b:Normal/gentle action

(6) Timer row 13b
Spin 1

(7) Timer row 24b
Normal action

(8) Contactor coil K1
Wash

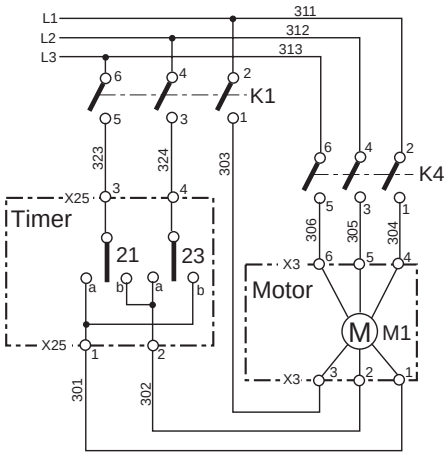
(9) Contactor coil K4
Spin

(10) Contactor K4
Spin

(11) Overheat protection F2

(12) Relay, program rapid advance

(13) Ⓒ = Power supply, see function diagram "power supply and start"



(14) Contactor K1
Wash

(15) Contactor K4
Spin

(16) Timer row 21 and 23
action right, action left

(17) Motor M1, wash and spin

Program Selector

	8	10
1 Cold		■
2 Warm	■	
3 Hot	■	
4 Perm. press	■	

1558

1547

Water filling

This section describes a machine which has a hot and cold water connection. Program P02 does not use Pre-rinse (stages 1-3) which means that the timer rapid advances past this section, see function section "Rapid Advance, Program Selection". Here is how water fills in other wash sections:

Prewash

During the prewash cycle row 5a (2) is closed which means that the water fills to the high level (the change-over contact 21-22-24 in the level sensor trips at high water level). Row 4b (5) is closed which means that cold water fills detergent compartment 1 with water valve Y11 (13). Row 2b (7) is closed and warm water fills directly into the drum with valve Y24 (17) in all programs except Cold, since row 7 (12) in the program selector is closed in all programs except Cold. Rows 5a (2), 4b (5) and 2b (7) are closed during the entire prewash. If the water level during prewash falls below the level sensor's preset level, water will refill (see chapter 26 on Level Detection).

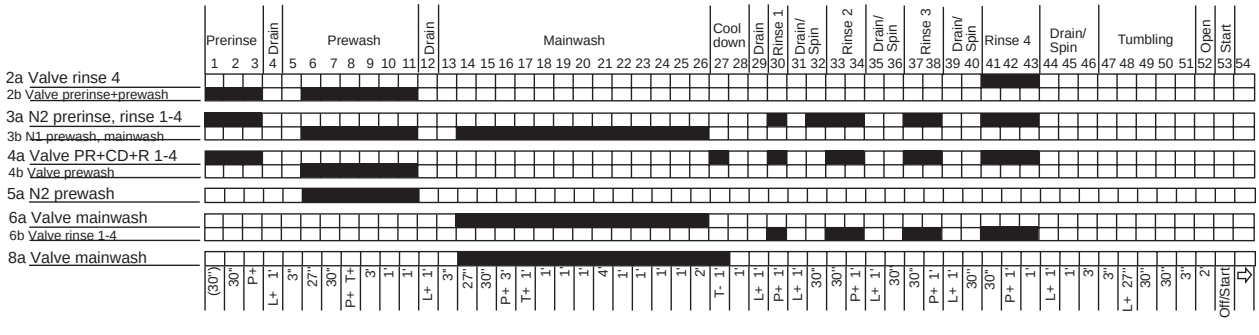
Main wash

During the main wash row 3b (1) is closed. Water fills to the low level because the shackle N (3) on the parent card is cut but to high water level if the shackle is closed. Voltage travels from the level sensor via row 8a (6). The program selector's row 5 (9) is closed during program. Hot and hot water fills detergent compartment 2 with water valve Y22 (14). During other wash programs the program selector's row 6 (10) is closed, and then cold water fills the detergent compartment 2 with water valve Y12 (15). During all programs hot water also fills directly into the drum with the water valve Y24 (17) since row 2b (7) is closed during the main wash. The rows are closed during the entire main wash which means that if the water level during this cycle falls below the level sensor's present level, water will refill.

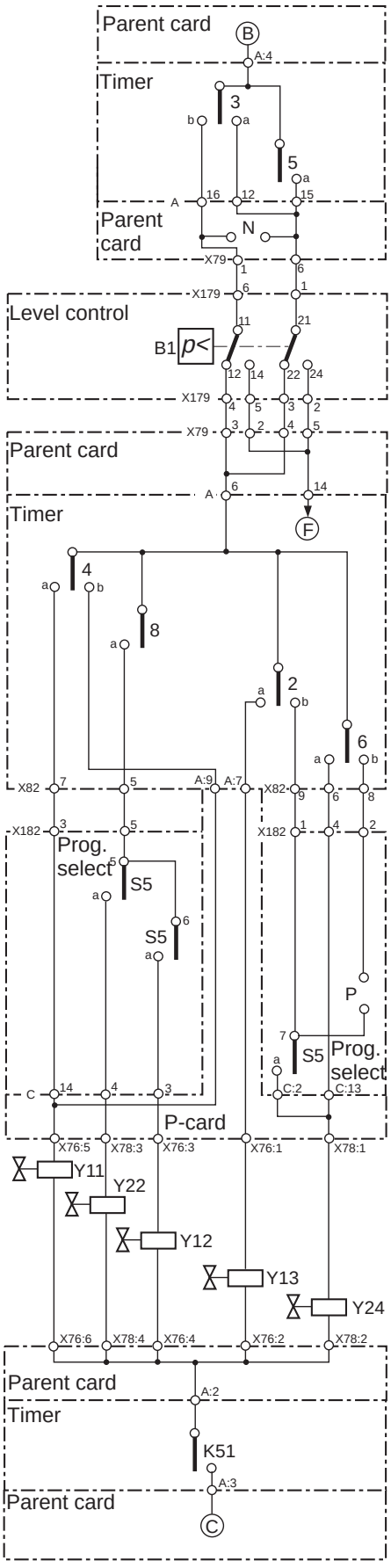
Rinse

During rinse cycles, row 3a (1) is closed which means that water fills to high level. Row 4a (5) is closed and valve Y11 (13) fills detergent compartment 1 with cold water. Row 6b (8) is also closed which means that if shackle P (11) on the parent card is closed, valve Y24 (17) receives voltage and warm water fills directly into the drum. For the fourth rinse, row 2a closes as well so that valve Y13 (16) can flush away any conditioner used from compartment 3.

Sequence diagram



1559



Program Selector

	5	6	7
1 Cold		■	
2 Warm		■	■
3 Hot	■		■
4 Perm. press		■	■

1560

Ⓑ = Power supply, see function diagram "Power supply and start"

(1) Timer row 3
a : N2 prerinse, rinse 1-4
b : N1 prewash, mainwash

(2) Timer row 5a
N2 prewash

(3) Shackle N
shackle closed: only high water level
shackle cut-off: low and high water level

(4) Level control

Ⓕ = voltage supply to timer motor, see section "Programmer supply"

(5) Timer row 4
a:Valve PR+CD+R 1-4 b:Valve prewash

(6) Timer row 8a
Valve mainwash

(7) Timer row 2
a:Valve rinse 4 b:Valve prerinse+prewash

(8) Timer row 6
a:Valve mainwash b:Valve rinse 1-4

(9) Program selector row 5

(10) Program selector row 6

(11) Shackle P
shackle closed: warm rinse water (not prog. Cold)
shackle cut-off: cold rinse water

(12) Program selector row 7

(13) Water valve Y11, compartment 1, cold

(14) Water valve Y22, compartment 2, hot

(15) Water valve Y12, compartment 2, cold

(16) Water valve Y13, compartment 3, cold

(17) Water valve Y24, drum, hot

(18) Relay, timer rapid advance

Ⓒ = Power supply, see functiondiagram "Power supply and start"

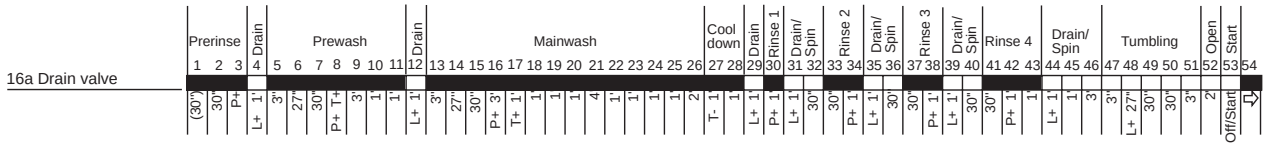
1548

Drain

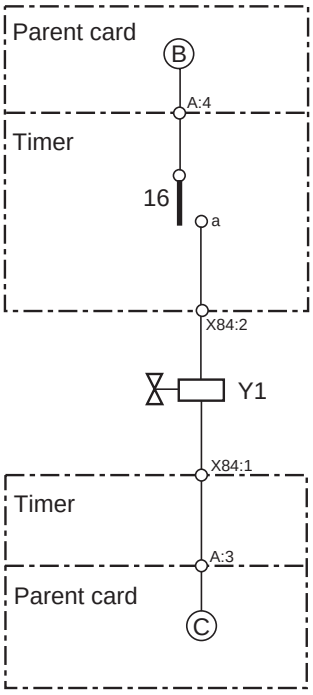
The drain valve closes when the control valve Y1 (2) is activated (if the cold water tap is open).

The valve will not close until the door is locked (this is when point Ⓑ receives voltage, see section "Power supply and Start"). Control valve Y1 is controlled by 16a (1) which itself is closed when drain valve 2 should be closed.

Sequence diagram



1561



(B) = Power supply, see function diagram "Power supply and start".

(1) Timer row 16a
Drain valve

(2) Valve, drain

(D) = Power supply, see function diagram "Power supply and start"

Programmer advance

The timer motor advances in the following way:

From timer rows

Rows 9a (1) and 11a (3) are closed during all drain and spin cycles. They are also closed during the first of the wash and rinse cycles when water is filling.

From level sensor

When water fills to the correct level, the level sensor's contact changes over and point (F) in the diagram receives voltage (see section on "Water filling"). During those cycles when timer rows 9a (1) and 11a (3) are open, the level sensor controls the advance of the timer motor. As a result, if water does not fill to the correct level, the timer will stop.

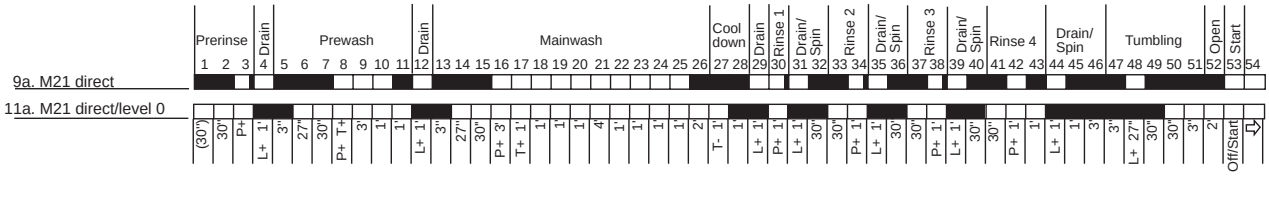
At program rapid advance

Contact K51 (2) closes when the program is rapid advanced so that the motor always receives voltage.

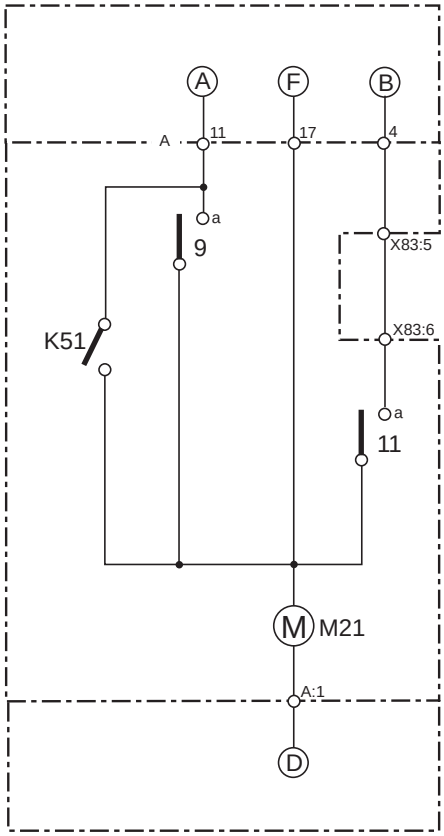
At heating

At stages 8, 17, 27, the programmer advances switches off internally in the timer even if the motor is still energised. Stages 8 and 17 are used for heating water. Machines without heating rapid advance past this stage (see section "Rapid advance, program selection").

Sequence diagram



1562



Ⓐ Ⓑ Ⓕ = Power supply. Points A and B, see function diagram "Power supply and Start". Point E, see function diagram "Water filling".

(1) Timer row 9a
M21 direct

(2) Relay K51, Timer rapid advance

(3) Timer row 11a
M21 direct/level 0

(4) Timer motor M21

Ⓓ = Power supply, see function diagram "Power supply and Start"

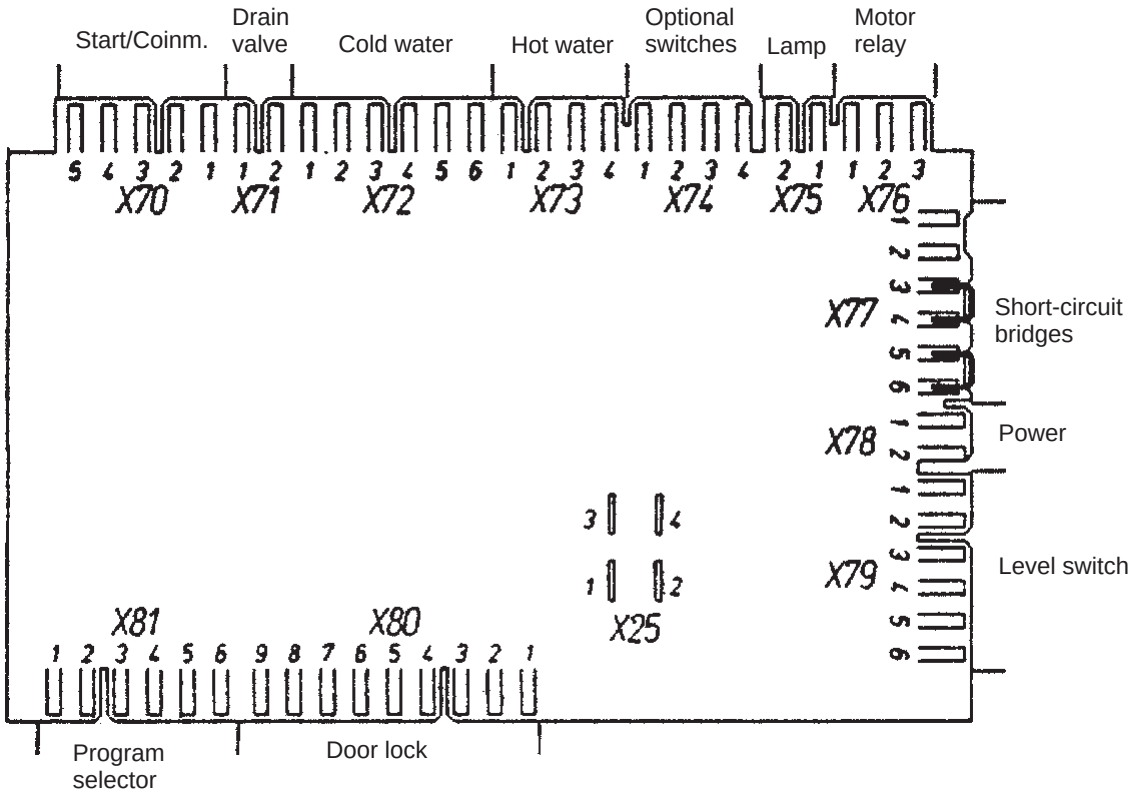
General

This chapter describes a mahcine with the wash program P03CH. The machine has an electromechanical programmer, hot and cold water connection, without heating and wash programs for laundrettes, coin-ops etc.

To facilitate fault-tracing in the machine electronics, the circuit diagram is divided into funcitonal sequences. The following sequences are described in this chapter:

- Power supply and start, machines without coin meter 2
- Power supply and start, machines with coin meter 4
- Safety lock 6
- Rapid advance and program selection 8
- Motor control 10
- Water filling 12
- Drain 16
- Programmer advance 20

Contact designations



1583

Power supply and start, machines without coin meter

Some control circuits do not receive voltage until the door and lock switch S3 (3) are closed (point (B)). Others receive voltage even when the door is open (point (A)). These feed points recur in other function diagrams.

The same conditions apply for feed points (C) and (D). Point (C) does not receive voltage until a switch S4 (9) in the safety lock delay unit is closed (i.e. door is locked). Point (D) receives voltage even when the door is open.

Start

When a program is completed, the machine stops at progam stage 53 and the door can be opened.

The door must be closed for the machine to start.

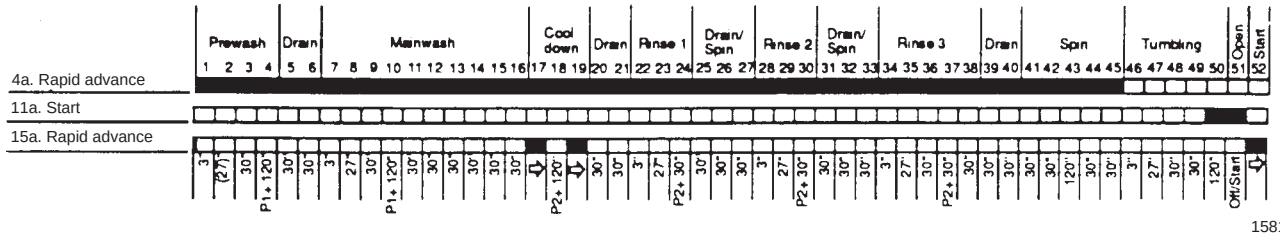
It is only when the door is closed that row 11a (5) receives voltage. When S6 is pressed to start a new program, the coil for rapid advance (8) receives voltage since row 11a (5) is closed at stage 51.

At stage 52 the timer stops until S6 is released. The timer then advances to stage 1 (row 15a (6) is closed at stage 52) and the wash program begins. This design prevents accidental excess rapid advance of the timer when starting

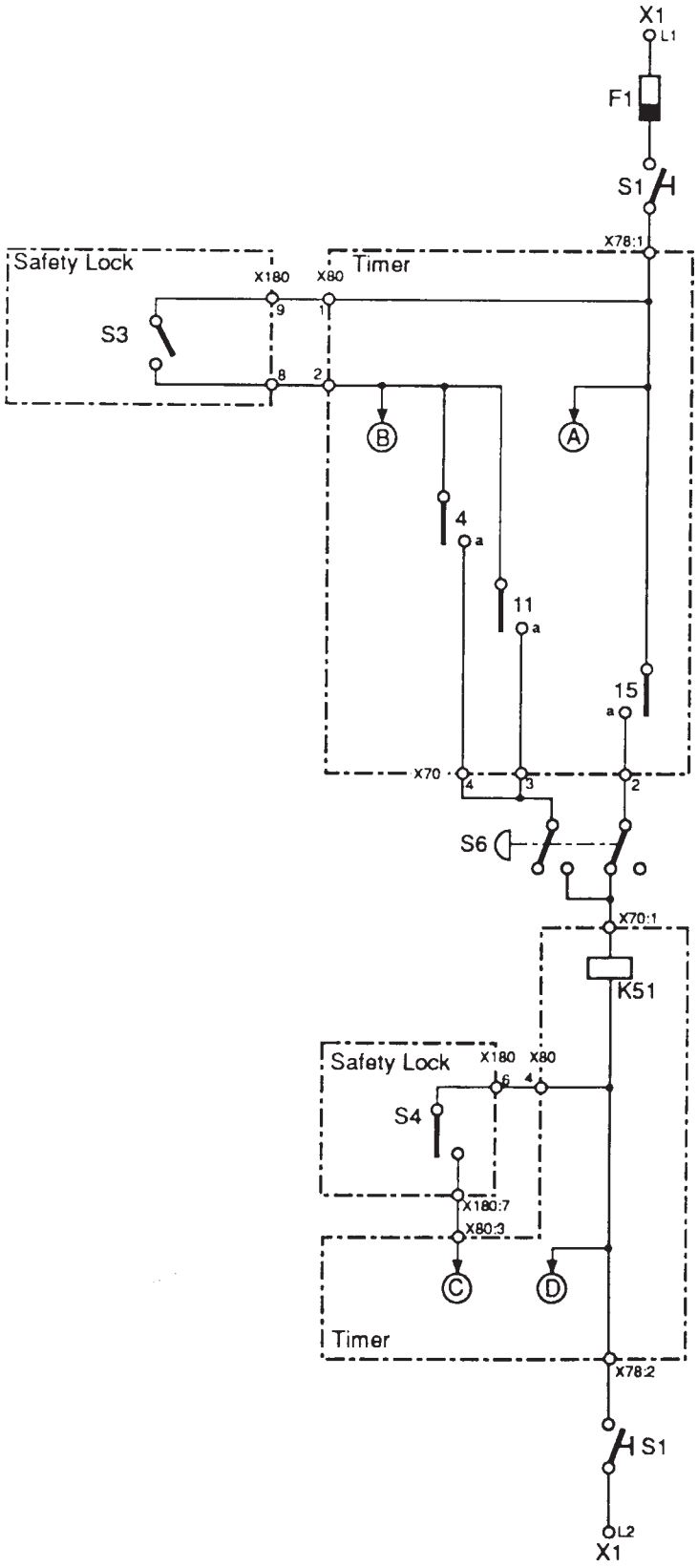
Program advance

By holding down S6 the timer can be advanced past different wash cycles (row 4a (4) is closed in stages 1-45).

Sequence diagram



1581



(1) F1 Fuse

(2) S1 Switch On – Off

(3) S3 Switch door

Ⓐ Ⓑ: Power supply to other functions

(4) Timer row 4 a
Rapid advance

(5) Timer row 11 a
Start

(6) Timer row 15 a
Rapid advance

(7) S6 Switch Start + K51

(8) K51 Coil for timer advance

(9) S4 Switch Doorlock

Ⓒ Ⓓ: Power supply to other functions

(10) S1 Switch On – Off

Power supply and start, machine with coin meter

Some control circuits do not receive voltage until the door and lock switch S3 (3) are closed (point (B)). Others receive voltage even when the door is open (point (A)). These feed points recur in other function diagrams.

The same conditions apply for feed points (C) and (D). Point (C) does not receive voltage until a switch S4 (9) in the safety lock delay unit is closed (i.e. door is locked). Point (D) receives voltage even when the door is open.

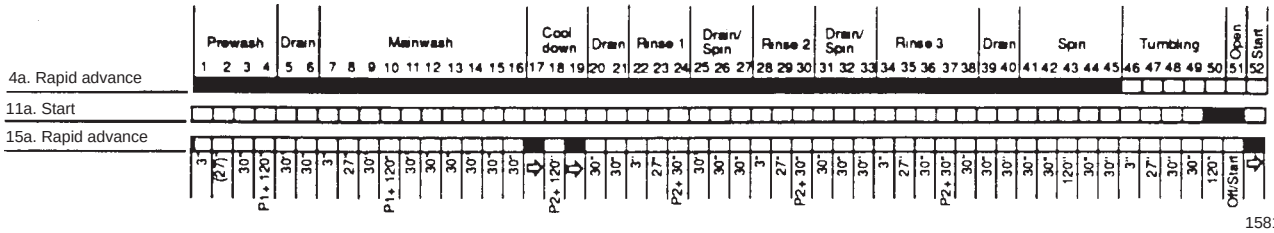
Start

When a program is completed, the machine stops at program stage 51 and the door can be opened.

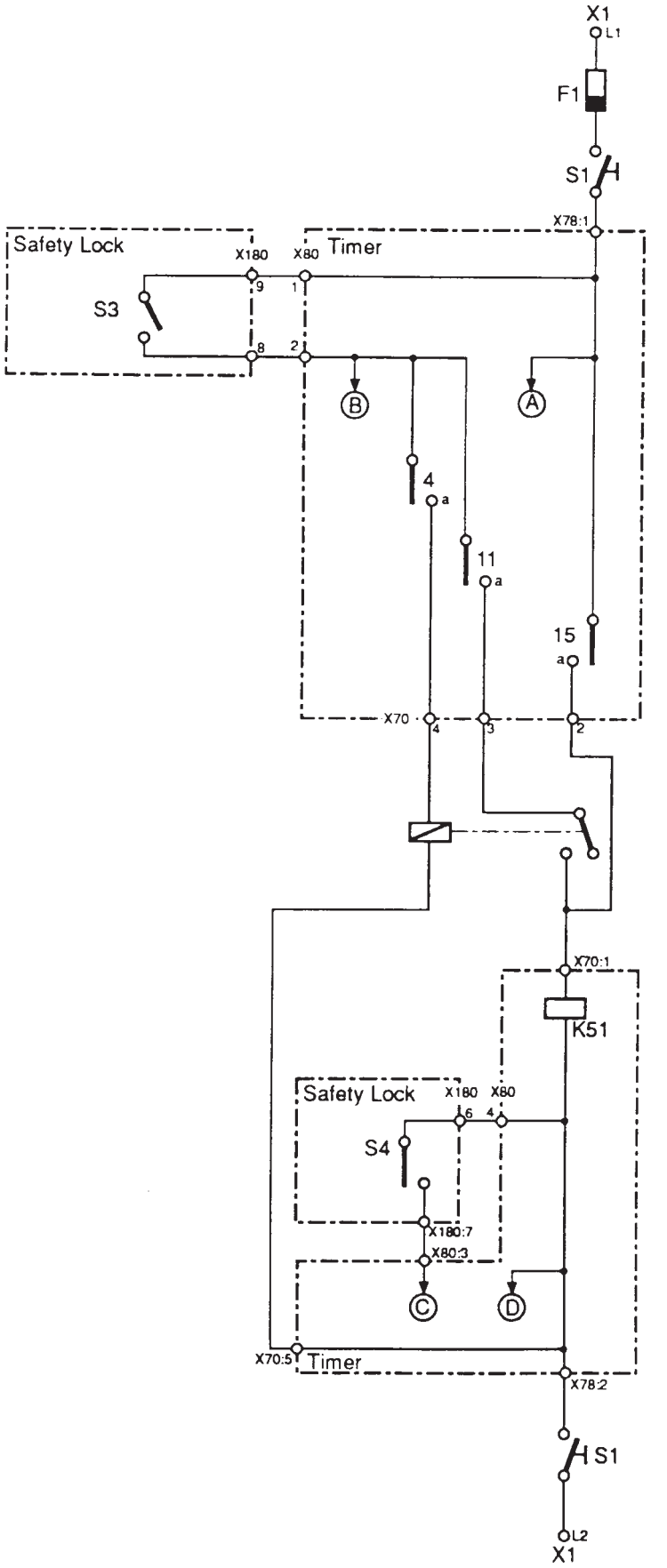
The door must be closed for the machine to start. It is only when the door is closed that the row 11a (5) receives voltage. When correct number of coins have been inserted into the coin-meter, a contact (7) in the coin-meter is closed and the coil for rapid advance (8) recieves voltage (row 11a (5) is closed in stage 51).

At stage 52 row 11a is released but the timer advances to stage 1 since row 15a (6) is closed at stage 52. This design always feeds the timer to stage 1 and directly start the wash program when correct number of coins have been inserted.

Sequence diagram



1581



(1) Fuse

(2) Switch On – Off

(3) Switch door

Ⓐ Ⓑ: Power supply to other functions

(4) Timer row 4 a
Rapid advance

(5) Timer row 11 a
Start

(6) Timer row 15 a
Rapid advance

(7) Coin meter

(8) Coil for timer advance

(9) Switch Doorlock

Ⓒ Ⓓ: Power supply to other functions

(10) Switch On – Off

1582

Safety Lock

The machine can not be started until the door is closed (point (Ⓑ) in the diagram does not receive voltage until the door is closed, see sequence diagram "Power supply and start"). When the start button on the machine is pressed, or the correct number of coins are inserted into the coin meter, the timer advances to stage 1. Row 9b (1) then closes and the solenoid which locks the door (4) receives voltage.

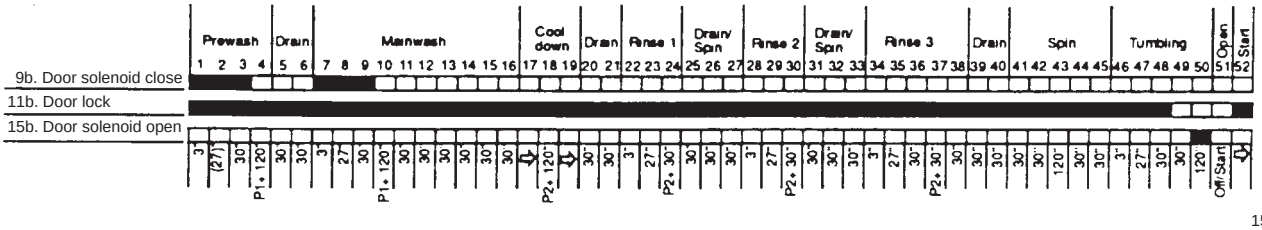
When the lock piston has locked the door, S4 (7) closes and point Ⓒ receives voltage. It is only then that the drum can begin to revolve and water begin to fill.

At program stage 1, row 11b (3) closes up which means that the bimetal spring in the delay unit heats up. Once the spring is heated, the delay unit holds the door locked.

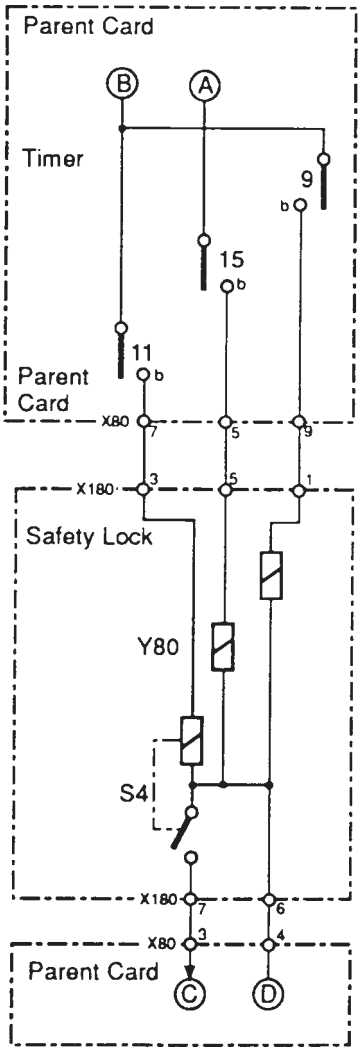
Row 11b is closed during the entire wash program. In the case of a power failure, it takes > 2 minutes for the bi-metal spring has cooled down and the door to open. This is a security measure that guarantees the drum has ample time to stop and that water can drain (the drain valve opens automatically in the event of a power failure).

During the last phase of the tumble cycle (program stage 49-50) row 11b (3) opens. When the program is completed (program stage 50), row 15b (2) closes and the solenoid which opens the lock (5) withdraws the lock piston so that the door can be opened immediately. This program stage lasts 2 minutes. In this time plus the time in stage 49 the bi-metal spring in the door lock have time to cool down so that the door does not lock when row 15b opens in stage 51.

Sequence diagram



1577



Ⓐ Ⓑ: Power supply, see function diagram "Power supply and start"

(1) Timer row 9 b
Door solenoid – close

(2) Timer row 15 b
Door solenoid – open

(3) Timer row 11 b
Door lock

(4) Door solenoid close

(5) Door solenoid open

(6) Coil delay unit

(7) S4 Switch delay unit

Ⓒ and Ⓓ = Power supply, see function diagram "Power supply and start"

Rapid advance, program selection

Program Permanent Press

When program Permanent Press is used, row 3 (10) and 4 (9) of the program selector are closed which means that rows 3a (3) rapid advances the timer in step 43-45 and row 1b (2) in step 17-19, which means shorter final extraction and no cool down.

Program Cold and Hot

In these programs row 4 (9) of the program selector is closed, which means that cool down is cut out when row 1b (2) rapid advances the timer in step 17-19.

If door is opened

If by any reason the door should be opened during operation, switch S3 (8) is closed and the timer rapid advances to step 50 because row 2a (14) is closed.

Shackles

The machine is supplied with two shackles mounted on the parent card, contact X77. The shackles have the following function:

X77:3-4 (7)

Shackle closed: No cool down after main wash
Schackle cut off: Cool down after main wash

X77:5/6 (2) (see: "Water filling")

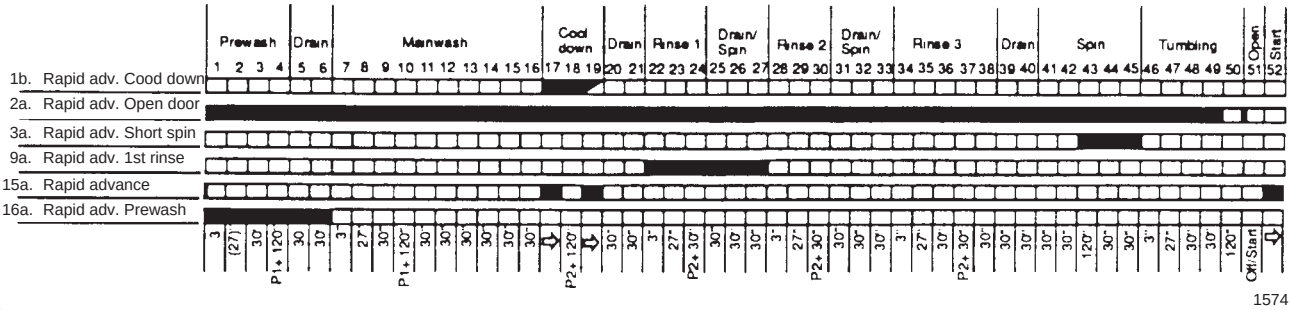
Shackle closed: High water level in pre-wash and main wash
Shackle cut off: Low water livel in pre-wash and main wash

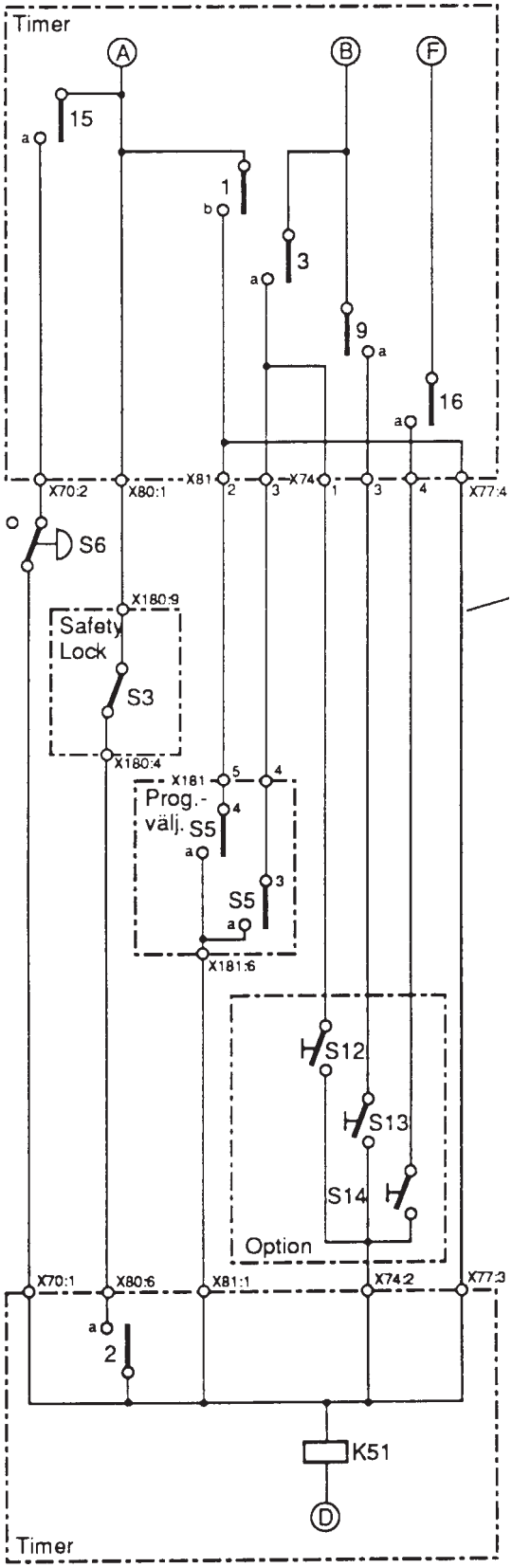
Switch S12-S14 (Option)

The three switches S12, S13 and S14 give more possibilities to vary the program and can be ordered separately from your dealer. The following parts will be cut out if the switches are closed:

Switch/ Shackle	Step	Part	Row
S12 (11)	Step 43-45	3 min shorter final extraction	3a (3)
S13 (12)	Step 22-27	No first rinse	9a (4)
S14 (13)	Step 11-6	No pre-wash	16a (5)

Sequence diagram





Program Selector

	3	4
1 Cold		■
2 Warm		■
3 Hot		
4 Perm. press	■	■

1575

Ⓐ Ⓑ Ⓕ = Power supply, see functions diagram "Power supply and start", F see functions diagram "Water filling"

(1) Timer row 15 a
Rapid advance

(2) Timer row 1 b
Rapid adv. Cool down

(3) Timer row 3 a
Rapid adv. Short spinn

(4) Timer row 9 a
Rapid adv. 1:st rinse

(5) Timer row 16 a
Rapid adv. Pre wash

(6) S6 Switch Start + K51

(7) Shackle X77:3-4 shackle closed: no cool down
shackle cut-off: cool down

(8) S3 Switch Door

(9) Timer row 4

(10) Timer row 3

Switches S12 – S14 : Option

(11) Switch S12 Short spinn

(12) Switch S13 No first rinse

(13) Switch S14 No pre wash

(14) Timer row 2 a
Rapid adv. Open door

(15) K51 Coil for timer rapid advance

Ⓓ = Power supply, see functions diagram "Power supply and start"

1573

Motor control

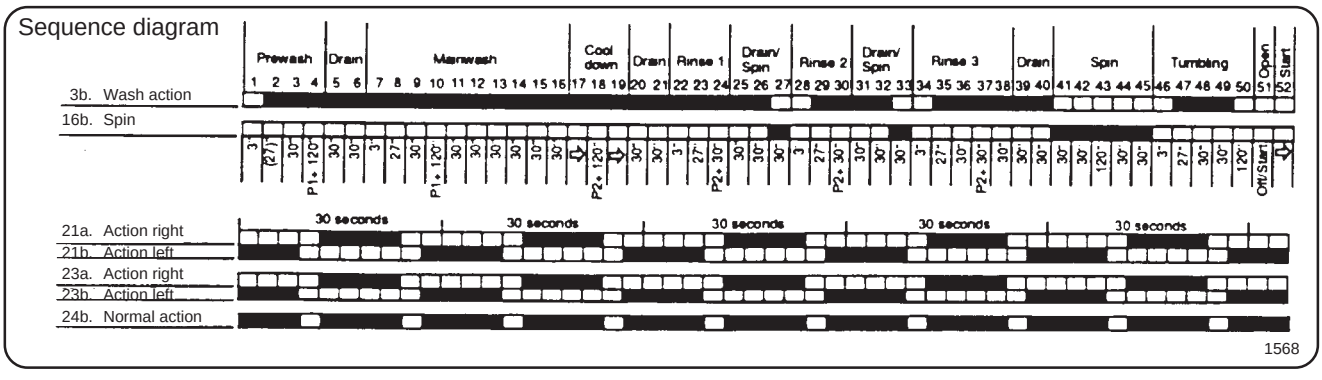
Normal Action (12 second rotation - 3 second pause)

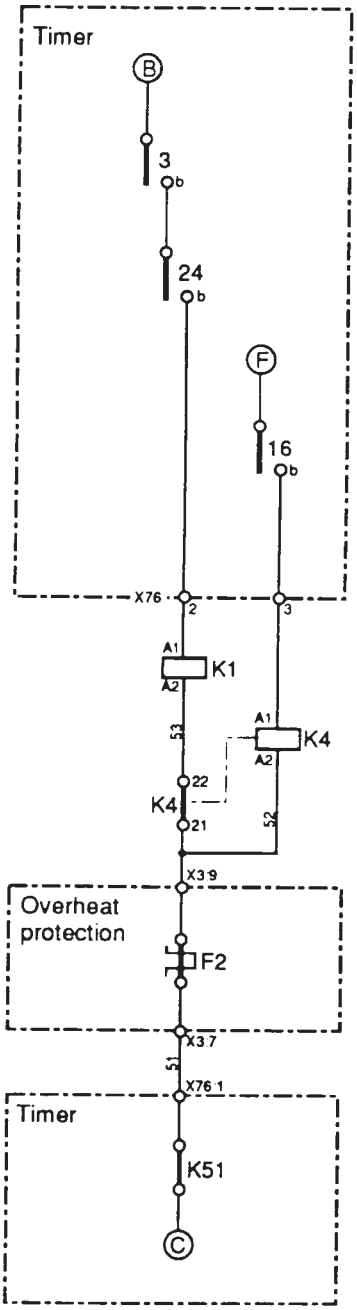
Row 3b (1) is closed when the motor is running with normal action. From row 3b the voltage is supplied to row 24b (2). This row is located in the timer's built-in reserver, where each stage lasts 3 seconds. Row 24b switches over at normal speed (12 seconds on, 3 seconds off, 12 seconds on etc.) and controls contactor K1 (4) which activates the motor wash winding.

Row 21 a-b and 23 a-b (11) switches two of the incoming phases so that the motor is reversing.

Spin

During the spin cycle, row 16b (3) activates spin contactor K4 (5). At the same time K4:21-22 (6) de-energises K1, so that the wash speed winding and extract winding of the motor can not be connected at the same time.





Ⓑ = Power supply, see functions diagram "Power supply and start"

(1) Timer row 3 b
Wash action

(2) Timer row 24 b
Normal action

Ⓕ = Power supply, see function diagram "Water filling"

(3) Timer row 16 b
Spin

(4) K1 Contactor coil
Wash

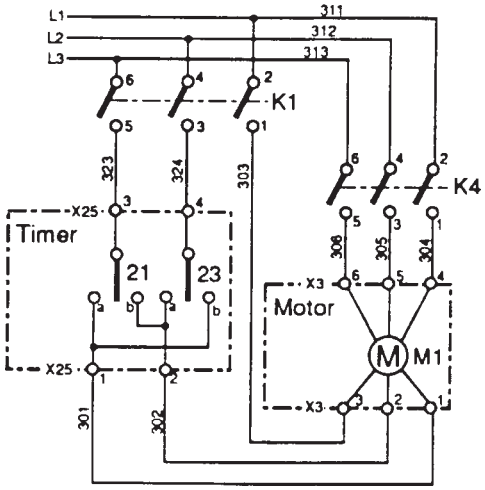
(5) K4 Contactor coil
Spin

(6) K4 Contactor
Spin

(7) F2 Overheat protection

(8) K51 Relay, program rapid advance

Ⓒ = Power supply, see function diagram "Power supply and start"



(9) K1 Contactor
Wash

(10) K4 Contactor
Spin

(11) Timer row 21 and 23
action right, action left

(12) M1 Motor, Wash and spin action

Water filling

Prewash

During the prewash cycle row 13a (1) is closed. Row 14a (6) is closed which means that cold water fills detergent compartment 1 with water valve Y11 (9).

Row 1 (5) in the program selectros is closed in program Warm, Hot and Permanent Press. In these programs water is filled directly into the drum from valve Y24 (17) as row 10b (8) is closed. All rows is closed during the entire prewash. If water level during prewash falls below the level sensor's preset level, water will refill (see chapter 26 on Level Detection).

Main wash

During the main wash row 13a (1) is closed. Row 5b (7) and 10a (8) are closed during main wash. Row 2 (4) and 1 (5) of the program selector control which of the water valves shall fill water:

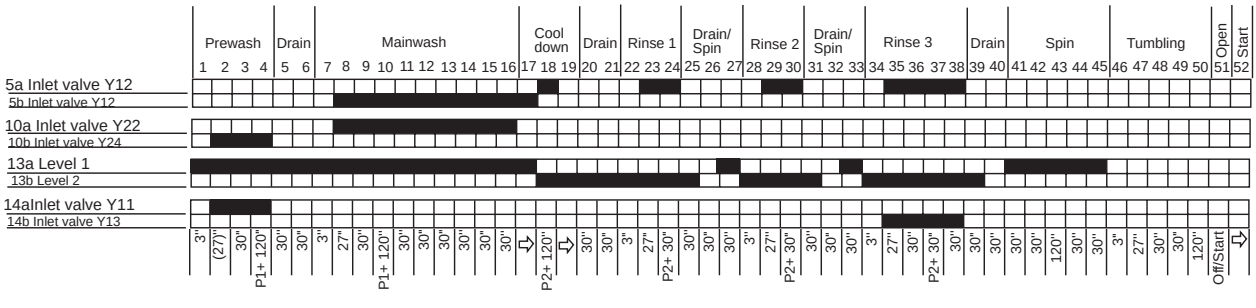
- In program Cold only cold water is filled through compartment 2 with valve Y12 (11).
- In program Permanent Press and Warm both hot and cold water is filled with valve Y12 (11) and Y22 (13).
- In program Hot only hot water is filled with valve Y22 (13).

The rows 5b (7) and 10a (8) are closed during the whole main wash and if the water level is decreasing the machine will fill up again to correct level.

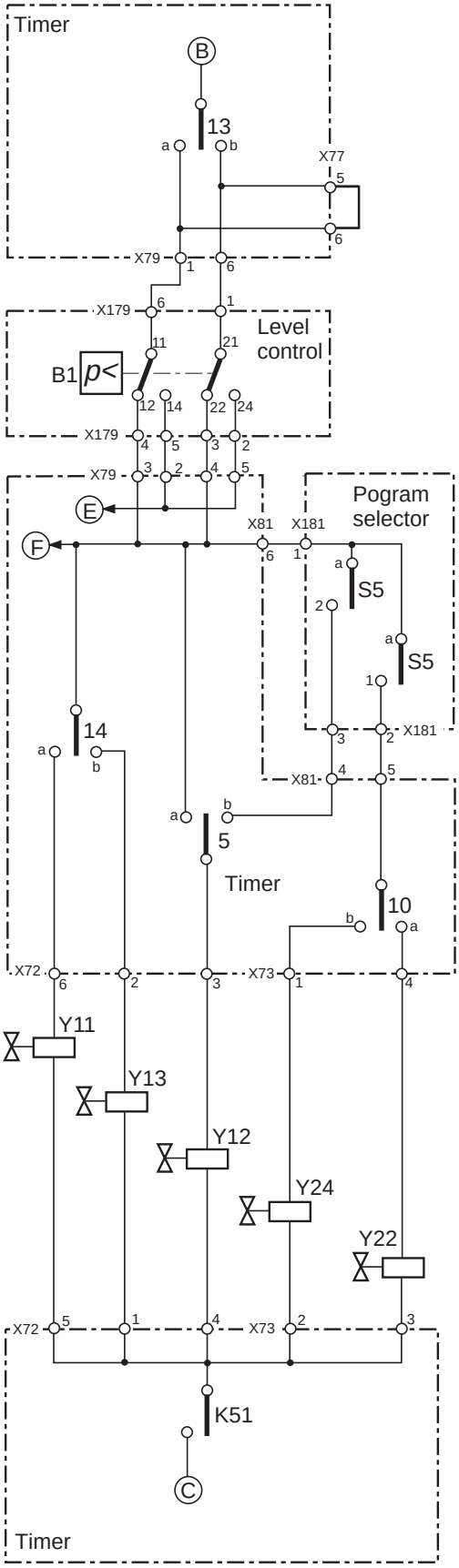
Rinse

During the rinses rows 13b (1) and 5a (7) are closed, which gives water filling with cold water through compartment 2 to high level with valve Y12 (11). During rinse No. 3 row 14b (b) is also closed so that valve Y13 (10) can flush down rinsing agent in compartment 3.

Sequence diagram



1566



Program selector

	1	2
1 Cold		■
2 Warm	■	■
3 Hot	■	
4 Perm. press	■	■

1570

Ⓑ = Power supply, see function diagram "Power Supply and Start"

(1) Timer row 13
a: Level 1
b: Level 2

(2) Shackle X77:5-6
shackle closed: only high water level
shackle cut-off: low and high water level

(3) B1 Level control

Ⓔ Ⓕ = voltage supply to other function sequences

(4) Timer row 2

(5) Timer row 1

(6) Timer row 14
a: Inlet valve Y11
b: Inlet valve Y13

(7) Timer row 5
a: Inlet valve Y12
b: Inlet valve Y12

(8) Timer row 10
a: Inlet valve Y22
b: Inlet valve Y24

(9) Y11 Water valve, cold, detergent 1

(10) Y13 Water valve, cold, detergent 3

(11) Y12 Water valve, cold, detergent 2

(12) Y24 Water valve, hot, drum

(13) Y22 Water valve, hot, detergent 2

(14) K51 Relay, timer rapid advance

(15) Ⓒ = Power supply, see function diagram "Power Supply and Start"

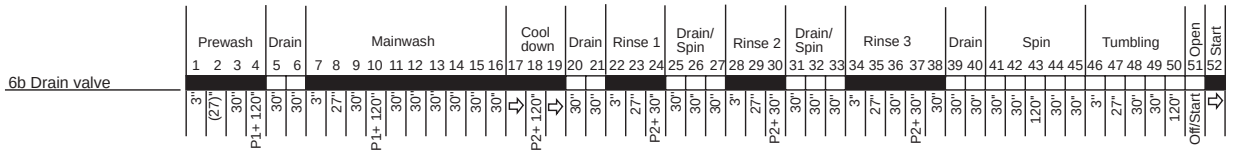
1566

Drain

The drain valve closes when the control valve Y1 (2) is activated (if the cold water tap is open).

The valve will not close until the door is locked (this is when point Ⓒ receives voltage, see section "Power supply and Start"). Control valve Y1 is controlled by row 6b (1) which itself is closed when drain valve 2 should be closed.

Sequence diagram



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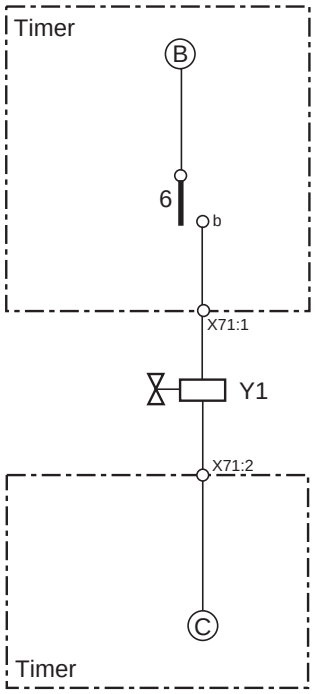


(B) = Power supply, see function diagram "Power Supply and Start."

(1) Timer row 6b
Drain valve

(2) Y1 Drain valve

(C) = Power supply, see function diagram "Power Supply and Start"

Programmer advance

The timer motor advances in the following way:

From timer

Rows 1a (1) is closed during all drain and spin cycles. They are also closed during the first part of the wash and rinse cycles when water is filling.

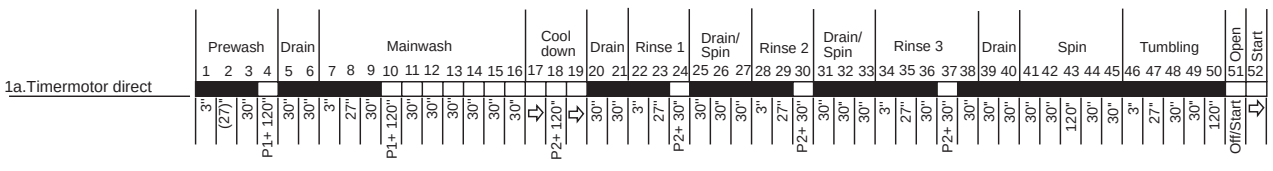
From level sensor

When water fills to the correct level, the level sensor's contact changes over and point (E) in the diagram receives voltage (see section on "Water filling"). During those cycles when timer row 1a (1) is open, the level sensor controls the advance of the timer motor. As a result, it water dows not fill to the correct level, the timer will stop.

At program rapid advance

Contact K51 (2) closes when the program is rapid advanced so that the motor always receives voltage.

Sequence diagram



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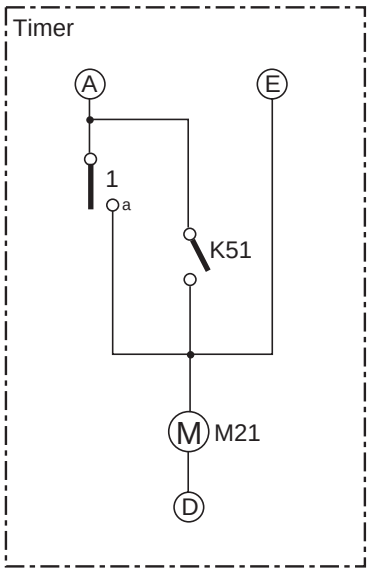


Ⓐ Ⓔ = Power supply. Point A, see function diagram "Power Supply and Start". Point B, see function diagram "Water filling".

(1) Timer row 1a
Timermotor direct

(2) Relay K51, Timer rapid advance

(3) M21 Timer motor M21

Ⓓ = Power supply, see function diagram "Power Supply and Start".

Components

Fig. 1

P5 Program selector for wash program.

The selector must be set to a program position in order for the machine to start - the selector functions as a switch.

P1 Timer - controls the program sequences according to program schedule. Reverser is built in to the timer

K1 Relay, wash speed

K4 Relay, spin speed

K21 Relay, heating

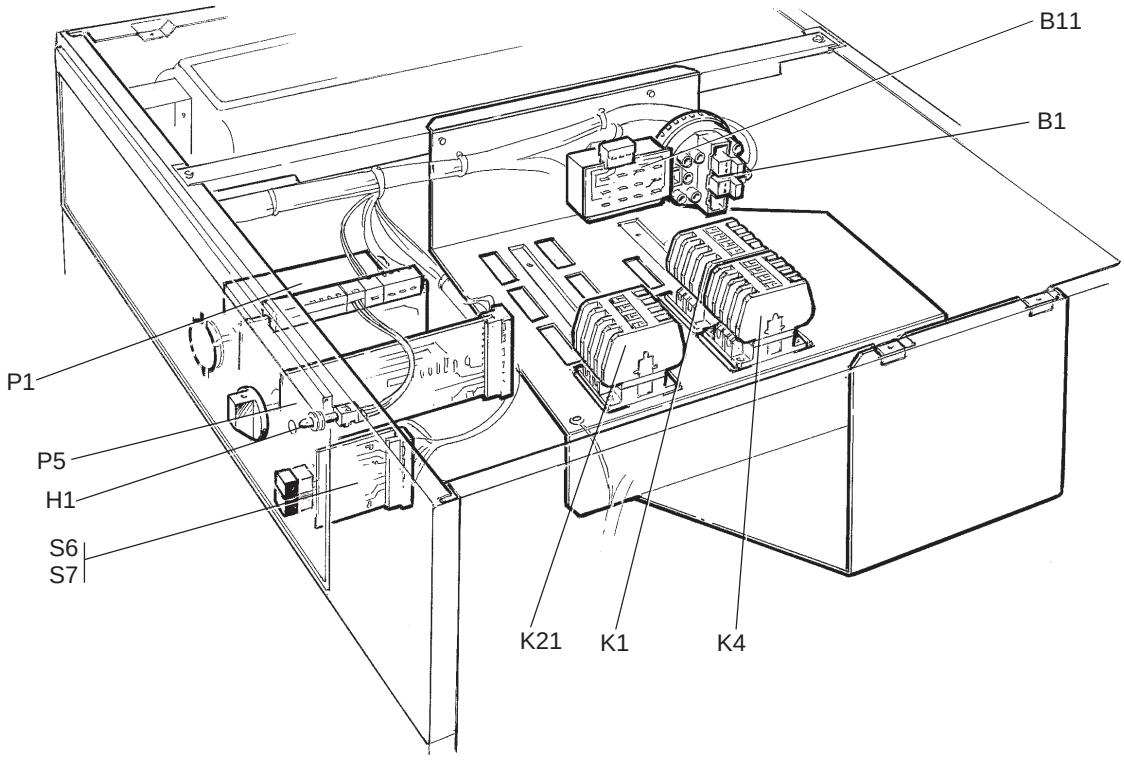
S6 Push button unit – with two push buttons, one spring mechanised start button and one two position button for program selection.

H1 Signal lamp – lights when the program selector is turned to a program position. Turns off when the program selector is turned to **OFF**.

B1 Level switch – to monitor high and low water level. The level switch also protects the machine from dryout and spinning with water in the machine.

B11 Thermostat – controls the wash temperature by turning off the heating elements when desired temperature is reached.

1



1415

Components

Fig. 1

P1 Electronic micro-processor controlled timer – controls the respective program sequences according to program schedule.

K1 Relay, wash speed

K2 Relay, wash speed

K4 Relay, spin speed

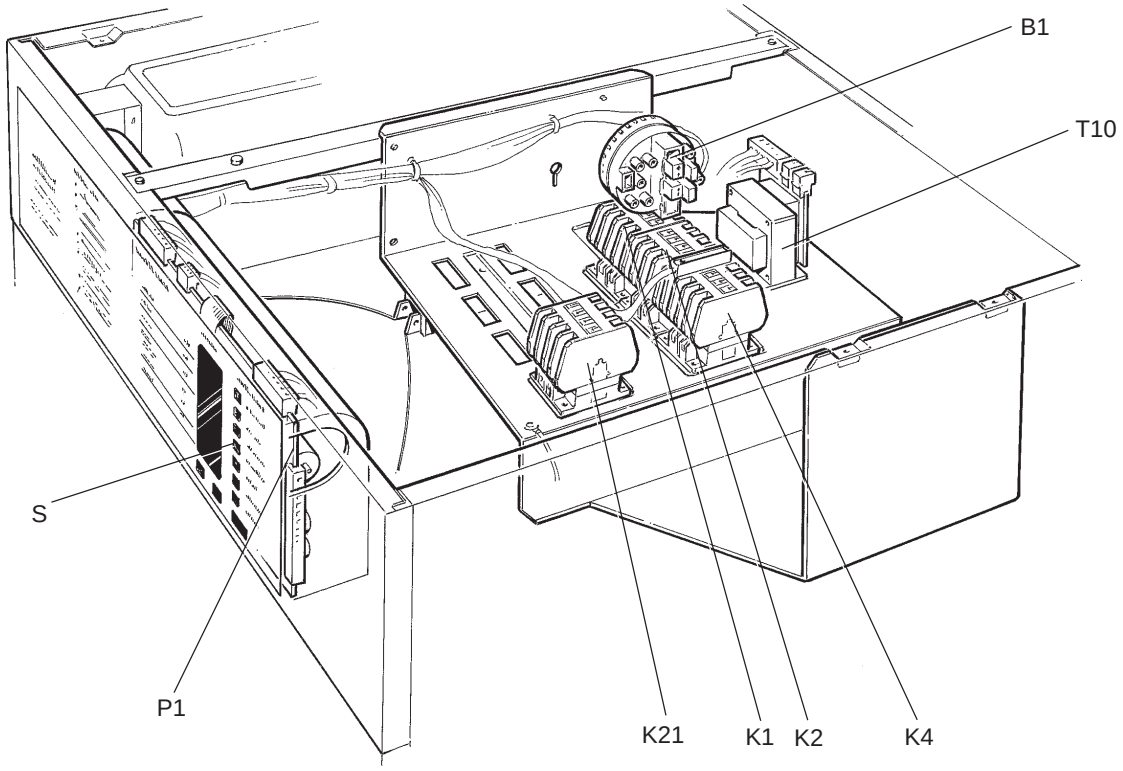
K21 Relay, heating

S Panel display with built-in push buttons

B1 Level switch — to monitor high and low water levels. The level sensor also protects the machine from dryout and spinning with water in the machine.

T10 Transformer — power supply for the electronic unit. Adaptable to different main voltages: 110 V, 208 V, 220 V, 240 V.

1



1419

Description

Fig. 1

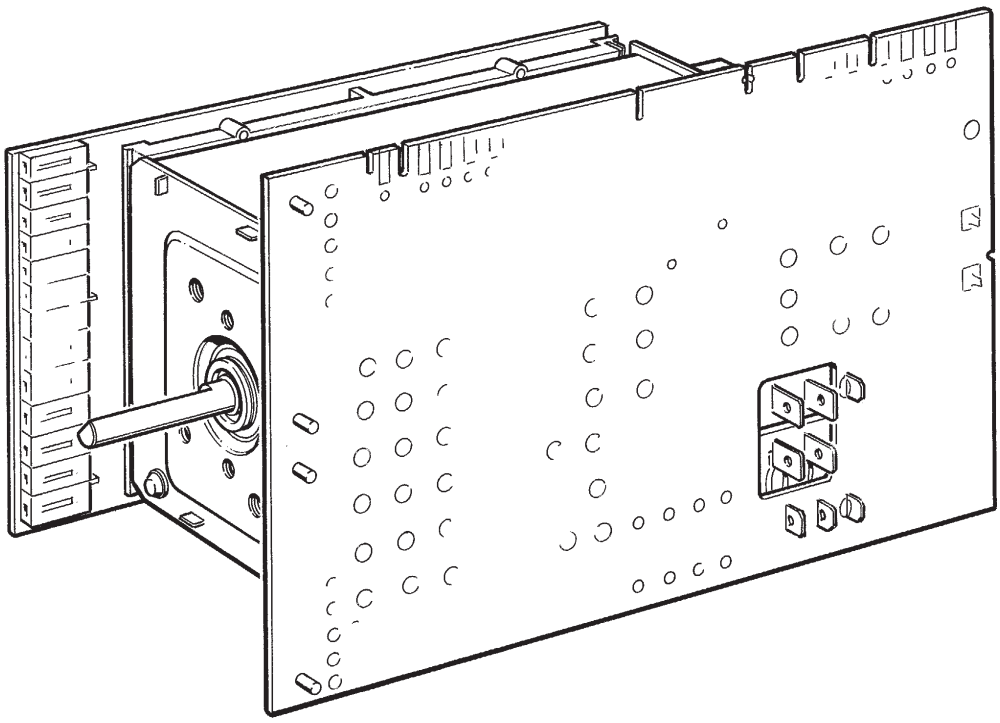
The timer controls the machine's various functions, such as water filling, draining and heating. The machine has no independent reverser (to control reversed motor operation) this function being built in to the programmer.

The timer consists of a program selector cylinder with fixed cams which operate closing and opening contacts. The cylinder is driven by a synchronic motor.

By activating a built-in relay, one can quickly advance past the various program sequences.

During water filling and heating, the synchronic motor stops which means that the time required for these functions is not included in the programmed wash time.

1



1420

Repair instructions

A faulty timer must be replaced.

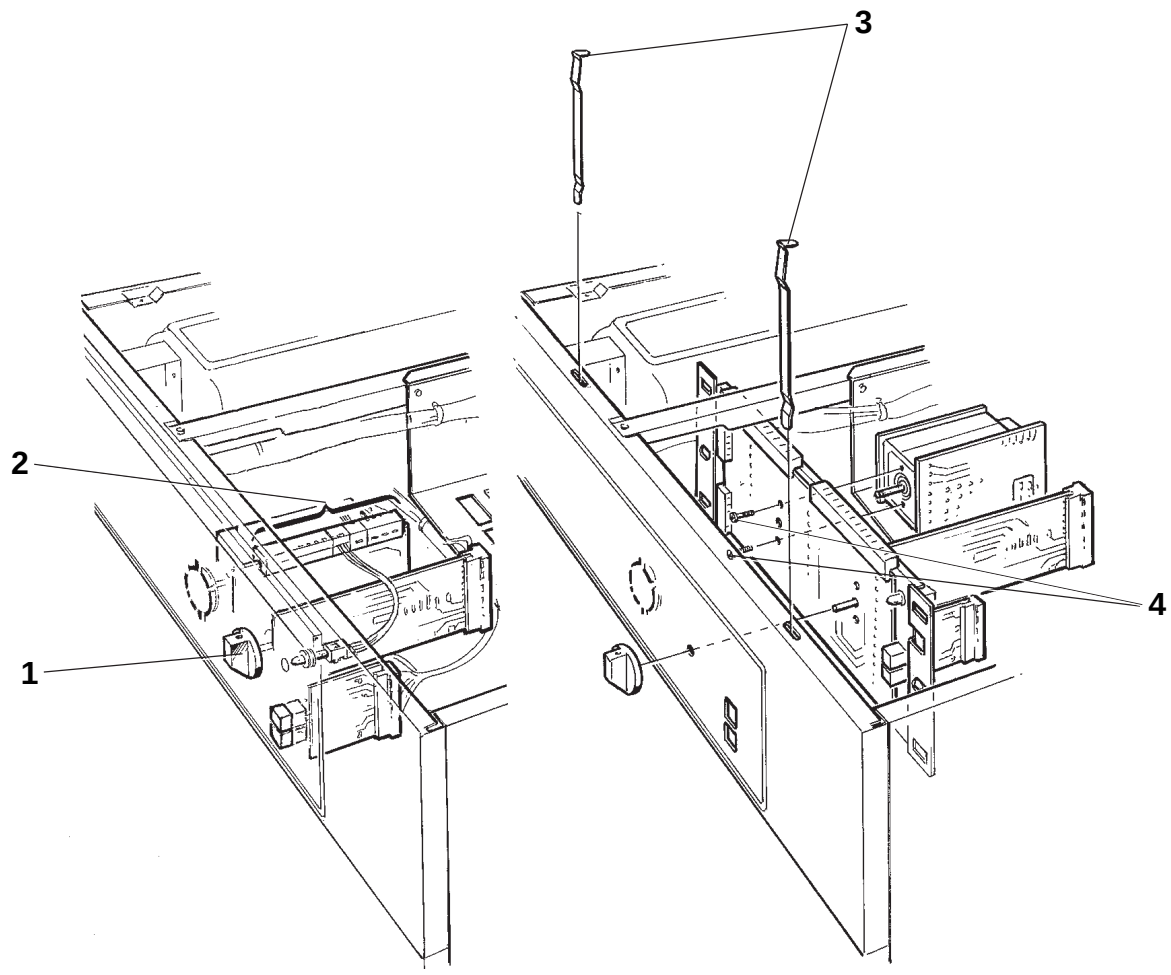
Removal

Fig. 2

1. Remove the program selector knob using a 2 mm hex key.
2. Unplug all contacts and connections to the timer. Note how these were mounted.

   It is not necessary to disconnect other components on the component panel. Only the timer connections should be unplugged.
3. Pull up the two metal strips supporting the component panel.
4. Fold the unit backwards and remove the program indicator disk. Unscrew the timer binding screws and remove the timer.

2



Description

Fig. 1

The timer is electronic and consists of one circuit board. One half of the circuit board contains microprocessors, program memory, temperature control, power supply circuits, etc. The other half contains relays and interface suppression circuits. The programmer has the following outputs and inputs:

- Outputs which, via relays, control the various machine functions, such as motor, water valves and safety lock.
- Outputs which control the information that is to appear on the display window mounted on the board's other side.
- Inputs which detect which buttons are depressed on the front panel.
- Inputs which give information about the machine's status from safety lock, level sensor, temperature switch and coin meter, if there is one.

The programmer is controlled by the instructions stored in its program memory. The program memory stores information about procedures, service program, relay control, input detection, etc. In addition, the memory contains the machine's standard programs.

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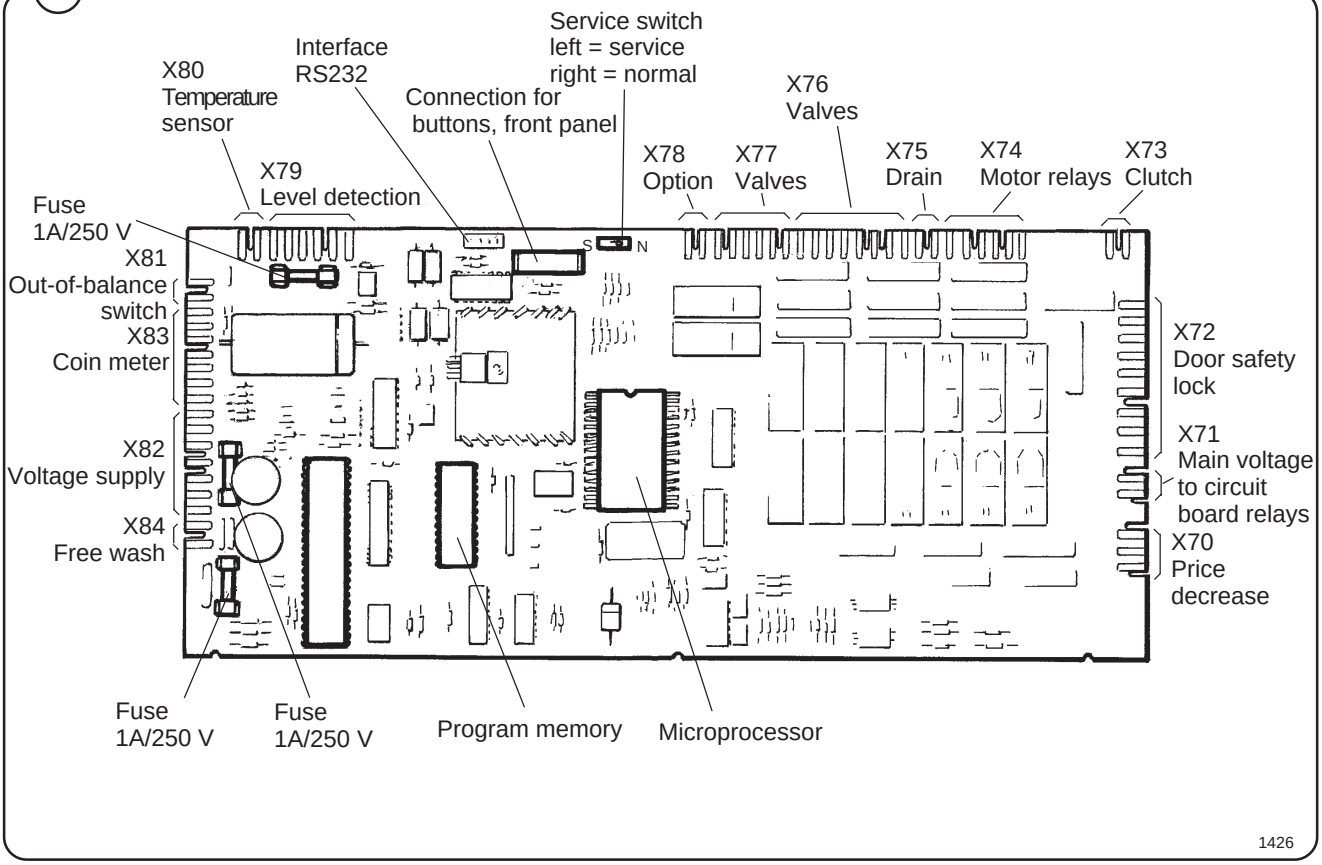

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Repair instructions

In the event of a function error, check the following:

- Check that the fuse on the back side of the machine beside the power connections strip is whole.
- Check that the voltage supplies to the electronic circuit card are OK. Measure the voltage supply on board connector X83 between the following inputs:
  - X83:1 - 3 approx. 7 V~
  - X83:4 - 5 approx. 15 V~
  - X83:6 - 7 approx. 13 V~
- Check the three glass pipe fuses on the circuit board (see illustration on the preceding page). Fuse rating 1 A/250 V.

If the above points are checked and the function error remains, replace the entire circuit board.

Removing the circuit board

1 Remove the left (seen from behind) upper protective cover from the circuit board.

Fig. 2

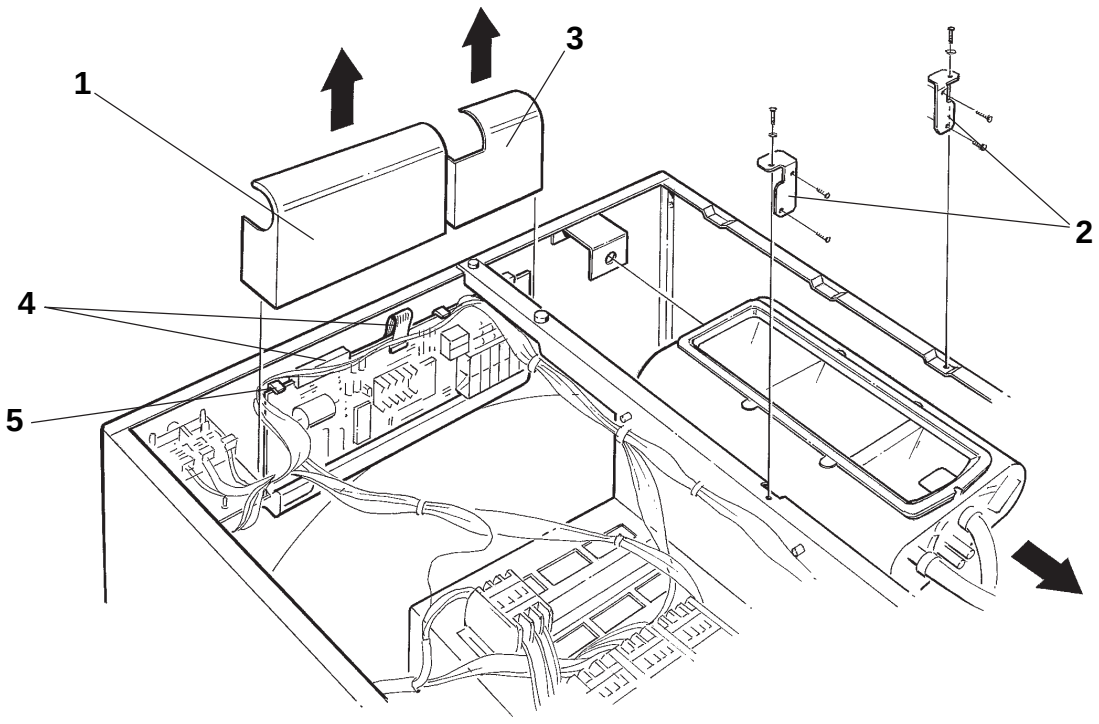
2 Unscrew both of the rear brackets in the detergent dispenser and on the side panel.

3 Remove the right upper protective cover.

4 Undo the board connectors from the circuit board. Be especially careful with the flat cable to the panel's push buttons. Note how the connectors are mounted.

5 Undo the three quick release brackets and remove the board, pulling first straight back so that the display window on the back side of the board cleans; then to the side.

2



Description

Fig. 1

The level switch is a pressure sensor controlling two different drum water levels by sensing air pressure in a hose connected to the drum's bottom. When the water rises in the drum and hose, the air in the hose compresses and, at two preset pressure levels (shut-off levels), two different alternating contacts in the pressure sensor are activated.

Fig. 2

When the water drains from the drum, the contacts switch back to original position, but now at lower water levels than was required to activate the contacts when the drum was being filled. These levels are called minimum levels. If the water level during washing falls below the minimum level, water will be added until the shut-off level is again reached.

Control and fault tracing

All level sensors are factory-set for the various machines. As a rule, this setting should not be changed. For that reason, the level controls are sealed with enamel paint.

A faulty level switch can not be repaired and should be replaced.

> **IMPORTANT!**
>
> **The machine guarantee ceases to be valid if the level sensor is tampered with.**

Water level check

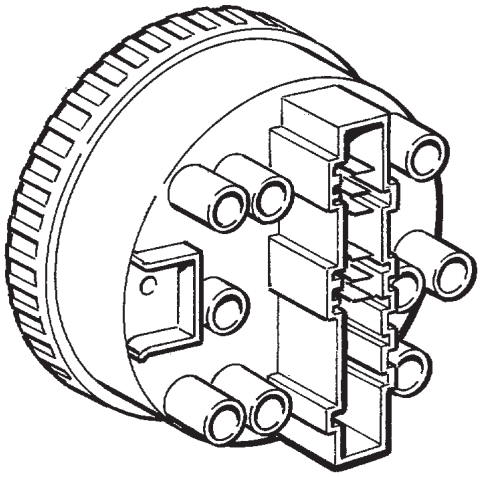
Fig. 2

Start the machine and select a standard program. Check low water level for prewash and main wash according to the illustration. Advance the program using the **START** button and check high water level for rinsing.

Water level is too high

- Check that the hose connecting the level switch and the drain valve is not obstructed. When necessary and when the machine is empty of water, clean the hose by disconnecting it from the level switch and blowing air through it.
- Check the hose for holes which can be caused by the hose rubbing against the pulley.
- Overfilling can also be caused by burnt contacts in the level switch. If this is the case, replace the level switch.

1



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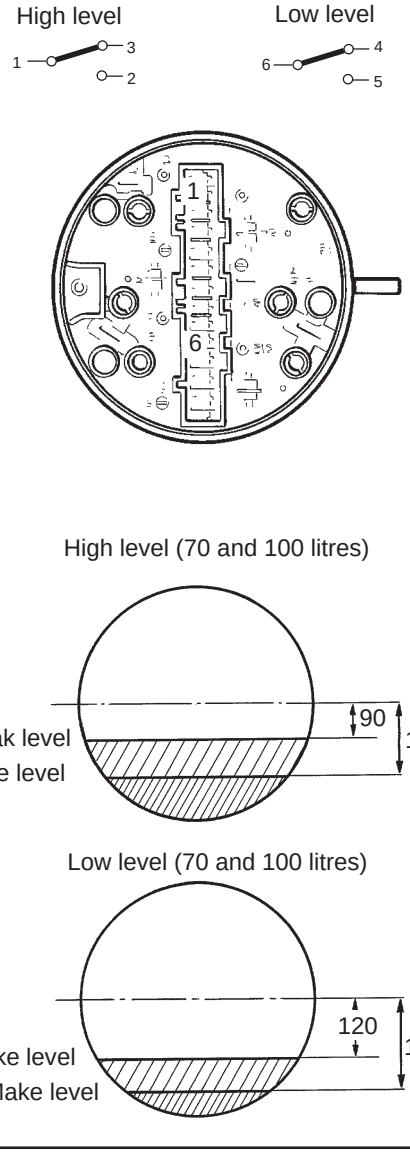

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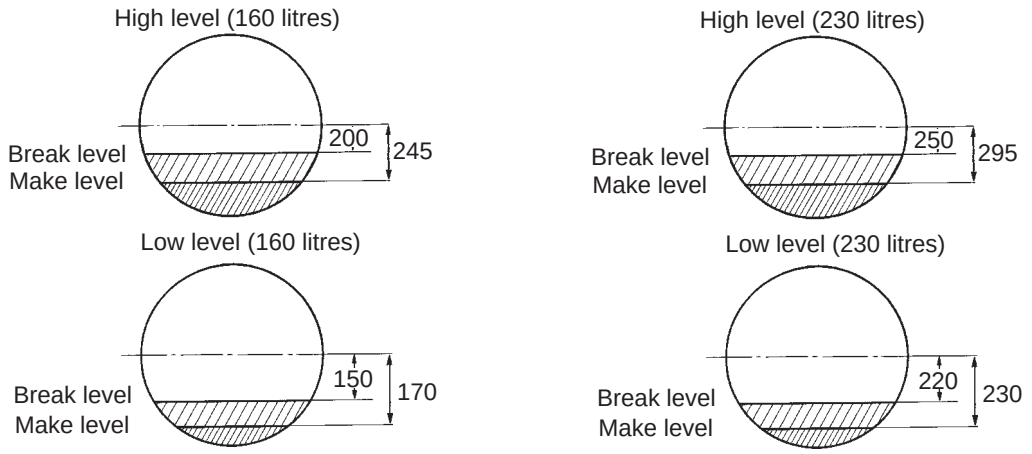


Machine does not fill with water

- Check the level switch function by:
  - connecting a meter between the contact pins
  - disconnect the hose from the drain valve
  - blow air carefully through the hose and monitor the meter contact functions.
- Insufficient water filling can also be caused by burnt contacts in the level switch. If this is the case, replace the level switch.

Replacing the level switch

- Blow through the hose to clean it before the new level switch is installed.
- There may not be water in the machine during installation.

Adjustment of level switch

The machine guarantee ceases to be valid if the level switch sealant is broken without manufacturer permission. After adjustments are made, the sensor should be resealed.

The level sensor has two adjustment screws for high water level and two for low level. For each level, the screws have the following functions:

Fig. 3

- level screw

  raise (clockwise adjustment) or lower transition point for both minimum and shut-off level.

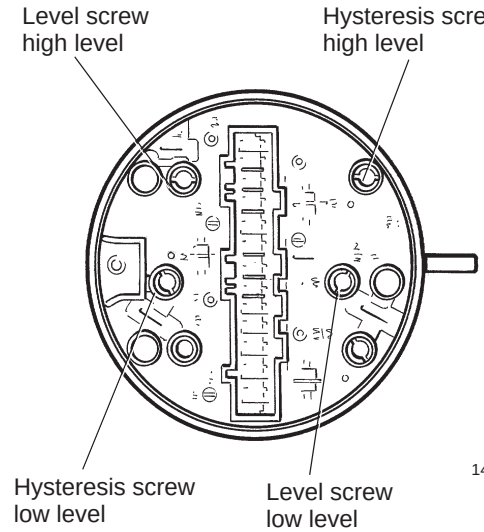
  Make sure that these screws are not turned too far counter-clockwise or else the springs under the screws will loosen and the level sensor will become nonfunctional.

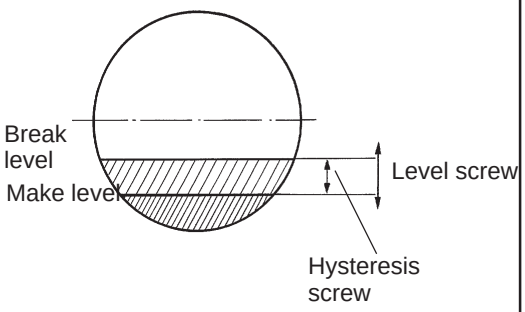
- hysteresis screw

  increase (clockwise adjustment) or decrease the distance between the minimum level and the shut-off level. The shut-off level is not changed during this adjustment.

Always adjust the shut-off level first using the level screw and then adjust the minimum level using the hysteresis screw.

3





Data

Range off-on	approx. 4°C
Max. temperature for sensor	150°C
Sensor medium	Liquid

Description

Fig. 1 The thermostat monitors the temperature while the machine carries out a program. The heating element contactor is controlled using open and closed contacts.

Fig. 2 The thermostat sensor is located at the lowest point of the outer drum to the left of the heating element. A liquid-filled cable (capillary tube) runs from the sensor to the thermostat, located in the automatic control unit. The water temperature controls the liquid expansion and thereby the activation of the various thermostat contacts.

Temperature selection (contact selection) (90°C, 60°C, 40°C or 30°C) is controlled by the programmer and the program selector.

Repair instructions

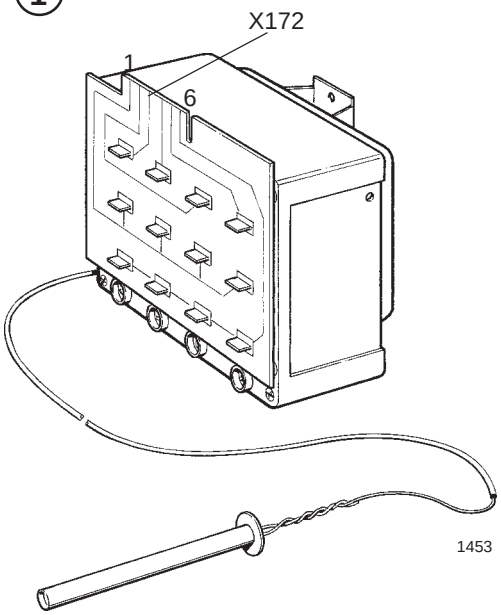
All thermostats are factory-set for the various machines. As a rule, this setting should not be changed. For that reason, the thermostats are sealed with enamel paint.

N.B! The machine guarantee ceases to be valid if the thermostat is tampered with.

Replacing the thermostat

- Remove the front panel and pull out the thermostat sensor.
- Undo the capillary tube strapping and replace the thermostat. Install the new capillary tube in the same way as the old one.

1



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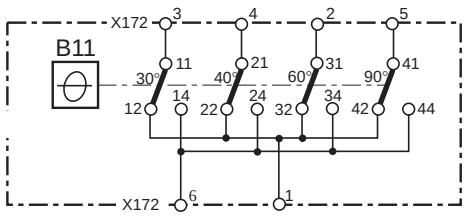

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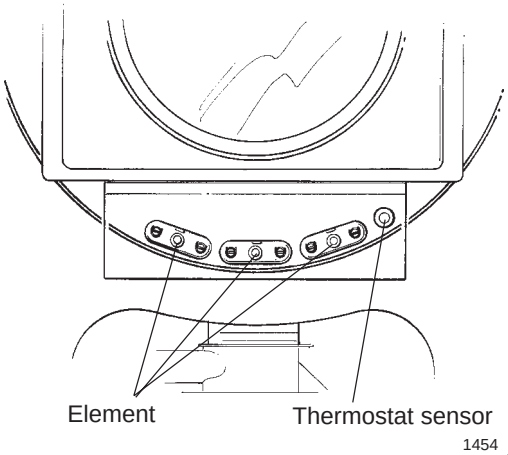

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Door

Fig. 1 The door is mounted on a special anchor plate which sits on the machine's outer drum. The door glass is fitted in the door with only a door seal which also is tightly fit directly against the outer drum when the door is closed. The glass is not glued-coated making it easy to replace.

Door seal leakage

Fig. 2 If the seal is not torn or damaged in some other way, the cause of the leakage could be decreased elasticity of the seal. Place a 4-7 mm sized O-ring around the entire seal in the seal slit (see illustration).

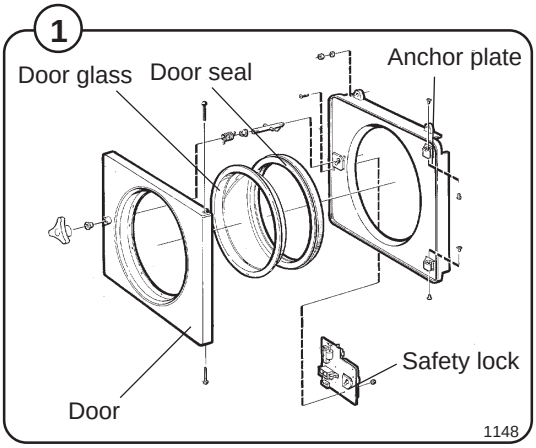
If the leakage persists, change the seal.

Safety lock

Fig. 3 The safety lock is mounted on a circuit card with a contact for quick connection. The following is on the circuit card:

- the lock plate against which the safety lock knob locks the door.
- the microswitch which indicates that the door is closed.
- a lock unit which keeps the door from opening when the machine is in operation. This unit consists of:
  - a double functioning solenoid
  - a delay unit with a bimetal spring
  - a lock bolt which can be controlled by both the solenoid and the delay unit.
  - a catch which keeps the lock bolt from locking when the door is open. The catch also controls a microswitch.

1



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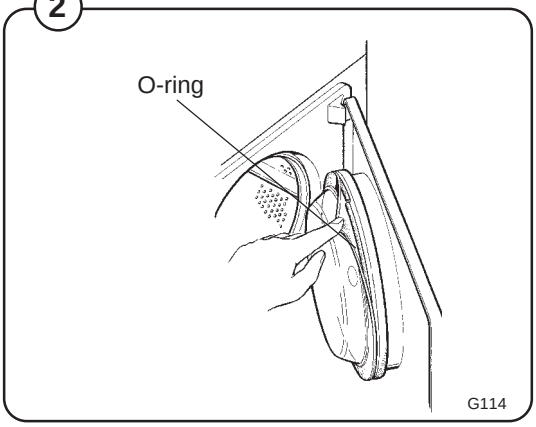

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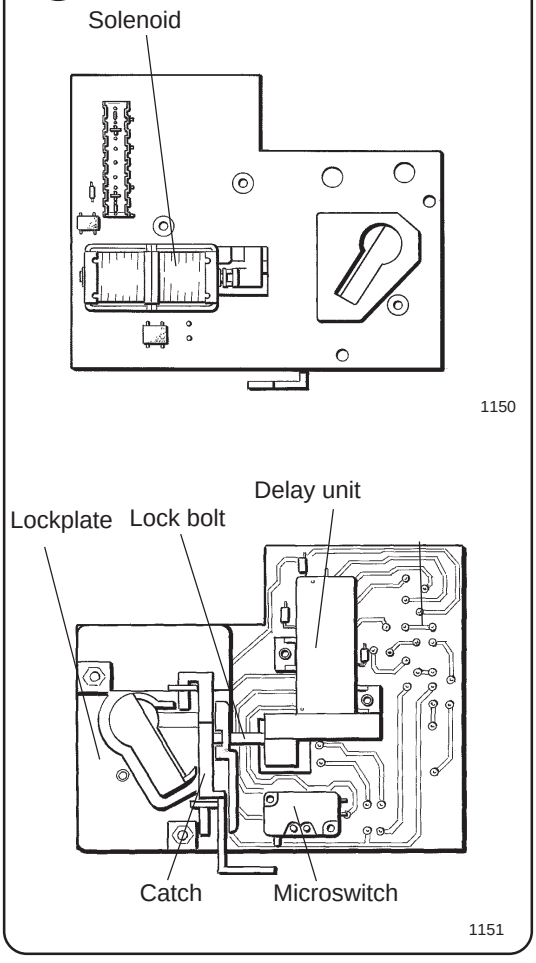


Function

When the door is closed, the microswitch trips and indicates to the timer that the door is closed.

When the machine starts, the solenoid locks the lock knob by drawing the lock bolt into closed position. A microswitch in the delay unit is controlled by the lock bolt and indicates that the lock bolt is in closed position. Only when this signal is received does the drum start to rotate and water begin to fill the drum.

When the wash program is completed, the solenoid releases the lock bolt and the safety lock can be opened without any delay. The solenoid remains energized for approx. two minutes so that the bimetal spring in the delay unit can cool-down and not re-lock the door when the solenoid de-energizes.

If a power failure occurs during a wash cycle, the delay unit keeps the door locked for approx. two minutes allowing the drum to stop rotating and the water to drain (the drain valve opens automatically in the case of a power failure).

Fault tracing

If the solenoid does not lock the door:

- Check that there is voltage reaching the right coil in the solenoid. Measure the voltage supply to the coil to check for possible power failure.
- Check that the lock bolt runs smoothly (the door must be closed) and that the solenoid plunger does not jam.

The door remains locked longer than approx. two minutes:

- Check that there is voltage to the left coil in the magnet. Measure the voltage supply to the coil to check for possible power failure.

Other possible reasons for faults:

- Faulty microswitch
- Faulty switch in delay unit

N.B!

The safety lock is an important safety component and may not be repaired. In case of faulty functioning, the entire safety lock should be replaced.

Motor runs slowly

The motor is probably only running on two phases (applies to three phase machines).

- Check that the voltage supply to the motor is correct.
- Remove the quick connector and check for open motor windings or a short circuit.

Motor is very noisy or stalls

- Faulty bearings — replace the motor or bearing (for motor replacement, see below).

Removing the motor

Fig. 4

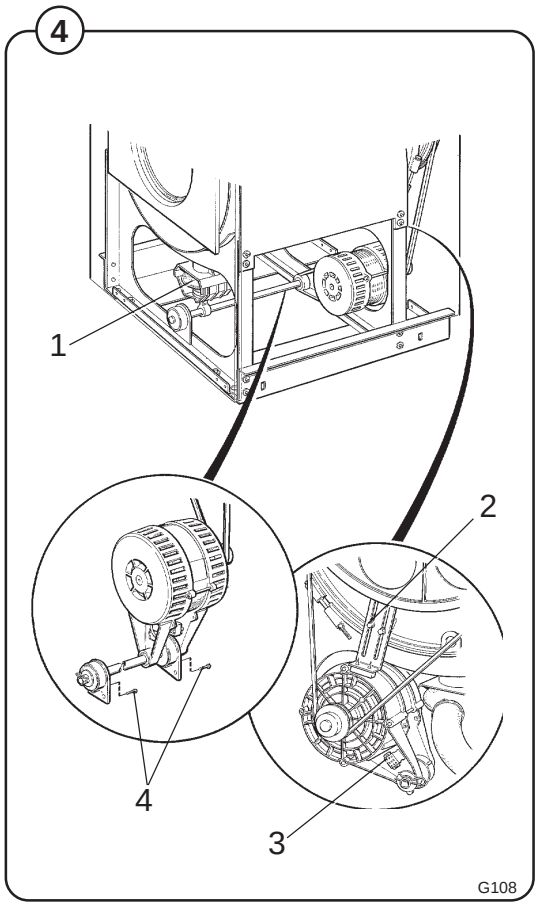
1 Remove the drain valve from the shaft by lifting it up.

2 Remove the tensioner.

3 Remove the quick connector to the motor.

4 Unscrew the two screws which hold the shaft in place. Pull the shaft towards the front of the machine so that the bracket guide pins release.

5 Remove the motor from the shaft. Use soap solution if the rubber bushings are resistant.



Data

Capacity at 300 kPa	300 litres/min
Operating limits	40-1000 kPa

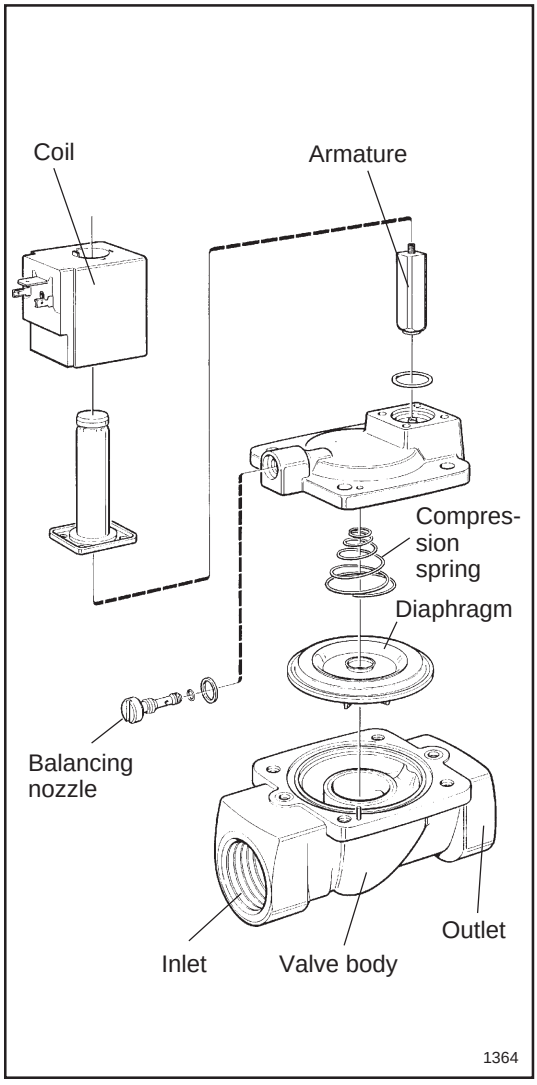
Description

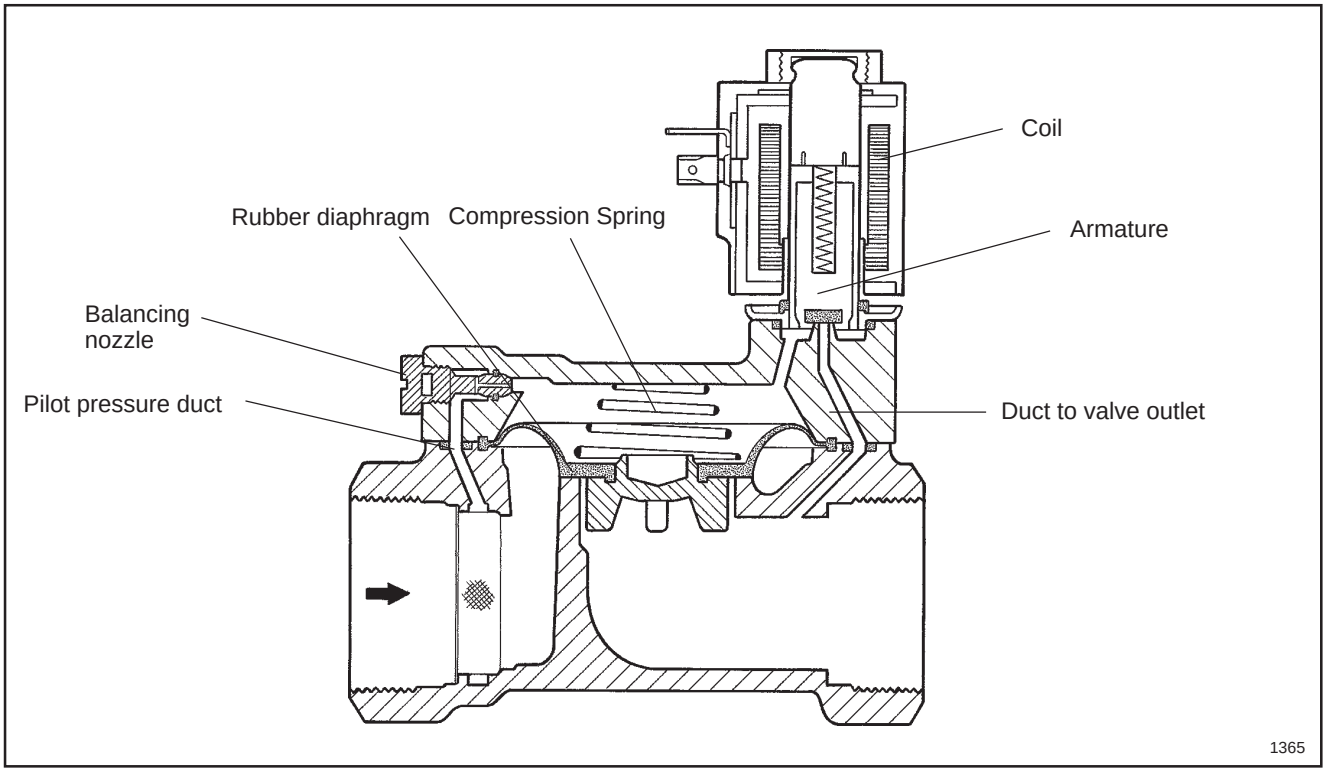
The valve is electromagnetically operated and has a rubber diaphragm as its opening and closing element. The valve utilises the water pressure when opening and closing.

When the electromagnetic is de-energised, the valve is closed.

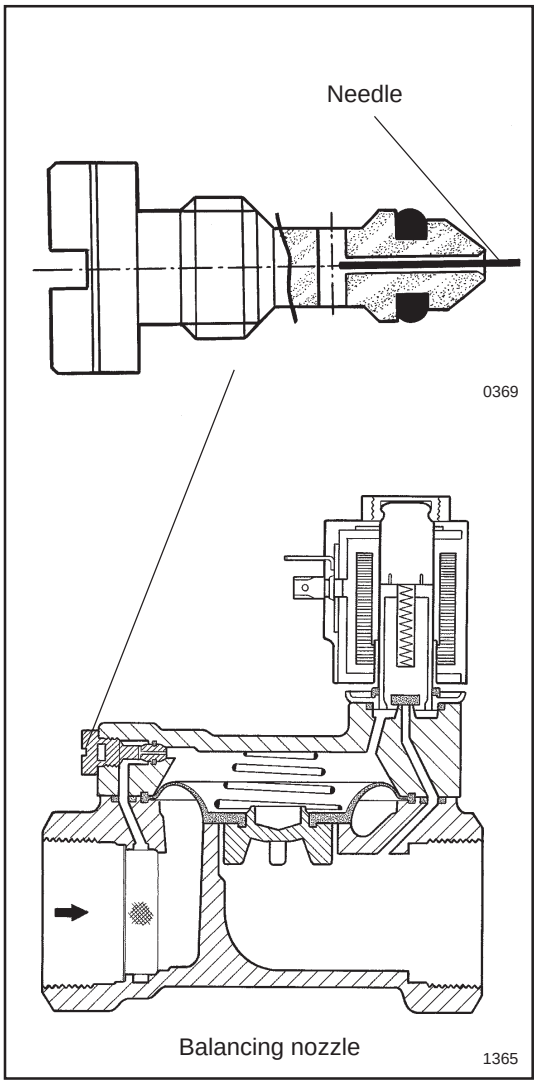
The water pressure acts through the pilot pressure opening on the top of the rubber diaphragm. Because the water pressure is acting on a relatively larger area on the top of the diaphragm than on the bottom (part of the underside of the daphragm is in contact with the outlet of the valve, where there is no prssure) the water pressure from below is insufficient to lift the diaphragm, so that the diaphragm forms a seal against the valve seat.

When the magnet is energised, the opening from the top of the diaphragm to the outlet of the valve is opened. Since the diameter of this opening is greater than that of the pilot opening, the diameter of which is limited by the balancing nozzle, the pressure on the top of the diapragm can then lift the diaphragm and open the valve.





Repair instruction



Valve operation gradually gets worse

Hot water with high lime content cause scale deposits in the balancing nozzle of the valve. Clean the nozzle as follows:

- Shut off the water.
- Unscrew the nozzle and clean it with a needle or similar. A nozzle marked with one ring around the head of the screw has a bore diameter of 0.5 mm and a nozzle with two rings has a bore diameter of 0.8 mm. The diameter of the needle used to clean the nozzle must not be greater than the bore diameter.
- Re-fit the nozzle.
- Turn on the water, check operation and check for leaks.
- If this does not help, check that the inlet filter of the pilot channel is not blocked.

Where the water is very hard, i.e. contains a high lime content, it is recommended that the 0.5 mm nozzle should be replaced with a 0.8 mm nozzle.

Valve does not open

- Check for voltage at coil.
- Measure the resistance of the coil to check for short circuit or open circuit.
- Dismantle the valve and check that the armature is not binding. If necessary, clean to remove scale, particularly in the ducts of the valve between the top and bottom of the diaphragm.
- Remove the coil and clean the metal surfaces of the magnet core.

Valve does not close

- Check that there is no voltage across the coil. Normally the valve is closed when the coil is de-energised.
- Dismantle the valve and check the armature return spring and check that the armature is not binding. If necessary, remove limescale deposit, particularly in the ducts of the valve between the top and bottom of the diaphragm.
- Check the balancing nozzle in accordance with the instructions under the heading "Valve function gradually gets worse".

Data

Max. capacity fully open	outlet	160 l/min.
	inlet	20 l/min.
Working range, water pressure		0,5-10 bar
Number of outlets		1, 2, 3 or 4

Description

Fig. 1 The valve is electromagnetically operated and has a rubber diaphragm as its opening and closing element. The valve utilises the water supply pressure when opening and closing.

Fig. 2 When the valve coil is de-energized, the valve is closed. The water pressure builds up over the diaphragm through the diaphragm pilot pressure opening and holds the valve closed.

When the coil is energized, the plunger is pushed up and the water pressure above the diaphragm can be relieved through the pressure balancing canal to the valve outlet. At that point, the water pressure in the flow pipe can lift the diaphragm, allowing the valve to open.

There is a close-meshed filter which filters polutants in the inlet pipe. The filter is easily removable for cleaning.

In the outlet, a throttle adjusts the water flow to the machine requirements.

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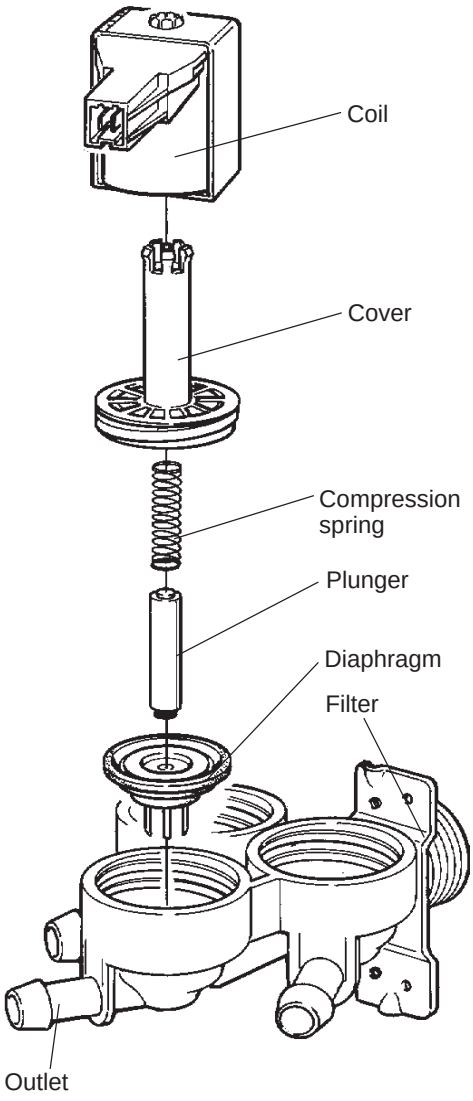

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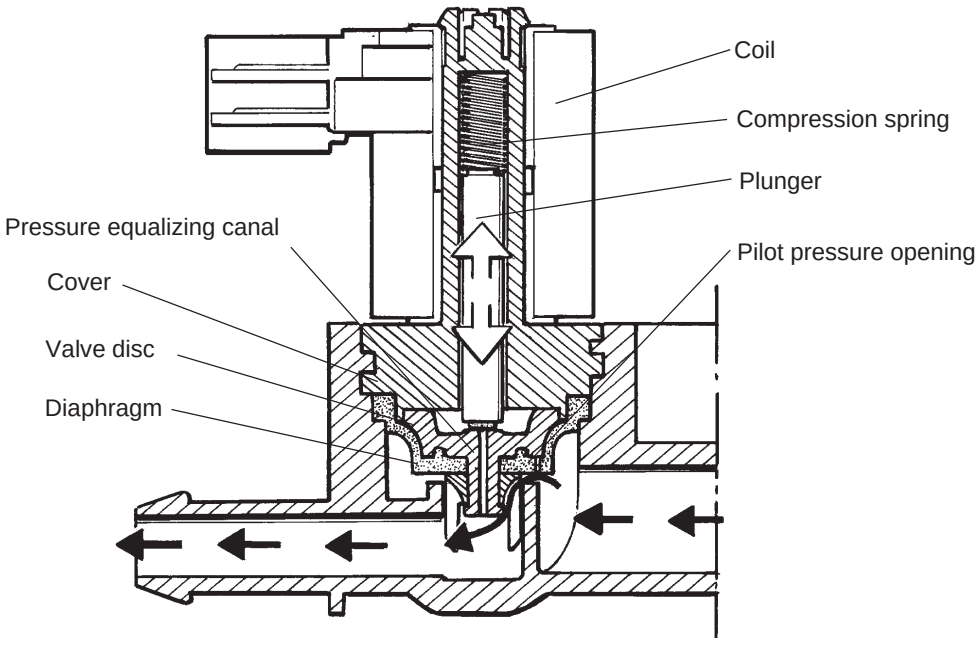


Repair instructions

Lime deposits can block the valve diaphragm hole and prevent the valve from functioning properly.

It is therefore a good idea to take apart and clean the valve regularly depending on operation conditions and the degree of polutants and lime content present in the water.

Valve does not open

- Check that there is voltage supply to the coil.
- Measure the voltage supply to the coil to check for a possible power failure or short circuit.
- Take apart the valve and check the valve diaphragm openings.
- Check the inlet filter and clean it when necessary.
- Remove the coil and clean the coil core surfaces.

Valve does not close

- Check that there is no voltage across the coil. Normally the valve is closed when the coil is not energized.
- Check the return spring.
- Check the diaphragm (pilot pressure opening).

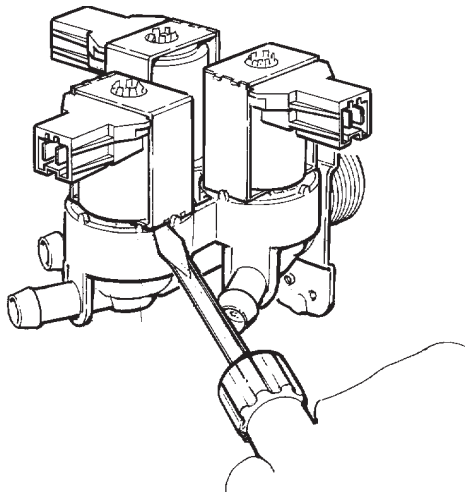
Dismantling of the valve

Fig. 3
1. Carefully pry off the valve coil using a screw driver.

Fig. 4
2. Turn and lift the valve cover using a special tool and a wrench. (The special tool is attached to one of the machine's water hoses upon delivery.)

Fig. 5

3



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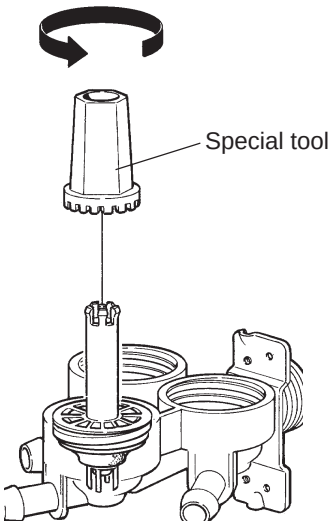

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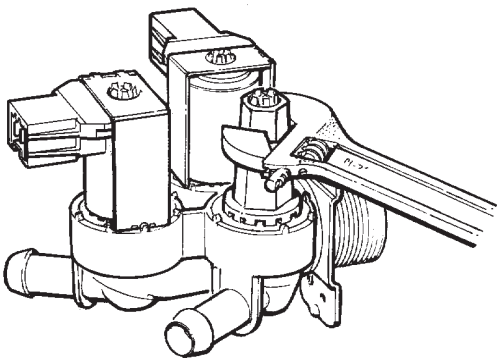

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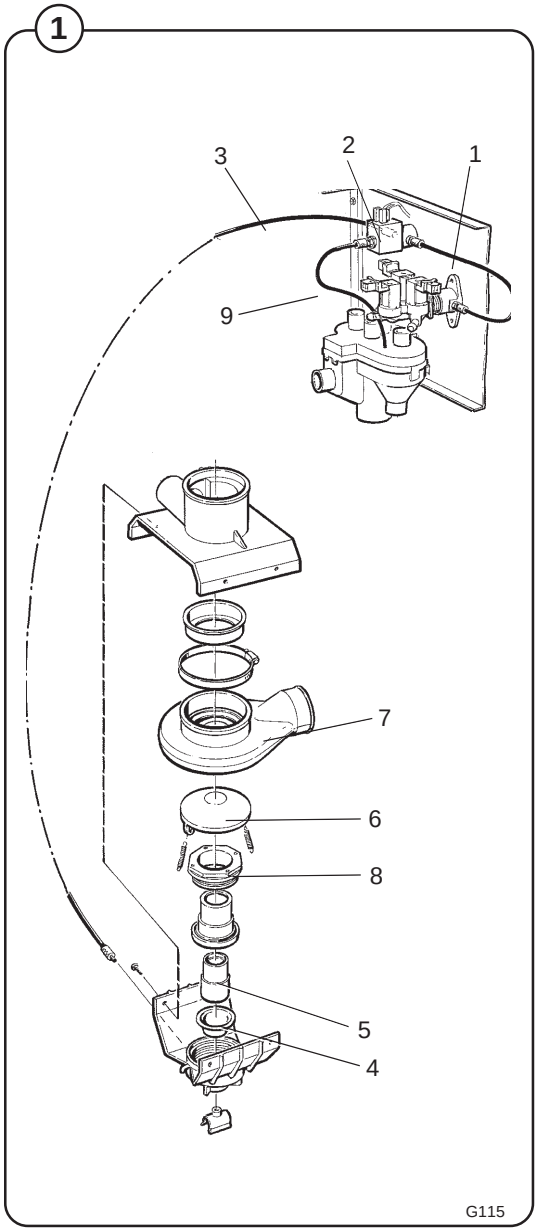
Description

Fig. 1

The drain valve utilises the water pressure in the cold water inlet to close the valve. A hose (1) connects the water inlet and the control valve (2). When the control valve is activated, it opens and allows water to pass through the supply main (3) which is connected to the drain valve. The water pushes up a rubber diaphragm (4) and a piston (5) by means of a pressure plate (6) which closes the rubber diaphragm (7) on the valve.

When the control valve shuts off the water pressure leading to the drain valve, the springs (8) pull back the piston. The return water passes through the control valve to the drain via the return hose and is drained (9).



Fault tracing

Drain valve does not close

Check that:

- there is voltage supply to the control valve (2).
- hoses and control valve are not blocked. This is done by disconnecting the supply main (3) to the drain valve and activating the control valve.
- the rubber diaphragm (4) is ok.
- the piston (5) is not jammed.

Drain valve does not open

Check that:

- the return hose (9) is not blocked.
- the piston (5) is not jammed.

Description

Fig. 1 The three machine elements are located at the bottom of the outer drum and are accessible from the front of the machine. They are switched on by a heating contactor (K2) which is controlled by the timer, level sensor and thermostat.

Fault tracing

Warm up time is unusually long

- Use a multimeter to check whether any of the elements is burnt out. To access the elements, remove the front panel of the machine.
- Lime deposits can reduce the output of the elements. Remove the deposits when necessary. Use the deliming agent in accordance with supplier instructions.

Replacing the element

- Shut-off the main switch and make sure that there is no electrical supply to the machine.
- No the positions of the connections and disconnect those connections to the element.
- On element, unscrew the nut on the middle screw and turn the screw a quarter turn counterclockwise. The dolly on the inner side of the element is turned at the same time allowing the element to be disconnected.
- Place the new element in position, turn the screw a quarter turn clockwise and tighten the nut. Restore connections to the element.
- Fill the machine and check that there is no leakage at the element.

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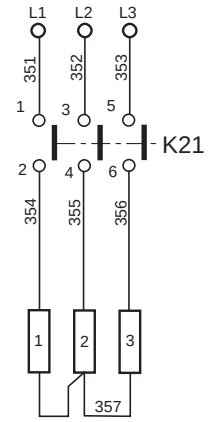

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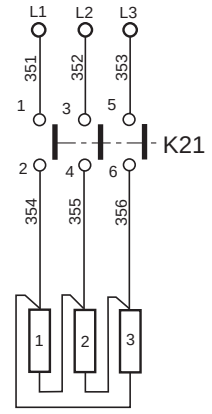

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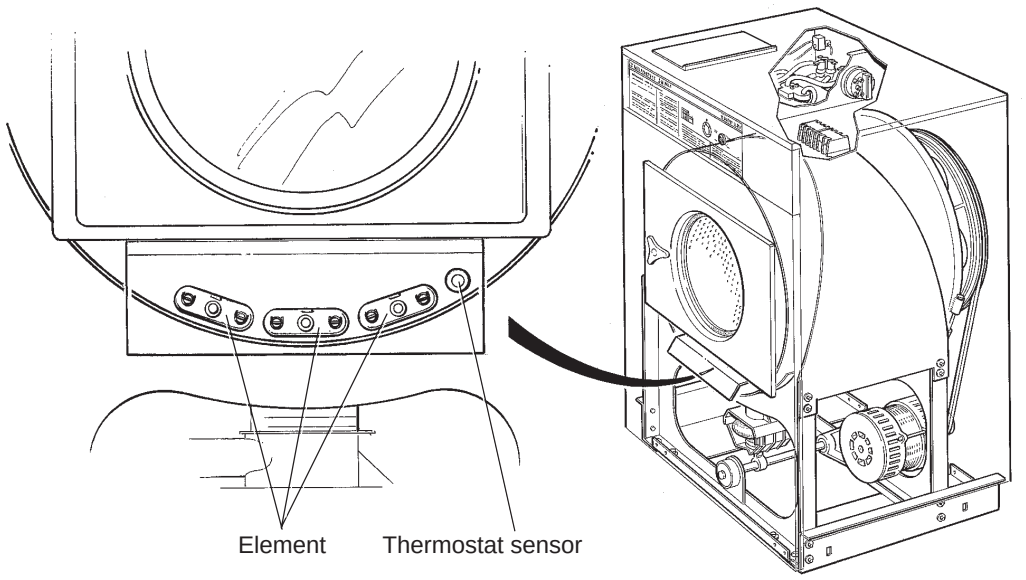

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Description

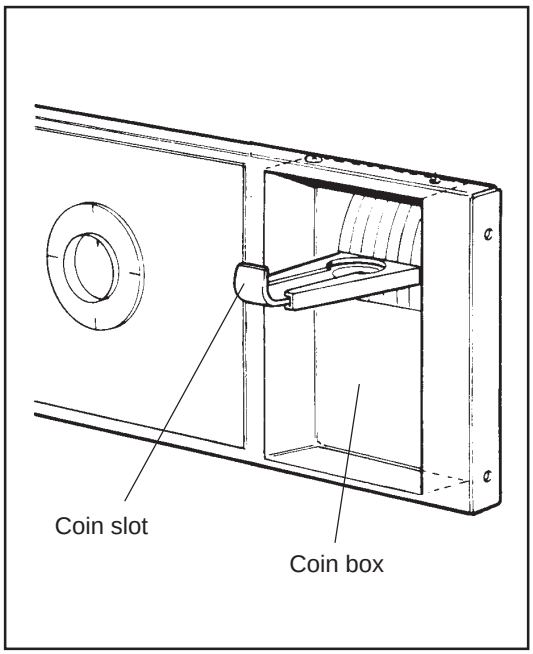


Fig. 1

The coin meter, which is of the Greenwald type, consists of:

- Coin slot, single or double – for one or several insertions.
- Cassette
- Coin box with lock
- Counter unit
- Mechanism Alternative 1: relay mechanism for programme connected coin meters.
  Alternative 2: timer motor, for time connected coin meter.

The time connected coin meter (alternative 2) is supplied with a standard timer wheel. This is easily replaced to provide the required time.

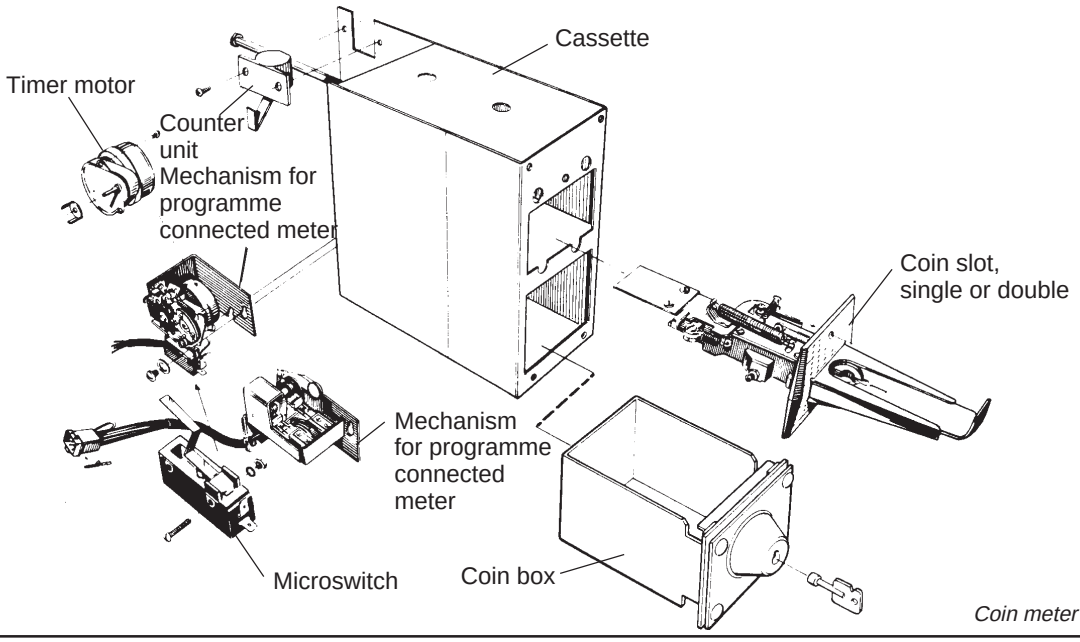
Alternative 1: Programme connected coin meter

When the coin slot with a coin or token is pushed in, the slot actuates a relay mechanism which starts the machine's timer and advances the timer to the start position thus starting the washing program.

The relay is actuated throughout the washing programme and switches off when the timer has returned to position 0. After this a new coin insertion is required.

Coin meters for two of several coins do not provide the start pulse until the correct number or coins or tokens have been fed into the meter.

There is no fast forward on the machine if there is a coin feed connected to the programme.



Coin meter

Alternative 2: Timed coin meter (Available only on the Swedish market)

When the coin slot with coin or token is pushed in, the slot actuates a catch which advances a wheel.

This actuates a microswitch which provides power (phase) to the automatic unit of the machine. It is now possible to start the machine.

The paid time has run out. The wheel is turned so that the microswitch cuts the phase to the automatic unit and timer motor. The washing programme is broken and the machine is emptied of its water.

If several coins or tokens are inserted simultaneously the coin meter provides power to the automatic unit for the total time that has been paid for, regardless of whether the machine is running or not. The time counting stops if the main switch is switched OFF and restart when the main switch is switched ON.

Time connected coin meters allow for the rapid advance by means of the start button. This may be required if a part of the programme cycle is to be ommitted.

Altering the running time of the coin meter – timed coin meter

- Turn the time dial manually until the V-track filts in a cog on the black wheel.
- Carefully lift off the time dial from the shaft with a small screwdriver.
- Install the new time dial on the shaft.

Possible faults and corrective measures

1. The machine is without power.
   – Check fuses, including the operating fuse
   – Check the connection cable
2. The coin meter mechanism does not function
   – Check that the catch advances the wheel
   – Check the return spring on the coin slot
   – Check the catch in the relay mechanism (only applicable on program connected coin meter)
3. The microswitch is not actuated by the wheel or is defect.
   – Adjust or replace the microswitch

Description

Fig. 1 The frame is constructed of flanged plates for stability and torsional rigidity. The drum is mounted directly on the frame without shock-absorbing mechanisms. For this reason, the frame should be stably installed on a underlying foundation (see installation instructions). The drum is mounted in the frame surrounded by a steel plate which is riveted to the frame.

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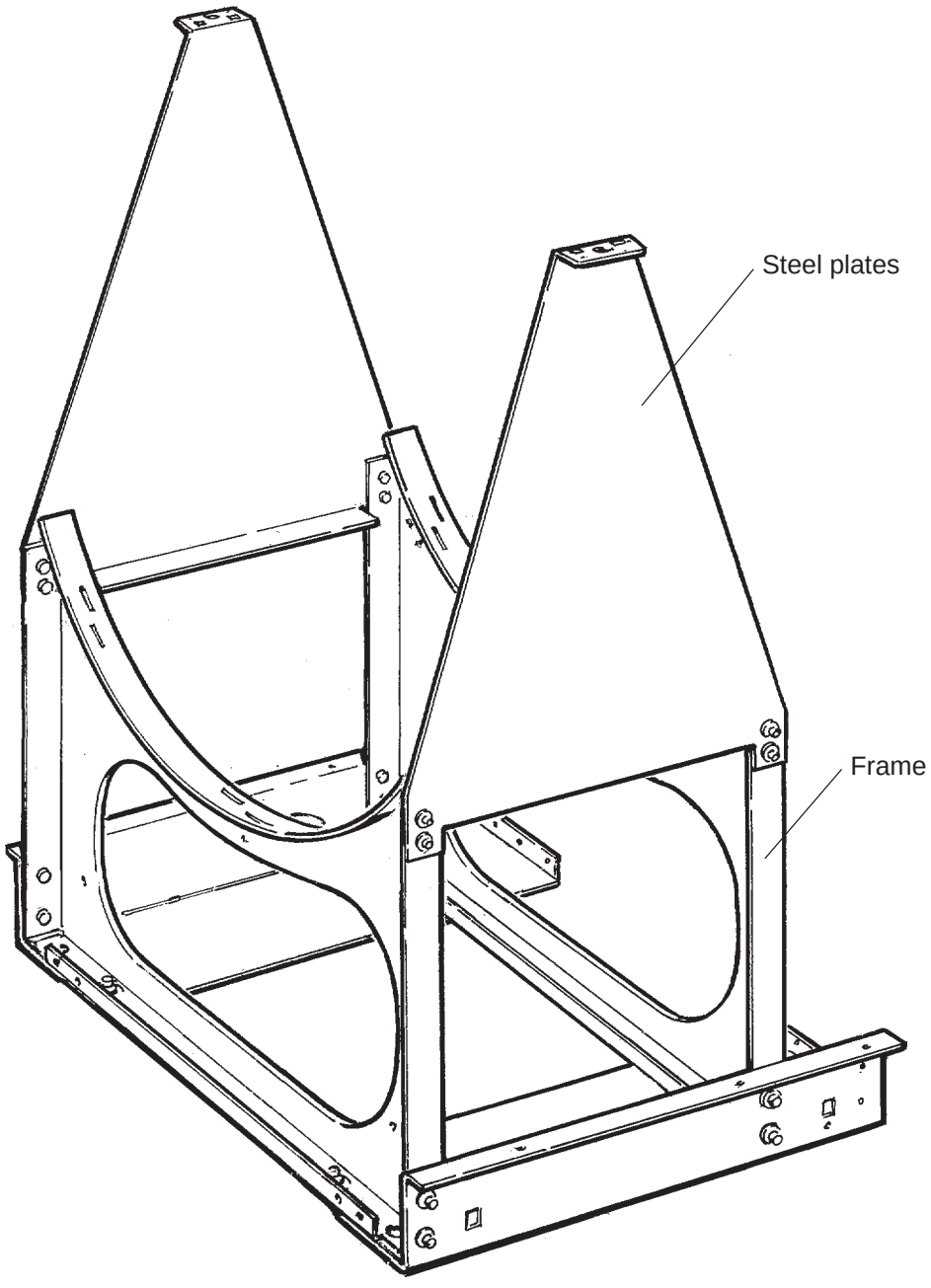

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