

MC 6P
SERVICE MANUAL

Nilfisk

Preface

This service manual contains detailed description of the main repair work on the cold HPW MC 6P.

Repair work requires a suitable testing workplace with the necessary water and power supply.

If operating errors are evident, refer the customer to the operating instructions.

A fault in the cleaner can have several causes as described in the section on troubleshooting.

Refer to the illustrated spare parts lists during repairs. They show the assembly position and the sequence in which the individual components should be assembled.

See ”Technical Service Bulletin (TSB) sheets. They include information on technical modifications that have been made after this repair manual was printed.

”Technical Service Bulletin” sheets are also valid as a supplement to the spare parts list until publication of a new edition.

Repair manuals and ” Technical Service Bulletin” sheets should be available at the site where repairs are carried out.

It is not permitted to give them to third parties.

Use original **Nilfisk** spare parts only.

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For your own safety



Repair work should be carried out by persons instructed in electrical installations or by trained electricians only.

Observe valid safety regulations for electrical equipment. In particular, observe the following regulations:

IEC 60335-2-79

EN 60335-2-79

Additionally:

Also see national regulations

Before using the cleaner, always read the operating instructions and keep them readily available.

Only allow the high pressure

ESD measures (electrostatic discharge)

Take the following ESD precautions before carrying out any repairs to the electronics:

- Touch the earth conductor before repairing the cleaner (to discharge electrostatic charge from your body).
- Wear wrist band if necassary.
- Use a conductive floor covering or a conductive table cover.
- Never touch the printed circuit board or electronic components (always hold on to plastic).
- Transport electronic components in conductive packaging (e.g. ESD bag).

Item number: 107146750		MC 6P-2300/5.0 FA 230/1/60 US
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	155
Pressure p_{gun} @ Q_{nom}	bar	130
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min (gpm)	16,8 (4,4)
Suction height dry	m (ft.)	1 (3)
Suction height primed	m (ft.)	2,5 (8)
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	6,02
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,73
ELECTRIC:		
Electrical data	V/ph/Hz	230V/1ph/60Hz
Current @ V_1	A	28
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1740
Electric diagram item number	-	106420563
UNIT DATA:		
Nozzle Size	-	NT 0680
Max. inlet temperature (suction)	°C (°F)	50 (122)
Max. inlet temperature (primed)	°C (°F)	70 (158)
Max. inlet temperature (pressure fed)	°C (°F)	80 (176)
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C (°F)	40 (104)
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 15m - Black
Sound power typeplate	dBA	88
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 30
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg (lb)	90 (198)
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	6

Item number: 107146751		MC 6P-250/1100 FA 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	239
Pressure p_{gun} @ Q_{nom}	bar	219
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	15,65
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	15,5
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0475
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	93
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	89
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	6

Item number: 107146752		MC 6P-180/1300 FA 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	168
Pressure p_{gun} @ Q_{nom}	bar	140
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	18,7
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	13,3
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0700
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	86
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	6

Item number: 107146754		MC 6P-180/1300 FA 220-440/3/60 EXPT
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	172
Pressure p_{gun} @ Q_{nom}	bar	144
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	18,8
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	220V/3ph/60Hz
Current @ V_1	A	24,7
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1740
Electric diagram item number	-	106420556
UNIT DATA:		
Nozzle Size	-	NT 0700
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 30
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	87
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	6

Technical data

Item number: 107146755		MC 6P-170/1600 FA 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	162
Pressure p_{gun} @ Q_{nom}	bar	120
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	23,5
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	15
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0950
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	89
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	5

Item number: 107146758		MC 6P-250/1100 FAXT 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	240
Pressure p_{gun} @ Q_{nom}	bar	210
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	15,3
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	15,3
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0475
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/101406119
High pressure hose	-	DN10 x 15m - Black
Sound power typeplate	dBA	93
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	96
Size - Machine alone	LxWxH (mm)	930x570x1020
Detergent suction	% (+/-)	6

Item number: 107146759		MC 6P-180/1300 FAXT 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	172
Pressure p_{gun} @ Q_{nom}	bar	138
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	18,7
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	14
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0700
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/101406119
High pressure hose	-	DN10 x 15m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	93
Size - Machine alone	LxWxH (mm)	930x570x1020
Detergent suction	% (+/-)	6

Item number: 107146760		MC 6P-180/1300 FAXT 230-400/3/50 NO
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	172
Pressure p_{gun} @ Q_{nom}	bar	138
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	18,7
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	230V/3ph/50Hz
Current @ V_1	A	24,5
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420556
UNIT DATA:		
Nozzle Size	-	NT 0700
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 STD INCL. SWIVEL NILFISK
Lance primary/secondary	-	101406108/101406119
High pressure hose	-	DN10 x 15m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 25
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	93
Size - Machine alone	LxWxH (mm)	930x570x1020
Detergent suction	% (+/-)	6

Item number: 107146761		MC 6P-170/1600 FAXT 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	167
Pressure p_{gun} @ Q_{nom}	bar	120
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	23
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	15,5
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0950
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	Spray gun ERGO 3000
Lance primary/secondary	-	106403014/101406119
High pressure hose	-	DN10 x 15m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	96
Size - Machine alone	LxWxH (mm)	930x570x1020
Detergent suction	% (+/-)	5

Item number: 107146765		GERNI POSEIDON 6-65 FA 415/3/50 AU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	168
Pressure p_{gun} @ Q_{nom}	bar	140
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	18,7
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	415V/3ph/50Hz
Current @ V_1	A	13,3
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0700
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 ST GUN W. HOSE SWIVEL - GERNI
Lance primary/secondary	-	101406134/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	20
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	86
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	6

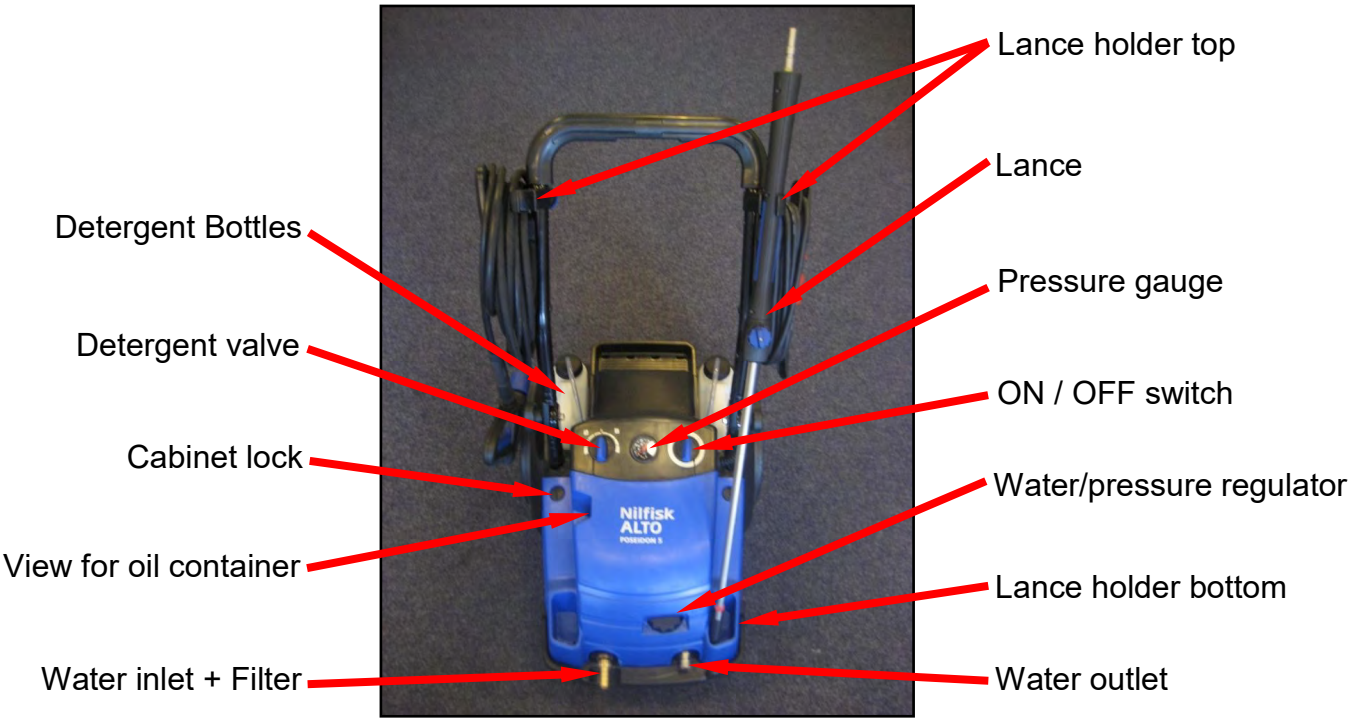
Item number: 107146766		MC 6P-250/1100 FA 415/3/50 GERNI
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	239
Pressure p_{gun} @ Q_{nom}	bar	219
Retaining/opening pressure	bar	
Flow Q_{nom}	l/min	15,65
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	415V/3ph/50Hz
Current @ V_1	A	15,5
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 0475
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	ERGO 2000 ST GUN W. HOSE SWIVEL - GERNI
Lance primary/secondary	-	101406134/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	93
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	20
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	89
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	6

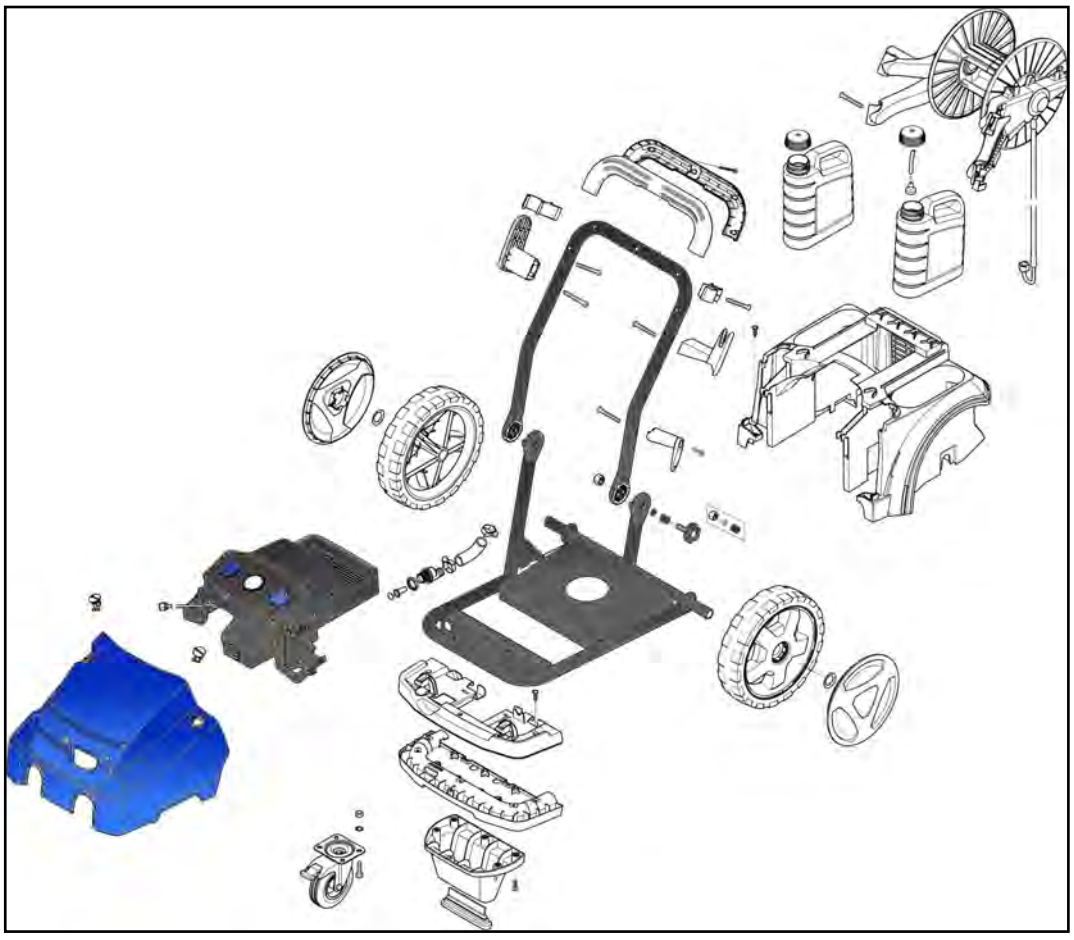
Item number: 107146773		MC 6P-120/1950 FA 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	115
Pressure p_{gun} @ Q_{nom}	bar	84
Retaining/opening pressure	bar	140 +5 / - 0
Flow Q_{nom}	l/min	30,5
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	15
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 1500
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	High Flow Spray Handle
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	89
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	-

Item number: 107146774		MC 6P-120/1950 FAXT 400/3/50 EU
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	120
Pressure p_{gun} @ Q_{nom}	bar	84
Retaining/opening pressure	bar	140 +5 / - 0
Flow Q_{nom}	l/min	30,5
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	400V/3ph/50Hz
Current @ V_1	A	15,5
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 1500
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	High Flow Spray Handle
Lance primary/secondary	-	101406108/101406119
High pressure hose	-	DN10 x 15m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 16
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	96
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	-

Item number: 107146775		MC 6P-120/1950 FA 230-400/3/50 NO
Service manual data		
PUMP:		
Pressure p_{pump} @ Q_{nom}	bar	115
Pressure p_{gun} @ Q_{nom}	bar	84
Retaining/opening pressure	bar	140 +5 / - 0
Flow Q_{nom}	l/min	30,5
Suction height dry	m	1
Suction height primed	m	2,5
Pump type	-	NA6
Number of pistons	-	4
Pump piston type	-	Full Ceramic
Cylinder stroke	mm	0
Pump oil type	-	Castrol Alphasyn T 150
Pump oil amount per pump	l	0,95
ELECTRIC:		
Electrical data	V/ph/Hz	230V/3ph/50Hz
Current @ V_1	A	25
Current limiter	A	-
High voltage test voltage	V	1500
HV insulation resistance min.	MΩ	1
Earth circuit resistance max.	Ω	0,2
Speed	rpm	1450
Electric diagram item number	-	106420552
UNIT DATA:		
Nozzle Size	-	NT 1500
Max. inlet temperature (suction)	°C	50
Max. inlet temperature (primed)	°C	70
Max. inlet temperature (pressure fed)	°C	80
Max. water inlet pressure	bar	10
Min. water inlet pressure	bar	1
Max. ambient temperature	°C	40
Gun Type	-	High Flow Spray Handle
Lance primary/secondary	-	101406108/None
High pressure hose	-	DN10 x 10m - Black
Sound power typeplate	dBA	90
Vibration ISO 5349 Lance 1	m/s^2	<1,5; +/-1
Cleaning Impact	kg-force	
Fuse size	A	C 32
Protection Class	-	IPX5
Weight - Machine incl. standard acc.	kg	89
Size - Machine alone	LxWxH (mm)	775x570x1020
Detergent suction	% (+/-)	-

Overview MC 6P





MC 6P Cabinet & frame parts

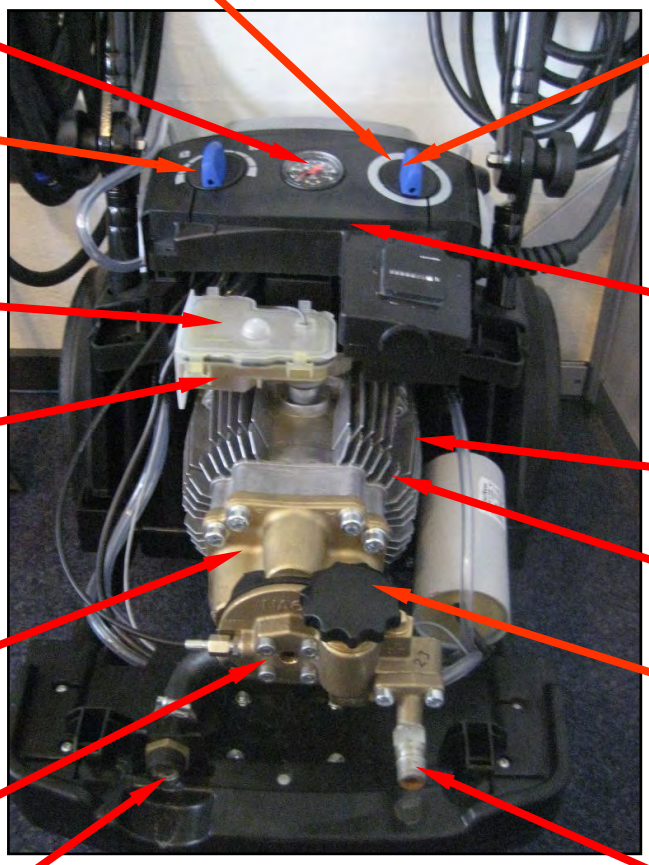
Overview MC 6P



”0” = Stop

”I” = ON

”M” = Manual. Manual means the Auto Start/Stop system is eliminated. This is used if the pump is used on suction and not on pressurized water supply.



Pressure gauge
Detergent valve
Pump oil lid
Pump oil container
Cylinder head
By-pass system
Water inlet/Filter
ON-OFF switch
Electrical box
D-bearing cover
Cylinder block
Water regulation
Water outlet

Overview MC 6P-120/1920FA



Lance holder top

Lance

Detergent Bottles

ON / OFF switch

Cabinet lock

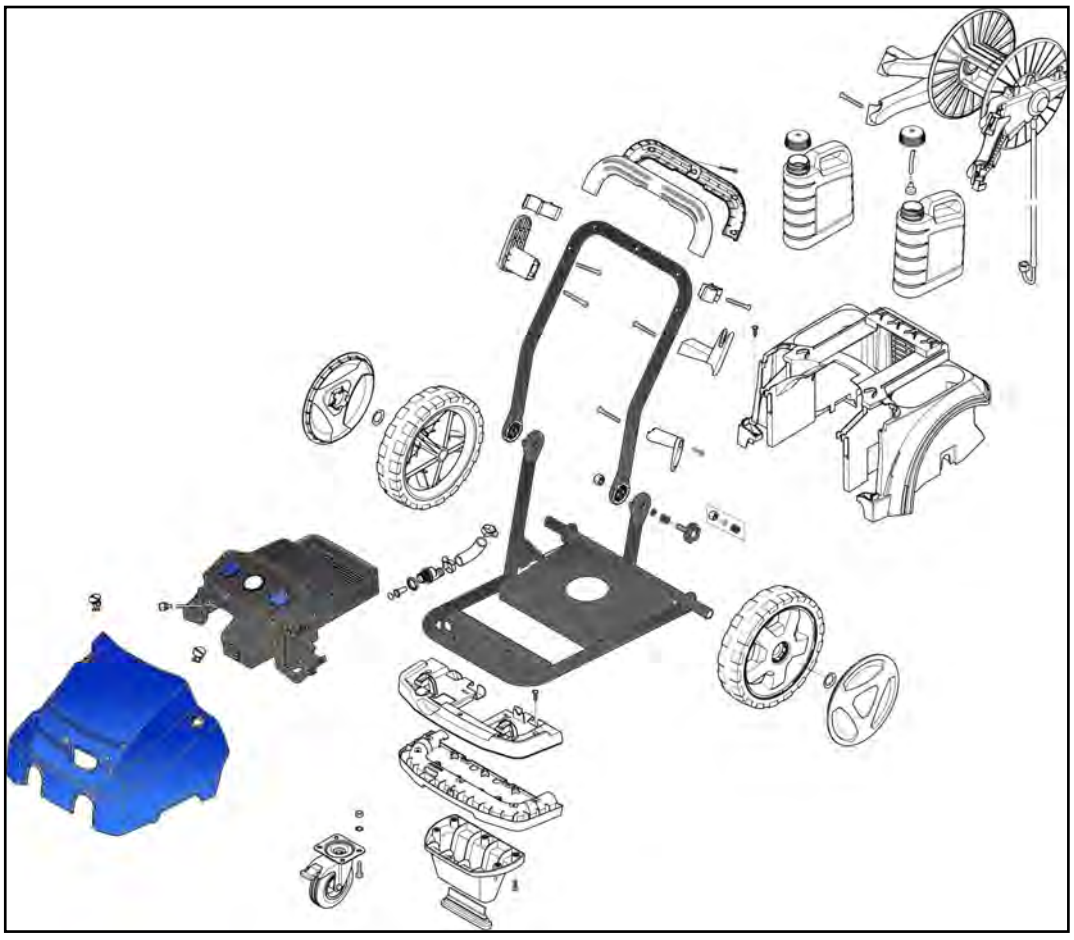
Water/pressure regulator

View for oil container

Lance holder bottom

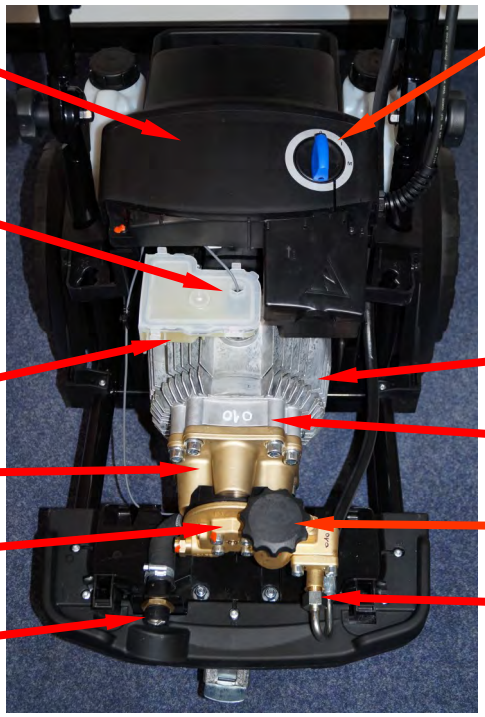
Water outlet.
In this case with hose reel, a HP hose is going from pump outlet to hose reel.

Water inlet + Filter



MC 6P Cabinet & frame parts

Overview MC 6P-120/1920FA

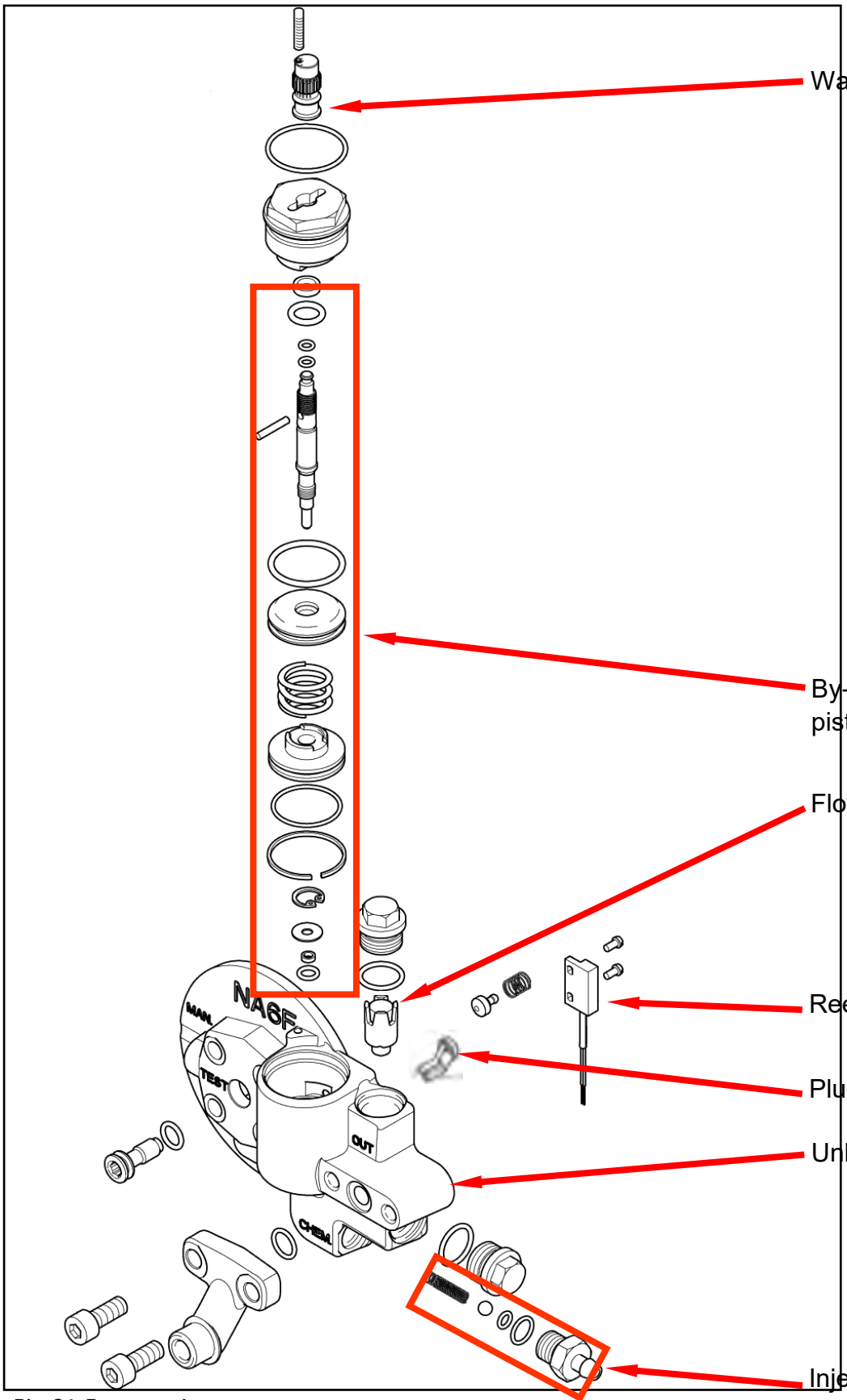


The main differences between the three MC 6P 120 bar models and the other models are.

The MC 6P 120 bar has….

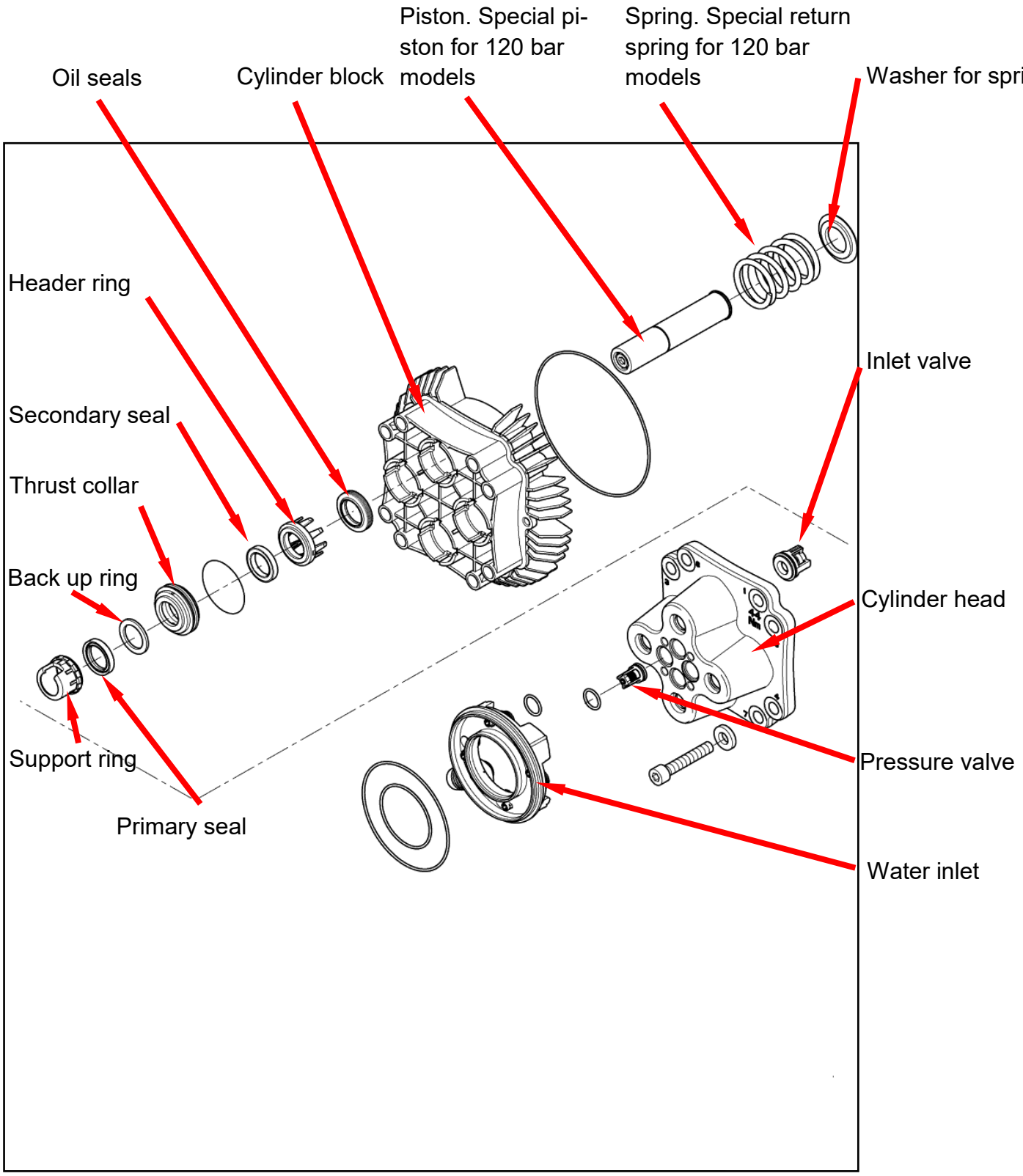
- No internal detergent system-
- No Manometer
- Higher water volume
- Lower pressure

MC 6P By-pass valve– FA Models

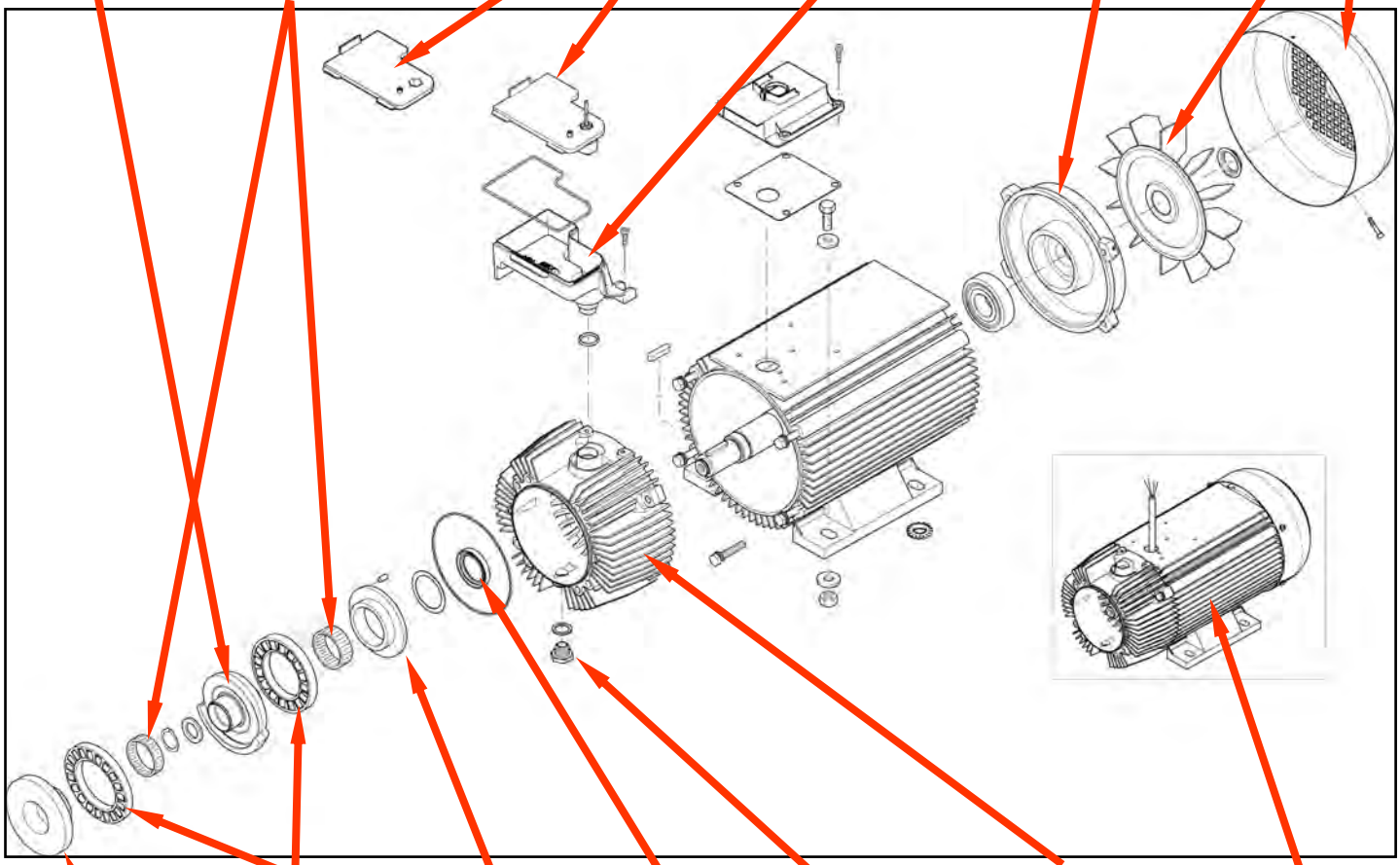


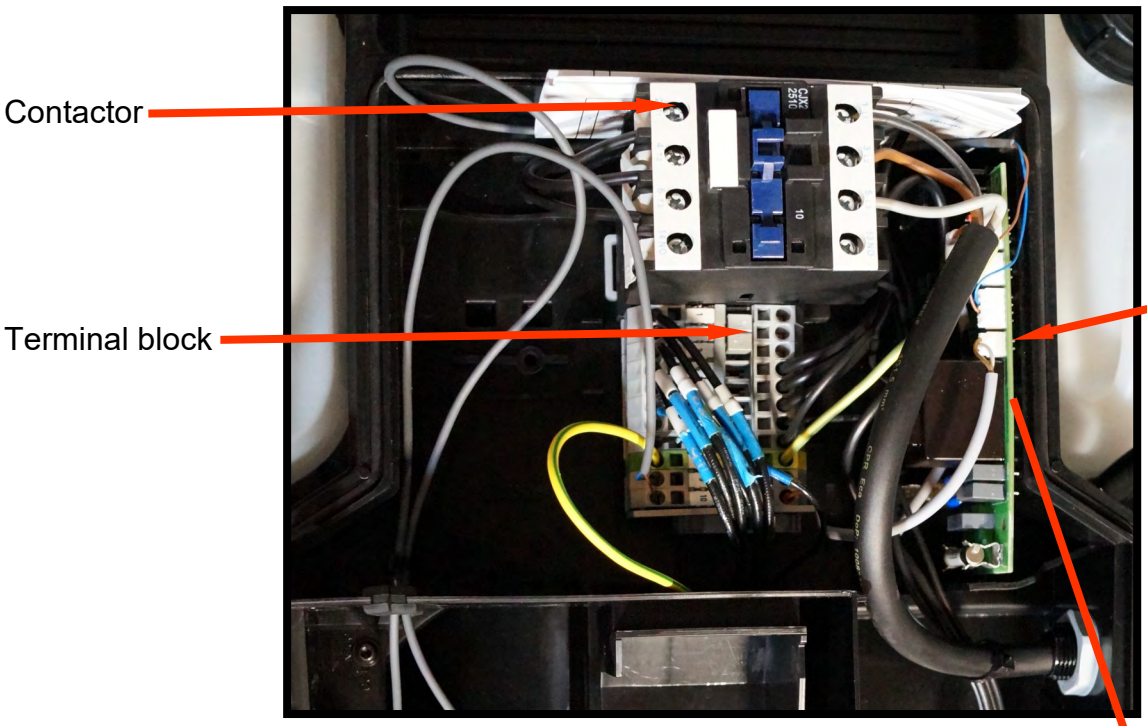
Pic. C4: By-pass valve

MC 6P Pump



Pic. C5: Pump parts

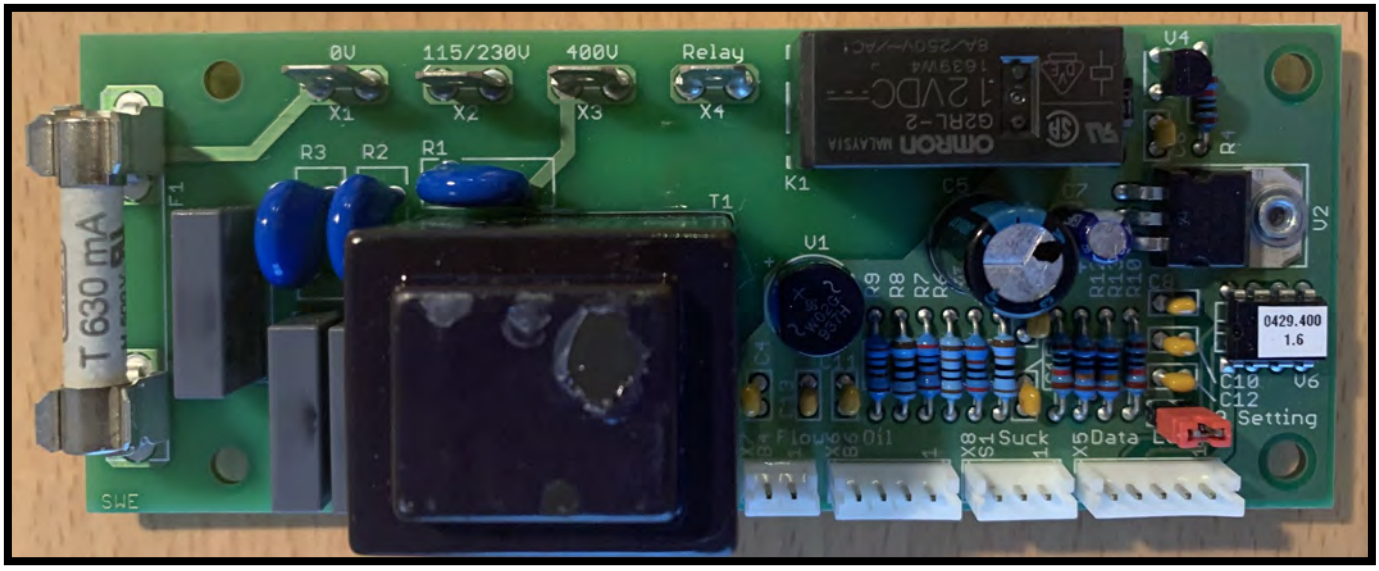

Fan cover
Lid for oil container
End bearing cover
Needle bearing
Wobble disc
Oil container
Fan
Cylindrical roller bearing
D-bearing cover
Bearing track
Bearing track
Oil seal
Oil plug
Motor complete


Contactor
Terminal block
PCBA

E-box


0V
115/230V
400V
Relay
X1
X2
X3
X4
R3
R2
R1
F1
T1
K1
V1
V4
U2
T 630 mA
SWE
0429.400
1.6
C10
C12
Setting
Suck
Data

PCB



Operation of MC 6P FA:

The PCB has following functions:

1. To start the motor when starting the machine.
2. To stop the motor when operation of the machine is finished.
3. To run the motor in by-pass for 20 sec. after water flow stop and B4 is ”low” (open).
4. To record and store data concerning the machine work stiuation, operation and by-pass.

The PCB is protected by a fuse (630 mA—slow) placed on the board.

Pre-conditions: Machine hooked up to adequate water and power supply.

Main switch S1 in position ”0” (OFF):

- There is main voltage at the terminal 1 and 2 on S1 and terminal 1,3 and 5 on K1, but no power on the PCB

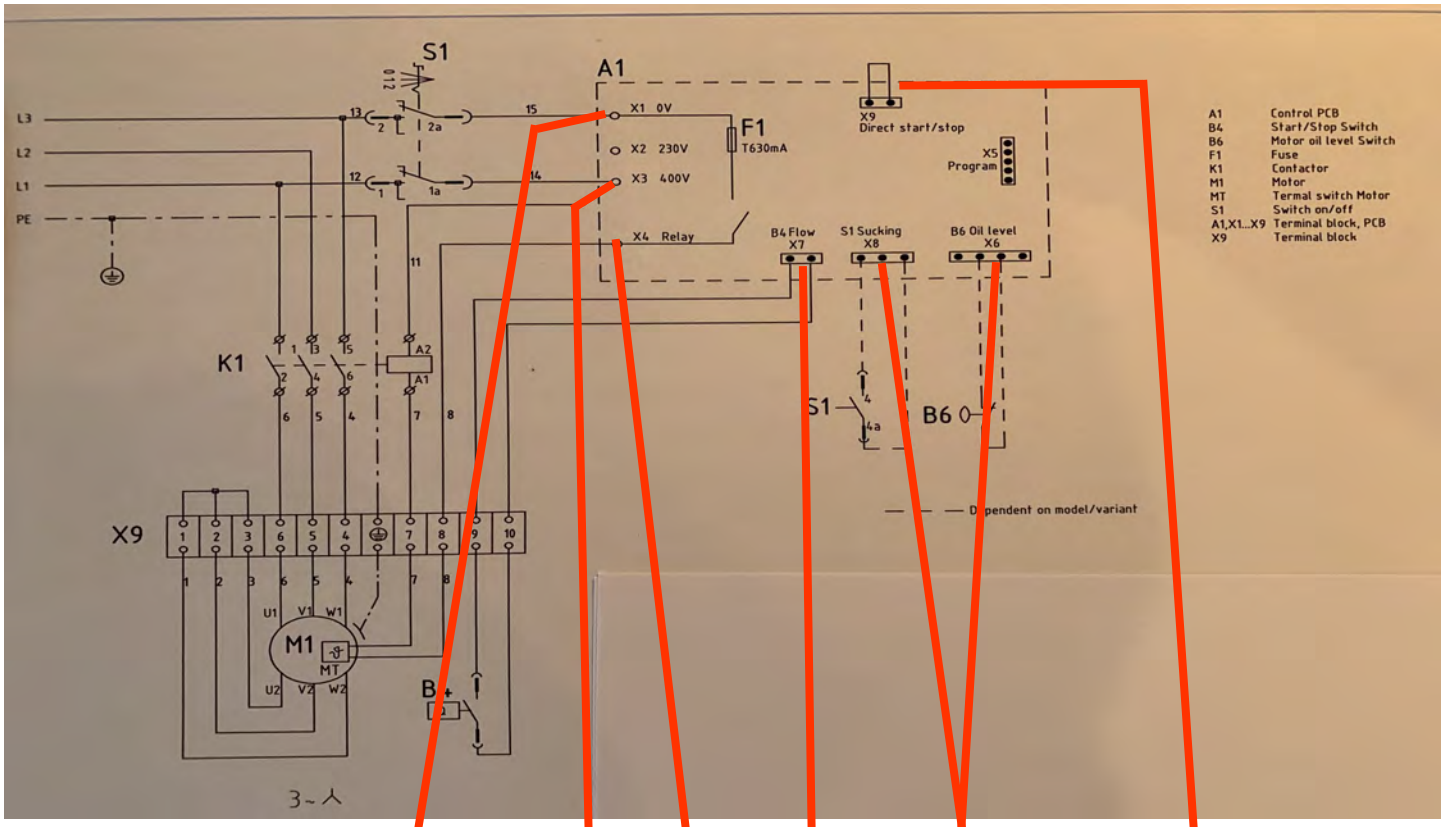
- Machine is still off.

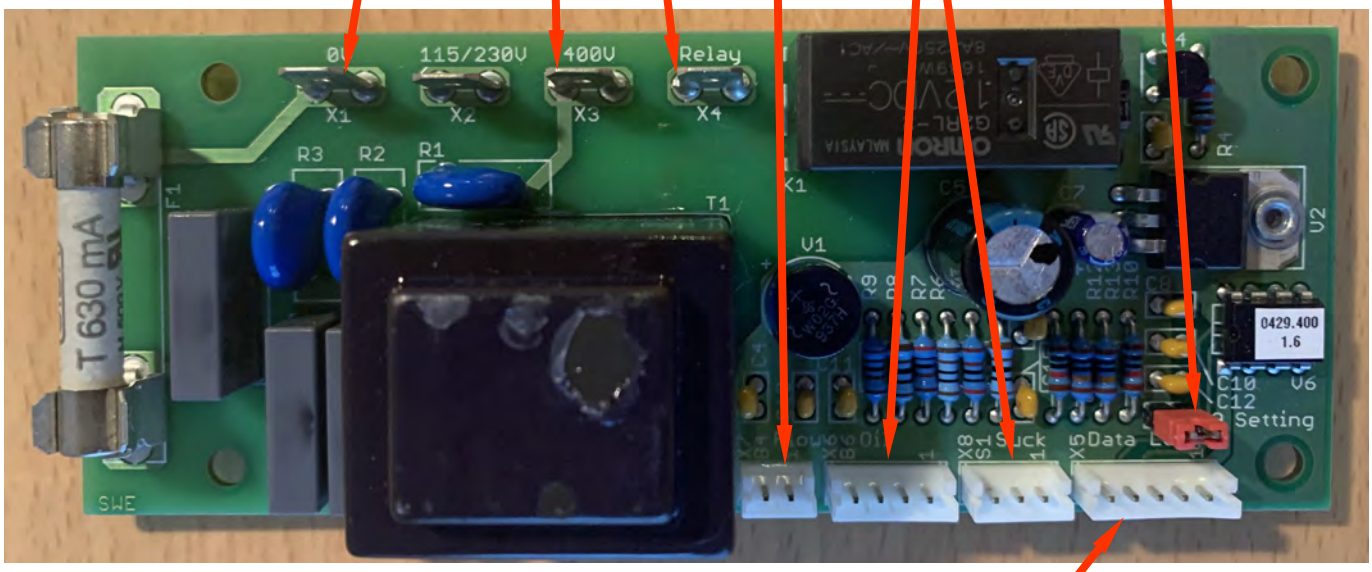
Main switch S1 turned into position ”1” (ON):

- Spray handle is closed; No water flow out of pump; if B4 is ”low” and MT (motor winding temp. below < 160°C or < 320°F) is closed, machine runs in by-pass for 20 sec. and stop.

- When the spray handle is activated there is a water flow out of the pump, because of the water inlet pressure (direct water supply). The flow piston is moved up by the water flow and is activating the reed switch B4 (goes high), and the PCBA powers the control power circuit with 24V AC. The contactor K1 is pulled by the contactor coil, and the motor starts, water flows out of pump.

- Closing spray handle. Working pressure increases, pump switch to by-pass mode and have no water flow - B4 goes ”low”, machine runs in by-pass for 20sec. and then stop.





Datalogger connection

By-Pass valve system MC 6P



By-pass valve components for the MC 6P models (not 120 bar models).

By-pass valve for MC 6P has internal injector system.

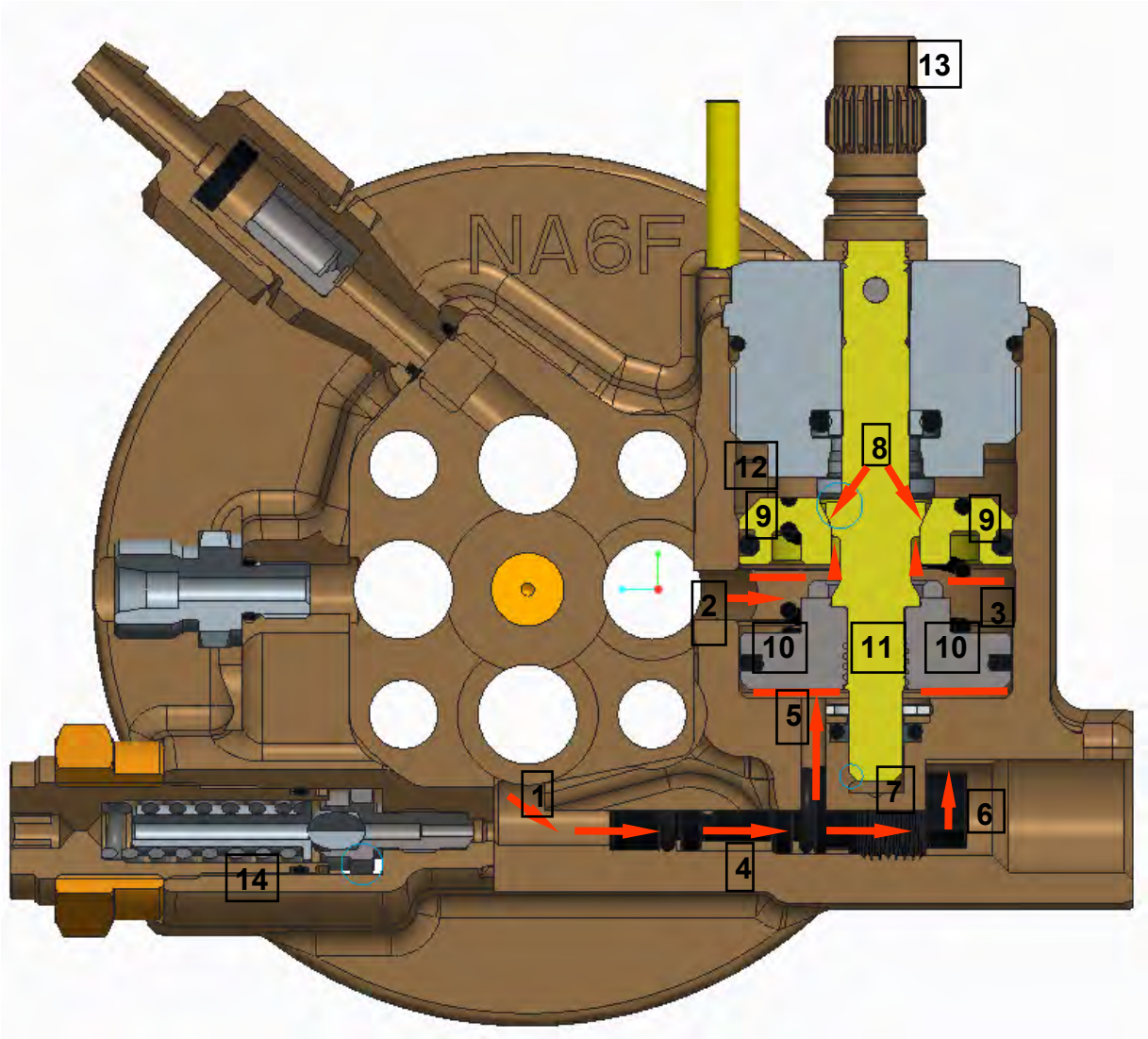
By-Pass valve system_MC 6P 120bar models



By-pass valve components for the MC 6P 120 bar models.

By-pass valve for MC 6P 120 bar models do not have internal injector system.

By-Pass valve system_MC 6P



By-pass valve components are shown in high pressure running mode.

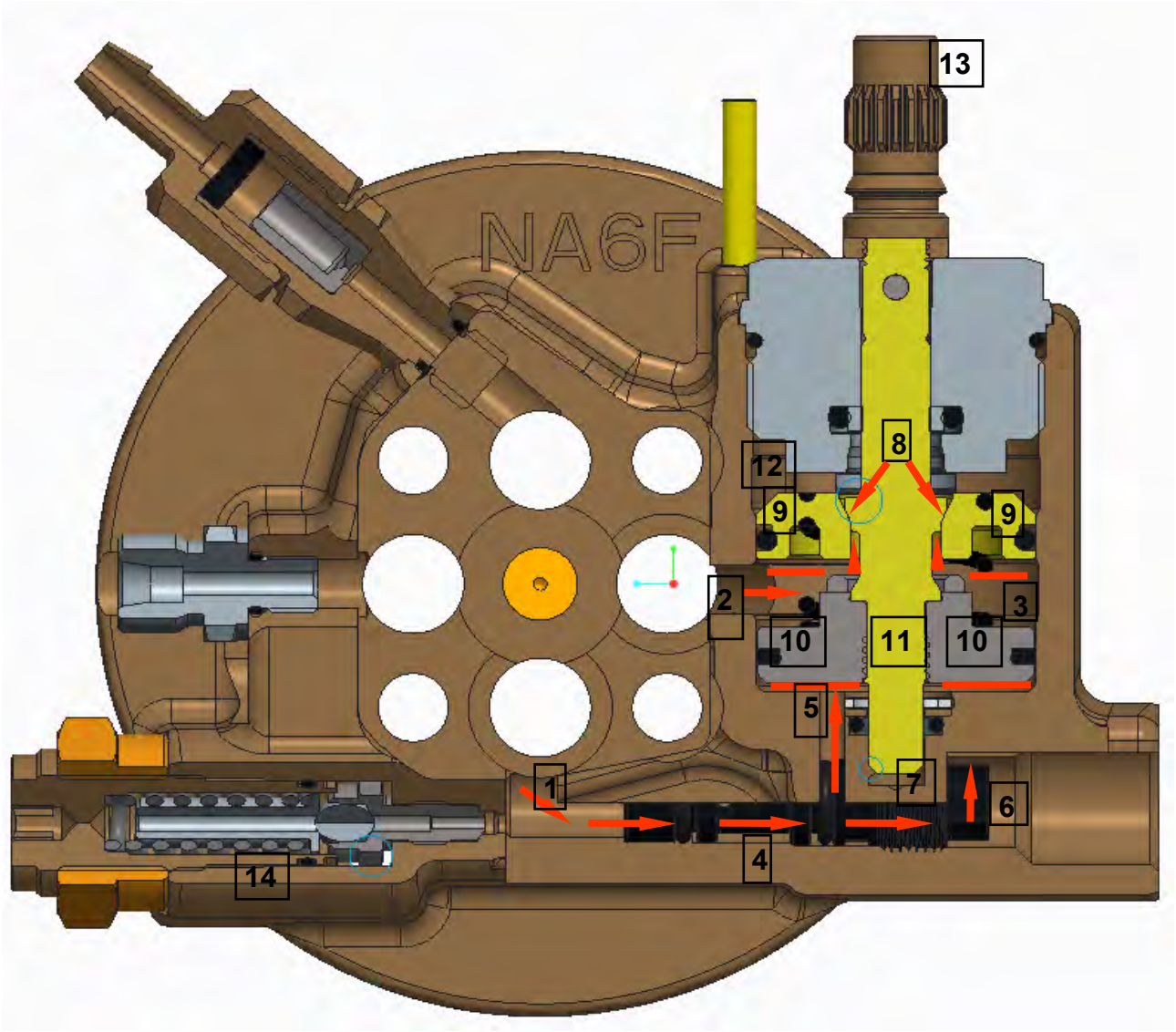
The water is flowing from the 4 pump pressure valves through the channel (1) to the injector nozzle (4) and also to the by-pass valve housing area (2 & 3) between the 2 pistons (9) and (10). Pos. (1,2, 3, 4, 5 and 6) is high pressure areas. Below the by-pass valve stem (11) there is water inlet pressure in the area marked (7) as this area is connected to the pump water inlet side through a small channel.

Area marked (8) is the valve cone and seat area. This is where the water/pressure is stopped from flowing from the pressurized side to the pump water inlet side. When the by-pass valve is in by-pass mode, the cone is lifted from the seat, and opens for water flow back to water inlet side. Pos. (9) is the by-pass valve upper piston which is in a fixed position during operation. Pos. (10) is the by-pass valve lower piston, which can move up and down. Pos. 11 is the by-pass valve stem, which can move up and down together with piston (10). Stem (11) and piston (10) are screwed together. Pos. (12) is the channel in which the water flows back to the water inlet side when pump is running in by-pass.

Pos. (13) is the water volume/pressure regulator.

Pos. (14) is the safety valve.

By-Pass valve system_MC 6P



By-pass valve function in high pressure running mode.

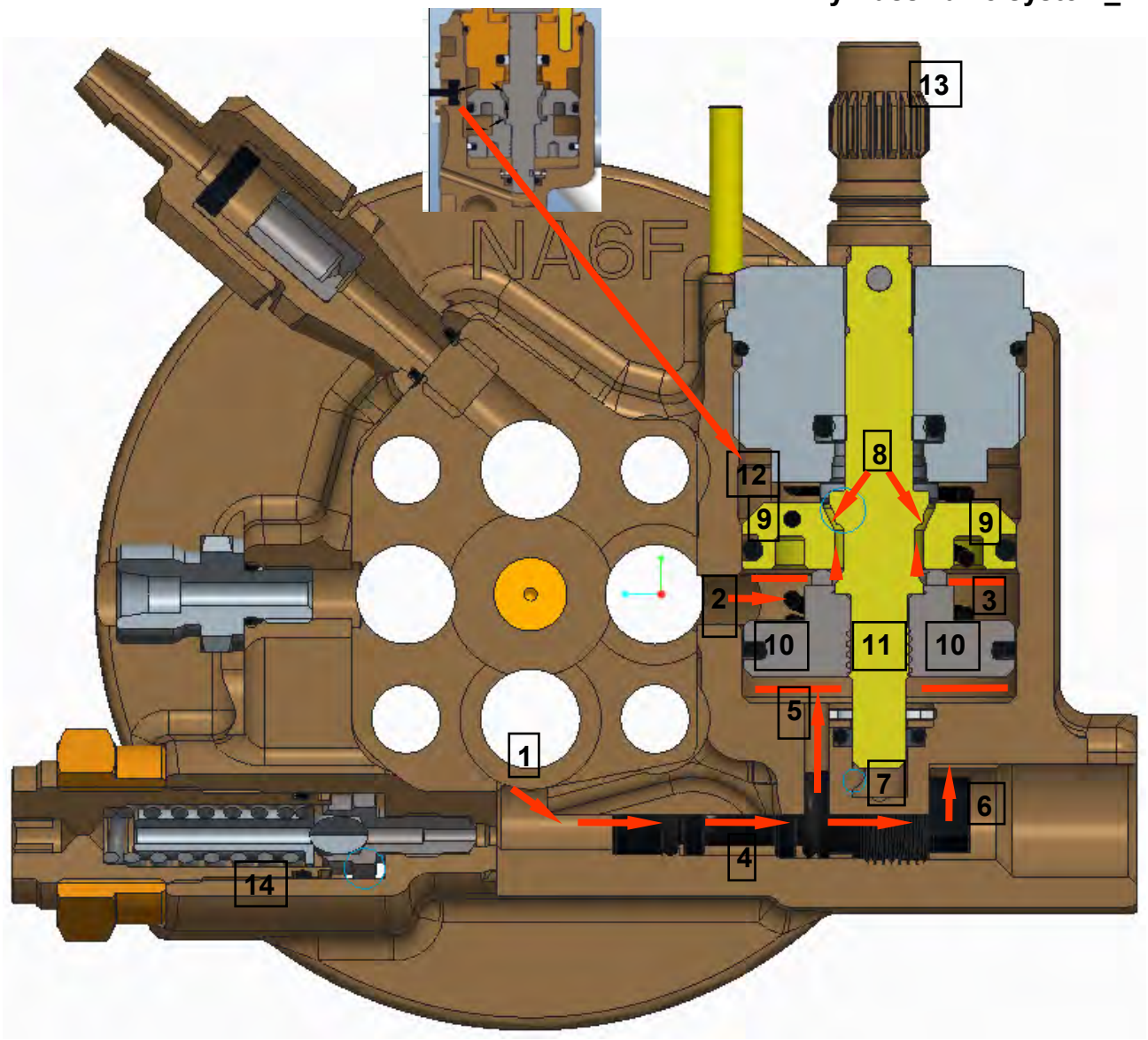
Motor is running, spray handle is open, water is flowing to the HP nozzle.

During operation there is high pressure at pos. 1,2,3,4,5,6. Water flows from the pressure valves (1) through the injector nozzle (4) to the outlet (6) and out to the HP nozzle in the lance.

The pressure in the by-pass valve is higher above piston (10) than below. The reason for that is water flowing through the injector nozzle. There is a pressure drop over the injector nozzle (restriction) which means pressure is lost—on purpose, so we can control the position of the stem/lower piston. (Higher pressure before injector nozzle than after) So the pressure in the channel/area (5) (below lower piston (10)) is lower than in area (2, 3). The higher pressure above piston (10), will push down the stem (11) against the seat (8), so water/pressure cannot escape between cone and seat—so all water volume is flowing out to the HP nozzle in the lance. Piston (10) is also moving down, as lower piston and stem is screwed together.

When the water regulator (13) is turned clockwise, the stem (11) and piston (10) will move up, and the cone will lift from the seat (8) and some of the water volume will flow back to the pump water inlet side. This means less water to the HP nozzle—equal lower pressure.

By-Pass valve system_MC 6P



By-pass valve function in by-pass mode.

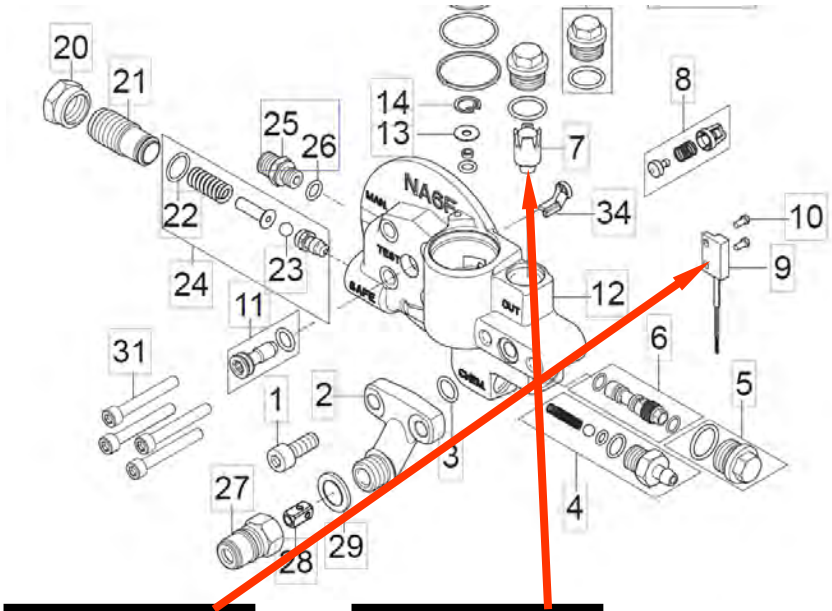
Motor is running, spray handle is CLOSED, water is NOT flowing to the HP nozzle.

Now the water flow in the bypass valve stop—no flow through the injector nozzle—so no pressure drop.

Now pressure builds up (spray handle is closed) until the setting of the safety valve (14) which opens shortly. When there is no pressure drop over the injector nozzle, the pressure in area (1, 2, 3, 4, 5, 6) will be the same. Because of a larger area on the lower side of piston (10) than on the upper side, together with the area on the stem (close to the cone/seat (8), the lower piston (10) together with the stem will move up.

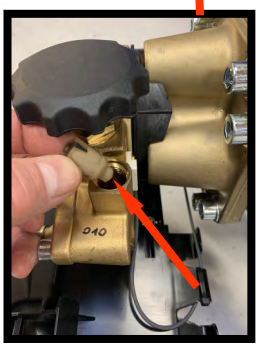
When these two components moves up, the cone will lift from the seat (8), and water can now flow through. Water is now flowing through a small valve in the by-pass channel (12) and back to the water inlet side of the pump. The purpose of this small valve is two things—to help creating correct by-pass pressure, and to make it possible to suck water with the pump.

Flow Switch system





Reed Switch

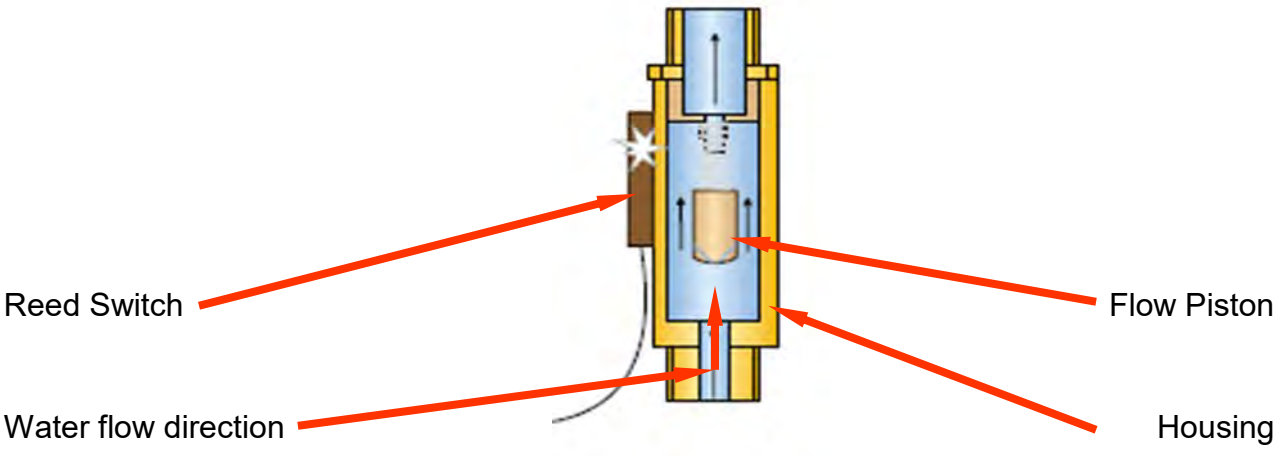


Flow Piston

The Reed Switch is an ON/OFF switch. Reed Switches can be N/O (normally OPEN) or N/C (normally CLOSED. In this model it is a N/O switch

When a magnet comes close to the Reed Switch it either closes or opens.

A flow switch consists of a Housing, Reed Switch, Piston with Magnet, and (in some cases) a return spring for the piston.
When water is flowing through the flow switch the piston is moved towards the reed switch. When the piston with magnet reaches the reed switch, the reed switch closes (or opens) and gives a signal to the control (PCBA) of the machine.
When there is no flow through the flow switch, the flow piston will in this MC 6P design drop down due to gravity and the piston moves away from the reed switch and the reed switch will open and break the circuit. This signal is send to the control PCBA.
It takes 20 sec. after the reed switch opens until the motor stops—equal “by-pass time”.



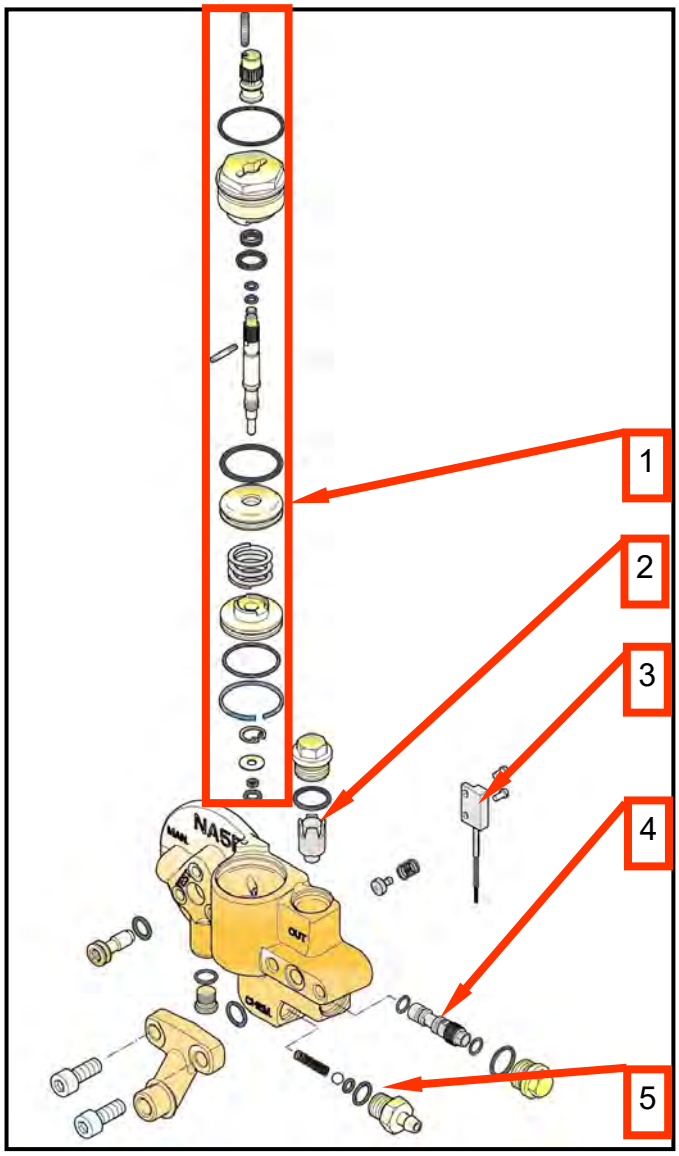
General failures

Fault	Cause	Remedy
Pressure drop	- Air in the system. - High pressure nozzle blocked / worn. - Pressure control on the spray lance is not set correctly. - Detergent container empty. - Water inlet temperature too high.	• Vent the system by operating the spray gun several times at short intervals .If necessarly operate the cleaner for a short time without the High pressure hose connected. • Clean / replace the high pressure nozzle. • Set the required working pressure. • Change container or close detergent valve. • See technical data part ”B”.
Pressure fluctuations	- Lack of water - Water inlet hose is too long or its cross-section too small. - Lack of water caused by blocked water filter. - Lack of water because max. permissible suction height has not been heeded. - Pump sucks in air (suction mode)	• Open water tap. • Use specified water inlet hose(Refer to user manual). • Clean the water filter in the water connection. (Never work without water filter). • See technical data part ”B” • Check that the suction set is air tight.
The motor does not start when the cleaner is switced on.	- The plug is not inserted properly, i.e. there is no current. - The main fuse is switced off.	• Check the plug, lead and switch.If necessary have them replaced by a trained electrician. • Switch on the main fuse.

General failures

Fault	Cause	Remedy
When the cleaner is switched on the motor buzzes without starting.	– The main voltage is too low or there is a phase failure (3 ph model). – The pump is blocked or frozen. – Incorrect cross-section or lenght of the extension lead.	• Have the electrical connections checked. • Pump needs service (see part ”F”). • Use lead with correct cross section and length.
The motor switches off.	– The overload protection has been activated due to overheating or overloading of the motor. – High pressure nozzle is dirty.	• Check that the main voltage and the cleaner voltage are the same. Switch off the cleaner and allow it to cool for at least 3 minutes. • Change the high pressure nozzle.
Cleaner starts / stops by itself.	– Leakage on high pressure side.	• Locate the leak and repair it. (See next page).
No detergents drawn in.	– Injector is dirty or suction hose is blocked. – Detergent container empty. – The cap on the nozzle is not set at low pressure.	• Clean. • Top up/change the container. • Turn cap of the FlexoPower nozzle towards ”CHEM” up to the stop.
Working pressure too low. Working pressure too low and loud noise comming from pump .	- Suction - and pressure valves leaking. - Piston U-sleves in pump worn. - Piston stocked in pump.	• Replace parts. • Check pump for damaged parts — demount and reassemble pump housing with the right

By-pass valve failures NA6 (NA5)



Pic. E1: By-pass valve..

Symptom: Machine doesn't start when activating the spray gun.

Cause: Defective reed switch (3) or stocked flow piston (2).

Remedy: Replace defective parts.

Symptom: Irregular working pressure.

Cause: Injector nozzle (4) is worn.

Remedy: Replace injector nozzle.

Symptom: Low working pressure

Cause: By-pass valve kit (1) worn and leaks water.

Remedy: Replace By-pass valve kit.

Symptom: Suction inlet for detergent leaks water. Water flowing back to detergent tank.

Cause: Non return valve (5) defective.

Remedy: Replace non return valve.



Tool List for NA6 MPU

Pump

Description	Tool	Torque
By-pass Valve FA		
4 M8 screws for unloader valve	Unbracho 6	20 Nm
2 M8 screws for outlet fitting	Unbracho 6	20 Nm
Plug for flow switch	NV14	14 Nm
Opening pressure valve	NV22	20 Nm
Adjustment screw	Unbracho 6	N/A
Plug 1/8" (only for NA5	Unbracho 4	10 Nm
Plug for control piston	NV30	40 Nm
Test Screw	Unbracho 6	14 Nm
Plug for venturi tube	NV14	14 Nm
Detergent studs	NV 17	20 Nm
Venturi	NV 8	1,4 Nm

Cylinder Head		
8 M10 screws for pump assy	Unbracho 8	30 Nm
Thrust collar	Screw driver	N/A
Outlet valves	Pull out tool	N/A
Inlet valves	Mandrel and hammer	N/A
Primary seals	ø24 Seal tool	N/A
Cylinderblock		
2 M6 service screws	Unbracho 5	10 Nm
Oil seals	Ring and hammer	N/A
Wobble disc assy		
Lock ring	Lock ring pliers	N/A

Motor

D-bearing cover		
4 M8 screws for D-bearing cover	Unbracho 6	20 Nm
Oil plug outlet	NV24	40 Nm
Fan		
4 screws for fan cover	Screw driver *	1 Nm
Lock ring	Pliers	N/A
Fan		N/A
N-bearing cover		
4 M8 screws for N-bearing cover	Unbracho 6	20 Nm



Pic. F1: Machine ID Plate

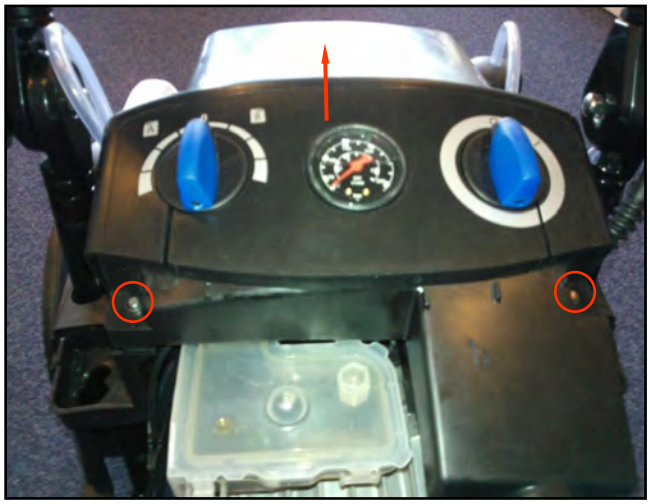
- Identify the machine version at the dataplate.
- Find the techincal data for the machine version in this manual chapter ”A”.



Pic. F2: Cabinet

The cabinet is disassembled by turning the two lock screws (1) on top of the cabinet.

Open the cabinet and pull forward.



Pic. F3: E– box

The lid for the electrical box is assembled with

2 x torx T20 screws.

Remove the screws and push the lid back-wards to open the E-box.



Pic. F4: Oil container

The oil container is assembled to the pump by the 2x Torx 20 screws.



Pic. F7: Valve housing

- Disassemble the valve housing from the cylinder block by the 8 bolts.
- Be aware of the o-rings and valve parts.



Pic. F8: Thrust collar

- Be carefull not to damage the surface inside when disassembling the thrust collar.
- Inspect the thrust collar for damages before assembling.



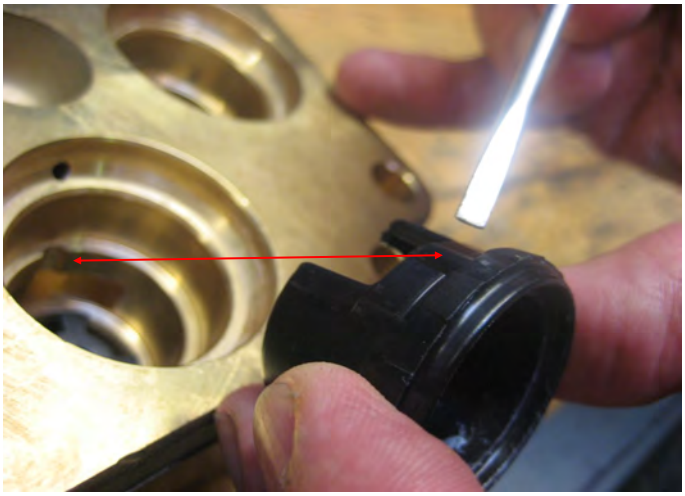
Pic. F9: Cylinder head

- Carefully tip out the sleeves with an adequate puller or screwdriver and replace them. Be careful not to scratch the surface.



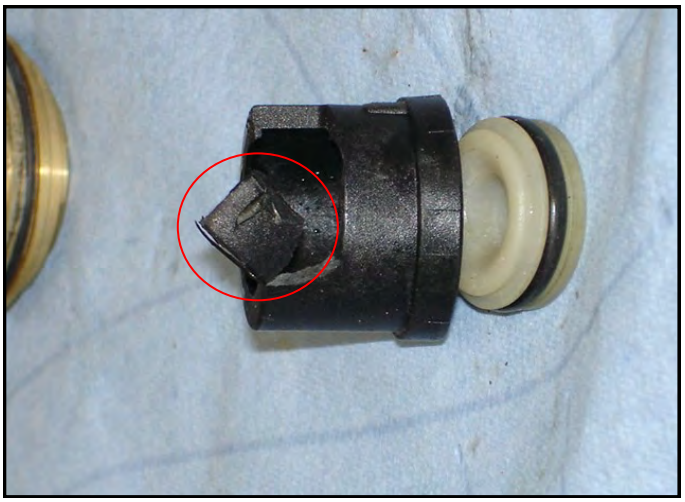
Pic. F10: Cylinder head

Suction valves



Pic. F.11: Header ring

Assemble header ring in right position. Knob on header ring must be placed in groove in cylinderhead. Drop —do not knock it into the right position.



Pic. F12: Header ring

If the header ring is mounted wrongly and not according to instruction, there is a big risk of damaging the header ring and parts of it will block pistons and valves in the pump or get stucked in the non return valve in the unloader.



Cylinder head bolts

IMPORTANT:

Cylinder head bolt Torque:

Step 1: Tighten bolt 1-8 with 20 Nm

Step 2: Tighten bolt 1-8 with 30 Nm

Step 3: Re-tighten ALL bolts with 30 Nm

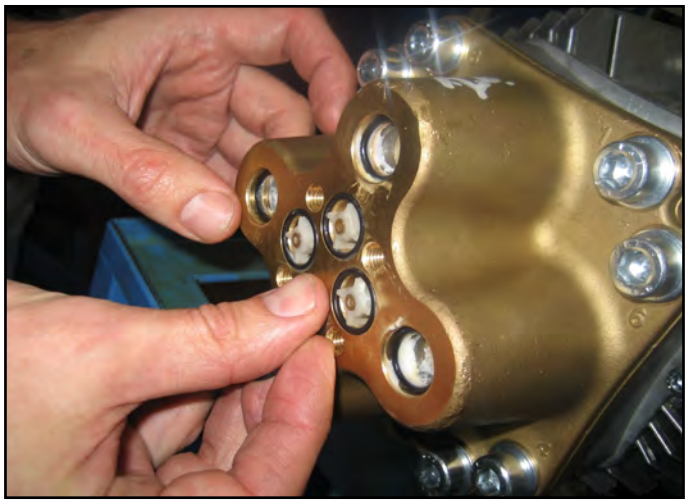
IMPORTANT:

Cylinder head bolt Torque:

<u>Bolts must be tightened in a criss-cross sequence.</u>

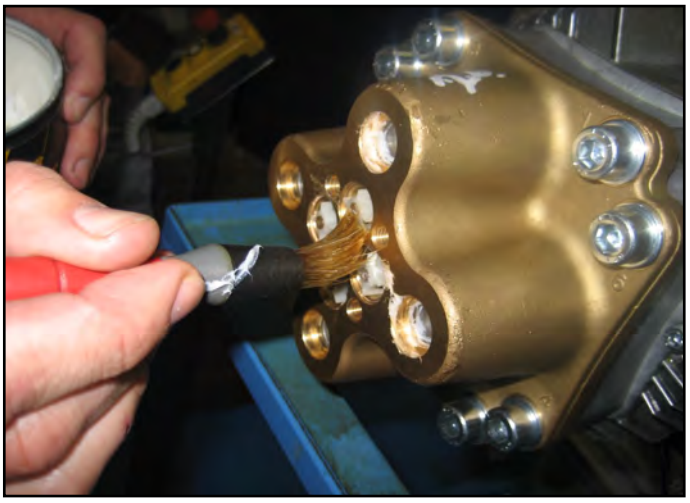
(Bolts are marked with number 1-8 in the pump head).

Pump valves



Pic. F14: Pressure and suction valves

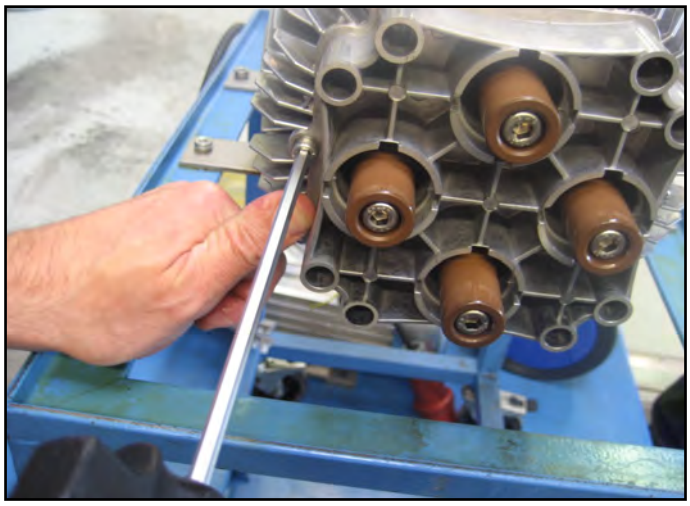
- The pressure valves can easily be taken out of the cylinder head.
- Replace with new parts if necessary.



Pic. F15: Pressure and suction valves

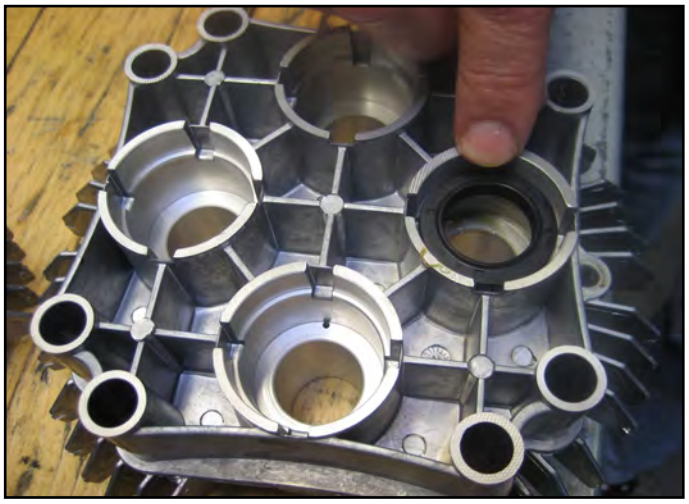
- Lubricate by replacement of valves

Cylinder Block



Pic. F16: Cylinder block

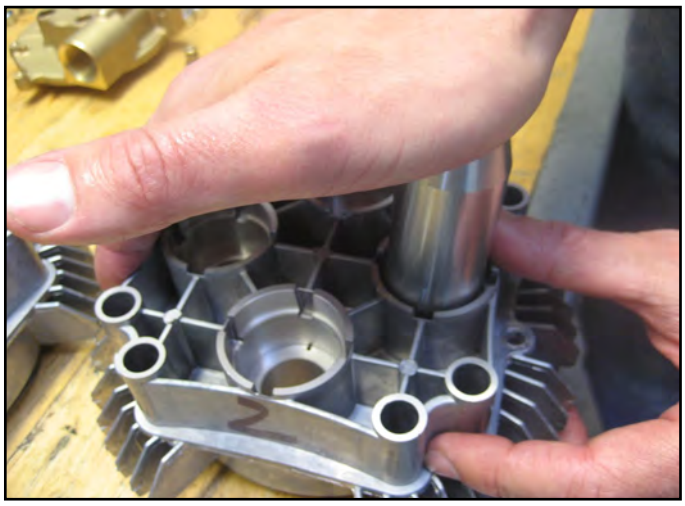
- Removal of cylinder block



Pic. F17: Oil Seals

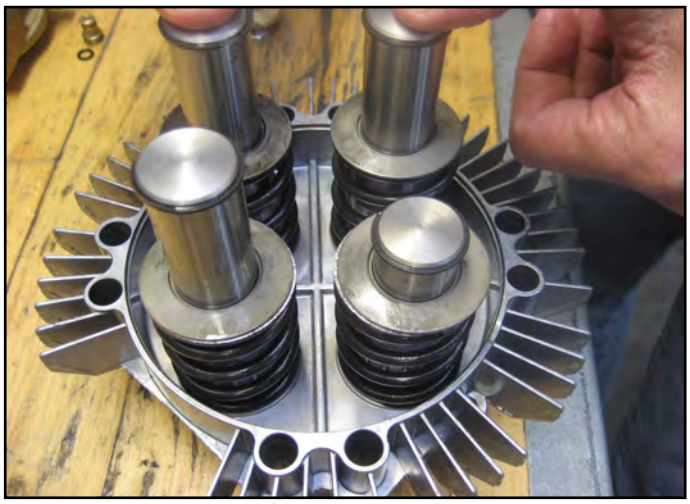
- Disassemble the oil sleeves using an adequate puller or a screwdriver.
- Be careful not to damage the surface of the cylinder block.

Oil seals and pistons



Pic. F18: Oil seals

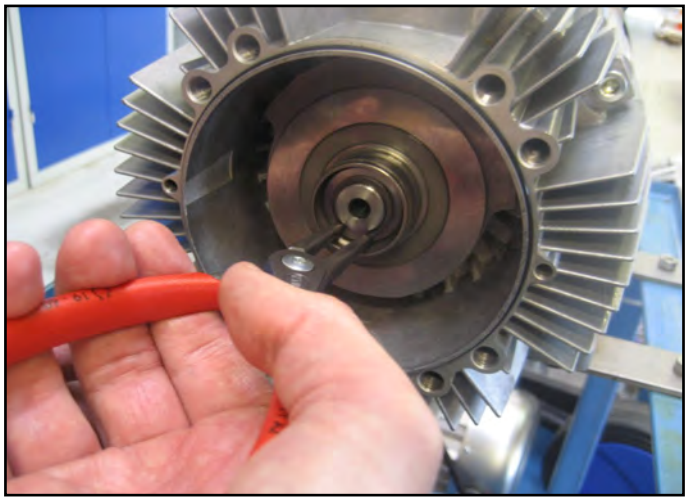
- To make replacement easier moisten the sleeves with soapy water.
- Assemble the sleeves using a box spanner.



Pic. F19: Pistons

- Place seals, pistons and springs as shown.

Wobble disc



Pic. F20: Wobble disc

- The woble disc is fastend to the motor shaft with a circlip.



Pic. F21: Wobble disc and bearings

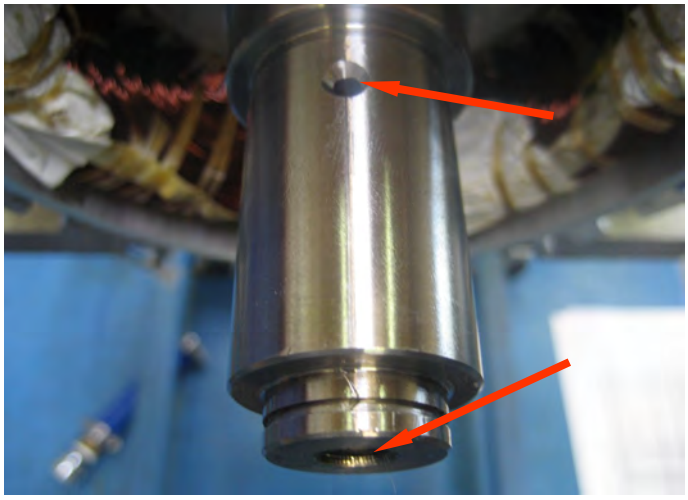
- Overview of the woble disc parts inside the D- bearing cover.

D-bearing cover



Pic. F22: D-bearing cover

- The D-bearing cover is mounted to the Motor by four 6mm bolts.
- When the bearing is damaged, always replace the complete D-bearing cover.



Pic. F23: Motor shaft

- Motor shaft with lubrication holes—for better lubrication of the woble disc system.
- Make sure to clean the lubrication channel through the 2 holes (see arrows above).



Pic. F24: D-bearing cover

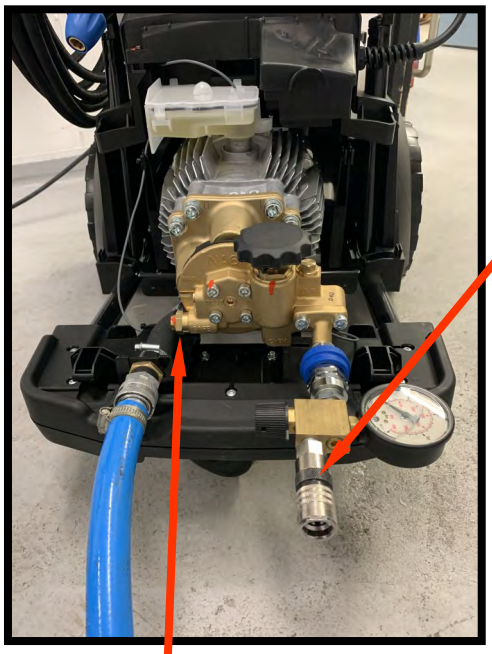
- Overview of the D-bearing cover with bearing and bearing track.



Pic. F25: Woble disc system

- Assemble of complete woble disc system.

Safety valve adjustment



Safety valve

Use a 6 mm Allen key and a 22 mm wrench to adjust the safety valve

Test manometer—1206358. Use adaptor 1220126 for connecnting the HP hose to the test manometer.

Adjustment procedure.

The safety valve factory setting for opening pressure is working pressure +25 to +30 bar.

Adjustment procedure for safety valve.

Connect machine to water supply, and mount test manometer with FULL OPEN valve on machine outlet coupling.

Make sure water volume regulator is set to full water volume (fully counterclockwise)

Mount high pressure hose with spray handle and lance on test manometer. MAKE SURE high pressure nozzle is new / OK. Check you have the correct pressure shown on the MAHCINES manometer. (Same pressure as written on the machine ID plate).

Read the working pressure on TEST MANOMETER.

Dismount high pressure hose from test manometer

Start pump with fully open valve on test manometer, and SLOWLY close the valve on test manometer.

Read the opening pressure on the test manometer. Opening pressure must be between 25—30 bar higher than the normal working pressure you read on the test manometer. (Opening pressure is the max. pressure you reach just before the pressure drops)

Adjust safety valve with 6 mm Allen Key, after loosen the counter nut with a 22 mm wrench

Turn clockwise for higher opening pressure, and counterclockwise for lower opening pressure.

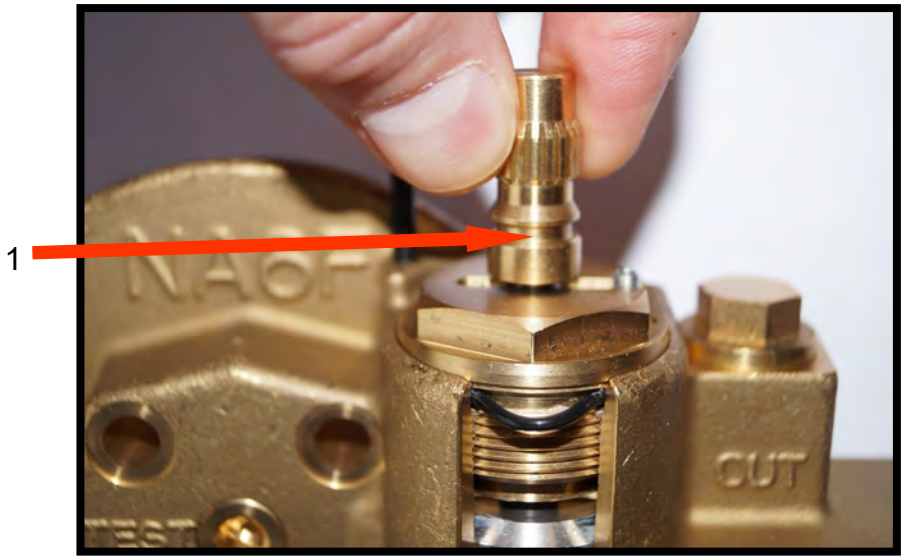
Opening pressure must never exceed 250 bars.

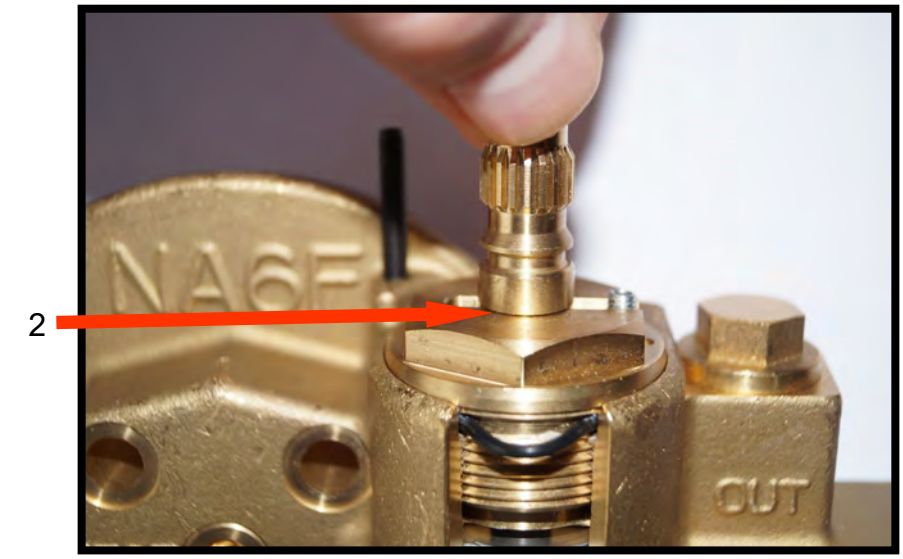
Water regulator adjustment

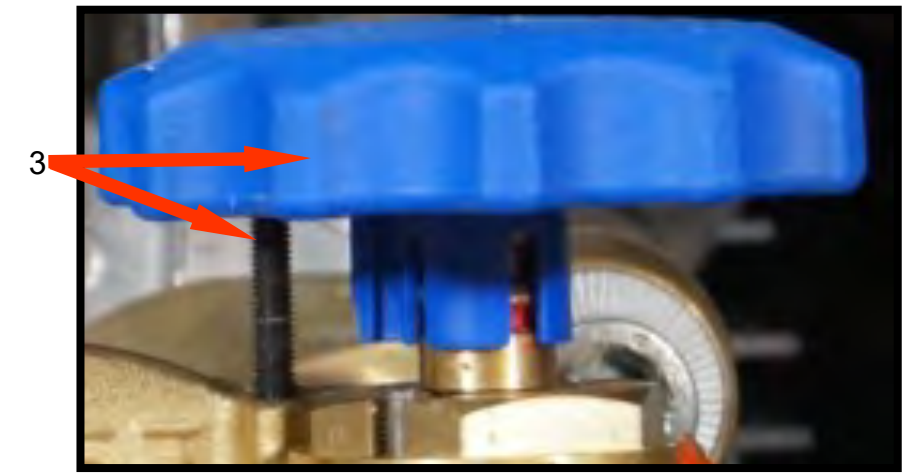
With dismounted blue handle for the water regulator, and machine without pressure do the following to adjust the water regulator:

Turn gently the small brass shaft (1) counterclockwise until it JUST touches the surface of the plug (2)

Push down the blue handle (3)on the top of the shaft, and position it so the handle stop is positioned on front of the screw (3) (when looking at the picture below)







Tool List for NA6 MPU

Pump

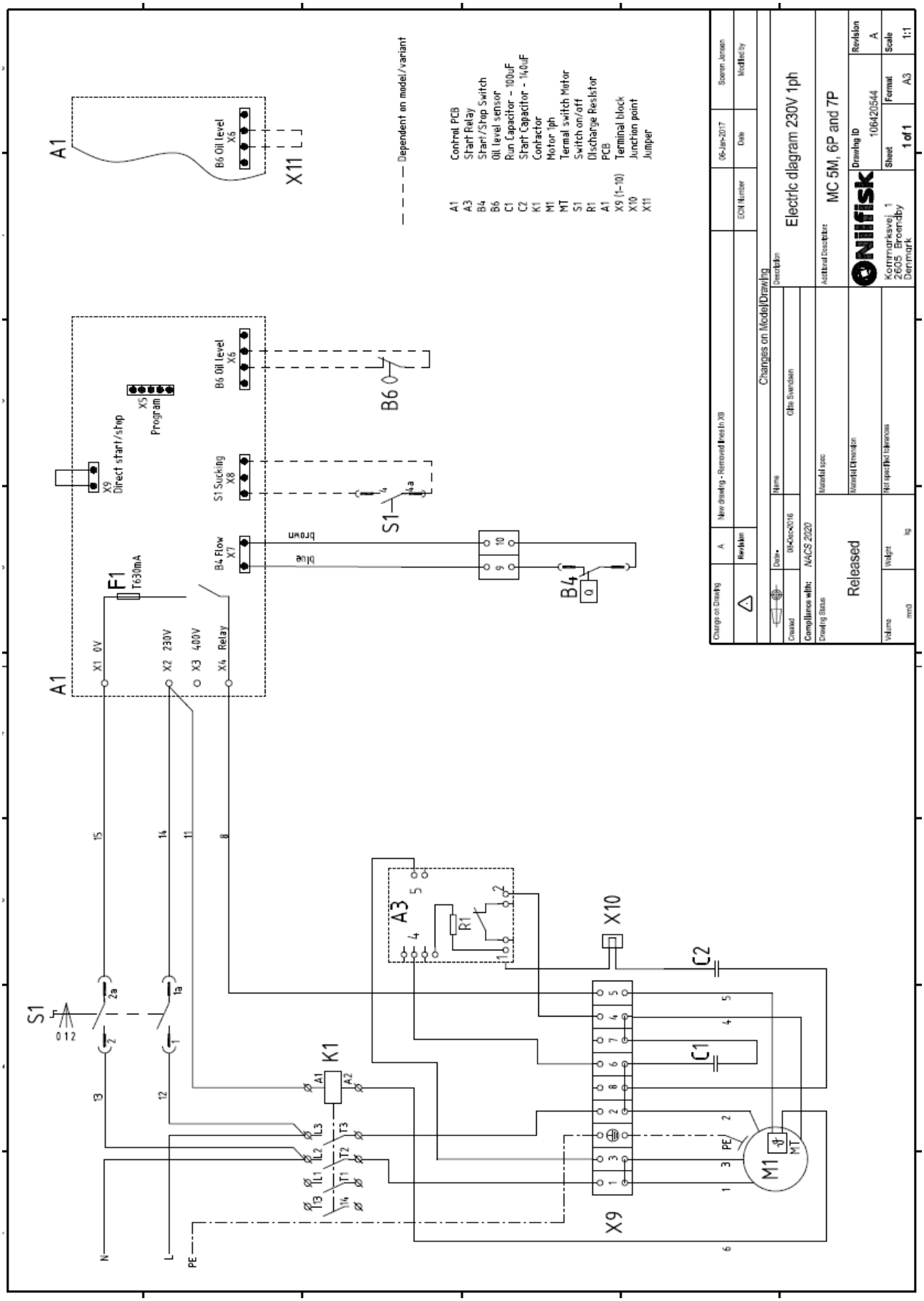
Description	Tool	Torque
By-pass Valve FA		
4 M8 screws for unloader valve	Unbracho 6	20 Nm
2 M8 screws for outlet fitting	Unbracho 6	20 Nm
Plug for flow switch	NV14	14 Nm
Opening pressure valve	NV22	20 Nm
Adjustment screw	Unbracho 6	N/A
Plug 1/8" (only for NA5	Unbracho 4	10 Nm
Plug for control piston	NV30	40 Nm
Test Screw	Unbracho 6	14 Nm
Plug for venturi tube	NV14	14 Nm
Detergent studs	NV 17	20 Nm
Venturi	NV 8	1,4 Nm

Cylinder head		
8 M10 screws for	Unbracho 8	30 Nm
Thrust collar	Screw driver	N/A
Outlet valves	Pull out tool	N/A
Inlet valves	Mandrel and hammer	N/A
Primary seals	ø24 Seal tool	N/A
Cylinderblock		
2 M6 service screws	Unbracho 5	10 Nm
Oil seals	Ring and hammer	N/A
Wobble disc assy		
Lock ring	Lock ring pliers	N/A

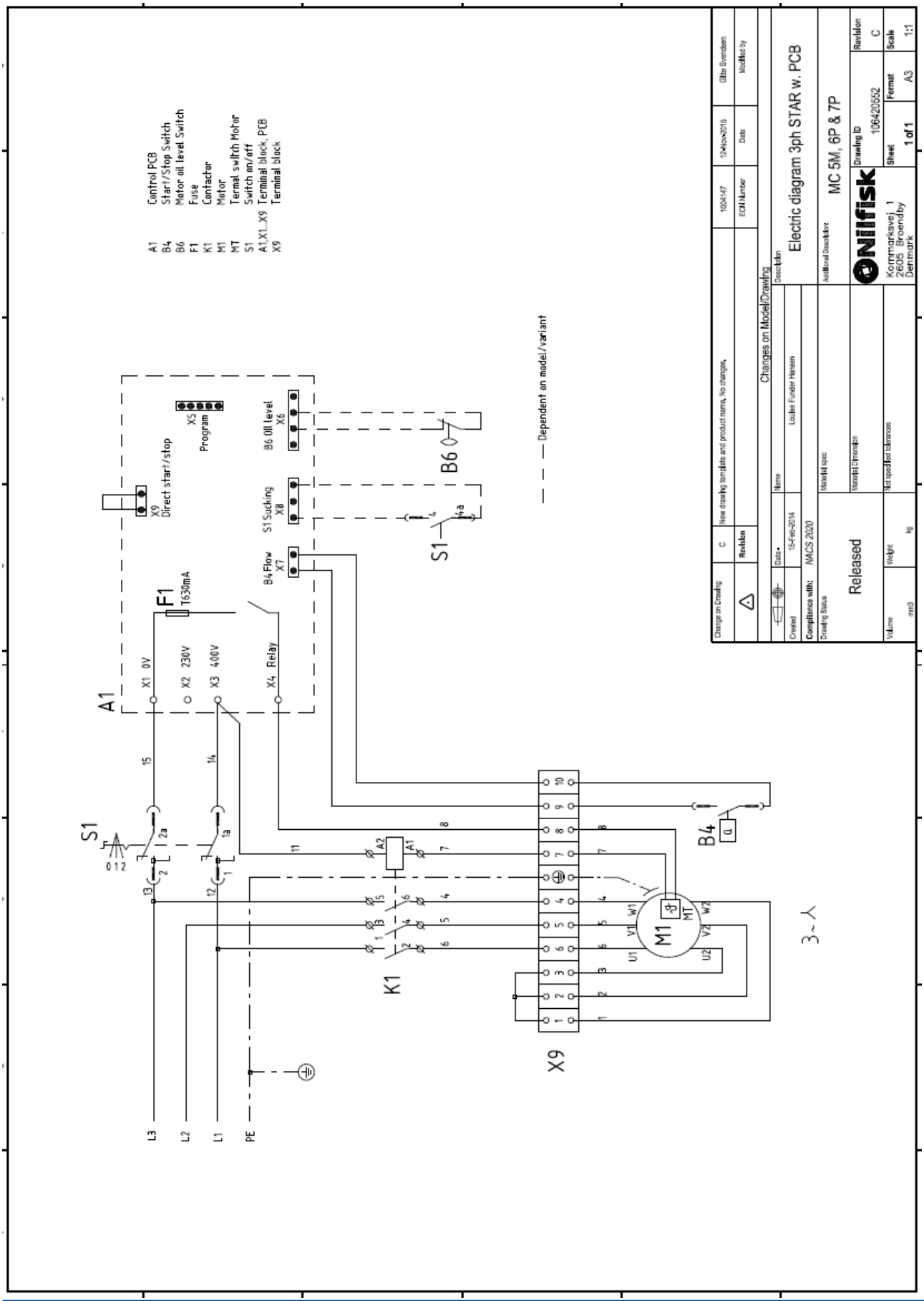
Motor

D-bearing cover		
4 M8 screws for D-bearing cover	Unbracho 6	20 Nm
Oil plug outlet	NV24	40 Nm
Fan		
4 screws for fan cover	Screw driver *	1 Nm
Lock ring	Pliers	N/A
Fan		N/A
N-bearing cover		
4 M8 screws for N-bearing cover	Unbracho 6	20 Nm

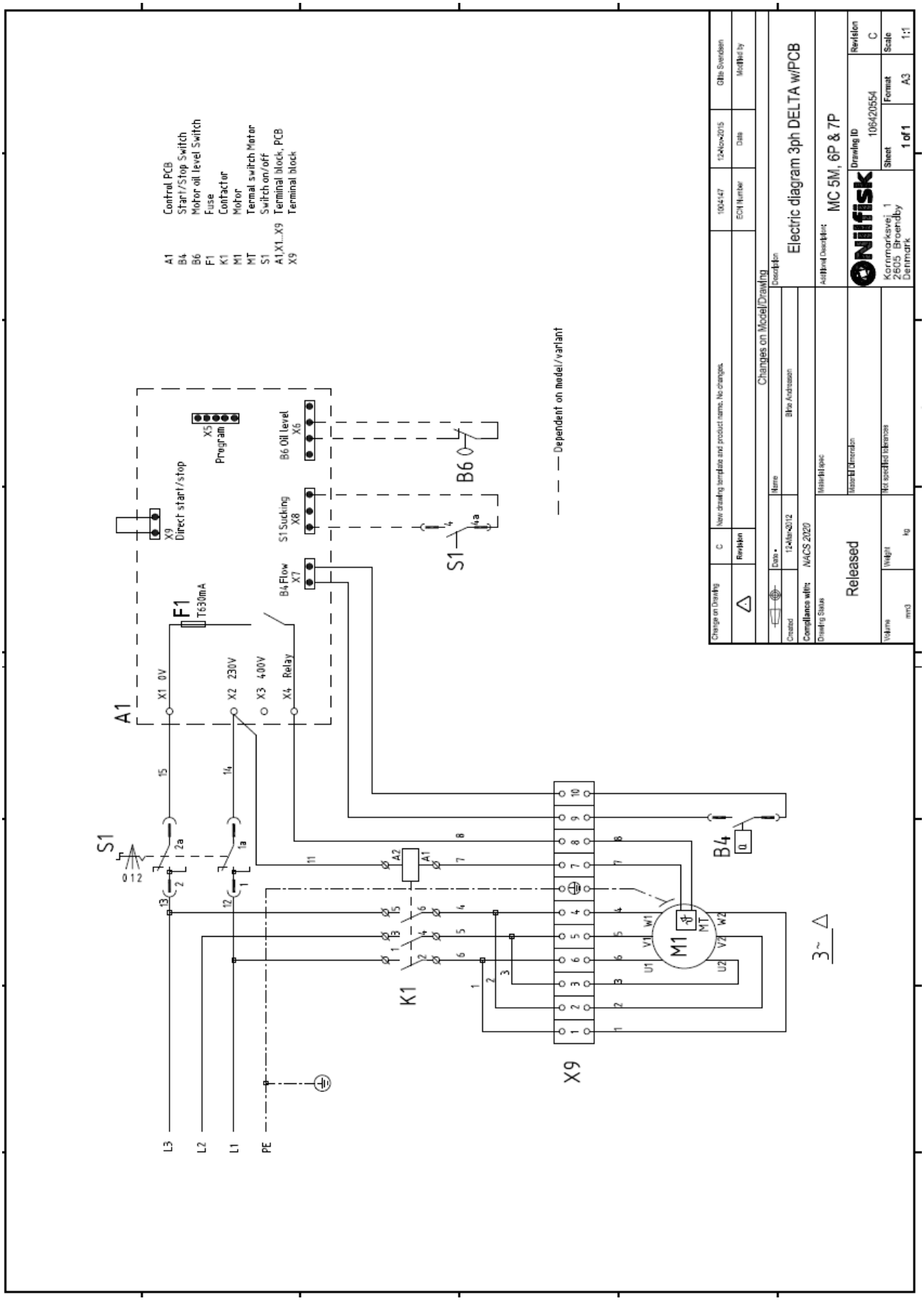
106420544, 1 ph 230V



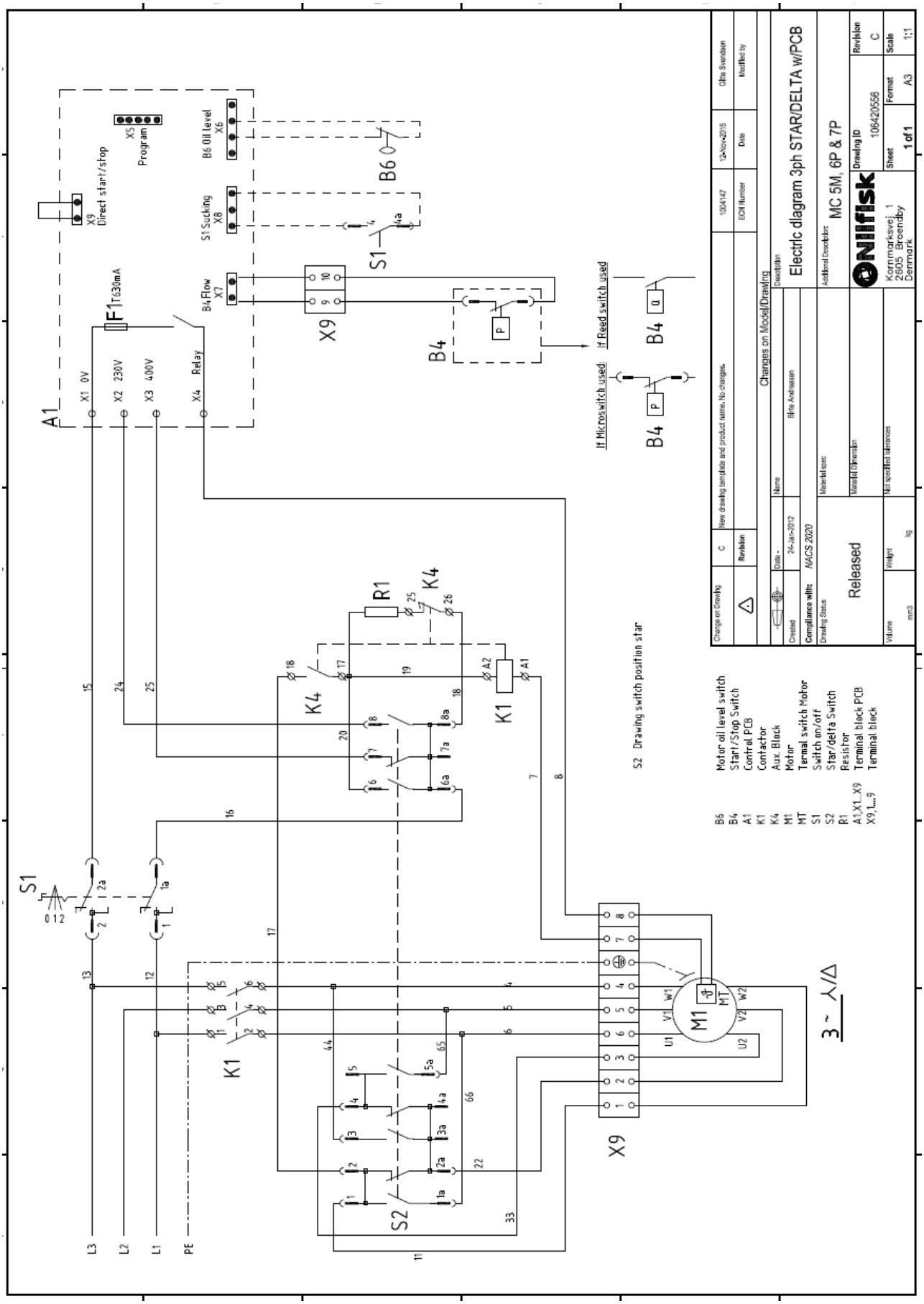
106420552 3 ph STAR w.PCBA



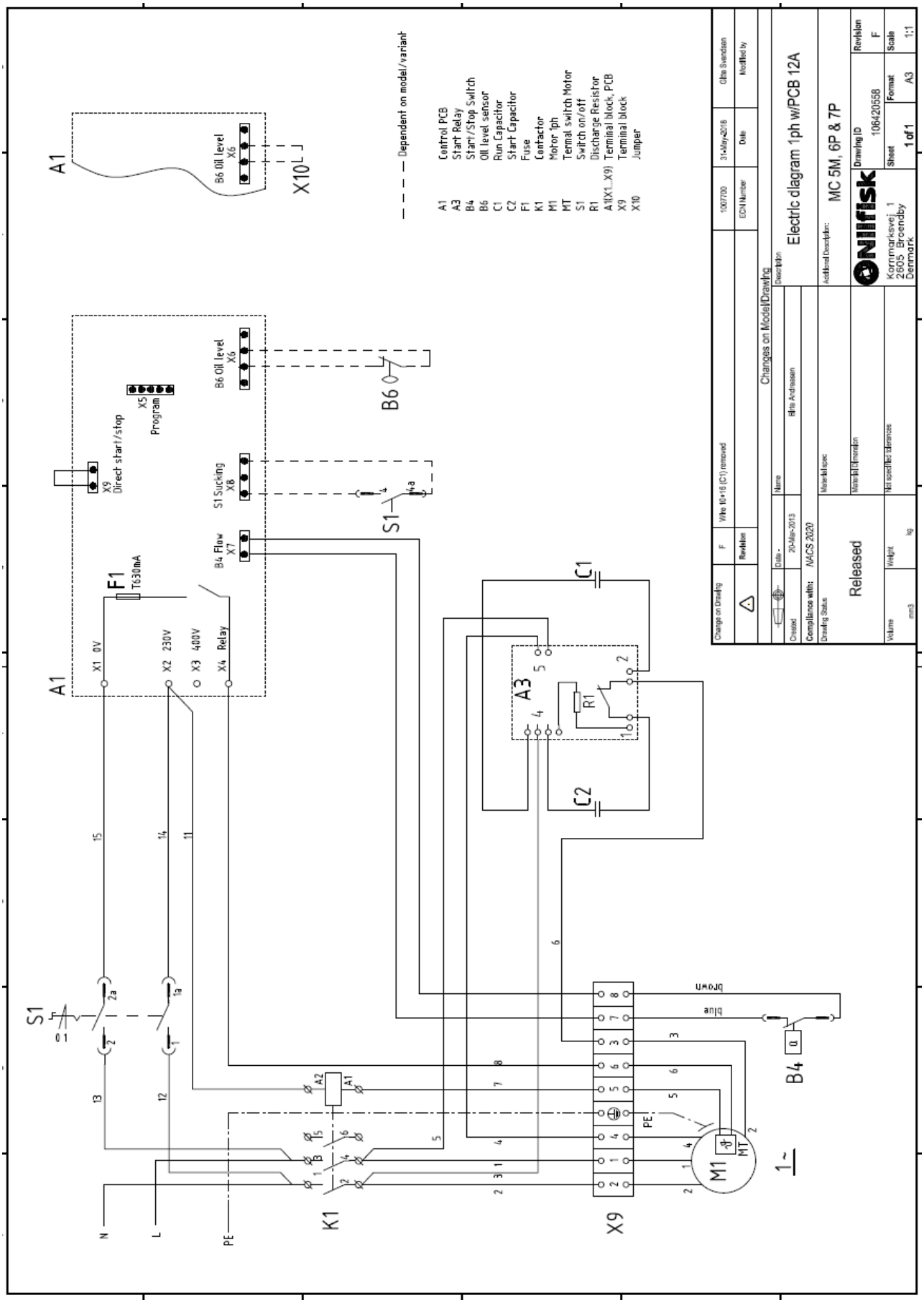
106420554, 3 ph DELTA w.PCBA



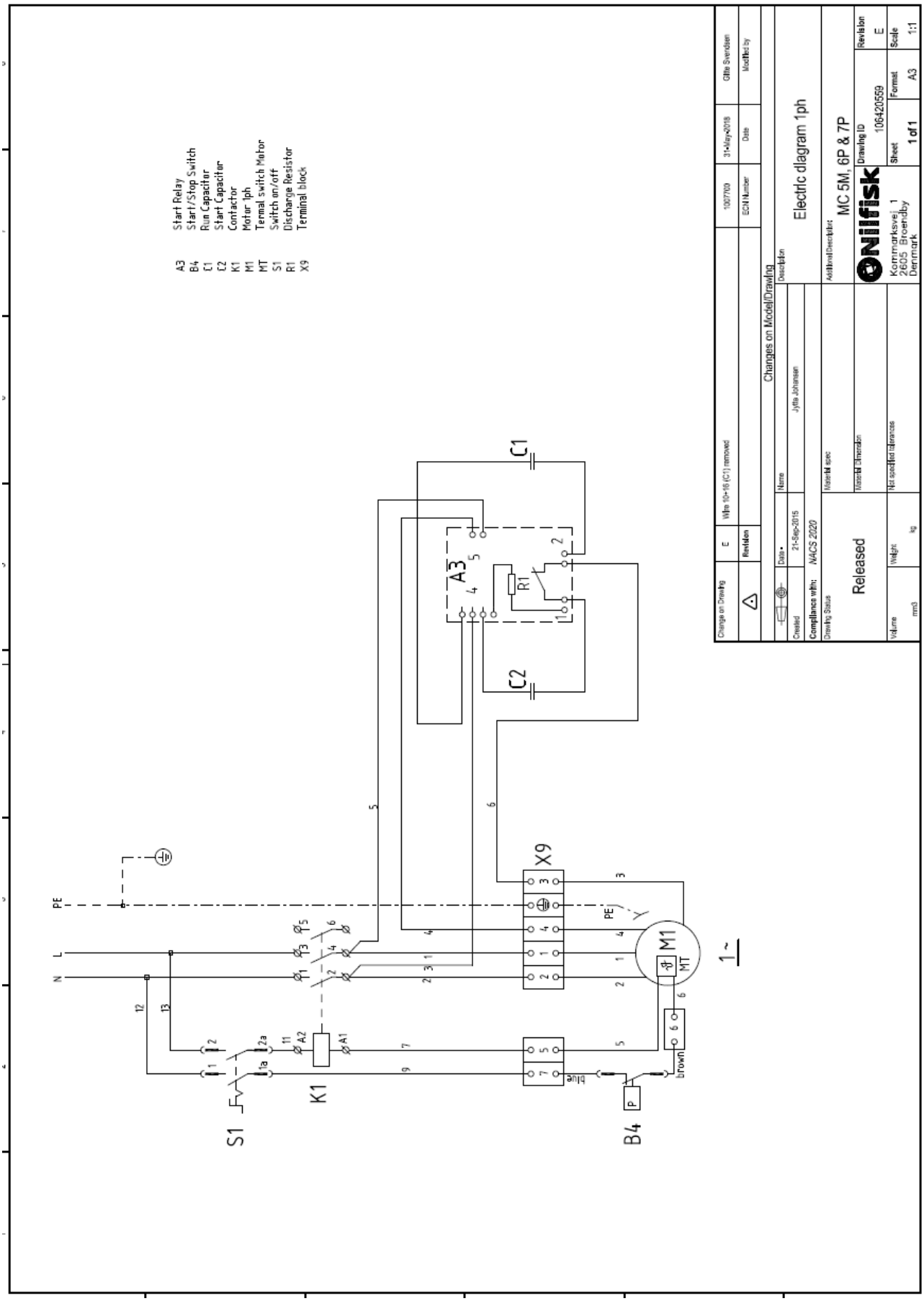
106420556, 3 ph STAR or DELTA w.PCBA



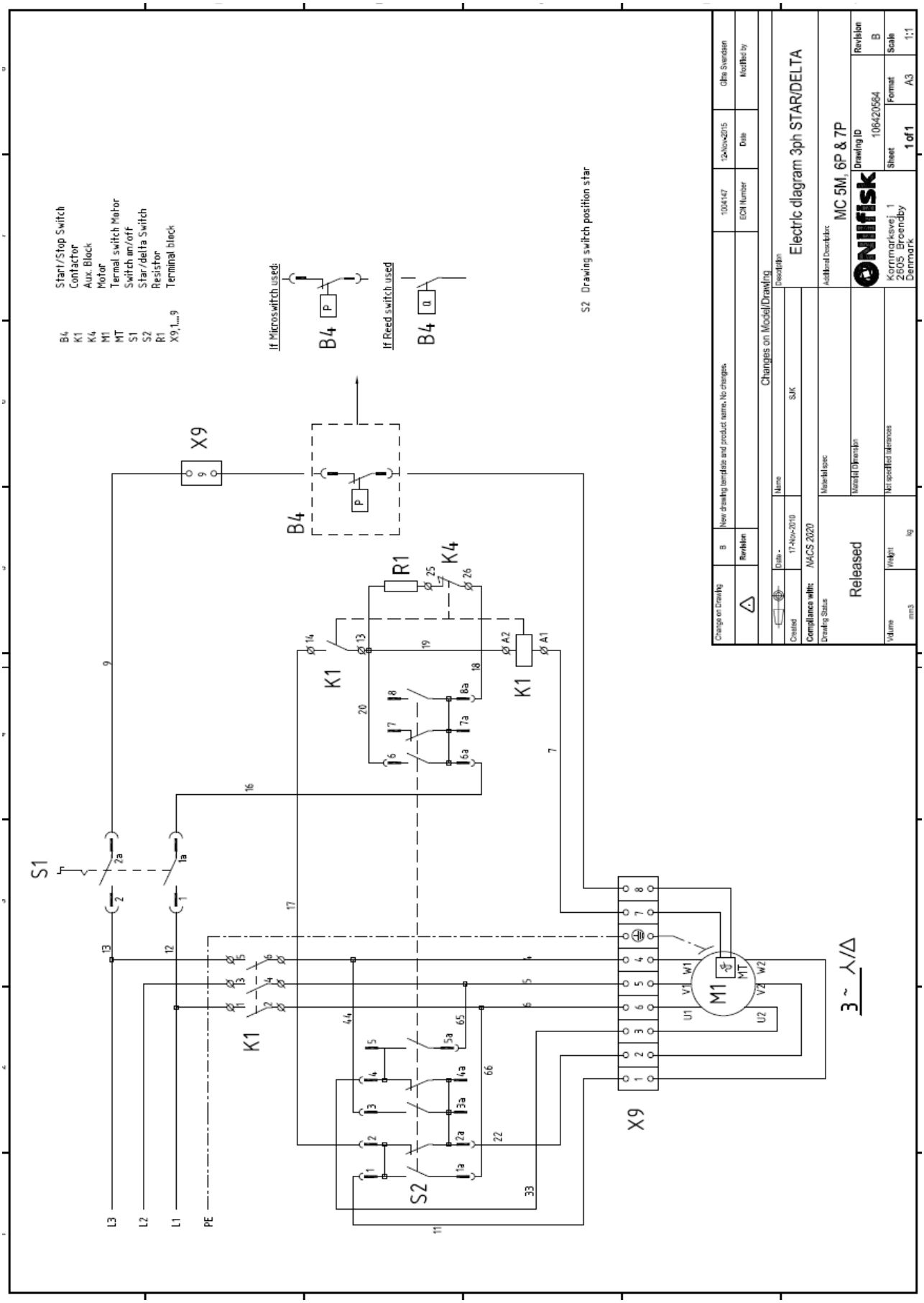
106420558, 1 ph 230V w.PCBA



106420559, 1 ph Model



106420564, 3 ph STAR-DELTA



Part Number	Description	Remarks
	Special Tools	
1206358	Test Pressure Gauge	Adjustment safety valve opening pres-sure
301000383	DATALOGGER	Pulling out data from PCBA
	Additional Materials* **	
41455	Grease (-15 C to +130 C)	Valve grease
31001229	Pump oil Alphasyn T-150	20 L container
5218433	Pump oil Alphasyn T-150	1 L container
N/A	Grease for pump head bolts	Grease Molykote P74

Notes



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