

OPERATING MANUAL

Ecoclean EcoCFlex, Classic



Machine type	Cleaningmachine Cylinder-Head AJ-200
Customer	Januar Land Rover Wolverhampton United Kingdom
Customer's order-no.	EJQ PO12 H77312
Customer's inventory-no.	M1H1-100-1
DÜRR job no.	MK.135736.1510

Dürr Ecoclean GmbH
Hans-Georg-Weiss-Str. 10
D-52156 Monschau



Tel / Phone: **02472/83-0**

Telefax: **02472/83-165**

E-Mail: ecoclean.monschau@durr.com

Typ
Type: **Cleaningmachine Cylinder-Head AJ-200**

Anlagenart
Type of machine **EcoCFlex, Classic**

Kunde
Customer: **Januar Land Rover
Wolverhampton United Kingdom**

Kunden-Bestell-Nr
Customer order no. **EJQ PO12 H77312**

Dürr Auftrag Nr
Dürr job no. **MK.135736.1510**

Kunden Inventar-Nr.
Customer inventory no. **M1H1-100-1**

Dürr Fabrik-Nr.
Manufacturing no. **56307**

Baujahr
year of construction **2013**

Ihr Ansprechpartner
(Dokumentation)
your contact person
(documentation)

Herr Fast

Tel. 02472/83-196

Fax 02472/83-141

e-mail wolfgang.fast@ecoclean.durr.com

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
9	1	+C-FC117.01	Fuses of power supply upstream control voltage have tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
10	1	+C-QB22.01 / -FC22.05	Fuses of 110V AC power supply before main switch have tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
11	1	+C-FC118.01	Input cards power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
12	1	+C-FC120.01	Output cards power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
13	1	+C-FC121.01	ET200pro input modules fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
14	1	+C-QB110.01 / -FC110.05	Fuse of 110V AC power supply after main switch has tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
15	1	+C-FC123.01	Pneumatics valve terminal fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
16	1	+C-FC119.01	Fuse of power supply upstream control voltage has tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
17	3	+C-FB26.01 / -FC26.01	Socket-outlets, cabinet lighting power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
18	1	+C-QB20.01 / -FC20.03	PNOZ power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
19	3	+C-FB30.01	Socket-outlets residual current circuit-breaker tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
20	1	+C-QB11.01 / -QB11.05	Load distribution circuit-breaker tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
41	1	=BW1+M-BL165.4	Floor tray leak detector tripped	Water in floor tray.	Check tanks and piping for leaks. Remove fluid from floor tray using the drain pump unit. Check proper operation of leak detector.
49	3	+C-BT4.0	Supply cabinet temperature not OK	Temperature sensor in specified cabinet has tripped.	Check cabinet temperature. Check that cabinet cooling is not obstructed. Check proper operation of temperature sensor.
50	3	+C-BT4.2	Control cabinet temperature not OK	Temperature sensor in specified cabinet has tripped.	Check cabinet temperature. Check that cabinet cooling is not obstructed. Check proper operation of temperature sensor.
52	3	+C-QB27.01	Work chamber lighting circuit breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
53	3	+C-QB29.01	Supply cabinet cooler motor circuit breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
54	3	+C-EC29.01	Supply cabinet cooler overtemperature fault	Cabinet cooler indicates overtemperature	Check cabinet temperature. Check that cabinet cooling is not obstructed.
57	2	+M-BPI74.0 / +P01-MB84.01	Main pneumatic shutoff valve pressure not OK	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
58	2	+M-BPI74.1 / +P01-MB84.04	Pneumatic pressure at main shutoff valve not OK after guard door circuit	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
59	2	+M-BPI74.3/7 / +P01-MB84.07	Vacuum drier pneumatics main shutoff valve pressure not OK	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
73	1		Home position not reached! Return machine to home in manual mode	Machine fails to reach home position in Automatic return to home mode.	Individually return systems to home in manual mode and check which system causes the fault.
74	1		Stop at end of cycle not reached!	Machine does not return to home after selection of stop at end of cycle.	Check end positions shown in manual mode screens to see what system has not reached home position. If roller conveyors are used, check for a exit accumulation. Release the part and push it to the next part passage sensor (prox. switch).
75	1		Programming fault -> OB121 call, read-out CPU diagnosis	A programming error has called interrupt block OB121.	Read-out fault alarm buffer of CPU using programming device. Please contact manufacturer.
76	1		I/O access error -> OB122 call, read-out CPU diagnosis	An I/O access error has called interrupt block OB122. Any one of the bus devices has been faulty at least for short time.	Read-out fault alarm buffer of CPU using programming device. With the aid of the message shown you can localize the block that tried to access the bus device.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
80	3		Machine cycle time exceeded	The machine doesn't achieve the specified setpoint cycle time.	Check robot program sequence. Check systems relevant to cycle time. Check specified setpoint cycle time on operator panel.
97	1		Profibus / Profinet group fault (use individual diagnosis on OP)	At least one bus device is faulty. Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Read-out individual fault from OP diagnosis. Check cabling, wiring and connections for faults. Check internal fuses. Consult component manual.
121	1	+C-TA45.04	Bus module 21 error: HP pump variable frequency drive	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
130	1	+M-MR86.01-DP1	Bus module 30 error: wash robot	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
135	1	+M-KF610.00	Bus module 35 error: ET200PRO right inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
136	1	+M-KF611.00	Bus module 36 error: ET200PRO left inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
137	1	+M-KF612.00	Bus module 37 error: ET200pro HP pump inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
138	1	+M-KF614.00	Bus module 38 error: ET200PRO FAS filter inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
139	1	+M-KF615.00	Bus module 39 error: ET200PRO vacuum inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
176	1	+M-KF590.01	Bus module 76 error: valve terminal 1	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
177	1	+M-KF592.01	Bus module 77 error: valve terminal 2	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
178	1	+M-KF596.01	Bus module 78 error: valve terminal 3	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
228	1	+C-XF195.04	Bus module 128 error: PN/PN coupler	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
233	1	+C-KF150.05 / -KF 153.04	Overall equipment Emergency Off safety circuit NOK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
243	1	+C-SF151.01	E-Stop at operator desk operated	Emergency OFF button has been operated.	Unlock Emergency OFF button.
244	1	+M-SF151.03	Overall machine Emergency Off tripped	Emergency OFF button has been operated.	Unlock Emergency OFF button.
245	1	+M-SF151.04	E-OFF operated at vacuum drier	Emergency OFF button has been operated.	Unlock Emergency OFF button.
255	1	+M-RO1	E-OFF operated at robot	Emergency OFF button has been operated.	Unlock Emergency OFF button.
257	1	+C-KF150.05	Machine E-OFF safety circuit not OK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
258	1	+C-KF155.05	Emergency Off safety circuit of gantry NOK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
259	1	+C-KF153.01	Robot Emergency OFF safety circuit NOK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
273	1		Global wash module safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
274	3		Ext. conveyors global safety circuit not OK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
275	1		Housing door safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
276	3		Ext. conveyors guard doors global safety circuit not OK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
277	3	+C-KF165.01	Guard doors - vacuum chamber safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
278	1	+C-KF168.01	Gantry guard doors safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
289	1	=TS+M-SF161.02	Housing guard door / machine maintenance door open	Safety circuit of guard doors not OK	Close and lock robot housing door. Check wiring, if necessary.
290	1	=TS+M-SF161.02	Housing guard door / machine maintenance door unlocked	Safety circuit of guard doors not OK	Close and lock robot housing door. Check wiring, if necessary.
295	1	+C-KF163.01	Sliding doors diagnostic message	Safety circuit of guard doors not OK	Close and lock sliding doors. Check read heads/actuators. Check wiring if necessary.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
297	3	=TS+M-SF166.02	Vacuum chamber guard door open	Safety circuit of guard doors not OK	Close and lock guard doors. Check wiring, if necessary. Make diagnostic evaluation on safety relay (see separate manual).
298	3	=TS+M-SF166.02	Vacuum chamber guard door unlocked	Safety circuit of guard doors not OK	Close and lock guard doors. Check wiring, if necessary.
410	2	+M-BGI69.4 / -SF164.01	Sliding door 1 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
413	2	+M-BGI69.4 / -KH93.1	Sliding door 1 opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
414	2	+M-SF164.01 / -KH93.0	Sliding door 1 closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
418	2	+M-BGI69.5 / -SF164.05	Sliding door 2 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
421	2	+M-BGI69.5 / -KH93.3	Sliding door 2 opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
422	2	+M-SF164.05 / -KH93.2	Sliding door 2 closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
425	1	+M-BGI69.4/5	Sliding doors not open and robot in door interfer. area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
481	1	+C-QB86.01	Robot incoming feeder circuit-breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
488	2	+M-MR86.01	Robot general overhaul interval reached	Robot has reached number of operations for general overhaul.	Carry out servicing, see separate operating instructions. Initiate / perform maintenance task according to maintenance plan.
489	2	+M-MR86.01	KUKA robot is not in auto mode	Key switch on robot cabinet not in Auto position.	Place key switch in Auto position, acknowledge message on robot control panel if necessary.
490	2	+M-MR86.01	KUKA general robot fault	Robot outputs error signal.	The fault is displayed on the Teach pendant. See separate operating instructions of robot.
491	2	+M-MR86.01	KUKA – not ready		
492	2	+M-MR86.01	KUKA – Robot doesn't start		
493	2	+M-MR86.01	KUKA - Robot has left programmed path	Robot is not in a defined position and cannot be returned to home in auto mode.	Please move robot to safe pos. and return to home using 'AMoveHome' routine and 'Forward' button.
494	2	+M-MR86.01	KUKA - battery fault	Robot battery empty.	Do not switch off the robot! Replace the battery as described in operating instructions manual.
495	2	+M-MR86.01	KUKA - Servos not switched on		
496	2	+M-MR86.01	KUKA – Robot teach panel active	Teachpanel switch is activated.	Flip the switch.
529	1	=PNE+M-BPI74.2	Robot sealing air pressure NOK	Insufficient sealing air pressure.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
530	2	=PNE+M-BPI74.6	Robot sealing air overpressure NOK	Sealing air pressure is too high.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
533	1		Robot gripper shift register error	Shift register indicates part in gripper despite gripper being open.	Check shift register and gripper. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
536	2		Robot part placing activated	Sub-tasks aborted by special function.	Part has not been treated completely! Deselect special function and re-load part if necessary.
537	1	+M-MR86.01	Robot user program error	Programming errors made during changes to robot program.	Check robot program and correct as required.
538	1	+M-MR86.01	Robot not in home position! See help text	Robot is not in a defined position and cannot be returned to home in auto mode.	Please move robot to safe pos. and return to home using 'AMoveHome' routine and 'Forward' button.
539	1	+M-MR86.01	Unknown robot job! PLC has transferred wrong job.	PLC transmitted unknown part type to robot.	Check part scanner. Create part type in PLC and robot program.
540	1	+M-MR86.01	Robot not in defined position! See help text	Robot is not in a defined position and cannot be returned to home in auto mode.	Please move robot to safe pos. and return to home using 'AMoveHome' routine and 'Forward' button.
541	1	+M-MR86.01	Robot program status not defined	Programming errors made during changes to robot program.	Check robot program and correct as required.
545	1	=PNE+M-BGI70.0/.1	Robot gripper signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
546	1	=PNE+M-BGI70.1	Robot gripper opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
547	1	=PNE+M-BGI70.0	Robot gripper closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
552	2		Robot gripper maintenance interval reached (fault)	Gripper has reached number of operations for maintenance.	Initiate / perform maintenance task according to maintenance plan.
617	3	=K20+M-BLI65.2	IFW working level not reached	Tank cannot be filled.	Check limit switches for correct operation and mounting. Check pipes for leaks. Check operation of shutoff valves.
618	3	=K20+M-BLI65.2	IFW level switch not OK	Level switch outputs '1' signal while pump is off.	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits.
625	2	=PNE+M-BGI63.0/.4	IFW shutoff valve 1 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
626	2	=PNE+M-BGI63.0	IFW shutoff valve 1 opens too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
627	2	=PNE+M-BGI63.0	IFW shutoff valve 1 opens too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
628	2	=PNE+M-BGI63.4	IFW shutoff valve 1 closes too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
629	2	=PNE+M-BGI63.4	IFW shutoff valve 1 closes too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
633	2	=PNE+M-BGI63.1/.5	IFW shutoff valve 2 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
634	2	=PNE+M-BGI63.5	IFW shutoff valve 2 opens too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
635	2	=PNE+M-BGI63.5	IFW shutoff valve 2 opens too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
636	2	=PNE+M-BGI63.1	IFW shutoff valve 2 closes too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
637	2	=PNE+M-BGI63.1	IFW shutoff valve 2 closes too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
641	2	=PNE+M-BGI63.2/.6	IFW shutoff valve 3 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
642	2	=PNE+M-BGI63.6	IFW shutoff valve 3 opens too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
643	2	=PNE+M-BGI63.6	IFW shutoff valve 3 opens too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
644	2	=PNE+M-BGI63.2	IFW shutoff valve 3 closes too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
645	2	=PNE+M-BGI63.2	IFW shutoff valve 3 closes too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
726	3	=V51+M-BPI130.0	Vacuum drier vacuum not reached	Negative pressure was not reached within preset time.	Check vacuum chamber for leaks. Check vacuum pump performance. Check pressure switch for proper operation. Check for correct bath temperature setpoint.
727	3	=V51+M-BPI130.4	Vacuum drier ambient pressure not reached	Ambient pressure was not reached within preset time.	Check vacuum relief valve for proper operation. Check pressure switch for proper operation and setpoint.
729	3	=PNE+M-BGI130.2/.6	Vacuum drier vacuum valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
730	3	=PNE+M-BGI130.6	Vacuum drier vacuum valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
731	3		Vacuum drier vacuum valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
		=PNE+M-BGI130.2			
737	3		Vacuum pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
		+C-QB58.01			
741	1	+C-QAQ15.1	Vacuum pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
744	3	=V51+M-MA58.01	Vacuum pump oil change interval reached	Set oil change interval exceeded.	Change oil. Acknowledge oil change on operator panel.
745	3	=V51+M-BTI130.5	BECKER vacuum pump oil temperature NOK (130°C fault)	The vacuum pump oil temperature is too high.	Check oil level and oil filter of pump. Check proper operation of switch and replace if necessary.
746	3	+M-BLI131.6	BECKER vacuum pump oil level NOK	Vacuum pump oil level insufficient.	Top-up till oil is visible in the oil gauge. Check proper operation of switch and replace if necessary.
777	3	+M-BGI131.0 / - BGI131.2	Vacuum drier hood signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
778	3	+M-BGI131.0	Vacuum drier hood opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
779	3		Vacuum drier hood closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
		+M-BGI131.2			
784	3	+M-BGI132.4/7	Vacuum drier hood gap checker operated	Gap checker operated, no passage check active and chamber is open.	Check whether section is clear. Check light barrier for correct operation and alignment. Check mechanical equipment for accidental actuation.
791	1	+M-BGI131.0	Vacuum drier not open and robot in unload-end interference area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
792	1	+M-BGI131.0	Vacuum drier not open and gantry in machine interference area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
864	2	=P22+M-MA42.01	Wash pump runs against closed valve	Pump switched on and all valves closed.	Open at least one valve in order to be able to start the pump.
865	2	+C-KF42.04	Wash pump thermistor protection tripped	Response of thermal protection. Motor draws overcurrent. Motor winding overtemperature. Relay malfunction.	Check motor load and temperature. Check drive system for sluggishness. Check thermistor relay operation and wiring.
866	2	+C-QB42.01	Wash pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
867	2	=P24+M-BPI61.2/6	Wash pump pressure NOK	Insufficient pump pressure.	Check drive system. Check delivery pipe for leaks. Is rated pump pressure reached acc. to the gauge? Check pressure switch for proper operation. Check completeness of spray system nozzles.
868	2	=P24+M-BPI61.2/6	Wash pump pressure switch NOK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
872	1	+C-QA42.08	Wash pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
873	2	+C-KF43.04	Wash booster pump thermistor protection tripped	Response of thermal protection. Motor draws overcurrent. Motor winding overtemperature. Relay malfunction.	Check motor load and temperature. Check drive system for sluggishness. Check thermistor relay operation and wiring.
874	2	+C-QB43.01	Wash booster pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
875	2	=P24+M-BPI61.2/6	Wash booster pump pressure NOK	Insufficient pump pressure.	Check drive system. Check delivery pipe for leaks. Is rated pump pressure reached acc. to the gauge? Check pressure switch for proper operation. Check completeness of spray system nozzles.
876	2	=P24+M-BPI61.2/6	Wash booster pump pressure switch NOK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
880	1	+C-QA43.08	Wash booster pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
898	2	+C-QB45.01	HP pump circuit-breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
900	2	=P34+M-BTI72.2/6	HP pump oil temperature not OK	Oil temperature high	See separate operating instructions by Hammelmann. Check sensor adjustment.
901	2	=P34+M-BPI72.0/4	HP pump oil pressure not OK	Low oil level in HP pump; Oil filter choked; Emulsion forming.	See separate operating instructions by Hammelmann. Check sensor adjustment.
902	2	=P34+M-BT200.0	HP pump pressure switch not OK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
906	2	=P34+M-BTI72.1/5	HP pump supply temperature too high	High bath temperature.	Check temp controller for correct setpoint. Check proper operation of heating contactor. Check temperature sensor for correct operation and setpoint.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
907	2	+C-QB47.06	HP pump fan motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.
908	2	=P34+M-BPI72.0/.4	HP pump oil cooling circuit pressure switch not OK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
912	2	=P34+M-BT200.0	HP pump pressure exceeded	HP pump pressure not ok	Check drive system and pressure switch for proper operation. Set correct pressure by means of bypass valve.
915	2	+C-QB47.01	HP oil cooler pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
920	1	+C-QA46.08	HP pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
921	2	+C-TA45.01	HP pump variable frequency drive fault	Variable frequency drive fault. Look up the fault code on the display.	See separate motor manual.
923	2	+C-TA45.01	HP pump actual speed has exceeded VFD setting range	HP pump runs at max. speed but doesn't deliver set pressure.	Check coupling between motor and pump. Check nozzles and lances for correct fit. Check piping for leaks.
924	2	+C-TA45.01	HP pump VFD not ready	No 'ready' feedback signal from VFD.	Check 400V power supply (fuse/motor protection). Check VFD. See separate motor manual.
925	2	+C-TA45.01	HP pump VFD no output stage enabled feedback	No 'output stage enabled' feedback on activation.	Check VFD. See separate motor manual.
926	2	+C-TA45.01	No speed feedback from HP pump VFD	No speed feedback on activation.	Check VFD. See separate motor manual.
927	2	+C-TA45.01	HP pump VFD process data not enabled	No 'process data enabled' feedback from VFD.	Check VFD. See separate motor manual.
928	2	+C-TA45.01	HP pump setpoint speed has exceeded VFD setting range	HP pump runs at max. speed but doesn't deliver set pressure.	Check coupling between motor and pump. Check nozzles and lances for correct fit. Check piping for leaks.
929	2	+M-BT200.0	HP pump pressure cannot be relieved at idling speed	Lance may be choked	Clean lance or nozzle, replace if required.
931	1	+C-QA15.2	HP oil cooler pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
932	1	+CQA15.3	HP fan contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
936	2	=P34+M-MA45.01	HP pump oil change interval reached (fault)	Oil expiry date reached.	Change the oil. See separate operating instructions by Hammelmann.
940	3	=P34+M-BT200.0	HP pump pressure low, check cleaning result!	Insufficient HP pump pressure	Check motor and pressure switch for proper operation and check pump delivery pipe for leaks. Check completeness of HP nozzles.
945	2	=P34+M-KHQ72.0	HP tool 1 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
946	2	=P34+M-KHQ72.1	HP tool 2 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
947	2	=P34+M-KHQ72.3	HP tool 3 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
948	2	=P34+M-KHQ72.4	HP tool 4 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
949	2	=P34+M-KHQ73.0	HP tool 5 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
950	2	=P34+M-KHQ73.1	HP tool 6 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
951	2	=P34+M-KHQ72.0/.1	HP tool 7 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
952	2	=P34+M-KHQ72.3/.4	HP tool 8 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
953	2	=P34+M-KHQ72.0	HPV 1 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
954	2	=P34+M-KHQ72.1	HPV 2 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
955	2	=P34+M-KHQ72.3	HPV 3 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
956	2	=P34+M-KHQ72.4	HPV 4 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
957	2	=P34+M-KHQ73.0	HPV 5 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
958	2	=P34+M-KHQ73.1	HPV 6 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
959	2	=P34+M-KHQ72.0/.1	HPV 7 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
960	2	=P34+M-KHQ72.3/.4	HPV 8 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
961	2	=P34+M-KHQ72.0	HP tool 1 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
962	2	=P34+M-KHQ72.1	HP tool 2 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
963	2	=P34+M-KHQ72.3	HP tool 3 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
964	2	=P34+M-KHQ72.4	HP tool 4 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
965	2	=P34+M-KHQ73.0	HP tool 5 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
966	2	=P34+M-KHQ73.1	HP tool 6 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
967	2	=P34+M-KHQ72.0/.1	HP tool 7 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
968	2	=P34+M-KHQ72.3/.4	HP tool 8 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
969	3	=P34+M-KHQ72.0	HP tool 1 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
970	3	=P34+M-KHQ72.1	HP tool 2 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
971	3	=P34+M-KHQ72.3	HP tool 3 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
972	3	=P34+M-KHQ72.4	HP tool 4 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
973	3	=P34+M-KHQ73.0	HP tool 5 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
974	3	=P34+M-KHQ73.1	HP tool 6 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
975	3	=P34+M-KHQ72.0/.1	HP tool 7 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
976	3	=P34+M-KHQ72.3/.4	HP tool 8 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
977	2	=P34+M-KHQ72.0	HP tool 1 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
978	2	=P34+M-KHQ72.1	HP tool 2 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
979	2	=P34+M-KHQ72.3	HP tool 3 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
980	2	=P34+M-KHQ72.4	HP tool 4 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
981	2	=P34+M-KHQ73.0	HP tool 5 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
982	2	=P34+M-KHQ73.1	HP tool 6 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
983	2	=P34+M-KHQ72.0/.1	HP tool 7 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
984	2	=P34+M-KHQ72.3/.4	HP tool 8 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
985	2		HP teaching timeout	Max. teaching time exceeded.	Check whether setpoints fit lance and pump.
986	2	=P34 040	Special function HP test nozzle activated!	Special function HP test nozzle activated! No automatic sequence possible.	Deselect function in special function screens.
1034	3	=P34+M-BPI72.3/.7	HP feed pump bag filter choked fault	Filter bags are choked.	Replace filters.
1050	2	+C-QB44.01	HP feed pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1051	2	=P34+M-BPI72.3/.7	HP feed pump pressure NOK	Insufficient pump pressure.	Check drive system. Check delivery pipe for leaks. Is rated pump pressure reached acc. to the gauge? Check pressure switch for proper operation. Check completeness of spray system nozzles.
1052	2	=P34+M-BPI72.3/.7	HP feed pump pressure switch not OK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
1056	1	+C-QAQ15.0	HP feed pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1065	3	+C-QB50.01	Detergent dosing pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1066	3	=A6+M-BL156.2	Detergent dosing pump detergent pot low level	Detergent dosing pot is empty. Level switch or wiring defective.	Fill the pot with suitable detergent. Check wiring and correct operation of level switch, if necessary.
1067	1	+C-QA16.6	Detergent dosing pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1081	2	+C-QB51.01	Oil separator supply pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1082	2	=B22+M-B67.1/.5	Oil separator overflow protection fault	Oil separator overfilled. Level switch or wiring defective.	Drain oil pot in oil separator. Check proper operation of level switch and cabling as necessary.
1088	1	+C-QA16.2	Oil separator supply pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1089	3	+C-QB49.01	Drain pump unit motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1096	1	+C-QAQ16.0	Drain pump unit contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1097	2	=B20+M-BL166.0 / -BLK 66.5	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1098	2	=B20+M-BL166.0 / -BL166.4	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
1099	2	=B20+M-BLI66.2 / -BLI66.5 / -B	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1100	2	=B20+M-BLI66.0	Dirty tank low level protection	Low water level in dirty tank	Check make-up water input solenoid valve. Check level switch for proper operation and replace if necessary. Check wiring.
1101	2	=B20+M-BLI66.4	Dirty tank overflow protection	Too much water in dirty tank	Check make-up water input solenoid valve. Check level switch for proper operation and replace if necessary. Check wiring.
1102	2	=B20+M-BLI66.0 / -BLI66.2	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1103	2	=B20+M-BLI66.0 / -BKL 66.5	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1106	2	=B20+M-BGI56.0	Clean tank low level protection	Low water in clean tank	Check level switch for proper operation and replace if necessary. Check wiring. Check for accidental actuation of switches.
1161	2	+C-KF82.04	Dirty tank heating overtemperature safety thermostat	Bath temperature inadmissibly high.	Check temp controller for correct setpoint. Check proper operation of heating contactor. Check temperature sensor for correct operation and setpoint.
1162	2	+M-BT200.2	Dirty tank heating overtemperature analog sensor	Bath temperature exceeded limit set on operator panel.	Check temp controller for correct setpoint. Check proper operation of heating contactor. Check temperature sensor for correct operation and setpoint.
1164	2	+M-BT200.2	Dirty tank heating analog sensor NOK	Temperature sensor indicates faulty value.	Check temperature shown on operator control panel. Check proper operation of temperature sensor.
1167	2	+C-QB80.01	Dirty tank heating circuit-breaker tripped	The circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1168	1	+C-QA80.07	Dirty tank heating contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1169	2		Bath cooling starting temperature lower than bath setpoint temp.	Incorrect sensor settings.	Check thermostat for proper operation and setpoints.
1265	2	+C-QB52.01	Exhaust fan motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1267	2	=V41+M-BPI56.6	Blow fan blowing pressure not OK	Insufficient blow pressure.	Check drive system. Check offtake damper for proper operation. Check pressure switch for correct setpoint and proper operation.
1268	2	=V41+M-BPI56.6	Exhaust fan blowing pressure switch NOK	Blow pressure switch defective.	Check the blow pressure switch.
1272	1	+C-QA16.4	Exhaust fan contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1338	2	+C-QB53.01	FAS filter rotary actuator motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1339	2	+M-BGI84.3	FAS filter rotary actuator timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1340	2	=F23a+M-BPI82.2/6	FAS filter differential pressure > 0.5 bar fault (choked)	Filter candles cannot be cleaned by backflushing	Filter candles must be cleaned manually (for details see chapter 6).
1341	2		FAS filter number of backflush cycles exceeded	Filter candles cannot be cleaned by backflushing	Filter candles must be cleaned manually (for details see chapter 6).
1342	2	=F23a+M-BGI82.1/5	FAS filter chip clean-out valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1343	2	=F23a+M-BGI82.1	FAS filter chip clean-out valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1344	2	=F23a+M-BGI82.5	FAS filter chip clean-out valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1345	2	=F23a+M-BGI82.0/4	FAS filter backflush valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1346	2	=F23a+M-BGI82.4	FAS filter backflush valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
1347	2	=F23a+M-BGI82.0	FAS filter backflush valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1348	2	=F23a+M-BGI82.3/7	FAS filter discharge valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1349	2	=F23a+M-BGI82.7	FAS filter discharge valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1350	2	=F23a+M-BGI82.3	FAS filter discharge valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1351	2	+M-BLI84.0	FAS filter dirt pipe chip level fault	Chips in dirt pipe cannot be removed by backflushing.	Initiate several backflush operations by hand. Chips may be stuck in the dirt pipe, clean the dirt pipe by hand (for details see chapter 6)
1360	1	+C-QA17.4	FAS filter rotary actuator contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1368	2		FAS filter scraper conveyor return pump max. runtime reached / filter choked	Maximum runtime reached. Not below pump-off level.	Check pump for proper operation and choking. Check filter for choking. Check level switch for proper operation and check switching points according to list of setpoints.
1377	3	+C-QB54.01	FAS filter dragout conveyor chain motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1378	1	+C-QAQ17.6/17.7	FAS filter dragout conveyor chain motor contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1379	1	+C-QAQ17.5	FAS filter return pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1380	3	=H23+M-BLI83.1/5	FAS filter scraper conveyor tank level switch discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and setpoints.
1381	3	=H23+M-BLI83.1/5	FAS filter scraper conveyor tank overflow	Too much water in tank	Check function of return pump. Check proper operation of level switch. Check wiring.
1382	2	=H23+M-BLI83.1/5	FAS filter scraper conveyor tank overflow	Too much water in tank	Check function of return pump. Check proper operation of level switch. Check wiring.
1383	3	+M-BGI84.6	FAS filter scraper conveyor torque monitor	Torque monitor has tripped	Check scraper conveyor for sluggishness. Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch.
1384	3	+C-QB55.01	FAS filter scraper conveyor return pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1602	2	=PNE+M-BGI69.0/ 1	Lance guide signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1603	2	=PNE+M-BGI69.1	Lance guide lowering timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1604	2	=PNE+M-BGI69.0	Lance guide raising timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1605	2	=TS+M-BGI69.2	Lance guide lance 1 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1606	2	=TS+M-BGI69.3	Lance guide lance 2 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1607	2	=TS+M-BGI69.6	Lance guide lance 3 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1608	2	=TS+M-BGI69.7	Lance guide lance 4 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1817	1	+M-BGI132.4	Vestibule robot load station shift register error	Part status in shift register doesn't match the information from sensors.	Check shift register and position. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
1818	1		Vestibule loading robot and gantry indicate they are not clear	Both robots are inside the transfer area.	Return robot to home position in manual mode using the teach panel.
1819	1	+M-BGI132.4/133.1	Vestibule robot load station part scanning plausibility check	Implausible status of sensors	Check sensors for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1820	1	+M-BGI132.4/133.3	Vestibule robot load station Petrol part scanning plausibility check	Implausible status of sensors	Check sensors for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1824	1		Vestibule robot load station shift register unknown type	Part status in shift register doesn't match the information from sensors.	Check shift register and position. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
1825	1	+M-BGI132.7	Vestibule robot unload station shift register error	Part status in shift register doesn't match the information from sensors.	Check shift register and position. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
1826	1		Vestibule unloading robot and gantry indicate they are not clear	Both robots are inside the transfer area.	Return robot to home position in manual mode using the teach panel.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	TAG	Message	Cause	Remedy
1827	1	+M-BG132.7/133.5	Vestibule robot unload station part scanning plausibility check	Implausible status of sensors	Check sensors for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1839	1		Vestibule blow system not up and wash robot in interference area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
2001	4	+C-XD90_0	Gantry connector not plugged in	Hardware connector not plugged in	Info only.
2002	4	+C-XD90_0	Gantry control voltage on	Control voltage on signal via hardware	Info only.
2009	4	+M-BG133.0	Vestibule robot load station transmitter light barrier plausibility check	Transmitter has 1 signal	Determine cause
2010	4	+M-BG133.2	Vestibule robot load station Petrol transmitter light barrier plausibility check	Transmitter has 1 signal	Determine cause
2011	4	+M-BG133.4	Vestibule robot unload station transmitter light barrier plausibility check	Transmitter has 1 signal	Determine cause
2161	4		IFW re-wash treatment deactivated!	Treatment deselected via special function.	Activate treatment.
2162	4		IFW spray system 1 deactivated!	Treatment deselected via special function.	Activate treatment.
2163	4		IFW spray system 2 deactivated!	Treatment deselected via special function.	Activate treatment.
2193	4		Robot gripper maintenance interval reached (warning)	Gripper has reached number of operations for maintenance.	Initiate / perform maintenance task according to maintenance plan.
2197	4	+M-MR86.01	Robot maintenance interval reached (warning)	Robot has reached number of operations for servicing.	Carry out local servicing, see separate operating instructions. Initiate / perform maintenance task according to maintenance plan.
2198	4	+M-MR86.01	Robot not at 100%	Robot not at 100%	Change robot override on robot control desk
2199	4	+M-MR86.01	Robot battery low level	Robot battery low level	Info only.
2401	4	+M-BPI74.4 / +P01-MB84.01	Main pneumatic shutoff valve pressure not OK - warning	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
2402	4	+M-BPI74.5 / +P01-MB84.04	Main pneumatic shutoff valve after door safety circuit pressure not OK - warning	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
2403	4	+M-BPI74.3/7 / +P01-MB84.07	Vacuum drier pneumatics main shutoff valve pressure not OK	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
2409	4		High-pressure unit completely deactivated!	HP unit does not treat.	Activate HP unit.
2410	4	=P34+M-MA45.01	HP pump oil change interval reached (warning)	Oil expiry date reached.	Change the oil. See separate operating instructions by Hammelmann.
2411	4	+C-TA45.01	HP pump variable frequency drive warning	Variable frequency drive outputs warning message. Look up the fault code on the display.	See separate motor manual.
2417	4	OPTION	Cooling water supply pressure NOK	User-supplied operating pressure not sufficient.	Check connections. Check proper operation of pressure switch.
2418	4	OPTION	Insufficient cooling water supply flowrate	The flowrate of the cooling water provided by the customer is too low	Check local cooling water supply. Check ball valve positions. Check shutoff valve and temperature monitor.
2441	4		HP nozzle system 1 deactivated!	Treatment deselected via special function.	Activate treatment.
2442	4		HP nozzle system 2 deactivated!	Treatment deselected via special function.	Activate treatment.
2443	4		HP nozzle system 3 deactivated!	Treatment deselected via special function.	Activate treatment.
2444	4		HP nozzle system 4 deactivated!	Treatment deselected via special function.	Activate treatment.
2445	4		HP nozzle system 5 deactivated!	Treatment deselected via special function.	Activate treatment.
2446	4		HP nozzle system 6 deactivated!	Treatment deselected via special function.	Activate treatment.
2447	4		HP nozzle system 7 deactivated!	Treatment deselected via special function.	Activate treatment.
2448	4		HP nozzle system 8 deactivated!	Treatment deselected via special function.	Activate treatment.
2449	4		HP teaching activated	HP teach run activated via special function.	Info only.
2450	3		HP teaching completed successfully	Data have been saved.	Info only.
2529	4	=A6+M-BL156.2	Detergent dosing pump detergent pot low level	Detergent dosing pot is empty. Level switch or wiring defective.	Fill the pot with suitable detergent. Check wiring and correct operation of level switch, if necessary.
2545	4		Oil separator overflow protection warning	Oil separator overfilled. Level switch or wiring defective.	Drain oil pot in oil separator. Check proper operation of level switch and cabling as necessary.
2553	4		Drain pump unit activated in auto mode!	Drain pump unit activated in auto mode!	Deactivate drain pump unit in auto mode!
2555	4	=P10+M-SFI65.3	Drain pump unit max. runtime reached	Drain pump unit stops automatically after one hour.	Operate key-switch again.
2561	4		Complete re-fill active!	Complete re-fill active.	Automatic deactivation or deselection in special functions screens after fill levels are reached.
2562	4		Complete re-fill operation finished successfully!	Complete re-fill finished, working level reached.	Close manual ball valve for quick filling if open.
2563	4		Make-up water meter check (choking)	Valve has been operated but water meter supplies no flow pulses.	Check piping filter for choking. Check local water supply.
2564	4		Make-up water valve check (leakage)	Valve has not been operated but water meter supplies flow pulses.	Check make-up water valve for leaks.
2565	4		Demin. water top-up meter check (choking)	Valve has been operated but water meter supplies no flow pulses.	Check piping filter for choking. Check local water supply.
2566	4		Demin. water top-up valve check (leakage)	Valve has not been operated but water meter supplies flow pulses.	Check make-up water valve for leaks.

Störmeldungen

Fehler, Ursachen und Behebungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

Störmeldungen

Störmeldeliste

[illegible]

1. PRELIMINARY REMARKS

2. SAFETY INSTRUCTIONS

**3. EQUIPMENT DESCRIPTION /
TECHNICAL DATA**

4. OPERATING INSTRUCTIONS

**5. FAULTS /
TROUBLESHOOTING AND REMEDIAL ACTION**

**6. UPKEEP
MAINTENANCE AND SERVICING INSTRUCTIONS**

7. LIST OF SPARE AND WEARING PARTS

**8. OPERATING REPORTS /
MEASUREMENT AND SETTING DATA**

9. CERTIFICATES

10. EC DECLARATION OF CONFORMITY

11. DRAWINGS

12. OUTSOURCED ITEMS OPERATING INSTRUCTIONS

DOCUMENTATION REVISION SHEET

Rev.	Description	Name	Last modified on

1. Preliminary Remarks

Table of Contents

1.	Preliminary Remarks	1-1
1.1	Preface	1-3
1.2	General notes	1-4
1.3	Liability and warranty	1-5
1.4	General information on understanding this manual	1-7
1.4.1	How to read this manual	1-7



CHAPTER 1

PRELIMINARY REMARKS

PRELIMINARY REMARKS

1.1 Preface

DÜRR Ecoclean GmbH, in 100 % ownership of DÜRR AG, performs the functions of the parent from its German locations in Filderstadt and Monschau. The Company's subsidiaries are:

- Dürre Ecoclean S.A.S. (Loué, France)
- Dürre Ecoclean Inc. (Wixom, MI, USA)
- Dürre Ecoclean spol. s r.o. (Oslavany-Padochov, Czechia)
- Dürre Ecoclean c/o Schenck Shanghai Machinery Corp. Ltd. (Shanghai, China)
- Dürre Ecoclean (Pune, India)

DÜRR Ecoclean GmbH is a market leader in the fields of industrial cleaning technology and chip and coolant systems. The company develops and produces equipment for the treatment of a great variety of parts made of metal, plastics, and glass, as well as equipment for lubricant treatment. The company's range of customers includes the automotive industry and its suppliers, as well as the general market.

With technically sophisticated equipment, Dürr meets the ever-increasing demands of customers with regard to cleaning quality, economics, and environmental protection. Through the development of innovative processes, **DÜRR Ecoclean GmbH** responds to the advancing complexity of parts and the increasing manufacturing accuracy.

In close co-operation with selected suppliers, special Dürr components (OEM products) have been developed for this purpose. It is only through the use of these components that the high demands on availability, treatment results and cost efficiency can be ensured.

The use of products not authorized by Dürr will void any warranty claims.

The operating instruction manual is meant to be an aid for persons installing, operating, and servicing the equipment.

Knowledge of this operating instructions manual is a strict prerequisite for the avoidance of faulty equipment handling and for ensuring a fault-free operation. Therefore, it must be ensured that any person mandated with the use or operation of the equipment has read and understood this operating instruction manual prior to commencing work.

Our Customer Service Department will be glad to assist you with any queries or problems that may arise.

1.2 General notes

The manual summarizes the important technical data and descriptions required for the installation, the operation, and the maintenance and upkeep of the equipment. Enclosed with this manual are spare parts lists, separate operating instructions on individual equipment units (if required), and drawings.

By strict observance of the instructions stated in this manual, the following conditions are meant to be achieved:

- constant readiness for operation of the equipment;
- proper operation and, as a result, the best possible quality of part treatment;
- timely detection and removal of defects and thus a reduction of upkeep and repair costs;
- ensuring operational safety;
- Prolonging equipment life.

Any person in charge of the equipment must have knowledge of and access to the operating instructions manual at any given time. The skilled personnel in charge of operation and maintenance of the equipment must be fully informed of the contents of this manual. One copy of the operating instructions manual is to be kept available local to the equipment.

In addition to the operating instructions manual, any general, legal and other binding regulations with regard to the prevention of accidents and environmental protection must be observed. Any such duties also relate to handling dangerous substances and to supplying, or wearing, personal protective equipment.

Any person working with or on the equipment must have read and fully understood the operating instructions manual prior to commencing work. This applies in particular to persons carrying out occasional tasks like set-up, maintenance, and upkeep work.

To the extent permitted by law, **DÜRR Ecoclean GmbH** excludes any liability for consequential damage arising from non-compliance with this operating instructions manual.

DÜRR Ecoclean GmbH does not assume any liability for wilful intent and gross negligence.

All rights remain reserved, including the right to reproduce this manual or parts thereof in any form.

The contents of the manual are subject to change without prior notice.

The equipment is subject to technical modification without prior notice.

In order to prevent accidents and ensure optimum performance, the equipment must neither be modified nor converted in any way, unless with express permission of **DÜRR Ecoclean GmbH**.

The enclosed separate operating instructions on individual equipment units must be followed and observed with priority.

PRELIMINARY REMARKS

The equipment user must prepare instructions for the behaviour of operating and maintenance personnel during special incidents as well as special safety instructions. These must also be kept available local to the equipment

1.3 Liability and warranty

We have provided all information regarding the operation and upkeep of the equipment to the best of our experience and understanding so far, and to the best of our knowledge.

Warranty claims to be considered are determined in our General Terms and Conditions. The customer shall only be entitled to warranty claims if **DÜRR Ecoclean GmbH** is responsible for defects or damage to the equipment arising in spite of Customer's compliance with the instructions in this manual.

We accept liability for any errors and omissions only to the extent of warranty defined in the main contract, to the exclusion of any further claims. Any and all claims to further compensation, for whatever legal reason, shall be excluded.

We do not assume any liability or warranty in any of the following cases:

- the instructions and information given in the manual are not observed;
- fault alarms, or any faults arising at the equipment, are ignored and accepted without removing or remedying them;
- the equipment, including associated units and components, is operated incorrectly, or is not operated in the proper sequence.
- the equipment is not used for its intended purpose;
- guard systems are not used, or put out of function.
- any functional changes are made without our written consent;
- applicable safety instructions are ignored (see corresponding chapter in this manual);
- the equipment, including associated units and components, is not maintained properly or at proper intervals (even though specified original spare parts are used), or if checks and inspections are not conducted.
- modifications, conversions, or extensions that may affect safety are carried out without permission of DÜRR Ecoclean GmbH. This also applies to the installation, or adjustment, of guards and safety-relevant components and to welding work on load-bearing parts.

The following conditions shall apply in addition:

- Wear parts are not covered by the manufacturer's warranty.
- Only original spare parts authorized by the manufacturer must be purchased and used for replacement.

If warranty claims are asserted, they must be submitted to the factory or plant in a written form, indicating the Serial No., the Job Ref., and the exact designation of the unit or equipment component.

If damage or defects are rectified by the customer or by a third party without our prior consent, **DÜRR Ecoclean GmbH** shall not be obliged to accept any claims or charges.

1.4 General information on understanding this manual

- For every start-up, operation, maintenance and repair of the equipment observe the procedures specified in this operating instructions manual.
- Carefully read this operating instructions manual before you start the equipment. Be sure to strictly observe any safety instructions specifically marked!
- Follow all the instructions so that accidents, or damage to persons or equipment, are avoided.
- Places in the document marked with an asterisk (*) refer to optional equipment with additional or extending functionality. These descriptions apply if the relevant equipment is included in your scope of order.
- It is prohibited to make this manual available to a third party. Doing so obliges the customer to pay compensation.

1.4.1 How to read this manual

The pictographs used are explained in chapter 2 ('Safety').

- Bullet points are used to list several facts. These bullet points are not bound to a certain sequence.
1. Numberings are used when a certain sequence must be followed, e. g. for operating steps.

Text is indented if a certain condition occurs after an operating step.

2. Fundamental Safety Instructions

Table of Contents

2.	Fundamental Safety Instructions	2-1
2.1	Basic requirement	2-3
2.2	Warning signs and symbols	2-3
2.2.1	Warning signs	2-3
2.2.2	Mandatory signs	2-5
2.2.3	Other indication signs	2-6
2.3	Prevention of accidents, general	2-7
2.4	Intended use	2-8
2.4.1	Improper use of the equipment	2-8
2.4.2	Inadmissible modes of operation	2-9
2.5	Dangers at the equipment	2-10
2.5.1	Hazards by noise	2-11
2.6	Safety facilities	2-12
2.6.1	Emergency Stop	2-12
2.6.2	Effects of Emergency Stop buttons	2-13
2.6.3	Effect of door safety switches	2-13
2.7	Instructions for equipment user	2-14
2.7.1	Safety through regular maintenance	2-15
2.7.2	Lighting	2-16
2.7.3	Hazards by equipment modifications	2-16
2.7.4	Training	2-16
2.8	Safety instructions for personnel	2-17
2.8.1	Equipment operators	2-17
2.8.2	Duties of equipment operator	2-18
2.9	Wear protective equipment	2-19
2.10	Hazards from pneumatic / hydraulic equipment	2-20
2.11	Hazards from electrical energy	2-21
2.12	Rules regarding batteries	2-22
2.13	Oils, greases and other chemical substances	2-24
2.14	Hazards from gas, dust, vapour, smoke	2-24
2.15	Safety rules for waste water treatment	2-25



KAPITEL 2

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS

2.1 Basic requirement

A basic requirement for safe and trouble-free use of the equipment is familiarity with the fundamental safety instructions in this operating instructions manual. Beyond these, observe all local rules and regulations for the prevention of accidents and generally accepted technical rules for safe and proper working.

2.2 Warning signs and symbols

The warning signs and symbols used in these operating instructions are explained hereafter. They refer to safety-relevant situations and conditions. You will find identical symbols on the equipment.

2.2.1 Warning signs

Warning signs refer to hazards you may encounter when operating the equipment. The signs may be of a general nature or be complemented by additional warning signs and symbols.

DANGER



Imminent danger

This symbol indicates an imminent hazard with a high risk that will result in severe injury or death if not avoided. This signal word is restricted to extreme hazards.

WARNING



Possible hazard

This symbol indicates a possible hazard with a medium risk that will result in severe injury or death if not avoided.

CAUTION



Hazard and damage to material

This symbol indicates a hazard with a low risk that will result in light or moderate injury or in property damage if not avoided.

SAFETY INSTRUCTIONS

**Risk of electric shock**

This symbol warns of a dangerous electric shock.

**Warning of magnetic field**

This symbol is used to indicate dangers from magnetic fields.

**Danger from lyes and acids**

This symbol warns of hazards arising from lyes and acids.

**Danger from hot surfaces**

This symbol warns of hot surfaces.

2.2.2 Mandatory signs

The following mandatory signs indicate the personal protective measures that must be taken.



Wear protective gloves



Wear ear protectors



Wear face protector



Wear protective clothing

2.2.3 Other indication signs

The following signs/symbols refer to additional information, e. g. on documentation or on the equipment.



This symbol indicates important facts or circumstances and useful information.



This symbol warns of environmental damage and calls your attention to facts and circumstances relevant for environment.



This symbol indicates an area which must not be entered by unauthorized persons.



This symbol indicates an area which must not be entered by persons with a pacemaker.

2.3 Prevention of accidents, general

In order to ensure safety, every person coming into contact with the equipment must be aware of the contents of the entire operating instructions. This is the only way to minimise the risks involved.

This cleaning machine satisfies the basic safety and health requirements of the European Union. Nevertheless, dangerous situations may occur.

If the operating instructions and other specifications relating to equipment or operation, as well as the rules and regulations for the prevention of accidents, are duly observed, this equipment is safe to operate. Nevertheless, its use may give rise to physical hazards to the operator or third parties, or to damage of the equipment or other property.

The equipment must only be operated in proper technical condition. For this, these operating instructions must be observed.

Observe local law for safety and health at work at all times. Same applies to environmental regulations.

In order to ensure safety it is imperative that only the personnel responsible for operation of the equipment is in the hazardous zone of the equipment.

If several persons work on the equipment good co-operation and fine tuning of their activities are essential. Expertise and sense of responsibility of employer and employees are essential for safe and effective use of the equipment.

Observe following fundamental instructions regarding clothes: It is prohibited to wear wide and/or loosely fitting clothes in order to prevent drawing-in of clothes. This applies in particular to ties, long hair and necklaces and the like.

Hazardous zones of the equipment must be accessed by authorised personnel only.

Keep all safety and danger signs on the equipment in a legible state!

2.4 Intended use

The equipment has been designed according to the state of the art and recognized safety rules.

Intended use of the equipment is only and exclusively the cleaning of Cylinder-Head AJ-200S. Loading of the equipment takes place automatically.

It is prohibited to use the equipment for any purpose other than its intended purpose. This may cause incalculable risks.

You must only use only detergents which are approved by **Dürr Ecoclean GmbH**.

WARNING



Risk of injury!

Improper handling of the equipment may result in personal injury!
Use the equipment only in proper technical condition and in accordance with its intended purpose. Observe the operating and safety instructions and be aware of the hazards.

Any modifications to the equipment, to the process, or to the parts must be agreed with and approved in writing by **Dürr Ecoclean GmbH**.

DÜRR Ecoclean GmbH shall not be liable for any damage due to any use of the cleaning machine other than for its intended purpose.

Therefore use the equipment only in proper technical condition and only for its intended purpose. Always ensure that all safety aspects and hazards are duly considered and the Operating Instructions are observed! Any defect or malfunction must be promptly repaired, especially if it may affect safety! To do so shut down and lock-out the machine.

2.4.1 Improper use of the equipment

The equipment may give rise to additional hazards if it is operated improperly by untrained personnel or if it is used for any purpose other than cleaning of the aforesaid products.

Keep these Operating Instructions accessible to the user and to operating, maintenance and repair personnel throughout the service life of the equipment. Ensure that one copy of these Operating Instructions remains available near the equipment. Keep one copy of these Operating Instructions on hand during maintenance and repair work!

The machine is intended for cleaning of the parts stated in chapter 3 (Technical Data) only.

2.4.2 Inadmissible modes of operation

The operational safety of the equipment supplied to you is only ensured if it is used in accordance with its intended purpose. Limits or thresholds and other indications stated in these operating instructions must never be exceeded.

In the event of changes to the mode of operation, shut down and lock-out the machine. Request the written approval of **DÜRR Ecoclean GmbH** for re-starting and operating the machine!

2.5 Dangers at the equipment

WARNING



Risk of injury

In automatic mode there is a risk of crushing and shearing due to the moving parts of the machine:
Movement or suddenly starting movement of these parts involves the risk of injury.



Be sure to always keep clear of the hazardous area if the machine is operated in auto mode.

WARNING



Risk of injury

During maintenance there is a risk of crushing and shearing due to the moving parts of the machine.



It is prohibited for unauthorized persons to enter the machine for service or upkeep.



Danger from hot pipes

Touching hot pipes involves the risk of burning injury. The hazardous places are marked by a warning sign!



Never touch hot pipes!



Danger from hot motors

Touching hot drive motors (e.g. the robot servo motors) involves the risk of burning injury.



Therefore let motors cool down before working on them. If this is not possible take appropriate protective measures, e.g. by wearing gloves.

**Risk of explosion**

There is a risk of explosion if hot parts come into contact with explosive or highly inflammable chemical substances.

Do NOT, at any given time, handle explosive or highly inflammable chemical substances local to the equipment!

2.5.1 Hazards by noise

WARNING**Risk of injury from noise**

Persons continuously exposed to a high noise level run the risk of causing permanent damage to their hearing organs. The result is deafness. Sound insulation on the equipment must be in position during operation, which means that all openings must be closed.

Ear protection must be worn in areas designated with this symbol.



2.6 Safety facilities

Never remove or override any safety facilities such as guard hoods or protective circuitry during normal equipment operation.

If set-up, maintenance and repairwork require any guards to be removed, put them back in place and check them for proper function immediately upon completion of the maintenance and repairwork.

DANGER



Risks of injury

If you override the safety precautions or guards, remove them or put them out of function in any way, you will endanger yourself and other people working on the equipment.

This may include:

- most severe injuries by moving parts of the robot or the machine;
- a deadly electric shock.

2.6.1 Emergency Stop



In case of emergency press one of the Emergency Stop buttons. This will cause an immediate stop of the equipment.

Use Emergency Stop buttons exclusively in case of danger to persons or equipment.

In all other cases shut down the equipment in accordance with the corresponding procedure.



Actuation of the Emergency Stop button may lead to an undefined shut-down condition. Therefore check all moving parts and return them to their home positions as required before restarting the equipment. It may be necessary to remove wrong products and/or incorrectly positioned products.

Before you can finally restart the equipment, reset the Emergency Stop.

Emergency Stop buttons are provided within reach of operator at several easily accessible locations.

2.6.2 Effects of Emergency Stop buttons

The HMI operator panels display fault alarm messages.

Emergency Stop buttons switch off all motors. The pneumatic system remains pressurized. The hydraulic system is depressurized.

Stop categories according to EN 60204-1: Category 1.

The circuit has a two-channel configuration of category 4 according to DIN EN 954 (DIN EN ISO 13849-1).

Categories according to EN 60204-1:

Category 0: Stoppage by immediate disconnection of power supply to the equipment drive units (i.e. uncontrolled stoppage);

Uncontrolled stoppage means:

Stopping a machine movement by cutting off the power supply to the machine drive units; operation of all brakes and/or other mechanical stoppage devices.

Category 1: Power supply to the machine drive units is maintained in order to achieve stoppage. Interruption of power supply does not take place before the actual stoppage (controlled stoppage);

Controlled stoppage means:

Stopping a machine movement, e. g. by zeroing the electric command signal once the control system has detected the stop signal. However, power supply to the machine drive units is maintained during the stopping procedure.

2.6.3 Effect of door safety switches

Door safety switches without interlocks can be opened during ongoing operation. The equipment motors stop immediately.

Door safety switches with interlocks can only be opened during ongoing operation if 'Open door' is requested beforehand. The machine will complete the current cycle and then return to home position. The door safety switch with interlock cannot be opened until the machine is in home position.

2.7 Instructions for equipment user

The user of equipment is obliged to prepare operator instructions on the basis of operating instructions and local operating conditions. In additions to instructions for normal operations they should in particular include instructions for following special operating modes:

- Set-up
- Trial run
- Troubleshooting
- Upkeep
- Maintenance
- Inspection
- Repair work

Operating instructions can be prepared in accordance with following structure:

- Field of applications
- Hazards and safety measures in normal and special operation
- General requirements with regard to personnel
- Instructions on how to respond to emergencies.

Operating instructions should be prepared in particular for larger individual machines and equipment. They form the basis for the necessary briefings.

Past experience with accidents has shown that set-up men are exposed to the same hazards as operators. Do not start such work on machinery and equipment until:

- hazardous movements have come to a standstill
- unauthorised, inadvertent and unexpected starting is excluded (by locking of the main command direction or by disconnection of plug connectors and locking of parts which may change their positions, e.g. by means of brake, return barrier, non-return valve or props)
- starting of a hazardous movement due to stored energy is prevented (by relieving pressure, shutting-off, blocking, lowering, releasing).



The equipment user must advise personnel at least half-yearly that these instructions must be observed.

2.7.1 Safety through regular maintenance

Maintenance is not only intended to provide for trouble-free production but also to guarantee the safe condition through regular checks, maintenance and repair activities.

The requirement is to have machinery involving hazardous movements including their guards checked:

- prior to first commissioning
- at appropriate intervals and
- following changes or repairs

by skilled staff members to determine its safe condition or at least externally visible damage or defects. Furthermore an inspection by an expert must be carried out.

Inspection intervals depend on manufacturer instructions, regulations or standard operating procedures of users. We recommend that you draw up an inspection protocol.

Skilled staff members must fulfil the following requirements:

A skilled person is any person who, due to their professional training and experience have sufficient skills with regard to the machine, equipment or other facilities to be checked, and who is sufficiently familiar with the relevant codes and regulations (such as national laws, DIN norms, VDE regulations, technical rules of other European or EFTA member states) to be able to judge the safe condition of the machine, equipment or other facilities to be checked.

The user may be required to prove that the relevant staff has the required skills.

We recommend that such checks be carried out in strict compliance with inspection check lists to be prepared in accordance with regulations, operating instructions and experience.

User must guarantee that maintenance and repairs on parts relevant to safety are properly carried out to ensure the required safety.

For every start-up, operation, maintenance and repair of the equipment observe the procedures specified in this operating instructions manual. Before starting-up, make sure that all equipment components are firmly mounted in place and all and any tools and auxiliaries have been removed from the equipment area.

Mounting, dismounting, maintenance and repairwork must only be carried out by skilled persons observing the safety instructions given in this operating instructions manual!

2.7.2 Lighting

Insufficient lighting makes it impossible or difficult to recognise the condition of operating and traffic zones, obstacles which may lead to tripping or dirt which may lead to slipping. Insufficient lighting also makes it difficult to walk safely.

Principle :

Ensure sufficient lighting! Lighting must guarantee that the condition of operating and traffic zones, walkways and danger zones.

2.7.3 Hazards by equipment modifications

Any modifications to the equipment or to the process must be agreed with and approved by **DÜRR Ecoclean GmbH**.

DÜRR Ecoclean GmbH shall not be liable for any damage due to any use of the equipment other than for its intended purpose.

2.7.4 Training

The equipment user is obliged to give training in mode of operation, use and protective actions to be taken to every person working with or on the equipment.

Running the equipment in a manner consistent with its intended use also means that the Operating Instructions are duly observed and the inspection and maintenance requirements met.

Trained persons must confirm by their signature that they have read the operating instructions completely and understood all points. Responsibility for damage due to untrained personnel shall be borne solely by the user.

The proper installation and correct operation of all guards must be checked daily.

2.8 Safety instructions for personnel

2.8.1 Equipment operators

- **Skilled personnel:** this term refers to individuals who, due to their professional training, skills, experience, and familiarity with the relevant codes and regulations, are able to judge the tasks assigned to them and to detect potential hazards.
- **Trained persons:** this term refers to operators who have been instructed and, if necessary, trained in the tasks assigned to them, are aware of the hazards resulting from inappropriate action, and have been cautioned with regard to the use of the relevant protection devices and protective measures.
- **Laymen:** this term refers to individuals who neither qualify as skilled person nor as trained person.

Only trained personnel must work on/with the equipment observing the safety instructions given in this operating instructions manual!

Observation of the following points is imperative for protection of life, health and the environment:

- Note the legally defined minimum age levels !
- All personnel must be fully familiarized with the equipment and its components prior to start-up.
- Before the equipment is put into operation, personnel must have received a safety training by the user identifying and explaining hazard points. This safety training shall be repeated at appropriate intervals as necessary.
- Before putting the equipment into operation the operator must familiarize himself with the operating instructions.
- Avoid all unsafe procedures or working methods!

If any fault or danger is detected by personnel this must be notified to the user or his authorised representative without delay.

Work on the equipment (e.g. electrical equipment) must only be carried out by skilled persons.

Personnel to be trained, taught, instructed or undergoing general training must be allowed to work on the equipment only under permanent supervision of an experienced person.

Always see to it that injuries (even minor wounds) are promptly treated so as to minimize infection risks.

All accidents (injuries or property damage) must be immediately reported to the relevant supervisor or safety commissioner.

If the material processed may cause any hazard it is a must to wear the personal protective equipment or make sure that appropriate protective measures are taken.

SAFETY INSTRUCTIONS

The equipment is designed so that all applicable accident prevention rules and regulations will be fulfilled when the system is properly operated and used according to its intended purpose.

Following items must be available near the equipment for use in case of emergency:

- First Aid kit
- Fire extinguishers of suitable classification

Pay attention to the fire alarm and fire fighting facilities.

2.8.2 Duties of equipment operator

The equipment operator must check the functions of all guards every day at the beginning of work.

Guards are emergency stopping devices, safety triggers, pull-wire stop controls and other emergency systems.

In case of defects which may affect the safety of persons the operator must stop the equipment.

Prior to starting the equipment, the operator must ensure that this action will not put any persons into danger. The same applies to the actuation of an enable switch (accept switch).

The equipment operator must ensure that the equipment and hangers are not loaded beyond the admissible limit.

2.9 Wear protective equipment

For maintenance and repairs and also for certain operating procedures, wear the following personal protective equipment in addition to the specified working clothes!

Take utmost care when working with acids and lyes. Wear your personal protective equipment and observe the legally required protective measures.



Protective gloves of heat and acid resistant material



Wear face protector



Protective clothes of acid-resistant material

2.10 Hazards from pneumatic / hydraulic equipment

Work on hydraulic equipment must only be carried out by persons having special knowledge and experience in hydraulics!

Check all piping, hoses and couplings at regular intervals for leaks and externally visible damage. Remove any damage immediately! Escaping oil may cause burning injury and fire.

Relieve the pressure in system sections and pressure pipe runs to be opened (hydraulic fluid, compressed air) in accordance with operating instructions before starting any repair-work.

Lay and install hydraulic and compressed-air lines properly! Do not mix up connections! Valves and fittings as well as length and quality of hoses must meet all requirements.

2.11 Hazards from electrical energy



Risk of electric shock!

Touching live parts involves the risk of electric shock! Even with the main disconnect switch open, some parts remain live:

- Feeder
- Fuses
- Socket outlets and lamps

Live parts are marked with the symbol on the left.

Use only genuine fuses with the specified amperage! In the event of faults in power supply switch off the equipment at once!

Work on electrical equipment or components must only be carried out by an electrical specialist or by persons who have received instruction under direction and supervision of an electrical specialist in accordance with the rules for electrical work.

Where specified, safely disconnect power supply to any equipment components on which inspection, maintenance or repairwork is to be carried out. First check the isolated components for absence of voltage, then earth and short them and insulate any live parts in the vicinity!

Inspect/check the electrical equipment regularly. Remedy defects like loose connections or charred cables at once.

If it is necessary to carry out work on live parts, call in a second person to operate the emergency stop or main disconnect switch with voltage trip in the event of emergency. Enclose the working area with a red-and-white guard chain and put up a warning sign. Use insulated tools only!

For working on high-voltage equipment, isolate from supply, connect the supply cable to ground and short the components, e.g. capacitors, by earth rod.

2.12 Rules regarding batteries

Mandatory notice under section 18 of the German Batteries Act

Return acceptance of used batteries

DÜRR equipment, products or components may contain batteries or electrical accumulators, hereinbelow referred to as batteries. Both portable and industrial batteries are used.

- **Industrial batteries** are batteries intended exclusively for industrial, commercial purposes and for electrically powered vehicles of any type.
- **Portable batteries** are batteries that are sealed and can be hand-carried. Industrial batteries are not portable batteries.

Batteries may contain **pollutants or heavy metals** which may be detrimental to the environment or to health. Batteries are recycled, given that they contain **important raw materials** such as iron, zinc, manganese or nickel. For this reason, used batteries must not be disposed of in domestic waste. As the final user you are obliged by law to commit used batteries to a collection system separate from unsorted municipal waste. For this, you have the following options:

Portable batteries

- can be returned free of charge to a collecting facility covered by a take-back scheme (e.g., the Joint Take-Back System) as organized, for instance, by commercial organizations and communal administrations; or
- kept ready for collection by a take-back scheme under the terms of your own agreement with such scheme; or
- returned to DÜRR.

Industrial batteries

- can be delivered to a commercial used battery disposal contractor; or
- returned to DÜRR.

DÜRR accepts returned batteries only if they correspond in type to the ones you have received in new condition from us and provided they are returned in quantities commonly disposed of by final users.

If you opt for a **return of used batteries to DÜRR**, please send them with adequate postage prepaid and packed in compliance with applicable transport law, stating the key word "Batterien" on the packaging, to the following address:

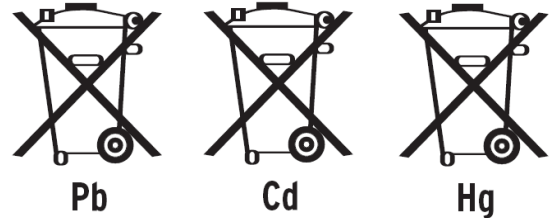
DÜRR Ecoclean GmbH
Stichwort „ Batterien“
z.Hd. Herrn Holger Lapp
Hans-Georg-Weiss-Str. 10
52156 Monschau

Marking of batteries

The crossed waste bin symbol indicates that batteries and electrical accumulators must not be disposed of in domestic waste.

The letters under the bin have the following meaning:

- Pb: battery contains lead
- Cd: battery contains cadmium
- Hg: battery contains mercury



Field of application

The return scheme described above reflects the provisions of the German Batteries Act.

In other countries, different regulations regarding the marking, return and disposal of batteries may apply. Battery disposal must comply with relevant national law in this case. Please consult with the government office or public administration responsible in your area.

2.13 Oils, greases and other chemical substances

When handling oil, grease and other chemical substances, observe the safety instructions applicable to the product.

Any contact with chemical agents should be avoided. Prior to start working with such substances, personnel must read and observe the instructions for use on the packing. This applies to all chemical substances, i.e. also to cleaning agents.



Hazardous substances must be extracted or removed in a manner avoiding any hazards to personnel or to the environment. An environmental hazard may also be created by the inadvertent release ('leakage') of hazardous material. Observe all applicable legal regulations.



In the event of an accident with acids or lyes rinse the affected parts of the body with flowing tap water. Be sure to consult the works doctor!

2.14 Hazards from gas, dust, vapour, smoke

Carry out welding, flame-cutting and grinding work on the equipment only when this is expressly permitted. This may involve a risk of fire or explosion.

Before carrying out welding, flame-cutting or grinding work clean the equipment and its environment from dust and combustible materials and ensure adequate ventilation (risk of explosion)!

For work in confined space observe any local regulations that may apply!

2.15 Safety rules for waste water treatment

The various procedures for waste-water treatment cause chemical changes to substances. There are so many procedures, steps and substances which may be hazardous to man and environment that it is impossible to specify generally valid safety rules and advice.

Rather, the user must pay attention to the following issues:

- Check that the special instructions from manufacturers / suppliers of substances / chemicals are complete and add workplace-specific instructions as required.
- Inform staff in detail and at regular, short intervals about potential hazards and required safety measures.
- Design and maintain the building infrastructure in such a way that existing regulations are met and potential dangers excluded or minimised as much as possible.
- Create the organizational prerequisites for safe work procedures and safety-minded behaviour
- Provide suitable personal protective equipment.
- Ensure by means of supervision and checks that instructions are observed and personal protective equipment is worn.

Maintain and operate equipment which is used to store or process substances hazardous to water in such a way that any contamination of water resources is excluded. To meet this requirement user must enlist the services of qualified expert companies for maintenance, repairs and cleaning in accordance with § 19 g ¹WHG unless user fulfills the requirements himself. It is recommended to sign a monitoring contract with **DÜRR Ecoclean GmbH**.

Dangerous substances or substances hazardous to water as defined by the Dangerous Substances Ordinance or the German Water Management Act are used in almost all processes for waste-water treatment.

For handling of these substances observe the provisions of ²GefStoffV and WHG, in particular with respect to:

- the obligation to mark the containers
- in-company danger signs and safety rules
- monitoring and operation of the equipment.

User must make sure that containers and piping are marked unmistakably and permanently if any danger may arise from their contents, temperatures or mix-ups.

We urgently recommend that you analyse all substances – even those for which marking is not compulsory under GefStoffV – for characteristics which are hazardous or detrimental to health and mark them accordingly. We recommend that you use the symbols specified in GefStoffV for marking such substances as their meanings are widely known and the introduction of additional symbols would cause confusion. Also observe the regulations for the prevention of accidents 'Safety markings on the workplace' (VGB 125) whose attachment includes the required prohibiting signs, warning signs, mandatory signs and escape signs.

¹ Wasserhaushaltsgesetz (German Water Management Act)

² Gefahrstoffverordnung (Dangerous Substances Ordinance)

SAFETY INSTRUCTIONS

This is of particular importance for maintenance and repair work. Many a time have mix-ups of piping led to serious accidents.

The GefStoffV obliges the industry to take appropriate action for protecting human life and health and the environment when handling dangerous substances. These actions include the implementation of applicable regulations for safety at work and accident prevention. The user must examine whether dangerous substances may occur at a workstation and, if so, whether applicable regulations with regard to maximum concentrations are observed. If limit values should not be met despite appropriate protective action, the user must provide employees with effective protective gear and keep such gear in good working order.

GefStoffV obliges the industry to prepare operating instructions mentioning the dangers to man and environment involved in handling dangerous substances, and defining the appropriate protective measures and rules of behaviour.

3. Equipment Description / Technical Data

Table of Contents:

3.	Equipment Description / Technical Data	3-1
3.1	General equipment data	3-3
3.1.1	Utilities supply	3-4
3.1.2	Part data	3-4
3.2	Handling, installation, dismounting	3-5
3.2.1	General	3-5
3.2.2	Shipping and handling	3-5
3.2.3	Installation	3-7
3.2.4	Equipment shutdown and disposal	3-8
3.3	Pneumatic installation on the equipment	3-9
3.4	Equipment description	3-10
3.4.1	Equipment design	3-10
3.4.2	Ball valves	3-10
3.4.3	Safety devices	3-11
3.4.4	General notes on maintenance	3-11
3.5	Modules	3-12
3.5.1	HBG 054 Layout	3-12
3.5.2	HBG 111 Machine housing with tank and floor tray	3-13
3.5.3	HBG 131 Make-up water connection A1	3-15
3.5.4	HBG 151 Load and unload opening	3-16
3.5.5	HBG 162 IFW tank	3-17
3.5.6	HBG 181 Cooling zone (in external conveyors MK135757VK and MK135738VK)	3-19
3.5.7	HBG 182 Vacuum chamber	3-20
3.5.8	HBG 281 External conveyor system (MK135738VK and MK757VK)	3-21
3.5.9	HBG 341 Robot system	3-22
3.5.10	HBG 345 Robot gripper	3-23
3.5.12	HBG 421 Spray system 10 bar	3-24
3.5.13	HBG 432 Hybrid nozzle 330bar	3-24
3.5.14	HBG 435 High pressure manifold pipe	3-25
3.5.14.1	High-pressure fluid bag filter F33	3-26
3.5.14.2	High-pressure feed pump P32	3-26
3.5.14.3	High-pressure pump P34	3-26
3.5.14.4	HP bath cooling W35	3-26
3.5.15	HBG 451 HP linear motion unit 3D	3-27
3.5.16	HBG 462 HP tools	3-28
3.5.17	HBG 551 Electric heating	3-29
3.5.18	HBG 561 Cooling water supply A2 / HBG 562 Bath cooling W35	3-30
3.5.19	HBG 641 Air circulation/exhaust system V41	3-32
3.5.20	HBG711 Drain pump unit P10	3-33
3.5.21	HBG 721 Oil separator B22	3-33
3.5.21.1	Oil separator pump P21	3-33
3.5.22	HBG 731 Detergent dosing system A6	3-34

EQUIPMENT DESCRIPTION / TECHNICAL DATA

3.5.23	HBG 752 FAS filter F23a with drag-out conveyor H23	3-35
3.5.24	HBG 752 External manifold pipe	3-37
3.5.24.1	Wash feed pump P22	3-38
3.5.24.2	Wash booster pump P24	3-38
3.5.25	HBG 911 Control stations	3-39
3.5.26	HBG 941 Pneumatic system	3-40

3.1 General equipment data

Equipment dimensions:

Machine housing (L x W x H)	5,600 x 3,580 x 3,600 mm
Shipping dimensions L x W x H	approx. 6,000 / 4,000 / 4,000 mm
Weight (empty) (shipping dimensions)	16,000 kg
Weight (with full tanks)	19,000 kg
Loading level:	1,730 mm
Unloading level:	1,016 mm

Line cycle time	30 sec.
Machine cycle time	90 sec. (three machines working at the same time)
Working time	480 min./shift
Number of shifts	3 shifts per day
Equipment availability	≥ 95 %
Part unload temperature	ambient + 5° C (ambient range = 22° C – 35° C)
Tank capacity:	3000 litres
Heating power:	45 kW
Painting (machine)	RAL 7035 (light grey) primer and top coat



For ratings of individual units (components) see spare parts list and operating instructions on outsourced items. (see chapter 7 “Spare and wear parts lists” and chapter 12 “Operating instructions on outsourced items”)

3.1.1 Utilities supply

Utility	Basic data	Connection	Consumption
Electricity (with HP)	3 x 400 V / 230 V / 50 Hz	260 A	approx. 175 kVA
Make-up water	min. 2 bar (3 < °e < 12.5)	R 1"	approx. 50 l/h
Cooling water	28° C – 3 bar 34° C – 1 bar delta t = 6° C	R 2"	Bath cooling ~ 4.0 m³/h Vapour condenser ~ 4.0 m³/h HP circuit cooling ~ 0.7 m³/h Cooling tunnel ~ 5.0 m³/h E-Cabinet cooling ~ 0.5 m³/h
Compressed air	min. 5 bar	R 1"	approx. 5 Nm³/h
Waste water	1 bar (no back-pressure)	R 1 ¼"	3,000 l (1 h)
Exhaust air		DN 250	1000 m³/h, up to 3000 m³/h for short time during loading /unloading

3.1.2 Part data

Part type	Cylinder-Head AJ-200 3 Cyl. Head
Drawing No.	Type G4D3-6049-BA2 Sheet 1-10 RevA, Date 07.03.2012 Type G4D3-6049-CA1 Sheet 1-10 RevB, Date 07.03.2012 Type H4P3-6049-A
Dimensions L x dia.	max. 550 mm x 310 mm x 95 mm
Part weight	Cyl. head approx. 15 kg Adapter plate approx. 50 kg
Line cycle time	30 sec.
Machine cycle time	90 sec. (three machines working at the same time)

3.2 Handling, installation, dismounting

3.2.1 General

It is strongly recommended to check the entire equipment immediately upon delivery for completeness and damage sustained in transit. This can be done on the basis of the packing list and other documents accompanying the shipment. Complaints can generally be recognized only if they are reported to the forwarding agent or **Dürr Ecoclean GmbH** on the day on which you receive the equipment.

It is the duty of the user to comply with applicable environmental regulations and disposal requirements (packaging, oil change, cleaning agents, etc.).

3.2.2 Shipping and handling

Observe the information given in this chapter for any equipment handling operations.



If shipping/handling and installation of the equipment is not carried out by **Dürr Ecoclean GmbH** following notes must be observed!

Claims

We expressly point out that we cannot accept any liability or warranty for damage due to improper handling. If in doubt, contact the manufacturer before any equipment handling operations.

Handling instructions



Make sure to observe the safety instructions in chapter 2 and the applicable regulations for the prevention of accidents!

Handling procedures

As a general rule a crane or fork lift truck is used for loading the equipment.

Please make sure to observe the following rigging sketch.

CAUTION**Damage due to improper handling**

Failure to observe the instructions in the rigging sketch enclosed may lead to damage to the machine or parts thereof.

For equipment weight, please refer to the Technical Data in chapter 3.

Appoint qualified staff members to give directions to the lifting gear operator!

Use only suitable and approved means of loading. Observe all applicable safety rules and regulations for the prevention of accidents.

WARNING**Risk of injury by falling objects**

There is a risk of injury by falling parts or components. Do not stand or work under suspended objects!



The equipment must only be handled without any fluid charge. Therefore, empty all tanks before any handling operation!

EQUIPMENT DESCRIPTION / TECHNICAL DATA

When offloading the cleaning machine and putting it in place see to it that the machine is kept in horizontal position.

Make sure that the load is properly secured. Use appropriate sling points !

Secure the equipment against inadvertent displacement before or immediately after loading, using the recommended/supplied securing or retaining devices. Affix appropriate warning signs!

3.2.3 Installation



The shop floor must be absolutely flat and horizontal. Make sure that the equipment is adequately levelled to ensure proper operation!

The overall equipment is adjustable in height by the levelling devices on the baseframe (± 15 mm).

After installation remove the heavy-duty eyebolts. Whenever you wish to move the cleaning machine to another location in future make sure that only heavy-duty eyebolts are used for handling.

Eyebolts of C15 acc. to DIN 580 must not be used!

All parts must be correctly fitted and meet all requirements for proper operation of the system.

Feeders and control cables inside the equipment are to be laid in protective conduit or ducting in accordance with special and general conditions and rules.



For technical components the **max. ambient temperature is 50°C**. Make sure that this temperature will not be exceeded.

3.2.4 Equipment shutdown and disposal

Dismounting of the individual equipment assemblies must only be made by skilled persons qualified for such work.

For dismounting, isolate the equipment from power supply properly and completely. All cable connections to the equipment must be removed.

Also remove any other connections or links between equipment and building or other equipment assemblies.

Disposal



For disposal of the equipment at the end of its service life enlist the services of a qualified expert disposal company.

The individual equipment components must be separated into

- Steel
- Oil-contaminated parts (e.g. pumps, piping, etc.)
- Electric components
- Plastics

The individual components must then be disposed of in a proper way satisfying the applicable local rules and regulations.

3.3 Pneumatic installation on the equipment

The pneumatic equipment of the cleaning machine is completely installed.



Make sure that a pneumatic supply line is connected with a diameter of 1" and a permanent pressure of min. 5 bar g. Compressed air supplied to the machine must be oil-free and dry.

Before carrying out a general functional test of the machine check the sense of rotation of the individual motors.

Start the general functional test by conducting a comprehensive test of all manual functions. Only then should the machine be run in automatic mode.

Even for minor movements of the machine isolate the machine from all external utilities supplies. Re-connect to the mains properly before re-starting!

For re-starting be sure to observe the operating instructions!

All robot movements must be carried out and checked in teaching mode using the hand-held terminal. (Observe instructions for commissioning of robot).

3.4 Equipment description

3.4.1 Equipment design



A complete description of the individual equipment assemblies is given in chapter 12.1, Operating instructions on outsourced items. This chapter provides information on equipment assemblies specifically designed and manufactured for your machine.

The machine is of compact design and construction. The machine casing is mounted on a floor tray and houses all pumps and filters and the switchgear cabinets.

The work chamber is provided with one large maintenance door. This is for inspections and maintenance work.

This door is monitored by a safety limit switch which brings the machine into Emergency Off condition when the door is opened.

The cleaning machine is delivered as a completely preassembled unit unless otherwise requested. This reduces the installation and commissioning time to the minimum.

3.4.2 Ball valves

The home position of the ball valves is evident from the coloured markings on the valve handles:

Green = open

Red = closed

During automatic mode of operation, the ball valves are in home position.

3.4.3 Safety devices



For details on the safety facilities refer to chapter 2: Safety.

This equipment has the following electric safety facilities:

- Emergency Stop button
- Door safety switch with lock

Locations of Emergency Stop buttons

Emergency Stop buttons are located as follows:

- Operator panel
- Robot programming device
- Robot cabinet

Locations of door safety switches

Door safety switches are located as follows:

- Chamber access door

3.4.4 General notes on maintenance



We have summarized all maintenance work to be done on the assemblies in chapter 6 'Maintenance'.

3.5 Modules

3.5.1 HBG 054 Layout

Standard design:

Separation into treatment section and utilities section

Utilities section with water treatment and filtration systems

Floor tray acc. to German Water Management Act (WHG)

Fluid-contacting parts made of stainless steel

Function / Description:

Cleaning of parts with or without pallets by means of aqueous medium

Part handling by robot integrated into treatment zone

3.5.2 HBG 111 Machine housing with tank and floor tray

Function / Description:

The machine body is made up of a self-supporting construction with integrated tank and WHG-compliant floor tray.

All treatment modules, tanks and all equipment components and assemblies are arranged inside a sound-insulating cabin which is part of the machine housing. This set-up permits a restriction of the noise level to 80 dB(A).

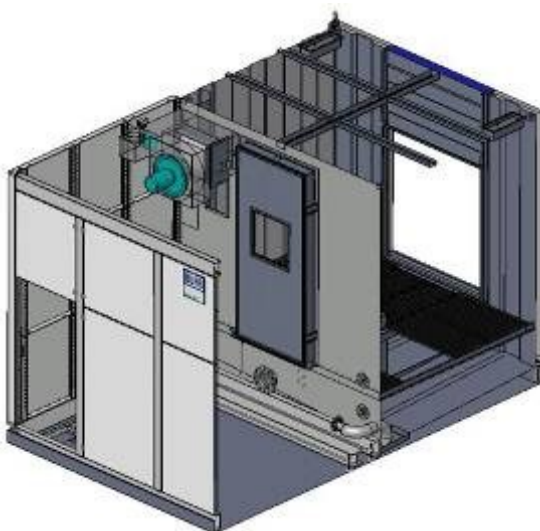
A maintenance door provides access to the treatment zone and permits installation and removal of the robot and all treatment modules. The door is interlocked by means of an EUCHNER proximity safety switch.

The robot mounting plate is arranged inside the treatment zone. It serves to carry the robot.

Beneath the robot mounting plate there is the 3000-litre dirty-fluid tank with its bottom sloping towards the pump sump. Design: welded, brushed seams. The tank is fitted with galvanized open-mesh flooring above fluid level.

The floor tray made of 3mm thick stainless steel sheet (grade 1.4301) is arranged underneath the machine housing. The floor tray is dimensioned to collect the fluid volume of the dirty tank in the event of a leak. The floor tray meets the 'Axiom of Concern' of the German Water Management Act, due to co-ordination between TÜV Rheinland / Aachen branch, the Water Management Authority of the district of Aachen (Lower Water Management Authority), and the Dürr company as a certified and approved specialized supplier within the meaning of section 19 H of the Water Management Act. As a result, the standard floor tray proposed by Dürr requires no additional suitability approval. Any additional demands raised by the user or Lower Water Management Authority with a view to meeting the 'Axiom of Concern' must form the subject matter of a separate agreement and purchase order.

The steel sheet enclosure of the circulating/exhaust air system and a blow-off station form part of this HGB main construction group.



EQUIPMENT DESCRIPTION / TECHNICAL DATA

Standard design:

- Loading of parts at face end
- Housing separated into treatment zone and utilities section
- Self-supporting steel sheet construction mounted on WHG-compliant floor tray
- Treatment zone with open tank, open mesh flooring, and roof
- Treatment zone with opening for part loading/unloading and maintenance door for access and for installation of robot
- Partition joint provided for splitting of the cleaning machine for shipping purposes
- Integrated air circulation/exhaust system and blow-off station
- Integrated mounting plate for supported robot types
- Preparation for dismounting fixture

Function / Description:

Treatment zone to accommodate all requisite treatment modules

The utilities section accommodates all pumps, electric cabinets, piping, etc.

All fluids returning from part cleaning are collected in an open tank, filtered and recycled to the cleaning process

Pump groups are arranged on mounting platforms

Notes on maintenance

WARNING



Hazards upon entering the work chambers

There is a risk of injury related to movements of automatic units (robot). Before entering the work chamber switch off and lock out the machine to prevent inadvertent restarting.

WARNING



Slipping hazard

There is a risk of injury by slipping if the open-mesh flooring is not laid correctly. Place open-mesh flooring in the work chamber with concave side up only.

3.5.3 HBG 131 Make-up water connection A1

Standard design:

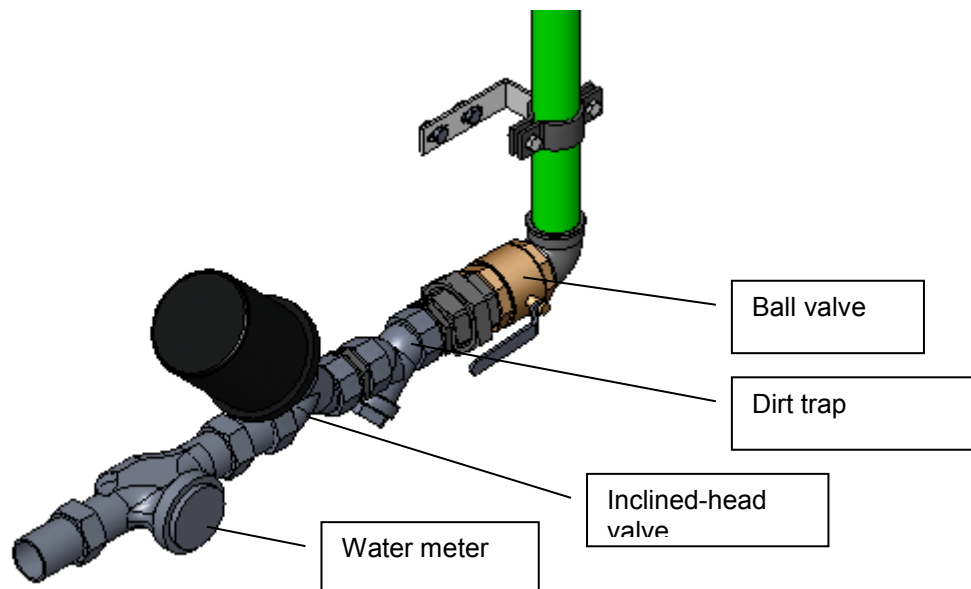
- Nominal size of connection: 1"
- Pipe material: galvanized steel
- With pneumatically operated inclined-head valve (make GEMÜ) and manual ball valve

Function / Description:

If the fluid level in the machine tank falls below the min. level switch the inclined head valve opens to top-up make-up water. After that, the inclined head valve closes again.

Options:

- Nominal size of connection: 2"
- Connection with water meter and dirt trap (in both nominal sizes)



3.5.4 HBG 151 Load and unload opening

Standard design:

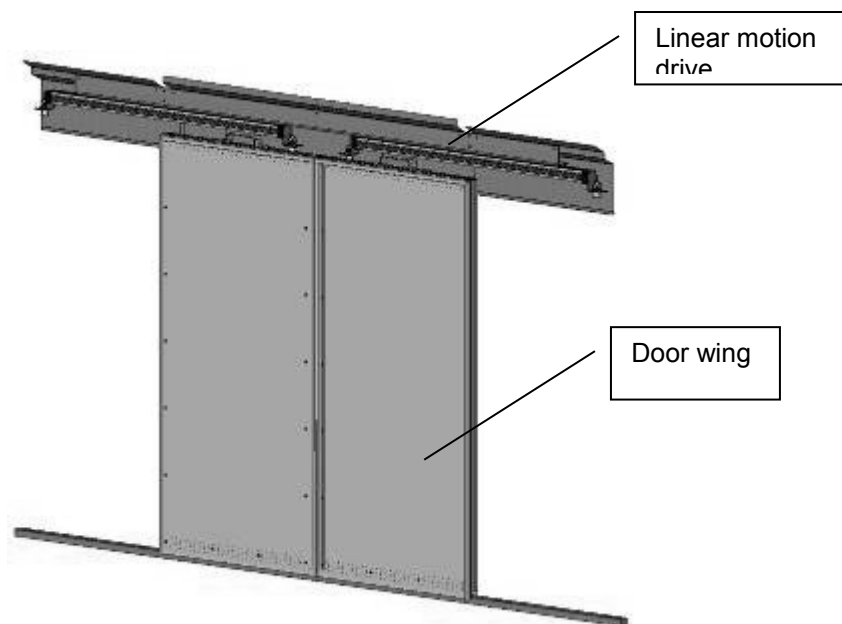
- Double-wing sliding door
Opening dimensions: 1,680 mm x 1,785 mm
Opening and closing time: 3.5 sec
Material: aluminium
- Operated by pneumatic linear motion drive, make: Festo
- Door positions monitored by proximity sensors

Function / Description:

The parts are taken into the treatment zone through the load/unload opening.

Options:

Sound insulation of sliding door



3.5.5 HBG 162 IFW tank

Standard design:

- Octagonal tank, outside diameter 850mm, height 1,100mm
Wall thickness: 3mm
Volume: 600l
- Five spray boxes with a total of 32 solid jet nozzles (volume flow per nozzle 71l/min, hole diameter 7mm) are fitted to the tank.
- Spray pressure: 10 bar

Function / Description:

General pre-cleaning of parts by injection flood washing.

The robot takes the part into the filled flood tank where fluid is applied uniformly through solid-jet nozzles. The robot gripper moves the part in a rotating manner, thus ensuring an all-penetrating injection flood washing of the part.

A level sensor is mounted in the top section of the IFW sensor. The fluid inside the tank must operate this sensor before the injection flood wash process can be started.

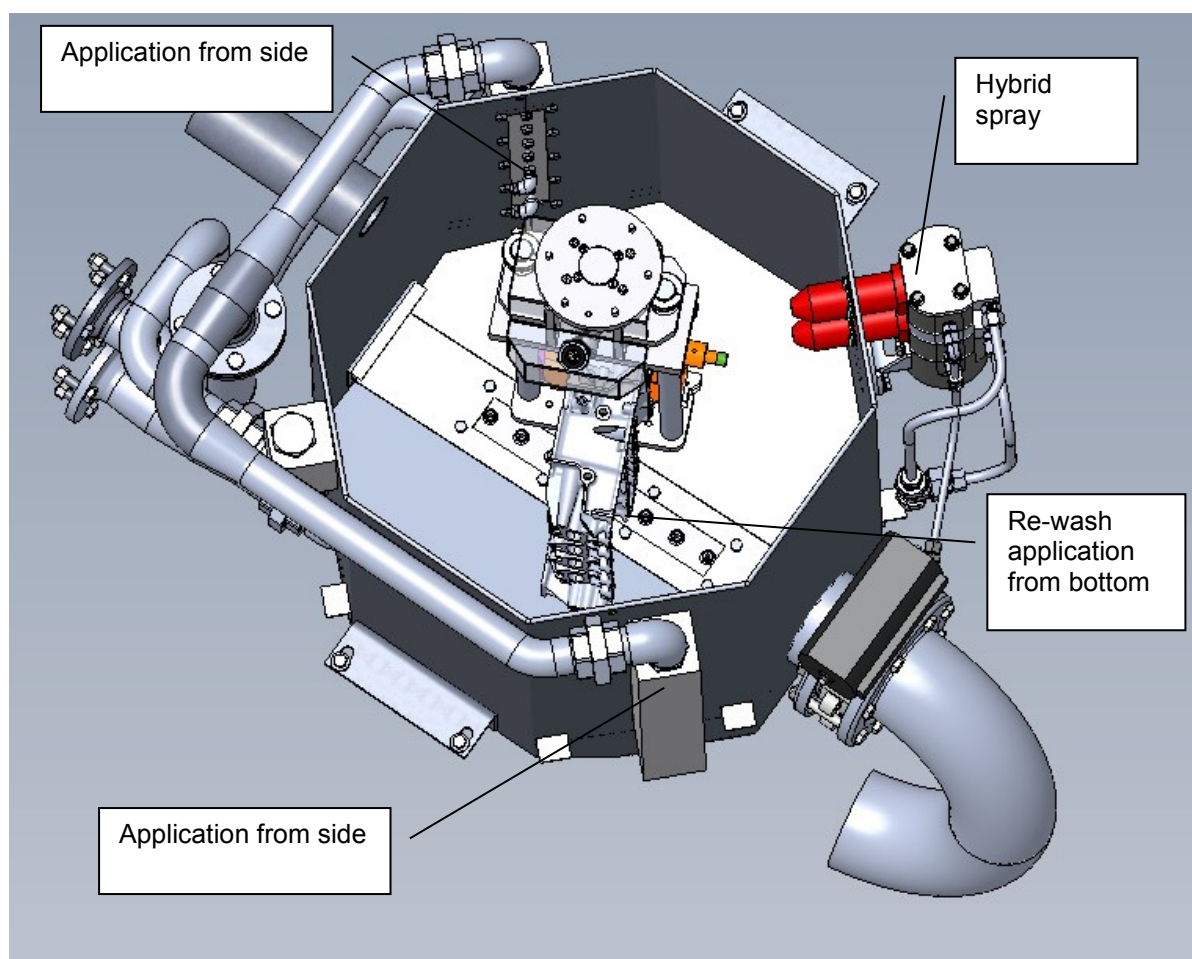
The IFW tank can also be used for a general re-wash operation without bath. This requires the addition of an adjustable opening in the bottom section of the IFW tank for rapid draining and input of wash fluid.

Options:

- Octagonal tank, outside diameter 650 mm, height 900 mm
Wall thickness: 3mm
Volume: 300l

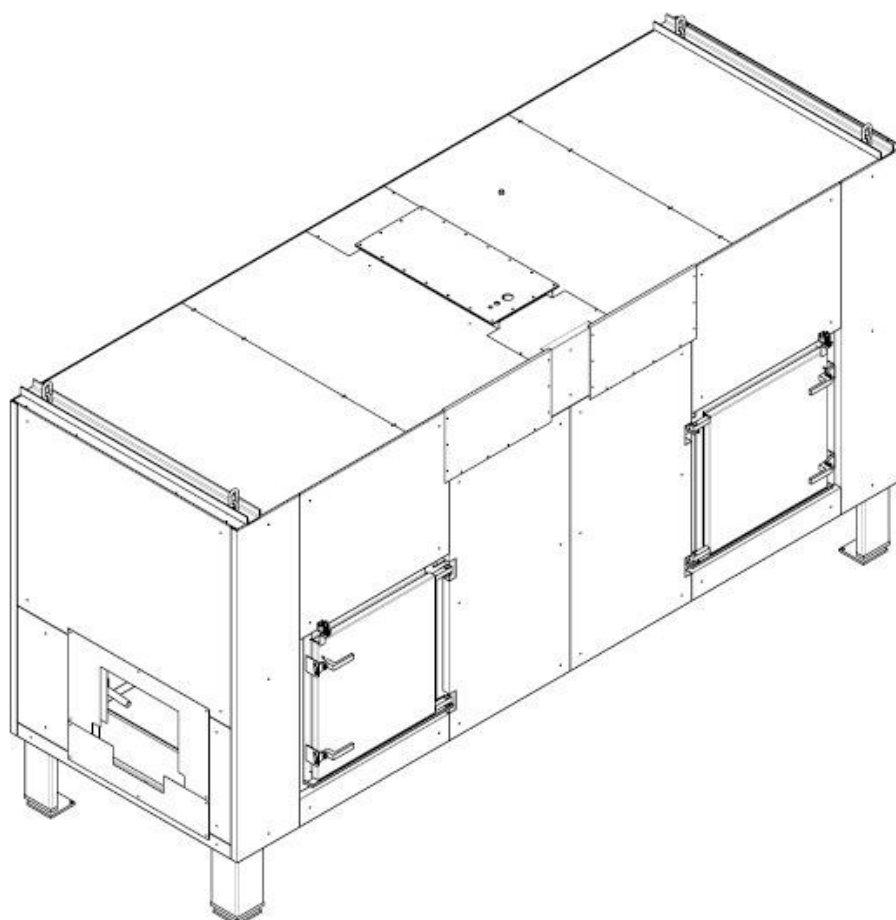
IFW tank

See application chart, pos. 1-3



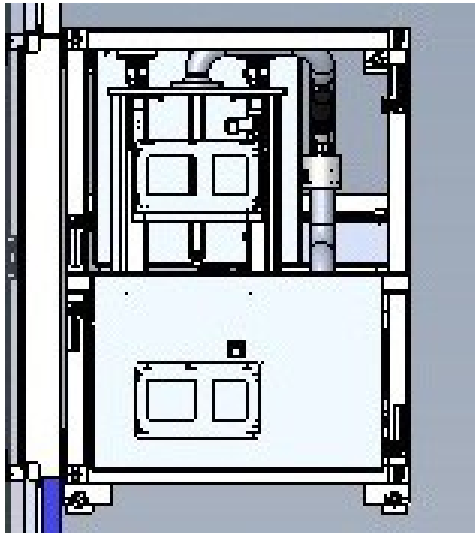
3.5.6 HBG 181 Cooling zone (in external conveyors MK135757VK and MK135738VK)

A cooling zone is installed beside the cleaning cells. Here the parts are cooled after treatment in the work chamber.



3.5.7 HBG 182 Vacuum chamber

A vacuum chamber is installed beside the cleaning cells. Here the parts are dried after treatment in the work chamber.



After closing of the doors the vacuum pump creates a vacuum. This lowers the evaporation temperature, causing the residual fluid on the parts to evaporate.

A vacuum pump supplied by Becker generates the negative pressure in the vacuum chamber.

For a detailed description please refer to Becker's documentation enclosed in chapter 12.

3.5.8 HBG 281 External conveyor system (MK135738VK and MK757VK)

For a detailed description please refer to Bleichert's documentation enclosed in chapter 12.

3.5.9 HBG 341 Robot system

Standard design:

- Make: Kuka
- Type: KR 210 Foundry Exclusive

Provided by Jaguar Land Rover

Function / Description:

- The robot gripper picks up the part from the external conveyor / part nest, takes it through the process steps required for cleaning and drying and then deposits the part again.

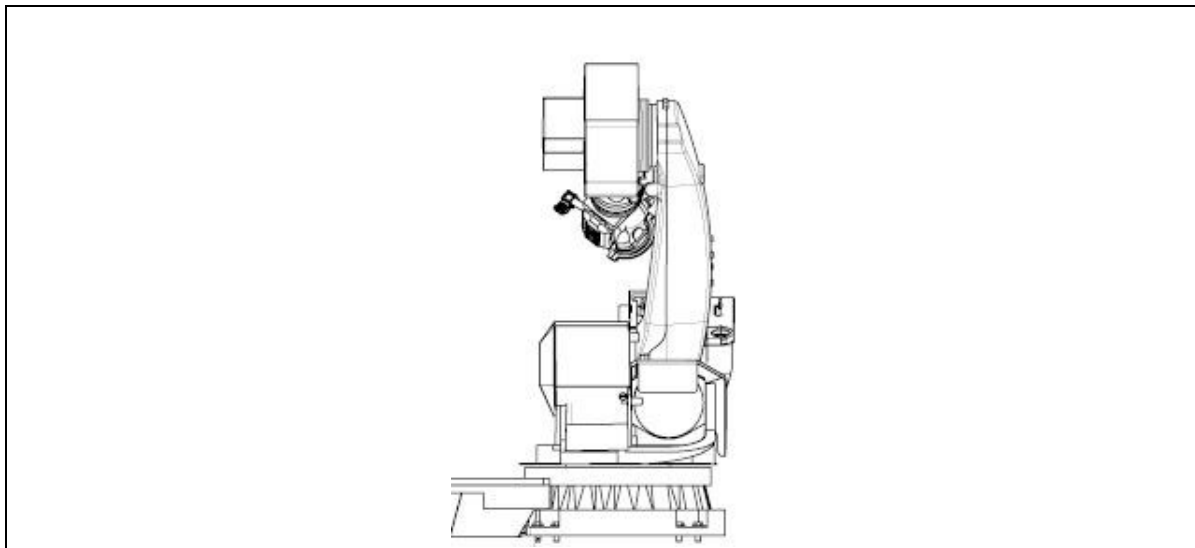
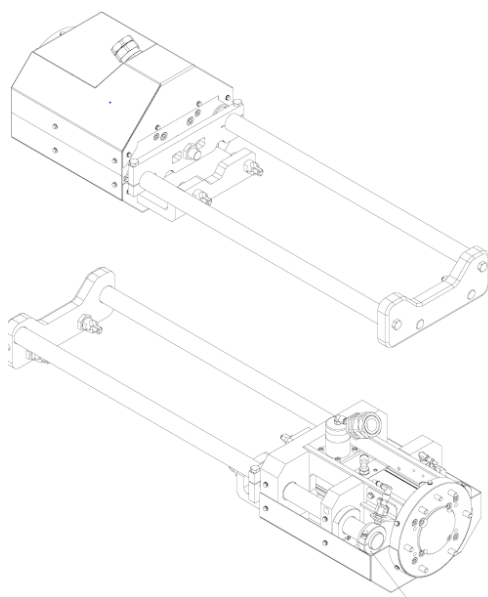


Abb. 5-1: HBG 341: Robot system

3.5.10 HBG 345 Robot gripper

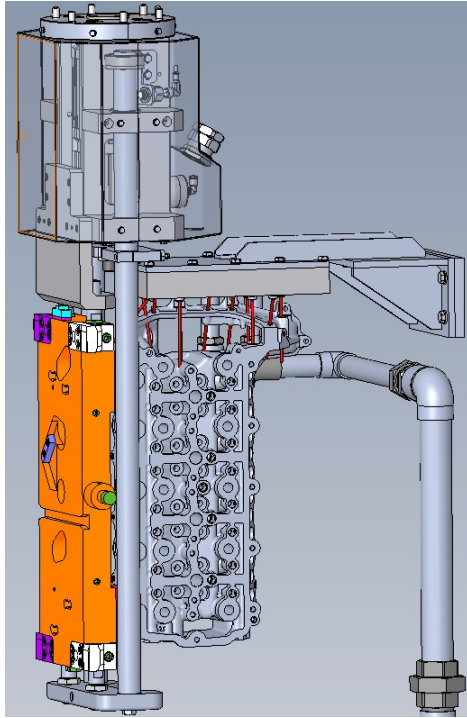
See separate instructions by Festo Pneumatic cylinder DNC-80-50

Chapter 12 Operating instructions on outsourced items



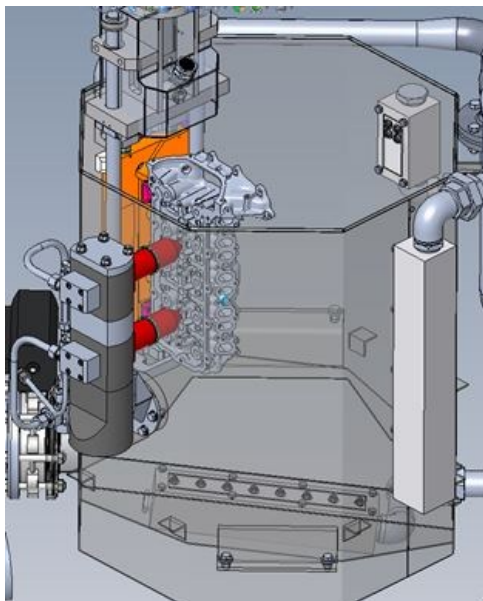
3.5.12 HBG 421 Spray system 10 bar

See application chart, pos. 3 pinpointed spray system



3.5.13 HBG 432 Hybrid nozzle 330bar

See application chart, pos. 2 hybrid spray



3.5.14 HBG 435 High pressure manifold pipe**Design:**

- HP pump: Make: Hammelmann
Delivery: 66 l/min
Head: 6,000 m
Motor rating: 75 kW
- HP feed pump Make: KSB
Delivery: 16 m³/h
Head: 37 m
Motor rating: 3 kW
- 2 bag filters Make: Eaton
Maximum throughput: 40 m³/h
Mesh: 20 µm
- Shutoff valves and expansion joints in supply pipe
- Hydraulic couplings, series S, make: Ermeto in high-pressure pipe

Function / Description:

The HP feed pump sucks contaminated wash fluid from the machine tank (optionally from the clean tank) and feeds it through the bag filters at a pressure of 3.7 bar.

Following filtration the HP pump builds up a pressure of 600 bar.

The wash fluid is fed to the HP treatment tools via the HP valve block.

If no HP treatment is active, the wash fluid is returned to the tank by gravity.

The head of the HP pump is connected to the tank by a pipe for piston cooling.

Options:

- HP pump: Make: Hammelmann
Delivery: 91 l/min
Head: 3,300 m
Motor rating: 55 kW

Both HP pump types are fitted with a variable frequency drive and an additional cooling fan on the motor.

3.5.14.1 High-pressure fluid bag filter F33

A set of bag filters is installed to filter the fluid.

For details of operation and maintenance see chapter 6

3.5.14.2 High-pressure feed pump P32

For details of operation and maintenance see separate instructions by KSB

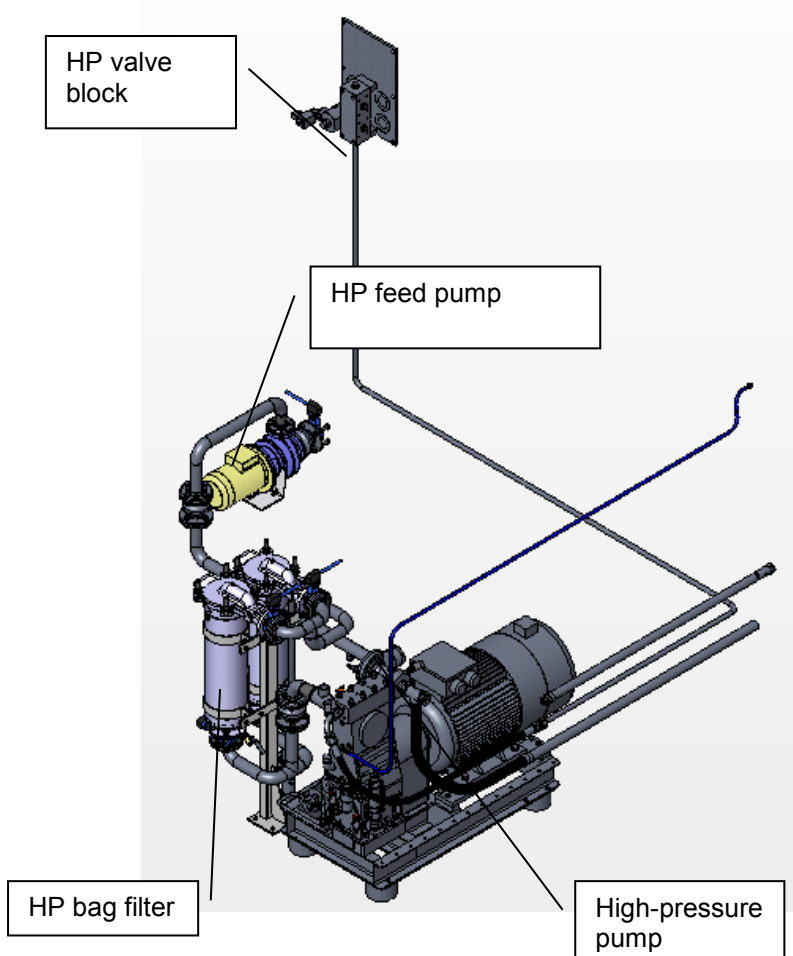
3.5.14.3 High-pressure pump P34

For details of operation and maintenance see separate instructions by Hammelmann

3.5.14.4 HP bath cooling W35

The bath fluid is heated up considerably by the HP treatment and must be cooled down.

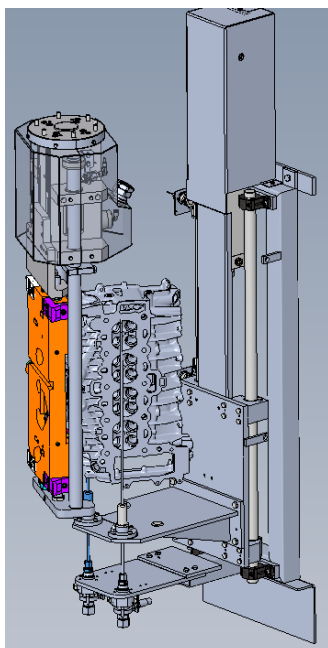
For this purpose a heat exchanger is installed to reduce the bath fluid temperature by means of local cooling water.



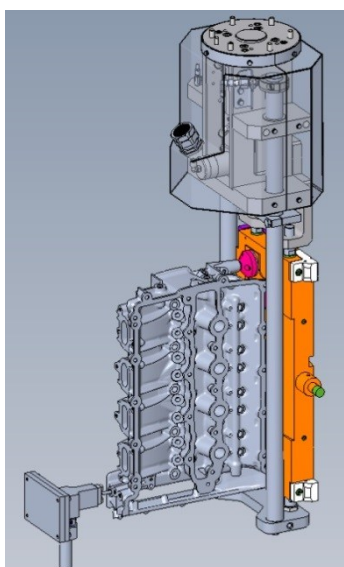
3.5.15 HBG 451 HP linear motion unit 3D

See application chart

Pos. 4 HP deburring of main oil galleries

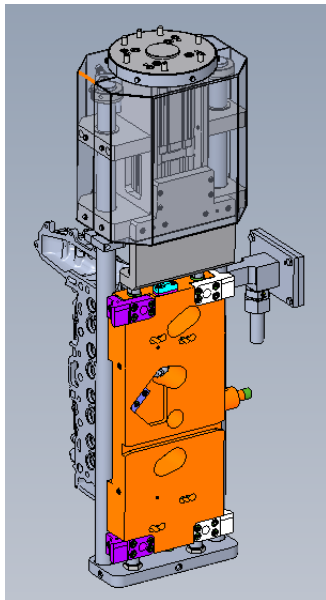
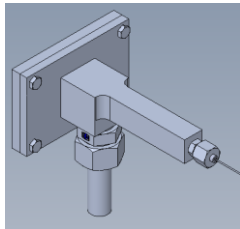


Pos. 5 HP deburring of exhaust face oil ways



3.5.16 HBG 462 HP tools

Pos. 6 HP deburring of oil galleries



3.5.17 HBG 551 Electric heating

The machine comes with an electric heating system.

The electric heating system heats the wash fluid contained in the tank to a maximum temperature of 60°C.

The electric heater with 45 kW rating is flange-mounted in the tank with an adapter flange.

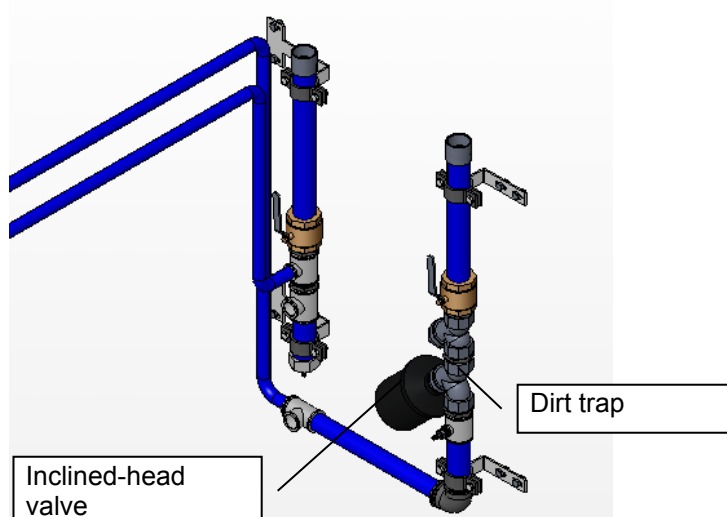
3.5.18 HBG 561 Cooling water supply A2 / HBG 562 Bath cooling W35**Standard design:**

- Nominal size of connection: 2"
- Pipe material: galvanized steel
- Cooling water supply:
- Manual ball valve
- Dirt trap
- Pneumatically operated inclined-head valve
- Cooling water return
- Ball valve

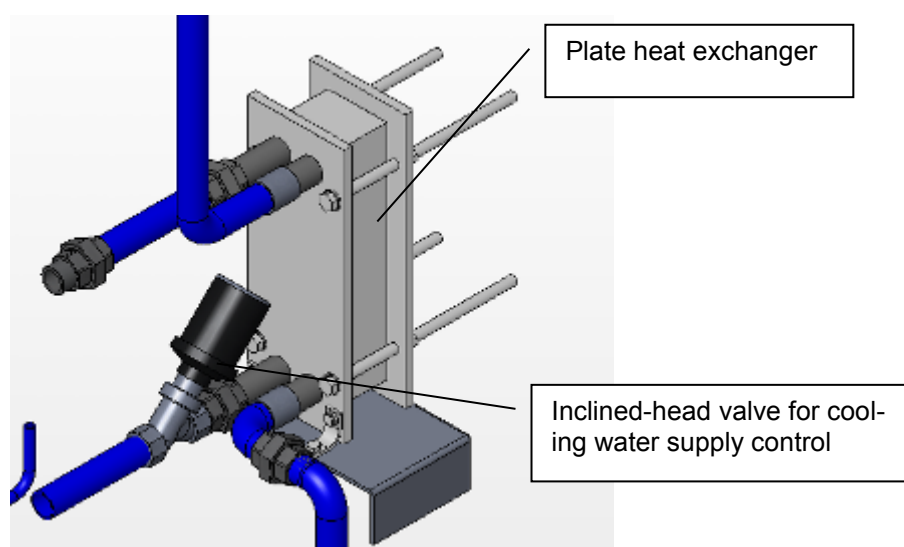
Function / Description:

Cooling of:

- Vapour condenser in air circulation/exhaust system
- Oil cooler of HP pump
- Fluid cooling for HP pump: The wash fluid handled by the HP pump must not be hotter than 58°C. Therefore, the fluid contained in the tank needs to be cooled down to this temperature while the pumps are running. This is achieved in a plate heat exchanger.
- Plate heat exchanger Make: Funke
Cooling water and wash fluid connections: 1 1/4"
- Pneumatically operated inclined-head valve for cooling water supply control



Arrangement of cooling water supply



Arrangement of bath cooler

3.5.19 HBG 641 Air circulation/exhaust system V41

Standard design:

- Mist collector: Make: Munters
Delivery: 3,000 m³/h
Material: PPTV
Collecting efficiency: 98%
- Radial fan Make: BVA Kockelmann
Feed rate: 3,000 m³/h
Differential pressure: 30 mbar
Material: 1.4301
- Pneumatic rotary actuator for offtake damper

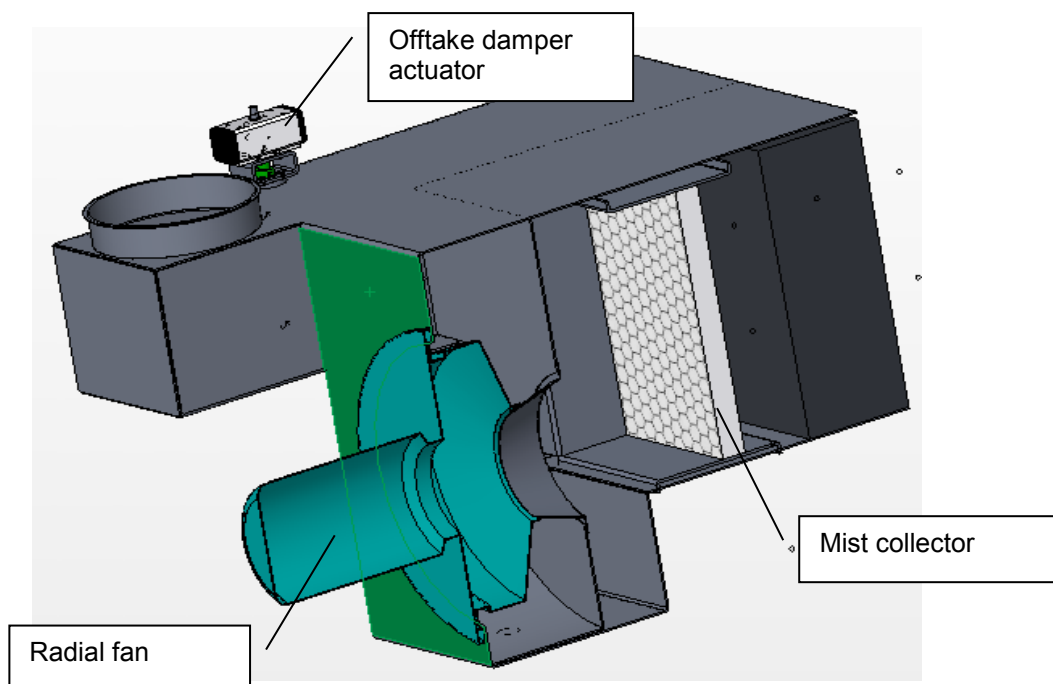
Function / Description:

The radial fan sucks in hot, wet air from the treatment zone through the mist collector.

The mist collector is 98% efficient on droplets larger than 15 micron.

The radial fan returns the dried air through the blow box into the treatment zone if the loading door is closed or into the user's exhaust system if the loading door is open (no vapours escape through loading door).

Inside the vapour condenser the air is cooled to remove any additional, condensing water droplets.



3.5.20 HBG711 Drain pump unit P10

Function / Description:

Draining of:

- Tank in machine housing (b“
- Floor tray
- Oil separator (B22)
- Filter system (F23a and F33)

into user's waste-water treatment system.

The shutoff valves of the drain pump unit are hand-operated.

Draining operation must be started and stopped by hand, only and exclusively via key switch.

3.5.21 HBG 721 Oil separator B22

Description

The oil separator serves for separation of demulsified oil and grease from the bath surface.

To improve the separation of oil and cleaning fluid a specially designed coalescing plate pack has been integrated.

The oil is collected in the oil collecting pot. A level switch indicates when the pot is full and has to be emptied.

The cleaned fluid is returned to the wash tank.

3.5.21.1 Oil separator pump P21

A dirty-water pump delivers the fluid from the tank to the oil separator.

- Dirty-water pump: Make: Johnson Pump
Delivery: 9 m³/h
Head: 10 m
Motor rating: 0.75 kW

3.5.22 HBG 731 Detergent dosing system A6**Version:**

Dosing pot with integrated dosing pump and level switch

- Make: Prominent
- Tank volume: 140 l
- Tank material: PE
- Dosing pump Solenoid diaphragm pump
- Delivery 19 l/h
- Head 20 m
- Motor rating 17 W

Function / Description:

- Detergent input takes place together with make-up water input.
- Fluid concentration is customer-specific.
- Initial filling can be done via dosing system or by hand.
- No detergent concentration measurement in bath fluid.

Topping-up the dosing pot

The dosing pot is located in the cell.

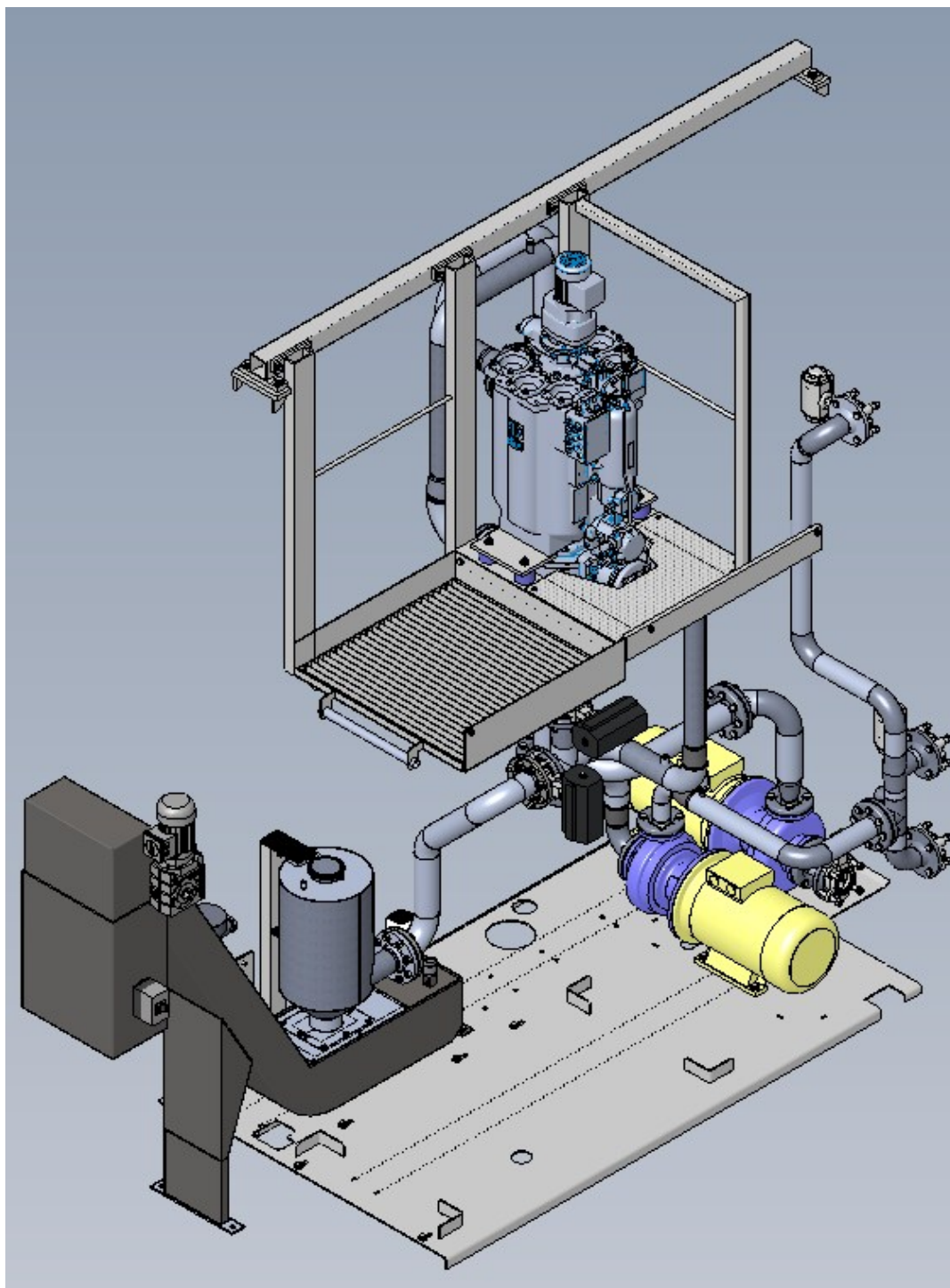
Minimum level switches in the dosing pot will detect if the pot is nearly empty.

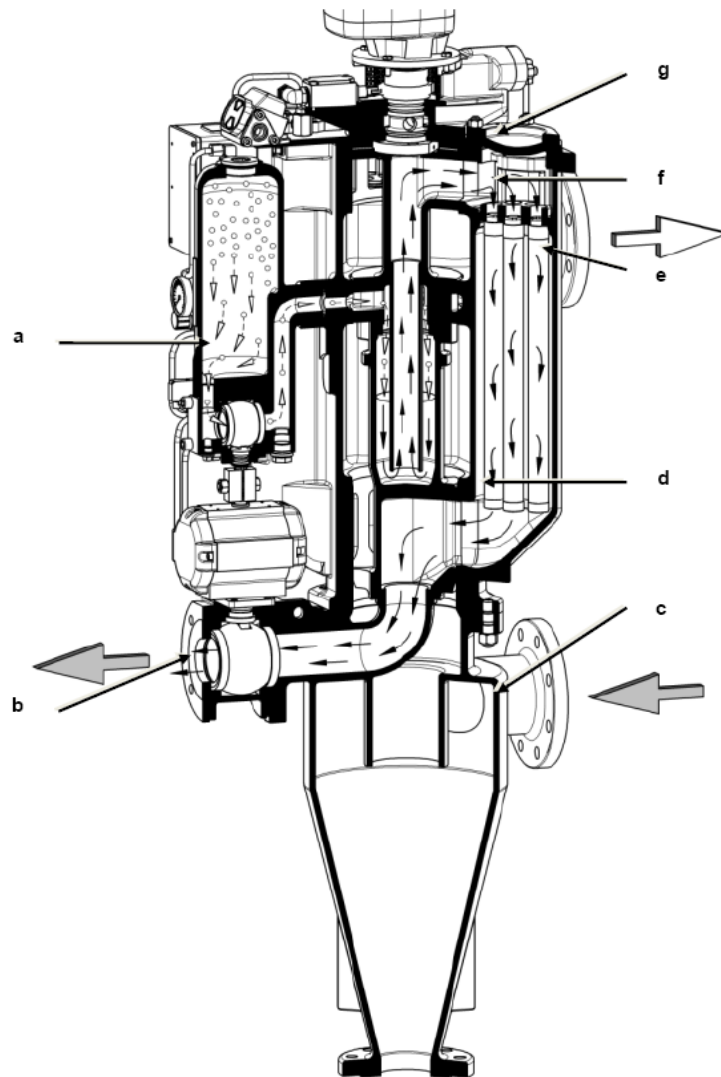


If both screen display and warning light indicate that the dosing pot is nearly empty, the pot must be topped-up within one hour.

If the dosing pot is not topped up, the equipment will stop after one hour.

3.5.23 HBG 752 FAS filter F23a with drag-out conveyor H23





Legend:

- a) Compressed-air reservoir
- b) Backflushed fluid outlet
- c) Filter inlet
- d) Filter candles
- e) Filter outlet
- f) Filter chamber
- g) Maintenance opening

The fluid enters the filter at the bottom connecting flange, flows through the cyclone for coarse dirt separation and into the filter chambers, through the filter candles, and exists at the top connecting flange.

Coarse dirt is separated in the cyclone and drops into the collecting chamber. The level inside the collecting chamber is monitored. When the level sensor outputs the corresponding signal a backflush cycle takes place.

Dirt particles which are larger than the filter mesh size accumulate on the outside of the filter candle. When the differential pressure is exceeded a backflushing cycle takes place. Fluid is abruptly pressed by compressed air from the clean side towards the dirty side of the filter candles, removing solids from the cartridges and entraining them out of the filter chamber.

A backflush cycle is initiated by following events:

- Collecting chamber full
- Max. differential pressure reached
- Set time interval reached

The fluid discharged in a backflush cycle is taken to the settling pot where fluids and solids are separated from each other. The fluid is returned to the machine tank, the solids are dropped into a waste bin.

3.5.24 HBG 752 External manifold pipe

Standard design:

- Feed pump and booster pump: Make: KSB
 Delivery: 80 m³/h
 Head: 55 m
 Motor rating 18.5 kW
- Feed pump comes with rotation brake to minimize pump housing wear
- Pressure switch downstream booster pump
- Shutoff valves and expansion joints

Function / Description:

The feed pump sucks contaminated wash fluid from the machine tank and feeds it through the bag filters at a pressure of 5.5 bar.

After filtration the booster pump boosts the pressure to 11bar minus any pressure losses occurring in the piping.

The wash fluid is piped to the IFW tank.

The pumps are arranged on the mounting platform and always positioned in the same way.

EQUIPMENT DESCRIPTION / TECHNICAL DATA

3.5.24.1 Wash feed pump P22

For details of operation and maintenance see separate instructions by KSB

3.5.24.2 Wash booster pump P24

For details of operation and maintenance see separate instructions by KSB

3.5.25 HBG 911 Control stations**Data**

HBG	Proximity safety switch: Make: Fortress, Type: MA4-M7-SKL11-AKL61-SL411 Door hinged on right side
HBG	Key switch Make: Fortress, Type: CLK-SUCR "PK" A KEY (Red)
HBG	Key switch Make: Fortress, Type: CLK-SUCB "PK" A KEY (Blue)
HBG	Key switch Make: Fortress, Type: MLK-SUCS "OP" KEY (Gold)

3.5.26 HBG 941 Pneumatic system

Data

Make:	Festo System VTSA
-------	-------------------

Description

Basic valve terminal and valve terminal for optional vacuum feature connected via Profibus.
All other valve terminals connected via internal bus.

Options:

- Valve terminal for optional high pressure equipment mounted on baseplate for basic valve terminal
- Valve terminal for optional vacuum equipment mounted on separate baseplate
- Valve terminal for optional high-pressure part guide, mounted on the baseplate for basic valve terminal

See pneumatic diagram EPLAN P8 sheet 1099 ff

ECOCFLEX transport instruction

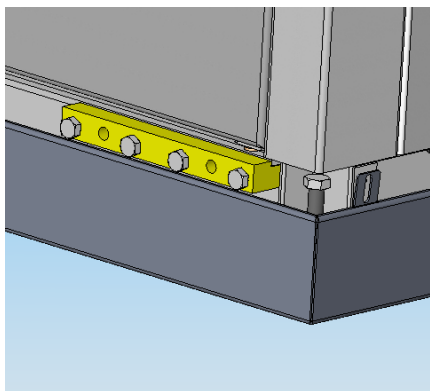
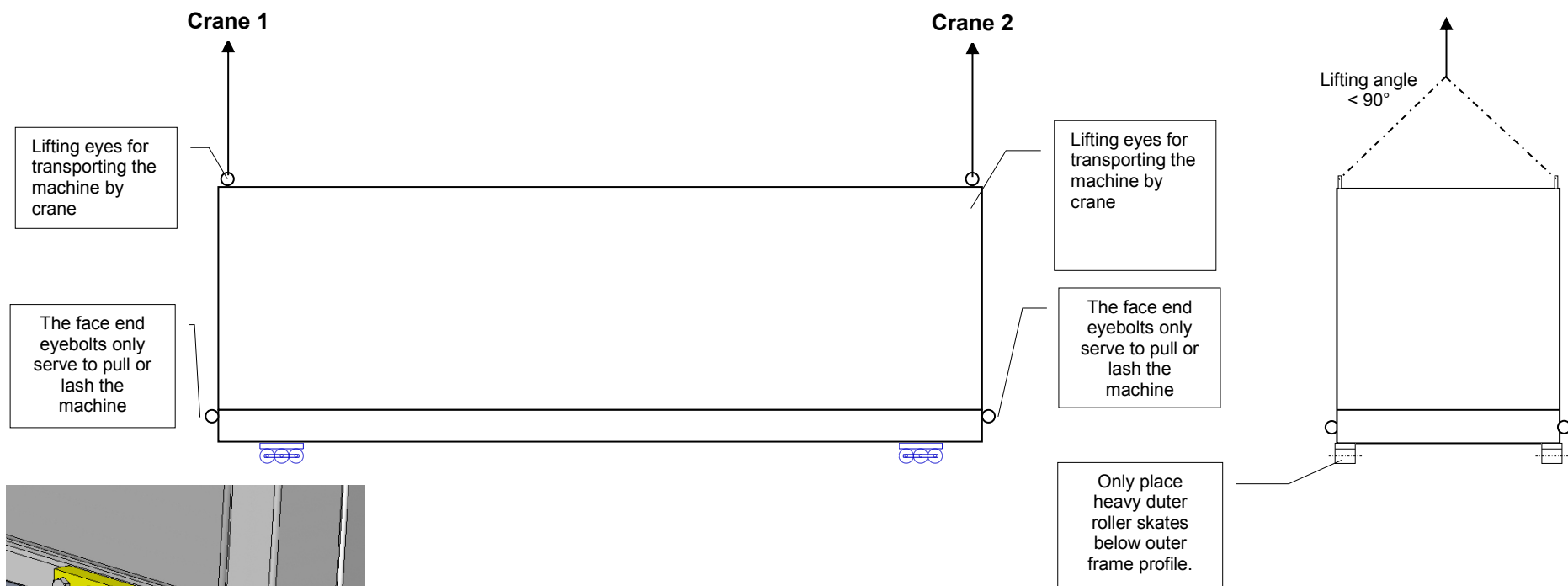


Caution!

The machine must be lifted using the provided lifting eyes on the machine roof. This requires 2 cranes.

Be careful not to damage the sound insulation when lifting the machine.

The face end eye bolts only serve to pull the machine using heavy duty roller skates and for lashing during transport.



Using hydraulic jacks, the machine can be lifted at the adapters for insertion of conveying rollers.

Caution!

Do not lift at the eyebolts – the lifting capacity is insufficient.

Caution!

When using heavy duty roller skates the set bolts of the machine must be screwed back until the floor tray fits the baseframe.

4. Operating instructions

Table of Contents:

4.1	Start-up	4-3
4.1.1	Starting the equipment	4-4
4.1.2	Stoppage	4-5
4.2	Operation	4-6
4.3	HMI	4-7
4.3.1	General	4-7
4.3.1.1	Equipment overview	4-7
4.3.1.2	Preconditions for starting	4-7
4.3.2	Preparations	4-8
4.3.2.1	Equipment units (starting conditions)	4-8
4.3.2.2	Cycle modes	4-8
4.3.3	Production	4-9
4.3.3.1	Shift register	4-9
4.3.3.2	Part counter (totalising)	4-9
4.3.3.3	Cycle times	4-9
4.3.4	Process	4-10
4.3.4.1	Maintenance interval	4-10
4.3.4.2	Seven-day clock timer	4-10
4.3.4.3	Special functions	4-11
4.3.4.4	Settings (parameters)	4-13
4.3.4.5	FAS filter and drag-out conveyor	4-13
4.3.4.6	IFW tank	4-14
4.3.4.7	Vacuum system	4-14
4.3.4.8	Detergent input	4-15
4.3.4.9	Tank temperature	4-16
4.3.4.10	High-pressure control	4-17
4.3.4.11	Cooling zone	4-18
4.3.5	Diagnosis	4-19
4.3.5.1	Fault messages (alarms)	4-19
4.3.5.2	Message archive	4-19
4.3.5.3	Hardware diagnosis (HW diagnosis)	4-19
4.3.6	System	4-20
4.3.6.1	Language	4-20
4.3.6.2	Password administration	4-20
4.3.6.3	Lamp test	4-20
4.4	Modes of operation	4-21
4.4.1	Set-up mode (Manual mode)	4-21
4.4.2	Return to home	4-21
4.4.3	Inline operation (Automatic mode)	4-21
4.4.4	Stop at end of cycle	4-22
4.4.5	Stand-by mode	4-22
4.4.6	Run-out	4-22
4.4.7	Special modes of operation	4-23

4.4.7.1	Indexing without treatment	4-23
4.4.7.2	Continuous mode (test run only for programmer)	4-23
4.4.7.3	Operation with open guard doors	4-24
4.4.8	Passwords	4-25
4.5	Software versions	4-26

4.1 Start-up

Before starting up the machine convince yourself that all supply and discharge lines, especially the electric connection, have been properly installed and satisfy the applicable VDE standards and regulations for the prevention of accidents. Also observe any additional instructions of the manufacturers.

Following actions must be taken prior to starting the equipment:

- Check connecting terminals (on commissioning)
- Check electric connection for clockwise phase sequence (on commissioning)
- Check compressed-air supply (min. 5.5 bar), open the hand lever valve.
- Check make-up water supply.
- Check cooling water supply / switch on cooler
- Check cleaning fluid level and top-up as necessary.

4.1.1 Starting the equipment

DANGER



Avoid serious accidents

If there are any persons inside the machine while it is being switched on, they run the risk of serious injury.
It is a must to ensure that nobody is inside the machine while it is being switched on.

Proceed as follows to start up the equipment:

- **Close** main disconnect switch
 - Switch on control voltage by **Control Voltage ON**.
 - If the OP screen is blank press any button on the OP to deactivate blanking.
 - Remove any active faults and press the **Reset fault** button.
 - Select **Auto** or **Set-Up** mode on operator panel.
 - Return the machine to home by pressing the **HomePos** button on the OP
 - Start the selected mode of operation by pressing the **Start On** button. **Start On** is not required for set-up mode.
 - In automatic mode the equipment starts treatment as soon as the bath temperature has reached the required starting level. With automatic mode started the equipment keeps heating up the bath for as long as the starting temperature is not yet reached.
-



Always make sure to set all manual ball valves in their correct position before starting any mode of operation or special function. See description in chapter 5.

4.1.2 Stoppage

Immediate stoppage:

- You can stop the process at any time by pressing the **Stop** pushbutton. However, it is not recommended to stop the machine in this way.
- If you press the **Stop at end of cycle** pushbutton the machine will complete the current cleaning process and then stop.

Operation of the 'Control voltage OFF' button interrupts power supply to the machine.

In order to completely isolate the equipment from power supply, set the main disconnect switch to the open ('0') position. Depending on machine design the lighting circuit and leakage alarm circuit may remain live. These voltage circuits are marked separately.



If control voltage is OFF, no bath treatment takes place and there is no heat-up to operating temperature and no stop delay of the vacuum pumps.

4.2 Operation

Symbol	Function	Button
	Alarm	K1
	Auto mode	K4
	Manual mode	K12
	Home position	K5
	Stop	K13
	Start cycle	K6
	Stop at end of cycle	K14
	Run-out	K15
	Help	K2
	Escape	K10
	Acknowledge fault	K18
	Unlock the guard doors	K9

4.3 HMI

4.3.1 General

4.3.1.1 Equipment overview

The Equipment Overview screen shows part presence in the load/unload station and in the machine stations as well as the positions of separator and conveyor system.

Moreover, the Overview screen shows the location and designation of Emergency OFF buttons and of guard doors and maintenance doors.

Help: Explains the symbols shown in the Equipment Overview screen.

4.3.1.2 Preconditions for starting

The precondition to be met for starting Auto mode is shown in the header on the OP.

4.3.2 Preparations

4.3.2.1 Equipment units (starting conditions)

Press the Page-/Page+ button on the operator panel to open the various sub-screens and use the side buttons to switch the corresponding equipment unit on or off. As a general rule, the OFF position is on the left side and the ON position on the right side.

The filled arrows indicate that the interlocking conditions for the requested unit have been met, allowing the unit to be switched on.

If a high-priority fault comes up during starting, the unit is switched off immediately.

4.3.2.2 Cycle modes

In the Cycle Modes screen you can select various cycle modes for the machine. As with the set-up functions, use the cursor buttons on the right and left sides of the display for selection.

4.3.3 Production

4.3.3.1 Shift register

This screen shows an overview of the parts inside the machine. You can make an entry in the Code column to change the shift register.

CAUTION



Input errors cause damage to the parts!

Wrong status input may render parts useless.

Consequences of erroneous part status changes:

- Parts already finished are treated once again.
- Parts become useless.
- Parts not yet treated are discharged without treatment because they are considered to be finished or inexistent.

The shift register is to be edited by trained persons only!

4.3.3.2 Part counter (totalising)

The parts treated in the machine are counted both separately by the individual types and totalised.



For more detailed information about these screens please refer to the Siemens configuration manual.

4.3.3.3 Cycle times

This screen shows an overview of cycle times of the overall equipment and individual stations.

4.3.4 Process

4.3.4.1 Maintenance interval

In this screen you can read the setpoint (time till warning) and the actual hours the machine has run. If the actual time exceeds the set time, warning is given on the operator panel and service action has to be taken.

After servicing you can press the **Reset** button to set the actual value at zero.

If you do not reset the counter the system will initiate fault shutdown when the actual value exceeds the fault shutdown limit.

4.3.4.2 Seven-day clock timer

Clock timer programming

The seven-day clock timer switches the channels on when the set starting time is reached and off when the set stopping time is reached, depending on the current date and time.

Use the MODE field to select the mode of operation of the seven-day clock timer separately for each channel. Following modes are possible:

- Clock mode: The respective channel is activated or de-activated according to the times set.
- Offline: This channel is switched permanently off.
- Online: The channel is switched permanently on.



The clock timer channel is only active if no mode of operation is active. Furthermore, **control voltage** must be kept on.

Channels

- - Tank heating
- - Bath treatment
- - Vacuum pump

4.3.4.3 Special functions

In this screen you can activate or de-activate individual functions or systems of the machine. For more details please refer to the chapter 'Systems and Functions'.

4.3.4.3.1 Lock/unlock guard doors

Activates / de-activates the guard doors. Moreover, all guard doors can be locked/unlocked together or, optionally, each guard door separately.

4.3.4.3.2 Deselections

Select/deselect IFW

Activates or deactivates the IFW function. If deselected, no injection flood wash cycle takes place.

Select/deselect vacuum drier

Activates / de-activates the vacuum drier. No parts will be placed into the drier.

Select/deselect exhaust fan

Activates / de-activates the exhaust unit. With the unit deactivated the vestibule atmosphere will not be sucked off.

Select/deselect HP valves

Activates or deactivates the requisite high-pressure valves. If deselected, no treatment takes place via the HP valve. Depending on optional equipment provided you can select or deselect several HP valves.

4.3.4.3.3 Complete re-fill with fluid

Using this function you can make a complete re-fill of the machine with fluid. This function is stopped automatically when the fluid in the tanks has reached the working level.

4.3.4.3.4 HP test nozzle

Activates or deactivates the high-pressure test nozzle. The HP test nozzle is used to test the HP pump. To do so, connect the high-pressure pump to the HP test nozzle using a hose (see chapter 6).

Take the following actions:

- Switch on the HP oil cooler pump, the HP cooling fan, the wash feed pump, the HP feed pump and the HP pump in set-up mode.
- Close bypass valve

Now the pump is automatically run up to full speed.

CAUTION



Incorrect implementation of test nozzle operation

Test nozzle to be used by trained personnel only. For this procedure, safety interlocks are partly disabled or suppressed.

The high-pressure pump must be connected to the test nozzle!

4.3.4.3.5 HP valve teaching

Activates or deactivates the high-pressure valve teaching function. After any change of nozzles a teaching run is **absolutely** required to determine the pump speed. For this proceed as follows:

- Select set-up mode.
- Activate the HP valve teaching function for the respective valve.
- The HP pump speed is increased slowly until the set pressure is reached.
- After a successful teaching run the HP special function is reset automatically, the pumps are switched off and the bypass valve is opened.
- Successful teaching run is shown on the message window by 'HP teaching completed successfully'.

4.3.4.4 Settings (parameters)

In this screen you can set treatment times, speeds and other parameters. For more details please refer to the chapter 'Systems and Functions'.

General machine parameters:

Waiting time for standby

Waiting time before standby mode is activated.

Cycle time setpoint

Here the cycle time setpoint is entered for treatment of a part.

CAUTION



Input errors cause damage to the parts!

Wrong status input may render parts useless.

Parameters to be entered or changed by skilled and trained persons only.

4.3.4.5 FAS filter and drag-out conveyor

The setpoints for the FAS filter and drag-out conveyor are as follows:

FAS filter

Flush cycle time:

Waiting time till next flushing cycle is activated.

Cycle time till backflushing:

Display of time remaining till backflushing starts

Flush time:

Duration of flushing cycle

FAS drag-out conveyor

Drag-out conveyor pump stop delay:

Time which the drag-out conveyor pump is to keep running after an FAS filter backflush cycle.

Set drag-out motor runtime:

Set runtime of the drag-out conveyor once it has been operated

Actual drag-out motor runtime:

Actual runtime of the drag-out conveyor from when it was operated

4.3.4.6 IFW tank

The setpoints for the IFW tank are as follows:

<u>Set complete drain time:</u>	Display of drain time in sec. only
<u>Actual drain time:</u>	Shows the current draining time in sec.
<u>Tank is drained:</u>	LED display
<u>Set partial draining delay time:</u>	Entry of partial draining delay time in sec.
<u>Actual partial draining delay time:</u>	Shows the current partial draining delay time in sec.
<u>Set partial drain time:</u>	Entry of set partial draining in sec.
<u>Actual partial drain time:</u>	Shows the current partial draining time in sec.

4.3.4.7 Vacuum system

<u>Treatment time:</u>	This treatment time sets the duration of treatment in the vacuum chamber. The remaining time is also indicated.
<u>Treatment cycles:</u>	The treatment cycle of the vacuum chamber can be entered in this field. The actual status is shown as well.

4.3.4.8 Detergent input

In the detergent concentration field you can define how much detergent is to be added automatically for a complete re-fill of the water tank or for make-up water input.

Complete re-fill:

Automatic detergent input on complete re-fill

Make-up input:

Automatic detergent input on topping-up with make-up water

In the dosing pump field you can enter how much detergent is to be added manually. The set quantity is automatically converted into pump runtime as a function of the given pump delivery. In the input field you can enter an extra quantity of detergent. This increases the pump runtime automatically.

Input time or:

Here you can enter the quantity of additional detergent input (will be calculated and shown under 'Input quantity').

Extra detergent:

You can also delete this entry if too much detergent has been put in by mistake.

Input quantity:

Quantity of detergent which is put in based on entered input time or additional detergent

When all values have been entered you can activate the pump using the **Start Pumpe** button. When the pump runtime has elapsed the pump stops automatically.

4.3.4.9 Tank temperature

In these screens you can read and set the temperatures of the water tanks. If two water tanks are provided, either the screens are duplicated or the parameters of both tanks are shown in one screen.

Actual temperature:

Shows the current temperature. Display only.

Starting temperature:

When this temperature is reached the pumps are started and the wash cell treatment commences.

Set temperature:

This is the set treatment temperature. When this value is reached the heaters are switched off.

Overtemperature:

When this temperature is reached the system is shut down for safety reasons.

Option:

Bath cooling:

This is an optional feature for active cooling of the water in the tank when the set temperature is reached.

Press the **History** button to view the temperature profile over the last five hours. The temperature scale can be adjusted for better reading accuracy.



There is no protection level for scale adjustment.

4.3.4.10 High-pressure control

In the high-pressure screen you can set the pressure for each high-pressure tool. The PLC controls the speed so as to reach the set pressure. After changing the pressure you should execute the special function 'HP teaching'. Furthermore additional values for monitoring nozzle wear can be entered in this screen.

<u>HP valve:</u>	Pressures for the individual high-pressure tools
<u>Taught speed:</u>	Indicates the taught speed at which set pressure has been reached
<u>Actual pressure:</u>	Indicates the actual pressure at the HP pump outlet
<u>Actual speed [rpm]:</u>	Current pump motor speed related to the motor shaft.
<u>Blockage fault:</u>	Indicates the percentage by which the set pressure may be exceeded until a shutdown takes place.
<u>'Eroded' warning:</u>	Outputs a warning if the pressure falls below the setpoint value by x%.
<u>'Eroded' fault:</u>	Outputs a fault alarm if the pressure falls below the setpoint value by x%.

The number of valves varies with the optional equipment provided. Another option is to switch the valves together or in a hybrid configuration.

Overview of HP valves

HP valve	Head line MK135736/737/757	Block line MK135738/739/758	Valve
HP V1	V1 duplex lance 1	V1 duplex lance 1 (OPTION only)	A72.0
HP V2	V2 duplex lance 2 (OPTION only)	V2 duplex lance 2 (OPTION only)	A72.1
HP V3	not applicable	V3 small duplex lance 3 (OPTION only)	A72.2
HP V4	Nozzle	V4 small duplex lance 4 (OPTION only)	A72.3
HP V5	Hybrid nozzle	Hybrid nozzle	A73.0
HP V6	Nozzle	Nozzle	A73.1
HP V7	Combination of V1+2	Combination of V1+2	A72.0/.1
HP V8	not applicable	Combination of V3+4	A72.2/.3

4.3.4.11 Cooling zone

Parameters for indexing conveyors in the cooling zone.

Actual treatment time:

Display of the current treatment time in the cooling zone Display only.

Set treatment time:

Here you can enter the cooling zone treatment time.

Actual conveying time:

Display of the current conveying time in the cooling zone. Times can also be displayed separately for individual positions. Display only.

Set conveying time:

Here you can enter the conveying time in the cooling zone.

4.3.5 Diagnosis

All faults are displayed in the Diagnosis menu. From this menu you can go to following sub-screens:

- Messages
- Message archive
- Hardware diagnosis

4.3.5.1 Fault messages (alarms)

This shows all faults and alarm messages.

Press the Reset fault button to reset the faults after remedying their cause.

4.3.5.2 Message archive

This shows the fault alarms stored since the fault message buffer was last cleared.

4.3.5.3 Hardware diagnosis (HW diagnosis)

From this menu item you can access another sub-menu which allows a detailed diagnosis of Profinet and Profibus.

Use the Profinet/bus diagnosis to detect the faulty device at once. Enter an address to view detailed error descriptions:

- Profinet/bus status of faulty or failed devices
- Detailed information on the network in case of a bus error.

4.3.6 System

4.3.6.1 Language

changes the language of the operator panel environment

4.3.6.2 Password administration

makes it possible to unblock users or change passwords

4.3.6.3 Lamp test

serves to check operation of LEDs and lamps

4.4 Modes of operation

Use the operator panel to select the mode of operation.

The following modes have been implemented:

Manual: Set-up mode / manual mode

Auto: Automatic mode

If Auto mode is selected, this mode must be additionally activated or de-activated using the **Start On** or **Stop** button.

When mode of operation is changed from Auto to Manual the machine stops immediately without completing the treatment.

4.4.1 Set-up mode (Manual mode)

High-priority faults disable this mode or inhibit its activation.

4.4.2 Return to home

Start 'return to home' by pressing the green Home Position button. In order to start this function, either Inline operation or Set-up mode must be selected. In Automatic Mode it is sufficient to press the button once. In Set-Up Mode, the movement takes place only for as long as the button is kept depressed.

Flashing of the light in the button indicates that 'return to home' has been activated. When home position is reached the light turns to steady light.

If a unit fails to return to home position you can easily localise this unit in the movement screens (see also chapter 4.4.1, 'Set-up mode').

4.4.3 Inline operation (Automatic mode)

This mode is selected by pressing the **Auto** button on the machine control panel. To activate this mode press the Start On button.

The mode can be started only if no fault is active.

If the equipment is not in home position, return-to-home mode is selected automatically before Auto mode is started. The home position indicator LED flashes while the equipment returns to home position. After that the automatic mode starts immediately.

If you are unable to start the equipment go to the Starting Preconditions screen for more information.

4.4.4 Stop at end of cycle

If the Stop at end of cycle button is pressed during automatic operation the initiated cleaning cycle is completed and the equipment stops in home position. If automatic external conveyors are provided, no parts now are loaded any more. The light in this button flashes. When home position is reached the machine stops and the lamp in the button turns to steady light. By pressing this button again you can deselect the 'Stop at end of cycle' function for as long as home position is not reached. The equipment remains in automatic mode of operation.

If the mode of operation is not changed after the equipment has stopped, you can re-start the machine by pressing the Start On button.

4.4.5 Stand-by mode

If no new parts are loaded into the machine during automatic operation, or if parts get jammed at the unload station of the cleaning machine, the equipment goes to an energy-saving standby mode after a given period of time.

Equipment units not really needed are switched off.

When parts are loaded again, or the accumulation of parts is cleared, the equipment units re-start and the normal automatic mode is resumed.

4.4.6 Run-out

If Run-out mode is selected during automatic operation the equipment continues production until no parts are in the machine any more. If automatic external conveyors are provided, no parts now are loaded any more. When all parts are run out the machine stops in home position.

Press the Run-out button again to deselect the function before all parts have run out of the machine. The equipment remains in automatic mode of operation.

If the mode of operation is not changed you can re-start the machine by pressing the Start ON button.

4.4.7 Special modes of operation

4.4.7.1 Indexing without treatment

For testing the mechanical operations you can activate the special function Indexing without treatment. Whilst all mechanical operations are being performed, there is no cleaning process taking place and the pumps are not started. The treatment process is simulated only if at least one part is in the machine.

You can select and deselect this function only if automatic mode is deactivated.

4.4.7.2 Continuous mode (test run only for programmer)

Use this function to run the machine continuously, e.g. for testing after set-up. The system does not switch over to standby mode. In contrast to 'Indexing without treatment', the full wash cycle takes place but no parts are fed into the machine. The treatment process is performed only if at least one part is in the machine. The parts are re-treated over and again until this mode is finished.

You can select and deselect this function only if automatic mode is deactivated.

CAUTION**No standby mode – Operator mistakes cause damage to parts!**

Repeated treatment cycles may render the parts in the equipment useless.

The Continuous Mode function should be activated by trained and skilled persons only because the system does not enter into standby mode.

4.4.7.3 Operation with open guard doors

Operation of the equipment is not possible with the guard doors open.

You can only operate the robot in manual mode and, subject to pressing the enabling button, some pneumatic movements required for robot operation.

DANGER



resulting from equipment operation with open guard doors

Before using this function make sure that there are no persons inside the machine or close to the units.

In this mode of operation take care

- to keep a safe distance of 850 mm from moving parts and
 - to have a firm foothold.
-

4.4.8 Passwords

All passwords must be treated confidentially and disclosed only to persons authorized to change password protected parameters.



The person in charge of password assignment should remove this page from this operating instructions manual and keep it in a safe place.

Master password

The master password provides access to all password-protected screens.

The master password for this machine is: **ADMIN / 0310**;



The associated OP password level is '9'. This is also the highest password level assigned in the OP.

Service password

On delivery of the equipment a service password is set up for service engineers. This is required to access the parameter settings screens.

The service password for this machine is: **SERVICE / 100**.



The associated OP password level is '5'.

Repeated entry of a wrong password will block the user. A blocked user can only be unblocked by another user having administrator authority.

4.5 Software versions

Following software versions have been used in programming the system:

Software	Version	Note
Step 7	V5.5 + SP1	
Starter	V4.3.3	
Win CC Flexible	2008 SP3	

5. Faults

5.1 Troubleshooting - Faults, Causes and Remedies

Following on the next pages is a table with a list of possible fault messages, their possible causes and remedial actions. The number shown in the 'No.' column corresponds to the fault number on display. The number shown in the 'Effect' column indicates how the equipment reacts to the given fault.

Text printed in *italics* indicates "placeholders" for component designations etc. which can be shown in addition in the fault alarm text on the display.

Legend on fault effects:

Fault priority	Meaning
1	Automatic mode stops immediately / manual mode can be started
2	Automatic mode stops at end of cycle / manual mode can be started
3	Automatic mode remains active / manual mode can be started Shut-down after one hour <u>Option: section-automatic operations</u> Depending on the machine type, some systems operate in section-automatic mode. This means that the automatic operation of these systems is isolated from the other equipment. All faults related to section-automatic operation are priority 3 faults. Faulty section-automatic systems are stopped immediately.
4	Display only - acknowledgement not required

For systems which can be deselected on the operator control panel the reaction in deactivated condition is always 4.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
9	1	+C-FC117.01	Fuses of power supply upstream control voltage have tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
10	1	+C-QB22.01 / -FC22.05	Fuses of 110V AC power supply before main switch have tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
11	1	+C-FC118.01	Input cards power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
12	1	+C-FC120.01	Output cards power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
13	1	+C-FC121.01	ET200pro input modules fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
14	1	+C-QB110.01 / -FC110.05	Fuse of 110V AC power supply after main switch has tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
15	1	+C-FC123.01	Pneumatics valve terminal fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
16	1	+C-FC119.01	Fuse of power supply upstream control voltage has tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
17	3	+C-FB26.01 / -FC26.01	Socket-outlets, cabinet lighting power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
18	1	+C-QB20.01 / -FC20.03	PNOZ power supply fuse tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
19	3	+C-FB30.01	Socket-outlets residual current circuit-breaker tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
20	1	+C-QB11.01 / -QB11.05	Load distribution circuit-breaker tripped	One of the miniature circuit-breakers has tripped due to overcurrent drawal.	Check proper operation of fuse. Check wiring. Check consumer and replace if necessary.
41	1	=BW1+M-BL165.4	Floor tray leak detector tripped	Water in floor tray.	Check tanks and piping for leaks. Remove fluid from floor tray using the drain pump unit. Check proper operation of leak detector.
49	3	+C-BT4.0	Supply cabinet temperature not OK	Temperature sensor in specified cabinet has tripped.	Check cabinet temperature. Check that cabinet cooling is not obstructed. Check proper operation of temperature sensor.
50	3	+C-BT4.2	Control cabinet temperature not OK	Temperature sensor in specified cabinet has tripped.	Check cabinet temperature. Check that cabinet cooling is not obstructed. Check proper operation of temperature sensor.
52	3	+C-QB27.01	Work chamber lighting circuit breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
53	3	+C-QB29.01	Supply cabinet cooler motor circuit breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
54	3	+C-EC29.01	Supply cabinet cooler overtemperature fault	Cabinet cooler indicates overtemperature	Check cabinet temperature. Check that cabinet cooling is not obstructed.
57	2	+M-BPI74.0 / +P01-MB84.01	Main pneumatic shutoff valve pressure not OK	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
58	2	+M-BPI74.1 / +P01-MB84.04	Pneumatic pressure at main shutoff valve not OK after guard door circuit	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
59	2	+M-BPI74.3/7 / +P01-MB84.07	Vacuum drier pneumatics main shutoff valve pressure not OK	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
73	1		Home position not reached! Return machine to home in manual mode	Machine fails to reach home position in Automatic return to home mode.	Individually return systems to home in manual mode and check which system causes the fault.
74	1		Stop at end of cycle not reached!	Machine does not return to home after selection of stop at end of cycle.	Check end positions shown in manual mode screens to see what system has not reached home position. If roller conveyors are used, check for a exit accumulation. Release the part and push it to the next part passage sensor (prox. switch).
75	1		Programming fault -> OB121 call, read-out CPU diagnosis	A programming error has called interrupt block OB121.	Read-out fault alarm buffer of CPU using programming device. Please contact manufacturer.
76	1		I/O access error -> OB122 call, read-out CPU diagnosis	An I/O access error has called interrupt block OB122. Any one of the bus devices has been faulty at least for short time.	Read-out fault alarm buffer of CPU using programming device. With the aid of the message shown you can localize the block that tried to access the bus device.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
80	3		Machine cycle time exceeded	The machine doesn't achieve the specified setpoint cycle time.	Check robot program sequence. Check systems relevant to cycle time. Check specified setpoint cycle time on operator panel.
97	1		Profibus / Profinet group fault (use individual diagnosis on OP)	At least one bus device is faulty. Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Read-out individual fault from OP diagnosis. Check cabling, wiring and connections for faults. Check internal fuses. Consult component manual.
121	1	+C-TA45.04	Bus module 21 error: HP pump variable frequency drive	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
130	1	+M-MR86.01-DP1	Bus module 30 error: wash robot	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
135	1	+M-KF610.00	Bus module 35 error: ET200PRO right inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
136	1	+M-KF611.00	Bus module 36 error: ET200PRO left inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
137	1	+M-KF612.00	Bus module 37 error: ET200pro HP pump inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
138	1	+M-KF614.00	Bus module 38 error: ET200PRO FAS filter inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
139	1	+M-KF615.00	Bus module 39 error: ET200PRO vacuum inputs	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
176	1	+M-KF590.01	Bus module 76 error: valve terminal 1	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
177	1	+M-KF592.01	Bus module 77 error: valve terminal 2	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
178	1	+M-KF596.01	Bus module 78 error: valve terminal 3	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
228	1	+C-XF195.04	Bus module 128 error: PN/PN coupler	Voltage failure, contact problem, wire discontinuity, consequential fault in bus sequence.	Check wiring, cabling and connections for faults. Check internal fuse, consult component manual.
233	1	+C-KF150.05 / -KF 153.04	Overall equipment Emergency Off safety circuit NOK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
243	1	+C-SF151.01	E-Stop at operator desk operated	Emergency OFF button has been operated.	Unlock Emergency OFF button.
244	1	+M-SF151.03	Overall machine Emergency Off tripped	Emergency OFF button has been operated.	Unlock Emergency OFF button.
245	1	+M-SF151.04	E-OFF operated at vacuum drier	Emergency OFF button has been operated.	Unlock Emergency OFF button.
255	1	+M-RO1	E-OFF operated at robot	Emergency OFF button has been operated.	Unlock Emergency OFF button.
257	1	+C-KF150.05	Machine E-OFF safety circuit not OK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
258	1	+C-KF155.05	Emergency Off safety circuit of gantry NOK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
259	1	+C-KF153.01	Robot Emergency OFF safety circuit NOK	Emergency OFF switches safety circuit NOK.	Unlock Emergency OFF button. Check wiring if necessary.
273	1		Global wash module safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
274	3		Ext. conveyors global safety circuit not OK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
275	1		Housing door safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
276	3		Ext. conveyors guard doors global safety circuit not OK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
277	3	+C-KF165.01	Guard doors - vacuum chamber safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
278	1	+C-KF168.01	Gantry guard doors safety circuit NOK	Safety circuit of guard doors not OK	Check the reason for operation of the safety switch and reset the safety relay. Check wiring. Make diagnostic evaluation on safety relay (see separate manual).
289	1	=TS+M-SF161.02	Housing guard door / machine maintenance door open	Safety circuit of guard doors not OK	Close and lock robot housing door. Check wiring, if necessary.
290	1	=TS+M-SF161.02	Housing guard door / machine maintenance door unlocked	Safety circuit of guard doors not OK	Close and lock robot housing door. Check wiring, if necessary.
295	1	+C-KF163.01	Sliding doors diagnostic message	Safety circuit of guard doors not OK	Close and lock sliding doors. Check read heads/actuators. Check wiring if necessary.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
297	3	=TS+M-SF166.02	Vacuum chamber guard door open	Safety circuit of guard doors not OK	Close and lock guard doors. Check wiring, if necessary. Make diagnostic evaluation on safety relay (see separate manual).
298	3	=TS+M-SF166.02	Vacuum chamber guard door unlocked	Safety circuit of guard doors not OK	Close and lock guard doors. Check wiring, if necessary.
410	2	+M-BGI69.4 / -SF164.01	Sliding door 1 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
413	2	+M-BGI69.4 / -KH93.1	Sliding door 1 opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
414	2	+M-SF164.01 / -KH93.0	Sliding door 1 closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
418	2	+M-BGI69.5 / -SF164.05	Sliding door 2 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
421	2	+M-BGI69.5 / -KH93.3	Sliding door 2 opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
422	2	+M-SF164.05 / -KH93.2	Sliding door 2 closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
425	1	+M-BGI69.4/5	Sliding doors not open and robot in door interfer. area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
481	1	+C-QB86.01	Robot incoming feeder circuit-breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
488	2	+M-MR86.01	Robot general overhaul interval reached	Robot has reached number of operations for general overhaul.	Carry out servicing, see separate operating instructions. Initiate / perform maintenance task according to maintenance plan.
489	2	+M-MR86.01	KUKA robot is not in auto mode	Key switch on robot cabinet not in Auto position.	Place key switch in Auto position, acknowledge message on robot control panel if necessary.
490	2	+M-MR86.01	KUKA general robot fault	Robot outputs error signal.	The fault is displayed on the Teach pendant. See separate operating instructions of robot.
491	2	+M-MR86.01	KUKA – not ready		
492	2	+M-MR86.01	KUKA – Robot doesn't start		
493	2	+M-MR86.01	KUKA - Robot has left programmed path	Robot is not in a defined position and cannot be returned to home in auto mode.	Please move robot to safe pos. and return to home using 'AMoveHome' routine and 'Forward' button.
494	2	+M-MR86.01	KUKA - battery fault	Robot battery empty.	Do not switch off the robot! Replace the battery as described in operating instructions manual.
495	2	+M-MR86.01	KUKA - Servos not switched on		
496	2	+M-MR86.01	KUKA – Robot teach panel active	Teachpanel switch is activated.	Flip the switch.
529	1	=PNE+M-BPI74.2	Robot sealing air pressure NOK	Insufficient sealing air pressure.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
530	2	=PNE+M-BPI74.6	Robot sealing air overpressure NOK	Sealing air pressure is too high.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
533	1		Robot gripper shift register error	Shift register indicates part in gripper despite gripper being open.	Check shift register and gripper. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
536	2		Robot part placing activated	Sub-tasks aborted by special function.	Part has not been treated completely! Deselect special function and re-load part if necessary.
537	1	+M-MR86.01	Robot user program error	Programming errors made during changes to robot program.	Check robot program and correct as required.
538	1	+M-MR86.01	Robot not in home position! See help text	Robot is not in a defined position and cannot be returned to home in auto mode.	Please move robot to safe pos. and return to home using 'AMoveHome' routine and 'Forward' button.
539	1	+M-MR86.01	Unknown robot job! PLC has transferred wrong job.	PLC transmitted unknown part type to robot.	Check part scanner. Create part type in PLC and robot program.
540	1	+M-MR86.01	Robot not in defined position! See help text	Robot is not in a defined position and cannot be returned to home in auto mode.	Please move robot to safe pos. and return to home using 'AMoveHome' routine and 'Forward' button.
541	1	+M-MR86.01	Robot program status not defined	Programming errors made during changes to robot program.	Check robot program and correct as required.
545	1	=PNE+M-BGI70.0/.1	Robot gripper signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
546	1	=PNE+M-BGI70.1	Robot gripper opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
547	1	=PNE+M-BGI70.0	Robot gripper closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
552	2		Robot gripper maintenance interval reached (fault)	Gripper has reached number of operations for maintenance.	Initiate / perform maintenance task according to maintenance plan.
617	3	=K20+M-BLI65.2	IFW working level not reached	Tank cannot be filled.	Check limit switches for correct operation and mounting. Check pipes for leaks. Check operation of shutoff valves.
618	3	=K20+M-BLI65.2	IFW level switch not OK	Level switch outputs '1' signal while pump is off.	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits.
625	2	=PNE+M-BGI63.0/.4	IFW shutoff valve 1 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
626	2	=PNE+M-BGI63.0	IFW shutoff valve 1 opens too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
627	2	=PNE+M-BGI63.0	IFW shutoff valve 1 opens too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
628	2	=PNE+M-BGI63.4	IFW shutoff valve 1 closes too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
629	2	=PNE+M-BGI63.4	IFW shutoff valve 1 closes too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
633	2	=PNE+M-BGI63.1/.5	IFW shutoff valve 2 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
634	2	=PNE+M-BGI63.5	IFW shutoff valve 2 opens too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
635	2	=PNE+M-BGI63.5	IFW shutoff valve 2 opens too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
636	2	=PNE+M-BGI63.1	IFW shutoff valve 2 closes too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
637	2	=PNE+M-BGI63.1	IFW shutoff valve 2 closes too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
641	2	=PNE+M-BGI63.2/.6	IFW shutoff valve 3 signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
642	2	=PNE+M-BGI63.6	IFW shutoff valve 3 opens too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
643	2	=PNE+M-BGI63.6	IFW shutoff valve 3 opens too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
644	2	=PNE+M-BGI63.2	IFW shutoff valve 3 closes too fast	Movement reaches stop position too early.	Check limit switches for correct position and mounting. Check valves. Adjust flow restrictors as necessary.
645	2	=PNE+M-BGI63.2	IFW shutoff valve 3 closes too slow	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
726	3	=V51+M-BPI130.0	Vacuum drier vacuum not reached	Negative pressure was not reached within preset time.	Check vacuum chamber for leaks. Check vacuum pump performance. Check pressure switch for proper operation. Check for correct bath temperature setpoint.
727	3	=V51+M-BPI130.4	Vacuum drier ambient pressure not reached	Ambient pressure was not reached within preset time.	Check vacuum relief valve for proper operation. Check pressure switch for proper operation and setpoint.
729	3	=PNE+M-BGI130.2/.6	Vacuum drier vacuum valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
730	3	=PNE+M-BGI130.6	Vacuum drier vacuum valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
731	3		Vacuum drier vacuum valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
		=PNE+M-BGI130.2			
737	3		Vacuum pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
		+C-QB58.01			
741	1	+C-QAQ15.1	Vacuum pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
744	3	=V51+M-MA58.01	Vacuum pump oil change interval reached	Set oil change interval exceeded.	Change oil. Acknowledge oil change on operator panel.
745	3	=V51+M-BTI130.5	BECKER vacuum pump oil temperature NOK (130°C fault)	The vacuum pump oil temperature is too high.	Check oil level and oil filter of pump. Check proper operation of switch and replace if necessary.
746	3	+M-BLI131.6	BECKER vacuum pump oil level NOK	Vacuum pump oil level insufficient.	Top-up till oil is visible in the oil gauge. Check proper operation of switch and replace if necessary.
777	3	+M-BGI131.0 / - BGI131.2	Vacuum drier hood signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
778	3	+M-BGI131.0	Vacuum drier hood opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
779	3		Vacuum drier hood closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
		+M-BGI131.2			
784	3	+M-BGI132.4/7	Vacuum drier hood gap checker operated	Gap checker operated, no passage check active and chamber is open.	Check whether section is clear. Check light barrier for correct operation and alignment. Check mechanical equipment for accidental actuation.
791	1	+M-BGI131.0	Vacuum drier not open and robot in unload-end interference area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
792	1	+M-BGI131.0	Vacuum drier not open and gantry in machine interference area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
864	2	=P22+M-MA42.01	Wash pump runs against closed valve	Pump switched on and all valves closed.	Open at least one valve in order to be able to start the pump.
865	2	+C-KF42.04	Wash pump thermistor protection tripped	Response of thermal protection. Motor draws overcurrent. Motor winding overtemperature. Relay malfunction.	Check motor load and temperature. Check drive system for sluggishness. Check thermistor relay operation and wiring.
866	2	+C-QB42.01	Wash pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
867	2	=P24+M-BPI61.2/6	Wash pump pressure NOK	Insufficient pump pressure.	Check drive system. Check delivery pipe for leaks. Is rated pump pressure reached acc. to the gauge? Check pressure switch for proper operation. Check completeness of spray system nozzles.
868	2	=P24+M-BPI61.2/6	Wash pump pressure switch NOK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
872	1	+C-QA42.08	Wash pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
873	2	+C-KF43.04	Wash booster pump thermistor protection tripped	Response of thermal protection. Motor draws overcurrent. Motor winding overtemperature. Relay malfunction.	Check motor load and temperature. Check drive system for sluggishness. Check thermistor relay operation and wiring.
874	2	+C-QB43.01	Wash booster pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
875	2	=P24+M-BPI61.2/6	Wash booster pump pressure NOK	Insufficient pump pressure.	Check drive system. Check delivery pipe for leaks. Is rated pump pressure reached acc. to the gauge? Check pressure switch for proper operation. Check completeness of spray system nozzles.
876	2	=P24+M-BPI61.2/6	Wash booster pump pressure switch NOK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
880	1	+C-QA43.08	Wash booster pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
898	2	+C-QB45.01	HP pump circuit-breaker tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
900	2	=P34+M-BTI72.2/6	HP pump oil temperature not OK	Oil temperature high	See separate operating instructions by Hammelmann. Check sensor adjustment.
901	2	=P34+M-BPI72.0/4	HP pump oil pressure not OK	Low oil level in HP pump; Oil filter choked; Emulsion forming.	See separate operating instructions by Hammelmann. Check sensor adjustment.
902	2	=P34+M-BT200.0	HP pump pressure switch not OK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
906	2	=P34+M-BTI72.1/5	HP pump supply temperature too high	High bath temperature.	Check temp controller for correct setpoint. Check proper operation of heating contactor. Check temperature sensor for correct operation and setpoint.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
907	2	+C-QB47.06	HP pump fan motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.
908	2	=P34+M-BPI72.0/.4	HP pump oil cooling circuit pressure switch not OK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
912	2	=P34+M-BT200.0	HP pump pressure exceeded	HP pump pressure not ok	Check drive system and pressure switch for proper operation. Set correct pressure by means of bypass valve.
915	2	+C-QB47.01	HP oil cooler pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
920	1	+C-QA46.08	HP pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
921	2	+C-TA45.01	HP pump variable frequency drive fault	Variable frequency drive fault. Look up the fault code on the display.	See separate motor manual.
923	2	+C-TA45.01	HP pump actual speed has exceeded VFD setting range	HP pump runs at max. speed but doesn't deliver set pressure.	Check coupling between motor and pump. Check nozzles and lances for correct fit. Check piping for leaks.
924	2	+C-TA45.01	HP pump VFD not ready	No 'ready' feedback signal from VFD.	Check 400V power supply (fuse/motor protection). Check VFD. See separate motor manual.
925	2	+C-TA45.01	HP pump VFD no output stage enabled feedback	No 'output stage enabled' feedback on activation.	Check VFD. See separate motor manual.
926	2	+C-TA45.01	No speed feedback from HP pump VFD	No speed feedback on activation.	Check VFD. See separate motor manual.
927	2	+C-TA45.01	HP pump VFD process data not enabled	No 'process data enabled' feedback from VFD.	Check VFD. See separate motor manual.
928	2	+C-TA45.01	HP pump setpoint speed has exceeded VFD setting range	HP pump runs at max. speed but doesn't deliver set pressure.	Check coupling between motor and pump. Check nozzles and lances for correct fit. Check piping for leaks.
929	2	+M-BT200.0	HP pump pressure cannot be relieved at idling speed	Lance may be choked	Clean lance or nozzle, replace if required.
931	1	+C-QA15.2	HP oil cooler pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
932	1	+CQA15.3	HP fan contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
936	2	=P34+M-MA45.01	HP pump oil change interval reached (fault)	Oil expiry date reached.	Change the oil. See separate operating instructions by Hammelmann.
940	3	=P34+M-BT200.0	HP pump pressure low, check cleaning result!	Insufficient HP pump pressure	Check motor and pressure switch for proper operation and check pump delivery pipe for leaks. Check completeness of HP nozzles.
945	2	=P34+M-KHQ72.0	HP tool 1 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
946	2	=P34+M-KHQ72.1	HP tool 2 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
947	2	=P34+M-KHQ72.3	HP tool 3 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
948	2	=P34+M-KHQ72.4	HP tool 4 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
949	2	=P34+M-KHQ73.0	HP tool 5 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
950	2	=P34+M-KHQ73.1	HP tool 6 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
951	2	=P34+M-KHQ72.0/.1	HP tool 7 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
952	2	=P34+M-KHQ72.3/.4	HP tool 8 doesn't open	HP valve has been activated but pressure switch indicates no pressure.	Check HP valve, check pressure switch, check bus module output card.
953	2	=P34+M-KHQ72.0	HPV 1 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
954	2	=P34+M-KHQ72.1	HPV 2 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
955	2	=P34+M-KHQ72.3	HPV 3 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
956	2	=P34+M-KHQ72.4	HPV 4 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
957	2	=P34+M-KHQ73.0	HPV 5 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
958	2	=P34+M-KHQ73.1	HPV 6 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
959	2	=P34+M-KHQ72.0/.1	HPV 7 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
960	2	=P34+M-KHQ72.3/.4	HPV 8 pressure switch faulty or tool does not close	Pressure switch indicates pressure although HP valve is de-energized.	Check HP valve, check pressure switch, check bus module output card.
961	2	=P34+M-KHQ72.0	HP tool 1 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
962	2	=P34+M-KHQ72.1	HP tool 2 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
963	2	=P34+M-KHQ72.3	HP tool 3 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
964	2	=P34+M-KHQ72.4	HP tool 4 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
965	2	=P34+M-KHQ73.0	HP tool 5 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
966	2	=P34+M-KHQ73.1	HP tool 6 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
967	2	=P34+M-KHQ72.0/.1	HP tool 7 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
968	2	=P34+M-KHQ72.3/.4	HP tool 8 choked	Teaching data deviate from actual value by x %.	Clean nozzle or lance, replace if required.
969	3	=P34+M-KHQ72.0	HP tool 1 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
970	3	=P34+M-KHQ72.1	HP tool 2 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
971	3	=P34+M-KHQ72.3	HP tool 3 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
972	3	=P34+M-KHQ72.4	HP tool 4 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
973	3	=P34+M-KHQ73.0	HP tool 5 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
974	3	=P34+M-KHQ73.1	HP tool 6 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
975	3	=P34+M-KHQ72.0/.1	HP tool 7 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
976	3	=P34+M-KHQ72.3/.4	HP tool 8 eroded warning	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
977	2	=P34+M-KHQ72.0	HP tool 1 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
978	2	=P34+M-KHQ72.1	HP tool 2 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
979	2	=P34+M-KHQ72.3	HP tool 3 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
980	2	=P34+M-KHQ72.4	HP tool 4 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
981	2	=P34+M-KHQ73.0	HP tool 5 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
982	2	=P34+M-KHQ73.1	HP tool 6 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
983	2	=P34+M-KHQ72.0/.1	HP tool 7 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
984	2	=P34+M-KHQ72.3/.4	HP tool 8 eroded fault	Teaching data deviate from actual value by x %.	Replace nozzle or lance.
985	2		HP teaching timeout	Max. teaching time exceeded.	Check whether setpoints fit lance and pump.
986	2	=P34 040	Special function HP test nozzle activated!	Special function HP test nozzle activated! No automatic sequence possible.	Deselect function in special function screens.
1034	3	=P34+M-BPI72.3/.7	HP feed pump bag filter choked fault	Filter bags are choked.	Replace filters.
1050	2	+C-QB44.01	HP feed pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1051	2	=P34+M-BPI72.3/.7	HP feed pump pressure NOK	Insufficient pump pressure.	Check drive system. Check delivery pipe for leaks. Is rated pump pressure reached acc. to the gauge? Check pressure switch for proper operation. Check completeness of spray system nozzles.
1052	2	=P34+M-BPI72.3/.7	HP feed pump pressure switch not OK	Pressure switch says pressure OK even though pump is switched off.	Check correct operation and setpoints of pressure switches.
1056	1	+C-QAQ15.0	HP feed pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1065	3	+C-QB50.01	Detergent dosing pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1066	3	=A6+M-BLI56.2	Detergent dosing pump detergent pot low level	Detergent dosing pot is empty. Level switch or wiring defective.	Fill the pot with suitable detergent. Check wiring and correct operation of level switch, if necessary.
1067	1	+C-QA16.6	Detergent dosing pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1081	2	+C-QB51.01	Oil separator supply pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1082	2	=B22+M-B67.1/.5	Oil separator overflow protection fault	Oil separator overfilled. Level switch or wiring defective.	Drain oil pot in oil separator. Check proper operation of level switch and cabling as necessary.
1088	1	+C-QA16.2	Oil separator supply pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1089	3	+C-QB49.01	Drain pump unit motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1096	1	+C-QAQ16.0	Drain pump unit contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1097	2	=B20+M-BLI66.0 / -BKL 66.5	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1098	2	=B20+M-BLI66.0 / -BLI66.4	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
1099	2	=B20+M-BLI66.2 / -BLI66.5 / -B	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1100	2	=B20+M-BLI66.0	Dirty tank low level protection	Low water level in dirty tank	Check make-up water input solenoid valve. Check level switch for proper operation and replace if necessary. Check wiring.
1101	2	=B20+M-BLI66.4	Dirty tank overflow protection	Too much water in dirty tank	Check make-up water input solenoid valve. Check level switch for proper operation and replace if necessary. Check wiring.
1102	2	=B20+M-BLI66.0 / -BLI66.2	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1103	2	=B20+M-BLI66.0 / -BKL 66.5	Dirty tank level switch discrepancy	Both level switches output signal "1".	Check level switches for correct operation and mounting. Check for accidental level switch actuation, e.g. due to dirt deposits in glass tube.
1106	2	=B20+M-BGI56.0	Clean tank low level protection	Low water in clean tank	Check level switch for proper operation and replace if necessary. Check wiring. Check for accidental actuation of switches.
1161	2	+C-KF82.04	Dirty tank heating overtemperature safety thermostat	Bath temperature inadmissibly high.	Check temp controller for correct setpoint. Check proper operation of heating contactor. Check temperature sensor for correct operation and setpoint.
1162	2	+M-BT200.2	Dirty tank heating overtemperature analog sensor	Bath temperature exceeded limit set on operator panel.	Check temp controller for correct setpoint. Check proper operation of heating contactor. Check temperature sensor for correct operation and setpoint.
1164	2	+M-BT200.2	Dirty tank heating analog sensor NOK	Temperature sensor indicates faulty value.	Check temperature shown on operator control panel. Check proper operation of temperature sensor.
1167	2	+C-QB80.01	Dirty tank heating circuit-breaker tripped	The circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1168	1	+C-QA80.07	Dirty tank heating contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1169	2		Bath cooling starting temperature lower than bath setpoint temp.	Incorrect sensor settings.	Check thermostat for proper operation and setpoints.
1265	2	+C-QB52.01	Exhaust fan motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1267	2	=V41+M-BPI56.6	Blow fan blowing pressure not OK	Insufficient blow pressure.	Check drive system. Check offtake damper for proper operation. Check pressure switch for correct setpoint and proper operation.
1268	2	=V41+M-BPI56.6	Exhaust fan blowing pressure switch NOK	Blow pressure switch defective.	Check the blow pressure switch.
1272	1	+C-QA16.4	Exhaust fan contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1338	2	+C-QB53.01	FAS filter rotary actuator motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1339	2	+M-BGI84.3	FAS filter rotary actuator timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1340	2	=F23a+M-BPI82.2/6	FAS filter differential pressure > 0.5 bar fault (choked)	Filter candles cannot be cleaned by backflushing	Filter candles must be cleaned manually (for details see chapter 6).
1341	2		FAS filter number of backflush cycles exceeded	Filter candles cannot be cleaned by backflushing	Filter candles must be cleaned manually (for details see chapter 6).
1342	2	=F23a+M-BGI82.1/5	FAS filter chip clean-out valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1343	2	=F23a+M-BGI82.1	FAS filter chip clean-out valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1344	2	=F23a+M-BGI82.5	FAS filter chip clean-out valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1345	2	=F23a+M-BGI82.0/4	FAS filter backflush valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1346	2	=F23a+M-BGI82.4	FAS filter backflush valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?

Störmeldungen
Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
1347	2	=F23a+M-BGI82.0	FAS filter backflush valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1348	2	=F23a+M-BGI82.3/7	FAS filter discharge valve signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1349	2	=F23a+M-BGI82.7	FAS filter discharge valve opening timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1350	2	=F23a+M-BGI82.3	FAS filter discharge valve closing timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1351	2	+M-BLI84.0	FAS filter dirt pipe chip level fault	Chips in dirt pipe cannot be removed by backflushing.	Initiate several backflush operations by hand. Chips may be stuck in the dirt pipe, clean the dirt pipe by hand (for details see chapter 6)
1360	1	+C-QA17.4	FAS filter rotary actuator contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1368	2		FAS filter scraper conveyor return pump max. runtime reached / filter choked	Maximum runtime reached. Not below pump-off level.	Check pump for proper operation and choking. Check filter for choking. Check level switch for proper operation and check switching points according to list of setpoints.
1377	3	+C-QB54.01	FAS filter dragout conveyor chain motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1378	1	+C-QAQ17.6/17.7	FAS filter dragout conveyor chain motor contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1379	1	+C-QAQ17.5	FAS filter return pump contactor fault feedback	Contactor doesn't close or open	Check contactor for proper operation
1380	3	=H23+M-BLI83.1/5	FAS filter scraper conveyor tank level switch discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and setpoints.
1381	3	=H23+M-BLI83.1/5	FAS filter scraper conveyor tank overflow	Too much water in tank	Check function of return pump. Check proper operation of level switch. Check wiring.
1382	2	=H23+M-BLI83.1/5	FAS filter scraper conveyor tank overflow	Too much water in tank	Check function of return pump. Check proper operation of level switch. Check wiring.
1383	3	+M-BGI84.6	FAS filter scraper conveyor torque monitor	Torque monitor has tripped	Check scraper conveyor for sluggishness. Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch.
1384	3	+C-QB55.01	FAS filter scraper conveyor return pump motor protection tripped	The motor circuit-breaker of this unit has tripped. Motor draws overcurrent.	Check drive system for sluggishness; check wiring for short circuit; check proper operation of motor and check electrically if necessary; check drive system for blockage.
1602	2	=PNE+M-BGI69.0/ 1	Lance guide signal discrepancy	Both limit switches output "1" signal.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1603	2	=PNE+M-BGI69.1	Lance guide lowering timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1604	2	=PNE+M-BGI69.0	Lance guide raising timeout	Movement reaches end position too late.	Check limit switches for correct position and mounting. Check clearance between triggering mechanical equipment and limit switch. Mechanical equipment or drive sluggish?
1605	2	=TS+M-BGI69.2	Lance guide lance 1 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1606	2	=TS+M-BGI69.3	Lance guide lance 2 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1607	2	=TS+M-BGI69.6	Lance guide lance 3 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1608	2	=TS+M-BGI69.7	Lance guide lance 4 broken	Lance bent. Lance guide defective or hole in part blocked.	Replace lance. Check part hole, lance guide and sensors.
1817	1	+M-BGI132.4	Vestibule robot load station shift register error	Part status in shift register doesn't match the information from sensors.	Check shift register and position. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
1818	1		Vestibule loading robot and gantry indicate they are not clear	Both robots are inside the transfer area.	Return robot to home position in manual mode using the teach panel.
1819	1	+M-BGI132.4/133.1	Vestibule robot load station part scanning plausibility check	Implausible status of sensors	Check sensors for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1820	1	+M-BGI132.4/133.3	Vestibule robot load station Petrol part scanning plausibility check	Implausible status of sensors	Check sensors for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1824	1		Vestibule robot load station shift register unknown type	Part status in shift register doesn't match the information from sensors.	Check shift register and position. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
1825	1	+M-BGI132.7	Vestibule robot unload station shift register error	Part status in shift register doesn't match the information from sensors.	Check shift register and position. Check sensors on external conveyor and gripper. Correct shift register on operator panel, if necessary.
1826	1		Vestibule unloading robot and gantry indicate they are not clear	Both robots are inside the transfer area.	Return robot to home position in manual mode using the teach panel.

Störmeldungen Fehler, Ursachen und Behebungen

Störmeldeliste

Nr.	Prio.	BMK	Meldung	Ursache	Behebung
1827	1	+M-BG132.7/133.5	Vestibule robot unload station part scanning plausibility check	Implausible status of sensors	Check sensors for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
1839	1		Vestibule blow system not up and wash robot in interference area	System has lost the end position.	Check limit switches for correct operation and mounting. Check mechanical equipment for accidental limit switch actuation.
2001	4	+C-XD90 0	Gantry connector not plugged in	Hardware connector not plugged in	Info only.
2002	4	+C-XD90 0	Gantry control voltage on	Control voltage on signal via hardware	Info only.
2009	4	+M-BG133.0	Vestibule robot load station transmitter light barrier plausibility check	Transmitter has 1 signal	Determine cause
2010	4	+M-BG133.2	Vestibule robot load station Petrol transmitter light barrier plausibility check	Transmitter has 1 signal	Determine cause
2011	4	+M-BG133.4	Vestibule robot unload station transmitter light barrier plausibility check	Transmitter has 1 signal	Determine cause
2161	4		IFW re-wash treatment deactivated!	Treatment deselected via special function.	Activate treatment.
2162	4		IFW spray system 1 deactivated!	Treatment deselected via special function.	Activate treatment.
2163	4		IFW spray system 2 deactivated!	Treatment deselected via special function.	Activate treatment.
2193	4		Robot gripper maintenance interval reached (warning)	Gripper has reached number of operations for maintenance.	Initiate / perform maintenance task according to maintenance plan.
2197	4	+M-MR86.01	Robot maintenance interval reached (warning)	Robot has reached number of operations for servicing.	Carry out local servicing, see separate operating instructions. Initiate / perform maintenance task according to maintenance plan.
2198	4	+M-MR86.01	Robot not at 100%	Robot not at 100%	Change robot override on robot control desk
2199	4	+M-MR86.01	Robot battery low level	Robot battery low level	Info only.
2401	4	+M-BPI74.4 / +P01-MB84.01	Main pneumatic shutoff valve pressure not OK - warning	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
2402	4	+M-BPI74.5 / +P01-MB84.04	Main pneumatic shutoff valve after door safety circuit pressure not OK - warning	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
2403	4	+M-BPI74.3/7 / +P01-MB84.07	Vacuum drier pneumatics main shutoff valve pressure not OK	Pneumatic pressure is not sufficient.	Check local compressed-air supply. Open shutoff ball valve in main line. Check proper operation of pressure switch and replace if necessary.
2409	4		High-pressure unit completely deactivated!	HP unit does not treat.	Activate HP unit.
2410	4	=P34+M-MA45.01	HP pump oil change interval reached (warning)	Oil expiry date reached.	Change the oil. See separate operating instructions by Hammelmann.
2411	4	+C-TA45.01	HP pump variable frequency drive warning	Variable frequency drive outputs warning message. Look up the fault code on the display.	See separate motor manual.
2417	4	OPTION	Cooling water supply pressure NOK	User-supplied operating pressure not sufficient.	Check connections. Check proper operation of pressure switch.
2418	4	OPTION	Insufficient cooling water supply flowrate	The flowrate of the cooling water provided by the customer is too low	Check local cooling water supply. Check ball valve positions. Check shutoff valve and temperature monitor.
2441	4		HP nozzle system 1 deactivated!	Treatment deselected via special function.	Activate treatment.
2442	4		HP nozzle system 2 deactivated!	Treatment deselected via special function.	Activate treatment.
2443	4		HP nozzle system 3 deactivated!	Treatment deselected via special function.	Activate treatment.
2444	4		HP nozzle system 4 deactivated!	Treatment deselected via special function.	Activate treatment.
2445	4		HP nozzle system 5 deactivated!	Treatment deselected via special function.	Activate treatment.
2446	4		HP nozzle system 6 deactivated!	Treatment deselected via special function.	Activate treatment.
2447	4		HP nozzle system 7 deactivated!	Treatment deselected via special function.	Activate treatment.
2448	4		HP nozzle system 8 deactivated!	Treatment deselected via special function.	Activate treatment.
2449	4		HP teaching activated	HP teach run activated via special function.	Info only.
2450	3		HP teaching completed successfully	Data have been saved.	Info only.
2529	4	=A6+M-BL156.2	Detergent dosing pump detergent pot low level	Detergent dosing pot is empty. Level switch or wiring defective.	Fill the pot with suitable detergent. Check wiring and correct operation of level switch, if necessary.
2545	4		Oil separator overflow protection warning	Oil separator overfilled. Level switch or wiring defective.	Drain oil pot in oil separator. Check proper operation of level switch and cabling as necessary.
2553	4		Drain pump unit activated in auto mode!	Drain pump unit activated in auto mode!	Deactivate drain pump unit in auto mode!
2555	4	=P10+M-SFI65.3	Drain pump unit max. runtime reached	Drain pump unit stops automatically after one hour.	Operate key-switch again.
2561	4		Complete re-fill active!	Complete re-fill active.	Automatic deactivation or deselection in special functions screens after fill levels are reached.
2562	4		Complete re-fill operation finished successfully!	Complete re-fill finished, working level reached.	Close manual ball valve for quick filling if open.
2563	4		Make-up water meter check (choking)	Valve has been operated but water meter supplies no flow pulses.	Check piping filter for choking. Check local water supply.
2564	4		Make-up water valve check (leakage)	Valve has not been operated but water meter supplies flow pulses.	Check make-up water valve for leaks.
2565	4		Demin. water top-up meter check (choking)	Valve has been operated but water meter supplies no flow pulses.	Check piping filter for choking. Check local water supply.
2566	4		Demin. water top-up valve check (leakage)	Valve has not been operated but water meter supplies flow pulses.	Check make-up water valve for leaks.

Störmeldungen

Fehler, Ursachen und Behebungen

Störmeldeliste

[illegible]

6. Maintenance

Table of Contents

6.	Maintenance	6-1
6.1	Contents and Purpose	6-3
6.2	Validity	6-3
6.3	Safety instructions for maintenance and repairs	6-4
6.3.1	Safety rules for work on piping	6-6
6.3.2	Oils, greases and other chemical substances	6-7
6.3.3	Gas, dust, vapours, fumes and smoke	6-7
6.4	General regulations for cleaning and maintenance work	6-8
6.5	Guards	6-9
6.6	Maintenance work	6-10
6.6.1	General cleaning	6-10
6.6.2	Functional tests	6-10
6.6.3	Pneumatic system	6-11
6.6.4	Blowing air fan with cross-flow heat exchanger and mist collector	6-13
6.6.5	Leak detector	6-13
6.7	Handling systems	6-14
6.7.1	Robot	6-14
6.7.2	Gripper	6-15
6.8	Work chamber	6-16
6.8.1	Sliding door	6-16
6.8.2	Cleaning the work chambers	6-16
6.8.3	Open-mesh flooring in work chamber	6-17
6.8.4	Flood tank	6-17
6.8.5	Spray system	6-19
6.8.6	HP systems	6-19
6.9	Cleaning fluids	6-21
6.9.1	Manifold piping	6-21
6.9.2	Heating	6-21
6.9.3	Dosing system	6-22
6.9.4	Detergent	6-23
6.9.5	Changing the bath fluid	6-23

6.9.6	Emptying the cleaning machine	6-24
6.10	Bag filter	6-26
6.10.1	Changing the filter bags	6-27
6.11	High pressure	6-29
6.11.1	High-pressure pump	6-29
6.11.2	HP test nozzle	6-30
6.12	Vacuum chamber	6-31
6.12.1	Vacuum pump	6-32
6.12.2	Cooling zone	6-33

6.1 Contents and Purpose

These instructions are meant to provide the user, i.e. trained and skilled personnel with all information required for upkeep, maintenance and service or for the establishment of in-company maintenance instructions.

The statements in these instructions are guidelines which have to be adjusted and maybe corrected as necessary to suit the operating conditions prevailing after commissioning and to suit the given equipment work-load.

The maintenance and care instructions enable the equipment user to perform preventative maintenance. Enclosed proprietary operating instructions include maintenance instructions of outsourced items. These are to be observed with priority. The skilled personnel in charge of operation and maintenance of the equipment must be fully informed of the contents of these instructions. One copy of the maintenance and servicing instructions is to be kept available local to the equipment.

6.2 Validity

The present maintenance and servicing instructions serve as a guideline for maintenance and upkeep. Any deviating or supplementary points found during operation of the equipment shall be observed in addition.



This chapter describes the maintenance and upkeep of the equipment in general and of project-specific assemblies. Maintenance and upkeep of outsourced items are described in chapter 12: 'Operating instructions on outsourced items'.

6.3 Safety instructions for maintenance and repairs

Perform all maintenance and servicing work regularly and carefully. Any repair work found necessary shall be carried out by skilled personnel immediately upon discovery of the defect or damage.

For this it is advisable to call for maintenance personnel of DÜRR Ecoclean GmbH. We also recommend to have the equipment inspected by our after sales service at regular intervals of time.

All maintenance and servicing work shall be carried out by skilled personnel only. In cases of doubt it is advisable to consult the experts of DÜRR Ecoclean GmbH or of the relative manufacturers.

For all such work observe the valid regulations for the prevention of accidents, the regulations of the competent supervisory authorities, the instructions of the chemicals suppliers and the safety regulations in the DÜRR Ecoclean GmbH operating instructions manual.

Cleaning and repair work shall only be carried out with the equipment at standstill. If repair work using an open flame is inevitable, first clean the equipment thoroughly to avoid any risk of fire or explosion.



Dispose of any wastes from cleaning and repair work in compliance with the regulations of the competent Supervisory Authorities.

For any work on live components first isolate all poles of the equipment safely from power supply. Check the earthing connections of electrical equipment especially after every cleaning work.

Observe the set-up, maintenance and inspection routines and intervals specified in the operating instructions manual, including the instructions for replacement of components and parts of equipment. Such work must be performed by skilled professionals only. Whenever you have to perform any work concerning operation, production adaptation, set-up or adjustment of the equipment and its safety-related parts as well as inspection, maintenance and repairs, observe the start-up and shutdown procedures specified in the Operating Instructions and all relevant maintenance instructions.

For maintenance work and repairs make sure that the equipment cannot be energized. This means, open the main disconnect switch before starting any work and lock-it out to prevent inadvertent reclosing.



Risk of electric shock!

Even with the equipment shut down, the beacon (warning lamp), the fuses and the electric feeder remain live.

Guard the area of maintenance work with wide clearances as necessary.

For replacement of single parts and larger assemblies or sub-assemblies carefully attach and secure these to the hoisting equipment so as to avoid all and any handling hazards. Lifting gear and load suspension devices must be suitable for the purpose and in proper working order. Load-bearing capacities must not be exceeded.

When working at overhead levels, use ladders, elevating equipment or working platforms specifically designed for this purpose or other devices satisfying all safety requirements. Do not use machine parts as climbing aids. Keep handles, steps, handrails, landings, platforms and ladders free from dirt and clean as necessary.

Clean the equipment, specifically connections and couplings, unions, fittings, etc. before commencing maintenance or repair work. Do not use aggressive cleaning agents.

When carrying out maintenance and repair work always tighten loose screws and bolts and check all of them.

6.3.1 Safety rules for work on piping



Hazards due to hot surfaces

You can be injured by touching hot surfaces. Before starting work on pipelines, fittings, components, instruments and equipment which contain or carry hot liquids or vapours, switch off the heating system and wait until the relevant lines or equipment have cooled down and are fully depressurized.

Shutoff valves mounted upstream and downstream of the relevant pipe sections or items of equipment shall be closed and adequately secured against unauthorized and inadvertent opening as long as work on the system continues. Wherever possible drain the contents of piping and components and collect in suitable containers.

Always keep any moving parts of equipment (pumps) covered by the guard provided for this purpose.

To shut down the heating system it is not enough to close the control valve in the hot water or steam line. Always close the manual shutoff valves provided in these lines.

A control valve is **no** shutoff device!



Hazards of corrosive injury!

There is a risk of injury from acids and lyes. Before starting work on piping, fittings, valves, instruments and equipment components which contain or carry aggressive media such as acids or lyes, switch off the heating system and wait until the relevant pipes or equipment have cooled down and are fully depressurized.

Be sure to drain pipes and equipment in a suitable manner before starting any work.

Wear protective clothing and observe all applicable regulations with regard to handling acids and lyes!

Remove residual acid or lye by flushing with sufficient quantities of water. Observe any applicable special regulations for specific equipment or systems.

When performing repair or maintenance work on plastics components bear in mind that rigid (hard) PVC and plasticized (soft) PVC must **never** be joined. (Example: gaskets made of plasticized PVC between rigid PVC flanges. Plasticizers migrate into rigid PVC causing material embrittlement. The result is stress cracking and destruction of the component.

Observe the relevant DIN standards and manufacturer's instructions.

6.3.2 Oils, greases and other chemical substances

When handling oil, grease and other chemical substances, observe the safety instructions and packing instructions applicable to the product.

6.3.3 Gas, dust, vapours, fumes and smoke

Observe all rules and regulations valid at the place of work.

Do not perform hot work such as welding, flame-cutting or grinding work on the equipment without explicit prior approval.

Before carrying out welding, flame-cutting or grinding work on the equipment and its environment, clean the equipment of dust and combustible materials and ensure adequate ventilation.

6.4 General regulations for cleaning and maintenance work

The following pages contain safety instructions and regulations that need to be observed when carrying out maintenance work.

WARNING



Risk of injury!

Non-observance of the instructions may result in injury. Observe all instructions in this chapter.



Burning and scalding hazard!

You can be injured by touching the pipes! In order to protect yourself when carrying out maintenance and upkeep tasks on the equipment, be sure to wear protective gloves for any work on the pipes!



6.5 Guards

WARNING



Risk of injury!

There is a high risk of injury if guards have not been installed or do not work properly. After completion of any work make sure that all guards are in place!

All moving parts which might create any hazards are covered with protective guards.

These guards must only be removed by skilled personnel for repairs or maintenance purposes and only with the equipment shut down. Upon completion of this work, re-install the guards again properly.

6.6 Maintenance work

6.6.1 General cleaning

Carry out following cleaning work at regular intervals of time:

- Clean the equipment from coarse dirt accumulation and deposits inside and outside.
- Check all filters (air filters and bag filters) for their degree of choking and clean as necessary.
- Clean the floor tray incorporated in the baseframe from coarse dirt deposits.
- Clean the operator control panel (display) using a wet non-linting cloth.

6.6.2 Functional tests

Check all moving parts of the equipment every month for proper operation and wear. This applies in particular to:

- Part loading
- Robot
- Part unloading
- Test the function of shutoff valves and actuators.
- Grippers (especially locating pins and bushings)
- Lifting doors of cleaning machine and vacuum drier
- Check all piping of the equipment for leaks. Also check all compressed-air lines, hoses and couplings for leaks and externally visible damage.



Wear protective gloves because of the risk of burning and scalding on pipes!

6.6.3 Pneumatic system

All piping, hoses and couplings are to be checked at regular intervals for leaks and externally visible damage by a skilled person.



Fig. 1 Pneumatics

Here some examples of possible defects on hoses:

1. Damage of the outer layer extending down to the fabric (e.g. chafe marks, cuts or cracks).
2. Embrittlement of the outer layer (e.g. crack formation in hose material)
3. Deformations not in compliance with the natural shape of the hose, in pressurized or depressurized condition or under bending forces (e.g. layer separation, formation of bubbles, pinch points, kinks or folds)
4. Leaks
5. Installation requirements not met
6. Hose "growing out" of the valve or fitting
7. Damage to or deformation of the valve or fitting affecting the function and strength of the valve or fitting or of its connection with the hose
8. Corrosion of valve or fitting affecting its function and strength
9. Shelf life and service life exceeded

For any work on the pneumatic system, duly shut down the equipment (main disconnect switch "OFF"), close compressed-air input and depressurize the compressed air lines.

DANGER**caused by pressurized vessels**

Pressure accumulators must be vented separately!

The compressed-air lines are routed and installed properly.

Their connections are marked to avoid confusion.

6.6.4 Blowing air fan with cross-flow heat exchanger and mist collector

Take following actions at regular intervals:

- Check and clean cross-flow heat exchanger (visual inspection)
- Air leakage gap – check blow nozzle
- Clean blow nozzle



Fig. 2 Blowing air fan

6.6.5 Leak detector

The system is equipped with a leak detector. The leak detector is installed in the floor tray. Response of the detector closes the make-up water valve and switches off the filter module pumps. This initiates a fault alarm and illuminates the red light on the machine roof. In order to avoid malfunctions keep the floor tray clean and dry and clean it as necessary.

6.7 Handling systems

6.7.1 Robot

For robot maintenance please refer to KUKA separate operating instructions.
Check correct operation of robot at regular intervals.

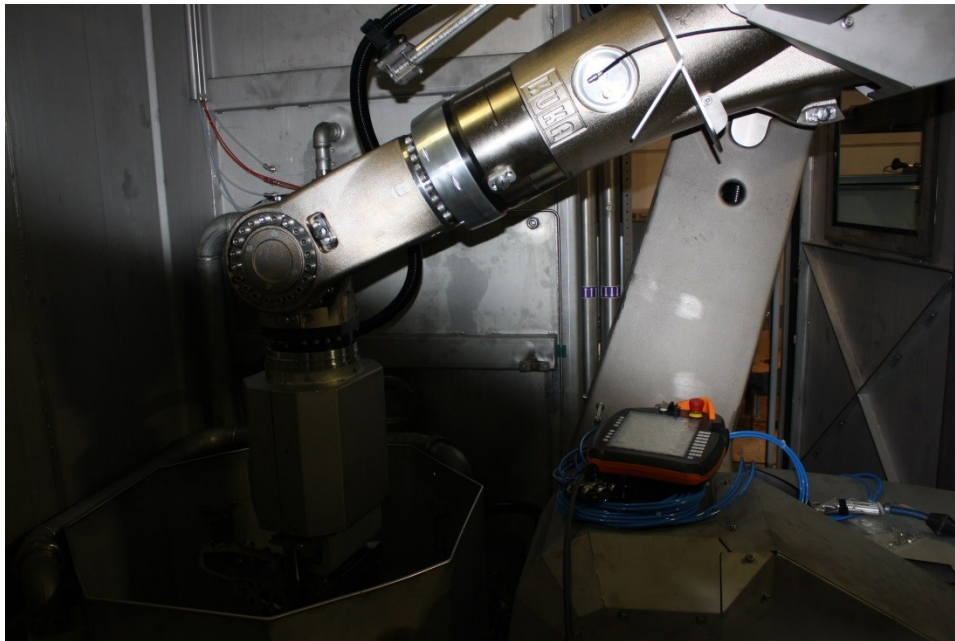


Fig. 3 Robot

Checking the robot home position

To check the robot home position move the gripper to the reference point inside the chamber (using teaching mode, see software operating instructions).

After running the corresponding test program the end position must be reached again exactly.

6.7.2 Gripper

The gripper system is rated and dimensioned for 1 million cycles without requiring maintenance. During this time the components require no regreasing. The figure of 1 million cycles refers to operation on oil-free/dry air (air quality class 4 as per DIN ISO 8573-1. The use of oiled compressed air may extend the service life.

After 1 million cycles are reached the gripper finger should be checked at regular intervals. If the check reveals excessive play in the finger mechanism the components should be replaced.

For spare parts and repair kits please refer to list of spare parts or contact Müller Maschinenteknik.

Before starting any cleaning, inspection or maintenance work isolate the gripper system from the factory supply and observe the safety instructions.



Fig. 4 Gripper



Fig. 4a Gripper

Maintenance plan

Monthly	Check all hoses and connections for damage
Yearly	Check tightness of connections and fittings
	Check all hose connections for leaks
	Check guide units for play

For gripper maintenance see separate operating instructions by Müller Maschinentechnik

6.8 Work chamber

6.8.1 Sliding door

The sliding door of the treatment chamber must undergo a general functional test at regular intervals of time. Check the following points in particular:

- Check operation of linear motion drive

6.8.2 Cleaning the work chambers

The work chamber of the equipment must be cleaned at regular intervals, i.e. remove any deposits from walls and bottom. Remove any balls or tangles of chips or swarf or other coarse deposits from the tanks by hand through the maintenance door. Clean the seals of the clean-out openings and check them for damage and replace if necessary.

WARNING



Hazard from inadvertent starting of equipment

Before entering the work chamber switch off and lock out the machine to prevent inadvertent restarting

Open the door to take the following actions in the work chamber:

- Check work chamber for dirt accumulation and clean as necessary.
- Check spray system nozzles for dirt deposits and clean as necessary.
- Check condition and proper operation of gripper and multihose.
- Check HP pipe couplings and hoses for leaks and damage.
- Check high-pressure nozzles and lances for wear.

6.8.3 Open-mesh flooring in work chamber

WARNING



Slipping hazard

Place open-mesh flooring in the work chamber with concave side up only. Otherwise there is a risk of slipping.

6.8.4 Flood tank

Perform the following maintenance work on the flood tank, depending on the amount of dirt collected:

- Check flood tank for coarse contamination at regular intervals and clean as necessary.
- Check nozzles in flood tank for tight fit.
- Check nozzles in flood tank for obstructions and clean as necessary.



Fig. 5 Flood tank

6.8.5 Spray system

Pos. 3



Fig. 6 Spray system Pos. 3

6.8.6 HP systems

Pos. 4



Fig. 7 HP system Pos. 4

Pos. 5



Fig. 8 HP system Pos. 5

Pos. 6



Fig. 9 HP system Pos. 6

- Check nozzles for tight fit.
- Check pipe unions and couplings of high-pressure system for tight fit and for leaks (visual inspection) and re-tighten as necessary.
- Check the lances.

6.9 Cleaning fluids

6.9.1 Manifold piping

Take the following actions:

- Check operation of pumps (read the pressure).
- Perform maintenance of pumps.
(see separate instructions by pump manufacturers)
- Check the pump motors.
- Check shutoff and control valves for proper operation and for leaks.
- Check pipework for leaks.

6.9.2 Heating

- Check all electric connections.



Fig. 10 Heater

6.9.3 Dosing system

Topping-up the dosing pot

The dosing pot is mounted at a central location.

The min. level switches in the dosing pot give warning by screen display and warning light when the pot is almost empty.

In response to this warning, top-up the pot within one hour. Otherwise the equipment will stop.

Dosing pump

Check the dosing pump for proper operation and for damage once a month.

(Please observe separate operating instructions in chapter 12.)



Fig. 11 Dosing unit

6.9.4 Detergent

CAUTION



Hazards due to use of unsuitable detergent

Use aqueous detergents only which are suitable for high-pressure service (up to approx. 500 bar) and neutral in contact with non-ferrous metals!

(e.g. Henkel Neutrapon 5013)

In selecting the detergent to be used see to it that it will not attack the materials used in manufacture of the machine. To avoid foaming of the detergent also take care that the agent selected is suitable for spray applications. Observing the treatment temperatures specified by the detergent manufacturer (e.g. Henkel) is as important as closely observing the specified detergent concentration.

6.9.5 Changing the bath fluid

The fluid changing interval (draining and re-charging the machine fluid) depends on the specific service conditions prevailing in your case. The factors influencing the fluid lifetime are essentially the input of solids (e.g. in the form of chips) and liquid contaminants (e.g. in the form of oils and cooling lubricants) related to your specific demands on tolerable residual contamination, i.e. on the cleaning degree.



Use your personal protective equipment for changing the fluid, i.e. wear protective clothing, gloves and face protector.

6.9.6 Emptying the cleaning machine

CAUTION



Emptying and cleaning of the machine must be made by skilled persons only.

The ball valve markings have the following meanings:

Red: closed in home position

Green: open in home position

Yellow: restricted in home position

Having operated the respective ball valves as required, you can pump the equipment fluid into the waste water treatment unit and immediately start cleaning with a high-pressure cleaner.

The procedure is as follows:

Emptying		Open ball valve
Tank B20		B20-B009 P10-B004
Oil separator B22 Oil collecting pot		B22-B001 B22-B003 P10-B004
High-pressure bag filter	F33-F002 F23-F012	F33-B005 F33-B015 P10-B004
FAS filter	F23a-F002 F23a-F012	F23a-B006 P10-B004
Draining of floor tray A5		P10-B007 P10-B004

On completion of cleaning operation be sure to re-close the ball valves and plugs.

Starting the drain pump unit

- Stop automatic mode
- Set selector switch SFI165.3 to on

Visually watch tank draining operation. Be sure to switch off the pump after draining is completed.

During draining of the dirty-fluid tank the pump keeps running for as long as the selector switch SFI165.3 is in the ON position.



Fig. 12 Selector switch

6.10 Bag filter



Fig. 13 Bag filter

The machine has several filter pots.

You can isolate the filter pots separately for maintenance purposes by closing the supply and return ball valves.

Lifetime of the filter inserts and cleaning intervals depend on the amount of dirt collected and cannot therefore be specified in advance.

During the time of running-in the machine check the filters every day to become familiar with the actual rate of filter choking and the appropriate filter cleaning intervals in your specific case.

For the fault messages on the display, their causes and remedies please refer to chapter 5 'Troubleshooting, Faults, Causes and Remedies'.

6.10.1 Changing the filter bags

Close supply (1) and return (2) shutoff valves (closed positions: 1a, 2a).

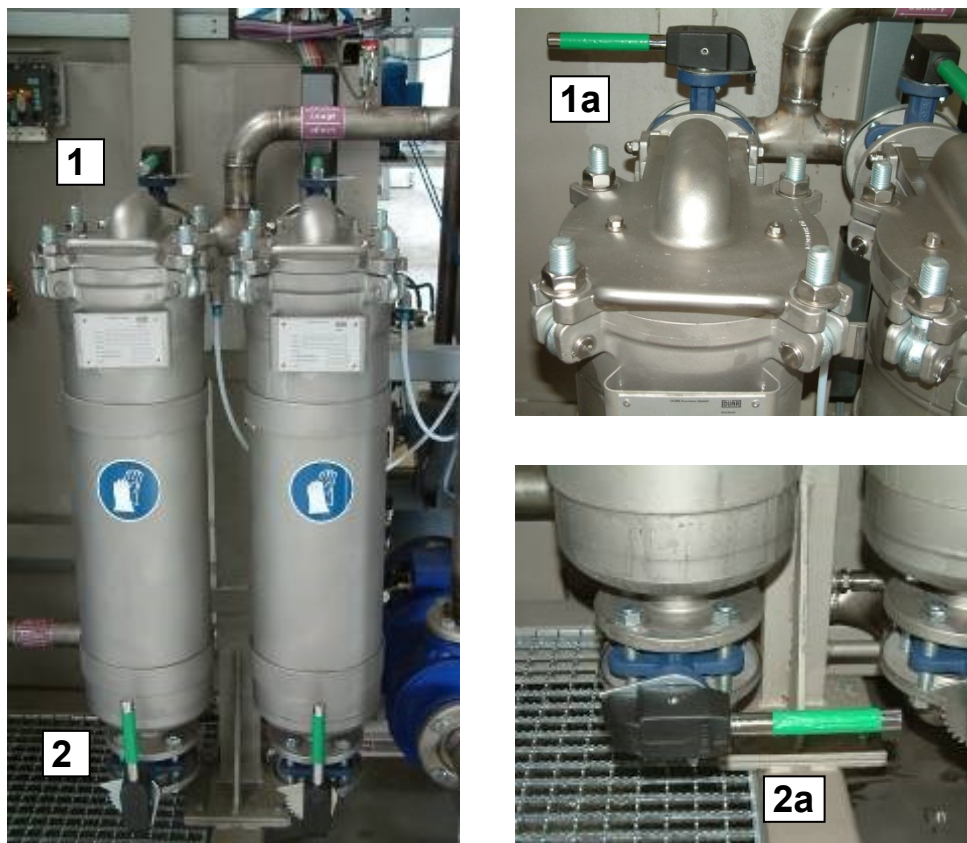
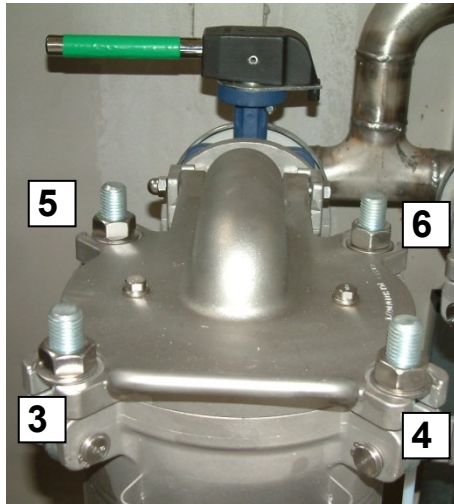
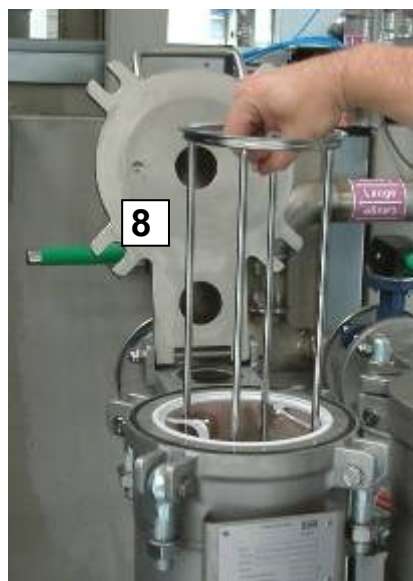


Fig. 14 Example of filter bag change

Loosen bolts (3, 4, 5, 6) on filter lid using a wrench (7) and open the filter lid.



Pull out mounting aid (8) and bag filter insert (9) and let it drip off in hanger (14).



Pull out strainer basket (10) with enclosed tool (11) and clean as required.



Insert new filter bag using mounting aid (8).

Clean and check seals (12, 13) for damage before closing the lid.

Close the filter lid, tighten the bolts and open the shutoff valves.



6.11 High pressure

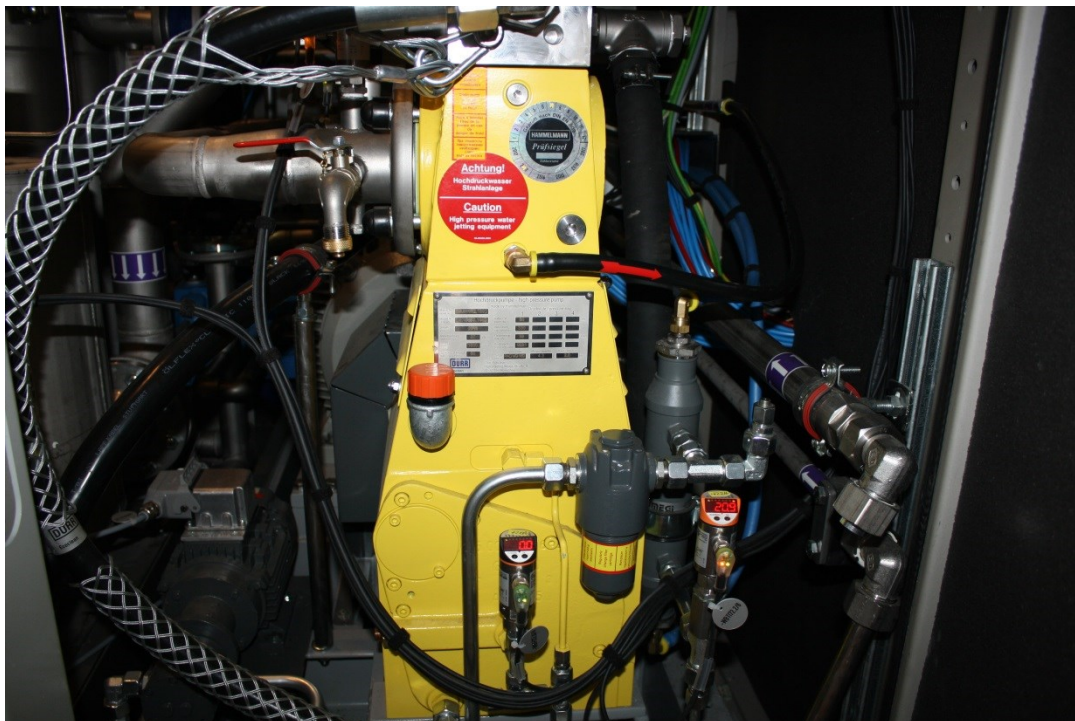


Fig. 15 High-pressure pump

- Check the high-pressure pipes for leaks every day. Re-tighten connections and replace defective parts as necessary.

6.11.1 High-pressure pump

Daily

- Check oil level of the pump.
- First oil change after 1000 hours run
- Subsequent oil changes at yearly intervals



Notice:

Please observe separate instructions for the high-pressure pump by Hammelmann in chapter 12.

6.11.2 HP test nozzle

The test nozzle serves for checking the HP pump pressure. The diameter of the nozzle installed is selected to suit the amount of water consumed by the machine during operation.

The pressure existing in the high-pressure spray system is monitored by a pressure switch.

If the pressure is insufficient, check the spray system.

A firmly installed test nozzle is provided for this purpose.

Connect the hose to the test nozzle as shown on the photo.

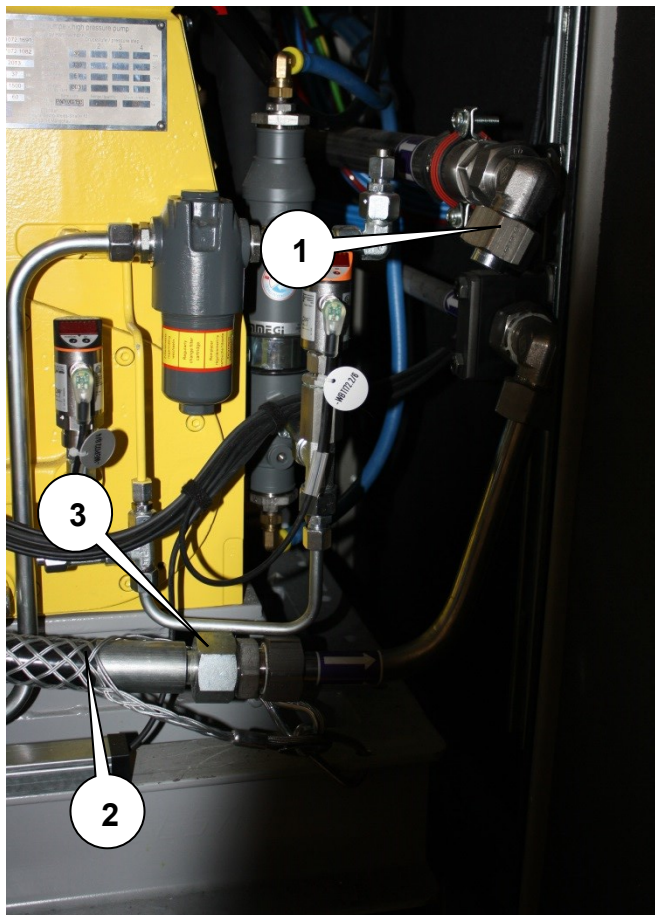


Fig. 15a Test nozzle connection

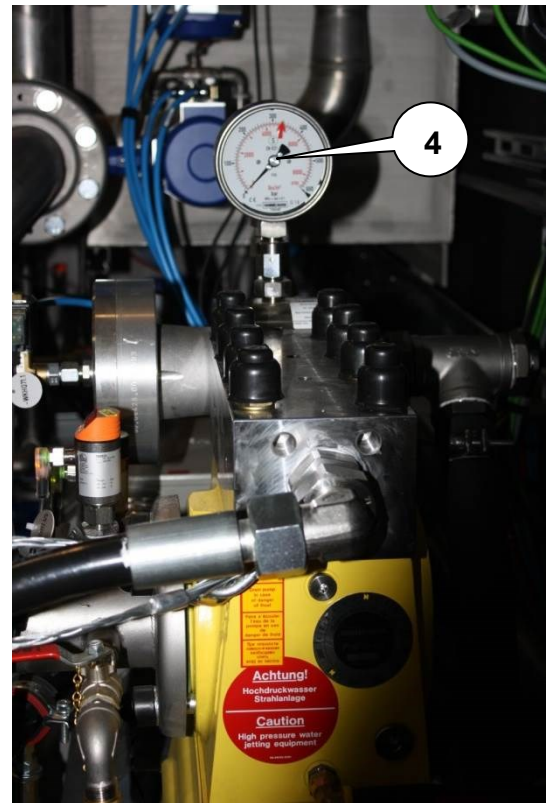


Fig. 15b Pressure gauge

- Loosen retaining nut (3).
- Connect test nozzle (1) with high-pressure hose (2).
- Check pressure at gauge (4).

6.12 Vacuum chamber

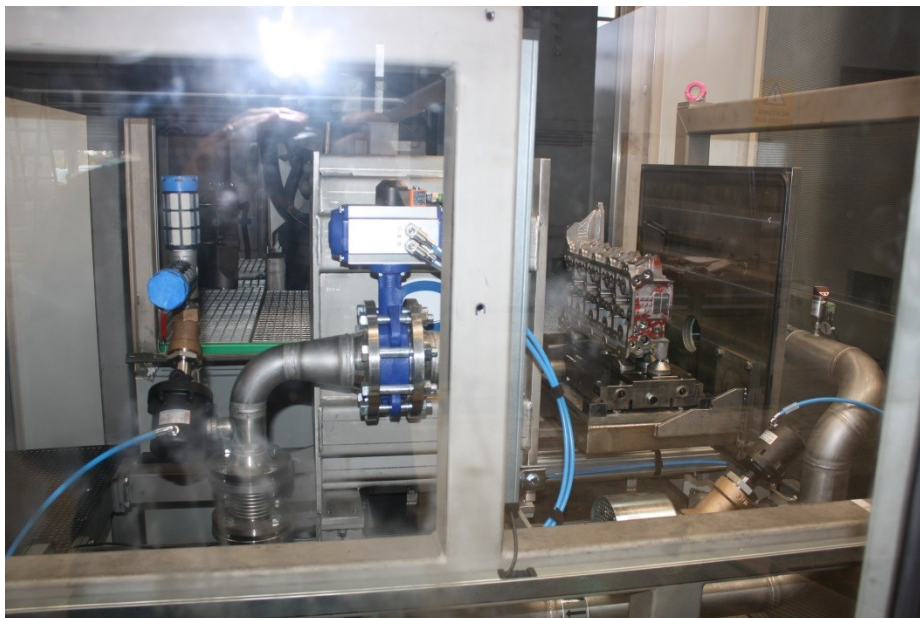


Fig. 16 Vacuum chamber

Check vacuum chamber seals for damage and guide rails for wear and replace as necessary.

Also carry out following checks:

Pneumatic system

- Check operation of piston drive.

6.12.1 Vacuum pump

- Check for proper operation.
- Change the oil at least every 2000 h (twice a year).
- Replace filter cartridges on every oil change.
- Perform annual maintenance.



Notice:

Please observe separate instructions for the vacuum pump by Busch in chapter 12.

6.12.2 Cooling zone

The cooling zone is loaded and unloaded by means of a gantry gripper provided by user. The parts are carried through the cooling zone on an endless chain conveyor.

Check the cooling zone for contamination at regular intervals and clean as necessary.

The maintenance intervals for the cooling zone must be adapted to suit the local operating conditions.

Cooling zone



Fig. 17 Cooling zone



Fig. 17a Cooling zone

Air filter

Clean the air intake filter of this unit at regular intervals (every 1 to 4 weeks depending on the level of air pollution) or replace it if necessary (spare filter).

Refrigerant circuit

We recommend yearly inspections by a refrigeration systems specialist. This inspection comprises functional checks of all switching devices and safety features. The operational performance of the chiller and the response of the refrigeration capacity controller are checked and corrected as necessary and a report is prepared.

The evaporator installed in the cooling duct should also be cleaned at regular intervals of time to ensure sufficient air circulation and hence sufficient refrigerating capacity.



Maintenance Schedule

Equipment: **EcoCFlex**

Machine: **MK.135736.1510,**

Serial No.: **56307**

Inventory No.: **M1H1-100-1**

OP100 Cylinder Head



Jaguar Land Rover

TPM Maintenance Schedule

EcoCFlex

Inv.No.: M1H1-100-1

Per-shift / daily / weekly activities

MK.135736.1510,

○ 1- CLEANING △ 2- INSPECTION □ 3- MAINTENANCE

Symbol	Number	Item	EcoCFlex	Quantity	Activity	By	Time required [min]	During operation	During stoppage
○	1.00.00	Overall equipment and surroundings		w	Clean from coarse dirt inside and outside	Team	30		x
○	1.01.00	Machine filters		w	Check for choking and clean if necessary	Team	5		x
○	1.02.00	Work chamber		w	Clean work chamber	Team	20		x
△	2.03.01	Bulkhead doors		w	Check sealings for damage and replace as required.	Team	5		x
△	2.03.02	Bulkhead doors		w	Check linear drive unit mechanism	Team	5		x
△	2.04.01	Vacuum chamber - sealings		w	Check for damage, replace if necessary	Team	5		x
△	2.04.02	Vacuum chamber - bulkhead doors		w	Check linear drive unit mechanism	Team	5		x
○	1.04.03	Vacuum chamber		w	Clean chamber	Team	10		x
△	2.05.01	Vacuum pump		d	Check oil level and top up if necessary	Team	5		x
△	2.05.03	Vacuum pump		w	Check vacuum pump for leaks	Team	5		x
□	3.06.01	Bag filter	Alarm Signal		Change filter bag.	Team	10		x
△	2.10.01	Pipes (pipeline route), pneumatic hoses and components of the complete equipment (incl. valves, dirt traps etc.)		w	Visually inspect for proper operation, leaks, dirt deposits	Team	10	x	
△	2.11.01	Tank		w	Visually inspect for damage, leaks, dirt deposits	Team	5	x	
□	3.15.01	Cooling water supply dirt trap		w	Clean	Team	10		x
△	2.17.01	Spray system		d	Visually inspect for damage, leaks, dirt deposits	Team	5		x
△	2.19.01	Gripper		d	Check part fixture, pneumatics	Team	5		x
△	2.20.01	Robot - protective hose		w	Check and replace components as necessary	Team	5		x

TPM Maintenance Schedule

EcoCFlex

Inv.No.: M1H1-100-1

Monthly / quarterly activities

MK.135736.1510,

○ 1- CLEANING △ 2- INSPECTION □ 3- MAINTENANCE

Symbol	Number	Item	EcoCFlex		Quantity	Activity	By	Time required [min]	During operation	During stoppage
△	2.04.04	Vacuum chamber – rollers and guides		m		Check for wear and tear and replace if necessary	Team	5		x
○	1.04.05	Vacuum chamber – vacuum pipe		q		Clean	Team	30		x
○	1.05.04	Vacuum pump		m		Visually inspect / pump room, clean as necessary	Team	5		x
△	2.05.05	Vacuum pump		m		Check electrical connections	Team	5		x
△	2.12.02	Blow system – hoses		m		Check for damage and replace if necessary	Team	5		x
△	2.17.02	Spray system		q		Check nozzles, clean or replace as required	Team	5		x
△	2.19.02	Gripper		m		Check locating pins and bushings	Team	5		x
△	2.20.02	Robot		m		Clean and check for wear	Team	5		x
○	1.21.01	Floor tray		m		Clean from coarse dirt	Team	10		x
○	1.22.01	Operator panels		m		Clean using a wet non-linting cloth	Team	5	x	
○	1.23.01	Circulating air systems		m		Check and clean as necessary	Team	5	x	
○	1.24.01	Housing doors		q		Clean door limit switches	Team	10		x
△	2.25.01	Moving parts of complete machine		m		Check for wear and tear and replace if necessary	Team	15		x
△	2.26.01	Tank drains of overall equipment		m		Check for leaks and replace as required	Team	15		x
△	2.27.01	Pneumatic system of overall equipment		m		Visually inspect for proper operation, leaks, dirt deposits	Team	10	x	

TPM Maintenance Schedule

Half-yearly / yearly activities

EcoCFlex

MK.135736.1510,

Inv.No.: **M1H1-100-1**

○ 1- CLEANING △ 2- INSPECTION □ 3- MAINTENANCE

Symbol	Number	Item	EcoCFlex		Quantity	Activity	By	Time required [min]	During operation	During stoppage
○	1.05.06	Vacuum pump		y		Check intake strainer, clean if necessary	Team	5		x
△	2.05.07	Vacuum pump		y		Check operation of measuring systems and safety facilities	Team	5		x
○	1.05.08	Vacuum pump		y		Clean silencer	Team	5		x
□	3.05.09	Vacuum pump	6000h		7 l	Oil change SUPER LUBE 100	Team	5		x
△	2.05.10	Vacuum pump	8000h			Clean strainer, replace if necessary	Team	5		x
□	3.05.11	Vacuum pump	16000h			General pump overhaul	Team	30		x
□	3.08.01	Block pumps	8000h	y		Check lubricant; change as required	Team	30		x
□	3.19.03	Gripper	0,5 Mio.Sp	y		Maintenance by Dürr specialists	Team	60		x
○	1.23.02	Air recirculation system - mist collector		h		Clean demister cassettes by hand (HP cleaner)	Team	5		x
○	1.23.03	Air recirculation system - mist collector		y		Clean inside of casing (HP cleaner)	Team	5		x
○	1.23.04	Air recirculation system - fan		y		Clean impeller	Team	5		x
○	1.23.05	Air recirculation system - motor		y		Check bolted connections	Team	5		x

TPM Maintenance Schedule

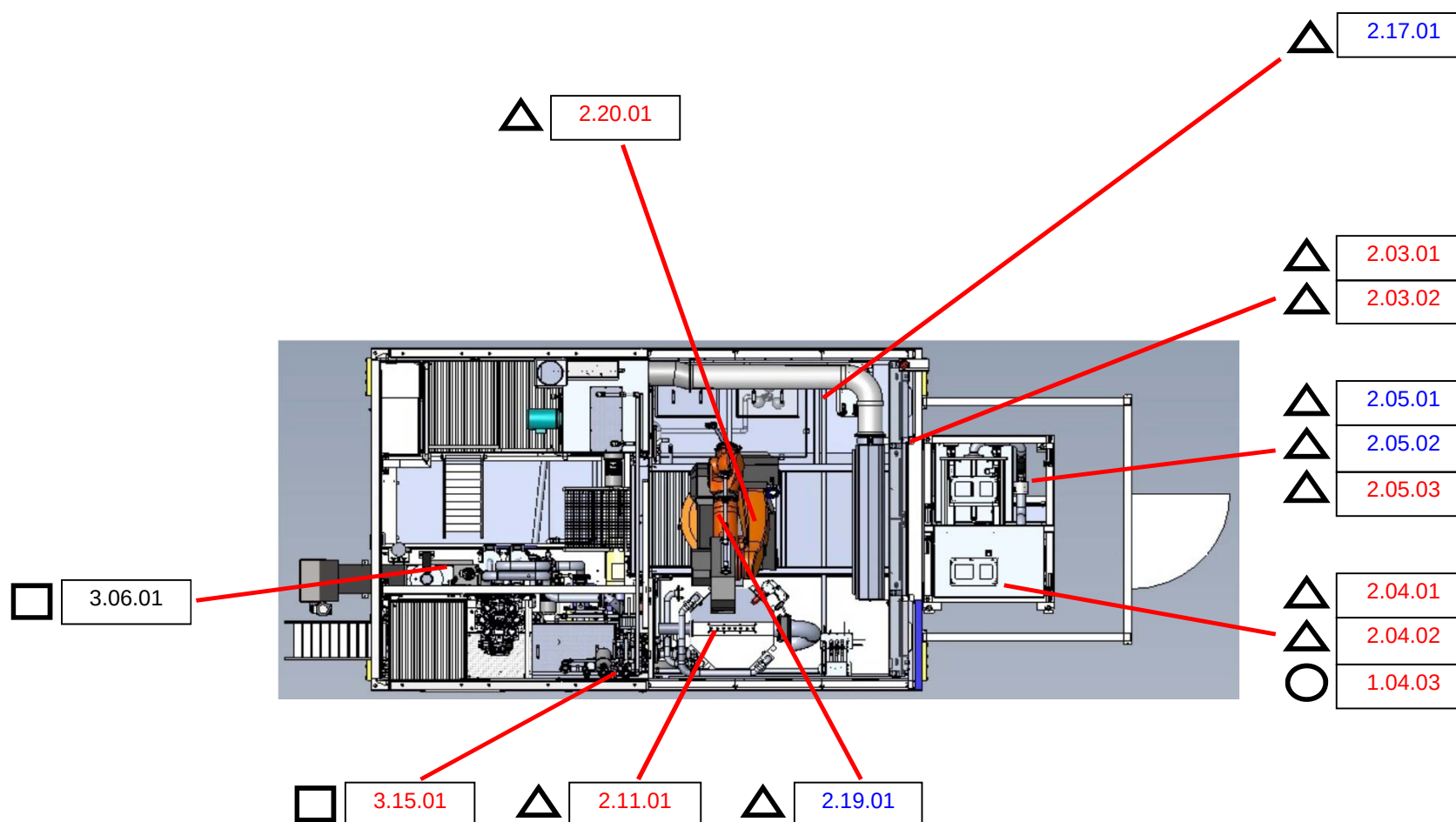
Layout for per-shift / daily / weekly activities

EcoCFlex

MK.135736.1510,

Inv.No.:

M1H1-100-1



TPM Maintenance Schedule

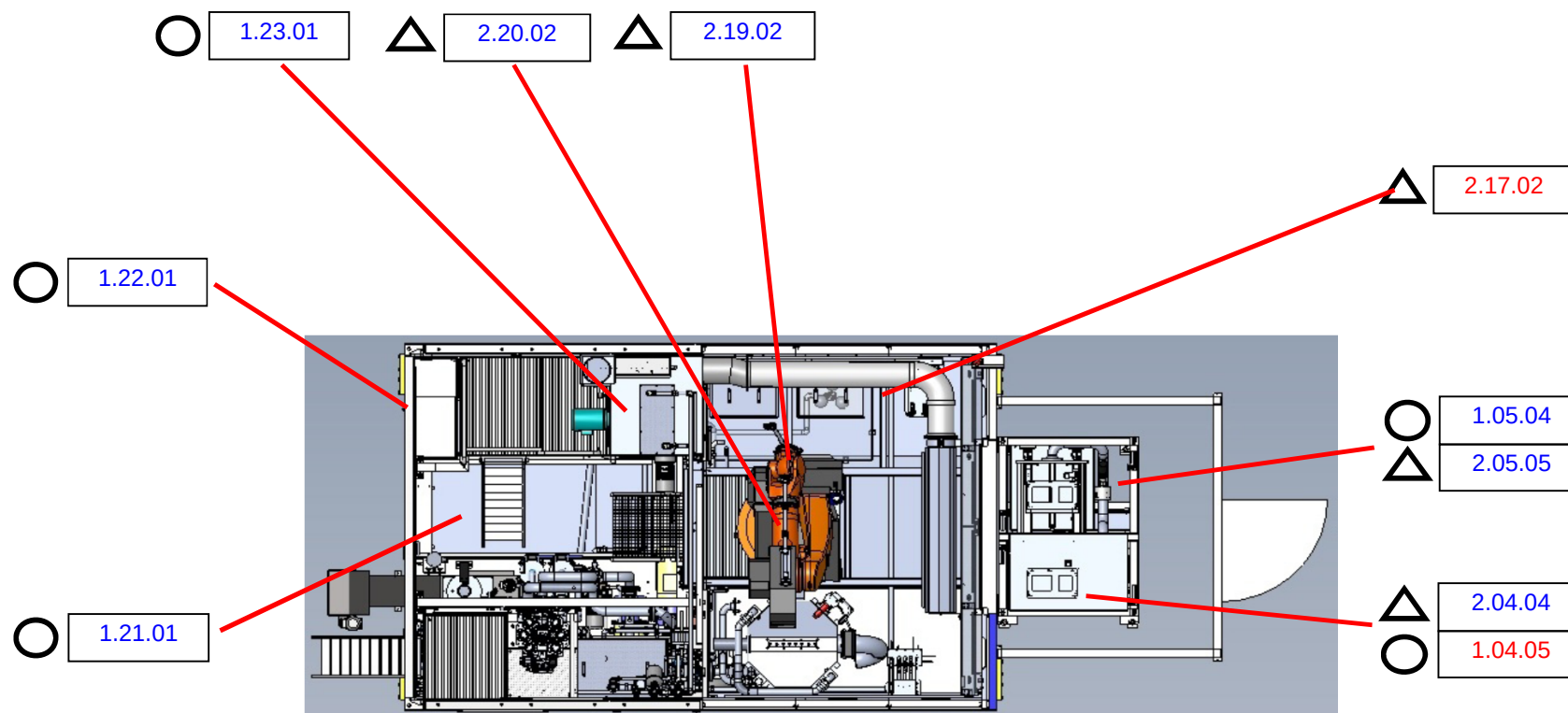
Layout for monthly / quarterly activities

EcoCFlex

MK.135736.1510,

Inv.No.:

M1H1-100-1



TPM Maintenance Schedule

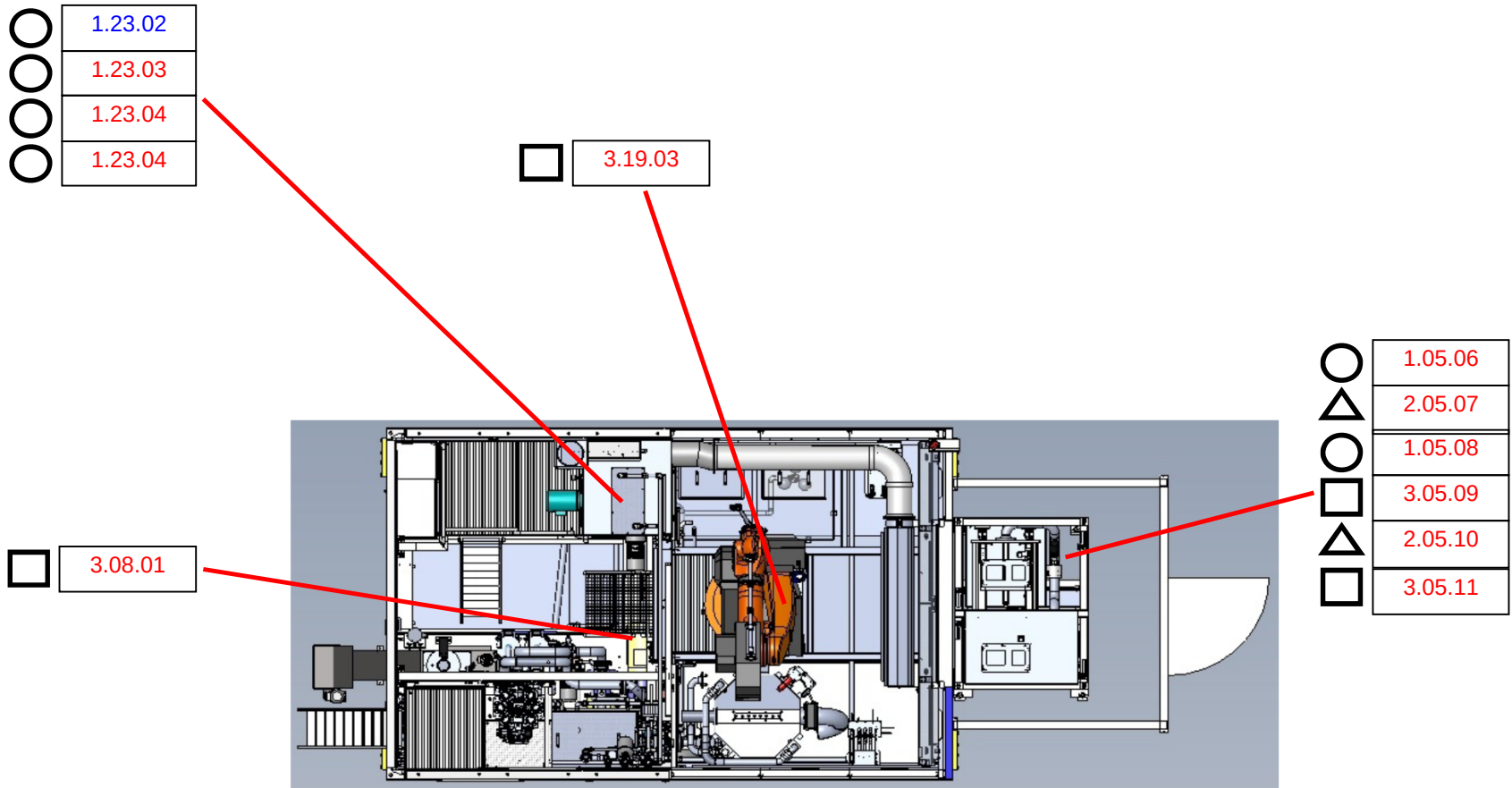
EcoCFlex

Inv.No.:

M1H1-100-1

Layout for half-yearly / yearly activities

MK.135736.1510,



LIST OF SPARE AND WEARING PARTS

7. List of spare and wearing parts

Company address:	DÜRR Ecoclean GmbH Hans-Georg-Weiss-Str. 10 D - 52156 Monschau
Telefon / Phone	0049 2472 / 83-0
Telefax	0049 2472 / 83-165

Your contact for **Service** and **Spare parts** is the Dürr Ecoclean after-sales service in Monschau

	Alexander Heitmann
Telefon / Phone	0049 2472 / 83-171
Telefax	0049 2472 / 83-149
E-Mail	alexander.heitmann@ecoclean.durr.com

In order to find the spare parts you need as easily as possible please consult the relevant spare parts list showing the item numbers of the individual units and components.

Dürr job no. MK.135736.1510

Dürr serial no. 56307

You would assist us and accelerate execution of your spare parts order by specifying the following data on your spare parts order:

Main construction group (HBG)

Construction group (BG)

Item (Pos.)

Dürr part No.

Quantity

The quantities shown on the list relate to the number of units actually installed in the equipment or the number of parts actually installed in the unit.

The items marked with the letter "V" in the list are wear parts and those marked "E" are spare parts.

If you observe the above notes you facilitate processing of your order and enable us to make delivery as soon as by all means possible.

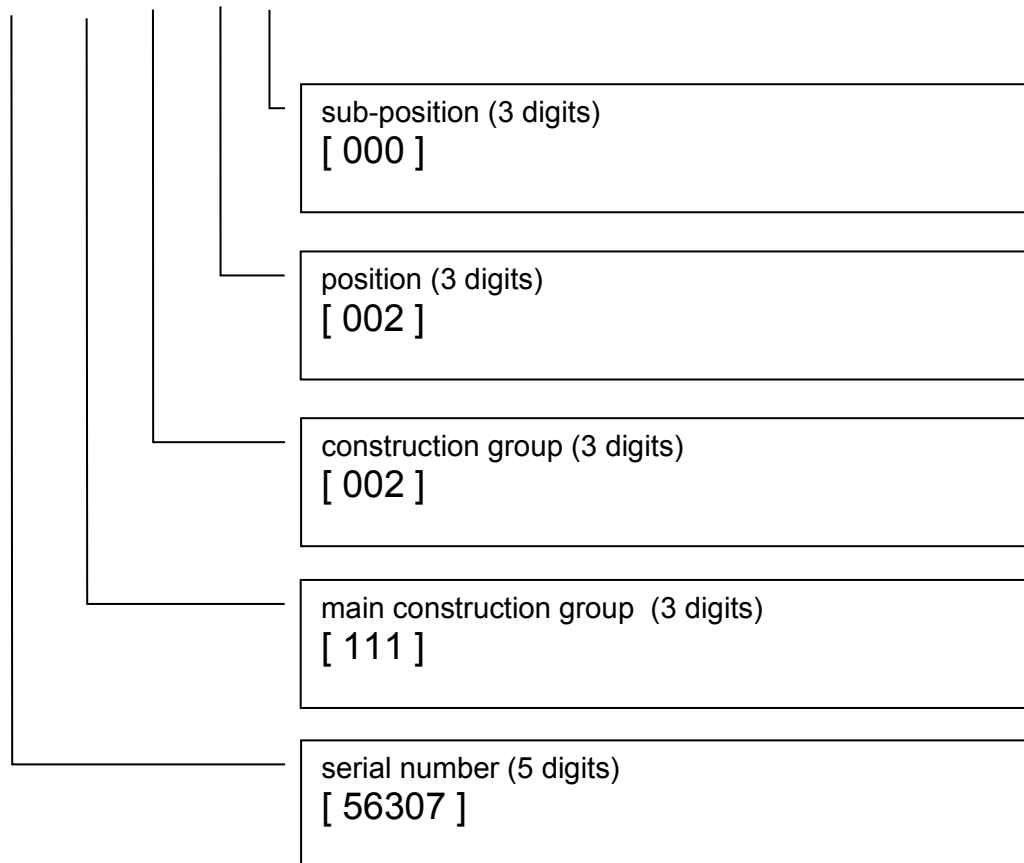
The delivery of spare parts ordered according to the spare parts list will be made on the basis of our general terms and conditions.

LIST OF SPARE AND WEARING PARTS

7.1 Explanation on how a Wear and Spare Parts List is structured

Key for „Order No.“

xxxxx-xxx-xxx-xxx-xxx [example: 56307-111-002-002-000]



Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
1			1	ST	56307-111	CLASSIC BMW HOUSING									
2			5	ST	56307-111-001-002	LIQUID LEVEL SENSOR - LMT100	TYPE = LMT100 CONNECTION = G 1/2" VOLTAGE [V] = 18-30 DC	from stock	E	267,00 €	7128695	IFM ELECTRONIC (EFFECTOR	LMT100		
3			1	ST	56307-111-001-005	LEVEL SWITCH - L=273MM	TYPE = LI2142 CONNECTION = M12X1 LENGTH = 273.00 mm DIAMETER = 16.000 mm VOLTAGE [V] = 10-36	from stock	E	227,00 €	7129352	IFM ELECTRONIC (EFFECTOR	LI2142		
4			4	M	56307-111-002-003	MOUNTING RAIL - MQ-21-RA2	TYPE = MQ-21-RA2 WIDTH = 41.3000 mm LENGTH = 3.000.00 mm	21	E	48,00 €	7084356	HILTI	303990		
5			11	ST	56307-111-004-024	SEALING RING - A16X20X2	TYPE = FORM A APPLICATION = HYDRAULIC THICKNESS = 2.000 mm STANDARD = 7603	from stock	V	1,00 €	5M3560016				
6			7	ST	56307-111-004-025	SEALING RING - A14X18X1.5	TYPE = FORM A APPLICATION = HYDRAULIC THICKNESS = 1.500 mm STANDARD = 7603	from stock	V	1,00 €	5M3560014				
7			8	M	56307-111-010-001	SEALING CORD - ROUND 22	TYPE = PROTEC 05535 TYPE = CELLULAR RUBBER APPLICATION= E.G. TOP SECTION DOOR THICKNESS = 22.000 mm	from stock	V	18,00 €	5H2515011		2103-SCHWARZ		
8			2	ST	56307-111-010-021	ROD END - KI16-D	TYPE = KI16-D TYPE = MAINTENANCE-FREE CONNECTION = FEMALE RIGHT-HANDED THREAD	from stock	V	35,00 €	7062388	ASKUBAL			
9			1	ST	56307-111-010-216	LOCKING LEVER, RIGHT		on request	E	156,00 €	3M50841210	Dürr Ecoclean GmbH			
10			1	ST	56307-111-010-217	LOCKING LEVER, RIGHT		on request	E	117,00 €	3M50827610	Dürr Ecoclean GmbH			
11			1	ST	56307-111-014-001	SGG GLASS PANE - 650 X 650 X 18 MM	LENGTH= 650.00 mm WIDTH = 650.0000 mm THICKNESS = 18.000 mm	28	E	201,00 €	7128399				
12			3	M	56307-111-014-002	SEALING CORD - RD 6	THICKNESS= 6.000 mm	from stock	V	18,00 €	5H2512015				
13			8	ST	56307-111-021-006	WELDING BOLT - M 8 X 12		21	E	2,00 €	7105134	KORSING			
14			6	M	56307-111-021-014	SHAPED GASKET - TYPE 1011-15	TYPE = 1011-15 TYPE = SELF-LOCKING APPLICATION = CLAMPING RANGE 1.0-3.5 MM	from stock	V	7,00 €	5H2525006	EMKA	1011-15		
15			4	ST	56307-111-021-215	BUSHING		on request	E	134,00 €	X000606300	Dürr Ecoclean GmbH			
16			2	ST	56307-111-030-002	BUSHING - 18/20/26X22	TYPE = WITH BRONZE BACKING TYPE = EGF18220-E40-B LENGTH = 22.00 mm	from stock	V	6,00 €	5M1046048	INA	EGF18220-E40-B		
17			2	M	56307-111-030-003	PROFIED CORD - 5 X 2.0	TYPE = MS 344 TYPE = AUTO-ADHESIVE THICKNESS = 2.000 mm WIDTH = 5.0000 mm	from stock	V	3,00 €	5H2528001				
18			2	M	56307-111-030-004	PROFIED CORD - 5 X 2.0	TYPE = MS 344 TYPE = AUTO-ADHESIVE THICKNESS = 2.000 mm WIDTH = 5.0000 mm	from stock	V	3,00 €	5H2528001				
19			2	ST	56307-111-030-007	ONE-WAY FLOW CONTROL VALVE - GRLA-3/8-B	TYPE = GRLA-3/8-B CONNECTING THREAD = G 3/8	from stock	E	32,00 €	5M3050236	FESTO	151178		
20			1	ST	56307-111-030-010	STOP BUFFER - D 40X30/M 8	TYPE = D40X30/M8 DIAMETER = 40.000 mm	from stock	V	6,00 €	5M1415002	RRG	40/30/4		
21			1	ST	56307-111-030-032	EDGE-RAISED SEALING RING - NW 250	TYPE = FOR 2MM WALL THICKNESS NOMINAL SIZE DN = 250	from stock	V	6,00 €	5L8501016	JACOB & SÖHNE	10257952		
22			1	ST	56307-111-030-037	ROD END - TYPE CRSGS-M16X1.5	TYPE = CRSGS-M16X1.5 TYPE = MAINTENANCE-FREE CONNECTION = FEMALE RIGHT-HANDED THREAD	14	V	101,00 €	7011802	FESTO	195584		

Spare and Wear Parts List

Customer:

Jaguar Cars Ltd.

Job ref. No.:

MK.135736.1510

DÜRR machine No.:

56307

Inventory No.M1H1-100-1

Rev. Date: 08.11.2013

Contact: Alexander Heitmann

Phone: +49(2472) 83-171

Fax: +49(2472) 83-149

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
23			1	ST	56307-111-030-038	STANDARD CYLINDER MALE THREAD - D= 63 STROKE=	TYPE = DNC-63-50-PPV-A TYPE = LINEAR DOUBLE-ACTING STANDARD = NF E 49.003.1 DIAMETER = 63.000 mm	21	E	130,00 €	7083291	FESTO	163403		
24			1	ST	56307-111-030-039	SWIVEL FLANGE - SNCS-63	TYPE = SNCS-63 DIAMETER = 63.000 mm	21	E	50,00 €	7062322	FESTO	174400		
25			1	ST	56307-111-030-212	SHAFT		on request	V	513,00 €	X004404200	Dürr Ecoclean GmbH			
26			2	ST	56307-111-043-001	LAMP - 36W, 11024V	VOLTAGE [V] = 24	35	E	335,00 €	7104850	WALDMANN	111450011		
27			2	M	56307-111-044-003	PROFIED CORD - 5 X 2.0	TYPE = MS 344 TYPE = AUTO-ADHESIVE THICKNESS = 2.000 mm WIDTH = 5.0000 mm	from stock	V	3,00 €	5H2528001				
28			1	ST	56307-111-046-009	PRESSURE SPRING - 2.5X25X 49	TYPE = D-269 MEAN WINDING DIAM. = 25.00 mm UNLOADED LENGTH = 49.00 mm STANDARD = 17224	from stock	V	7,00 €	5M1513001	GUTEKUNST			
29			2	ST	56307-111-049-006	HANDLE - L=170 B=28		from stock	E	5,00 €	5S1207100	EMKA	1095-19		
30			1	ST	56307-121	Dismounting fixture									
31			1	ST	56307-131	BMW MAKE-UP WATER INPUT									
32			1	ST	56307-131-002-001	BALL VALVE - DN 25	CONNECTION = SOCKET BALL VALVE TYPE = M300F NOM. SIZE DN = 25 CONNECTING THREAD = 1" NOM. PRESSURE PN = 30,0	from stock	V	16,00 €	5R0113206				
33			1	ST	56307-131-002-003	INCLINED HEAD VALVE- G1", 0-10 BAR	TYPE = 554 CONNECTION = SLEEVE NOM. SIZE DN = 25 CONNECTING THREAD = 1"	from stock	E	166,00 €	5R0217206	GEMÜ	554-25-D-1-9-5-1-1		
34			1	ST	56307-131-002-008	DIRT TRAP - 1"	CONNECTION = 1" NOM. PRESSURE PN = 16.0 STRAINER BASKET MATERIAL= 1.4401	21	E	189,00 €	7015475	AEROMATIC	8.610.025		
35			1	ST	56307-131-002-009	WATER METER - MTKI-N QN 6 - PTFE BL 1"	TYPE = MTKI-N QN 6 - PTFE CONNECTION = R1"-G1 14" LENGTH = 260.00 mm	35	E	451,00 €	7012507	ZENNER			
36			1	ST	56307-151	SLIDING DOOR									
37			2	ST	56307-151-001-001	PNEUMATIC CYLINDER - D= 50 STROKE= 805	TYPE = CRDNG-50-805-PPV-A-S6 DIAMETER = 50.000 mm	7	E	457,00 €	7106552	FESTO	185295		
38			2	ST	56307-151-001-002	ROD CLEVIS - M16X1,5	TYPE = CRSG-M16X1.5	14	V	112,00 €	7012173	FESTO	13571		
39			4	ST	56307-151-001-003	ONE-WAY FLOW CONTROL VALVE - 151172 GRLA-1/8-B	TYPE = GRLA-1/4-B CONNECTING THREAD = G 1/4	from stock	E	37,00 €	5M3050232	FESTO	151172		
40			28	M	56307-151-001-005	PNEUMATIC HOSE - 1025T0800	TYPE = STANDARD O.D.	from stock	E	22,00 €	5M3105201	LEGRIS	1025T0800		
41			2	ST	56307-151-001-009	COTTER PIN - 4,0 X 63	DIAMETER= 4.000 mm LENGTH = 63.00 mm STANDARD = DIN EN ISO 1234	21	E	1,00 €	7105531				
42			2	ST	56307-151-001-210	BOLT		on request	E	90,00 €	X013171901	Dürr Ecoclean GmbH			
43			2	ST	56307-151-001-211	HOLDER		on request	E	399,00 €	X013026902	Dürr Ecoclean GmbH			
44			2	ST	56307-151-001-212	ADAPTER		on request	E	360,00 €	X013022703	Dürr Ecoclean GmbH			
45			2	ST	56307-151-002-002	PROXIMITY SWITCH - M18 / L=95 - 5MM	TYPE = IGMF 05 GSP/10 TYPE = 1NO PNP VOLTAGE [V] = 10-30	from stock	E	263,00 €	5M6261007	EGE-ELEKTRONIK	P 30701/10METER		
46			2	ST	56307-151-002-210	STRIP		on request	V	600,00 €	X058030600	Dürr Ecoclean GmbH			
47			2	ST	56307-151-002-211	HOLDER		on request	E	600,00 €	X058032000	Dürr Ecoclean GmbH			

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
48			1	ST	56307-151-002-212	HOLDER		on request	E	750,00 €	X058032200	Dürr Ecoclean GmbH			
49			4	ST	56307-151-003-001	DEEP GROOVE BALL BEARING - 25/52X15	TYPE = S6205.2RSR.W203B STANDARD = 625 WIDTH = 15.0000 mm	from stock	V	113,00 €	5M1001725	FAG			
50			4	ST	56307-151-003-002	RETAINING RING -52X2	TYPE = SERIES 7100 DIAMETER D1 = 52.0 mm THICKNESS = 2.000 mm STANDARD = DIN 472	14	E	5,00 €	7015772				
51			4	ST	56307-151-003-210	ROLLER		on request	V	519,00 €	X015812601	Dürr Ecoclean GmbH			
52			8	ST	56307-151-003-211	SPACER		on request	E	180,00 €	X015813101	Dürr Ecoclean GmbH			
53			4	ST	56307-151-003-212	BOLT		on request	E	195,00 €	X015812902	Dürr Ecoclean GmbH			
54			2	ST	56307-151-003-213	HOLDER		on request	E	750,00 €	X015862203	Dürr Ecoclean GmbH			
55			2	ST	56307-151-003-214	HOLDER		on request	E	660,00 €	X057515200	Dürr Ecoclean GmbH			
56			2	ST	56307-151-005-020	ACTUATOR – 55X30X12 MM	TYPE = CES-A-BLN-U2-103450 TYPE = USABLE FOR DOORS HINGED ON LEFT OR RIGHT	from stock	V	39,00 €	7103892	EUCHNER	103450		
57			1	ST	56307-151-005-021	NON-CONTACT SAFETY SWITCH - 95X30X12	TYPE = CES-AR-CL2-AH-SG-105753 TYPE = UNICODE, DOOR HINGED ON LEFT VOLTAGE [V] = 24	from stock	E	284,00 €	7107391	EUCHNER	105753		
58			1	ST	56307-151-005-022	NON-CONTACT SAFETY SWITCH - 95X30X12	TYPE = CES-AR-CR2-AH-SG-105751 TYPE = UNICODE, DOOR HINGED ON RIGHT VOLTAGE [V] = 24	from stock	E	294,00 €	7126974	EUCHNER	105751		
59			2	ST	56307-151-005-023	CONNECTING CABLE - M8, 8-POLE, PU, 20M	TYPE = C-M08F08-08X014PU20.0-ES TYPE = M8; 8-POLE	from stock	E	164,00 €	7107392	EUCHNER	106673		
60			2	ST	56307-151-005-214	STRIP		on request	V	390,00 €	X015637901	Dürr Ecoclean GmbH			
61			1	ST	56307-162	IFW WITH 600L FLOODING VALVE+PINPOINTED NOZZLE									
62			1	ST	56307-162-001-001	LIQUID LEVEL SENSOR - LMT100	TYPE = LMT100 CONNECTION = G 1/2" VOLTAGE [V] = 18-30 DC	from stock	E	267,00 €	7128695	IFM ELECTRONIC (EFECTOR)	LMT100		
63			1	ST	56307-162-001-005	SHUTOFF VALVE WITH ACTUATOR – DN150 PN10/1	TYPE = RS CONNECTION = FLANGE MOUNT NOM. SIZE DN= 150 NOM. PRESSURE PN = 10.0 - 16.0	from stock	V	766,00 €	7083273	CRANE PROCESS	APGD5C161F0A000		
64			28	ST	56307-162-001-007	FLAT JET NOZZLE D=7,0/R	TYPE = JCA 2390 B1 CONNECTION = R 3/8" SPRAY ANGLE = 0 deg, HOLE DIAMETER = 7,00 mm	from stock	V	11,00 €	5R2202060	PNR			
65			1	ST	56307-162-001-012	SOCKET - EVC002	TYPE = EVC002 TYPE = STRAIGHT LENGTH = 5,000.00 mm	from stock	E	15,00 €	7130066	IFM ELECTRONIC (EFECTOR)	EVC002		
66			2	ST	56307-162-001-026	ONE-WAY FLOW CONTROL VALVE - 151172 GRLA-1/8-B	TYPE = GRLA-1/4-B CONNECTING THREAD = G 1/4	from stock	E	37,00 €	5M3050232	FESTO	151172		
67			1	ST	56307-162-001-210	DEVICE		on request	E	650,00 €	X002955500	Dürr Ecoclean GmbH			

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**
DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
68			2	ST	56307-162-001-211	DEVICE		on request	E	auf Anfrage	X072854700	Dürr Ecoclean GmbH			
69			1	ST	56307-162-001-212	DEVICE		on request	E	1.375,00 €	X059927401	Dürr Ecoclean GmbH			
70			2	ST	56307-162-003-001	FLAT GASKET - DN 65	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 65 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	3,00 €	5R0901510				
71			1	ST	56307-162-004-008	FLAT GASKET - DN 65	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 65 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	3,00 €	5R0901510				
72			1	ST	56307-162-004-015	FLAT GASKET - DN 50	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 50 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	1,26 €	5R0901509				
73			1	ST	56307-181	Cooling zone									
74			1	ST	56307-181-001-001	FAN - MSN 70-31,5/200-2	TYPE = RADIAL TYPE = MSN 70-31.5/200-2 VOLUME FLOW = 6600.00 m3/h MOTOR RATING [kW] = 5.5 VOLTAGE [Hz] = 50 [V] = 400/690 FREQUENCY [Hz] = 50 TERMINAL BOX POSITION = STANDARD	35	E	3.939,00 €	7137616	BVA-KOCKELMANN			
75			1	ST	56307-181-001-002	CHILLER - WK30/VA	TYPE = WK30/VA VOLUME FLOW = 6000.00 VOLTAGE [V] = 400 FREQUENCY [Hz] = 50	49	E	#####	7064408	H&H GERÄTEBAU	1-102-0468		
76			1	ST	56307-181-001-003	ADAPTER - E40096 M18 - G1/2"	TYPE = E40096 CONNECTION = M18/G1/2"	from stock	E	36,00 €	5R1470125	IFM ELECTRONIC (EFECTOR	E40096		
77			1	ST	56307-181-001-004	PROTECTIVE SLEEVE - G1/2", D=18, L=182	TYPE = FOR TEMPERATURE SENSOR TS/TT CONNECTION = 1/2"	from stock	E	52,00 €	5R1451029	IFM ELECTRONIC (EFECTOR	E35020		
78			1	ST	56307-181-001-005	ADAPTER - E 30018	TYPE = FOR TEMPERATURE SENSOR TYPE = E 30018 CONNECTION = G 1/2	from stock	E	23,00 €	5R1470115	IFM ELECTRONIC (EFECTOR	E30018		
79			1	ST	56307-181-001-006	INCLINED HEAD VALVE - G1/2", 0-12 BAR	TYPE = 554 CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2"	from stock	E	130,00 €	5R0217004	GEMÜ	554-15-D-1-9-5-1-0		
80			2	ST	56307-181-001-007	BALL VALVE - DN 25	CONNECTION = SOCKET BALL VALVE TYPE = M300F NOM. SIZE DN = 25 CONNECTING THREAD = 1" NOM. PRESSURE PN = 30,0	from stock	V	16,00 €	5R0113206				
81			1	ST	56307-181-001-011	TEMPERATURE SENSOR - TN7531	TYPE = TN 2531 CONNECTION = M18X1,5	from stock	E	365,00 €	7101599	IFM ELECTRONIC (EFECTOR	TN2531		
82			1	ST	56307-181-001-012	TEMPERATURE SENSOR - TS 5051	TYPE = CABLE LENGTH 5000 MM TYPE = TS 5051 CONNECTION = M12X1	from stock	E	83,00 €	5R1462003	IFM ELECTRONIC (EFECTOR	TS5051		
83			1	ST	56307-181-001-013	EVALUATOR - TR 2432	TYPE = FOR SENSOR TS/TT TYPE = TR 2432 CONNECTION = M12X1	from stock	E	487,00 €	5R1470011	IFM ELECTRONIC (EFECTOR	TR2432		
84			25	M	56307-181-001-018	PROFIED CORD - 5 X 2.0	TYPE = MS 344 TYPE = AUTO-ADHESIVE THICKNESS = 2.000 mm WIDTH = 5.0000 mm	from stock	V	3,00 €	5H2528001				
85			70	ST	56307-181-012-001	BLOW NOZZLE - D=30, L=200 5L150600		from stock	E	16,00 €	5L1506003	DÜRR ECOCLEAN GMBH (FRANCE)	09980		
86			8	ST	56307-181-012-002	BLOW NOZZLE - D=30, L=80		from stock	E	auf Anfrage	5L1506001	DÜRR ECOCLEAN GMBH (FRANCE)	03827		

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
87			156	ST	56307-181-012-003	CLAMP - D=30	APPLICATION= FOR BLOW NOZZLE	from stock	E	4,00 €	5L1506011	DÜRR ECOCLEAN GMBH (FRANCE)	03828		
88			4	M	56307-181-201-001	SEALING CORD - ROUND 22	TYPE = PROTEC 05535 TYPE = CELLULAR RUBBER APPLICATION= E.G. TOP SECTION DOOR THICKNESS = 22.000 mm	from stock	V	18,00 €	5H2515011		2103-SCHWARZ		
89			4	M	56307-181-202-001	SEALING CORD - ROUND 22	TYPE = PROTEC 05535 TYPE = CELLULAR RUBBER APPLICATION= E.G. TOP SECTION DOOR THICKNESS = 22.000 mm	from stock	V	18,00 €	5H2515011		2103-SCHWARZ		
90			1	M	56307-181-203-001	SHAPED GASKET - TYPE 1011-15	TYPE = 1011-15 TYPE = SELF-LOCKING APPLICATION = CLAMPING RANGE 1.0-3.5 MM	from stock	V	7,00 €	5H2525006	EMKA	1011-15		
91			1	M	56307-181-204-001	SHAPED GASKET - TYPE 1011-15	TYPE = 1011-15 TYPE = SELF-LOCKING APPLICATION = CLAMPING RANGE 1.0-3.5 MM	from stock	V	7,00 €	5H2525006	EMKA	1011-15		
92			2	ST	56307-181-911-001	PROXIMITY SWITCH - M18X1 - 8MM	TYPE = BES 516-326-G-S4-C TYPE = PNP NORMALLY OPEN, VOLTAGE [V] = 10-30	from stock	E	52,00 €	5M6261006	BALLUFF			
93			1	ST	56307-182	VACUUM CHAMBER									
94			1	ST	56307-182-001-001	VACUUM PUMP - D 250	TYPE = TYPE= D 250 MOTOR RATING [kW] = 5.5/6.4 VOLTAGE [V] = 340-430 - 50HZ FREQUENCY [Hz] = 50/60	from stock	E	5.059,00 €	7136991	BECKER	G013470		
95			1	ST	56307-182-001-001-076	AIR EXHAUST	APPLICATION= FOR VACUUM PUMP D250 TYPE = ST628-0-1.3 TYPE = POS.76	from stock	V	76,00 €	5R5511860	BECKER	72750599628		
96			1	ST	56307-182-001-001-077	SEALING	APPLICATION= FOR VACUUM PUMP D250 TYPE = U4.190-0-164 TYPE = POS.77	from stock	V	41,00 €	5R5511856	BECKER	50300026400		
97			1	ST	56307-182-001-001-079	SEALING	APPLICATION= FOR VACUUM PUMP D250 TYPE = U4.190-169 TYPE = POS.79	from stock	V	21,00 €	5R5511853	BECKER	00300026400		
98			2	ST	56307-182-001-001-083	AIR DE-OILER	APPLICATION= FOR VACUUM PUMP D250 TYPE = U4.250-33.1MH TYPE = POS.83	from stock	V	383,00 €	7126250	BECKER	96541700000		
99			1	ST	56307-182-001-001-101	COARSE SEPARATOR	APPLICATION= FOR VACUUM PUMP D250 TYPE = U4.190-0-160 TYPE = POS.101	from stock	V	118,00 €	7126252	BECKER	50600126400		
100			1	ST	56307-182-001-001-104	SIEVE	APPLICATION= FOR VACUUM PUMP D250 TYPE = U.4.190-123 TYPE = POS.104	from stock	V	73,00 €	7126263	BECKER	00800426400		
101			2	ST	56307-182-001-001-118	O-RING F. OIL GAUGE	APPLICATION= FOR VACUUM PUMP D250 TYPE = FOR OIL GAUGE TYPE = POS.118	from stock	V	2,00 €	5R5511858	BECKER	91310500100		
102			2	ST	56307-182-001-001-119	OIL GAUGE	APPLICATION= FOR VACUUM PUMP D250 TYPE = 240AS R3/4" MD TYPE = POS.119	from stock	V	32,00 €	5R5511857	BECKER	90730900000		
103			1	ST	56307-182-001-001-282	OIL LEVEL SENSOR	APPLICATION= FOR VACUUM PUMP D250 TYPE = POS.282	from stock	V	187,00 €	5R5511863	BECKER	74110399682		
104			1	ST	56307-182-001-001-405	AIR FILTER CARTRIDGE FOR INTAKE FILTER	APPLICATION= FOR VACUUM PUMP D250 TYPE = POLY / 851	from stock	V	220,00 €	7107268	BECKER	90956700000		
105			1	ST	56307-182-001-001-443	FILTER CARTRIDGE	APPLICATION= FOR VACUUM PUMP D250 TYPE = POLY / 825	from stock	V	91,00 €	7131364	BECKER	90956500000		
106			1	ST	56307-182-001-001-701	SILENCER	APPLICATION= FOR VACUUM PUMP D250 TYPE = FOR GAS BALLAST VALVE	21	V	49,00 €	5R5511861	BECKER	93970060000		
107			1	ST	56307-182-001-001-702	MAINTENANCE INDICATOR	APPLICATION= FOR VACUUM PUMP D250 TYPE = ST691-0-1	from stock	V	51,00 €	5R5511862	BECKER	91680099691		

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
108			2	ST	56307-182-001-001-703	SYNTHETIC OIL - LUBE 100	APPLICATION= FOR VACUUM PUMP D250 TYPE = LUBE S100	from stock	E	257,00 €	5R5511859	BECKER	96001600200		
109			1	ST	56307-182-001-003	EVALUATOR - TR7432 - 40/+300 °C	TYPE = FOR SENSOR TS/TT TYPE = TR 7432 CONNECTION = G 1/2"A VOLTAGE [V] = 18-32	from stock	E	195,00 €	7101600	IFM ELECTRONIC (EFFECTOR	TR7432		
110			12	ST	56307-182-002-005	TRACK ROLLER - 305703C- 2Z	TYPE = 305703C-2Z WIDTH = 17.5000 mm	21	V	74,00 €	7078292	SKF			
111			12	ST	56307-182-002-217	SPACER		on request	E	120,00 €	X018824800	Dürr Ecoclean GmbH			
112			2	ST	56307-182-003-010	DIABOLO ROLLER		from stock	V	162,00 €	4N00720510	Dürr Ecoclean GmbH			
113			2	ST	56307-182-003-011	CYLINDRICAL ROLLER		from stock	V	124,00 €	4N00720410	Dürr Ecoclean GmbH			
114			1	ST	56307-182-003-014	PNEUMATIC CYLINDER - D= 50 STROKE= 500	TYPE = DNC-50-500-PPV-A DIAMETER = 50.000 mm	35	E	142,00 €	7063539	FESTO	163380		
115			2	ST	56307-182-003-016	PROXIMITY SWITCH - M18X1 - 8MM	TYPE = BES 516-326-G-S4-C TYPE = PNP NORMALLY OPEN, VOLTAGE [V] = 10-30	from stock	E	52,00 €	5M6261006	BALLUFF			
116			1	ST	56307-182-003-019	O-RING 800 X 12.0	TYPE = SHOCK-VULCANIZED THICKNESS = 12.000 mm STANDARD = 3771	21	V	350,00 €	7141146				
117			4	ST	56307-182-003-020	SPACER		from stock	V	30,00 €	4N0071401B	Dürr Ecoclean GmbH			
118			1	ST	56307-182-003-021	SWIVEL FLANGE - SNCS-50	TYPE = SNCS-50 DIAMETER = 50.000 mm	10	E	43,00 €	7087430	FESTO	174399		
119			4	ST	56307-182-003-023	SPACER		from stock	V	30,00 €	4N0071541B	Dürr Ecoclean GmbH			
120			1	ST	56307-182-003-212	RAIL - GUIDE		on request	E	auf Anfrage	X074402100	Dürr Ecoclean GmbH			
121			1	ST	56307-182-003-213	RAIL - GUIDE		on request	E	auf Anfrage	X074402800	Dürr Ecoclean GmbH			
122			1	ST	56307-182-003-221	HOLDER		on request	E	540,00 €	X017966701	Dürr Ecoclean GmbH			
123			4	ST	56307-182-003-228	SPACER		on request	E	150,00 €	X018143700	Dürr Ecoclean GmbH			
124			2	ST	56307-182-004-013	SILENCER - U-1	TYPE = U-1 CONNECTING THREAD = G 1"	from stock	V	81,00 €	5M3295045	FESTO	2312		
125			1	ST	56307-182-004-016	INCLINED HEAD VALVE- G1", 0-10 BAR	TYPE = 554 CONNECTION = SLEEVE NOM. SIZE DN = 25 CONNECTING THREAD = 1"	from stock	E	182,00 €	7065540	GEMÜ	554-25-D-1-9-5-2-1- 2061		
126			1	ST	56307-182-004-019	FLEXIBLE EXPANSION JOINT - DN 50, PN 6	TYPE = KDO NOM. SIZE DN = 50 NOM. PRESSURE PN = 6,0	from stock	V	430,00 €	5R1802009	SKODOCK			
127			1	ST	56307-182-004-021	SHUTOFF VALVE WITH ACTUATOR - DN80	TYPE = RS CONNECTION = RING HOUSING NOM. SIZE DN = 80 NOM. PRESSURE PN = 10,0	from stock	E	281,00 €	5R0228210	Dürr Ecoclean GmbH OEM			
128			1	ST	56307-182-004-021-010	SHUTOFF VALVE WITHOUT ACTUATOR - DN80 PN10	TYPE = RS CONNECTION = FLANGE NOM. SIZE DN= 80 NOM. PRESSURE PN = 10,0	21	E	226,00 €	7102893	CRANE PROCESS	ALGD2C100F		
129			1	ST	56307-182-004-023	INCLINED HEAD VALVE- G2", 0-3 BAR	TYPE = 554 CONNECTION = SLEEVE NOM. SIZE DN = 50 CONNECTING THREAD = 2"	from stock	E	224,00 €	7065192	GEMÜ	554-50-D-1-9-5-2-1- 2061		
130			1	ST	56307-182-004-024	SILENCER - TYPE 570-6, G2"	TYPE = 570-6, G2" CONNECTING THREAD = G 2"	from stock	V	208,00 €	5M3295109	RIEGLER	570-6		

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
131			1	ST	56307-182-004-024-010	FELT WASHERS - TYPE 570/5 AND 570/6	TYPE = FOR SILENCER 570/5 U 570/6	21	E	24,00 €	7145136	RIEGLER	576		
132			1	ST	56307-182-004-025	PRESSURE SWITCH -1000-1000 MBAR (PSI/KPA)	TYPE = PN 7009 APPLICATION = VACUUM CONNECTION = G1/4" MEASURING RANGE [bar] = -1 - +1 VOLTAGE [V] = 18-36	from stock	E	298,00 €	5R1423127	IFM ELECTRONIC (EFECTOR)	PN7009		
133			2	ST	56307-182-004-031	FLAT GASKET - DN 50	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 50 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	1,26 €	5R0901509				
134			3	ST	56307-182-004-032	FLAT GASKET - DN 80	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 80 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	E	3,00 €	5R0901511				
135			1	ST	56307-182-004-033	CAM - D=53MM	TYPE = TRIGGER CAM	from stock	V	21,00 €	5M6260050	IFM ELECTRONIC (EFECTOR)	E17320		
136			1	ST	56307-182-004-034	PROXIMITY SWITCH - 40X26X26 - 4MM	TYPE = 2NO PNP VOLTAGE [V] = 10-36	from stock	E	107,00 €	5M6260001	IFM ELECTRONIC (EFECTOR)	IN5225		
137			4	ST	56307-182-005-001	TRACK ROLLER - 305703C-2Z	TYPE = 305703C-2Z WIDTH = 17.5000 mm	21	V	74,00 €	7078292	SKF			
138			4	ST	56307-182-005-216	SPACER		on request	E	120,00 €	X018824800	Dürr Ecoclean GmbH			
139			8	ST	56307-182-006-211	HOLDER -		on request	E	auf Anfrage	X074705500	Dürr Ecoclean GmbH			
140			3	ST	56307-182-007-001	LIGHT BARRIER RECEIVER - M18 / L=70 - 16	TYPE = BLE 18E-PO-1P-E5-D-S4S TYPE = 1NC PNP VOLTAGE [V] = 10-30	from stock	E	156,00 €	5M6280002	BALLUFF	BLE 18E-PO-1P-E5-D-S4S		
141			3	ST	56307-182-007-008	LIGHT BARRIER TRANSMITTER - M18 / L=70 - 16000	TYPE = BLS 18E-XX-1P-E5-X-S 4 TYPE = TRANSMITTER VOLTAGE [V] = 10-30	from stock	E	142,00 €	5M6380003	BALLUFF	BLS 18E-XX-1P-E5-X-S 4		
142			3	ST	56307-182-007-009	PROXIMITY SWITCH - 40X40X62 - 20MM	TYPE = BES Q40KFU-PAC20B-SO4G TYPE = PNP-ANTIVALENT VOLTAGE [V] = 10-30	21	E	71,00 €	7057323	BALLUFF			
143			1	ST	56307-182-007-214	SHEET -		on request	E	auf Anfrage	X074757700	Dürr Ecoclean GmbH			
144			26	ST	56307-182-007-215	HOLDER		on request	E	18,00 €	X078057000	Dürr Ecoclean GmbH			
145			1	ST	56307-281	EXTERNAL CONVEYOR SYSTEM									
146			1	ST	56307-341	KUKA ROBOT - KR 210 FOUNDRY EXCLUSIVE									
147			1	ST	56307-341-001-001	ROBOT - KR 210 FOUNDRY EXCLUSIVE	TYPE = KR 210 FOUNDRY EXCLUSIVE TYPE = FOR CLEANING MACHINES	98	E	#####	7122202	KUKA			
148			15	M	56307-341-001-004	PNEUMATIC HOSE - PUN-8X1.25 RED	TYPE = EXT. CALIBRATION TYPE = PUN-8X1.25	14	E	2,00 €	7086382	FESTO	178412		
149			8	M	56307-341-002-001-001	PROTECTIVE HOSE - NW29	TYPE = PURRB TYPE = CORRUGATED CONDUIT	from stock	V	17,00 €	5R1013100	REIKU	PURRB-29G		
150			3	ST	56307-341-002-001-002	GRIPPING CLAMP - NW29	TYPE = PASSB APPLICATION= REINFORCED SUPPORT	from stock	V	21,00 €	5M9026300	REIKU	PASSB-29K		

Spare and Wear Parts List

Customer:

Jaguar Cars Ltd.

Job ref. No.:

MK.135736.1510

DÜRR machine No.:

56307

Inventory No.M1H1-100-1

Rev. Date: 08.11.2013

Contact: Alexander Heitmann

Phone: +49(2472) 83-171

Fax: +49(2472) 83-149

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
151			3	ST	56307-341-002-001-003	MIDDLE JAW- NW29	TYPE = PAMBB	from stock	V	7,00 €	5M9026500	REIKU	PAMBB-29F/G		
152			5	ST	56307-341-002-001-004	PROTECTOR - NW29	TYPE = PAPRB	from stock	V	15,00 €	5M9026100	REIKU	PAPRB-29F/G		
153			1	ST	56307-341-002-001-005	ROTARY FLANGE FOR CORRUGATED TUBE	TYPE = PADFB	from stock	V	28,00 €	5M9026400	REIKU	PADFB-52		
154			1	ST	56307-341-002-001-006	FITTING - "NW29 M40 X 1,5 FOR PROF	TYPE = MSGVM-29M40U APPLICATION = PROFILE "G"	from stock	E	242,00 €	5M9027004	REIKU	MSGVM-29M40U		
155			1	ST	56307-341-002-001-007	SEALING FOR FITTING MSGVM-29M40U	TYPE = E155/25 TYPE = BORE SIZE 25	from stock	V	4,00 €	5M9028100	REIKU	E155/25		
156			1	ST	56307-341-002-002-001	GRIPPING CLAMP - NW29	TYPE = PASSB APPLICATION= REINFORCED SUPPORT	from stock	V	21,00 €	5M9026300	REIKU	PASSB-29K		
157			1	ST	56307-341-002-002-002	MIDDLE JAW- NW29	TYPE = PAMBB	from stock	V	7,00 €	5M9026500	REIKU	PAMBB-29F/G		
158			1	ST	56307-341-002-002-201	HOLDER		from stock	E	567,00 €	X011608301	Dürr Ecoclean GmbH			
159			1	ST	56307-341-002-003-001	REINFORCED SUPPORT – NW29	TYPE = VPHOB	from stock	V	8,00 €	5M9026200	REIKU	VPHOB-29		
160			2	ST	56307-341-004-001	EYEBOLT - M10X 17	LENGTH= 17.00 mm STANDARD = DIN 580	from stock	E	2,00 €	5S0131001				
161			2	ST	56307-341-005-213	ADAPTER		on request	E	94,00 €	X006862300	Dürr Ecoclean GmbH			
162			1	ST	56307-345	GRIPPER									
163			2	ST	56307-345-001-002	ADJUSTING RING - 35MM	DIAMETER= 35.000 mm LENGTH = 20.00 mm	7	E	56,00 €	7142140	MISUMI	SSCD35		
164			1	ST	56307-345-002-001	PNEUMATIC CYLINDER - D= 80 STROKE= 50	TYPE = DNC-80-50-PPV-A-KP-SA DIAMETER = 80.000 mm	28	V	1.440,00 €	7155840	FESTO	1356808		
165			2	ST	56307-345-002-002	PLAIN BEARING BUSH - 35/39/40	TYPE = WITHOUT NECK, TYPE = FORM S, WIDTH = 40.0000 mm	21	V	8,00 €	7138666	IGUS	H370SM-3539-40		
166			2	ST	56307-345-002-003	SCRAPER RING - DA=41,8, DI=35, B=5	TYPE = WE31 00350-T46 N WIDTH = 5.0000 mm	21	V	36,00 €	7138665	BUSAK & SHAMBAN			
167			1	ST	56307-345-002-004	FITTING - "NW29 M40 X 1,5 FOR PROF	TYPE = MSGVM-29M40U APPLICATION = PROFILE "G"	from stock	E	242,00 €	5M9027004	REIKU	MSGVM-29M40U		
168			1	ST	56307-345-002-005	SEALING FOR FITTING MSGVM-29M40U	TYPE = E155/25 TYPE = BORE SIZE 25	from stock	V	4,00 €	5M9028100	REIKU	E155/25		
169			2	ST	56307-345-002-007	PROXIMITY SWITCH - M12X1 - 6MM	TYPE = PNP NORMALLY OPEN, VOLTAGE [V] = 10-30	21	E	140,00 €	7063059	IPF ELEKTRONIC	IC120126		
170			2	ST	56307-345-002-008	CLAMPING HOLDER - M16 / L=35 - D=12MM	TYPE = BES 12.0-KH-9ST TYPE = SHORT	21	E	11,00 €	7153793	BALLUFF	BES 12.0-KH-9ST		
171			1	ST	56307-345-002-012	SCRAPER RING - 25-35-7	TYPE = AS TYPE = SINGLE-ACTING APPLICATION = CYLINDER PROTECTION THICKNESS = 7.000 mm STANDARD = ISO 6195 B	14	V	30,00 €	7151151	SIMRIT	AS 25,00 35,00 7,0		
172			2	ST	56307-345-002-031	PLAIN BEARING BUSH - 35/39/47X26	TYPE = WITH NECK, TYPE = FORM F, WIDTH = 26.0000 mm	21	V	14,00 €	7080161	IGUS	H370FM-3539-26		
173			2	ST	56307-345-002-214	BOLT		on request	E	150,00 €	X074658801	Dürr Ecoclean GmbH			
174			2	ST	56307-345-002-223	SPACER RING		on request	E	105,00 €	X077517200	Dürr Ecoclean GmbH			

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total install- ed quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
175			2	ST	56307-345-003-213	BOLT		on request	E	150,00 €	X074658801	Dürr Ecoclean GmbH			
176			1	ST	56307-348	ROBOT SET-UP SPIKES									
177			2	ST	56307-348-001-001	ADAPTER		from stock	E	33,00 €	X018031204	Dürr Ecoclean GmbH			
178			2	ST	56307-348-001-002	ADAPTER		from stock	E	63,00 €	X018030604	Dürr Ecoclean GmbH			
179			1	ST	56307-348-001-003	ADAPTER		from stock	E	57,00 €	X018030204	Dürr Ecoclean GmbH			
180			5	ST	56307-348-001-004	MEASURING SPIKE		from stock	E	15,00 €	X018089002	Dürr Ecoclean GmbH			
181			6	ST	56307-348-001-006	MEASURING SPIKE		from stock	E	94,00 €	X018077902	Dürr Ecoclean GmbH			
182			1	ST	56307-348-001-214	MEASURING SPIKE		on request	E	109,00 €	X018175702	Dürr Ecoclean GmbH			
183			2	ST	56307-348-001-220	MEASURING SPIKE		on request	E	90,00 €	X048645703	Dürr Ecoclean GmbH			
184			2	ST	56307-348-001-225	MEASURING SPIKE		on request	E	94,00 €	X057294403	Dürr Ecoclean GmbH			
185			3	ST	56307-348-001-226	MEASURING SPIKE		on request	E	75,00 €	X064813402	Dürr Ecoclean GmbH			
186			1	ST	56307-421	10 BAR SPRAY SYSTEM									
187			1	M	56307-421-001-001	SEALING CORD - RD 6	THICKNESS= 6.000 mm	from stock	V	18,00 €	5H2512015				
188			11	ST	56307-421-001-005	FLAT JET NOZZLE - D=3.0/R1/4" 0=DEG	TYPE = JBA 2124 B1 CONNECTION = R 1/4" SPRAY ANGLE = 0 deg, HOLE DIAMETER = 3.00 mm	from stock	V	8,00 €	5R2202302	PNR			
189			3	ST	56307-421-001-213	MEASURING SPIKE		on request	E	94,00 €	X018175503	Dürr Ecoclean GmbH			
190			1	ST	56307-421-003-018	FLAT GASKET - DN 40	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 40 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	E	2,00 €	5R0901508				
191			1	ST	56307-432	HYBRID NOZZLE 330bar 2x29l/min, a=186mm									
192			4	ST	56307-432-001-001	O-RING – 72.62X3.53	THICKNESS= 3.530 mm	from stock	V	2,00 €	5H2538023	KSA			
193			2	ST	56307-432-001-003	RETAINING NUT – HP LANCE D=8 -		from stock	E	26,00 €	4M5208931A	Dürr Ecoclean GmbH			
194			4	ST	56307-432-001-006	HP CYLINDRICAL RING - 8X12X3		from stock	V	5,00 €	5M3561008	HAMMELMANN	01.00742.0142		
195			2	ST	56307-432-001-007	O-RING 35 X 5	THICKNESS= 5.000 mm STANDARD = 3771	from stock	V	6,00 €	7084835				
196			2	ST	56307-432-001-024	SEALING RING – SHAFT D. 58-62	TYPE = TWVS00600-N60 TYPE = V-SEAL	from stock	V	4,00 €	5M1301045	BUSAK & SHAMBAN			
197			2	ST	56307-432-001-215	NOZZLE		on request	V	auf Anfrage	X069468100	Dürr Ecoclean GmbH			

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
198			2	ST	56307-432-001-216	LANCE		on request	V	auf Anfrage	X072900000	Dürr Ecoclean GmbH			
199			2	ST	56307-432-001-217	LOCATING DEVICE		on request	V	66,00 €	X023071600	Dürr Ecoclean GmbH			
200			2	ST	56307-432-001-220	CHANNEL		on request	E	600,00 €	X057053101	Dürr Ecoclean GmbH			
201			1	ST	56307-432-002-001	INCLINED HEAD VALVE - G1/2", 0-12 BAR	TYPE = 554-15D-137-51-0 CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2"	from stock	E	233,00 €	5R0217202	GEMÜ	88044905		
202			1	ST	56307-432-002-002	INCLINED HEAD VALVE - G1/2", 0-25 BAR	TYPE = 554 CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2"	from stock	E	270,00 €	5R0217204	GEMÜ	554-15-D-1-37-5-2-0		
203			2	ST	56307-432-002-003	NON-RETURN VALVE - G 1/4" IGW	TYPE = RÜCK 14 ES CONNECTING THREAD = G1/4" IG NOM. PRESSURE PN = 16,0	from stock	E	90,00 €	7106134	ESSKA	853120400011		
204			1	ST	56307-432-003-003	FLAT GASKET - DN 40	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 40 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	E	2,00 €	5R0901508				
205			2	ST	56307-432-003-004	FLAT GASKET - DN 65	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 65 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	3,00 €	5R0901510				
206			1	ST	56307-432-003-005	O-RING 94.5 X 3.0	THICKNESS= 3.000 mm STANDARD = 3771	from stock	V	4,00 €	7065698				
207			1	ST	56307-432-004-001	HP CYLINDRICAL RING - 34X40X3		from stock	V	7,00 €	5M3561034	HAMMELMANN	04.00742.0012		
208			1	ST	56307-432-004-002	DOUBLE NIPPLE - M36X2/M33X2	CONNECTING THREAD = M36X2/M33X2	from stock	E	220,00 €	5R0410306	HAMMELMANN	08.03200.0007		
209			2	ST	56307-432-004-005	PIPE CLAMP - D=25	TYPE = W. INSERT A. PLATES TYPE = RI DIAMETER [mm] = 25X39	from stock	E	43,00 €	5M3549307	STAUFF	SPAL 5025 PPR DPAL-AS-1.4301		
210			1	ST	56307-435	HP MANIFOLD PIPE 91L/MIN 330BAR FOR FAS BMW									
211			1	ST	56307-435-002-001	LOW-VOLTAGE MOTOR - 37 KW, 225S	TYPE = 1LG6 220-4MA60-Z A11+G17 RATING [kW] = 37 VOLTAGE [V] = 400/690 FREQUENCY [Hz] = 50	56	E	3.547,00 €	7125063	SIEMENS	1LG6 220-4MA60-Z A11+G17		
212			1	ST	56307-435-002-001	HIGH-PRESSURE PUMP - HDP 72 FOR VFD	TYPE = HDP 72 FOR VFD TYPE = WATER-COOLED MOTOR RATING [kW] = 37 VOLTAGE [V] = 400/690 FREQUENCY [Hz] = 50	84	E	#####	7125064	HAMMELMANN			
213			1	ST	56307-435-002-002	EXTREME PRESSURE HOSE - DN 20, GL 130	TYPE = PRESS FITTINGS TYPE = 2440N NOM. SIZE DN = 20 CONNECTING THREAD = M36X2 LENGTH = 1,300.00 mm	from stock	V	846,00 €	5R1008050	FRAUENHOF HUGO	281708		
214			1	ST	56307-435-002-007	DOUBLE NIPPLE - M48X2/M36X2	CONNECTING THREAD = M36X2/M48X2	from stock	E	324,00 €	5R0410309	HAMMELMANN	08.05200.1006		
215			1	ST	56307-435-002-008	SAFETY VALVE - 300/400 BAR	CONNECTING THREAD = G 1/2	49	V	1.264,00 €	7075756	HAMMELMANN	00.05877.0039		
216			4	ST	56307-435-002-009	PIPE CLAMP - D=25 25	TYPE = W. INSERT A. PLATES TYPE = RI DIAMETER [mm] = 25X39	from stock	E	12,00 €	5M3549305	STAUFF	SPAL 5025 PPR DPAL-AS		

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
217			2	ST	56307-435-002-010	PRESSURE SWITCH - 0-25/0-363/0-2,5 BAR/PSI	TYPE = PN 7003 APPLICATION = LIQUID AND GASEOUS MEDIA CONNECTION = G1/4" MEASURING RANGE [bar] = 0 - 25 VOLTAGE [V] = 18-36	from stock	E	507,00 €	5R1423123	IFM ELECTRONIC (EFECTOR	PN7003		
218			2	ST	56307-435-002-011	TEMPERATURE SENSOR - TN 7531	TYPE = TN 7531 CONNECTION = M18X1.5 VOLTAGE [V] = 18-32	from stock	E	236,00 €	7101601	IFM ELECTRONIC (EFECTOR	TN7531		
219			2	ST	56307-435-002-014	ADAPTER - E40096 M18 - G1/2"	TYPE = E40096 CONNECTION = M18/G1/2"	from stock	E	36,00 €	5R1470125	IFM ELECTRONIC (EFECTOR	E40096		
220			4	ST	56307-435-002-019	HOSE FITTING - DN10	TYPE = SEALING HEAD + RETAINING NUT TYPE = 3C NOMINAL SIZE DN = 10	from stock	E	6,00 €	5R1012418	PARKER	3C382-10-6		
221			13	M	56307-435-002-020	PUSH-ON HOSE - DN10	TYPE = 831 PUSH-LOK NOMINAL SIZE DN = 10	from stock	E	17,00 €	5R1005248	PARKER	831-6-BLU-RL		
222			1	ST	56307-435-002-024	PRESSURE SWITCH - 0 - 600 BAR/PSI/MPA	TYPE = PN 3060 CONNECTION = G1/4" MEASURING RANGE [bar] = 0 - 600 VOLTAGE [V] = 20-30	from stock	E	487,00 €	5R1423128	IFM ELECTRONIC (EFECTOR	PN3060		
223			1	ST	56307-435-002-028	BALL VALVE - DN 15	CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2" NOM. PRESSURE PN = 64,0	from stock	V	7,00 €	5R0113204				
224			1	ST	56307-435-002-036	DOUBLE NIPPLE - M33X2/M36X2 FOR INSIDE SEALING	TYPE = FOR INSIDE SEALING CONNECTING THREAD = M33X2/M36X2	from stock	E	286,00 €	7077087	HAMMELMANN	01.02981.0495		
225			1	ST	56307-435-002-037	HP CYLINDRICAL RING - 22X27X3		from stock	V	12,00 €	5M3561010	HAMMELMANN	04.00742.0057		
226			1	ST	56307-435-002-215	ADAPTER		from stock	E	94,00 €	X000403500	Dürr Ecoclean GmbH			
227			1	ST	56307-435-003-001	BLOCK PUMP - ETABLOC GN32-160/302 G10	TYPE = ETABLOC GN32-160/302 G10 TERMINAL BOX POSITION = TOP HEAD [m] = 37 MOTOR RATING [kW] = 3 VOLTAGE [V] = 400/690 FREQUENCY [Hz] = 50	14	E	1.777,00 €	7124589	KSB			
228			1	ST	56307-435-003-002	SHUTOFF VALVE - DN50 PN10/16	TYPE = RS CONNECTION = RING HOUSING NOM. SIZE DN = 50 NOM. PRESSURE PN = 10,0	from stock	E	138,00 €	5R0138203	CRANE PROCESS	AHGD2C100H		
229			1	ST	56307-435-003-006	FLAT GASKET - DN 50	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 50 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	1,26 €	5R0901509				
230			1	ST	56307-435-003-008	FLAT GASKET - DN 32	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 32 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	E	1,00 €	5R0901507				
231			1	ST	56307-435-003-009	FLEXIBLE EXPANSION JOINT - DN 50	TYPE = ERV-GR 50.16 VSD TYPE = GREEN BAND NOM. SIZE DN = 50 NOM. PRESSURE PN = 16,0	from stock	V	281,00 €	5R1802015	ELAFLEX			
232			2	ST	56307-435-008-001-001	BAG FILTER - TBF-0102-AD10-050D-11HON-M	TYPE = TBF-0102-AD10-050D-11HON-M TYPE = TOPLINE CONNECTION = DN50	from stock	E	1.128,00 €	5R1220315	EATON TECHNOLOGIES	F632572		
233			2	ST	56307-435-008-001-001-010	SEALING KIT FOR TBF-112-S-10-M	TYPE = F.TBF-112-S-10-M TYPE = LID SEAL STANDARD = 3771	from stock	V	16,00 €	5R1220912				

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
234			2	ST	56307-435-008-001-014	BALL VALVE – DN8 PN30	CONNECTION = SLEEVE NOM. SIZE DN = 8 CONNECTING THREAD = 1/4" NOM. PRESSURE PN = 30,0	from stock	V	8,00 €	5R0113202				
235			2	ST	56307-435-008-001-018	EXTREME PRESSURE HOSE - DN 12, GL 250	TYPE = PRESS FITTINGS TYPE = 102 NOM. SIZE DN = 12 CONNECTING THREAD = M22X1.5 LENGTH = 250.00 mm	from stock	V	32,00 €	7145564	PROTEC	12-2TE-250-DKOL- DKOL		
236			2	ST	56307-435-008-001-020	BALL VALVE - DN 15	CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2" NOM. PRESSURE PN = 64,0	from stock	V	7,00 €	5R0113204				
237			1	ST	56307-435-008-003	BAG POSITIONER - BLK- HAYFLOW	TYPE = BLK-HAYFLOW LENGTH = 756.00 mm	from stock	E	232,00 €	5R1220944	EATON TECHNOLOGIES	F670843A		
238			2	ST	56307-435-008-004	FILTER ELEMENT - 25 MICRON	TYPE = PEXL-25-P02HAY-08L LENGTH = 700,00 mm MESH SIZE = 25.0 µm	from stock	V	34,00 €	5R1222232	EATON TECHNOLOGIES	F5873429		
239			2	ST	56307-435-008-005	RESTRAINER BASKET - BKT- AS-AC-HAYFLOW	TYPE = BKT-AS-02-HAYFLOW LENGTH = 706.00 mm	from stock	E	370,00 €	5R1220933	EATON TECHNOLOGIES	F671224A		
240			1	ST	56307-435-008-006	EXTRACTION TOOL - AH- HAYFLOW	TYPE = AH-HAYFLOW	from stock	E	55,00 €	5R1220943	EATON TECHNOLOGIES	F670844A		
241			4	ST	56307-435-008-007	SHUTOFF VALVE - DN50 PN10/16	TYPE = RS CONNECTION = RING HOUSING NOM. SIZE DN = 50 NOM. PRESSURE PN = 10,0	from stock	E	138,00 €	5R0138203	CRANE PROCESS	AHGD2C100H		
242			1	ST	56307-435-011-001	NOZZLE INSERT WITH CYLINDRICAL RING D=2,2	TYPE = A, ROUND JET, BORE DIAMETER = 2.20 mm	from stock	V	88,00 €	7004537	HAMMELMANN	04.05318.0026 + 01.00742.0142		
243			1	ST	56307-435-011-003	TEST NOZZLE 200 LTR - . . .		from stock	E	150,00 €	3N0070601A	Dürr Ecoclean GmbH			
244			1	ST	56307-435-012-010	MEMORY-CARD - 6ES7 954- 8LC01-0AA0	APPLICATION= FOR S7-1X00 CPU/SINAMICS TYPE = 4 MB	5	E	74,00 €	7158237	SIEMENS	6ES7 954-8LC01- 0AA0		
245			1	ST	56307-435-013-001	HIGH-PRESSURE HOSE - DN 38, GL 100	TYPE = PRESS FITTINGS TYPE = 222 B NOM. SIZE DN = 38 CONNECTING THREAD = M52X2 LENGTH = 1,000.00 mm	21	V	481,00 €	7087223	KRÄMER HYDRAULIK	0100078		
246			2	ST	56307-435-039-002	BALL VALVE – DN8 PN30	CONNECTION = SLEEVE NOM. SIZE DN = 8 CONNECTING THREAD = 1/4" NOM. PRESSURE PN = 30,0	from stock	V	8,00 €	5R0113202				
247			1	ST	56307-451	HP LINEAR UNIT 3D									
248			1	ST	56307-451-001-003	PNEUMATIC CYLINDER - D= 63 STROKE= 500	TYPE = DNC-63-500-PPV DIAMETER = 63.000 mm	21	E	158,00 €	7077465	FESTO	163426		
249			2	ST	56307-451-001-009	PROXIMITY SWITCH - M18X1 - 5MM	TYPE = IGMF05-GSP5M TYPE = 1NO PNP VOLTAGE [V] = 10-30	from stock	E	223,00 €	5M6261008	EGE-ELEKTRONIK	IGMF05-GSP5M		
250			4	ST	56307-451-001-010	SHAFT BLOCK - LSCS 30	TYPE = FOR LINEAR BEARING TYPE = LSCS 30	21	V	108,00 €	7080300	SKF			
251			2	ST	56307-451-001-016	PROXIMITY SWITCH - M18 / L=95 - 5MM	TYPE = IGMF 05 GSP/10 TYPE = 1NO PNP VOLTAGE [V] = 10-30	from stock	E	263,00 €	5M6261007	EGE-ELEKTRONIK	P 30701/10METER		
252			4	ST	56307-451-001-018	SPRING PLUNGER - M12X26	TYPE = STAINLESS STEEL TYPE = W. BALL	from stock	V	13,00 €	5M1560112	KIPP	03035-212		
253			2	ST	56307-451-001-026	GUIDE SHAFT - 30H7 X 1090 LG	TYPE = HARD/GROUND/HARD CHR. DIAMETER [mm] = 30 H7 LENGTH = 1,090.00 mm	21	V	150,00 €	7080375	BOSCH REXROTH/DEUTSCHE STAR			
254			2	ST	56307-451-001-028	ONE-WAY FLOW CONTROL VALVE - 151172 GRLA-1/8-B	TYPE = GRLA-1/4-B CONNECTING THREAD = G 1/4	from stock	E	37,00 €	5M3050232	FESTO	151172		

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total install d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
255			20	M	56307-451-001-029	PNEUMATIC HOSE - 1025T0800	TYPE = STANDARD O.D.	from stock	E	22,00 €	5M3105201	LEGRIS	1025T0800		
256			2	ST	56307-451-001-214	LANCE		on request	V	528,00 €	X007093500	Dürr Ecoclean GmbH			
257			2	ST	56307-451-001-216	LOCKING MECHANISM		on request	E	109,00 €	X002813500	Dürr Ecoclean GmbH			
258			1	ST	56307-451-001-222	BUSHING		on request	E	90,00 €	X002825100	Dürr Ecoclean GmbH			
259			4	ST	56307-451-001-224	BUSHING		on request	V	128,00 €	X002786400	Dürr Ecoclean GmbH			
260			3	ST	56307-451-001-225	BEARING		on request	E	auf Anfrage	X002801800	Dürr Ecoclean GmbH			
261			1	ST	56307-451-001-228	BEARING		on request	E	auf Anfrage	X007097300	Dürr Ecoclean GmbH			
262			2	ST	56307-451-001-229	MEASURING SPIKE		on request	E	78,00 €	X018077302	Dürr Ecoclean GmbH			
263			1	ST	56307-451-001-230	STOPPER -		on request	V	auf Anfrage	X074851300	Dürr Ecoclean GmbH			
264			2	ST	56307-451-002-211	HIGH-PRESSURE LANCE - LANCE DIAMETER 6	CONNECTION = BITE TYPE FITTING LENGTH = 725.00 mm	on request	V	699,00 €	X008999600	Dürr Ecoclean GmbH			
265			2	ST	56307-451-002-212	BEARING - PLAIN BEARING DIA. 6		on request	V	auf Anfrage	X074772500	Dürr Ecoclean GmbH			
266			2	ST	56307-451-002-213	ADAPTER - LANCE DIAMETER 6		on request	V	auf Anfrage	X074778500	Dürr Ecoclean GmbH			
267			2	ST	56307-451-003-003	DOUBLE NIPPLE - M36X2/M33X2	CONNECTING THREAD = M36X2/M33X2	from stock	E	220,00 €	5R0410306	HAMMELMANN	08.03200.0007		
268			2	ST	56307-451-003-004	HP CYLINDRICAL RING - 34X40X3		from stock	V	7,00 €	5M3561034	HAMMELMANN	04.00742.0012		
269			6	ST	56307-451-003-006	PIPE CLAMP - D=25	TYPE = W. INSERT A. PLATES TYPE = RI DIAMETER [mm] = 25X39	from stock	E	43,00 €	5M3549307	STAUFF	SPAL 5025 PPR DPAL-AS-1.4301		
270			2	ST	56307-451-003-008	EXTREME PRESSURE HOSE - DN 8, GL 600	TYPE = PRESS FITTINGS TYPE = 2,380N NOM. SIZE DN = 8 CONNECTING THREAD = M24X1.5 LENGTH = 600.00 mm	from stock	V	416,00 €	5R1008010	FRAUENHOF HUGO	281704		
271			1	ST	56307-460	OPTION HP VALVES BMW									
272			5	ST	56307-460-001-009	2/2-WAY SOLENOID VALVE M33X2	TYPE = ROUND SHAPE CONNECTING THREAD = M33X2	from stock	E	4.243,00 €	7067996	HAMMELMANN	00.05875.0067		
273			5	ST	56307-460-001-010	O-RING 50 X 5	THICKNESS= 5.000 mm STANDARD = 3771	from stock	V	2,00 €	5H2538080				
274			1	ST	56307-460-001-211	FEEDER		on request	E	3.468,00 €	X003089102	Dürr Ecoclean GmbH			
275			1	ST	56307-462	HP tools									
276			1	ST	56307-462-001-002	NOZZLE INSERT WITH CYLINDRICAL RING D=1,5	TYPE = A, ROUND JET, BORE DIAMETER = 1.50 mm	21	V	74,00 €	7005317	HAMMELMANN	04.05318.0025		
277			1	ST	56307-462-001-210	SPRAY BOX		on request	E	auf Anfrage	X073498900	Dürr Ecoclean GmbH			
278			1	ST	56307-462-002-210	SPRAY BOX -		on request	E	auf Anfrage	X075315500	Dürr Ecoclean GmbH			

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
279			1	ST	56307-462-002-214-003	HP CYLINDRICAL RING - 8X12X3		from stock	V	5,00 €	5M3561008	HAMMELMANN	01.00742.0142		
280			2	ST	56307-462-003-001	HP CYLINDRICAL RING - 34X40X3		from stock	V	7,00 €	5M3561034	HAMMELMANN	04.00742.0012		
281			2	ST	56307-462-003-002	DOUBLE NIPPLE - M36X2/M33X2	CONNECTING THREAD = M36X2/M33X2	from stock	E	220,00 €	5R0410306	HAMMELMANN	08.03200.0007		
282			4	ST	56307-462-003-005	PIPE CLAMP - D=25	TYPE = W. INSERT A. PLATES TYPE = RI DIAMETER [mm] = 25X39	from stock	E	43,00 €	5M3549307	STAUFF	SPAL 5025 PPR DPAL-AS-1.4301		
283			1	ST	56307-551	Electric tank heating									
284			1	ST	56307-551-001-001	FLANGE-MOUNTED HEATER - 36KW, IMMERSION DEPTH=1000	RATING [W] = 45000 CONNECTION = FLANGE CONNECTION = DN 125 VOLTAGE [V] = 3 X 400	from stock	E	1.336,00 €	5R5011320	ELEKTRA-LINDAU	65/0201/1		
285			1	ST	56307-551-001-002	EVALUATOR - TR 2432	TYPE = FOR SENSOR TS/TT TYPE = TR 2432 CONNECTION = M12X1	from stock	E	487,00 €	5R1470011	IFM ELECTRONIC (EFECTOR	TR2432		
286			1	ST	56307-551-001-003	TEMPERATURE SENSOR - TS 2051	TYPE = CABLE LENGTH 2000 MM TYPE = TS 2051 CONNECTION = M12X1	from stock	E	78,00 €	5R1462004	IFM ELECTRONIC (EFECTOR	TS2051		
287			2	ST	56307-551-001-004	ADAPTER - E 30018	TYPE = FOR TEMPERATURE SENSOR TYPE = E 30018 CONNECTION = G 1/2	from stock	E	23,00 €	5R1470115	IFM ELECTRONIC (EFECTOR	E30018		
288			1	ST	56307-551-001-005	PROTECTIVE SLEEVE - G1/2", D=18, L=182	TYPE = FOR TEMPERATURE SENSOR TS/TT CONNECTION = 1/2"	from stock	E	52,00 €	5R1451029	IFM ELECTRONIC (EFECTOR	E35020		
289			1	ST	56307-551-001-006	THERMOSTAT - +50/+200 °C	TYPE = 1M, SENSOR DIAMETER 6X85 TYPE = ATHF-70/U CONNECTION = M18X1 VOLTAGE [V] = 230	from stock	E	176,00 €	5R1410012	JUMO	60/60001290		
290			1	ST	56307-551-001-007	PROTECTIVE SLEEVE - G 1/2" 150X6.2	TYPE = FOR PT100 OR PT1000 REMOTE SENSOR TYPE = 909710/10-848-8-150-104- 26/000 CONNECTION = G 1/2	from stock	E	87,00 €	7104732	JUMO	00489141		
291			1	ST	56307-551-001-211	Seal		21	V	91,00 €	X000285401	Dürr Ecoclean GmbH			
292			1	ST	56307-551-001-212	Seal		on request	V	69,00 €	X000285101	Dürr Ecoclean GmbH			
293			1	ST	56307-561	BMW COOLING WATER SUPPLY									
294			1	ST	56307-561-001-001	INCLINED HEAD VALVE- G2", 0-10 BAR	TYPE = 514 CONNECTION = SLEEVE NOM. SIZE DN = 50 CONNECTING THREAD = 2" NOM. PRESSURE PN = 16,0	from stock	E	466,00 €	5R0217409	GEMÜ	514-50-D-1-9-5-1-2		
295			2	ST	56307-561-001-002	BALL VALVE - DN50 PN25	CONNECTION = SLEEVE TYPE = M300F NOM. SIZE DN = 50 CONNECTING THREAD = 2" NOM. PRESSURE PN = 25,0	from stock	V	44,00 €	5R0113209				
296			1	ST	56307-561-001-003	DIRT TRAP - R 2", PN25	TYPE = 1N TYPE = SOCKET, CONNECTION = R2" NOM. PRESSURE PN = 25,0 STRAINER BASKET MATERIAL= 1.4571	from stock	E	190,00 €	5R1201210	SAMSON			
297			1	ST	56307-562	BMW BATH COOLING									
298			1	ST	56307-562-001-001	HEAT EXCHANGER - FP 05-35-1-NH	TYPE = PLATE HEAT EXCHANGER TYPE = FP 05-35-1-NH CONNECTION = G 1" RATING [kW] = 90	42	E	761,00 €	7106476	FUNKE			
299			1	ST	56307-562-001-002	INCLINED HEAD VALVE	TYPE = 554 CONNECTION = SLEEVE NOM. SIZE DN = 32 CONNECTING THREAD = 1 1/4"	from stock	E	179,00 €	5R0217007	GEMÜ	554-32-D-1-9-5-1-1		
300			2	ST	56307-562-001-038	HOSE FITTING - DN25 1"	TYPE = BSP + RETAINING NUT NOMINAL SIZE DN = 25	from stock	E	40,00 €	5R1012320	PARKER	39282-16-16		

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total install d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
301			6 M		56307-562-001-039	PUSH-ON HOSE – DN25	TYPE = 801 PUSH-LOK NOMINAL SIZE DN = 25	from stock	E	50,00 €	5R1005255	PARKER	801-16-BLK-RL		
302			1 ST		56307-641	BMW air circulation system									
303			1 ST		56307-641-001-001	FAN - MSN 50-25/300	TYPE = RADIAL TYPE = MSN 50-25/300 VOLUME FLOW = 3000.00 m3/h MOTOR RATING [kW] = 4 VOLTAGE [V] = 400/690 FREQUENCY [Hz] = 50 TERMINAL BOX POSITION = 3 O'CLOCK	56	E	3.244,00 €	7087371	BVA-KOCKELMANN			
304			1 ST		56307-641-001-002	MIST COLLECTOR - DH2125	TYPE = DH2125 LENGTH A= 590.000 mm LENGTH B = 680.0 mm	42	V	1.277,00 €	7101621	MUNTERS			
305			1 ST		56307-641-001-003	FLOW MONITOR	TYPE = SI 5000 CONNECTION = M18X1.5 VOLTAGE [V] = 20-36	from stock	E	448,00 €	5R1426115	IFM ELECTRONIC (EFECTOR	SI5000		
306			1 ST		56307-641-001-004	ADAPTER - E40096 M18 - G1/2"	TYPE = E40096 CONNECTION = M18/G1/2"	from stock	E	36,00 €	5R1470125	IFM ELECTRONIC (EFECTOR	E40096		
307			1 ST		56307-641-002-001	HEAT EXCHANGER - 650X225X505	TYPE = VAPOUR CONDENSER TYPE = WT-FL44 VOLUME FLOW = 3000.00 m3/h CONNECTION = 1 1/4" RATING [kW] = 31	49	E	2.922,00 €	7103600	H&H GERÄTEBAU			
308			2 ST		56307-641-002-005	QUICK VENT VALVE - R 3/8", PN12	TYPE = SE10A CONNECTING THREAD = 3/8" NOM. PRESSURE PN = 12,0	from stock	E	14,00 €	5R0203123				
309			4 ST		56307-641-002-012	HOSE FITTING - DN25 1"	TYPE = BSP + RETAINING NUT NOMINAL SIZE DN = 25	from stock	E	40,00 €	5R1012320	PARKER	39282-16-16		
310			8 M		56307-641-002-013	PUSH-ON HOSE – DN25	TYPE = 801 PUSH-LOK NOMINAL SIZE DN = 25	from stock	E	50,00 €	5R1005255	PARKER	801-16-BLK-RL		
311			1 ST		56307-711	DRAIN PUMP UNIT									
312			1 ST		56307-711-002-001	DIRTY WATER PUMP - FREF 50-125 / G1 MQO	TYPE = FREF 50-125 G1 MQO TERMINAL BOX POSITION = TOP HEAD [m] = 17 MOTOR RATING [kW] = 2.2 VOLTAGE [V] = 230/400 FREQUENCY [Hz] = 50	from stock	E	1.624,00 €	7133630	JOHNSON PUMP	5.3711 A6		
313			1 ST		56307-711-002-002	BALL VALVE - DN50 PN25	CONNECTION = SLEEVE TYPE = M300F NOM. SIZE DN = 50 CONNECTING THREAD = 2" NOM. PRESSURE PN = 25,0	from stock	V	44,00 €	5R0113209				
314			2 ST		56307-711-002-003	BALL VALVE - R1 1/4"	CONNECTION = SLEEVE TYPE = M300F BALL VALVE TYPE = M300F NOM. SIZE DN = 32 CONNECTING THREAD = 1 1/4" NOM. PRESSURE PN = 25,0	from stock	V	29,00 €	5R0113207				
315			1 ST		56307-711-002-012	NON-RETURN VALVE -R 1 1/4", PN16	TYPE = A-690 CONNECTION TYPE = SLEEVE CONNECTING THREAD = 1 1/4" NOM. PRESSURE PN = 16,0	from stock	E	105,00 €	5R0230107				
316			1 ST		56307-721	DÜRR RIGHT OIL SEPARATOR PUMP FOR FAS									
317			1 ST		56307-721-001-001	LIQUID LEVEL SWITCH - LMT 110	TYPE = LMT110 CONNECTION = G 1/2" VOLTAGE [V] = 18-30	28	E	235,00 €	7130588	IFM ELECTRONIC (EFECTOR	LMT110		
318			2 ST		56307-721-001-002	BALL VALVE - DN 25	CONNECTION = SOCKET BALL VALVE TYPE = M300F NOM. SIZE DN = 25 CONNECTING THREAD = 1" NOM. PRESSURE PN = 30,0	from stock	V	16,00 €	5R0113206				

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
319			4	ST	56307-721-001-027	HOSE FITTING - DN25 1"	TYPE = BSP + RETAINING NUT NOMINAL SIZE DN = 25	from stock	E	40,00 €	5R1012320	PARKER	39282-16-16		
320			1	ST	56307-721-002-001	DIRTY WATER PUMP - FREF 32-110	TYPE = FREF 32-110 G1 MQO TERMINAL BOX POSITION = TOP HEAD [m] = 10 MOTOR RATING [kW] = 0.75 VOLTAGE [V] = 230/400 FREQUENCY [Hz] = 50	from stock	E	904,00 €	7133628	JOHNSON PUMP	5.3701 A6		
321			2	ST	56307-721-002-003	BALL VALVE - R1 1/4"	CONNECTION = SLEEVE TYPE = M300F BALL VALVE TYPE = M300F NOM. SIZE DN = 32 CONNECTING THREAD = 1 1/4" NOM. PRESSURE PN = 25,0	from stock	V	29,00 €	5R0113207				
322			1	ST	56307-721-002-017	GLOBE VALVE - R 3/4", PN16	CONNECTION = SLEEVE NOM. SIZE DN = 20 CONNECTING THREAD = 3/4" NOM. PRESSURE PN = 16,0	14	E	64,00 €	7057918				
323			3	ST	56307-721-003-001	FLOAT - D=120	DIAMETER= 120.000 mm	from stock	E	96,00 €	5R2307002	BOLLER			
324			1	ST	56307-731	DOSING SYSTEM									
325			1	ST	56307-731-001-001	DOSING SYSTEM - MAKE PROMINENT	NO. OF PUMPS= 1 PUMP TYPE = BT4B 0220 PPB 2000 UA 000000 HEAD [m] = 20 VOLTAGE [V] = 110-230 RATING [W] = 6.4-15.2 FREQUENCY [Hz] = 50/60	49	E	1.054,00 €	7075334	PROMINENT			
326			3	ST	56307-731-001-002	BALL VALVE - DN 15	CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2" NOM. PRESSURE PN = 64,0	from stock	V	7,00 €	5R0113204				
327			2	ST	56307-731-001-003	HOSE FITTING - G1/2 D=9/12	TYPE = STRAIGHT MALE UNION DIAMETER [mm] = 9/12 MM	from stock	E	16,00 €	5M3132101	RIEGLER	120.34		
328			1	ST	56307-752	EcoFAS WITH DRAGOUT CONVEYOR BMW									
329			1	ST	56307-752-001-001	BACKFLUSH FILTER TYPE 6.63	TYPE = 6.63 TYPE = HOUSING CHEMICALLY NICKEL-PLATED INSIDE NO. OF FILTER INSERTS 36 MESH SIZE = 75.0 µm NOM. SIZE DN = 100 NOM. PRESSURE PN = 10.0 VOLTAGE [V] = 230/400 FREQUENCY [Hz] = 50 60 RATING [kW] = 0,09	126	E	#####	7066130	BOLL&KIRCH			
330			1	ST	56307-752-001-001- 010	FLUSHING VALVE ASSEMBLY - 6.63 DN100	NOM. SIZE DN = 100	21	E	3.972,00 €	7104076	BOLL&KIRCH	0600566		
331			30	ST	56307-752-001-001- 020	FILTER CATRIDGE - 1340098, Z37968 TELA5110	TYPE = Z37968 TELA 5110 TYPE = TELA 5110 MESH SIZE = 75.0 µm	50	V	126,00 €	7065467	BOLL&KIRCH	1340098		
332			1	ST	56307-752-001-002	BLOCK PUMP - ETABLOC GN50-200/1852 G10	TYPE = WITH ROTATION BRAKE TYPE = ETABLOC GN50-200/1852 G10 TERMINAL BOX POSITION = TOP HEAD [m] = 55 MOTOR RATING [kW] = 18.5 VOLTAGE [V] = 400/690 FREQUENCY [Hz] = 50	49	E	4.411,00 €	7105046	KSB			

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
333			1	ST	56307-752-001-003	BLOCK PUMP - ETABLOC GN50-200/1852 G10	TYPE = ETABLOC GN50-200/1852 G10 TERMINAL BOX POSITION = TOP HEAD [m] = 55 MOTOR RATING [kW] = 18.5 VOLTAGE [V] = 400/690 FREQUENCY [Hz] = 50	35	E	4.411,00 €	7105047	KSB			
334			1	ST	56307-752-001-006	PROXIMITY SWITCH - DW- AS-503-M30-002.M3	TYPE = DW-AS-503-M30-002 TYPE = 1NO PNP VOLTAGE [V] = 10-30	from stock	E	154,00 €	5M6218003	CONTRINEX	DW-AS-503-M30- 002		
335			1	ST	56307-752-001-007	PRESSURE SWITCH - 0-25/0- 363/0-2,5 BAR/PSI	TYPE = PN 7003 APPLICATION = LIQUID AND GASEOUS MEDIA CONNECTION = G1/4" MEASURING RANGE [bar] = 0 - 25 VOLTAGE [V] = 18-36	from stock	E	507,00 €	5R1423123	IFM ELECTRONIC (EFFECTOR)	PN7003		
336			1	ST	56307-752-001-014	BALL VALVE - DN 15	CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2" NOM. PRESSURE PN = 64,0	from stock	V	7,00 €	5R0113204				
337			1	ST	56307-752-001-015	NON-RETURN BALL VALVE R 1/2", PN16	TYPE = 402 CONNECTION = SLEEVE NOM. SIZE DN = 15 CONNECTING THREAD = 1/2" NOM. PRESSURE PN = 16,0	from stock	E	233,00 €	5R0201014	THIES			
338			2	ST	56307-752-001-016	SHUTOFF VALVE WITH ACTUATOR - DN80 PN16	TYPE = RS CONNECTION = FLANGE MOUNT NOM. SIZE DN = 80 NOM. PRESSURE PN = 10,0 - 16,0	from stock	V	437,00 €	5R0228080	CRANE PROCESS	ALSD5B161E0A000		
339			2	ST	56307-752-001-016- 010	VALVE BODY LINING - DN 80	APPLICATION= FOR DAMPER RS TYPE = W. SUPPORTING RING NOM. SIZE DN = 80	from stock	V	184,00 €	5R0228963	CRANE PROCESS	KS1A0080-9F-0000		
340			3	ST	56307-752-001-020	SHUTOFF VALVE WITH ACTUATOR - DN65	TYPE = RS CONNECTION = RING HOUSING NOM. SIZE DN = 65 NOM. PRESSURE PN = 10,0	from stock	E	259,00 €	5R0228205	Dürr Ecoclean GmbH OEM			
341			3	ST	56307-752-001-020- 010	SHUTOFF VALVE - DN65 PN10	TYPE = RS CONNECTION = RING HOUSING NOM. SIZE DN = 65 NOM. PRESSURE PN = 10,0 - 16,0	21	V	151,00 €	7086009	CRANE PROCESS	AKGD2C100F		
342			1	ST	56307-752-001-021	SHUTOFF VALVE - DN65 PN10	TYPE = RS CONNECTION = RING HOUSING NOM. SIZE DN = 65 NOM. PRESSURE PN = 10,0	from stock	E	200,00 €	5R0138205	CRANE PROCESS	AKSD2C100H		
343			2	ST	56307-752-001-022	FLAT GASKET - DN 50	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 50 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	1,26 €	5R0901509				
344			5	ST	56307-752-001-023	FLAT GASKET - DN 65	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 65 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	V	3,00 €	5R0901510				
345			1	ST	56307-752-001-024	PRESSURE SWITCH - 0-25/0- 363/0-2,5 BAR/PSI	TYPE = PN 7003 APPLICATION = LIQUID AND GASEOUS MEDIA CONNECTION = G1/4" MEASURING RANGE [bar] = 0 - 25 VOLTAGE [V] = 18-36	from stock	E	507,00 €	5R1423123	IFM ELECTRONIC (EFFECTOR)	PN7003		
346			3	ST	56307-752-001-030	FLAT GASKET - DN 80	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 80 THICKNESS = 2.000 mm NOM. PRESSURE PN = 40.0 STANDARD = EN 1514-1	from stock	E	3,00 €	5R0901511				

Spare and Wear Parts List

Customer: **Jaguar Cars Ltd.**

Job ref. No.: **MK.135736.1510**

DÜRR machine No.: **56307**

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
347			2	ST	56307-752-001-031	FLAT GASKET – DN100	TYPE = KLINGERSIL ASBESTOS-FREE NOM. SIZE DN = 100 THICKNESS = 2.000 mm NOM. PRESSURE PN = 16.0 STANDARD = EN 1514-1	from stock	V	4,00 €	5R0901512				
348			12	ST	56307-752-001-032	ONE-WAY FLOW CONTROL VALVE - 151172 GRLA-1/8-B	TYPE = GRLA-1/4-B CONNECTING THREAD = G 1/4	from stock	E	37,00 €	5M3050232	FESTO	151172		
349			1	ST	56307-752-001-210	BUSHING		on request	E	168,00 €	X001698601	Dürr Ecoclean GmbH			
350			1	ST	56307-752-002-006	BLIND LID FOR CLAMP FLANGE	TYPE = FOR CLAMP FLANGE NOM. SIZE DN= 100 STANDARD = 32676	from stock	E	55,00 €	7075702	STAHLCON	401400		
351			1	ST	56307-752-002-007	CLAMP SEAL – 4"	TYPE = FOR CLAMP FLANGE NOM. SIZE DN= 100	from stock	E	8,00 €	7061412	STAHLCON	509400		
352			1	ST	56307-752-003-001	DRAG-OUT CONVEYOR - KF 30 L 23 L - P38,1	TYPE = KF30 L 23 L - P38,1 DRAWING NO. = 912Z091	63	E	7.701,00 €	7103760	BÄR+CO.			
353			1	ST	56307-752-003-001-001	RETURN PUMP		28	E	677,00 €	7103554	BRINKMANN	TL 50/240		
354			1	ST	56307-752-003-001-003	INTERMEDIATE SHEET – KF30	TYPE = KF30	56	E	379,00 €	7152330	BÄR+CO.			
355			1	ST	56307-752-003-001-004	PILLOW BLOCK BEARING - PB30	TYPE = PB30	10	V	93,00 €	7152326	INA	PBY30		
356			1	ST	56307-752-003-001-005	DRIVE SPROCKET	DRAWING NO= 12032060 (003)	10	V	106,00 €	7152334	BÄR+CO.			
357			1	ST	56307-752-003-001-006	WORM GEAR MOTOR - 2KJ1601-6CC13-2	TYPE = 2KJ1601-6CC13-2HH2-Z TYPE = HOLLOW SHAFT OUTPUT SPEED [1/min] = 1.2 RATING [kW] = 0.18 VOLTAGE [V] = 400 FREQUENCY [Hz] = 50	10	E	918,00 €	7152353	SIEMENS	2KJ1601-6CC13-2HH2-Z		
358			1	ST	56307-752-003-001-007	BEARING SUPPORT – KF30 - P38,1	TYPE = FF - P38,1	56	E	47,00 €	7152356	BÄR+CO.			
359			1	ST	56307-752-003-001-008	DEEP GROOVE BALL BEARING - 30/62X16	TYPE = 6206.2RSR STANDARD = 625 WIDTH = 16.0000 mm	14	V	22,00 €	7004720	FAG			
360			1	ST	56307-752-003-001-009	DEFLECTOR SPROCKET	DRAWING NO= 12032061 (004)	10	V	115,00 €	7152335	BÄR+CO.			
361			1	M	56307-752-003-001-010	SOLID-PIN CHAIN	TYPE = P38,1	56	V	91,00 €	7152333	BÄR+CO.			
362			1	ST	56307-752-003-001-011	DRAG FLIGHT - KF30 - P38,1	TYPE = WITHOUT BRUSH, TYPE = KF30 - P38,1	56	E	27,00 €	7152328	BÄR+CO.			
363			1	ST	56307-752-003-001-012	DRAG FLIGHT - KF30 - P38,1	TYPE = WITH BRUSH TYPE = KF30 - P38,1	56	E	460,00 €	7152329	BÄR+CO.			
364			1	ST	56307-752-003-001-013	PROXIMITY SWITCH - M12X1 / L=40,5 - 5MM	TYPE = BES 516-131-S4-C TYPE = PNP NORMALLY OPEN/NORMALLY CLOSED, VOLTAGE [V] = 10-30	14	E	179,00 €	7152331	BALLUFF	BES0161		
365			1	ST	56307-752-003-001-014	CONICAL SPRING WASHER - A 250/12,2X1,5	TYPE = A DIAMETER D1= 250.0 mm, DIAMETER D2= 12.2 mm THICKNESS = 1.500 mm	14	V	33,00 €	7152337	BÄR+CO.			
366			4	ST	56307-752-009-010	METAL RUBBER BUFFER - D=75, L=40/M12	TYPE = THREADED BOLT BOTH ENDS DIAMETER = 75.000 mm	from stock	E	40,00 €	7057301				
367			1	ST	56307-752-011-001	BAG FILTER - SBF-0104-AD16-040B	TYPE = SBF-0104-AD16-040B TYPE = SIDELINE CONNECTION = 1 1/2"	21	E	1.024,00 €	7083853	EATON TECHNOLOGIES	F610006		

Spare and Wear Parts List

Customer:

Jaguar Cars Ltd.

Job ref. No.:

MK.135736.1510

DÜRR machine No.:

56307

Inventory No.M1H1-100-1

Rev. Date: **08.11.2013**

Contact: **Alexander Heitmann**

Phone: **+49(2472) 83-171**

Fax: **+49(2472) 83-149**

E-Mail: alexander.heitmann@ecoclean.durr.com



DÜRR ECOCLEAN GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

Item	DÜRR recom- men- dation	Customer selection	Total installe d quantity	Unit	Technical location	Designation	Additional description	Lead time in days	E/V /Y/ Z par t	Unit price	Ref.No.	Supplier	Order No.	Total price DÜRR recom- mendation	Total price CUSTOMER selection
368			1	ST	56307-752-011-001-001	SEALING - OR-SBF-V-C03	TYPE = OR-SBF-V-C03	10	V	64,00 €	7152007	EATON TECHNOLOGIES	F670070		
369			1	ST	56307-752-011-001-002	SEALING - VI-MO-65-OR	TYPE = VI-MO-65-OR	14	V	44,00 €	7152008	EATON TECHNOLOGIES	F670398		
370			1	ST	56307-752-011-001	FILTER BAG - PE-50-P04H-50M	TYPE = PE-50-P04H-50M LENGTH = 380.00 mm MESH SIZE = 50.0 µm	21	V	13,00 €	7085267	EATON TECHNOLOGIES	F5858079		
371			1	ST	56307-752-015-001	PRESSURE SPRING - 2.5X25X 49	TYPE = D-269 MEAN WINDING DIAM.= 25.00 mm UNLOADED LENGTH = 49.00 mm STANDARD = 17224	from stock	V	7,00 €	5M1513001	GUTEKUNST			
372			5	ST	56307-752-911-001	PROXIMITY SWITCH - 40X26X26 - 4MM	TYPE = 2NO PNP VOLTAGE [V] = 10-36	from stock	E	107,00 €	5M6260001	IFM ELECTRONIC (EFECTOR	IN5225		
373			5	ST	56307-752-911-002	CAM - D=53MM	TYPE = TRIGGER CAM	from stock	V	21,00 €	5M6260050	IFM ELECTRONIC (EFECTOR	E17320		
374			1	ST	56307-781	EcoCFlex SOUND INSULATION									
375			1	ST	56307-911	CONTROL STATION									
376			1	ST	56307-911-111-001	SAFETY SWITCH - MA2-M7-SKL11-AKL61	TYPE = MA2-M7-SKL11-AKL61-SL411 TYPE = DOOR HINGED ON LEFT SIDE VOLTAGE [V] = 24	21	E	1.035,00 €	7160000	FORTRESS	MA2-M7-SKL11-AKL61-SL411		
377			1	ST	56307-911-111-002	SAFETY SWITCH - MA4-M7-SKL11-AKL61	TYPE = MA4-M7-SKL11-AKL61-SL411 TYPE = DOOR HINGED ON RIGHT SIDE VOLTAGE [V] = 24	21	E	1.035,00 €	7160001	FORTRESS	MA4-M7-SKL11-AKL61-SL411		
378			1	ST	56307-911-111-003	KEY - CLK-SUCR "PK" A KEY(RED)	TYPE = CLK-SUCR "PK" A KEY(RED)	21	E	39,00 €	7160010	FORTRESS			
379			1	ST	56307-911-111-004	KEY - CLK-SUCB "PK" B KEY(BLUE)	TYPE = CLK-SUCB "PK" B KEY(BLUE)	21	E	39,00 €	7160013	FORTRESS			
380			2	ST	56307-911-111-005	KEY - MLK-SUGS "OP" KEY(GOLD)	TYPE = MLK-SUGS "OP" KEY(GOLD)	21	E	39,00 €	7160008	FORTRESS			
381			1	ST	56307-941	PNEUMATICS									
382			1	ST	56307-941-001-001	PNEUMATICS (COMPLETE CTRL)	VALVE TYPE= VTSA	35	E	8.176,00 €	7158688	FESTO			
383			1	ST	56307-941-001-002	FILTER CARTRIDGE - MS6-LFP-C	TYPE = MS6-LFP-C	7	V	7,00 €	7158694	FESTO	534499		
384			1	ST	56307-941-281-001	PNEUMATICS (COMPLETE CTRL)	VALVE TYPE= VSVA	35	E	1.267,00 €	7159496	FESTO			
385			1	ST	56307-941-281-002	FILTER CARTRIDGE - MS6-LFP-C	TYPE = MS6-LFP-C	7	V	7,00 €	7158694	FESTO	534499		
386			1	ST	56307-981	CABINET MANUFACTURE									
387			1	ST	56307-983	ELECTRICAL INSTALLATION									
					56307-983-001-020										

8. Operating Reports / Measurement and Setting Data

Table of Contents

This chapter contains:

- a) Set points
- b) Noise measurement protocol

Machine	Lower limit	Upper limit	Guideline value	Actually set
Waiting time till standby	1 min	5 min	3	
Cycle time setpoint	30 sec.	9990 sec.	90	
Vacuum	Lower limit	Upper limit	Guideline value	Actually set
Set vacuum time	1s	300s		
Set vacuum cycles	0 cyc	5 cyc		
Set vacuum pumps warm-up time	0	60	2	min.
Set vacuum pumps stop-delay time	5	60	10	min.
310_IFW_Process tank	Lower limit	Upper limit	Guideline value	Actually set
Set partial draining delay time	0s	10s		
Set partial draining time	0s	20s		
Tank 1 temperature analog	Lower limit	Upper limit	Guideline value	Actually set
Starting temperature	5°C	Overtemperature		
Setpoint temperature	5°C	Overtemperature		
Bath cooling - temperature	5°C	Overtemperature		
Overtemperature	5°C	65°C		
Oil separator	Lower limit	Upper limit	Guideline value	
Collecting time until cleaning cycle	1h	365h		
Cleaning time setpoint	3s	60s		
Detergent input	Lower limit	Upper limit	Guideline value	
Tank 1				
Tank 1 complete re-fill	0%	10%	1%	
Tank 1 make-up	0%	10%	1%	
PLC fixed value "PUMP1_DELIVERY_RATE" PUMP DELIVERY RATE (CALIBRATED) IN SECONDS PER LITER			360s	
FAS filter	Lower limit	Upper limit	Guideline value	
Flush cycle time	5 min	30 min	30 min	
Rinse time	1 sec.	3 sec.	2 sec.	
FAS scraper	Lower limit	Upper limit	Guideline value	
Scraper pump off-delay	1 sec.	10 sec.	5 sec.	
Scraper motor setpoint runtime	5 sec.	20 sec.	10 sec.	
High pressure	Lower limit	Upper limit	Guideline value	Actually set
HP valve 1 setpoint	99	300		

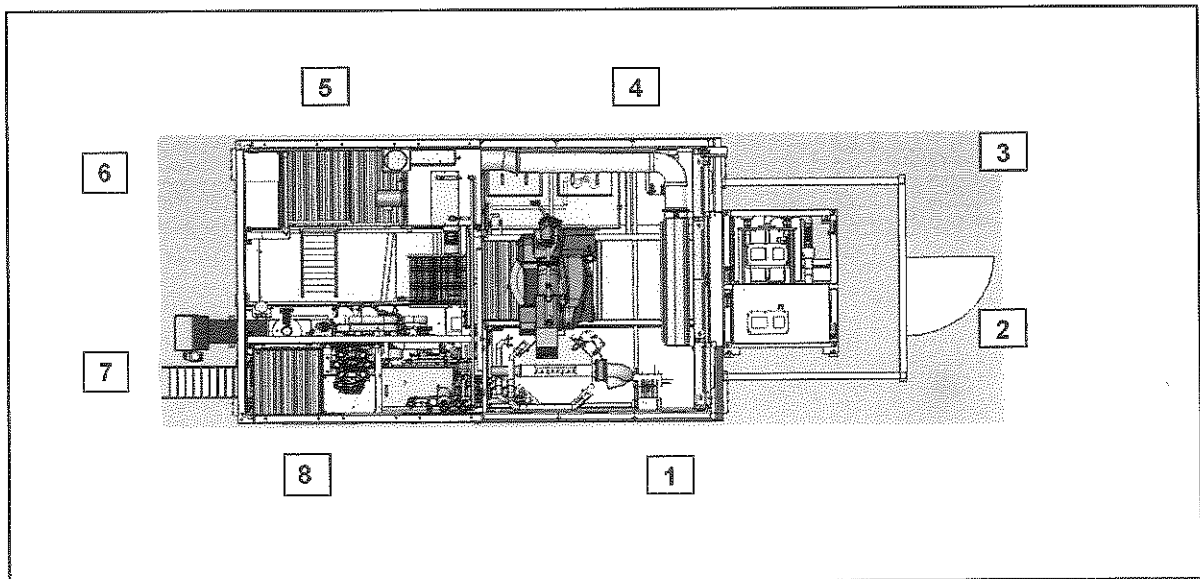
HP valve 1 speed taught	300			
HP valve 4 setpoint	99	300		
HP valve 4 speed taught	300			
HP valve 5 setpoint	99	300		
HP valve 5 speed taught	300			
HP valve 6 setpoint	99	300		
HP valve 6 speed taught	300			
HP valve 7 setpoint	99	300		
HP valve 7 speed taught	300			
HP valve 8 setpoint	99	300		
HP valve 8 speed taught	300			
Max. deviation - negative limit for alarm	0	99%	15%	
Max. deviation - negative limit for warning	0	99%	10%	
Max. deviation - positive limit for alarm	0	99%	15%	
HP valve 8 speed taught				
Pressure in test nozzle mode 1500 r.p.m.			372	

Maintenance intervals	Lower limit	Upper limit	Guideline value	Actually set
Wash robot gripper (all grippers, type-independent)				
Warning value	0 cyc	450000 cyc	450000 cyc	
Error value	0 cyc	500000 cyc	500000 cyc	
Wash robot				
KUKA Warning value	0 h	2700 h	2700 h	
KUKA Error value	0 h	3000 h	3000 h	
Vacuum pump 1				
Becker pump Warning value	0 h	700 h	700 h	
Becker pump Error value	0 h	1000 h	1000 h	
HP pump				
Warning value	0 h	1800 h	1800 h	
Error value	0 h	2000 h	2000 h	

Measurement of sound pressure level

Noise data sheet for machine acceptance
according to DÜRR Ecoclean Factory Standard and DIN 45 635

Machine: **MK.135736.1510**
Type: **Ecoclean - EcoCFlex, Classic**
Manufacturer: **DÜRR Ecoclean GmbH, Monschau**
Machine No.: **56307**
Further data:
Meas. location/date: **Monschau, 06.11.2013**



Measuring surface sound pressure level at 1 m, dB(A)

All-round measurement:

	Meas. Points	Machine with external level	external level only	
	1	75,1		
Evenly arrange at least	2	72,1		Measure at every meas. point:
4 measuring points on	3	72,3		- machine with external level,
the 'imaginary' enveloping	4	74,5		- external level with
surface around the machine;	5	77,2		machine stopped;
distance to machine = 1 m	6	75,1		
	7	74,7		The external level
	8	75,7		should fall below
	9			machine level
	10			by at least 5 dB.
	Mean value	74,9	0,0	

Room correction K₂ acc. to DIN 45 635:
tick one applicable value only

0
1
2
3

Room reflexions:

- non (green field)
- minor/low machine density
- "normal" machine density
- close to strongly reflecting surfaces (other machines, room)

Corrected sound pressure level, dB(A)

	without K ₂	with K ₂	Max. specified value
Meas. surface sound pressure level at 1m	74,9	72,9	77

06.11.2013

Date

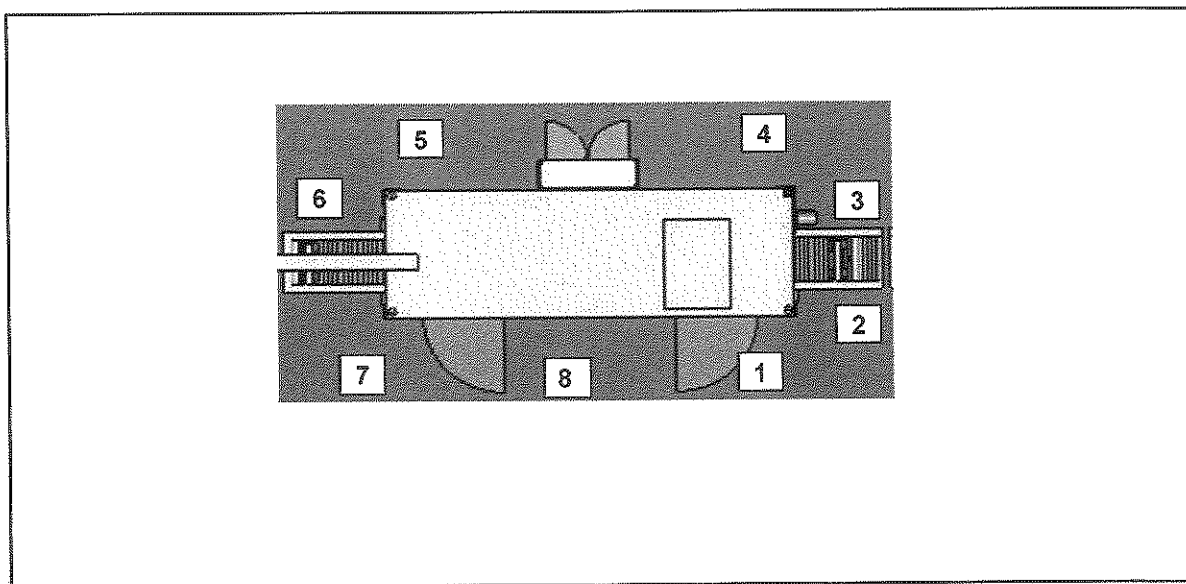
Name / signature

Measurement of sound pressure level

Noise data sheet for machine acceptance

according to DÜRR Ecoclean Factory Standard and DIN 45 635

Machine: **MK.135736.1510 Kühlzone**
Type: **Ecoclean - EcoCFlex, Classic**
Manufacturer: **DÜRR Ecoclean GmbH, Monschau**
Machine No.: **56307**
Further data:
Meas. location/date: **Monschau, den 14.11.2013**



Measuring surface sound pressure level at 1 m, dB(A)

All-round measurement:

	Meas. Points	Machine with external level	external level only
	1	76,4	71,8
	2	79,5	71,8
	3	79,5	71,8
	4	76,9	71,8
	5	75,6	71,8
	6	79,5	71,8
	7	79,5	71,8
	8	75,0	71,8
	9		
	10		
	Mean value	78,1	71,8

Evenly arrange at least 4 measuring points on the 'imaginary' enveloping surface around the machine; distance to machine = 1 m

Measure at every meas. point:
- machine with external level,
- external level with machine stopped;

The external level should fall below machine level by at least 5 dB.

Room correction K₂ acc. to DIN 45 635:
tick one applicable value only

0
1
2
3

Room reflexions:

- non (green field)
- minor/low machine density
- "normal" machine density
- close to strongly reflecting surfaces (other machines, room)

Corrected sound pressure level, dB(A)

	without K ₂	with K ₂
Meas. surface sound pressure level at 1m	76,9	74,9

Max. specified value

77

14.11.2013

Date

Hartmut Jung

Name / signature

9. Certificates

Contents:

- **TÜV Certificate**
Quality management system for design, manufacture and sales of the product lines
DIN EN ISO 9001 : 2008
valid until **2014-12-10**
Certificate Registration no.: 12 100 41874/03 TMS
- **TÜV Certificate**
Quality management system Productions tools
VDA 6.4 : 2005
valid until **2014-12-10**
Certificate Registration-no.: 12 110 41874/03 TMS
- **TÜV Certificate**
Environmental management system for design, manufacture and sales of the product lines
ISO 14001 : 2004
valid until **2014-11-21**
Certificate Registration no: 12 104 41874/02 TMS



Management Service

CERTIFICATE

The Certification Body
of TÜV SÜD Management Service GmbH

certifies that



Ecoclean

Dürr Ecoclean GmbH

Hans-Georg-Weiss-Str. 10

52156 Monschau

Germany

has established and applies
a Quality Management System for

**Design, engineering, manufacturing,
sales, installation and services of
cleaning and filtration systems.**

An audit was performed, Report No. **70780256**

Proof has been furnished that the requirements
according to

ISO 9001:2008

are fulfilled. The certificate is valid in conjunction
with the main-certificate until **2014-12-10**

Certificate Registration No. **12 100 41874/03 TMS**

M. Wegner



Munich, 2011-12-19

QMS-TGA-ZM-07-92

CERTIFICATE SUPPLEMENT

The TÜV SÜD Management Service GmbH

approved by

VERBAND DER AUTOMOBILINDUSTRIE e.V. (VDA) / Z. Nr. 08-QMC-6.4-020

hereby certifies that the company



Ecoclean

Dürr Ecoclean GmbH

Location:

**Hans-Georg-Weiss-Str. 10
52156 Monschau
Germany**

for the scope of application:
Design, engineering, manufacturing,
sales, installation and services of
cleaning and filtration systems

maintains a

Quality Management System according to VDA 6.4:2005
(with product development).

This certificate supplement is only valid in connection with the ISO 9001-Certificate
Registration No.: 12 100 41874/03 TMS. It confirms that the
quality management system is additionally qualified in fulfilling the requirements specified
in VDA 6.4:2005, which supplements those in ISO 9001:2008.

Evidence has been provided during the quality audit, report no. 70780256.

This certificate supplement is valid until **2014-12-10**

TMS-Registration No.: **12 110 41874/03 TMS**

VDA-Number (Database): **0001918**

Date of issue: 2011-12-19



Munich, 2011-12-19



Management Service

CERTIFICATE

The Certification Body
of TÜV SÜD Management Service GmbH

certifies that



Ecoclean

Dürr Ecoclean GmbH

Hans-Georg-Weiss-Str. 10

52156 Monschau

Germany

has established and applies
an Environmental Management System for

**Design, engineering, manufacturing,
sales, installation and services of
cleaning and filtration systems.**

An audit was performed, Report No. **70780256**

Proof has been furnished that the requirements
according to

ISO 14001:2004

are fulfilled. The certificate is valid in conjunction
with the main-certificate until **2014-11-21**

Certificate Registration No. **12 104 41874/02 TMS**

M. Wegner



Munich, 2011-12-19

EMS-TGA-ZM-07-92

10. Declaration of Conformity

Contents:

- Declaration of Conformity
- BGV-A3 confirmation
- Confirmation of inspection of electrical equipment as per EN 60204-1

For the equipment

Type: **ECOCLEAN EcoCFlex, Classic**

DÜRR Job Ref. No. **MK.135736.1510**



DECLARATION OF CONFORMITY



EC DECLARATION OF CONFORMITY



pursuant to EC Machinery Directive 2006/42/EC

Dürr Ecoclean GmbH
Hans-Georg-Weiss-Str. 10
52156 Monschau

We, **Dürr Ecoclean GmbH**, hereby declare that the equipment referred to hereafter conforms with the applicable fundamental safety and health requirements of the EC directives in its design, construction and type as placed in the market by us. Any modifications made to the equipment without our consent render this Declaration null and void.

Equipment designation	Cleaningmachine for
Part	Cylinder-Head AJ-200
Machine type	Ecoclean EcoCFlex, Classic
Dürr Serial No.:	56307
DÜRR Job Ref. No.	MK.135736.1510
Equipment location	Wolverhampton United Kingdom
User inventory No.	M1H1-100-1
Equipment built in:	2013

Applied EC directives and standards

• EC Directive 2006/42/EC	Machinery Directive
• EC Directive 2004/108/EC	Directive on Electromagnetic Compatibility
• EC Directive 2006/95/EC	Directive on Electrical Equipment Designed for Use Within Certain Voltage Limits
• DIN EN 12100-1 and -2	Safety of Machines
• EN 60204	Electrical Equipment of Machines

Applied national standards and specifications

• VDE 0100	
-------------------	--

Monschau,

Datum

Frank Knott (General Engineering Mgr)

Wolfgang Fast (Documentation)

The

EC Declaration of Conformity / EC Manufacturer's Declaration

shall follow after commissioning of the equipment and completion of the required tests.

PRÜFZERTIFIKAT
in dt.

BESCHEINIGUNG BGV A3
in dt.

BESCHEINIGUNG EN 60204
in dt.

EG-KONFORMITÄTSERKLÄRUNG
in dt.

SICHERHEITSHINWEISE ELEKTRIK
in dt.

Prüfzertifikat

FLEXIVA®
automation & Robotik

(auch Deckblatt der Prüfcheckliste)

D-09439 Amtsberg, Weißbacher Str. 3, Tel: 037209-671-0

Prüfung erfolgte nach Prüfvorschrift P0612 Werksnorm FLEXIVA

Anlage: Reinigungsanlage

Endkunde: Jaguar/Landrover

Auftrags-Nr.: MK135736-00

Zeichnungs-Nr.: keine

Auftrags-Nr. Flexiva: K130745

Serien-Nr.: 0913 / K130745 / +XXX_E

Prüfdatum:

Pers.-Nr. Prüfer:

Unterschrift Prüfer:

19.9.13
2002

Jaguar Land Rover

Amtsberg, 20.09.2013

BESCHEINIGUNG BGV A3

Nach §5 Absatz 4 der Unfallverhütungsvorschrift

„ELEKTRISCHE ANLAGEN UND BETRIEBSMITTEL“ (BGV A3)

Hiermit wird bescheinigt, daß die elektrische Anlage / das elektrische Betriebsmittel

Steuerschrank für Reinigungsanlage

Zeichnungs-Nr. :

Auftrags-Nr. : K135736

Flexiva-Nr. : K130745-P10

unter Beachtung der elektrotechnischen Regeln, den Bestimmungen der Unfallverhütungsvorschrift
„ELEKTRISCHE ANLAGEN UND BETRIEBSMITTEL“ (BGV A3)
entspricht.

Insbesondere wurden Maßnahmen getroffen:

1. Zum Schutz gegen direktes Berühren der aktiven Teile
2. Zum Schutz bei indirekter Berührung
3. Es wurden Maßnahmen getroffen, daß der spannungsfreie Zustand der aktiven Teile hergestellt und sichergestellt werden kann.

Unterschrift
Leiter Automatisierung

FLEXIVA®
automation & Robotik GmbH
Weißbacher Str. 3, D-09439 Amtsberg
U. Winkler
Tel./Fax: 03 72 09 - 671-76 / 30



Jaguar Land Rover

Amtsberg, 20.09.2013

BESCHEINIGUNG EN 60204

„PRÜFUNG DER ELEKTRONISCHEN AUSRÜSTUNG VON INDUSTRIEMASCHINEN“.

Hiermit wird bescheinigt, daß die elektrische Anlage / das elektrische Betriebsmittel

Steuerschrank für Reinigungsanlage

Zeichnungs-Nr. :

Auftrags-Nr. : K135736

Flexiva-Nr. : K130745-P10

den Bestimmungen der Prüfvorschrift nach EN 60204 entspricht.

Insbesondere wurden Maßnahmen getroffen:

1. Isolationswiderstand
nach EN 60204-1 Abschnitt 18.3
- Meßpunkte „Zugang zu den Trafos an den Sicherungen“
- Meßpunkte „Abgänge von den Sicherungen“
2. Funktionsprüfung:
nach EN 60204-1 Abschnitt 18.6
3. Durchgangsprüfung:
Die Verdrahtung der elektrischen Anlage / des elektrischen Betriebsmittels wird
anhand des Stromlaufplanes durchgeführt.

Unterschrift
Leiter Automatisierung

FLEXIVA®
automation & Robotik GmbH
Weißbacher Straße 3 • D-09439 Amtsberg
U. Winkler - Dienst
Tel./Fax: 03 72 09 - 671-76 / -30



EG-KONFORMITÄTSERKLÄRUNG im Sinne der EG-Richtlinien

- EG-Niederspannungsrichtlinie (2006/95/EG)
- EG-Richtlinie elektromagnetische Verträglichkeit (2004/108/EG)

Hiermit erklären wir, dass das nachstehend bezeichnete elektrische Betriebsmittel in seiner Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den Bestimmungen der genannten EG-Richtlinien entspricht. Bei einer mit uns nicht abgestimmten Änderung des Betriebsmittels verliert diese Erklärung ihre Gültigkeit.

Elektrische Betriebsmittel

Produktbezeichnung : Steuerschrank für Reinigungsanlage
Typ : K135736
Nummer : 0913/K130745/+XXX_E
Baujahr : 2013

Hersteller

FLEXIVA automation & Robotik GmbH
Weißbächer Straße 3
09439 Amtsberg

Folgende harmonisierte Normen wurden angewendet:

- DIN EN ISO 13850 (Sicherheit von Maschinen -- Not-Halt -- Gestaltungsleitsätze)
- DIN EN 60204-1 (Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen)
- DIN EN 55011 (Grenzwerte und Messverfahren für Funkstörung von industriellen, wissenschaftlichen und medizinischen Hochfrequenzgeräten)
- DIN EN 55022 (Grenzwerte und Messverfahren für Funkstörungen von Einrichtungen der Informationstechnik)
- DIN EN 61000 6-4 (EMV Grundnorm Störaussendung Industriebereich)
- DIN EN 61000 6-2 (EMV Grundnorm Störfestigkeit im Industriebereich)

Der Betrieb der Anlage ist untersagt, bis der Hersteller der Gesamtanlage die Gesamtkonformität bestätigt hat.

Amtsberg, 20.09.2013
Leiter Automatisierung

FLEXIVA®
automation & Robotik GmbH
Weißbächer Straße 3 • D-09439 Amtsberg
Udo Winkler Dienst
Tel./Fax: 03 72 09 - 671-76 / 30



Bezeichnung der Anlage : Steuerschrank für Reinigungsanlage

Typ : K135736

Anlagen-Nr. : 0913/K130745/+XXX_E

Kunde : Jaguar Land Rover

SICHERHEITSHINWEISE - ELEKTRIK

Davon ausgehend, dass die Elektrik der o.g. Anlage vom Konstrukteur in Übereinstimmung mit den derzeit geltenden Europäischen Normen und Richtlinien konstruiert wurde, wurde die Anlage von uns unter Beachtung der Änderungen, wenn vorhanden, in der beigefügten Änderungsmitteilung hergestellt.

Unter anderem: Elektrische Ausrüstung von Niederspannungsanlagen/-einrichtungen;
Allgemeine Anforderungen DIN EN 60204-1
NOT-HALT Einrichtungen DIN EN ISO 13850

Warnung vor Restgefahren

Das Öffnen der Elektroausrüstung (Schaltschränke, Bedienpult) ist nur eingewiesenem Fachpersonal unter Beachtung der notwendigen Sicherheitsvorkehrungen gestattet.

Zur Unfallverhütung bei Instandhaltungs-, Wartungs- und Reparaturarbeiten ist die Anlage spannungsfrei zu schalten, sowie die Spannungsfreiheit zu prüfen und zu sichern.

Alle orange/gelb verdrahteten Geräte stehen auch bei ausgeschaltetem Hauptschalter unter Spannung und sind entsprechend gekennzeichnet.

Vor dem Anschluß und Zuschalten der Netzspannung ist die Übereinstimmung zwischen der werkseitigen Netzform beim Betreiber und der im Schrank vorgesehenen Netzform zu überprüfen.

Vor Inbetriebnahme der Anlage ist zu überprüfen, ob Klemmenabdeckungen, die zum Anschließen externer Kabelverbindungen entfernt wurden, zur Einhaltung des Berührungsschutzes wieder fachgerecht angebracht wurden.

Vor Inbetriebnahme der Anlage sind alle Drähte auf feststehenden Anschluss zu prüfen. Dabei ist das Drehmoment je nach Herstellerangaben zu beachten.

Die NOT-HALT-Funktion ist bei der Inbetriebnahme der Anlage zu überprüfen.

Wenn die elektrische Ausrüstung vollständig mit der Maschine verbunden ist, ist eine Prüfung nach DIN EN 60204-1 (VDE 0113) Absatz 18 auszuführen.

Die Parametrierung, Einstellung und Bedienung der Anlage darf nur von eingewiesenem Fachpersonal vorgenommen werden.

Die Anlage ist nur für den bestimmungsgemäßen Gebrauch bestimmt.

Zusätzlich zu beachten sind, falls vorhanden, die Hinweise der MECHANIK.

Diese Hinweise sind in der Gefahrenanalyse zu berücksichtigen.



12. Operating Instructions on Outsourced Items

Table of Contents:

Description	Make:	Chapter
Drag-out conveyor Type = KF30L23L-P38,1	Bär	1
Light barrier transmitter Type = BLS 18E-XX-1P-E5-X-S4	Balluff	2
Light barrier receiver Type = BLE 18E-PO-1P-E5-D-S4S		
Proximity switch Type = BES 516-326-G-S4-C Type = BES 516-131-S4-C Type = BES Q40KFU-PAC20B-S04G		
Vacuum pump Type = D250	Becker	3
Backflush filter Type = 6.63	Boll & Kirch	4
Fan Type = MSN 70-31,5/200-2 Type = MSN 50-25/300	BVA Kockelmann	5
Shutoff valve without actuator Type = RS	Crane	6
Shutoff valve with actuator Type = RS		
Bag filter SBF-0104-AD16-040B Version = Sideline	Eaton	7
Proximity switch Type = IGMF 05 GSP/10	EGE-Elektronik	8
Flange-mounted heater Type = 45 kW ET=1300	Elektro-Lindau	9
Non-contact safety switch Type = CES-AR-CL2-AH-SG-105753 Type = CET3-AR-CRA-AH-50X-SH	Euchner	10
Actuator Type = CET-A-BWK-50X		

OPERATING INSTRUCTIONS ON OUTSOURCED ITEMS

Description	Make:	Chapter
Type = CES-A-BLN-U2-103450		
Pneumatic cylinder Type = DNC-63-50-PPV-A Type = DNC-50-500-PPV-A Type = CRDNG-50-805-PPV-A-S6 Type = DNC-80-50-PPV-A-KP-SA	Festo	11
One-way flow control valve Type = GRLA-1/4-B		
Plate heat exchanger Type = FP 05-35-1-NH	Funke	12
Inclined head valve Type = 554 Type = 514	Gemü	13
Heat exchanger Type = WT-FL44 Chiller Type = WK30/VA	H&H Gerätebau	14
High-pressure pump Type = HDP 72 for VFD design	Hammelmann	15
Pressure switch Type = PN3060 Type = PN7003 Type = PN7009 Temperature sensor Type = TN2531 Type = TN7531 Type = TS2051 Type = TS5051 Evaluator Type = TR2432 Type = TR7432 Level probe Type = LMT100 Type = LMT110 Level switch Type = LI2142 Proximity switch Type = IN5225 Flow monitor	ifm electronic	16

OPERATING INSTRUCTIONS ON OUTSOURCED ITEMS

Description	Make:	Chapter
Type = SI5000 Type = SD6000		
Proximity switch Type = IC120126	IPF Electronic	17
Dirty-water pump Type = FREF 50-125 G1 MQO Type = FREF 32-110 G1 MQO	Johnson Pump	18
Thermostat Type = ATHF-70/U	JUMO	19
ETABLOC block pump Type = GN50-200/1852 Type = SN50-250/2202 S10 Type = GN32-160/302 G10	KSB	20
Robot (PROVIDED BY JAGUAR LAND ROVER) Type = KR 210 FOUNDRY	KUKA	21
Dosing unit Type = BT4B 0220 PPB 2000 UA 000000	ProMinent	22
Three-phase motor Typ = 1LG6 220-4MA60-Z A11+G17	Siemens	23
Worm gear Type = 2KJ1601-6CC13-2HH2-Z		24
		25
		26