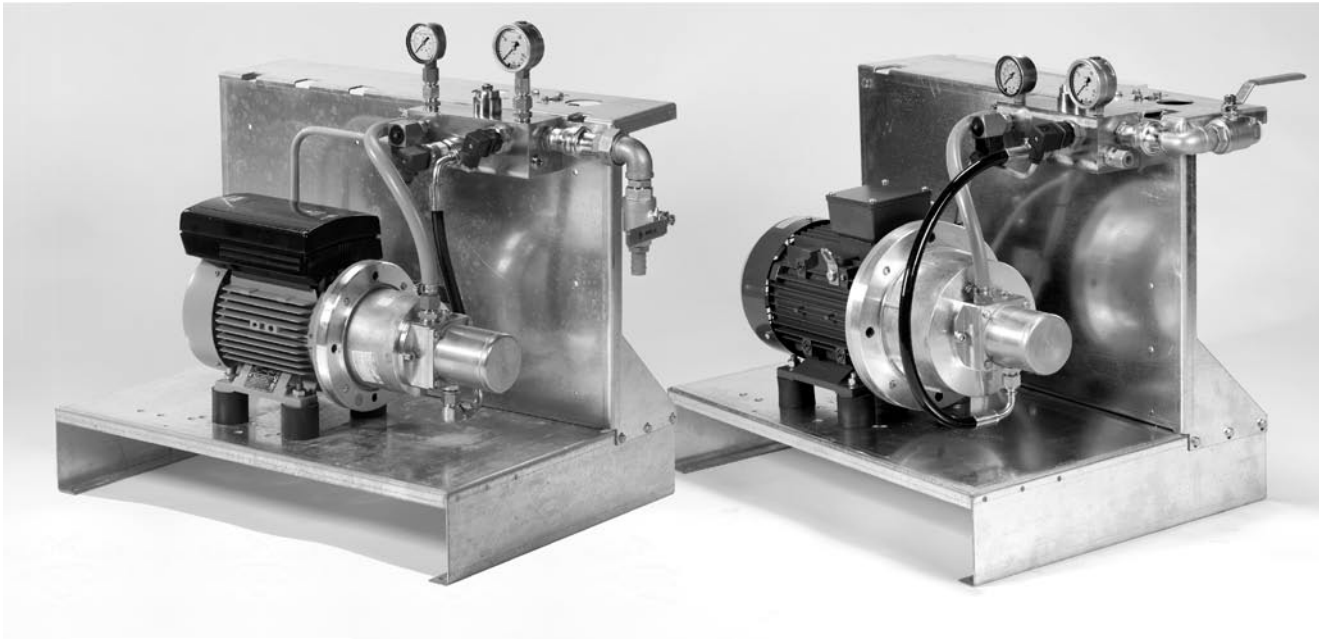
INSTRUCTIONS

Installation and commissioning instructions
Nessie® Plug&Spray™ unit

180R9126



180R9126

Contents

1. Introduction

Congratulations on your Danfoss Nessie Plug&Spray™ unit. To ensure the best performance and service life of our product, please read this instruction carefully and follow the recommendations how to integrate the Plug&Spray™ unit into your system.

2. General performance

The Nessie high-pressure water products from Danfoss are designed to operate on clean tap or potable water and technical water with low conductivity (De-Mineralized, De-Ionized, Reverse Osmosis). Danfoss defines clean tap water as water filtered to 10 µm absolute, β value > than 5000. This means that the water is filtered to a level where 99.995% of all particles larger than10 µm have been filtered out. Since Nessie pumps are water lubricated and cooled, failing to meet the water quality specification will reduce the expected service life of the components and void the limited warranty. It should be noted that systems with high-pressure atomization nozzles require a high filtration degree of the water to ensure optimal performance of the spray nozzles.

It is the responsibility of the end-user to provide sufficient feed water.

The system must be properly bled of air to prevent the pump from cavitating and running dry. Improper bleeding will cause cavitation and damage the pump (see chapter on commissioning).

Danfoss Nessie products are manufactured to operate properly at water temperatures of 3°C to 50°C (37°F to 122°F). Operation outside this area may cause damage to the system.

The Plug&Spray™ unit must be operated within the specifications stated in this manual. Sustained operation of components above the recommended limits will cause excessive wear and shorter service life.

3. General warranty issues

Component warranty is provided through the system manufacturer. All questions concerning warranty must be made with the system Original Equipment Manufacturer. Danfoss will not honour any warranty claims made directly to Danfoss from the end-user.

Danfoss will furthermore not accept warranty claims on components having operated outside the general and specific performance specifications and guidelines.

Spare parts and components are available through the system provider.

4. Identification

The Plug&Spray™ unit carries a nameplate sticker on the mounting plate indicating type and serial number of the unit. The pump carries a nameplate sticker too.

Please have all serial numbers and code numbers handy for service claims.

5. Safety

The Nessie Plug&Spray™ unit is capable of generating very high pressure that can be harmful to human beings. It is recommended to wear appropriate personal protection equipment when commissioning and servicing the system.

6. System design

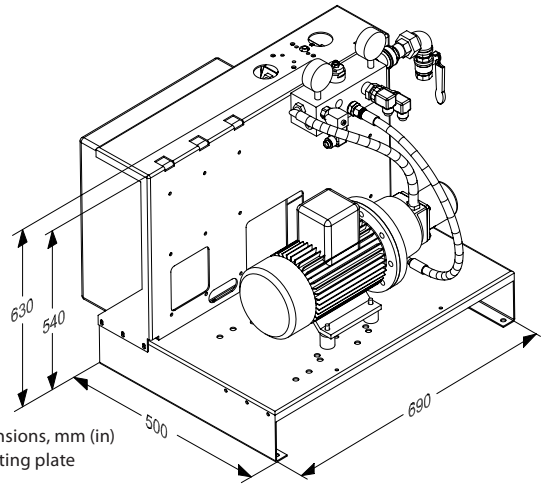
The Plug&Spray™ units are designed for humidification and adiabatic cooling with high-pressure atomization. The units come in a constant speed version with IEC or Nema electric motor as well as in a version with constant pressure regulation using a Danfoss FCM 300 variable speed drive motor.

The Plug&Spray™ units are available with 6 different pump sizes (see technical data) to match the required flow demand. The motor power is dimensioned to provide design flow at a system pressure of max. 100 bar or 1450 psi.

The Nessie high-pressure axial-piston pumps provide excellent pressure stability at high efficiency and low noise level. Accumulators are superfluous. The Plug&Spray™ units comprise all necessary components to ensure the best possible performance, maximum service life with maximum protection of the pump. The units are very compact and require very little space and are suitable for both wall and floor mounting.

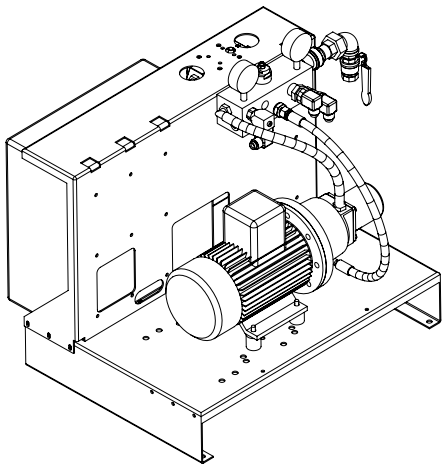
7. Mechanical installation
The Plug&Spray™ units can be floor mounted. It is also possible to mount the unit on supports on a wall.

The optional electric connecting box can be factory-installed, mounted on a suitable wall or on supports at eye level on the pump unit.



Dimensions, mm (in)
Mounting plate

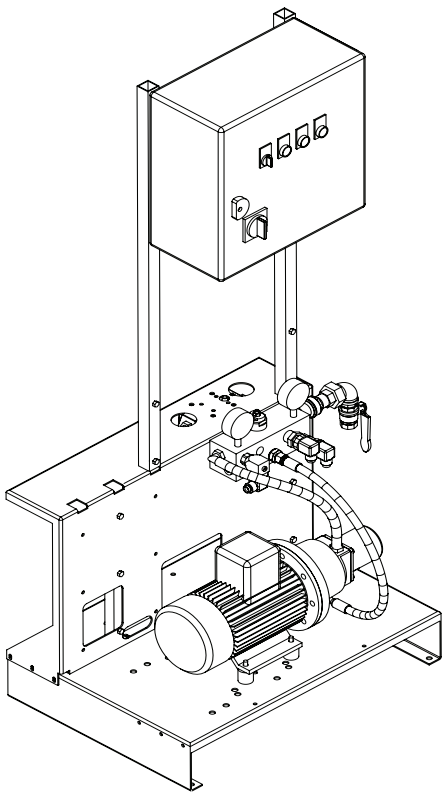
Compact design:
The Plug&Spray™ unit is placed on a suitable flat area and fixed to the floor with 4 bolts. If required, the unit can also be placed on angle supports mounted in required height. The optional connecting box is mounted on the pump unit from factory.



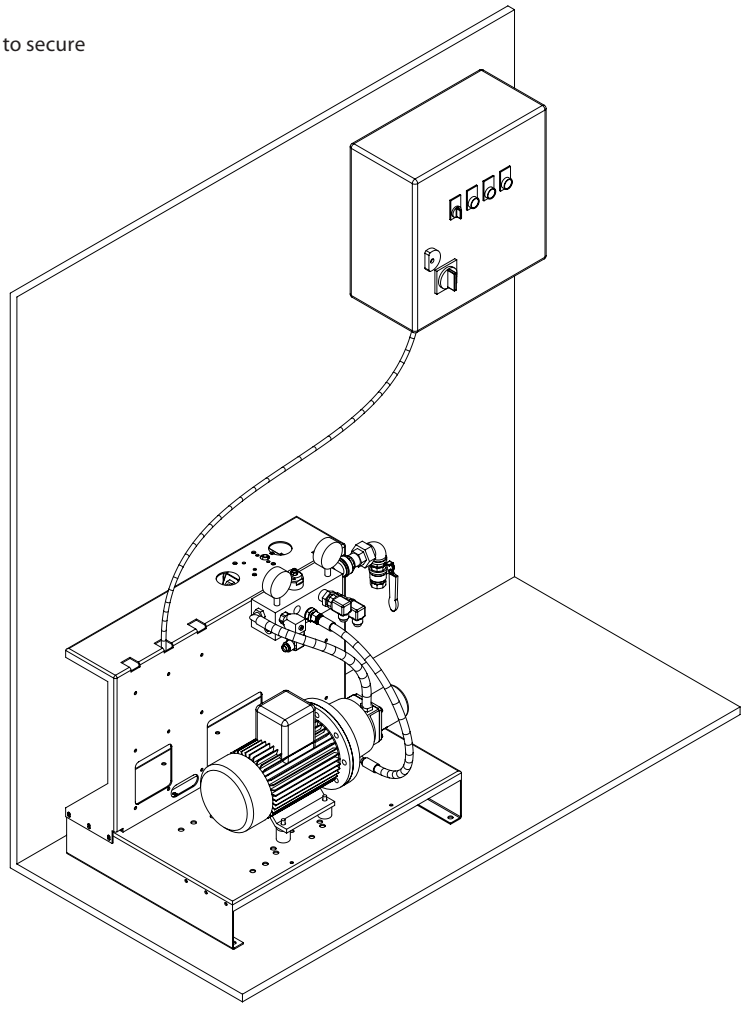
Free-standing arrangement:
For free-standing arrangement, the optional electric connecting box or, as required, the control unit is mounted on supports at the pump unit. The supports are dismantled during transport.

The upper support part is inserted into the bottom part during installation and joined together with the supplied screws.

NB: The mounting plate must be fixed to the floor with 4 bolts to secure the system against tipping.



Wall mounting:
In units for wall mounting, the optional electric connecting box or, as required, the control unit is connected to the pump unit by a 2-metres cable from factory. Usually the pump unit is placed on the floor and the connecting box wall mounted.

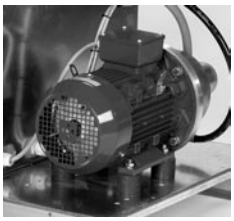


8. Electrical connection

Please note: The electrical connection for the Nessie Plug&Spray™ units is only to be installed by authorized and skilled personnel. Local directions must be followed under any circumstance.

8.1 Basic unit without electrical connecting box
Constant speed version (CS)

Electric motor:

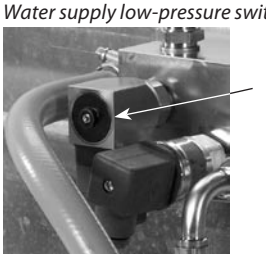


The electric motor is a standard IEC or Nema AC motor and has to be wired and protected against overload according to local codes. See the motor nameplate for technical data.

Connect to the motor terminals as necessary.

The motor is wound for 3 × 230/400 V in IEC version and 3 × 230/460 V in Nema version. Special versions with single-phase motors or other supply voltages are available on request. Check the nameplate data!

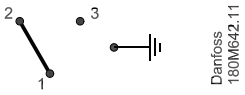
Water supply low-pressure switch:



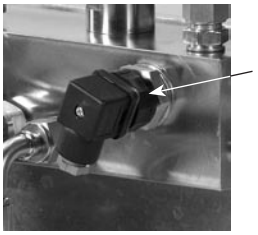
The switch protects the pump against cavitation (insufficient supply pressure) or from running dry (no water supply). Wire the break contact to your control system to stop the motor at insufficient supply pressure. The contact 1-3 is made when the pressure is sufficient.

The switch is set to be activated at 1.6 bar.

Max. load: 250 V AC/24 V DC, 0.5 A



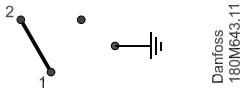
Water temperature switch:



The switch protects the system against overheating. Wire the break contact to your control system to stop the motor at high temperature. The contact 1-2 is made when the temperature is below 50°C.

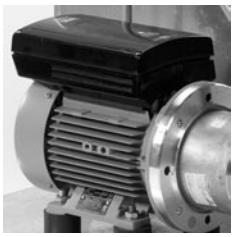
The switch is set to be activated at 50°C ±5°C.

Max. load: 250 V AC/24 V DC, 0.5 A



8.2 Basic unit without electrical connecting box
Variable speed version (VS)

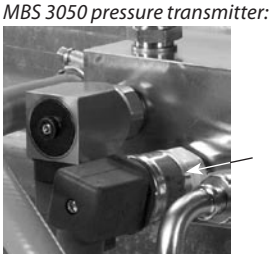
FCM 300 drive motor:



The Danfoss FCM 300 drive motor has to be connected to a 380-480 V 50/60 Hz 3-phase power supply as described in the operation instruction (delivered with variable speed Plug&Spray™ Units).

Please read the instruction carefully.

MBS 3050 pressure transmitter:



The MBS 3050 pressure transmitter is already wired into the FCM 300 drive motor (terminal 6 for 24 V DC power supply and terminal 1 analogue input 4-20 mA)

8.3 Additional wiring of the FCM 300 drive motor

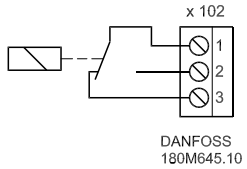
The FCM 300 drive motor provides numerous possibilities for additional connections to the control system. As minimum the following connections are recommended:

- Start/Stop — Terminal 4
- Reset (push button) — Terminal 3
- Fault indication — Relay X 102

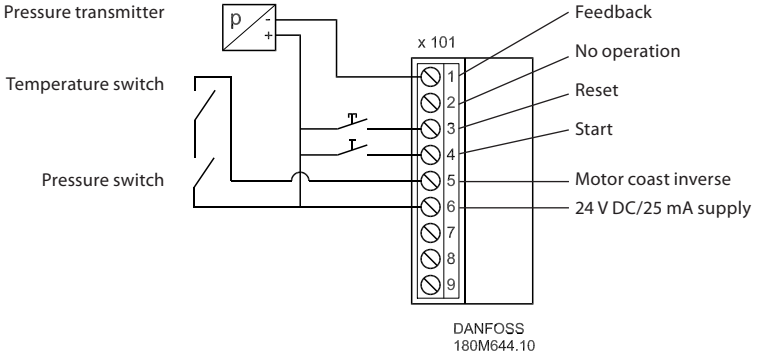
The low-pressure switch and the high-temperature switch are integrated in the safety loop of the FCM 300 from factory (please see diagram).

- Motor coast, inverse — Terminal 5

Please refer to the FCM 300 instructions for detailed information.



Fault relay

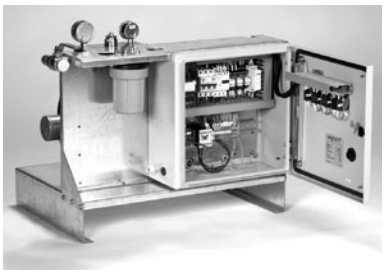


8.4 Units with electrical connecting box
Constant speed version (CS)

Plug&Spray™ units equipped with electrical connecting box from factory are fully wired and prepared for direct power supply connection. The following connections must be made:

- 3-phase power supply (3 × 400 V)
- Start-signal through external potential-free contact
- Fault relay

Please refer to the wiring diagram delivered with the system.



8.5 Units with electrical connecting box
Variable speed version (VS)

Plug&Spray™ units equipped with electrical connecting box from factory are fully wired and prepared for direct power supply connection. The operator's control is placed in the front panel of the drive motor connecting box. The following connections must be made:

- 3-phase power supply (3 × 400 V)
- Start-signal through external potential-free contact
- Fault relay

Please refer to the wiring diagram and the manual delivered with the FCM 300 drive motor.

9. Water connection:

Water supply
Connection of water supply, filter, low-pressure switch and manometer are integrated in the common connection block of the Plug&Spray™ unit.

Water supply

The Plug&Spray™ units can operate on tap water or technical water, such as water from a reverse osmosis plant.
Included in the consignment are a ball valve, rotating fittings and a check valve preventing return flow into the supply.

The water temperature must be kept between +3 and +50°C, respectively 37 and 122°F.

The supply pressure must not exceed 2 and 4 bar. In case of unstable or peak water pressure, a pressure reduction valve and an electrical shut off valve are recommendable.

A supply pressure of at least 2 bar/29 psi is recommended to compensate for the pressure loss in the filter element depending on the degree of contamination. The low-pressure protection switch is set to 1,6 bar.

Checking the water supply pressure

Make sure that the water supply pressure is neither insufficient nor excessive. Check the reading of the manometer.
The manometer measures the pressure after the filter and can thus be used to monitor the filter condition.

⚠ Cavitation or over-pressurization can cause severe damage to the pump.

High-pressure connection

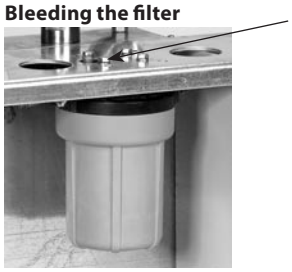
Two high-pressure connections are integrated in the common Plug&Spray™ connecting block.

The ports are G 3/8" female. One of the connections is plugged from factory.

On request, a 3/8" NPT adapter is available.

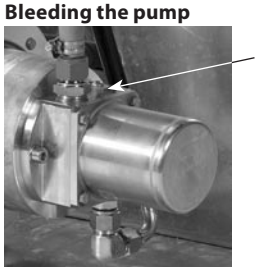
10. Commissioning:

Bleeding the filter



Turn on the water and open the ball valve. Press the red button several times to bleed the filter housing. Repeat until no more air escapes from the filter, just water.

Bleeding the pump



Untighten the bleeding plug of the pump approximately one-two revolutions. Bleed the pump until no more air escapes from the pump.

Close and tighten the bleeding plug!

⚠ Repeat the bleeding procedure for filter and pump after short operation of the pump to prevent any remaining air from accumulating in the pump.

Direction of rotation

⚠ Check the direction of rotation of the motor by briefly starting the motor and watch the cooling fan. During this, the high-pressure connection should not be connected (pressure less testing.) The fan wheel has to turn clockwise. Compare with the arrow on the pump or pump support.

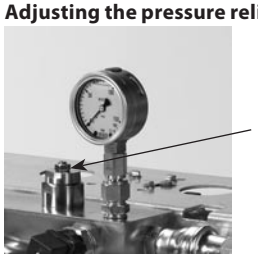
If the direction is incorrect, swap two supply phases and check again. With units with drive motor FCM 300 please check the programming (see section on programming of the FCM 300 below).

Flushing the system

The Plug&Spray™ units are protected from factory against corrosion and frost with MPG (monopropylene glycol). Flush the system thoroughly before connecting the application to the high-pressure discharge connection.

⚠ Insufficient flushing can cause bacteria growth resulting in health problems!

Adjusting the pressure relief valve



A pressure relief valve, type VRH 30 CA cartridge is installed in the common connection block of the Plug&Spray™ units allowing adjusting the discharge pressure between 25 and 140 bar.

Adjust the desired pressure at zero flow, by means when all nozzles (consumers) are not in operation.

In units with variable speed, the relief pressure valve should always be adjusted slightly higher than the PID controller set point, i.e. at set point 70 bar, set the relief valve to at least 80-85 bar.

Untighten the retaining nut, turn the adjustment screw until the desired pressure is read on the manometer, and tighten the retaining nut to fix the setting.

Checking the joint connections – and for leakages

As soon as the system has reached steady operating conditions, however, no later than after 10 hours' operation, the system is stopped and all pipe connections and fixing devices checked and, if required, tightened (various parts may get loose during transport or installation).

Minimum programming of the FCM 300 drive motor

There are two ways to program the FCM 300 drive motor (please also refer to FCM Design Guide or Operation Manual):

- Using the Danfoss "Local Control Panel" (LCP 2) or
- The Danfoss PC software

Both solutions connect into the RS 485 interface of the drive motor (X 100).

In general, the FCM 300 drive motor comes with a standard factory setting. A few parameters must, however, be set to adapt the FCM to the Plug&Spray™ setup. Danfoss Nessie has programmed the minimum setup as described below (deviation from factory setting):

To start with, please set the language in parameter 001 to *English* if necessary.

Par. No.	Parameter description	Required setting
100	Configuration	Process closed loop
200	Rotation direction	132 Hz counter clockwise
201	min. output frequency	16.7 Hz (equals 1000 rpm)
		33 Hz for NPS 10, 12.5 VS (equals 1000 rpm)
202	max. output frequency	50 Hz (equals 3000 rpm)
		85 Hz for NPS 10, 12.5 (equals 2400 rpm)
215	Preset reference 1	Depends on application, see description below
323	Relay function X102	Fault
331	Input 1, analogue	Feedback
332	Input 2, digital	No operation
335	Input 5, digital	Motor coast inverse
336	Input 1, min. scaling	4.0 mA
415	Maximum actual value/feedback	160.000
416	Reference/feedback unit	bar
440	Process PID proportional gain	To be programmed on commissioning, eg 2.00
441	Process PID integral time	To be programmed on commissioning, eg 4.00 s
455	Speed range monitoring	Disabled
205	Maximum reference	160 bar (must be programmed after par. 415)

Par. 215, preset reference 1:
The setting of this parameter determines the set point of the PID-controller and thus the system pressure. The setting is expressed as a percentage of the feedback range programmed in par. 414/415.

Example:
transmitter range 0…160 bar, desired set point 70 bar: 70/160 = 0,4375
Program 43,75% in parameter 215

To program the FCM 300 according to the additional wiring described above, please refer to the FCM Design Guide or Operation Manual.

⚠ When finished programming the FCM 300, make sure to press START before unplugging the LCP 2 or the PC software. Then disconnect power; otherwise the system will not start when applying power next time.

11. Maintenance

11.1 Filter replacement:

The supply pressure manometer allows to check the supply pressure and to monitor it for preventative maintenance, e.g. changing filter. When the pressure drop across the filter increases over time as the filter becomes dirty, the pressure will decrease. To avoid an unforeseen system stop, replace the filter cartridge before reaching the cut-off pressure level of 1.6 bar (23 psi).

- Use only original Danfoss spare part
- Shut the ball valve
- Relief pressure from the system by pressing the red button
- Remove the filter housing and the used cartridge
- Attach the gaskets on both ends (thin type) to the new cartridge
- Insert the new cartridge
- Please be careful with the O-ring in the filter housing
- Turn the filter house carefully when reapplying
- Make sure that the gasket stays in proper position
- Only hand tighten the filter house, do not use a tool!

⚠ Never run the system without filter cartridge! Improper filtration may result in severe damage or reduced lifetime. Danfoss will not accept warranty claims due to contamination.

11.2 Pump replacement

Nessie pumps are maintenance-free. Under normal operation conditions and with sufficient filtration, the pump service life is at least 8000 operating hours. Only when the pump performance is decreasing or the noise level increasing, the pump should be replaced immediately.

In systems with high availability demands, Danfoss recommends a preventive pump replacement after 8000 operating hours.

The replacement must only be made by an authorized Danfoss service partner.

11.3 Decommissioning

Humidification and adiabatic cooling systems are often seasonally operated. This may result in longer periods of no operation and the following problems:

- Hygiene problems due to bacteria growth (bio film)
- Corrosion of vital parts (if air accumulates in the system over time)

The best way to avoid both problems is to run the system - although not needed - for a couple of minutes every day to entirely replace the water in the system. An optional drain valve may be installed to drain the system to the sewer. If this is not feasible, the system should be preserved as described in the following chapter about frost protection.

11.4 Frost protection:

If the Plug&Spray™ unit is exposed to temperatures below freezing, the system must be frost protected with a glycol mixture (minimum 35% of monopropylene glycol).

Follow this procedure:

- Disconnect the water supply; connect the supply to a canister with glycol mixture
- Drain the system as much as possible, remove the filter housing to drain it
- Connect the high-pressure discharge to the same canister with glycol mixture
- Briefly run the pump pressure-less to entirely fill the system with glycol mixture
- To re-commission, flush the system as described above
- It is recommended to renew the filter cartridge shortly after re-commissioning!

⚠ Never just drain the system! Remaining water will result in corrosion and damage! Always refill the system with water or glycol mixture.

12. Trouble Shooting

Motor does not start:

- Check power supply
- Check start permission from control system
- FCM 300:
  - o Check programming
  - o Is a start signal applied to terminal 4?
  - o Is the supply pressure sufficient?
  - o Is the water temperature below 50°C/122°F
  - o Is line 2 blinking when using an LCP? If so, press START
  - o Reset the FCM after a fault or trip condition

Pump does not generate pressure:

- Check water supply:
  - o Ball valve open?
  - o Supply pressure OK?
  - o Filter OK, not clogged?
- Repeat bleeding procedure
  - o Bleed the filter
  - o Bleed the pump
- Check application:
  - o Is any dump valve open?
  - o Are all nozzles properly installed and tight?
  - o Is there still any air in pipes and hoses?
- After pump replacement:
  - o Have the installation instructions for the pump been observed?
  - o Has the flexible coupling between motor and pump been installed properly? No axial load is tolerated!

Pump generates too low pressure:

- Is the pressure relief valve properly adjusted?
- Is the FCM 300 pressure set point programmed correctly?
- Are there any leakages in the system?
- Do all nozzles spray as expected?
- Is the Plug&Spray™ unit properly sized in relation to the nozzles?

Pump is noisy:

- A noisy pump is often a sign of cavitation.
  - o Is the system properly bleeded?
  - o Is the supply pressure sufficient?
  - o In case of a mechanical failure, stop the pump immediately and return it for inspection.

Pressure decreases over time:

- The pump is providing less and less pressure over time.
  - o Has the resistance of the nozzles changed?
  - o Are there any leakages in the system?
  - o Is the pressure relief valve still adjusted correctly?
  - o The pump may have reached its service life and requires a refurbishment.

13. Technical data:

Water supply:	
Water supply	∅19 mm hose fitting or G 3/4" female thread
Pressure	min. 2 bar (28 psi), max. 4 bar (56 psi)
Filter	10 µm absolute beta > 5000, 5" or 10" (10, 12.5 VS)
Pressure switch	1.6 bar (23 psi), make or break 250 V a.c./24 V d.c. 0.5 A
Temperature switch	50°C +/- 5°C, break 250 V a.c./24 V d.c. 0.5 A
High pressure pump:	
Max. discharge pressure	100 bar (1450 psi), continuous
Min. pump speed	1000 rpm
Max. pump speed	3000 rpm, 2400 rpm NPS10,12.5 VS
Discharge connection	G 3/8" female, 3/8" NPT adapter on request
Pressure relief valve:	
Type	VRH 30 CA cartridge
Capacity	max. 30 l/min/1800 l/h (8 gpm)
Adjustment range	25-140 bar (350-2000 psi)
Environmental conditions:	
Water temperature supply	+3°C - +50°C/37°F - 122°F
Ambient temperature	+3°C - +50°C/37°F - 122°F, VS units max. 40°C/104°F
Storage temperature	-25°C - +65°C/13°F - 149°F with frost protection!
Operation & storage humidity	5-95% rF, non condensing

Type	**NPS 1CS**	**NPS 2CS**	**NPS 3.2CS**	**NPS 4CS**	**NPS 6.3CS**	**NPS 10CS**	**NPS 12.5CS**	**NPS 2VS**	**NPS 3.2VS**	**NPS 4VS**	**NPS 6.3VS**	**NPS 10VS**	**NPS 12.5VS**
Ordering code	180U3300	180U3301	180U3302	180U3303	180U3304	180U3305	180U3306	180U3307	180U3308	180U3309	180U3310	180U3311	180U3312
Pump type	PAH 2	PAH 2	PAH 3.2	PAH 4	PAH 6.3	PAH 10	PAH 12.5	PAH 2	PAH 3.2	PAH 4	PAH 6.3	PAH 10	PAH 12.5
Minimum flow at 100 bar*	7.5 l/h	10 l/h	20 l/h	30 l/h	50 l/h	75 l/h	100 l/h	10 l/h	20 l/h	30 l/h	50 l/h	75 l/h	100 l/h
Maximum flow at 100 bar*	75 l/h	100 l/h	200 l/h	300 l/h	500 l/h	750 l/h	1000 l/h	300 l/h	450 l/h	600 l/h	1000 l/h	1350 l/h	1750 l/h
Motor type	0.55 kW 6-pole	0.75 kW 4-pole	1.5 kW 4-pole	1.5 kW 4-pole	2.2 kW 4-pole	3 kW 4-pole	4 kW 4-pole	FCM 315 2-pole	FCM 322 2-pole	FCM 322 2-pole	FCM 340 2-pole	FCM 355 4-pole	FCM 355 4-pole
Motor voltage	3×230/ 400 V 50 Hz	3×230/ 400 V 50 Hz	3×230/ 400 V 50 Hz	3×230/ 400 V 50 Hz	3×230/ 400 V 50 Hz	3×230/ 400 V 50 Hz	3×400/ 690 V 50 Hz	3×380- 480 V 50/60 Hz	3×380- 480 V 50/60 Hz	3×380- 480 V 50/60 Hz	3×380- 480 V 50/60 Hz	3×380- 480 V 50/60 Hz	3×380- 480 V 50/60 Hz
Motor current, FLA	1.7A (400 V)	1.9 A (400 V)	3.5 A (400 V)	3.5 A (400 V)	4.7 A (400 V)	6.3 A (400 V)	8.2 A (400 V)	3.3/2.6 A (380 V/ 480 V)	4.7/3.7 A (380 V/ 480 V)	4.7/3.7 A (380 V/ 480 V)	7.9/6.4 A (380 V/ 480 V)	11/8.7 A (380 V/ 480 V)	11/8.7 A (380 V/ 480 V)
Cos φ	0.72	0.77	0.79	0.79	0.82	0.83	0.83	1	1	1	1	1	1
Speed in rpm	900	1400	1400	1400	1420	1420	1440	1000- 3000	1000- 3000	1000- 3000	1000- 3000	1000- 2400	1000- 2400
Weight without options	55 kg	55 kg	58 kg	58 kg	67 kg	73 kg	76 kg	64 kg	70 kg	70 kg	81 kg	104 kg	104 kg
Shipping weight	85 kg	85 kg	88 kg	88 kg	97 kg	103 kg	106 kg	94 kg	100 kg	100 kg	111 kg	134 kg	134 kg
Crate size H×B×T	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m	0.8 m × 0.6 m × 0.8 m

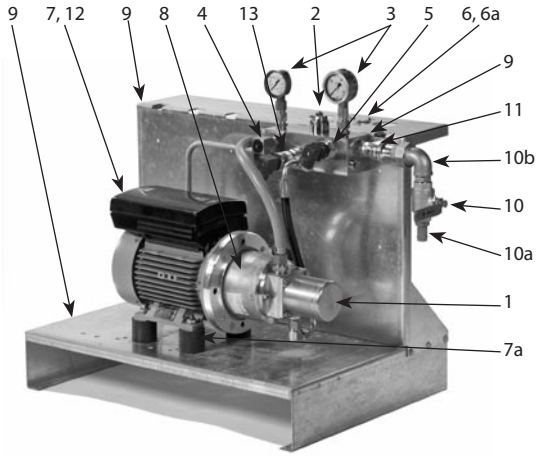
* Minimum and maximum flow increase with decreasing system pressure. Please observe technical data in pump data sheet.

14. Purchase of spare parts:

For the purchase of spare parts or other replacement units, type and serial number of the components to replace must always be stated. And if possible, the serial number for the whole system should be stated too.

Spare Part list

No.	Quant	Description	Spare part no.
1	1	Pump PAH 2 (NPS 1)	180B0031
		Pump PAH 2 (NPS 2)	180B0031
		Pump PAH 3.2 (NPS 3.2)	180B0077
		Pump PAH 4 (NPS 4)	180B0030
		Pump PAH 6.3 (NPS 6.3)	180B0029
		Pump PAH 10 (NPS 10)	180B0032
		Pump PAH 12.5 (NPS 12.5)	180B0033
2	1	Pressure Relief valve VRH 30 CA Cartridge	180G0032
3	1	High-pressure manometer 0-160 bar	180X5875
	1	Low-pressure manometer 0-10 bar	180N0663
4	1	Water supply switch 1.6 bar	180N0140
5	1	Water temperature switch 50° switch	180N0157
6	1	Filter housing 5" (NPS 1 - 12.5 CS, 2-6.3 VS)	180N0075
		Filter housing 10" (NPS 10 – 12.5 VS)	180X5224
6a	1	Filter cartridge 5" 10 µm abs	180N0037
6a	1	Filter cartridge 10" 10 µm abs	180X5225
7	1	Electric motor 0.55 kW (NPS 1 CS-IEC)	180N0671
		Electric motor 0.75 kW (NPS 2 CS-IEC)	180N0371
		Electric motor 1.5 kW (NPS 3.2 4 CS-IEC)	180N0021
		Electric motor 2.2 kW (NPS 6.3 CS-IEC)	180N0280
		Electric motor 3 kW (NPS 10 CS-IEC)	180N0127
		Electric motor 4 kW (NPS 12.5 CS-IEC)	180N0672
7a	4	Vibration dampers	180N0673
8	1	Pump support (NPS 1.2 IEC, 2 VS)	180N0304
		Pump support (NPS 3.2-10 CS, 3.2-6.3 VS))	180N0196
		Pump support (NPS 10, 12.5 VS)	180N0078
		Flexible coupling (NPS 1.2 CS, 2VS)	180Z0304
		Flexible coupling (NPS 3.2-12.5 CS, 3.2-6.3 VS)	180Z0227
		Flexible coupling (NPS 10, 12.5 VS)	180Z0226
9	1	Mounting plate – horizontal part	180N0487
		Mounting plate – vertical part	180N0488
		Connection block without connecting parts	180G0452
10	1	Ball valve ¾"	180N0222
10a	1	Hose fitting ×∅ 19mm	180N0674
10b	1	Swivel union ¾"	180N0649
11	1	Non-return valve	180N0223
12		Motor FCM 315 (NPS 2 VS)	177H0373
		Motor FCM 322 (NPS 3.2, 4 VS)	177H0393
		Motor FCM 340 (NPS 6.3 VS)	177H0446
		Motor FCM 355 (NPS 10, 12.5 VS)	177H0243
13	1	Pressure transmitter MBS 3050 0-160 bar	060G1152
14	1	FCM 300 operating device (LPC2)	175N0131
14a	1	Plug kit	175N2545
14b	1	Cable for plug kit	175N0162



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