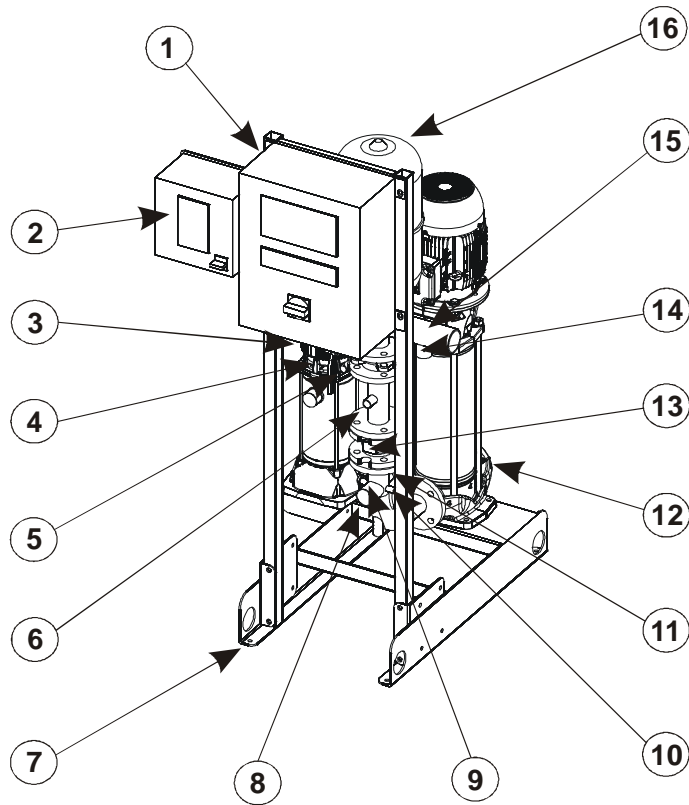
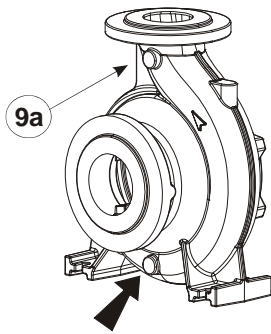


**FIRE-FIGHTING SET TO STANDARDS EN 12845 – UNI 10999**

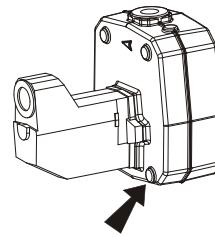
**1 NKV Electropump + Pilot Pump**



**Main Electropump**



**Pilot Electropump**



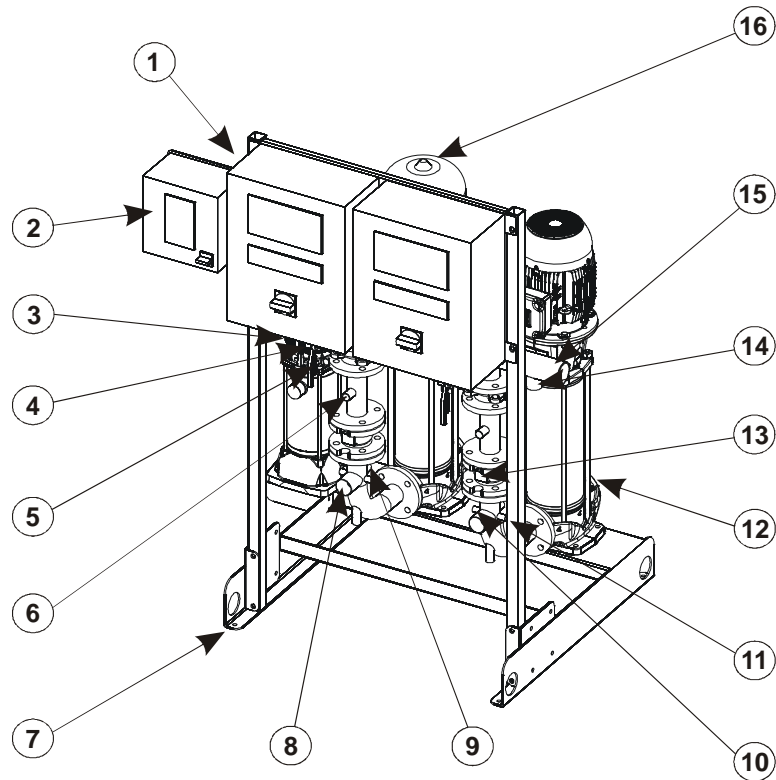
**ATTENTION!**

WHEN THE SET IS SUPPLIED, THE PUMP BODY DRAINAGE CAP IS UNSCREWED!  
THE DRAINAGE CAP IS IN THE BAG ATTACHED TO THE SET!

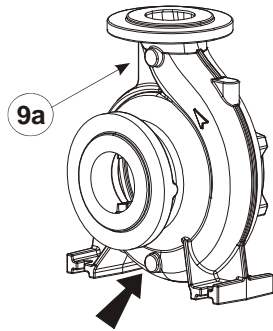
- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1 Independent control panel for each main pump</li> <li>2 Pilot pump control panel</li> <li>3 Pilot pump</li> <li>4 Pilot pump pressure switch</li> <li>5 Interception valve that may be padlocked</li> <li>6 Starting pressure switches circuit</li> <li>7 Holes for fixing to the ground</li> <li>8 2" coupling for priming tank</li> <li>9 ¼" coupling for recirculating water</li> <li>9a Pump air and recirculating vent 3/8"</li> </ul> | <ul style="list-style-type: none"> <li>10 Pump running pressure switch</li> <li>11 Test system for check valve</li> <li>12 Independent intakes</li> <li>13 Check valve on service pump</li> <li>14 1" coupling for sprinkler flow switch in pump room</li> <li>15 Single delivery manifold</li> <li>16 Expansion vessel for pilot pump</li> </ul> |
|--|---|

**FIRE-FIGHTING SET TO STANDARDS EN 12845 – UNI 10999**

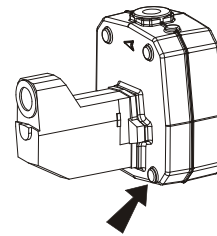
**2 NKV Electropumps + Pilot Pump**



**Main Electropump**



**Pilot Electropump**



**ATTENTION!**

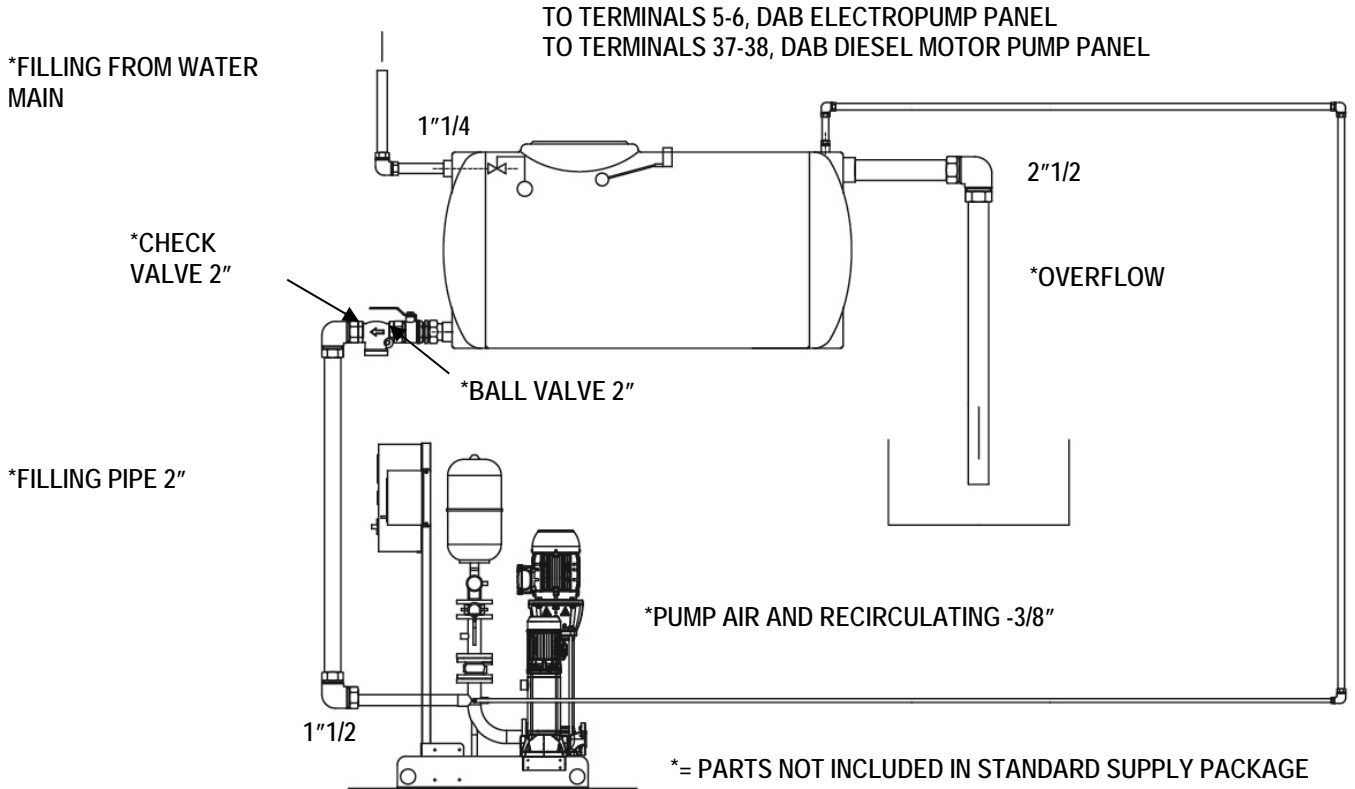
WHEN THE SET IS SUPPLIED, THE PUMP BODY DRAINAGE CAP IS UNSCREWED!  
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- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1 Independent control panel for each main pump</li> <li>2 Pilot pump control panel</li> <li>3 Pilot pump</li> <li>4 Pilot pump pressure switch</li> <li>5 Interception valve that may be padlocked</li> <li>6 Starting pressure switches circuit</li> <li>7 Holes for fixing to the ground</li> <li>8 2" coupling for priming tank</li> <li>9 1/4" coupling for recirculating water</li> <li>9a Pump air and recirculating vent 3/8"</li> </ul> | <ul style="list-style-type: none"> <li>10 Pump running pressure switch</li> <li>11 Test system for check valve</li> <li>12 Independent intakes</li> <li>13 Check valve on service pump</li> <li>14 1" coupling for sprinkler flow switch in pump room</li> <li>15 Single delivery manifold</li> <li>16 Expansion vessel for pilot pump</li> </ul> |
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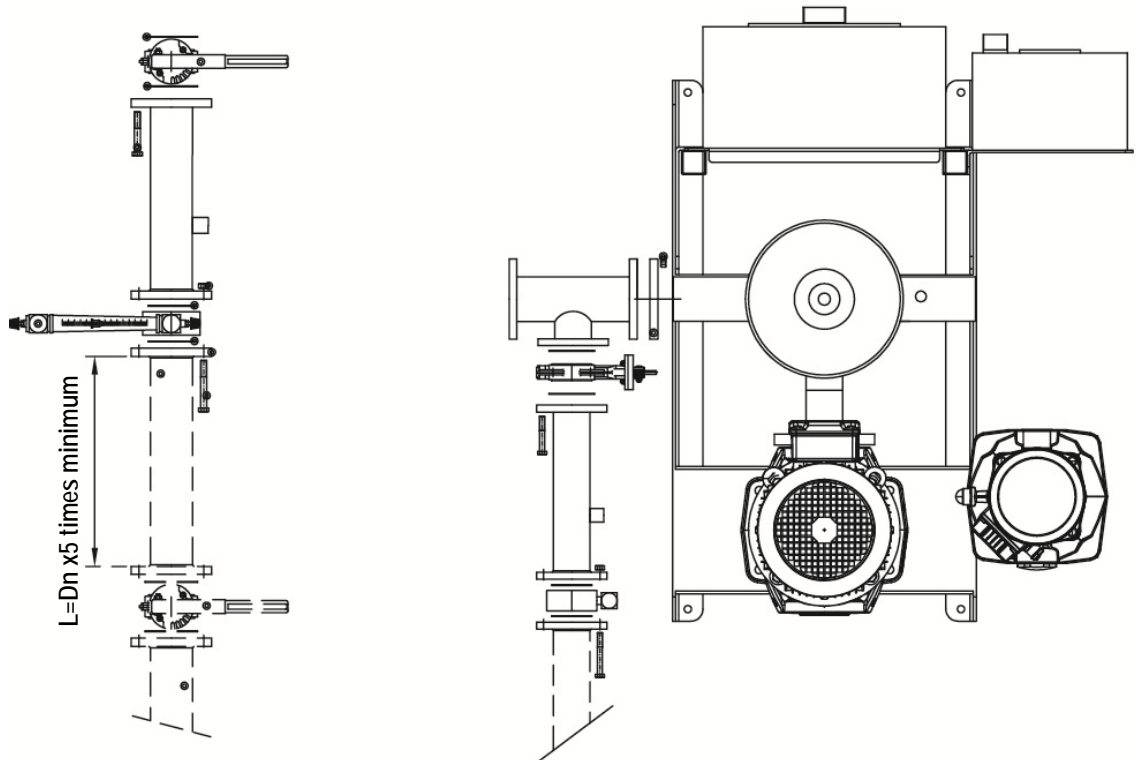
## FIRE-FIGHTING SETS TO UNI-EN 12845 WITH VERTICAL PUMPS

### PRIMING TANK TO UNI-EN 12845

A priming tank of 500 l must be installed for each main pump in the event of installation above water level ("above head") only.



### FLOW METER KIT



	page
<b>INDEX</b>	
<b>1. GENERAL</b>	23
<b>2. WARNINGS</b>	23
2.1. Skilled technical personnel	23
2.2. Safety	23
2.3. Responsibility	23
<b>3. INSTALLATION</b>	23
<b>4. ELECTRICAL CONNECTION</b>	24
<b>5. CHECKING OPERATION OF THE SET</b>	24
5.1. Checking operation of the Electropump	24
5.2. Checking operation of the Compensating Electropump (Pilot Pump)	25
5.3. Sets with several pumps	25
<b>6. PERIODIC MAINTENANCE</b>	25
6.1. Weekly check	25
6.2. Monthly check	25
6.3. Quarterly check	25
6.4. Half-yearly check	26
6.5. Yearly check	26
6.6. Three-yearly check	26
6.7. Ten-yearly check	26
<b>7. REGULATING THE SET</b>	26
7.1. Calibration of the pressure switches	26
<b>8. COMPENSATING ELECTROPUMP</b>	27
<b>9. MAINTENANCE</b>	27
9.2. Troubleshooting	27

**1. GENERAL**



**Read this documentation carefully before installation.** Installation and operation must comply with the local safety regulations in force in the country in which the product is installed. Everything must be done in a workmanlike manner and exclusively by qualified technical personnel (paragraph 2.1) in possession of the skills required by the regulations in force. Failure to respect the safety regulations not only causes risk to personal safety and damage to the equipment, but invalidates every right to assistance under guarantee.

**Keep this manual with care for further consultation even after the first installation.**

**2. WARNINGS**

**2.1. Skilled technical personnel**



**It is indispensable that installation be carried out by competent, skilled personnel in possession of the technical qualifications required by the specific legislation in force.**

The term **skilled personnel** means persons whose training, experience and instruction, as well as their knowledge of the respective standards and requirements for accident prevention and working conditions, have been approved by the person in charge of plant safety, authorizing them to perform all the necessary activities, during which they are able to recognize and avoid all dangers. (Definition for qualified technical personnel IEC 60634)

**2.2. Safety**

Use is allowed only if the electric system is in possession of safety precautions in accordance with the regulations in force in the country where the product is installed (for Italy CEI 64/2).


**2.3. Responsibility**




**The Manufacturer does not vouch for correct operation of the set or for any damage that it may cause if it has been tampered with, modified and/or run outside the recommended work range or without the aid of our control and protection panels.**


**The Manufacturer declines all responsibility for possible errors in this instructions manual, if due to misprints or errors in copying. The Manufacturer reserves the right to make any modifications to products that it may consider necessary or useful, without affecting their essential characteristics**

**3. INSTALLATION**

**3.1.**  The set must be fitted in a well ventilated place, protected from unfavourable weather conditions, and with an environment temperature not less than 4°C (10°C if motor pumps are installed too), and not exceeding 40°C. Position the set in such a way that any maintenance jobs can be carried out without difficulty.

**3.2.**  Ensure that the system pipes are independently supported and do not weigh down on the set manifolds so as to avoid deformation or breaking of any of its components.

**3.3.** Vibration-damping couplings should be fitted between the suction and delivery pipes and the system.

- 3.4.  Ensure that the characteristics of the water supply source are such as always to guarantee the flow rate required in the expected operating conditions.
- 3.5. Make the intake section following all the precautions necessary to keep load losses to a minimum and to avoid the formation of air pockets, for example:
- Position the set as close as possible to the water supply source.
  - Provide each pump with its own intake pipe (EN 12845 – UNI 10779).
  - Lay the suction pipes horizontally or sloping slightly upwards towards the set.
  - Avoid using elbows or couplings that cause sudden changes in direction. If necessary, use bends with a wide radius.






**Avoid the “siphon” effect at intake: it risks unpriming the pumps!**

- 3.6. The vertical distance between the pump intake and the minimum water level must not exceed 3.2 metres. (EN 12845 point 10.6.2.3 – UNI 10779)

#### 4. ELECTRICAL CONNECTION

##### ATTENTION: RESPECT THE SAFETY REGULATIONS IN FORCE

- 4.1.  **The electrical installation must be carried out by a qualified, skilled electrician (see point 2.1.) in compliance with the Safety Regulations in force in the country where the product is installed.**
- 4.2.  Check the power supply voltage and frequency. Values differing from those on the motor plate could cause irremediable damage.
- 4.3.  Connect the leads of the power supply cable to the terminal board on the control panel, **giving priority to the earth lead.**

**For the wiring diagram of the control panel and the respective informative notes, see the enclosed documentation.**

#### 5. CHECKING OPERATION OF THE SET

##### 5.1. CHECKING OPERATION OF THE ELECTROPUMP

- Turn the main switch on the electropump panel to 1 (ON).  
Check the direction of rotation of the electropump, starting it **for a few moments** with the START button and check that, when viewed from the fan side, the motor is turning in a clockwise direction. If not, exchange on the terminal board any two leads of the **electropump panel power supply**.
- Turn the selector on the electropump panel to AUT position.
- Open a valve in the system (or the pump manual start valve, located near the pressure switches)
- Check that the electropump starts.
- Close the valve in the system (or the pump manual start valve, located near the pressure switches)
- Put the system under pressure.
- Stop the electropump with the STOP button on the electric panel.

**To check failed starting of the electric pump see the electropump instructions manual.**



##### ATTENTION: DURING OPERATION OF THE ELECTROPUMP:

- Check for any water leaks in the system and stop the electropump if necessary.
- The contact that indicates when the electropump is running closes and may activate any connected alarms.

**5.2. CHECKING OPERATION OF THE COMPENSATING ELECTROPUMP (PILOT PUMP)**

The compensating pump (or pilot pump) is an auxiliary pump which intervenes to draw small amounts of water. It starts at a pressure higher than the starting pressure of the main pumps and stops when the pressure in the system is restored.

It is not obligatory, but it is recommended in order to avoid needless starts of the main pumps in the case of leaks in the system.

- a) Turn the main switch on the electropump panel to 1 (ON).  
To check the direction of rotation of the compensating electropump (or pilot pump), **turn its selector to MAN for a few moments** and check that, when viewed from the fan side, the motor is turning in a clockwise direction.  
If not, exchange on the terminal board any two leads of the **power supply of the panel for the compensating electropump (or pilot pump)**.
- b) Turn the selector on the electropump panel to AUT position.
- c) Turn on a hydrant in the system.
- d) Check that the compensating electropump (or pilot pump) starts.
- e) Turn off the hydrant.
- f) Check that the electropump stops AUTOMATICALLY.

**5.3. SETS WITH SEVERAL PUMPS**

Standard EN 12845 – UNI 10779 contemplates various solutions with one or more pumps having similar characteristics:

- if TWO pumps are installed, each pump supplies the total flow rate of the system (100%),
- if THREE pumps are installed, each pump supplies 50% of the total flow rate.

Also, in sets where more than one pump is installed with superior or duplicate water supply, only one pump will be electric (10.2). From this it may be deduced that, **in the case of a superior or duplicated supply**, the sets will be composed of:

- a) 1 electropump (100%),
- b) 1 Diesel motor pump (100%),
- c) 1 electropump + 1 Diesel motor pump (each supplies 100%),
- d) 1 electropump + 2 Diesel motor pumps (each supplies 50%),
- e) 3 Diesel motor pumps (each supplies 50%),

**In the case of a single supply, there are no limits to the number of electropumps.**

DAB supplies the sets in a “modular” version, in separate units, so as to be able to make up all the versions mentioned above. By means of the JOINING MANIFOLD (see drawing on page 32) it is possible to join the manifolds so as to obtain a single delivery manifold.

The intakes, the electric panels, etc. remain separate as contemplated by standard EN 12845 – UNI 10779.

**6. PERIODIC MAINTENANCE**

The whole fire-fighting system to standard EN 12845 – UNI 10779, including the set of fire-fighting pumps, **must always be kept in perfect working order**. For this reason, regular maintenance is of particular importance.

According to standard EN 12845 point 20.1.1 – UNI 10779, the user must:

- carry out a programme of inspections and checks;
- arrange a testing, assistance and maintenance programme,
- document and record the activities, filing the documents in a special register kept in the building.

The user must ensure that the testing, assistance and maintenance programme is carried out under contract by the installer of the system or by a company with the same qualifications.

**6.1. WEEKLY CHECK (to be carried out at intervals of no more than 7 days)**

The weekly check of the fire-fighting set to standard EN 12845 – UNI 10779 contemplates checking and noting down the following values:

- pressure of pressure gauges,
- water level in the tanks – water reserves,
- correct position of the interception valves.

To test the automatic starting of the pumps, proceed as described below:

- Check the levels of the fuel and lubricating oil in the Diesel motors.
- Open the pump manual start valve (ref. 5).
- Check that the pump starts and make a note of the starting pressure.
- Close the manual start valve.

**6.2. MONTHLY CHECK**

**Check the level and density of the acid in all the cells or the starting batteries** with a densimeter.

If the acid density is low, check the battery charger and, if necessary, change the batteries.

**6.3. QUARTERLY CHECK (at intervals of no more than 13 weeks – see EN 12845 point 20.3.2 – UNI 10779)**

- Check for any changes in the system, changed class of risk, etc.
- Check sprinklers, pipes, pipe supports (see EN 12845 point 20.3.3.2 – UNI 10779).
- Start the pumps and check the pressure and the flow rate.
- Check the operation of any generators – generating sets.
- Check the correct position of the interception valves.
- Check the correct operation of the secondary electric power supply coming from Diesel generators.

**6.4. HALF-YEARLY CHECK (at intervals of no more than 6 months – see EN 12845 point 20.3.3 – UNI 10779)**

- Check the dry alarm valves (in the system).
- Check the operation of the alarms in the control room and/or at the Fire Station.

**6.5. YEARLY CHECK (at intervals of no more than 12 months – see EN 12845 point 20.3.4 – UNI 10779)**

- Check the pressure and the flow rate of the pumps against the values given on the technical data plate.
- Check the alarm for failed starting of the Diesel motor pump according to EN 12845 point 10.9.7.2 – UNI 10779. (make the six attempts to start alternately on the two batteries).

After the six attempts, check that the following are activated on the electric panel:

- the failed start warning light,
- the failed start alarm contact.

Straight after testing, restart the motor immediately with the manual test button “OPERATE MANUAL START”.

- Check the operation of the float valves and the filters in the tanks.

**6.6. THREE-YEARLY CHECK**

- Check for corrosion outside and INSIDE the tanks, repairing the protection if necessary.
- Check the interception and check valves, replace them if necessary.

**6.7. TEN-YEARLY CHECK**

After no more than 10 years, clean all the tanks and check the internal structure.

**7. REGULATING THE SET**

**7.1. CALIBRATION OF THE PRESSURE SWITCHES**

Standard EN 12845 – UNI 10779 contemplates two pressure switches for each pump, each pressure switch with normally closed contacts connected in series.

Opening any one of the two pressure switches causes the pump to start.

For pressure switch settings different from those carried out in the factory, proceed in accordance with the following instructions during handover testing of the pumping set:

- the type of pressure switch installed in the pump set,
- the pressure limits indicated on the data plates of each pump,
- the limit indicated by standard EN 12845 – UNI 10779 according to which the two pressure switches must be calibrated in such a way as to start the pump at a value **pump pressure with delivery closed x 0.8**.
- In the case of sets with two pumps, the second pump will be started at a value **pump pressure with delivery closed x 0.6**.

**Danfoss pressure switch type KP**

Slacken the 2 screws and remove the cover.

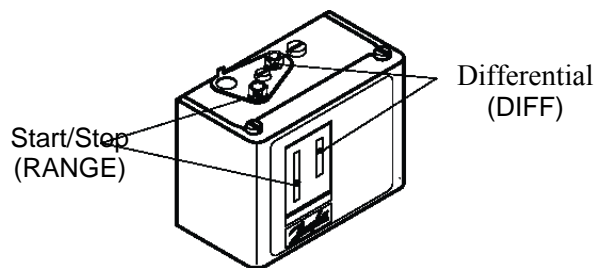
Unscrew the locking screw above the regulating screws.

Set the upper pressure limit on the START-STOP regulating scale (marked RANGE), turning the cross-headed screw.

Then set the lower pressure limit using the differential scale (marked DIFF), turning the hexagonal head screw.

Re-tighten the locking screw.

Replace the cover and tighten the 2 screws.



**Klockner Moeller pressure switch type MCS**

Undo the 4 screws and remove the cover.

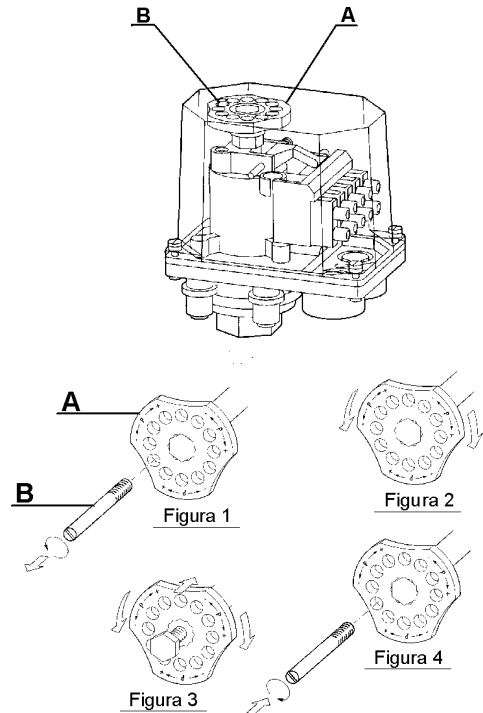
Slacken and remove the locking screw “B” positioned in one of the 12 holes in the regulating knob “A”. (figure 1)

When the regulating knob “A” is turned clockwise, the pump starting and stopping pressures are increased at the same time. When it is turned counter-clockwise they are decreased. (figure 2)

When the regulating knob “A” is pressed and turned counter-clockwise, the differential between the starting and the stopping pressure of the pump is increased (the starting pressure decreases while the stopping pressure remains fixed). When the regulating knob “A” is pressed and turned clockwise, the differential is decreased. (figure 3)

Replace and tighten the locking screw “B” in the hole in the regulating knob “A” that is most aligned with one of the two threads under the knob. (figure 4)


Replace the cover and tighten the 4 screws.



**8. COMPENSATING ELECTROPUMP**

**8.1.** The pump sets may be provided with a self-priming compensating pump, JET models, connected to the delivery manifold by means of a check valve and an interception ball valve.

**Instead the suction, as in any pump of a set according to standards EN 12845 – UNI 10779, is kept independent.**

**8.2.**  Keep the pressure switch that controls the compensating pump always calibrated with starting and stopping pressures **higher** than the others. This is indispensable in order to allow this pump to perform its task of compensating small falls in pressure in the system before starting the main electropumps and motor pump.

**9. MAINTENANCE**

**9.1.** All our sets are subjected to strict testing of both the electrical and the hydraulic part.

It is unusual for malfunctions to occur, unless due to external or completely accidental causes.

**9.2.** Below is a table with some suggestions on regulating the set in the event of irregularities in operation.

FAULTS	POSSIBLE CAUSES	REMEDIES
A PUMP IN THE SET DOES NOT PRIME.	<ol style="list-style-type: none"> <li>1. Suction pipe with insufficient diameter; excessive use of couplings which cause sudden variations in direction of the suction pipe; siphon effect.</li> <li>2. Suction pipe clogged.</li> <li>3. Air infiltrations in the suction pipe of the pump.</li> <li>4. Foot valve clogged or blocked.</li> <li>5. Interception valve on suction partly closed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check that the suction pipe is correctly made, as indicated in the paragraph on "Installation".</li> <li>2. Clean it or change it.</li> <li>3. Testing under pressure, check the perfect seal in the couplings, the joins and the pipes.</li> <li>4. Clean it or change it.</li> <li>5. Open it completely.</li> </ol>
A PUMP IN THE SET DOES NOT START.	<ol style="list-style-type: none"> <li>1. Main motive power switch and/or main auxiliary circuit switch off (in position "0").</li> <li>2. Protection overload switches of the transformer and/or of the auxiliary circuit faulty or tripped.</li> <li>3. The Diesel motor pump starting batteries are not efficient.</li> <li>4. Electric circuit interrupted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Switch them on, turning them to position "1" and check that the two green lights come on indicating that the panel is live.</li> <li>2. If faulty, change them. If tripped, reset them.</li> <li>3. Check the efficiency of the battery chargers in the motor pump panel (check absorption of the motor pump panel with ammeters) If the batteries are inefficient, change them.</li> <li>4. Use a tester to find the point of interruption and repair it.</li> </ol>

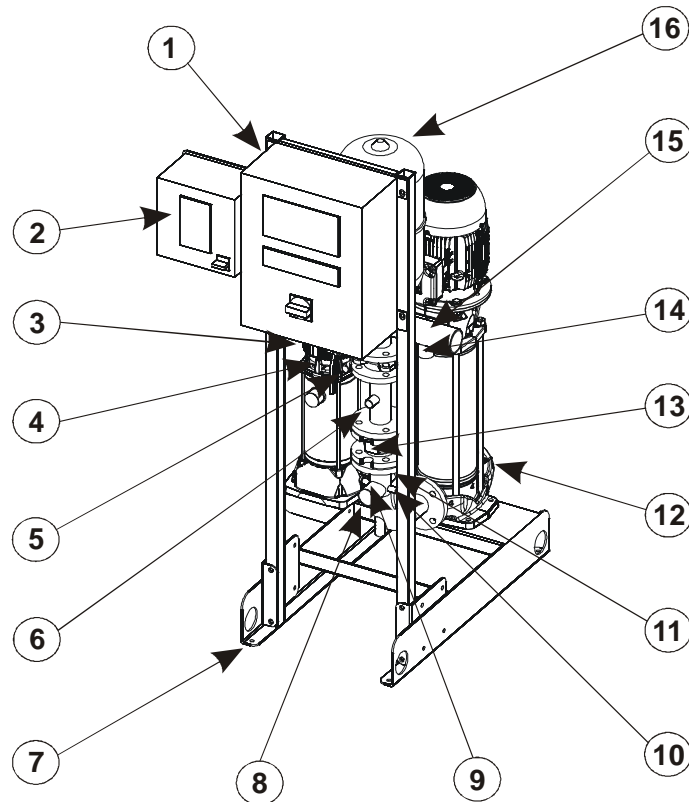


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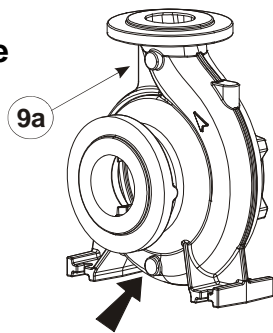
<p>THE STOP BUTTON DOES NOT STOP THE PUMP</p>	<ol style="list-style-type: none"> <li>1. Important water leaks in the system, so the pressure is not re-established above the opening pressure of the pressure switch (about 1.5 bar above the closing pressure of the pressure switch, that is the starting pressure of the electropump and of the motor pump) .</li> <li>2. A jumper has been fitted on the terminals for connecting the float for the priming tank (to be installed in the event of suction above head)</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the joins, couplings and pipes.</li> <li>2. Remove the jumper in the event of suction below head. Insert the float for the priming tank in the event of suction above head.</li> </ol>
<p>THE SET DOES NOT SUPPLY THE REQUIRED CHARACTERISTICS.</p>	<ol style="list-style-type: none"> <li>1. The set chosen is undersized for the characteristics of the system.</li> <li>2. Excessive water consumption for the flow rate that can be supplied by the water supply source (tank, well, mains, etc.)</li> <li>3. Motors turning in inverse direction.</li> <li>4. One or more pumps clogged.</li> <li>5. Pipes clogged.</li> <li>6. Foot valves clogged or blocked (set above head).</li> <li>7. Interception valves at suction and delivery partly closed.</li> <li>8. Air infiltrations in the suction pipes of the set pumps.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace it with one that suits the required characteristics.</li> <li>2. Increase the flow rate that can be supplied by the water supply source.</li> <li>3. Change it, performing the operation described in the paragraph on “Starting”.</li> <li>4. Dismantle them and clean the pump body and the impellers, ensuring that they are in good condition.</li> <li>5. Clean them or change them.</li> <li>6. Clean them or change them.</li> <li>7. Open them completely.</li> <li>8. Testing under pressure, check the perfect seal in the couplings, the joins and the pipes.</li> </ol>
<p>WHEN STOPPED, ONE OR MORE PUMPS IN THE SET TURN IN INVERSE DIRECTION.</p>	<ol style="list-style-type: none"> <li>1. The respective not return or foot valves do not close well or are blocked.</li> <li>2. The respective suction pipe is not airtight.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check seal and correct operation.</li> <li>2. Check the seal, testing under pressure.</li> </ol>
<p>AFTER BEING STOPPED, A PUMP IN THE SET DOES NOT START AGAIN.</p>	<ol style="list-style-type: none"> <li>1. Motor protection fuses burnt out.</li> <li>2. No current is reaching the coil of the respective remote control switch.</li> <li>3. Remote control switch coil interrupted.</li> <li>4. The system pressure is not reaching the respective control pressure switch.</li> <li>5. Faulty control pressure switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change them.</li> <li>2. Use a tester to check the electric circuit as far as the coil itself and repair any interruption found.</li> <li>3. Change it.</li> <li>4. Remove it and clean the connecting sleeve.</li> <li>5. Change it.</li> </ol>
<p>THE MOTOR OF AN ELECTROPUMP IN THE SET IS VIBRATING.</p>	<ol style="list-style-type: none"> <li>1. A motor protection fuse has burnt out.</li> <li>2. Fuse holder base slack or faulty.</li> <li>3. Contacts of the respective remote control switch worn or faulty.</li> <li>4. Pump blocked.</li> <li>5. Bearings worn.</li> <li>6. Electric wires broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change it.</li> <li>2. Secure it if slack. Change it if faulty.</li> <li>3. Change the remote control switch.</li> <li>4. Free it.</li> <li>5. Change them.</li> <li>6. Check and repair them.</li> </ol>

# FEUERLÖSCHANLAGE GEMÄSS EN 12845 – UNI 10999

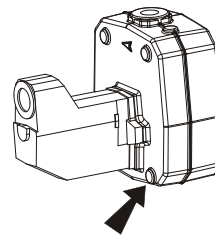
## 1 Elektropumpe NKV + Pilotpumpe



**Haupt-Elektropumpe**



**Pilot-Elektropumpe**



**ACHTUNG!**

DIE GRUPPE WIRD MIT AUSGESCHRAUBTEM AUSLASSDECKEL DES PUMPENKÖRPERS GELIEFERT!  
 DER AUSLASSDECKEL BEFINDET SICH IN DEM AN DER GRUPPE BEFESTIGTEN BEUTEL!

- |    |  |    |  |
|----|--|----|--|
| 1  | Separate Schalttafel für jede Hauptpumpe | 10 | Druckwächter laufende Pumpe                        |
| 2  | Schalttafel Pilotpumpe                   | 11 | Prüfsystem für Rückschlagventil                    |
| 3  | Pilotpumpe                               | 12 | Unabhängige Saugteile                              |
| 4  | Druckwächter für Pilotpumpe              | 13 | Rückschlagventil an Betriebspumpe                  |
| 5  | Verriegelbares Sperrventil               | 14 | Anschluss 1" für Flusswächter Sprinkler Pumpenraum |
| 6  | Kreis Anlauf-Druckwächter                | 15 | Alleiniges Druckrohr                               |
| 7  | Löcher für Bodenbefestigung              | 16 | Ausdehnungsgefäß für Pilotpumpe                    |
| 8  | Anschluss 2" für Saugtank                |    |  |
| 9  | Anschluss 1/4" für Wasserrückführung     |    |  |
| 9a | Entlüftung Pumpe und Rückführung 3/8"    |    |  |