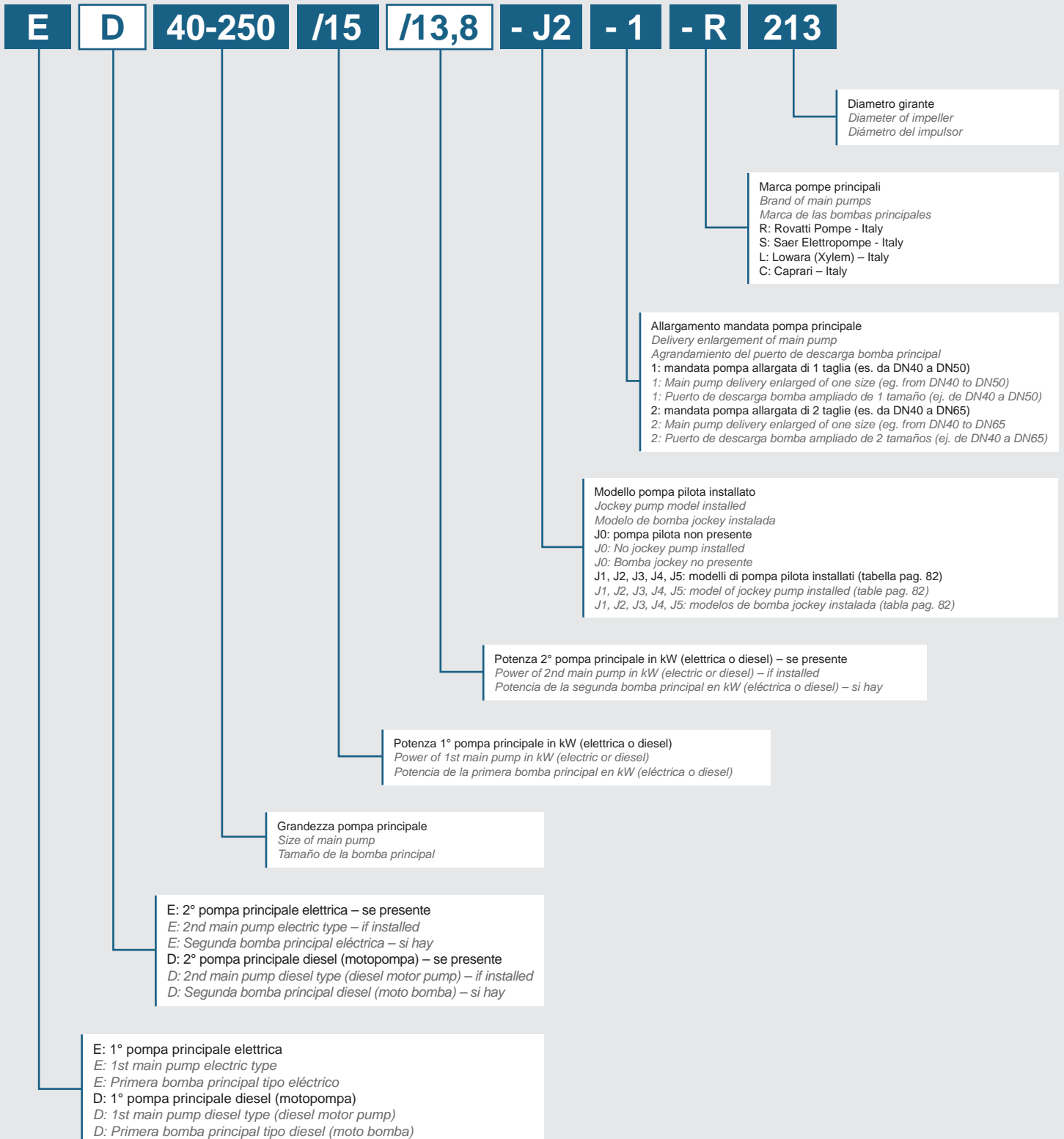


LETTURA MODELLI / HOW TO READ MODELS / LECTURA DE MODELOS

Lettura Modelli dei Gruppi Antincendio EN 12845

How to read Models of Fire Fighting Units EN 12845

Lectura de Modelos de los Equipos Contra-Incendio EN 12845



LETTURA MODELLI / HOW TO READ MODELS / LECTURA DE MODELOS

Esempi di gruppi antincendio / Example of fire fighting units / Ejemplos de grupos contra incendio

Mod. ED40-250/15/13,8-J2-1-R213:

Elettropompa principale (kW15) + motopompa principale (kW13.8) + pompa pilota J2, pompe principali marca Rovatti mod. 40-250/213, mandate pompe principali allargate di una taglia (dal DN40 al DN50).

Mod. E40-200/11-J0-2-L199:

Elettropompa principale (kW11), pompa pilota non presente, pompa principale marca Lowara mod. 40-200/199, mandata pompa principale allargata di due taglie (dal DN40 al DN65).

Mod. EE100-250/75/75-J2-1-C225:

Elettropompa principale (kW75) + elettropompa principale (kW75) + pompa pilota J2, pompe principali marca Caprari mod. 100-250/225, mandate pompe principali allargate di una taglia (dal DN100 al DN125).

Mod. D125-250/132.4-J3-2-S251:

Motopompa principale (kW132.4) + pompa pilota J3, pompa principale marca Saer mod. 125-250/251, mandata pompa principale allargata di due taglie (dal DN125 al DN200).

Mod. ED40-250/15/13,8-J2-1-R213:

Main electric pump (kW15) + main diesel motor pump (kW13.8) + jockey pump J2, brand of main pumps Rovatti mod. 40-250/213, delivery of main pumps increased of one size (from DN40 to DN50).

Mod. E40-200/11-J0-2-L199:

Main electric pump (kW11), no jockey pump, brand of main pumps Lowara mod. 40-200/199, delivery of main pump increased of two sizes (from DN40 to DN65).

Mod. EE100-250/75/75-J2-1-C225:

Main electric pump (kW75) + main electric pump (kW75) + jockey pump J2, brand of main pumps Caprari mod. 10-250/225, delivery of main pumps increased of one size (from DN100 to DN125).

Mod. D125-250/132.4-J3-2-S251:

Main diesel motor pump (kW132.4) + jockey pump J3, brand of main pumps Saer mod. 125-250/251, delivery of main pumps increased of two sizes (from DN125 to DN200).

Mod. ED40-250/15/13,8-J2-1-R213:

Bomba principal eléctrica (KW15) + bomba principal de motor diesel (kW13.8) + bomba jockey J2, bombas principales marca Rovatti mod. 40-250/213, tubería de impulsión de las bombas principales ampliadas de un tamaño (de DN40 a DN50).

Mod. E40-200/11-J0-2-L199:

Bomba principal eléctrica (KW11), no hay bomba jockey, bomba principal marca Lowara mod. 40-200/199, tubería de impulsión de la bomba principal ampliada de dos tamaños (de DN40 a DN65).

Mod. EE100-250/75/75-J2-1-C225:

Bomba principal eléctrica (KW75) + bomba principal eléctrica (KW75), bomba jockey J2, bombas principales marca Caprari mod. 100-250/225, tubería de impulsión de las bombas principales ampliadas de un tamaño (de DN100 a DN125).

Mod. D125-250/132.4-J3-2-S251:

Bomba principal de motor diesel (kW132.4) + bomba jockey J3, bomba principal marca Saer mod. 125-250/251, tubería de impulsión de la bomba principal ampliada de dos tamaños (de DN125a DN200).

LETTURA CODICI / HOW TO READ CODES / LECTURA DE CÓDIGOS

Lettura Codici dei Gruppi Antincendio EN 12845

How to read Codes of Fire Fighting Units EN 12845

Lectura de Códigos de los Equipos Contra-Incendio EN 12845

A parità di pompe e motori, ogni tipo di gruppo antincendio può avere 2 modelli e codici a seconda che le pompe principali abbiano la mandata allargata di 1 o di 2 taglie.

At the same pumps and motors, each type of fire fighting unit can have 2 models and codes depending on whether the main pumps have the delivery enlarged 1 or 2 sizes.

A paridad de bombas y motores, cada tipo de grupo contra incendio puede tener 2 modelos y códigos dependiendo de que las bombas principales tengan la descarga ampliada de 1 o 2 tamaños.

Esempi di codici / Codes examples / Ejemplos de códigos

cod. A0456-**(...)** → mod. ED40-250/15/13,8-J2-**(...)**-R213

cod. A0456-**(1)** → mod. ED40-250/15/13,8-J2-**(1)**-R213

cod. A0456-**(2)** → mod. ED40-250/15/13,8-J2-**(2)**-R213

...	Codice e Modello Generici del Gruppo General Code and Model of the Unit Código y Modelo General del Grupo
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1	Mandata Pompa Allargata di 1 taglia Pump's delivery enlarged of 1 size Descarga del la bomba ampliada de 1 tamaño
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2	Mandata Pompa Allargata di 2 taglie Pump's delivery enlarged of 2 sizes Descarga del la bomba ampliada de 2 tamaños
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The Fourgroup fire fighting units are built in conformity with the European Standard EN 12845 for automatic sprinkler systems and for hydrant systems.

All the main components of the booster set are factory connected and assembled in accordance with this standard. The configuration of the booster set depends on the number of pumps installed and on the type of electric motor or diesel engine; two main service pumps, one as back-up of the other, are normally installed for fire-fighting systems.

The choice of electric motors or diesel engines depends on the level of reliability required from the system.

The EN 12845 standard (point 10.2) in case of superior or duplicate water supplies, and if more than one pump is installed, ask that no more than one service main pump can be driven by the electric motor.

Fire-fighting units are often equipped with one electric service pump and one diesel service pump.

It is important to fit the units with a jockey pump, with which the system pressure level can be maintained without having to start the main pumps.

Operation

The pumps start operating after a fall in the pressure level in the fire extinguishing system.

The first pump to be triggered is the jockey pump. If this pump cannot restore the pressure level, the main pump starts. When there is more than one main pump, the pumps start in cascade sequence, with the starting pressure switches set at different pressure levels.

The pressure switches of the main pumps are used only for starting, as the pumps must be stopped manually in accordance to EN 12845 standard (or automatically with a timer, in accordance with UNI 10779 standard).

The recirculation diaphragm allows for operation of the main pumps also when the delivery port is closed (with no consumption of water in the system), avoiding overheating of the water inside the pump body.

The Fourgroup fire fighting units are configured according to EN 12845 standard, they are also one by one factory tested and they may be composed of:

- 1 or 2 main "back pull-out" pumps (coupling with electric motor or diesel engine)
- 1 or 2 main submersible borehole pumps

Electric Motors

- Two-pole induction type, 50 Hz, $n = 2,900$ rpm – Threephase 230/400V $\pm 10\%$ up to 3 kW - 400/690V $\pm 10\%$ 4 kW and higher - Insulation class F - Protection IP 54 for close coupled pumps, IP 55 for pumps with coupling and IP 68 for submersible borehole pumps.

Diesel engines

- These are direct-injection pumps fitted with electric control box, fuel tank, starter batteries and silencer.

The fire fighting booster set is built and completed with the following main components:

- jockey electric pump (if specified). The jockey pump is automatically started and stopped by its pressure switch in order to restore supply pressure, this prevents the service pumps from starting and activating the main alarms (The maximum pressure developed by the jockey pump is always greater than the pressure of the main pumps). Jockey pump can be a self-priming jet pump, a vertical or horizontal multistage pump. If the fire fighting unit is completed with the jockey pump, there are also included: nr.1 cylindrical 20-liter membrane pressure tank (16 bar), ball valve, non-return valve on delivery, pressure gauge and an electric panel in the automatic mode
- an electric control panel for each service pump
- two pressure switches for each service pump (if the first fails, the second repeats permission for the pump to start)
- on the discharge side of each service pump there are: a pressure switch to indicate the pump is operating, an on-off valve, a pressure gauge, a check valve and a tap for connection to the priming circuit for suction lift installations. If the service pump works with a closed discharge line (close valve), a water recirculation tap has been applied to the pump body in order to prevent the pump from overheating
- for each main pump there are manual test circuit with pressure switches, pressure gauge, non return valve and ball valve
- delivery manifold connected to each pump
- suction manifold is never supplied
- single base containing all the booster set components within a compact structure and ready for installation

To complete the pump station as requested by the EN 12845 standard, the booster sets needs the following accessories:

- suction side kit
- flow meter and manifold for flow meter
- alarm panel
- set of spare parts for diesel engines.
- priming tank with accessories (for suction lift installations only)

FIRE FIGHTING SYSTEMS EN 12845



Control panel for main electric pump (electric motor)

Each main pump has its own electric control board housed in a metal cabinet with IP54 protection. The box contains the devices required for operation and control of the pump.

In automatic mode electric motor starting is direct for power ratings up to 22kW (Hp 30), for motors with a rating equal to or higher than 30 kW (Hp 40) pump starting is of the star-delta type (In emergency mode the starting is always direct-on-line type).

Features of control panel for electric main pump (star-delta type)

- Input voltage 3 ~ 50/60Hz 400V $\pm 10\%$
- Transformer 400 V/24 V for auxiliary circuit
- Very low voltage input for no. 2 pressure switches of start (NC contact with system in pressure and electric pump off)
- Very low voltage input for control of the electric pump from float switch in the priming tank (NO contact with tank full of water)
- Very low voltage input for signaling of electric pump in pressure/on from pressure switch (NO contact with system in pressure and electric pump off)
- Selector with key automatic-0-emergency: in automatic position starting of the pump by electronic unit, in emergency position immediate starting of the pump
- Electronic unit for electric pump control
- Pushbuttons for stop/start of the pump for manual test
- Pushbutton for test of the electronic unit's lights
- Pushbutton for scrolling the functions of the unit
- LCD Display for the visualization of n° 3 voltmeters, n° 3 ammeters, frequency-meter, wattmeter, varmeter, volt-ammeter, $\cos\phi$ -meter, total run meter, partial run meter, history of the events
- Signaling lights
- Operation mode according to UNI10779 with timer for delay of stop of the electric pump adjustable from 1' to 30'
- Visualizations of the display settable in 5 languages: Italian, English, Spanish, German, French
- Functions of delay and specific alarms settable from electronic unit (refer to the manual enclose to the panels)
- Contactor for control of the electric pump dimensioned in AC3
- Auxiliary and motor protection fuses
- Main switch with interlocking door
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "voltage supply available"
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "request for pump starting"
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "pump running"
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "start failed"
- Steel enclosure
- Protection IP54

On request:

- Timer for pumps stop after 20 minutes (UNI 10779)

Control panel for main diesel pump (diesel engine)

This control panel contains the control devices for the control of the diesel motor and the battery chargers for feeding the starter accumulators.

Features of control panel for diesel main motor-pump

- Input voltage 1 ~ 50/60Hz 230V $\pm 10\%$
- Input from n°02 external lead batteries for control of the starting motor and supply of auxiliary circuits
- Very low voltage input for control from n° 2 call/start pressure switches in series (NC contact with system in pressure and diesel pump stopped)
- Very low voltage input for control of the diesel pump from float switch in the priming tank (NO contact with tank full of water)
- Very low voltage input for signaling of electric pump in pressure/on from pressure switch (NO contact with diesel pump off)
- Electronic unit for diesel pump control
- Selector with key automatic-manual: in automatic position starting of the diesel pump by electronic unit, in manual position starting of the diesel pump by start pushbutton of the electronic unit
- Pushbuttons for manual start of the diesel pump
- Pushbutton for manual shut off of the diesel pump
- Pushbutton for restoring from anomalies
- Pushbutton for testing the manual start (active in case of failure of automatic start)
- Pushbutton for test of the electronic unit's lights
- Pushbutton for scrolling the functions of the unit
- Pushbuttons for Manual Emergency protected by "Safe crash"
- LCD Display for the visualization of n° 2 batteries' voltmeters, n° 2 batteries'ammeters, round meters, total run meter, partial run meter, indicator of fuel level, water thermometer, oil thermometer, oil manometer, batteries starting counter, history of the events
- Signaling lights
- Operation mode according to UNI10779 with timer for delay of stop of the electric pump adjustable from 1' to 30'
- Visualizations of the display settable in 5 languages: Italian, English, Spanish, German, French
- Functions of delay and specific alarms settable from electronic unit (refer to the manual enclose to the panels)
- N°02 battery chargers 12Vdc 3A (24Vdc 3A for 24V version)
- Auxiliary protection fuses
- Main switch with interlocking door
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "automatic operation excluded"
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "control panel breakdown"
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "diesel pump operating"
- Alarm output with exchangeable contact (max 5A 250V AC1) for signaling of "start failed"
- Steel enclosure
- Output with cable holder
- Protection IP54

On request:

- Timer for pumps stop after 20 minutes (UNI 10779)

**Electric jockey-pump control panel**

When the jockey pump is installed, there is an electric control panel that controls and protects the pump.

- Features of control panel for electric jockey pump (direct starting)
- Electronic control panel
- Input voltage 3~50/60 Hz 400V \pm 10% (three-phase)
- Very low voltage input for external pressure switch
- Very low voltage input for 3 level probes
- Probes suitable for conductive not inflammable liquids (not included)
- Selector for filling/emptying operation of the level probes
- Internal adjuster for probes
- Selector for automatic-off-manual motor operation (manual temporary)
- Green led for power on
- Green led for motor operating
- Red led for water level alarm
- Red led for motor overload protection alarm
- Adjustable electronic protection from motor overload
- Time for activation of protection: 5"
- Auxiliary circuits and motor protection fuse
- Alarm output with exchangeable contacts 5 A 250 V (resistive load)
- Main switch with door interlock
- Box in ABS
- Output with cable holder
- Protection IP54





DELIVERY PIPE OF MAIN PUMP AND SPEED WATER INSIDE

The point 13.2.3 of EN 12845 standard defines that the water velocity shall not exceed 6m/s through the valves and 10m/s at any other point in the system, for the stabilized flow condition for the hydraulically most favourable and unfavourable area of operation.

At the same capacity by increasing the diameter decreases the velocity of water, which is why we propose in this catalog the fire fighting main pumps in two versions: one with delivery port of main pumps extended by concentric cone of one size (DN + 1) and the other version with delivery port of main pumps extended by concentric cone of two sizes (DN + 2). Some dimensions of the fire fighting units proposed, as the diameter of the delivery manifold and its distance from the ground, vary slightly depending if the delivery of the main pumps are enlarged one or two sizes.

Example:

Fire Fighting Unit mod. ED 40-250/15/13.8-J2-①-R213: delivery port of main pump is DN40 → enlarged of 1 size to DN50 (DN + 1) → stop valve and check valve are of the diameter DN50

Fire Fighting Unit mod. EE100-250/75/75-J2-②-C225: delivery port of main pump is DN100 → enlarged of 2 sizes to DN150 (DN + 2) → stop valve and check valve are of the diameter DN150

To choose the right fire fighting unit, depending the working point and the resulting velocity of water flow in the main delivery pump, please consult the following table.pompa principale, si consulti la tabella seguente.

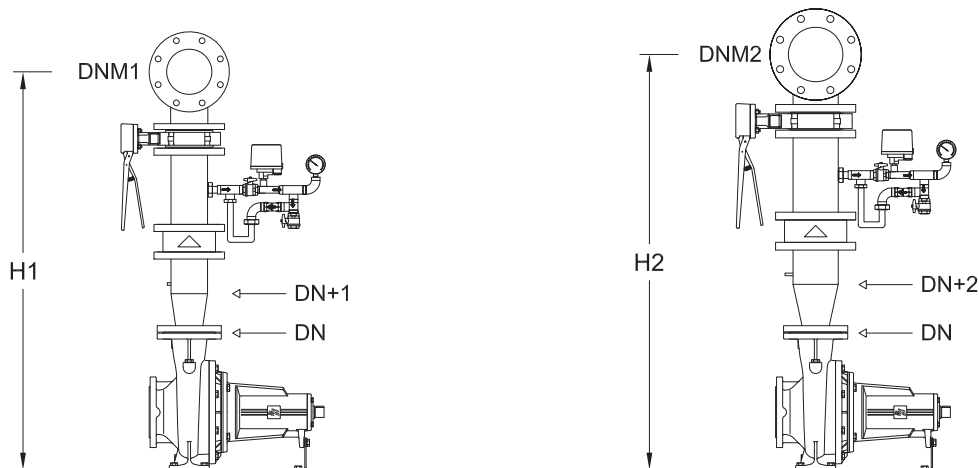
Table of velocity of water not exceeding 6 m/s, depending on the flow capacity and pipe diameters

Water Speed ≤ 6 m/s								
Q (l/m)	0÷706	707÷1.194	1.195÷1.807	1.808÷2.824	2.825÷4.413	4.414÷6.355	6.356÷11.299	11.300÷17.654
Ø min	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250

Example:

- Having a main pump with a discharge outlet of DN50 and capacity operating point of l/m 1200, you will have to choose a fire fighting unit that increase the main pump delivery to DN80 (DN+2)
- Having a main pump with a discharge outlet of DN50 and capacity operating point of l/m 1000, you will have to choose a fire fighting unit that increase the main pump delivery to DN65 (DN+1)

Drawing of main pump's delivery enlarged 1 size (DN+1) and the same pump's delivery enlarged 2 sizes (DN+2)



The fire fighting units with the main pump delivery enlarged two sizes (DN+2), compared to those with the main pump delivery enlarged one size (DN+1), they have lower flow velocity, lower pressure drop and delivery unique manifold of larger diameter.

The fire fighting units proposed in this catalog are available in two versions, at the same model of main pumps: one with the delivery of the main pump enlarged by one size and one with the delivery of the main pump enlarged two sizes.

The following are examples of two fire fighting units with identical main pumps, but with different enlargement of main pump delivery:

Fire Fighting Unit mod. ED40-250/15/13.8-J2-①-R213 → unit with main pumps 40-250/R213 and delivery of main pumps enlarged 1 size

Fire Fighting Unit mod. ED40-250/15/13,8-J2-②-R213 → unit with main pumps 40-250/R213 and delivery of main pumps enlarged 2 sizes

SUCTION PIPE OF MAIN PUMP



SUCTION PIPE OF MAIN PUMP AND SPEED WATER INSIDE

The pump suction shall be connected to a straight or taper pipe at least two diameters long. The taper pipe shall have a horizontal top side and a maximum included angle not exceeding 20°.

The stop valves shall not be installed directly on the suction port of the main pump. Suction piping shall be laid either horizontally or with a continuous slight rise towards the pump to avoid the possibility of air locks forming in the pipe.

In the conditions of main pump with positive head installation, the diameter of the suction pipe shall not be less than 65mm (DN65) and shall be such that the speed is not more than 1.8 m/s when the pump is operating at the maximum required flow.

In the conditions of main pump with suction lift installation, the diameter of the suction pipe shall not be less than 80mm (DN80) and shall be such that the speed is not more than 1.5 m/s when the pump is operating at the maximum required flow.

Following tables for quick selection of eccentric reducers, to use in conditions of suction lift or positive head installations.

Positive Head Installation – quick selection table for eccentric reductions depending the maximum required flow (to have flow velocity $V \leq 1,8$ m/s)

To maintain inside the suction pipe of the main pump flow velocities indicated in the standard EN 12845, depending on the maximum flow rate required by the plant, you have to enlarge the suction port of the main pump to the minimum diameter indicated in the following table:

Water Speed $V \leq 1,8$ m/s										
Q (l/m)	0÷358	359÷542	543÷848	849÷1324	1325÷1907	1908÷3390	3391÷5297	5298÷7626	7627÷10381	10382÷13558
Ø min	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400

Suction Lift Installation – quick selection table for eccentric reductions depending the maximum required flow (to have flow velocity $V \leq 1,5$ m/s)

To maintain inside the suction pipe of the main pump flow velocities indicated in the standard EN 12845, depending on the maximum flow rate required by the plant, you have to enlarge the suction port of the main pump to the minimum diameter indicated in the following table:

Water Speed $V \leq 1,5$ m/s									
Q (l/m)	0÷452	453÷706	707÷1103	1104÷1589	1590÷2824	2825÷4413	4414÷6355	6356÷8650	8651÷11299
Ø min	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400

Clarification: the previous tables suggest only indications concerning the maximum permissible speed in suction of main pumps, that choice may not be enough because the standard EN 12845 requires also that the suction piping, including all valves and fittings, shall be designed in such a way as to ensure that the available NPSH at the pump inlet exceeds the required NPSH by at least 1 m at the maximum pump flow as shown in table 14 of the EN 12845 norm.

Drawing of a main pump's suction enlarged by eccentric reduction, from the diameter DNA to the diameter DNB

