FIRE FIGHTING SYSTEMS

Series

STOPFIRE

PACKFIRE

FIRE

EFAFLU

Bombas e Ventiladores

"...It is important for a company to maintain its plan of inspections and maintenances since 80% of businesses affected by a major incident either never to re-open or close within 18 months..."

(Source, AXA)

INTRODUCTION

Since ancient times, the relationship between human beings and fire was close and necessary. Thanks to this element, the man could warm up, overcome the darkness, cook food and defend themselves from wild animals.

However, this depended on a delicate balance: keeping the fire under control. Without control, the fire destroyed everything that was on its way. We know from historical records of the existence of large fires that destroyed entire cities: Rome (year 64), London (1666), Lisbon (1755), caused by an earthquake, Chicago (1871). Therefore, the man prepared to deal with the tragedy involving a wildfire, especially when affected property or the heritage of large cities, appearing therefore the first firefighters.

But it was only the early nineteenth century, when appeared the first automatic fire-fighting devices: they were the sprinklers, pulverization elements of water that were modernizing and improving its response until today.

To ensure the flow and pressure conditions on the sprinklers they were installed water pumps. This development was being carried out by the middle of the twentieth century. The pumps represent the heart of the fire protection system. If the sprinklers are already for many, an element of unpronounceable name, but with a clear feature (water pulverization), the unaware of the fire pumps is much bigger. However, it is an essential element in the operation of the system by which most of their functions and critical signals are duplicated, as in those applications where you have to ensure the reliability of the same (as in aviation).

It is not known, for example, that in the most critical systems there is a double pump, so that in case of failure of one can start the second; it is not known that these pumps are driven by two electric motors with different electrical connections and completely independent; it is not known that in certain cases, one of these pumps, or both, may be replaced by diesel engines, to minimize the dependence on electrical power; it is not known that the starting is granted through a device that detects the pressure drop in the network (pressure switch) which is also in duplicate, beyond the respective emergency starting buttons.

These are just some of the most basic aspects of pumping sets, combining the best of mechanical and electrical engineering to ensure the safety of all and that it can be identified through the catalog you have in the hands.

Miguel Vidueira
SERVICIOS TÉCNICOS CEPRETEC, S.L.
GRUPO CEPREVEN

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NOTE

All the information and specifications included in this catalogue can be modified by EFAFLU without prior notice.

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PUMPING SYSTEMS

In order to satisfy the market demands regarding the fire fighting systems, EFAFLU offers two wide ranges of systems - PACKFIRE and STOPFIRE - subdivided into different series, allowing in this manner to meet the technical, economic and operational needs required in each installation.

The fire fighting systems PACKFIRE series are designed to meet the needs of extinguishers plants. This series meets the requirements established and acquired by EFAFLU over several years and from his vast experience in the field.

The fire fighting systems STOPFIRE series are designed for installations where apply technical rules or international standards from which we highlight:

NFPA

FM APPROVED

cepreven

UL

apsad

AENOR Producto Certificado

CEA

EN 12845



Besides the standards involved, the pumping systems are usually characterized by the following sets:

MAIN Pump set

Consisting by pump / motor / electrical panel have the aim to provide the flow and pressure needed for installation in accordance with the requirements of the project. The system starts automatically by pressure dropping by order of the pressure switch / pressure transducer.

STAND-BY Pump set

It has the same characteristics of the main pump set. It should be taken into account that the energy source of the stand-by pump sets must be independent from the main pump set.

JOCKEY Group

The jockey pump is usually a vertical multistage pump, electrical drive, dimensioned to keep the system pressurized, controlled by a pressure switch, compensating pressure variations resulting from small leaks in the installation. A jockey pump should be used exclusively for this purpose so the flow to be selected should be reduced.

TESTS Mainfold

Equipped with a flow meter, it allows checking the flow rate from the main pumps, both at its nominal operating points as the requested by the respective standard.

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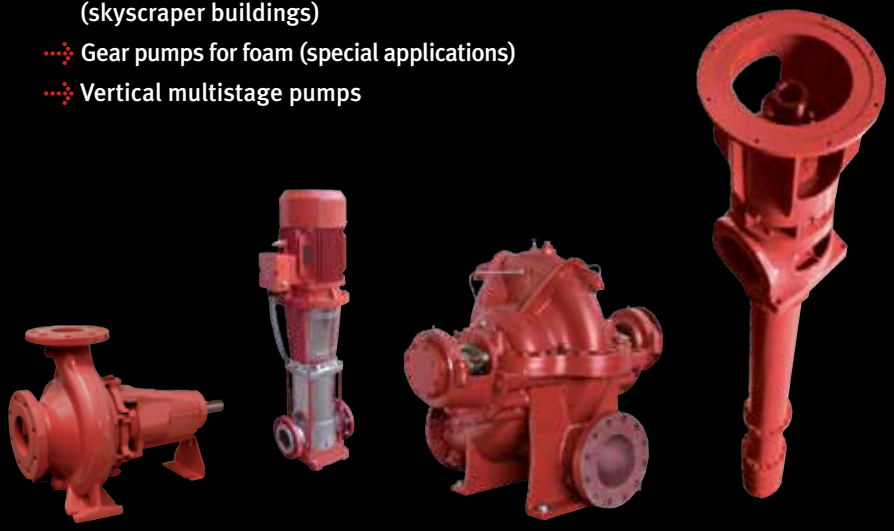
MAIN EQUIPMENTS

Pumps

As being one of the main components in a fire fighting system, the pumps can be of different types:

- Horizontal Split-Case centrifugal pumps
- Line-Shaft submersible pumps
- Standard End-Suction centrifugal pumps
- Horizontal multistage pumps with multiple exits (skyscraper buildings)
- Gear pumps for foam (special applications)
- Vertical multistage pumps



The construction materials of the pumps must take into account the pumped liquid as well as the required by the standards.
The pumps used by our range STOPFIRE are usually of cast iron construction with bronze impeller, however we also manufacture them in other materials such as zinc-free bronze or stainless steel 316, for example, applications with seawater.

The pumps should have the required characteristics requested by the standards and / or have the approval of the competent authorities such as the FM-Factory Mutual and UL-Underwriters Laboratories.

Motors

The pumps are driven either by an electric motor or a diesel engine.

Where diesel motor is supplied it is also included in the scope of supply the fuel tank, the exhaust silencer and the electric batteries.

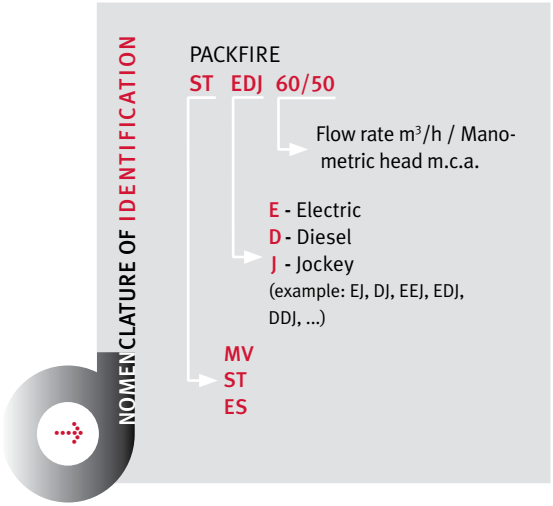
Electrical controllers

The electrical controllers are used to command and control the fire sets and are built in a metal cabinet meeting the standards and approvals required by the project.

The electrical controllers can be individual, one for each pump, and in some cases there is a single controller.

The fire fighting systems PACKFIRE are designed to fulfill the needs of the extinguisher installations where is required a fire-pack. This series meets the requirements established by EFAFLU and acquired by its vast experience in the field.
The fire fighting systems PACKFIRE are compact and work under automatic, semi-automatic or manual operation. The automatic system allows its use in sites without a permanent technical support.
The electrical controller performs automatic startups scheduled to verify the operation of the system.

To allow monitoring the pumping system status at distance are available in electrical controllers voltage free contacts for this purpose.



PACKFIRE **MV**

The main/stand-by and jockey pumps are BMV series, multistage, vertical, in line, casing in cast iron construction and stainless steel impellers attached to the vertical three-phase electric motor by a rigid coupling.

Electrical controller for control and protection of main/stand-by and jockey electric pumps, allowing the operation in three operating systems (manual / semi-automatic / automatic) as well as the automatic and periodic functional test, with the possibility of remote information of the main functions. Electrical controller in metal box with IP 54 protection and painted in red RAL3000 colour.

Vertical three-phase electric asynchronous motor, totally enclosed, squirrel cage rotor; fan-cooled, manufactured according to DIN 42673 and IEC Standards. For power above than 4kW the start-up is star-delta (SD), for the others the direct on line (DOL).

The pumps are mounted on a single base frame with the electrical controller(s).

Set of instrumentation, control and hydraulic accessories consisting of: pressure switches of high sensitivity (one per pump), manometer in glycerin bath, an automatic air vent plug with the inclusion of a check valve for possible repairs, a tank of pre-compressed air for 20 Lt/15 At.; cut valves and check valves in the discharge of each pump; common discharge manifold; common base frame for pumps, flow switch.

The return Kit (bypass) to relieve excessive pressure in the system, consisting of a shut-off valve, an electro valve, a filter Y, a pressure switch of very high sensitivity. This kit, in conjunction with electrical and electronic equipment installed in the panel allows a periodic and automatic test of the pumping set in a closed circuit.

Optional equipments:

- Suction manifold;
- Steroidal differential protection
- Fire repeater Panel
- Remote information via GSM
- Others on request

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PACKFIRE ST

The main/stand-by pumps are single stage, horizontal, of NNJM or E-NM standards series to power up to 37kW (for superior power are used the NNJ pumps), construction of cast iron or stainless steel and three-phase electric motor. The jockey pump is the series BMV, multistage, vertical, in line, casing in cast iron construction and stainless steel impellers attached to the vertical three-phase electric motor by a rigid coupling.

If the stand-by pump is attached to an internal combustion engine then it will be of normalized horizontal pumps NNJ, E-NPVL or CJG, of cast iron construction or stainless steel and attached by a flexible coupling.

Electrical controller for control and protection of main/stand-by and jockey electric pumps, allowing the three operating systems (manual / semi-automatic / automatic) as well as the automatic and periodic maintenance, with the possibility of information at distance of the main functions. The electrical controller in metal box with mechanical protection IP 54 and painted on red fire colour.

Diesel controller for control and protection of stand-by pump, allowing in three operating systems (manual / semi-automatic / automatic) as well as the automatic and periodic maintenance, with has the possibility of remote information of the main functions. The electrical controller in metal box with mechanical protection IP 54 and painted on red fire colour.

Three-phase electric asynchronous motor, totally enclosed, squirrel cage rotor, fan-cooled, manufactured according to DIN 42673 and IEC Standards. For power above than 4kW the start-up is star-delta, for the others is direct on line.

Diesel engine cooling by water or air, with direct injection, instantaneous cold start-up, stop solenoid valve and exhaust system. Fuel tank is with minimal autonomy at least 3 hours. Star-up system is by 12V or 24V battery.

Set of instrumentation, control and hydraulic accessories consisting of: pressure switches of high sensitivity (one per pump), manometer in glycerin bath, an automatic air vent plug with the inclusion of a check valve for possible repairs, a tank of pre-compressed air for 20 Lt/16 At.; cut valves and check valves in the discharge per each pump; flow switch, common discharge manifold.

Common base frame for electric pumps and diesel pumps up to 55 kW, for superior powers are used independent base frames.

The return Kit (bypass) to relieve excessive pressure in the system, consisting of a shut-off valve, an electro valve, a filter Y, a pressure switch of very high sensitivity (to small flows). This kit, in conjunction with electrical and electronic equipment installed in the panel allows a periodic and automatic test of the pumping set in a closed circuit.

Optional equipments:

- Suction manifold;
- Steroidal differential protection
- Fire repeater Panel
- Remote information via GSM
- Others on request

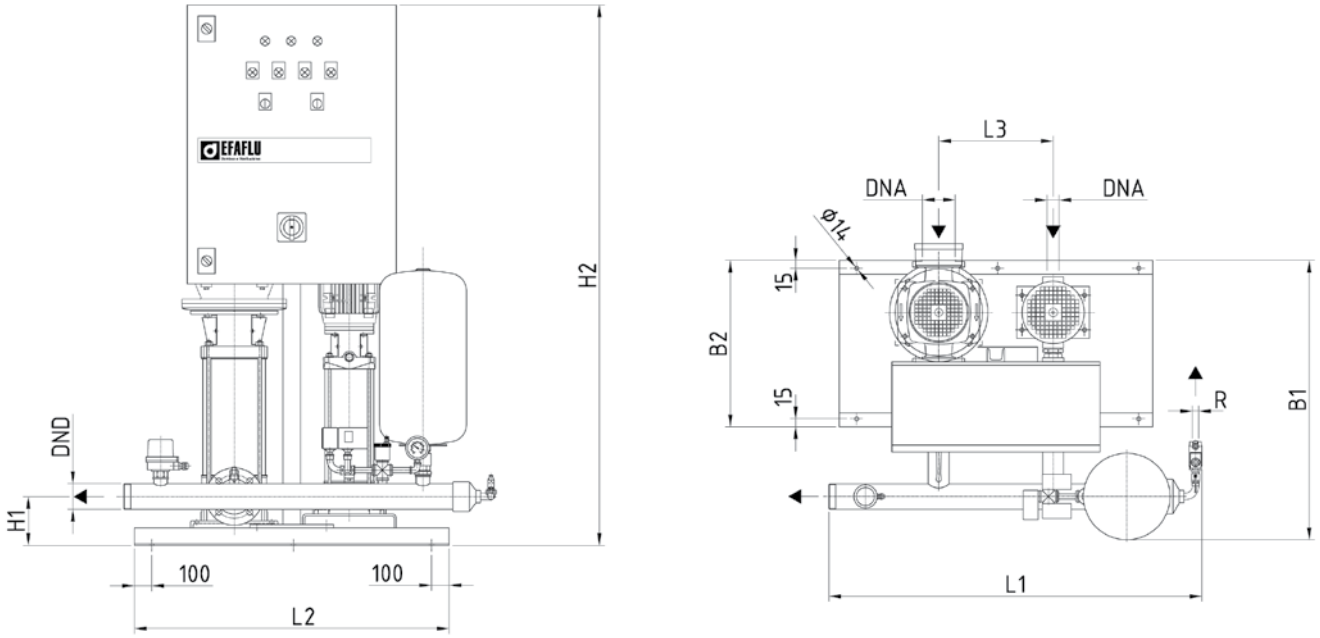
PACKFIRE ES

The fire fighting systems PACKFIRE ES are identical construction to those described above but with special requirements requested for a specific project or other type pumps such as pumps ILS/ILD series, KPH series or others not specified before.

		FLOW RATE PACKFIRE **MV**												
Pressure [m.c.a.]	m³/h	20	25	30	35	40	45	50	55	60	65	70	75	80
30		BMV 16-2	BMV 20-3	BMV 32-30-2	BMV 32-30-2	BMV 42-20-2	BMV 42-20-2	BMV 42-20-2	BMV 42-20	BMV 65-20-2	BMV 65-20-1	BMV 65-20-1	BMV 65-20	BMV 85-20-2
	kW	2.2	4	5.5	5.5	5.5	5.5	5.5	7.5	7.5	11	11	11	11
40		BMV 16-5	BMV 20-4	BMV 32-30-2	BMV 32-40-2	BMV 42-20	BMV 42-20	BMV 42-30-2	BMV 42-30	BMV 65-20	BMV 65-20	BMV 65-30-2	BMV 65-30-1	BMV 85-20
	kW	5.5	5.5	5.5	7.5	7.5	7.5	11	11	11	11	15	15	15
50		BMV 16-6	BMV 20-6	BMV 32-40	BMV 32-50-2	BMV 42-30-2	BMV 42-30-2	BMV 42-30	BMV 42-40-2	BMV 65-30-2	BMV 65-30-1	BMV 65-30	BMV 65-30	BMV 85-30-2
	kW	5.5	7.5	7.5	11	11	11	11	15	15	15	18.5	18.5	18.5
60		BMV 16-7	BMV 20-6	BMV 32-50-2	BMV 32-50	BMV 42-30	BMV-42-40-2	BMV 42-40-2	BMV 42-40	BMV 65-30	BMV 65-30	BMV 65-40-2	BMV 65-40-1	BMV 85-30
	kW	7.5	7.5	11	11	11	15	15	15	18.5	18.5	18.5	22	22
70		BMV 16-8	BMV 20-7	BMV 32-60-2	BMV 32-60	BMV 42-40-2	BMV 42-40	BMV 42-40	BMV 42-50	BMV 65-40-2	BMV 65-40-1	BMV 65-40	BMV 65-50-2	BMV 85-40-2
	kW	7.5	7.5	11	11	15	15	15	18.5	18.5	22	22	30	30
80		BMV 16-8	BMV 20-9	BMV 32-60-2	BMV 32-70	BMV 42-40	BMV 42-50-2	BMV 42-50-2	BMV 42-60-2	BMV 65-40	BMV 65-40	BMV 65-50-2	BMV 65-50	BMV 85-40-2
	kW	7.5	11	11	15	15	18.5	18.5	22	22	22	30	30	30
90		BMV 16-10	BMV 20-10	BMV 32-70-2	BMV 32-80	BMV 42-50-2	BMV 42-50-2	BMV 42-50	BMV 42-60	BMV 65-50-2	BMV 65-50-1	BMV 65-50	BMV 65-60-2	BMV 85-40
	kW	11	11	15	15	18.5	18.5	18.5	22	30	30	30	30	30
100		BMV 16-10	BMV 20-11	BMV 32-70	BMV 32-90-2	BMV 42-50	BMV 42-60-2	BMV 42-60	BMV 42-70-2	BMV65-50-1	BMV 65-50	BMV 65-60-2	BMV 65-60	BMV 85-50-2
	kW	11	15	15	18.5	18.5	22	22	30	30	30	30	37	37

		FLOW RATE PACKFIRE **ST**											
Pressure [m.c.a.]	m³/h	24	30	45	60	75	90	120	150	180	210	240	270
30		NNJ 40-160	NNJ 40-160	NNJ 40-160	NNJ 50-160	NNJ 50-160	NNJ 50-200	NNJ 80-160	NNJ 80-160	NNJ 80-160	NNJ 100-160	NNJ 100-160	NNJ 100-160
	kW	4	5.5	5.5	7.5	11	15	18.5	18.5	22	30	30	30
40		NNJ 40-200	NNJ 40-200	NNJ 40-200	NNJ 50-200	NNJ 50-200	NNJ 65-160	NNJ 65-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-200
	kW	5.5	7.5	11	15	15	15	22	30	30	37	45	45
50		NNJ 40-200	NNJ 40-200	NNJ 40-200	NNJ 50-200	NNJ 50-200	NNJ 65-200	NNJ 65-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-250
	kW	7.5	11	11	15	18.5	22	30	30	37	45	45	55
60		NNJ 40-200	NNJ 40-200	NNJ 40-250	NNJ 50-200	NNJ 50-250	NNJ 65-200	NNJ 65-250	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-250	NNJ 100-250
	kW	11	11	15	18.5	22	30	37	37	45	55	75	75
70		NNJ 40-250	NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250
	kW	15	15	18.5	22	30	37	45	45	55	75	75	75
80		NNJ 40-250	NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250
	kW	15	18.5	22	30	30	37	45	55	75	75	75	75
90		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250	NNJ 100-260
	kW	18.5	22	30	30	37	45	55	75	75	90	90	90
100		NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 65-315	NNJ 65-315	NNJ 80-250	NNJ 100-260	NNJ 100-260	NNJ 100-315	NNJ 100-315
	kW	22	30	37	37	45	55	75	75	90	90	110	132

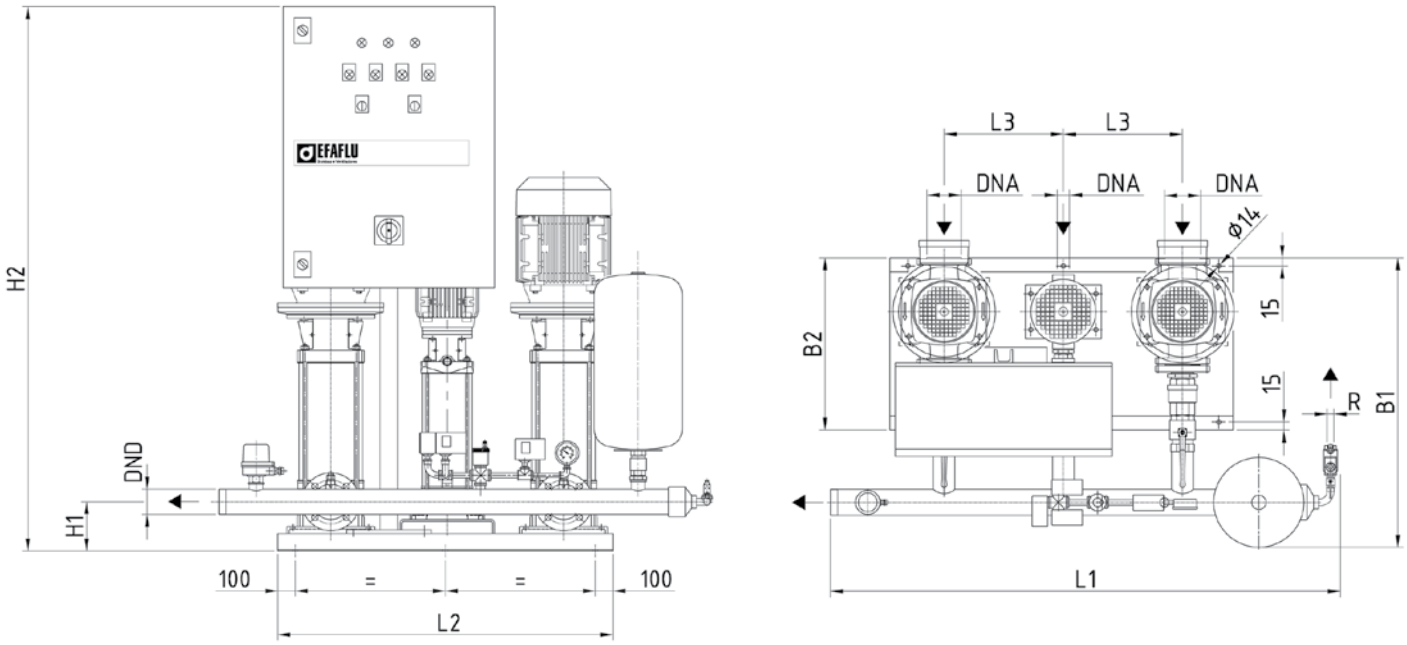
DIMENSIONS (mm)



PACKFIRE MV EJ

PACKFIRE MV EJ	kW	B1	B2	H1	H2	L1	L2	L3	ØDND	R"	ØDNA	ØDNA (J)
BMV16	≤ 15	903	600	140	1550	1215	1100	420	DN65	1/2"	DN50	1"
BMV20	≤ 18,5	903	600	140	1550	1215	1100	420	DN65	1/2"	DN50	1"
BMV32	≤ 11	1005	600	155	1550	1215	1100	420	DN80	1/2"	DN65	1"
BMV32	15	1005	600	155	1640	1215	1100	420	DN80	1/2"	DN65	1"
BMV32	18.5	1005	600	155	1770	1215	1100	420	DN80	1/2"	DN65	1"
BMV42	≤ 11	1110	600	190	1550	1180	1100	420	DN100	1/2"	DN80	1"
BMV42	15	1110	600	190	1550	1180	1100	420	DN100	1/2"	DN80	1"
BMV42	18.5	1110	600	190	1586	1180	1100	420	DN100	1/2"	DN80	1"
BMV42	22	1110	600	190	1706	1180	1100	420	DN100	1/2"	DN80	1"
BMV42	30	1110	600	190	1856	1180	1350	420	DN100	1/2"	DN80	1"
BMV65	≤ 18,5	1110	600	190	1550	1220	1100	450	DN150	3/4"	DN100	1"
BMV65	22	1051	600	190	1560	1220	1100	450	DN150	3/4"	DN100	1"
BMV65	30	1051	500	205	1726	1220	1350	450	DN150	3/4"	DN100	1"
BMV65	37	1051	500	205	1809	1220	1350	450	DN150	3/4"	DN100	1"
BMV85	≤ 22	1066	600	190	1550	1220	1100	450	DN150	3/4"	DN100	1"
BMV85	30	1066	500	205	1682	1220	1350	450	DN150	3/4"	DN100	1"
BMV85	37	1066	500	205	1774	1220	1350	450	DN150	3/4"	DN100	1"

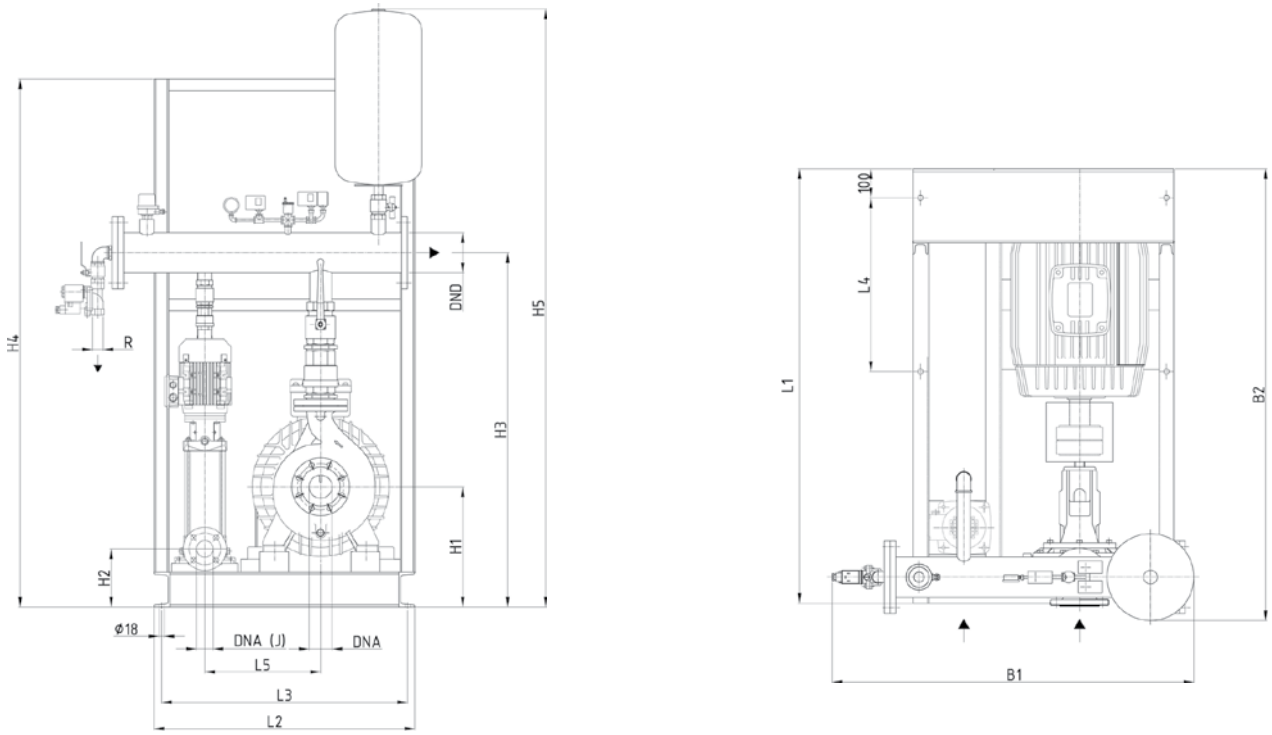
DIMENSIONS (mm)



PACKFIRE MV EEJ

PACKFIRE MV EEJ	kW	B1	B2	H1	H2	L1	L2	L3	ØDND	R"	ØDNA	ØDNA (J)
BMV16	≤ 15	903	600	140	1550	1635	1100	420	DN65	1/2"	DN50	1"
BMV20	≤ 18,5	903	600	140	1550	1635	1100	420	DN65	1/2"	DN50	1"
BMV32	≤ 11	1005	600	155	1550	1635	1100	420	DN80	1/2"	DN65	1"
BMV32	15	1005	900	155	1640	1635	1350	420	DN80	1/2"	DN65	1"
BMV32	18.5	1005	900	155	1770	1635	1350	420	DN80	1/2"	DN65	1"
BMV42	≤ 11	1110	600	190	1550	1660	1100	450	DN100	1/2"	DN80	1"
BMV42	15	1110	900	190	1550	1660	1350	450	DN100	1/2"	DN80	1"
BMV42	18.5	1110	900	190	1586	1660	1350	450	DN100	1/2"	DN80	1"
BMV42	22	1110	900	190	1706	1660	1350	450	DN100	1/2"	DN80	1"
BMV42	30	1110	900	190	1856	1660	1350	450	DN100	1/2"	DN80	1"
BMV65	≤ 18,5	1110	900	190	1550	1670	1350	450	DN150	3/4"	DN100	1"
BMV65	22	1051	900	190	1560	1670	1350	450	DN150	3/4"	DN100	1"
BMV65	30	1051	500	205	1726	1770	1350	500	DN150	3/4"	DN100	1"
BMV65	37	1051	500	205	1809	1770	1350	500	DN150	3/4"	DN100	1"
BMV85	≤ 22	1066	900	190	1550	1670	1350	450	DN150	3/4"	DN100	1"
BMV85	30	1066	500	205	1682	1770	1350	500	DN150	3/4"	DN100	1"
BMV85	37	1066	500	205	1774	1770	1350	500	DN150	3/4"	DN100	1"

DIMENSIONS (mm)

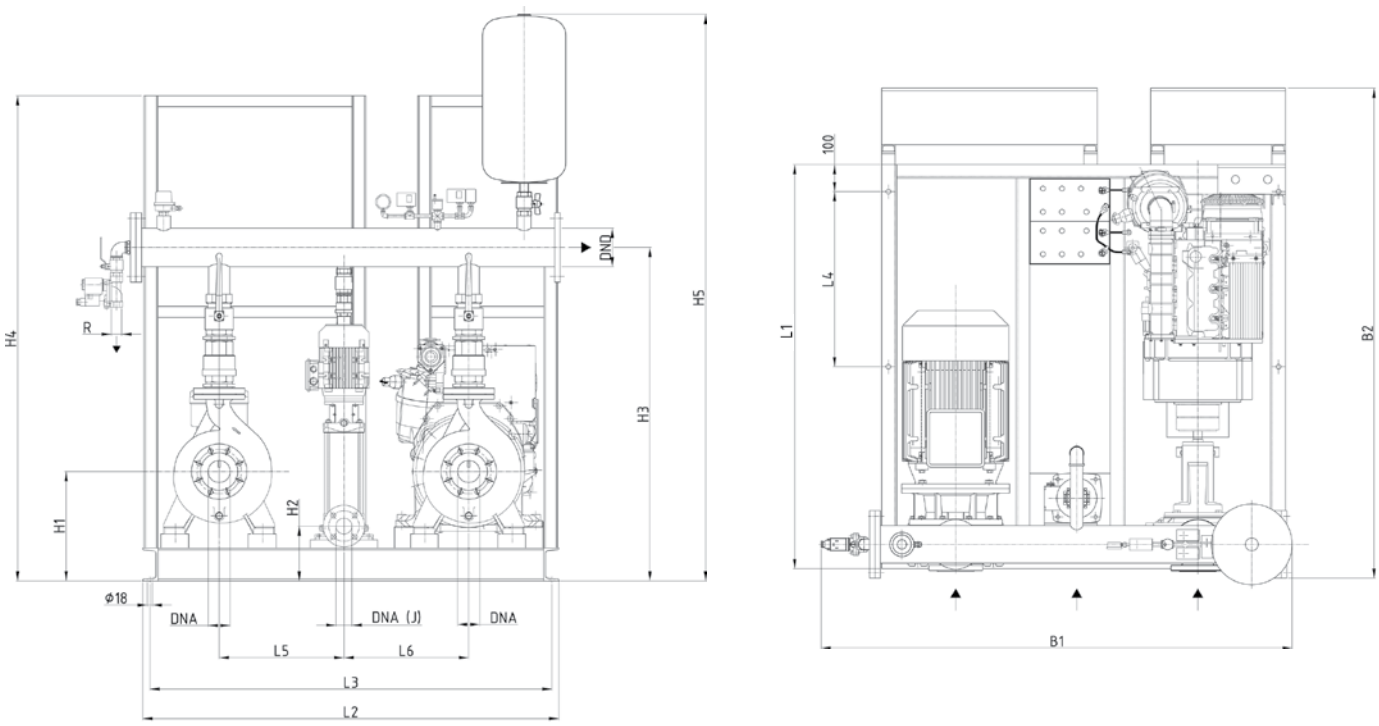


PACKFIRE ST EJ

PACKFIRE ST EJ/DJ	B1	B2	H1	H2	H3	H4	H5	L1*	L2	L3	L4	L5	DNA	DNA(J)	DND	R"
40 - 160 40 - 200	1130	1473	290	161	826	1500	1429	1100	800	760	500	450	65	25	65	1/2"
40 - 250	1130	1473	310	181	890	1500	1492	1100	800	760	450	400	65	25	65	1/2"
50 - 160 50 - 200 50 - 250	1200	1663	330	181	947	1500	1557	1300	950	860	600	400	65	25	80	3/4"
65 - 160 65 - 200	1207	1880	365	201	1063	1500	1685	1500	900	860	700	400	80	25	100	3/4"
65 - 250 65 - 315	1207	1913	390	201	1113	1500	1735	1500	900	860	700	400	80	25	100	3/4"
65 - 315 - 75 kW	1257	2253	410	241	1178	1500	1800	1800	1080	1030	400	450	100	32	125	3/4"
80 - 160	1207	1668	370	201	1110	1500	1732	1300	900	860	600	400	100	32	100	3/4"
80 - 200 80 - 250	1240	2008	390	221	1200	1500	1832	1600	900	850	700	400	100	32	125	1"
80 - 250 - 75 kW	1240	2253	410	241	1219	1500	1854	1800	1080	1030	400	450	100	32	125	1"
100 - 160 100 - 200	1441	2029	435	221	1223	1500	1897	1600	900	850	700	540	125	32	200	1"
100 - 315 100 - 250 100 - 260	1442	2253	455	241	1243	1500	1917	1800	1080	1030	450	540	125	32	200	1"

* On EJ version L1 is of 600 mm up to 11 kW. From 15 to 37 kW L1 is of 900 mm.

DIMENSIONS (mm)



PACKFIRE ST EDJ

PACKFIRE ST EEJ/EDJ	B1	B2	H1	H2	H3	H4	H5	L1*	L2	L3	L4	L5	L6	DNA	DNA(J)	DND	R"
40 - 160 40 - 200	1670	1496	290	161	826	1500	1429	1100	1250	1214	450	410	410	65	25	65	1/2"
40 - 250	1564	1496	330	181	909	1500	1512	1100	1250	1214	450	375	375	65	25	65	1/2"
50 - 160 50 - 200 50 - 250	1654	1900	330	181	947	1500	1557	1500	1500	1460	650	410	410	65	25	80	3/4"
65 - 160 65 - 200	1657	1890	370	201	1028	1500	1649	1500	1500	1460	650	425	475	80	25	100	3/4"
65 - 250 65 - 315	1727	2113	390	201	1113	1500	1735	1700	1550	1500	750	425	475	80	25	100	3/4"
65 - 315 - 75 kW	2127	2463	440	241	1208	1500	1843	2000	2180	740/1030	450	540	810	100	32	125	3/4"
80 - 160	1698	1867	370	201	1122	1500	1757	1500	1500	1460	650	425	475	100	32	125	3/4"
80 - 200 80 - 250	1709	2118	410	221	1230	1500	1877	1700	1550	1500	750	425	475	100	32	150	1"
80 - 250 - 75 kW	2160	2398	440	241	1262	1500	1909	2000	2180	740/1030	450	540	810	100	32	150	1"
100 - 160 100 - 200	1732	2123	435	221	1223	1500	1897	1700	1550	1500	750	450	450	125	32	200	1"
100 - 260 100 - 250 100 - 315	2210	2600	455	241	1243	1200	1917	2000	2180	740/1030	450	540	810	125	32	200	1"

* On EEJ version L1 is of 600 mm up to 11 kW. From 15 to 37 kW L1 is of 900 mm.

The fire fighting systems STOPFIRE are designed to fulfill the needs of any installation type in accordance with a particular standard or technical regulation.

The fire fighting systems keep the network of fire pressurized starting automatically by the pressure drop in the network. While the jockey pump has automatic start and stop operations, the main/stand-by groups after being put into operation, only stop manually.
The standard systems beyond the duty point dimensioned to a specific system must respect the second duty point specified by each standard.

NOMENCLATURE OF IDENTIFICATION

STOPFIRE
NE EDJ 60/50

- 60/50 → Flow rate m³/h / Manometric head m.c.a.
- EDJ → E - Electric; D - Diesel; J - Jockey (example: EJ, DJ, EEJ, EDJ, DDJ, ...)
- NE → EN - EN12845; NE - CEPREVEN; NA - NFPA20; FM - Factory Mutual; NO - Other standards; ES - Special pumps

STOPFIRE **EN**

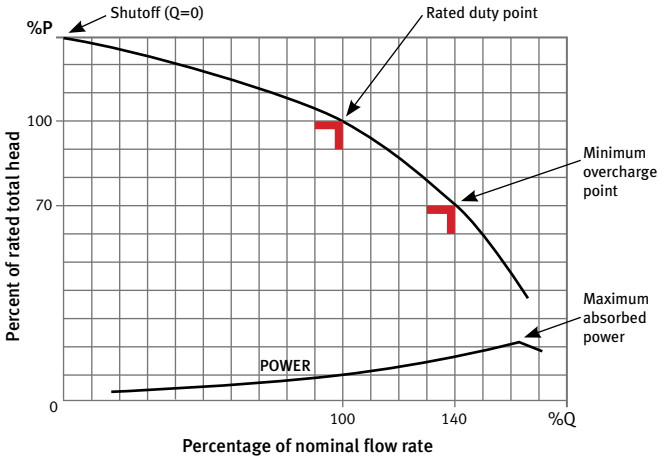
The fire fighting systems STOPFIRE EN are designed in accordance with the European Standard EN12845.

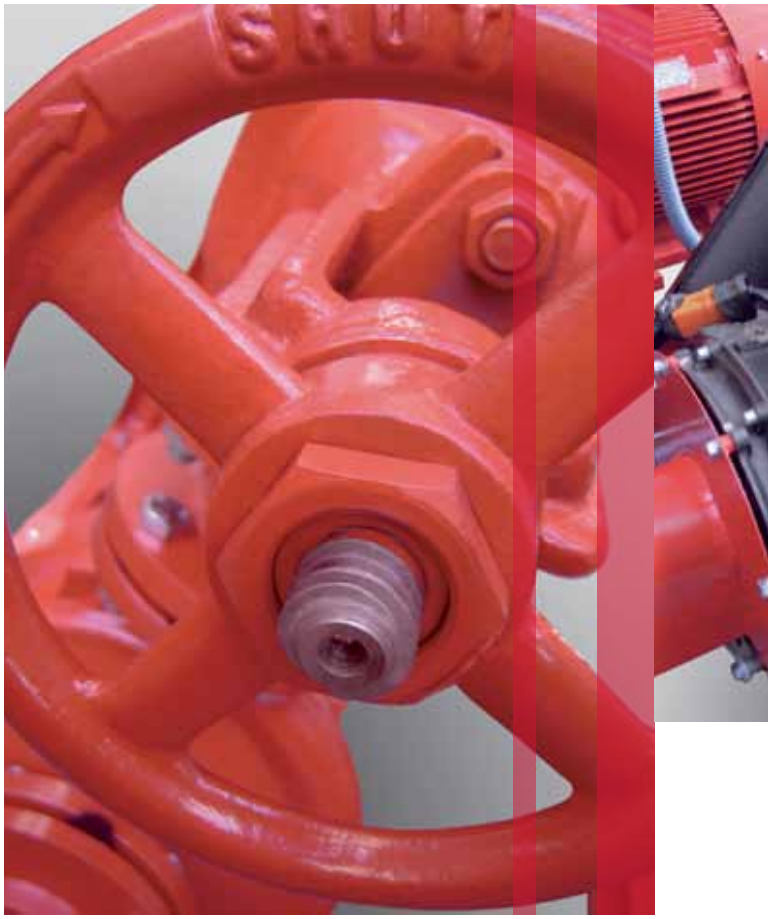
The system must be dimensioned, taking into account the level of risk identified for the installation and ensuring the automatic supply of flow and pressure required.
The pumps should have a curve which the maximum pressure is, at zero flow, decreasing progressively with the flow increasing. The pumps can be operated by an electric motor or diesel engine with power required to cover the entire curve. The coupling between the pump and the engine must allow the disassembly of the pump rotating components without dismantling the suction and compression piping.

When installed more than one pump their curves of characteristics must allow the operation in parallel.

The pump room must be protected by a network of sprinklers and must have fire resistance of, at least, 60 min. and can not be used for any other purpose than for fire protection. The temperature of the room can not be less than 4ºC for electric groups and 10ºC for diesel groups. In the case of using groups with diesel engines shall be provided adequate ventilation according to the manufacturer information.

Whenever possible, the pumps should be with positive suction, if not possible it should be used column submersible pumps or horizontal pumps equipped with individual automatic priming system.
In addition to the nominal duty point dimensioned for the project the pump must be able to deliver 140% of nominal flow at a pressure not less than 70%.





The supply of the electrical energy to the controller must be independent for the system of fire and separated from all other connections. The electrical controllers should enable automatic start-up and manual stop and must be equipped with ammeter. This includes the lights for the presence of voltage, pump request, pump running and starting failure. There is a beep sound in a state of alarm or pump running.
The diesel engine must be able to work continuously at nominal power being able of starting with the room at a temperature of 5ºC. The cooling system of the diesel engine can be made by heat exchanger or radiator and air intake must have a suitable filter. The exhaust system must be equipped by a silencer. The fuel tank must be the capacity of 3 to 6 hours of operation according to the risk of the installation. The voltage of the batteries and the starter motor should not be less than 12V.

CONSTRUCTIVE ELEMENTS

The main/stand-by pumps are of the horizontal type, from normalized horizontal pumps NNJ or CJG series or column submersible type, construction in cast iron with impeller in bronze or stainless steel and operated by three phase electric motor or diesel engine. The pump is coupled to the engine through a flexible coupling with spacer, protected by guard and mounted on common base frame.

The jockey pump is multicellular, vertical, in line, casing in cast iron construction and stainless steel impellers attached to the vertical three-phase electric motor through a rigid coupling.

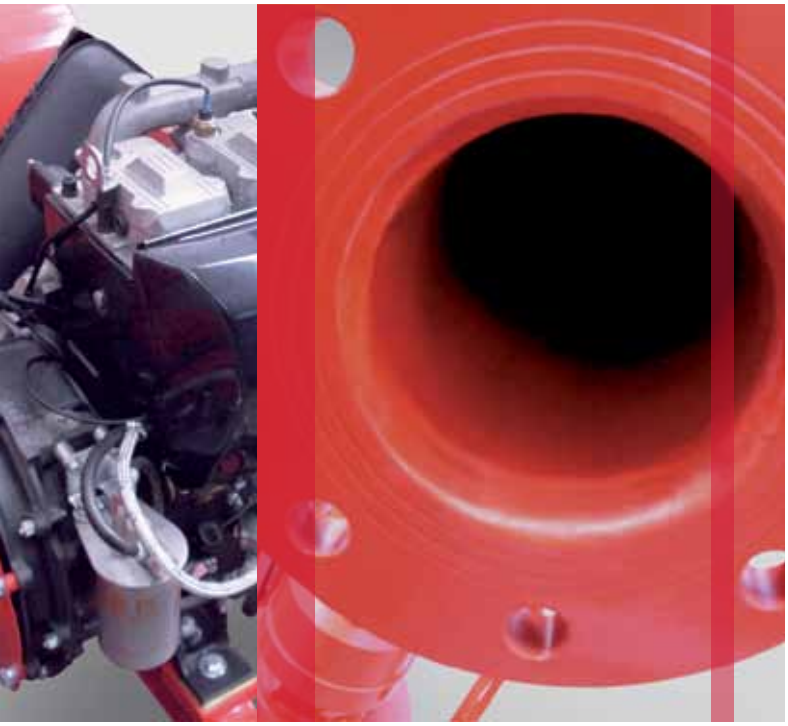
Three-phase electric asynchronous motor, totally enclosed, squirrel cage rotor, fan-cooled, manufactured according to DIN 42673 and IEC Standards. For power above than 4kW the start-up is star-delta, for the others is direct on line.

Diesel engine, developed specifically for Fire Fighting Systems, water or air cooling, with direct injection, instantaneous cold start-up, stop solenoid valve, exhaust silencer and instrument panel comprising rotation counter, oil pressure gauge and temperature gauge, hour counter. A fuel tank is with a minimum autonomy of 3 to 6 hours (according to the degree of risk).

Starting system by 12V or 24V battery, with sufficient capacity to carry out the start-up sequences imposed by the Standard, with emergency buttons and two sets of batteries.

Electrical controller(s) for control and protection of main pump and auxiliary electric pump allows the manual or automatic starting of the main/reserve pump and the stop is only manual, with the possibility of remote information of the main functions. The electrical controller is in metal box with mechanical protection IP 54 and painted on red fire colour and with the signs and alarms requested by the standard.

Set of instrumentation, control and hydraulic accessories consisting of: pressure switches of high sensitivity (one per pump), manometer in glycerin bath, an automatic air vent plug with the inclusion of a check valve for possible repairs, a tank of pre-compressed air for 20 Lt/16 At.; cut valves and check valves in the discharge per each pump; common discharge manifold; common base frame for electric pumps and diesel pumps up to 55 kW, for superior powers are used independent base frames.



OPTIONAL

Proof manifold with: a T Curved, shut-off valve and a flow meter (of rot meter type installed between flanges) and flow display to enable reading 150% of the nominal flow, sectioned by two stop valves.

Optional equipments:

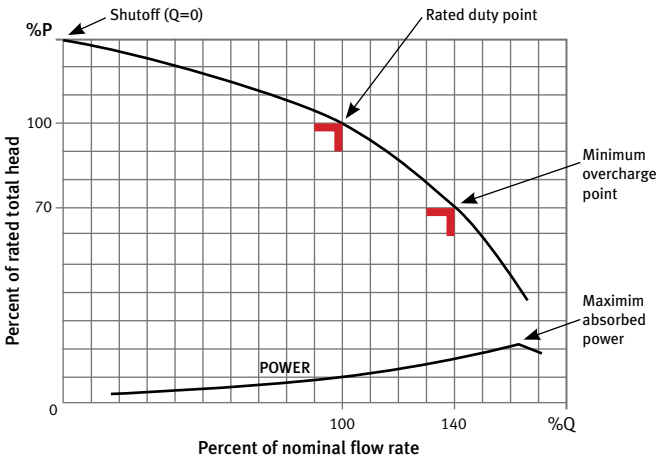
- Suction manifold;
- Steroidal differential protection
- Fire repeater Panel
- Others on request

STOPFIRE NE

The fire fighting systems STOPFIRE NE are designed in accordance with the Spanish Technical Standard CEPREVEN R.T.2 – ABA

All shut-off valves must remain fully open for the proper functioning of the installation and they should have a device to verify that they are in the open position. If this device is hidden it will need a monitoring electrical system. The speed of closure of the valves should be such that its speed of closure must avoid the risk of water hammer, and the wheel should be turned in at least two laps to make the cut. The flow rates and operating times to ensure the fire fighting system is determined by the specific system.

Pumping set formed by one main pump or several pumps with equal total capacity. The main pumping sets should be of manual and automatic star-up but with the stop only manual. The main pumps can not be used to maintain the system pressure, to this end it is necessary a small group of auxiliary pump (jockey) with start and stop automatically. The pumping equipment can not be used for any purpose other than fire protection. The pumps must work in parallel regardless of your rotation. When a unit is composed by two pumps each one must have to debit the flow and pressure required for the project. Where there are installed 3 pumps each one has to debit at least half the flow to the pressure required. The elements in contact with water must be of suitable material to prevent rust or corrosion of movable parts. The impellers are cast bronze or stainless steel. The type of pump and mounting system must allow the repair and maintenance without disconnecting the suction and compression tubing or removing the engine, except those with power less than 5kW and the vertical submersible pumps. The pumping set should be able to debit 140% of nominal flow at a pressure not less than 70% of the nominal pressure.



The pumping sets of fire fighting systems must be installed in sites easily accessible, independent, protected from fire and other risks of nature and endowed with a drainage system. The ventilation systems and replacement natural air needed for the room pumps must be planned and calculated depending on the type of engines installed as well as its cooling system. The room must have a fire resistance of 60 minutes and should only be for fire protection. Whenever possible, the pumps should be horizontal and centrifugal ones and be with positive suction, if this is not possible, must be used submersible pumps, column or horizontal pumps equipped with independent automatic priming system.

The engines of the sets can be electric or diesel. The engine rated power must be equal or superior to the maximum power absorbed by the pump at any point on the characteristics curve including when that point has a flow greater than the overload. The power to the start-up and control board will be exclusive to the fire system and independent of any other connection. All power cables must be protected against fire and mechanical damage. The diesel engine must be able to work continuously at the nominal power being capable of pulling out with the room to a temperature of 5ºC. The cooling system of the diesel engine can be made by heat exchanger or radiator and the air inlet must have a suitable filter. The exhaust system must be equipped by a silencer. The fuel tank must be capable of 6 hours operation and will be for the exclusive use of that motor. The voltage of the batteries and the starter should not be less than 12V.

CONSTRUCTIVE ELEMENTS

The main/stand-by pumps are horizontal End-suction NNJ (EN733) or CJG (ISO2858) series or vertical line shaft pumps series of construction in cast iron with impeller in bronze or stainless steel and operated by three phase electric engine or diesel engine. The pump is coupled to the engine through a flexible coupling with spacer, protected by guard and mounted on common base frame.

The jockey pump is multicellular, vertical, in line, casing in cast iron construction and stainless steel impellers attached to the vertical three-phase electric motor through a rigid coupling.
Three-phase electric asynchronous motor, totally enclosed, squirrel cage rotor, fan-cooled, manufactured according to DIN 42673 and IEC Standards. For power above than 4kW the start-up is star-delta, for the others the direct on line.

Diesel engine, developed specifically for Fire Fighting Systems, water or air cooling, with direct injection, instantaneous cold start-up, solenoid stop valve, exhaust silencer and instrument panel comprising rotation counter, oil pressure gauge and temperature gauge, hour counter.
A fuel tank is with a minimum autonomy of 3 to 6 hours with the engine running at full load.
Starting system by 12V or 24V battery, with sufficient capacity to carry out the start-up sequences imposed by the Standard, with emergency buttons and two sets of batteries.

Electrical controller(s) for control and protection of main pump and stand-by pump allows the manual or automatic starting of the main/stand-by pump and the stop only manual, with the possibility of remote information of the main functions. The electrical controller is in metal box with mechanical protection IP 54 and painted in factory on red fire colour and with the signs and alarms requested by the standard.

Set of instrumentation, control and hydraulic accessories consisting of: pressure switches of high sensitivity (one per pump), manometer in glycerin bath, an automatic air vent plug with the inclusion of a check valve for possible repairs, a tank of pre-compressed air for 20 Lt/16 At.; cut valves and check valves in the discharge per each pump; common discharge manifold; common base frame for electric pumps and Diesel pumps up to 55 kW, for superior powers are used independent base frames.

OPTIONAL

A proof manifold with: a T Curved, shut-off valve and a flow meter (of rot meter type installed between flanges) and flow display to enable to read 150% of the nominal flow, sectioned by two stop valves.

Optional equipments:

- Suction manifold;
- Steroidal differential protection (alarm/signalling)
- Fire repeater Panel
- Others on request

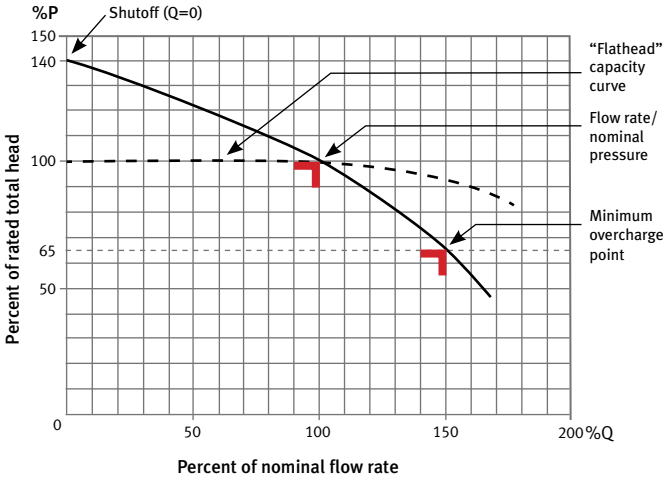
STOPFIRE NA AND FM

The fire fighting systems STOPFIRE NA and FM are built according to American Standard NFPA20 and in the case of fire fighting systems STOPFIRE FM approved FM-Factory Mutual and / or UL-Underwriters Laboratories.

The Standard NFPA20 is applied to centrifugal Single-stage or vertical or horizontal multistage pumps and to positive displacement pumps of vertical or horizontal axis. The pumps more used are those of split-case and the column submersible ones.

The centrifugal pumps of surface can not be selected to be installed in negative suction. In these cases is usually selected a column submersible pump. The engines of the sets can be electric or diesel. The electrical controllers are independent including the jockey pump.

The pumping set should be able to debit 150% of nominal flow at a pressure not less than 65% of the nominal pressure. The pressure at zero flow can not exceed 140% of nominal pressure that can not be less than 101% of the same.
In the case of a central in accordance with the standard NFPA20 and with the approval FM-Factory Mutual and/or UL-Underwriters Laboratories the components must be approved or listed by these entities. The pump does not just be FM / UL, all components have to be also (pumps, controllers and motors).



STOPFIRE NA and FM

WE HIGHLIGHT SOME **ADVANTAGES** OF OUR NA AND FM SYSTEMS:

- Flow switch on the cooling circuit of the motor;
- Cooling circuit by water oversized and sized according to the requirement of minimum flow to cool / protect the pump
- The cooling circuit by water is connected to the pump discharge
- The grills can be connected in the electric controller, without requiring additional relay / hardware
- Exhaust flanged compensator
- Exhaust silencer also equipped with flanges and supplied as standard with the counter-flanges and gaskets
- Exhaust system (silencer + compensator) is oversized according to the maximum allowable counter-pressure for turbo
- Pressure switch is always equipped with manual test circuit (valve + check valve)
- Heat exchanger designed to withstand the maximum pressure of the pump at all times, thereby eliminating the need for a pressure relief valve in the bypass emergency
- Fuel tank with double wall with recovery of leaked fuel
- 4 batteries (2x24V) as standard
- Whole system mounted and connected on a common skid "ready to work" (each main pump with its own platform)
- All units are tested
- Installation and maintenance personalized manual (issued in the serial number of the unit)

CONSTRUCTIVE ELEMENTS

The fire fighting systems according to NFPA20 with or without FM approval or UL are mounted on one base frame with all components installed and ready to work.
The system is composed by one or more main pumps coupled to electric or diesel engines and linked to the respective controllers. In the case of pumps operated by diesel motors, except in cases of high dimensions, the fuel tank is always double wall and is mounted on the platform of the pump.

Optional equipments:

- Flowmeters;
- Ventilation grills
- Main relief device
- Valves and collectors

STOPFIRE NO

The Fire Fighting Systems STOPFIRE NO are built according to the international standards such as UNE 23-500-90, APSAD, CEA 4001 - 200-4 or others.

The design and performance features are defined on each of the standards.

STOPFIRE ES

The Fire Fighting Systems range STOPFIRE ES has special design however fulfilling an international standard. From this family of systems we highlight:

- Fire Fighting Systems with multistage pump with multiple outputs (Photo 1) used in building skyscrapers. This solution meets the requirements of NFPA20 and lets you use a pump instead of 3, if you have 3 outputs, which makes the system very compact and less expensive. The flanges of discharge can be positioned in multiple directions.

- Fire Fighting Systems with positive displacement pump (Photo 2) for foam systems, using the single pump on the market with the approval of FM / UL. To make the system as compact as possible, this pump can be attached to the same engine of the main pump eliminating the need for a new engine.

Photo 1

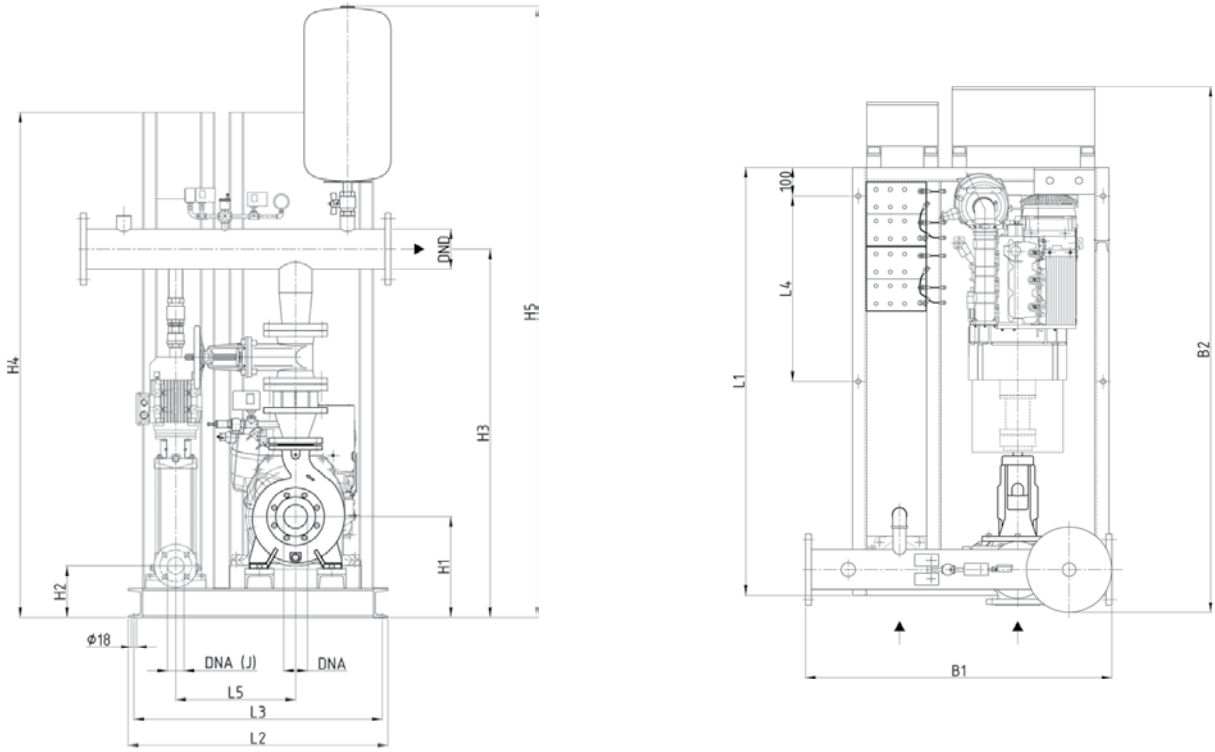
- Compact containerized turnkey systems. The fire fighting systems are inserted into a “house” built for this purpose (not using conventional containers) maximum width of 3.2 m, which allows transport without special means, and where they are installed all components necessary for its operation. These systems fully equipped allowed its use on the mobile situations such as in building yards or seaports.

Photo 2

		FLOW RATE STOPFIRE EN										
Pressure [m.c.a.]	m³/h	24	30	45	60	75	90	120	150	180	210	240
30		NNJ 40-160	NNJ 40-160	NNJ 50-160	NNJ 50-160	NNJ 50-160	NNJ 80-160	NNJ 80-160	NNJ 100-160	NNJ 100-160	NNJ 100-160	NNJ 100-160
	kW	4	5.5	7.5	7.5	11	15	18.5	22	30	30	30
40		NNJ 40-200	NNJ 40-200	NNJ 50-160	NNJ 50-200	NNJ 50-200	NNJ 50-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-200
	kW	7.5	7.5	11	15	15	18.5	30	30	30	37	37
50		NNJ 40-200	NNJ 40-200	NNJ 50-200	NNJ 50-200	NNJ 50-200	NNJ 65-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-200
	kW	7.5	11	18.5	18.5	18.5	22	37	37	37	45	55
60		NNJ 40-200	NNJ 40-200	NNJ 50-200	NNJ 50-200	NNJ 65-200	NNJ 65-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-250	NNJ 100-250
	kW	11	11	22	22	30	30	45	45	45	55	75
70		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250	NNJ 100-260
	kW	15	15	22	22	30	37	45	55	75	75	75
80		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-260
	kW	18.5	18.5	30	30	37	37	55	75	75	90	90
90		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250
	kW	22	22	30	30	45	45	75	75	75	90	110
100		NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 65-315	NNJ 80-250	NNJ 80-250	NNJ 100-260	NNJ 100-260	NNJ 100-260
	kW	22	37	37	45	45	55	75	75	110	110	110

		FLOW RATE STOPFIRE NE										
Pressure [m.c.a.]	m³/h	24	30	45	60	75	90	120	150	180	210	240
30		NNJ 40-160	NNJ 40-160	NNJ 50-160	NNJ 50-160	NNJ 50-160	NNJ 80-160	NNJ 80-160	NNJ 100-160	NNJ 100-160	NNJ 100-160	NNJ 100-160
	kW	4	5.5	7.5	7.5	11	15	18.5	22	30	30	30
40		NNJ 40-200	NNJ 40-200	NNJ 50-160	NNJ 50-200	NNJ 50-200	NNJ 50-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-200
	kW	7.5	7.5	11	15	15	18.5	30	30	30	37	37
50		NNJ 40-200	NNJ 40-200	NNJ 50-200	NNJ 50-200	NNJ 50-200	NNJ 65-200	NNJ 80-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-200
	kW	7.5	11	18.5	18.5	18.5	22	37	37	37	45	55
60		NNJ 40-200	NNJ 40-200	NNJ 50-200	NNJ 50-200	NNJ 65-200	NNJ 65-200	NNJ 80-200	NNJ 80-200	NNJ 100-200	NNJ 100-250	NNJ 100-250
	kW	11	11	22	22	30	30	45	45	45	55	75
70		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250	NNJ 100-260
	kW	15	15	22	22	30	37	45	55	75	75	75
80		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-260
	kW	18.5	18.5	30	30	37	37	55	75	75	90	90
90		NNJ 40-250	NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 80-250	NNJ 80-250	NNJ 80-250	NNJ 100-250	NNJ 100-250
	kW	22	22	30	30	45	45	75	75	75	90	110
100		NNJ 40-250	NNJ 50-250	NNJ 50-250	NNJ 65-250	NNJ 65-250	NNJ 65-315	NNJ 80-250	NNJ 80-250	NNJ 100-260	NNJ 100-260	NNJ 100-260
	kW	22	37	37	45	45	55	75	75	110	110	110

DIMENSIONS (mm)

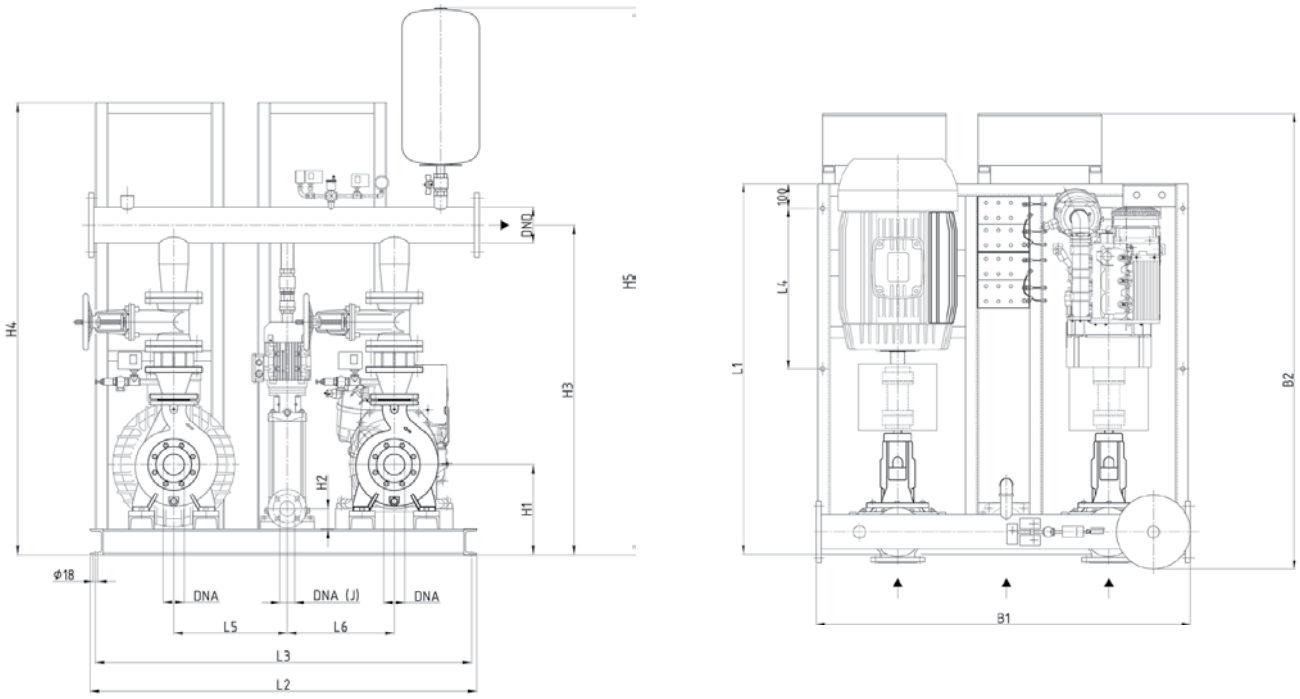


STOPFIRE EN and NE DJ

STOPFIRE EN and NE EJ/DJ	B1	B2	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	DNA	DNA (J)	DND
40 - 160 40 - 200	1080	1550	290	161	916	1500	1519	1100	950	914	500	400	65	25	65
40 - 250	1080	1550	310	181	936	1500	1541	1100	950	914	500	400	65	25	65
50 - 160 50 - 200 50 - 250	1100	1750	330	181	1006	1500	1616	1300	950	910	600	400	65	25	80
65 - 160 65 - 200 65 - 250	1100	1950	365	201	1103	1500	1723	1500	950	900	700	400	80	25	100
65 - 250 ≥ 45	1100	2000	390	201	1128	1500	1748	1500	950	900	700	400	80	25	100
65 - 315	1100	2300	410	241	1265	1500	1910	1800	1080	1030	400	450	80	25	100
80 - 160	1100	1950	370	201	1208	1500	1841	1500	950	900	700	400	100	25	125
80 - 200 ≥ 55	1100	2300	410	241	1265	1500	1910	1800	1080	1030	400	450	100	25	150
80 - 250	1100	2000	390	221	1240	1500	1885	1500	950	900	700	400	100	25	150
80 - 250 ≥ 55	1100	2300	410	241	1265	1500	1910	1800	1080	1030	400	450	100	25	150
100 - 160 100 - 200	1220	2100	435	221	1393	1500	2063	1600	900	864	700	540	125	32	200
100 - 250 100 - 260 100 - 315	1220	2600	455	241	1413	1500	2083	2000	1080	1030	450	540	125	32	200

Note
Vent-plug dimensions:
-Relief valve = 1”
-Seals = 1/2”

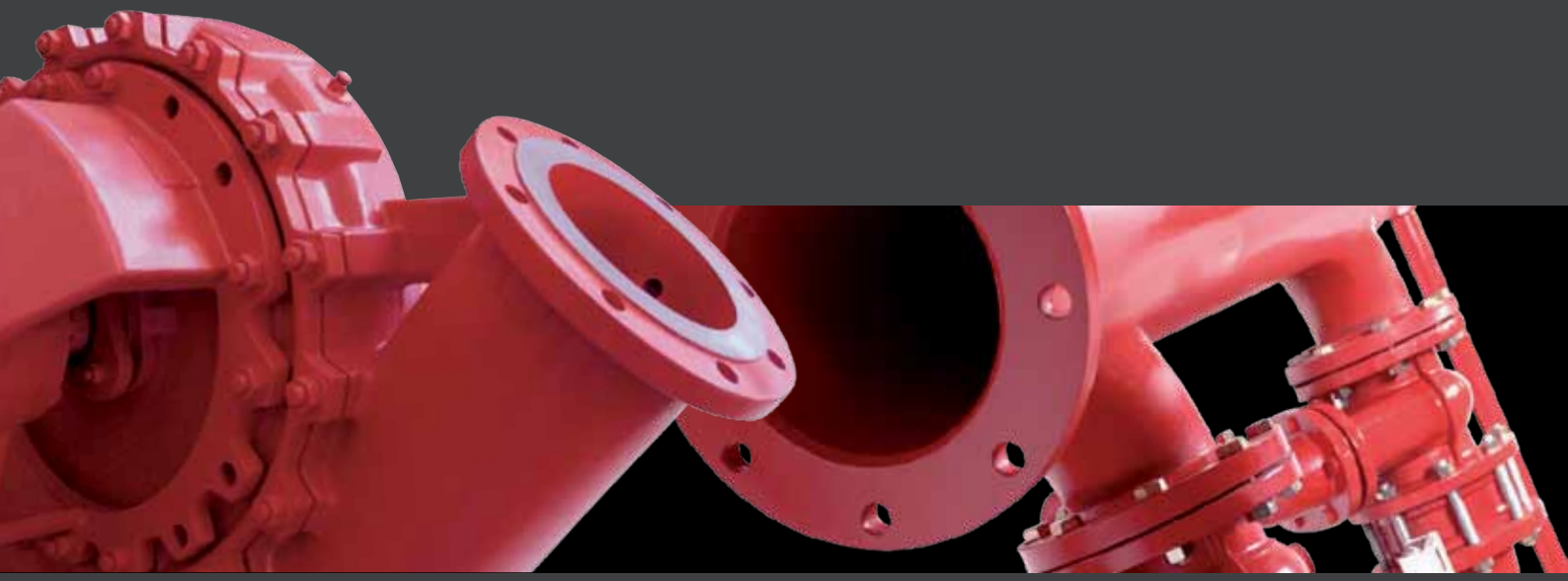
DIMENSIONS (mm)



STOPFIRE EN and NE EDJ

STOPFIRE EN and NE EEJ/EDJ	B1	B2	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	DNA	DNA (J)	DND
40 - 160 40 - 200	1475	1550	290	161	916	1500	1519	1100	1250	1214	450	375	375	65	25	80
40 - 250	1405	1900	330	181	956	1500	1561	1500	1500	1460	650	410	410	65	25	80
50 - 160 50 - 200 50 - 250	1475	1900	330	181	1006	1500	1616	1500	1500	1460	650	430	470	65	25	100
65 - 160 65 - 200	1500	1950	370	201	1098	1500	1718	1500	1500	1460	650	425	475	80	25	100
65 - 250 65 - 315	1500	2200	390	201	1138	1500	1758	1700	1550	1500	750	425	475	80	25	125
80 - 160	1500	2200	370	201	1208	1500	1841	1700	1550	1500	750	425	475	100	25	125
80 - 200 80 - 250	1500	2200	410	221	1260	1500	1905	1700	1550	1500	750	425	475	100	25	150
65 - 315 - 75 kW	1610	2550	440	241	1315	1500	1960	2000	2180	740/1030	450	540	810	100	32	125
80 - 250 - 75 kW	1610	2550	440	241	1315	1500	1960	2000	2180	740/1030	450	540	810	100	32	150
100 - 315 100 - 250 100 - 260	2030	2600	455	241	1499	1200	2169	2000	2180	740/1030	450	540	810	125	32	200
100 - 160 100 - 200	1580	2200	435	221	1368	1500	2038	1700	1550	1500	750	450	450	125	32	200

Note
Vent-plug dimensions:
-Relief valve = 1”
-Seals = 1/2”



EFAFLU is a Portuguese company with more than 60 years of experience, entirely dedicated to development, manufacture, marketing, technical support as well as after-sales service of pumps, pumping systems and fans. Our products are distributed throughout Portugal and abroad by specialised and qualified partners.

We continuously develop our organisation and our products in order to provide advanced technology solutions and quality services that ensure we are the most reliable partner in the market. We are aware of the environmental problem. Accordingly, we are concerned about supplying equipment with the highest energy savings. Furthermore, we manufacture from recyclable materials.

We are committed to create value for society by betting on employees' personal valuation and fulfilment, raising the quality standards of the market and a sustained value relationship towards shareholders.

UNIÃO EUROPEIA
Fundo Europeu de Desenvolvimento Regional

QUADRO DE REFERÊNCIA ESTRATÉGICO NACIONAL

COMPETE

HEAD OFFICE/FACTORY:
Póvoa de Varzim, Portugal
Telef.: [+351] 252 298 700
Fax: [+351] 252 615 480
e-mail: geral@efaflu.pt
vendasnorte@efaflu.pt

LLOYD'S REGISTER QUALITY ASSURANCE ISO9001
certificação acreditada IPAC

www.efaflu.pt

EFAFLU Bombas e Ventiladores, S.A.

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