MCE/P
INVERTER

PRESSURE PUMPS

MCE/P 11 - MCE/P 15 - MCE/P 22

MCE/P 30 - MCE/P 55

MCE/P 110 - MCE/P 150

MCE/P is the leading edge of teh Dab Inverters family and are ideal for professional and very severe applications.
They can drive pumps of up to 15 kW.
These units combine the simplicity with the robust design and power of an inverter drive.
MCE/P are mounted on the pump, and are equipped with pressure sensors and the **optional flow sensors** as required.
The use of a flow sensor, moreover, allows a better pressure regulation.
The **MCE/P** can easily be set up in booster sets,thanks to a standard wire cable connection.
Comfort, energy saving, protections and simplicity are the keywords of this professional series.
The **MCE/P** units are air cooled.
The **MCE/P** can be easily installed in existing systems and can operates with all pumps Facility to create sets with interchange of up to 8 pumps.

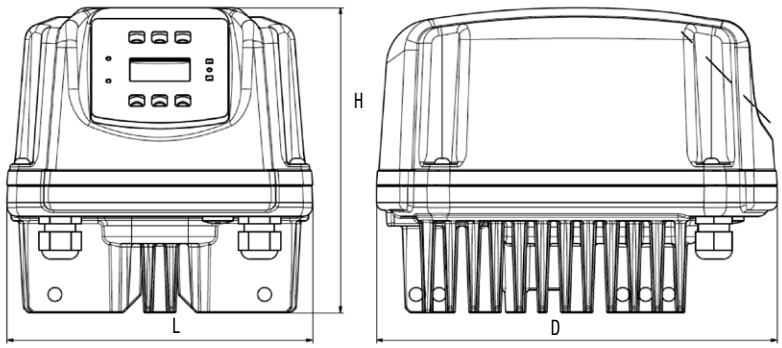
- Self-ventilated panel-mounting inverters for hydraulic pumps.
- For three-phase pumps up to 3HP - 2,2kW (model MCE/P 11 – MCE/P 15 – MCE/P 22)
  For three-phase pumps up to 7,5 HP - 5.5 kW (model MCE/P 30 – MCE/P 55) .
  For three-phase pumps up to 20HP – 15kW (MCE/P 110 – MCE/P 150).
- OLED graphic display.
- Input power supply 1 x 230V 50-60Hz (model MCE/P 11 – MCE/P 15 – MCE/P 22)
  Input power supply 3 x 400V 50-60Hz (model MCE/P 30 – MCE/P 55
  MCE/P 110 – MCE/P 150).
- Electric pump nominal frequency 50-200 Hz.
- Control range in accordance with the sensor utilised, with standard range of 1-24bar.
- Protections against voltage surges.
- Adjustable overload protection.
- Extended connectivity.
- Protection rating: IP55.
- Dry run protection.
- Short circuit between output phases.
- Overtemperature protection.
- Anti-seize and anti-frost function.
- Costant pressure.

TECHNICAL DATA

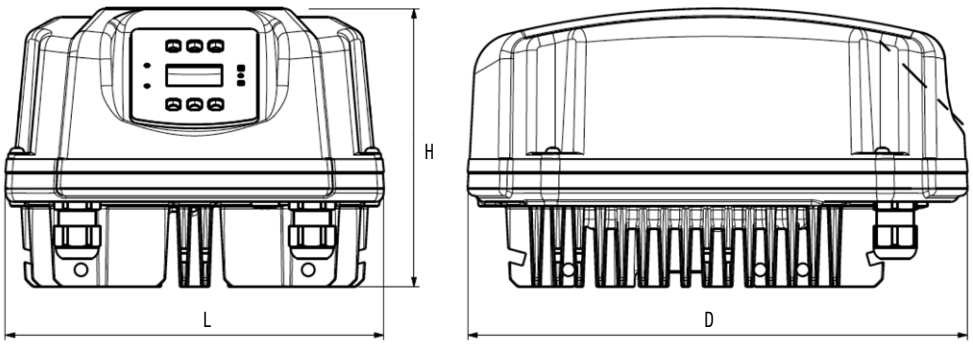
MODEL	CODE	NOMINAL MOTOR POWER kW	MAX NOMINAL MOTOR CURRENT A	MIN NOMINAL MOTOR CURRENT A	VOLTAGE 50 Hz	PUMP VOLTAGE 50 Hz	MOTOR FRAME
MCE/P 11	60145919	1.1	6.5	1.0	Single-phase 1x230	Three-phase 3x230	71 80
MCE/P 15	60145920	1.5	8,0	1.0	Single-phase 1x230	Three-phase 3x230	90
MCE/P 22	60145921	2.2	10.5	1.0	Single-phase 1x230	Three-phase 3x230	90 100
MCE/P 30	60145922	3	7,5	2.0	Three-phase 3x400	Three-phase 3x400	100
MCE/P 55	60145923	5,5	13,5	2.0	Three-phase 3x400	Three-phase 3x400	112 132
MCE/P 110	60145924	11.0	24	2.0	Three-phase 3x400	Three-phase 3x400	132 160
MCE/P 150	60145925	15.0	32	2.0	Three-phase 3x400	Three-phase 3x400	160

DIMENSIONS AND WEIGHTS

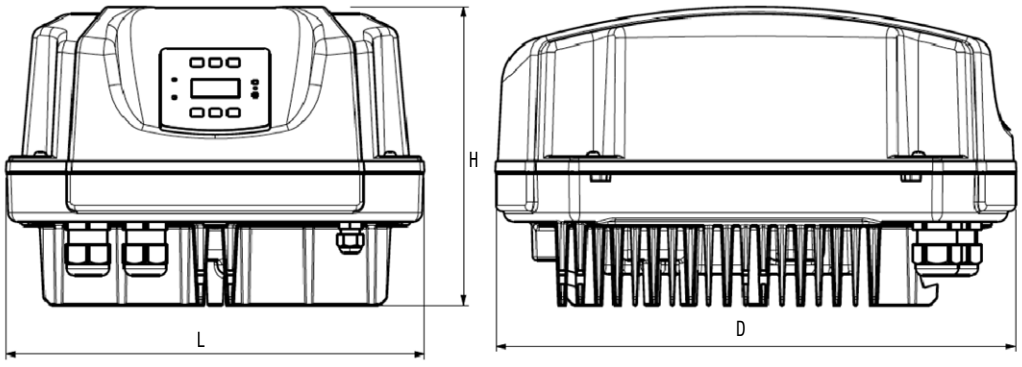
MCE/P 11 - MCE/P 15 - MCE/P 22



MCE/P 30 - MCE/P 55



MCE/P 110 - MCE/P 150



MODEL	L	H	D	PACKAGING DIMENSIONS			WEIGHT KG	Q.TY x PALLET
				L/D	L/L	H		
MCE/P 11	200	199	262	265	235	215	5	24
MCE/P 15	200	199	262	265	235	215	5	24
MCE/P 22	200	199	262	265	235	215	5	24
MCE/P 30	267	196	352	360	280	200	7,6	32
MCE/P 55	267	196	352	360	280	200	7,6	32
MCE/P 110	343	244	425	435	345	265	12	12
MCE/P 150	343	244	425	435	345	265	12	12

ENERGY SAVING

Reducing motor speed, even marginally, can lead to an appreciable reduction in power consumption because the absorbed power of an electric motor is proportional to the rpm cubed. For example, a pump powered by the mains that runs at approximately 2950 rpm, will run approximately 20% slower (i.e. at 2360 rpm) when fed with a 40 Hz supply, leading to a saving of 40% in terms of absorbed power. The motor speed reduction increases pump life signifi cantly, thanks to the reduction of mechanical stress.

Pump performance in relation to variations in rpm
Pump rpm n has a very signifi cant infl uence on pump performance.
In the absence of cavitation phenomena the law of similarity is applicable, as shown in equation 1.

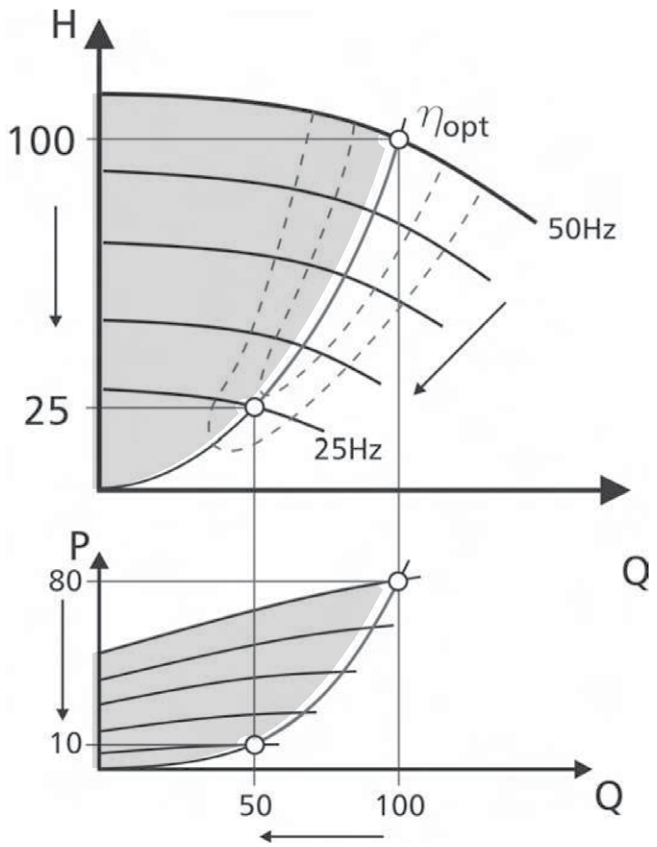
- Flow rate changes in a linear manner with changes in speed.
- Pressure changes in a squared relationship with changes in rpm.
- Power changes in a cubed relationship with changes in rpm.
- A small change in rpm produces a very large change in power.

Equation 1

$$\frac{Q_x}{Q} = \frac{n_x}{n} \qquad Q_x = Q \times \frac{n_x}{n}$$

$$\frac{H_x}{H} = \left(\frac{n_x}{n}\right)^2 \qquad H_x = Hx \left(\frac{n_x}{n}\right)^2$$

$$\frac{P_x}{P} = \left(\frac{n_x}{n}\right)^3 \qquad P_x = Px \left(\frac{n_x}{n}\right)^3$$



- a lowering of the fl ow acc. to the linear function.
- a reduction of the head according to a quadratic function.
- a reduction of the power consumption acc. to a cubic function!

POWER ECONOMY TABLE

MCE/P 11 – MCE/P 15 – MCE/P 22

Example showing use of a 2,2 kW pump for 10 hours/day *

Performance required of the pump	Minutes/ day	Instantaneous power (ON/OFF)	Power with MCE/P	kWh (ON/OFF)	kWh (INVERTER)	kWh saved
0% - 20%	30	1,32	0,50	0,66	0,25	0,41
20% - 30%	30	1,32	0,50	0,66	0,25	0,41
30% - 40%	60	1,37	0,55	1,37	0,55	0,82
40% - 50%	240	1,41	0,60	5,66	2,39	3,27
50% - 60%	120	1,54	0,69	3,08	1,38	1,70
60% - 70%	54	1,82	0,94	1,64	0,85	0,79
70% - 80%	30	2,04	1,30	1,02	0,65	0,37
80% - 90%	24	2,17	1,76	0,87	0,70	0,16
90% - 100%	12	2,20	2,07	0,44	0,41	0,03
			TOT.	**15,39**	**7,44**	**7,95**

YEARLY SAVING
7,95 kWh X 365 = **2902 kWh**
2902 kWh X 0,2 € / kWh =
€ 580,34

As we will see, in an average day of operation the MCE/P unit provides **a saving of 7,95 kWh,** equivalent to 60%, with respect to the consumption of a conventional on/off pump.

MCE/P 30 – MCE/P 55

Example showing use of a5,5 kW pump for 10 hours/day *

Performance required of the pump	Minutes/ day	Instantaneous power (ON/OFF)	Power with MCE/P	kWh (ON/OFF)	kWh (INVERTER)	kWh saved
0% - 20%	30	3,30	1,26	1,65	0,63	1,02
20% - 30%	30	3,30	1,26	1,65	0,63	1,02
30% - 40%	60	3,42	1,38	3,42	1,38	2,04
40% - 50%	240	3,54	1,49	14,14	5,97	8,17
50% - 60%	120	3,85	1,73	7,70	3,46	4,24
60% - 70%	54	4,56	2,36	4,10	2,12	1,98
70% - 80%	30	5,11	3,26	2,55	1,63	0,92
80% - 90%	24	5,42	4,40	2,17	1,76	0,41
90% - 100%	12	5,50	5,19	1,10	1,04	0,06
			TOT.	**38,48**	**18,61**	**19,87**

YEARLY SAVING
19,87 kWh X 365 = **7254 kWh**
7254 kWh X 0,2 € / kWh =
€ 1.450,85

As we will see, in an average day of operation the MCE/P unit provides a **saving of 19,87 kWh,** equivalent to 60%, with respect to the consumption of a conventional on/off pump.

MCE/P 110 – MCE/P 150

Example showing use of a 15 kW pump for 10 hours/day *

Performance required of the pump	Minutes/day	Instantaneous power (ON/OFF)	Power with PWM	kWh (ON/OFF)	kWh (INVERTER)	kWh saved
0% - 20%	30	9,00	3,43	4,50	1,71	2,79
20% - 30%	30	9,00	3,43	4,50	1,71	2,79
30% - 40%	60	9,32	3,75	9,32	3,75	5,57
40% - 50%	240	9,64	4,07	38,57	16,29	22,29
50% - 60%	120	10,50	4,71	21,00	9,43	11,57
60% - 70%	54	12,43	6,43	11,19	5,79	5,40
70% - 80%	30	13,93	8,89	6,96	4,45	2,52
80% - 90%	24	14,79	12,00	5,91	4,80	1,11
90% - 100%	12	15,00	14,14	3,00	2,83	0,17
			TOT.	**104,96**	**50,75**	**54,20**

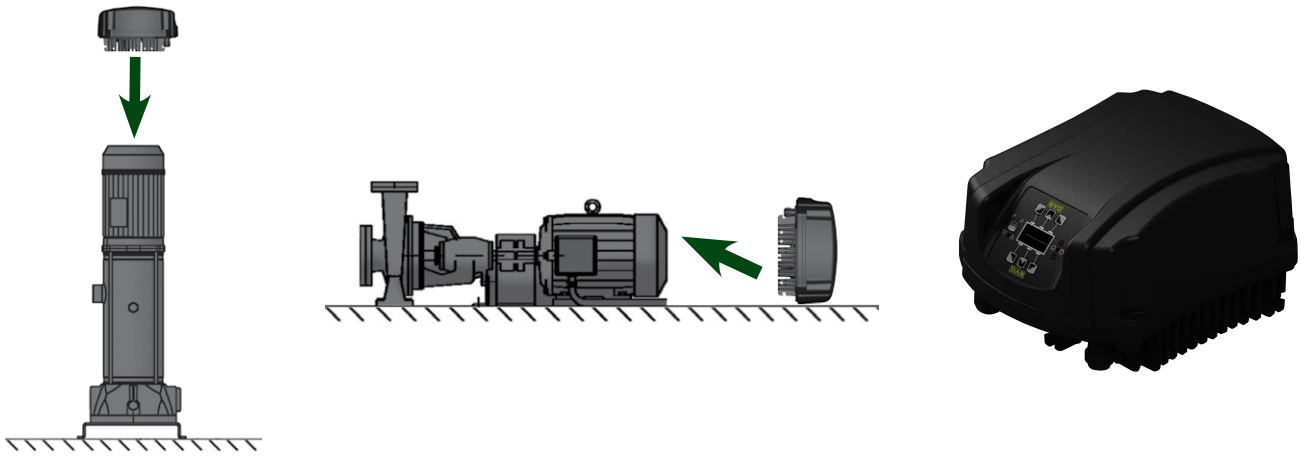
As we will see, in an average day of operation the MCE/P unit provides **a saving of 54,20 kWh**, equivalent to 60%, with respect to the consumption of a conventional on/off pump.

YEARLY SAVING
54,20 kWh X 365 = **19784 kWh**
19784 kWh X 0,2 € / kWh =
€ 3.956,86

*The table shows a comparison of **daily consumption** of a standard pump driven by an On/Off system and a pump driven by a MCE/P inverter.

CONNECTIONS ON MOTOR

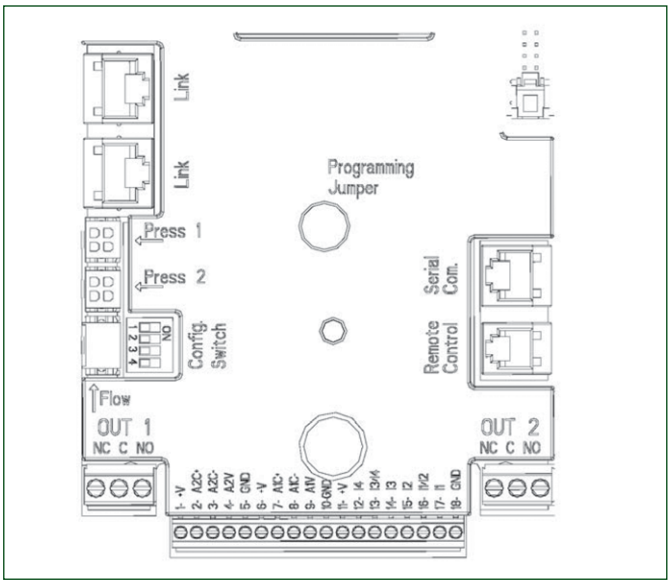
1 Hydraulic diagram



The MCE is installed on the motor base.
The inverter can operate both vertically and horizontally.
2 kits are available for assembly on the motor:
Tie-rods:
These are connected to the MCE dissipator and fan cover.
They require a solid fan cover able to withstand the weight of the inverter, i.e. secured by means of bolts or screws.

Fan cover kit:
The fan cover kit is used in all situations where the fan cover is not sufficiently solid or strong enough to withstand the weight of the inverter.

TWIN OPERATION



Groups of up to 2 pumps can be created. To do this, the pumps must be hydraulically connected to the same output and inlet manifolds (naturally, this is not necessary for twin circulation pumps).
The 2 MCE/P inverters also have to be connected using the special interconnection cable, connecting both inverters to one of the 2 connectors marked Link.
For the twin system to operate correctly, all the external connections of the input terminal board must be parallel connected between the 2 MCE/P units, with the numbers of the individual pins corresponding (e.g. pin 17 of MCE- 22/C-1 to pin 17 of MCE-22/C-2 and so on).