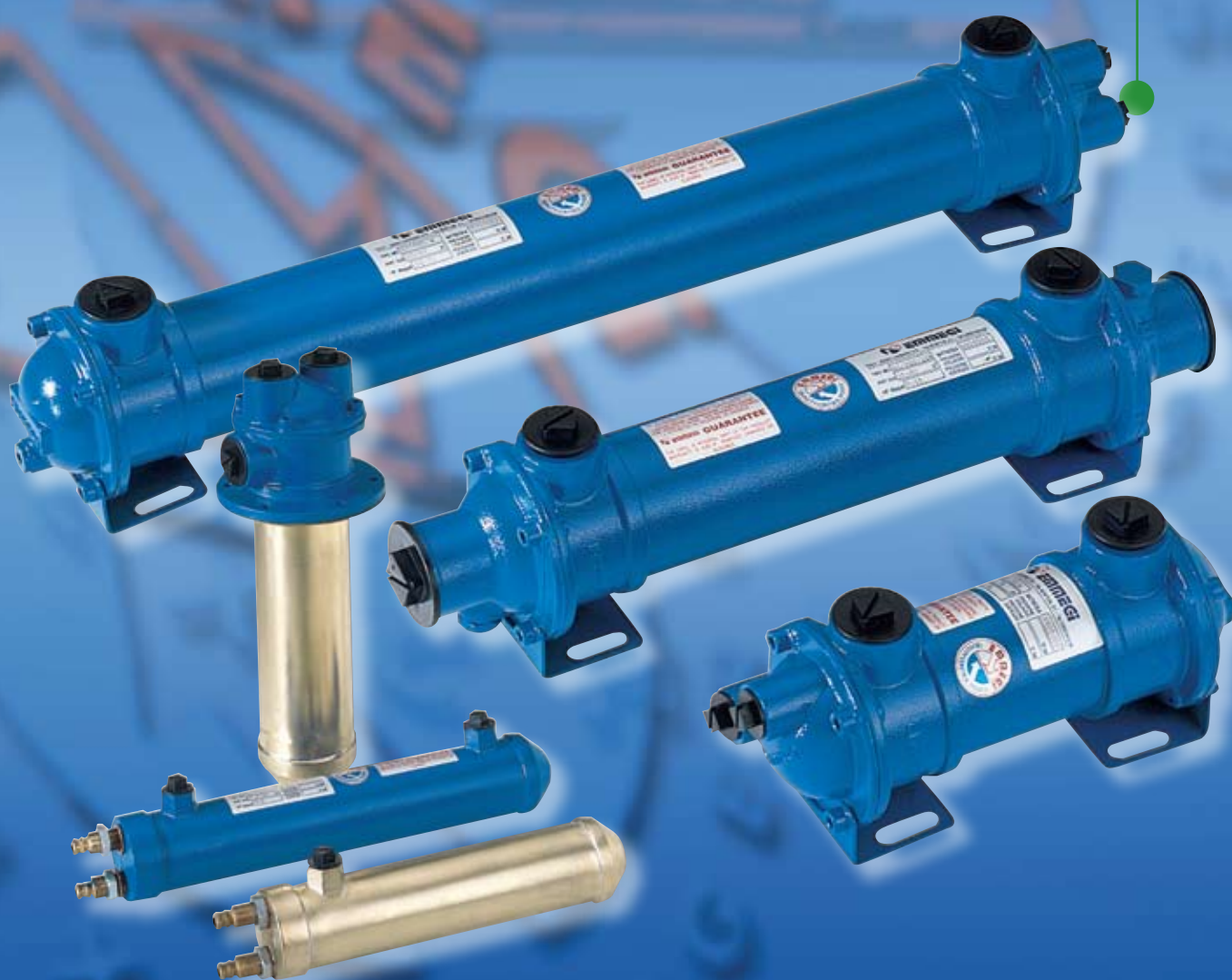


# Scambiatori Acqua-Olio

## *Water-Oil heat-exchangers*



**ENNEMECI**





Gli scambiatori di calore acqua-olio EMMEGI, sono utilizzati per il raffreddamento di circuiti oleodinamici e sono normalmente inseriti su linee di ritorno.

La gamma **EMMEGI** comprende una vasta scelta di modelli caratterizzati da un'elevata efficienza. La scelta di materiali di prima qualità, lavorati con macchine di precisione, consente di ottenere un prodotto altamente affidabile.

Gli scambiatori **EMMEGI** hanno circuito acqua ispezionabile, a 1,2,4 passaggi, e possono essere forniti con valvola termostatica che consente un notevole risparmio sul consumo dell'acqua.

## Fluidi compatibili

- . OIL MINERALI, HL, HLP.
- . EMULSIONI ACQUA/OLIO
- . ACQUA/GLICOLE
- . ACQUA/ACQUA INDUSTRIALE
- . PER ALTRI FLUIDI CONSULTARE **EMMEGI**

## Specifiche tecniche

- . VERSIONI : STANDARDS - ACQUA MARINA - AISI - .....
- . PRESSIONE DI ESERCIZIO : 12 bar.
- . PRESSIONE DI COLLAUDO : 18 bar.
- . TEMPERATURA MAX DI ESERCIZIO : 120°C

## Installazione

In fig. 1 è indicata la corretta posizione d'entrata dei due fluidi, che devono circolare in controcorrente per ottenere il massimo scambio termico.

Il posizionamento dello scambiatore sulla macchina deve essere fatta utilizzando appositi supporti elastici, e quindi collegata all'impianto idraulico ed alla rete idrica mediante tubi flessibili. E' consigliabile prevedere, su impianti che lavorano in ambienti con forti escursioni termiche, una valvola di by-pass (fig.2) tra ingresso e uscita olio.

Con temperature molto basse e impianto fermo è opportuno mantenere l'acqua in continua circolazione per evitare dannose rotture; oppure svuotare lo scambiatore avvalendosi del tappo di scarico.

**EMMEGI** heat-exchangers water-oil are normally used for the cooling of oil hydraulic systems and are installed on the return line of the system.

The **EMMEGI** range comprises a vast choice of applicable models, highly efficient. The range of high quality material working with precision machinery, all produce an extremely reliable product.

The **EMMEGI** heat exchangers have a water system of 1,2 or 4 circuits as they can be supplied with thermostatic valves which greatly assist in the reduction of water consumption.

## Compatible fluids

- . MINERAL OILS; HL; HLP.
- . MIXTURE WATER/OIL
- . WATER-GLICOLIC ACID
- . WATER/INDUSTRIAL WATER
- . FOR OTHER FLUIDS, CONTACT **EMMEGI**

## Technical specification

- . VERSION: FRESH WATER - SEA WATER - AISI
- . OPERATING PRESSURE : 12 bar
- . TEST PRESSURE : 18 bar
- . MAX OPERATING TEMPERATURE : 120°C

## Installation

The correct position of inlet of the two fluids is indicated in fig. 1. They should circulate in opposite direction, in order to obtain the maximum heat exchange.

The positioning of the heat exchanger on the machine should be carried out using appropriate flexible supports and all those in connection with hydraulic or power plant, through flexible tubing. It is advisable, to preserve the heat exchanger, that a by-pass valve is inserted (fig.2).

At very low temperatures, it is advisable to keep the water in constant circulation, to prevent harmful fractures otherwise emptying the exchanger by use of the discharge valve.

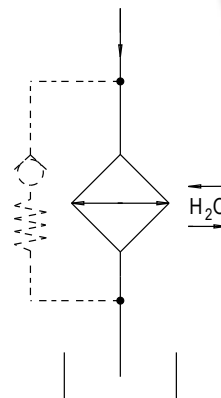
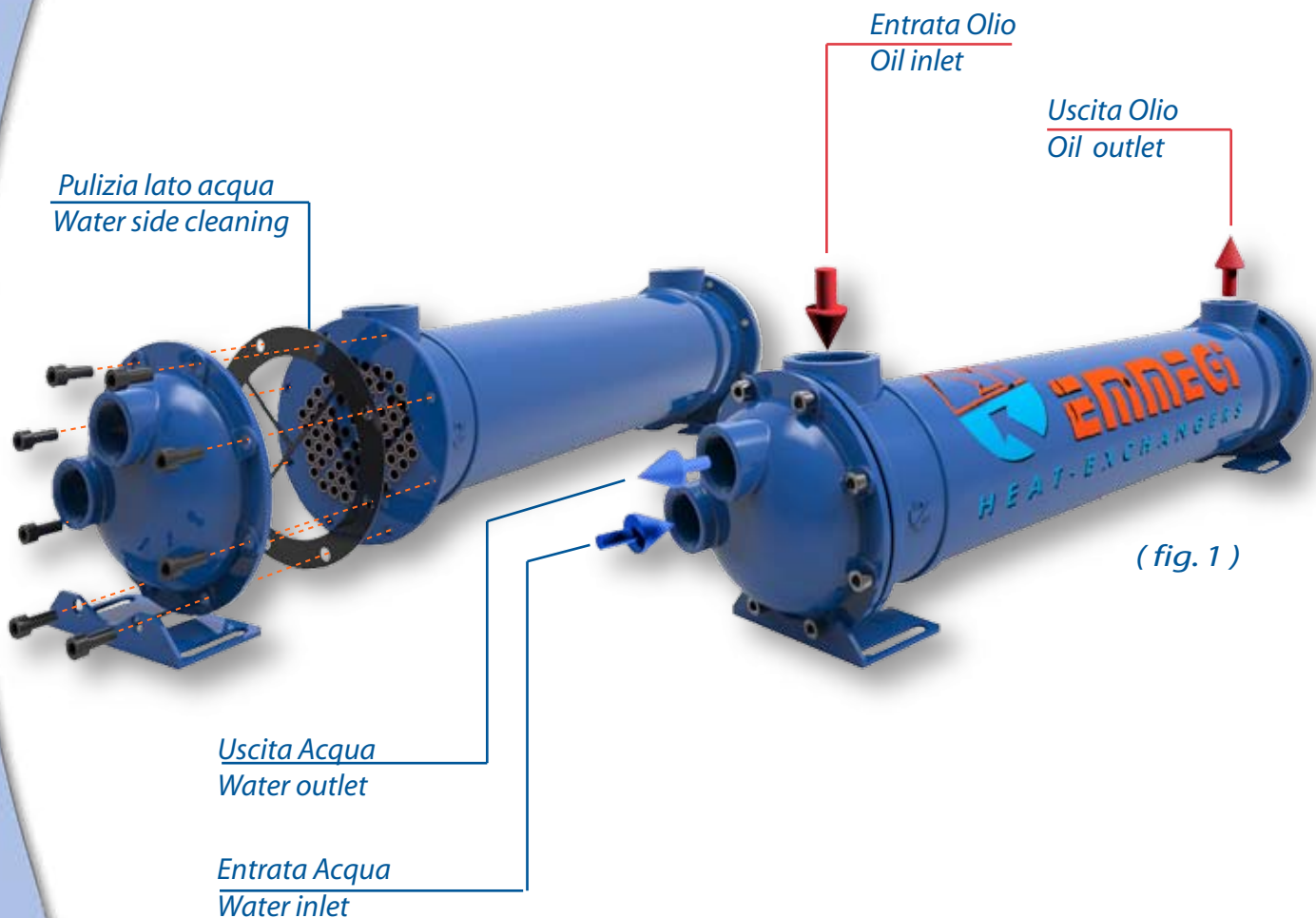


fig.2



( fig. 1 )

## Manutenzione

### Pulizia lato acqua

Per garantire il massimo rendimento dello scambiatore, è consigliabile una periodica ispezione del circuito acqua al fine d'eliminare eventuali tracce di calcare o altre impurità che si sono depositate all'interno dei tubi. Quest'operazione si compie agevolmente togliendo solo il fondello e procedendo allo scivolamento dei tubi.

### Pulizia lato olio

Su questo lato del circuito, la pulizia avviene mediante flussaggio con perclorilene fatto circolare in controcorrente per ca. 30 min. Procedere quindi all'eliminazione dei residui tramite flussaggio con acqua calda.

## Maintenance

### Water side cleaning

To guarantee the maximum effectiveness in exchange, an inspection of the water circuit is advisable, to eliminate all trace of lime or any other impurities, which might be deposited inside the tubes.

This operation will be easily accomplished by removing the headers and flushing out the tubes.

### Oil side cleaning

In this part of the circuit, the cleaning will be carried out through the circulation of perchloride in the opposite direction of the normal flow, for about 30 minutes. This will help to eliminate any residue left by flushing out with hot water.

## Esempio di scelta dello scambiatore di calore

### DATI :

|                      |                              |
|----------------------|------------------------------|
| Portata olio         | : 60 [lt/min.]               |
| Peso specifico       | : 0,88 [Kg/dm <sup>3</sup> ] |
| Calore specifico     | : 0,49 [Kcal/Kg °C]          |
| Viscosità            | : 32 [cst]                   |
| Temperatura IN olio  | : 55 [°C]                    |
| Temperatura IN acqua | : 20 [°C]                    |
| Potenza da dissipare | : 15 [KW]                    |

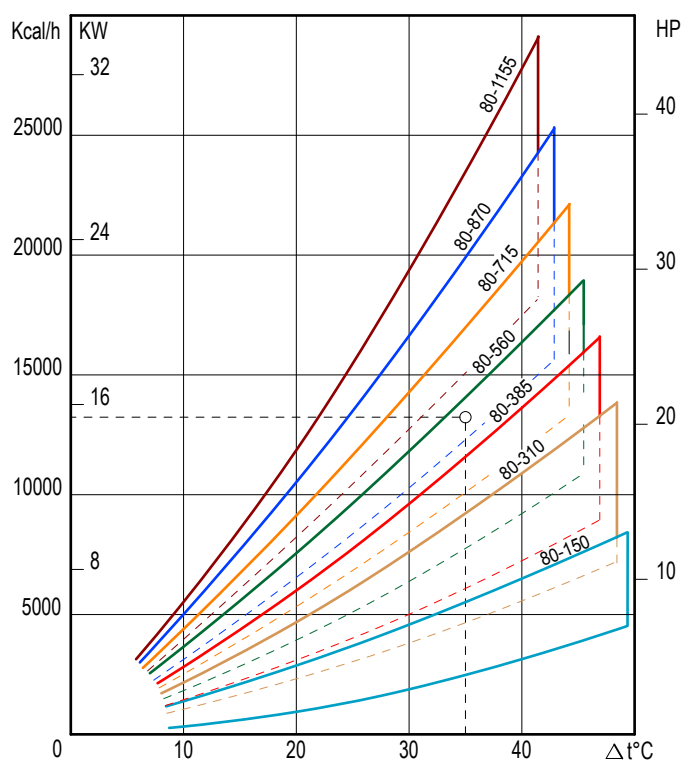
Conoscendo la portata dell'olio, la potenza da dissipare, e stabilito il  $\Delta T$ , ovvero la differenza tra la temperatura ingresso olio e la temperatura ingresso acqua, si può ricercare sui diagrammi riportati a catalogo lo scambiatore idoneo.

## Data relating to heat exchanger selection

### DATA :

|                   |                              |
|-------------------|------------------------------|
| Oil flow          | : 60 [lt/min.]               |
| Specific weight   | : 0,88 [Kg/dm <sup>3</sup> ] |
| Specific heat     | : 0,49 [Kcal/Kg °C]          |
| Viscosity         | : 32 [cst]                   |
| Oil temperature   | : 55 [°C]                    |
| Water temperature | : 20 [°C]                    |
| Cooling power     | : 15 [KW]                    |

Knowing the fluidity and flow rate of the oil, cooling power and stability of  $\Delta T$  (IN running temperature of oil - water temperature) you can adjust these calculations to the specifications given in our catalogue.



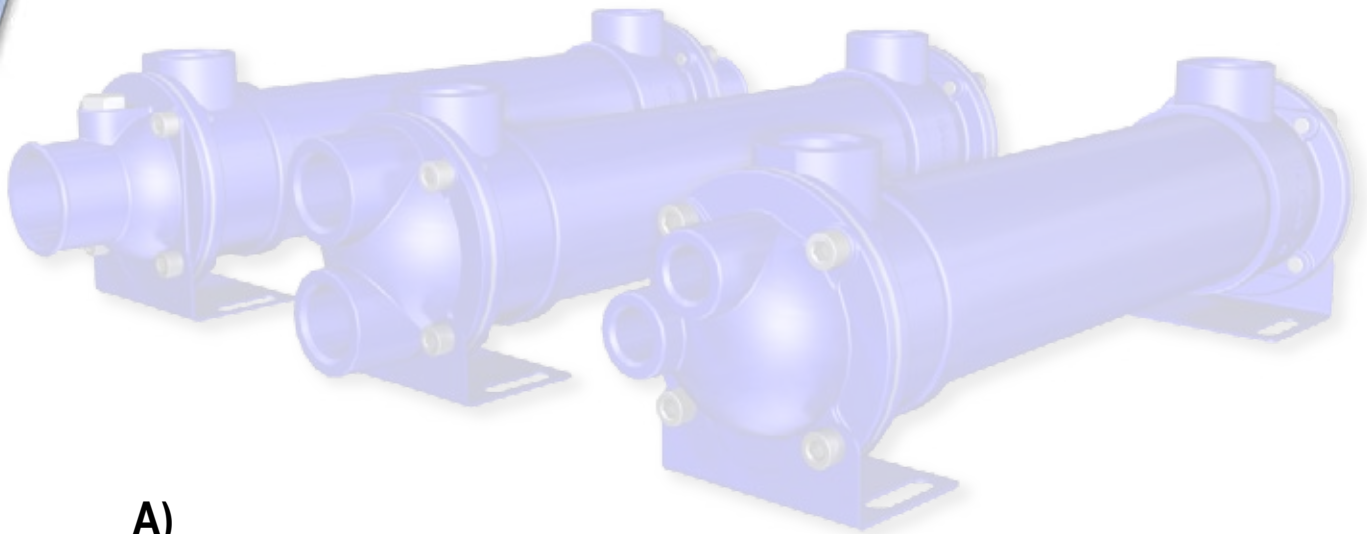
| TIPO<br>TYPE   | PORTATA OLIO<br>OIL FLOW<br>( lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>-55°C H20-20°C |
|----------------|---------------------------------------|--|
| MG 80-150-...  | 25 - 75                               | 4 - 8  |
| MG 80-310-...  | 25 - 80                               | 7 - 14   |
| MG 80-385-...  | 25 - 80                               | 9 - 17   |
| MG 80-560-...  | 25 - 80                               | 12 - 20  |
| MG 80-715-...  | 35 - 120                              | 15 - 24  |
| MG 80-870-...  | 40 - 130                              | 18 - 29  |
| MG 80-1155-... | 40 - 130                              | 22 - 36  |

Lo scambiatore selezionato risulta il modello MG-80-870-4.

La dissipazione segnata nel diagramma di rendimento espressa in HP si ottiene con viscosità pari a 32 cst e portate acqua indicate nella seguente tabella A:

Selected exchangers results in the model MG-80-870-4.

The marked dissipation on the exchange diagram expressed in HP will be arrived, with a viscosity of 32 cst and water flow as indicated in our following table A:



**A)**

| n° passaggi lato acqua<br>n° of water circuits | lt/min x ogni HP da dissipare<br>l/min x any HP to be dissipated |
|--|--|
| 1  | 3  |
| 2  | 2  |
| 4  | 1  |

Nel caso s'abbiano variazioni di temperatura e portata d'acqua, considerare i seguenti coefficienti:

In the case where there are substantial in temperature and flow of water, consider the following coefficients:

**B)**

**Fattore di correzione scambio termico**  
Cooling power correction factor

| Portata acqua<br><i>Water flow</i>                | Portata indicata in tabelle "A"<br><i>Flow expressed in table "A"</i> | Due volte la portata indicata nella tabella "A"<br><i>Flow expressed in table "A" multiply x 2</i> | Tre volte la portata indicata nella tabella "A"<br><i>Flow expressed in table "A" multiply x 3</i> |
|---|---|--|--|
| Fattore di correzione<br><i>Correction factor</i> | 1   | 1,2  | 1,4  |

**C)**

**Fattore di correzione T °C acqua con olio a 55°C**  
Temp °C water correction factor with oil at 55°C

| Temperatura acqua<br><i>Water temp</i>            | 20°C | 25°C | 30°C | 35°C |
|---|------|------|------|------|
| Fattore di correzione<br><i>Correction factor</i> | 1    | 0.85 | 0.70 | 0.60 |

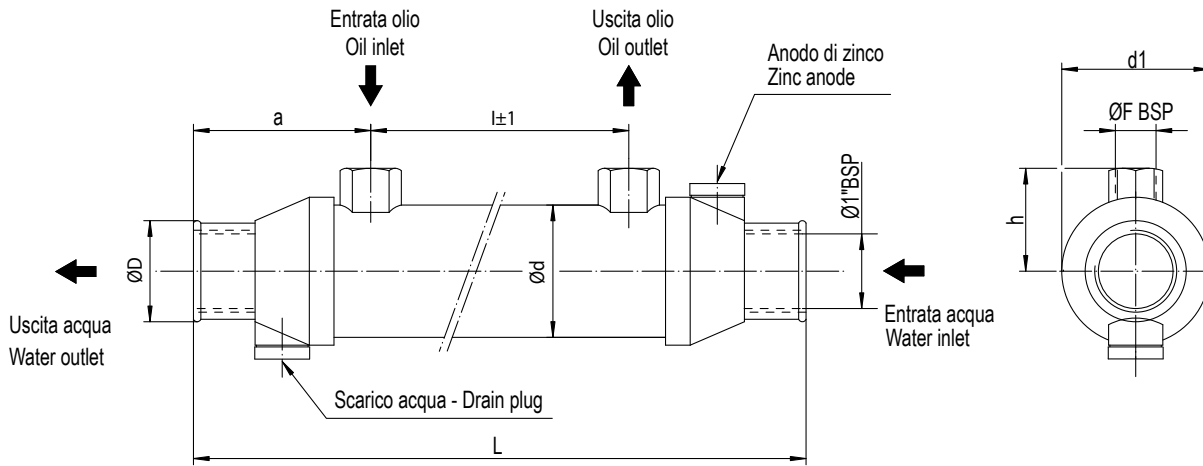
Se per la scelta, tutti i dati non sono conosciuti, contattare la **EMMEGI**.

If in doubt any of this data, contact **EMMEGI**.

# Scambiatori acqua-olio serie MG 54

## Water-oil heat exchangers series MG 54

Con circuito acqua a un passaggio. One way water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLINO<br>SHELL |
|--------------|---------------|--------------------------------|-----------------------|-----------------|---------------------|
| SEA WATER    | CuNi10Mn1Fe   | CuZn37                         | CuZn37                | CuZn40          | CuZn37              |

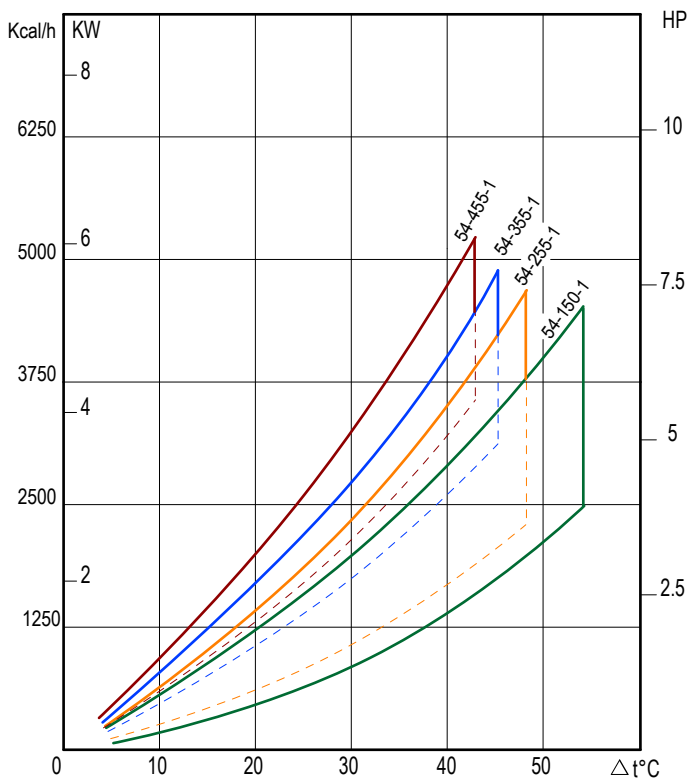
| TIPO<br>TYPE | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISSIPATI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H <sub>2</sub> O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg  | Dimensioni - Over all dimension |      |     |     |    |    |    |    |
|--------------|--------------------------------------|--|-------------------------------|-----|---------------------------------|------|-----|-----|----|----|----|----|
|              |                                      |  |                               |     | 1 Pass                          |      |     |     |    |    |    |    |
|              |                                      |  |                               |     | ØD                              | ØF   | l   | L   | a  | Ød | d1 | h  |
| MG 54-150-1  | 10-40                                | 1.5-4  | 0.26                          | 1.3 | 39                              | 3/8" | 150 | 303 | 74 | 54 | 60 | 42 |
| MG 54-255-1  | 10-50                                | 2-4.5  | 0.4                           | 1.8 | 39                              | 3/8" | 255 | 399 | 74 | 54 | 60 | 42 |
| MG 54-355-1  | 10-50                                | 3.5-5.5  | 0.5                           | 2.3 | 39                              | 3/8" | 355 | 499 | 74 | 54 | 60 | 42 |
| MG 54-455-1  | 10-50                                | 4-6.5  | 0.6                           | 2.7 | 39                              | 3/8" | 455 | 599 | 74 | 54 | 60 | 42 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule



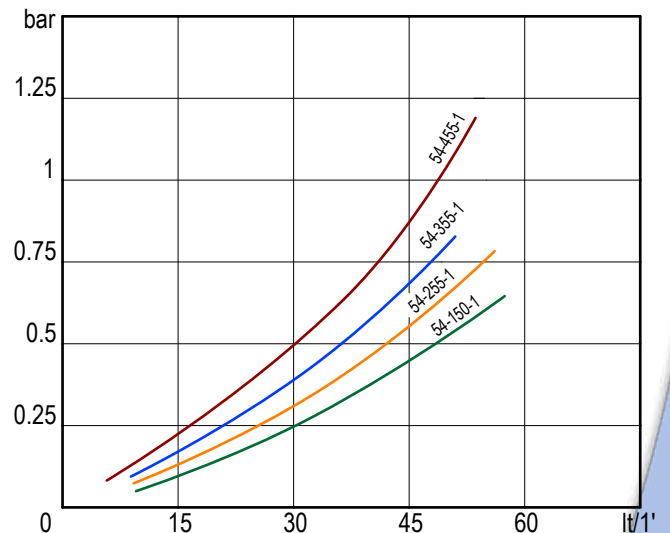
### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

#### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

### PERDITE DI CARICO (32 cst)

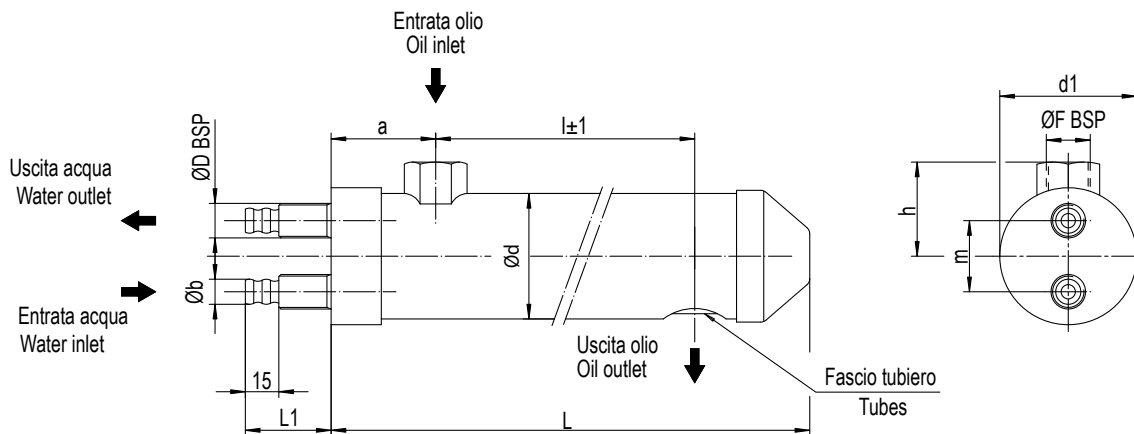
#### PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGC 60e80

## Water-oil heat exchangers series MGC 60e80

Con circuito acqua a due passaggi. Two ways water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | CuZn37            |

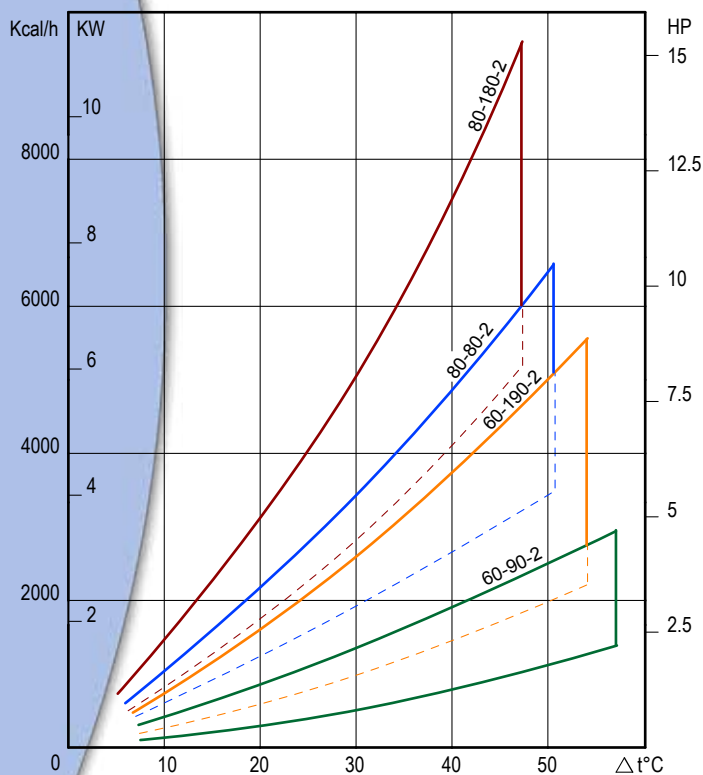
| TIPO<br>TYPE | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg  | Dimensioni - Over all dimension |      |     |     |    |    |    |    |    |    |    |
|--------------|--------------------------------------|--|-------------------------------|-----|---------------------------------|------|-----|-----|----|----|----|----|----|----|----|
|              |                                      |  |                               |     | 2 Pass                          |      |     |     |    |    |    |    |    |    |    |
|              |                                      |  |                               |     | ØD                              | ØF   | l   | L   | L1 | a  | Øb | Ød | d1 | h  | m  |
| MGC 60-90-2  | 5-30                                 | 1-2.5  | 0.3                           | 1.5 | 3/8"                            | 1/2" | 90  | 190 | 40 | 48 | 13 | 60 | 65 | 45 | 38 |
| MGC 60-190-2 | 7.5-40                               | 2.5-5  | 0.4                           | 2   | 3/8"                            | 1/2" | 190 | 290 | 40 | 48 | 13 | 60 | 65 | 45 | 38 |
| MGC 80-80-2  | 25-60                                | 3.5-6.5  | 0.5                           | 2.3 | 1/2"                            | 3/4" | 80  | 190 | 40 | 50 | 16 | 80 | 85 | 65 | 45 |
| MGC 80-180-2 | 30-80                                | 5.5-10   | 0.7                           | 3.5 | 1/2"                            | 3/4" | 180 | 290 | 40 | 50 | 16 | 80 | 85 | 65 | 45 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

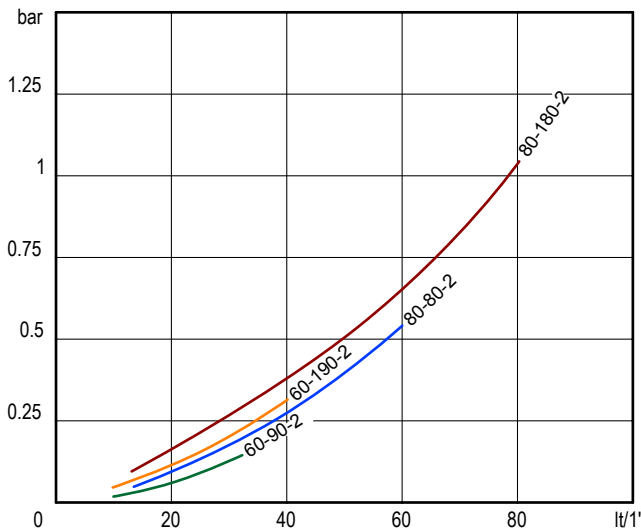
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)

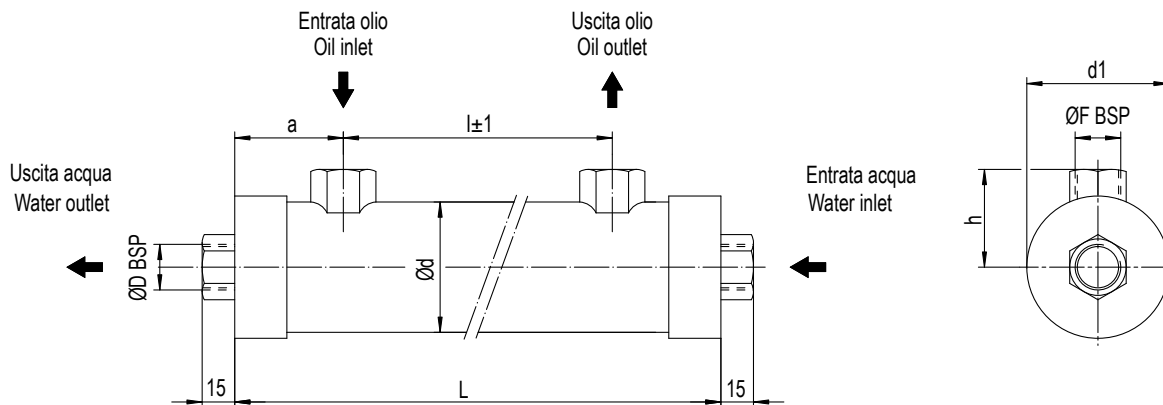




# Scambiatori acqua-olio serie MGE 60

## Water-oil heat exchangers series MGE 60

Con circuito acqua a un passaggio. One way water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLINO<br>SHELL |
|--------------|---------------|--------------------------------|-----------------------|-----------------|---------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | CuZn37              |

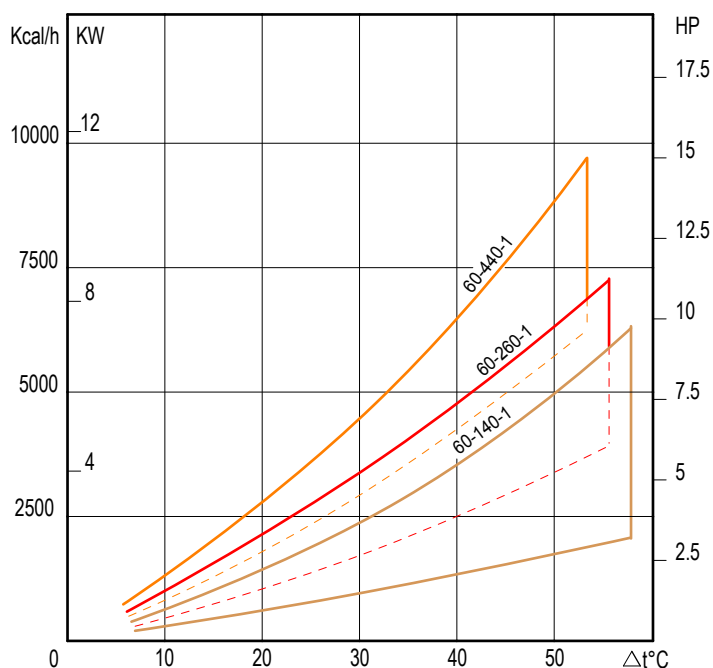
| TIPO<br>TYPE | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H <sub>2</sub> O=20° | CAPACITA'<br>CONTENTS<br>(lt) | Kg  | Dimensioni - Over all dimension |      |     |     |    |    |    |    |
|--------------|--------------------------------------|--|-------------------------------|-----|---------------------------------|------|-----|-----|----|----|----|----|
|              |                                      |  |                               |     | 1 Pass                          |      |     |     |    |    |    |    |
|              |                                      |  |                               |     | ØD                              | ØF   | l   | L   | a  | Ød | d1 | h  |
| MGE 60-140-1 | 5-30                                 | 1.5-4.5  | 0.4                           | 1.8 | 1/2"                            | 1/2" | 140 | 240 | 50 | 60 | 65 | 45 |
| MGE 60-260-1 | 7.5-40                               | 3.5-6.5  | 0.6                           | 3   | 1/2"                            | 1/2" | 260 | 360 | 50 | 60 | 65 | 45 |
| MGE 60-440-1 | 10-50                                | 6-9  | 0.9                           | 5   | 1/2"                            | 1/2" | 440 | 540 | 50 | 60 | 65 | 45 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule



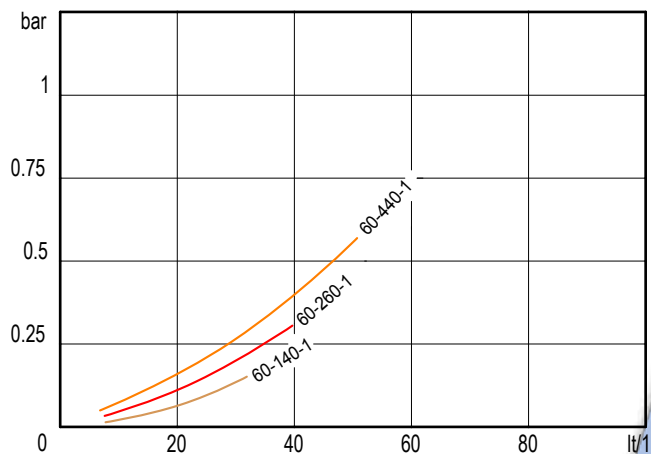
### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

#### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

### PERDITE DI CARICO (32 cst)

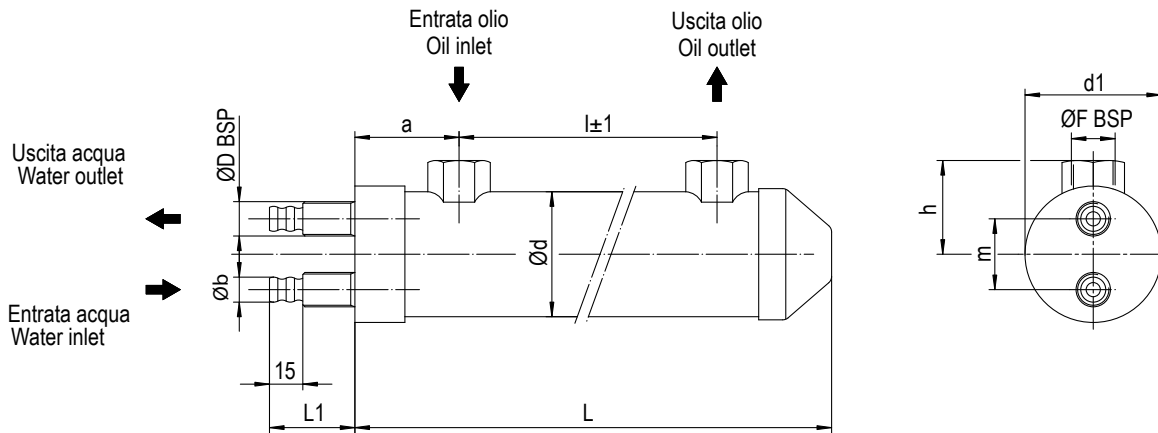
#### PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGE 60

## Water-oil heat exchangers series MGE 60

Con circuito acqua a due passaggi. Two ways water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | CuZn37            |

| TIPO<br>TYPE | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg  | Dimensioni - Over all dimension |      |     |     |    |    |    |    |    |    |    |
|--------------|--------------------------------------|--|-------------------------------|-----|---------------------------------|------|-----|-----|----|----|----|----|----|----|----|
|              |                                      |  |                               |     | 2 Pass                          |      |     |     |    |    |    |    |    |    |    |
|              |                                      |  |                               |     | ØD                              | ØF   | l   | L   | L1 | a  | Øb | Ød | d1 | h  | m  |
| MGE 60-140-2 | 5-30                                 | 1-4  | 0.4                           | 1.8 | 3/8"                            | 1/2" | 140 | 245 | 40 | 50 | 13 | 60 | 65 | 45 | 38 |
| MGE 60-260-2 | 7.5-40                               | 3-6  | 0.6                           | 3   | 3/8"                            | 1/2" | 260 | 365 | 40 | 50 | 13 | 60 | 65 | 45 | 38 |
| MGE 60-440-2 | 10-50                                | 5-8.5  | 0.9                           | 5   | 3/8"                            | 1/2" | 440 | 545 | 40 | 50 | 13 | 60 | 65 | 45 | 38 |

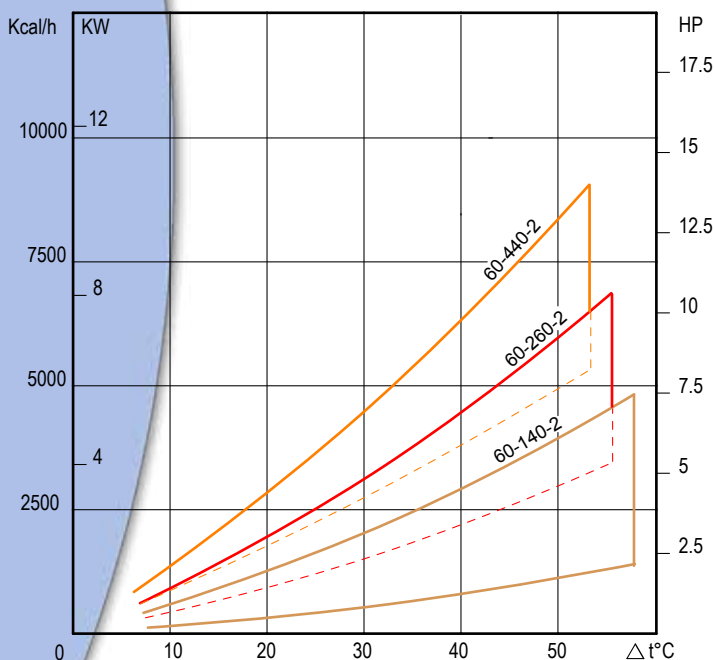


### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

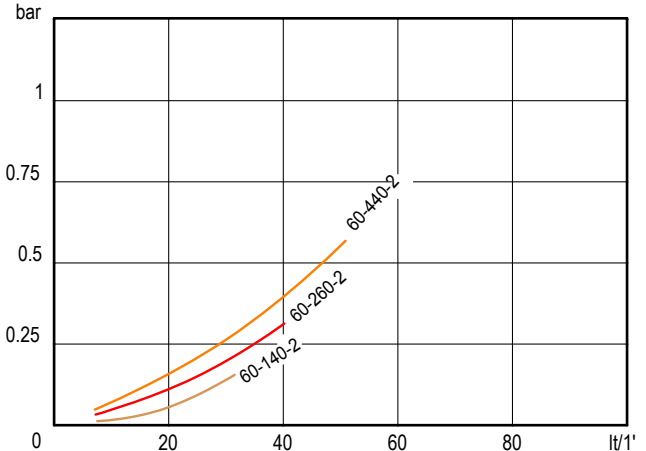
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

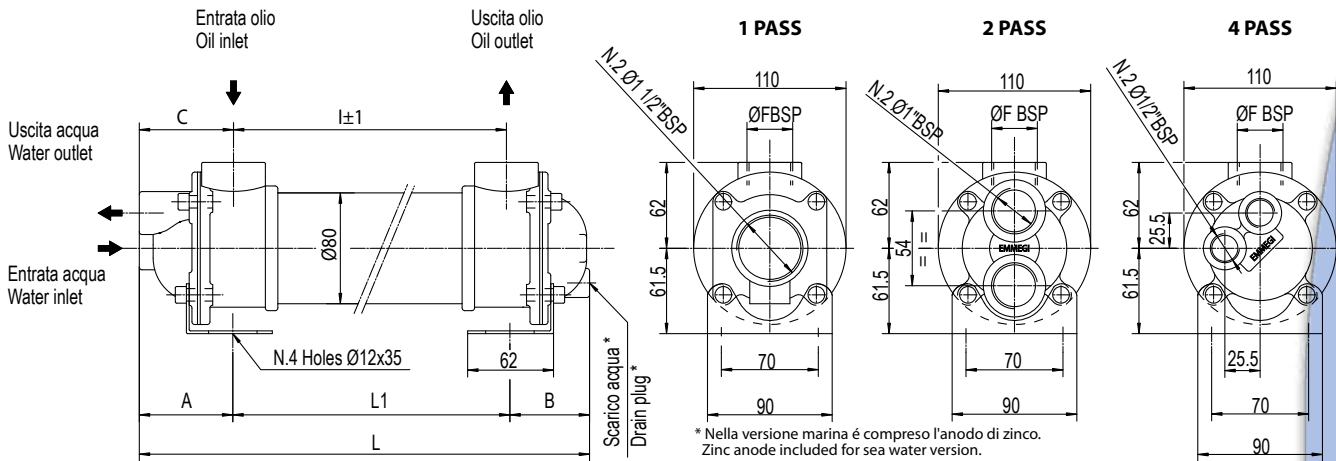
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MG80

## Water-oil heat exchangers series MG80

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |
| SEA WATER    | CuNi10Mn1Fe   | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |

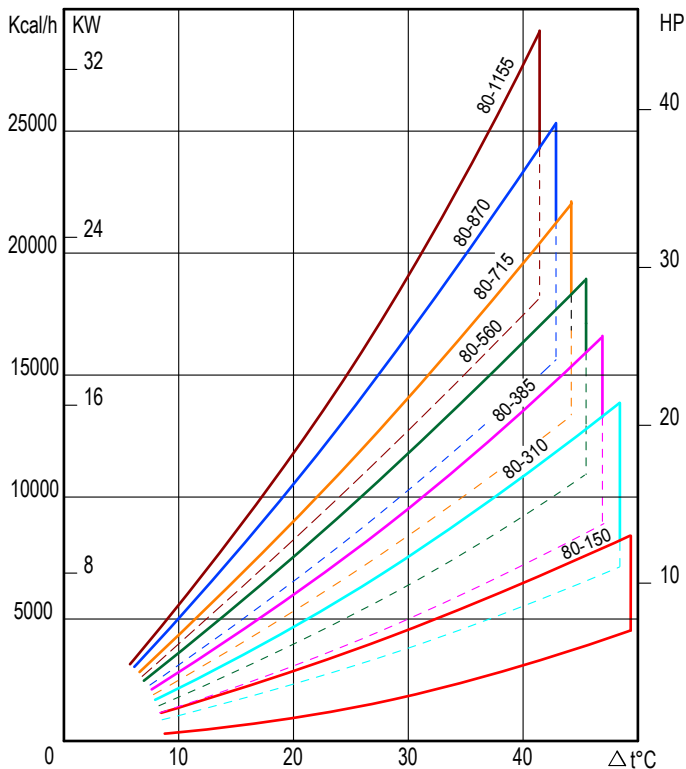
| TIPO<br>TYPE  | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H <sub>2</sub> O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg   | Dimensioni - Over all dimension |    |    |      |      |      |      |        |    |    |      |      |      |      |        |    |    |      |      |      |      |  |  |  |
|---------------|--------------------------------------|---|-------------------------------|------|---------------------------------|----|----|------|------|------|------|--------|----|----|------|------|------|------|--------|----|----|------|------|------|------|--|--|--|
|               |                                      |   |                               |      | 1 Pass                          |    |    |      |      |      |      | 2 Pass |    |    |      |      |      |      | 4 Pass |    |    |      |      |      |      |  |  |  |
|               |                                      |   |                               |      | ØF                              | A  | B  | C    | I    | L    | L1   | ØF     | A  | B  | C    | I    | L    | L1   | ØF     | A  | B  | C    | I    | L    | L1   |  |  |  |
| MG 80-150-..  | 25-75                                | 4-8   | 0.65                          | 4.5  | 1"                              | 90 | 90 | 85.5 | 150  | 321  | 141  | 1"     | 72 | 64 | 67.5 | 150  | 277  | 141  | 1"     | 72 | 64 | 67.5 | 150  | 277  | 141  |  |  |  |
| MG 80-310-..  | 25-80                                | 7-14  | 1.1                           | 5.7  | 1"                              | 90 | 90 | 85.5 | 310  | 481  | 301  | 1"     | 72 | 64 | 67.5 | 310  | 437  | 301  | 1"     | 72 | 64 | 67.5 | 310  | 437  | 301  |  |  |  |
| MG 80-385-..  | 25-80                                | 9-17  | 1.3                           | 6    | 1"                              | 90 | 90 | 85.5 | 385  | 556  | 376  | 1"     | 72 | 64 | 67.5 | 385  | 512  | 376  | 1"     | 72 | 64 | 67.5 | 385  | 512  | 376  |  |  |  |
| MG 80-560-..  | 25-80                                | 12-20   | 1.9                           | 7.5  | 1"                              | 90 | 90 | 85.5 | 560  | 731  | 551  | 1"     | 72 | 64 | 67.5 | 560  | 687  | 551  | 1"     | 72 | 64 | 67.5 | 560  | 687  | 551  |  |  |  |
| MG 80-715-..  | 35-120                               | 15-24   | 2.3                           | 8    | 1"                              | 90 | 90 | 85.5 | 715  | 886  | 706  | 1"     | 72 | 64 | 67.5 | 715  | 842  | 706  | 1"     | 72 | 64 | 67.5 | 715  | 842  | 706  |  |  |  |
| MG 80-870-..  | 40-130                               | 18-29   | 2.8                           | 10   | 1"                              | 90 | 90 | 85.5 | 870  | 1041 | 861  | 1"     | 72 | 64 | 67.5 | 870  | 997  | 861  | 1"     | 72 | 64 | 67.5 | 870  | 997  | 861  |  |  |  |
| MG 80-1155-.. | 40-130                               | 22-36   | 3.7                           | 13.5 | 1"                              | 90 | 90 | 85.5 | 1155 | 1326 | 1146 | 1"     | 72 | 64 | 67.5 | 1155 | 1282 | 1146 | 1"     | 72 | 64 | 67.5 | 1155 | 1282 | 1146 |  |  |  |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

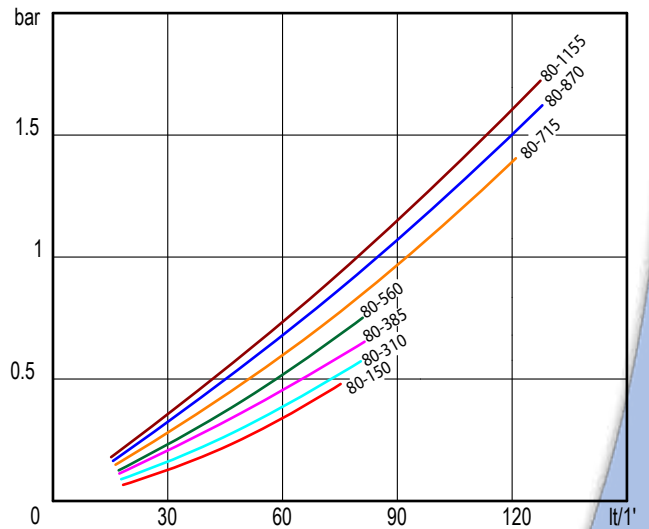
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

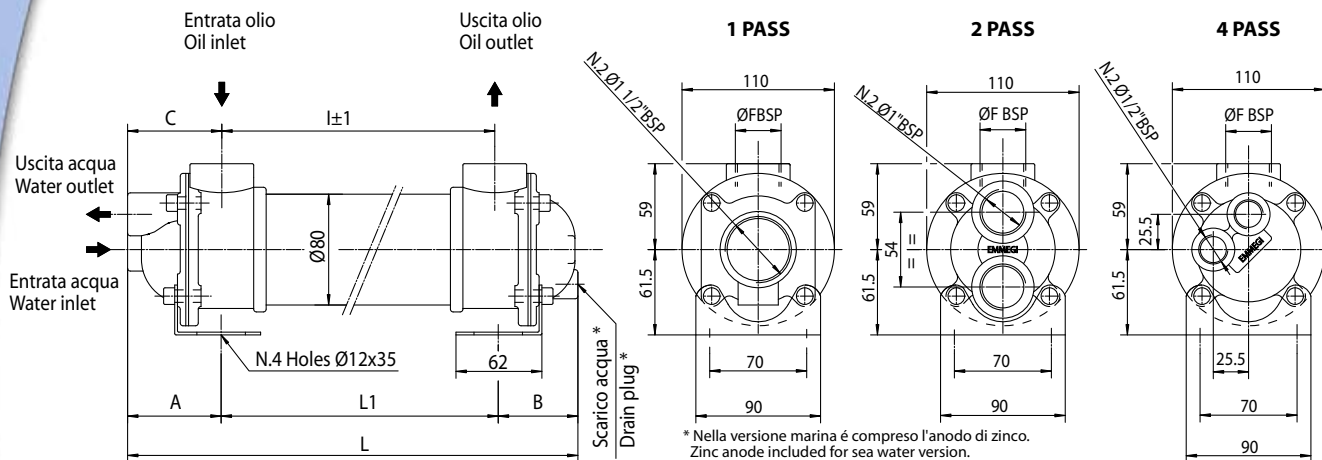
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MG81

## Water-oil heat exchangers series MG81

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |
| SEA WATER    | CuNi10Mn1Fe   | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |

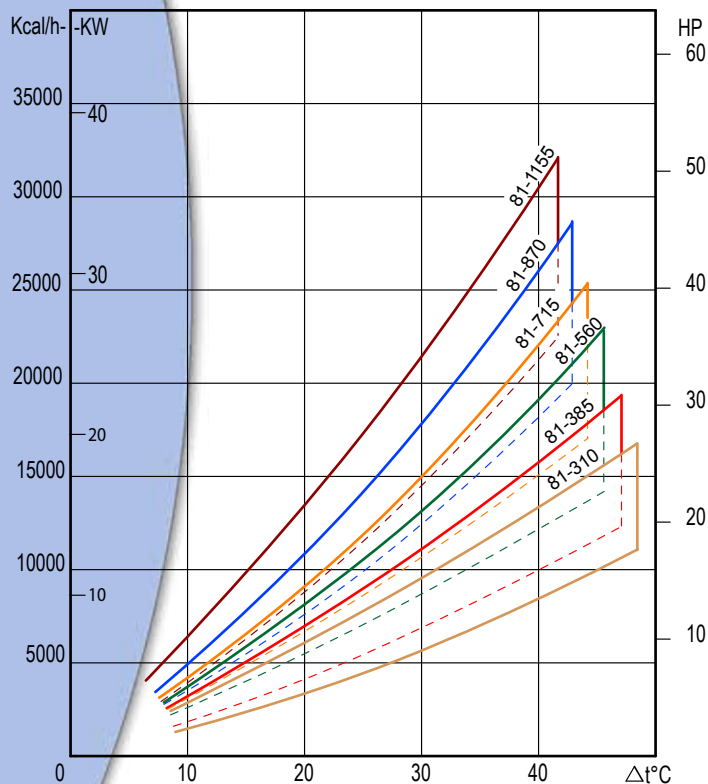
| TIPO<br>TYPE | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg   | Dimensioni - Over all dimension |    |    |    |      |      |      |        |    |    |    |      |      |      |        |    |    |    |      |      |      |
|--------------|--------------------------------------|--|-------------------------------|------|---------------------------------|----|----|----|------|------|------|--------|----|----|----|------|------|------|--------|----|----|----|------|------|------|
|              |                                      |  |                               |      | 1 Pass                          |    |    |    |      |      |      | 2 Pass |    |    |    |      |      |      | 4 Pass |    |    |    |      |      |      |
|              |                                      |  |                               |      | ØF                              | A  | B  | C  | I    | L    | L1   | ØF     | A  | B  | C  | I    | L    | L1   | ØF     | A  | B  | C  | I    | L    | L1   |
| MG 81-310..  | 50-120                               | 11-18  | 1.2                           | 5.7  | 1 1/2"                          | 90 | 90 | 92 | 310  | 494  | 314  | 1 1/2" | 72 | 64 | 74 | 310  | 450  | 314  | 1 1/2" | 72 | 64 | 74 | 310  | 450  | 314  |
| MG 81-385..  | 50-120                               | 13-21  | 1.4                           | 6    | 1 1/2"                          | 90 | 90 | 92 | 385  | 569  | 389  | 1 1/2" | 72 | 64 | 74 | 385  | 525  | 389  | 1 1/2" | 72 | 64 | 74 | 385  | 525  | 389  |
| MG 81-560..  | 60-150                               | 16-25  | 2                             | 7.5  | 1 1/2"                          | 90 | 90 | 92 | 560  | 744  | 564  | 1 1/2" | 72 | 64 | 74 | 560  | 700  | 564  | 1 1/2" | 72 | 64 | 74 | 560  | 700  | 564  |
| MG 81-715..  | 75-180                               | 20-29  | 2.4                           | 8    | 1 1/2"                          | 90 | 90 | 92 | 715  | 899  | 719  | 1 1/2" | 72 | 64 | 74 | 715  | 855  | 719  | 1 1/2" | 72 | 64 | 74 | 715  | 855  | 719  |
| MG 81-870..  | 75-180                               | 24-34  | 2.9                           | 10   | 1 1/2"                          | 90 | 90 | 92 | 870  | 1054 | 874  | 1 1/2" | 72 | 64 | 74 | 870  | 1010 | 874  | 1 1/2" | 72 | 64 | 74 | 870  | 1010 | 874  |
| MG 81-1155.. | 75-180                               | 29-40  | 3.8                           | 13.5 | 1 1/2"                          | 90 | 90 | 92 | 1155 | 1339 | 1159 | 1 1/2" | 72 | 64 | 74 | 1155 | 1295 | 1159 | 1 1/2" | 72 | 64 | 74 | 1155 | 1295 | 1159 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

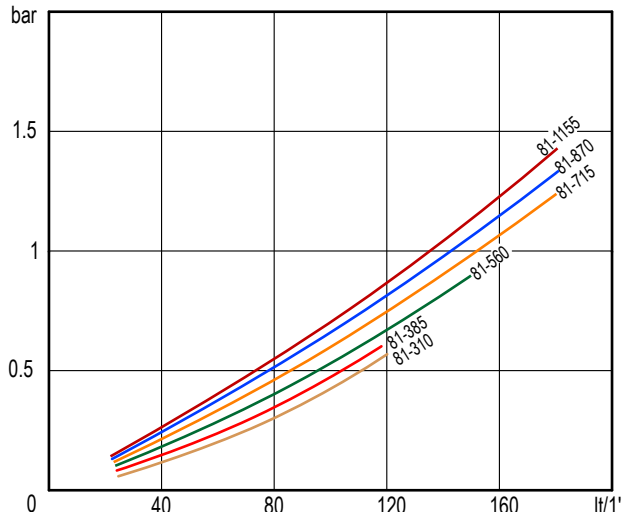
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

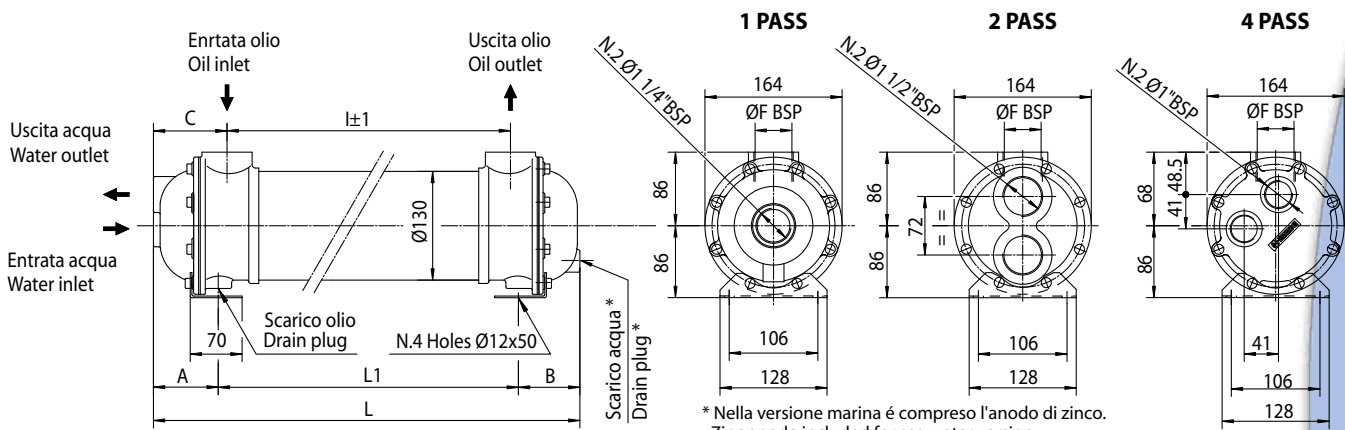
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MG130

## Water-oil heat exchangers series MG130

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



\* Nella versione marina è compreso l'anodo di zinco. Zinc anode included for sea water version.

Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |
| SEA WATER    | CuNi10Mn1Fe   | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |

| TIPO<br>TYPE  | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL=55°C<br>H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |    |    |    |      |      |      |        |        |    |    |      |      |      |        |    |        |    |      |      |      |  |  |  |
|---------------|--------------------------------------|---|-------------------------------|----|---------------------------------|----|----|----|------|------|------|--------|--------|----|----|------|------|------|--------|----|--------|----|------|------|------|--|--|--|
|               |                                      |   |                               |    | 1 Pass                          |    |    |    |      |      |      |        | 2 Pass |    |    |      |      |      |        |    | 4 Pass |    |      |      |      |  |  |  |
|               |                                      |   |                               |    | ØF                              | A  | B  | C  | I    | L    | L1   | ØF     | A      | B  | C  | I    | L    | L1   | ØF     | A  | B      | C  | I    | L    | L1   |  |  |  |
| MG 130-285..  | 60-160                               | 12-30   | 3                             | 16 | 1 1/2"                          | 85 | 85 | 94 | 285  | 473  | 303  | 1 1/2" | 80     | 75 | 89 | 285  | 458  | 303  | 1 1/2" | 80 | 75     | 89 | 285  | 458  | 303  |  |  |  |
| MG 130-535..  | 80-200                               | 18-48   | 5.2                           | 22 | 1 1/2"                          | 85 | 85 | 94 | 535  | 723  | 553  | 1 1/2" | 80     | 75 | 89 | 535  | 708  | 553  | 1 1/2" | 80 | 75     | 89 | 535  | 708  | 553  |  |  |  |
| MG 130-845..  | 120-280                              | 35-68   | 7.9                           | 28 | 1 1/2"                          | 85 | 85 | 94 | 845  | 1033 | 863  | 1 1/2" | 80     | 75 | 89 | 845  | 1018 | 863  | 1 1/2" | 80 | 75     | 89 | 845  | 1018 | 863  |  |  |  |
| MG 130-995..  | 120-280                              | 41-78   | 9.2                           | 32 | 1 1/2"                          | 85 | 85 | 94 | 995  | 1183 | 1013 | 1 1/2" | 80     | 75 | 89 | 995  | 1168 | 1013 | 1 1/2" | 80 | 75     | 89 | 995  | 1168 | 1013 |  |  |  |
| MG 130-1105.. | 120-280                              | 50-90   | 10                            | 35 | 1 1/2"                          | 85 | 85 | 94 | 1105 | 1293 | 1123 | 1 1/2" | 80     | 75 | 89 | 1105 | 1278 | 1123 | 1 1/2" | 80 | 75     | 89 | 1105 | 1278 | 1123 |  |  |  |

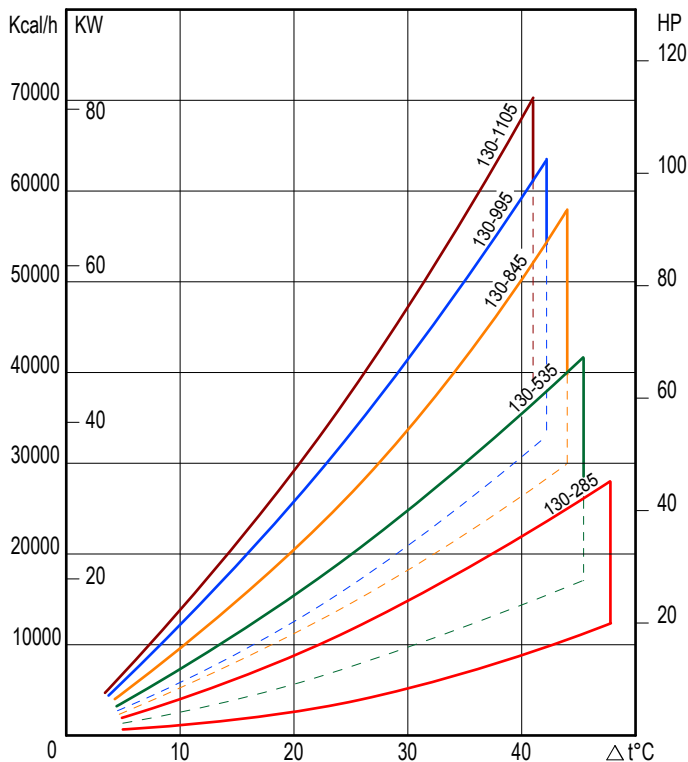


### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule

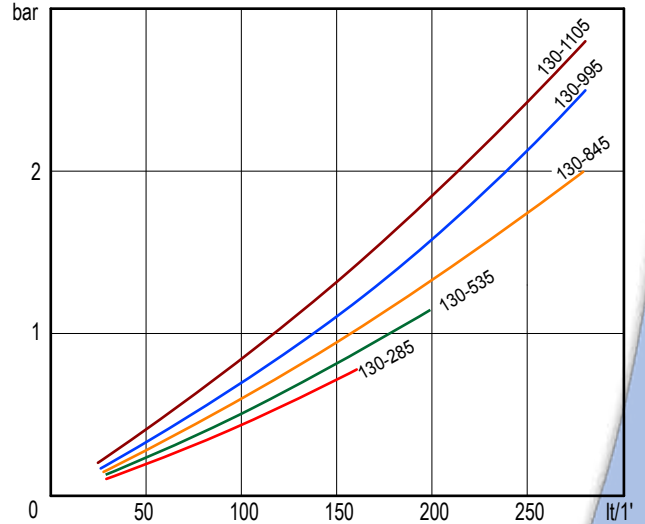


### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

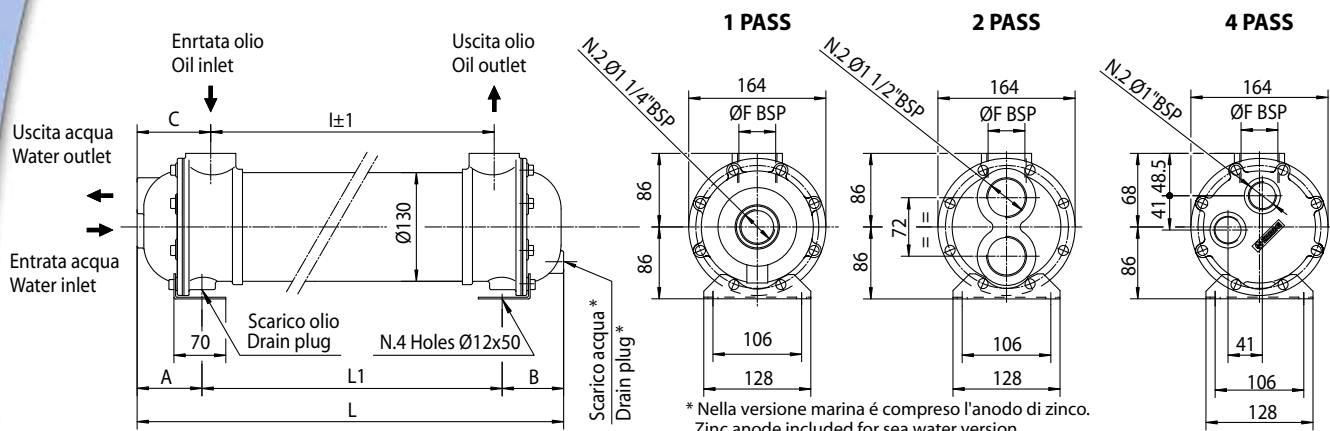
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MG131

## Water-oil heat exchangers series MG131

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



\* Nella versione marina è compreso l'anodo di zinco. Zinc anode included for sea water version.

Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |
| SEA WATER    | CuNi10Mn1Fe   | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |

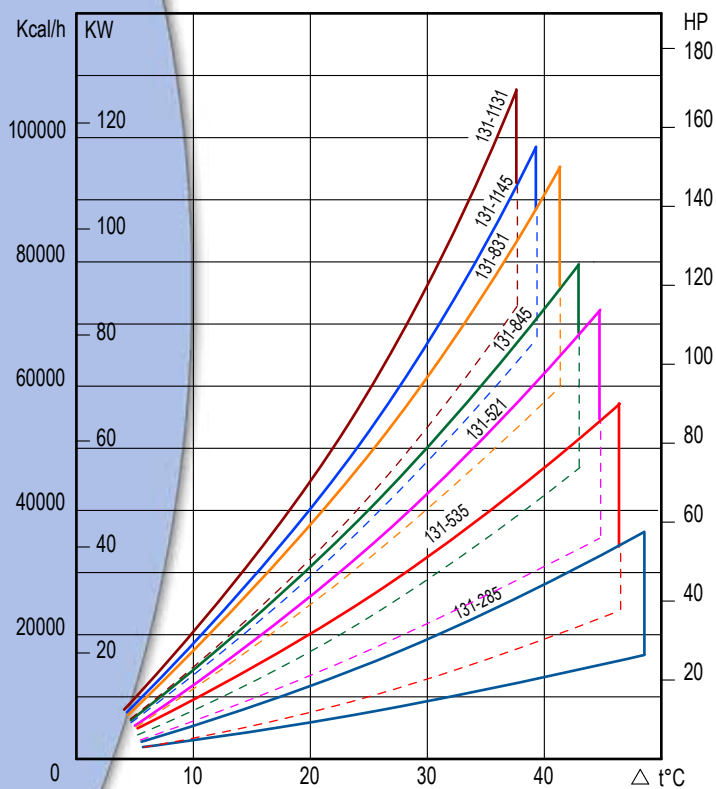
| TIPO<br>TYPE   | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H <sub>2</sub> O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |    |    |     |      |      |        |        |    |    |    |      |        |      |        |    |    |    |      |      |      |  |  |  |
|----------------|--------------------------------------|---|-------------------------------|----|---------------------------------|----|----|-----|------|------|--------|--------|----|----|----|------|--------|------|--------|----|----|----|------|------|------|--|--|--|
|                |                                      |   |                               |    | 1 Pass                          |    |    |     |      |      | 2 Pass |        |    |    |    |      | 4 Pass |      |        |    |    |    |      |      |      |  |  |  |
|                |                                      |   |                               |    | ØF                              | A  | B  | C   | I    | L    | L1     | ØF     | A  | B  | C  | I    | L      | L1   | ØF     | A  | B  | C  | I    | L    | L1   |  |  |  |
| MG 131-285...  | 50-140                               | 17-38   | 2.7                           | 17 | 1 1/2"                          | 85 | 85 | 94  | 285  | 473  | 303    | 1 1/2" | 80 | 75 | 89 | 285  | 458    | 303  | 1 1/2" | 80 | 75 | 89 | 285  | 458  | 303  |  |  |  |
| MG 131-535...  | 80-200                               | 24-63   | 4.5                           | 23 | 1 1/2"                          | 85 | 85 | 94  | 535  | 723  | 553    | 1 1/2" | 80 | 75 | 89 | 535  | 708    | 553  | 1 1/2" | 80 | 75 | 89 | 535  | 708  | 553  |  |  |  |
| MG 131-521...  | 120-280                              | 40-82   | 4.6                           | 23 | 2"                              | 85 | 85 | 102 | 521  | 725  | 555    | 2"     | 80 | 75 | 97 | 521  | 710    | 555  | 2"     | 80 | 75 | 97 | 521  | 710  | 555  |  |  |  |
| MG 131-845...  | 100-250                              | 56-96   | 6.9                           | 29 | 1 1/2"                          | 85 | 85 | 94  | 845  | 1033 | 863    | 1 1/2" | 80 | 75 | 89 | 845  | 1018   | 863  | 1 1/2" | 80 | 75 | 89 | 845  | 1018 | 863  |  |  |  |
| MG 131-831...  | 160-400                              | 77-120  | 7                             | 29 | 2"                              | 85 | 85 | 102 | 831  | 1036 | 866    | 2"     | 80 | 75 | 97 | 831  | 1020   | 865  | 2"     | 80 | 75 | 97 | 831  | 1020 | 865  |  |  |  |
| MG 131-1145... | 120-280                              | 85-132  | 8                             | 36 | 1 1/2"                          | 85 | 85 | 94  | 1145 | 1333 | 1163   | 1 1/2" | 80 | 75 | 89 | 1145 | 1318   | 1163 | 1 1/2" | 80 | 75 | 89 | 1145 | 1318 | 1163 |  |  |  |
| MG 131-1131... | 160-420                              | 102-153   | 8.1                           | 36 | 2"                              | 85 | 85 | 102 | 1131 | 1335 | 1165   | 2"     | 80 | 75 | 97 | 1131 | 1320   | 1165 | 2"     | 80 | 75 | 97 | 1131 | 1320 | 1165 |  |  |  |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

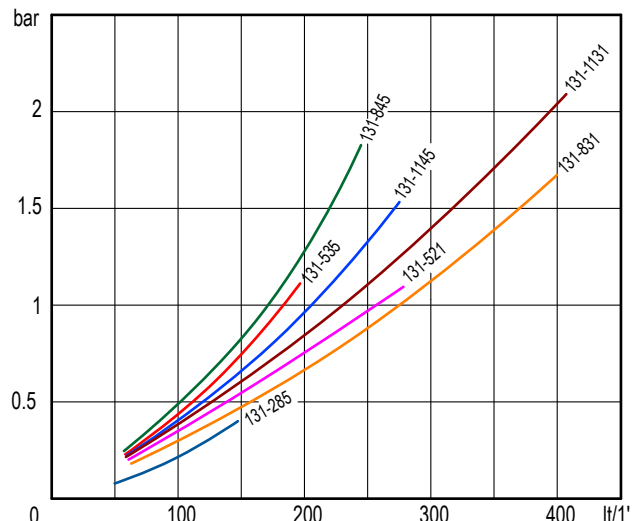
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

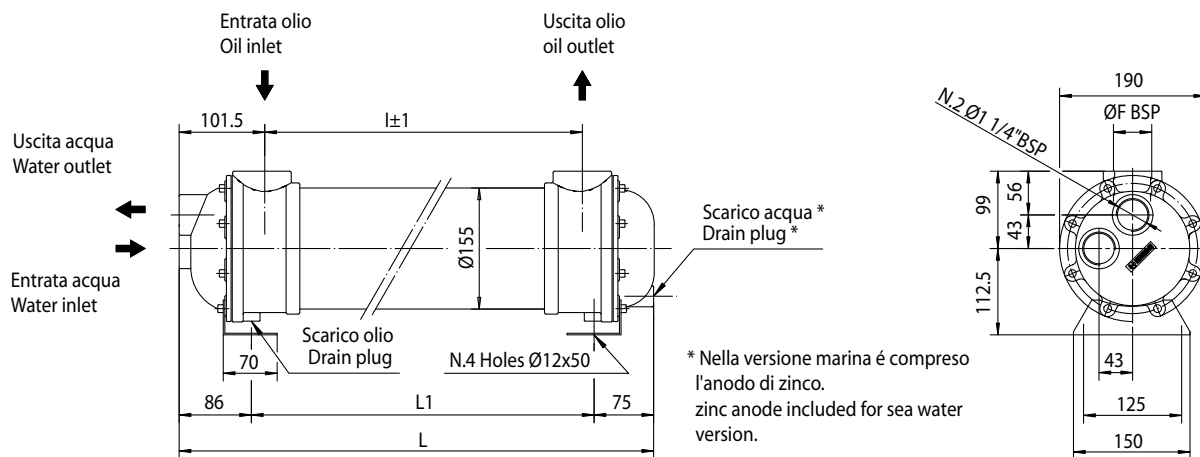
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MG155

## Water-oil heat exchangers series MG155

Con circuito acqua ispezionabile a quattro passaggi. Four ways controllable water circuit



Le dimensioni e le caratteristiche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |
| SEA WATER    | CuNi10Mn1Fe   | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |

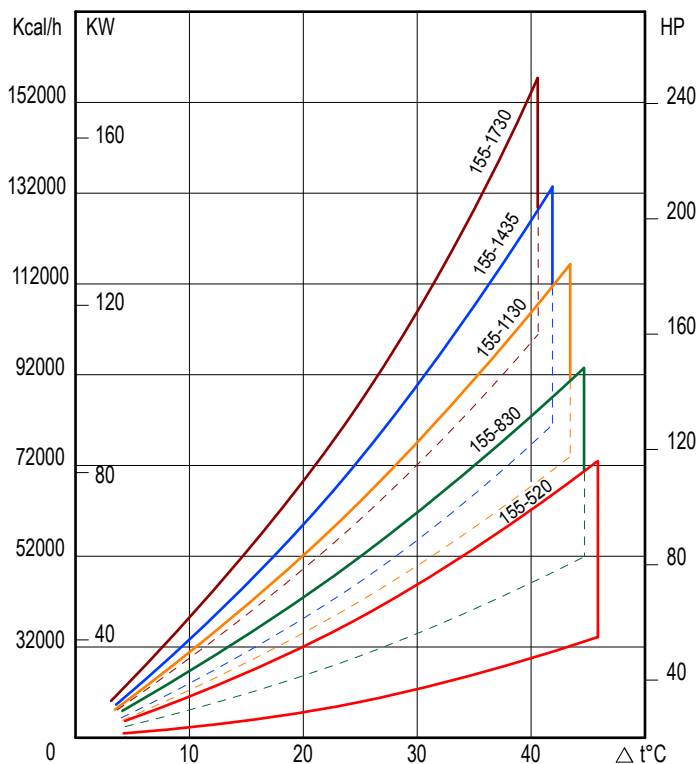
| TIPO<br>TYPE  | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL=55°C<br>C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |      |      |      |
|---------------|--------------------------------------|---|-------------------------------|----|---------------------------------|------|------|------|
|               |                                      |   |                               |    | 4 Pass                          |      |      |      |
|               |                                      |   |                               |    | ØF                              | I    | L    | L1   |
| MG 155-520-4  | 120-300                              | 55-120  | 6.4                           | 35 | 2"                              | 520  | 712  | 551  |
| MG 155-830-4  | 140-380                              | 95-155  | 9.6                           | 43 | 2"                              | 830  | 1022 | 861  |
| MG 155-1130-4 | 160-420                              | 115-185   | 12.8                          | 51 | 2"                              | 1130 | 1322 | 1161 |
| MG 155-1435-4 | 180-450                              | 135-235   | 16                            | 58 | 2"                              | 1435 | 1627 | 1466 |
| MG 155-1730-4 | 180-450                              | 160-250   | 19                            | 66 | 2"                              | 1730 | 1922 | 1761 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule

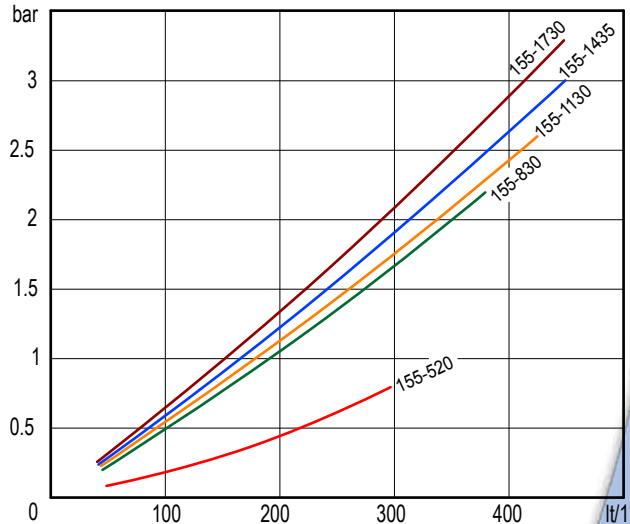


### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

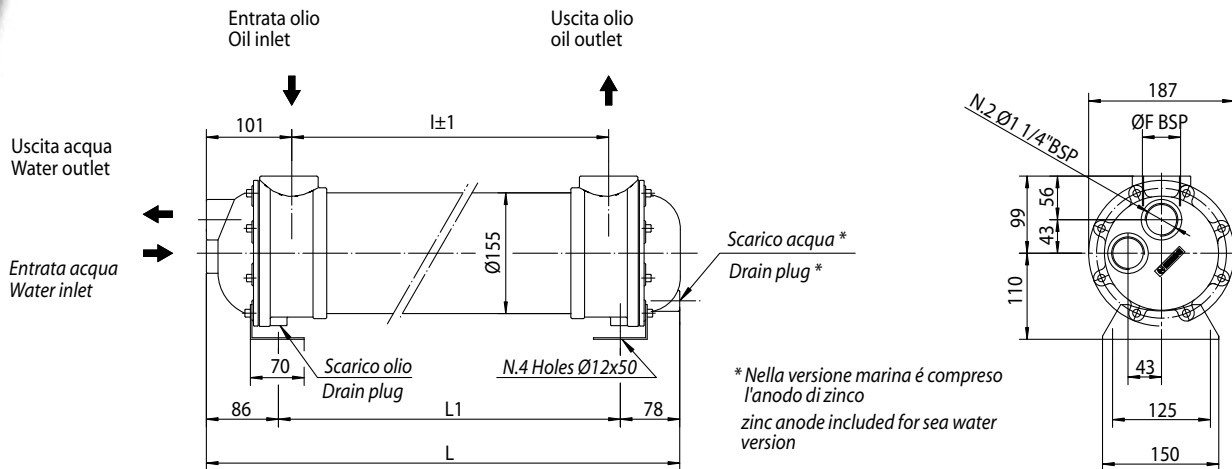
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MG157

## Water-oil heat exchangers series MG157

Con circuito acqua ispezionabile a quattro passaggi. Four ways controllable water circuit



Le dimensioni e le caratteristiche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |
| SEA WATER    | CuNi30Mn1Fe   | CuZn40                         | CuZn37                | CuZn40          | Fe510.2           | Rubber-cork          |

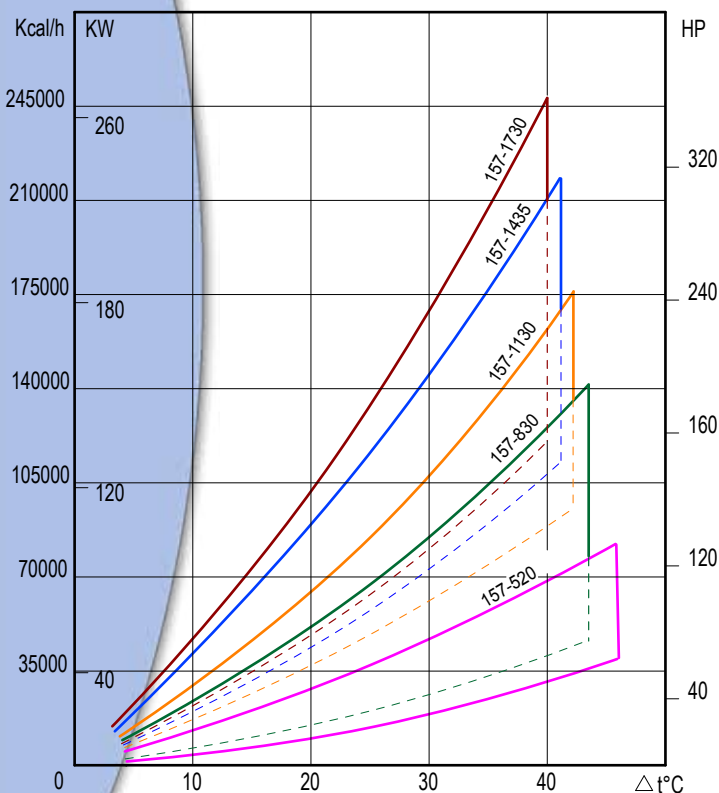
| TIPO<br>TYPE  | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL=55°C<br>H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |      |      |      |
|---------------|--------------------------------------|---|-------------------------------|----|---------------------------------|------|------|------|
|               |                                      |   |                               |    | 4 Pass                          |      |      |      |
|               |                                      |   |                               |    | ØF                              | I    | L    | L1   |
| MG 157-520-4  | 120-300                              | 35-92   | 5.5                           | 40 | 2"                              | 520  | 711  | 547  |
| MG 157-830-4  | 140-380                              | 54-166  | 8.4                           | 50 | 2"                              | 830  | 1021 | 857  |
| MG 157-1130-4 | 160-420                              | 110-215   | 11.3                          | 59 | 2"                              | 1130 | 1321 | 1157 |
| MG 157-1435-4 | 180-450                              | 140-280   | 14.1                          | 66 | 2"                              | 1435 | 1626 | 1462 |
| MG 157-1730-4 | 180-450                              | 155-315   | 17                            | 76 | 2"                              | 1730 | 1921 | 1757 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

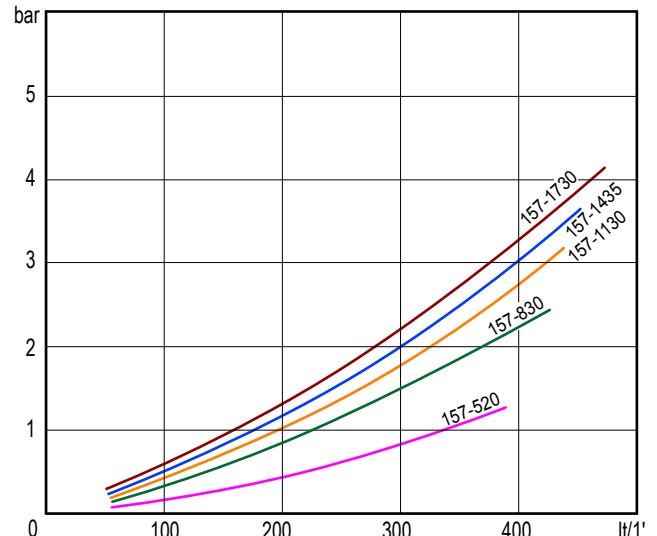
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)

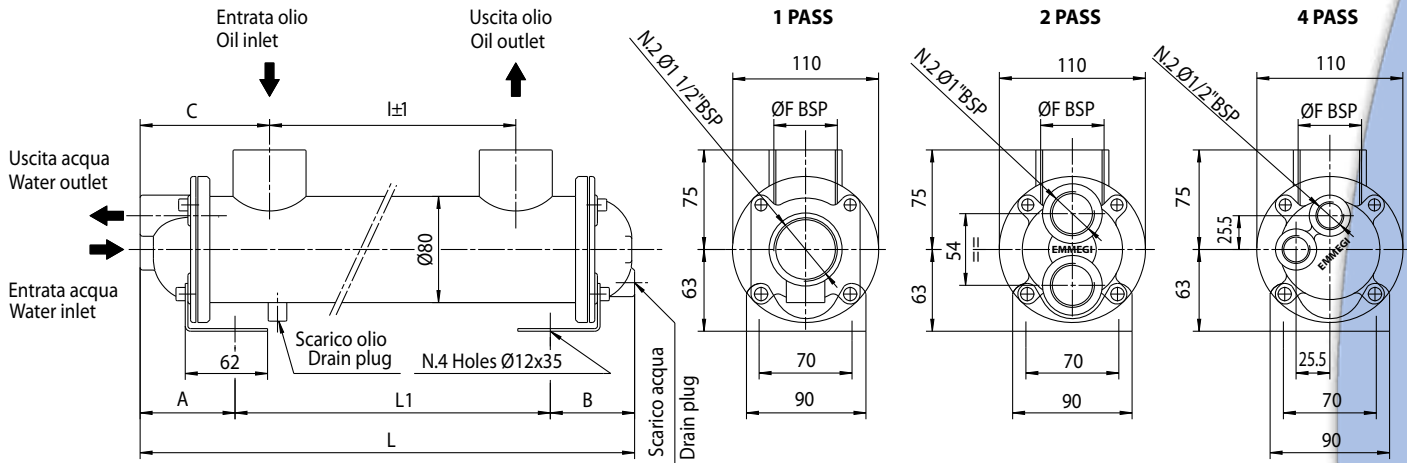




# Scambiatori acqua-olio serie MGB80 - AISI 304

## Water-oil heat exchangers series MGB80 - AISI 304

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| Aisi         | Aisi 304      | Aisi 304                       | Aisi 304              | CuZn40          | Aisi 304          | Graphite - kevlar    |

| TIPO<br>TYPE   | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |    |    |       |      |      |        |        |    |    |       |      |        |      |        |    |    |       |      |      |      |
|----------------|--------------------------------------|--|-------------------------------|----|---------------------------------|----|----|-------|------|------|--------|--------|----|----|-------|------|--------|------|--------|----|----|-------|------|------|------|
|                |                                      |  |                               |    | 1 Pass                          |    |    |       |      |      | 2 Pass |        |    |    |       |      | 4 Pass |      |        |    |    |       |      |      |      |
|                |                                      |  |                               |    | ØF                              | A  | B  | C     | I    | L    | L1     | ØF     | A  | B  | C     | I    | L      | L1   | ØF     | A  | B  | C     | I    | L    | L1   |
| MGB 80-250-..  | 30-160                               | 6-14   | 1.1                           | 6  | 1 1/2"                          | 90 | 90 | 127.5 | 250  | 505  | 325    | 1 1/2" | 72 | 64 | 127.5 | 250  | 461    | 325  | 1 1/2" | 72 | 64 | 127.5 | 250  | 461  | 325  |
| MGB80-500-..   | 40-180                               | 10-24  | 2                             | 9  | 1 1/2"                          | 90 | 90 | 127.5 | 500  | 755  | 575    | 1 1/2" | 72 | 64 | 127.5 | 500  | 711    | 575  | 1 1/2" | 72 | 64 | 127.5 | 500  | 711  | 575  |
| MGB 80-805-..  | 40-180                               | 15-30  | 3                             | 12 | 1 1/2"                          | 90 | 90 | 127.5 | 805  | 1060 | 880    | 1 1/2" | 72 | 64 | 127.5 | 805  | 1016   | 880  | 1 1/2" | 72 | 64 | 127.5 | 805  | 1016 | 880  |
| MGB 80-1110-.. | 50-200                               | 20-42  | 4                             | 15 | 1 1/2"                          | 90 | 90 | 127.5 | 1110 | 1365 | 1185   | 1 1/2" | 72 | 64 | 127.5 | 1110 | 1321   | 1185 | 1 1/2" | 72 | 64 | 127.5 | 1110 | 1321 | 1185 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

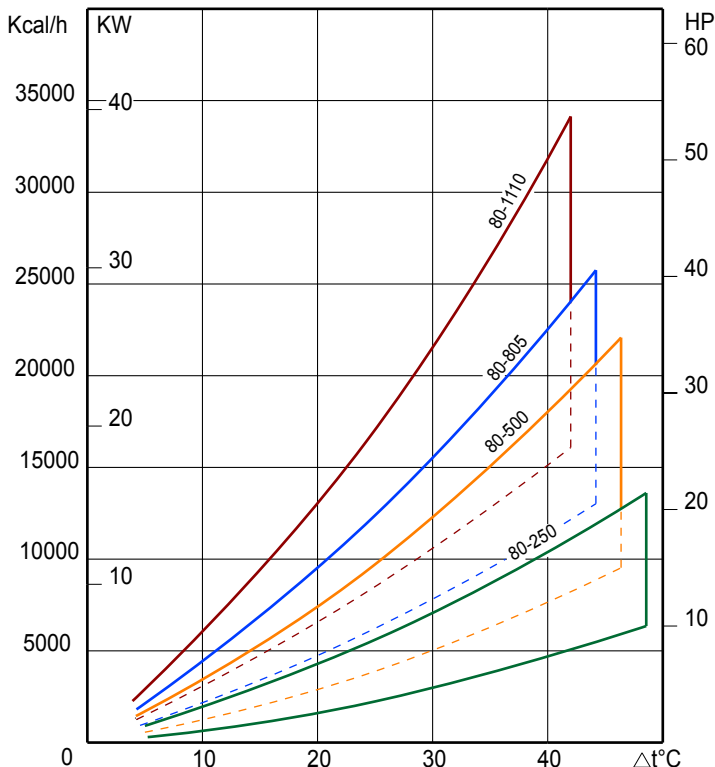
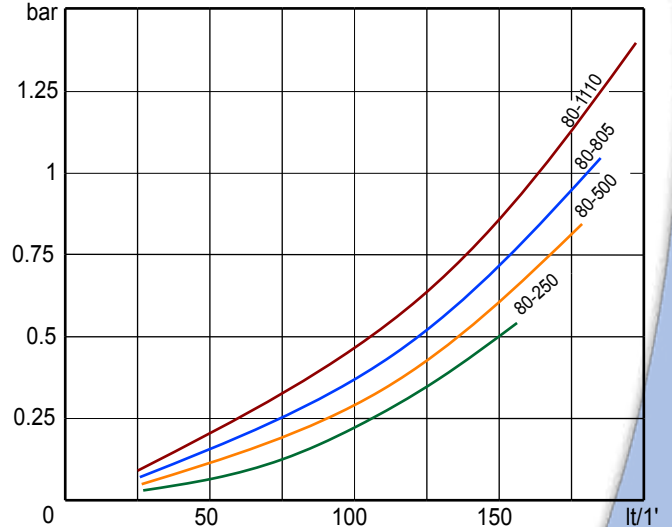
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

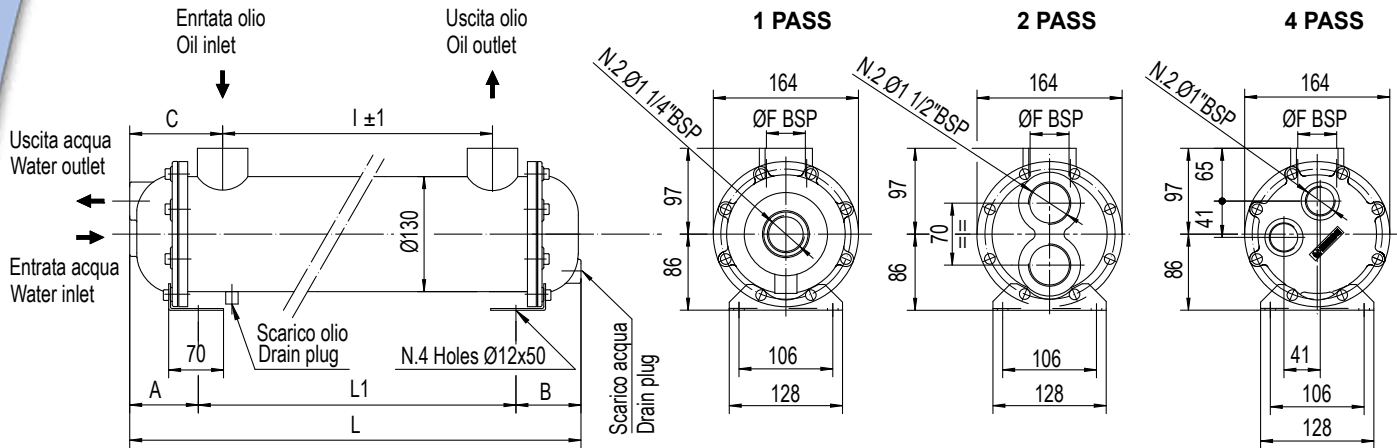
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGB130 - AISI 304

## Water-oil heat exchangers series MGB130 - AISI 304

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| AISI         | AISI 304      | AISI 304                       | AISI 304              | CuZn40          | AISI 304          | Graphite-kevlar      |

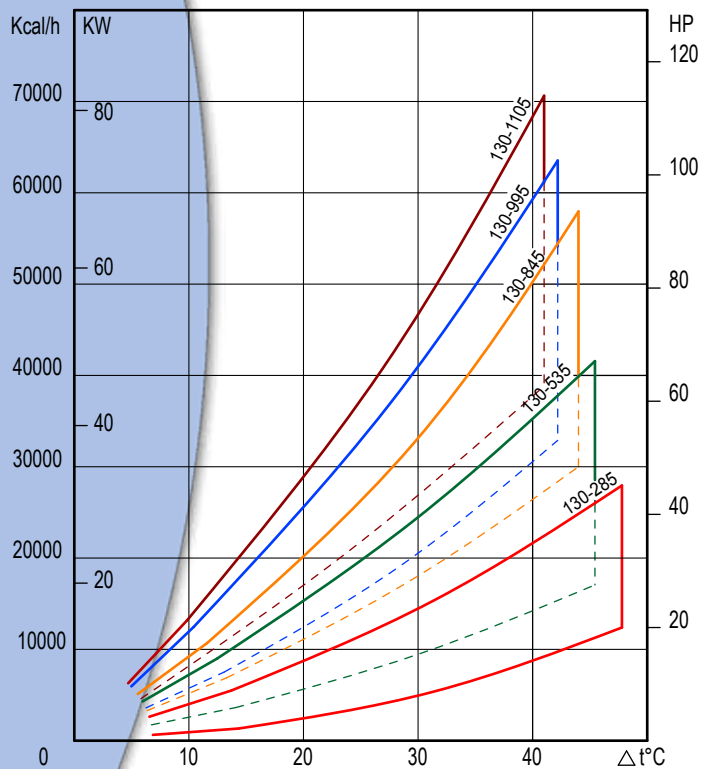
| TIPO<br>TYPE   | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL=55°C<br>H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |    |    |       |      |      |      |        |    |    |       |      |      |      |        |    |    |       |      |      |      |  |  |  |
|----------------|--------------------------------------|---|-------------------------------|----|---------------------------------|----|----|-------|------|------|------|--------|----|----|-------|------|------|------|--------|----|----|-------|------|------|------|--|--|--|
|                |                                      |   |                               |    | 1 Pass                          |    |    |       |      |      |      | 2 Pass |    |    |       |      |      |      | 4 Pass |    |    |       |      |      |      |  |  |  |
|                |                                      |   |                               |    | ØF                              | A  | B  | C     | I    | L    | L1   | ØF     | A  | B  | C     | I    | L    | L1   | ØF     | A  | B  | C     | I    | L    | L1   |  |  |  |
| MGB130-285...  | 60-160                               | 12-30   | 3                             | 16 | 1 1/2"                          | 85 | 85 | 132   | 285  | 549  | 379  | 1 1/2" | 80 | 75 | 127   | 285  | 534  | 379  | 1 1/2" | 80 | 75 | 127   | 285  | 536  | 381  |  |  |  |
| MGB130-535...  | 80-200                               | 18-48   | 5.2                           | 22 | 1 1/2"                          | 85 | 85 | 129.5 | 535  | 794  | 624  | 1 1/2" | 80 | 75 | 124.5 | 535  | 779  | 624  | 1 1/2" | 80 | 75 | 124.5 | 535  | 781  | 626  |  |  |  |
| MGB130-845...  | 120-280                              | 35-68   | 7.9                           | 28 | 1 1/2"                          | 85 | 85 | 124.5 | 845  | 1094 | 924  | 1 1/2" | 80 | 75 | 119.5 | 845  | 1079 | 924  | 1 1/2" | 80 | 75 | 119.5 | 845  | 1081 | 926  |  |  |  |
| MGB130-995...  | 120-280                              | 41-78   | 9.2                           | 32 | 1 1/2"                          | 85 | 85 | 132   | 995  | 1259 | 1089 | 1 1/2" | 80 | 75 | 127   | 995  | 1244 | 1089 | 1 1/2" | 80 | 75 | 127   | 995  | 1246 | 1091 |  |  |  |
| MGB130-1105... | 120-280                              | 50-90   | 10                            | 35 | 1 1/2"                          | 85 | 85 | 129.5 | 1105 | 1364 | 1194 | 1 1/2" | 80 | 75 | 124.5 | 1105 | 1349 | 1194 | 1 1/2" | 80 | 75 | 124.5 | 1105 | 1351 | 1196 |  |  |  |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule

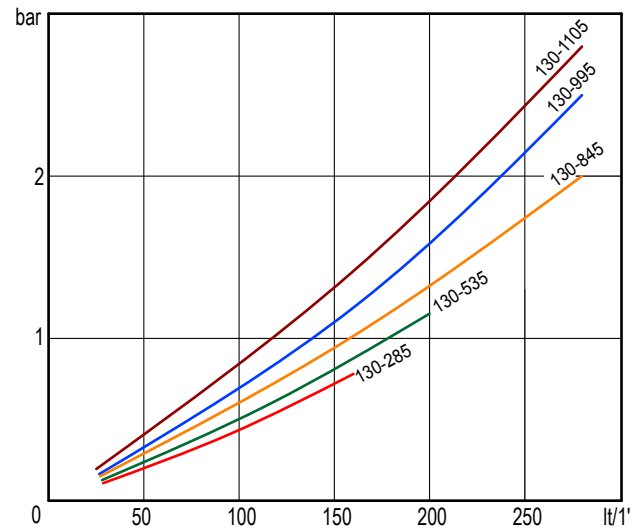


### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

#### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

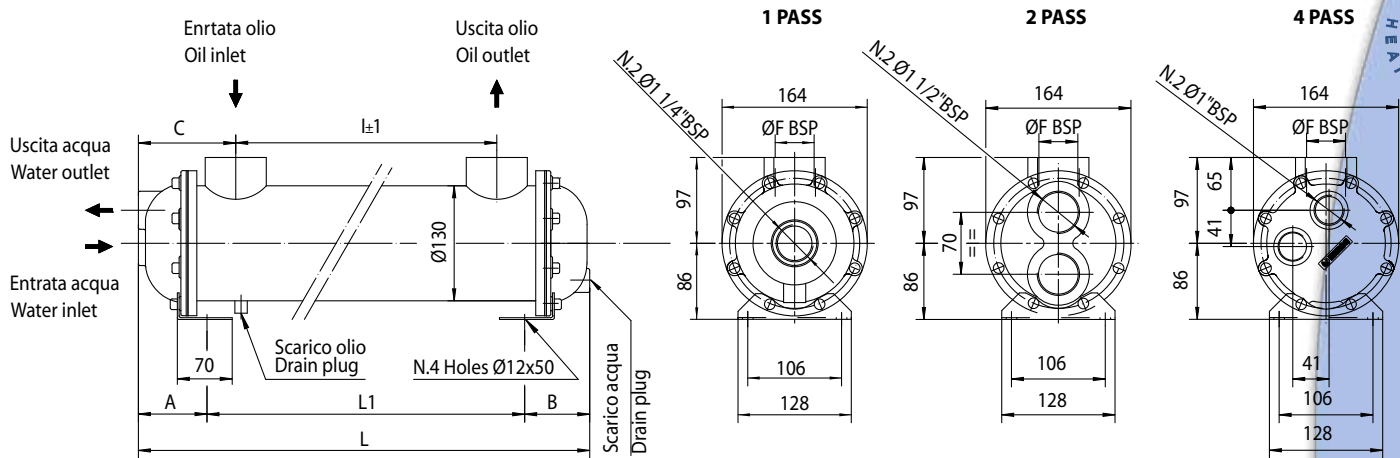
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGB131 - AISI 304

## Water-oil heat exchangers series MGB131 - AISI 304

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| Aisi         | AiSi 304      | AiSi 304                       | AiSi 304              | CuZn40          | AiSi 304          | Graphite-kevlar      |

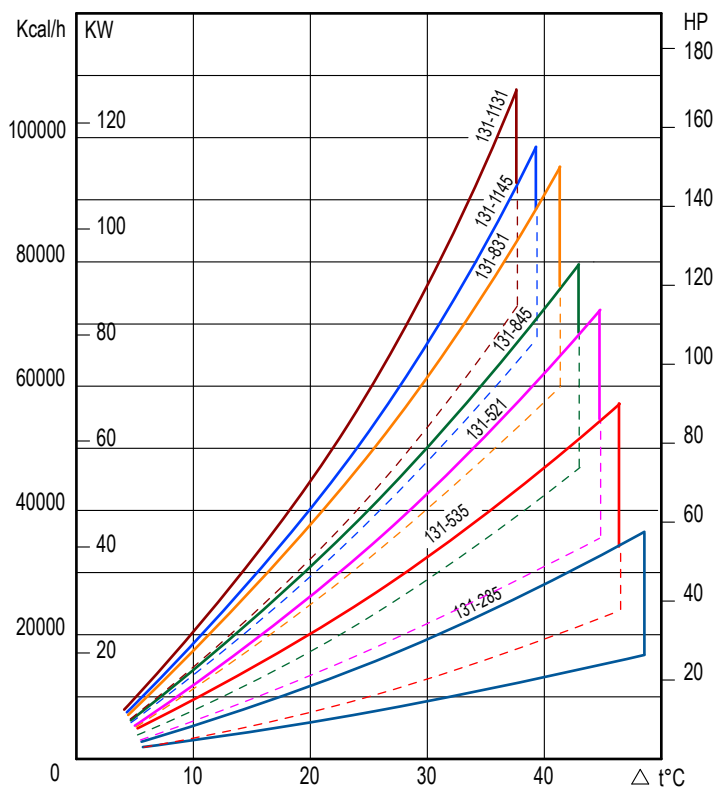
| TIPO<br>TYPE    | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |    |    |       |      |      |        |        |    |    |       |      |        |      |        |    |    |       |      |      |      |
|-----------------|--------------------------------------|--|-------------------------------|----|---------------------------------|----|----|-------|------|------|--------|--------|----|----|-------|------|--------|------|--------|----|----|-------|------|------|------|
|                 |                                      |  |                               |    | 1 Pass                          |    |    |       |      |      | 2 Pass |        |    |    |       |      | 4 Pass |      |        |    |    |       |      |      |      |
|                 |                                      |  |                               |    | ØF                              | A  | B  | C     | I    | L    | L1     | ØF     | A  | B  | C     | I    | L      | L1   | ØF     | A  | B  | C     | I    | L    | L1   |
| MGB 131-285-..  | 50-140                               | 17-38  | 2.7                           | 17 | 1 1/2"                          | 85 | 85 | 132   | 285  | 549  | 379    | 1 1/2" | 80 | 75 | 127   | 285  | 534    | 379  | 1 1/2" | 80 | 75 | 127   | 285  | 536  | 381  |
| MGB 131-535-..  | 80-200                               | 24-63  | 4.5                           | 23 | 1 1/2"                          | 85 | 85 | 129.5 | 535  | 794  | 624    | 1 1/2" | 80 | 75 | 124.5 | 535  | 779    | 624  | 1 1/2" | 80 | 75 | 124.5 | 535  | 781  | 626  |
| MGB 131-521-..  | 120-280                              | 40-82  | 4.6                           | 23 | 2"                              | 85 | 85 | 136.5 | 521  | 794  | 624    | 2"     | 80 | 75 | 131.5 | 521  | 779    | 624  | 2"     | 80 | 75 | 131.5 | 521  | 781  | 626  |
| MGB 131-845-..  | 100-250                              | 56-96  | 6.9                           | 29 | 1 1/2"                          | 85 | 85 | 124.5 | 845  | 1094 | 924    | 1 1/2" | 80 | 75 | 119.5 | 845  | 1079   | 924  | 1 1/2" | 80 | 75 | 119.5 | 845  | 1081 | 926  |
| MGB 131-831-..  | 160-400                              | 77-120   | 7                             | 29 | 2"                              | 85 | 85 | 131.5 | 831  | 1024 | 924    | 2"     | 80 | 75 | 126.5 | 831  | 1079   | 924  | 2"     | 80 | 75 | 126.5 | 831  | 1081 | 926  |
| MGB 131-1145-.. | 120-280                              | 85-132   | 8                             | 36 | 1 1/2"                          | 85 | 85 | 124.5 | 1145 | 1394 | 1224   | 1 1/2" | 80 | 75 | 119.5 | 1145 | 1379   | 1224 | 1 1/2" | 80 | 75 | 119.5 | 1145 | 1379 | 1224 |
| MGB 131-1131-.. | 160-420                              | 102-153  | 8.1                           | 36 | 2"                              | 85 | 85 | 131.5 | 1131 | 1394 | 1224   | 2"     | 80 | 75 | 126.5 | 1131 | 1379   | 1224 | 2"     | 80 | 75 | 126.5 | 1131 | 1379 | 1224 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

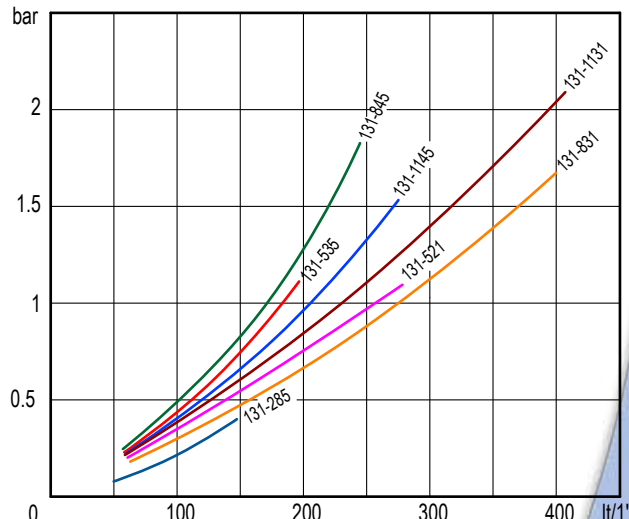
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

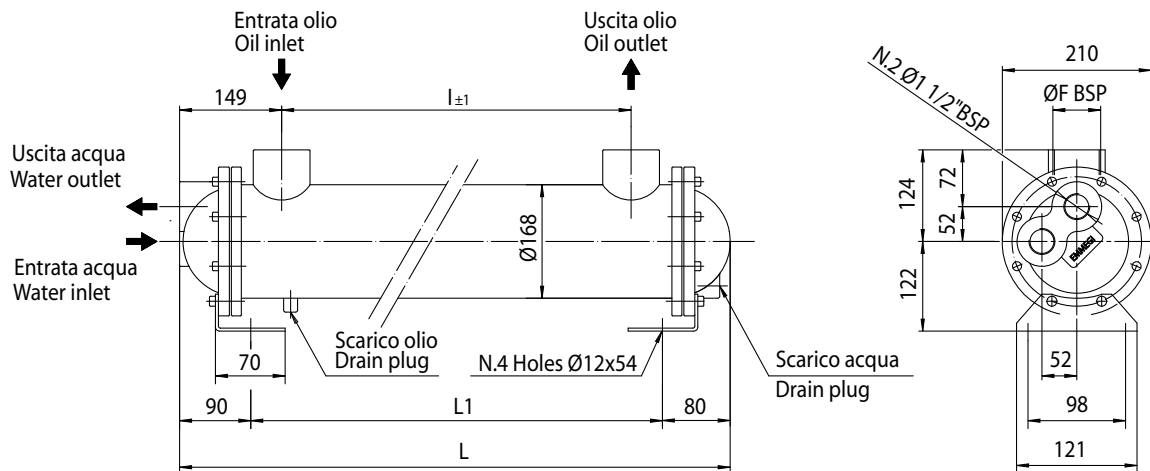
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGB 168 - AISI 304

## Water-oil heat exchangers series MGB 168 - AISI 304

Con circuito acqua ispezionabile a quattro passaggi. Four ways controllable water circuit



Le dimensioni e le caratteristiche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| AISI         | AISI 304      | AISI 304                       | AISI 304              | G25             | AISI 304          | Graphite-kevlar      |

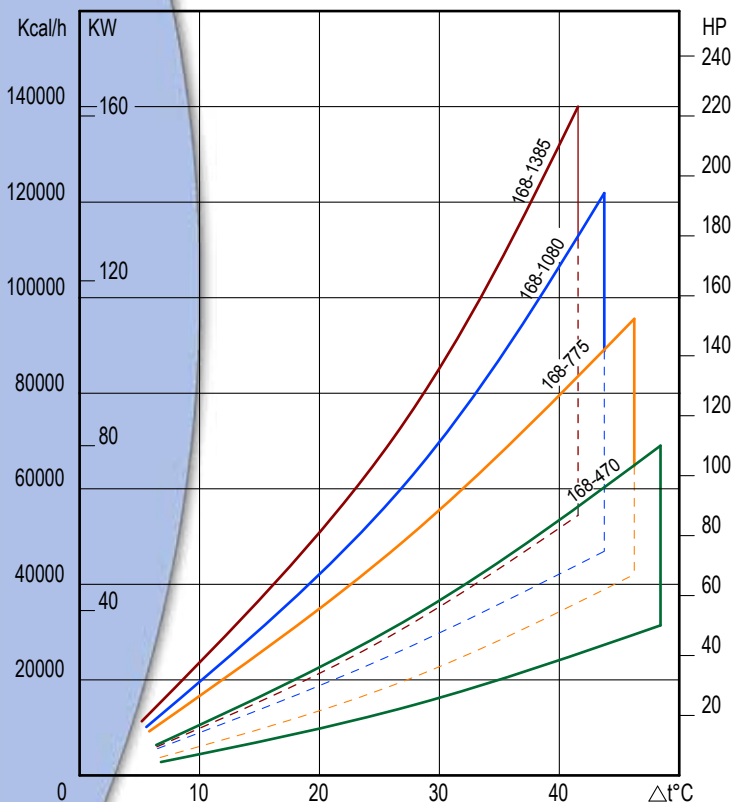
| TIPO<br>TYPE   | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL=55°C<br>H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | Dimensioni - Over all dimension |      |      |      |
|----------------|--------------------------------------|---|-------------------------------|----|---------------------------------|------|------|------|
|                |                                      |   |                               |    | 4 Pass                          |      |      |      |
|                |                                      |   |                               |    | ØF                              | I    | L    | L1   |
| MGB 168-470-4  | 100-450                              | 32-72   | 8.3                           | 35 | 2"                              | 470  | 756  | 586  |
| MGB 168-775-4  | 120-500                              | 45-105  | 12.5                          | 43 | 2"                              | 775  | 1061 | 891  |
| MGB 168-1080-4 | 150-550                              | 55-142  | 16.7                          | 50 | 2"                              | 1080 | 1366 | 1196 |
| MGB 168-1385-4 | 150-550                              | 70-172  | 21                            | 57 | 2"                              | 1385 | 1671 | 1501 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule

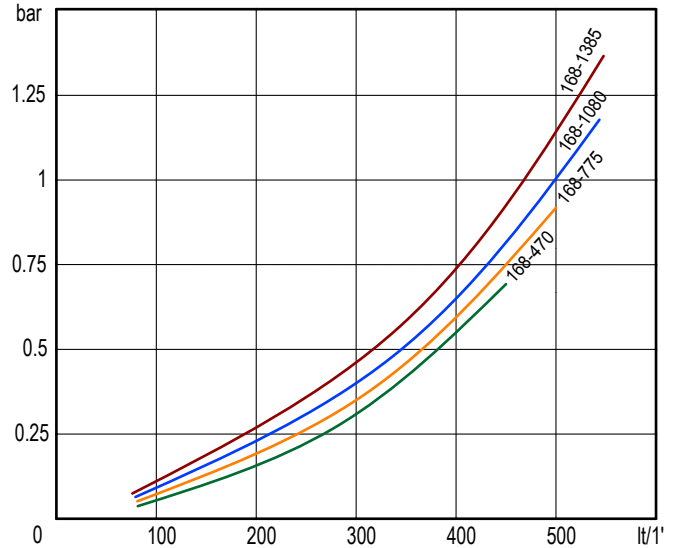


### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

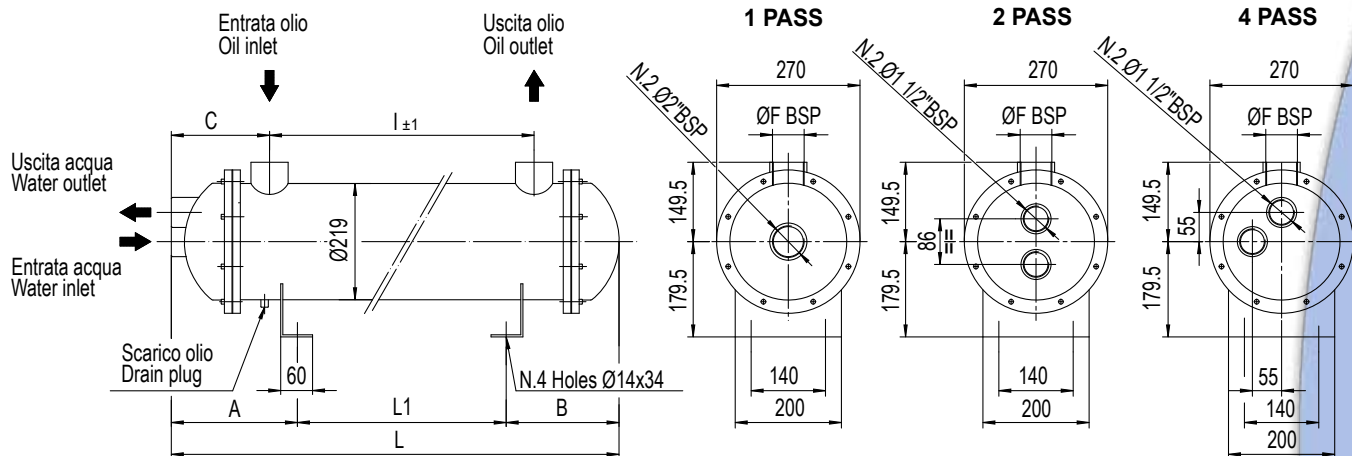
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGB 220

## Water-oil heat exchangers series MGB 220

Con circuito acqua ispezionabile a uno-due-quattro passaggi. One-two-four ways controllable water circuit



Le dimensioni e le caratteristiche tecniche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | C40                            | CuZn37                | Fe 510.2        | Fe510.2           | OR 4900              |
| Aisi         | AiSi 304      | AiSi 304                       | AiSi 304              | AiSi 304        | AiSi 304          | OR 4900              |

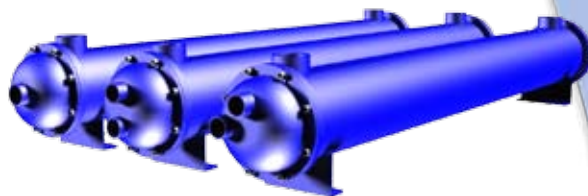
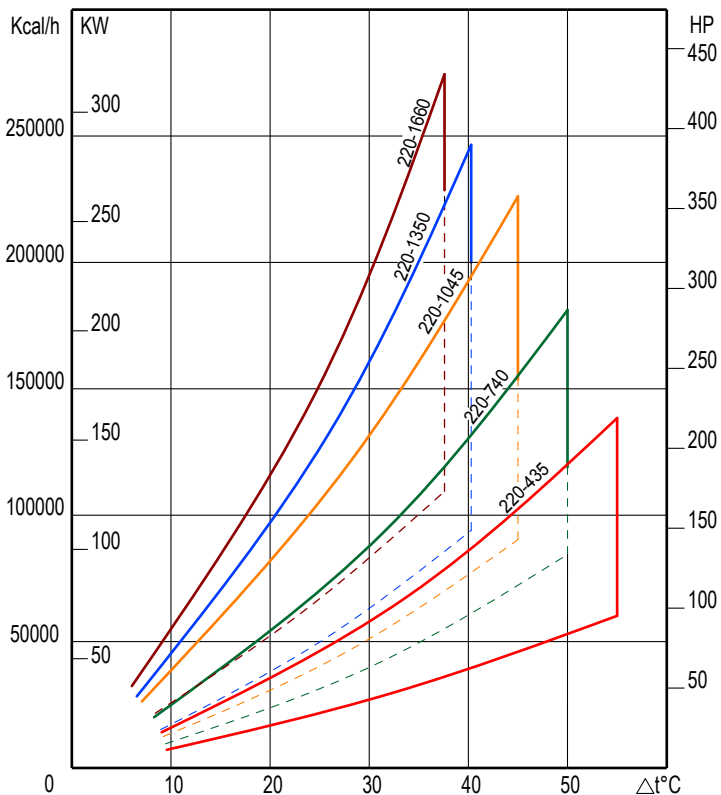
| TIPO<br>TYPE    | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg  | Dimensioni - Over all dimension |     |     |       |      |      |        |        |     |     |       |      |        |      |        |     |     |       |      |      |      |
|-----------------|--------------------------------------|--|-------------------------------|-----|---------------------------------|-----|-----|-------|------|------|--------|--------|-----|-----|-------|------|--------|------|--------|-----|-----|-------|------|------|------|
|                 |                                      |  |                               |     | 1 Pass                          |     |     |       |      |      | 2 Pass |        |     |     |       |      | 4 Pass |      |        |     |     |       |      |      |      |
|                 |                                      |  |                               |     | ØF                              | A   | B   | C     | I    | L    | L1     | ØF     | A   | B   | C     | I    | L      | L1   | ØF     | A   | B   | C     | I    | L    | L1   |
| MGB 220-435-..  | 80-800                               | 50-120   | 11                            | 48  | 2 1/2"                          | 264 | 225 | 207.5 | 435  | 811  | 322    | 2 1/2" | 235 | 225 | 178.5 | 435  | 782    | 322  | 2 1/2" | 235 | 225 | 178.5 | 435  | 782  | 322  |
| MGB 220-740-..  | 100-800                              | 75-180   | 16.8                          | 82  | 2 1/2"                          | 264 | 225 | 207.5 | 740  | 1116 | 627    | 2 1/2" | 235 | 225 | 178.5 | 740  | 1087   | 627  | 2 1/2" | 235 | 225 | 178.5 | 740  | 1087 | 627  |
| MGB 220-1045-.. | 100-800                              | 100-250  | 22.2                          | 110 | 2 1/2"                          | 264 | 225 | 207.5 | 1045 | 1421 | 932    | 2 1/2" | 235 | 225 | 178.5 | 1045 | 1392   | 932  | 2 1/2" | 235 | 225 | 178.5 | 1045 | 1392 | 932  |
| MGB 220-1350-.. | 100-800                              | 125-320  | 27.9                          | 120 | 2 1/2"                          | 264 | 225 | 207.5 | 1350 | 1726 | 1237   | 2 1/2" | 235 | 225 | 178.5 | 1350 | 1697   | 1237 | 2 1/2" | 235 | 225 | 178.5 | 1350 | 1697 | 1237 |
| MGB 220-1660-.. | 100-800                              | 150-390  | 33.6                          | 145 | 2 1/2"                          | 264 | 225 | 207.5 | 1660 | 2036 | 1547   | 2 1/2" | 235 | 225 | 178.5 | 1660 | 2007   | 1547 | 2 1/2" | 235 | 225 | 178.5 | 1660 | 2007 | 1547 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

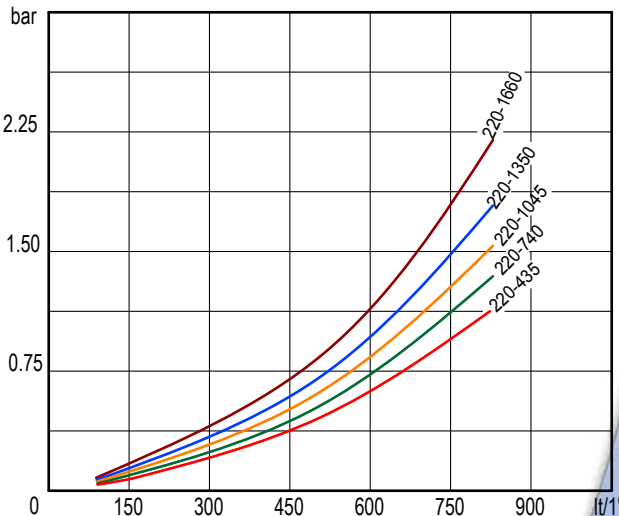
At the maximum and minimum flow stated in schedule



### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

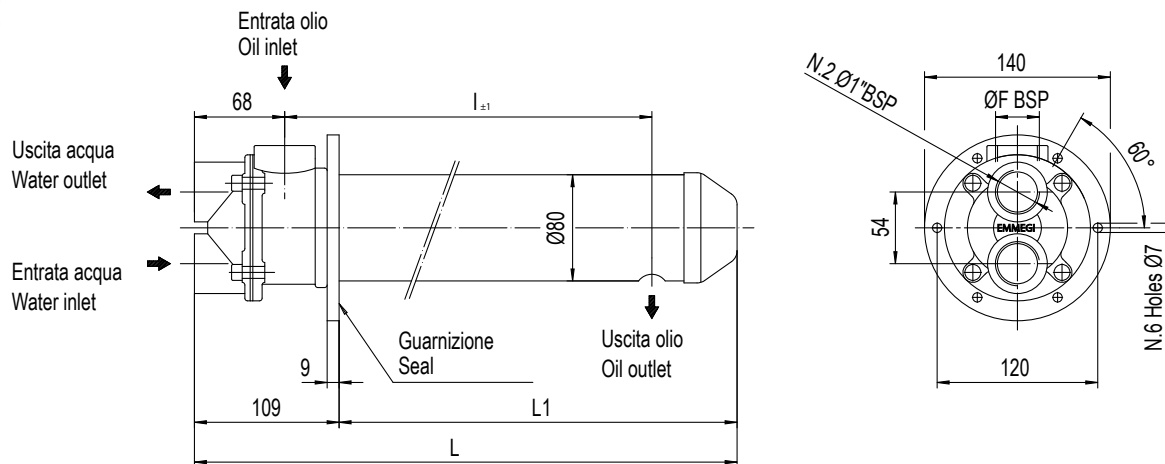
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGF 80

## Water-oil heat exchangers series MGF 80

Con circuito acqua ispezionabile a due passaggi. Two ways controllable water circuit



Le dimensioni e le caratteristiche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | CuZn37            | Rubber-cork          |

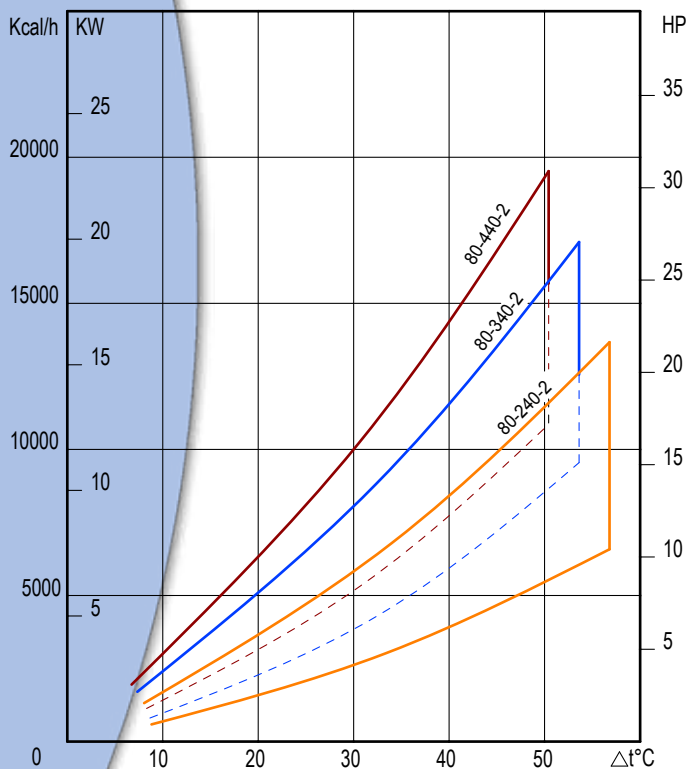
| TIPO<br>TYPE | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL=55°C<br>C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg  | Dimensioni - Over all dimension |     |     |     |
|--------------|--------------------------------------|---|-------------------------------|-----|---------------------------------|-----|-----|-----|
|              |                                      |   |                               |     | 2 Pass                          |     |     |     |
|              |                                      |   |                               |     | ØF                              | I   | L   | L1  |
| MGF 80-240-2 | 20-60                                | 3-6   | 0.9                           | 5   | 1"                              | 240 | 369 | 260 |
| MGF 80-340-2 | 30-70                                | 6-9   | 1.2                           | 5.7 | 1"                              | 340 | 469 | 360 |
| MGF 80-440-2 | 40-80                                | 9-12  | 1.5                           | 6.4 | 1"                              | 440 | 569 | 460 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule

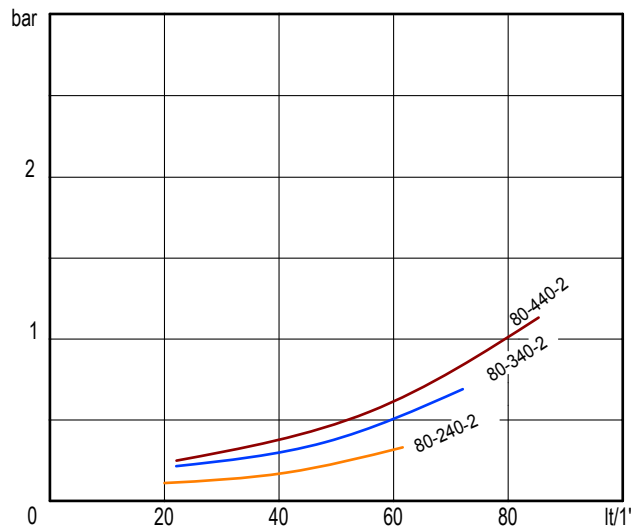


### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

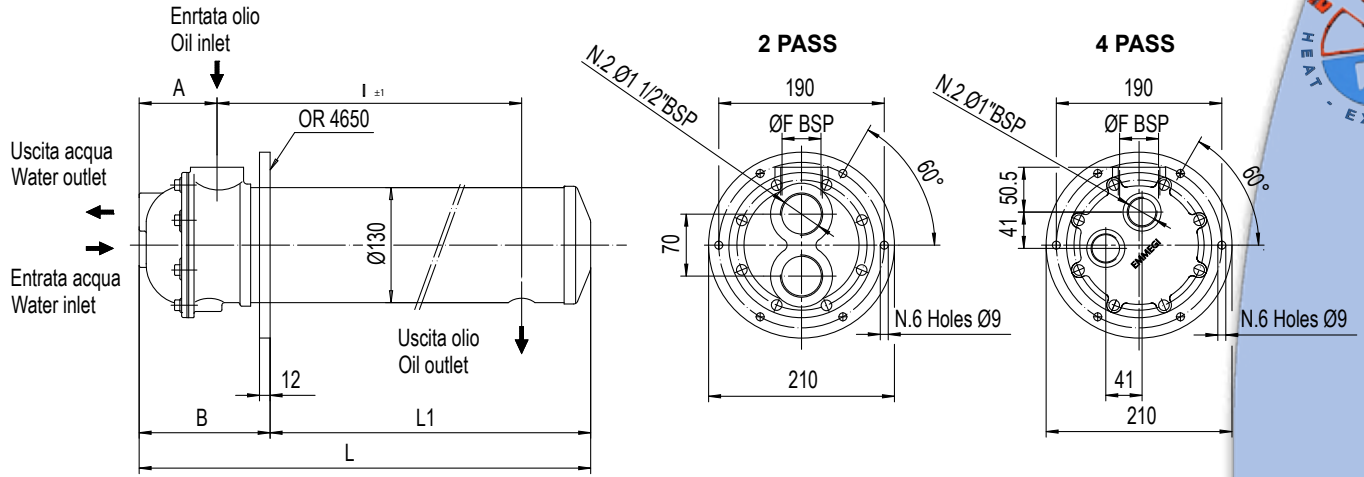
### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)



# Scambiatori acqua-olio serie MGF 131

## Water-oil heat exchangers series MGF 131

Con circuito acqua ispezionabile a due-quattro passaggi. Two-four ways controllable water circuit.



Le dimensioni e le caratteristiche non sono impegnative. Over-all dimension and technical characteristics are not binding.

| TIPO<br>TYPE | TUBI<br>TUBES | PIASTRA TUBIERA<br>TUBES SHEET | DEFLETTORI<br>BAFFLES | FONDI<br>COVERS | MANTELLO<br>SHELL | GUARNIZIONI<br>SEALS |
|--------------|---------------|--------------------------------|-----------------------|-----------------|-------------------|----------------------|
| STANDARD     | CuDHP         | CuZn40                         | CuZn37                | CuZn40          | CuZn37            | Rubber-cork          |

| TIPO<br>TYPE    | PORTATA OLIO<br>OIL FLOW<br>(lt/min) | HP DISPERSI<br>CON OLIO<br>HP DISSIPATED<br>WITH OIL<br>=55°C H2O=20°C | CAPACITA'<br>CONTENTS<br>(lt) | Kg | A  | B   | Dimensioni - Over all dimension |      |      |      |        |      |      |      |
|-----------------|--------------------------------------|--|-------------------------------|----|----|-----|---------------------------------|------|------|------|--------|------|------|------|
|                 |                                      |  |                               |    |    |     | 2 Pass                          |      |      |      | 4 Pass |      |      |      |
|                 |                                      |  |                               |    |    |     | ØF                              | I    | L    | L1   | ØF     | I    | L    | L1   |
| MGF 131-310-..  | 50-150                               | 20-40  | 3.2                           | 16 | 88 | 148 | 1 1/2"                          | 310  | 462  | 314  | 1 1/2" | 310  | 462  | 314  |
| MGF 131-453-..  | 100-150                              | 40-75  | 4.3                           | 22 | 88 | 148 | 1 1/2"                          | 453  | 613  | 465  | 1 1/2" | 453  | 613  | 465  |
| MGF 131-623-..  | 150-300                              | 58-96  | 5.7                           | 28 | 95 | 160 | 2"                              | 623  | 795  | 635  | 2"     | 623  | 795  | 635  |
| MGF 131-805-..  | 150-350                              | 78-118   | 7.1                           | 32 | 95 | 160 | 2"                              | 805  | 977  | 817  | 2"     | 805  | 977  | 817  |
| MGF 131-1124-.. | 200-400                              | 105-150  | 9.6                           | 35 | 95 | 160 | 2"                              | 1124 | 1296 | 1136 | 2"     | 1124 | 1296 | 1136 |

### DIAGRAMMA RENDIMENTO

Alla portata massima e minima indicata in tabella

### PERFORMANCE DIAGRAM

At the maximum and minimum flow stated in schedule

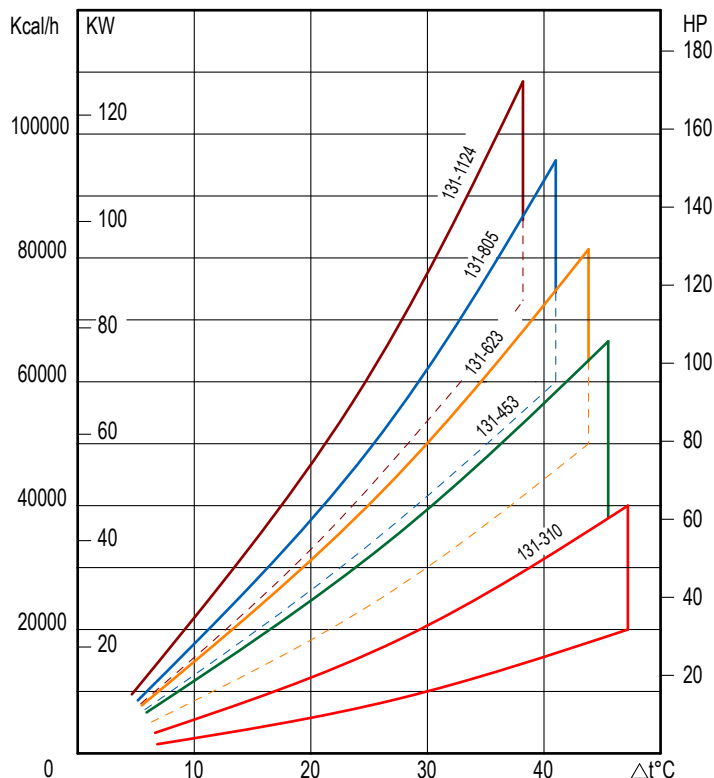
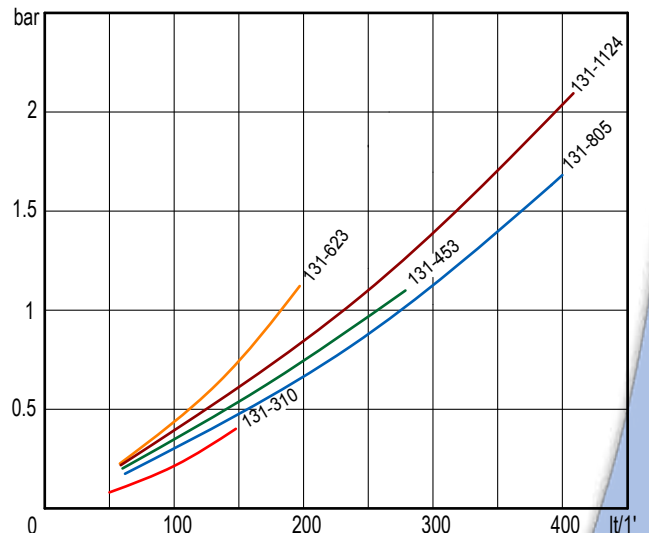


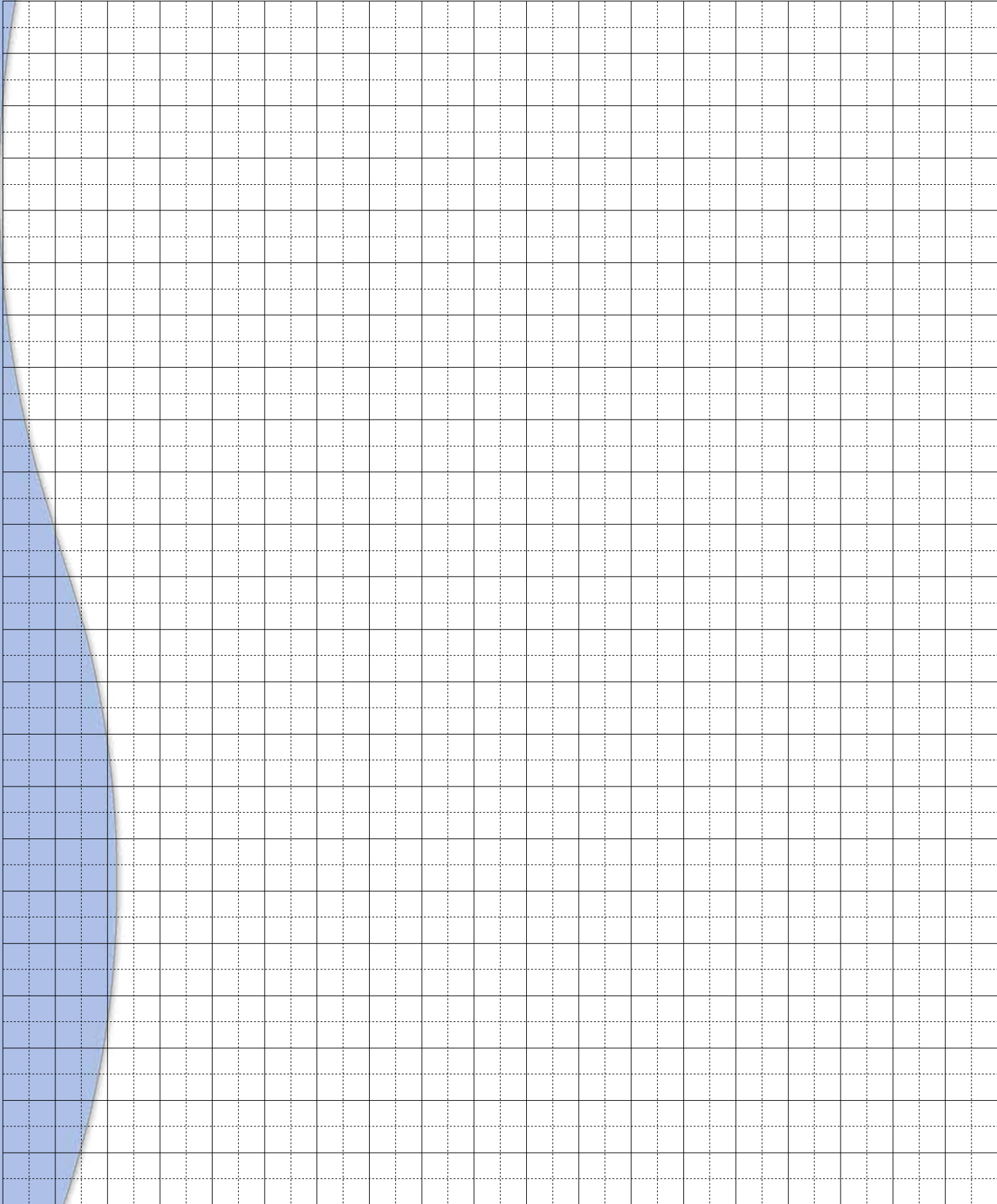
### FATTORE DI CORREZIONE (F)-PERDITE DI CARICO

### CORRECTION FACTOR (F)-PRESSURE DROP

| CST | 10  | 15   | 20   | 30 | 40  | 50  | 60  | 80  | 100 | 200 | 300 |
|-----|-----|------|------|----|-----|-----|-----|-----|-----|-----|-----|
| F   | 0.5 | 0.65 | 0.77 | 1  | 1.2 | 1.4 | 1.6 | 1.9 | 2.1 | 3.3 | 4.3 |

### PERDITE DI CARICO (32 cst) PRESSURE DROP (32 cst)









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