



**EBARA**

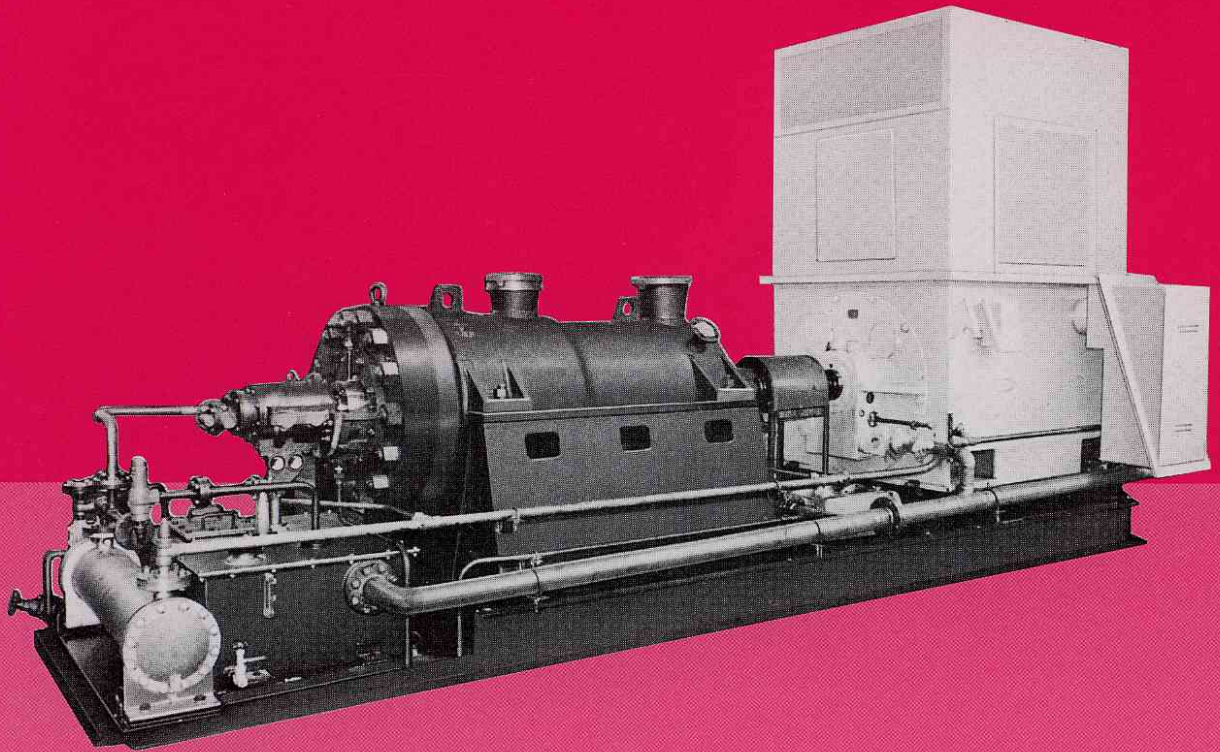
CS1842EE

# HORIZONTAL DOUBLE CASE PUMPS

Multi Stage, Ring Section Inner Casing, Diffuser Type For Refineries,  
Sea Water Injection, Boiler Feed and Other High Pressure Services

Models

**DCS/DCD** **API 610**



# HORIZONTAL DOUBLE CASE PUMPS

Multi Stage, Ring Section Inner Casing, Diffuser Type For Refinery,  
Sea Water Injection, Boiler Feed and Other High Pressure Services

Model

## DCS/DCD

API 610

EBARA MODEL DCS/DCD HORIZONTAL BARREL PUMPS of multistage, double case, ring section inner casing type have been widely used in refineries, for sea water injection, boiler feed and other high pressure services for many years.

Many improvements have been recently made on this pump to enhance its performance. Our modern tape controlled machines in conjunction with advanced quality control procedures insure that these pumps meet our high manufacturing

standards. Unique original design of this high performance pump provides for superior and extended low-cost operation. Model DCD denotes double suction impeller type.

### Applications

- Petroleum Refineries
- Petrochemical Industries
- Other Chemical Industries
- Boiler Feed
- Liquid Gas Transfer
- Mine Dewatering
- Sea Water Injection for Oil-wells

### Ratings

|                            |  |
|----------------------------|--|
| Capacities                 | As required  |
| Heads                      | As required  |
| Discharge pressures        | As required  |
| Hydrostatic test pressures | As required  |
| Speeds                     | Standard 50Hz 2950 min <sup>-1</sup><br>Standard 60Hz 3550 min <sup>-1</sup> |
| Max. allowable revolutions | 7000 min <sup>-1</sup>   |
| Rotation                   | Clockwise viewed from inboard side   |
| Temperatures               | ~450°C { ~850°F }*   |
| Impeller type              | Enclosed   |
| Nozzles                    | Top-Top  |
| Flanges                    | ~ANSI 2500 lb, other standards also available                                |
| Shaft sealing              | Mechanical seal, Conventional packing, floating seal & throttle bushing      |

\* This value in parenthesis { } are reference only.

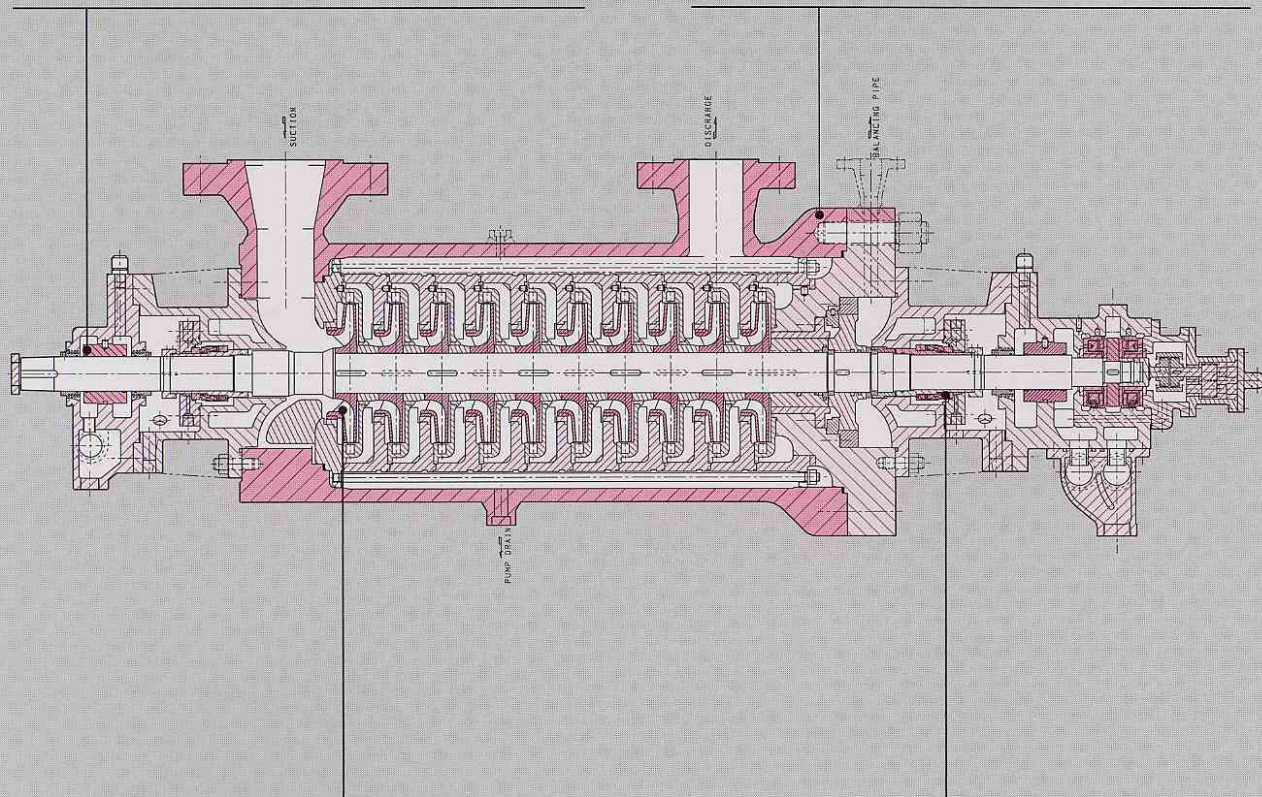
### Features

- Centerline support and heavy duty design.
- Double casing, permits removal of the inner casing.
- Full compliance with API 610 specifications.
- Flexibility of design handles wide range of liquids.
- All components have been designed for maximum parts interchangeability.
- Low NPSH performance.

## Construction

**Bearings:** Bearings are horizontally split for ease of removal and inspection. Journal bearings are sleeve type and babbit lined. The thrust bearing is pivot shoe type. Alternately, a ball bearing can be installed. Although the pump operates in complete radial and axial balance under normal conditions, the thrust bearing has ample capacity to withstand any emergency which might arise during operation.

**Casing:** Double casing construction, features a simple cylindrical outer casing and cover with only one circular joint, enclosing this inner casing. The space between the inner and outer casing is filled with the liquid being pumped at full discharge pressure. The outer casing alone withstands the bursting pressure and is subjected to tension stresses, while the inner casing is under compression stress only.



**Impellers:** The impellers are of the closed type accurately finished and carefully balanced both statically and dynamically. Axial thrust caused by impellers, is balanced by hydraulic balancing devices. Balance drum can be provided instead of balance disk on request. Double suction impeller for first stage is available to reduce NPSH requirements. This feature is available on pump model DCD.

**Shaft Sealing:** Both stuffing boxes are subject to suction pressure on standard designs. Pressure at the stuffing box opposite the suction end is reduced to suction pressure with a balancing device and balancing pipe. Various stuffing box arrangements are available to satisfy specific customer requirements. Various standard arrangements are conventional packing, mechanical seal, etc.

## Metallurgy

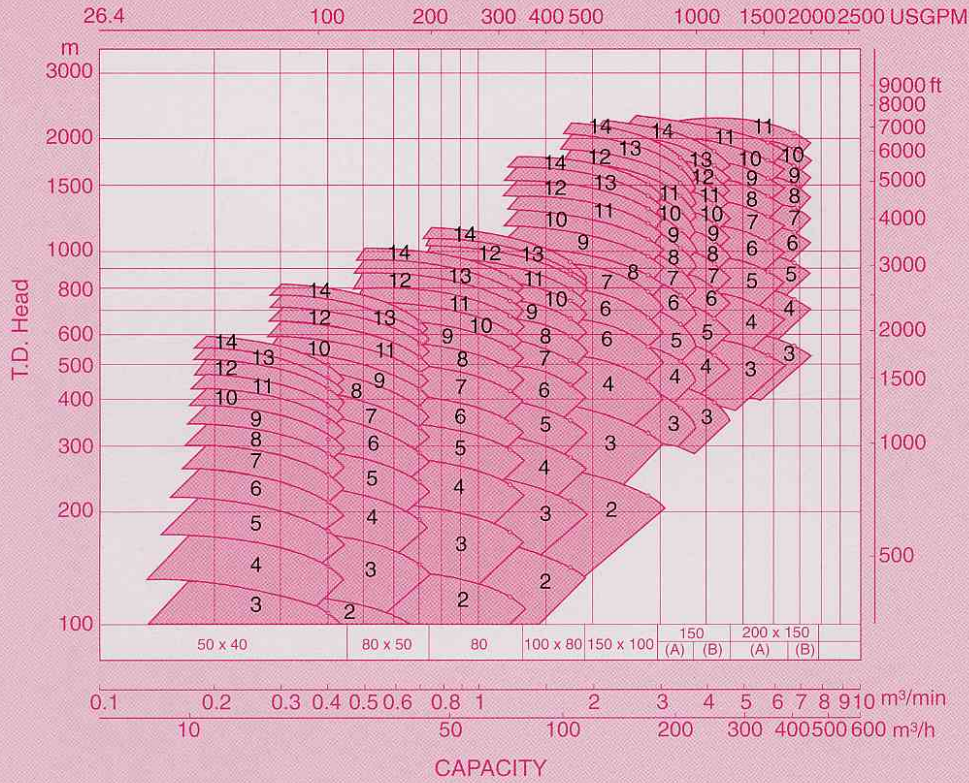
| Part Name          | Materials JIS/ASTM-AISI |                  |                 |
|--------------------|-------------------------|------------------|-----------------|
|                    | C. Steel                | 13% Cr. Steel    | 316 S. Steel    |
| Outer Casing       | SF440/A105              | SF440/A105       | SUS316/AISI316  |
| Inner Casing       | SF440/A105              | SUS420J1/AISI420 | SUS316/AISI316  |
| Casing Cover       | SF440/A105              | SF440/A105       | SUS316/AISI316  |
| Inner Casing Cover | S30C/AISI1030           | SUS420J1/AISI420 | SUS316/AISI316  |
| Impeller           | A487CA6NM               | A487CA6NM        | SCS14A/A743CF8M |
| Shaft              | SCM440/AISI4140         | SUS420J1/AISI420 | SUS316/AISI316  |
| Shaft Sleeve       | SUS420J1/AISI420        | SUS420J1/AISI420 | SUS316/AISI316  |
| Case Wear Ring     | A743CA40                | A743CA40         | SUS316/AISI316  |

Note: Other materials supplied on request.

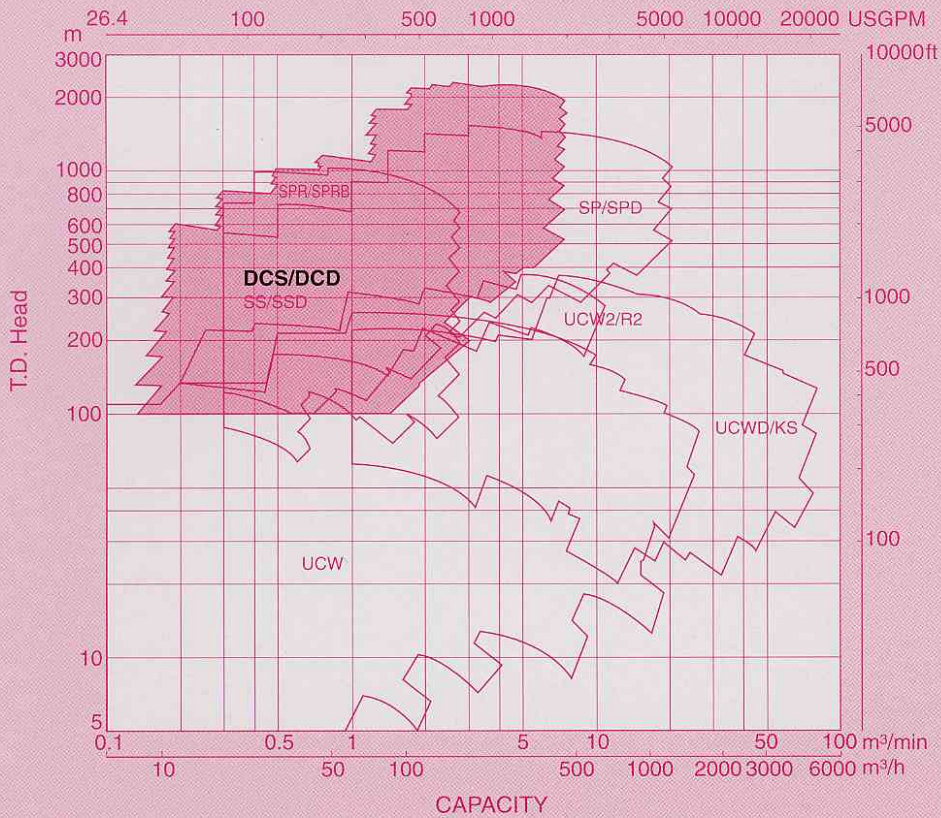
# Performance Ranges

Models DCS/DCD

**50<sub>Hz</sub>**



## General Process Pumps

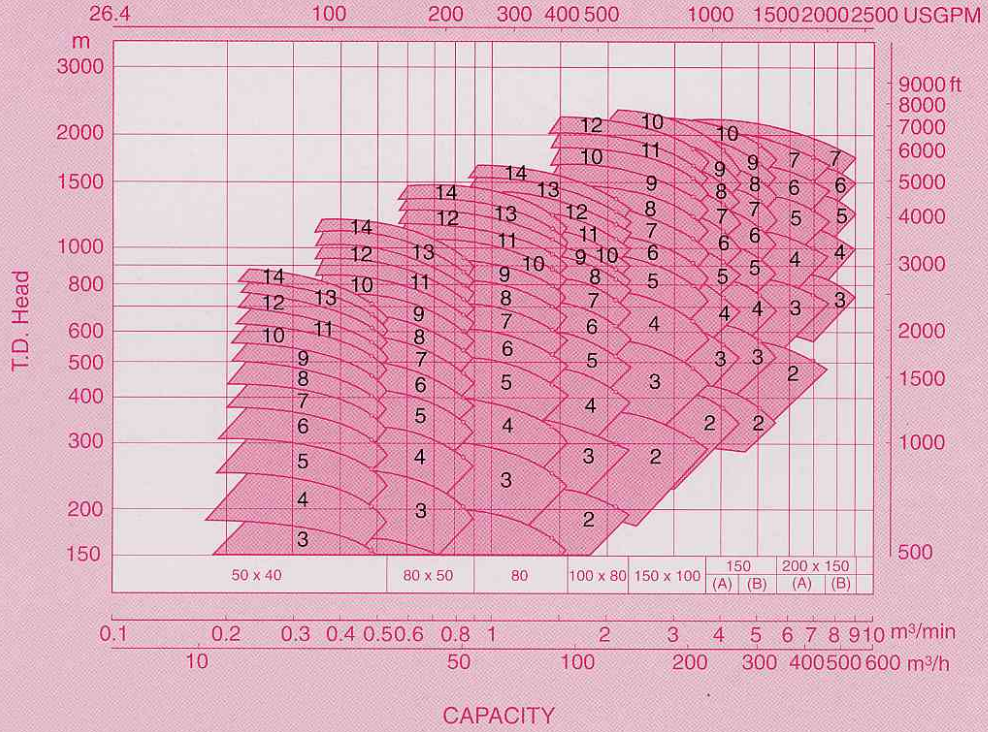


Performance ranges shown on these charts are for preliminary selection only. In case of over 2500m total head requirement, high speed application should be recommended. Please contact to Ebara Corporation International Division Office shown on back page of this catalog.

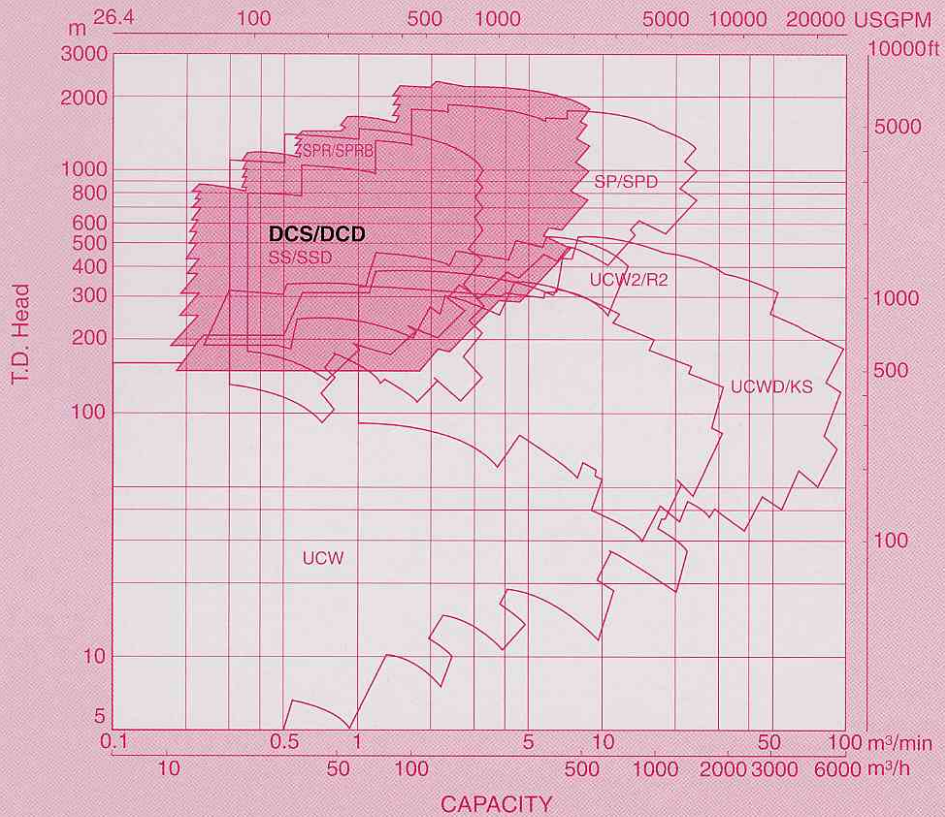
# Performance Ranges

Models DCS/DCD

60 Hz

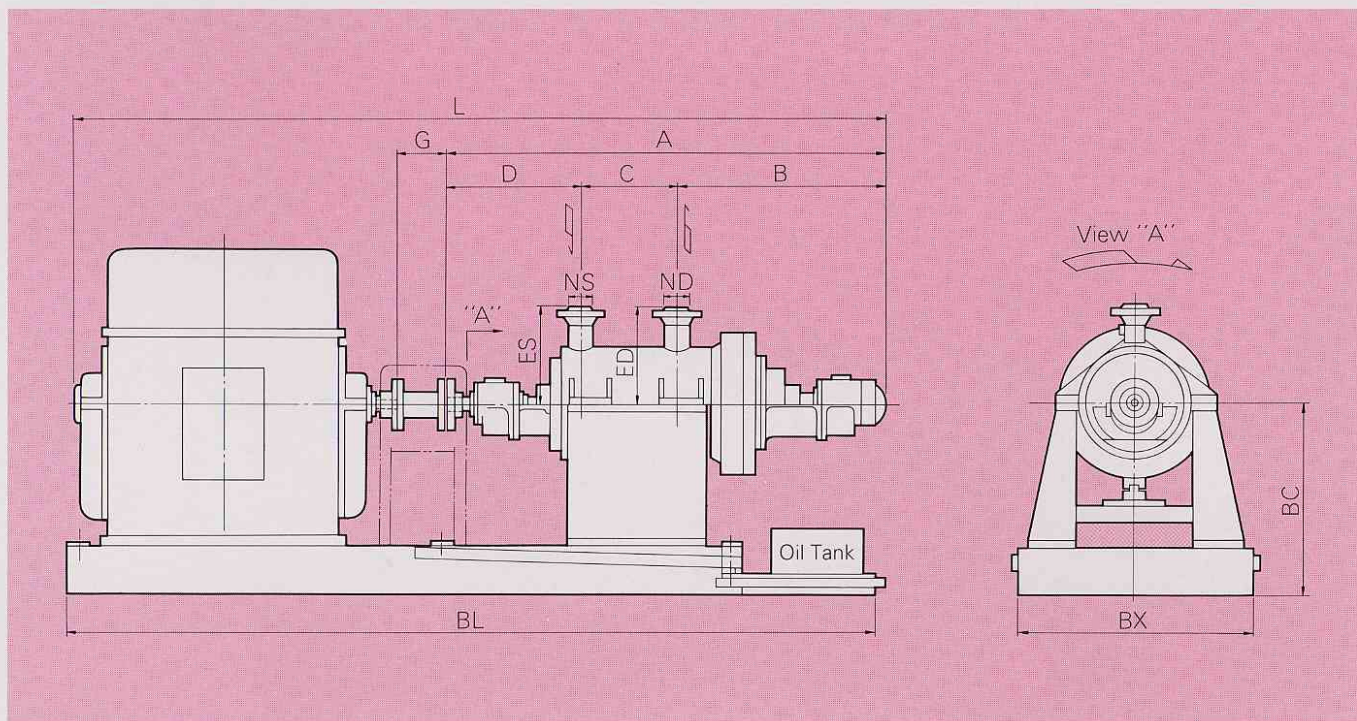


General Process Pumps



Performance ranges shown on these charts are for preliminary selection only. In case of over 2500m total head requirement, high speed application should be recommended. Please contact to Ebara Corporation International Division Office shown on back page of this catalog.

# Dimensions



Unit (mm)

| Size        | Number stages | NS | ND | A    | B    | C   | D   | (Suction) ES | (Discharge) ED | G   | BC  | L    | BX   | BL   |      |
|-------------|---------------|----|----|------|------|-----|-----|--------------|----------------|-----|-----|------|------|------|------|
| 50 x 40 DCS | 6             | 50 | 40 | 1169 | 451  | 248 | 470 | 200          | 240            | 160 | 450 | 2400 | 600  | 2200 |      |
|             | 7             | 50 | 40 | 1221 | 451  | 300 | 470 | 200          | 240            | 160 | 450 | 2400 | 600  | 2200 |      |
|             | 8             | 50 | 40 | 1273 | 451  | 352 | 470 | 200          | 240            | 160 | 450 | 2500 | 600  | 2300 |      |
|             | 9             | 50 | 40 | 1325 | 451  | 404 | 470 | 200          | 240            | 160 | 450 | 2500 | 600  | 2300 |      |
|             | 10            | 50 | 40 | 1377 | 451  | 456 | 470 | 200          | 240            | 160 | 450 | 2600 | 600  | 2400 |      |
|             | 11            | 50 | 40 | 1398 | 445  | 508 | 445 | 200          | 240            | 160 | 450 | 2600 | 600  | 2400 |      |
|             | 12            | 50 | 40 | 1450 | 445  | 560 | 445 | 200          | 240            | 160 | 450 | 2700 | 600  | 2500 |      |
|             | 13            | 50 | 40 | 1502 | 445  | 612 | 445 | 200          | 240            | 160 | 450 | 2800 | 600  | 2600 |      |
|             | 14            | 50 | 40 | 1554 | 445  | 664 | 445 | 200          | 240            | 160 | 450 | 2900 | 600  | 2700 |      |
|             | 80 x 50 DCS   | 5  | 80 | 50   | 1169 | 452 | 238 | 479          | 230            | 270 | 160 | 450  | 2400 | 700  | 2200 |
|             |               | 6  | 80 | 50   | 1225 | 452 | 294 | 479          | 230            | 270 | 160 | 450  | 2400 | 700  | 2200 |
|             |               | 7  | 80 | 50   | 1281 | 452 | 350 | 479          | 230            | 270 | 160 | 450  | 2600 | 700  | 2400 |
|             |               | 8  | 80 | 50   | 1337 | 452 | 406 | 479          | 230            | 270 | 160 | 450  | 2700 | 700  | 2500 |
|             |               | 9  | 80 | 50   | 1393 | 452 | 462 | 479          | 230            | 270 | 160 | 450  | 2800 | 700  | 2600 |
| 10          |               | 80 | 50 | 1449 | 452  | 518 | 479 | 230          | 270            | 160 | 500 | 3000 | 700  | 2800 |      |
| 11          |               | 80 | 50 | 1505 | 452  | 574 | 479 | 245          | 285            | 160 | 500 | 3100 | 700  | 2900 |      |
| 12          |               | 80 | 50 | 1561 | 452  | 630 | 479 | 245          | 285            | 160 | 500 | 3200 | 700  | 3000 |      |
| 13          |               | 80 | 50 | 1617 | 452  | 686 | 479 | 245          | 285            | 160 | 500 | 3200 | 700  | 3000 |      |
| 14          |               | 80 | 50 | 1673 | 452  | 742 | 479 | 245          | 285            | 160 | 500 | 3300 | 700  | 3100 |      |
| 80 DCS      |               | 4  | 80 | 80   | 1147 | 466 | 197 | 484          | 260            | 300 | 160 | 500  | 2500 | 700  | 2300 |
|             |               | 5  | 80 | 80   | 1211 | 466 | 261 | 484          | 260            | 300 | 160 | 500  | 2600 | 700  | 2400 |
|             |               | 6  | 80 | 80   | 1275 | 466 | 325 | 484          | 260            | 300 | 160 | 500  | 2900 | 700  | 2700 |
|             |               | 7  | 80 | 80   | 1339 | 466 | 389 | 484          | 260            | 300 | 160 | 500  | 2900 | 700  | 2700 |
|             | 8             | 80 | 80 | 1403 | 466  | 453 | 484 | 260          | 300            | 160 | 550 | 3100 | 800  | 2900 |      |
|             | 9             | 80 | 80 | 1552 | 514  | 517 | 521 | 280          | 320            | 160 | 550 | 3200 | 800  | 3000 |      |
|             | 10            | 80 | 80 | 1616 | 514  | 581 | 521 | 280          | 320            | 160 | 550 | 3300 | 800  | 3100 |      |
|             | 11            | 80 | 80 | 1680 | 514  | 645 | 521 | 280          | 320            | 160 | 550 | 3400 | 800  | 3200 |      |
|             | 12            | 80 | 80 | 1744 | 514  | 709 | 521 | 280          | 320            | 160 | 550 | 3400 | 800  | 3200 |      |
|             | 13            | 80 | 80 | 1808 | 514  | 773 | 521 | 280          | 320            | 160 | 550 | 3500 | 800  | 3300 |      |
|             | 14            | 80 | 80 | 1872 | 514  | 837 | 521 | 280          | 320            | 160 | 550 | 3600 | 800  | 3400 |      |

# Dimensions

Unit (mm)

| Size              | Number stages     | NS  | ND  | A    | B    | C    | D   | (Suction) ES | (Discharge) ED | G   | BC   | L    | BX   | BL   |      |
|-------------------|-------------------|-----|-----|------|------|------|-----|--------------|----------------|-----|------|------|------|------|------|
| 100 × 80 DCS      | 3                 | 100 | 80  | 1202 | 516  | 160  | 526 | 310          | 350            | 200 | 500  | 2800 | 800  | 2500 |      |
|                   | 4                 | 100 | 80  | 1272 | 516  | 230  | 526 | 310          | 350            | 200 | 500  | 2900 | 800  | 2600 |      |
|                   | 5                 | 100 | 80  | 1342 | 516  | 300  | 526 | 310          | 350            | 200 | 550  | 3100 | 800  | 2800 |      |
|                   | 6                 | 100 | 80  | 1412 | 516  | 370  | 526 | 310          | 350            | 200 | 550  | 3100 | 800  | 2800 |      |
|                   | 7                 | 100 | 80  | 1482 | 516  | 440  | 526 | 310          | 350            | 200 | 550  | 3200 | 800  | 2900 |      |
|                   | 8                 | 100 | 80  | 1552 | 516  | 510  | 526 | 310          | 350            | 200 | 550  | 3300 | 800  | 3000 |      |
|                   | 9                 | 100 | 80  | 1622 | 516  | 580  | 526 | 310          | 350            | 200 | 550  | 3400 | 800  | 3100 |      |
|                   | 10                | 100 | 80  | 1692 | 516  | 650  | 526 | 310          | 350            | 200 | 550  | 3400 | 900  | 3100 |      |
|                   | 11                | 100 | 80  | 1762 | 516  | 720  | 526 | 310          | 350            | 200 | 550  | 3500 | 900  | 3200 |      |
|                   | 12                | 100 | 80  | 1832 | 516  | 790  | 526 | 310          | 350            | 200 | 550  | 3600 | 900  | 3300 |      |
|                   | 13                | 100 | 80  | 2021 | 574  | 887  | 560 | 370          | 410            | 200 | 550  | 3800 | 900  | 3500 |      |
|                   | 14                | 100 | 80  | 2093 | 574  | 959  | 560 | 370          | 410            | 200 | 550  | 3800 | 900  | 3500 |      |
|                   | 150 × 100 DCS     | 6   | 150 | 100  | 1605 | 565  | 475 | 565          | 390            | 430 | 200  | 550  | 3300 | 900  | 3000 |
|                   |                   | 7   | 150 | 100  | 1690 | 565  | 560 | 565          | 390            | 430 | 200  | 550  | 3400 | 900  | 3100 |
| 8                 |                   | 150 | 100 | 2164 | 906  | 658  | 600 | 410          | 450            | 200 | 600  | 4100 | 900  | 4600 |      |
| 9                 |                   | 150 | 100 | 2249 | 906  | 743  | 600 | 410          | 450            | 200 | 600  | 4200 | 900  | 4700 |      |
| 10                |                   | 150 | 100 | 2394 | 915  | 828  | 651 | 410          | 450            | 200 | 600  | 4500 | 1000 | 5000 |      |
| 11                |                   | 150 | 100 | 2479 | 915  | 913  | 651 | 410          | 450            | 200 | 650  | 4700 | 1000 | 5200 |      |
| 12                |                   | 150 | 100 | 2564 | 915  | 998  | 651 | 410          | 450            | 200 | 650  | 4800 | 1000 | 5300 |      |
| 13                |                   | 150 | 100 | 2649 | 915  | 1083 | 651 | 410          | 450            | 200 | 650  | 4900 | 1100 | 5400 |      |
| 14                |                   | 150 | 100 | 2734 | 915  | 1168 | 651 | 410          | 450            | 200 | 650  | 5100 | 1100 | 5600 |      |
| 150 (A) DCS       |                   | 5   | 150 | 150  | 2212 | 1022 | 450 | 740          | 540            | 580 | 220  | 850  | 4000 | 1200 | 4500 |
|                   | 6                 | 150 | 150 | 2300 | 1022 | 538  | 740 | 540          | 580            | 220 | 850  | 4100 | 1200 | 4600 |      |
|                   | 7                 | 150 | 150 | 2388 | 1022 | 626  | 740 | 540          | 580            | 220 | 850  | 4100 | 1200 | 4600 |      |
|                   | 8                 | 150 | 150 | 2476 | 1022 | 714  | 740 | 540          | 580            | 220 | 850  | 4600 | 1200 | 5100 |      |
|                   | 9                 | 150 | 150 | 2564 | 1022 | 802  | 740 | 540          | 580            | 220 | 850  | 4800 | 1200 | 5300 |      |
|                   | 10                | 150 | 150 | 2652 | 1022 | 890  | 740 | 540          | 580            | 220 | 850  | 4900 | 1200 | 5400 |      |
|                   | 11                | 150 | 150 | 2710 | 1022 | 978  | 710 | 545          | 585            | 220 | 850  | 5100 | 1200 | 5600 |      |
|                   | 12                | 150 | 150 | 2798 | 1022 | 1066 | 710 | 545          | 585            | 220 | 850  | 5100 | 1200 | 5600 |      |
|                   | 13                | 150 | 150 | 2886 | 1022 | 1154 | 710 | 545          | 585            | 220 | 850  | 5300 | 1200 | 5800 |      |
|                   | 14                | 150 | 150 | 2974 | 1022 | 1242 | 710 | 545          | 585            | 220 | 850  | 5400 | 1200 | 5900 |      |
|                   | 150 (B) DCS       | 5   | 150 | 150  | 2194 | 1022 | 450 | 722          | 540            | 580 | 220  | 850  | 4200 | 1200 | 4700 |
|                   |                   | 6   | 150 | 150  | 2282 | 1022 | 538 | 722          | 540            | 580 | 220  | 850  | 4400 | 1200 | 4900 |
|                   |                   | 7   | 150 | 150  | 2370 | 1022 | 626 | 722          | 540            | 580 | 220  | 850  | 4600 | 1200 | 5100 |
|                   |                   | 8   | 150 | 150  | 2458 | 1022 | 714 | 722          | 540            | 580 | 220  | 850  | 4700 | 1200 | 5200 |
| 9                 |                   | 150 | 150 | 2546 | 1022 | 802  | 722 | 545          | 585            | 220 | 850  | 4800 | 1200 | 5300 |      |
| 10                |                   | 150 | 150 | 2634 | 1022 | 890  | 722 | 545          | 585            | 220 | 850  | 5100 | 1200 | 5600 |      |
| 11                |                   | 150 | 150 | 2722 | 1022 | 978  | 722 | 545          | 585            | 220 | 850  | 5200 | 1200 | 5700 |      |
| 12                |                   | 150 | 150 | 2810 | 1022 | 1066 | 722 | 545          | 585            | 220 | 850  | 5300 | 1200 | 5800 |      |
| 13                |                   | 150 | 150 | 2898 | 1022 | 1154 | 722 | 545          | 585            | 220 | 850  | 5400 | 1200 | 5900 |      |
| 14                |                   | 150 | 150 | 2986 | 1022 | 1242 | 722 | 545          | 585            | 220 | 850  | 5500 | 1200 | 6000 |      |
| 200 × 150 (A) DCS |                   | 4   | 200 | 150  | 2136 | 1006 | 395 | 735          | 670            | 710 | 220  | 900  | 4500 | 1300 | 5000 |
|                   |                   | 5   | 200 | 150  | 2231 | 1006 | 490 | 735          | 670            | 710 | 220  | 900  | 4600 | 1300 | 5100 |
|                   |                   | 6   | 200 | 150  | 2326 | 1006 | 585 | 735          | 670            | 710 | 220  | 950  | 4800 | 1300 | 5300 |
|                   |                   | 7   | 200 | 150  | 2421 | 1006 | 680 | 735          | 670            | 710 | 220  | 950  | 4900 | 1300 | 5400 |
|                   | 8                 | 200 | 150 | 2516 | 1006 | 775  | 735 | 670          | 710            | 220 | 950  | 5000 | 1300 | 5500 |      |
|                   | 9                 | 200 | 150 | 2611 | 1006 | 870  | 735 | 670          | 710            | 220 | 950  | 5100 | 1300 | 5600 |      |
|                   | 10                | 200 | 150 | 2706 | 1006 | 965  | 735 | 670          | 710            | 220 | 1000 | 5200 | 1300 | 5700 |      |
|                   | 11                | 200 | 150 | 2801 | 1006 | 1060 | 735 | 670          | 710            | 220 | 1000 | 5500 | 1300 | 6000 |      |
|                   | 200 × 150 (B) DCS | 5   | 200 | 150  | 2271 | 1006 | 530 | 735          | 670            | 710 | 220  | 950  | 4800 | 1300 | 5300 |
|                   |                   | 6   | 200 | 150  | 2376 | 1006 | 635 | 735          | 670            | 710 | 220  | 950  | 4900 | 1300 | 5400 |
|                   |                   | 7   | 200 | 150  | 2481 | 1006 | 740 | 735          | 670            | 710 | 220  | 950  | 5000 | 1300 | 5500 |
| 8                 |                   | 200 | 150 | 2586 | 1006 | 845  | 735 | 670          | 710            | 220 | 950  | 5100 | 1300 | 5600 |      |
| 9                 |                   | 200 | 150 | 2691 | 1006 | 950  | 735 | 670          | 710            | 220 | 950  | 5400 | 1300 | 5900 |      |
| 10                |                   | 200 | 150 | 2796 | 1006 | 1055 | 735 | 670          | 710            | 220 | 1000 | 5500 | 1300 | 6000 |      |
| 11                |                   | 200 | 150 | 2901 | 1006 | 1160 | 735 | 670          | 710            | 220 | 1000 | 5600 | 1300 | 6100 |      |

Notes: Dimensions are in mm and, for guidance only.

Certified drawings will be provided in all cases of actual construction. Motor dimensions are approximate for a given IEC.



# EBARA CORPORATION

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Please send your enquiries to the above International Division

○: Liaison Offices

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Ebara International Corporation (Sparks)  
Airvac Inc. (Rochester)  
Ebara Technologies Incorporated (Sacramento)  
Ebara Solar, Inc. (Large, PA)

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Ebara Indústrias Mecânicas e Comércio Ltda.  
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Ebara Pumps UK Limited (Hounslow)

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Ebara Qingdao Co., Ltd. (Qingdao)  
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(Yantai)  
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(Shanghai)  
Sinopec-Ebara Machinery Co., Ltd. (Beijing)

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