

6" STAINLESS STEEL SUBMERSIBLE BOREHOLE PUMPS SS SERIES

DEPEND ON
DAVEY

WATER PRODUCTS



6" BOREHOLE PUMPS

PRODUCT DESCRIPTION

6" stainless steel submersible borehole pump manufactured from corrosion and abrasion resistant stainless steel. Close coupled to Nema standard submersible electric motor. Designed for flow rates to 77m³/hr, 1,280lpm from standard 6" ID bore casing.

APPLICATIONS

- Water supply
- Turf watering
- Irrigation
- Mine dewatering
- Water treatment

FEATURES & BENEFITS

Advanced stainless steel manufacturing technology
State of the art stainless steel construction

Complete 316SS hydraulic design

- High efficiency pump design
- Flexible stage construction
- Unique sand handling capabilities

High efficiency impeller design
Radial flow impeller for 18 & 27m³/hr

Axial flow impeller for 45 & 60m³/hr

- Maximum efficiency
- Reduced power consumption
- Maximum performance from 6" ID bore

Silicon carbide sleeve running in a fluted nitrile bearing

- Wear resistant for longer pump life
- Unique sand handling design

Check valve assembly incorporated into discharge head

Stainless steel up thrust washer

- Pump & motor protection
- Horizontal or vertical operation

Hexagonal shaft design

Single outer casing

Flexible stage design

- Maximum pump strength
- Maximum operating pressure
- Matched pump performance
- Easy to install & service

OPERATING LIMITS

Capacity to 77m³/hr
1280lpm

Max. total head 500m

Max. allowable sand content 50g/m³

Water temperature 10 to 50°C

Motor 5.5kW to 37kW

Max. diameter 144m with standard motor
147 with Star Delta motor

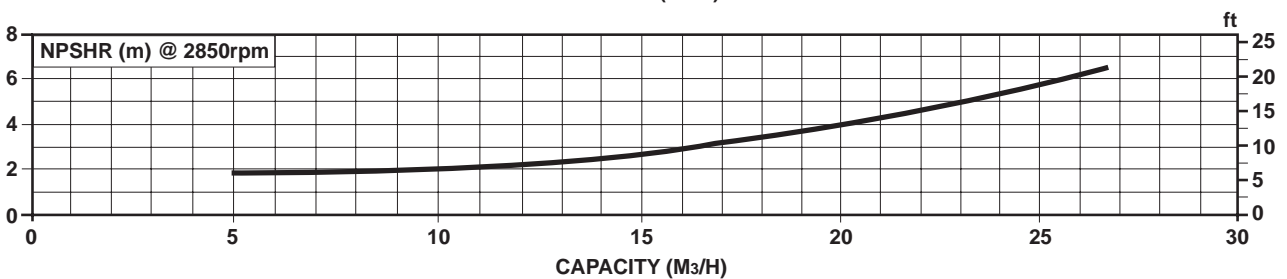
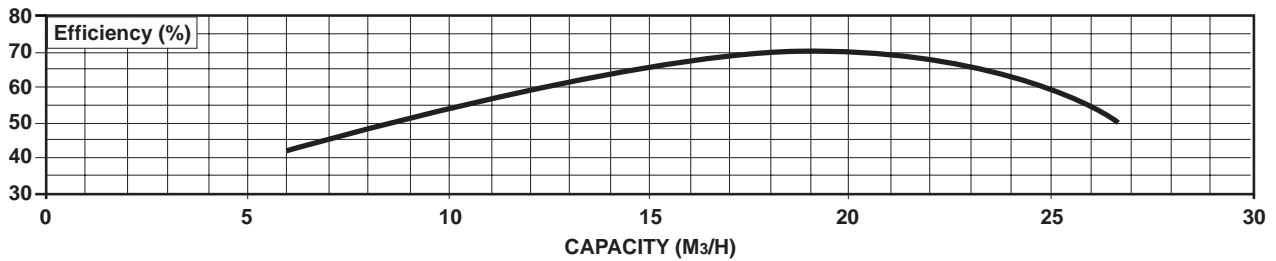
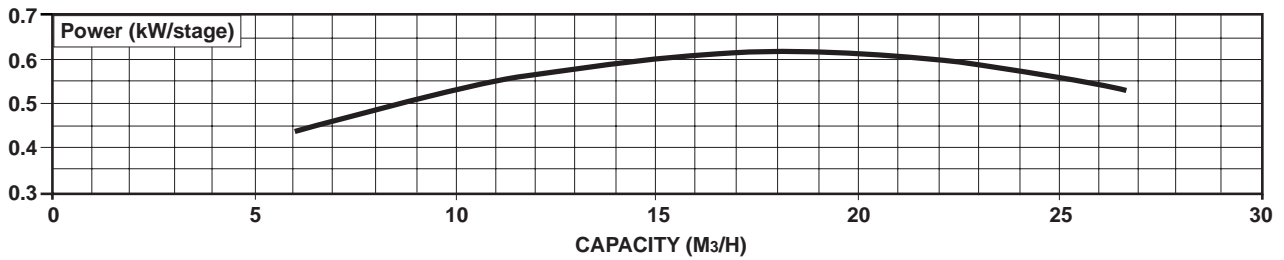
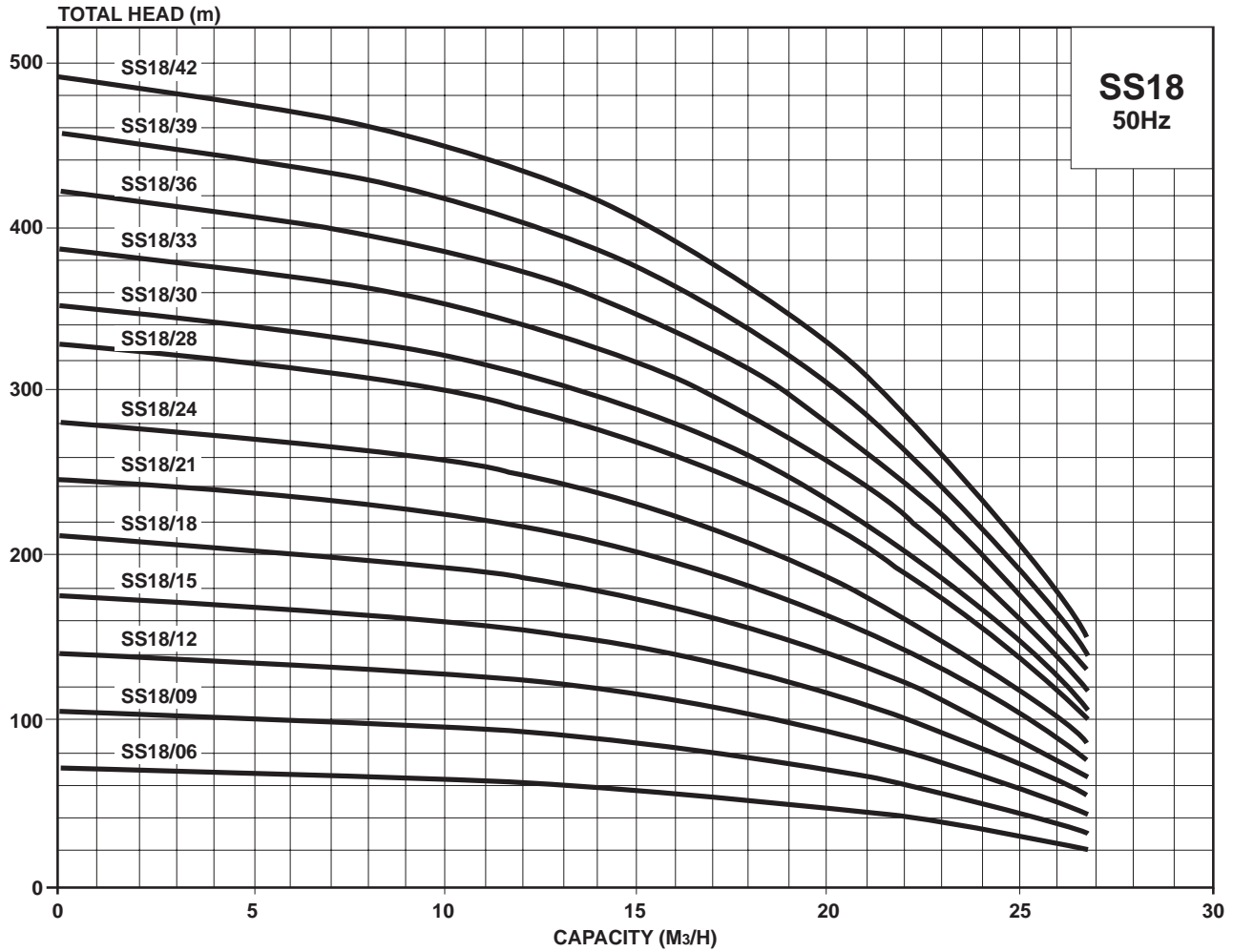
Rotation counter clockwise when looking into discharge

Vertical or horizontal mounting



TECHNICAL SPECIFICATIONS

HYDRAULIC PERFORMANCE - SS18 SERIES



Ql/s

2

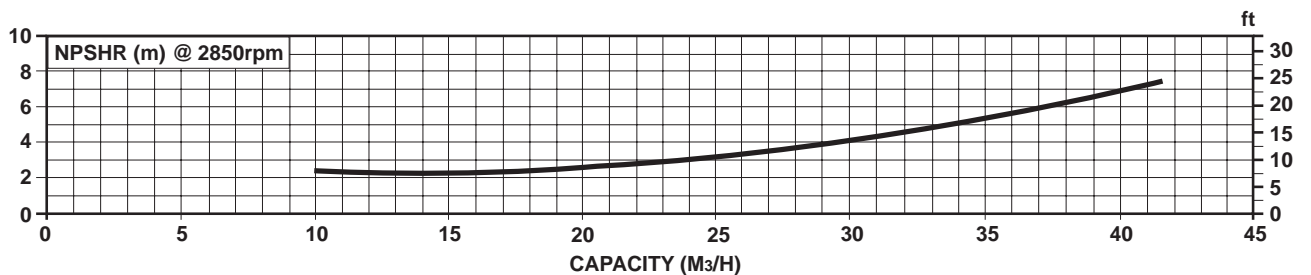
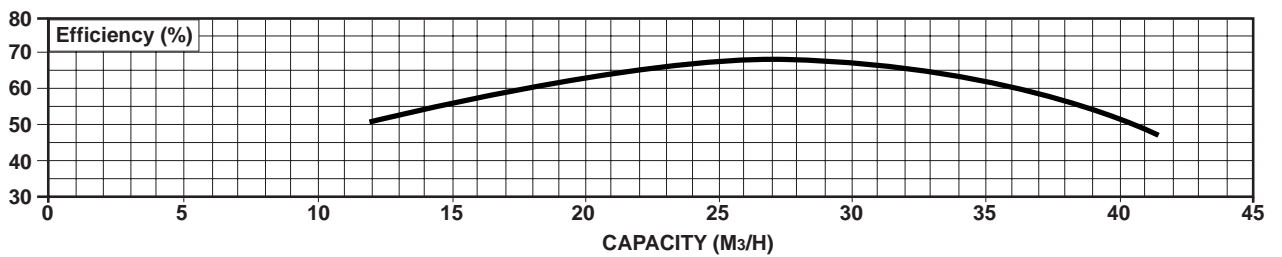
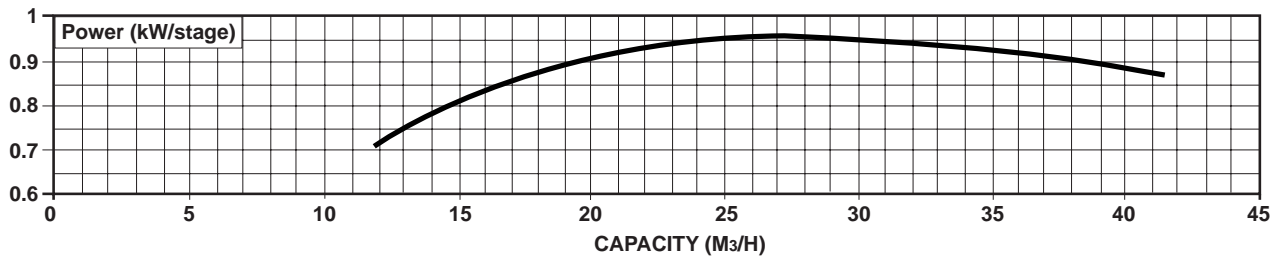
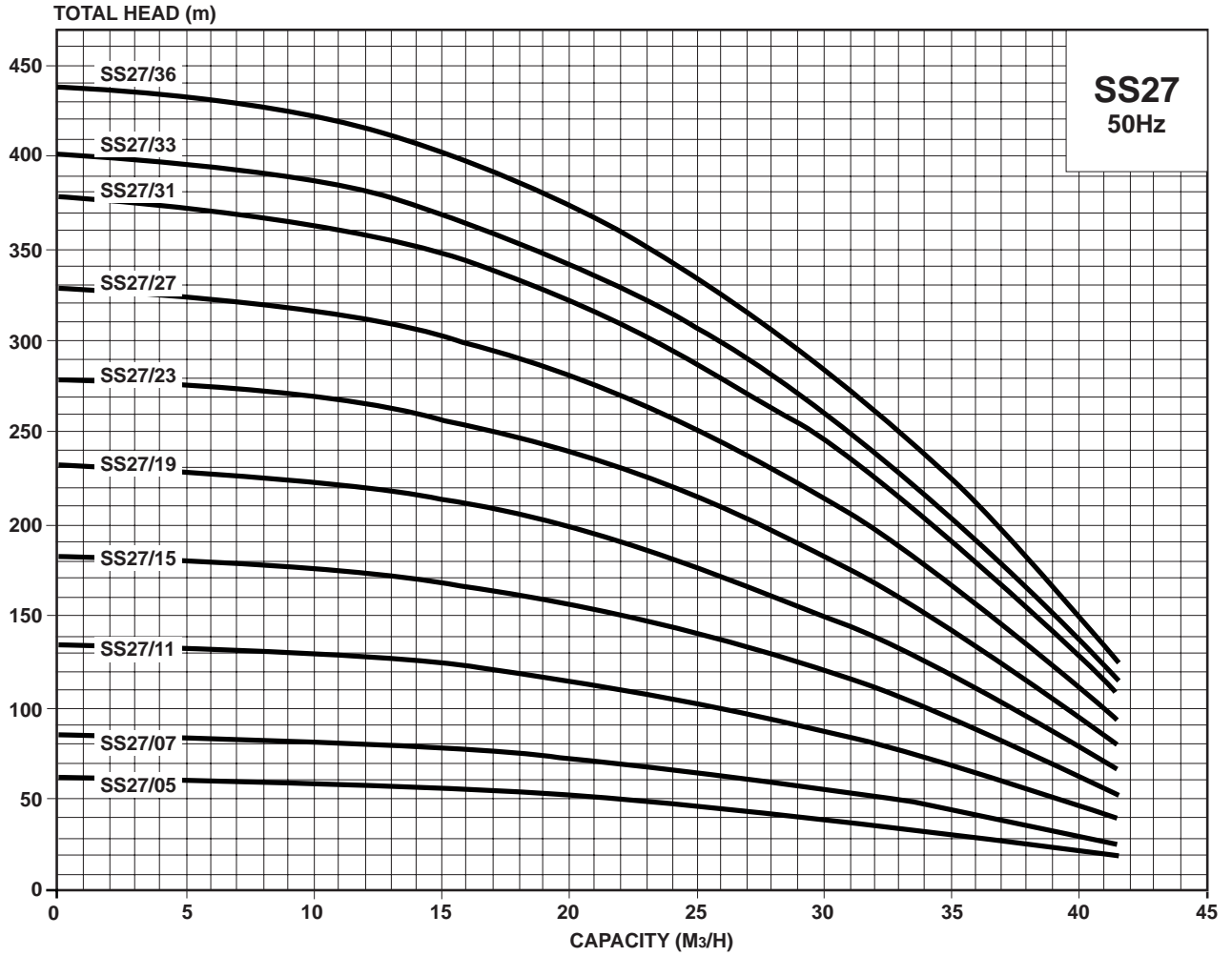
4

6

8

TECHNICAL SPECIFICATIONS

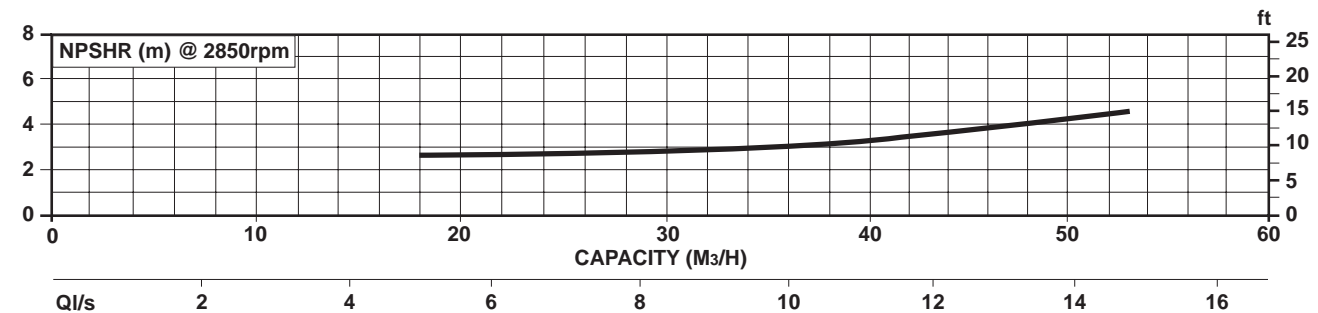
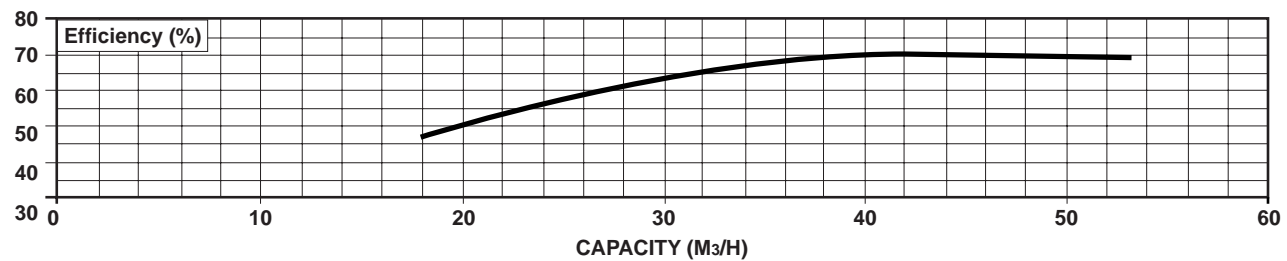
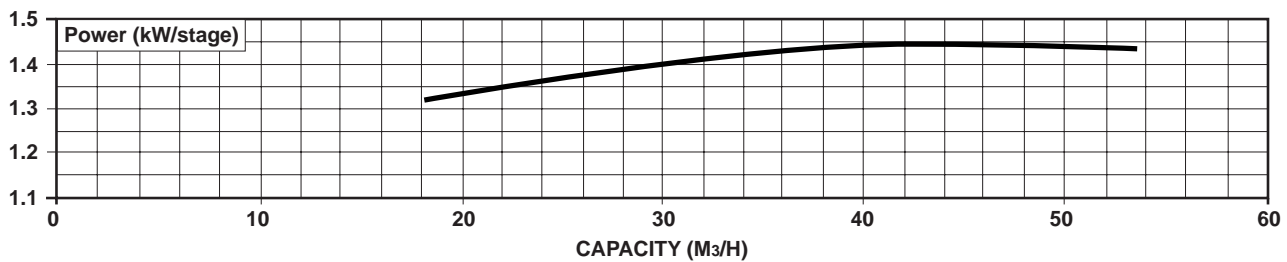
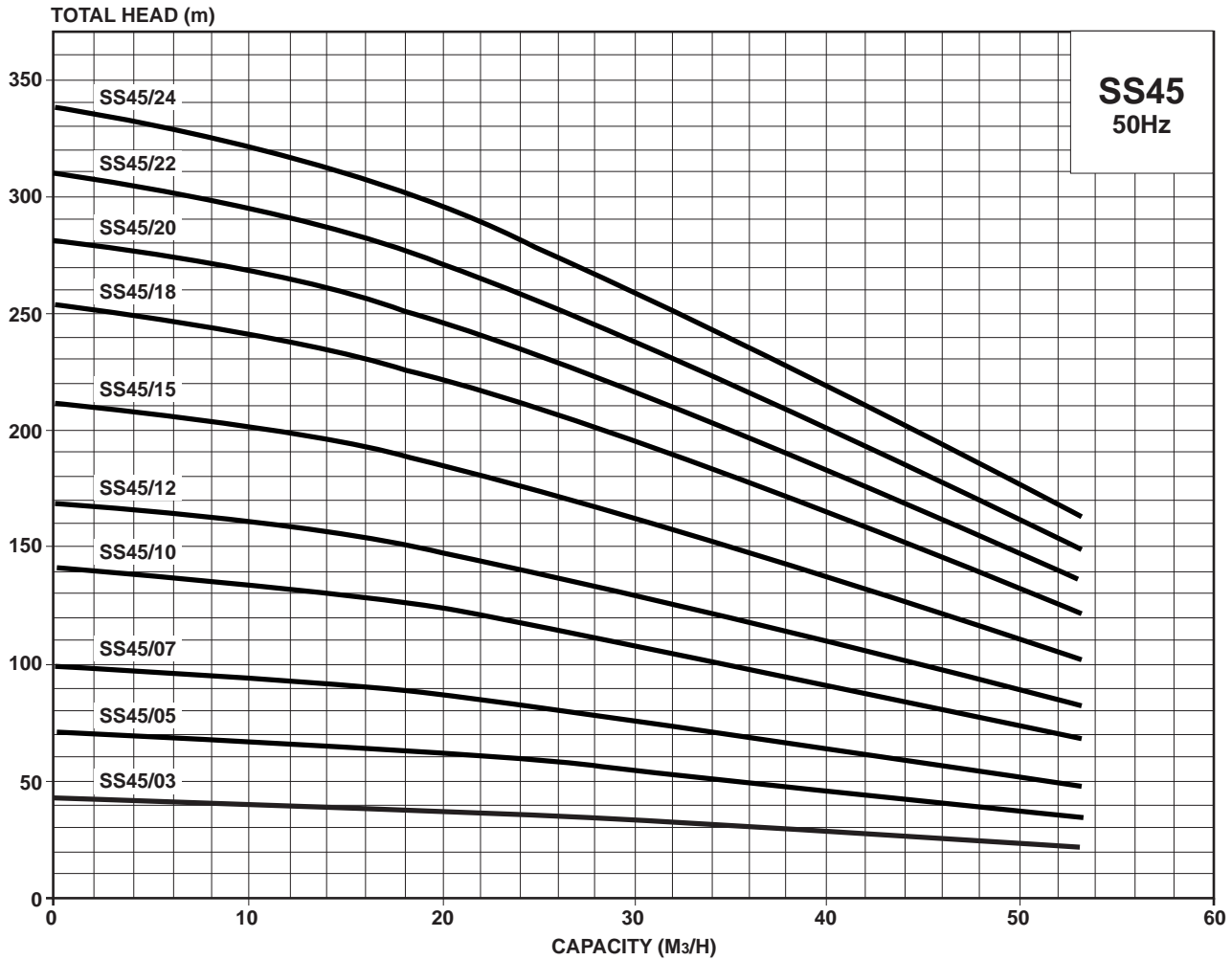
HYDRAULIC PERFORMANCE - SS27 SERIES



Ql/s 2 4 6 8 10 12

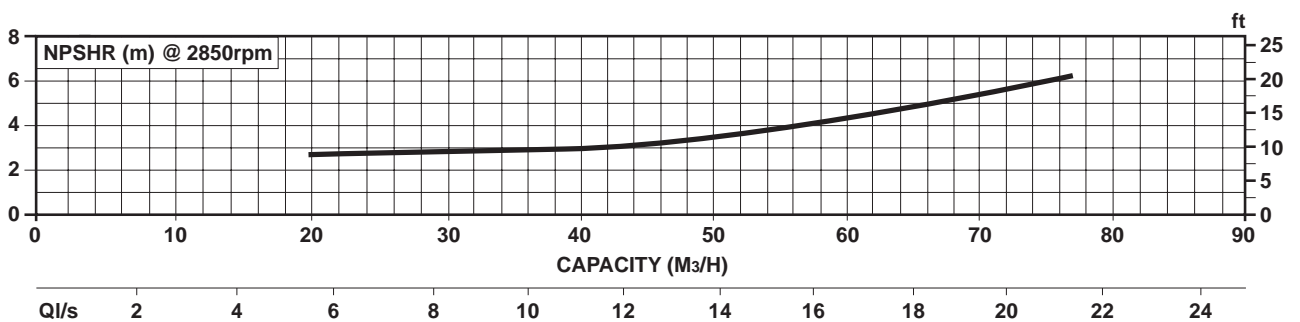
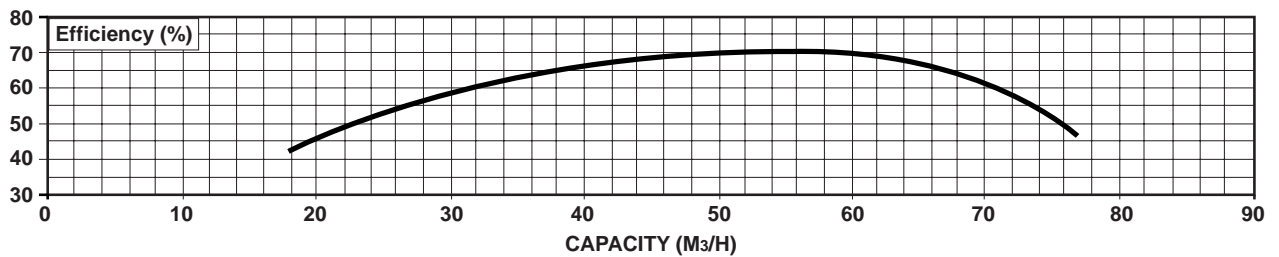
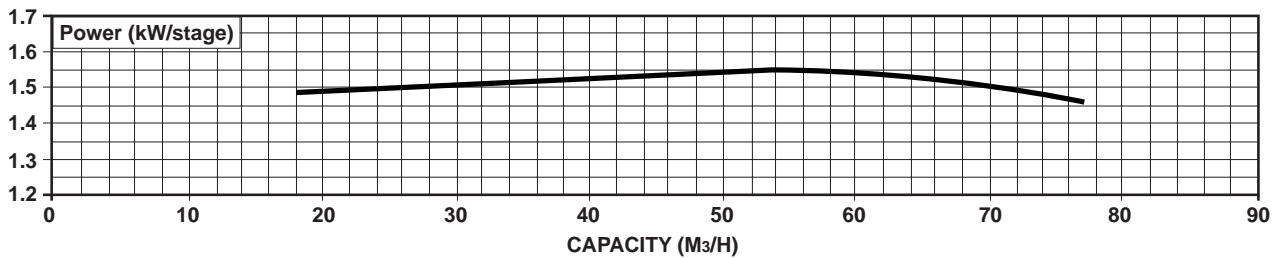
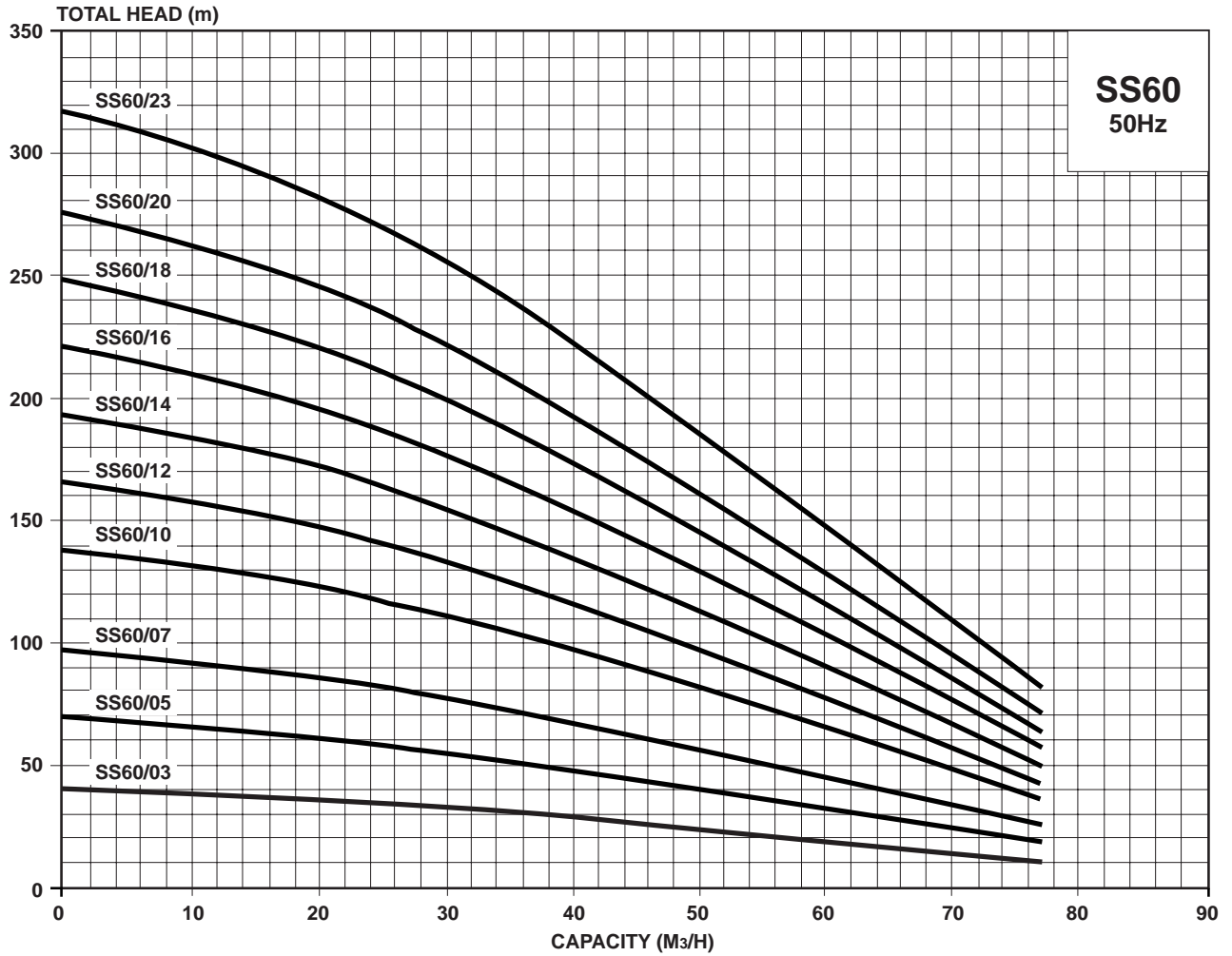
TECHNICAL SPECIFICATIONS

HYDRAULIC PERFORMANCE - SS45 SERIES



TECHNICAL SPECIFICATIONS

HYDRAULIC PERFORMANCE - SS60 SERIES



Ql/s 2 4 6 8 10 12 14 16 18 20 22 24

TECHNICAL SPECIFICATIONS

DIMENSIONS

| Pump Model | Motor Power kW | Pump Discharge BSP | Pump Dia. mm | Motor Dia. mm | Pump | | Motor | | Pump Unit | |
|------------|----------------|---------------------------------|--------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | | | Length mm | Weight kg | Length mm | Weight kg | Length mm | Weight kg |
| SS18/06 | 4 | 2 ¹ / ₂ " | 144 | 98 | 431 | 11.5 | 583 | 23.2 | 1014 | 34.7 |
| SS18/09 | 5.5 | 2 ¹ / ₂ " | 144 | 98 | 544 | 14.0 | 698 | 28.5 | 1242 | 42.5 |
| SS18/12 | 7.5 | 2 ¹ / ₂ " | 144 | 138 | 656 | 16.5 | 646 | 43.3 | 1302 | 59.8 |
| SS18/15 | 9.3 | 2 ¹ / ₂ " | 144 | 138 | 769 | 19.0 | 679 | 45.6 | 1448 | 64.6 |
| SS18/18 | 11 | 2 ¹ / ₂ " | 144 | 138 | 881 | 21.5 | 711 | 49.0 | 1592 | 70.5 |
| SS18/21 | 15 | 2 ¹ / ₂ " | 144 | 138 | 994 | 24.0 | 776 | 54.8 | 1770 | 78.8 |
| SS18/24 | 15 | 2 ¹ / ₂ " | 144 | 138 | 1106 | 26.5 | 776 | 54.8 | 1882 | 81.3 |
| SS18/28 | 18.5 | 2 ¹ / ₂ " | 144 | 138 | 1256 | 29.5 | 842 | 61.4 | 2098 | 90.9 |
| SS18/30 | 18.5 | 2 ¹ / ₂ " | 144 | 138 | 1331 | 31.5 | 842 | 61.4 | 2173 | 92.9 |
| SS18/33 | 22 | 2 ¹ / ₂ " | 144 | 138 | 1444 | 34.0 | 907 | 67.4 | 2351 | 101.4 |
| SS18/36 | 22 | 2 ¹ / ₂ " | 144 | 138 | 1556 | 36.0 | 907 | 67.4 | 2463 | 103.4 |
| SS18/39 | 30 | 2 ¹ / ₂ " | 144 | 138 | 1669 | 38.0 | 1037 | 81.7 | 2706 | 119.7 |
| SS18/42 | 30 | 2 ¹ / ₂ " | 144 | 138 | 1781 | 40.0 | 1037 | 81.7 | 2818 | 121.7 |
| SS27/05 | 5.5 | 3" | 144 | 98 | 459 | 12.5 | 698 | 28.5 | 1157 | 41.0 |
| SS27/07 | 7.5 | 3" | 144 | 138 | 552 | 14.5 | 646 | 43.3 | 1198 | 57.8 |
| SS27/11 | 11 | 3" | 144 | 138 | 738 | 18.5 | 711 | 49.0 | 1449 | 67.5 |
| SS27/15 | 15 | 3" | 144 | 138 | 924 | 22.5 | 776 | 54.8 | 1700 | 77.3 |
| SS27/19 | 18.5 | 3" | 144 | 138 | 1110 | 26.0 | 842 | 61.4 | 1952 | 87.4 |
| SS27/23 | 22 | 3" | 144 | 138 | 1296 | 30.0 | 907 | 67.4 | 2203 | 97.4 |
| SS27/27 | 30 | 3" | 144 | 138 | 1482 | 34.0 | 1037 | 81.7 | 2519 | 115.7 |
| SS27/31 | 30 | 3" | 144 | 138 | 1668 | 38.0 | 1037 | 81.7 | 2705 | 119.7 |
| SS27/33 | 37 | 3" | 144 | 138 | 1808 | 42.0 | 1405 | 115.0 | 3213 | 157.0 |
| SS27/36 | 37 | 3" | 144 | 138 | 1948 | 48.0 | 1405 | 115.0 | 3353 | 163.0 |
| SS45/03 | 5.5 | 3" | 144 | 98 | 459 | 13.5 | 698 | 28.5 | 1157 | 42.0 |
| SS45/05 | 7.5 | 3" | 144 | 138 | 645 | 18.0 | 646 | 43.3 | 1291 | 61.3 |
| SS45/07 | 11 | 3" | 144 | 138 | 831 | 22.5 | 711 | 49.0 | 1542 | 71.5 |
| SS45/10 | 15 | 3" | 144 | 138 | 1110 | 29.5 | 776 | 54.8 | 1886 | 84.3 |
| SS45/12 | 18.5 | 3" | 144 | 138 | 1296 | 34.0 | 842 | 61.4 | 2138 | 95.4 |
| SS45/15 | 22 | 3" | 144 | 138 | 1575 | 40.5 | 907 | 67.4 | 2482 | 107.9 |
| SS45/18 | 30 | 3" | 144 | 138 | 1854 | 47.5 | 1037 | 81.7 | 2891 | 129.2 |
| SS45/20 | 30 | 3" | 144 | 138 | 2040 | 52.0 | 1037 | 81.7 | 3077 | 133.7 |
| SS45/22 | 37 | 3" | 144 | 138 | 2226 | 56.5 | 1405 | 115.0 | 3631 | 171.5 |
| SS45/24 | 37 | 3" | 144 | 138 | 2412 | 61.0 | 1405 | 115.0 | 3817 | 176.0 |
| SS60/03 | 5.5 | 3" | 144 | 98 | 459 | 13.5 | 698 | 28.5 | 1157 | 42.0 |
| SS60/05 | 7.5 | 3" | 144 | 138 | 645 | 18.0 | 646 | 43.3 | 1291 | 61.3 |
| SS60/07 | 11 | 3" | 144 | 138 | 831 | 23.0 | 711 | 49.0 | 1542 | 72.0 |
| SS60/10 | 15 | 3" | 144 | 138 | 1110 | 30.0 | 776 | 54.8 | 1886 | 84.8 |
| SS60/12 | 18.5 | 3" | 144 | 138 | 1296 | 34.5 | 842 | 61.4 | 2138 | 95.9 |
| SS60/14 | 22 | 3" | 144 | 138 | 1482 | 39.0 | 907 | 67.4 | 2389 | 106.4 |
| SS60/16 | 30 | 3" | 144 | 138 | 1668 | 43.5 | 1037 | 81.7 | 2705 | 125.2 |
| SS60/18 | 30 | 3" | 144 | 138 | 1854 | 48.0 | 1037 | 81.7 | 2891 | 129.7 |
| SS60/20 | 37 | 3" | 144 | 138 | 2040 | 52.5 | 1405 | 115.0 | 3445 | 167.5 |
| SS60/23 | 37 | 3" | 144 | 138 | 2319 | 59.0 | 1405 | 115.0 | 3724 | 174.0 |

MATERIALS OF CONSTRUCTION

| PART | MATERIAL |
|--|---------------------------|
| Outer case with motor adapter | 316L stainless steel |
| Discharge head with built-in check valve | 316L stainless steel |
| Sealing oring | Nitrile rubber |
| Upper bowl | 316L stainless steel |
| Upper bowl with upper bearing bush | Nitrile |
| Upper bowl with upper journal sleeve | Silicon carbide (SiC) |
| Pump shaft | 316 stainless steel |
| Coupling to motor | 316 / 329 stainless steel |
| Diffuser | 316L stainless steel |
| Diffuser with floating neck ring | Teflon (PTFE) |
| Diffuser with secondary bearing bush | Nitrile |
| Diffuser with secondary journal sleeve | 316 stainless steel |
| Impeller | 316L stainless steel |
| Cable guard | 316 stainless steel |
| Suction strainer | 316 stainless steel |
| Insert locking outer case | 316 stainless steel |
| Up-thrust washer | 316 stainless steel |
| Screws and washers | 316 stainless steel |

TECHNICAL SPECIFICATIONS

FRANKLIN MOTOR SPECIFICATIONS - 4 "

| Motor Size kW | Power Supply | Full Load Current Amps @ Voltage | | | Locked Rotor Current Amps | Efficiency @ Full Load | Thrust N | Weight kg | Length mm |
|---------------|--------------|----------------------------------|------|------|---------------------------|------------------------|----------|-----------|-----------|
| | | 220V | 230V | 240V | | | | | |
| 4 | 3 Phase | 9.8 | 10.0 | 10.3 | 59 | 77.0% | 6500 | 23.2 | 583 |
| 5.5 | 3 Phase | 13.5 | 13.7 | 14.2 | 70 | 78.0% | 6500 | 28.5 | 698 |
| 7.5 | 3 Phase | 18.6 | 17.4 | 17.0 | 99 | 76.0% | 6500 | 32.1 | 774 |

FRANKLIN MOTOR SPECIFICATIONS - 6 "

| Motor Size kW | Power Supply | Full Load Current Amps @ Voltage | | | Locked Rotor Current Amps | Efficiency @ Full Load | Thrust N | Weight kg | Length mm |
|---------------|--------------|----------------------------------|------|------|---------------------------|------------------------|----------|-----------|-----------|
| | | 380V | 400V | 415V | | | | | |
| 7.5 | 3 Phase | 16.5 | 16.0 | 16.2 | 91.0 | 79.0% | 15500 | 43.3 | 646 |
| 9.3 | 3 Phase | 21.0 | 20.7 | 21.0 | 116.0 | 80.0% | 15500 | 45.6 | 679 |
| 11 | 3 Phase | 24.2 | 23.0 | 24.1 | 141.0 | 81.0% | 15500 | 49.0 | 711 |
| 15 | 3 Phase | 32.0 | 31.3 | 31.0 | 174.0 | 81.5% | 15500 | 54.8 | 776 |
| 18.5 | 3 Phase | 40.0 | 38.5 | 38.5 | 215.0 | 82.5% | 15500 | 61.4 | 842 |
| 22 | 3 Phase | 47.0 | 45.3 | 45.0 | 278.0 | 82.5% | 15500 | 67.4 | 907 |
| 30 | 3 Phase | 64.1 | 63.5 | 64.6 | 397.0 | 82.5% | 27500 | 81.7 | 1037 |
| 37 | 3 Phase | 80.1 | 77.9 | 77.9 | 434.0 | 84.7% | 27500 | 115.0 | 1405 |
| 45 | 3 Phase | 95.5 | 93.9 | 93.2 | 526.0 | 84.2% | 27500 | 130.0 | 1557 |

ELECTRICAL CABLE SELECTION

Cable for submersible motors must be suitable for submerged operation and adequate in size to operate within rated temperature and maintain adequate voltage at the motor.

Cable may be twisted conductors with or without jacket or flat molded type.

Cable selections from the following table maintain motor voltage to at least 95% of supply voltage with maximum rated running amps and maintain acceptable starting voltage and cable temperature.

ELECTRICAL CABLE SELECTION CHART* - 3x415V SUPPLY

| Motor Size kW | | Metric cable size (square mm) | | | | | | | | | |
|------------------|-----|-------------------------------|-----|-----|-----|-----|------|------|------|------|------|
| | | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 | 70 |
| 4.0 | 5.5 | 90 | 160 | 265 | 391 | 678 | 1058 | 1599 | 2196 | 3070 | 4140 |
| 5.5 | 7.5 | 69 | 126 | 200 | 300 | 510 | 790 | 1220 | 1670 | 2330 | 3160 |
| 7.5 | 10 | 57 | 92 | 150 | 230 | 390 | 610 | 930 | 1280 | 1790 | 2440 |
| 11 | 15 | - | 57 | 100 | 150 | 260 | 410 | 630 | 860 | 1220 | 1660 |
| 15 | 20 | - | - | 80 | 120 | 200 | 310 | 470 | 660 | 920 | 1240 |
| 18.5 | 25 | - | - | - | 90 | 160 | 240 | 380 | 520 | 720 | 990 |
| 22 | 30 | - | - | - | 80 | 140 | 210 | 320 | 440 | 620 | 850 |
| 30 | 40 | - | - | - | - | 100 | 150 | 240 | 320 | 460 | 620 |
| 37 | 50 | - | - | - | - | - | 130 | 200 | 260 | 370 | 510 |
| 45 | 60 | - | - | - | - | - | - | 160 | 210 | 310 | 410 |

*For other voltages and single phase, contact Davey.

TECHNICAL SPECIFICATIONS

WATER TEMPERATURE

Reduced motor loading in water over 30°C (86°F)

| Water Temperature | Approximate Allowable % of Maximum Nameplate Amps | | |
|-------------------|---|------------------------|-----------------------|
| | Through 3 hp (2.2 kW) | 5-15 hp (3.7-11 kW) | Over 15 hp (11 kW) |
| 35°C | 100% | 100% | 90% |
| 40°C | 100% | 90% | 80% |
| 45°C | 90% | 80% | 70% |
| 50°C | 80% | 70% | 60% |
| 55°C | 70% | 60% | 45% |

Do not use submersible motors in water over 55°C (130°F).

With proper water flow past the motor, Franklin submersible motors are designed to operate up to nameplate amperage rating in water as hot as 30°C. If the water temperature exceeds 30°C, reduce the load by changing pumps or throttling the pump discharge.

FREQUENCY OF STARTS

The average number of starts per day over a period of months or years influences the life of a submersible pumping system. Excessive cycling affects the life of control components such as pressure switches, starters, relays and capacitors, plus splines and bearings. Rapid cycling can also cause motor overheating and winding failures.

The pump size, tank size and other controls should be selected to keep the starts per day as low as practical for longest life. The maximum allowable number of starts per 24 hour day, are shown in the table below.

Motors should be allowed to run a minimum of one minute to dissipate heat build up from starting current.

| Motor Rating | | Average Number of Starts per 24 Hr. Day | |
|--------------|----------|---|-------------|
| kW | hp | Single Phase | Three Phase |
| .75 to 4.0 | 1 to 5½ | 100 | 300 |
| 5.5 to 22 | 7½ to 30 | | 100 |
| Over 22 | Over 30 | | 100 |

COOLING REQUIREMENTS @ 30°C

| 4" Franklin Motors | | | | |
|--------------------|-------|-------------------|------|-------|
| Bore size | | Minimum Flow Rate | | |
| Inch | mm | lpm | gpm | m³/hr |
| 4 | 101.6 | 4.5 | 1.0 | 0.27 |
| 5 | 127.0 | 26.5 | 5.8 | 1.59 |
| 6 | 152.4 | 49.2 | 10.8 | 2.95 |
| 8 | 203.2 | 113.5 | 25.0 | 6.81 |
| 10 | 254.0 | 189.2 | 41.7 | 11.35 |

| 6" Franklin Motors | | | | |
|--------------------|-------|-------------------|-------|-------|
| Bore size | | Minimum Flow Rate | | |
| Inch | mm | lpm | gpm | m³/hr |
| 6 | 152.4 | 34 | 7.5 | 2.1 |
| 7 | 177.8 | 95 | 20.9 | 5.7 |
| 8 | 203.2 | 170 | 37.4 | 10.2 |
| 10 | 254.0 | 340 | 74.9 | 20.4 |
| 12 | 304.8 | 530 | 116.7 | 31.8 |
| 14 | 355.6 | 760 | 167.4 | 45.6 |

If flow rate is less than above or water is coming from above the pump a shroud must be fitted. A shroud is always required in an open body of water eg. a dam or river, or a cascading bore.

PUMP MOUNTING POSITION

Motors are suitable for operation in mounting positions from vertical shaft to horizontal. If 4 inch motors are started more than 10 times per day, it is recommended the shaft be tilted up at least 15° from horizontal to minimise coast-down wear of the up thrust washer.

OVERLOAD PROTECTION, THREE PHASE

Characteristics of submersible motors differ from standard motors and special overload protection is required. In order to provide sufficient protection against overload and locked rotor, the overload relay has to be of the following characteristics :-

- Trip time of <10 sec. at 500% I_N (name plate current) based on cold bimetal
- Protection against single phasing
- Must trip at 120% I_N (name plate current)
- Temperature compensated to avoid nuisance tripping

This literature is not a complete guide to product usage. Further information is available from your Davey dealer, Davey Customer Service Centre and from the relevant product installation and Operating Instructions. This data sheet must be read in conjunction with the relevant product Installation and Operating Instructions and all applicable statutory requirements. Product specifications may change without notice.

© Davey is a registered trademark of Davey Products Pty Ltd. © Davey Products Pty Ltd 2007.



Visit Davey on-line for further information
davey.com.au

DEPEND ON
DAVEY

WATER PRODUCTS

Davey Products Pty Ltd

Member of the GUD Group
ABN 18 066 327 517
Head Office and Manufacturing
6 Lakeview Drive,
Scoresby, Australia 3179
Ph: +61 3 9730 9222
Fax: +61 3 9753 4100
Website: davey.com.au
Customer Service Centre
Ph: 1300 367 866
Fax: 1300 369 119
E-mail: sales@davey.com.au
Interstate Offices
Sydney • Brisbane • Adelaide
Perth • Townsville

International
6 Lakeview Drive,
Scoresby, Australia 3179
Ph: +61 3 9730 9121
Fax: +61 3 9753 4248
E-mail: export@davey.com.au

Germany
Kantstrasse 47,
04275 Leipzig
Ph: +49 341 301 0412
Fax: +49 341 301 0413
E-mail: akrenz@daveyeurope.com

New Zealand
2 Rothwell Avenue,
North Harbour, Auckland 1330
Ph: +64 9 914 3680
Fax: +64 9 914 3685
Website: daveynz.co.nz
E-mail: sales@daveynz.co.nz

USA - Davey Pumps Inc.
1005 N. Commons Drive
Aurora, Illinois 60504
Ph: +1 630 898 6976
Fax: +1 630 851 7744
Website: daveyusa.com
E-mail: sales@daveyusa.com