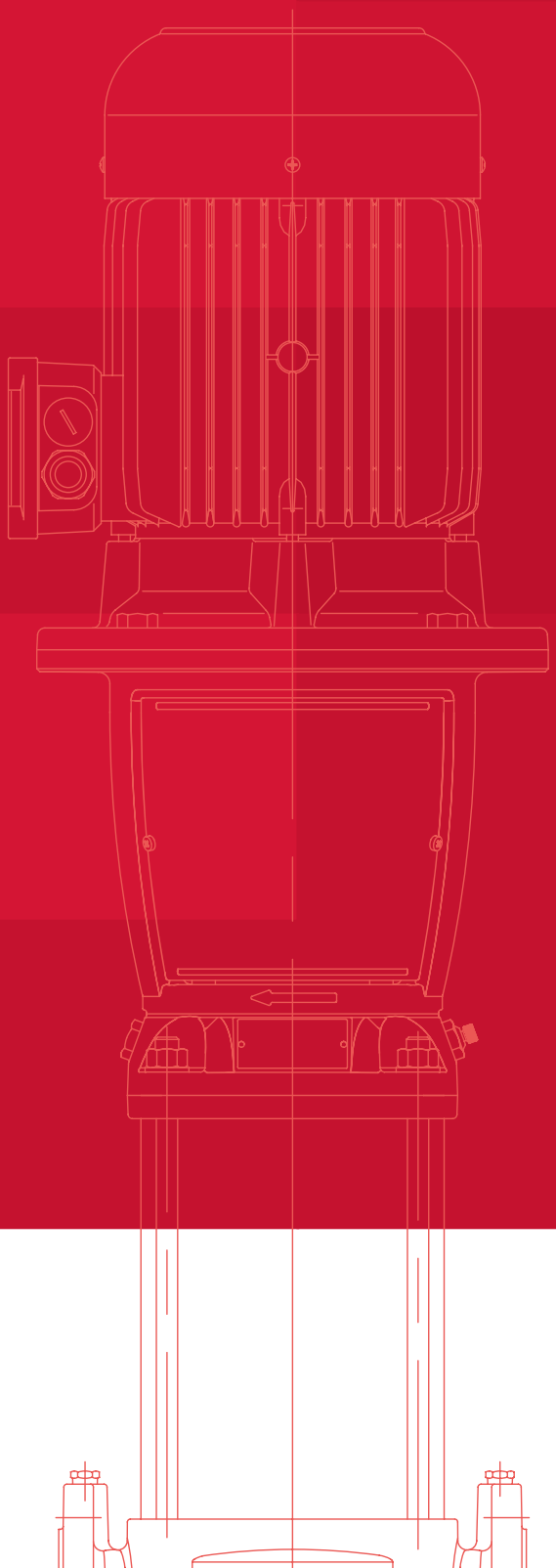
# XVM S Series

Technical Guide

## Vertical multistage electric pumps

50 Hz



ESPA
Innovative Solutions

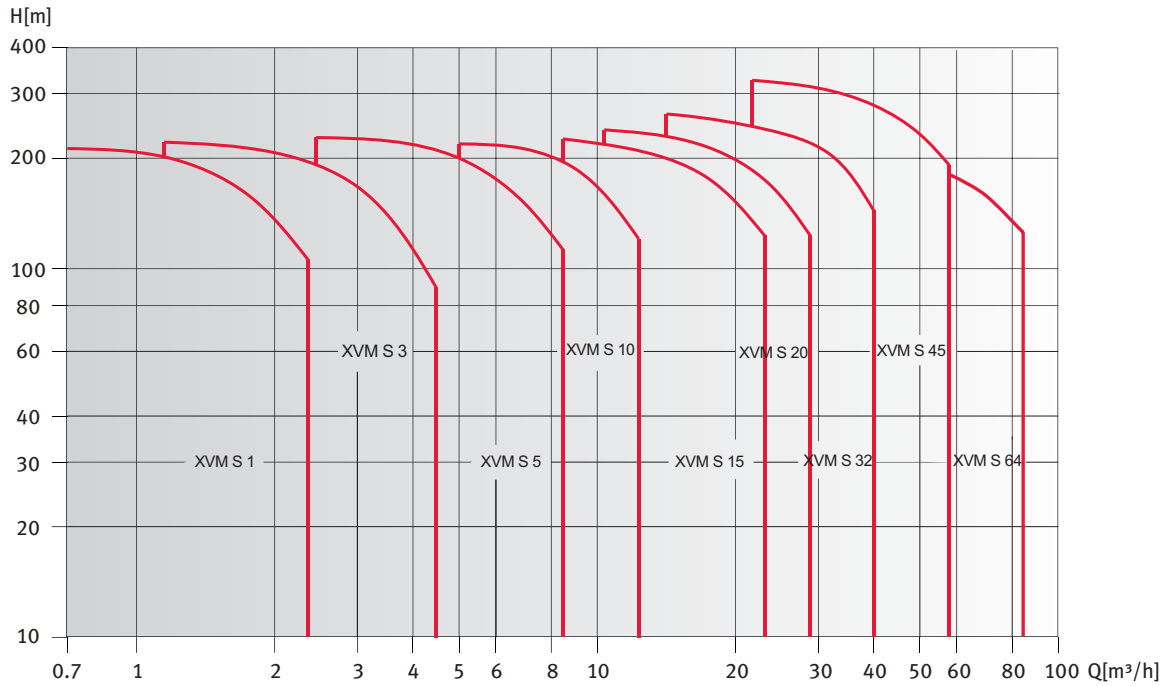
## Vertical multistage electric pumps XVM S series

# The XVM S pump is a vertical, multistage pump made of stainless steel.

**Market sectors:** Civil, agricultural, light industry, water treatment, heating and air conditioning.

- Handling of water, free of suspended solids, in the civil, industrial and agricultural sectors.
- Pressure boosting and water supply systems.
- Irrigation systems.
- Wash systems.
- Water treatment plants.
- Handling of moderately aggressive liquids, demineralized water, water and glycol, etc.
- Circulation of hot and cold water for heating, cooling and conditioning systems.
- Boiler feed.

**Field of application** ⇢ XVM S at 2900 rpm



## Specifications

- The **XVM S** is a non-self-priming vertical multistage pump
- The liquid end, located between the upper cover and the pump casing, is held in place by tie rods.
- The pump casing is available with different configurations and connection types.

## Technical data

- Delivery: up to 85 m³/h.
- Head: up to 330 m.
- Temperature of pumped liquid: -15°C to +120°C standard version.

## Hydraulic assembly specifications

- Liquid end made entirely of stainless steel in the 1-3-5-10-15-20-32-45-64 m³/h standard version.
- Materials are suitable for handling potable water

## Electrical and motor specifications

- Squirrel cage motor with short circuit rings, closed aluminium box and external ventilation.
- Serial motors with powers up to 45 kW (inclusive) in the 2-poles version.
- The surface motors have efficiency values that fall within the range normally referred to as efficiency class 2. In Eff1 option.
- IP 55 protection.
- Class F insulation.

## XVM S 1,3,5,10,15,20,32,45,64

- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- The following versions are available:
  - F: round flanges, in-line delivery and suction ports, AISI 304.
  - N: round flanges, in-line delivery and suction ports, AISI 316.
- Versions with round flanges that can be coupled to counter flanges, according to EN 1092.
- Round flanges made of zinc-plated steel are standard supply for the F versions.
- Round counter flanges made of stainless steel are standard supply for the N version.
- Easy maintenance. No special tools required for assembly or disassembly.

## XVM S

| | XVM S | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 3 | 5 | 10 | 15 | 20 | 32 | 45 | 64 |
| Max efficiency flow ($m^3/h$) | 1 | 3 | 5 | 10 | 15 | 20 | 32 | 45 | 64 |
| Flow range ($m^3/h$) | 0.7-2.4 | 1.2-4.5 | 2.5-8.5 | 5-13 | 8.5-23.5 | 10.5-29 | 15-40 | 22-58 | 30-85 |
| Maximum pressure (bar) | 21.5 | 23 | 24 | 21.5 | 23 | 24.3 | 27.5 | 33 | 21.8 |
| Motor Power (kW) | 0.37-2.2 | 0.37-3 | 0.37-5.5 | 0.37-7.5 | 1.1-15 | 1.1-18.5 | 1.5-30 | 3-45 | 4-45 |
| Standard temperature (ºC) | -15 to +120 | | | | | | | | |
| Flange | DN 25/ DN 32/ | DN 25/ DN 32/ | DN 25/ DN 32/ | DN 40 | DN 50 | DN 50 | DN 65 | DN 80 | DN 100 |
| Victaulic-connections | R1 1/4 DN 32 | R1 1/4 DN 32 | R1 1/4 DN 32 | R2 DN 50 | R2 DN 50 | R2 DN 50 | N/A | N/A | N/A |

## Maximum operating and inlet pressures

| Stages | Maximum Operating Pressure | Stages | Maximum Inlet Pressure |
|---|---|---|---|
| XVM S 1 | | | |
| 2-36 | 25bar | 2-36 | 10bar |
| XVM S 3 | | | |
| 2-36 | 25bar | 2-29<br>31-36 | 10bar<br>15bar |
| XVM S 5 | | | |
| 2-36 | 25bar | 2-16<br>18-36 | 10bar<br>15bar |
| XVM S 10 | | | |
| 1-16<br>17-22 | 16bar<br>25bar | 1-6<br>7-22 | 8bar<br>10bar |
| XVM S 15 | | | |
| 1-10<br>12-17 | 16bar<br>25bar | 1-3<br>4-17 | 8bar<br>10bar |
| XVM S 20 | | | |
| 1-10<br>12-17 | 16bar<br>25bar | 1-3<br>4-17 | 8bar<br>10bar |
| XVM S 32 | | | |
| (1-1)-7<br>(8-2)-14 | 16bar<br>30bar | (1-1)-4<br>(5-2)-10<br>(11-2)-14 | 4bar<br>10bar<br>15bar |
| XVM S 45 | | | |
| (1-1)-5<br>(6-2)-11<br>(12-2)-(13-2) | 16bar<br>30bar<br>33bar | (1-1)-2<br>(3-2)-5<br>(6-2)-(13-2) | 4bar<br>10bar<br>15bar |
| XVM S 64 | | | |
| (1-1)-5<br>(6-2)-(8-1) | 16bar<br>30bar | (1-1)-(2-2)<br>(2-1)-(4-2)<br>(4-1)-(8-1) | 4bar<br>10bar<br>15bar |

**Rule to follow:** The inlet pressure + the pressure against a closed valve < Max. Operating pressue.

ESPA

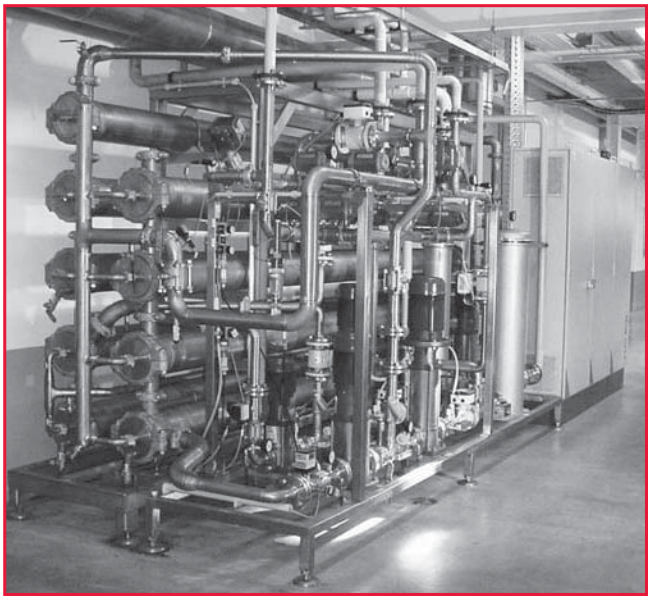
## Water supply and pressure boosting
- Pressure boosting in buildings, hotels, residential complexes.
- Pressure booster stations, supply of water networks.
- Booster packages.

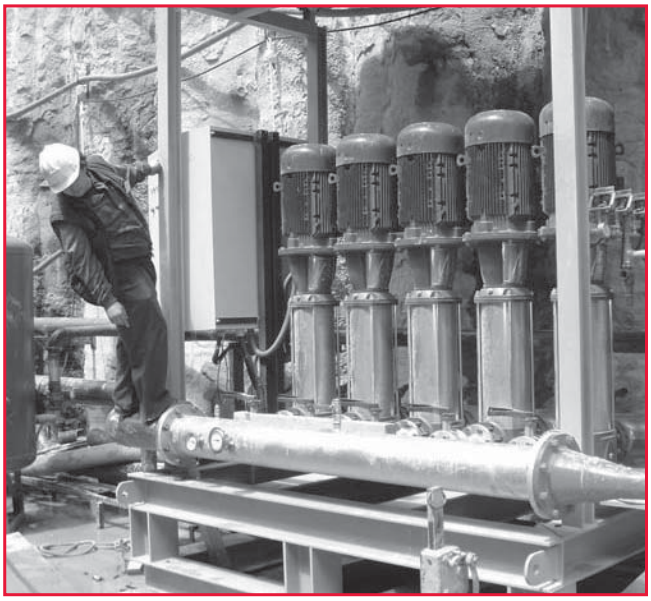
## Water treatment
- Ultrafiltration systems.
- Reverse osmosis systems.
- Water softeners and de-mineralization.
- Distillation systems.
- Filtration.

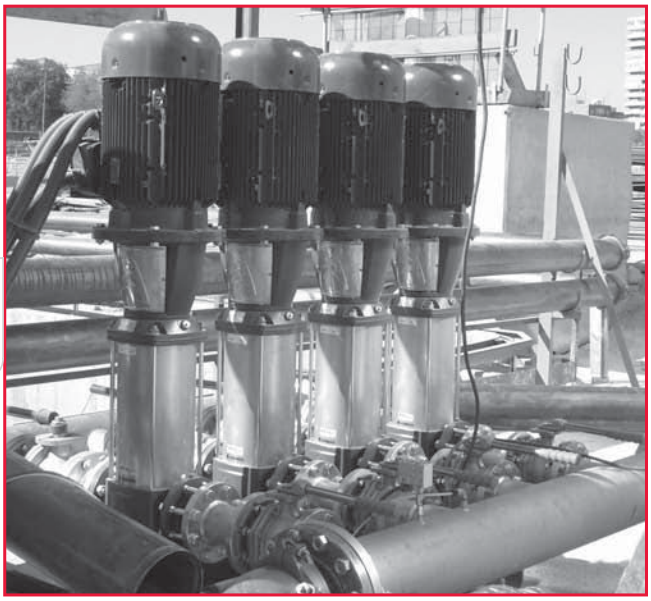
## Light industry
- Washing and cleaning plants.
- Firefighting system pumps.

## Irrigation and agriculture
- Greenhouses.
- Humidifiers.
- Sprinkler irrigation.

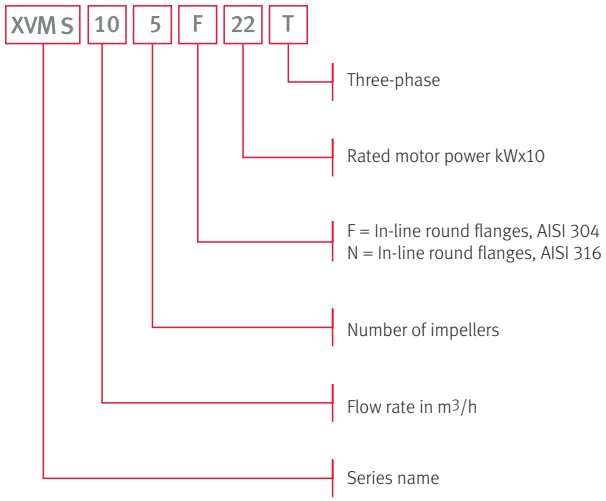
## Heating, ventilation and air conditioning
- Cooling towers and facilities.
- Refrigerators.
- Induction heating.
- Heat exchangers.
- Boilers.



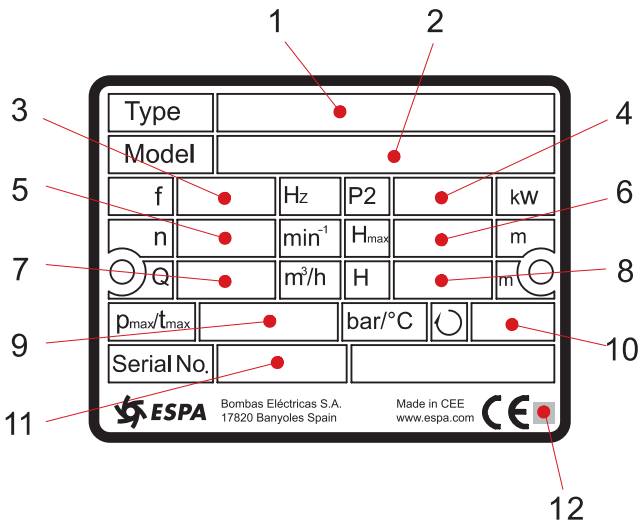




## Identification data

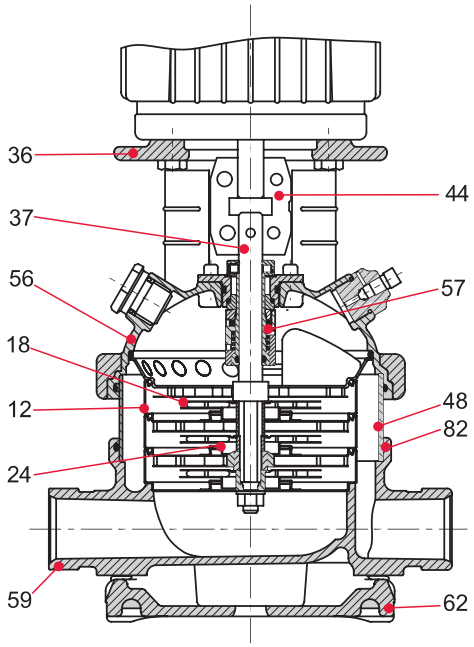



## Nominal data




- 1. Pump Type — Seal Type
- 2. Pump Model
- 3. Frequency
- 4. Rated Power
- 5. Speed
- 6. Maximum Head
- 7. Capacity
- 8. Head Range
- 9. Maximum Operating Pressure
- 10. Rotating Direction
- 11. Serial number
- 12. Year of manufacture

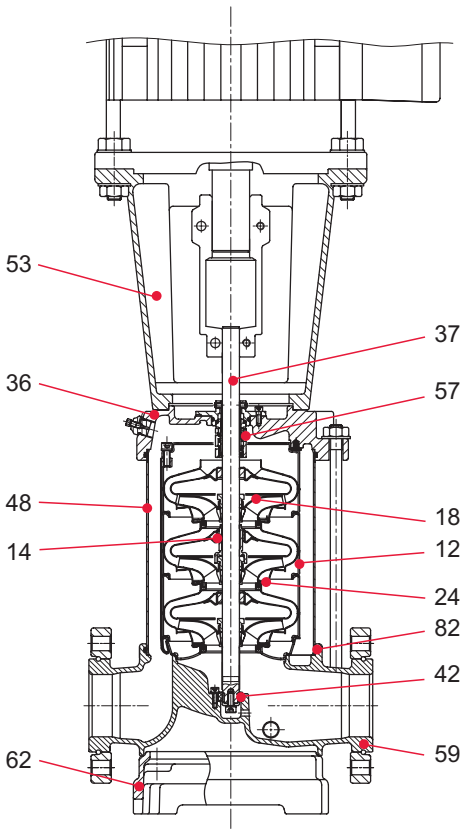
## XVM S 1, 3, 5, 10, 15, 20




## Construction and Material

| Pos. | Name | Material | XVM S 1,3,5,10,15,20 "F" Standard | | XVM S 1,3,5,10,15,20 "N" Standard | |
|---|---|---|---|---|---|---|
| | | | Europe | USA | Europe | USA |
| 36 | Pump head | Cast Iron | EN-GJS-450-10 | ASTM 65-45-12 | EN-GJS-450-10 | ASTM 65-45-12 |
| 56 | Pump head cover | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 18 | Impeller | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 37 | Shaft | Stainless steel | 1.4057 | AISI 431 | 1.4401 | AISI 316 |
| 48 | Outer Sleeve | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 82 | O-ring for outer sleeve | EPDM | | | | |
| 12 | Chamber | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 24 | Neck ring | PTEE | | | | |
| 59 | Base<br>Base | Cast Iron<br>Stainless steel | 1.4301 | AISI 304 | N/A<br>1.4401 | AISI 316 |
| 62 | Base plate | Cast Iron | EN-GJL-200 | ASTM 25B | EN-GJL-200 | ASTM 25B |
| 44 | Coupling | Fe-Cu-C | SINT C11 | MPIF FC0525 | SINT C11 | MPIF FC0525 |
| 57 | Mechanical seal | Cartridge type | | | | |

## XVM S 32, 45, 64




## Construction and Material

| Pos. | Name | Material | XVM S 32,45,64 "F" Standard | | XVM S 32,45,64 "N" Standard | |
|---|---|---|---|---|---|---|
| | | | Europe | USA | Europe | USA |
| 36 | Pump head | Cast Iron<br>Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 53 | Motor Bracket | Cast Iron | EN-GJL-250 | ASTM 35B | EN-GJL-250 | ASTM 35B |
| 18 | Impeller | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 37 | Shaft | Stainless steel | 1.4057 | AISI 431 | 1.4401 | AISI 316 |
| 48 | Outer Sleeve | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 82 | O-ring for outer sleeve | EPDM | | | | |
| 12 | Chamber | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 24 | Neck ring | Carbon Fiber + POB + PTFE | | | | |
| 59 | Base | Cast Iron | N/A | | | |
| | Base | Stainless steel | 1.4301 | AISI 304 | 1.4401 | AISI 316 |
| 62 | Base plate | Cast Iron | EN-GJL-250 | ASTM 35B | EN-GJL-250 | ASTM 35B |
| 57 | Mechanical seal | Cartridge type | | | | |
| 14 | Bearing ring | | Bronze | | POB + Graphite + PTFE | |
| 42 | Bottom bearing ring | Tungsten carbide/<br>Tungsten carbide | | | | |

## Motor Data

| Motor Type | | | | Nominal current in [A] | | | | |
|---|---|---|---|---|---|---|---|---|
| HP | KW | Pole | Flange | Frame | 3~220 V | 3~240 V | 3~380 V | 3~415 V |
| 0.5 | 0.37 | 2 | B14 | 71 | 1.7 | 2 | 1.1 | 1.3 |
| 0.75 | 0.55 | | | 71 | 2.5 | 2.8 | 1.5 | 1.7 |
| 1.0 | 0.75 | | | 80 | 3.5 | 3.9 | 2.1 | 2.3 |
| 1.5 | 1.1 | | | 90S | 4.4 | 4.7 | 2.7 | 2.9 |
| 2.0 | 1.5 | | | 90L | 5.9 | 5.7 | 3.4 | 3.3 |
| 3.0 | 2.2 | | | 90L | 8.5 | 8 | 4.9 | 4.6 |
| 4.0 | 3.0 | | | 100L | 11.4 | 11.4 | 6.6 | 6.6 |
| 5.5 | 4.0 | | | 112M | 15.4 | 16.3 | 8.9 | 9.4 |
| 7.5 | 5.5 | | B5 | 132S | 20.8 | 20.8 | 12 | 12 |
| 10.0 | 7.5 | | | 132M | 27.4 | 26.7 | 15.8 | 15.4 |
| 15 | 11 | | | 160M | | | 21.2 | 20 |
| 20.0 | 15.0 | | | 160M | | | 27.7 | 25.5 |
| 25 | 18.5 | | | 160L | | | 35.2 | 32.4 |
| 30 | 22 | | | 180M | | | 41.3 | 38.2 |
| 40 | 30 | | | 180L | | | 54.2 | 50.4 |
| 50 | 37 | | | 200L | | | 70.8 | 65.6 |
| 60 | 45 | | | 200L | | | 83.1 | 79.2 |

## Mechanical Seal

- Standard Cartridge type mechanical seal make of Silicon Carbide/Silicon Carbide/EPDM or Viton.
- Based on the type of application, alternative materials are available for the seal and the elastomers.
- The cartridge type mechanical seal can be replaced in minutes without special tools and without dismantling the pump.

## List of Materials

| | |
|---|---|
| Q: Silicon carbide | E: EPDM |
| U: Tungsten carbide | V: Viton |
| B: Carbon | |

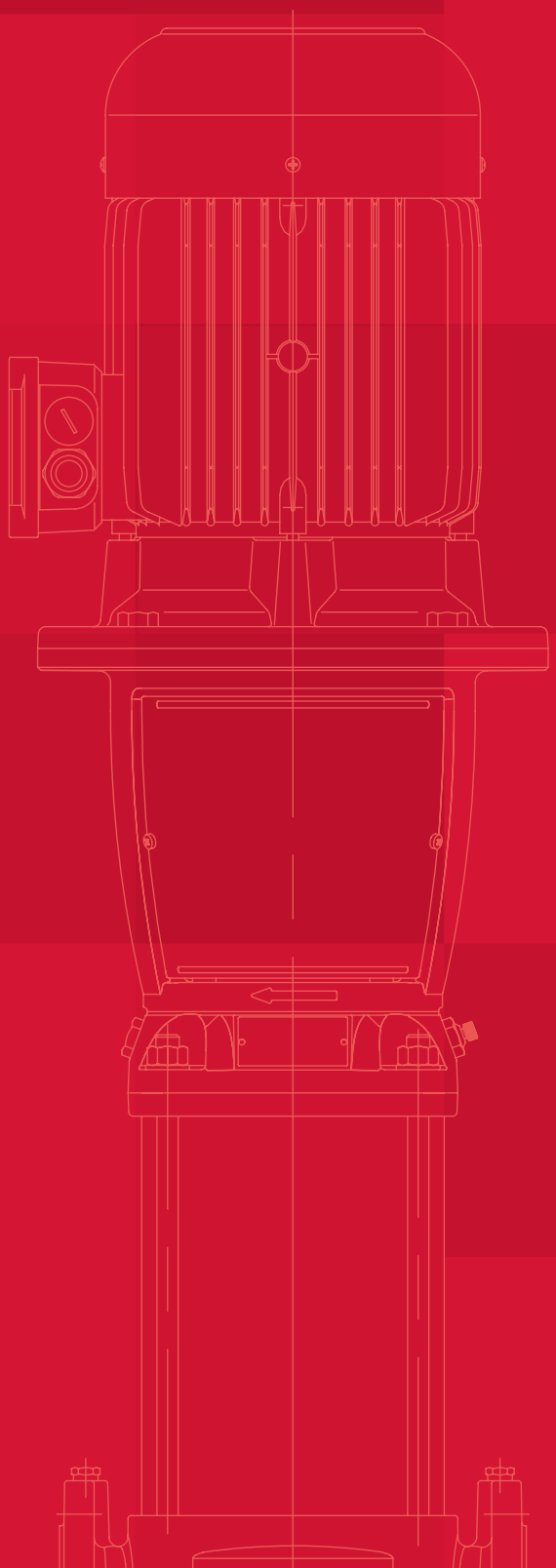
## Type of Seal

| Seal Type | XVM S 1/3/5/10/15/20/32/45/64 |
|---|---|
| Mechanical Seals | |
| S: Cartridge seal | • |
| QQ | • |
| UU | Optional |
| QB | Optional |
| UB | Optional |
| Seals | |
| E | • |
| V | • |

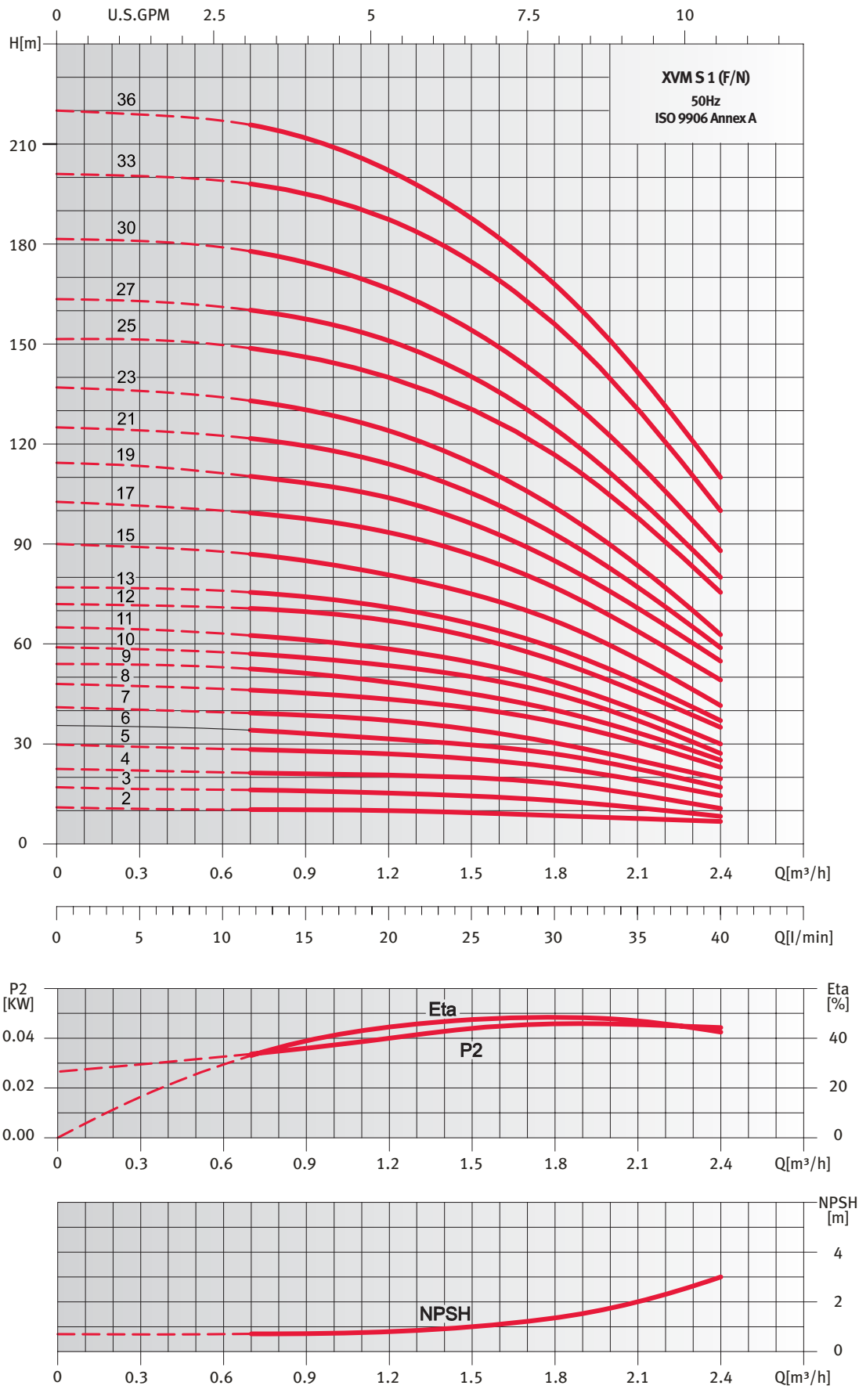
# XVM S Series

## Operating dimensions, weights and curves

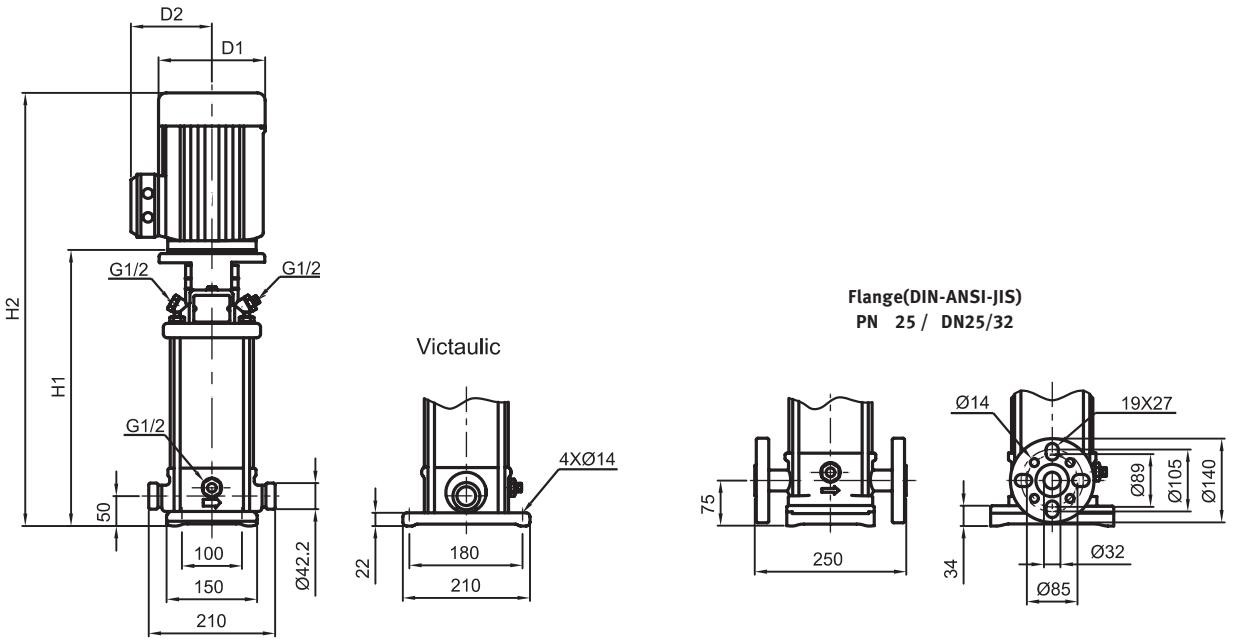
50 Hz



**XVM S 1**

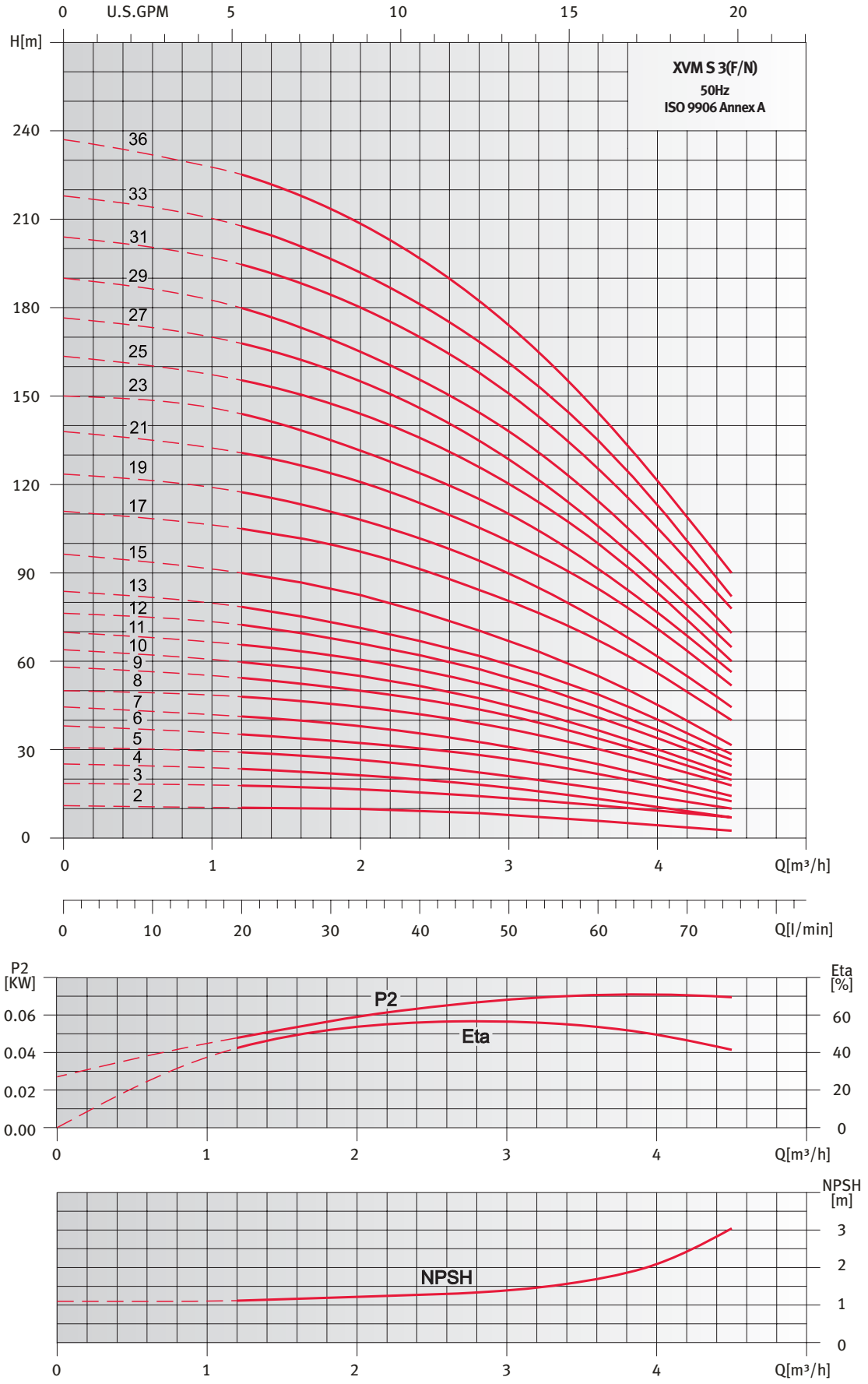

0 U.S.GPM 2.5 5 7.5 10
H[m]
XVM S 1 (F/N)
50Hz
ISO 9906 Annex A
36
33
30
27
25
23
21
19
17
15
13
12
11
10
9
8
7
6
5
4
3
2
210
180
150
120
90
60
30
0
0 0.3 0.6 0.9 1.2 1.5 1.8 2.1 2.4 Q[m³/h]
0 5 10 15 20 25 30 35 40 Q[l/min]
P2 [KW]
Eta [%]
Eta
P2
0.04
0.02
0.00
40
20
0
0 0.3 0.6 0.9 1.2 1.5 1.8 2.1 2.4 Q[m³/h]
NPSH [m]
NPSH
4
2
0
0 0.3 0.6 0.9 1.2 1.5 1.8 2.1 2.4 Q[m³/h]

## Dimensions and weights-XVM S 1

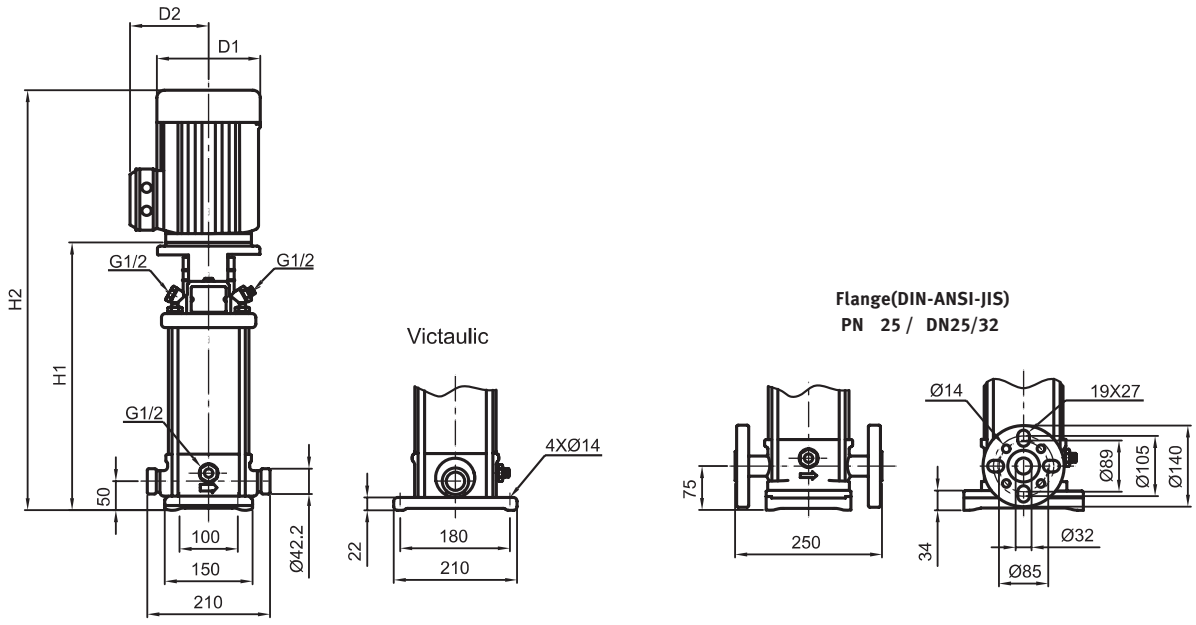



| Pump type | Motor | XVM S Dimension[mm] | | | | | | Net weight [kg] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Victaulic | | DIN flange | | | | | |
| | P2 [KW] | H1 | H2 | H1 | H2 | D1 | D2 | Victaulic | DIN flange |
| XVM S 1-2 | 0.37 | 257 | 448 | 282 | 473 | 141 | 109 | 16 | 20 |
| XVM S 1-3 | 0.37 | 257 | 448 | 282 | 473 | 141 | 109 | 16 | 21 |
| XVM S 1-4 | 0.37 | 275 | 466 | 300 | 491 | 141 | 109 | 17 | 21 |
| XVM S 1-5 | 0.37 | 293 | 484 | 318 | 509 | 141 | 109 | 17 | 12 |
| XVM S 1-6 | 0.37 | 311 | 502 | 336 | 527 | 141 | 109 | 18 | 22 |
| XVM S 1-7 | 0.37 | 329 | 520 | 354 | 545 | 141 | 109 | 18 | 22 |
| XVM S 1-8 | 0.55 | 347 | 538 | 372 | 563 | 141 | 109 | 19 | 23 |
| XVM S 1-9 | 0.55 | 365 | 556 | 390 | 581 | 141 | 109 | 20 | 24 |
| XVM S 1-10 | 0.55 | 383 | 574 | 408 | 599 | 141 | 109 | 20 | 24 |
| XVM S 1-11 | 0.55 | 401 | 592 | 426 | 617 | 141 | 109 | 20 | 24 |
| XVM S 1-12 | 0.75 | 425 | 656 | 450 | 681 | 141 | 109 | 23 | 27 |
| XVM S 1-13 | 0.75 | 443 | 674 | 468 | 699 | 141 | 109 | 23 | 28 |
| XVM S 1-15 | 0.75 | 479 | 710 | 504 | 735 | 141 | 109 | 24 | 28 |
| XVM S 1-17 | 1.1 | 515 | 746 | 540 | 771 | 141 | 109 | 27 | 31 |
| XVM S 1-19 | 1.1 | 551 | 782 | 576 | 807 | 141 | 109 | 28 | 32 |
| XVM S 1-21 | 1.1 | 587 | 818 | 612 | 843 | 141 | 109 | 29 | 33 |
| XVM S 1-23 | 1.1 | 623 | 854 | 648 | 879 | 141 | 109 | 30 | 34 |
| XVM S 1-25 | 1.5 | 675 | 950 | 700 | 975 | 175 | 140 | 37.5 | 41.0 |
| XVM S 1-27 | 1.5 | 711 | 986 | 736 | 1011 | 175 | 140 | 38.2 | 41.8 |
| XVM S 1-30 | 1.5 | 765 | 1040 | 790 | 1065 | 175 | 140 | 39.4 | 42.9 |
| XVM S 1-33 | 2.2 | 819 | 1094 | 844 | 1119 | 175 | 140 | 42.5 | 46.0 |
| XVM S 1-36 | 2.2 | 873 | 1148 | 898 | 1173 | 175 | 140 | 43.6 | 47.2 |

## XVM S 3

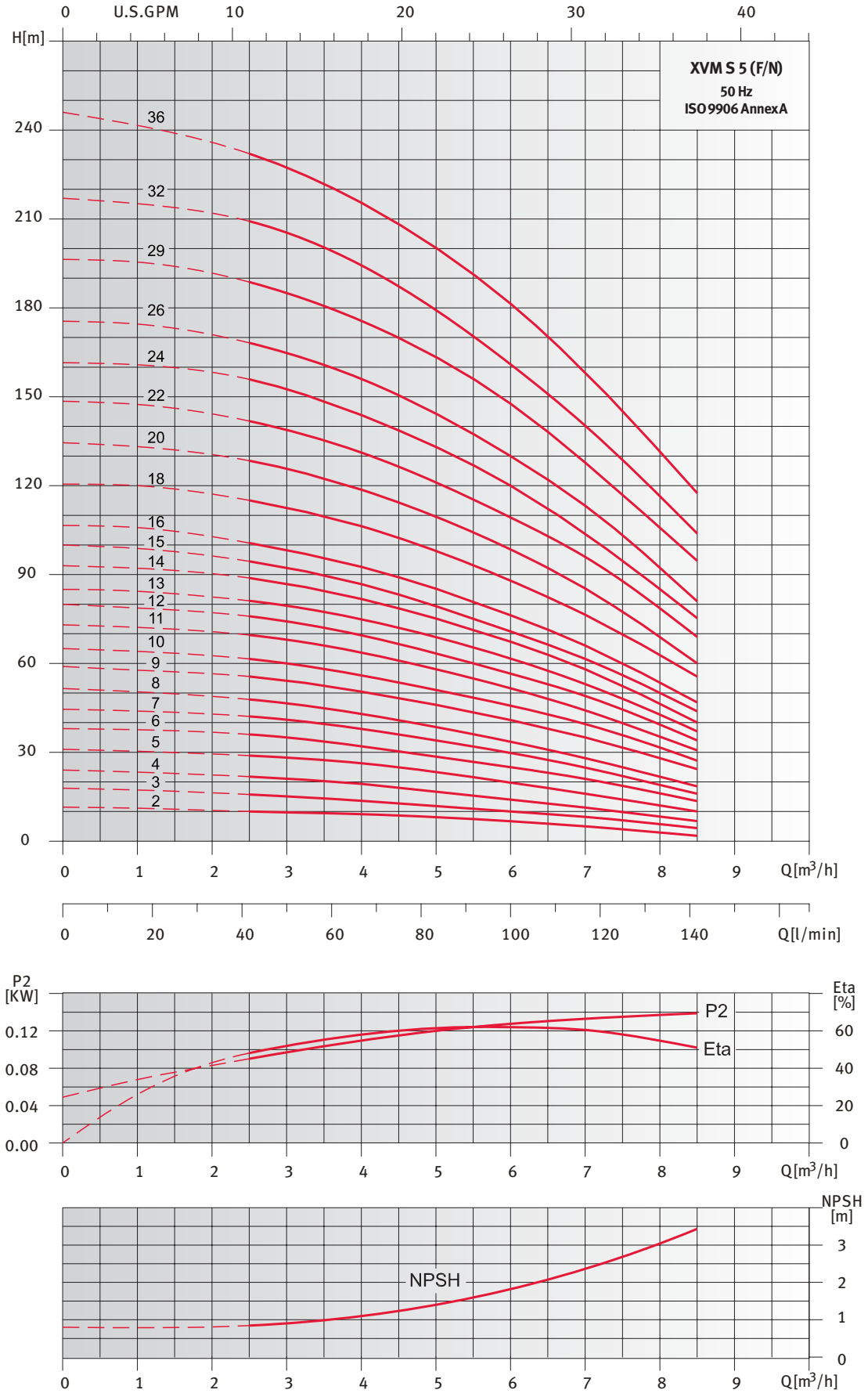

0 U.S.GPM 5 10 15 20
H[m]
XVM S 3(F/N)
50Hz
ISO 9906 Annex A
240
210
180
150
120
90
60
30
0
36
33
31
29
27
25
23
21
19
17
15
13
12
11
10
9
8
7
6
5
4
3
2
0 1 2 3 4 Q[m³/h]
0 10 20 30 40 50 60 70 Q[l/min]
P2 [KW]
0.06
0.04
0.02
0.00
P2
Eta
Eta [%]
60
40
20
0
0 1 2 3 4 Q[m³/h]
NPSH [m]
NPSH
3
2
1
0
0 1 2 3 4 Q[m³/h]

## Dimensions and weights-XVM S 3

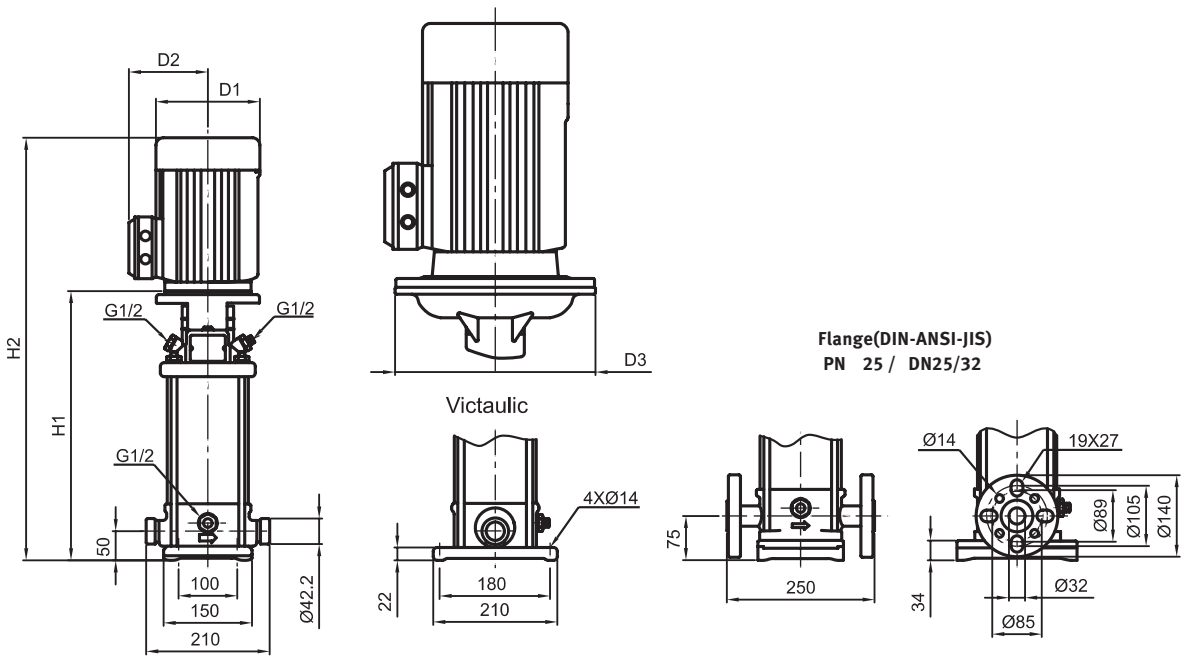



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] Victaulic H1 | Victaulic H2 | DIN flange H1 | DIN flange H2 | D1 | D2 | Net weight [kg] Victaulic | Net weight [kg] DIN flange |
|---|---|---|---|---|---|---|---|---|---|
| XVM S 3-2 | 0.37 | 257 | 448 | 282 | 473 | 141 | 109 | 16 | 19 |
| XVM S 3-3 | 0.37 | 257 | 448 | 282 | 473 | 141 | 109 | 16 | 19 |
| XVM S 3-4 | 0.37 | 275 | 466 | 300 | 491 | 141 | 109 | 17 | 19 |
| XVM S 3-5 | 0.37 | 293 | 484 | 318 | 509 | 141 | 109 | 17 | 20 |
| XVM S 3-6 | 0.55 | 311 | 502 | 336 | 527 | 141 | 109 | 18 | 21 |
| XVM S 3-7 | 0.55 | 329 | 520 | 354 | 545 | 141 | 109 | 19 | 21 |
| XVM S 3-8 | 0.75 | 353 | 584 | 378 | 609 | 141 | 109 | 21 | 24 |
| XVM S 3-9 | 0.75 | 371 | 602 | 396 | 627 | 141 | 109 | 22 | 24 |
| XVM S 3-10 | 0.75 | 389 | 620 | 414 | 645 | 141 | 109 | 22 | 25 |
| XVM S 3-11 | 1.1 | 407 | 638 | 432 | 663 | 141 | 109 | 25 | 27 |
| XVM S 3-12 | 1.1 | 425 | 656 | 450 | 681 | 141 | 109 | 25 | 28 |
| XVM S 3-13 | 1.1 | 443 | 674 | 468 | 699 | 141 | 109 | 26 | 28 |
| XVM S 3-15 | 1.1 | 479 | 710 | 504 | 735 | 141 | 109 | 26 | 29 |
| XVM S 3-17 | 1.5 | 531 | 806 | 556 | 831 | 175 | 140 | 34.5 | 38.1 |
| XVM S 3-19 | 1.5 | 567 | 842 | 592 | 867 | 175 | 140 | 35.3 | 38.8 |
| XVM S 3-21 | 2.2 | 603 | 878 | 628 | 903 | 175 | 140 | 38.0 | 41.6 |
| XVM S 3-23 | 2.2 | 639 | 914 | 664 | 939 | 175 | 140 | 38.8 | 42.3 |
| XVM S 3-25 | 2.2 | 675 | 950 | 700 | 975 | 175 | 140 | 39.5 | 43.1 |
| XVM S 3-27 | 2.2 | 711 | 986 | 736 | 1011 | 175 | 140 | 40.3 | 43.8 |
| XVM S 3-29 | 2.2 | 747 | 1022 | 772 | 1047 | 175 | 140 | 41.0 | 44.6 |
| XVM S 3-31 | 3 | 787 | 1107 | 812 | 1132 | 196 | 148 | 48.2 | 51.8 |
| XVM S 3-33 | 3 | 823 | 1143 | 848 | 1168 | 196 | 148 | 49.1 | 52.5 |
| XVM S 3-36 | 3 | 877 | 1197 | 902 | 1222 | 196 | 148 | 50.1 | 53.7 |

**XVM S 5**

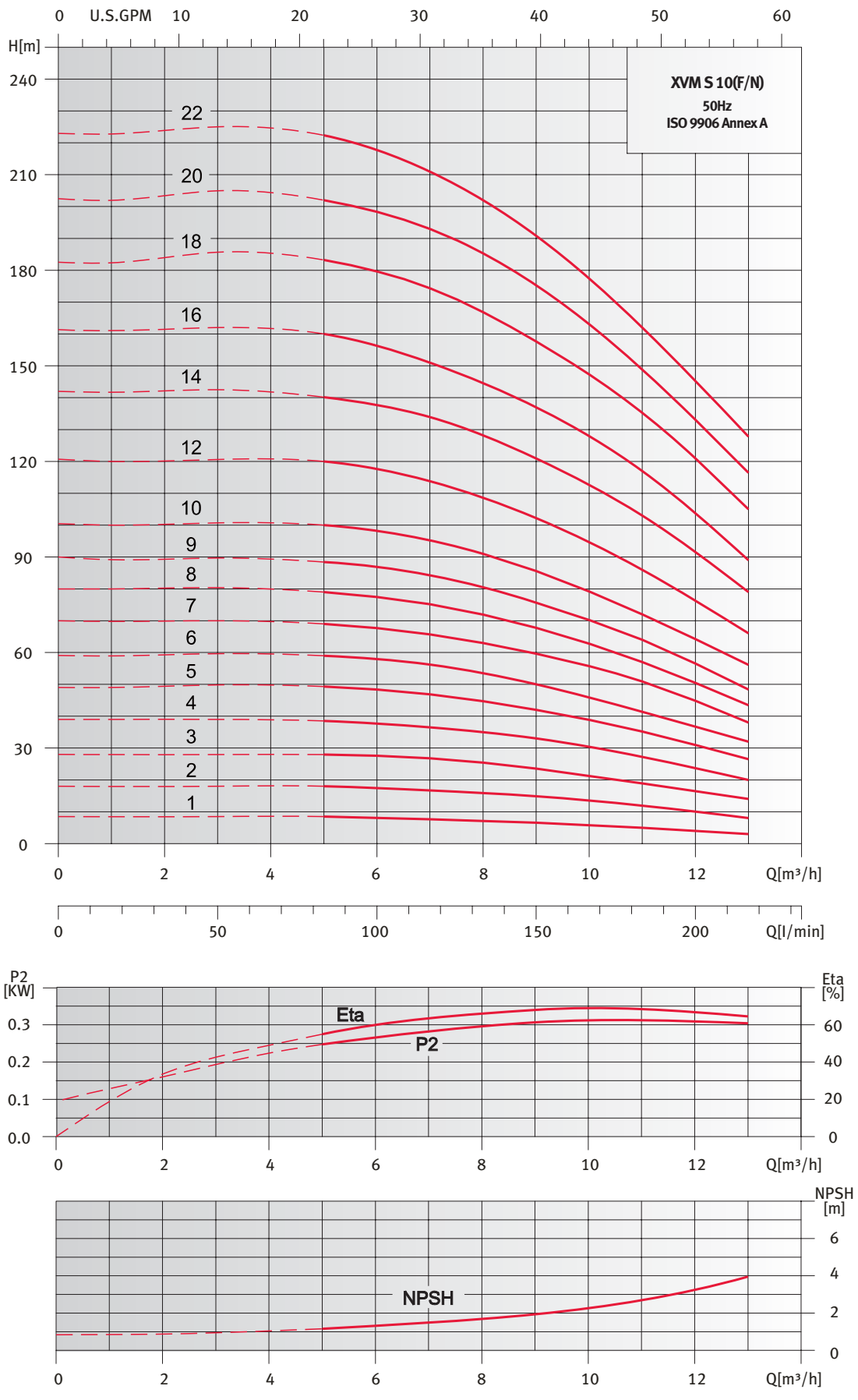

XVM S 5 (F/N)
50 Hz
ISO 9906 Annex A
0 U.S.GPM 10 20 30 40
H[m]
240
210
180
150
120
90
60
30
0
36
32
29
26
24
22
20
18
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
0 1 2 3 4 5 6 7 8 9 Q[m³/h]
0 20 40 60 80 100 120 140 Q[l/min]
P2 [KW]
0.12
0.08
0.04
0.00
P2
Eta
Eta [%]
60
40
20
0
0 1 2 3 4 5 6 7 8 9 Q[m³/h]
NPSH
NPSH [m]
3
2
1
0
0 1 2 3 4 5 6 7 8 9 Q[m³/h]

## Dimensions and weights-XVM S 5

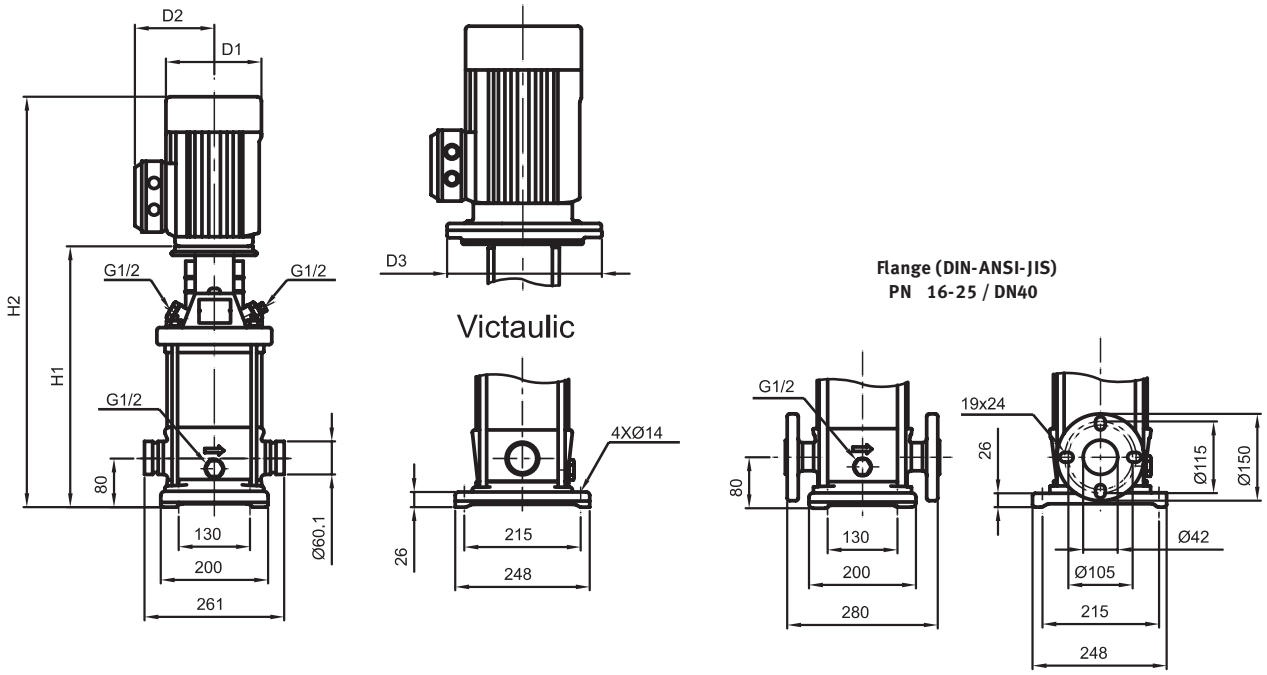



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] Victaulic H1 | Victaulic H2 | DIN flange H1 | DIN flange H2 | D1 | D2 | D3 | Net weight [kg] Victaulic | DIN flange |
|---|---|---|---|---|---|---|---|---|---|---|
| XVM S 5-2 | 0.37 | 257 | 448 | 282 | 473 | 141 | 109 | | 16 | 21 |
| XVM S 5-3 | 0.55 | 284 | 475 | 309 | 500 | 141 | 109 | | 18 | 22 |
| XVM S 5-4 | 0.55 | 311 | 502 | 336 | 527 | 141 | 109 | | 18 | 22 |
| XVM S 5-5 | 0.75 | 344 | 575 | 369 | 600 | 141 | 109 | | 21 | 25 |
| XVM S 5-6 | 1.1 | 371 | 602 | 396 | 627 | 141 | 109 | | 24 | 28 |
| XVM S 5-7 | 1.1 | 398 | 629 | 423 | 654 | 141 | 109 | | 24 | 28 |
| XVM S 5-8 | 1.1 | 425 | 656 | 450 | 681 | 141 | 109 | | 25 | 29 |
| XVM S 5-9 | 1.5 | 468 | 743 | 493 | 768 | 175 | 140 | | 32.5 | 36.5 |
| XVM S 5-10 | 1.5 | 495 | 770 | 520 | 795 | 175 | 140 | | 33.5 | 37.1 |
| XVM S 5-11 | 2.2 | 522 | 797 | 547 | 822 | 175 | 140 | | 36.1 | 39.6 |
| XVM S 5-12 | 2.2 | 549 | 824 | 574 | 849 | 175 | 140 | | 36.7 | 40.2 |
| XVM S 5-13 | 2.2 | 576 | 851 | 601 | 876 | 175 | 140 | | 37.2 | 40.8 |
| XVM S 5-14 | 2.2 | 603 | 878 | 628 | 903 | 175 | 140 | | 37.8 | 41.3 |
| XVM S 5-15 | 2.2 | 630 | 905 | 655 | 930 | 175 | 140 | | 38.4 | 41.9 |
| XVM S 5-16 | 2.2 | 657 | 932 | 682 | 957 | 175 | 140 | | 39.0 | 42.5 |
| XVM S 5-18 | 3 | 715 | 1035 | 740 | 1060 | 196 | 148 | | 46.5 | 50.1 |
| XVM S 5-20 | 3 | 769 | 1089 | 794 | 1114 | 196 | 148 | | 47.7 | 59.4 |
| XVM S 5-22 | 4 | 823 | 1158 | 848 | 1183 | 219 | 162 | | 55.8 | 60.5 |
| XVM S 5-24 | 4 | 877 | 1212 | 902 | 1237 | 219 | 162 | | 57.0 | 61.6 |
| XVM S 5-26 | 4 | 931 | 1266 | 956 | 1291 | 219 | 162 | | 58.1 | 63.4 |
| XVM S 5-29 | 4 | 1012 | 1347 | 1037 | 1372 | 219 | 162 | | 59.8 | 83.7 |
| XVM S 5-32 | 5.5 | 1123 | 1483 | 1148 | 1508 | 234 | 199 | 300 | 80.2 | 86.0 |
| XVM S 5-36 | 5.5 | 1231 | 1591 | 1256 | 1616 | 234 | 199 | 300 | 82.5 | |

## XVM S 10

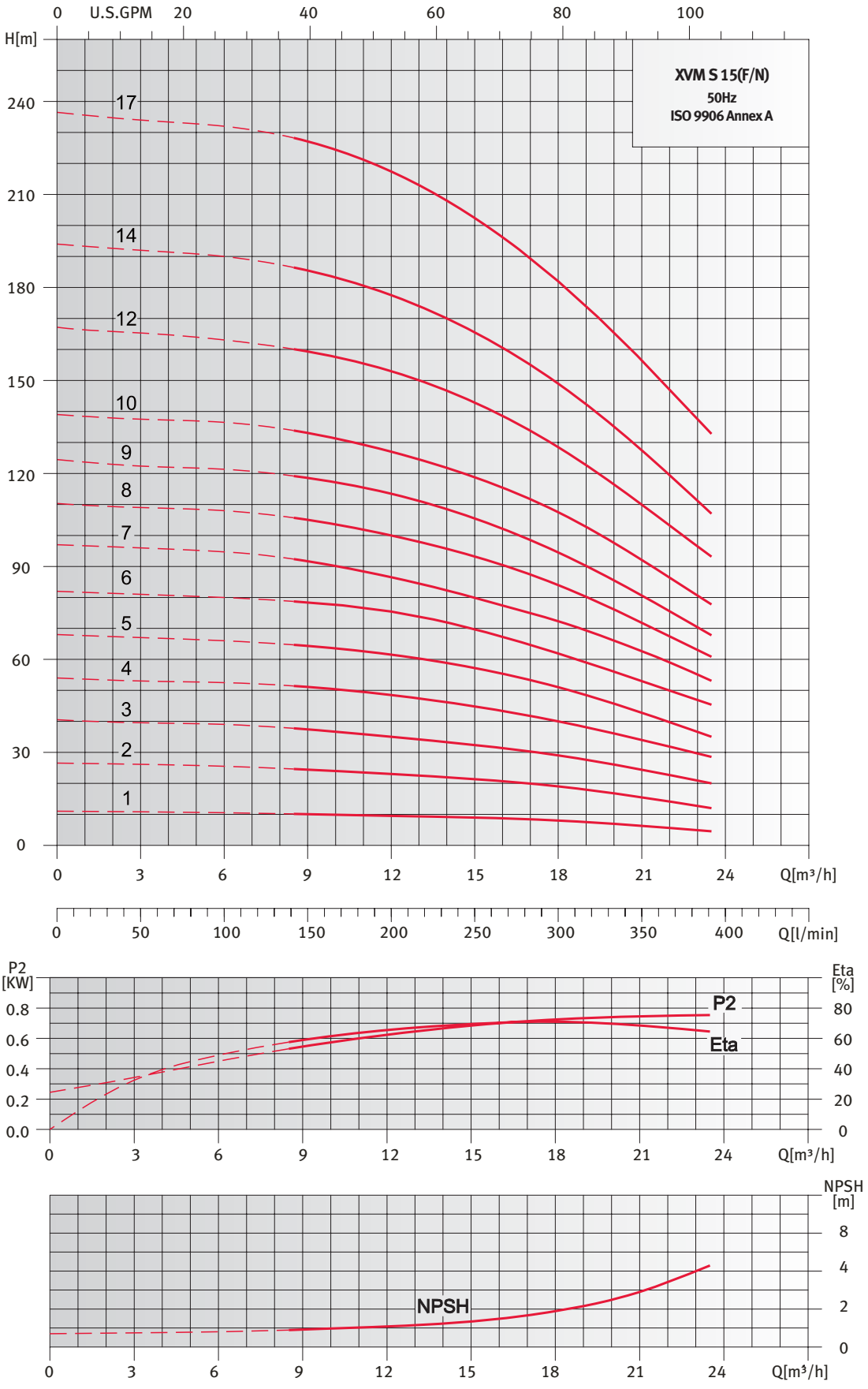

XVM S 10(F/N)
50Hz
ISO 9906 Annex A
0 U.S.GPM 10 20 30 40 50 60
H[m]
240
210
180
150
120
90
60
30
0
22
20
18
16
14
12
10
9
8
7
6
5
4
3
2
1
0 2 4 6 8 10 12 Q[m³/h]
0 50 100 150 200 Q[l/min]
P2 [KW]
0.3
0.2
0.1
0.0
Eta
P2
Eta [%]
60
40
20
0
0 2 4 6 8 10 12 Q[m³/h]
NPSH
NPSH [m]
6
4
2
0
0 2 4 6 8 10 12 Q[m³/h]

## Dimensions and weights-XVM S 10

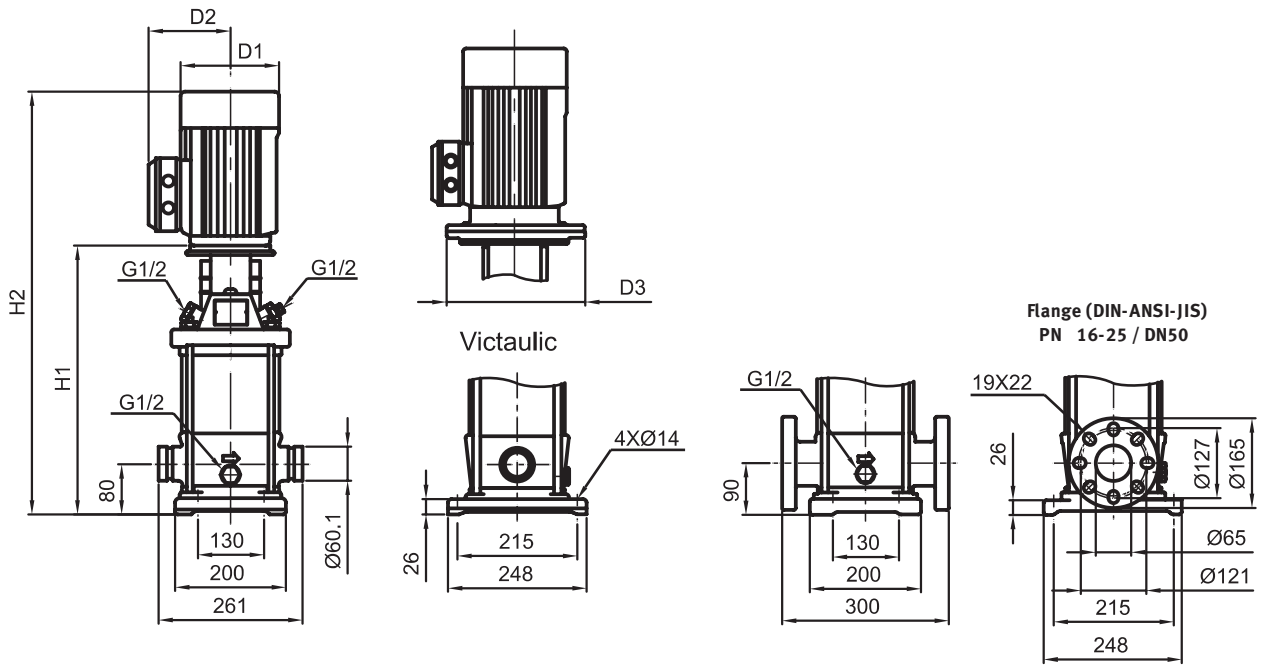



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] Victaulic H1 | Victaulic H2 | DIN flange H1 | DIN flange H2 | D1 | D2 | D3 | Net weight [kg] Victaulic | DIN flange |
|---|---|---|---|---|---|---|---|---|---|---|
| XVM S 10-1 | 0.37 | 353 | 544 | 353 | 544 | 141 | 109 | | 28 | 32 |
| XVM S 10-2 | 0.75 | 357 | 588 | 357 | 588 | 141 | 109 | | 31 | 34 |
| XVM S 10-3 | 1.1 | 387 | 618 | 387 | 618 | 141 | 109 | | 34 | 38 |
| XVM S 10-4 | 1.5 | 433 | 708 | 433 | 708 | 175 | 140 | | 43.6 | 47.1 |
| XVM S 10-5 | 2.2 | 463 | 738 | 463 | 738 | 175 | 140 | | 46.6 | 50.1 |
| XVM S 10-6 | 2.2 | 493 | 768 | 493 | 768 | 175 | 140 | | 47.6 | 51.1 |
| XVM S 10-7 | 3 | 528 | 848 | 528 | 848 | 196 | 148 | | 54.4 | 57.9 |
| XVM S 10-8 | 3 | 558 | 878 | 558 | 878 | 196 | 148 | | 55.4 | 59.0 |
| XVM S 10-9 | 3 | 588 | 908 | 588 | 908 | 196 | 148 | | 56.5 | 60.0 |
| XVM S 10-10 | 4 | 618 | 853 | 618 | 953 | 219 | 162 | | 64.5 | 68.0 |
| XVM S 10-12 | 4 | 678 | 1013 | 678 | 1013 | 219 | 162 | | 66.5 | 70.0 |
| XVM S 10-14 | 5.5 | 770 | 1130 | 770 | 1130 | 234 | 199 | 300 | 93.4 | 96.9 |
| XVM S 10-16 | 5.5 | 830 | 1190 | 830 | 1190 | 234 | 199 | 300 | 95.4 | 99.0 |
| XVM S 10-18 | 7.5 | 890 | 1290 | 890 | 1290 | 234 | 199 | 300 | 106.5 | 110.0 |
| XVM S 10-20 | 7.5 | 950 | 1350 | 950 | 1350 | 234 | 199 | 300 | 108.5 | 112.0 |
| XVM S 10-22 | 7.5 | 1010 | 1410 | 1010 | 1410 | 234 | 199 | 300 | 110.6 | 114.1 |

**XVM S 15**

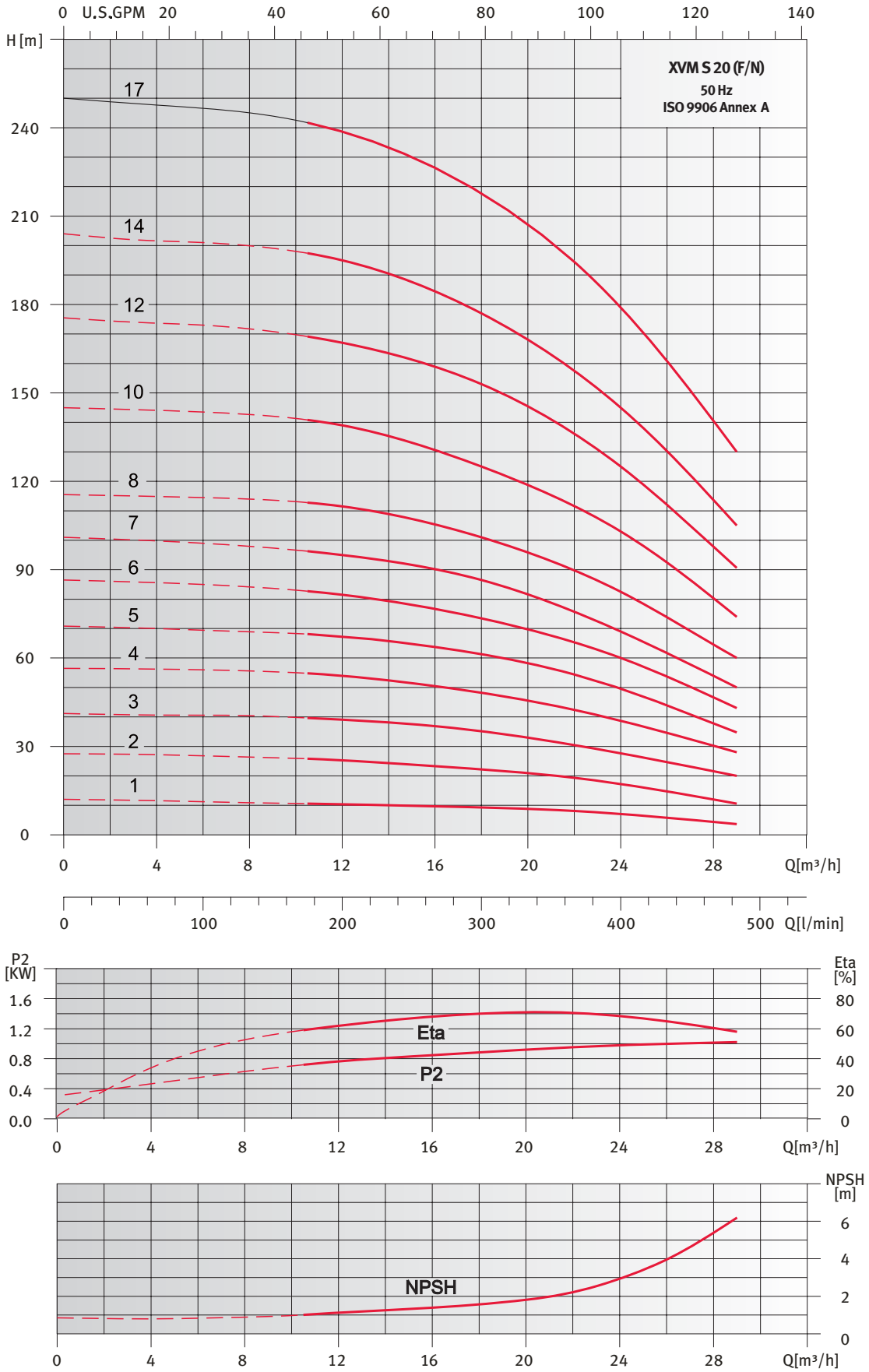

XVM S 15(F/N)
50Hz
ISO 9906 Annex A
0 U.S.GPM 20 40 60 80 100
H[m]
240
210
180
150
120
90
60
30
0
17
14
12
10
9
8
7
6
5
4
3
2
1
0 3 6 9 12 15 18 21 24 Q[m³/h]
0 50 100 150 200 250 300 350 400 Q[l/min]
P2 [KW]
0.8
0.6
0.4
0.2
0.0
Eta [%]
80
60
40
20
0
P2
Eta
0 3 6 9 12 15 18 21 24 Q[m³/h]
NPSH [m]
8
4
2
0
NPSH
0 3 6 9 12 15 18 21 24 Q[m³/h]

## Dimensions and weights-XVM S 15

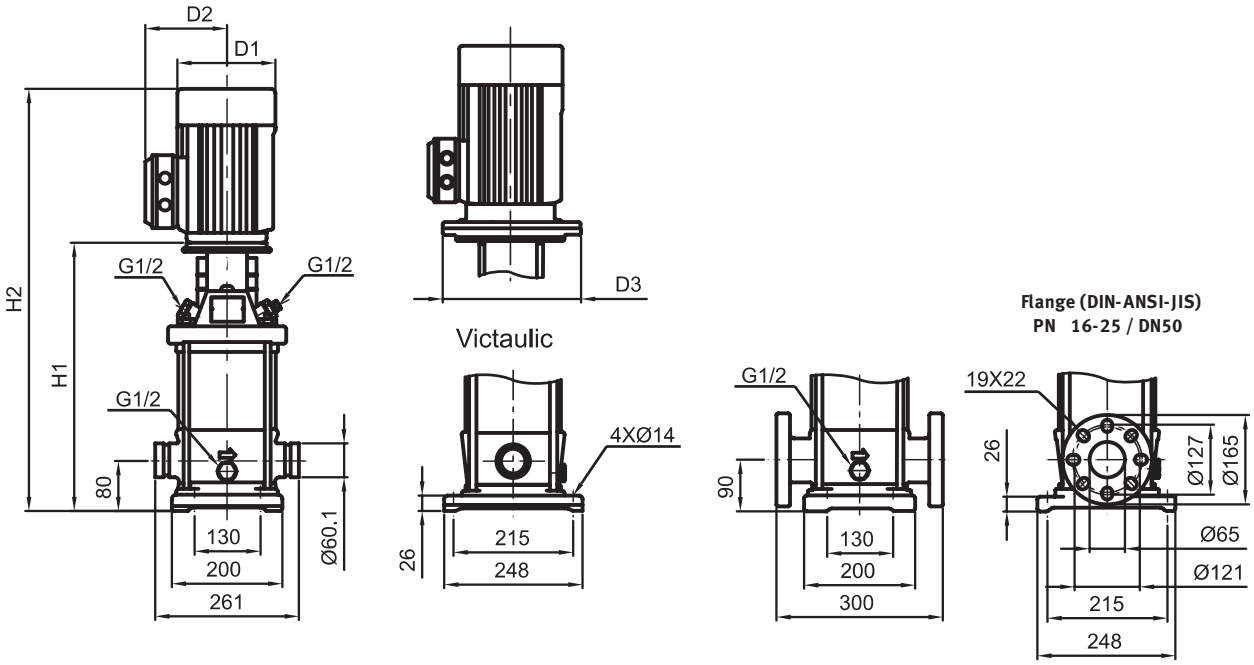



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] Victaulic H1 | Victaulic H2 | DIN flange H1 | DIN flange H2 | D1 | D2 | D3 | Net weight [kg] Victaulic | DIN flange |
|---|---|---|---|---|---|---|---|---|---|---|
| XVM S 15-1 | 1.1 | 387 | 618 | 397 | 628 | 141 | 109 | | 44.3 | 42 |
| XVM S 15-2 | 2.2 | 403 | 678 | 413 | 688 | 175 | 140 | | 34 | 48.8 |
| XVM S 15-3 | 3 | 453 | 773 | 463 | 783 | 196 | 148 | | 51.5 | 56.0 |
| XVM S 15-4 | 4 | 498 | 833 | 508 | 843 | 219 | 162 | | 59.9 | 64.4 |
| XVM S 15-5 | 4 | 543 | 878 | 553 | 888 | 219 | 162 | | 61.3 | 65.8 |
| XVM S 15-6 | 5.5 | 620 | 980 | 630 | 990 | 234 | 199 | 300 | 87.6 | 92.1 |
| XVM S 15-7 | 5.5 | 665 | 1025 | 675 | 1035 | 234 | 199 | 300 | 89.0 | 93.5 |
| XVM S 15-8 | 7.5 | 710 | 1110 | 720 | 1120 | 234 | 199 | 300 | 99.4 | 103.9 |
| XVM S 15-9 | 7.5 | 755 | 1155 | 765 | 1165 | 234 | 199 | 300 | 100.8 | 105.3 |
| XVM S 15-10 | 11 | 877 | 1322 | 887 | 1332 | 268 | 215 | 350 | 132.4 | 136.9 |
| XVM S 15-12 | 11 | 967 | 1412 | 977 | 1422 | 268 | 215 | 350 | 135.2 | 139.7 |
| XVM S 15-14 | 11 | 1057 | 1502 | 1067 | 1512 | 268 | 215 | 350 | 138.0 | 142.5 |
| XVM S 15-17 | 15 | 1192 | 1681 | 1202 | 1691 | 268 | 215 | 350 | 153.2 | 157.7 |

## XVM S 20

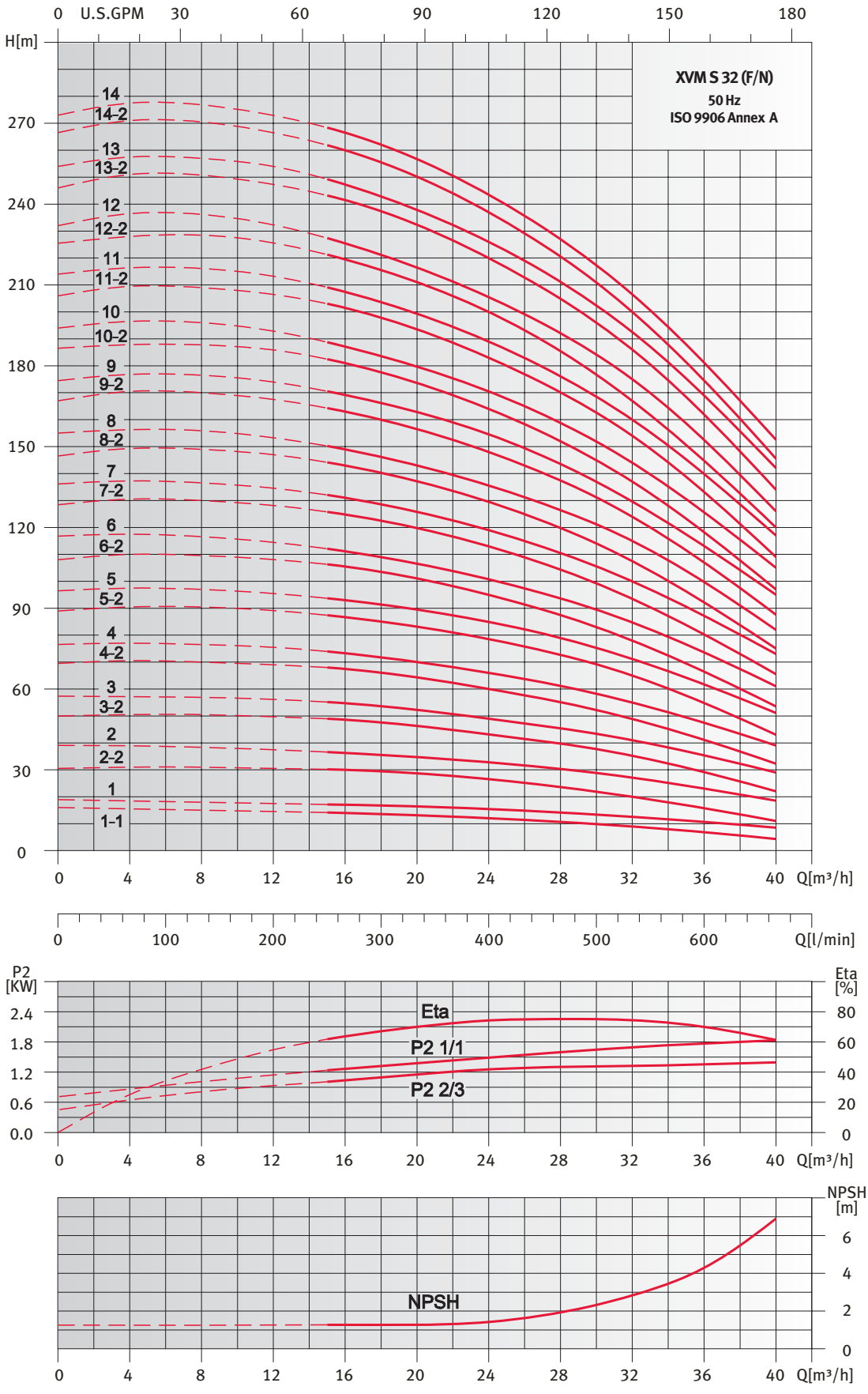

0 U.S.GPM 20 40 60 80 100 120 140
H [m]
XVM S 20 (F/N)
50 Hz
ISO 9906 Annex A
17
14
12
10
8
7
6
5
4
3
2
1
240
210
180
150
120
90
60
30
0
0 4 8 12 16 20 24 28 Q[m³/h]
0 100 200 300 400 500 Q[l/min]
P2 [KW]
Eta [%]
1.6
1.2
0.8
0.4
0.0
80
60
40
20
0
Eta
P2
0 4 8 12 16 20 24 28 Q[m³/h]
NPSH [m]
6
4
2
0
NPSH
0 4 8 12 16 20 24 28 Q[m³/h]

## Dimensions and weights-XVM S 20

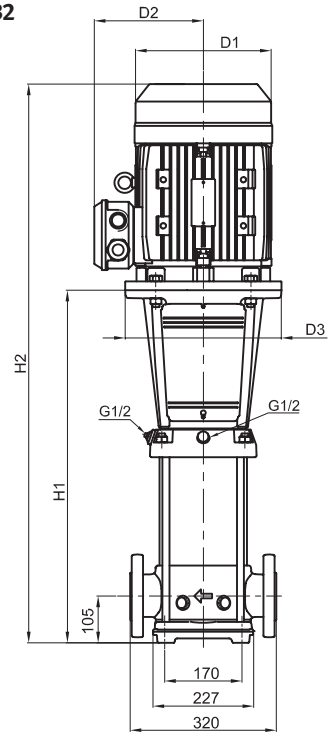



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] Victaulic H1 | Victaulic H2 | DIN flange H1 | DIN flange H2 | D1 | D2 | D3 | Net weight [kg] Victaulic | DIN flange |
|---|---|---|---|---|---|---|---|---|---|---|
| XVM S 20-1 | 1.1 | 387 | 618 | 397 | 628 | 141 | 109 | | 34 | 39 |
| XVM S 20-2 | 2.2 | 403 | 678 | 413 | 688 | 175 | 140 | | 44.3 | 48.8 |
| XVM S 20-3 | 4 | 453 | 788 | 463 | 798 | 219 | 162 | | 58.5 | 63.0 |
| XVM S 20-4 | 5.5 | 530 | 890 | 540 | 900 | 234 | 199 | 300 | 84.8 | 89.3 |
| XVM S 20-5 | 5.5 | 575 | 935 | 585 | 945 | 234 | 199 | 300 | 86.2 | 90.7 |
| XVM S 20-6 | 7.5 | 620 | 1020 | 630 | 1030 | 234 | 199 | 300 | 96.6 | 101.1 |
| XVM S 20-7 | 7.5 | 665 | 1065 | 675 | 1075 | 234 | 199 | 300 | 98.0 | 102.5 |
| XVM S 20-8 | 11 | 787 | 1232 | 797 | 1242 | 265 | 215 | 350 | 129.6 | 134.1 |
| XVM S 20-10 | 11 | 877 | 1322 | 887 | 1332 | 265 | 215 | 350 | 132.4 | 136.9 |
| XVM S 20-12 | 15 | 967 | 1456 | 977 | 1466 | 265 | 215 | 350 | 146.2 | 150.7 |
| XVM S 20-14 | 15 | 1057 | 1546 | 1067 | 1556 | 265 | 215 | 350 | 149.0 | 153.5 |
| XVM S 20-17 | 18.5 | 1192 | 1727 | 1202 | 1737 | 317 | 242 | 350 | 188.2 | 192.7 |

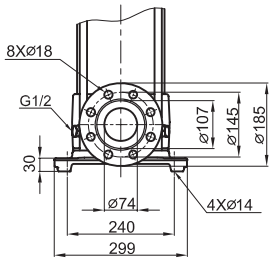
**XVM S 32**


0 U.S.GPM 30 60 90 120 150 180
H[m]
XVM S 32 (F/N)
50 Hz
ISO 9906 Annex A
14
14-2
13
13-2
12
12-2
11
11-2
10
10-2
9
9-2
8
8-2
7
7-2
6
6-2
5
5-2
4
4-2
3
3-2
2
2-2
1
1-1
270
240
210
180
150
120
90
60
30
0
0 4 8 12 16 20 24 28 32 36 40 Q[m³/h]
0 100 200 300 400 500 600 Q[l/min]
P2 [KW]
2.4
1.8
1.2
0.6
0.0
Eta [%]
80
60
40
20
0
Eta
P2 1/1
P2 2/3
0 4 8 12 16 20 24 28 32 36 40 Q[m³/h]
NPSH [m]
6
4
2
0
NPSH
0 4 8 12 16 20 24 28 32 36 40 Q[m³/h]

## Dimensions and weights-XVM S 32

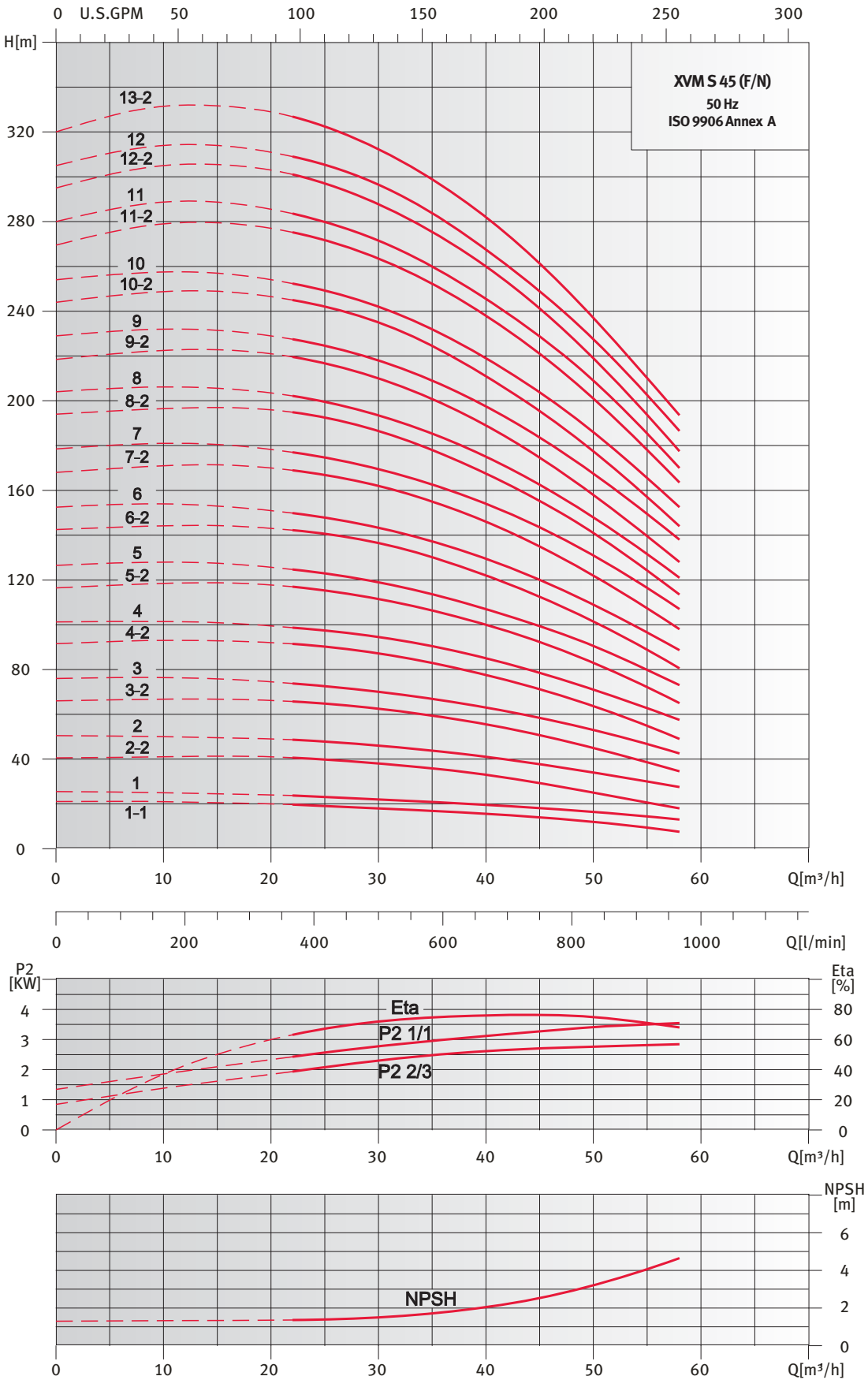



PN16-25-40 / DN65

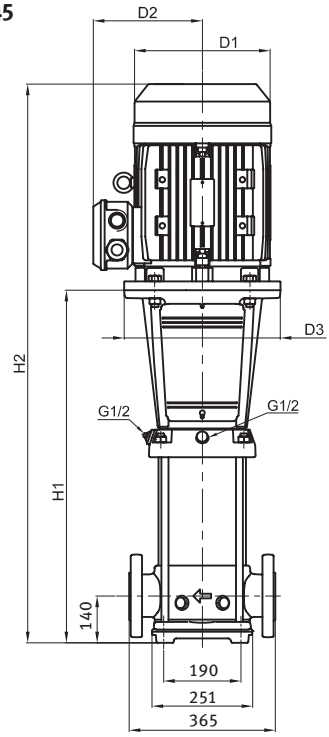



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] DIN flange H1 | H2 | D1 | D2 | D3 | Net weight [kg] DIN flange |
|---|---|---|---|---|---|---|---|
| XVM S 32-1-1 | 1.5 | 504 | 779 | 175 | 140 | 280 | 64.6 |
| XVM S 32-1 | 2.2 | 504 | 779 | 175 | 140 | 280 | 66.7 |
| XVM S 32-2-2 | 3.0 | 574 | 894 | 196 | 148 | 280 | 75.6 |
| XVM S 32-2 | 4.0 | 574 | 909 | 219 | 162 | 280 | 82.6 |
| XVM S 32-3-2 | 5.5 | 644 | 1004 | 234 | 199 | 300 | 99.5 |
| XVM S 32-3 | 5.5 | 644 | 1004 | 234 | 199 | 300 | 99.5 |
| XVM S 32-4-2 | 7.5 | 714 | 1114 | 234 | 199 | 300 | 111.5 |
| XVM S 32-4 | 7.5 | 714 | 1114 | 234 | 199 | 300 | 111.6 |
| XVM S 32-5-2 | 11.0 | 894 | 1294 | 268 | 215 | 350 | 148.1 |
| XVM S 32-5 | 11.0 | 894 | 1294 | 268 | 215 | 350 | 148.2 |
| XVM S 32-6-2 | 11.0 | 964 | 1409 | 268 | 215 | 350 | 151.1 |
| XVM S 32-6 | 11.0 | 964 | 1409 | 268 | 215 | 350 | 151.2 |
| XVM S 32-7-2 | 15.0 | 1034 | 1523 | 268 | 215 | 350 | 165.2 |
| XVM S 32-7 | 15.0 | 1034 | 1523 | 268 | 215 | 350 | 165.2 |
| XVM S 32-8-2 | 15.0 | 1104 | 1593 | 268 | 215 | 350 | 168.4 |
| XVM S 32-8 | 15.0 | 1104 | 1593 | 268 | 215 | 350 | 168.4 |
| XVM S 32-9-2 | 18.5 | 1174 | 1709 | 317 | 242 | 350 | 206.0 |
| XVM S 32-9 | 18.5 | 1174 | 1709 | 317 | 242 | 350 | 206.1 |
| XVM S 32-10-2 | 18.5 | 1244 | 1779 | 317 | 242 | 350 | 208.6 |
| XVM S 32-10 | 18.5 | 1244 | 1779 | 317 | 242 | 350 | 208.7 |
| XVM S 32-11-2 | 22.0 | 1314 | 1893 | 317 | 242 | 350 | 222.0 |
| XVM S 32-11 | 22.0 | 1314 | 1893 | 317 | 242 | 350 | 222.0 |
| XVM S 32-12-2 | 22.0 | 1384 | 1963 | 317 | 242 | 350 | 224.6 |
| XVM S 32-12 | 22.0 | 1384 | 1963 | 317 | 242 | 400 | 224.6 |
| XVM S 32-13-2 | 30.0 | 1384 | 2077 | 317 | 290 | 400 | 312.5 |
| XVM S 32-13 | 30.0 | 1454 | 2077 | 317 | 290 | 400 | 312.5 |
| XVM S 32-14-2 | 30.0 | 1524 | 2147 | 317 | 290 | 400 | 315.1 |
| XVM S 32-14 | 30.0 | 1524 | 2147 | 317 | 290 | 400 | 315.1 |

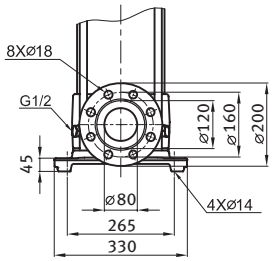
**XVM S 45**


XVM S 45 (F/N)
50 Hz
ISO 9906 Annex A
0 U.S.GPM 50 100 150 200 250 300
H[m]
0 40 80 120 160 200 240 280 320
13-2
12
12-2
11
11-2
10
10-2
9
9-2
8
8-2
7
7-2
6
6-2
5
5-2
4
4-2
3
3-2
2
2-2
1
1-1
0 10 20 30 40 50 60 Q[m³/h]
0 200 400 600 800 1000 Q[l/min]
P2 [KW]
0 1 2 3 4
Eta
P2 1/1
P2 2/3
Eta [%]
0 20 40 60 80
0 10 20 30 40 50 60 Q[m³/h]
NPSH
NPSH [m]
0 2 4 6
0 10 20 30 40 50 60 Q[m³/h]

## Dimensions and weights-XVM S 45

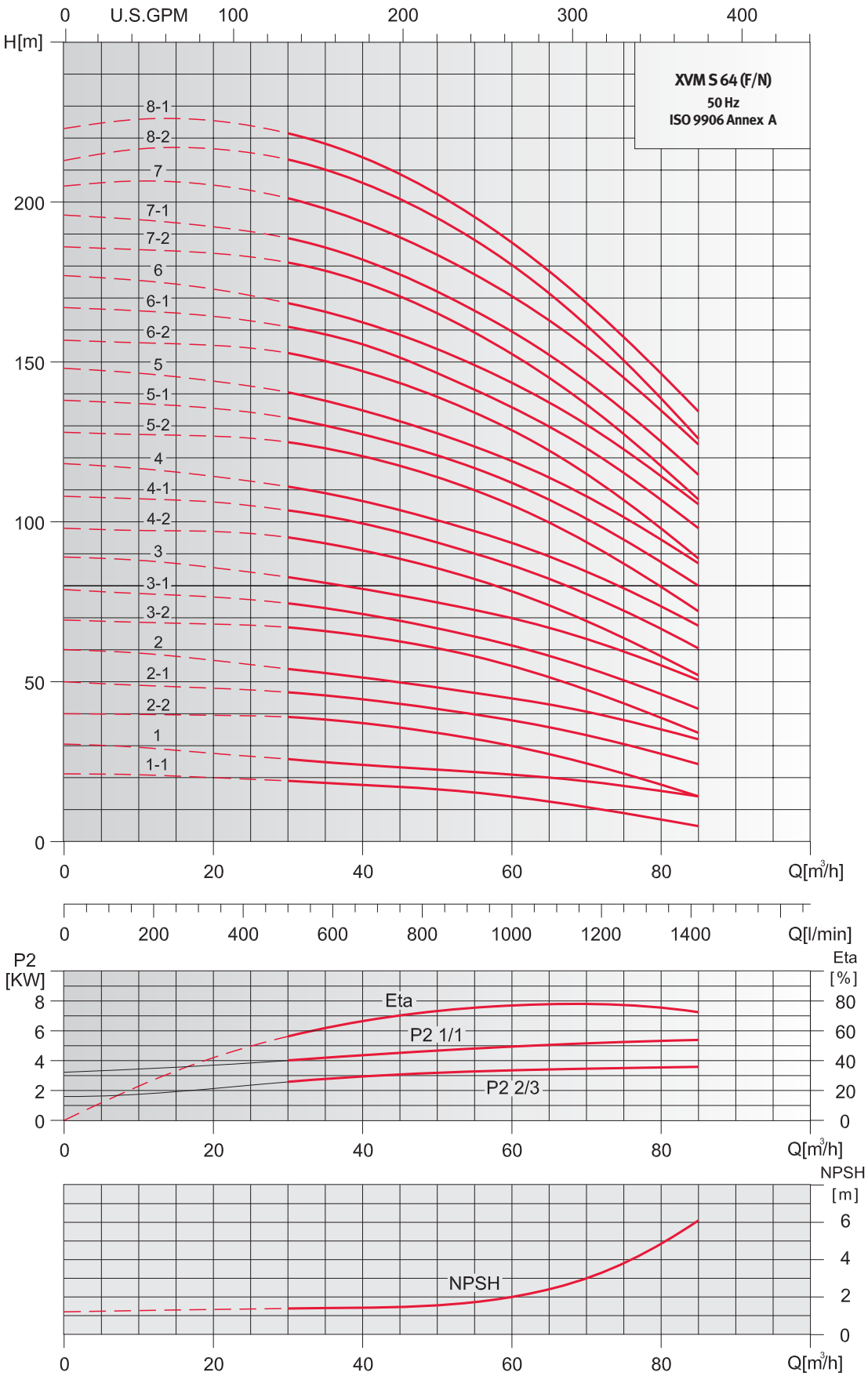



PN 16-25-40 / DN80

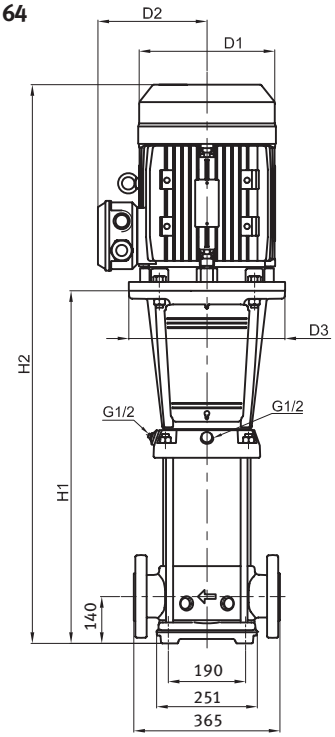



| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] DIN flange H1 | H2 | D1 | D2 | D3 | Net weight [kg] DIN flange |
|---|---|---|---|---|---|---|---|
| XVM S 45-1-1 | 3.0 | 559 | 879 | 196 | 148 | 280 | 79.3 |
| XVM S 45-1 | 4.0 | 559 | 894 | 219 | 162 | 280 | 86.3 |
| XVM S 45-2-2 | 5.5 | 639 | 999 | 234 | 199 | 300 | 103.8 |
| XVM S 45-2 | 7.5 | 639 | 1039 | 234 | 199 | 300 | 112.8 |
| XVM S 45-3-2 | 11.0 | 829 | 1274 | 268 | 215 | 350 | 150.0 |
| XVM S 45-3 | 11.0 | 829 | 1274 | 268 | 215 | 350 | 150.1 |
| XVM S 45-4-2 | 15.0 | 909 | 1398 | 268 | 215 | 350 | 164.7 |
| XVM S 45-4 | 15.0 | 909 | 1398 | 268 | 215 | 350 | 164.7 |
| XVM S 45-5-2 | 18.5 | 989 | 1524 | 317 | 242 | 350 | 203.4 |
| XVM S 45-5 | 18.5 | 989 | 1524 | 317 | 242 | 350 | 203.4 |
| XVM S 45-6-2 | 22.0 | 1069 | 1648 | 317 | 242 | 350 | 217.8 |
| XVM S 45-6 | 22.0 | 1069 | 1648 | 317 | 242 | 350 | 217.8 |
| XVM S 45-7-2 | 30.0 | 1149 | 1772 | 317 | 290 | 400 | 306.7 |
| XVM S 45-7 | 30.0 | 1149 | 1772 | 317 | 290 | 400 | 306.7 |
| XVM S 45-8-2 | 30.0 | 1229 | 1852 | 317 | 290 | 400 | 310.4 |
| XVM S 45-8 | 30.0 | 1229 | 1852 | 317 | 290 | 400 | 310.4 |
| XVM S 45-9-2 | 30.0 | 1309 | 1932 | 317 | 290 | 400 | 314.0 |
| XVM S 45-9 | 37.0 | 1309 | 2034 | 398 | 365 | 400 | 383.1 |
| XVM S 45-10-2 | 37.0 | 1389 | 2114 | 398 | 365 | 400 | 386.7 |
| XVM S 45-10 | 37.0 | 1389 | 2114 | 398 | 365 | 400 | 386.7 |
| XVM S 45-11-2 | 45.0 | 1469 | 2194 | 398 | 365 | 450 | 418.3 |
| XVM S 45-11 | 45.0 | 1469 | 2194 | 398 | 365 | 450 | 418.3 |
| XVM S 45-12-2 | 45.0 | 1549 | 2274 | 398 | 365 | 450 | 421.9 |
| XVM S 45-12 | 45.0 | 1549 | 2274 | 398 | 365 | 450 | 421.9 |
| XVM S 45-13-2 | 45.0 | 1629 | 2354 | 398 | 365 | 450 | 425.5 |

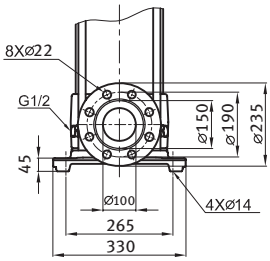
**XVM S 64**


0 U.S.GPM 100 200 300 400
H[m]
XVM S 64 (F/N)
50 Hz
ISO 9906 Annex A
8-1
8-2
7
7-1
7-2
6
6-1
6-2
5
5-1
5-2
4
4-1
4-2
3
3-1
3-2
2
2-1
2-2
1
1-1
0 20 40 60 80 Q[m³/h]
0 200 400 600 800 1000 1200 1400 Q[l/min]
P2 [KW]
Eta [%]
Eta
P2 1/1
P2 2/3
0 20 40 60 80 Q[m³/h]
NPSH [m]
NPSH
0 20 40 60 80 Q[m³/h]

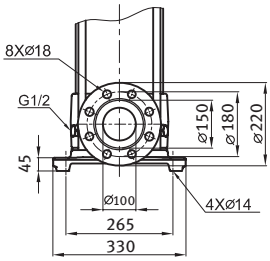
## Dimensions and weights - XVM S 64




Flange (DIN)
PN 25-40 / DN 100




Flange (DIN)
PN 16 / DN 100




| Pump type | Motor $P_2$ [KW] | XVM S Dimension [mm] DIN flange H1 | H2 | D1 | D2 | D3 | Net weight [kg] DIN flange |
|---|---|---|---|---|---|---|---|
| XVM S 64-1-1 | 4.0 | 563 | 898 | 219 | 162 | 280 | 81.94 |
| XVM S 64-1 | 5.5 | 563 | 923 | 234 | 199 | 300 | 95.82 |
| XVM S 64-2-2 | 7.5 | 646 | 1046 | 234 | 199 | 300 | 108.75 |
| XVM S 64-2-1 | 11.0 | 756 | 1201 | 268 | 215 | 350 | 142.33 |
| XVM S 64-2 | 11.0 | 756 | 1201 | 268 | 215 | 350 | 142.33 |
| XVM S 64-3-2 | 15.0 | 838 | 1327 | 268 | 215 | 350 | 157.34 |
| XVM S 64-3-1 | 15.0 | 838 | 1327 | 268 | 215 | 350 | 157.34 |
| XVM S 64-3 | 18.5 | 838 | 1373 | 317 | 242 | 350 | 192.34 |
| XVM S 64-4-2 | 18.5 | 921 | 1456 | 317 | 242 | 350 | 196.21 |
| XVM S 64-4-1 | 22.0 | 921 | 1500 | 317 | 242 | 350 | 206.97 |
| XVM S 64-4 | 22.0 | 921 | 1500 | 317 | 242 | 350 | 206.97 |
| XVM S 64-5-2 | 30.0 | 1003 | 1626 | 317 | 290 | 400 | 296.09 |
| XVM S 64-5-1 | 30.0 | 1003 | 1626 | 317 | 290 | 400 | 296.09 |
| XVM S 64-5 | 30.0 | 1003 | 1626 | 317 | 290 | 400 | 296.09 |
| XVM S 64-6-2 | 30.0 | 1086 | 1709 | 317 | 290 | 400 | 299.97 |
| XVM S 64-6-1 | 37.0 | 1086 | 1811 | 398 | 365 | 400 | 368.97 |
| XVM S 64-6 | 37.0 | 1086 | 1811 | 398 | 365 | 400 | 368.97 |
| XVM S 64-7-2 | 37.0 | 1168 | 1893 | 398 | 365 | 400 | 372.88 |
| XVM S 64-7-1 | 37.0 | 1168 | 1893 | 398 | 365 | 400 | 372.88 |
| XVM S 64-7 | 45.0 | 1172 | 1897 | 398 | 365 | 450 | 400.88 |
| XVM S 64-8-2 | 45.0 | 1255 | 1980 | 398 | 365 | 450 | 404.91 |
| XVM S 64-8-1 | 45.0 | 1255 | 1980 | 398 | 365 | 450 | 404.94 |

## Pumped Liquids

- XVM S pumps can handle a wide variety of liquids, each with its own characteristic.

## XVM S F version

- Non-corrosive liquids
- For fluid transfer, circulation and pressure boosting of cold or hot clean water.

## XVM S N version

- Industrial Liquids
- Light acids

- The fluids covered in the list are not complete, Data on the application limits of different pump materials when handling any of the listed fluids are considered to be the best choices. However, the table is intended as a general guide only, and cannot replace actual testing of the pumped fluids and pump materials under specific working conditions.
- When choosing the pump version, sufficient attention should be given to the flow medium, such as density, solidification point, viscosity as well as ex-protection requirement. The limits of applicability of the pumps, based on pressure and temperature must also be considered.

## Recommended

| Pumped fluid | "Fluid Concentration, temperature" | XVM S F | | XVM S N | |
|---|---|---|---|---|---|
| | | EPDM | Viton | EPDM | Viton |
| Acetic acid anhydride | 25 ℃ | | | • | |
| Alkaline cleaner | | • | | | |
| Aluminium sulphate | 10%, 25 ℃ | | | | • |
| Ammonia water (A. hydroxide) | 20%, 40 ℃ | • | | | |
| Ammonia hydrogen carbonate | 10%, 40 ℃ | • | | • | |
| Benzoic acid | 10%, 90 ℃ | | | | • |
| Boric acid | Unsaturated solution, 60 ℃ | | | | • |
| Butanol | 60 ℃ | • | | | |
| Calcium acetate | 30%, 50 ℃ | • | | | |
| Calcium hydroxide | Saturated solution, 50 ℃ | • | | | |
| Chromic acid | 1%, 20 ℃ | | | | • |
| Condensate | 90 ℃ | • | | | |
| Copper sulphate | Unsaturated solution, 60 ℃ | | | | • |
| Deionic (fully desalinated water) | 50 ℃ | | | • | |
| Ethanol | 100%, 20 ℃ | • | | | |
| Ehylene glycol/Diethylene glycol | 40%, 70 ℃ | • | • | • | • |
| Fixer | 25 ℃ | | | | • |
| Formic acid | 5%, 20 ℃ | | | • | |

| Pumped fluid | "Fluid Concentration, temperature" | XVM S F | | XVM S N | |
|---|---|---|---|---|---|
| | | EPDM | Viton | EPDM | Viton |
| Fruit juice | 50℃ | | | | |
| Glycerine | 50%, 50℃ | • | | | |
| Heating oil (Light) | | • | | | • |
| Hydraulic oil | 100%, 100℃ | | • | | |
| Isopropanol | | • | | | |
| Lactic acid | 10%, 20℃ | | | | • |
| Linoleic acid | 100%, 20℃ | • | | | |
| Linseed oil | 60℃ | | • | | |
| Liqueur | 60℃ | | | | • |
| Maize oil | 80℃ | | • | | |
| Maleic acid | 50%, 50℃ | | | | • |
| Methanol | 100%, 20℃ | • | | | |
| Motor oil | 100%, 80℃ | • | | | |
| Oil-water-mixture | 100 ℃ | | • | | |
| Oxalic acid | 1%, 20℃ | | | • | |
| Peanut oil | 100%, 80℃ | | • | | |
| Phosphoric acid | 20%, 20℃ | | | • | |
| Polyglycols | 90℃ | | • | | • |
| Polyethylene glycols | 40%, 70℃ | • | | | |
| Potassium carbonate | 10%, 60℃ | • | | | |
| Potassium hydrogen carbonate | 10%, 60℃ | • | | | |
| Potassium permanganate | 5%, 20℃ | | | • | |
| Potassium sulphate | Unsaturated solution, 80℃ | | | • | |
| Rapeseed oil | 100%, 80℃ | | • | | |
| Silicone oil | 100% | | • | | |
| Sodium carbonate | 10%, 60℃ | | | • | |
| Sodium hydroxide | 25%, 50℃ | | | • | |
| Sodium nitrate | Unsaturated solution, 80℃ | | | • | |
| Sodium phosphate | 5%, 100℃ | | | • | |
| Sodium sulphate | 10%, 60℃ | | | • | |
| Sulphuric acid | 5%, 25℃ | | | | • |
| Water | | | | | |
| Swimming pool water | 35℃ | • | | • | |
| Deionic | 50℃ | | | • | |
| Distilled water | 50℃ | | | • | |
| Decarbonated water | | | | • | |
| Soft water | | | | • | |
| Heating water | | | | • | |
| Boiler water | | | | • | |
| Pure water | | | | • | |
| Rinsing water | | • | | • | |

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