

**50 Hz**



# HM..P - HM..S - HM..N e-HM™ Series

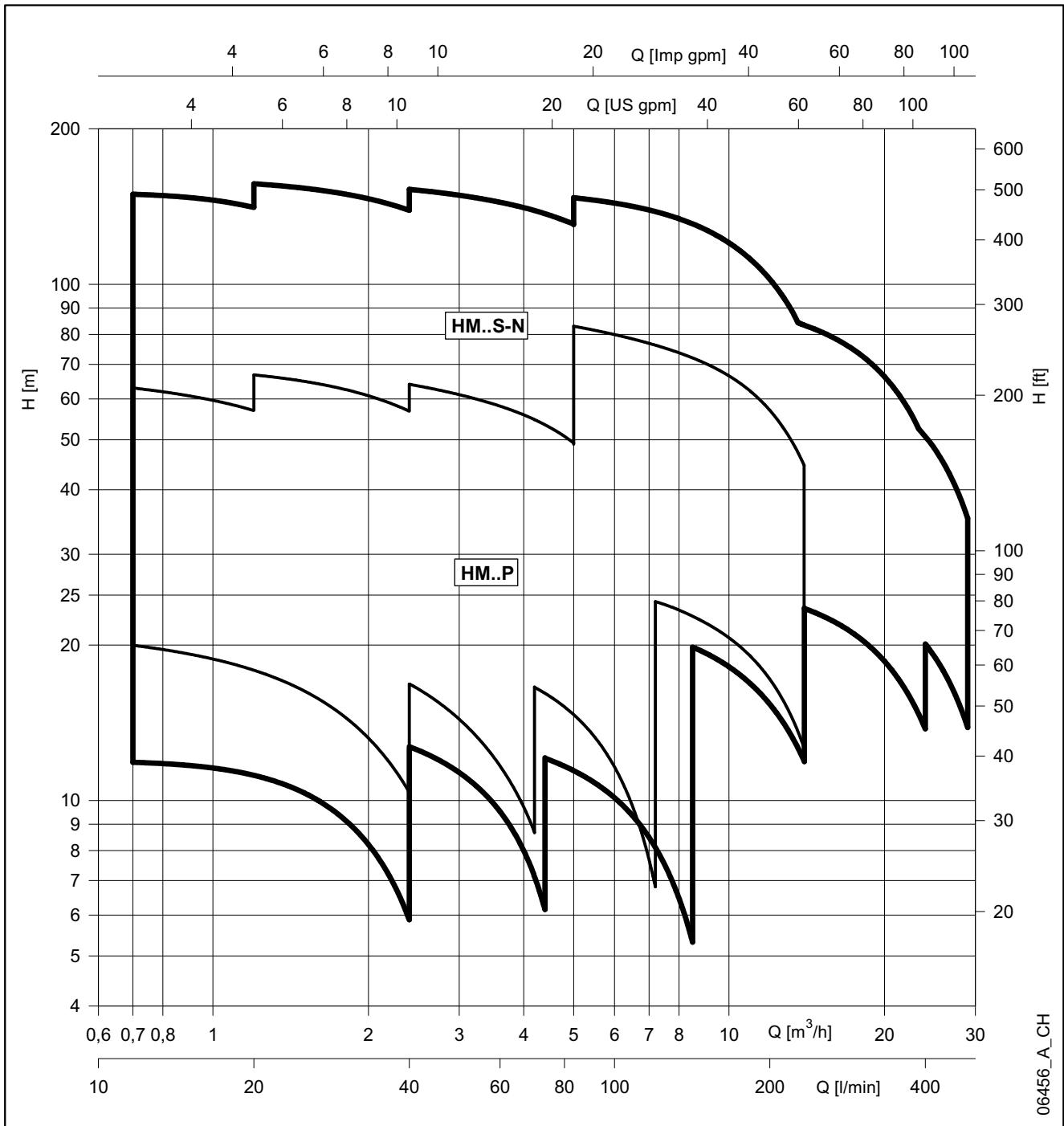
THREADED HORIZONTAL MULTISTAGE CENTRIFUGAL ELECTRIC PUMPS  
EQUIPPED WITH IE3 MOTORS

**ErP 2009/125/EC**

Cod. 191003921 Rev. B Ed.11/2013

 **LOWARA**  
a xylem brand

**e-HM™ SERIES**  
**HYDRAULIC PERFORMANCE AT 50 Hz**



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## **e-HM™ SERIES**

### **GENERAL INTRODUCTION**

Our customers are central to our business.

Many years of collaboration with them across the different markets and all over the world has taught us that the Building Services market requires specific pump design to meet the challenge of the energy saving and the industrial segments need customized and reliable compact pumps to ensure top performance of the systems and continuous quality of the production.

Therefore we have developed a wide range of horizontal multistage pumps, the e-HM™, to give an appropriate and dedicated solution to special applications and installations in the industry and in the building services market.



#### **Pump design**

The e-HM™ is a non-self-priming, end-suction horizontal multistage, high pressure centrifugal pump, with axial threaded inlet and radial threaded outlet. The pumps are close-coupled design and are equipped with non-standard Lowara motors. The e-HM™ is equipped with mechanical seal.

The e-HM™ are highly modular pumps that are fitted with an innovative hydraulic design that secures high efficiency performances and an increased Mean Time Between Failure.

The e-HM™ are available in two different configurations:

- "Compact" design for sizes 1HM, 3HM and 5HM up to 6 stages
- "Sleeve" design for sizes 1HM, 3HM and 5HM from 7 stages and above; any model of 10HM, 15HM and 22HM.

The "Compact" design is made of one single piece fabricated stainless steel pump body directly connected to the motor flange. The "Compact" has only one O-ring for the sealing of the casing that clearly reduces the leakages possibilities.

The "Sleeve" design is made of an external stainless steel TIG welded sleeve and of separate suction casing kept together with the mean of an aluminum casted pump bracket and of stainless steel tie rods screwed in the motor flange.

The e-HM™ is available in three different materials combination:

- HM..P: stainless steel pump body (EN 1.4301/ AISI 304) with Noryl™ impeller for sizes 1HM, 3HM, 5HM and 10HM up to 6 stages.
- HM..S: full stainless steel (EN 1.4301/ AISI 304) – any models.
- HM..N: full stainless steel (EN 1.4401/ AISI 316) – any models.

#### **Motor**

The e-HM™ are equipped with surface motors designed and manufactured in accordance with EN standards.

The e-HM™ series can be equipped as well with variable speed drivers such as the Teknospeed and the Hydrovar™.

#### **Range declination**

The e-HM™ are available as:

- Fix speed Electric pump.
- Variable speed system with Teknospeed driver embedded.

## SERIE e-HM™

### APPLICATIONS, BENEFITS – BUILDING SERVICES

The e-HM™ series and the different available configurations have been designed to cover a wide range of applications in the residential and small commercial building services from the water supply to pressure boosting as well as heating and cooling applications.

#### Applications

The e-HM™ series could be installed both in single private-own house and in small/medium residential buildings.

The e-HM™ series will be as well your preferred choice for water supply and pressure boosting in small block offices and shops. The e-HM™ series could be finally installed as well for small/medium irrigation installation.

#### Benefits

**Payback:** Installing the e-HM™ series guarantee a very short payback period as the premium efficiency makes the e-HM™ the lowest energy consuming fixed speed pump on the market.

Combined with Teknospeed makes the pump paying for itself in very quickly. (43% of reduced operating cost per year).

**Reliability:** The e-HM™ series secures as well reliable operations over time thanks to its robust and innovative design. This could be increased with the installation of the Teknospeed: variable speed operation reduces mechanical stress on the pump components and water hammering during stopping.

**Comfort:** The e-HM™ series guarantee as well an increased user comfort thanks to very silent operation. The combination of the e-HM™ series with the Teknospeed will secure constant pressures at any points of water in your building and constant temperatures even when other taps are opened!



**For the installers,** the e-HM™ series are easy to install and the best choice for the end user in term of energy savings. The combination of the e-HM™ with the Teknospeed is the guarantee of quick and easy installation as the system is supplier with cable, plug and pressure transmitter. Only small vessels are required.

#### Features

- Compact design with best-in class performances.
- Wide range of performances with 6 sizes and flow up to 29 m<sup>3</sup>/h.
- Nominal pressure up to 10 bar with Noryl™ impellers and 16 bar with stainless steel impellers.
- Versatile design of the smaller sizes (up to 5HM).
  - Compact version with Noryl™ impellers for restricted space installation.
  - High efficiency version with stainless steel impellers when energy saving is a must.
- Robust and silent design of the larger sizes (from 10HM to 22HM) due the sleeve configuration.
- IE3 Lowara motors: high performances and silent operations.
- Stainless steel material for pump body and main components in contact with the pumped liquid.
- “Essential O-ring design” that highly reduces the sealing weaknesses (1 O-Ring for Compact, 2 for Sleeve).

## e-HM™ SERIES APPLICATIONS, BENEFITS – INDUSTRY

The e-HM™ series and the different available configurations and standard options have been designed to cover a wide range of applications in industry from washing and cleaning machines, to cooling and heating applications, thru water treatment and filtration processes.

### Applications

The e-HM™ series could be installed either in machines where compactness and high performances are a must or within industrial processes where the user looks for a reliable modular design with a restricted vertical footprint.

The e-HM™ series offers as well a wide range of standard options to fit every single requirement coming from the industry. The different material and configuration available allow e-HM™ series working with a wide range of liquid temperature starting -30°C to +120°C.

### Benefits

**Reliability:** The e-HM™ series have been design to withstand heavy duty applications in Industry. For instance, e-HM™ balanced impeller helps decreasing the axial thrust withstand by the motor bearing extending its life time; pump body thickness has been increased by 20% to support heavy duty operation.

**Versatility:** The e-HM™ series have been designed to be modular, offering two different mechanical configurations (Very compact or highly efficient design) and multiple material executions (from Noryl™ impeller and AISI 304 pump body to full AISI 316 execution) and surface treatment (electropolishing and passivation). Multiple standard options make e-HM™ fitting in many different applications.

**Performances:** The e-HM™ series provide best-in class efficiency up to 72% that means 30% energy saving in average compare to similar pump design from the market. The e-HM™ series will be clearly your preferred choice to meet any efficiency requirements or simply to save money in your installation and processes.

**A global platform:** the e-HM™ series are assembled in different factories across the world to make e-HM™ always closer to our customers. Beyond our commitment to reduce the carbon footprint of e-HM™, this global platform secure that the same design is available everywhere with the same quality processes.

### Features

- Wide range of performances with 6 sizes, flow up to 29 m<sup>3</sup>/h, pressure up to 159 meters.
- Nominal pressure up to 10 bar with Noryl™ impellers and 16 bar with stainless steel impellers
- More than 85% of the range has the same suction height (90mm) for easy installation or system upgrade.
- Wide range of temperatures for pumped liquid: -30°C to +120°C (with stainless steel impellers).
- Wide range of voltages for worldwide applications.
- Availability of UL (cURus) motor version for North American market (230/460V 60 Hz with 9 pins control box.
- "Essential O-ring design" that highly reduces the sealing weaknesses (1 O-Ring for Compact, 2 for Sleeve).
- IE3 Lowara motors: high performances and silent operations.



## e-HM™ SERIES GENERAL CHARACTERISTICS

| HM..P SERIES                            | 1                                      | 3        | 5        | 10    |
|---|--|----------|----------|-------|
| Max efficiency flow (m <sup>3</sup> /h) | 1,8                                    | 3,0      | 5,0      | 10,6  |
| Flow range (m <sup>3</sup> /h)          | 0,7÷2,4                                | 1,2÷4,2  | 2,4÷7,2  | 5÷14  |
| Maximum head (m)                        | 69,3                                   | 72,7     | 73,8     | 91,7  |
| Motor power (kW)                        | 0,30÷0,75                              | 0,30÷1,1 | 0,40÷1,5 | 1,1÷3 |
| Max $\eta$ (%) of pump                  | 35                                     | 46       | 55       | 63    |
| Temperature pumped liquid (°C)          | -30... +60/90 (depending on the model) |          |          |       |

1-10hmp\_2p50-en\_b\_tg

| HM..S - HM..N SERIES                    | 1  | 3        | 5       | 10       | 15      | 22      |
|---|--|----------|---------|----------|---------|---------|
| Max efficiency flow (m <sup>3</sup> /h) | 1,6  | 3,0      | 5,8     | 10,6     | 17,3    | 20,0    |
| Flow range (m <sup>3</sup> /h)          | 0,7÷2,4                                    | 1,2÷4,4  | 2,4÷8,5 | 5÷14     | 8÷24    | 11÷29   |
| Maximum head (m)                        | 151  | 159      | 159     | 158      | 102     | 76,4    |
| Motor power (kW)                        | 0,30÷1,5                                   | 0,30÷2,2 | 0,30÷3  | 0,75÷5,5 | 1,5÷5,5 | 2,2÷5,5 |
| Max $\eta$ (%) of pump                  | 49   | 58       | 69      | 71       | 72      | 71      |
| Temperature pumped liquid (°C)          | -30... +60/90/120 (depending on the model) |          |         |          |         |         |

1-22hm\_2p50-en\_b\_tc

## CONNECTIONS

| TYPE                          |          | HM..P - HM..S - HM..N SERIES |    |        |        |        |        |
|-------------------------------|----------|------------------------------|----|--------|--------|--------|--------|
|                               |          | 1                            | 3  | 5      | 10     | 15     | 22     |
| Rp thread<br>(standard)       | suction  | 1                            | 1  | 1 1/4  | 1 1/2  | 2      | 2      |
|                               | delivery | 1                            | 1  | 1      | 1 1/4  | 1 1/2  | 1 1/2  |
| NPT thread<br>(on request)    | suction  | 1"                           | 1" | 1" 1/4 | 1" 1/2 | 2"     | 2"     |
|                               | delivery | 1"                           | 1" | 1"     | 1" 1/4 | 1" 1/2 | 1" 1/2 |
| DN Victaulic®<br>(on request) | suction  | 25                           | 25 | 32     | 40     | 50     | 50     |
|                               | delivery | 25                           | 25 | 25     | 32     | 40     | 40     |

1-22hm\_2p50-en\_b\_tc

## ELECTRIC PUMP NOISE

| POWER | NOISE     |
|-------|-----------|
| kW    | LpA<br>dB |
| 0,30  | 52        |
| 0,40  | 52        |
| 0,50  | 52        |
| 0,55  | 55        |
| 0,75  | 55        |
| 0,95  | 55        |
| 1,1   | 60        |
| 1,5   | 60        |
| 2,2   | 60        |
| 3     | 60        |
| 4     | 60        |
| 5,5   | 60        |

1-22hm\_mot\_2p50-en\_a\_tr

The table show the mean sound pressure (Lp) measured as per Curve A (Standard ISO 1680). Noise values were measured with the 50 Hz running with a tolerance of 3 dB (A).

## STORAGE AND TRANSPORT TEMPERATURE

from -40°C to +60°C.



## e-HM™ SERIES

### High efficiency horizontal multistage pump

### MARKET SECTORS

BUILDING SERVICES.  
INDUSTRY.



### APPLICATIONS

- Pressure boosting and water supply systems.
- Washing and cleaning industry including vehicles washing.
- Circulation of hot and cold liquids (like water, water and glycol) for heating, cooling and conditioning systems.
- Water treatment applications.
- Handling of moderately aggressive liquids.

### SPECIFICATIONS

#### PUMP

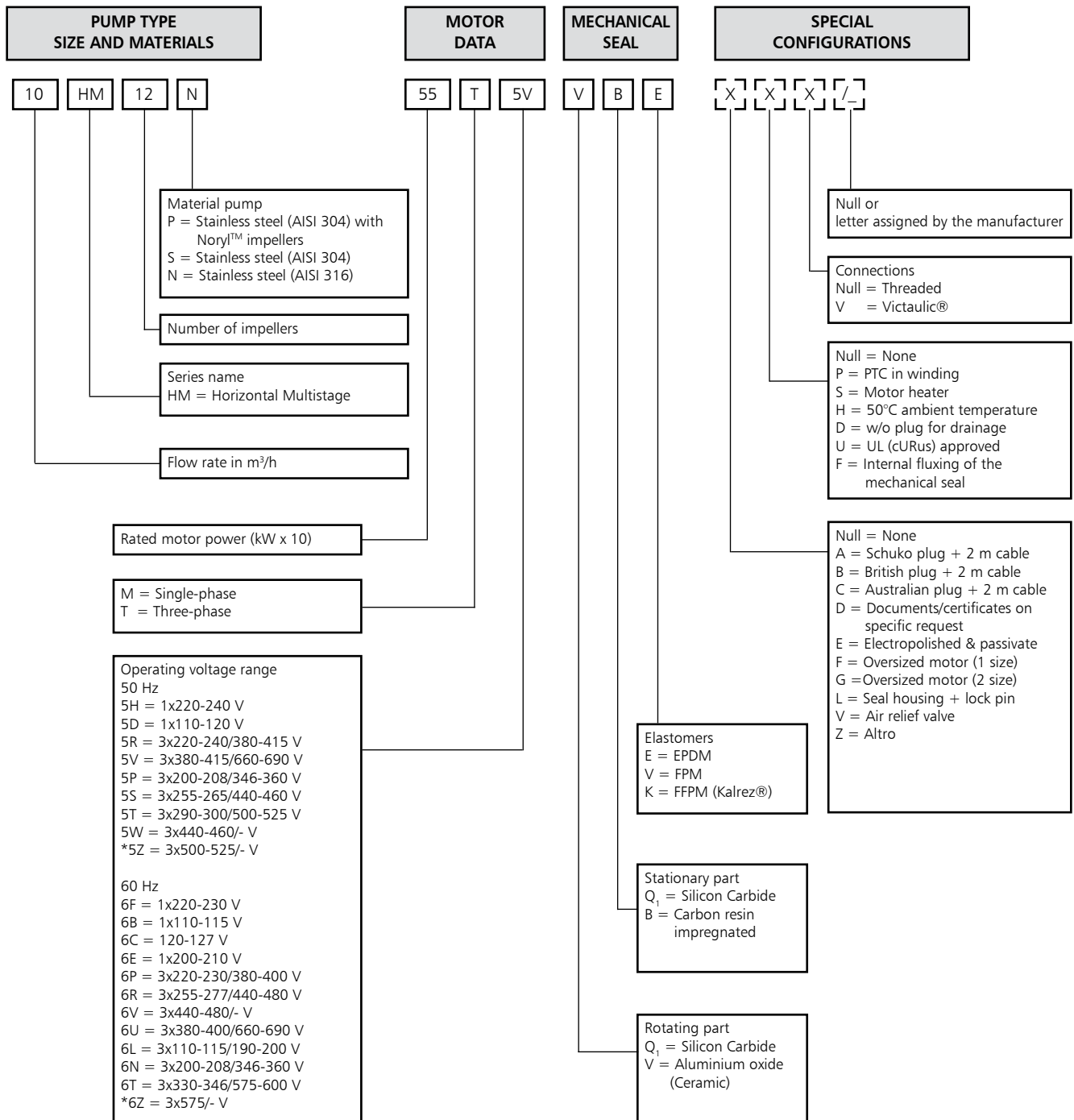
- Flow rate: up to 29 m<sup>3</sup>/h.
- Head: up to 159 m.
- Ambient temperature:
  - from -15°C to +50°C for three-phase version.
  - from -15°C to +45°C for single-phase version (from -15°C to +40°C for models 1HM06S/N, 3HM03S/N, 3HM02P, 5HM02S/N and for all models equipped with 0,95 kW motor).
- Temperature of the pumped liquid:
  - minimum from -10°C to -30°C according to gasket material.
  - maximum +90°C for three-phase version and uses according to EN 60335-2-41.
  - +120°C for three-phase version with stainless steel impellers (HM..S, HM..N) and uses other than EN 60335-2-41.
  - +60°C for single-phase version.
- Maximum operating pressure:
  - 10 bar (PN 10) for pumps with Noryl™ impeller.
  - 16 bar (PN 16) for pumps with stainless steel impeller.
- Connections: Rp threaded for both suction and discharge manifold.
- Hydraulic performances compliant with ISO 9906:2012 - Grade 3B (ex ISO 9906: 1999 - Annex A).

#### MOTOR

- Electric short-circuit squirrel-cage motor (TEFC), enclosed construction, air-cooled.
- 2-pole.
- IP 55 protection grade as motor only (EN 60034-5).  
IP X5 as electric pump (EN 60335-1).
- Insulation class 155 (F).
- Performances according to EN 60034-1.
- Standard voltage:
  - Single-phase: 220-240 V, 50 Hz.
  - Three-phase: 220-240/380-415 V, 50 Hz for powers up to 3 kW.
  - 380/415/660-690 V, 50 Hz for powers above 3 kW.
- Three-phase from 0,75 to 5,5 kW efficiency class IE3.

**All pumps are certified for drinking water use (WRAS and ACS).**

## e-HM™ SERIES IDENTIFICATION CODE



EXAMPLE: 10HM12N55T5VQB

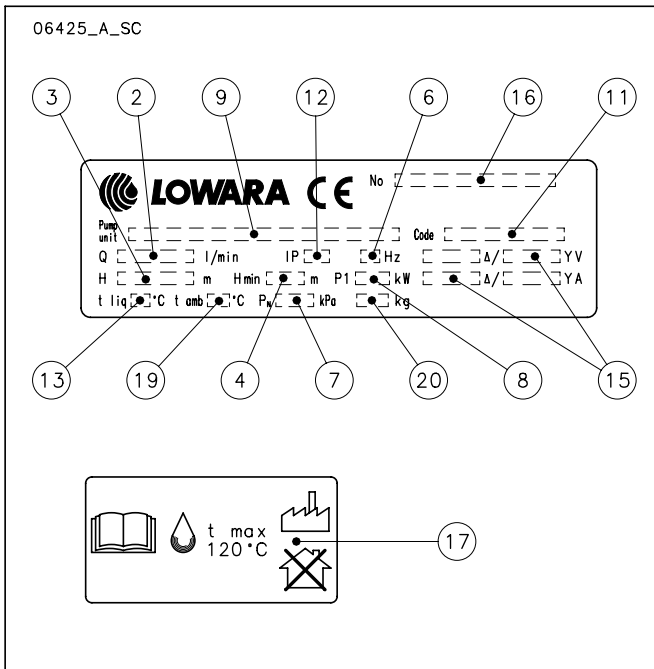
HM series electric pump, flow rate 10 m³/h, number of impellers 12, N version (AISI 316), rated motor power 5,5 kW, three-phase 50 Hz, voltage 380-415/660-690 V, Silicon/Carbide/EPDM mechanical seal.

\* For uses other than EN 60335-2-41.

For special configurations please contact the sales network.

**e-HM™ SERIES**  
**ELECTRIC PUMP RATING PLATE**

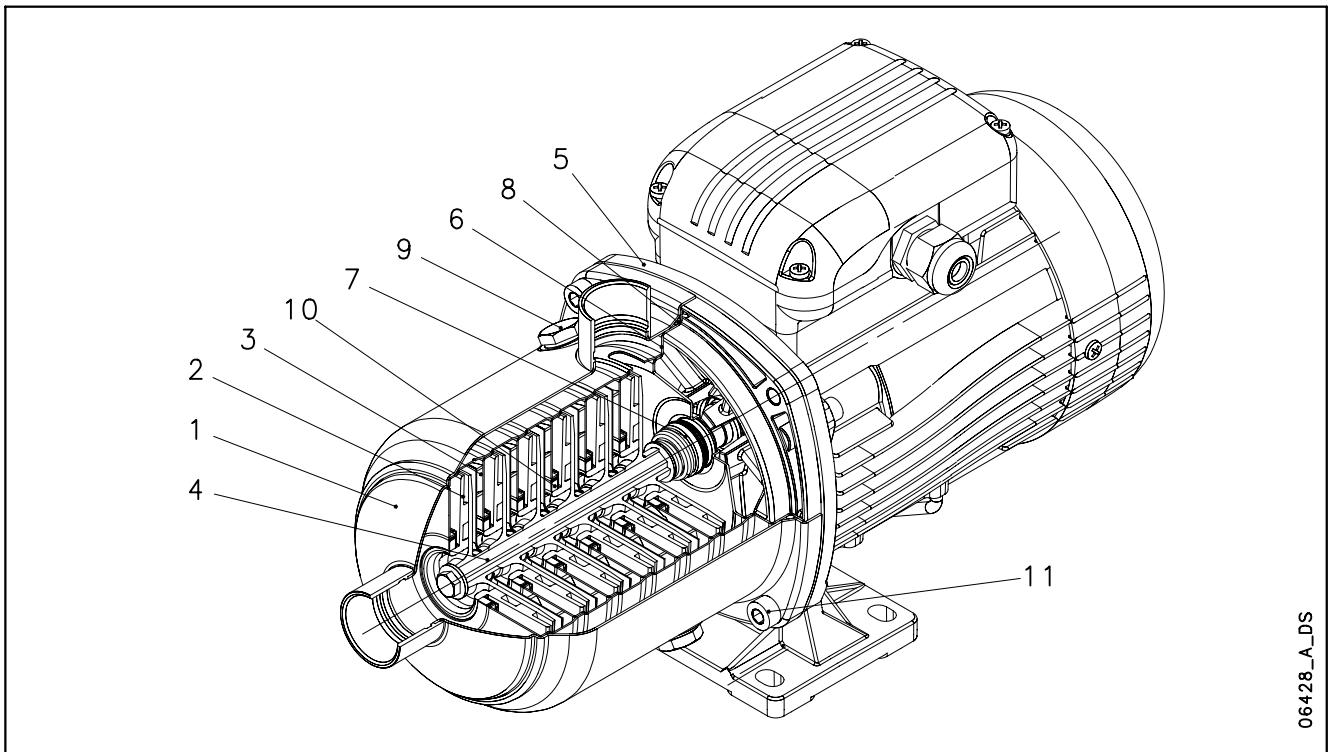
**LEGEND**



- 2 - Capacity range
- 3 - Head range
- 4 - Minimum head (EN 60335-2-41)
- 6 - Frequency
- 7 - Maximum operating pressure
- 8 - Electric pump unit absorbed power
- 9 - Pump / electric pump unit type
- 11 - Electric pump unit / pump part number
- 12 - Protection degree
- 13 - Maximum operating liquid temperature (uses as EN 60335-2-41)
- 15 - Rated voltage range
- 16 - Serial number (date + progressive number)
- 17 - Maximum operating liquid temperature (uses other than EN 60335-2-41)
- 19 - Maximum operating ambient temperature
- 20 - Electric pump weight

## 1, 3, 5 HM..P SERIES

### ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



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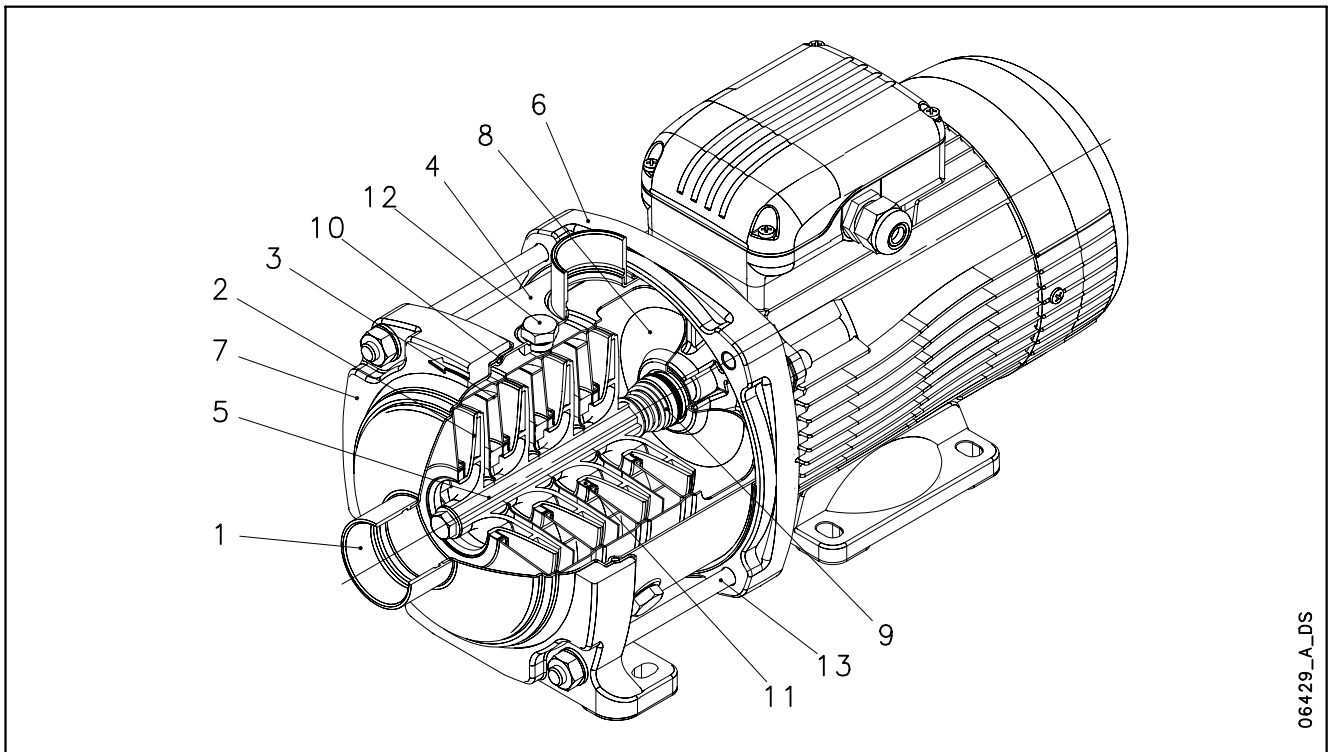
### TABLE OF MATERIALS

| REF. N. | NAME               | MATERIAL                | REFERENCE STANDARDS                 |          |
|---------|--------------------|-------------------------|-------------------------------------|----------|
|         |                    |                         | EUROPE                              | USA      |
| 1       | Pump body          | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 2       | Impeller           | Technopolymer (Noryl™)  |                                     |          |
| 3       | Diffuser           | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 5       | Shaft              | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 5       | Adapter            | Aluminium               | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -        |
| 6       | Seal housing       | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 7       | Mechanical seal    | Ceramic / Carbon / EPDM |                                     |          |
| 8       | Elastomers         | EPDM                    |                                     |          |
| 9       | Fill / drain plugs | Nickel-plated brass     | EN 12164-CuZn39Pb3 (CW614N)         | -        |
| 10      | Wear ring          | Technopolymer (PPS)     |                                     |          |
| 11      | Bolts and screws   | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |

1-3-5hm-p-en\_a\_tm

## 10 HM..P SERIES

### ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



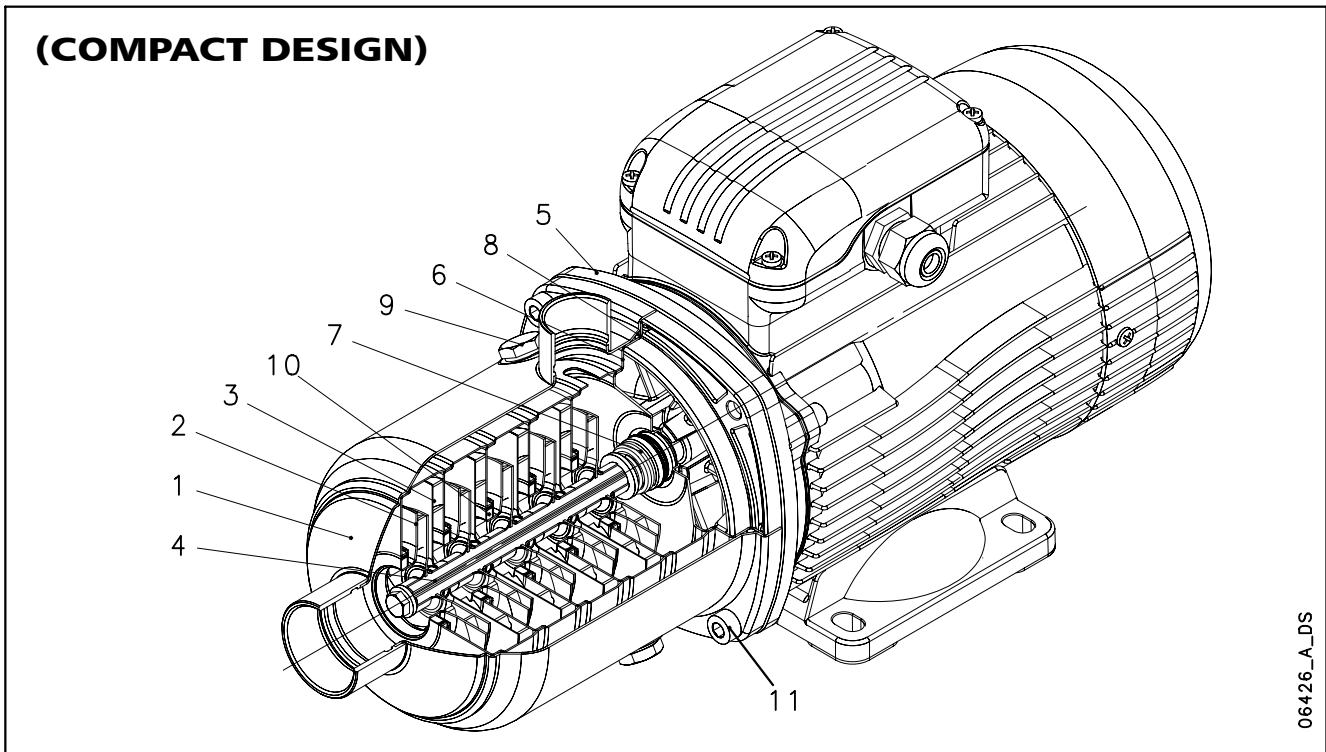
06429\_A\_DS

### TABLE OF MATERIALS

| REF. N. | NAME               | MATERIAL                | REFERENCE STANDARDS                 |          |
|---------|--------------------|-------------------------|-------------------------------------|----------|
|         |                    |                         | EUROPE                              | USA      |
| 1       | Head               | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 2       | Impeller           | Technopolymer (Noryl™)  |                                     |          |
| 3       | Diffuser           | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 4       | Outer sleeve       | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 5       | Shaft              | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 6       | Adapter            | Aluminium               | EN 1706-AC-ALSi11Cu2 (Fe) (AC46100) | -        |
| 7       | Ring with foot     | Aluminium               | EN 1706-AC-ALSi11Cu2 (Fe) (AC46100) | -        |
| 8       | Seal housing       | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 9       | Mechanical seal    | Ceramic / Carbon / EPDM |                                     |          |
| 10      | Elastomers         | EPDM                    |                                     |          |
| 11      | Wear ring          | Technopolymer (PPS)     |                                     |          |
| 12      | Fill / drain plugs | Stainless steel         | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316 |
| 13      | Tie rods           | Stainless steel         | EN 10088-1-X17CrNi16-2 (1.4057)     | AISI 431 |

10hm-p-en\_a\_tm

## 1, 3, 5 HM..S - HM..N SERIES ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



### TABLE OF MATERIALS HM..S SERIES

| REF. N. | NAME               | MATERIAL                | REFERENCE STANDARDS                 |          |
|---------|--------------------|-------------------------|-------------------------------------|----------|
|         |                    |                         | EUROPE                              | USA      |
| 1       | Pump body          | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 2       | Impeller           | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 3       | Diffuser           | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 4       | Shaft              | Stainless steel         | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316 |
| 5       | Adapter            | Aluminium               | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -        |
| 6       | Seal housing       | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 7       | Mechanical seal    | Ceramic / Carbon / EPDM |                                     |          |
| 8       | Elastomers         | EPDM                    |                                     |          |
| 9       | Fill / drain plugs | Stainless steel         | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316 |
| 10      | Wear ring          | Technopolymer (PPS)     |                                     |          |
| 11      | Bolts and screws   | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |

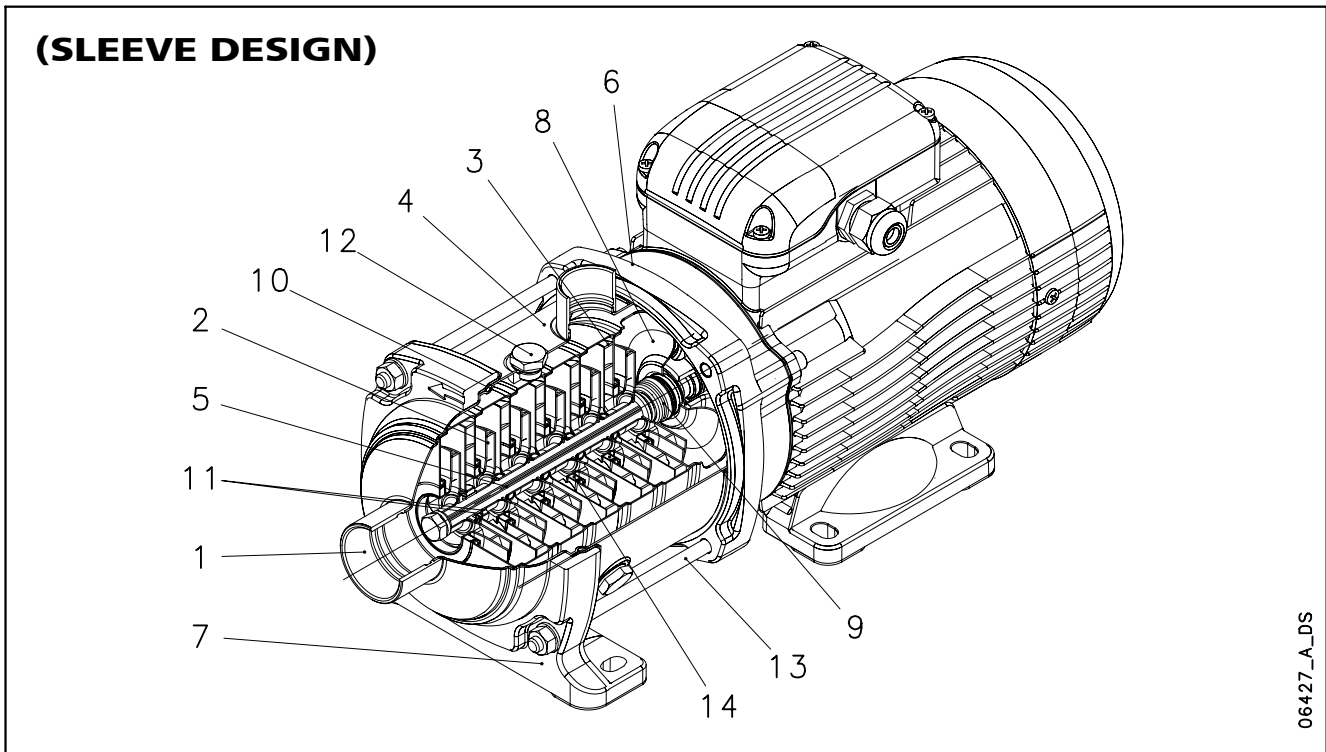
1-3-5hm-cp-s-en\_a\_tm

### TABLE OF MATERIALS HM..N SERIES

| REF. N. | NAME               | MATERIAL                | REFERENCE STANDARDS                 |           |
|---------|--------------------|-------------------------|-------------------------------------|-----------|
|         |                    |                         | EUROPE                              | USA       |
| 1       | Pump body          | Stainless steel         | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 2       | Impeller           | Stainless steel         | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 3       | Diffuser           | Stainless steel         | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 4       | Shaft              | Stainless steel         | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316  |
| 5       | Adapter            | Aluminium               | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -         |
| 6       | Seal housing       | Stainless steel         | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 7       | Mechanical seal    | Ceramic / Carbon / EPDM |                                     |           |
| 8       | Elastomers         | EPDM                    |                                     |           |
| 9       | Fill / drain plugs | Stainless steel         | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316  |
| 10      | Wear ring          | Technopolymer (PPS)     |                                     |           |
| 11      | Bolts and screws   | Stainless steel         | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304  |

1-3-5hm-cp-n-en\_a\_tm

## 1, 3, 5, 10, 15, 22 HM..S - HM..N SERIES ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



### TABLE OF MATERIALS HM..S SERIES

| REF. N. | NAME                     | MATERIAL  | REFERENCE STANDARDS                 |          |
|---------|--------------------------|---|-------------------------------------|----------|
|         |                          |   | EUROPE                              | USA      |
| 1       | Head                     | Stainless steel   | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 2       | Impeller                 | Stainless steel   | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 3       | Diffuser                 | Stainless steel   | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 4       | Outer sleeve             | Stainless steel   | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 5       | Shaft                    | Stainless steel   | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316 |
| 6       | Adapter                  | Aluminium   | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -        |
| 7       | Ring with foot           | Aluminium   | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -        |
| 8       | Seal housing             | Stainless steel   | EN 10088-1-X5CrNi18-10 (1.4301)     | AISI 304 |
| 9       | Mechanical seal          | Ceramic / Carbon / EPDM (PN10) - Silicon Carbide/Carbon/EPDM (PN16) |                                     |          |
| 10      | Elastomers               | EPDM  |                                     |          |
| 11      | Shaft sleeve and bushing | Tungsten carbide  |                                     |          |
| 12      | Fill / drain plugs       | Stainless steel   | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316 |
| 13      | Tie rods                 | Stainless steel   | EN 10088-1-X17CrNi16-2 (1.4057)     | AISI 431 |
| 14      | Wear ring                | Technopolymer (PPS)   |                                     |          |

### TABLE OF MATERIALS HM..N SERIES

1-22hm-cm-s\_a\_tm

| REF. N. | NAME                     | MATERIAL  | REFERENCE STANDARDS                 |           |
|---------|--------------------------|---|-------------------------------------|-----------|
|         |                          |   | EUROPE                              | USA       |
| 1       | Head                     | Stainless steel   | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 2       | Impeller                 | Stainless steel   | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 3       | Diffuser                 | Stainless steel   | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 4       | Outer sleeve             | Stainless steel   | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 5       | Shaft                    | Stainless steel   | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316  |
| 6       | Adapter                  | Aluminium   | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -         |
| 7       | Ring with foot           | Aluminium   | EN 1706-AC-AISI11Cu2 (Fe) (AC46100) | -         |
| 8       | Seal housing             | Stainless steel   | EN 10088-1-X2CrNiMo17-12-2 (1.4404) | AISI 316L |
| 9       | Mechanical seal          | Ceramic / Carbon / EPDM (PN10) - Silicon Carbide/Carbon/EPDM (PN16) |                                     |           |
| 10      | Elastomers               | EPDM  |                                     |           |
| 11      | Shaft sleeve and bushing | Tungsten carbide  |                                     |           |
| 12      | Fill / drain plugs       | Stainless steel   | EN 10088-1-X5CrNiMo17-12-2 (1.4401) | AISI 316  |
| 13      | Tie rods                 | Stainless steel   | EN 10088-1-X17CrNi16-2 (1.4057)     | AISI 431  |
| 14      | Wear ring                | Technopolymer (PPS)   |                                     |           |

1-22hm-cam-n-en\_a\_tm

**e-HM™ SERIES  
MECHANICAL SEALS**

**LIST OF MATERIALS ACCORDING TO EN 12756**

| POSITION 1 - 2                   | POSITION 3         | POSITION 4 - 5 |
|----------------------------------|--------------------|----------------|
| V : Aluminium oxide (Ceramic)    | E : EPDM           | G : AISI 316   |
| Q <sub>1</sub> : Silicon Carbide | V : FPM            |                |
| B : Carbon, resin-impregnated    | K : FFPM (Kalrez®) |                |

1-22hm\_ten-mec-en\_a\_tm

**TYPE OF SEAL**

| TYPE  | POSITION           |                      |                 |              |                       | *TEMPERATURE<br>(°C) | **OPERATING<br>PRESSURE |
|---|--------------------|----------------------|-----------------|--------------|-----------------------|----------------------|-------------------------|
|   | 1<br>ROTATING PART | 2<br>STATIONARY PART | 3<br>ELASTOMERS | 4<br>SPRINGS | 5<br>OTHER COMPONENTS |                      |                         |
| <b>STANDARD MECHANICAL SEAL</b>                 |                    |                      |                 |              |                       |                      |                         |
| VBEGG   | V                  | B                    | E               | G            | G                     | -30 + 90             | PN10                    |
| <b>OTHER TYPES OF AVAILABLE MECHANICAL SEAL</b> |                    |                      |                 |              |                       |                      |                         |
| VBVGG   | V                  | B                    | V               | G            | G                     | -10 + 90             | PN10                    |
| Q <sub>1</sub> Q <sub>1</sub> VGG               | Q <sub>1</sub>     | Q <sub>1</sub>       | V               | G            | G                     | -10 + 120            | PN10                    |
| Q <sub>1</sub> Q <sub>1</sub> KGG               | Q <sub>1</sub>     | Q <sub>1</sub>       | K               | G            | G                     | -20 + 120            | PN10                    |
| Q <sub>1</sub> Q <sub>1</sub> EGG               | Q <sub>1</sub>     | Q <sub>1</sub>       | E               | G            | G                     | -30 + 120            | PN10                    |
| <b>STANDARD MECHANICAL SEAL</b>                 |                    |                      |                 |              |                       |                      |                         |
| Q <sub>1</sub> BEGG                             | Q <sub>1</sub>     | B                    | E               | G            | G                     | -30 + 120            | PN16                    |
| <b>OTHER TYPES OF AVAILABLE MECHANICAL SEAL</b> |                    |                      |                 |              |                       |                      |                         |
| Q <sub>1</sub> Q <sub>1</sub> VGG               | Q <sub>1</sub>     | Q <sub>1</sub>       | V               | G            | G                     | -10 + 90             | PN16                    |
| Q <sub>1</sub> VBVGG                            | Q <sub>1</sub>     | B                    | V               | G            | G                     | -10 + 120            | PN16                    |
| Q <sub>1</sub> Q <sub>1</sub> KGG               | Q <sub>1</sub>     | Q <sub>1</sub>       | K               | G            | G                     | -20 + 90             | PN16                    |
| Q <sub>1</sub> BKGG                             | Q <sub>1</sub>     | B                    | K               | G            | G                     | -20 + 120            | PN16                    |
| Q <sub>1</sub> Q <sub>1</sub> EGG               | Q <sub>1</sub>     | Q <sub>1</sub>       | E               | G            | G                     | -30 + 90             | PN16                    |

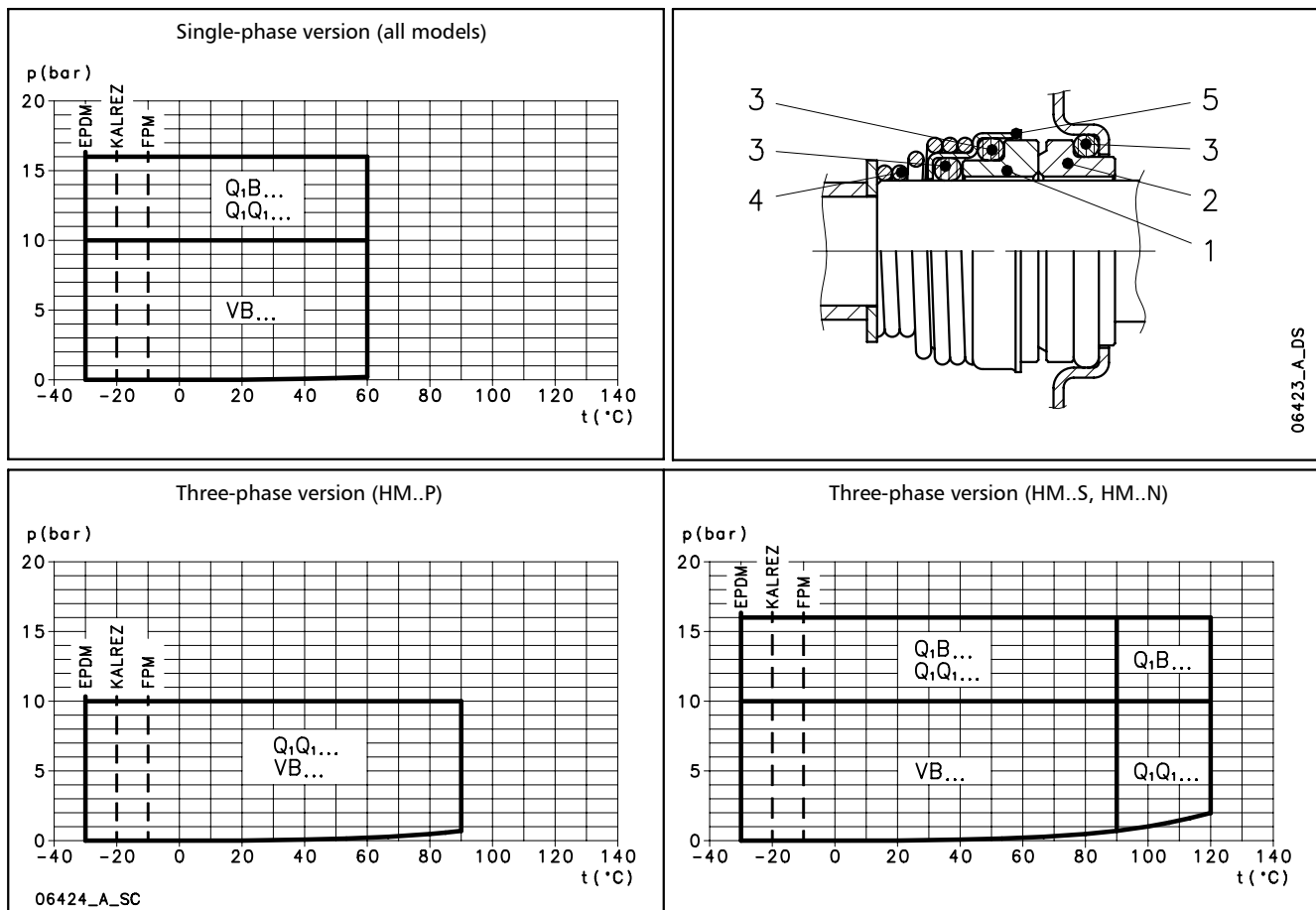
\* For all single-phase versions limit the temperature to +60°C.

1-22hm\_tipi-ten-mec-en\_b\_tc

For three-phase HM..P limit the temperature to +90°C.

\*\* Refer to the PN column of the DIMENSIONS AND WEIGHTS tables.

**PRESSURE/TEMPERATURE APPLICATION LIMITS FOR COMPLETE PUMP**





## COMPATIBILITY CHART FOR MATERIALS IN CONTACT WITH MOST COMMONLY USED LIQUIDS

| LIQUID                                 | CONCENTRATION (%) | TEMPERATURE MIN/MAX (°C) | SPECIF. WEIGHT (Kg/dm <sup>3</sup> ) | VERSIONS |       |       | RECOMMEND. SEAL | ELASTOM. |
|--|-------------------|--------------------------|--------------------------------------|----------|-------|-------|-----------------|----------|
|  |                   |                          |                                      | HM..P    | HM..S | HM..N |                 |          |
| Acetic acid                            | 80                | -10 +70                  | 1,05                                 | •        | •     | •     | Q1BEGG          | E        |
| Alkaline degreaser                     | 5                 | 80                       |                                      |          | •     |       | Q1BVGG          | V        |
| Aluminium sulfate                      | 30                | -5 +50                   | 2,71                                 |          |       | •     | Q1Q1VGG         | V        |
| Ammonia in water                       | 25                | -20 +50                  | 0,99                                 | •        | •     | •     | Q1BEGG          | E        |
| Ammonium sulfate                       | 10                | -10 +60                  | 1,77                                 | •        |       | •     | Q1Q1VGG         | V        |
| Benzoic acid                           | 70                | 0 +70                    | 1,31                                 |          | •     | •     | Q1BKGG          | K        |
| Boric acid                             | saturated         | -10 +90                  | 1,43                                 |          | •     | •     | Q1BEGG          | E        |
| Butyl alcohol                          | 100               | -5 +80                   | 0,81                                 | •        | •     | •     | Q1Q1KGG         | K        |
| Caustic soda                           | 25                | 0 +70                    | 2,13                                 | •        | •     | •     | Q1BVGG          | V        |
| Chloroform                             | 100               | -10 +30                  | 1,48                                 | •        | •     | •     | Q1BEGG          | E        |
| Citric acid                            | 5                 | -10 +70                  | 1,54                                 |          | •     | •     | Q1Q1VGG         | V        |
| Cleaning products                      | 10                | -5 +100                  |                                      |          | •     | •     | Q1BEGG          | E        |
| Copper sulfate                         | 20                | 0 +30                    | 2,28                                 | •        |       | •     | Q1BEGG          | E        |
| Cutting fluid                          | 100               | -5 +110                  | 0,90                                 | •        | •     | •     | Q1BEGG          | E        |
| Deionised, demineralised water         | 100               | -25 +110                 | 1                                    | •        | •     | •     | Q1BEGG          | E        |
| Denatured alcohol                      | 100               | -5 +70                   | 0,81                                 | •        | •     | •     | Q1BEGG          | E        |
| Diathermic oil                         | 100               | -5 +110                  | 0,90                                 | •        | •     | •     | Q1BEGG          | E        |
| Emulsion oil and water                 | any               | -5 +90                   |                                      | •        | •     | •     | Q1BEGG          | E        |
| Ethyl alcohol                          | 100               | -5 +40                   | 0,81                                 | •        | •     | •     | Q1BEGG          | E        |
| Ethylene glycol                        | 30                | -30 +120                 |                                      | •        |       | •     | Q1BEGG          | E        |
| Formaldehyde                           | 100               | 0 +30                    | 1,13                                 | •        | •     | •     | Q1BEGG          | E        |
| Formic acid                            | 5                 | -15 +25                  | 1,22                                 |          | •     | •     | Q1BVGG          | V        |
| Glycerine                              | 100               | +20 +90                  | 1,26                                 | •        | •     | •     | Q1BEGG          | E        |
| Hydraulic oil                          | 100               | -5 +110                  |                                      |          | •     | •     | Q1Q1VGG         | V        |
| Hydrochloric acid                      | 2                 | -5 +25                   | 1,20                                 |          |       | •     | Q1BVGG          | V        |
| Hydroxide sodium                       | 25                | 0 +70                    |                                      |          | •     | •     | Q1Q1KGG         | K        |
| Iron sulfate                           | 10                | -5 +30                   | 2,09                                 | •        |       | •     | Q1Q1VGG         | V        |
| Methyl alcohol                         | 100               | -5 +40                   | 0,79                                 | •        | •     | •     | Q1BEGG          | E        |
| Mineral oil                            | 100               | -5 +110                  | 0,94                                 | •        | •     | •     | Q1BEGG          | E        |
| Nitric acid                            | 50                | -5 +30                   | 1,48                                 |          | •     | •     | Q1BVGG          | V        |
| Perchloroethylene                      | 100               | -10 +30                  | 1,60                                 | •        | •     | •     | Q1Q1EGG         | E        |
| Phosphates-polyphosphates              | 10                | -5 +90                   |                                      | •        |       | •     | Q1Q1VGG         | V        |
| Phosphoric acid                        | 10                | -5 +30                   | 1,33                                 |          |       | •     | Q1Q1VGG         | V        |
| Propyl alcohol (Propanol)              | 100               | -5 +80                   | 0,80                                 |          | •     | •     | Q1BEGG          | E        |
| Propylene glycol                       | 30                | -30 +120                 |                                      |          | •     | •     | Q1BVGG          | V        |
| Sodium bicarbonate (Baking soda)       | saturated         |                          |                                      |          |       | •     | Q1BVGG          | V        |
| Sodium hypochlorite                    | 1                 | -10 +25                  |                                      |          |       | •     | Q1BVGG          | V        |
| Sodium nitrate                         | saturated         | -10 +80                  | 2,25                                 |          | •     | •     | Q1BVGG          | V        |
| Sodium sulfate                         | 15                | -10 +40                  | 2,60                                 |          | •     | •     | Q1BVGG          | V        |
| Sulphuric acid                         | 2                 | -10 +25                  | 1,84                                 |          |       | •     | Q1BKGG          | K        |
| Tannic acid                            | 20                | 0 +50                    |                                      |          |       | •     | Q1Q1VGG         | V        |
| Tartaric acid                          | 50                | -10 +25                  | 1,76                                 |          | •     | •     | Q1Q1EGG         | E        |
| Trichloroethylene                      | 100               | -10 +40                  | 1,46                                 | •        | •     | •     | Q1Q1EGG         | E        |
| Uric acid                              | 80                | -10 +80                  | 1,89                                 | •        | •     | •     | Q1Q1EGG         | E        |
| Vegetable oil                          | 100               | -5 +110                  | 0,95                                 | •        | •     | •     | Q1Q1EGG         | E        |
| Water                                  | 100               | -5 +120                  |                                      | •        | •     | •     | Q1Q1VGG         | V        |
| Water condensate                       | 100               | -5 +100                  | 1                                    | •        | •     | •     | Q1Q1EGG         | E        |
| Water detergents, mineral oils mixture | 10                | -5 +80                   |                                      |          | •     | •     | Q1BKGG          | K        |

tab-comp-hm-en\_a\_tm

The above table indicates the compatibility of materials depending on the pumped liquid. Check the specific weight of the liquid or the viscosity as this could affect the power input of the motor and hydraulic performance. For further details, please contact the sales network.

**e-HM™ SERIES  
MOTORS**

With the “Energy using Products” (EuP 2005/32/EC) and “Energy related Products” (ErP 2009/125/EC) directives, the European Commission has established requirements for promoting the use of products with low power consumption.

The various products considered include three-phase, 50 Hz surface motors, with power outputs ranging from 0,75 to 375 kW, also when integrated with other products, with characteristics as defined by the specific **Regulation (EC) n. 640/2009** implementing the requirements of the EuP and ErP Directives which also establish the following deadlines:

| from             | kW         | minimum level of efficiency (IE)     |
|------------------|------------|--------------------------------------|
| 16th June 2011   | 0,75 ÷ 375 | IE2                                  |
| 1st January 2015 | < 7,5      | IE2                                  |
|                  | 7,5 ÷ 375  | IE3                                  |
|                  |            | IE2 fitted with variable speed drive |
| 1st January 2017 | 0,75 ÷ 375 | IE3                                  |
|                  |            | IE2 fitted with variable speed drive |

- **Standard three-phase surface motors** ≥ 0,75 kW supplied as **IE3**.
- Short-circuit squirrel-cage motor, enclosed construction with external ventilation (TEFC).
- IP 55 protection degree.
- Insulation class 155 (F).
- Electrical performances according to EN 60034-1.
- IE efficiency according to EN 60034-30 (≥ 0,75 kW).
- Cable gland with metric according to EN 50262.
- **Single-phase** version:  
220-240 V 50 Hz  
Built-in automatic reset overload protection up to 2,2 kW.
- **Three-phase** version:  
220-240/380-415 V 50 Hz for power up to 3 kW.  
380-415/660-690 V 50 Hz for power above 3 kW.  
Overload protection to be provided by the user.

**SINGLE-PHASE MOTORS AT 50 Hz, 2-POLE**

| P <sub>N</sub><br>kW | MOTOR TYPE     | IEC SIZE | Construction Design | INPUT CURRENT<br>I <sub>n</sub> (A)<br>220-240 V | CAPACITOR |     | DATA FOR 230 V 50 Hz VOLTAGE |                                 |      |      |                      |                                |                                |
|----------------------|----------------|----------|---------------------|--|-----------|-----|------------------------------|---------------------------------|------|------|----------------------|--------------------------------|--------------------------------|
|                      |                |          |                     |  | µF        | V   | min <sup>-1</sup>            | I <sub>s</sub> / I <sub>n</sub> | η %  | cosφ | T <sub>n</sub><br>Nm | T <sub>s</sub> /T <sub>n</sub> | T <sub>m</sub> /T <sub>n</sub> |
| 0,50                 | SM63HM../1055  | 63       | SPECIAL             | 3,46-3,30  | 16        | 450 | 2705                         | 2,90                            | 66,9 | 0,98 | 1,76                 | 0,56                           | 1,61                           |
| 0,55                 | SM71HM../1055  | 71       |                     | 3,76-3,99  | 16        | 450 | 2820                         | 3,72                            | 68,9 | 0,91 | 1,86                 | 0,61                           | 2,00                           |
| 0,75                 | SM71HM../1075  | 71       |                     | 4,90-4,85  | 20        | 450 | 2765                         | 3,42                            | 70,1 | 0,96 | 2,59                 | 0,58                           | 1,75                           |
| 0,95                 | SM71HM../1095  | 71       |                     | 6,25-5,89  | 25        | 450 | 2740                         | 3,39                            | 71,1 | 0,98 | 3,31                 | 0,58                           | 1,66                           |
| 1,1                  | SM80HM../1115  | 80       |                     | 6,88-6,65  | 30        | 450 | 2800                         | 3,89                            | 74,7 | 0,96 | 3,75                 | 0,46                           | 1,72                           |
| 1,5                  | SM80HM../1155  | 80       |                     | 9,21-8,58  | 40        | 450 | 2810                         | 4,00                            | 76,1 | 0,98 | 5,09                 | 0,39                           | 1,74                           |
| 2,2                  | PLM90HM../1225 | 90       |                     | 12,5-11,6  | 70        | 450 | 2825                         | 4,47                            | 82,4 | 0,97 | 7,43                 | 0,53                           | 1,87                           |
|                      |                |          |                     |  |           |     |                              |                                 |      |      |                      |                                |                                |

1-22hm-motm-2p50-en\_a\_te

## e-HM™ SERIES THREE-PHASE MOTORS AT 50 Hz, 2-POLE

| P <sub>N</sub><br>kW | Efficiency η <sub>N</sub><br>% |      |      |                    |      |      |                    |      |      |                    |      |      |                    |      |      |         |      |      | Year of<br>manufacture |    |   |
|----------------------|--------------------------------|------|------|--------------------|------|------|--------------------|------|------|--------------------|------|------|--------------------|------|------|---------|------|------|------------------------|----|---|
|                      | Δ 220 V<br>Y 380 V             |      |      | Δ 230 V<br>Y 400 V |      |      | Δ 240 V<br>Y 415 V |      |      | Δ 380 V<br>Y 660 V |      |      | Δ 400 V<br>Y 690 V |      |      | Δ 415 V |      |      |                        | IE |   |
|                      | 4/4                            | 3/4  | 2/4  | 4/4                | 3/4  | 2/4  | 4/4                | 3/4  | 2/4  | 4/4                | 3/4  | 2/4  | 4/4                | 3/4  | 2/4  | 4/4     | 3/4  | 2/4  |                        |    |   |
| 0,30                 | 65,1                           | 64,4 | 59,3 | 65,2               | 62,1 | 54,7 | 62,8               | 58,5 | 50,1 | -                  | -    | -    | -                  | -    | -    | -       | -    | -    | -                      | -  | - |
| 0,40                 | 72,7                           | 72,3 | 67,9 | 71,4               | 69,5 | 63,5 | 68,7               | 65,9 | 58,8 | -                  | -    | -    | -                  | -    | -    | -       | -    | -    | -                      | -  | - |
| 0,50                 | 72,9                           | 73,5 | 70,3 | 72,3               | 71,5 | 66,7 | 71,1               | 69,1 | 63,0 | -                  | -    | -    | -                  | -    | -    | -       | -    | -    | -                      | -  | - |
| 0,55                 | 77,3                           | 76,9 | 73,3 | 77,1               | 75,8 | 71,3 | 76,1               | 74,3 | 69,1 | -                  | -    | -    | -                  | -    | -    | -       | -    | -    | -                      | -  | - |
| 0,75                 | 82,5                           | 83,1 | 81,3 | 82,8               | 82,7 | 80,1 | 82,6               | 82,0 | 78,9 | 82,5               | 82,0 | 78,9 | 82,5               | 82,0 | 78,9 | 82,5    | 82,0 | 78,9 | -                      | -  | - |
| 1,1                  | 84,0                           | 84,7 | 83,4 | 84,4               | 84,5 | 82,5 | 84,3               | 84,0 | 81,4 | 84,0               | 84,0 | 81,4 | 84,0               | 84,0 | 81,4 | 84,0    | 84,0 | 81,4 | -                      | -  | - |
| 1,5                  | 85,6                           | 86,5 | 85,8 | 85,9               | 86,4 | 84,9 | 86,0               | 86,0 | 84,0 | 85,6               | 86,0 | 84,0 | 85,6               | 86,0 | 84,0 | 85,6    | 86,0 | 84,0 | -                      | -  | - |
| 2,2                  | 86,5                           | 87,4 | 86,8 | 86,4               | 86,9 | 85,7 | 86,6               | 86,7 | 85,0 | 86,4               | 86,7 | 85,0 | 86,4               | 86,7 | 85,0 | 86,4    | 86,7 | 85,0 | -                      | -  | - |
| 3                    | 87,2                           | 88,5 | 88,3 | 87,5               | 88,2 | 87,5 | 87,5               | 87,8 | 86,4 | 87,2               | 87,8 | 86,4 | 87,2               | 87,8 | 86,4 | 87,2    | 87,8 | 86,4 | -                      | -  | - |
| 4                    | 89,1                           | 90,1 | 89,2 | 89,1               | 90,1 | 89,2 | 89,1               | 90,1 | 89,2 | 89,1               | 90,3 | 90,4 | 89,6               | 90,4 | 89,9 | 89,6    | 90,1 | 89,2 | -                      | -  | - |
| 5,5                  | 89,5                           | 89,6 | 88,0 | 89,5               | 89,6 | 88,0 | 89,5               | 89,6 | 88,0 | 89,5               | 90,3 | 89,9 | 89,7               | 90,0 | 89,0 | 89,6    | 89,6 | 88,0 | -                      | -  | - |

| P <sub>N</sub><br>kW | Manufacturer   |  | IEC SIZE | Construction<br>Design | N. of<br>Poles | f <sub>N</sub><br>Hz | Data for 400 V / 50 Hz Voltage |                                 |                      |                                |                                |
|----------------------|--|--|----------|------------------------|----------------|----------------------|--------------------------------|---------------------------------|----------------------|--------------------------------|--------------------------------|
|                      | Xylem Service Italia Srl<br>Reg. No. 07520560967<br>Montecchio Maggiore Vicenza - Italia |  |          |                        |                |                      | cosφ                           | I <sub>s</sub> / I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>s</sub> /T <sub>N</sub> | T <sub>m</sub> /T <sub>N</sub> |
|                      | Model  |  |          |                        |                |                      |                                |                                 |                      |                                |                                |
| 0,30                 | SM63HM../303   |  | 63       | SPECIAL                | 2              | 50                   | 0,63                           | 4,20                            | 1,05                 | 4,18                           | 4,12                           |
| 0,40                 | SM63HM../304   |  | 63       |                        |                |                      | 0,64                           | 4,35                            | 1,37                 | 4,14                           | 4,10                           |
| 0,50                 | SM63HM../305   |  | 63       |                        |                |                      | 0,69                           | 4,72                            | 1,75                 | 4,08                           | 4,00                           |
| 0,55                 | SM71HM../305   |  | 71       |                        |                |                      | 0,71                           | 6,25                            | 1,84                 | 3,96                           | 3,97                           |
| 0,75                 | SM80HM../307 E3  |  | 80       |                        |                |                      | 0,78                           | 7,38                            | 2,48                 | 3,57                           | 3,75                           |
| 1,1                  | SM80HM../311 E3  |  | 80       |                        |                |                      | 0,79                           | 8,31                            | 3,63                 | 3,95                           | 3,95                           |
| 1,5                  | SM80HM../315 E3  |  | 80       |                        |                |                      | 0,80                           | 8,80                            | 4,96                 | 4,31                           | 4,10                           |
| 2,2                  | PLM90HM../322 E3   |  | 90       |                        |                |                      | 0,80                           | 8,77                            | 7,28                 | 3,72                           | 3,70                           |
| 3                    | PLM90HM../330 E3   |  | 90       |                        |                |                      | 0,79                           | 7,81                            | 9,93                 | 4,26                           | 3,94                           |
| 4                    | PLM100HM../340 E3  |  | 100      |                        |                |                      | 0,85                           | 9,13                            | 13,2                 | 3,82                           | 4,32                           |
| 5,5                  | PLM112HM../355 E3  |  | 112      |                        |                |                      | 0,85                           | 10,5                            | 18,1                 | 4,74                           | 5,11                           |

| P <sub>N</sub><br>kW | Voltage U <sub>N</sub><br>V |       |       |       |       |       |       |       |       |       |       | n <sub>N</sub><br>min <sup>-1</sup> | Observe the regulations and codes locally<br>in force regarding sorted waste disposal. | Operating conditions **            |                         |      |
|----------------------|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------------|--|------------------------------------|-------------------------|------|
|                      | Δ                           |       |       | Y     |       |       | Δ     |       |       | Y     |       |                                     |  | Altitude<br>Above Sea<br>Level (m) | T. amb<br>min/max<br>°C | ATEX |
|                      | 220 V                       | 230 V | 240 V | 380 V | 400 V | 415 V | 380 V | 400 V | 415 V | 660 V | 690 V |                                     |  |                                    |                         |      |
| 0,30                 | 1,66                        | 1,82  | 1,96  | 0,96  | 1,05  | 1,13  | -     | -     | -     | -     | -     | 2715 ÷ 2775                         | ≤ 1000   | -15 / 40                           | No                      |      |
| 0,40                 | 2,03                        | 2,18  | 2,32  | 1,17  | 1,26  | 1,34  | -     | -     | -     | -     | -     | 2745 ÷ 2800                         |  |                                    |                         |      |
| 0,50                 | 2,42                        | 2,51  | 2,65  | 1,40  | 1,45  | 1,53  | -     | -     | -     | -     | -     | 2690 ÷ 2765                         |  |                                    |                         |      |
| 0,55                 | 2,46                        | 2,49  | 2,56  | 1,42  | 1,44  | 1,48  | -     | -     | -     | -     | -     | 2835 ÷ 2865                         |  |                                    |                         |      |
| 0,75                 | 2,96                        | 2,94  | 2,96  | 1,71  | 1,70  | 1,71  | 1,70  | 1,69  | 1,70  | 0,98  | 0,98  | 2875 ÷ 2895                         |  |                                    |                         |      |
| 1,1                  | 4,19                        | 4,14  | 4,16  | 2,42  | 2,39  | 2,40  | 2,41  | 2,38  | 2,38  | 1,39  | 1,37  | 2870 ÷ 2900                         |  |                                    |                         |      |
| 1,5                  | 5,56                        | 5,49  | 5,51  | 3,21  | 3,17  | 3,18  | 3,21  | 3,18  | 3,19  | 1,85  | 1,84  | 2870 ÷ 2895                         |  |                                    |                         |      |
| 2,2                  | 7,97                        | 7,90  | 7,98  | 4,60  | 4,56  | 4,61  | 4,57  | 4,54  | 4,57  | 2,64  | 2,62  | 2880 ÷ 2900                         |  |                                    |                         |      |
| 3                    | 11,0                        | 11,0  | 11,2  | 6,35  | 6,33  | 6,44  | 6,29  | 6,27  | 6,34  | 3,63  | 3,62  | 2865 ÷ 2895                         |  |                                    |                         |      |
| 4                    | 13,6                        | 13,4  | 13,4  | 7,87  | 7,75  | 7,74  | 7,80  | 7,62  | 7,61  | 4,50  | 4,40  | 2885 ÷ 2910                         |  |                                    |                         |      |
| 5,5                  | 18,1                        | 17,9  | 18,1  | 10,4  | 10,4  | 10,4  | 10,6  | 10,5  | 10,7  | 6,10  | 6,05  | 2880 ÷ 2910                         |  |                                    |                         |      |

\*\* Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

**e-HM™ SERIES**

**AVAILABLE VOLTAGES FOR SM and PLM MOTORS, 2-POLE**

| P <sub>N</sub><br>kW | SINGLE-PHASE |         |             |             |         |             |             |             |
|----------------------|--------------|---------|-------------|-------------|---------|-------------|-------------|-------------|
|                      | 50 Hz        |         |             |             | 60 Hz   |             |             |             |
|                      | 1 x 220-240  | 1 x 100 | 1 x 110-120 | 1 x 220-230 | 1 x 100 | 1 x 110-115 | 1 x 120-127 | 1 x 200-210 |
| 0,50                 | s            | -       | -           | s           | -       | -           | -           | -           |
| 0,55                 | s            | o       | o           | s           | o       | o           | o           | o           |
| 0,75                 | s            | o       | o           | s           | o       | o           | o           | o           |
| 0,95                 | s            | o       | o           | s           | o       | o           | o           | o           |
| 1,1                  | s            | -       | o           | s           | -       | o           | -           | o           |
| 1,5                  | s            | -       | -           | s           | -       | o           | -           | o           |
| 2,2                  | s            | -       | -           | s           | -       | -           | -           | -           |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |
|                      |              |         |             |             |         |             |             |             |

| P <sub>N</sub><br>kW | THREE-PHASE                 |                         |                     |                     |                     |               |               |                     |                             |                     |                   |                     |                     |                     |           |                   |                   |                   |                 |
|----------------------|-----------------------------|-------------------------|---------------------|---------------------|---------------------|---------------|---------------|---------------------|-----------------------------|---------------------|-------------------|---------------------|---------------------|---------------------|-----------|-------------------|-------------------|-------------------|-----------------|
|                      | 50 Hz                       |                         |                     |                     |                     |               |               |                     |                             | 60 Hz               |                   |                     |                     |                     |           | 50/60 Hz          |                   |                   |                 |
|                      | 3 x 220-230-240/380-400-415 | 3 x 380-400-415/660-690 | 3 x 200-208/346-360 | 3 x 255-265/440-460 | 3 x 290-300/500-525 | 3 x 440-460/- | 3 x 500-525/- | 3 x 220-230/380-400 | 3 x 255-265-277/440-460-480 | 3 x 380-400/660-690 | 3 x 440-460-480/- | 3 x 110-115/190-200 | 3 x 200-208/346-360 | 3 x 330-346/575-600 | 3 x 575/- | 3 x 230/400 50 Hz | 3 x 265/460 60 Hz | 3 x 400/690 50 Hz | 3 x 460/- 60 Hz |
| 0,30                 | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 0,40                 | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 0,50                 | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 0,55                 | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 0,75                 | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 1,1                  | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 1,5                  | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 2,2                  | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 3                    | s                           | o                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 4                    | o                           | s                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |
| 5,5                  | o                           | s                       | o                   | o                   | o                   | o             | o             | s                   | o                           | o                   | o                 | o                   | o                   | o                   | o         | o                 | o                 | o                 | o               |

s = Standard voltage    o = voltage upon request    - = Not available

hm-volt-low-a-en\_b\_te

**ErP 2009/125/EC**

**LOWARA**  
a xylem brand

**e-HM™ SERIES  
PUMPS**

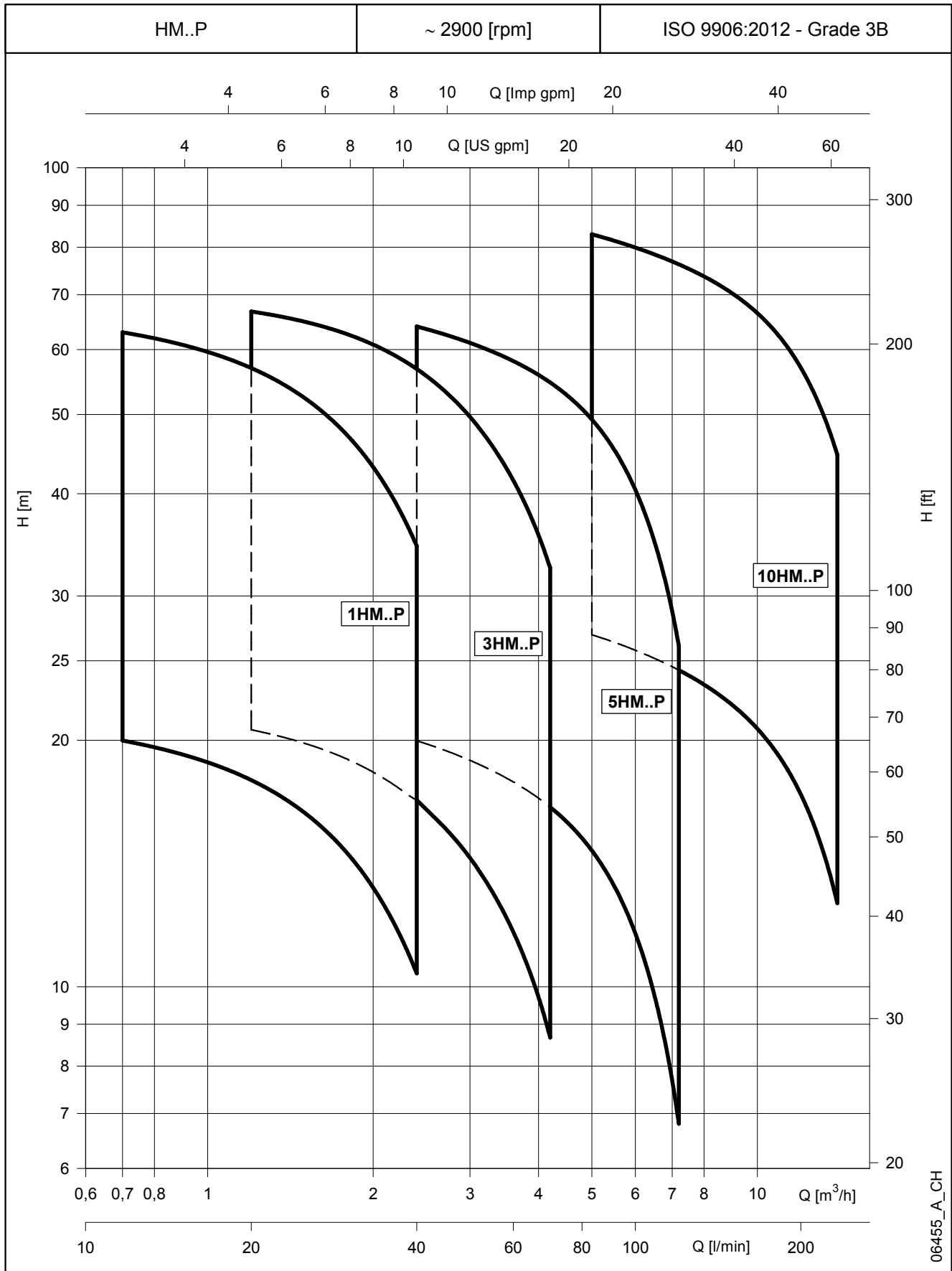
With the “Energy using Products” (EuP 2005/32/EC) and “Energy related Products” (ErP 2009/125/EC) directives, the European Commission has established requirements for promoting the use of products with low power consumption.

Among the various products considered there are also some typologies of pumps with the characteristics defined by the specific **Regulation (EU) n. 547/2012** implementing the requirements of Directives EuP and ErP.

The horizontal multistage pumps are not currently included within the scope of the Regulation.



**HM..P SERIES**  
**HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES**



06455\_A\_CH

## HM..P SERIES

### HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

| PUMP TYPE<br>HM..P | VERSION | MOTOR                |                 | ELECTRIC PUMP          |                |                | Q = DELIVERY                   |             |             |             |             |             |             |             |
|--------------------|---------|----------------------|-----------------|------------------------|----------------|----------------|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                    |         | P <sub>N</sub><br>kW | TYPE            | * P <sub>1</sub><br>kW | * I            |                | V/min 0<br>m <sup>3</sup> /h 0 | 11,7<br>0,7 | 16,0<br>1,0 | 21,0<br>1,3 | 26,0<br>1,6 | 31,0<br>1,9 | 36,0<br>2,2 | 40,0<br>2,4 |
|                    |         |                      |                 |                        | 220-240 V<br>A | 380-415 V<br>A |                                |             |             |             |             |             |             |             |
| 1HM03              | 1 ~     | 0,50                 | SM63HM../1055   | 0,56                   | 2,62           | -              | 33,6                           | 30,3        | 28,8        | 26,7        | 24,3        | 21,5        | 18,5        | 15,9        |
| 1HM04              |         | 0,50                 | SM63HM../1055   | 0,65                   | 2,90           | -              | 44,0                           | 39,3        | 37,2        | 34,4        | 31,1        | 27,4        | 23,3        | 19,9        |
| 1HM05              |         | 0,50                 | SM63HM../1055   | 0,74                   | 3,22           | -              | 54,0                           | 47,8        | 45,1        | 41,4        | 37,2        | 32,4        | 27,3        | 23,1        |
| 1HM06              |         | 0,75                 | SM71HM../1075   | 0,94                   | 4,33           | -              | 67,1                           | 60,1        | 57,0        | 52,8        | 48,0        | 42,4        | 36,3        | 31,1        |
| 1HM02              | 3 ~     | 0,30                 | SM63HM../303    | 0,36                   | 1,89           | 1,09           | 22,5                           | 20,2        | 19,2        | 17,9        | 16,2        | 14,4        | 12,4        | 10,6        |
| 1HM03              |         | 0,30                 | SM63HM../303    | 0,47                   | 1,94           | 1,12           | 32,8                           | 29,2        | 27,5        | 25,4        | 22,9        | 20,1        | 17,1        | 14,5        |
| 1HM04              |         | 0,40                 | SM63HM../304    | 0,58                   | 2,34           | 1,35           | 44,1                           | 39,3        | 37,2        | 34,3        | 31,0        | 27,3        | 23,2        | 19,8        |
| 1HM05              |         | 0,50                 | SM63HM../305    | 0,69                   | 2,64           | 1,52           | 54,4                           | 48,1        | 45,4        | 41,7        | 37,5        | 32,9        | 27,8        | 23,5        |
| 1HM06              |         | 0,75                 | SM80HM../307 E3 | 0,84                   | 2,80           | 1,62           | 69,3                           | 63,0        | 60,1        | 56,1        | 51,4        | 45,9        | 39,8        | 34,5        |

| PUMP TYPE<br>HM..P | VERSION | MOTOR                |                 | ELECTRIC PUMP          |                |                | Q = DELIVERY                   |             |             |             |             |             |             |             |
|--------------------|---------|----------------------|-----------------|------------------------|----------------|----------------|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                    |         | P <sub>N</sub><br>kW | TYPE            | * P <sub>1</sub><br>kW | * I            |                | V/min 0<br>m <sup>3</sup> /h 0 | 20,0<br>1,2 | 28,0<br>1,7 | 36,0<br>2,2 | 44,0<br>2,6 | 52,0<br>3,1 | 60,0<br>3,6 | 70,0<br>4,2 |
|                    |         |                      |                 |                        | 220-240 V<br>A | 380-415 V<br>A |                                |             |             |             |             |             |             |             |
| 3HM02              | 1 ~     | 0,50                 | SM63HM../1055   | 0,53                   | 2,55           | -              | 23,6                           | 21,5        | 20,4        | 18,9        | 17,1        | 15,1        | 12,9        | 9,9         |
| 3HM03              |         | 0,50                 | SM63HM../1055   | 0,65                   | 2,90           | -              | 34,8                           | 31,2        | 29,3        | 27,0        | 24,3        | 21,2        | 17,9        | 13,4        |
| 3HM04              |         | 0,50                 | SM63HM../1055   | 0,77                   | 3,34           | -              | 45,5                           | 40,3        | 37,5        | 34,2        | 30,3        | 26,2        | 21,8        | 15,9        |
| 3HM05              |         | 0,75                 | SM71HM../1075   | 1,01                   | 4,56           | -              | 58,4                           | 52,5        | 49,4        | 45,5        | 40,9        | 35,8        | 30,3        | 22,8        |
| 3HM06              |         | 0,95                 | SM71HM../1095   | 1,20                   | 5,29           | -              | 70,2                           | 63,0        | 59,2        | 54,4        | 48,9        | 42,8        | 36,2        | 27,2        |
| 3HM02              |         | 3 ~                  | 0,30            | SM63HM../303           | 0,44           | 1,92           | 1,11                           | 23,2        | 20,9        | 19,6        | 18,1        | 16,2        | 14,2        | 12,0        |
| 3HM03              | 0,40    |                      | SM63HM../304    | 0,58                   | 2,34           | 1,35           | 34,9                           | 31,3        | 29,3        | 26,9        | 24,2        | 21,1        | 17,8        | 13,4        |
| 3HM04              | 0,50    |                      | SM63HM../305    | 0,72                   | 2,68           | 1,55           | 45,8                           | 40,6        | 37,8        | 34,5        | 30,7        | 26,7        | 22,3        | 16,3        |
| 3HM05              | 0,75    |                      | SM80HM../307 E3 | 0,92                   | 2,96           | 1,71           | 60,2                           | 55,1        | 52,3        | 48,7        | 44,2        | 39,2        | 33,7        | 26,2        |
| 3HM06              | 1,1     |                      | SM80HM../311 E3 | 1,10                   | 3,75           | 2,17           | 72,7                           | 66,8        | 63,6        | 59,3        | 54,1        | 48,1        | 41,5        | 32,5        |

| PUMP TYPE<br>HM..P | VERSION | MOTOR                |                 | ELECTRIC PUMP          |                |                | Q = DELIVERY                   |             |             |             |             |             |            |            |
|--------------------|---------|----------------------|-----------------|------------------------|----------------|----------------|--------------------------------|-------------|-------------|-------------|-------------|-------------|------------|------------|
|                    |         | P <sub>N</sub><br>kW | TYPE            | * P <sub>1</sub><br>kW | * I            |                | V/min 0<br>m <sup>3</sup> /h 0 | 40,0<br>2,4 | 53,0<br>3,2 | 66,0<br>4,0 | 79,0<br>4,7 | 92,0<br>5,5 | 105<br>6,3 | 120<br>7,2 |
|                    |         |                      |                 |                        | 220-240 V<br>A | 380-415 V<br>A |                                |             |             |             |             |             |            |            |
| 5HM02              | 1 ~     | 0,50                 | SM63HM../1055   | 0,62                   | 2,79           | -              | 23,8                           | 20,1        | 18,7        | 17,2        | 15,5        | 13,4        | 10,7       | 7,0        |
| 5HM03              |         | 0,50                 | SM63HM../1055   | 0,78                   | 3,38           | -              | 35,0                           | 28,6        | 26,3        | 23,8        | 21,1        | 17,8        | 13,8       | 8,3        |
| 5HM04              |         | 0,75                 | SM71HM../1075   | 1,07                   | 4,79           | -              | 47,6                           | 39,7        | 36,8        | 33,7        | 30,2        | 25,9        | 20,6       | 13,2       |
| 5HM05              |         | 0,95                 | SM71HM../1095   | 1,31                   | 5,69           | -              | 59,4                           | 49,3        | 45,6        | 41,7        | 37,3        | 31,9        | 25,2       | 16,0       |
| 5HM06              |         | 1,1                  | SM80HM../1115   | 1,53                   | 6,84           | -              | 72,0                           | 60,4        | 56,1        | 51,5        | 46,2        | 39,8        | 31,9       | 20,8       |
| 5HM02              |         | 3 ~                  | 0,40            | SM63HM../304           | 0,54           | 2,30           | 1,33                           | 23,9        | 20,1        | 18,7        | 17,2        | 15,4        | 13,3       | 10,6       |
| 5HM03              | 0,50    |                      | SM63HM../305    | 0,74                   | 2,70           | 1,56           | 35,2                           | 28,8        | 26,5        | 24,2        | 21,5        | 18,2        | 14,2       | 8,6        |
| 5HM04              | 1,1     |                      | SM80HM../311 E3 | 1,01                   | 3,60           | 2,08           | 49,3                           | 42,9        | 40,4        | 37,7        | 34,5        | 30,4        | 25,2       | 17,8       |
| 5HM05              | 1,1     |                      | SM80HM../311 E3 | 1,24                   | 4,01           | 2,32           | 61,4                           | 53,1        | 49,9        | 46,4        | 42,3        | 37,2        | 30,6       | 21,3       |
| 5HM06              | 1,5     |                      | SM80HM../315 E3 | 1,47                   | 4,95           | 2,86           | 73,8                           | 64,0        | 60,2        | 56,1        | 51,2        | 45,0        | 37,3       | 26,1       |

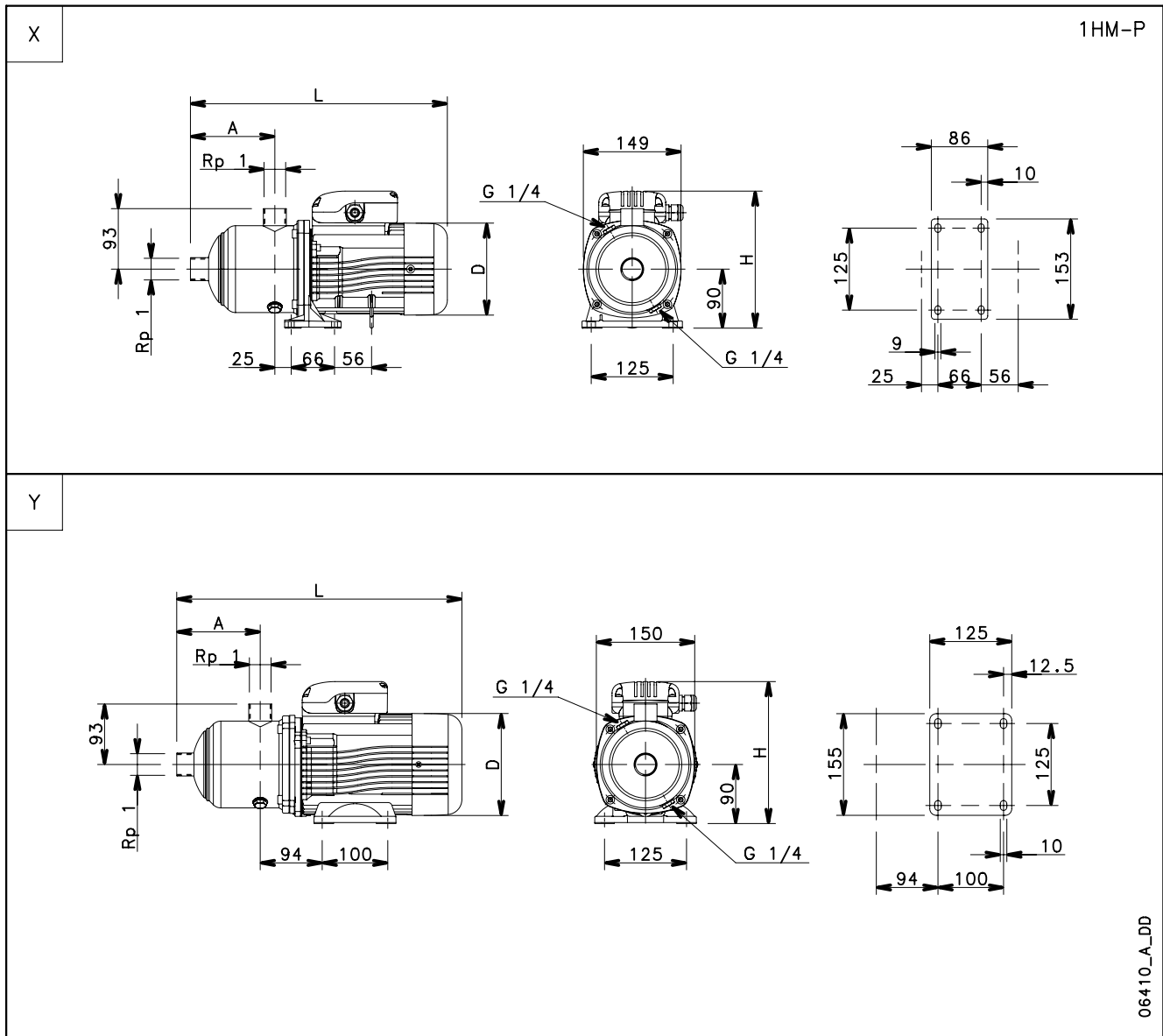
| PUMP TYPE<br>HM..P | VERSION | MOTOR                |                  | ELECTRIC PUMP          |                |                | Q = DELIVERY                   |             |            |            |            |             |             |             |
|--------------------|---------|----------------------|------------------|------------------------|----------------|----------------|--------------------------------|-------------|------------|------------|------------|-------------|-------------|-------------|
|                    |         | P <sub>N</sub><br>kW | TYPE             | * P <sub>1</sub><br>kW | * I            |                | V/min 0<br>m <sup>3</sup> /h 0 | 83,3<br>5,0 | 108<br>6,5 | 133<br>8,0 | 158<br>9,5 | 183<br>11,0 | 208<br>12,5 | 233<br>14,0 |
|                    |         |                      |                  |                        | 220-240 V<br>A | 380-415 V<br>A |                                |             |            |            |            |             |             |             |
| 10HM02             | 1 ~     | 1,1                  | SM80HM../1115    | 1,33                   | 6,06           | -              | 30,6                           | 26,9        | 25,2       | 23,4       | 21,4       | 19,1        | 16,2        | 12,6        |
| 10HM03             |         | 1,5                  | SM80HM../1155    | 1,88                   | 8,29           | -              | 45,6                           | 39,7        | 37,2       | 34,7       | 31,9       | 28,4        | 24,0        | 18,8        |
| 10HM04             |         | 2,2                  | PLM90HM../1225   | 2,40                   | 10,8           | -              | 60,6                           | 54,4        | 51,3       | 48,1       | 44,5       | 40,2        | 34,9        | 28,5        |
| 10HM05             |         | 2,2                  | PLM90HM../1225   | 2,87                   | 12,8           | -              | 75,3                           | 66,7        | 62,7       | 58,5       | 53,8       | 48,3        | 41,5        | 33,5        |
| 10HM02             | 3 ~     | 1,1                  | SM80HM../311 E3  | 1,23                   | 4,00           | 2,31           | 31,1                           | 27,8        | 26,3       | 24,6       | 22,7       | 20,4        | 17,5        | 14,1        |
| 10HM03             |         | 1,5                  | SM80HM../315 E3  | 1,75                   | 5,50           | 3,17           | 46,2                           | 40,9        | 38,6       | 36,2       | 33,4       | 30,1        | 25,8        | 20,6        |
| 10HM04             |         | 2,2                  | PLM90HM../322 E3 | 2,35                   | 7,58           | 4,38           | 61,2                           | 55,7        | 52,7       | 49,6       | 46,2       | 42,0        | 36,7        | 30,3        |
| 10HM05             |         | 3                    | PLM90HM../330 E3 | 2,94                   | 10,1           | 5,83           | 76,6                           | 69,8        | 66,2       | 62,3       | 58,0       | 52,8        | 46,2        | 38,2        |
| 10HM06             |         | 3                    | PLM90HM../330 E3 | 3,47                   | 11,2           | 6,45           | 91,7                           | 83,0        | 78,5       | 73,8       | 68,5       | 62,2        | 54,3        | 44,6        |

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

1-10hm-p-2p50-en\_b\_th

\* Maximum value in specified range: P<sub>1</sub> = input power; I = input current.

## 1HM..P SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



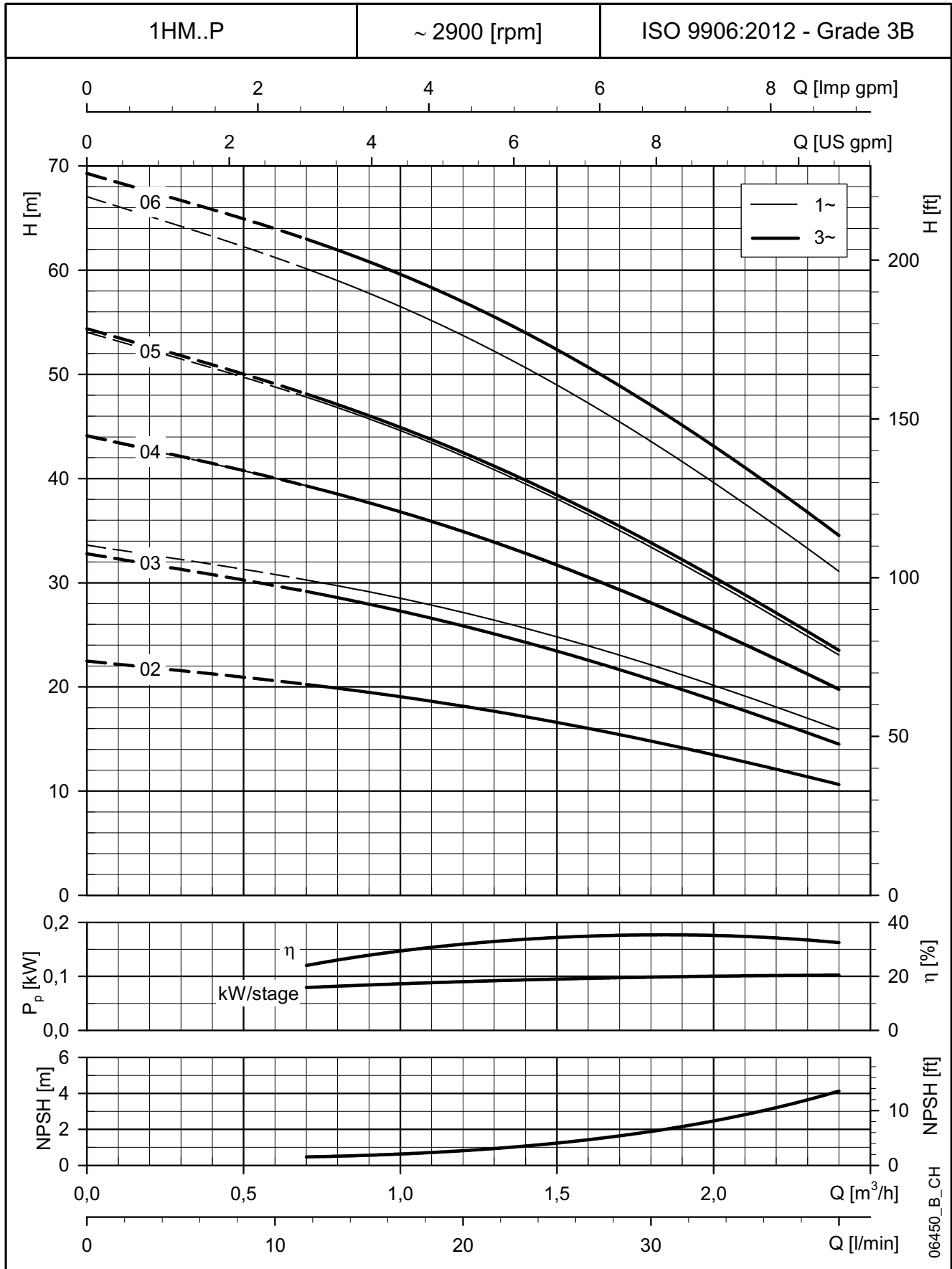
| PUMP TYPE | VERSION      | Ref. | MOTOR |      | DIMENSIONS (mm) |     |     |     | PN bar | WEIGHT kg |
|-----------|--------------|------|-------|------|-----------------|-----|-----|-----|--------|-----------|
|           |              |      | kW    | SIZE | A               | D   | H   | L   |        |           |
| 1HM03     | SINGLE-PHASE | X    | 0,50  | 63   | 87              | 120 | 201 | 336 | 10     | 7         |
| 1HM04     |              |      | 0,50  | 63   | 107             | 120 | 201 | 356 | 10     | 7         |
| 1HM05     |              |      | 0,50  | 63   | 127             | 120 | 201 | 376 | 10     | 8         |
| 1HM06     |              |      | 0,75  | 71   | 147             | 140 | 211 | 410 | 10     | 9         |

|       |             |   |      |    |     |     |     |     |    |    |
|-------|-------------|---|------|----|-----|-----|-----|-----|----|----|
| 1HM02 | THREE-PHASE | X | 0,30 | 63 | 87  | 120 | 201 | 336 | 10 | 6  |
| 1HM03 |             |   | 0,30 | 63 | 87  | 120 | 201 | 336 | 10 | 6  |
| 1HM04 |             |   | 0,40 | 63 | 107 | 120 | 201 | 356 | 10 | 7  |
| 1HM05 |             |   | 0,50 | 63 | 127 | 120 | 201 | 376 | 10 | 8  |
| 1HM06 |             | Y | 0,75 | 80 | 147 | 155 | 219 | 455 | 10 | 13 |

1hm-p-2p50-en\_b\_dd

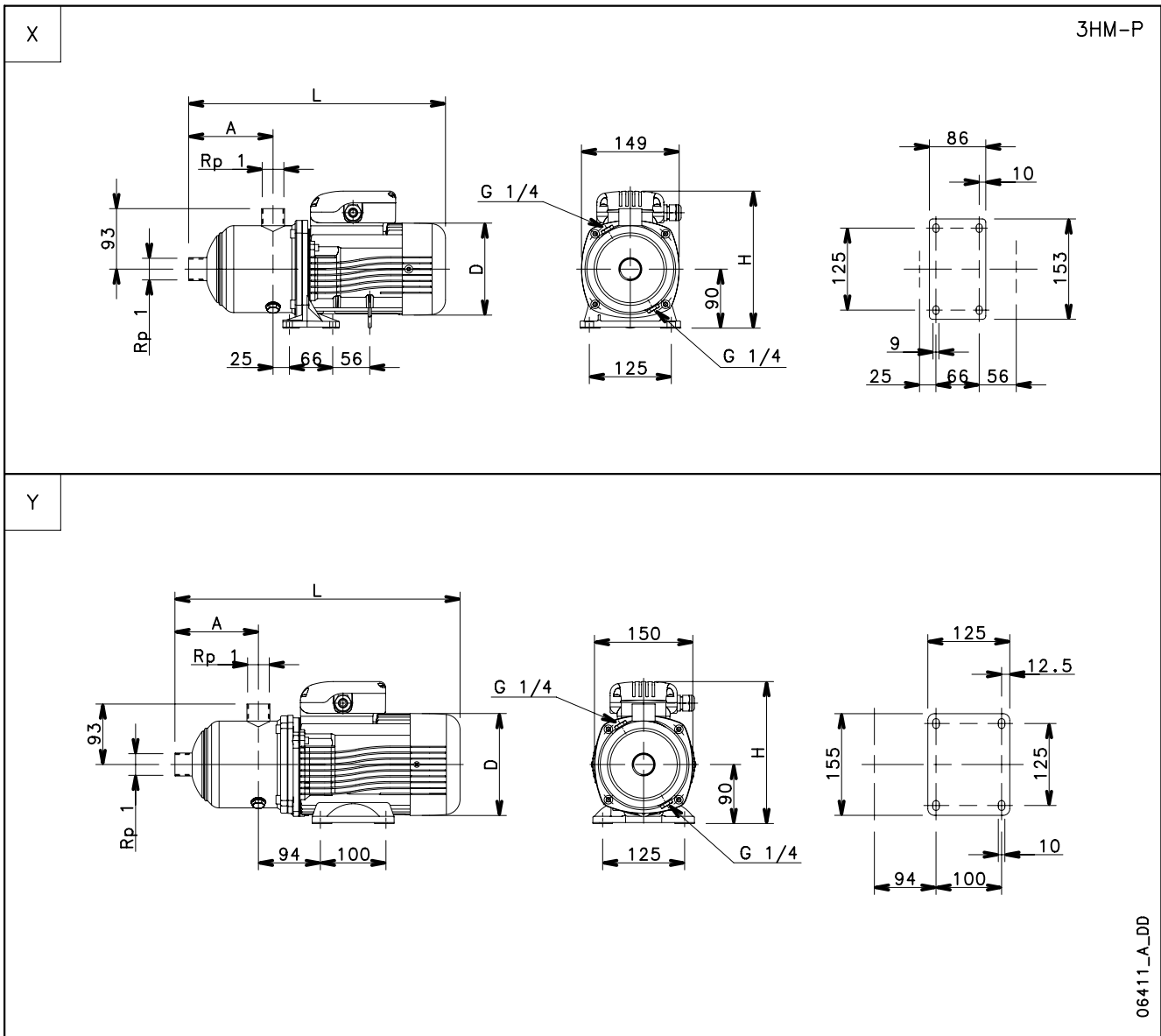


**1HM..P SERIES  
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

### 3HM..P SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES

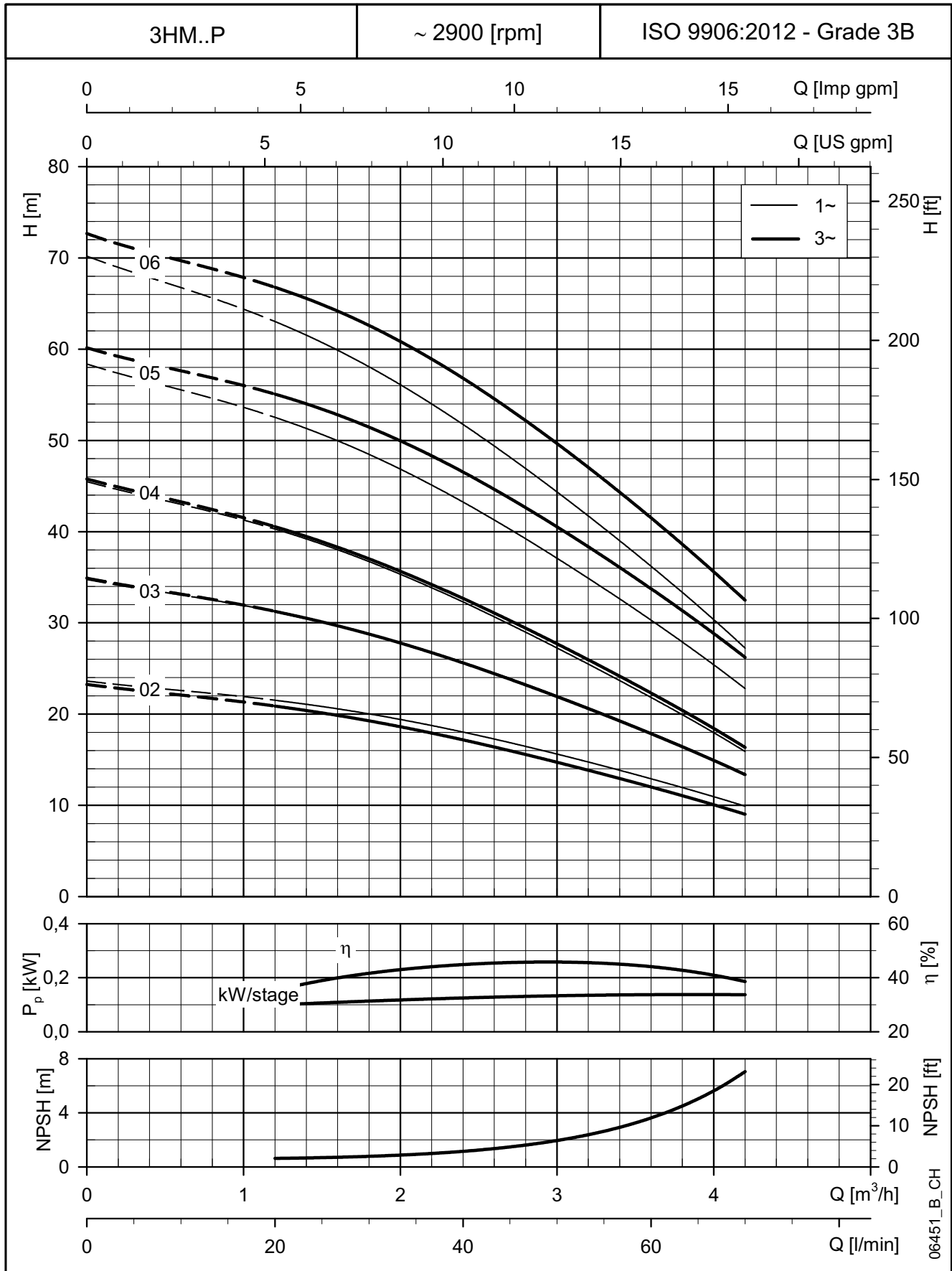


| PUMP TYPE | VERSION      | Ref. | MOTOR |      | DIMENSIONS (mm) |     |     |     | PN bar | WEIGHT kg |
|-----------|--------------|------|-------|------|-----------------|-----|-----|-----|--------|-----------|
|           |              |      | kW    | SIZE | A               | D   | H   | L   |        |           |
| 3HM02     | SINGLE-PHASE | X    | 0,50  | 63   | 87              | 120 | 201 | 336 | 10     | 7         |
| 3HM03     |              |      | 0,50  | 63   | 87              | 120 | 201 | 336 | 10     | 7         |
| 3HM04     |              |      | 0,50  | 63   | 107             | 120 | 201 | 356 | 10     | 7         |
| 3HM05     |              |      | 0,75  | 71   | 127             | 140 | 211 | 390 | 10     | 10        |
| 3HM06     |              |      | 0,95  | 71   | 147             | 140 | 220 | 410 | 10     | 11        |
| 3HM02     | THREE-PHASE  | X    | 0,30  | 63   | 87              | 120 | 201 | 336 | 10     | 6         |
| 3HM03     |              |      | 0,40  | 63   | 87              | 120 | 201 | 336 | 10     | 6         |
| 3HM04     |              |      | 0,50  | 63   | 107             | 120 | 201 | 356 | 10     | 7         |
| 3HM05     |              | Y    | 0,75  | 80   | 127             | 155 | 219 | 435 | 10     | 12        |
| 3HM06     |              |      | 1,1   | 80   | 147             | 155 | 219 | 455 | 10     | 13        |

3hm-p-2p50-en\_b\_dd

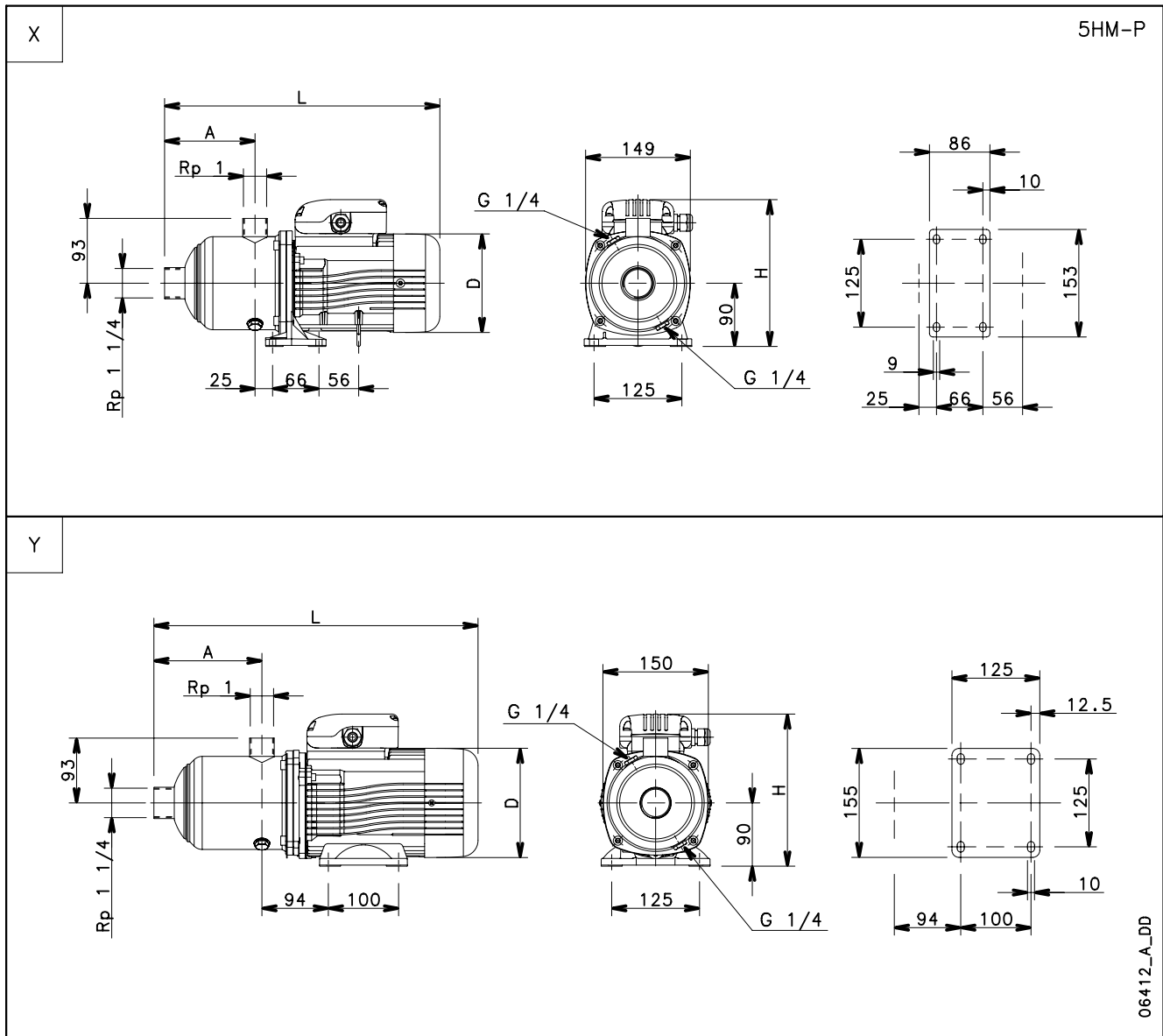
**3HM..P SERIES**

**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## 5HM..P SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES

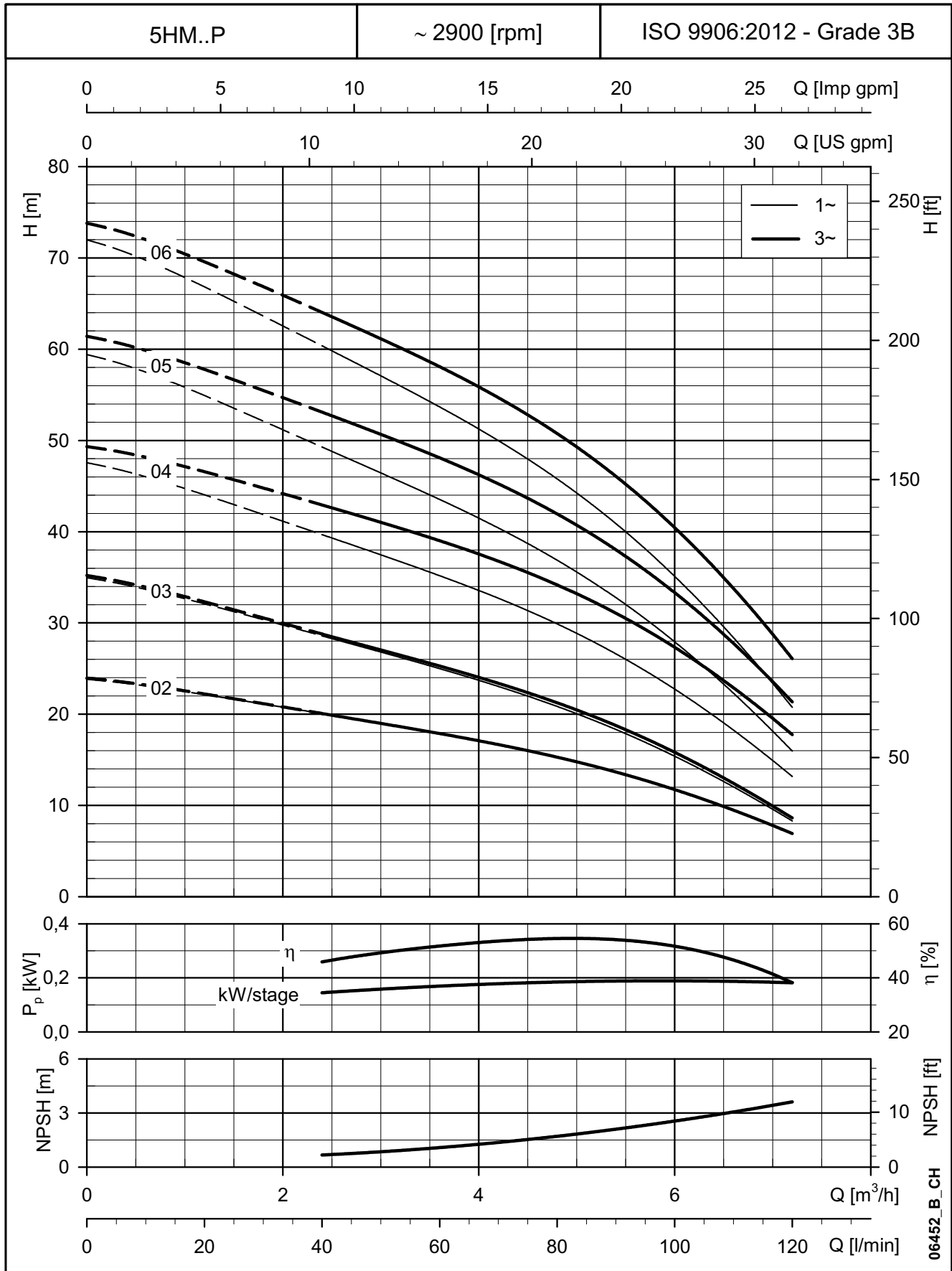


| PUMP TYPE | VERSION      | Ref. | MOTOR |      | DIMENSIONS (mm) |     |     |     | PN bar | WEIGHT kg |
|-----------|--------------|------|-------|------|-----------------|-----|-----|-----|--------|-----------|
|           |              |      | kW    | SIZE | A               | D   | H   | L   |        |           |
| 5HM02     | SINGLE-PHASE | X    | 0,50  | 63   | 89              | 120 | 201 | 338 | 10     | 7         |
| 5HM03     |              |      | 0,50  | 63   | 89              | 120 | 201 | 338 | 10     | 7         |
| 5HM04     |              |      | 0,75  | 71   | 109             | 140 | 211 | 372 | 10     | 10        |
| 5HM05     |              |      | 0,95  | 71   | 129             | 140 | 220 | 392 | 10     | 11        |
| 5HM06     |              | Y    | 1,1   | 80   | 149             | 155 | 227 | 457 | 10     | 14        |
| 5HM02     | THREE-PHASE  | X    | 0,40  | 63   | 89              | 120 | 201 | 338 | 10     | 6         |
| 5HM03     |              |      | 0,50  | 63   | 89              | 120 | 201 | 338 | 10     | 7         |
| 5HM04     |              | Y    | 1,1   | 80   | 109             | 155 | 219 | 417 | 10     | 13        |
| 5HM05     |              |      | 1,1   | 80   | 129             | 155 | 219 | 437 | 10     | 14        |
| 5HM06     |              |      | 1,5   | 80   | 149             | 155 | 219 | 457 | 10     | 15        |

5hm-p-2p50-en\_b\_td

### 5HM..P SERIES

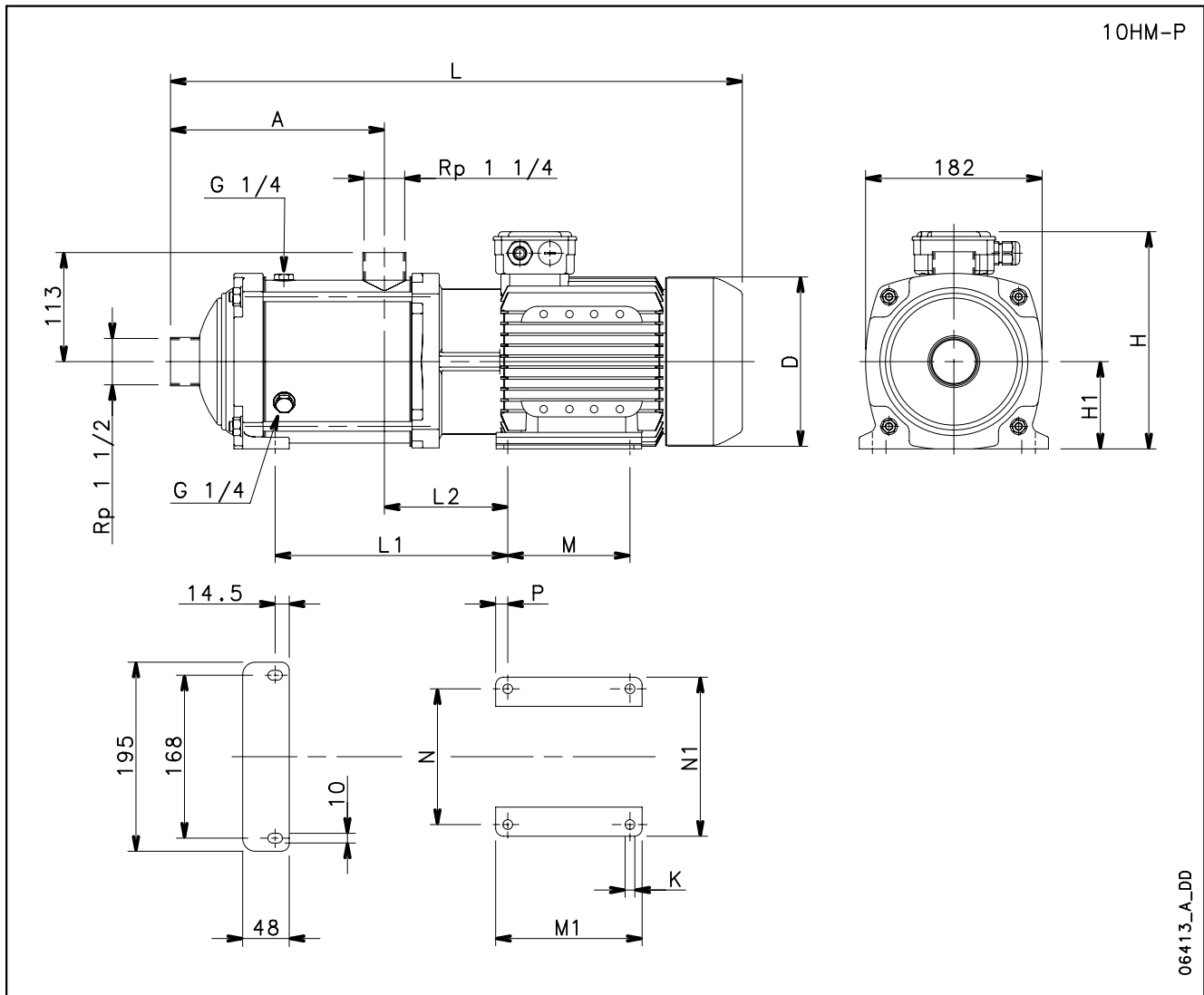
### OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

# 10HM..P SERIES

## DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES

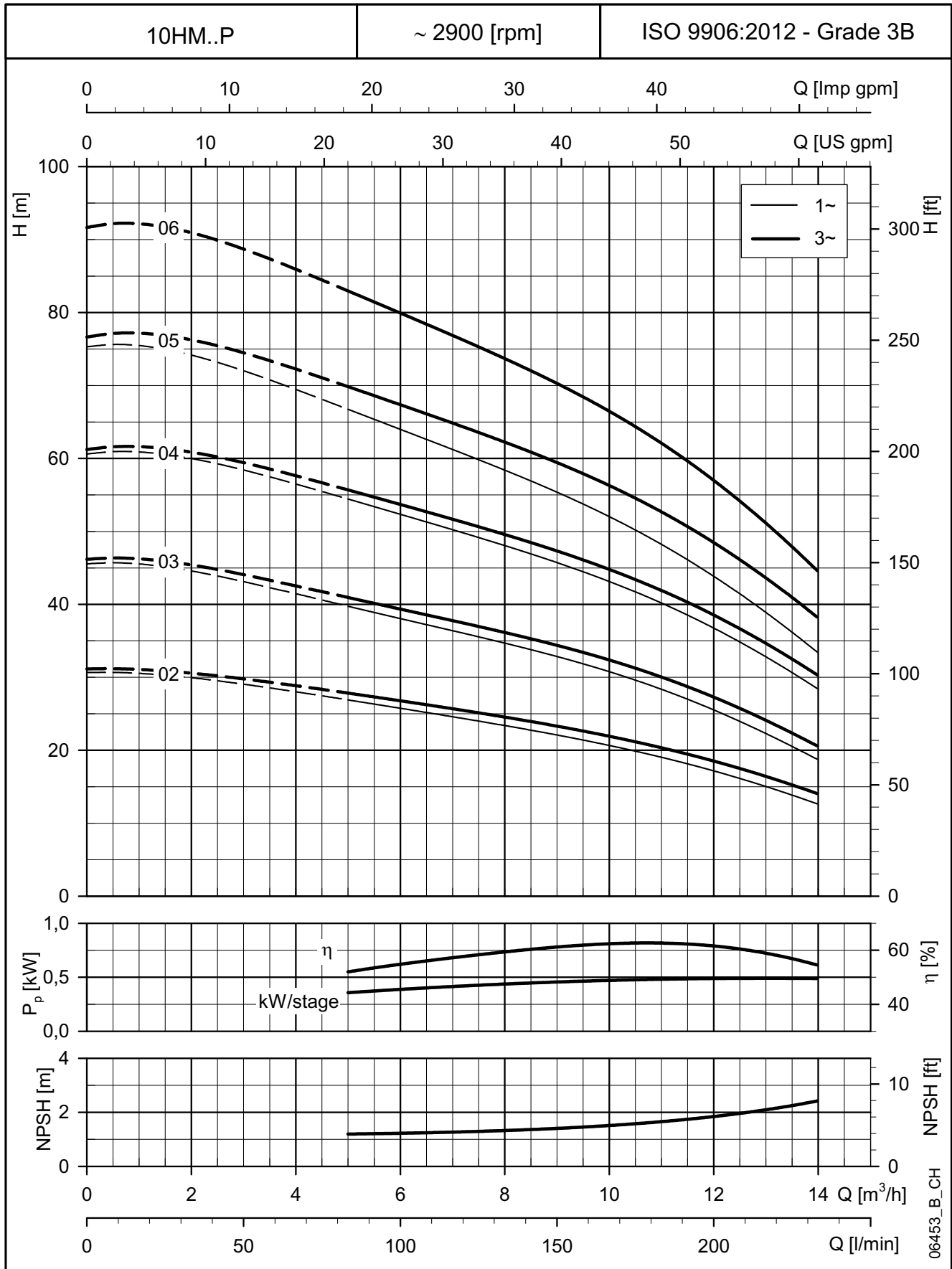


| PUMP TYPE | VERSION      | MOTOR |      | DIMENSIONS (mm) |     |     |    |     |     |     |     |     |     |     |      |    | PN | WEIGHT |
|-----------|--------------|-------|------|-----------------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|------|----|----|--------|
|           |              | kW    | SIZE | A               | D   | H   | H1 | L   | L1  | L2  | M   | M1  | N   | N1  | P    | K  |    |        |
| 10HM02    | SINGLE-PHASE | 1,1   | 80   | 125             | 155 | 227 | 90 | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 16     |
| 10HM03    |              | 1,5   | 80   | 125             | 155 | 227 | 90 | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 17     |
| 10HM04    |              | 2,2   | 90   | 157             | 174 | 249 | 90 | 531 | 176 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 26     |
| 10HM05    |              | 2,2   | 90   | 189             | 174 | 249 | 90 | 563 | 208 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 27     |
| 10HM02    | THREE-PHASE  | 1,1   | 80   | 125             | 155 | 219 | 90 | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 16     |
| 10HM03    |              | 1,5   | 80   | 125             | 155 | 219 | 90 | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 17     |
| 10HM04    |              | 2,2   | 90   | 157             | 174 | 224 | 90 | 531 | 176 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 23     |
| 10HM05    |              | 3     | 90   | 189             | 174 | 224 | 90 | 563 | 208 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 27     |
| 10HM06    |              | 3     | 90   | 221             | 174 | 224 | 90 | 595 | 240 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 28     |

10hm-p-2p50-en\_b\_td

### 10HM..P SERIES

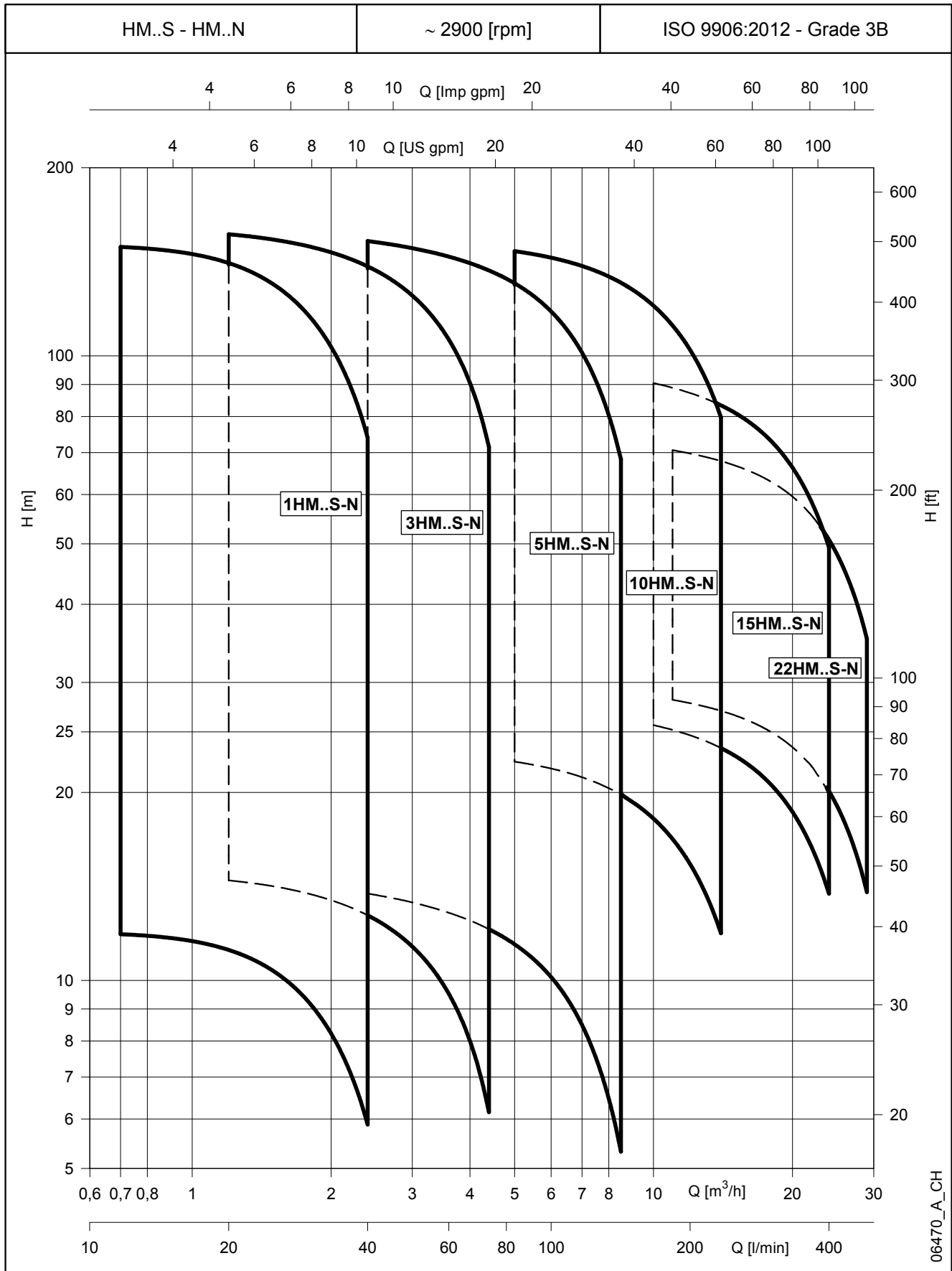
### OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**HM..S - HM..N SERIES**

**HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES**



06470\_A\_CH





## 5 HM..S - HM..N SERIES

### HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

| PUMP<br>TYPE<br>HM..S<br>HM..N              | VERSION | MOTOR                |                  | ELECTRIC PUMP          |                |                | Q = DELIVERY               |      |      |      |      |      |      |      |     |
|---|---------|----------------------|------------------|------------------------|----------------|----------------|----------------------------|------|------|------|------|------|------|------|-----|
|   |         | P <sub>N</sub><br>kW | TYPE             | * P <sub>1</sub><br>kW | * I            |                | l/min<br>m <sup>3</sup> /h | 0    | 40,0 | 57,0 | 74,0 | 91,0 | 108  | 125  | 142 |
|   |         |                      |                  |                        | 220-240 V<br>A | 380-415 V<br>A |                            |      |      |      |      |      |      |      |     |
| H = TOTAL HEAD IN METRES OF COLUMN OF WATER |         |                      |                  |                        |                |                |                            |      |      |      |      |      |      |      |     |
| 5HM02                                       | 1 ~     | 0,50                 | SM63HM../1055    | 0,52                   | 2,51           | -              | 14,9                       | 14,3 | 13,6 | 12,8 | 11,7 | 10,3 | 8,4  | 6,2  |     |
| 5HM03                                       |         | 0,50                 | SM63HM../1055    | 0,62                   | 2,80           | -              | 22,1                       | 20,9 | 19,8 | 18,4 | 16,7 | 14,5 | 11,6 | 8,3  |     |
| 5HM04                                       |         | 0,50                 | SM63HM../1055    | 0,73                   | 3,18           | -              | 29,2                       | 27,2 | 25,5 | 23,5 | 21,1 | 18,0 | 14,1 | 9,7  |     |
| 5HM05                                       |         | 0,75                 | SM71HM../1075    | 0,96                   | 4,37           | -              | 37,1                       | 35,2 | 33,3 | 31,0 | 28,2 | 24,5 | 19,7 | 14,1 |     |
| 5HM06                                       |         | 0,75                 | SM71HM../1075    | 1,08                   | 4,80           | -              | 44,2                       | 41,5 | 39,1 | 36,3 | 32,7 | 28,1 | 22,4 | 15,7 |     |
| 5HM07                                       |         | 0,95                 | SM71HM../1095    | 1,26                   | 5,49           | -              | 51,6                       | 48,6 | 45,8 | 42,4 | 38,3 | 33,0 | 26,3 | 18,4 |     |
| 5HM08                                       |         | 0,95                 | SM71HM../1095    | 1,37                   | 5,97           | -              | 58,8                       | 54,8 | 51,3 | 47,3 | 42,4 | 36,2 | 28,5 | 19,7 |     |
| 5HM09                                       |         | 1,1                  | SM80HM../1115    | 1,54                   | 6,87           | -              | 66,9                       | 63,1 | 59,5 | 55,3 | 50,0 | 43,2 | 34,7 | 24,6 |     |
| 5HM10                                       |         | 1,5                  | SM80HM../1155    | 1,77                   | 7,79           | -              | 74,7                       | 71,5 | 67,9 | 63,6 | 58,0 | 50,7 | 41,3 | 30,0 |     |
| 5HM11                                       |         | 1,5                  | SM80HM../1155    | 1,91                   | 8,42           | -              | 82,0                       | 78,2 | 74,1 | 69,1 | 62,9 | 54,7 | 44,3 | 32,0 |     |
| 5HM12                                       |         | 1,5                  | SM80HM../1155    | 2,04                   | 9,07           | -              | 89,3                       | 84,7 | 80,1 | 74,5 | 67,5 | 58,5 | 47,1 | 33,7 |     |
| 5HM13                                       |         | 2,2                  | PLM90HM../1225   | 2,21                   | 10,0           | -              | 97,7                       | 94,0 | 89,5 | 84,0 | 77,0 | 67,6 | 55,5 | 40,8 |     |
| 5HM14                                       |         | 2,2                  | PLM90HM../1225   | 2,34                   | 10,6           | -              | 105                        | 101  | 95,9 | 89,9 | 82,2 | 72,1 | 58,9 | 43,2 |     |
| 5HM15                                       |         | 2,2                  | PLM90HM../1225   | 2,47                   | 11,1           | -              | 112                        | 108  | 102  | 95,7 | 87,3 | 76,4 | 62,3 | 45,3 |     |
| 5HM17                                       |         | 2,2                  | PLM90HM../1225   | 2,72                   | 12,2           | -              | 127                        | 121  | 114  | 107  | 97,2 | 84,6 | 68,5 | 49,4 |     |
| 5HM02                                       |         | 3 ~                  | 0,30             | SM63HM../303           | 0,41           | 1,91           | 1,10                       | 14,8 | 13,9 | 13,2 | 12,2 | 11,1 | 9,6  | 7,8  | 5,5 |
| 5HM03                                       |         |                      | 0,40             | SM63HM../304           | 0,54           | 2,30           | 1,33                       | 22,2 | 20,9 | 19,7 | 18,3 | 16,5 | 14,3 | 11,5 | 8,2 |
| 5HM04                                       | 0,50    |                      | SM63HM../305     | 0,68                   | 2,62           | 1,51           | 29,3                       | 27,2 | 25,6 | 23,5 | 21,1 | 18,1 | 14,4 | 9,8  |     |
| 5HM05                                       | 0,75    |                      | SM80HM../307 E3  | 0,85                   | 2,83           | 1,64           | 37,8                       | 36,5 | 34,8 | 32,7 | 30,0 | 26,5 | 22,0 | 16,4 |     |
| 5HM06                                       | 1,1     |                      | SM80HM../311 E3  | 1,02                   | 3,60           | 2,08           | 45,5                       | 44,2 | 42,3 | 39,8 | 36,6 | 32,5 | 27,1 | 20,4 |     |
| 5HM07                                       | 1,1     |                      | SM80HM../311 E3  | 1,17                   | 3,88           | 2,24           | 53,0                       | 51,2 | 48,9 | 46,0 | 42,3 | 37,4 | 31,0 | 23,2 |     |
| 5HM08                                       | 1,1     |                      | SM80HM../311 E3  | 1,32                   | 4,18           | 2,41           | 60,4                       | 58,2 | 55,5 | 52,1 | 47,7 | 42,1 | 34,9 | 25,9 |     |
| 5HM09                                       | 1,5     |                      | SM80HM../315 E3  | 1,48                   | 4,97           | 2,87           | 68,1                       | 65,9 | 63,0 | 59,2 | 54,4 | 48,2 | 40,1 | 30,0 |     |
| 5HM10                                       | 1,5     |                      | SM80HM../315 E3  | 1,63                   | 5,26           | 3,04           | 75,5                       | 72,9 | 69,6 | 65,4 | 60,0 | 52,9 | 43,9 | 32,7 |     |
| 5HM11                                       | 1,5     |                      | SM80HM../315 E3  | 1,78                   | 5,55           | 3,21           | 83,0                       | 79,9 | 76,1 | 71,4 | 65,4 | 57,6 | 47,7 | 35,4 |     |
| 5HM12                                       | 2,2     |                      | PLM90HM../322 E3 | 1,97                   | 6,83           | 3,94           | 91,0                       | 88,3 | 84,4 | 79,5 | 73,1 | 64,7 | 54,0 | 40,6 |     |
| 5HM13                                       | 2,2     |                      | PLM90HM../322 E3 | 2,12                   | 7,13           | 4,12           | 98,4                       | 95,3 | 91,1 | 85,7 | 78,8 | 69,7 | 58,0 | 43,5 |     |
| 5HM14                                       | 2,2     |                      | PLM90HM../322 E3 | 2,27                   | 7,42           | 4,28           | 106                        | 102  | 97,8 | 91,9 | 84,3 | 74,5 | 61,9 | 46,2 |     |
| 5HM15                                       | 2,2     |                      | PLM90HM../322 E3 | 2,42                   | 7,73           | 4,46           | 113                        | 109  | 104  | 97,9 | 89,8 | 79,2 | 65,7 | 48,9 |     |
| 5HM17                                       | 3       |                      | PLM90HM../330 E3 | 2,77                   | 9,77           | 5,64           | 129                        | 125  | 119  | 112  | 103  | 91,2 | 75,9 | 56,9 |     |
| 5HM19                                       | 3       |                      | PLM90HM../330 E3 | 3,06                   | 10,3           | 5,97           | 144                        | 139  | 132  | 124  | 114  | 101  | 83,7 | 62,5 |     |
| 5HM21                                       | 3       |                      | PLM90HM../330 E3 | 3,36                   | 10,9           | 6,31           | 159                        | 153  | 146  | 137  | 125  | 110  | 91,3 | 67,8 |     |

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

5-hm-s-n-2p50-en\_b\_th

\* Maximum value in specified range: P<sub>1</sub> = input power; I = input current.

## 10, 15, 22 HM..S - HM..N SERIES HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

| PUMP TYPE<br>HM..S<br>HM..N                 | VERSION | MOTOR |                   | ELECTRIC PUMP |      |      | Q = DELIVERY           |                |                |                |                     |      |      |      |      |      |      |      |
|---|---------|-------|-------------------|---------------|------|------|------------------------|----------------|----------------|----------------|---------------------|------|------|------|------|------|------|------|
|   |         |       |                   |               |      |      | * P <sub>1</sub><br>kW | * I            |                |                | l/min 0             | 83,3 | 108  | 133  | 158  | 183  | 208  | 233  |
|   |         |       |                   |               |      |      |                        | 220-240 V<br>A | 380-415 V<br>A | 660-690 V<br>A | m <sup>3</sup> /h 0 | 5,0  | 6,5  | 8,0  | 9,5  | 11,0 | 12,5 | 14,0 |
| H = TOTAL HEAD IN METRES OF COLUMN OF WATER |         |       |                   |               |      |      |                        |                |                |                |                     |      |      |      |      |      |      |      |
| 10HM02                                      | 1 ~     | 1,1   | SM80HM../1115     | 1,06          | 5,15 | -    | -                      | 23,4           | 21,7           | 20,6           | 19,2                | 17,4 | 15,2 | 12,6 | 9,6  |      |      |      |
| 10HM03                                      |         | 1,1   | SM80HM../1115     | 1,39          | 6,27 | -    | -                      | 35,7           | 32,4           | 30,9           | 29,0                | 26,5 | 23,6 | 20,1 | 16,1 |      |      |      |
| 10HM04                                      |         | 1,5   | SM80HM../1155     | 1,83          | 8,11 | -    | -                      | 47,6           | 43,5           | 41,6           | 39,0                | 35,8 | 31,9 | 27,3 | 22,0 |      |      |      |
| 10HM05                                      |         | 2,2   | PLM90HM../1225    | 2,22          | 10,1 | -    | -                      | 60,0           | 55,3           | 53,0           | 50,0                | 46,0 | 41,2 | 35,5 | 28,8 |      |      |      |
| 10HM06                                      |         | 2,2   | PLM90HM../1225    | 2,55          | 11,5 | -    | -                      | 71,6           | 65,5           | 62,6           | 58,8                | 53,9 | 48,1 | 41,2 | 33,2 |      |      |      |
| 10HM02                                      | 3 ~     | 0,75  | SM80HM../307 E3   | 0,90          | 2,91 | 1,68 | -                      | 23,6           | 21,8           | 20,7           | 19,3                | 17,6 | 15,4 | 12,8 | 9,8  |      |      |      |
| 10HM03                                      |         | 1,1   | SM80HM../311 E3   | 1,30          | 4,15 | 2,40 | -                      | 36,2           | 33,6           | 32,3           | 30,5                | 28,2 | 25,3 | 21,9 | 17,9 |      |      |      |
| 10HM04                                      |         | 1,5   | SM80HM../315 E3   | 1,70          | 5,40 | 3,12 | -                      | 48,3           | 44,8           | 43,0           | 40,6                | 37,5 | 33,7 | 29,2 | 23,9 |      |      |      |
| 10HM05                                      |         | 2,2   | PLM90HM../322 E3  | 2,14          | 7,17 | 4,14 | -                      | 60,6           | 56,4           | 54,3           | 51,4                | 47,6 | 42,8 | 37,1 | 30,5 |      |      |      |
| 10HM06                                      |         | 2,2   | PLM90HM../322 E3  | 2,52          | 7,96 | 4,59 | -                      | 72,4           | 67,1           | 64,4           | 60,8                | 56,2 | 50,5 | 43,6 | 35,6 |      |      |      |
| 10HM07                                      |         | 3     | PLM90HM../330 E3  | 2,96          | 10,2 | 5,87 | -                      | 84,8           | 78,8           | 75,8           | 71,7                | 66,3 | 59,7 | 51,7 | 42,4 |      |      |      |
| 10HM08                                      |         | 3     | PLM90HM../330 E3  | 3,35          | 10,9 | 6,32 | -                      | 96,6           | 89,4           | 85,9           | 81,1                | 74,9 | 67,3 | 58,1 | 47,5 |      |      |      |
| 10HM09                                      |         | 4     | PLM100HM../340 E3 | 3,75          | -    | 6,74 | 3,89                   | 109            | 102            | 98,3           | 93,1                | 86,3 | 77,9 | 67,7 | 55,7 |      |      |      |
| 10HM10                                      |         | 4     | PLM100HM../340 E3 | 4,14          | -    | 7,20 | 4,16                   | 121            | 113            | 109            | 103                 | 95,2 | 85,7 | 74,4 | 61,1 |      |      |      |
| 10HM11                                      |         | 4     | PLM100HM../340 E3 | 4,52          | -    | 7,70 | 4,45                   | 133            | 124            | 119            | 112                 | 104  | 93,5 | 81,0 | 66,4 |      |      |      |
| 10HM12                                      |         | 5,5   | PLM112HM../355 E3 | 5,04          | -    | 9,39 | 5,43                   | 146            | 136            | 131            | 124                 | 115  | 104  | 90,4 | 74,5 |      |      |      |
| 10HM13                                      |         | 5,5   | PLM112HM../355 E3 | 5,42          | -    | 9,82 | 5,68                   | 158            | 147            | 142            | 134                 | 124  | 112  | 97,3 | 80,0 |      |      |      |

| PUMP TYPE<br>HM..S<br>HM..N                 | VERSION | MOTOR             |                   | ELECTRIC PUMP |      |      | Q = DELIVERY           |                |                |                |                     |      |      |      |      |      |      |      |
|---|---------|-------------------|-------------------|---------------|------|------|------------------------|----------------|----------------|----------------|---------------------|------|------|------|------|------|------|------|
|   |         |                   |                   |               |      |      | * P <sub>1</sub><br>kW | * I            |                |                | l/min 0             | 133  | 178  | 223  | 268  | 313  | 358  | 400  |
|   |         |                   |                   |               |      |      |                        | 220-240 V<br>A | 380-415 V<br>A | 660-690 V<br>A | m <sup>3</sup> /h 0 | 8,0  | 10,7 | 13,4 | 16,1 | 18,8 | 21,5 | 24,0 |
| H = TOTAL HEAD IN METRES OF COLUMN OF WATER |         |                   |                   |               |      |      |                        |                |                |                |                     |      |      |      |      |      |      |      |
| 15HM02                                      | 1 ~     | 1,5               | SM80HM../1115     | 1,77          | 7,83 | -    | -                      | 28,3           | 25,7           | 24,4           | 22,9                | 20,9 | 18,1 | 14,6 | 10,5 |      |      |      |
| 15HM03                                      |         | 2,2               | PLM90HM../1225    | 2,59          | 11,7 | -    | -                      | 43,0           | 38,7           | 36,9           | 34,7                | 31,8 | 28,3 | 23,9 | 19,0 |      |      |      |
| 15HM02                                      | 3 ~     | 1,5               | SM80HM../315 E3   | 1,63          | 5,29 | 3,05 | -                      | 28,8           | 26,3           | 25,2           | 23,8                | 21,8 | 19,2 | 15,7 | 11,7 |      |      |      |
| 15HM03                                      |         | 2,2               | PLM90HM../322 E3  | 2,57          | 8,05 | 4,65 | -                      | 43,6           | 39,6           | 37,9           | 35,8                | 33,1 | 29,7 | 25,4 | 20,6 |      |      |      |
| 15HM04                                      |         | 3                 | PLM90HM../330 E3  | 3,40          | 11,1 | 6,39 | -                      | 58,1           | 52,8           | 50,6           | 47,7                | 44,2 | 39,6 | 33,8 | 27,4 |      |      |      |
| 15HM05                                      |         | 4                 | PLM100HM../340 E3 | 4,21          | -    | 7,30 | 4,22                   | 72,9           | 66,7           | 63,9           | 60,5                | 56,1 | 50,5 | 43,3 | 35,3 |      |      |      |
| 15HM06                                      |         | 5,5               | PLM112HM../355 E3 | 5,13          | -    | 9,50 | 5,49                   | 87,8           | 80,4           | 77,2           | 73,2                | 67,9 | 61,2 | 52,7 | 43,1 |      |      |      |
| 15HM07                                      | 5,5     | PLM112HM../355 E3 | 5,91              | -             | 10,4 | 6,00 | 102                    | 93,3           | 89,4           | 84,6           | 78,4                | 70,5 | 60,6 | 49,4 |      |      |      |      |

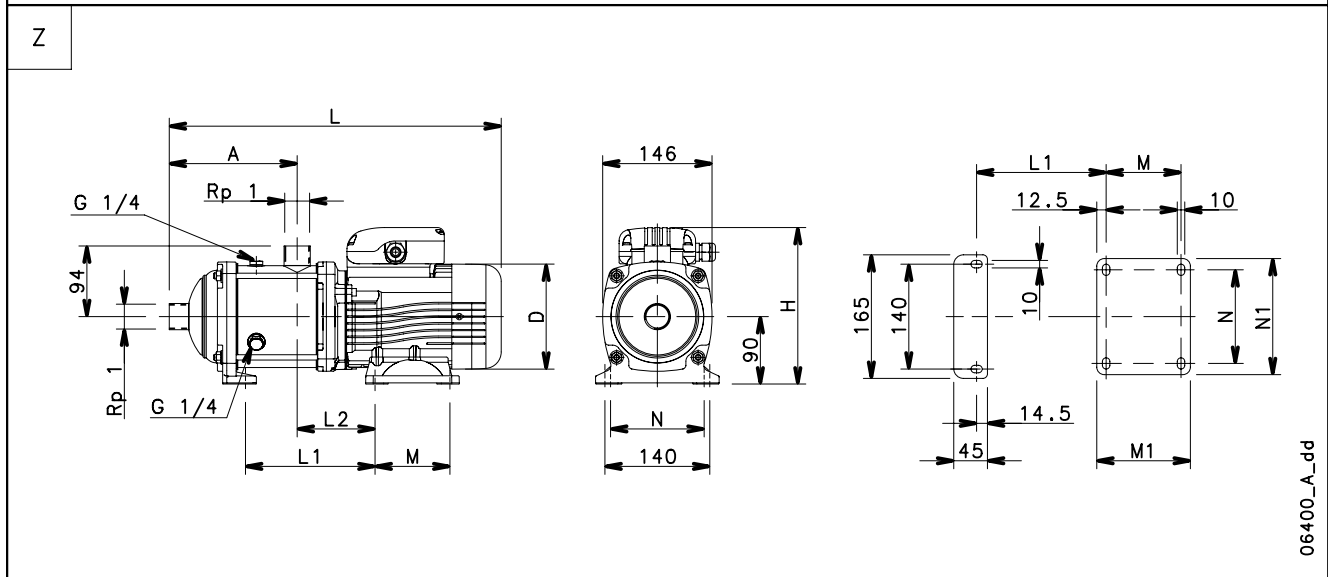
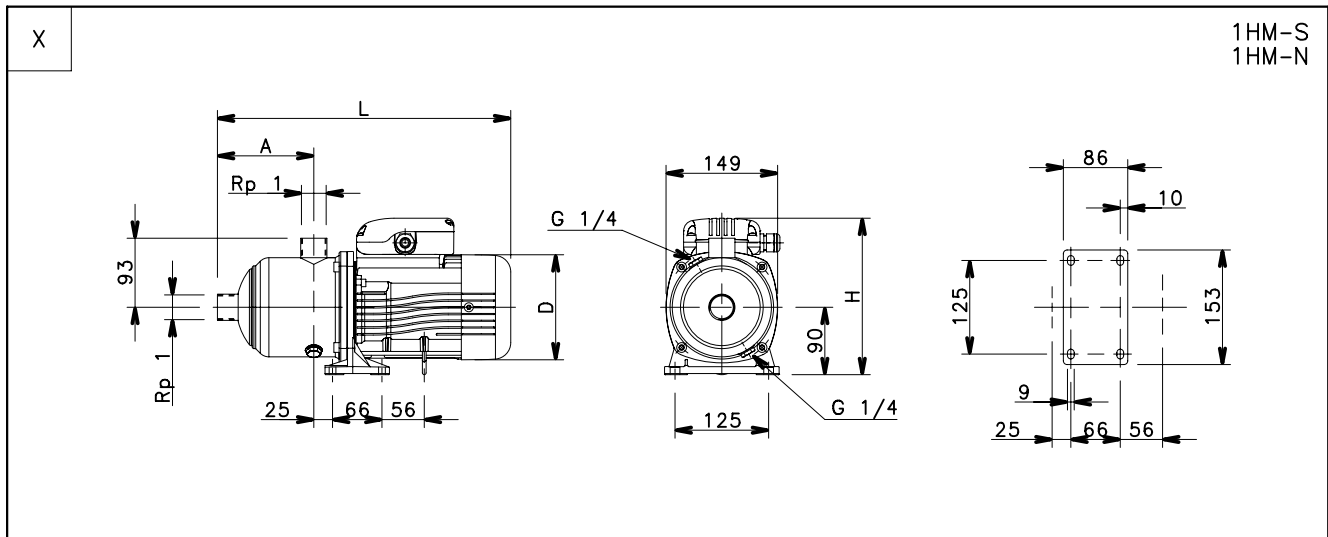
| PUMP TYPE<br>HM..S<br>HM..N                 | VERSION | MOTOR |                   | ELECTRIC PUMP |      |      | Q = DELIVERY           |                |                |                |                     |      |      |      |      |      |      |      |
|---|---------|-------|-------------------|---------------|------|------|------------------------|----------------|----------------|----------------|---------------------|------|------|------|------|------|------|------|
|   |         |       |                   |               |      |      | * P <sub>1</sub><br>kW | * I            |                |                | l/min 0             | 183  | 233  | 283  | 333  | 383  | 433  | 483  |
|   |         |       |                   |               |      |      |                        | 220-240 V<br>A | 380-415 V<br>A | 660-690 V<br>A | m <sup>3</sup> /h 0 | 11,0 | 14,0 | 17,0 | 20,0 | 23,0 | 26,0 | 29,0 |
| H = TOTAL HEAD IN METRES OF COLUMN OF WATER |         |       |                   |               |      |      |                        |                |                |                |                     |      |      |      |      |      |      |      |
| 22HM02                                      | 1 ~     | 2,2   | PLM90HM../1225    | 2,42          | 10,9 | -    | -                      | 29,9           | 27,4           | 26,0           | 24,3                | 21,8 | 18,5 | 14,3 | 9,3  |      |      |      |
| 22HM02                                      | 3 ~     | 2,2   | PLM90HM../322 E3  | 2,37          | 7,64 | 4,41 | -                      | 30,2           | 28,0           | 26,7           | 25,0                | 22,7 | 19,5 | 15,4 | 10,4 |      |      |      |
| 22HM03                                      |         | 3     | PLM90HM../330 E3  | 3,38          | 11,0 | 6,34 | -                      | 45,6           | 41,9           | 40,2           | 38,0                | 35,1 | 31,3 | 26,4 | 20,4 |      |      |      |
| 22HM04                                      |         | 4     | PLM100HM../340 E3 | 4,44          | -    | 7,56 | 4,37                   | 61,0           | 56,3           | 54,0           | 51,1                | 47,3 | 42,3 | 35,8 | 27,9 |      |      |      |
| 22HM05                                      |         | 5,5   | PLM112HM../355 E3 | 5,62          | -    | 10,0 | 5,79                   | 76,4           | 70,7           | 67,9           | 64,3                | 59,6 | 53,3 | 45,2 | 35,3 |      |      |      |

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

10-22hm-s-n-2p50-en\_b\_th

\* Maximum value in specified range: P<sub>1</sub> = input power; I = input current.

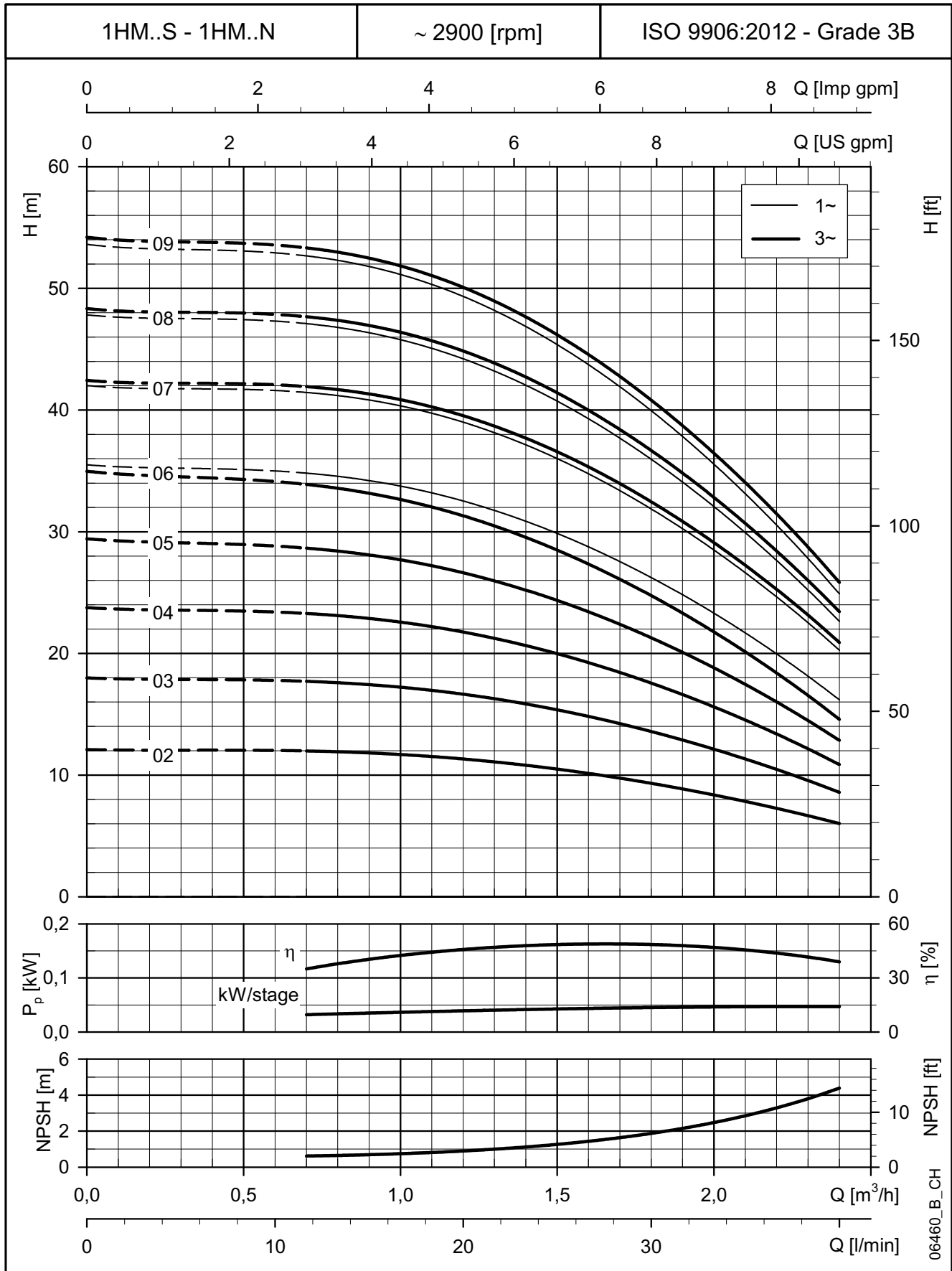
### 1HM..S - 1HM..N SERIES, (2 TO 9 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



| PUMP TYPE | VERSION      | Ref. | MOTOR |      | DIMENSIONS (mm) |     |     |     |     |     |     |     |     |     | PN | WEIGHT |
|-----------|--------------|------|-------|------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|--------|
|           |              |      | kW    | SIZE | A               | D   | H   | L   | L1  | L2  | M   | M1  | N   | N1  |    |        |
| 1HM06     | SINGLE-PHASE | X    | 0,50  | 63   | 147             | 120 | 201 | 396 | -   | -   | -   | -   | -   | -   | 10 | 8      |
| 1HM07     |              | Z    | 0,55  | 71   | 151             | 140 | 211 | 424 | 153 | 104 | 100 | 125 | 125 | 155 | 10 | 10     |
| 1HM08     |              | Z    | 0,55  | 71   | 171             | 140 | 211 | 444 | 173 | 104 | 100 | 125 | 125 | 155 | 10 | 11     |
| 1HM09     |              | Z    | 0,55  | 71   | 191             | 140 | 211 | 464 | 193 | 104 | 100 | 125 | 125 | 155 | 10 | 11     |

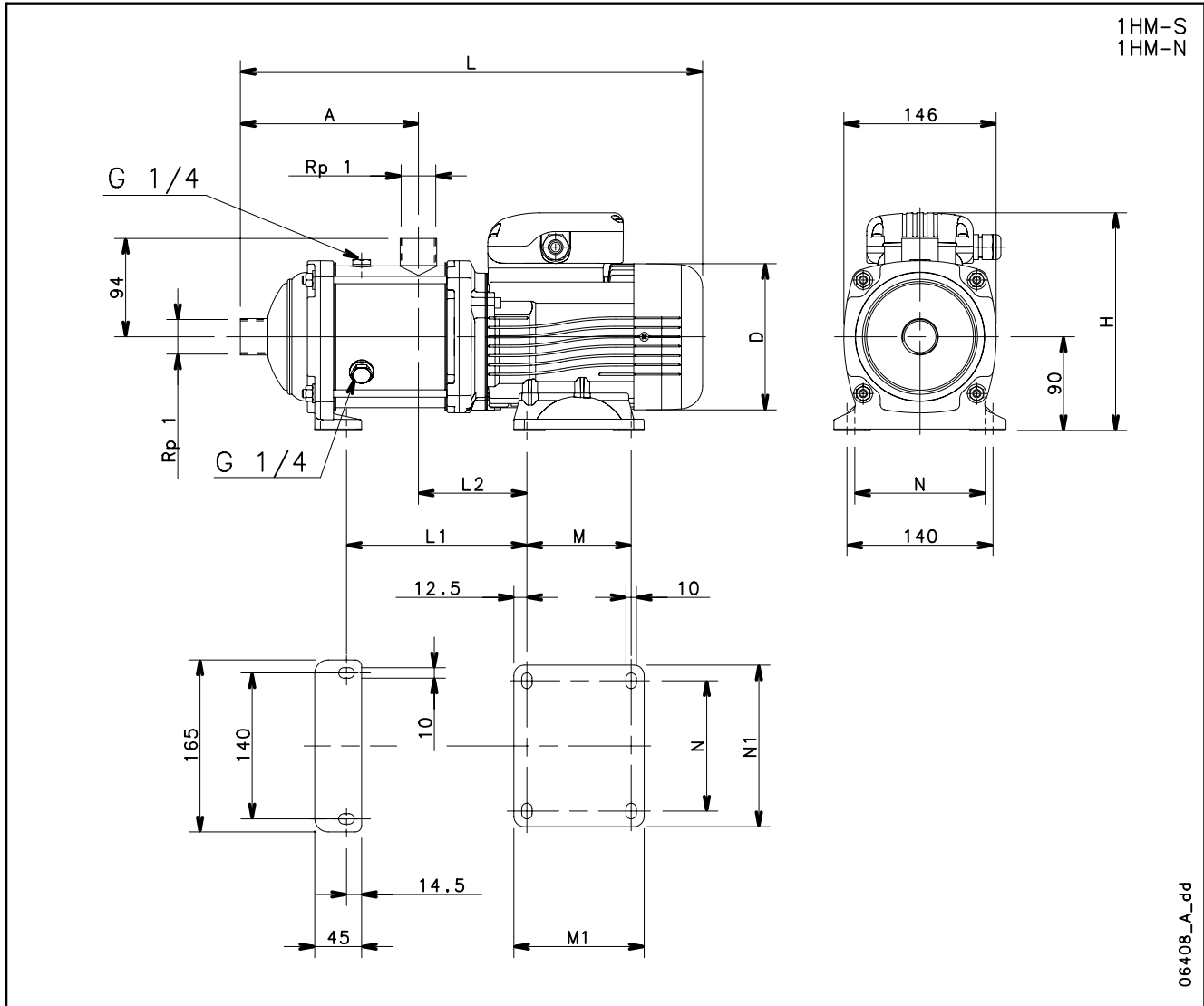
|       |             |   |      |    |     |     |     |     |     |     |     |     |     |     |    |    |
|-------|-------------|---|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 1HM02 | THREE-PHASE | X | 0,30 | 63 | 87  | 120 | 201 | 336 | -   | -   | -   | -   | -   | -   | 10 | 6  |
| 1HM03 |             |   | 0,30 | 63 | 87  | 120 | 201 | 336 | -   | -   | -   | -   | -   | -   | 10 | 6  |
| 1HM04 |             |   | 0,30 | 63 | 107 | 120 | 201 | 356 | -   | -   | -   | -   | -   | -   | 10 | 7  |
| 1HM05 |             |   | 0,30 | 63 | 127 | 120 | 201 | 376 | -   | -   | -   | -   | -   | -   | 10 | 7  |
| 1HM06 |             |   | 0,30 | 63 | 147 | 120 | 201 | 396 | -   | -   | -   | -   | -   | -   | 10 | 7  |
| 1HM07 |             | Z | 0,55 | 71 | 151 | 140 | 211 | 424 | 153 | 104 | 100 | 125 | 125 | 155 | 10 | 10 |
| 1HM08 |             |   | 0,55 | 71 | 171 | 140 | 211 | 444 | 173 | 104 | 100 | 125 | 125 | 155 | 10 | 11 |
| 1HM09 |             |   | 0,55 | 71 | 191 | 140 | 211 | 464 | 193 | 104 | 100 | 125 | 125 | 155 | 10 | 11 |

**1HM..S - 1HM..N SERIES, (2 TO 9 STAGES)  
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

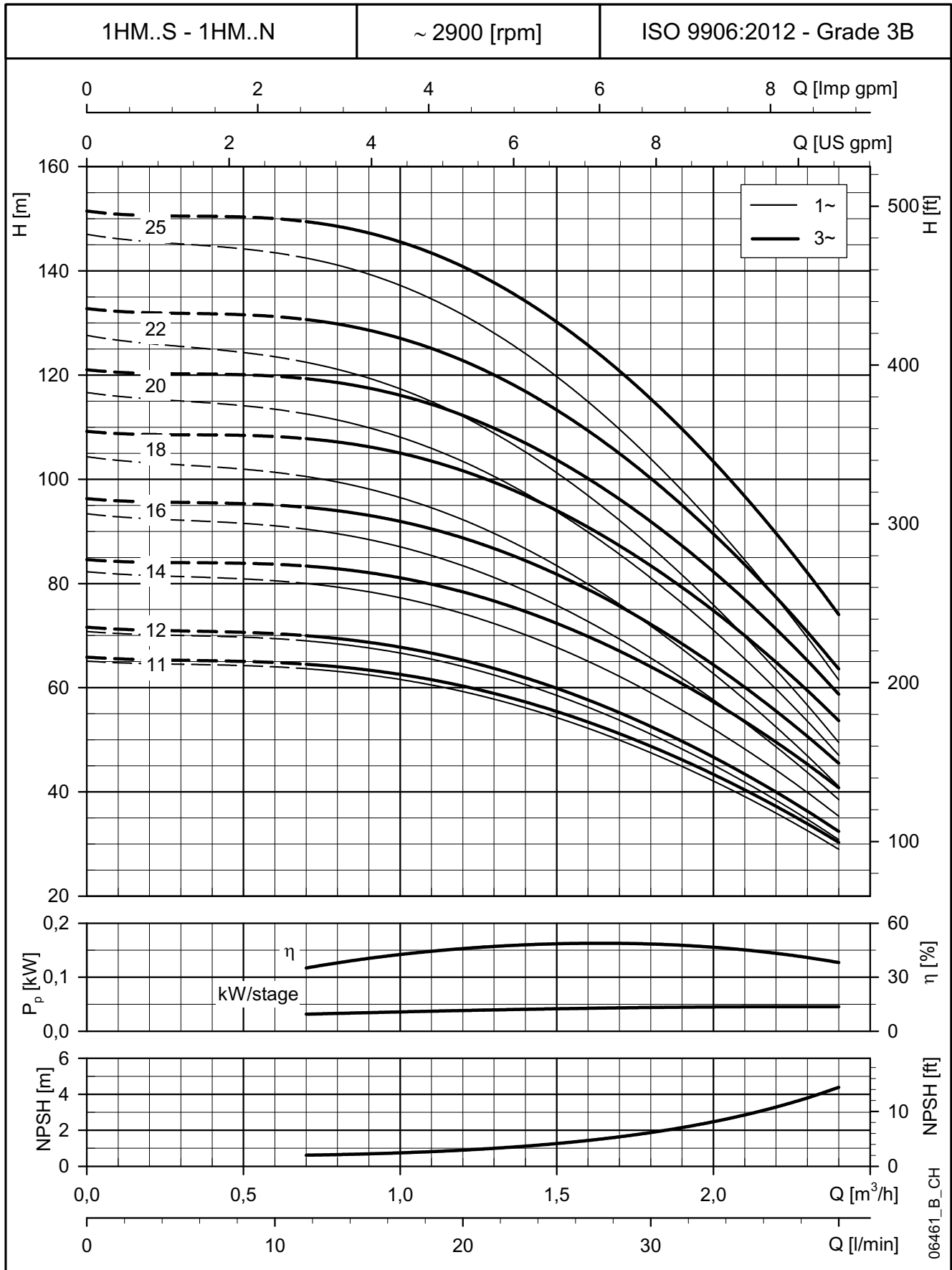
### 1HM..S - 1HM..N SERIES, (11 TO 25 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



| PUMP TYPE | VERSION      | MOTOR |      | DIMENSIONS (mm) |     |     |     |     |     |     |     |     |     | PN<br>bar | WEIGHT<br>kg |
|-----------|--------------|-------|------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------|--------------|
|           |              | kW    | SIZE | A               | D   | H   | L   | L1  | L2  | M   | M1  | N   | N1  |           |              |
| 1HM11     | SINGLE-PHASE | 0,55  | 71   | 231             | 140 | 211 | 504 | 233 | 104 | 100 | 125 | 125 | 155 | 10        | 12           |
| 1HM12     |              | 0,55  | 71   | 251             | 140 | 211 | 524 | 253 | 104 | 100 | 125 | 125 | 155 | 10        | 12           |
| 1HM14     |              | 0,75  | 71   | 291             | 140 | 211 | 564 | 293 | 104 | 100 | 125 | 125 | 155 | 10        | 14           |
| 1HM16     |              | 0,75  | 71   | 331             | 140 | 211 | 604 | 333 | 104 | 100 | 125 | 125 | 155 | 10        | 14           |
| 1HM18     |              | 0,75  | 71   | 371             | 140 | 211 | 644 | 373 | 104 | 100 | 125 | 125 | 155 | 16        | 15           |
| 1HM20     |              | 0,95  | 71   | 411             | 140 | 220 | 684 | 413 | 104 | 100 | 125 | 125 | 155 | 16        | 17           |
| 1HM22     |              | 0,95  | 71   | 451             | 140 | 220 | 724 | 453 | 104 | 100 | 125 | 125 | 155 | 16        | 17           |
| 1HM25     |              | 1,1   | 80   | 511             | 155 | 227 | 828 | 513 | 104 | 100 | 125 | 125 | 155 | 16        | 21           |

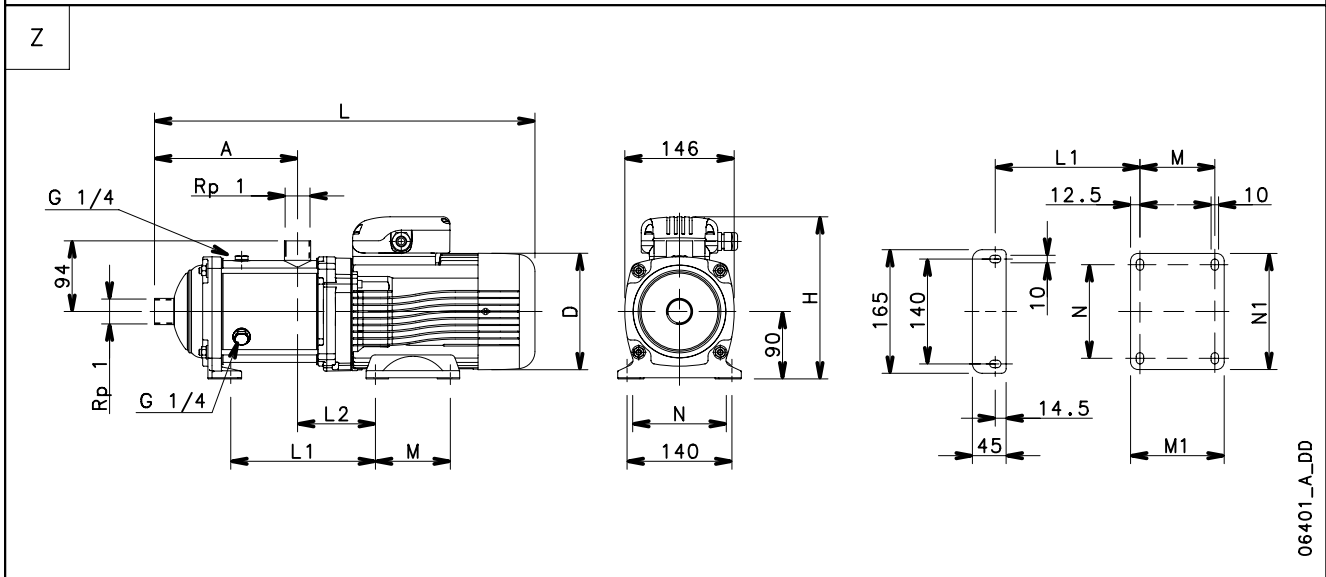
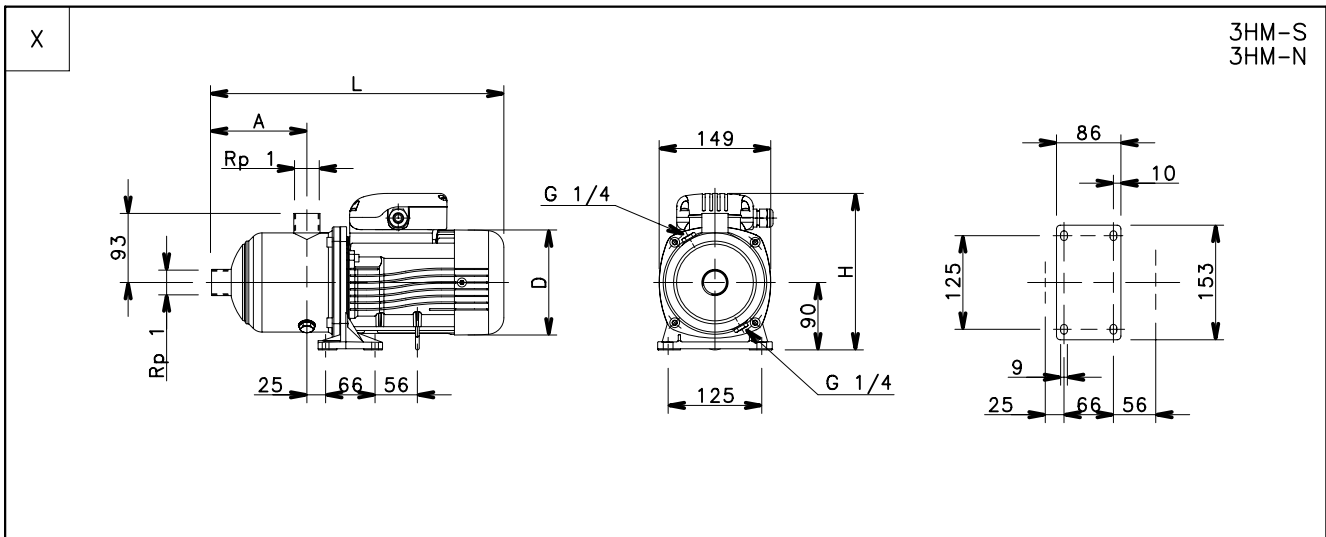
|       |             |      |    |     |     |     |     |     |     |     |     |     |     |    |    |
|-------|-------------|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 1HM11 | THREE-PHASE | 0,55 | 71 | 231 | 140 | 211 | 504 | 233 | 104 | 100 | 125 | 125 | 155 | 10 | 12 |
| 1HM12 |             | 0,55 | 71 | 251 | 140 | 211 | 524 | 253 | 104 | 100 | 125 | 125 | 155 | 10 | 12 |
| 1HM14 |             | 0,75 | 80 | 291 | 155 | 219 | 608 | 293 | 104 | 100 | 125 | 125 | 155 | 10 | 14 |
| 1HM16 |             | 0,75 | 80 | 331 | 155 | 219 | 648 | 333 | 104 | 100 | 125 | 125 | 155 | 10 | 14 |
| 1HM18 |             | 1,1  | 80 | 371 | 155 | 219 | 688 | 373 | 104 | 100 | 125 | 125 | 155 | 16 | 19 |
| 1HM20 |             | 1,1  | 80 | 411 | 155 | 219 | 728 | 413 | 104 | 100 | 125 | 125 | 155 | 16 | 20 |
| 1HM22 |             | 1,1  | 80 | 451 | 155 | 219 | 768 | 453 | 104 | 100 | 125 | 125 | 155 | 16 | 20 |
| 1HM25 |             | 1,5  | 80 | 511 | 155 | 219 | 828 | 513 | 104 | 100 | 125 | 125 | 155 | 16 | 23 |

**1HM..S - 1HM..N SERIES, (11 TO 25 STAGES)**  
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

### 3HM..S - 3HM..N SERIES, (2 TO 10 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES

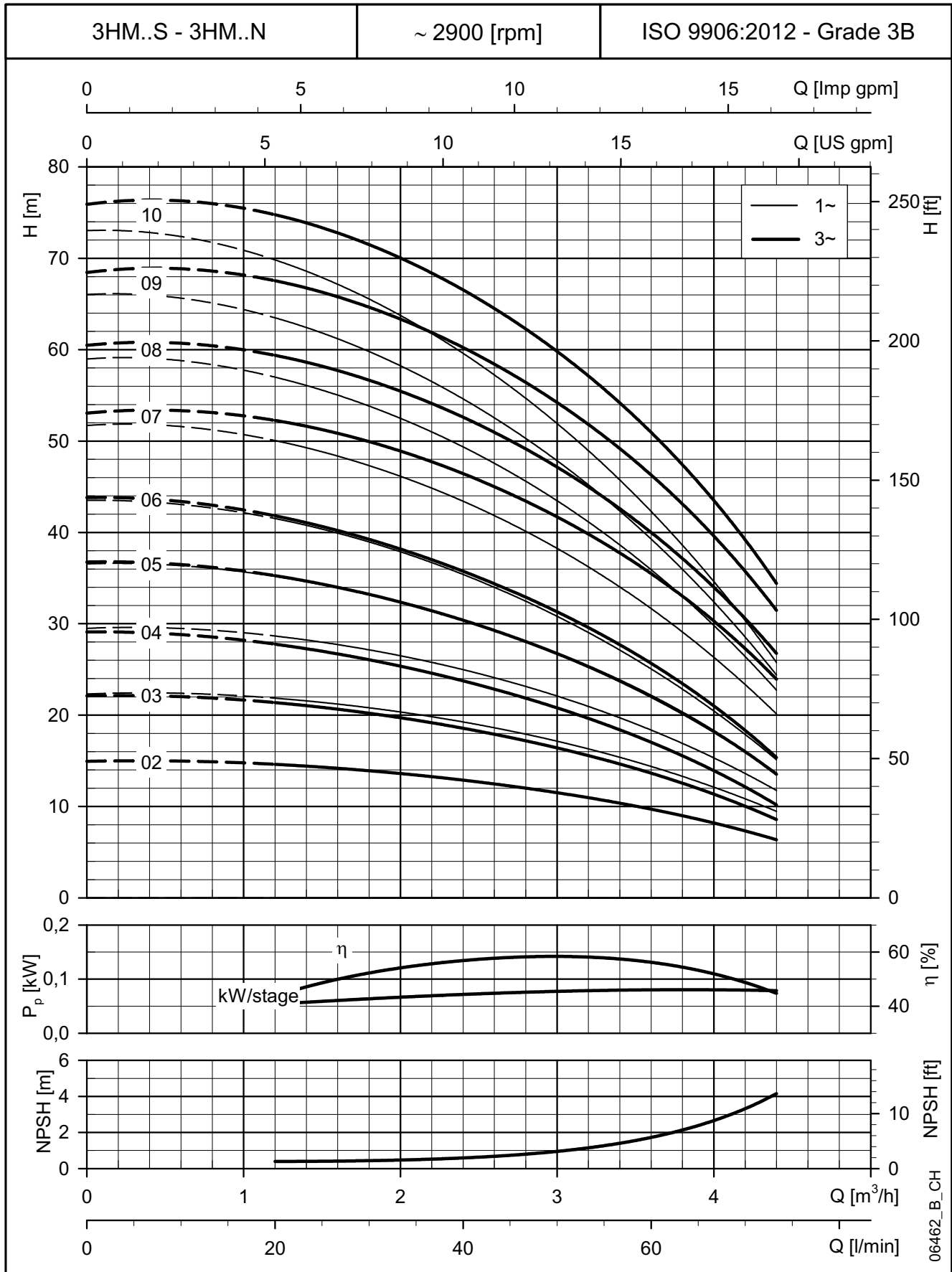


| PUMP TYPE | VERSION      | Ref. | MOTOR |      | DIMENSIONS (mm) |     |     |     |     |     |     |     |     | PN  | WEIGHT |    |
|-----------|--------------|------|-------|------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|----|
|           |              |      | kW    | SIZE | A               | D   | H   | L   | L1  | L2  | M   | M1  | N   |     |        | N1 |
| 3HM03     | SINGLE-PHASE | X    | 0,50  | 63   | 87              | 120 | 201 | 336 | -   | -   | -   | -   | -   | -   | 10     | 7  |
| 3HM04     |              |      | 0,50  | 63   | 107             | 120 | 201 | 356 | -   | -   | -   | -   | -   | -   | 10     | 8  |
| 3HM05     |              |      | 0,50  | 63   | 127             | 120 | 201 | 376 | -   | -   | -   | -   | -   | -   | 10     | 8  |
| 3HM06     |              |      | 0,50  | 63   | 147             | 120 | 201 | 396 | -   | -   | -   | -   | -   | -   | 10     | 8  |
| 3HM07     |              | Z    | 0,55  | 71   | 151             | 140 | 211 | 424 | 153 | 104 | 100 | 125 | 125 | 155 | 10     | 10 |
| 3HM08     |              |      | 0,75  | 71   | 171             | 140 | 211 | 444 | 173 | 104 | 100 | 125 | 125 | 155 | 10     | 12 |
| 3HM09     |              |      | 0,75  | 71   | 191             | 140 | 211 | 464 | 193 | 104 | 100 | 125 | 125 | 155 | 10     | 12 |
| 3HM10     |              |      | 0,75  | 71   | 211             | 140 | 211 | 484 | 213 | 104 | 100 | 125 | 125 | 155 | 10     | 12 |

|       |             |   |      |    |     |     |     |     |     |     |     |     |     |     |    |    |
|-------|-------------|---|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 3HM02 | THREE-PHASE | X | 0,30 | 63 | 87  | 120 | 201 | 336 | -   | -   | -   | -   | -   | -   | 10 | 6  |
| 3HM03 |             |   | 0,30 | 63 | 87  | 120 | 201 | 336 | -   | -   | -   | -   | -   | -   | 10 | 6  |
| 3HM04 |             |   | 0,30 | 63 | 107 | 120 | 201 | 356 | -   | -   | -   | -   | -   | -   | 10 | 7  |
| 3HM05 |             |   | 0,40 | 63 | 127 | 120 | 201 | 376 | -   | -   | -   | -   | -   | -   | 10 | 7  |
| 3HM06 |             |   | 0,50 | 63 | 147 | 120 | 201 | 396 | -   | -   | -   | -   | -   | -   | 10 | 8  |
| 3HM07 |             | Z | 0,75 | 80 | 151 | 155 | 219 | 468 | 153 | 104 | 100 | 125 | 125 | 155 | 10 | 14 |
| 3HM08 |             |   | 0,75 | 80 | 171 | 155 | 219 | 488 | 173 | 104 | 100 | 125 | 125 | 155 | 10 | 15 |
| 3HM09 |             |   | 1,1  | 80 | 191 | 155 | 219 | 508 | 193 | 104 | 100 | 125 | 125 | 155 | 10 | 16 |
| 3HM10 |             |   | 1,1  | 80 | 211 | 155 | 219 | 528 | 213 | 104 | 100 | 125 | 125 | 155 | 10 | 16 |

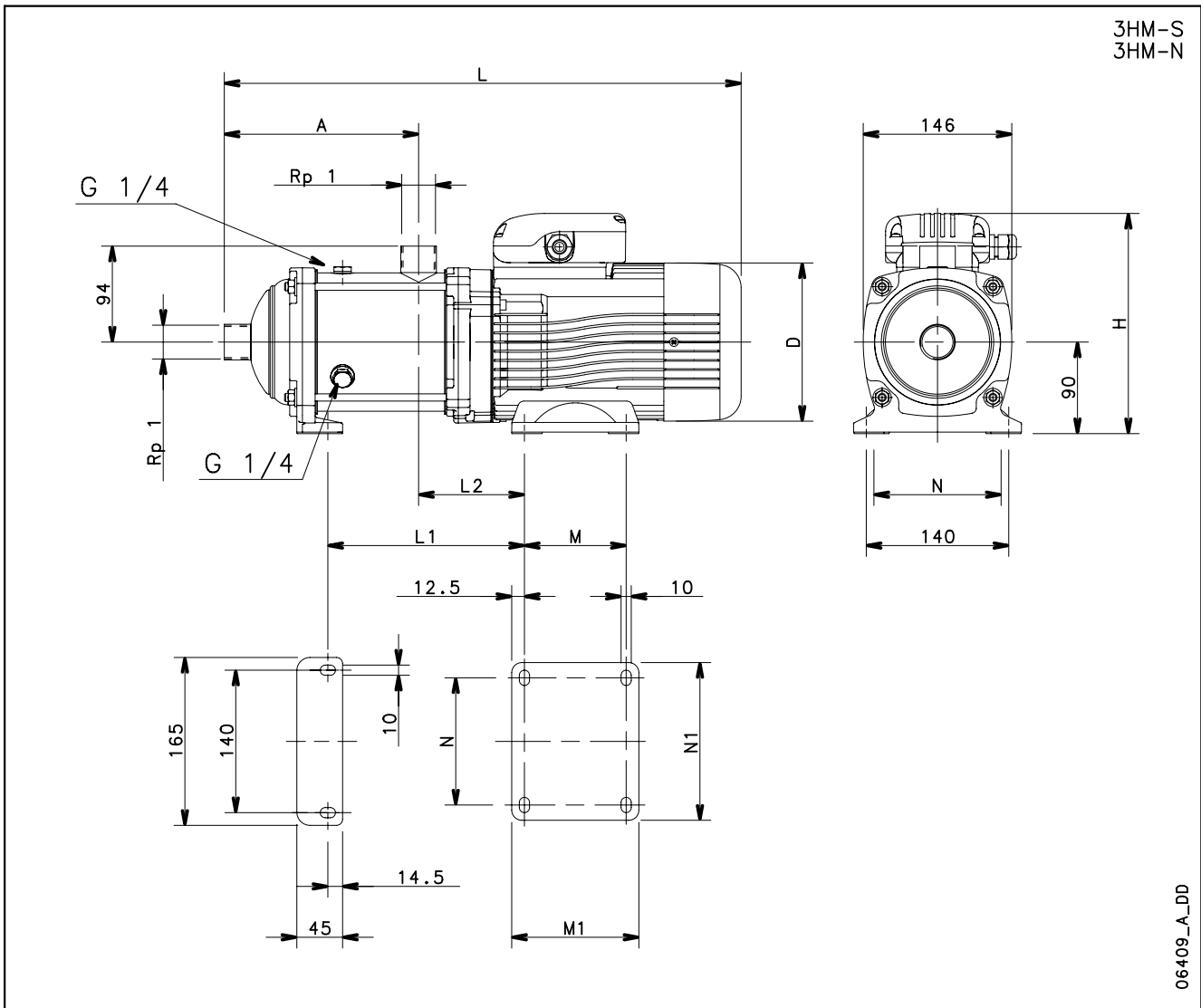


**3HM..S - 3HM..N SERIES, (2 TO 10 STAGES)**  
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

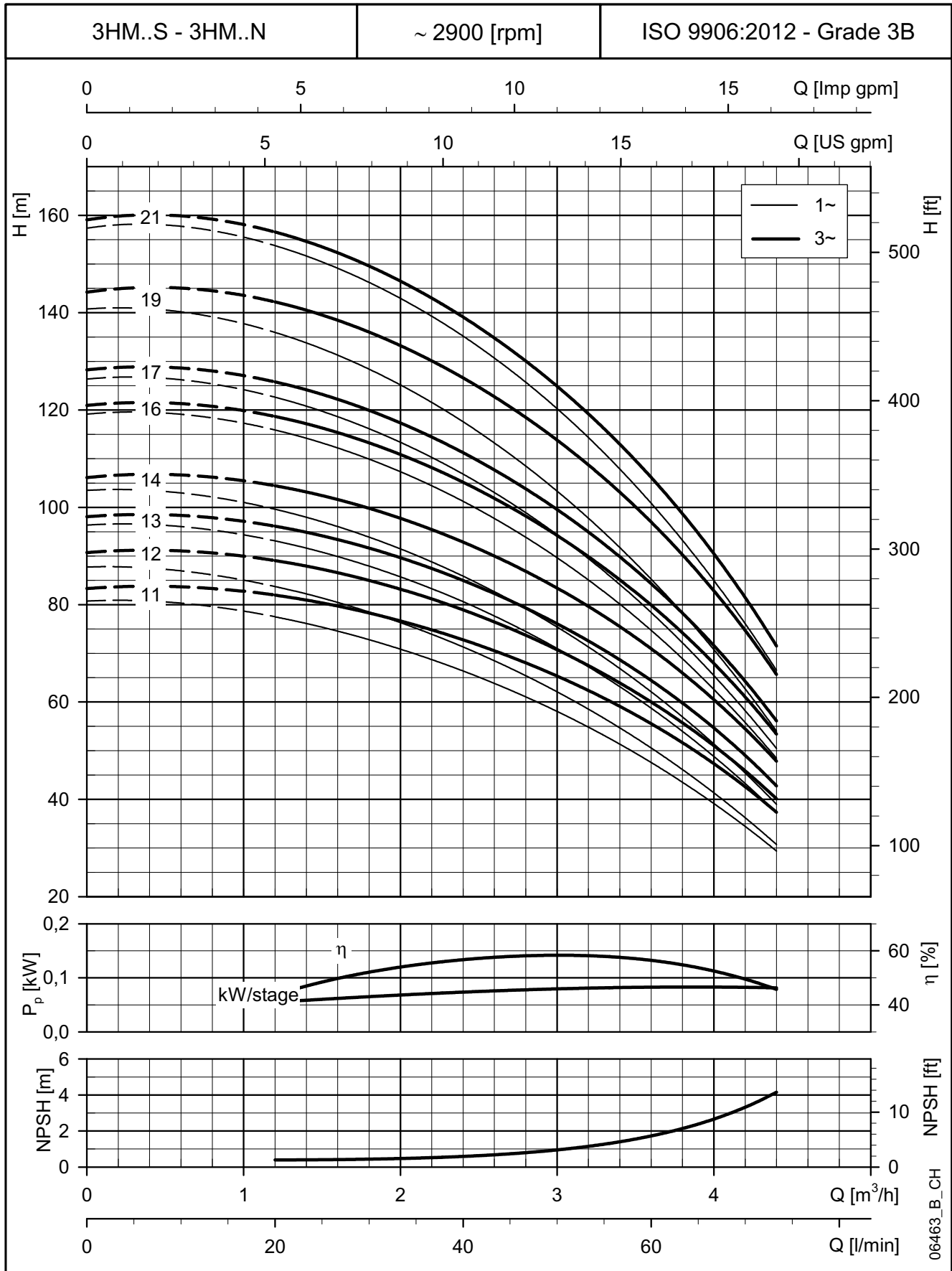
### 3HM..S - 3HM..N SERIES, (11 TO 21 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



| PUMP TYPE | VERSION   | MOTOR |      | DIMENSIONS (mm) |     |     |     |     |     |     |     |     |     | PN<br>bar | WEIGHT<br>kg |
|-----------|-----------|-------|------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------|--------------|
|           |           | kW    | SIZE | A               | D   | H   | L   | L1  | L2  | M   | M1  | N   | N1  |           |              |
| 3HM11     | MONOPHASE | 0,95  | 71   | 231             | 140 | 220 | 504 | 233 | 104 | 100 | 125 | 125 | 155 | 10        | 14           |
| 3HM12     |           | 0,95  | 71   | 251             | 140 | 220 | 524 | 253 | 104 | 100 | 125 | 125 | 155 | 10        | 14           |
| 3HM13     |           | 1,1   | 80   | 271             | 155 | 227 | 588 | 273 | 104 | 100 | 125 | 125 | 155 | 10        | 17           |
| 3HM14     |           | 1,1   | 80   | 291             | 155 | 227 | 608 | 293 | 104 | 100 | 125 | 125 | 155 | 16        | 18           |
| 3HM16     |           | 1,5   | 80   | 331             | 155 | 227 | 648 | 333 | 104 | 100 | 125 | 125 | 155 | 16        | 19           |
| 3HM17     |           | 1,5   | 80   | 351             | 155 | 227 | 668 | 353 | 104 | 100 | 125 | 125 | 155 | 16        | 20           |
| 3HM19     |           | 1,5   | 80   | 391             | 155 | 227 | 708 | 393 | 104 | 100 | 125 | 125 | 155 | 16        | 20           |
| 3HM21     |           | 2,2   | 90   | 431             | 174 | 249 | 804 | 456 | 127 | 125 | 150 | 140 | 164 | 16        | 29           |

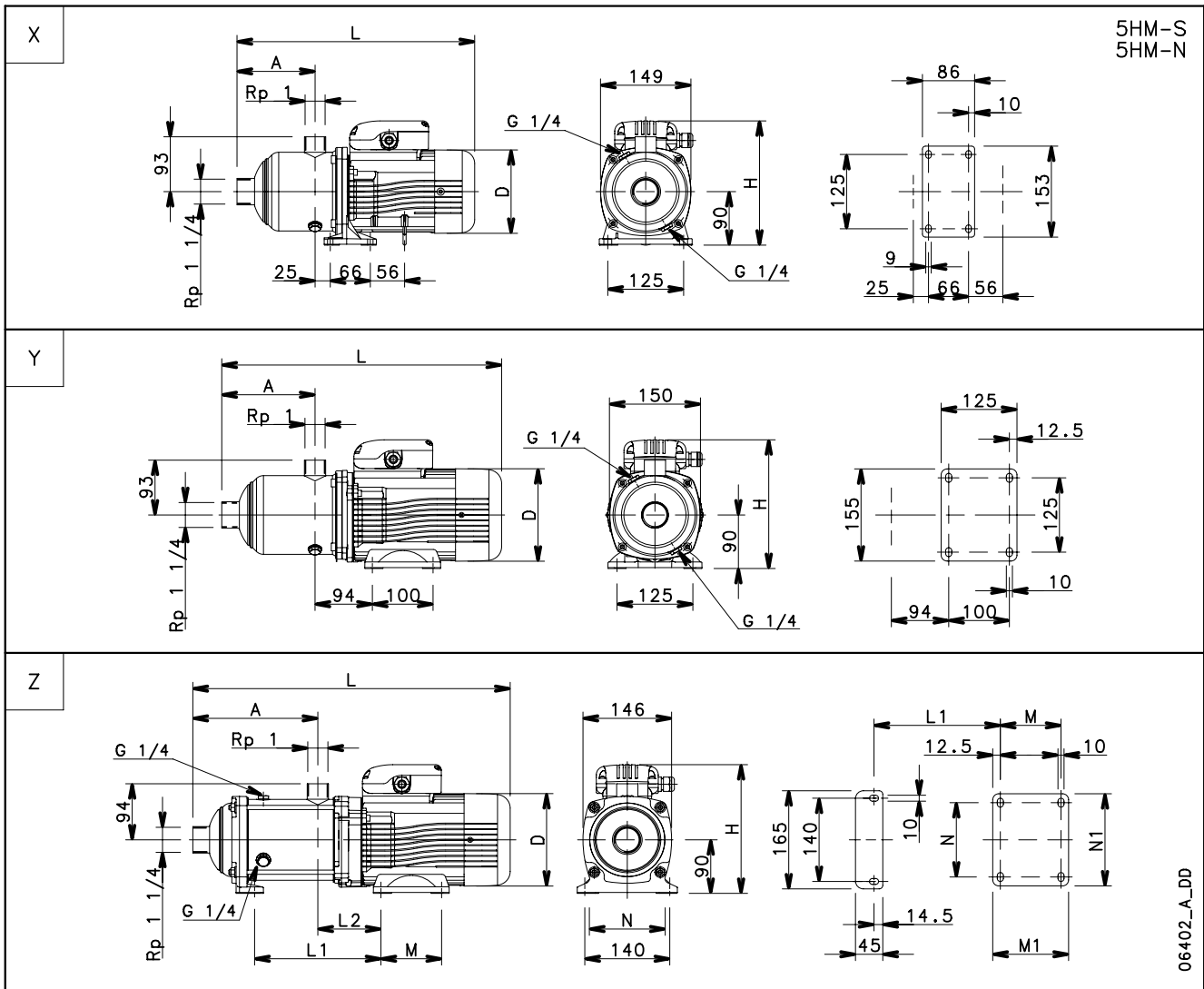
|       |         |     |    |     |     |     |     |     |     |     |     |     |     |    |    |
|-------|---------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 3HM11 | TRIFASE | 1,1 | 80 | 231 | 155 | 219 | 548 | 233 | 104 | 100 | 125 | 125 | 155 | 10 | 17 |
| 3HM12 |         | 1,1 | 80 | 251 | 155 | 219 | 568 | 253 | 104 | 100 | 125 | 125 | 155 | 10 | 17 |
| 3HM13 |         | 1,1 | 80 | 271 | 155 | 219 | 588 | 273 | 104 | 100 | 125 | 125 | 155 | 10 | 17 |
| 3HM14 |         | 1,5 | 80 | 291 | 155 | 219 | 608 | 293 | 104 | 100 | 125 | 125 | 155 | 16 | 19 |
| 3HM16 |         | 1,5 | 80 | 331 | 155 | 219 | 648 | 333 | 104 | 100 | 125 | 125 | 155 | 16 | 19 |
| 3HM17 |         | 1,5 | 80 | 351 | 155 | 219 | 668 | 353 | 104 | 100 | 125 | 125 | 155 | 16 | 20 |
| 3HM19 |         | 2,2 | 90 | 391 | 174 | 224 | 764 | 416 | 127 | 125 | 150 | 140 | 164 | 16 | 25 |
| 3HM21 |         | 2,2 | 90 | 431 | 174 | 224 | 804 | 456 | 127 | 125 | 150 | 140 | 164 | 16 | 26 |

**3HM..S - 3HM..N SERIES, (11 TO 21 STAGES)**  
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

### 5HM..S - 5HM..N SERIES, (2 TO 9 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES

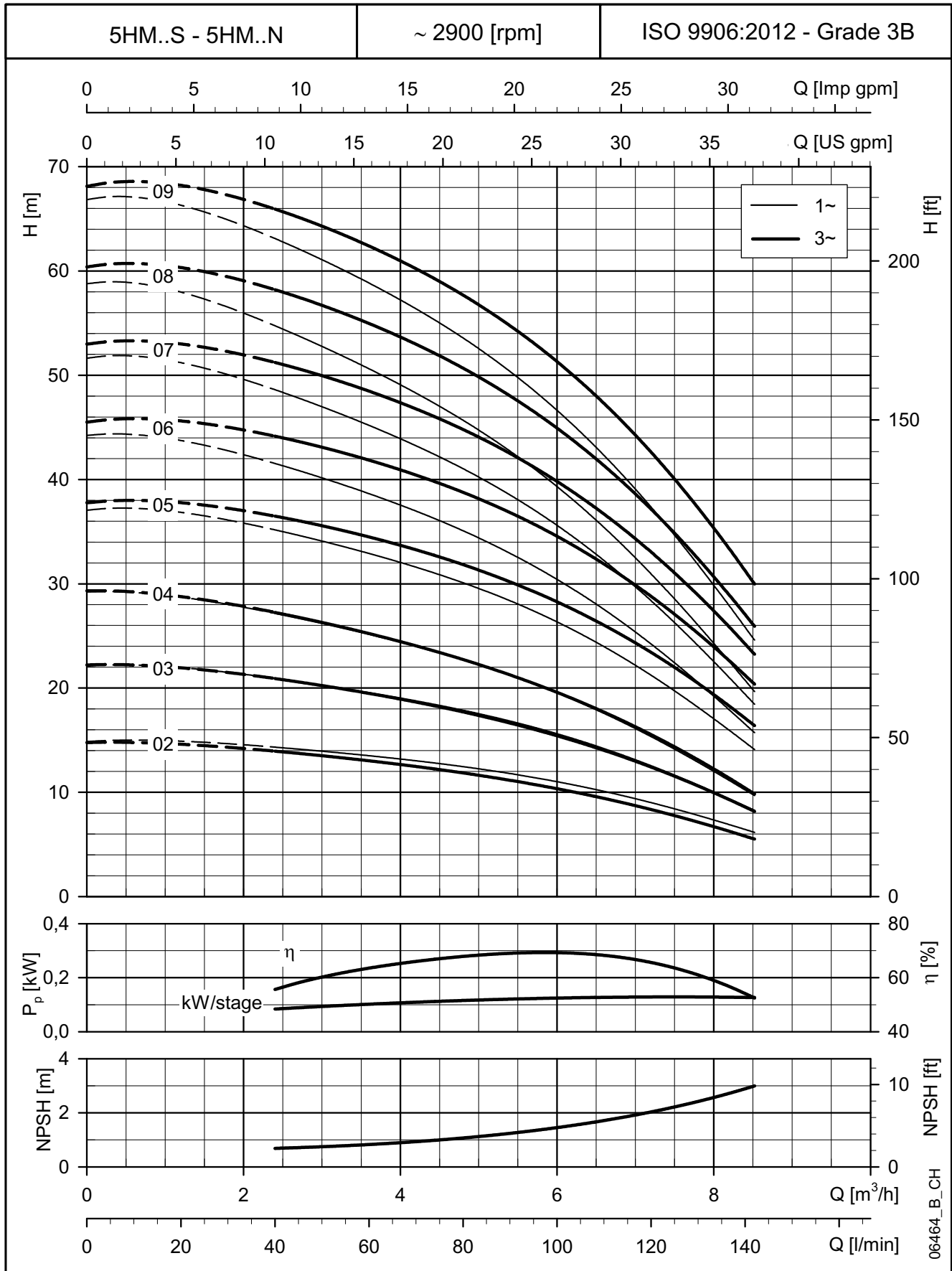


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| PUMP TYPE | VERSION      | Ref. | MOTOR |      | DIMENSIONS (mm) |     |     |     |     |     |     |     |     |     | PN | WEIGHT |     |
|-----------|--------------|------|-------|------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|--------|-----|
|           |              |      | kw    | SIZE | A               | D   | H   | L   | L1  | L2  | M   | M1  | N   | N1  |    |        | bar |
| 5HM02     | SINGLE-PHASE | X    | 0,50  | 63   | 79              | 120 | 201 | 353 | -   | -   | -   | -   | -   | -   | -  | 10     | 7   |
| 5HM03     |              |      | 0,50  | 63   | 104             | 120 | 201 | 353 | -   | -   | -   | -   | -   | -   | -  | 10     | 7   |
| 5HM04     |              |      | 0,50  | 63   | 129             | 120 | 201 | 378 | -   | -   | -   | -   | -   | -   | -  | 10     | 8   |
| 5HM05     |              |      | 0,75  | 71   | 154             | 140 | 211 | 417 | -   | -   | -   | -   | -   | -   | -  | 10     | 10  |
| 5HM06     |              | Z    | 0,75  | 71   | 158             | 140 | 211 | 430 | 158 | 104 | 100 | 125 | 125 | 155 | 10 | 11     |     |
| 5HM07     |              |      | 0,95  | 71   | 183             | 140 | 220 | 455 | 183 | 104 | 100 | 125 | 125 | 155 | 10 | 13     |     |
| 5HM08     |              |      | 0,95  | 71   | 208             | 140 | 220 | 480 | 208 | 104 | 100 | 125 | 125 | 155 | 10 | 13     |     |
| 5HM09     |              |      | 1,1   | 80   | 233             | 155 | 227 | 550 | 233 | 104 | 100 | 125 | 125 | 155 | 10 | 17     |     |

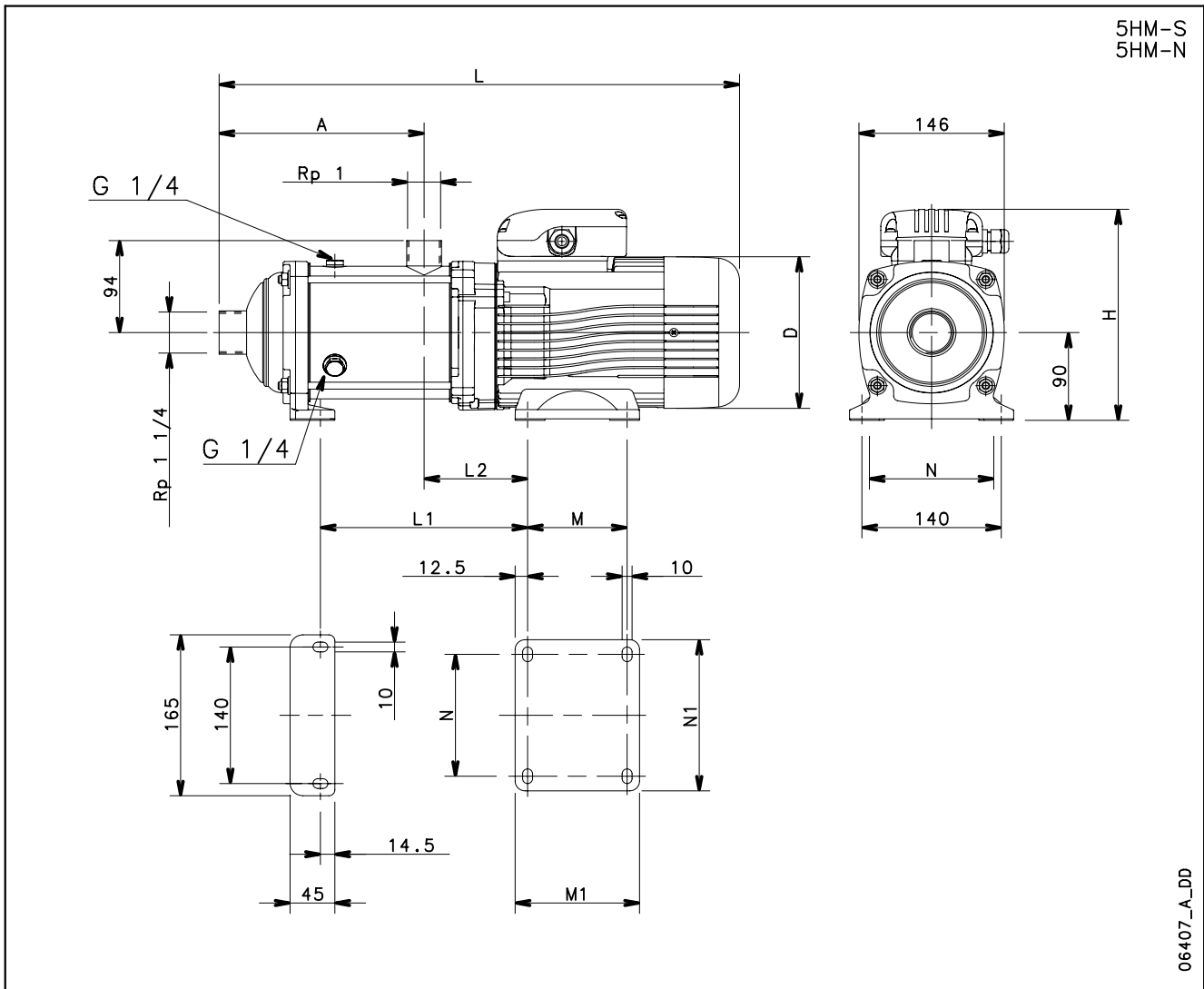
|       |             |   |      |     |     |     |     |     |     |     |     |     |     |     |     |    |    |
|-------|-------------|---|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 5HM02 | THREE-PHASE | X | 0,30 | 63  | 79  | 120 | 201 | 353 | -   | -   | -   | -   | -   | -   | 10  | 6  |    |
| 5HM03 |             |   | 0,40 | 63  | 104 | 120 | 201 | 353 | -   | -   | -   | -   | -   | -   | 10  | 7  |    |
| 5HM04 |             |   | 0,50 | 63  | 129 | 120 | 201 | 378 | -   | -   | -   | -   | -   | -   | 10  | 8  |    |
| 5HM05 |             | Z | 0,75 | 80  | 154 | 155 | 219 | 462 | -   | -   | -   | -   | -   | -   | 10  | 13 |    |
| 5HM06 |             |   | 1,1  | 80  | 158 | 155 | 219 | 475 | 158 | 104 | 100 | 125 | 125 | 155 | 10  | 15 |    |
| 5HM07 |             |   | 1,1  | 80  | 183 | 155 | 219 | 500 | 183 | 104 | 100 | 125 | 125 | 155 | 10  | 16 |    |
| 5HM08 |             |   | 1,1  | 80  | 208 | 155 | 219 | 525 | 208 | 104 | 100 | 125 | 125 | 155 | 10  | 16 |    |
| 5HM09 |             |   | Z    | 1,5 | 80  | 233 | 155 | 219 | 550 | 233 | 104 | 100 | 125 | 125 | 155 | 10 | 18 |

**5HM..S - 5HM..N SERIES, (2 TO 9 STAGES)  
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

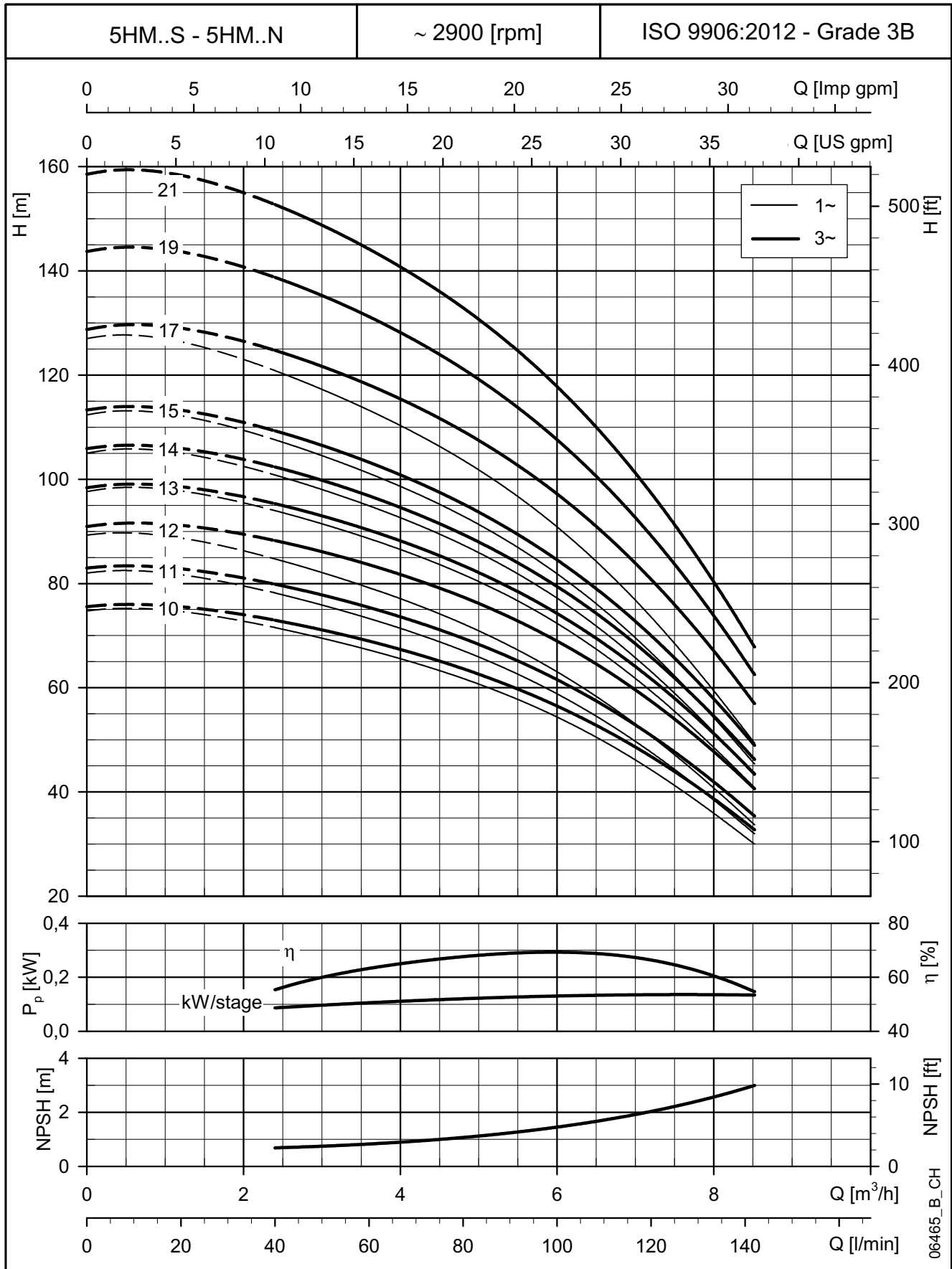
### 5HM..S - 5HM..N SERIES, (10 TO 21 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



| PUMP TYPE | VERSION      | MOTOR |      | DIMENSIONS (mm) |     |     |     |     |     |     |     |     |     | PN  | WEIGHT |
|-----------|--------------|-------|------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
|           |              | kW    | SIZE | A               | D   | H   | L   | L1  | L2  | M   | M1  | N   | N1  | bar | kg     |
| 5HM10     | SINGLE-PHASE | 1,5   | 80   | 258             | 155 | 227 | 575 | 258 | 104 | 100 | 125 | 125 | 155 | 10  | 18     |
| 5HM11     |              | 1,5   | 80   | 283             | 155 | 227 | 600 | 283 | 104 | 100 | 125 | 125 | 155 | 10  | 18     |
| 5HM12     |              | 1,5   | 80   | 308             | 155 | 227 | 625 | 308 | 104 | 100 | 125 | 125 | 155 | 10  | 19     |
| 5HM13     |              | 2,2   | 90   | 333             | 174 | 249 | 706 | 356 | 127 | 125 | 150 | 140 | 164 | 10  | 27     |
| 5HM14     |              | 2,2   | 90   | 358             | 174 | 249 | 731 | 381 | 127 | 125 | 150 | 140 | 164 | 16  | 28     |
| 5HM15     |              | 2,2   | 90   | 383             | 174 | 249 | 756 | 406 | 127 | 125 | 150 | 140 | 164 | 16  | 28     |
| 5HM17     |              | 2,2   | 90   | 433             | 174 | 249 | 806 | 456 | 127 | 125 | 150 | 140 | 164 | 16  | 29     |

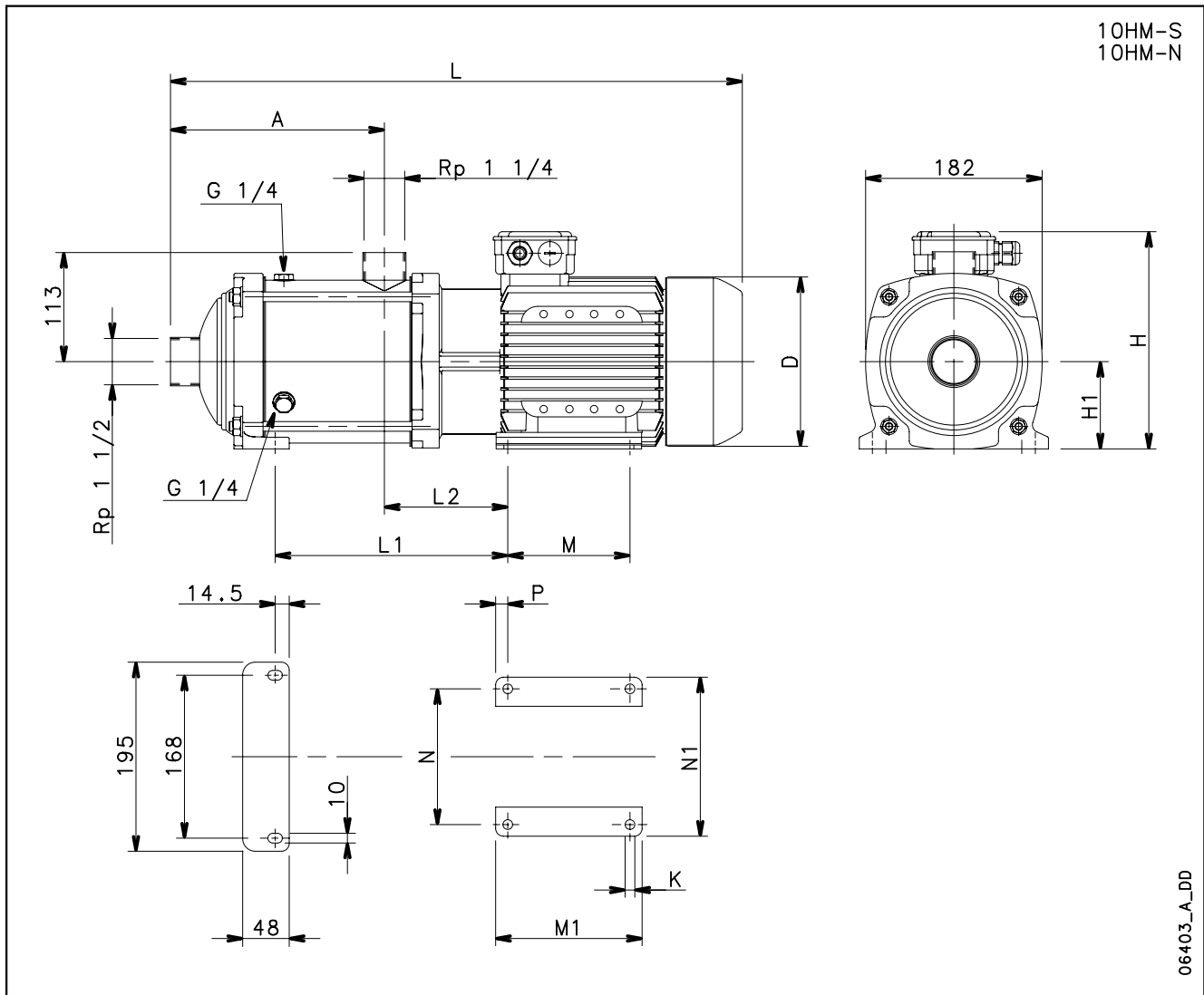
|       |             |     |    |     |     |     |     |     |     |     |     |     |     |    |    |
|-------|-------------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 5HM10 | THREE-PHASE | 1,5 | 80 | 258 | 155 | 227 | 575 | 258 | 104 | 100 | 125 | 125 | 155 | 10 | 18 |
| 5HM11 |             | 1,5 | 80 | 283 | 155 | 227 | 600 | 283 | 104 | 100 | 125 | 125 | 155 | 10 | 19 |
| 5HM12 |             | 2,2 | 90 | 308 | 174 | 224 | 681 | 308 | 127 | 125 | 150 | 140 | 164 | 10 | 24 |
| 5HM13 |             | 2,2 | 90 | 333 | 174 | 224 | 706 | 356 | 127 | 125 | 150 | 140 | 164 | 10 | 24 |
| 5HM14 |             | 2,2 | 90 | 358 | 174 | 224 | 731 | 381 | 127 | 125 | 150 | 140 | 164 | 16 | 25 |
| 5HM15 |             | 2,2 | 90 | 383 | 174 | 224 | 756 | 406 | 127 | 125 | 150 | 140 | 164 | 16 | 25 |
| 5HM17 |             | 3   | 90 | 433 | 174 | 224 | 806 | 456 | 127 | 125 | 150 | 140 | 164 | 16 | 29 |
| 5HM19 |             | 3   | 90 | 483 | 174 | 224 | 856 | 506 | 127 | 125 | 150 | 140 | 164 | 16 | 30 |
| 5HM21 |             | 3   | 90 | 533 | 174 | 224 | 906 | 556 | 127 | 125 | 150 | 140 | 164 | 16 | 31 |

**5HM..S - 5HM..N SERIES, (10 TO 21 STAGES)**  
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

### 10HM..S - 10HM..N SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



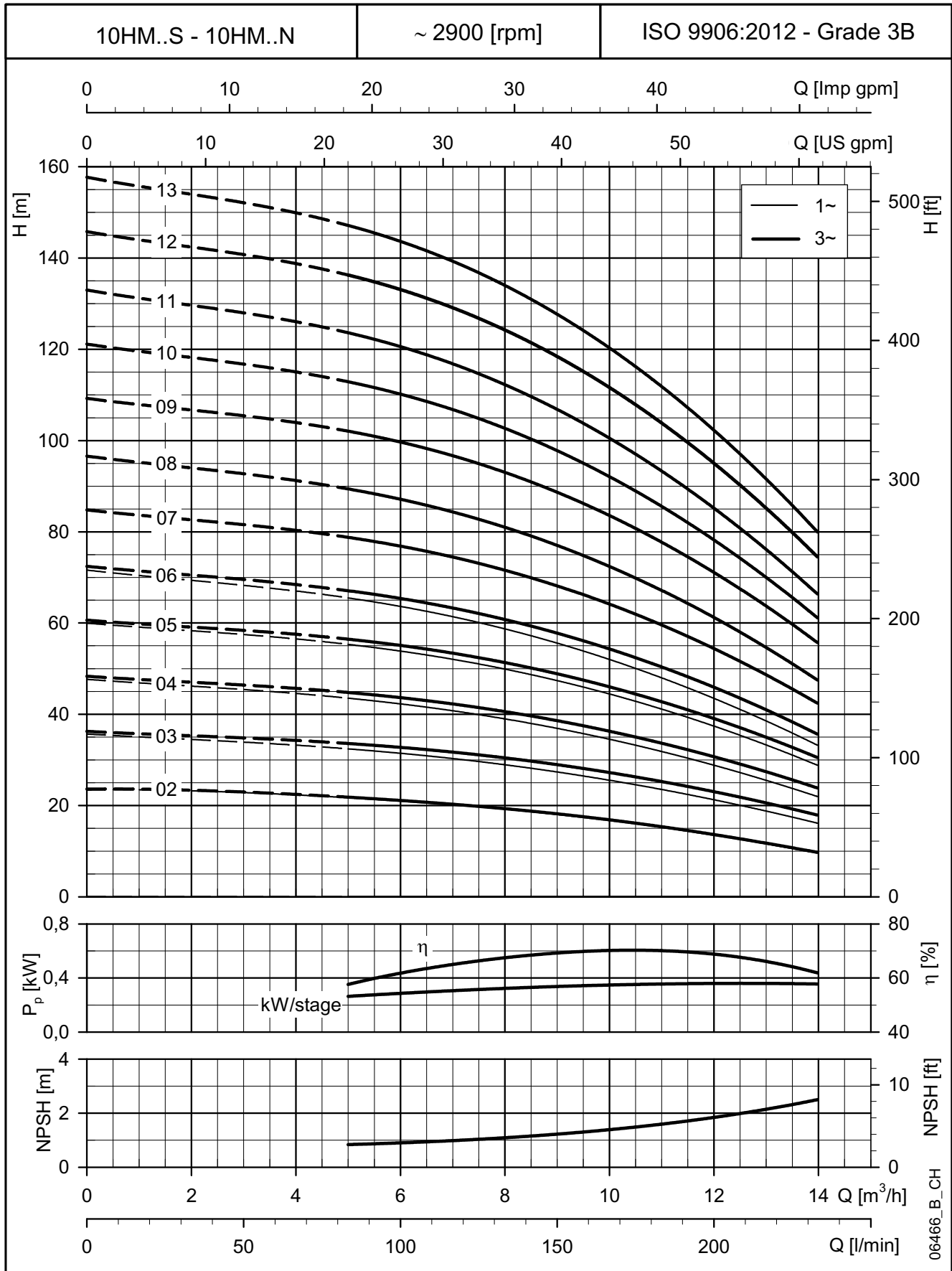
| PUMP TYPE | VERSION      | MOTOR |      | DIMENSIONS (mm) |     |     |    |     |     |     |     |     |     |     |      |    | PN  | WEIGHT |
|-----------|--------------|-------|------|-----------------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|------|----|-----|--------|
|           |              | kW    | SIZE | A               | D   | H   | H1 | L   | L1  | L2  | M   | M1  | N   | N1  | P    | K  | bar | kg     |
| 10HM02    | SINGLE-PHASE | 1,1   | 80   | 125             | 155 | 227 | 90 | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10  | 13     |
| 10HM03    |              | 1,1   | 80   | 125             | 155 | 227 | 90 | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10  | 17     |
| 10HM04    |              | 1,5   | 80   | 157             | 155 | 227 | 90 | 475 | 154 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10  | 19     |
| 10HM05    |              | 2,2   | 90   | 189             | 174 | 249 | 90 | 563 | 208 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10  | 25     |
| 10HM06    |              | 2,2   | 90   | 221             | 174 | 249 | 90 | 595 | 240 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10  | 26     |

|        |             |      |     |     |     |     |     |     |     |     |     |     |     |     |      |    |    |    |
|--------|-------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----|----|----|
| 10HM02 | THREE-PHASE | 0,75 | 80  | 125 | 155 | 219 | 90  | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 16 |
| 10HM03 |             | 1,1  | 80  | 125 | 155 | 219 | 90  | 443 | 122 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 17 |
| 10HM04 |             | 1,5  | 80  | 157 | 155 | 219 | 90  | 475 | 154 | 105 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 19 |
| 10HM05 |             | 2,2  | 90  | 189 | 174 | 224 | 90  | 563 | 208 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 25 |
| 10HM06 |             | 2,2  | 90  | 221 | 174 | 224 | 90  | 595 | 240 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 26 |
| 10HM07 |             | 3    | 90  | 253 | 174 | 224 | 90  | 627 | 272 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 30 |
| 10HM08 |             | 3    | 90  | 285 | 174 | 224 | 90  | 659 | 304 | 128 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 31 |
| 10HM09 |             | 4    | 100 | 317 | 197 | 254 | 100 | 720 | 356 | 147 | 140 | 170 | 160 | 184 | 15   | 12 | 16 | 38 |
| 10HM10 |             | 4    | 100 | 349 | 197 | 254 | 100 | 752 | 388 | 147 | 140 | 170 | 160 | 184 | 15   | 12 | 16 | 39 |
| 10HM11 |             | 4    | 100 | 381 | 197 | 254 | 100 | 784 | 420 | 147 | 140 | 170 | 160 | 184 | 15   | 12 | 16 | 40 |
| 10HM12 |             | 5,5  | 112 | 413 | 214 | 280 | 112 | 850 | 459 | 154 | 140 | 170 | 190 | 219 | 15   | 12 | 16 | 48 |
| 10HM13 |             | 5,5  | 112 | 445 | 214 | 280 | 112 | 882 | 491 | 154 | 140 | 170 | 190 | 219 | 15   | 12 | 16 | 49 |



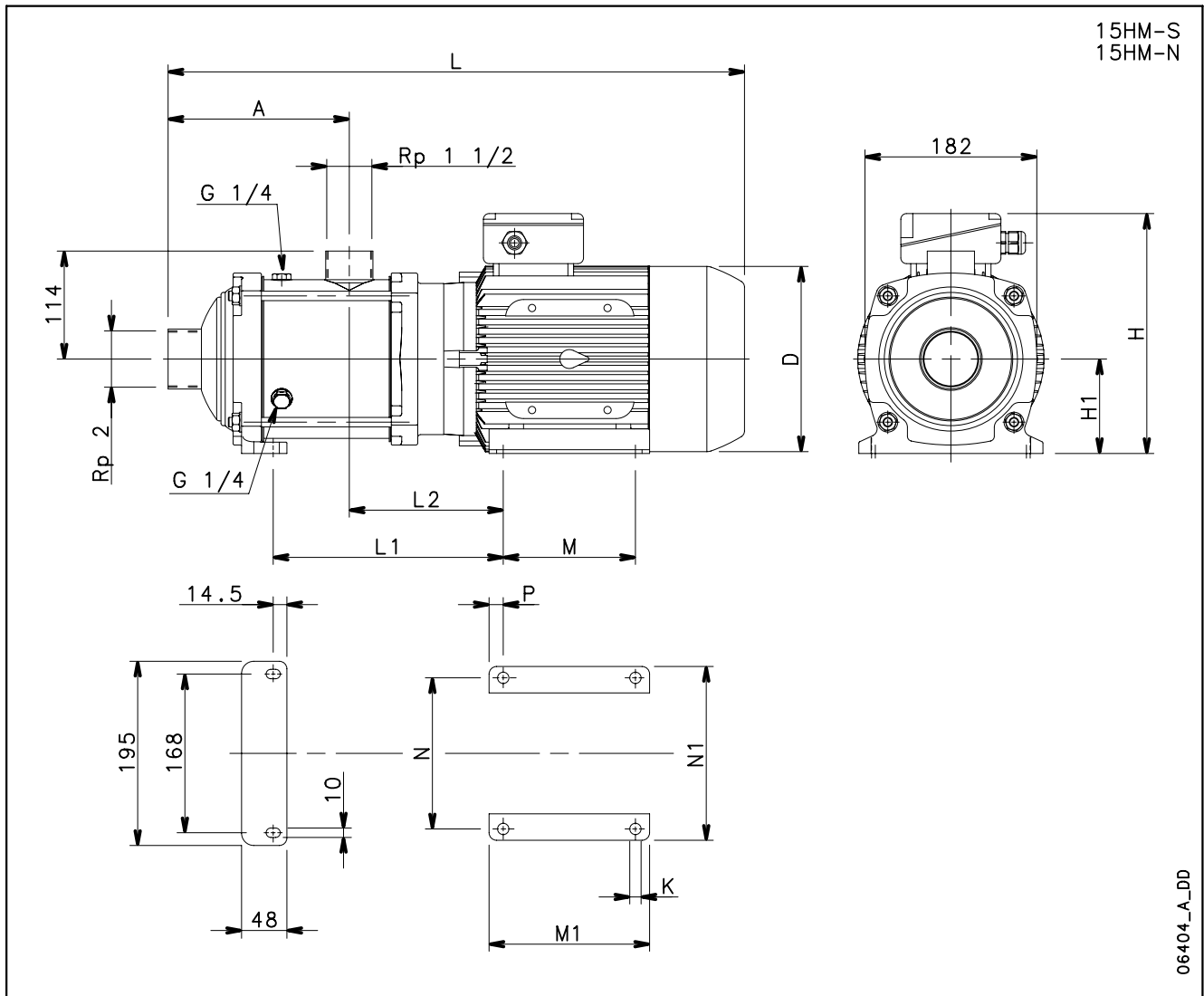
### 10HM..S - 10HM..N SERIES

### OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**15HM..S - 15HM..N SERIES**  
**DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES**



06404\_A\_DD

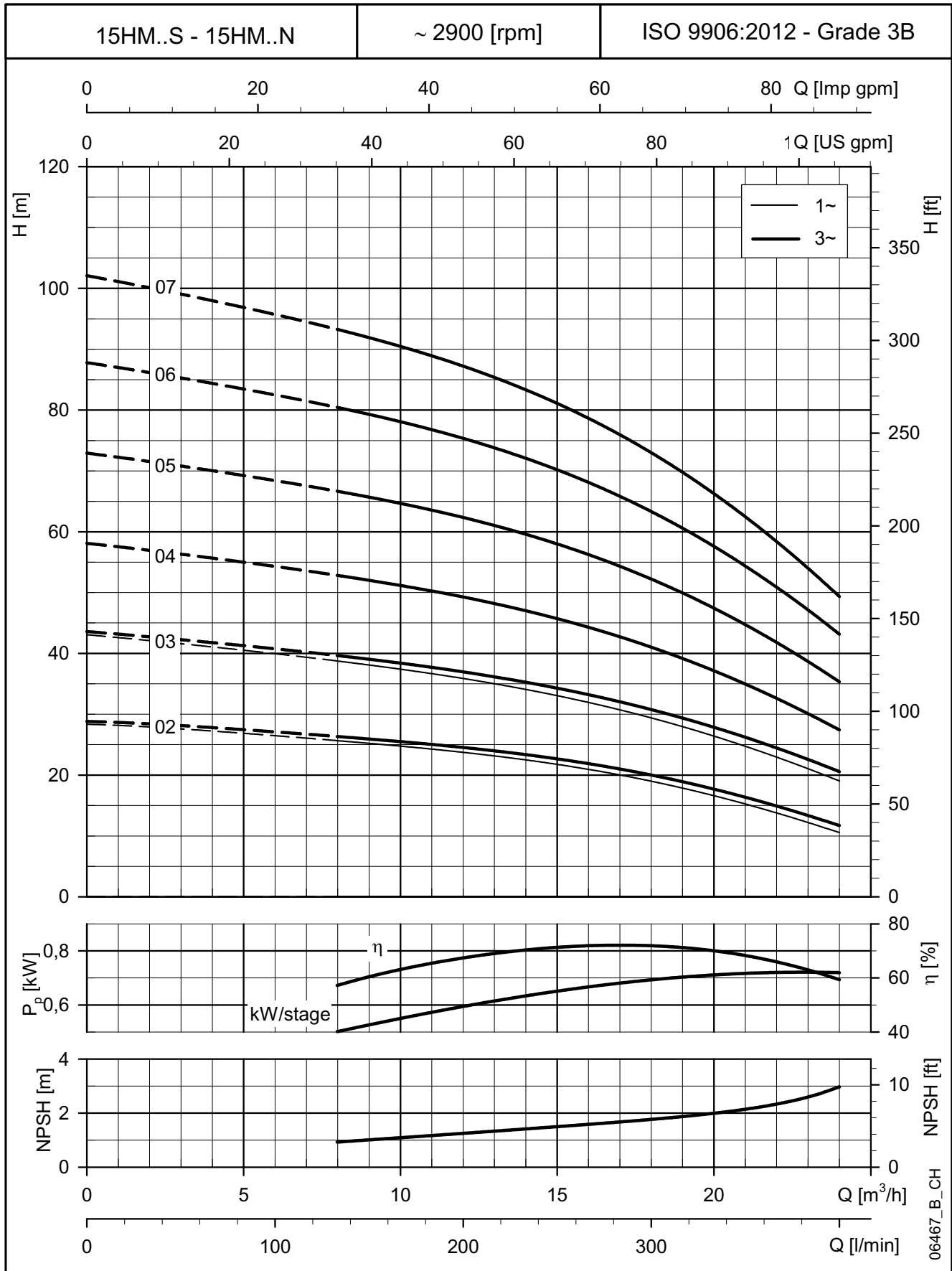
| PUMP TYPE | VERSION      | MOTOR |      | DIMENSIONS (mm) |     |     |    |     |     |     |     |     |     |     |      |    | PN | WEIGHT |
|-----------|--------------|-------|------|-----------------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|------|----|----|--------|
|           |              | kW    | SIZE | A               | D   | H   | H1 | L   | L1  | L2  | M   | M1  | N   | N1  | P    | K  | PN | kg     |
| 15HM02    | SINGLE-PHASE | 1,5   | 80   | 144             | 155 | 227 | 90 | 478 | 154 | 121 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 18     |
| 15HM03    |              | 2,2   | 90   | 144             | 174 | 249 | 90 | 534 | 176 | 144 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 26     |
|           |              |       |      |                 |     |     |    |     |     |     |     |     |     |     |      |    |    |        |

|        |             |     |     |     |     |     |     |     |     |     |     |     |     |     |      |    |    |    |
|--------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----|----|----|
| 15HM02 | THREE-PHASE | 1,5 | 80  | 144 | 155 | 219 | 90  | 478 | 154 | 121 | 100 | 125 | 125 | 155 | 12,5 | 10 | 10 | 18 |
| 15HM03 |             | 2,2 | 90  | 144 | 174 | 224 | 90  | 534 | 176 | 144 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 23 |
| 15HM04 |             | 3   | 90  | 192 | 174 | 224 | 90  | 582 | 224 | 144 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 27 |
| 15HM05 |             | 4   | 100 | 240 | 197 | 254 | 100 | 659 | 292 | 163 | 140 | 170 | 160 | 184 | 15   | 12 | 10 | 35 |
| 15HM06 |             | 5,5 | 112 | 288 | 214 | 280 | 112 | 741 | 347 | 170 | 140 | 170 | 190 | 219 | 15   | 12 | 10 | 43 |
| 15HM07 |             | 5,5 | 112 | 336 | 214 | 280 | 112 | 789 | 395 | 170 | 140 | 170 | 190 | 219 | 15   | 12 | 10 | 44 |
|        |             |     |     |     |     |     |     |     |     |     |     |     |     |     |      |    |    |    |

15hm-s-n-2p50-en\_b\_td

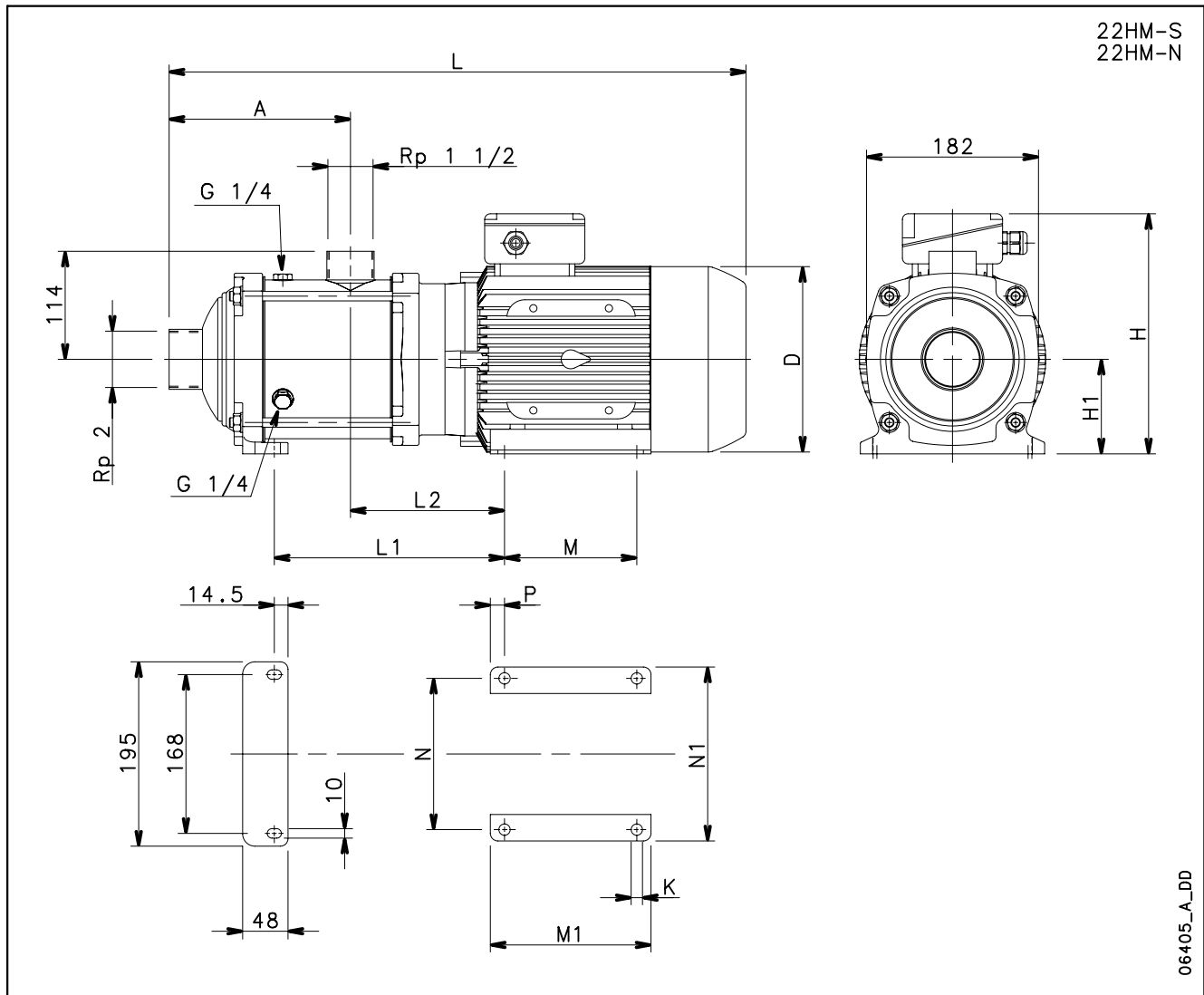
### 15HM..S - 15HM..N SERIES

### OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

## 22HM..S - 22HM..N SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES

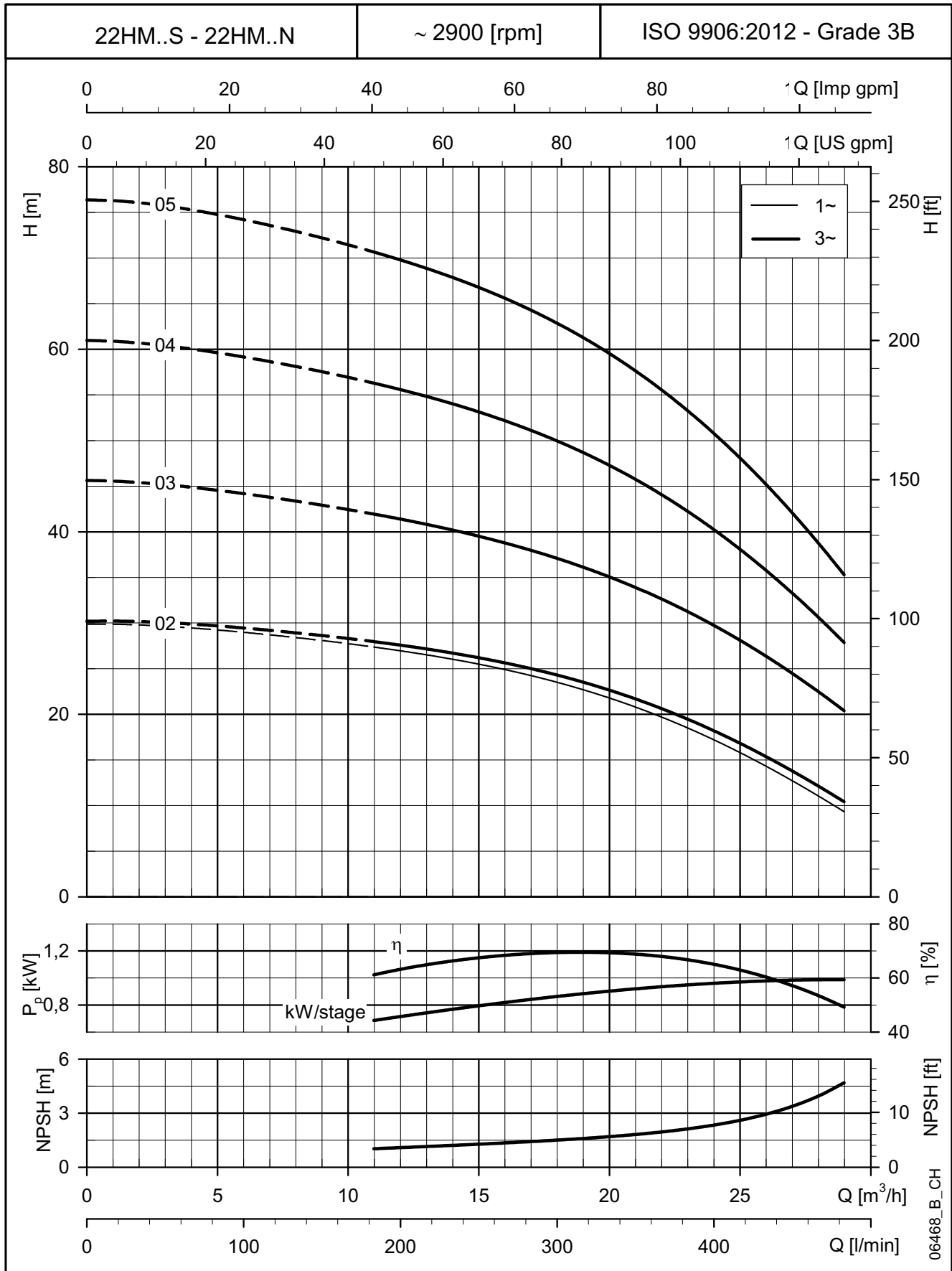


| PUMP TYPE | VERSION      | MOTOR |      | DIMENSIONS (mm) |     |     |    |     |     |     |     |     |     |     |      |    | PN  | WEIGHT |  |
|-----------|--------------|-------|------|-----------------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|------|----|-----|--------|--|
|           |              | kW    | SIZE | A               | D   | H   | H1 | L   | L1  | L2  | M   | M1  | N   | N1  | P    | K  | bar | kg     |  |
| 22HM02    | SINGLE-PHASE | 2,2   | 90   | 144             | 174 | 249 | 90 | 534 | 176 | 144 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10  | 26     |  |
|           |              |       |      |                 |     |     |    |     |     |     |     |     |     |     |      |    |     |        |  |
|           |              |       |      |                 |     |     |    |     |     |     |     |     |     |     |      |    |     |        |  |
|           |              |       |      |                 |     |     |    |     |     |     |     |     |     |     |      |    |     |        |  |

|        |             |     |     |     |     |     |     |     |     |     |     |     |     |     |      |    |    |    |
|--------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----|----|----|
| 22HM02 | THREE-PHASE | 2,2 | 90  | 144 | 174 | 224 | 90  | 534 | 176 | 144 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 23 |
| 22HM03 |             | 3   | 90  | 144 | 174 | 224 | 90  | 534 | 176 | 144 | 125 | 150 | 140 | 164 | 12,5 | 10 | 10 | 26 |
| 22HM04 |             | 4   | 100 | 192 | 197 | 254 | 100 | 611 | 244 | 163 | 140 | 170 | 160 | 184 | 15   | 12 | 10 | 33 |
| 22HM05 |             | 5,5 | 112 | 240 | 214 | 280 | 112 | 693 | 299 | 170 | 140 | 170 | 190 | 219 | 15   | 12 | 10 | 42 |
|        |             |     |     |     |     |     |     |     |     |     |     |     |     |     |      |    |    |    |

**22HM..S - 22HM..N SERIES**

**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .



## TKS with e-HM™ SERIES

### TKS Teknospeed variable speed systems

#### MARKET SECTORS

BUILDING SERVICES.  
INDUSTRY.

#### APPLICATIONS

- Pressure boosting and water supply systems.
- Open or close industrial systems.



The picture is purely indicative.

#### SPECIFICATIONS

##### TKS SYSTEM

- Single-phase power supply 230V +/- 10%, 50/60 Hz.
- Coupled to Lowara SM motors up to 1,1 kW three-phase.
- Ambient temperature: from 0°C to +40°C.

##### PUMP

- Flow rate: up to 8,5 m<sup>3</sup>/h.
- Head: up to 133 m.
- Temperature of the pumped liquid (with 40°C ambient temperature).  
+90°C for pumps with Noryl™ impeller.  
+120°C for pumps with stainless steel impeller.
- Maximum operating pressure:  
10 bar (PN 10) for pumps with Noryl™ impeller.  
16 bar (PN 16) for pumps with stainless steel impeller.
- Connections: Rp threaded for both suction and discharge manifold
- Hydraulic performances compliant with ISO 9906:2012 - Grade 3B  
(ex ISO 9906: 1999 - Annex A).

For other specifications, refer to the standard product.

##### MOTOR

- Electric short-circuit squirrel-cage motor (TEFC), enclosed construction, air-cooled.
- 2-pole.
- Three-phase, efficiency class IE3.
- IP 55 protection grade as motor only (EN 60034-5).  
IP X5 as electric pump (EN 60335-1).
- Insulation class 155 (F).
- Performances according to EN 60034-1.
- Standard voltage: 220-240/380-415 V, 50 Hz.

## TKS SERIES

### TECHNICAL DATA FOR FREQUENCY CONVERTER UNIT



### ELECTRICAL DATA

|                                       |   |
|---------------------------------------|---|
| POWER INPUT                           | 230V +/- 10% 1~ 50/60 Hz  |
| INPUT CURRENT                         | 6,8 A   |
| OUTPUT VOLTAGE                        | 230V 3~ variable according to the V/F curve (motor connected to 230V)   |
| OUTPUT CURRENT                        | 4,6 A   |
| OUTPUT FREQUENCY                      | Variable 12 ÷ 50 Hz in the speed adjustment mode<br>Variable 15 ÷ 50 Hz in the constant pressure control mode   |
| RECOMMENDED MOTORS                    | Max Lowara SM motor 1.1 kW 3~ max. overcurrent 5%   |
| PRESSURE TRANSMITTER                  | 4 ÷ 20 mA standard with two power   |
| ALARM RELAY                           | NC (normally closed) contact 1A 230 Vac resistive load;<br>positive logic operation (the contact is open if there are no alarm.<br>It closes in the event of alarm or no power input).  |
| MODULATION TYPE                       | PWM (Pulse Width Modulation)  |
| CONTROL TYPE                          | PI (Proportional factor – Integral factor)  |
| LINE PROTECTION (recommended)         | Magneto-thermal switch 16A curve-type C   |
| POWER CABLE                           | minimum cross-section 1.5 mm <sup>2</sup>   |
| PFC (POWER FACTOR CONTROLLER) CIRCUIT | This circuit absorbs sinusoidal current from the power input line, thereby ensuring the product complies with the EN 61000-3-2 standard: this is an indispensable requirement for complying with the EMC (Electromagnetic compatibility) Directive.<br>It also guarantees a constant set outlet pressure if the input voltage varies (within the permitted range 230V +/- 10%). |

### MECHANICAL DATA

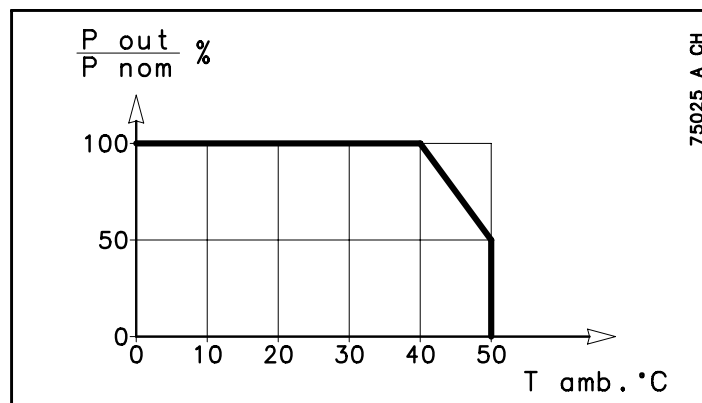
|                    |  |
|--------------------|--|
| PROTECTION         | IP 55  |
| RECOMMENDED MOTORS | Direct with standard Lowara SM motor terminal boards |
| RADIATOR MATERIAL  | Die-cast aluminium                                   |
| RADIATOR COLOUR    | Black  |

### OPERATING RANGE

|                                      |           |
|--------------------------------------|-----------|
| *AMBIENT TEMPERATURE                 | 0 ÷ 40 °C |
| MAX. HUMIDITY (WITHOUT CONDENSATION) | 95 %      |

\*For higher temperatures, please see derating curve

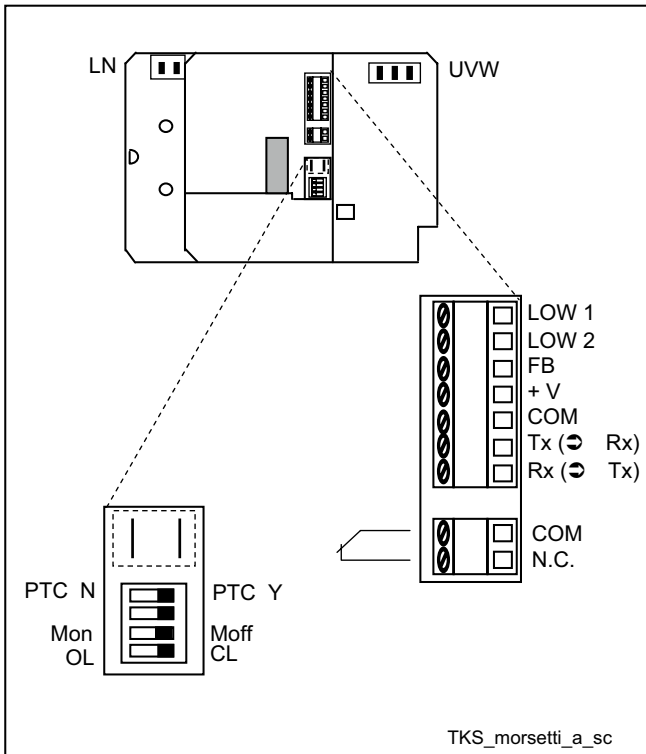
### DERATING CURVE





## TKS SERIES

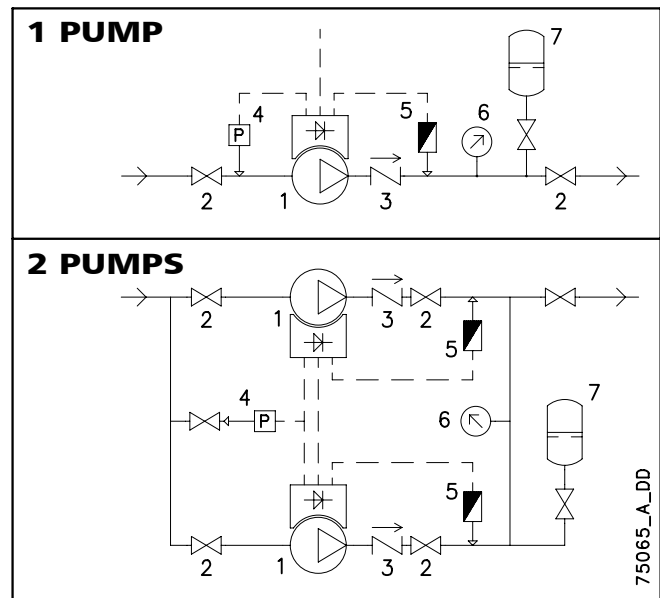
### WIRING DIAGRAM



### LEGEND

| REF.          | DESCRIPTION   |
|---------------|---|
| LN            | 230V single-phase power input                             |
| UVW           | 230V three-phase motor power input                        |
| LOW 1         | Float switch input  |
| LOW 2         | Float switch input  |
| FB            | Pressure transmitter signal                               |
| + V           | Pressure transmitter power input                          |
| COM           | Common serial line  |
| TX            | Serial signal   |
| RX            | Serial signal   |
| COM           | Common relay contact                                      |
| N.C.          | Normally closed relay contact                             |
| MICROSWITCHES |   |
| PTC N/PTC Y   | PTC configuration (Not used)                              |
| Mon/Mof       | Main pump/Secondary pump                                  |
| OL/CL         | Motor speed adjustment (OL)<br>Pressure control mode (CL) |

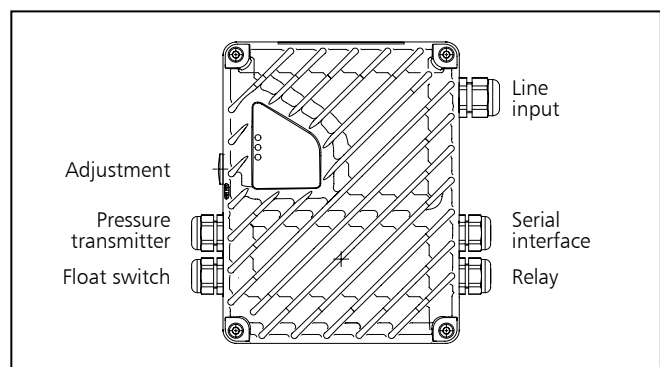
### SYSTEM CONNECTION SCHEME



### LEGEND

| REF. | COMPONENT              |
|------|------------------------|
| 1    | Teknospeed pump        |
| 2    | On/off valve           |
| 3    | Check valve            |
| 4    | Input pressure control |
| 5    | Pressure transmitter   |
| 6    | Pressure gauge         |
| 7    | Surge tank (5% Qmax)   |

### INPUTS/OUTPUTS



## TKS SERIES

### MOTOR SPEED ADJUSTMENT



The picture is purely indicative.

#### OPERATION:

Teknospeed can adjust motor speed in two ways:

1. **With a potentiometer**

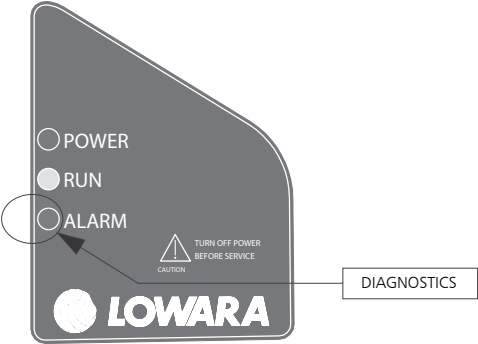
where the halfway position corresponds to a frequency of about 25 Hz (max frequency 50 Hz).

2. **With a 4 ÷ 20mA signal**

at the FB input (proportional speed).

- The LOW1 and LOW2 inputs work as START/STOP (run enable).
- The hydraulic performance of the pump is proportional to the motor speed.

### DIAGNOSTICS



| LED N° OF FLASHES | TYPE OF ALARM                       |
|-------------------|-------------------------------------|
| 2                 | Converter overcurrent               |
| 3                 | Converter overtemperature           |
| 4                 | Motor overtemperature               |
| 5                 | No water ( LOW1/LOW2)               |
| 6                 | No signal from pressure transmitter |
| 7                 | Undervoltage                        |
| 8                 | Serial interrupted (timeout)        |

### TYPE OF ALARM

- The number of times the red LED flashes identifies the type of alarm (see table).
- An attempt is made to reset the alarm every 20 seconds; after three unsuccessful attempts, the converter stops.
- If at least 10 minutes elapse after an alarm without any other faults occurring, the reset attempts counter is reset.

### NO WATER ALARM

- In the constant pressure control mode, the opening of the contacts between inputs LOW1 and LOW2 (float switch) generates the no water alarm.
- If the contact is reset, the pump restarts automatically.

## TKS/HM..P SERIES HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

| PUMP<br>TYPE<br>TKS/1HM..P | Power<br>supply | MOTOR                |                 | TKS SET                |                       | Q = DELIVERY        |      |      |      |      |      |      |      |
|----------------------------|-----------------|----------------------|-----------------|------------------------|-----------------------|---------------------|------|------|------|------|------|------|------|
|                            |                 | P <sub>N</sub><br>kW | TYPE<br>3x230 V | * P <sub>1</sub><br>kW | * I<br>220-240 V<br>A | l/min 0             | 11,7 | 16,0 | 21,0 | 26,0 | 31,0 | 36,0 | 40,0 |
|                            |                 |                      |                 |                        |                       | m <sup>3</sup> /h 0 | 0,7  | 1,0  | 1,3  | 1,6  | 1,9  | 2,2  | 2,4  |
| TKS/1HM03                  | 1 ~             | 0,30                 | SM63HM../303    | 0,50                   | 2,20                  | 32,8                | 29,2 | 27,5 | 25,4 | 22,9 | 20,1 | 17,1 | 14,5 |
| TKS/1HM04                  |                 | 0,40                 | SM63HM../304    | 0,61                   | 2,69                  | 44,1                | 39,3 | 37,2 | 34,3 | 31,0 | 27,3 | 23,2 | 19,8 |
| TKS/1HM05                  |                 | 0,50                 | SM63HM../305    | 0,73                   | 3,20                  | 54,4                | 48,1 | 45,4 | 41,7 | 37,5 | 32,9 | 27,8 | 23,5 |
| TKS/1HM06                  |                 | 0,75                 | SM80HM../307 E3 | 0,88                   | 3,89                  | 69,3                | 63,0 | 60,1 | 56,1 | 51,4 | 45,9 | 39,8 | 34,5 |

| PUMP<br>TYPE<br>TKS/3HM..P | Power<br>supply | MOTOR                |                 | TKS SET                |                       | Q = DELIVERY        |      |      |      |      |      |      |      |
|----------------------------|-----------------|----------------------|-----------------|------------------------|-----------------------|---------------------|------|------|------|------|------|------|------|
|                            |                 | P <sub>N</sub><br>kW | TYPE<br>3x230 V | * P <sub>1</sub><br>kW | * I<br>220-240 V<br>A | l/min 0             | 20,0 | 28,0 | 36,0 | 44,0 | 52,0 | 60,0 | 70,0 |
|                            |                 |                      |                 |                        |                       | m <sup>3</sup> /h 0 | 1,2  | 1,7  | 2,2  | 2,6  | 3,1  | 3,6  | 4,2  |
| TKS/3HM02                  | 1 ~             | 0,30                 | SM63HM../303    | 0,46                   | 1,99                  | 23,2                | 20,9 | 19,6 | 18,1 | 16,2 | 14,2 | 12,0 | 9,0  |
| TKS/3HM03                  |                 | 0,40                 | SM63HM../304    | 0,61                   | 2,62                  | 34,9                | 31,3 | 29,3 | 26,9 | 24,2 | 21,1 | 17,8 | 13,4 |
| TKS/3HM04                  |                 | 0,50                 | SM63HM../305    | 0,76                   | 3,25                  | 45,8                | 40,6 | 37,8 | 34,5 | 30,7 | 26,7 | 22,3 | 16,3 |
| TKS/3HM05                  |                 | 0,75                 | SM80HM../307 E3 | 0,97                   | 4,16                  | 60,2                | 55,1 | 52,3 | 48,7 | 44,2 | 39,2 | 33,7 | 26,2 |
| TKS/3HM06                  |                 | 1,1                  | SM80HM../311 E3 | 1,16                   | 4,97                  | 72,7                | 66,8 | 63,6 | 59,3 | 54,1 | 48,1 | 41,5 | 32,5 |

| PUMP<br>TYPE<br>TKS/5HM..P | Power<br>supply | MOTOR                |                 | TKS SET                |                       | Q = DELIVERY        |      |      |      |      |      |      |      |
|----------------------------|-----------------|----------------------|-----------------|------------------------|-----------------------|---------------------|------|------|------|------|------|------|------|
|                            |                 | P <sub>N</sub><br>kW | TYPE<br>3x230 V | * P <sub>1</sub><br>kW | * I<br>220-240 V<br>A | l/min 0             | 40,0 | 53,0 | 66,0 | 79,0 | 92,0 | 105  | 120  |
|                            |                 |                      |                 |                        |                       | m <sup>3</sup> /h 0 | 2,4  | 3,2  | 4,0  | 4,7  | 5,5  | 6,3  | 7,2  |
| TKS/5HM02                  | 1 ~             | 0,40                 | SM63HM../304    | 0,57                   | 2,44                  | 23,9                | 20,1 | 18,7 | 17,2 | 15,4 | 13,3 | 10,6 | 6,9  |
| TKS/5HM03                  |                 | 0,50                 | SM63HM../305    | 0,78                   | 3,34                  | 35,2                | 28,8 | 26,5 | 24,2 | 21,5 | 18,2 | 14,2 | 8,6  |
| TKS/5HM05                  |                 | 1,1                  | SM80HM../311 E3 | 1,31                   | 5,60                  | 61,4                | 53,1 | 49,9 | 46,4 | 42,3 | 37,2 | 30,6 | 21,3 |

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

tk-1-5hmp-2p50-en\_b\_th

\* Maximum value in specified range: P<sub>1</sub> = input power; I = input current.

## TKS/HM..S SERIES HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

| PUMP<br>TYPE<br>TKS/HM..S | Power<br>supply | MOTOR                |                 | TKS SET                |                       | Q = DELIVERY        |      |      |      |      |      |      |      |
|---------------------------|-----------------|----------------------|-----------------|------------------------|-----------------------|---------------------|------|------|------|------|------|------|------|
|                           |                 | P <sub>N</sub><br>kW | TYPE<br>3x230 V | * P <sub>1</sub><br>kW | * I<br>220-240 V<br>A | l/min 0             | 11,7 | 16,0 | 21,0 | 26,0 | 31,0 | 36,0 | 40,0 |
|                           |                 |                      |                 |                        |                       | m <sup>3</sup> /h 0 | 0,7  | 1,0  | 1,3  | 1,6  | 1,9  | 2,2  | 2,4  |
| TKS/1HM06                 | 1 ~             | 0,30                 | SM63HM../303    | 0,44                   | 1,94                  | 35,0                | 33,9 | 32,9 | 30,8 | 27,8 | 23,9 | 19,1 | 14,6 |
| TKS/1HM12                 |                 | 0,55                 | SM71HM../305    | 0,77                   | 3,38                  | 71,6                | 70,0 | 68,2 | 64,4 | 58,6 | 50,9 | 41,4 | 32,4 |
| TKS/1HM16                 |                 | 0,75                 | SM80HM../307 E3 | 0,98                   | 4,31                  | 96,3                | 94,6 | 92,4 | 87,6 | 80,1 | 70,0 | 57,4 | 45,5 |
| TKS/1HM22                 |                 | 1,1                  | SM80HM../311 E3 | 1,33                   | 5,84                  | 133                 | 131  | 128  | 121  | 111  | 97,2 | 79,9 | 63,6 |

| PUMP<br>TYPE<br>TKS/HM..S | Power<br>supply | MOTOR                |                 | TKS SET                |                       | Q = DELIVERY        |      |      |      |      |      |      |      |
|---------------------------|-----------------|----------------------|-----------------|------------------------|-----------------------|---------------------|------|------|------|------|------|------|------|
|                           |                 | P <sub>N</sub><br>kW | TYPE<br>3x230 V | * P <sub>1</sub><br>kW | * I<br>220-240 V<br>A | l/min 0             | 20,0 | 29,0 | 38,0 | 47,0 | 56,0 | 65,0 | 73,3 |
|                           |                 |                      |                 |                        |                       | m <sup>3</sup> /h 0 | 1,2  | 1,7  | 2,3  | 2,8  | 3,4  | 3,9  | 4,4  |
| TKS/3HM04                 | 1 ~             | 0,30                 | SM63HM../303    | 0,60                   | 2,57                  | 29,1                | 27,8 | 26,3 | 24,3 | 21,7 | 18,6 | 14,8 | 10,2 |
| TKS/3HM05                 |                 | 0,40                 | SM63HM../304    | 0,66                   | 2,85                  | 36,8                | 35,3 | 33,5 | 31,0 | 27,9 | 24,1 | 19,2 | 13,5 |
| TKS/3HM06                 |                 | 0,50                 | SM63HM../305    | 0,74                   | 3,16                  | 43,8                | 41,8 | 39,5 | 36,5 | 32,7 | 28,1 | 22,2 | 15,4 |
| TKS/3HM08                 |                 | 0,75                 | SM80HM../307 E3 | 1,00                   | 4,29                  | 60,5                | 59,4 | 57,0 | 53,5 | 49,0 | 43,1 | 35,6 | 26,7 |
| TKS/3HM13                 |                 | 1,1                  | SM80HM../311 E3 | 1,49                   | 6,41                  | 98,1                | 96,1 | 92,2 | 86,5 | 79,0 | 69,5 | 57,3 | 42,8 |

| PUMP<br>TYPE<br>TKS/HM..S | Power<br>supply | MOTOR                |                 | TKS SET                |                       | Q = DELIVERY        |      |      |      |      |      |      |      |
|---------------------------|-----------------|----------------------|-----------------|------------------------|-----------------------|---------------------|------|------|------|------|------|------|------|
|                           |                 | P <sub>N</sub><br>kW | TYPE<br>3x230 V | * P <sub>1</sub><br>kW | * I<br>220-240 V<br>A | l/min 0             | 40,0 | 57,0 | 74,0 | 91,0 | 108  | 125  | 142  |
|                           |                 |                      |                 |                        |                       | m <sup>3</sup> /h 0 | 2,4  | 3,4  | 4,4  | 5,5  | 6,5  | 7,5  | 8,5  |
| TKS/5HM02                 | 1 ~             | 0,30                 | SM63HM../303    | 0,43                   | 1,85                  | 14,8                | 13,9 | 13,2 | 12,2 | 11,1 | 9,6  | 7,8  | 5,5  |
| TKS/5HM03                 |                 | 0,40                 | SM63HM../304    | 0,57                   | 2,44                  | 22,2                | 20,9 | 19,7 | 18,3 | 16,5 | 14,3 | 11,5 | 8,2  |
| TKS/5HM04                 |                 | 0,50                 | SM63HM../305    | 0,72                   | 3,07                  | 29,3                | 27,2 | 25,6 | 23,5 | 21,1 | 18,1 | 14,4 | 9,8  |
| TKS/5HM05                 |                 | 0,75                 | SM80HM../307 E3 | 0,89                   | 3,84                  | 37,8                | 36,5 | 34,8 | 32,7 | 30,0 | 26,5 | 22,0 | 16,4 |
| TKS/5HM08                 |                 | 1,1                  | SM80HM../311 E3 | 1,39                   | 5,96                  | 60,4                | 58,2 | 55,5 | 52,1 | 47,7 | 42,1 | 34,9 | 25,9 |

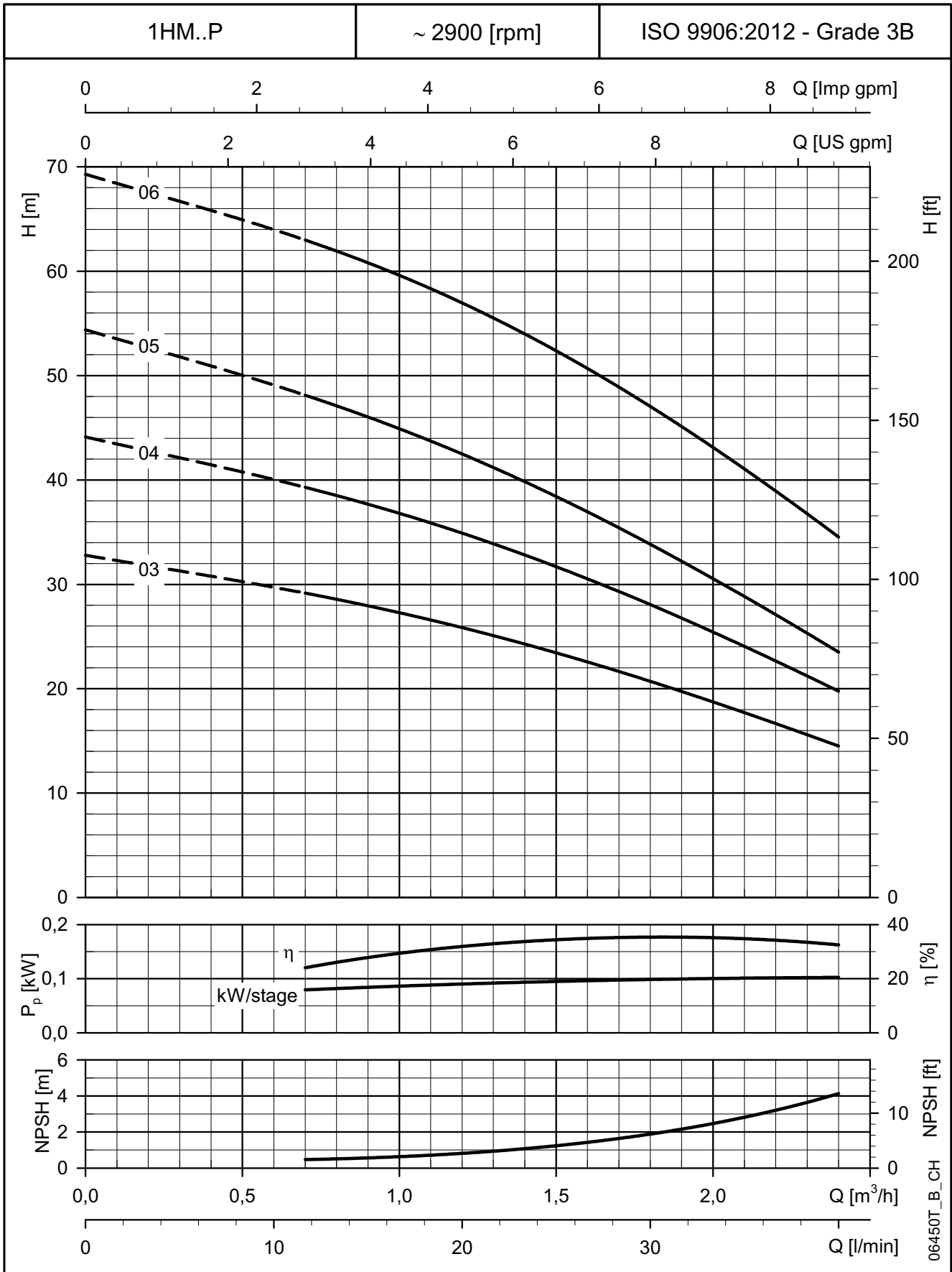
Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

tk-1-5hms-2p50-en\_b\_th

\* Maximum value in specified range: P<sub>1</sub> = input power; I = input current.

**TKS/1HM..P SERIES**

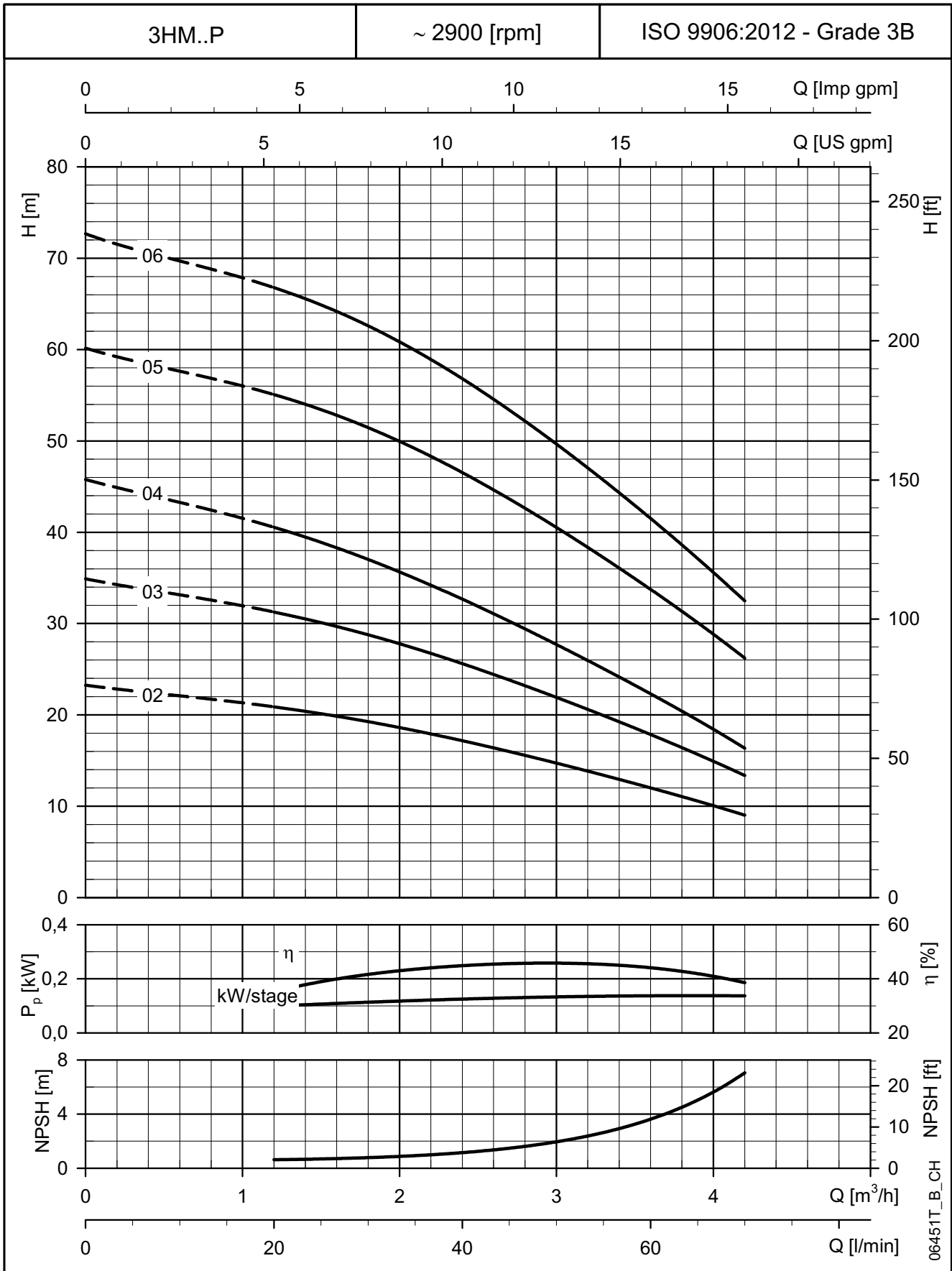
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**TKS/3HM..P SERIES**

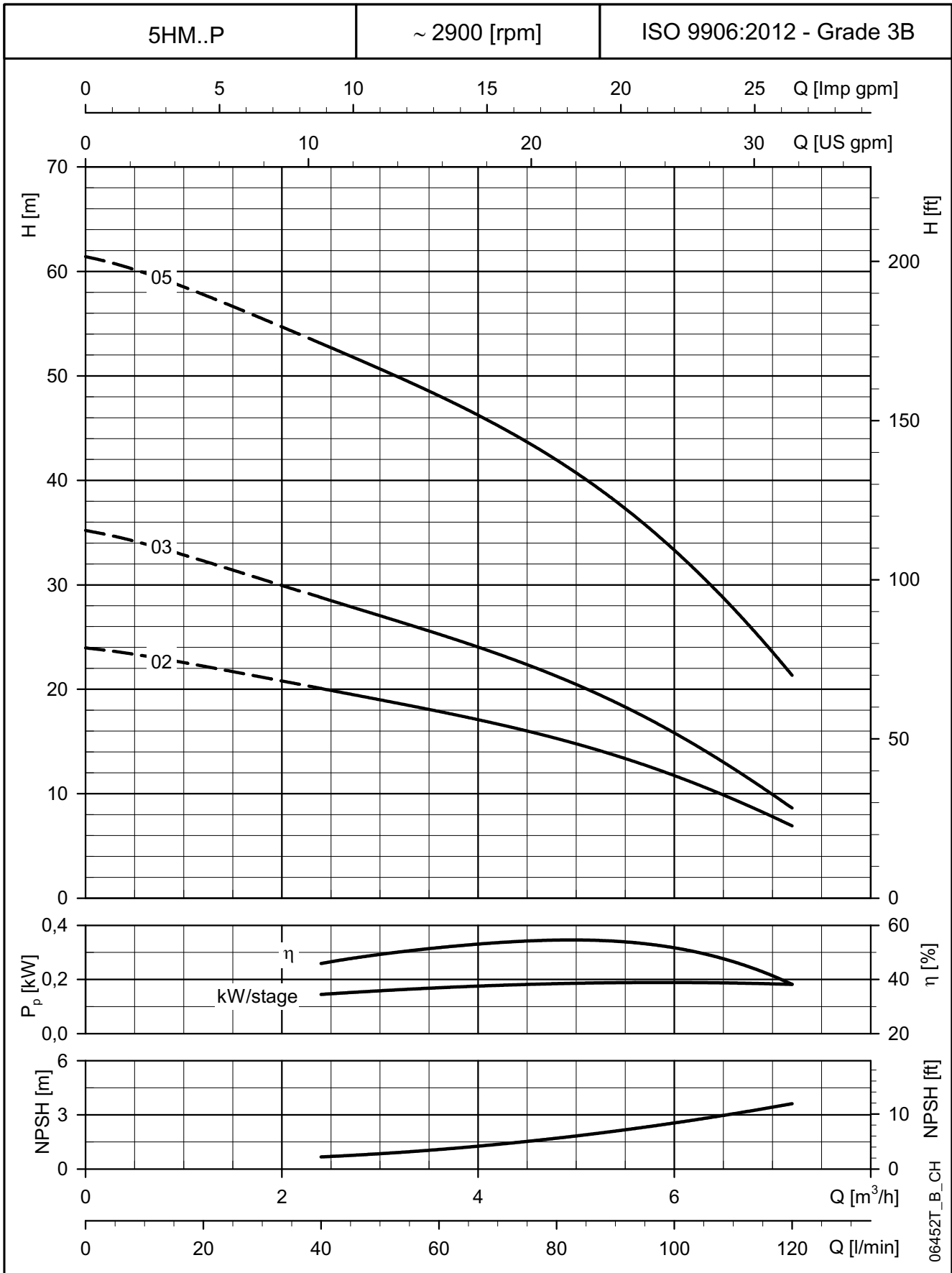
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**TKS/5HM..P SERIES**

**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

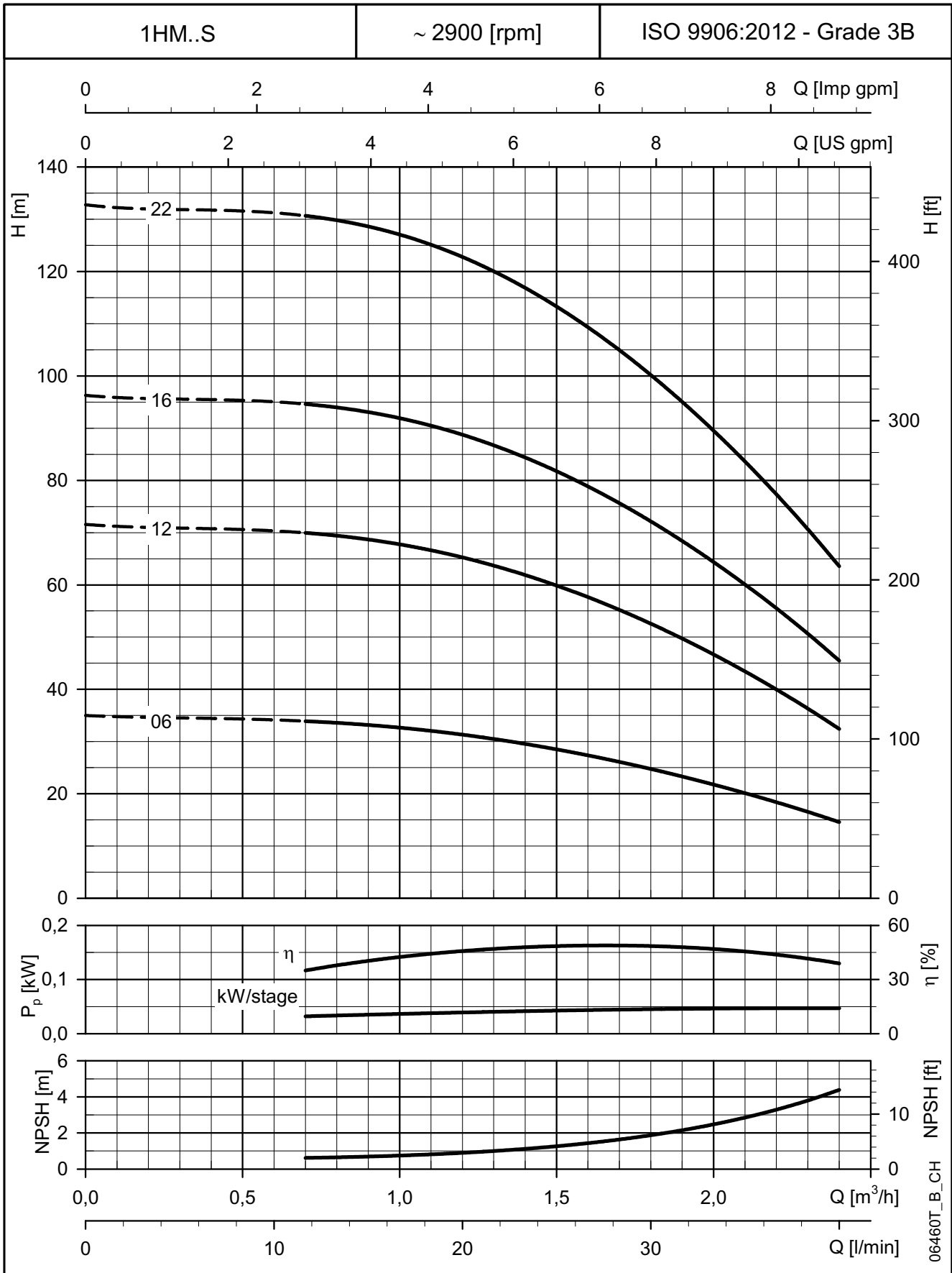


06452T\_B\_CH

These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**TKS/1HM..S SERIES**

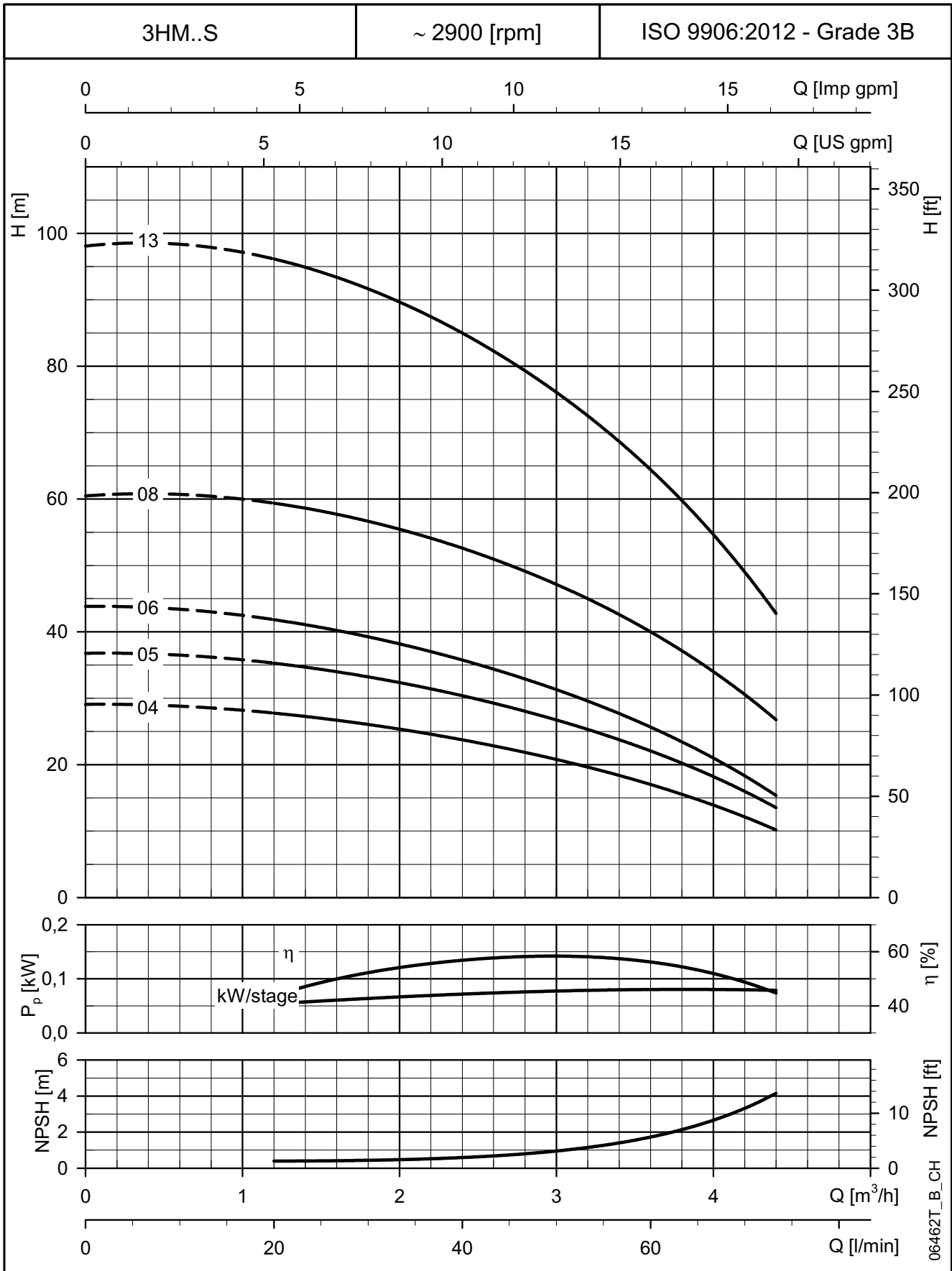
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**TKS/3HM..S SERIES**

**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

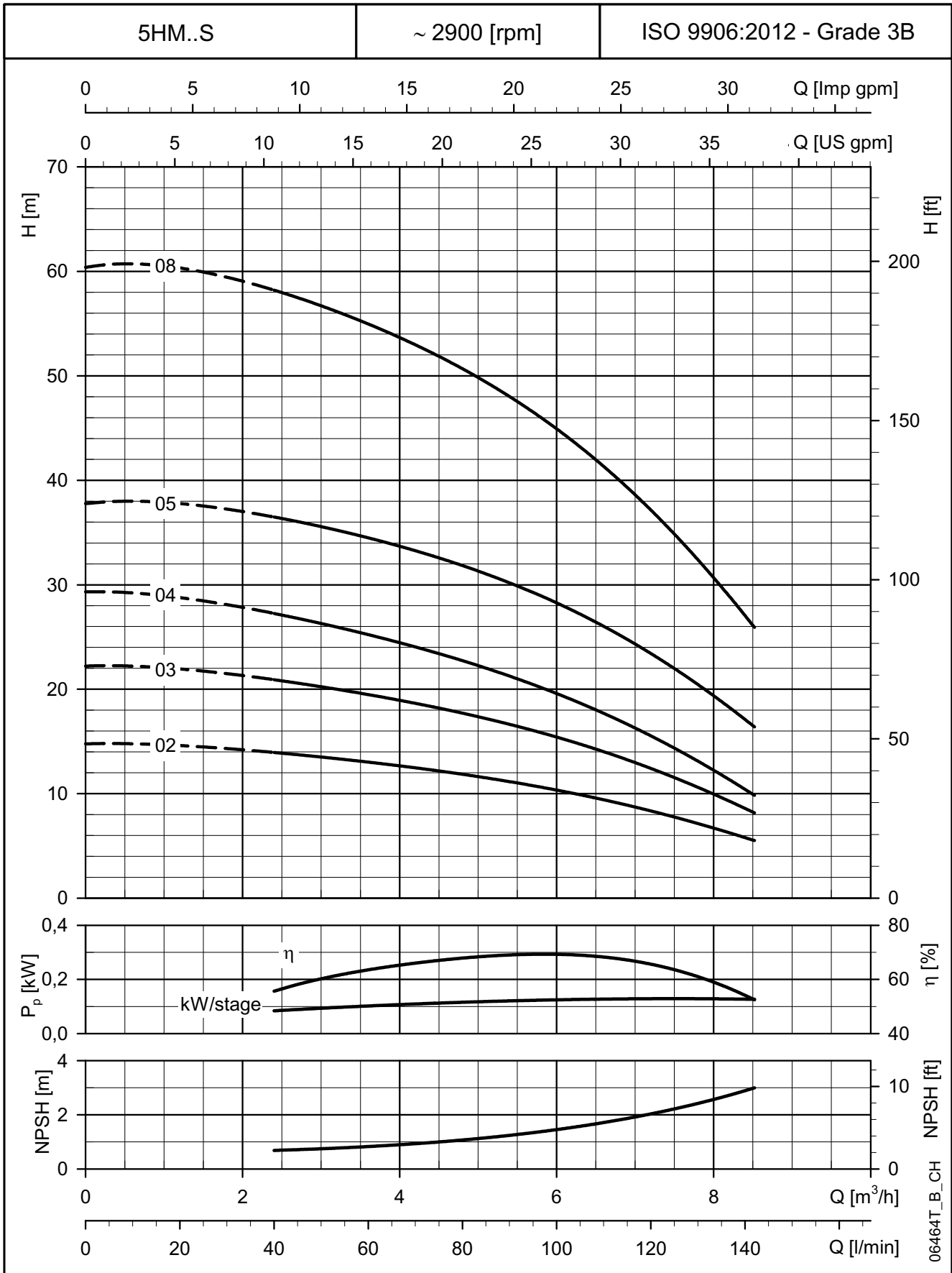


06462T\_B\_CH

These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

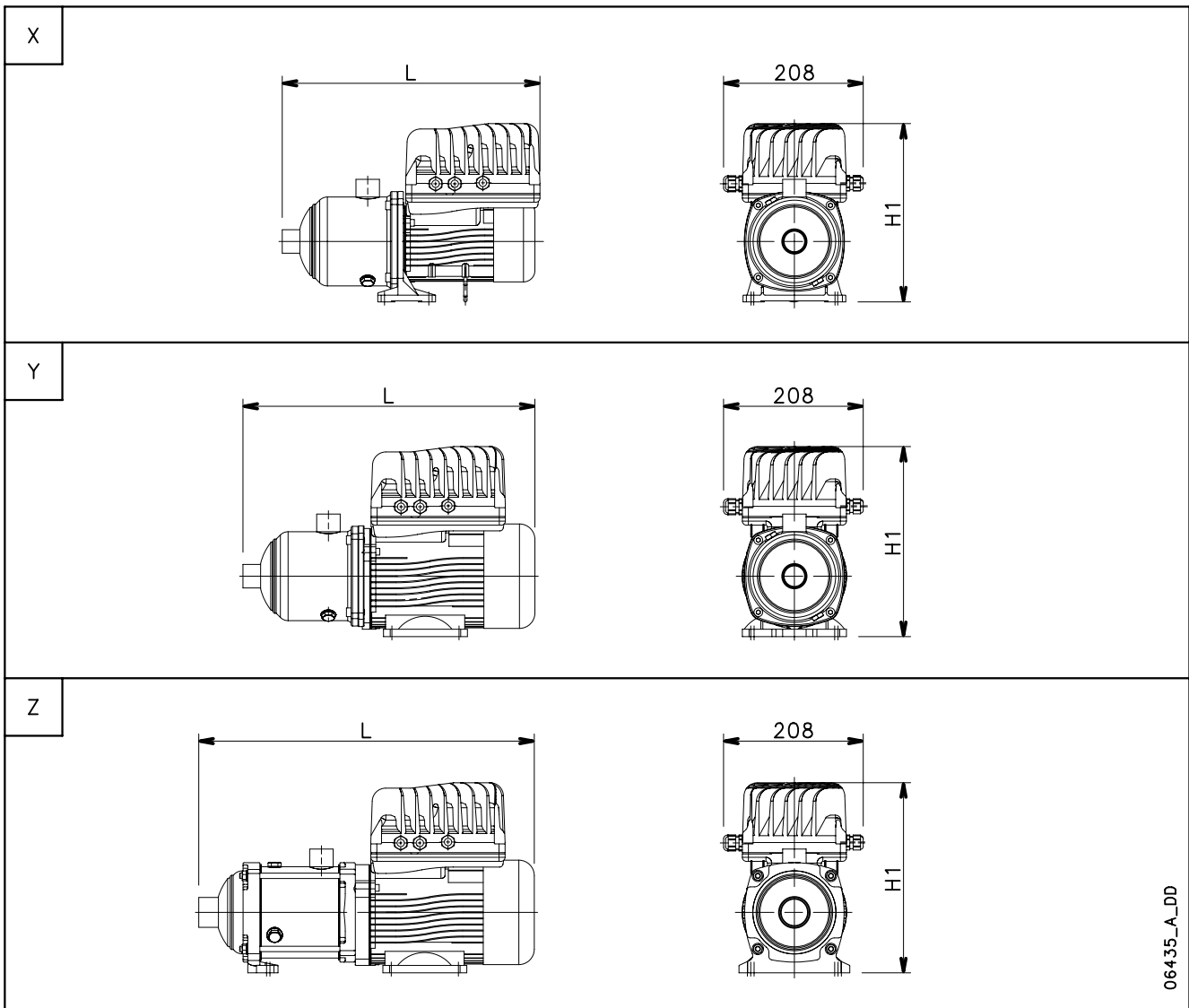


**TKS/5HM..S SERIES**  
**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .

**TKS/HM SERIES**  
**DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES**



06435\_A\_DD

| PUMP TYPE<br>TKS/HM..P | Ref. | DIMENSIONS (mm) |     |              |
|------------------------|------|-----------------|-----|--------------|
|                        |      | H1              | L   | WEIGHT<br>kg |
| TKS/1HM03P03T          | X    | 266             | 344 | 9            |
| TKS/1HM04P04T          |      | 266             | 364 | 10           |
| TKS/1HM05P05T          |      | 266             | 384 | 11           |
| TKS/1HM06P07T          | Y    | 284             | 455 | 16           |
| TKS/3HM02P03T          | X    | 266             | 344 | 9            |
| TKS/3HM03P04T          |      | 266             | 344 | 9            |
| TKS/3HM04P05T          |      | 266             | 364 | 10           |
| TKS/3HM05P07T          | Y    | 284             | 435 | 15           |
| TKS/3HM06P11T          |      | 284             | 455 | 16           |
| TKS/5HM02P04T          | X    | 266             | 346 | 9            |
| TKS/5HM03P05T          |      | 266             | 346 | 10           |
| TKS/5HM05P11T          | Y    | 284             | 437 | 17           |


| PUMP TYPE<br>TKS/HM..S | Ref. | DIMENSIONS (mm) |     |              |
|------------------------|------|-----------------|-----|--------------|
|                        |      | H1              | L   | WEIGHT<br>kg |
| TKS/1HM06S03T          | X    | 266             | 404 | 10           |
| TKS/1HM12S05T          | Z    | 276             | 524 | 15           |
| TKS/1HM16S07T          |      | 284             | 648 | 17           |
| TKS/1HM22S11T          |      | 284             | 768 | 23           |
| TKS/3HM04S03T          | X    | 266             | 364 | 10           |
| TKS/3HM05S04T          |      | 266             | 384 | 10           |
| TKS/3HM06S05T          |      | 266             | 404 | 11           |
| TKS/3HM08S07T          | Z    | 284             | 488 | 18           |
| TKS/3HM13S11T          |      | 284             | 588 | 20           |
| TKS/5HM02S03T          | X    | 266             | 361 | 9            |
| TKS/5HM03S04T          |      | 266             | 361 | 10           |
| TKS/5HM04S05T          |      | 266             | 386 | 11           |
| TKS/5HM05S07T          | Y    | 284             | 462 | 16           |
| TKS/5HM08S11T          | Z    | 284             | 525 | 19           |

For further dimensions refer to standard product







tkc-1-3-5hm-2n50-en\_h\_tfd

# ACCESSORIES




## ACCESSORIES

| MODEL  | REF.   | CODE      | DESCRIPTION  |
|--|--------|-----------|--|
| Ball valve<br>          | 1"     | 002676438 | 1" FF PN38 WITH DRAIN, CHROME PLATED BRASS                         |
|  | 1"     | 002679402 | 1" FF PN30, CHROME PLATED BRASS                                    |
|  | 1" 1/4 | R02661422 | 1"1/4 FF PN30, CHROME PLATED BRASS                                 |
|  | 1" 1/2 | R02661427 | 1"1/2 FF PN30, CHROME PLATED BRASS                                 |
|  | 2"     | R02661424 | 2" FF PN25, CHROME PLATED BRASS                                    |
|  | 1"     | 002675155 | 1" MF PN40, CHROME PLATED BRASS                                    |
|  | 1" 1/4 | R02661318 | 1"1/4 MF PN30, CHROME PLATED BRASS                                 |
|  | 1" 1/2 | 002675369 | 1"1/2 MF PN25, CHROME PLATED BRASS                                 |
|  | 2"     | 002679408 | 2" MF PN25, CHROME PLATED BRASS                                    |
|  | 1"     | 002679403 | 1" MF WITH UNION JOINT, CHROME PLATED BRASS                        |
|  | 1" 1/4 | 002679404 | 1"1/4 MF WITH UNION JOINT, CHROME PLATED BRASS                     |
|  | 1" 1/2 | 002676452 | 1"1/2 MF WITH UNION JOINT, CHROME PLATED BRASS                     |
|  | 2"     | NO CODE   | 2" MF WITH UNION JOINT, CHROME PLATED BRASS                        |
| Non-return valve<br>   | 1"     | 002675029 | 1" MF SUCTION MALE, PN 25, BRASS                                   |
|  | 1" 1/4 | 002675036 | 1"1/4 MF SUCTION MALE, PN 25, BRASS                                |
|  | 1" 1/2 | 002675043 | 1"1/2 MF SUCTION MALE, PN 25, BRASS                                |
|  | 2"     | 002675032 | 2" MF SUCTION MALE, PN 40, BRASS                                   |
|  | 1"     | 002675300 | 1" MF SUCTION MALE, PN16, STAINLESS STEEL AISI304                  |
|  | 1" 1/4 | 002675301 | 1"1/4 MF SUCTION MALE, PN16, STAINLESS STEEL AISI304               |
|  | 1" 1/2 | 002675302 | 1"1/2 MF SUCTION MALE, PN16, STAINLESS STEEL AISI304               |
|  | 2"     | 002675303 | 2" MF SUCTION MALE, PN16, STAINLESS STEEL AISI304                  |
|  | 1"     | 002675295 | 1" FF PN32, STAINLESS STEEL AISI316                                |
|  | 1" 1/4 | 002675296 | 1"1/4 FF PN28, STAINLESS STEEL AISI316                             |
|  | 1" 1/2 | 002675297 | 1"1/2 FF PN28, STAINLESS STEEL AISI316                             |
|  | 2"     | 002675298 | 2" FF PN23, STAINLESS STEEL AISI316                                |
| Union 3 Pieces MF<br> | 1"     | R02671048 | 1" MF, GALVANISED STEEL  |
|  | 1" 1/4 | R02671050 | 1"1/4 MF, GALVANISED STEEL   |
|  | 1" 1/2 | R02671052 | 1"1/2 MF, GALVANISED STEEL   |
|  | 2"     | R02671054 | 2" MF, GALVANISED STEEL  |
|  | 1"     | 002672655 | 1" MF, STAINLESS STEEL AISI 316                                    |
|  | 1" 1/4 | 002672656 | 1"1/4 MF, STAINLESS STEEL AISI 316                                 |
|  | 1" 1/2 | 002672657 | 1"1/2 MF, STAINLESS STEEL AISI 316                                 |
|  | 2"     | 002672658 | 2" MF, STAINLESS STEEL AISI 316                                    |
| GENYO<br>             | 1"     | 109120160 | GENYO 8A/F12   |
|  |        | 109120161 | GENYO 8A/F12, WITH ELECTRICAL CABLE                                |
|  |        | 109120170 | GENYO 8A/F15   |
|  |        | 109120171 | GENYO 8A/F15 WITH ELECTRICAL CABLE                                 |
|  |        | 109120180 | GENYO 8A/F22   |
|  |        | 109120181 | GENYO 8A/F22 WITH ELECTRICAL CABLE                                 |
|  |        | 109120210 | GENYO 16A/R15-30   |
|  |        | 109120211 | GENYO 16A/R15-30 WITH ELECTRICAL CABLE                             |
| Diaphragm tank<br>    | 8 lt   | 106110550 | 8 LITRES-8 BAR, 1" CONNECTION, FLANGE IN GALVANISED STEEL          |
|  | 24 lt  | 106110560 | 24 LITRES-8 BAR, 1" CONNECTION, FLANGE IN GALVANISED STEEL         |
|  | 24 lt  | 106111180 | 24 LITRES-10 BAR, 1" CONNECTION, FLANGE IN GALVANISED STEEL        |
|  | 24 lt  | 106111190 | 24 LITRES-16 BAR, 1" CONNECTION, FLANGE IN GALVANISED STEEL        |
|  | 18 lt  | 106227110 | 18 LITRES-10 BAR, 1" CONNECTION, FLANGE IN STAINLESS STEEL AISI304 |
|  | 24 lt  | 106110660 | 24 LITRES-10 BAR, 1" CONNECTION, FLANGE IN STAINLESS STEEL AISI304 |
|  | 24 lt  | 106110630 | 24 LITRES-16 BAR, 1" CONNECTION, FLANGE IN STAINLESS STEEL AISI304 |

## ACCESSORIES

| MODEL  | REF.       | CODE  | DESCRIPTION   |
|--|------------|---|---|
| Flexible Hose<br>                           | 1"         | 002542016   | 1" MF, L=170MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542001   | 1" MF, L=180MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542002   | 1" MF, L=230MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542018   | 1" MF, L=360MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542012   | 1" MF, L=400MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542007   | 1" MF, L=430MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542003   | 1" MF, L=450MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542010   | 1" MF, L=500MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542000   | 1" MF L=550MM PN16, REINFORCING BRADING IN GALVANISED STEEL       |
|  |            | 002542014   | 1" MF L=600MM PN16, REINFORCING BRADING IN GALVANISED STEEL       |
|  |            | 002542004   | 1" MF, L=700MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  |            | 002542019   | 1" MF, L=800MM PN16, REINFORCING BRADING IN GALVANISED STEEL      |
|  | 002542022  | 1" MF, L=1000MM PN16, REINFORCING BRADING IN GALVANISED STEEL   |   |
|  | 1" 1/4     | 002542040   | 1"1/4 MF L=700MM PN16, REINFORCING BRADING IN GALVANISED STEEL    |
|  |            | 002542041   | 1"1/4 MF L=800MM PN16, REINFORCING BRADING IN GALVANISED STEEL    |
|  |            | 002542042   | 1"1/4 MF L=900MM PN16, REINFORCING BRADING IN GALVANISED STEEL    |
| 002542044  |            | 1"1/4 MF L=1000MM PN16, REINFORCING BRADING IN GALVANISED STEEL |   |
| 1"1/2  | 002542050  | 1"1/2 MF L=500MM PN16, REINFORCING BRADING IN GALVANISED STEEL  |   |
|  | 002542054  | 1"1/2 MF L=800MM PN16, REINFORCING BRADING IN GALVANISED STEEL  |   |
| 2"   | 002542069  | 2" MF L=500MM PN16, REINFORCING BRADING IN GALVANISED STEEL     |   |
|  | 002542070  | 2" MF L=600MM PN16, REINFORCING BRADING IN GALVANISED STEEL     |   |
|   | 1" + Elbow | 002542006   | 1" MF 440+ELBOW PN16, REINFORCING BRADING IN GALVANISED STEEL     |
|  |            | 002542008   | 1" MF 480+ELBOW PN16, REINFORCING BRADING IN GALVANISED STEEL     |
|  |            | 002542013   | 1" MF 500+ELBOW PN16, REINFORCING BRADING IN GALVANISED STEEL     |
|  |            | 002542011   | 1" MF 550+ELBOW PN16, REINFORCING BRADING IN GALVANISED STEEL     |
|  |            | 002542043   | 1" MF800+ELBOW PN16, REINFORCING BRADING IN GALVANISED STEEL      |
| Pressure Switch<br>                       | 1/4"       | 002161101   | SQUARE-D FSG2(1,4-4,6), Rp1/4" CONNECTION GALVANISED STEEL        |
|  |            | 002161200   | SQUARE-D FYG22(2,8-7), Rp1/4" CONNECTION GALVANISED STEEL         |
|  |            | 002161201   | SQUARE-D FYG32(5,6-10,5), Rp1/4" CONNECTION GALVANISED STEEL      |
|  |            | 002161336   | ITALTECNICA PM/5(1-5), Rp1/4" CONNECTION GALVANISED STEEL         |
|  |            | 002161337   | ITALTECNICA PM/12(2,5-12), Rp1/4" CONNECTION GALVANISED STEEL     |
|  |            | 002161338   | ITALTECNICA PM/12S(1-8,5), Rp1/4" CONNECTION GALVANISED STEEL     |
| Pressure gauge with radial connection<br> | 1/4"       | 002110201   | 0-6 BAR, DRY TYPE, ABS CASE, 1/4" BRASS CONNECTION, D=50MM        |
|  |            | 002110242   | 0-10 BAR, DRY TYPE, ABS CASE, 1/4" BRASS CONNECTION, D=63MM       |
|  |            | 002110243   | 0-16 BAR, DRY TYPE, ABS CASE, 1/4" BRASS CONNECTION, D=63MM       |
|  |            | 002110251   | 0-10 BAR, DRY TYPE, AISI304 CASE, 1/4" AISI316 CONNECTION, D=63MM |
|  |            | 002110252   | 0-16 BAR, DRY TYPE, AISI304 CASE, 1/4" AISI316 CONNECTION, D=63MM |
| Hexagon Nipple<br>                        | 1"         | 002671855   | 1", GALVANISED STEEL  |
|  | 1" 1/4     | 002671856   | 1"1/4, GALVANISED STEEL   |
|  | 1" 1/2     | 002671857   | 1"1/2, GALVANISED STEEL   |
|  | 2"         | 002671858   | 2", GALVANISED STEEL  |
|  | 1"         | 002671820   | 1", STAINLESS STEEL AISI 316                                      |
|  | 1" 1/4     | 002671821   | 1"1/4, STAINLESS STEEL AISI316                                    |
|  | 1" 1/2     | 002671822   | 1"1/2, STAINLESS STEEL AISI316                                    |
|  | 2"         | 002671823   | 2", STAINLESS STEEL AISI 316                                      |
| 90° Elbow<br>                             | 1"         | 002670655   | 1" MF, GALVANISED STEEL   |
|  | 1" 1/4     | 002670656   | 1"1/4 MF, GALVANISED STEEL  |
|  | 1" 1/2     | 002670657   | 1"1/2 MF, GALVANISED STEEL  |
|  | 2"         | 002670658   | 2" MF, GALVANISED STEEL   |

## ACCESSORIES

| MODEL   | REF.   | CODE  | DESCRIPTION                                     |
|---|--|---|---|
|    | 1"   | 002670505   | 1" FF, GALVANISED STEEL                         |
|   | 1" 1/4                                       | R02671434   | 1"1/4 FF, GALVANISED STEEL                      |
|   | 1" 1/2                                       | 002670557   | 1"1/2 FF, GALVANISED STEEL                      |
|   | 2"   | 002670558   | 2" FF, GALVANISED STEEL                         |
|    | 1"   | 002670633   | 1" MF, STAINLESS STEEL AISI 316                 |
|   | 1" 1/4                                       | 002670634   | 1"1/4 MF, STAINLESS STEEL AISI 316              |
|   | 1" 1/2                                       | 002670635   | 1"1/2 MF, STAINLESS STEEL AISI 316              |
|   | 2"   | 002670636   | 2" MF, STAINLESS STEEL AISI 316                 |
|    | 1"   | 002670594   | 1" FF, STAINLESS STEEL AISI 316                 |
|   | 1" 1/4                                       | 002670595   | 1"1/4 FF, STAINLESS STEEL AISI 316              |
|   | 1" 1/2                                       | 002670596   | 1"1/2 FF, STAINLESS STEEL AISI 316              |
|   | 2"   | 002670597   | 2" FF, STAINLESS STEEL AISI 316                 |
| Fittings<br><br><br><br><br> | 1/4"   | R02671244   | CROSS 1/4" 3F1M, CHROME PLATED BRASS            |
|   |  | 002670881   | CROSS 1/4" 4F, STAINLESS STEEL AISI 316         |
|   |  | R02671020   | 90° ELBOW 90° 1/4" FF, CHROME PLATED BRASS      |
|   |  | R02671018   | 90° ELBOW 90° 1/4" MF, CHROME PLATED BRASS      |
|   |  | 002670590   | 90° ELBOW 90° 1/4" FF, STAINLESS STEEL AISI 316 |
|   |  | 002670629   | 90° ELBOW 90° 1/4" MF, STAINLESS STEEL AISI 316 |
|   |  | 002670777   | TEE 1/4" FFF, STAINLESS STEEL AISI 316          |
|   |  | R02672030   | TEE 1/4" FFF, CHROME PLATED BRASS               |
|   |  | 002679216   | TEE 1/4" FFM, CHROME PLATED BRASS               |
|   |  | 002679215   | TEE 1/4" FMF, CHROME PLATED BRASS               |
|   |  | 002679225   | TEE 1/4" MFM, CHROME PLATED BRASS               |
|   |  | 002679221   | TEE 1/4" MMF, CHROME PLATED BRASS               |
|   |  | 002679217   | TEE 1/4" MMM, CHROME PLATED BRASS               |
|   |  | R02661811   | BALL VALVE 1/4" FF PN15, CHROME PLATED BRASS    |
|   | 002675311                                    | BALL VALVE 1/4" FF PN60, STAINLESS STEEL AISI 316 |   |
|   | 002675345                                    | BALL VALVE 1/4" MF PN15, CHROME PLATED BRASS      |   |
|   | 002675351                                    | BALL VALVE 1/4" MF PN63, STAINLESS STEEL AISI 316 |   |
|   | 1/2"   | 002679264   | CROSS 1/2" 4F, CHROME PLATED BRASS              |
|   |  | 002670883   | CROSS 1/2" 4F, STAINLESS STEEL AISI 316         |
|   |  | R02671420   | 90° ELBOW 90° 1/2" FF, GALVANISED STEEL         |
|   |  | 002670592   | 90° ELBOW 90° 1/2" FF, STAINLESS STEEL AISI 316 |
|   |  | 002670631   | 90° ELBOW 90° 1/2" MF, STAINLESS STEEL AISI 316 |
|   |  | 002670779   | TEE 1/2" FFF, STAINLESS STEEL AISI 316          |
|   |  | R02672034   | TEE 1/2" FFF, CHROME PLATED BRASS               |
|   |  | 002679222   | TEE 1/2" MMF, CHROME PLATED BRASS               |
|   |  | 002679223   | TEE 1/2" MMM, CHROME PLATED BRASS               |
|   |  | 002679226   | TEE 1/2" MFM, CHROME PLATED BRASS               |
|   |  | 002679230   | TEE 1/2" FFM, CHROME PLATED BRASS               |
| 002675313   |  | BALL VALVE 1/2" FF PN60, STAINLESS STEEL AISI 316 |   |
| R02661820   |  | BALL VALVE 1/2" MF PN15, CHROME PLATED BRASS      |   |
| 002675352   |  | BALL VALVE 1/2" MF PN63, STAINLESS STEEL AISI 316 |   |
| 002675327   | BALL VALVE 1/2" FF PN15, CHROME PLATED BRASS |   |   |
| 1"  | 002670755                                    | TEE 1" FFF, GALVANISED STEEL                      |   |
|   | 002670781                                    | TEE 1" FFF, STAINLESS STEEL AISI 316              |   |
| 5 Ways Fitting<br>   | 1"   | 167320240   | R1", BRASS                                      |

# **REPORTS AND DECLARATIONS**

## REPORTS AND DECLARATIONS

### i) Test reports

- a) **Factory Test Report** (Lowara identity code: 1A)  
(not available for all pump types; contact Customer Service in advance)  
- Test report compiled at the end of the assembly line, including flow-head performance test (ISO 9906:2012 – Grade 3B) and tightness test.
- b) **Audit Test Report** (Lowara identity code: 1B)  
- Test report for electric pumps compiled in the test room, comprising flow-head-pump input-pump efficiency performance test (ISO 9906:2012 – Grade 3B)
- c) **NPSH Test Report** (Lowara identity code: 1A / CTF-NP)  
(unavailable for submerged or submergible pumps)  
- Test report for electric pumps compiled in the test room, comprising flow-NPSH performance test (ISO 9906:2012 – Grade 3B)
- d) **Noise Test Report** (Lowara identity code: 1A / CTF-RM)  
(unavailable for submerged pumps)  
- Report indicating sound pressure and power measurements (EN ISO 20361, EN ISO 11203, EN ISO 4871) using the  
• intensimetric (EN ISO 9614-1, EN ISO 9614-2), or  
• phonometric method.
- e) **Vibration Test Report**  
(unavailable for submerged or submergible pumps)  
- Report indicating vibration measurements (ISO 10816-1)

### ii) Declaration of product conformity with the technical requirements indicated in the order

- a) **EN 10204:2004 - type 2.1** (Lowara identity code: CTF-21)  
- does not include test results on supplied or similar products.
- b) **EN 10204:2004 - type 2.2** (Lowara identity code: CTF-22)  
- includes test results (materials certificates) on similar products.
- c) **EN 10204:2004 - type 3.1** (Lowara identity code: 1A / CTF-31 or 1B / CTF-31)  
- includes test report (*Factory Test Report* or *Audit Test Report*), list of materials, EC Declaration of Conformity (in addition to the one accompanying the product), certificates / declarations concerning materials in contact with water.

### iii) Issue of a further EC Declaration of Conformity,

- in addition to the one accompanying the product, it comprises references to European law and the main technical standards (e.g.: MD 2006/42/EC, EMCD 2004/108/EC, ErP 2009/125/EC).

*N.B.: if the request is made after receipt of the product, communicate the code (name) and serial number (date + progressive number).*

### iv) Manufacturer's declaration of conformity

- relative to one of more types of products without indicating specific codes and serial numbers.

### v) Other certificates and/or documentation on request

- subject to availability or feasibility.

### vi) Duplication of certificates and/or documentation on request

- subject to availability or feasibility.



# **TECHNICAL APPENDIX**

## NPSH

The minimum operating values that can be reached at the pump suction end are limited by the onset of cavitation.

Cavitation is the formation of vapour-filled cavities within liquids where the pressure is locally reduced to a critical value, or where the local pressure is equal to, or just below the vapour pressure of the liquid.

The vapour-filled cavities flow with the current and when they reach a higher pressure area the vapour contained in the cavities condenses. The cavities collide, generating pressure waves that are transmitted to the walls. These, being subjected to stress cycles, gradually become deformed and yield due to fatigue. This phenomenon, characterized by a metallic noise produced by the hammering on the pipe walls, is called incipient cavitation.

The damage caused by cavitation may be magnified by electrochemical corrosion and a local rise in temperature due to the plastic deformation of the walls. The materials that offer the highest resistance to heat and corrosion are alloy steels, especially austenitic steel. The conditions that trigger cavitation may be assessed by calculating the total net suction head, referred to in technical literature with the acronym NPSH (Net Positive Suction Head).

The NPSH represents the total energy (expressed in m.) of the liquid measured at suction under conditions of incipient cavitation, excluding the vapour pressure (expressed in m.) that the liquid has at the pump inlet.

To find the static height  $h_z$  at which to install the machine under safe conditions, the following formula must be verified:

$$h_p + h_z \geq (NPSH_r + 0.5) + h_f + h_{pv} \quad \textcircled{1}$$

where:

- $h_p$**  is the absolute pressure applied to the free liquid surface in the suction tank, expressed in m. of liquid;  $h_p$  is the quotient between the barometric pressure and the specific weight of the liquid.
- $h_z$**  is the suction lift between the pump axis and the free liquid surface in the suction tank, expressed in m.;  $h_z$  is negative when the liquid level is lower than the pump axis.
- $h_f$**  is the flow resistance in the suction line and its accessories, such as: fittings, foot valve, gate valve, elbows, etc.
- $h_{pv}$**  is the vapour pressure of the liquid at the operating temperature, expressed in m. of liquid.  $h_{pv}$  is the quotient between the  $P_v$  vapour pressure and the liquid's specific weight.
- 0,5** is the safety factor.

The maximum possible suction head for installation depends on the value of the atmospheric pressure (i.e. the elevation above sea level at which the pump is installed) and the temperature of the liquid.

To help the user, with reference to water temperature (4° C) and to the elevation above sea level, the following tables show the drop in hydraulic pressure head in relation to the elevation above sea level, and the suction loss in relation to temperature.

| Water temperature (°C) | 20  | 40  | 60  | 80  | 90  | 110  | 120  |
|------------------------|-----|-----|-----|-----|-----|------|------|
| Suction loss (m)       | 0,2 | 0,7 | 2,0 | 5,0 | 7,4 | 15,4 | 21,5 |

| Elevation above sea level (m) | 500  | 1000 | 1500 | 2000 | 2500 | 3000 |
|-------------------------------|------|------|------|------|------|------|
| Suction loss (m)              | 0,55 | 1,1  | 1,65 | 2,2  | 2,75 | 3,3  |

Friction loss is shown in the tables at pages 76-77 of this catalogue. To reduce it to a minimum, especially in cases of high suction head (over 4-5 m.) or within the operating limits with high flow rates, we recommend using a suction line having a larger diameter than that of the pump's suction port. It is always a good idea to position the pump as close as possible to the liquid to be pumped.

Make the following calculation:

Liquid: water at ~15°C  $\gamma = 1 \text{ kg/dm}^3$

Flow rate required: 25 m<sup>3</sup>/h

Head for required delivery: 70 m.

Suction lift: 3,5 m.

The selection is an 33SV3G075T pump whose NPSH required value is, at 25 m<sup>3</sup>/h, of 2 m.

For water at 15 °C

$$h_p = P_a / \gamma = 10,33\text{m}, h_{pv} = P_v / \gamma = 0,174\text{m} (0,01701 \text{ bar})$$

The  $H_f$  flow resistance in the suction line with foot valves is ~ 1,2 m.

By substituting the parameters in formula  $\textcircled{1}$  with the numeric values above, we have:

$$10,33 + (-3,5) \geq (2 + 0,5) + 1,2 + 0,17$$

from which we have: 6,8 > 3,9

The relation is therefore verified.

**VAPOUR PRESSURE**  
**VAPOUR PRESSURE  $p_s$  AND  $\rho$  DENSITY OF WATER TABLE**

| t  | T      | $p_s$   | $\rho$             | t   | T      | $p_s$   | $\rho$             | t      | T      | $p_s$  | $\rho$             |
|----|--------|---------|--------------------|-----|--------|---------|--------------------|--------|--------|--------|--------------------|
| °C | K      | bar     | kg/dm <sup>3</sup> | °C  | K      | bar     | kg/dm <sup>3</sup> | °C     | K      | bar    | kg/dm <sup>3</sup> |
| 0  | 273,15 | 0,00611 | 0,9998             | 55  | 328,15 | 0,15741 | 0,9857             | 120    | 393,15 | 1,9854 | 0,9429             |
| 1  | 274,15 | 0,00657 | 0,9999             | 56  | 329,15 | 0,16511 | 0,9852             | 122    | 395,15 | 2,1145 | 0,9412             |
| 2  | 275,15 | 0,00706 | 0,9999             | 57  | 330,15 | 0,17313 | 0,9846             | 124    | 397,15 | 2,2504 | 0,9396             |
| 3  | 276,15 | 0,00758 | 0,9999             | 58  | 331,15 | 0,18147 | 0,9842             | 126    | 399,15 | 2,3933 | 0,9379             |
| 4  | 277,15 | 0,00813 | 1,0000             | 59  | 332,15 | 0,19016 | 0,9837             | 128    | 401,15 | 2,5435 | 0,9362             |
| 5  | 278,15 | 0,00872 | 1,0000             | 60  | 333,15 | 0,1992  | 0,9832             | 130    | 403,15 | 2,7013 | 0,9346             |
| 6  | 279,15 | 0,00935 | 1,0000             | 61  | 334,15 | 0,2086  | 0,9826             | 132    | 405,15 | 2,867  | 0,9328             |
| 7  | 280,15 | 0,01001 | 0,9999             | 62  | 335,15 | 0,2184  | 0,9821             | 134    | 407,15 | 3,041  | 0,9311             |
| 8  | 281,15 | 0,01072 | 0,9999             | 63  | 336,15 | 0,2286  | 0,9816             | 136    | 409,15 | 3,223  | 0,9294             |
| 9  | 282,15 | 0,01147 | 0,9998             | 64  | 337,15 | 0,2391  | 0,9811             | 138    | 411,15 | 3,414  | 0,9276             |
| 10 | 283,15 | 0,01227 | 0,9997             | 65  | 338,15 | 0,2501  | 0,9805             | 140    | 413,15 | 3,614  | 0,9258             |
| 11 | 284,15 | 0,01312 | 0,9997             | 66  | 339,15 | 0,2615  | 0,9799             | 145    | 418,15 | 4,155  | 0,9214             |
| 12 | 285,15 | 0,01401 | 0,9996             | 67  | 340,15 | 0,2733  | 0,9793             | 155    | 428,15 | 5,433  | 0,9121             |
| 13 | 286,15 | 0,01497 | 0,9994             | 68  | 341,15 | 0,2856  | 0,9788             | 160    | 433,15 | 6,181  | 0,9073             |
| 14 | 287,15 | 0,01597 | 0,9993             | 69  | 342,15 | 0,2984  | 0,9782             | 165    | 438,15 | 7,008  | 0,9024             |
| 15 | 288,15 | 0,01704 | 0,9992             | 70  | 343,15 | 0,3116  | 0,9777             | 170    | 443,15 | 7,920  | 0,8973             |
| 16 | 289,15 | 0,01817 | 0,9990             | 71  | 344,15 | 0,3253  | 0,9770             | 175    | 448,15 | 8,924  | 0,8921             |
| 17 | 290,15 | 0,01936 | 0,9988             | 72  | 345,15 | 0,3396  | 0,9765             | 180    | 453,15 | 10,027 | 0,8869             |
| 18 | 291,15 | 0,02062 | 0,9987             | 73  | 346,15 | 0,3543  | 0,9760             | 185    | 458,15 | 11,233 | 0,8815             |
| 19 | 292,15 | 0,02196 | 0,9985             | 74  | 347,15 | 0,3696  | 0,9753             | 190    | 463,15 | 12,551 | 0,8760             |
| 20 | 293,15 | 0,02337 | 0,9983             | 75  | 348,15 | 0,3855  | 0,9748             | 195    | 468,15 | 13,987 | 0,8704             |
| 21 | 294,15 | 0,24850 | 0,9981             | 76  | 349,15 | 0,4019  | 0,9741             | 200    | 473,15 | 15,550 | 0,8647             |
| 22 | 295,15 | 0,02642 | 0,9978             | 77  | 350,15 | 0,4189  | 0,9735             | 205    | 478,15 | 17,243 | 0,8588             |
| 23 | 296,15 | 0,02808 | 0,9976             | 78  | 351,15 | 0,4365  | 0,9729             | 210    | 483,15 | 19,077 | 0,8528             |
| 24 | 297,15 | 0,02982 | 0,9974             | 79  | 352,15 | 0,4547  | 0,9723             | 215    | 488,15 | 21,060 | 0,8467             |
| 25 | 298,15 | 0,03166 | 0,9971             | 80  | 353,15 | 0,4736  | 0,9716             | 220    | 493,15 | 23,198 | 0,8403             |
| 26 | 299,15 | 0,03360 | 0,9968             | 81  | 354,15 | 0,4931  | 0,9710             | 225    | 498,15 | 25,501 | 0,8339             |
| 27 | 300,15 | 0,03564 | 0,9966             | 82  | 355,15 | 0,5133  | 0,9704             | 230    | 503,15 | 27,976 | 0,8273             |
| 28 | 301,15 | 0,03778 | 0,9963             | 83  | 356,15 | 0,5342  | 0,9697             | 235    | 508,15 | 30,632 | 0,8205             |
| 29 | 302,15 | 0,04004 | 0,9960             | 84  | 357,15 | 0,5557  | 0,9691             | 240    | 513,15 | 33,478 | 0,8136             |
| 30 | 303,15 | 0,04241 | 0,9957             | 85  | 358,15 | 0,5780  | 0,9684             | 245    | 518,15 | 36,523 | 0,8065             |
| 31 | 304,15 | 0,04491 | 0,9954             | 86  | 359,15 | 0,6011  | 0,9678             | 250    | 523,15 | 39,776 | 0,7992             |
| 32 | 305,15 | 0,04753 | 0,9951             | 87  | 360,15 | 0,6249  | 0,9671             | 255    | 528,15 | 43,246 | 0,7916             |
| 33 | 306,15 | 0,05029 | 0,9947             | 88  | 361,15 | 0,6495  | 0,9665             | 260    | 533,15 | 46,943 | 0,7839             |
| 34 | 307,15 | 0,05318 | 0,9944             | 89  | 362,15 | 0,6749  | 0,9658             | 265    | 538,15 | 50,877 | 0,7759             |
| 35 | 308,15 | 0,05622 | 0,9940             | 90  | 363,15 | 0,7011  | 0,9652             | 270    | 543,15 | 55,058 | 0,7678             |
| 36 | 309,15 | 0,05940 | 0,9937             | 91  | 364,15 | 0,7281  | 0,9644             | 275    | 548,15 | 59,496 | 0,7593             |
| 37 | 310,15 | 0,06274 | 0,9933             | 92  | 365,15 | 0,7561  | 0,9638             | 280    | 553,15 | 64,202 | 0,7505             |
| 38 | 311,15 | 0,06624 | 0,9930             | 93  | 366,15 | 0,7849  | 0,9630             | 285    | 558,15 | 69,186 | 0,7415             |
| 39 | 312,15 | 0,06991 | 0,9927             | 94  | 367,15 | 0,8146  | 0,9624             | 290    | 563,15 | 74,461 | 0,7321             |
| 40 | 313,15 | 0,07375 | 0,9923             | 95  | 368,15 | 0,8453  | 0,9616             | 295    | 568,15 | 80,037 | 0,7223             |
| 41 | 314,15 | 0,07777 | 0,9919             | 96  | 369,15 | 0,8769  | 0,9610             | 300    | 573,15 | 85,927 | 0,7122             |
| 42 | 315,15 | 0,08198 | 0,9915             | 97  | 370,15 | 0,9094  | 0,9602             | 305    | 578,15 | 92,144 | 0,7017             |
| 43 | 316,15 | 0,09639 | 0,9911             | 98  | 371,15 | 0,9430  | 0,9596             | 310    | 583,15 | 98,70  | 0,6906             |
| 44 | 317,15 | 0,09100 | 0,9907             | 99  | 372,15 | 0,9776  | 0,9586             | 315    | 588,15 | 105,61 | 0,6791             |
| 45 | 318,15 | 0,09582 | 0,9902             | 100 | 373,15 | 1,0133  | 0,9581             | 320    | 593,15 | 112,89 | 0,6669             |
| 46 | 319,15 | 0,10086 | 0,9898             | 102 | 375,15 | 1,0878  | 0,9567             | 325    | 598,15 | 120,56 | 0,6541             |
| 47 | 320,15 | 0,10612 | 0,9894             | 104 | 377,15 | 1,1668  | 0,9552             | 330    | 603,15 | 128,63 | 0,6404             |
| 48 | 321,15 | 0,11162 | 0,9889             | 106 | 379,15 | 1,2504  | 0,9537             | 340    | 613,15 | 146,05 | 0,6102             |
| 49 | 322,15 | 0,11736 | 0,9884             | 108 | 381,15 | 1,3390  | 0,9522             | 350    | 623,15 | 165,35 | 0,5743             |
| 50 | 323,15 | 0,12335 | 0,9880             | 110 | 383,15 | 1,4327  | 0,9507             | 360    | 633,15 | 186,75 | 0,5275             |
| 51 | 324,15 | 0,12961 | 0,9876             | 112 | 385,15 | 1,5316  | 0,9491             | 370    | 643,15 | 210,54 | 0,4518             |
| 52 | 325,15 | 0,13613 | 0,9871             | 114 | 387,15 | 1,6362  | 0,9476             | 374,15 | 647,30 | 221,20 | 0,3154             |
| 53 | 326,15 | 0,14293 | 0,9862             | 116 | 389,15 | 1,7465  | 0,9460             |        |        |        |                    |
| 54 | 327,15 | 0,15002 | 0,9862             | 118 | 391,15 | 1,8628  | 0,9445             |        |        |        |                    |

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### TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)

| FLOW RATE         |       |         | NOMINAL DIAMETER in mm and inches |               |              |              |              |               |  |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|-------|---------|-----------------------------------|---------------|--------------|--------------|--------------|---------------|--|--------------|--------------|---------------|--------------|--------------|--------------|--------------|------------|------------|--------------|--|--|--|--|--|--|--|--|--|--|--|--|
| m <sup>3</sup> /h | l/min |         | 15<br>1/2"                        | 20<br>3/4"    | 25<br>1"     | 32<br>1 1/4" | 40<br>1 1/2" | 50<br>2       | 65<br>2 1/2"   | 80<br>3"     | 100<br>4"    | 125<br>5"     | 150<br>6"    | 175<br>7"    | 200<br>8"    | 250<br>10"   | 300<br>12" | 350<br>14" | 400<br>16"   |  |  |  |  |  |  |  |  |  |  |  |  |
| 0,6               | 10    | v<br>hr | 0,94<br>16                        | 0,53<br>3,94  | 0,34<br>1,33 | 0,21<br>0,40 | 0,13<br>0,13 |               | The hr values must be multiplied by:<br>0,71 for galvanized or painted steel pipes<br>0,54 for stainless steel or copper pipes<br>0,47 for PVC or PE pipes |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 0,9               | 15    | v<br>hr | 1,42<br>33,9                      | 0,80<br>8,35  | 0,51<br>2,82 | 0,31<br>0,85 | 0,20<br>0,29 |               |  |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 1,2               | 20    | v<br>hr | 1,89<br>57,7                      | 1,06<br>14,21 | 0,68<br>4,79 | 0,41<br>1,44 | 0,27<br>0,49 | 0,17<br>0,16  |  |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 1,5               | 25    | v<br>hr | 2,36<br>87,2                      | 1,33<br>21,5  | 0,85<br>7,24 | 0,52<br>2,18 | 0,33<br>0,73 | 0,21<br>0,25  |  |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 1,8               | 30    | v<br>hr | 2,83<br>122                       | 1,59<br>30,1  | 1,02<br>10,1 | 0,62<br>3,05 | 0,40<br>1,03 | 0,25<br>0,35  |  |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 2,1               | 35    | v<br>hr | 3,30<br>162                       | 1,86<br>40,0  | 1,19<br>13,5 | 0,73<br>4,06 | 0,46<br>1,37 | 0,30<br>0,46  |  |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 2,4               | 40    | v<br>hr |                                   | 2,12<br>51,2  | 1,36<br>17,3 | 0,83<br>5,19 | 0,53<br>1,75 | 0,34<br>0,59  | 0,20<br>0,16   |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 3                 | 50    | v<br>hr |                                   | 2,65<br>77,4  | 1,70<br>26,1 | 1,04<br>7,85 | 0,66<br>2,65 | 0,42<br>0,89  | 0,25<br>0,25   |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 3,6               | 60    | v<br>hr |                                   | 3,18<br>108   | 2,04<br>36,6 | 1,24<br>11,0 | 0,80<br>3,71 | 0,51<br>1,25  | 0,30<br>0,35   |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 4,2               | 70    | v<br>hr |                                   | 3,72<br>144   | 2,38<br>48,7 | 1,45<br>14,6 | 0,93<br>4,93 | 0,59<br>1,66  | 0,35<br>0,46   |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 4,8               | 80    | v<br>hr |                                   | 4,25<br>185   | 2,72<br>62,3 | 1,66<br>18,7 | 1,06<br>6,32 | 0,68<br>2,13  | 0,40<br>0,59   |              |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 5,4               | 90    | v<br>hr |                                   |               | 3,06<br>77,5 | 1,87<br>23,3 | 1,19<br>7,85 | 0,76<br>2,65  | 0,45<br>0,74   | 0,30<br>0,27 |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 6                 | 100   | v<br>hr |                                   |               | 3,40<br>94,1 | 2,07<br>28,3 | 1,33<br>9,54 | 0,85<br>3,22  | 0,50<br>0,90   | 0,33<br>0,33 |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 7,5               | 125   | v<br>hr |                                   |               | 4,25<br>142  | 2,59<br>42,8 | 1,66<br>14,4 | 1,06<br>4,86  | 0,63<br>1,36   | 0,41<br>0,49 |              |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 9                 | 150   | v<br>hr |                                   |               |              | 3,11<br>59,9 | 1,99<br>20,2 | 1,27<br>6,82  | 0,75<br>1,90   | 0,50<br>0,69 | 0,32<br>0,23 |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 10,5              | 175   | v<br>hr |                                   |               |              | 3,63<br>79,7 | 2,32<br>26,9 | 1,49<br>9,07  | 0,88<br>2,53   | 0,58<br>0,92 | 0,37<br>0,31 |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 12                | 200   | v<br>hr |                                   |               |              | 4,15<br>102  | 2,65<br>34,4 | 1,70<br>11,6  | 1,01<br>3,23   | 0,66<br>1,18 | 0,42<br>0,40 |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 15                | 250   | v<br>hr |                                   |               |              | 5,18<br>154  | 3,32<br>52,0 | 2,12<br>17,5  | 1,26<br>4,89   | 0,83<br>1,78 | 0,53<br>0,60 | 0,34<br>0,20  |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 18                | 300   | v<br>hr |                                   |               |              | 3,98<br>72,8 | 2,55<br>24,6 | 1,51<br>6,85  | 1,00<br>2,49   | 0,64<br>0,84 | 0,41<br>0,28 |               |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 24                | 400   | v<br>hr |                                   |               |              | 5,31<br>124  | 3,40<br>41,8 | 2,01<br>11,66 | 1,33<br>4,24   | 0,85<br>1,43 | 0,54<br>0,48 | 0,38<br>0,20  |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 30                | 500   | v<br>hr |                                   |               |              | 6,63<br>187  | 4,25<br>63,2 | 2,51<br>17,6  | 1,66<br>6,41   | 1,06<br>2,16 | 0,68<br>0,73 | 0,47<br>0,30  |              |              |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 36                | 600   | v<br>hr |                                   |               |              |              |              | 5,10<br>88,6  | 3,02<br>24,7   | 1,99<br>8,98 | 1,27<br>3,03 | 0,82<br>1,02  | 0,57<br>0,42 | 0,42<br>0,20 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 42                | 700   | v<br>hr |                                   |               |              |              |              | 5,94<br>118   | 3,52<br>32,8   | 2,32<br>11,9 | 1,49<br>4,03 | 0,95<br>1,36  | 0,66<br>0,56 | 0,49<br>0,26 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 48                | 800   | v<br>hr |                                   |               |              |              |              | 6,79<br>151   | 4,02<br>42,0   | 2,65<br>15,3 | 1,70<br>5,16 | 1,09<br>1,74  | 0,75<br>0,72 | 0,55<br>0,34 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 54                | 900   | v<br>hr |                                   |               |              |              |              | 7,64<br>188   | 4,52<br>52,3   | 2,99<br>19,0 | 1,91<br>6,41 | 1,22<br>2,16  | 0,85<br>0,89 | 0,62<br>0,42 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 60                | 1000  | v<br>hr |                                   |               |              |              |              | 5,03<br>63,5  | 3,32<br>23,1   | 2,12<br>7,79 | 1,36<br>2,63 | 0,94<br>1,08  | 0,69<br>0,51 | 0,53<br>0,27 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 75                | 1250  | v<br>hr |                                   |               |              |              |              | 6,28<br>96,0  | 4,15<br>34,9   | 2,65<br>11,8 | 1,70<br>3,97 | 1,18<br>1,63  | 0,87<br>0,77 | 0,66<br>0,40 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 90                | 1500  | v<br>hr |                                   |               |              |              |              | 7,54<br>134   | 4,98<br>48,9   | 3,18<br>16,5 | 2,04<br>5,57 | 1,42<br>2,29  | 1,04<br>1,08 | 0,80<br>0,56 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 105               | 1750  | v<br>hr |                                   |               |              |              |              | 8,79<br>179   | 5,81<br>65,1   | 3,72<br>21,9 | 2,38<br>7,40 | 1,65<br>3,05  | 1,21<br>1,44 | 0,93<br>0,75 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 120               | 2000  | v<br>hr |                                   |               |              |              |              | 6,63<br>83,3  | 4,25<br>28,1   | 2,72<br>9,48 | 1,89<br>3,90 | 1,39<br>1,84  | 1,06<br>0,96 | 0,68<br>0,32 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 150               | 2500  | v<br>hr |                                   |               |              |              |              | 8,29<br>126   | 5,31<br>42,5   | 3,40<br>14,3 | 2,36<br>5,89 | 1,73<br>2,78  | 1,33<br>1,45 | 0,85<br>0,49 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 180               | 3000  | v<br>hr |                                   |               |              |              |              | 6,37<br>59,5  | 4,08<br>20,1   | 2,83<br>8,26 | 2,08<br>3,90 | 1,59<br>2,03  | 1,02<br>0,69 | 0,71<br>0,28 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 210               | 3500  | v<br>hr |                                   |               |              |              |              | 7,43<br>79,1  | 4,76<br>26,7   | 3,30<br>11,0 | 2,43<br>5,18 | 1,86<br>2,71  | 1,19<br>0,91 | 0,83<br>0,38 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 240               | 4000  | v<br>hr |                                   |               |              |              |              | 8,49<br>101   | 5,44<br>34,2   | 3,77<br>14,1 | 2,77<br>6,64 | 2,12<br>3,46  | 1,36<br>1,17 | 0,94<br>0,48 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 300               | 5000  | v<br>hr |                                   |               |              |              |              |               | 6,79<br>51,6   | 4,72<br>21,2 | 3,47<br>10,0 | 2,65<br>5,23  | 1,70<br>1,77 | 1,18<br>0,73 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 360               | 6000  | v<br>hr |                                   |               |              |              |              |               | 8,15<br>72,3   | 5,66<br>29,8 | 4,16<br>14,1 | 3,18<br>7,33  | 2,04<br>2,47 | 1,42<br>1,02 |              |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 420               | 7000  | v<br>hr |                                   |               |              |              |              |               |  | 6,61<br>39,6 | 4,85<br>18,7 | 3,72<br>9,75  | 2,38<br>3,29 | 1,65<br>1,35 | 1,21<br>0,82 |              |            |            | 1,21<br>0,64 |  |  |  |  |  |  |  |  |  |  |  |  |
| 480               | 8000  | v<br>hr |                                   |               |              |              |              |               |  | 7,55<br>50,7 | 5,55<br>23,9 | 4,25<br>12,49 | 2,72<br>4,21 | 1,89<br>1,73 | 1,39<br>0,82 |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 540               | 9000  | v<br>hr |                                   |               |              |              |              |               |  | 8,49<br>63,0 | 6,24<br>29,8 | 4,78<br>15,5  | 3,06<br>5,24 | 2,12<br>2,16 | 1,56<br>1,02 | 1,19<br>0,53 |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |
| 600               | 10000 | v<br>hr |                                   |               |              |              |              |               |  | 6,93<br>36,2 | 5,31<br>18,9 | 3,40<br>6,36  | 2,36<br>2,62 | 1,73<br>1,24 | 1,33<br>0,65 |              |            |            |              |  |  |  |  |  |  |  |  |  |  |  |  |

G-at-pct-en\_a\_th

hr = flow resistance for 100 m of straight pipeline (m)  
V = water speed (m/s)

## FLOW RESISTANCE TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES

The flow resistance is calculated using the equivalent pipeline length method according to the table below:

| ACCESSORY<br>TYPE  | DN                             |     |     |     |     |     |     |     |     |     |      |      |
|--------------------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|                    | 25                             | 32  | 40  | 50  | 65  | 80  | 100 | 125 | 150 | 200 | 250  | 300  |
|                    | Equivalent pipeline length (m) |     |     |     |     |     |     |     |     |     |      |      |
| 45° bend           | 0,2                            | 0,2 | 0,4 | 0,4 | 0,6 | 0,6 | 0,9 | 1,1 | 1,5 | 1,9 | 2,4  | 2,8  |
| 90° bend           | 0,4                            | 0,6 | 0,9 | 1,1 | 1,3 | 1,5 | 2,1 | 2,6 | 3,0 | 3,9 | 4,7  | 5,8  |
| 90° smooth bend    | 0,4                            | 0,4 | 0,4 | 0,6 | 0,9 | 1,1 | 1,3 | 1,7 | 1,9 | 2,8 | 3,4  | 3,9  |
| Union tee or cross | 1,1                            | 1,3 | 1,7 | 2,1 | 2,6 | 3,2 | 4,3 | 5,3 | 6,4 | 7,5 | 10,7 | 12,8 |
| Gate               | -                              | -   | -   | 0,2 | 0,2 | 0,2 | 0,4 | 0,4 | 0,6 | 0,9 | 1,1  | 1,3  |
| Non return valve   | 1,1                            | 1,5 | 1,9 | 2,4 | 3,0 | 3,4 | 4,7 | 5,9 | 7,4 | 9,6 | 11,8 | 13,9 |

G-a-pcv-en\_a\_th

The table is valid for the Hazen Williams coefficient  $C=100$  (cast iron pipework);

for steel pipework, multiply the values by 1,41;

for stainless steel, copper and coated cast iron pipework, multiply the values by 1,85;

When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

The values given are guideline values which are bound to vary slightly according to the model, especially for gate valves and non-return valves, for which it is a good idea to check the values supplied by manufacturers.

## VOLUMETRIC CAPACITY

| Litres<br>per minute<br>l/min | Cubic metres<br>per hour<br>m <sup>3</sup> /h | Cubic feet<br>per hour<br>ft <sup>3</sup> /h | Cubic feet<br>per minute<br>ft <sup>3</sup> /min | Imp. gal.<br>per minute<br>Imp. gal./min | US gal.<br>per minute<br>Us gal./min |
|-------------------------------|---|--|--|--|--------------------------------------|
| <b>1,000</b>                  | 0,0600  | 2,1189                                       | 0,0353   | 0,2200                                   | 0,2642                               |
| 16,6667                       | <b>1,000</b>                                  | 35,3147                                      | 0,5886   | 3,6662                                   | 4,4029                               |
| 0,4719                        | 0,0283  | <b>1,000</b>                                 | 0,0167   | 0,1038                                   | 0,1247                               |
| 28,3168                       | 1,6990  | 60,0000                                      | <b>1,000</b>                                     | 6,2288                                   | 7,4805                               |
| 4,5461                        | 0,2728  | 9,6326                                       | 0,1605   | <b>1,000</b>                             | 1,2009                               |
| 3,7854                        | 0,2271  | 8,0208                                       | 0,1337   | 0,8327                                   | <b>1,000</b>                         |

## PRESSURE AND HEAD

| Newton per<br>square metre<br>N/m <sup>2</sup> | kilo Pascal<br>kPa | bar<br>bar           | Pound force per<br>square inch<br>psi | metre<br>of water<br>m H <sub>2</sub> O | millimetre of<br>mercury<br>mm Hg |
|--|--------------------|----------------------|---------------------------------------|---|-----------------------------------|
| <b>1,000</b>                                   | 0,0010             | 1 x 10 <sup>-5</sup> | 1.45 x 10 <sup>-4</sup>               | 1.02 x 10 <sup>-4</sup>                 | 0,0075                            |
| 1000,0000                                      | <b>1,000</b>       | 0,0100               | 0,1450                                | 0,1020                                  | 7,5006                            |
| 1 x 10 <sup>5</sup>                            | 100,0000           | <b>1,000</b>         | 14,5038                               | 10,1972                                 | 750,0638                          |
| 6894,7570                                      | 6,8948             | 0,0689               | <b>1,000</b>                          | 0,7031                                  | 51,7151                           |
| 9806,6500                                      | 9,8067             | 0,0981               | 1,4223                                | <b>1,000</b>                            | 73,5561                           |
| 133,3220                                       | 0,1333             | 0,0013               | 0,0193                                | 0,0136                                  | <b>1,000</b>                      |

## LENGTH

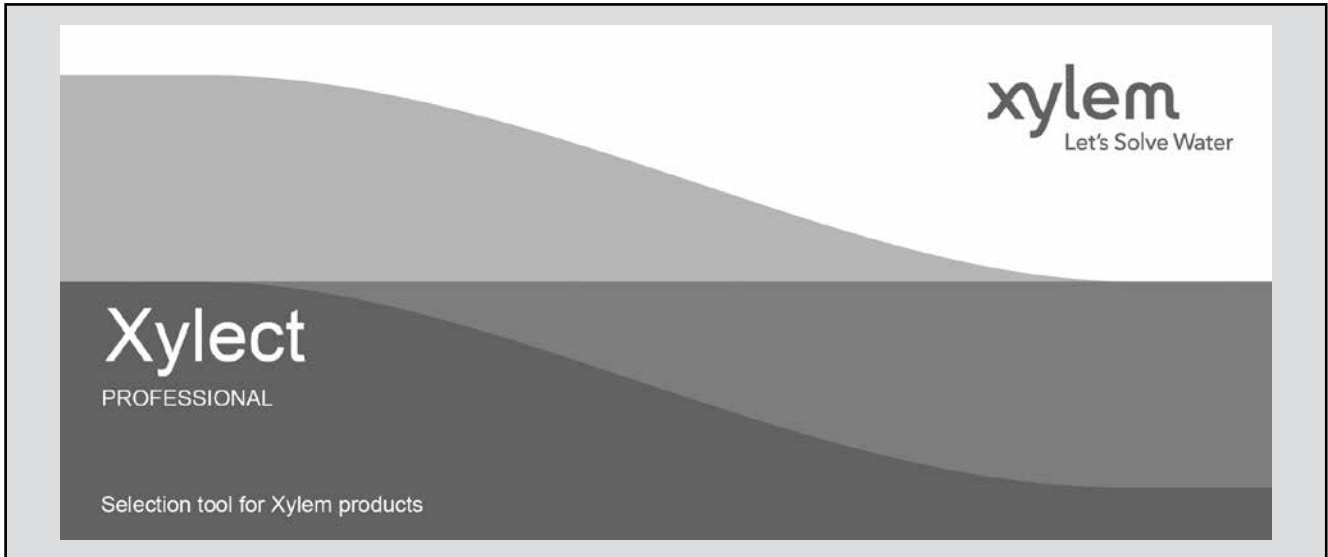
| millimetre<br>mm | centimetre<br>cm | metre<br>m   | inch<br>in   | foot<br>ft   | yard<br>yd   |
|------------------|------------------|--------------|--------------|--------------|--------------|
| <b>1,000</b>     | 0,1000           | 0,0010       | 0,0394       | 0,0033       | 0,0011       |
| 10,0000          | <b>1,000</b>     | 0,0100       | 0,3937       | 0,0328       | 0,0109       |
| 1000,0000        | 100,0000         | <b>1,000</b> | 39,3701      | 3,2808       | 1,0936       |
| 25,4000          | 2,5400           | 0,0254       | <b>1,000</b> | 0,0833       | 0,0278       |
| 304,8000         | 30,4800          | 0,3048       | 12,0000      | <b>1,000</b> | 0,3333       |
| 914,4000         | 91,4400          | 0,9144       | 36,0000      | 3,0000       | <b>1,000</b> |

## VOLUME

| cubic metre<br>m <sup>3</sup> | litre<br>litro | millilitre<br>ml    | imp. Gallon<br>imp. gal. | US gallon<br>US gal.     | cubic foot<br>ft <sup>3</sup> |
|-------------------------------|----------------|---------------------|--------------------------|--------------------------|-------------------------------|
| <b>1,000</b>                  | 1000,0000      | 1 x 10 <sup>6</sup> | 219,9694                 | 264,1720                 | 35,3147                       |
| 0,0010                        | <b>1,000</b>   | 1000,0000           | 0,2200                   | 0,2642                   | 0,0353                        |
| 1 x 10 <sup>-6</sup>          | 0,0010         | <b>1,000</b>        | 2.2 x 10 <sup>-4</sup>   | 2.642 x 10 <sup>-4</sup> | 3.53 x 10 <sup>-5</sup>       |
| 0,0045                        | 4,5461         | 4546,0870           | <b>1,000</b>             | 1,2009                   | 0,1605                        |
| 0,0038                        | 3,7854         | 3785,4120           | 0,8327                   | <b>1,000</b>             | 0,1337                        |
| 0,0283                        | 28,3168        | 28316,8466          | 6,2288                   | 7,4805                   | <b>1,000</b>                  |

G-at\_pp-en\_a\_sc

## FURTHER PRODUCT SELECTION AND DOCUMENTATION Xylect™



Xylect™ is pump solution selection software with an extensive online database of product information across the entire Lowara, and Vogel range of pumps and related products, with multiple search options and helpful project management facilities. The system holds up-to-date product information on thousands of products and accessories.

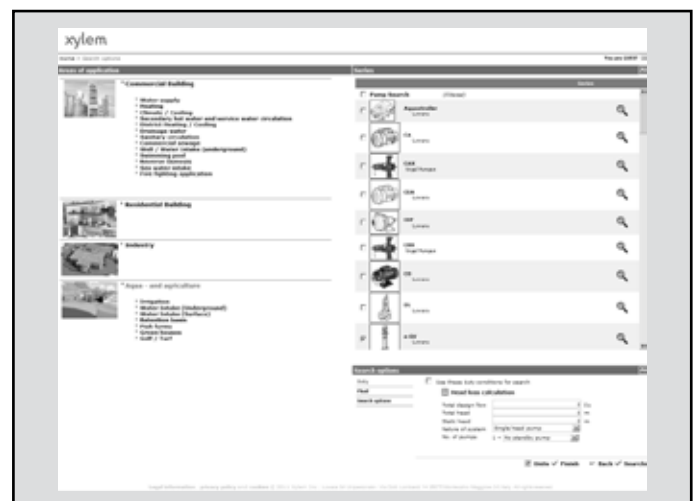
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara and Vogel products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect™ gives a detailed output:

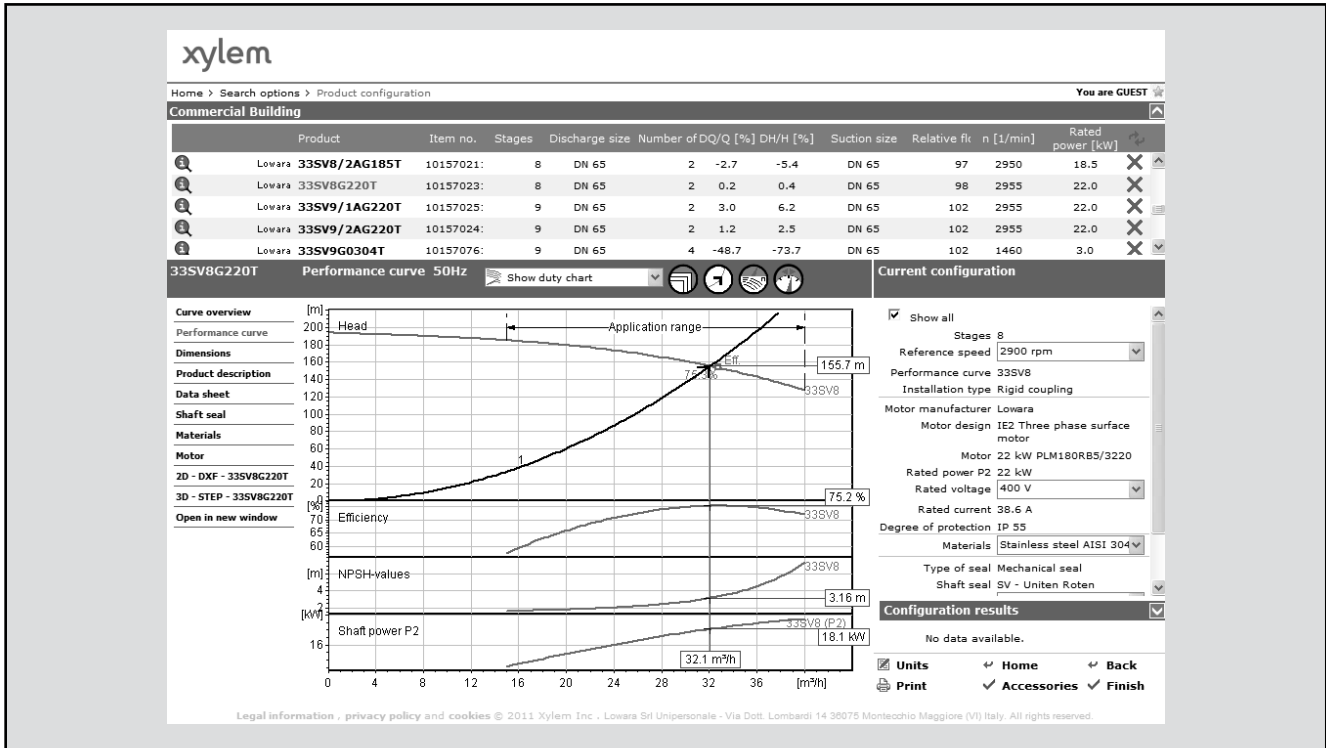
- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files



*The search by application guides users not familiar with the product range to the right choice.*

## FURTHER PRODUCT SELECTION AND DOCUMENTATION

### Xylect™



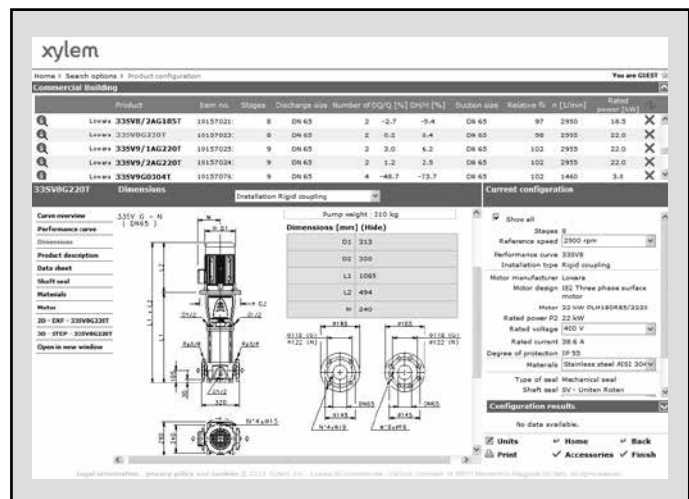
The detailed output makes it easy to select the optimal pump from the given alternatives.

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- Set own standard units
- Create and save projects
- Share projects with other Xylect™ users

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Dimensional drawings appear on the screen and can be downloaded in dxf format.









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- 2) a leading global water technology company.

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