

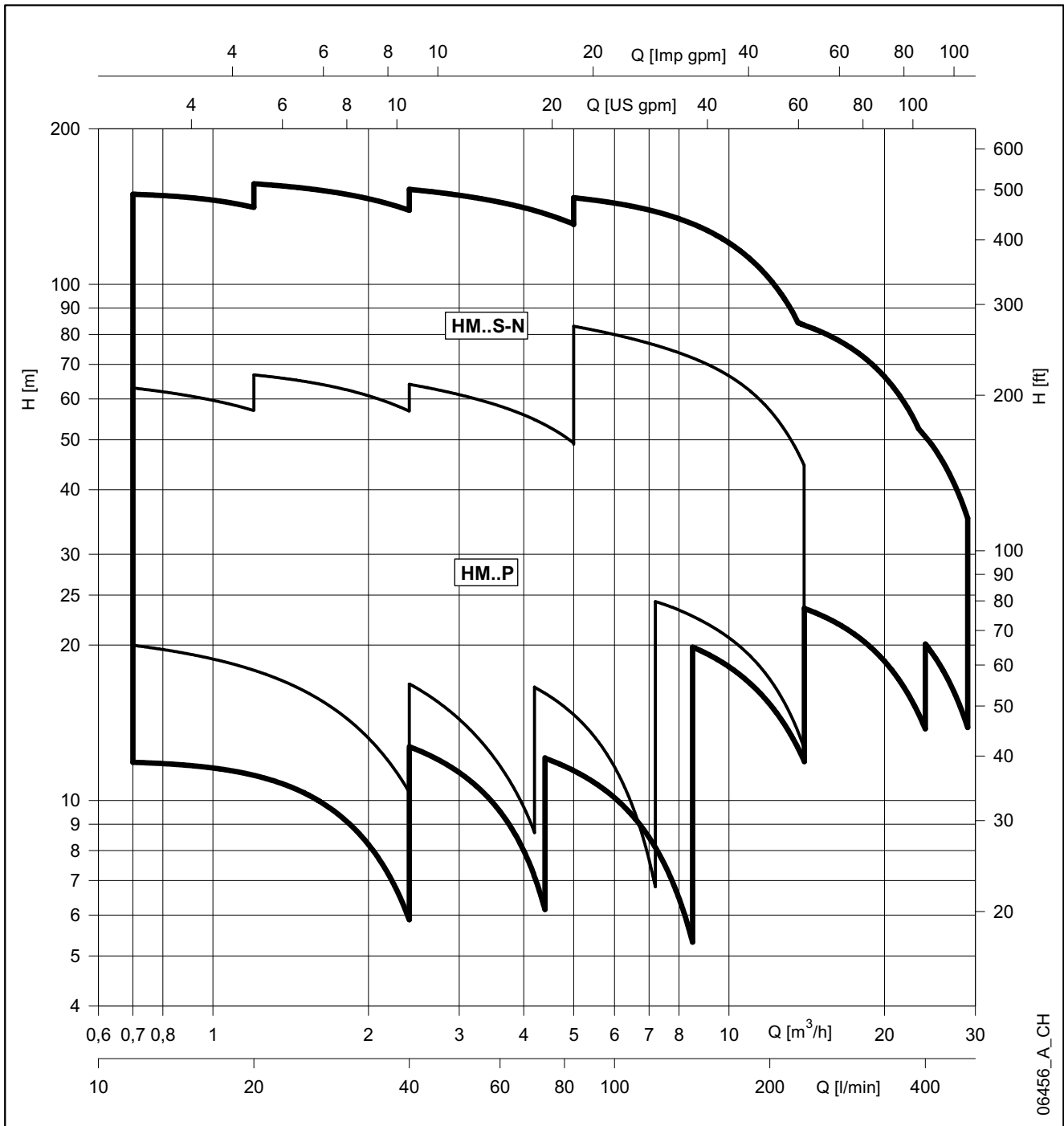
50 Hz



HM..P - HM..S - HM..N e-HM™ Series

THREADED HORIZONTAL MULTISTAGE CENTRIFUGAL ELECTRIC PUMPS
EQUIPPED WITH IE3 MOTORS COMPLYING WITH REGULATION (EC) no. 640/2009

e-HM™ SERIES
HYDRAULIC PERFORMANCE AT 50 Hz



06456_A_CH

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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 Lowara has 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™ is available in two different configurations:

- "Compact" design for sizes 1HM, 3HM and 5HM up to maximum 6 stages
- "Sleeve" design for sizes 1HM, 3HM and 5HM starting 7 stages and above; any models 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 material execution:

- HM..P: Stainless steel pump body (EN 1.4301/ AISI 304) with Noryl™ impeller for sizes 1HM, 3HM, 5HM and 10HM to maximum 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 Lowara designed and manufactured surface motors in accordance with EN standards.

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

Range declination

The e-HM™ series are available as:

- Single pump
- Variable speed system with Lowara Teknospeed variable 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 28m³/h.
- Nominal pressure up to 10 bars with Noryl™ impellers and 16 bars 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 manufactured 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, food and beverage and pharmaceutical applications.

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 28m³/h, pressure up to 160 meters.
- Nominal pressure up to 10 bars with Noryl™ impellers and 16 bars 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.
- Wide range of voltages for worldwide applications.
- Naturally born with full UL/CSA listed motor: 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 manufactured motors: high performances and silent operations.



e-HM™ SERIES GENERAL CHARACTERISTICS

HM..P SERIES	1	3	5	10
Max efficiency flow (m ³ /h)	1,8	3,0	5,0	10,6
Flow range (m ³ /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 η (%) of pump	35	46	55	63
Standard temperature (°C)	-30 +90			

1-10hmp_2p50-en_a_tg

HM..S - HM..N SERIES	1	3	5	10	15	22
Max efficiency flow (m ³ /h)	1,6	3,0	5,8	10,6	17,3	20,0
Flow range (m ³ /h)	0,7÷2,4	1,2÷4,4	2,4÷8,5	5÷14	8÷24	11÷29
Maximum head (m)	151,5	159,1	158,6	157,7	102,1	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 η (%) of pump	49	58	69	71	72	71
Standard temperature (°C)	-30 +90					

1-22hm_2p50-en_a_tc

CONNECTIONS

CONNECTION TYPE	HM..P - HM..S - HM..N SERIES					
	1	3	5	10	15	22
Rp thread (suction)	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Rp thread (delivery)	Rp 1	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/2	Rp 1 1/2
NPT thread (suction)	1" NPT	1" NPT	1" 1/4 NPT	1" 1/2 NPT	2" NPT	2" NPT
NPT thread (delivery)	1" NPT	1" NPT	1" NPT	1" 1/4 NPT	1" 1/2 NPT	1" 1/2 NPT
Victaulic®	•	•	•	•	•	•

• = Available.

1-22hm_2p50-en_a_tc

ELECTRIC PUMP NOISE

POWER	NOISE
kW	LpA 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 motor running idle with a tolerance of 3 dB (A).

STORAGE AND TRANSPORT TEMPERATURE

-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.
Food & beverage industries.



SPECIFICATIONS

PUMP

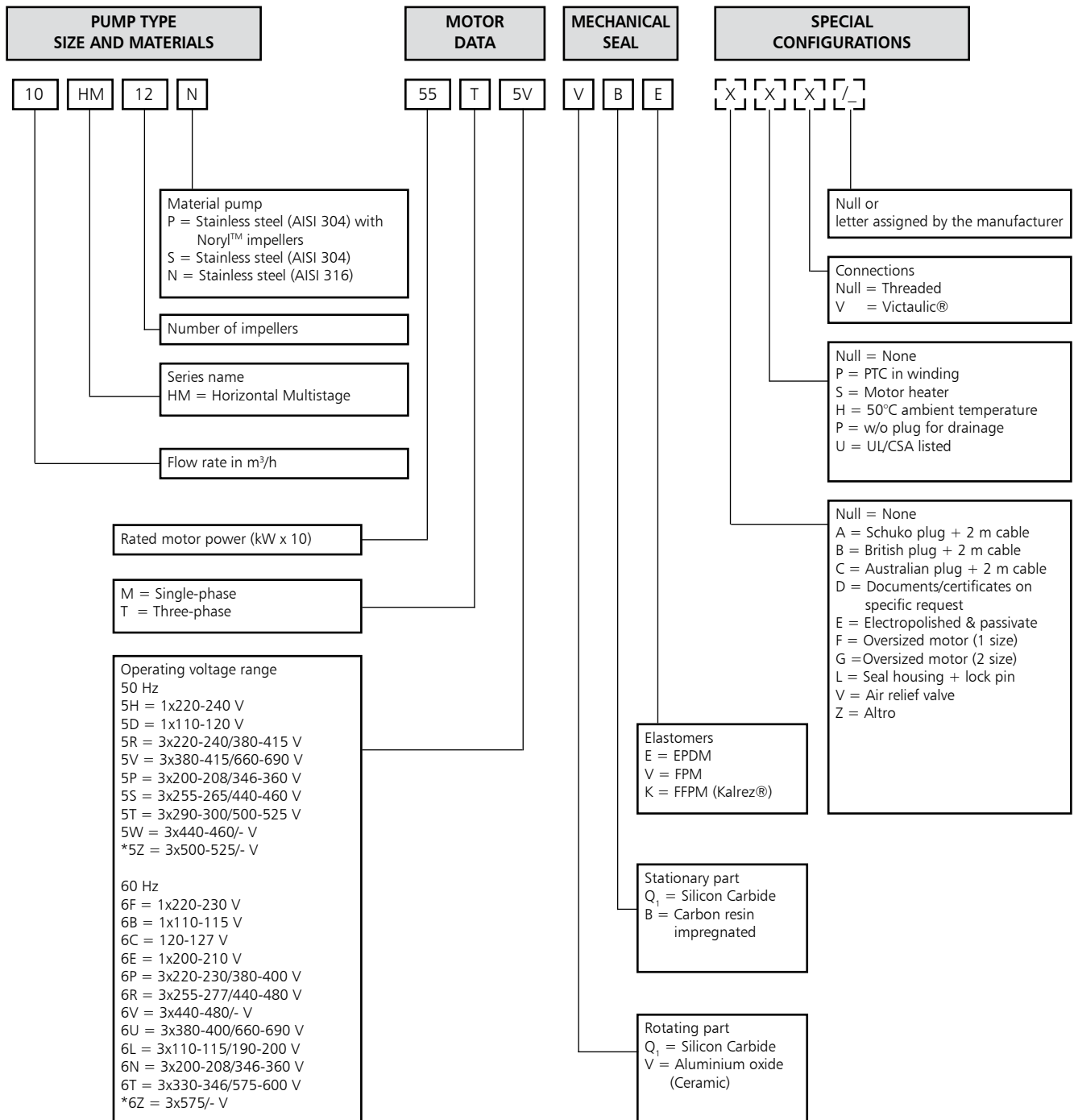
- Flow rate: up to 29m³/h.
- Head: up to 160 m.
- Ambient temperature:
 - Three-phase motor versions from -30°C to +50°C.
 - Single-phase motor versions from -30°C to +45°C (from -30°C to +40°C for 0,95 kW motor).
- Temperature of the pumped liquid:
 - +90°C for versions with three-phase motor uses as EN60335-2-41.
 - +120°C for versions with three-phase motor and stainless steel impeller (HM..S, HM..N) uses other than EN60335-2-41.
 - +60°C for versions with single-phase motor.
- Maximum operating pressure:
 - 10 bar (PN 10) for pumps with Noryl™ impeller.
 - 16 bar (PN 16) for pumps with stainless steel impeller and Q1BEGG or Q1Q1EGG mechanical seal (maximum liquid temperature +90°C).
- Connections: Rp threaded for both suction and discharge manifold.
- Hydraulic performances compliant with ISO 9906:2012 - Grade 3B.



MOTOR

- Electric short-circuit squirrel-cage motor (TEFC), enclosed construction, air-cooled, 2-pole:
 - Three-phase, efficiency class IE3 (compliant with Regulation (EC) n. 640/2009 and IEC 60034-30).
 - Single-phase version up to 2,2 kW (with built-in automatic reset overload protection).
- Protection class IP55.
- Insulation class 155 (F).
- Performances according to EN 60034-1.
- Standard voltage:
 - Single-phase: 220-240V, 50 Hz.
 - Three-phase: 220-240/380-415V, 50 Hz up to 3 kW.
380/415/660-690V, 50 Hz from 4 kW included.

e-HM™ SERIES IDENTIFICATION CODE



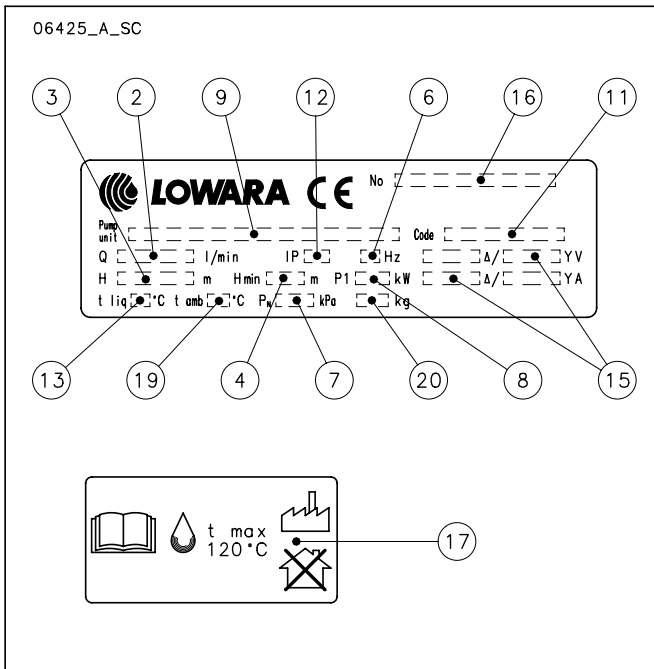
EXAMPLE: 10HM12N55T5VQBE

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
RATING PLATE

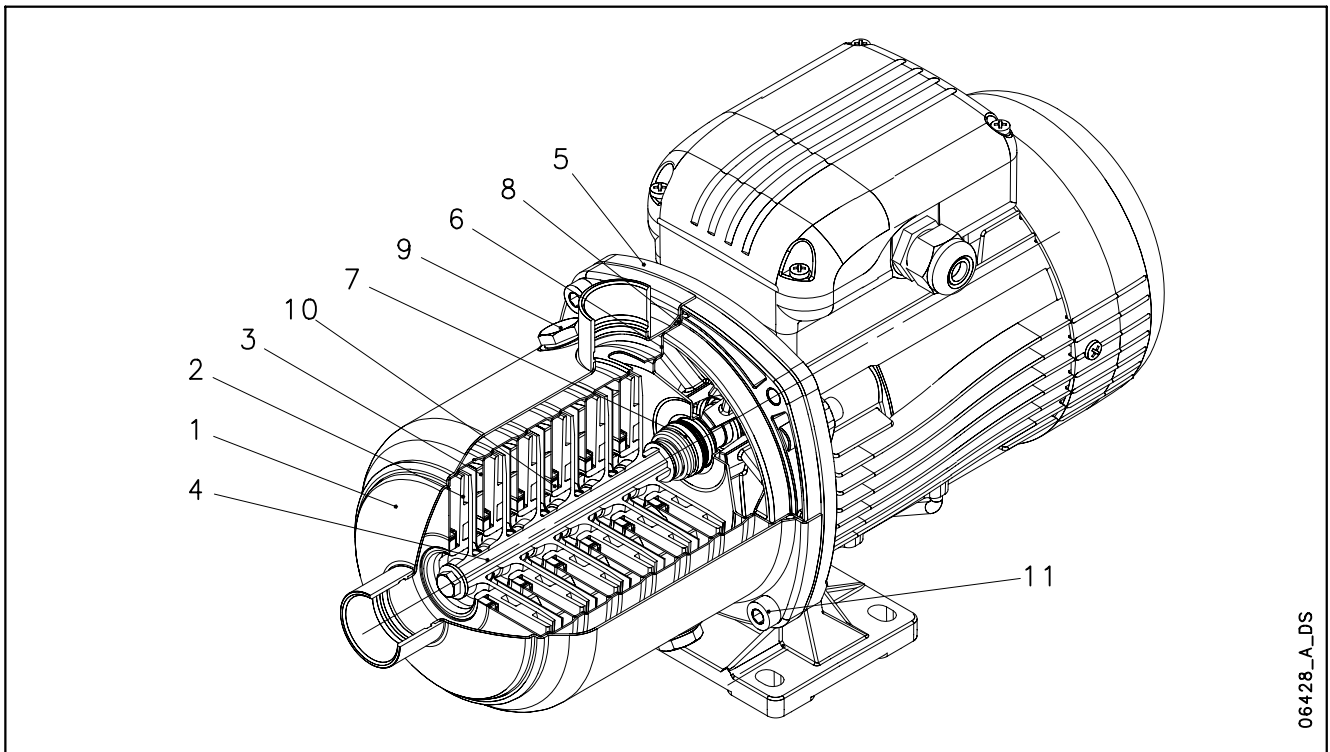


LEGEND

- 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 class
- 13 - Maximum operating liquid temperature (uses as EN 60335-2-41)
- 14 - Motor nominal power
- 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



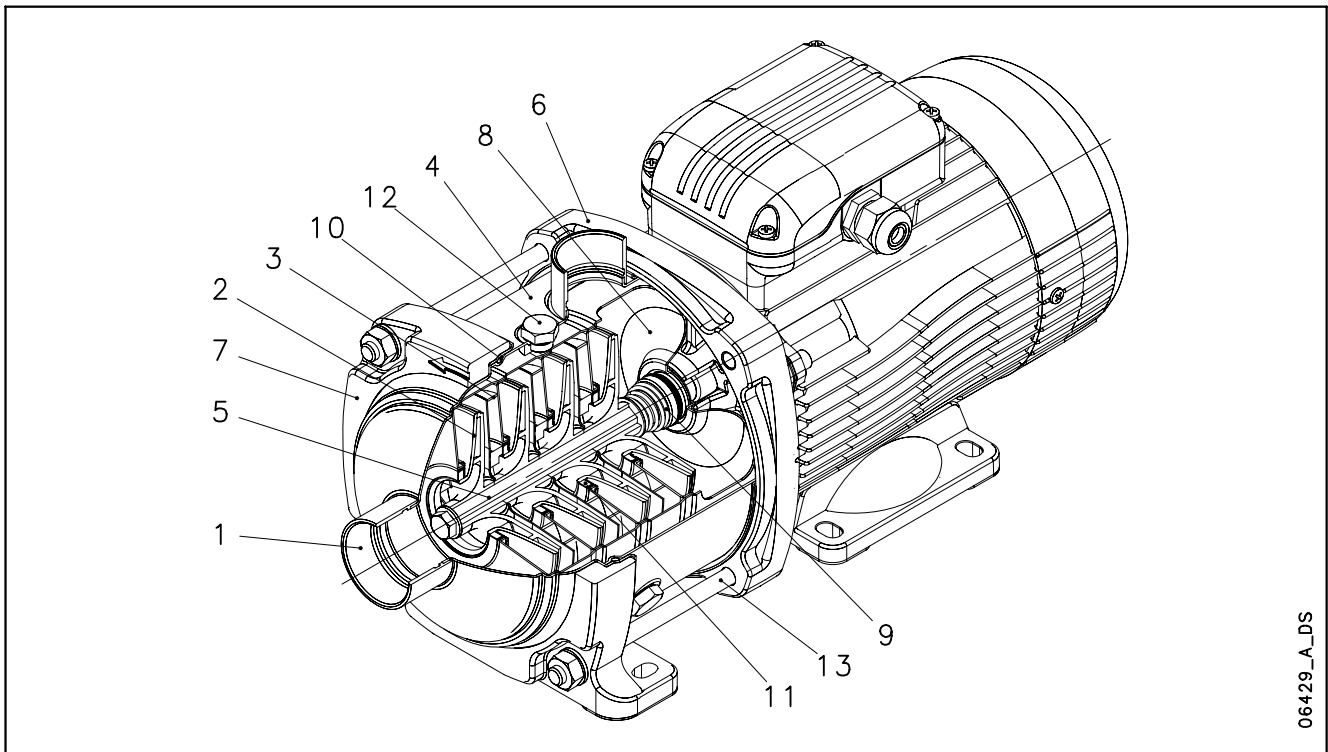
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TABLE OF MATERIALS

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

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1, 3, 5 HM..S - HM..N SERIES

ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS

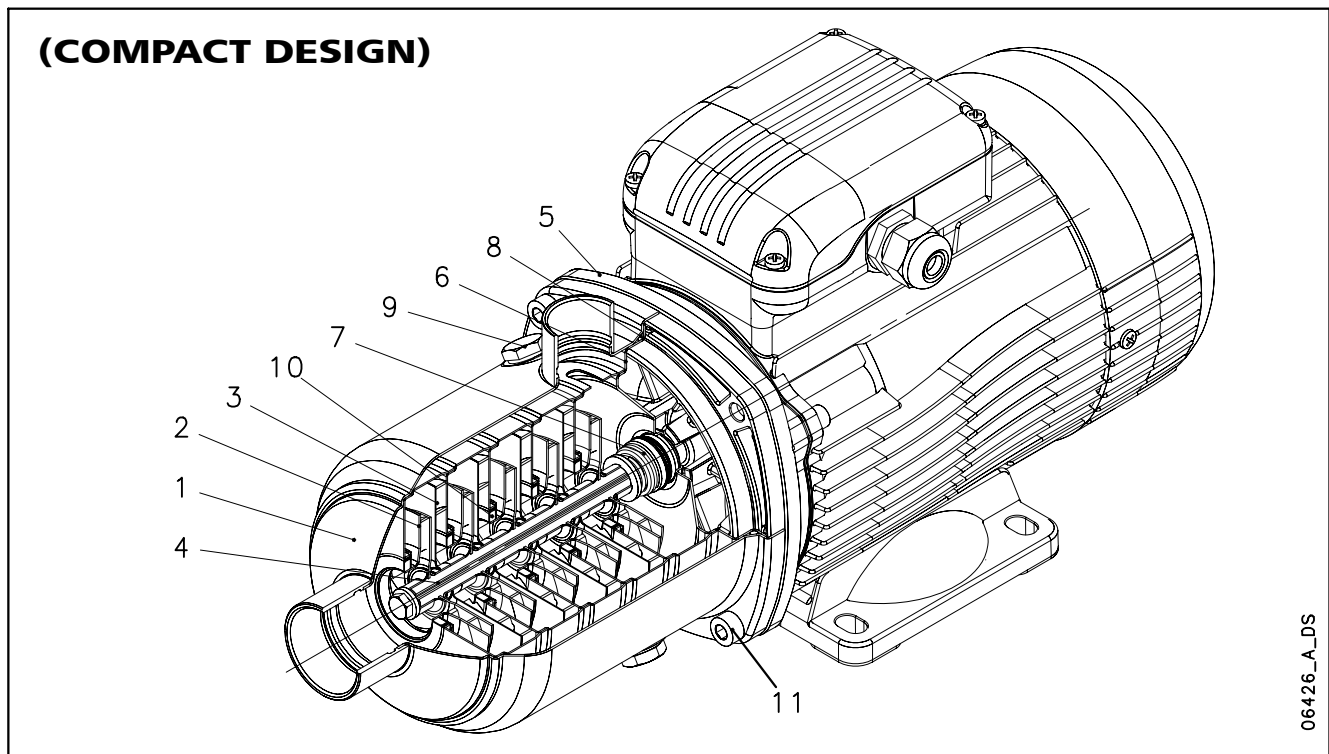


TABLE OF MATERIALS HM..S SERIES

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

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1, 3, 5, 10, 15, 22 HM..S - HM..N SERIES

ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS

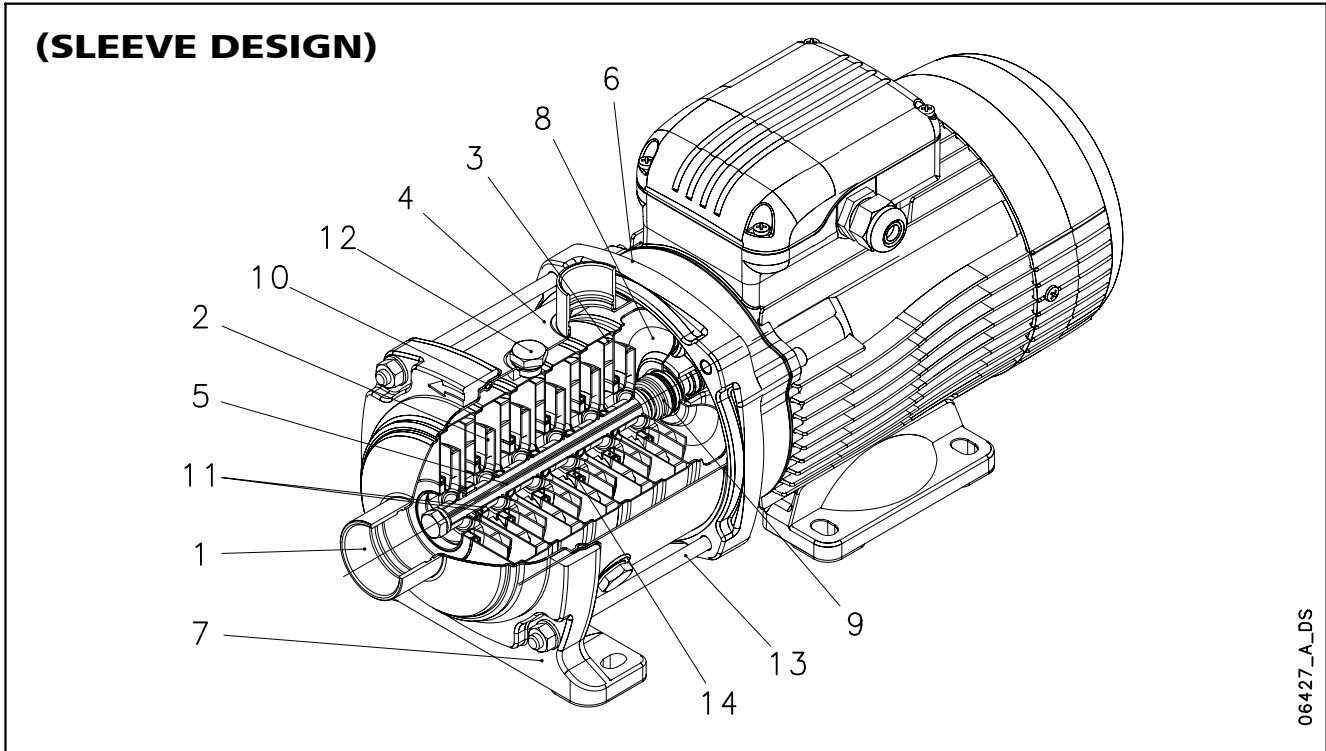


TABLE OF MATERIALS HM..S SERIES

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-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 (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)		

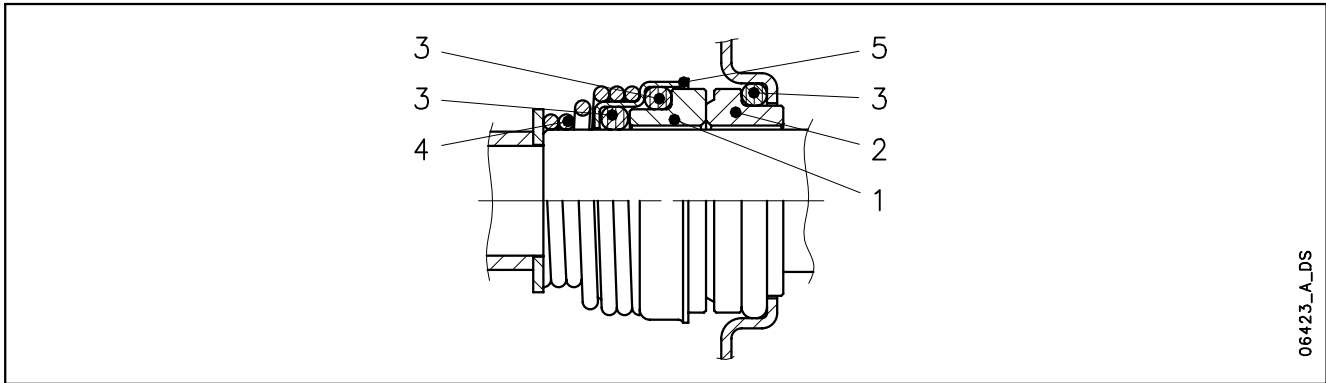
TABLE OF MATERIALS HM..N SERIES

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 and upper spacer	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-ALSi11Cu2 (Fe) (AC46100)	-
7	Ring with foot	Aluminium	EN 1706-AC-ALSi11Cu2 (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)		

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e-HM™ SERIES MECHANICAL SEALS



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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 ₁ : Silicon Carbide	V : FPM	
B : Carbon, resin-impregnated	K : FFPM (Kalrez®)	

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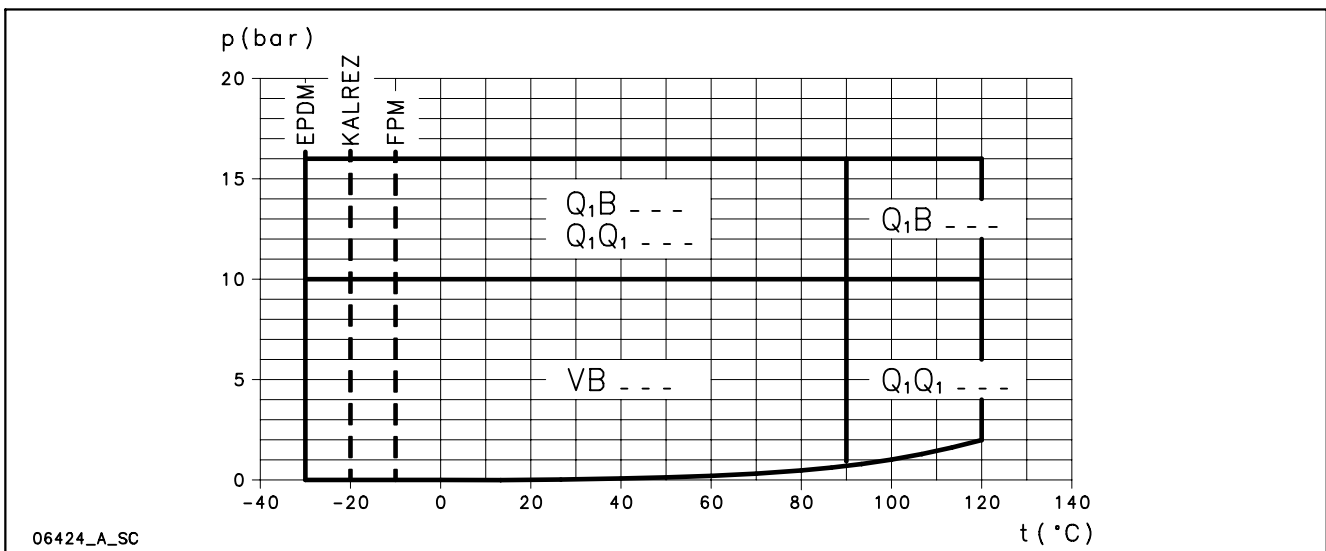
TYPE OF SEAL

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

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

1-22hm_tipi-ten-mec-en_a_tc

PRESSURE/TEMPERATURE APPLICATION LIMITS FOR COMPLETE PUMP (APPLICABLE WITH ANY OF THE SEALS LISTED ABOVE)



06424_A_SC

COMPATIBILITY CHART FOR MATERIALS IN CONTACT WITH MOST COMMONLY USED LIQUIDS

LIQUID	CONCENTRATION (%)	TEMPERATURE MIN/MAX (°C)	SPECIF. WEIGHT (Kg/dm ³)	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).
- IP55 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. For higher powers the protection must be provided by the user.
- **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 _N kW	MOTOR TYPE	IEC SIZE	Construction Design	INPUT CURRENT I _n (A) 220-240 V	CAPACITOR		DATA FOR 230 V 50 Hz VOLTAGE						
					µF	V	min ⁻¹	I _s / I _n	η %	cosφ	T _n Nm	T _s /T _n	T _m /T _n
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 _N kW	Efficiency η _N %																		IE	Year of manufacture			
	Δ 220 V Y 380 V			Δ 230 V Y 400 V			Δ 240 V Y 415 V			Δ 380 V Y 660 V			Δ 400 V Y 690 V			Δ 415 V							
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	82,5	82,0	78,9	82,5	82,0
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	84,0	84,0	81,4	84,0	84,0
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	85,6	86,0	84,0	85,6	86,0
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	86,4	86,7	85,0	86,4	86,7
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	87,2	87,8	86,4	87,2	87,8
4	88,7	89,4	88,1	88,7	89,4	88,1	88,7	89,4	88,1	88,7	89,4	88,1	88,7	89,4	88,1	88,7	89,4	88,1	88,7	89,4	88,1	88,7	89,4
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	88,7	89,3	89,4	88,1	89,6	89,6	88,0

P _N kW	Manufacturer		IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Lowara srl Unipersonale Reg. No. 03471820260 Montecchio Maggiore Vicenza - Italia						cosφ	I _s / I _N	T _N Nm	T _s /T _N	T _m /T _N
	Model										
0,30	SM63HM../303		63	SPECIAL	2	50	0,72	4,05	1,05	3,29	2,63
0,40	SM63HM../304		63				0,66	4,32	1,38	4,14	3,13
0,50	SM63HM../305		63				0,71	4,41	1,73	3,70	2,62
0,55	SM71HM../305		71				0,74	5,97	1,85	3,74	3,56
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	9,49	13,1	3,03	4,39
5,5	PLM112HM../355 E3		112				0,85	10,5	18,1	4,74	5,11

P _N kW	Voltage U _N V											n _N min ⁻¹	Operating conditions **		
	Δ			Y			Δ			Y			Altitude Above Sea Level (m)	T. amb min/max °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	1,65	1,70	1,78	0,95	0,98	1,03	-	-	-	-	-	2680 ÷ 2745	≤ 1000	-15 / 40	No
0,40	2,20	2,34	2,51	1,27	1,35	1,45	-	-	-	-	-	2740 ÷ 2790			
0,50	2,53	2,63	2,81	1,46	1,52	1,62	-	-	-	-	-	2715 ÷ 2770			
0,55	2,56	2,56	2,62	1,48	1,48	1,51	-	-	-	-	-	2825 ÷ 2850			
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	13,5	13,3	7,85	7,77	7,70	7,75	7,66	7,60	4,47	4,42	2890 ÷ 2915			
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			

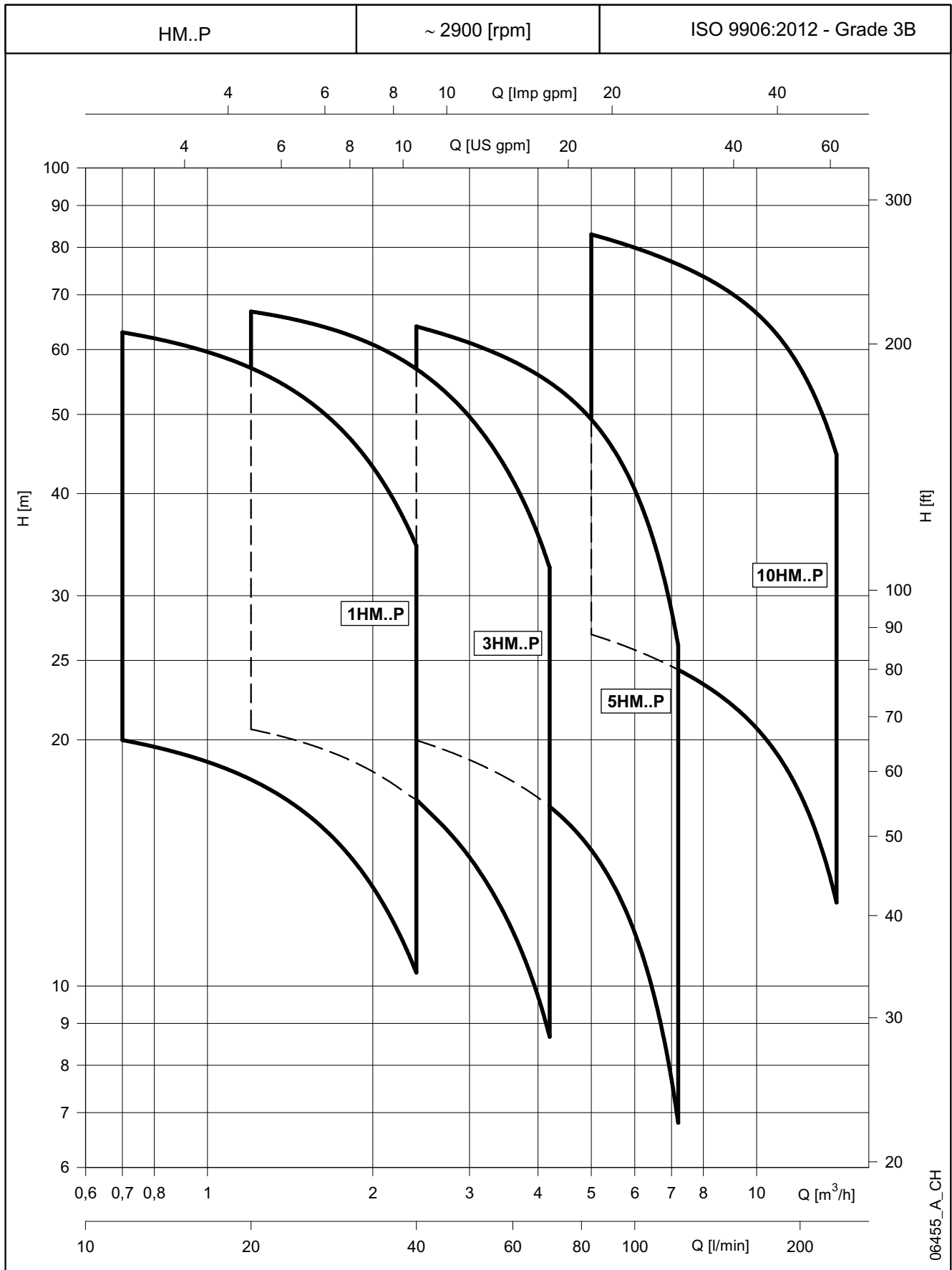
** Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

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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 HM..P	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
				* P ₁ kW	* I		V _{min} 0 m ³ /h 0	11,7	16,0	21,0	26,0	31,0	36,0	40,0
					220-240 V A	380-415 V A								
H = TOTAL HEAD IN METRES OF COLUMN OF WATER														
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	0,39	1,68	0,97	22,2	20,0	19,0	17,6	16,0	14,1	12,1	10,4
1HM03		0,30	SM63HM../303	0,49	1,77	1,02	32,4	28,7	27,1	24,9	22,4	19,6	16,5	14,0
1HM04		0,40	SM63HM../304	0,64	2,51	1,45	43,9	39,1	37,0	34,1	30,8	27,1	23,0	19,6
1HM05		0,50	SM63HM../305	0,76	2,79	1,61	54,6	48,5	45,8	42,2	38,0	33,4	28,3	24,0
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 HM..P	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
				* P ₁ kW	* I		V _{min} 0 m ³ /h 0	20,0	28,0	36,0	44,0	52,0	60,0	70,0
					220-240 V A	380-415 V A								
H = TOTAL HEAD IN METRES OF COLUMN OF WATER														
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	0,46	1,73	1,00	23,0	20,6	19,3	17,7	15,9	13,8	11,7	8,7
3HM03		0,40	SM63HM../304	0,64	2,51	1,45	34,7	31,1	29,2	26,8	24,0	21,0	17,7	13,2
3HM04		0,50	SM63HM../305	0,80	2,83	1,63	45,9	40,9	38,2	34,9	31,2	27,1	22,7	16,7
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 HM..P	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
				* P ₁ kW	* I		V _{min} 0 m ³ /h 0	40,0	53,0	66,0	79,0	92,0	105	120
					220-240 V A	380-415 V A								
H = TOTAL HEAD IN METRES OF COLUMN OF WATER														
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	0,60	2,48	1,43	23,8	20,0	18,6	17,1	15,3	13,2	10,5	6,8
5HM03		0,50	SM63HM../305	0,81	2,85	1,65	35,3	29,0	26,8	24,5	21,8	18,5	14,5	9,0
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

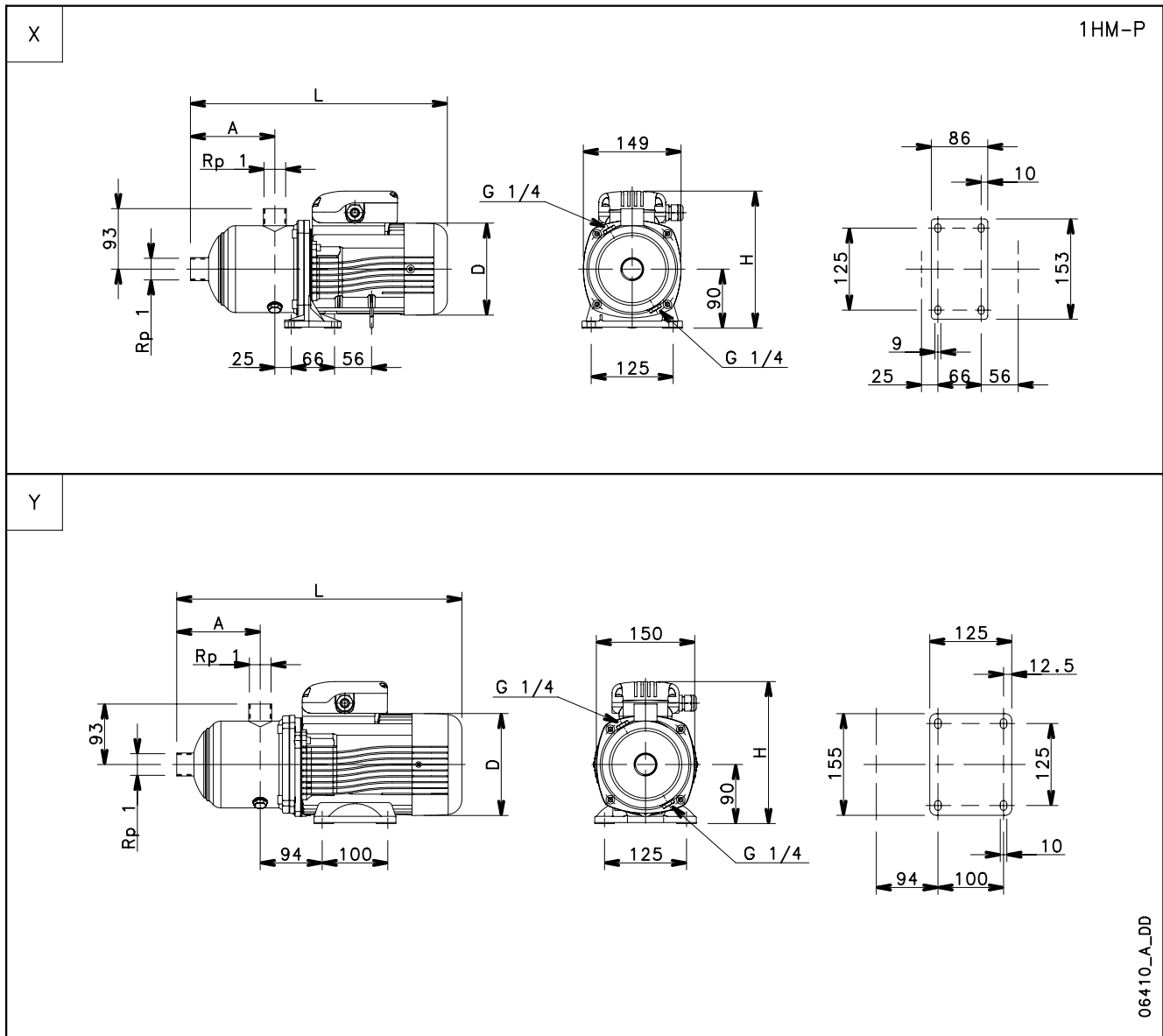
PUMP TYPE HM..P	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
				* P ₁ kW	* I		V _{min} 0 m ³ /h 0	83,3	108	133	158	183	208	233
					220-240 V A	380-415 V A								
H = TOTAL HEAD IN METRES OF COLUMN OF WATER														
10HM02	1 ~	1,1	SM80HM../1115	1,33	6,06	-	30,6	26,9	25,2	23,4	21,4	19,1	16,2	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	10,83	-	60,6	54,4	51,3	48,1	44,5	40,2	34,9	28,5
10HM05		2,2	PLM90HM../1225	2,87	12,84	-	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	10,09	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	11,17	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_a_th

* Maximum value in specified range: P₁ = input power; I = input current.

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



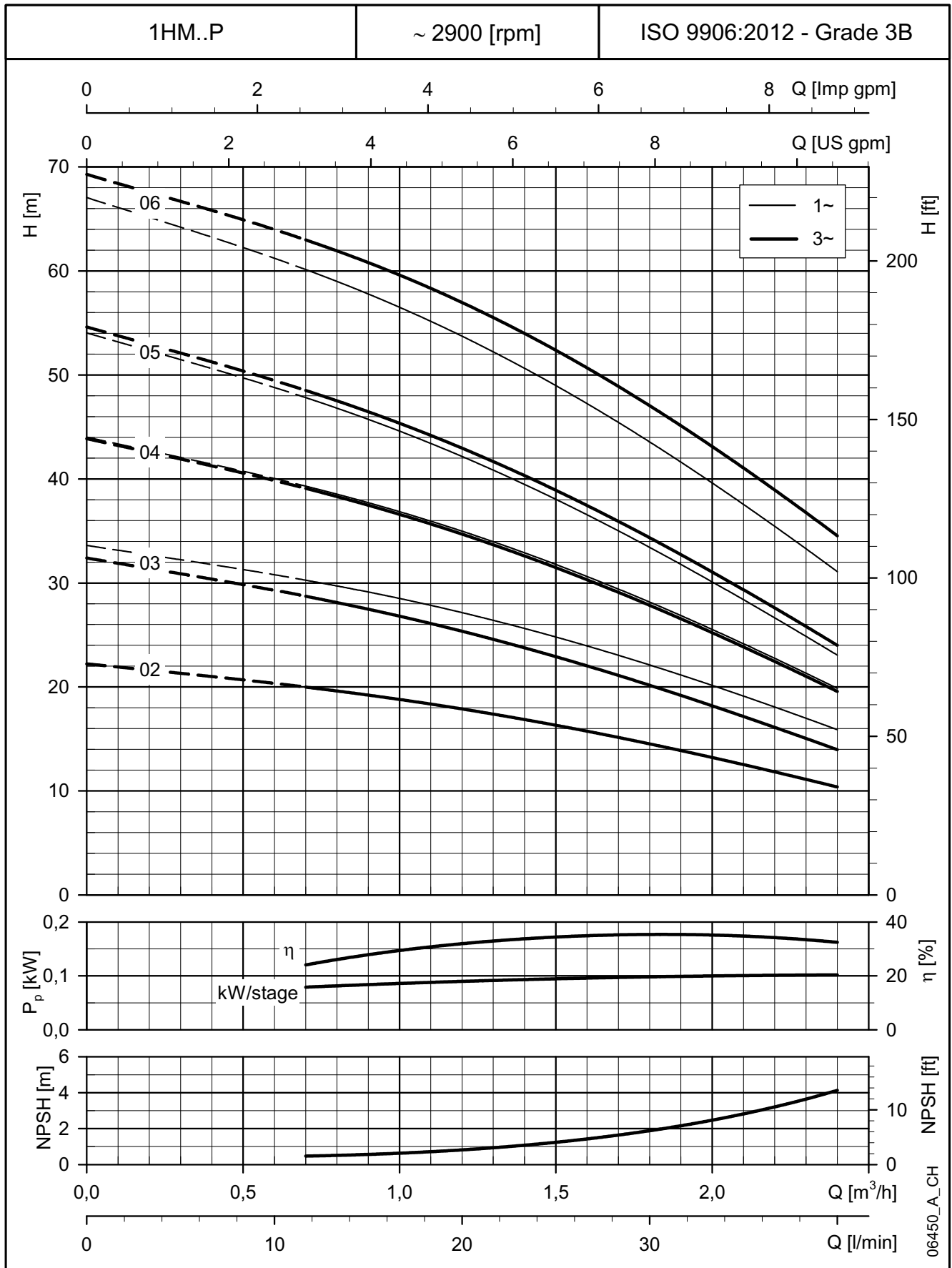
06410_A_DD

PUMP TYPE	VERSION	DIMENSIONS (mm)								
		Ref.	MOTOR		A	D	H	L	PN	WEIGHT kg
			kW	SIZE						
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		0,75	80	147	155	219	455	10	13	

1hm-p-2p50-en_a_td

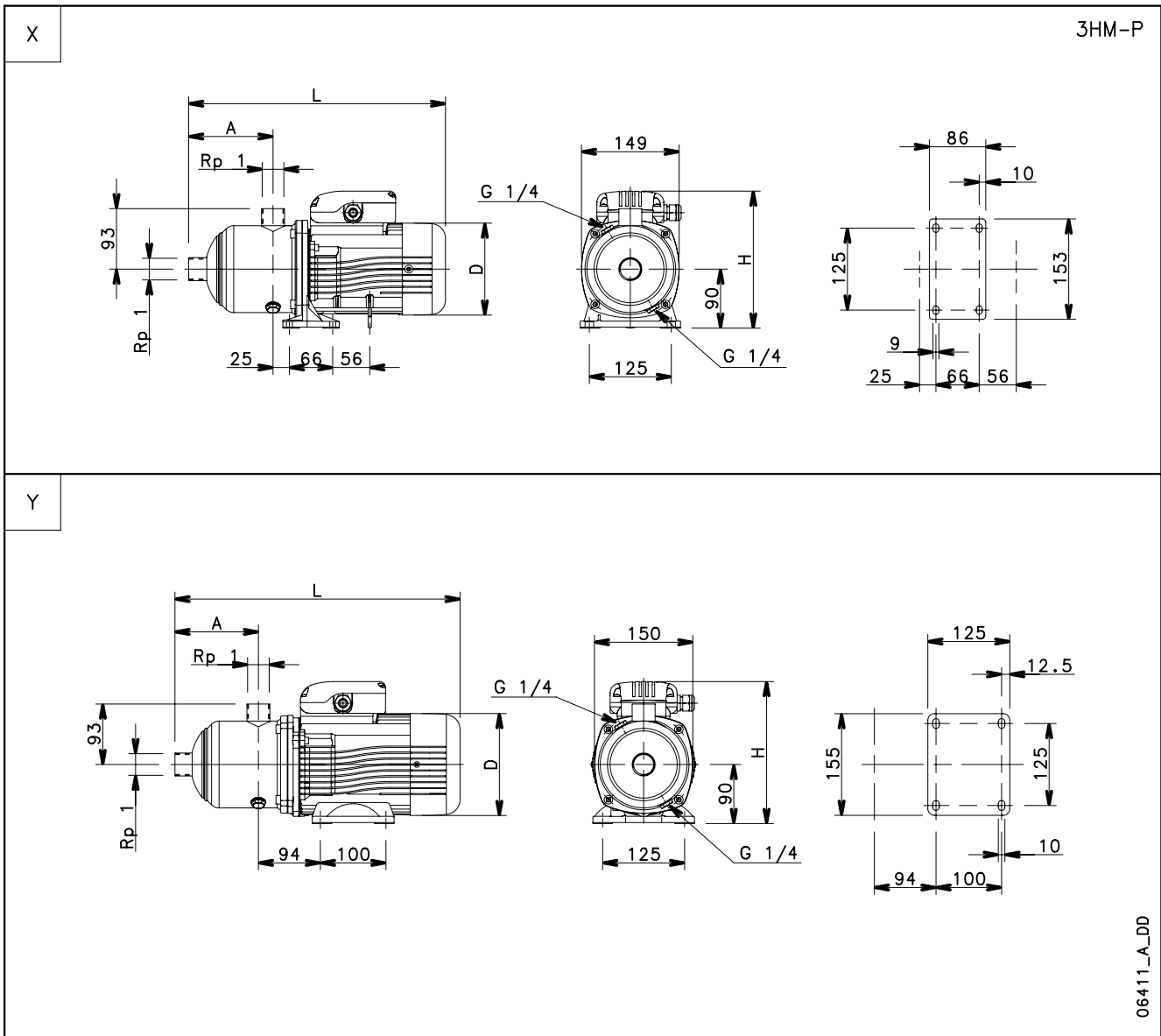
1HM..P SERIES

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



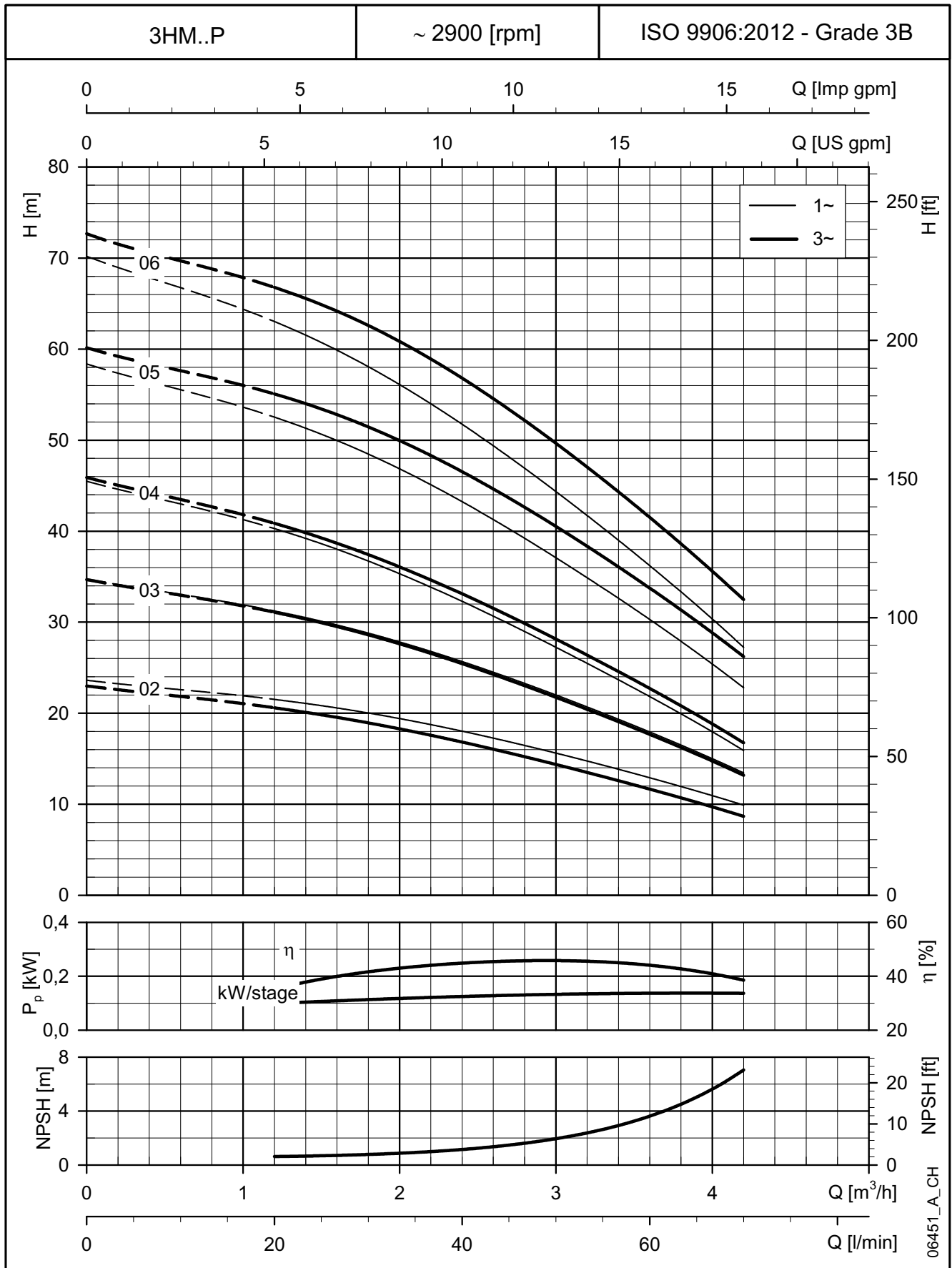
06411_A_DD

PUMP TYPE	VERSION	DIMENSIONS (mm)								
		Ref.	MOTOR		A	D	H	L	PN	WEIGHT kg
			kW	SIZE						
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_a_td

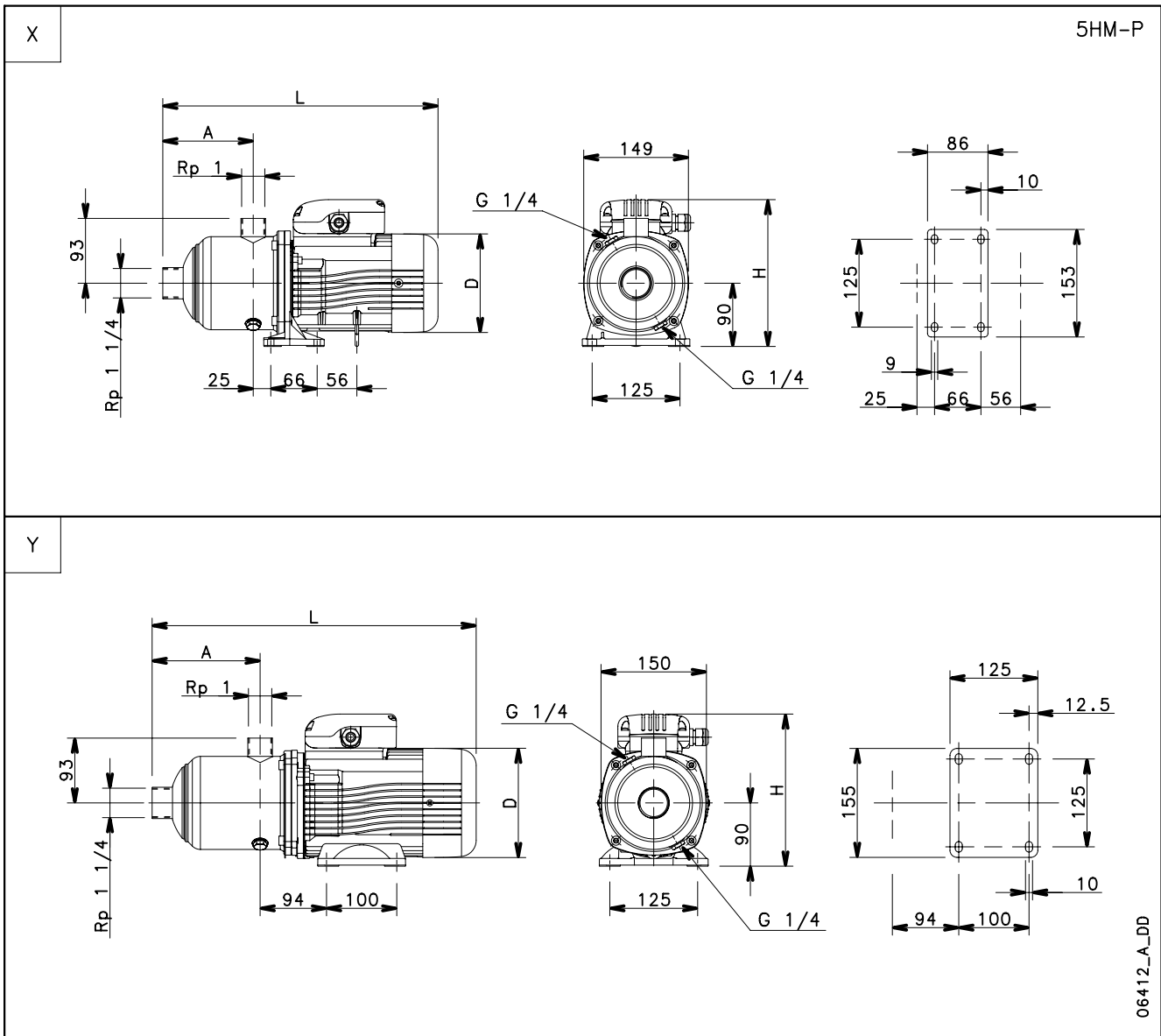
3HM..P SERIES

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

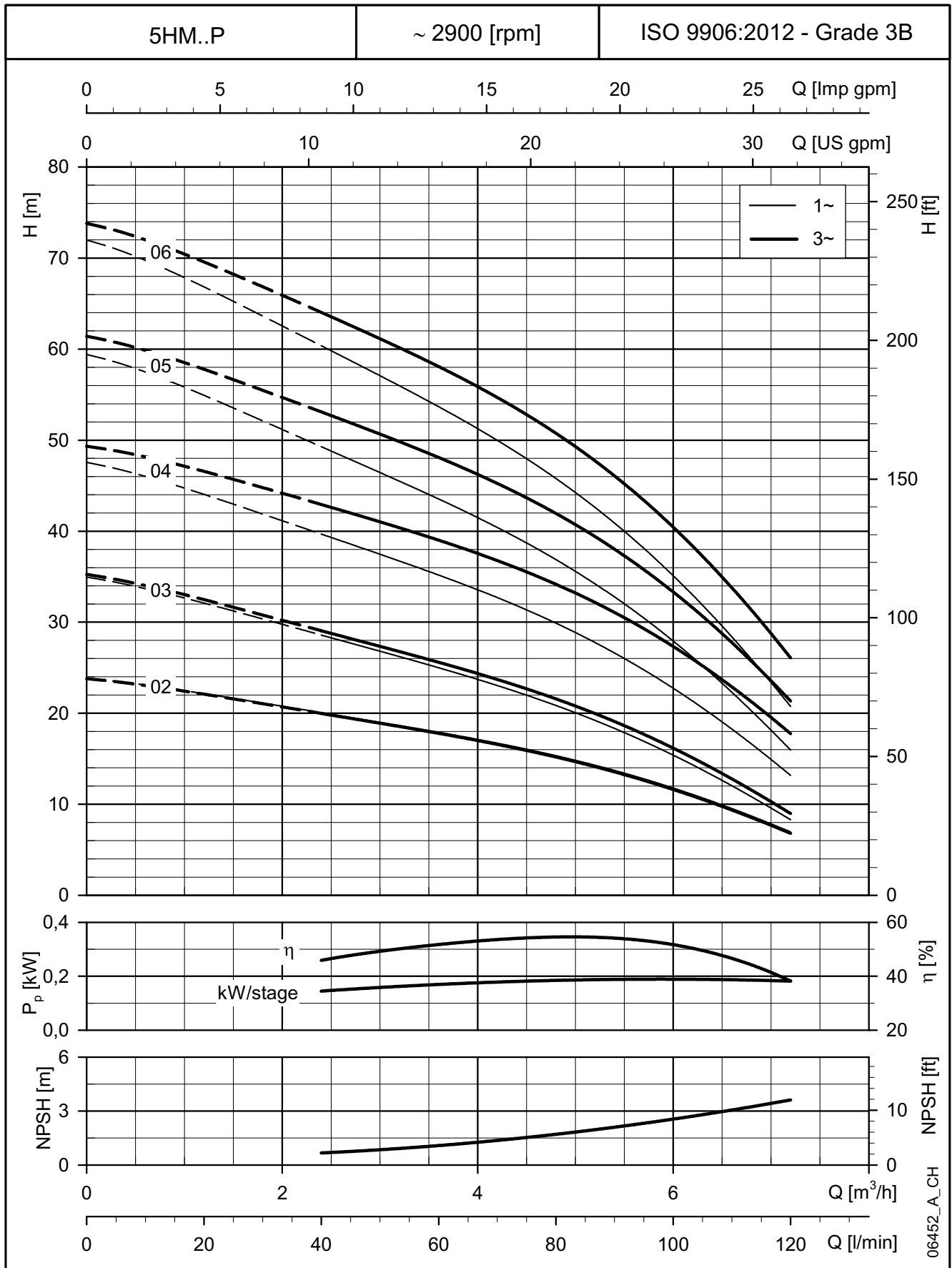


PUMP TYPE	VERSION	Ref.	DIMENSIONS (mm)							WEIGHT kg
			MOTOR		A	D	H	L	PN	
5HM02	SINGLE-PHASE	X	0,50	63	89	120	201	338	10	7
5HM03			0,50	63	89	120	201	338	10	7
5HM04			0,75	71	109	140	211	372	10	10
5HM05			0,95	71	129	140	220	392	10	11
5HM06		Y	1,1	80	149	155	227	457	10	14
5HM02	THREE-PHASE	X	0,40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

5HM..P SERIES

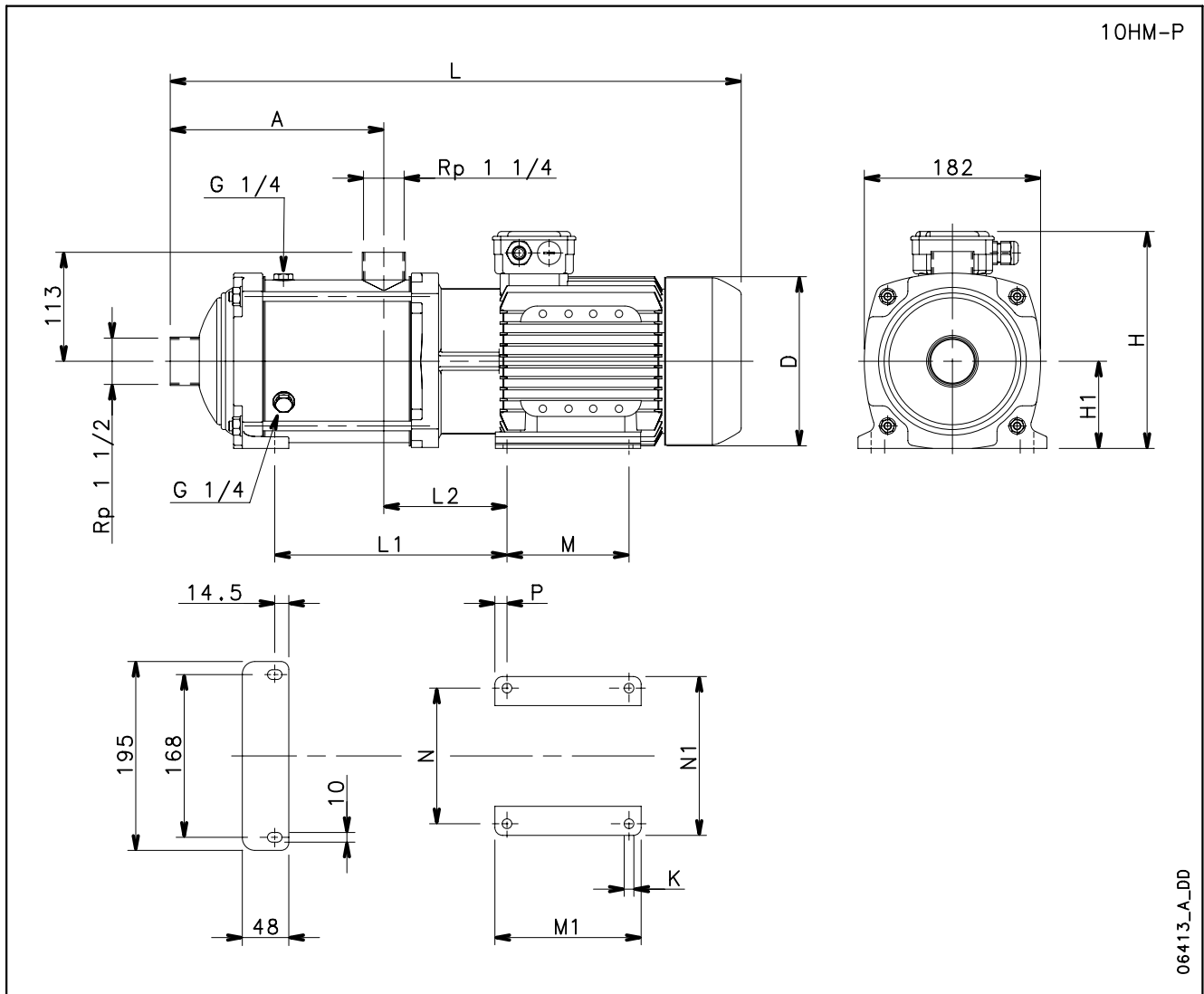
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

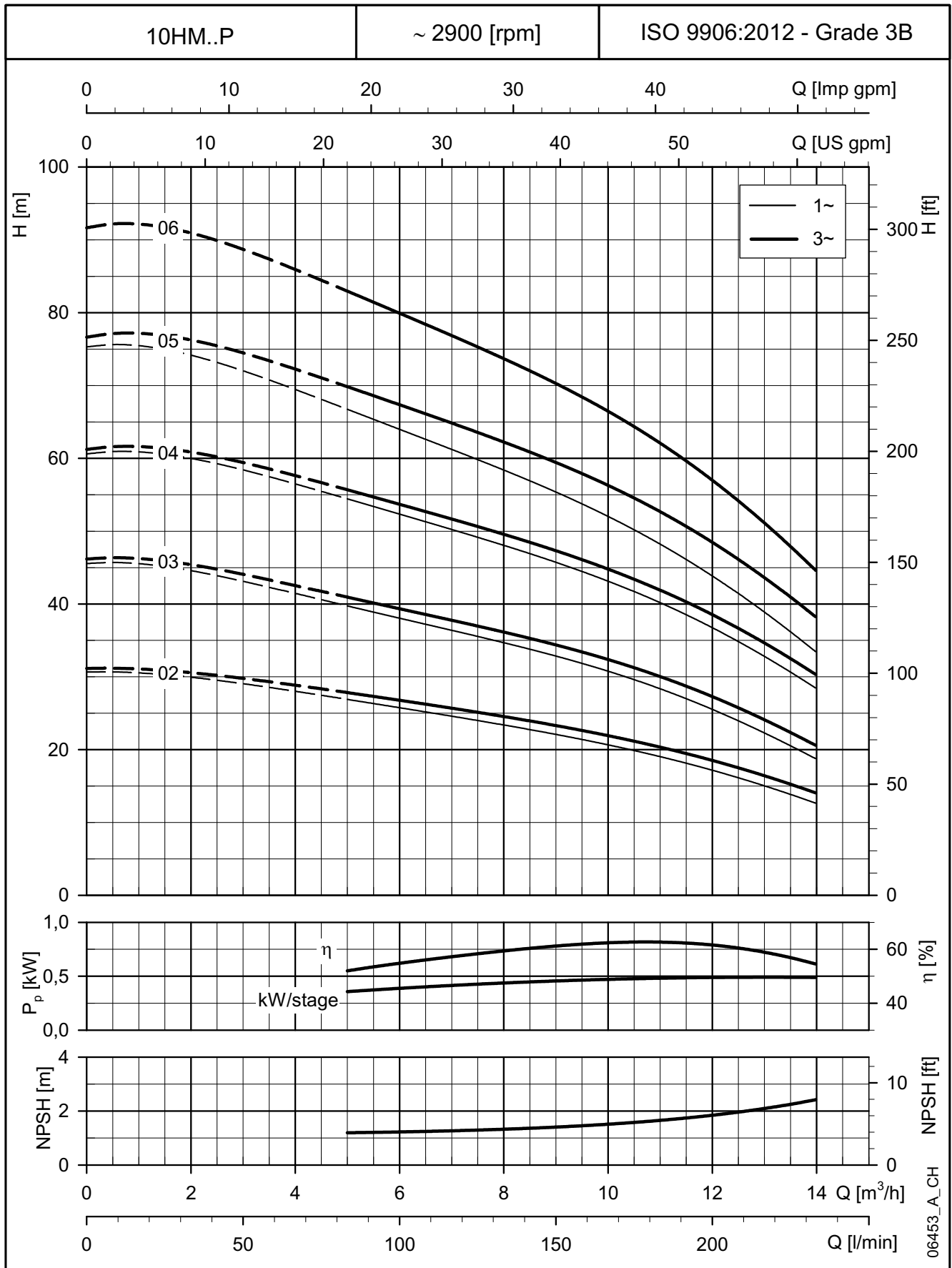


PUMP TYPE	VERSION	DIMENSIONS (mm)															WEIGHT kg	
		MOTOR		A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		PN
		kW	SIZE															
10HM02	SINGLE-PHASE	1,1	80	125	155	227	90	443	122	105	100	125	125	155	12,5	10	10	16
10HM03		1,5	80	125	155	227	90	443	122	105	100	125	125	155	12,5	10	10	17
10HM04		2,2	90	157	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_a_td

10HM..P SERIES

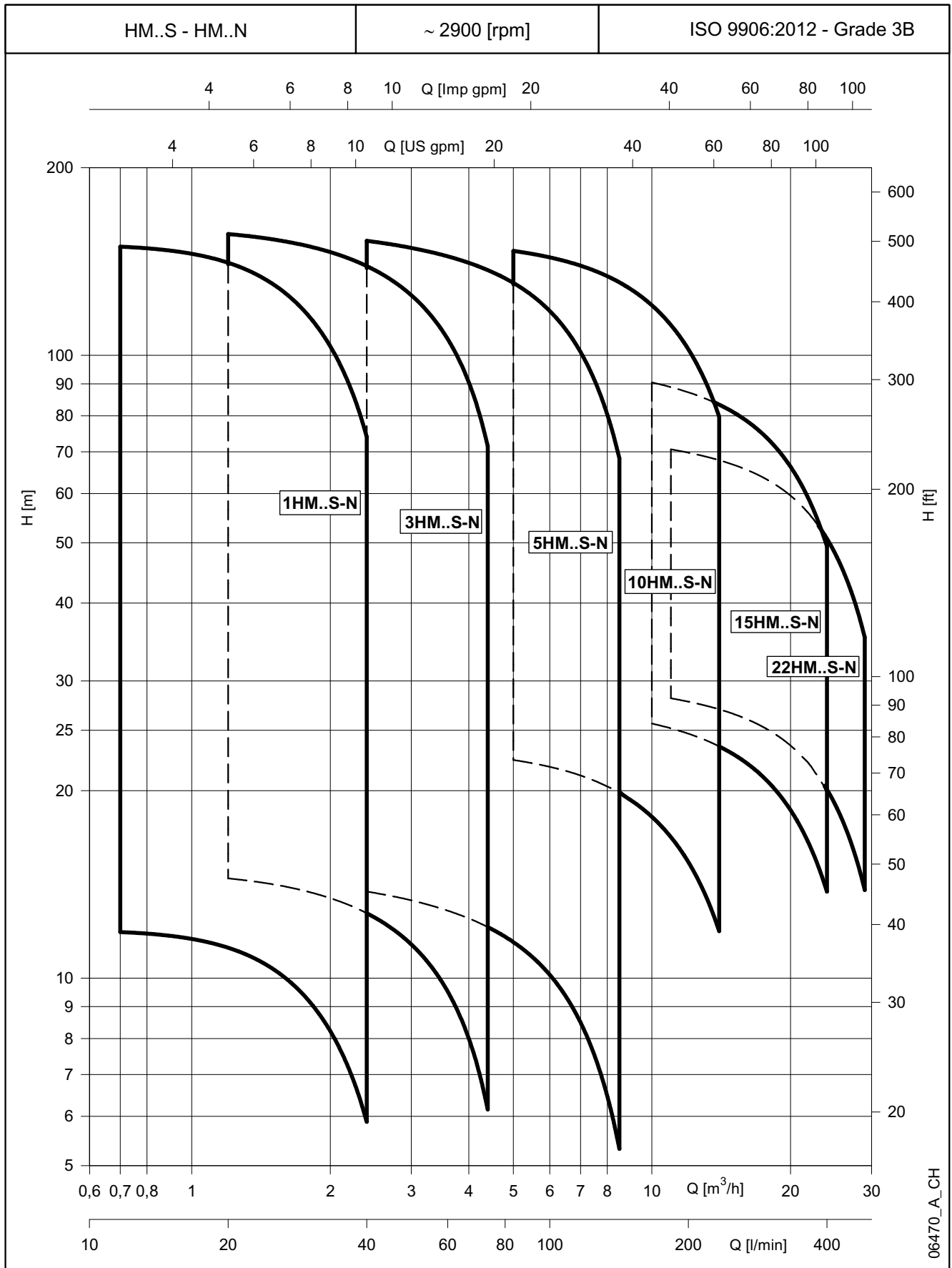
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

1, 3 HM..S - HM..N SERIES

HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
		P _N kW	TYPE	* P ₁ kW	* I		l/min 0 m ³ /h 0	11,7 0,7	16,0 1,0	21,0 1,3	26,0 1,6	31,0 1,9	36,0 2,2	40,0 2,4
					220-240 V A	380-415 V A								
1HM06	1 ~	0,50	SM63HM../1055	0,52	2,53	-	35,5	34,8	34,0	32,1	29,2	25,4	20,7	16,2
1HM07		0,55	SM71HM../1055	0,61	3,41	-	42,0	41,5	40,6	38,5	35,3	30,9	25,5	20,3
1HM08		0,55	SM71HM../1055	0,65	3,50	-	47,8	47,1	46,0	43,6	39,9	34,9	28,6	22,6
1HM09		0,55	SM71HM../1055	0,69	3,59	-	53,6	52,7	51,4	48,7	44,4	38,7	31,6	24,9
1HM11		0,55	SM71HM../1055	0,77	3,82	-	65,1	63,6	61,9	58,4	53,0	46,0	37,2	29,0
1HM12		0,55	SM71HM../1055	0,82	3,96	-	70,8	69,0	67,1	63,1	57,2	49,4	39,8	30,8
1HM14		0,75	SM71HM../1055	0,93	4,31	-	82,3	80,0	77,7	73,1	66,2	57,0	45,8	35,3
1HM16		0,75	SM71HM../1055	1,02	4,60	-	93,4	90,4	87,6	82,1	74,0	63,4	50,5	38,5
1HM18		0,75	SM71HM../1055	1,10	4,90	-	104,3	100,5	97,2	90,7	81,3	69,2	54,6	41,1
1HM20		0,95	SM71HM../1095	1,24	5,45	-	116,7	112,6	108,9	101,8	91,5	78,2	62,1	47,0
1HM22		0,95	SM71HM../1095	1,32	5,76	-	127,6	122,5	118,2	110,2	98,7	83,9	66,0	49,5
1HM25		1,1	SM80HM../1115	1,49	6,66	-	147,0	142,5	138,1	129,5	116,9	100,4	80,2	61,5
1HM02		3 ~	0,30	SM63HM../303	0,26	1,66	0,96	12,0	11,9	11,6	11,0	10,1	8,9	7,4
1HM03	0,30		SM63HM../303	0,31	1,67	0,96	17,8	17,5	17,1	16,2	14,8	12,9	10,6	8,4
1HM04	0,30		SM63HM../303	0,35	1,68	0,97	23,5	23,0	22,4	21,2	19,2	16,7	13,5	10,5
1HM05	0,30		SM63HM../303	0,40	1,70	0,98	29,1	28,3	27,5	25,9	23,4	20,1	16,1	12,4
1HM06	0,30		SM63HM../303	0,44	1,73	1,00	34,6	33,5	32,4	30,3	27,3	23,3	18,5	14,0
1HM07	0,55		SM71HM../305	0,50	2,24	1,29	42,2	41,7	40,8	38,8	35,6	31,2	25,8	20,6
1HM08	0,55		SM71HM../305	0,56	2,30	1,33	48,1	47,4	46,3	44,0	40,3	35,3	29,0	23,1
1HM09	0,55		SM71HM../305	0,61	2,37	1,37	53,9	53,0	51,8	49,1	44,9	39,2	32,1	25,5
1HM11	0,55		SM71HM../305	0,71	2,53	1,46	65,4	64,1	62,5	59,0	53,8	46,8	38,1	29,9
1HM12	0,55		SM71HM../305	0,76	2,60	1,50	71,1	69,5	67,7	63,9	58,1	50,4	40,8	31,8
1HM14	0,75		SM80HM../307 E3	0,83	2,79	1,61	84,6	83,4	81,5	77,4	70,9	62,1	51,2	40,8
1HM16	0,75		SM80HM../307 E3	0,93	2,98	1,72	96,3	94,6	92,4	87,6	80,1	70,0	57,4	45,5
1HM18	1,1		SM80HM../311 E3	1,05	3,66	2,11	109,2	107,8	105,6	100,4	92,1	81,0	67,0	53,7
1HM20	1,1		SM80HM../311 E3	1,15	3,85	2,22	121,0	119,3	116,7	110,8	101,6	89,2	73,6	58,7
1HM22	1,1		SM80HM../311 E3	1,26	4,06	2,34	132,8	130,7	127,7	121,2	111,0	97,2	79,9	63,6
1HM25	1,5	SM80HM../315 E3	1,42	4,87	2,81	151,5	149,5	146,3	139,0	127,6	112,0	92,5	74,0	

PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY								
		P _N kW	TYPE	* P ₁ kW	* I		l/min 0 m ³ /h 0	20,0 1,2	29,0 1,7	38,0 2,3	47,0 2,8	56,0 3,4	65,0 3,9	73,3 4,4	
					220-240 V A	380-415 V A									H = TOTAL HEAD IN METRES OF COLUMN OF WATER
3HM03	1 ~	0,50	SM63HM../1055	0,50	2,48	-	22,3	21,9	20,9	19,6	17,8	15,6	12,7	9,5	
3HM04		0,50	SM63HM../1055	0,57	2,64	-	29,5	28,7	27,3	25,5	23,0	20,0	16,1	11,8	
3HM05		0,50	SM63HM../1055	0,63	2,85	-	36,6	35,2	33,4	31,0	27,9	24,0	19,1	13,7	
3HM06		0,50	SM63HM../1055	0,70	3,09	-	43,5	41,5	39,3	36,2	32,3	27,5	21,7	15,1	
3HM07		0,55	SM71HM../1055	0,85	4,04	-	51,7	50,1	47,6	44,3	40,0	34,5	27,7	20,1	
3HM08		0,75	SM71HM../1055	0,95	4,38	-	59,0	57,0	54,2	50,4	45,4	39,2	31,4	22,7	
3HM09		0,75	SM71HM../1055	1,03	4,64	-	66,0	63,5	60,2	55,8	50,1	42,9	34,2	24,4	
3HM10		0,75	SM71HM../1055	1,11	4,92	-	73,0	69,8	66,1	60,9	54,4	46,4	36,7	25,8	
3HM11		0,95	SM71HM../1095	1,24	5,45	-	80,7	77,5	73,3	67,8	60,8	52,1	41,4	29,4	
3HM12		0,95	SM71HM../1095	1,31	5,72	-	87,8	83,7	79,1	72,9	65,1	55,5	43,8	30,7	
3HM13		1,1	SM80HM../1115	1,42	6,41	-	96,4	93,1	88,6	82,2	74,1	64,0	51,4	37,2	
3HM14		1,1	SM80HM../1115	1,51	6,73	-	103,5	99,6	94,6	87,7	78,8	67,8	54,2	39,0	
3HM16		1,5	SM80HM../1155	1,77	7,81	-	119,2	115,9	110,6	103,2	93,5	81,1	65,8	48,4	
3HM17		1,5	SM80HM../1155	1,85	8,20	-	126,4	122,7	116,9	108,9	98,5	85,3	68,8	50,4	
3HM19		1,5	SM80HM../1155	2,02	9,02	-	140,8	136,0	129,3	120,0	108,0	93,0	74,6	54,0	
3HM21		2,2	PLM90HM../1225	2,22	10,12	-	157,4	153,8	147,1	137,7	125,2	109,2	89,2	66,5	
3HM02		3 ~	0,30	SM63HM../303	0,33	1,66	0,96	14,8	14,5	13,8	12,9	11,8	10,3	8,4	6,2
3HM03			0,30	SM63HM../303	0,42	1,71	0,99	21,9	21,1	20,1	18,6	16,8	14,5	11,6	8,2
3HM04			0,30	SM63HM../303	0,50	1,78	1,03	28,8	27,4	25,8	23,8	21,2	18,1	14,1	9,5
3HM05	0,40		SM63HM../304	0,61	2,50	1,44	36,5	35,1	33,3	30,8	27,7	23,9	19,0	13,3	
3HM06	0,50		SM63HM../305	0,71	2,74	1,58	43,8	42,0	39,8	36,9	33,1	28,5	22,7	15,8	
3HM07	0,75		SM80HM../307 E3	0,75	2,65	1,53	53,1	52,3	50,2	47,2	43,3	38,2	31,7	23,9	
3HM08	0,75		SM80HM../307 E3	0,84	2,83	1,63	60,5	59,4	57,0	53,5	49,0	43,1	35,6	26,7	
3HM09	1,1		SM80HM../311 E3	0,95	3,49	2,02	68,5	67,6	65,0	61,2	56,2	49,7	41,4	31,5	
3HM10	1,1		SM80HM../311 E3	1,04	3,66	2,11	75,9	74,8	71,9	67,7	62,0	54,8	45,5	34,4	
3HM11	1,1		SM80HM../311 E3	1,14	3,83	2,21	83,3	82,0	78,7	74,0	67,8	59,8	49,5	37,3	
3HM12	1,1		SM80HM../311 E3	1,23	4,01	2,31	90,7	89,1	85,5	80,3	73,4	64,6	53,4	40,1	
3HM13	1,1		SM80HM../311 E3	1,33	4,20	2,42	98,1	96,1	92,2	86,5	79,0	69,5	57,3	42,8	
3HM14	1,5		SM80HM../315 E3	1,43	4,89	2,82	106,1	104,5	100,4	94,4	86,5	76,3	63,3	47,8	
3HM16	1,5		SM80HM../315 E3	1,61	5,24	3,02	121,0	118,7	113,9	107,0	97,8	86,1	71,1	53,4	
3HM17	1,5		SM80HM../315 E3	1,71	5,43	3,13	128,3	125,8	120,7	113,2	103,4	90,9	75,0	56,1	
3HM19	2,2	PLM90HM../322 E3	1,94	6,78	3,91	144,2	142,2	136,8	128,7	118,0	104,3	86,7	65,6		
3HM21	2,2	PLM90HM../322 E3	2,12	7,15	4,13	159,1	156,6	150,5	141,5	129,6	114,3	94,7	71,5		

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

1-3hm-s-n-2p50-en_a_th

* Maximum value in specified range: P₁ = input power; I = input current.

5 HM..S - HM..N SERIES

HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY								
		P _N kW	TYPE	* P ₁ kW	* I		l/min m ³ /h	0	40,0	57,0	74,0	91,0	108	125	142
					220-240 V A	380-415 V 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	10,03	-	97,7	94,0	89,5	84,0	77,0	67,6	55,5	40,8	
5HM14		2,2	PLM90HM../1225	2,34	10,56	-	105,0	100,8	95,9	89,9	82,2	72,1	58,9	43,2	
5HM15		2,2	PLM90HM../1225	2,47	11,10	-	112,4	107,6	102,2	95,7	87,3	76,4	62,3	45,3	
5HM17		2,2	PLM90HM../1225	2,72	12,20	-	127,0	120,9	114,5	106,8	97,2	84,6	68,5	49,4	
5HM02		3 ~	0,30	SM63HM../303	0,43	1,72	0,99	14,6	13,8	13,0	12,0	10,9	9,4	7,5	5,3
5HM03			0,40	SM63HM../304	0,60	2,48	1,43	22,1	20,8	19,6	18,2	16,4	14,2	11,4	8,0
5HM04	0,50		SM63HM../305	0,75	2,77	1,60	29,3	27,4	25,8	23,8	21,4	18,4	14,7	10,2	
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	105,9	102,4	97,8	91,9	84,3	74,5	61,9	46,2	
5HM15	2,2		PLM90HM../322 E3	2,42	7,73	4,46	113,3	109,3	104,3	97,9	89,8	79,2	65,7	48,9	
5HM17	3		PLM90HM../330 E3	2,77	9,77	5,64	128,8	124,8	119,2	112,2	103,1	91,2	75,9	56,9	
5HM19	3		PLM90HM../330 E3	3,06	10,34	5,97	143,7	138,8	132,5	124,5	114,2	100,9	83,7	62,5	
5HM21	3		PLM90HM../330 E3	3,36	10,94	6,31	158,6	152,7	145,6	136,6	125,2	110,4	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_a_th

* Maximum value in specified range: P₁ = input power; I = input current.

10, 15, 22 HM..S - HM..N SERIES

HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
		P _N kW	TYPE	* P ₁ kW	* I		l/min 0	83,3	108	133	158	183	208	233
					220-240 V A	380-415 V A	m ³ /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	SM71HM../1075	1,06	5,13	-	24,0	22,3	21,4	20,2	18,6	16,7	14,4	11,8
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	10,10	-	60,0	55,3	53,0	50,0	46,0	41,2	35,5	28,8
10HM06		2,2	PLM90HM../1225	2,55	11,51	-	71,6	65,5	62,6	58,8	53,9	48,1	41,2	33,2
10HM02	3 ~	0,75	SM80HM../307 E3	0,89	2,90	1,68	24,2	22,4	21,5	20,3	18,8	16,9	14,6	11,9
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	10,16	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	10,94	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	11,67	6,74	109,2	102,1	98,3	93,1	86,3	77,9	67,7	55,7
10HM10		4	PLM100HM../340 E3	4,14	12,47	7,20	121,1	112,9	108,6	102,8	95,2	85,7	74,4	61,1
10HM11		4	PLM100HM../340 E3	4,52	13,34	7,70	133,0	123,6	118,9	112,4	103,9	93,5	81,0	66,4
10HM12		5,5	PLM112HM../355 E3	5,04	16,27	9,39	145,8	136,3	131,3	124,3	115,3	104,0	90,4	74,5
10HM13		5,5	PLM112HM../355 E3	5,42	17,01	9,82	157,7	147,1	141,7	134,1	124,3	112,0	97,3	80,0

PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
		P _N kW	TYPE	* P ₁ kW	* I		l/min 0	133	178	223	268	313	358	400
					220-240 V A	380-415 V A	m ³ /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	1,86	8,24	-	28,6	25,8	24,5	23,0	21,1	18,8	15,8	12,6
15HM03		2,2	PLM90HM../1225	2,59	11,68	-	43,0	38,7	36,9	34,7	31,8	28,3	23,9	19,0
15HM02	3 ~	1,5	SM80HM../315 E3	1,73	5,47	3,16	29,1	26,5	25,3	23,9	22,1	19,8	17,0	13,8
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	11,06	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	12,64	7,30	72,9	66,7	63,9	60,5	56,1	50,5	43,3	35,3
15HM06		5,5	PLM112HM../355 E3	5,13	16,45	9,50	87,8	80,4	77,2	73,2	67,9	61,2	52,7	43,1
15HM07	5,5	PLM112HM../355 E3	5,91	17,98	10,38	102,1	93,3	89,4	84,6	78,4	70,5	60,6	49,4	

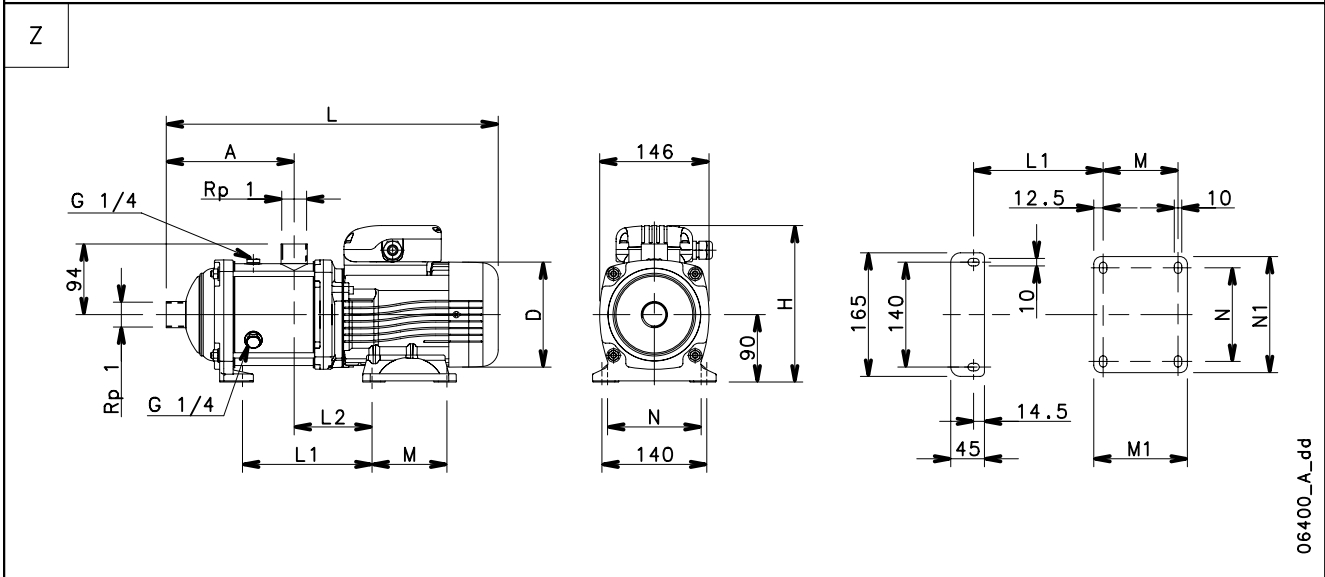
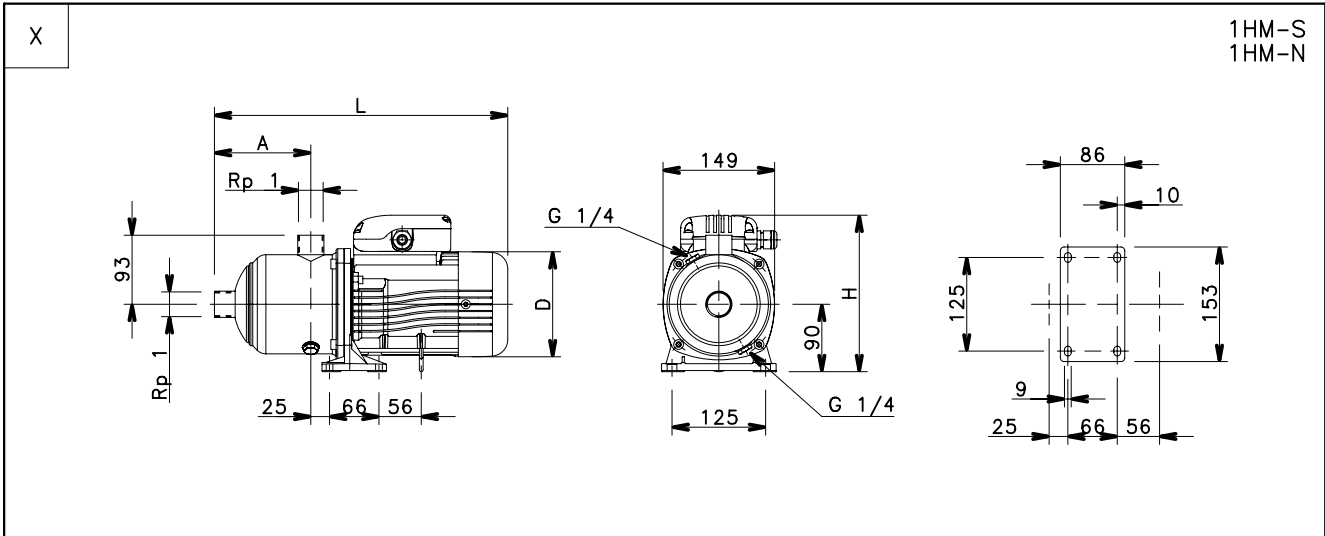
PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
		P _N kW	TYPE	* P ₁ kW	* I		l/min 0	183	233	283	333	383	433	483
					220-240 V A	380-415 V A	m ³ /h 0	11,0	14,0	17,0	20,0	23,0	26,0	29,0
H = TOTAL HEAD IN METRES OF COLUMN OF WATER														
22HM02	1 ~	2,2	PLM90HM../1225	2,35	10,62	-	30,2	27,6	26,4	24,8	22,8	20,2	16,9	12,9
22HM02	3 ~	2,2	PLM90HM../322 E3	2,29	7,46	4,31	30,5	28,1	27,0	25,6	23,6	21,1	17,9	13,9
22HM03		3	PLM90HM../330 E3	3,38	10,99	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	13,09	7,56	61,0	56,3	54,0	51,1	47,3	42,3	35,8	27,9
22HM05		5,5	PLM112HM../355 E3	5,62	17,33	10,01	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_a_th

* Maximum value in specified range: P₁ = input power; I = input current.

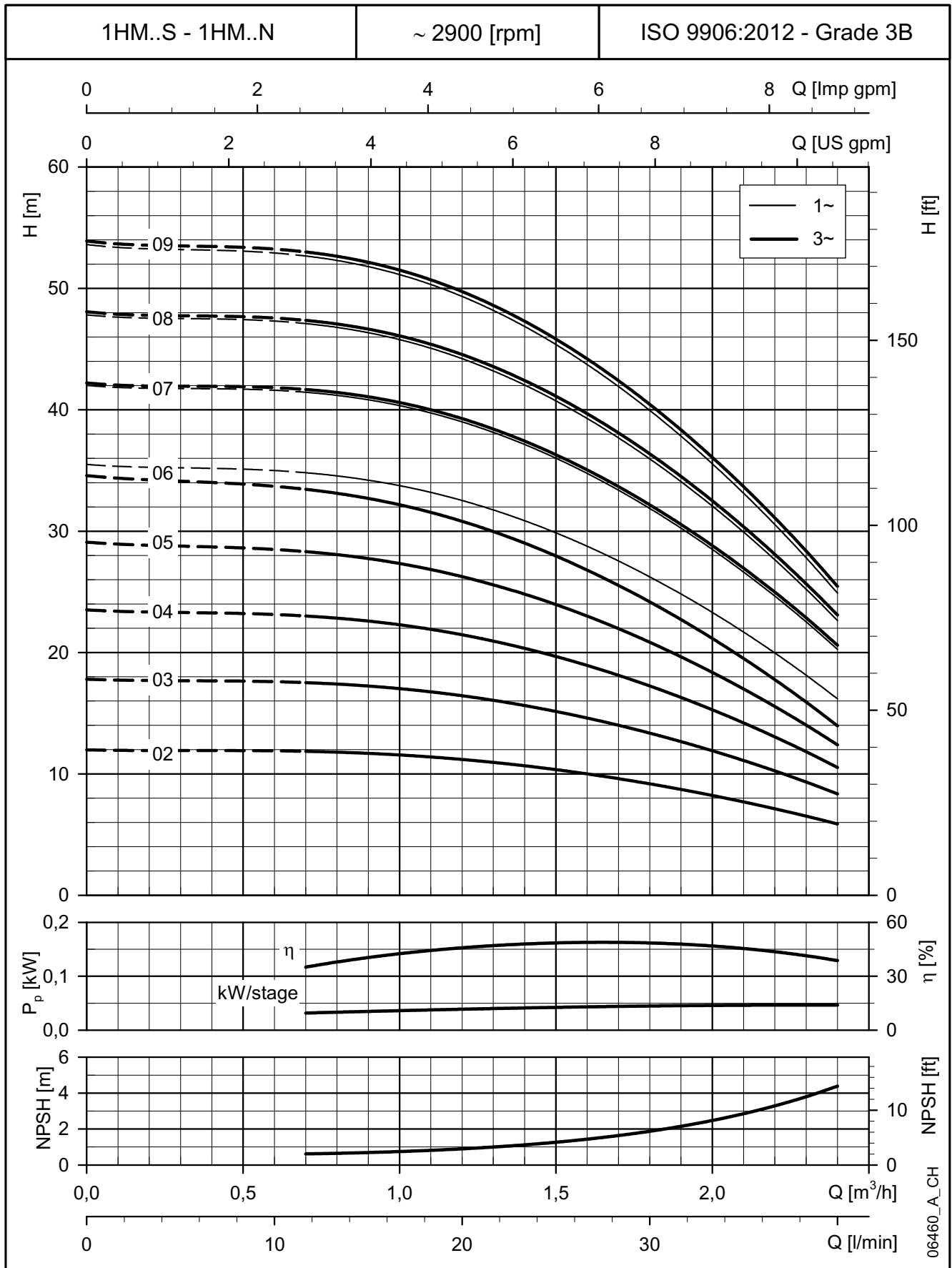
1HM..S - 1HM..N SERIES, (2 TO 9 STAGES)
DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)														WEIGHT kg
		Ref.	MOTOR		A	D	H	L	L1	L2	M	M1	N	N1	PN	
			kW	SIZE												
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

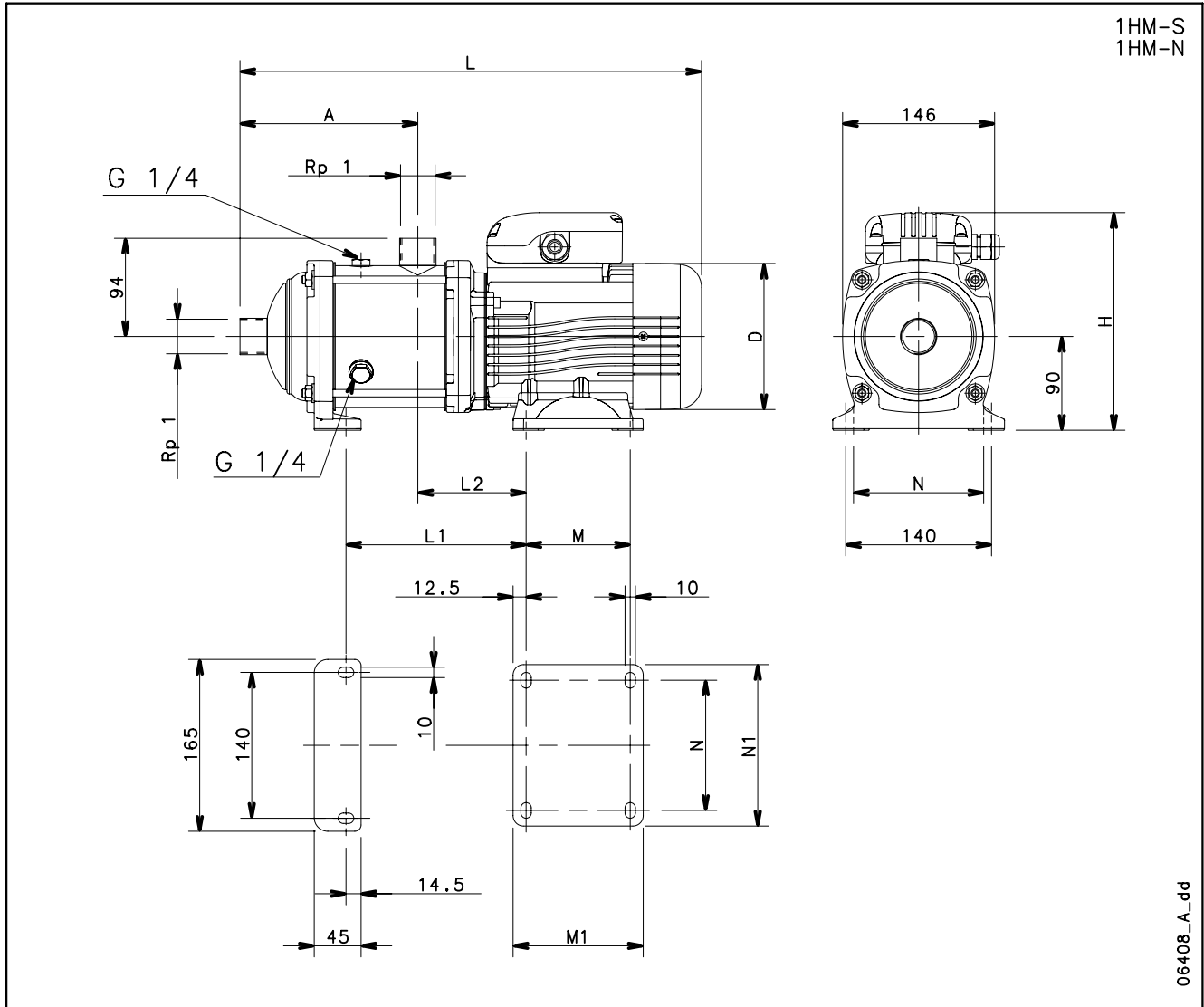
1HM02	THREE-PHASE	X	0,30	63	87	120	201	336	-	-	-	-	-	-	10	6
1HM03			0,30	63	87	120	201	336	-	-	-	-	-	-	10	6
1HM04			0,30	63	107	120	201	356	-	-	-	-	-	-	10	7
1HM05			0,30	63	127	120	201	376	-	-	-	-	-	-	10	7
1HM06			0,30	63	147	120	201	396	-	-	-	-	-	-	10	7
1HM07		Z	0,55	71	151	140	211	424	153	104	100	125	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 $\nu = 1 \text{ mm}^2/\text{sec}$.

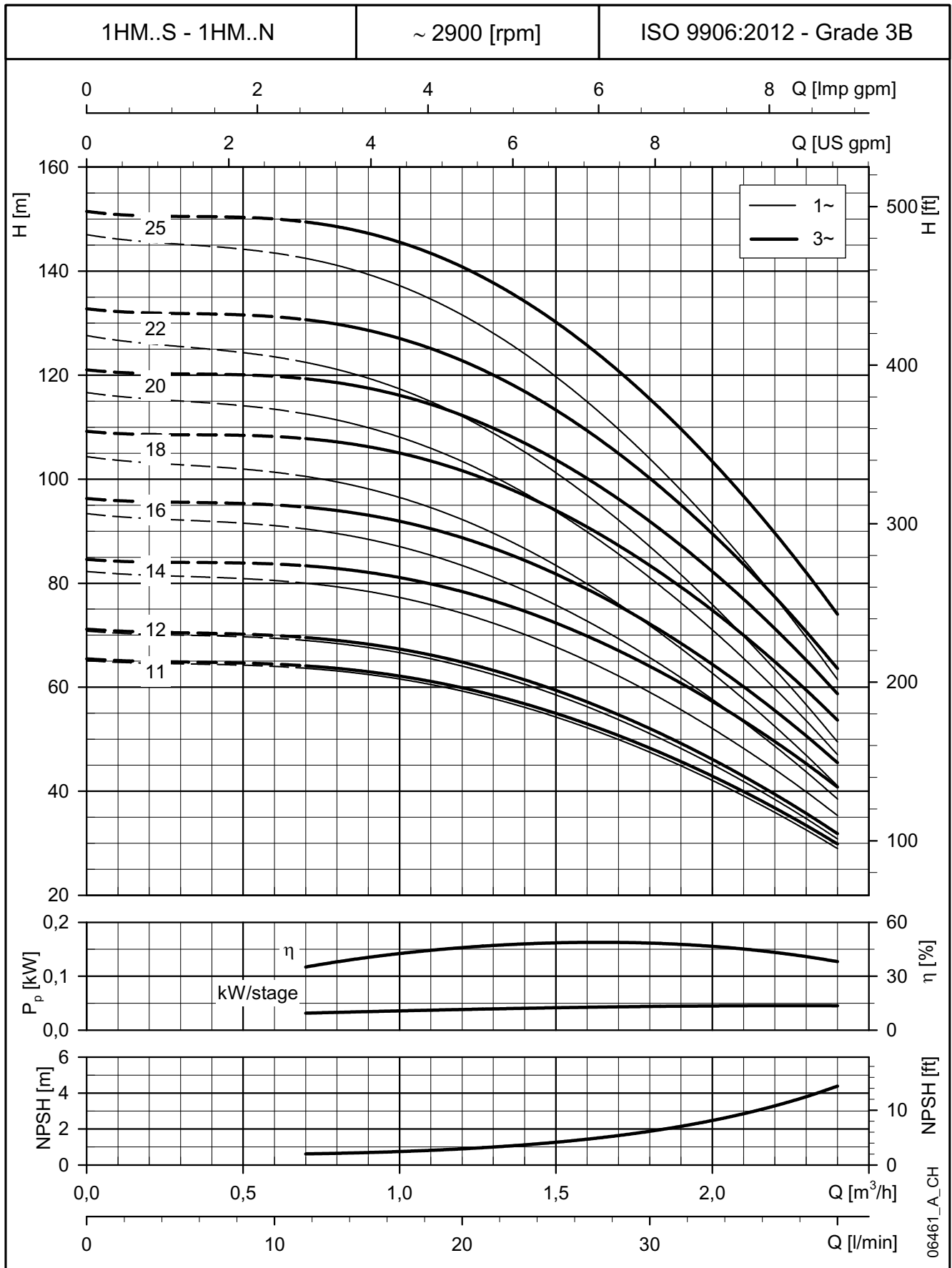
1HM..S - 1HM..N SERIES, (11 TO 25 STAGES)
DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)													WEIGHT kg
		MOTOR		A	D	H	L	L1	L2	M	M1	N	N1	PN	
		KW	SIZE												
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

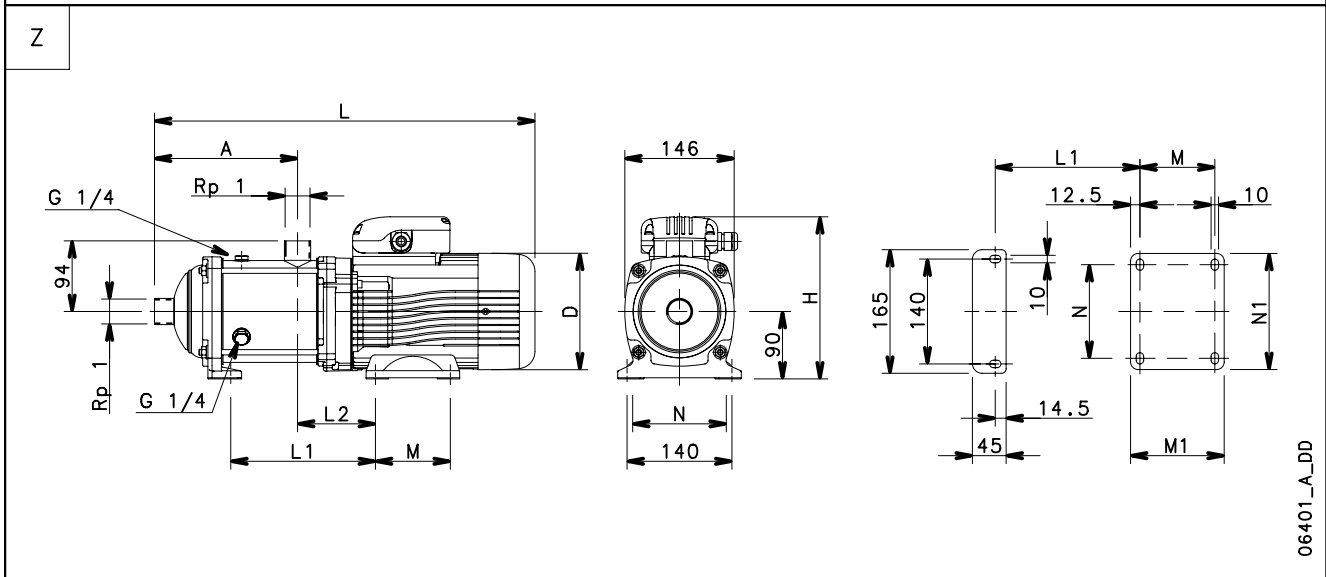
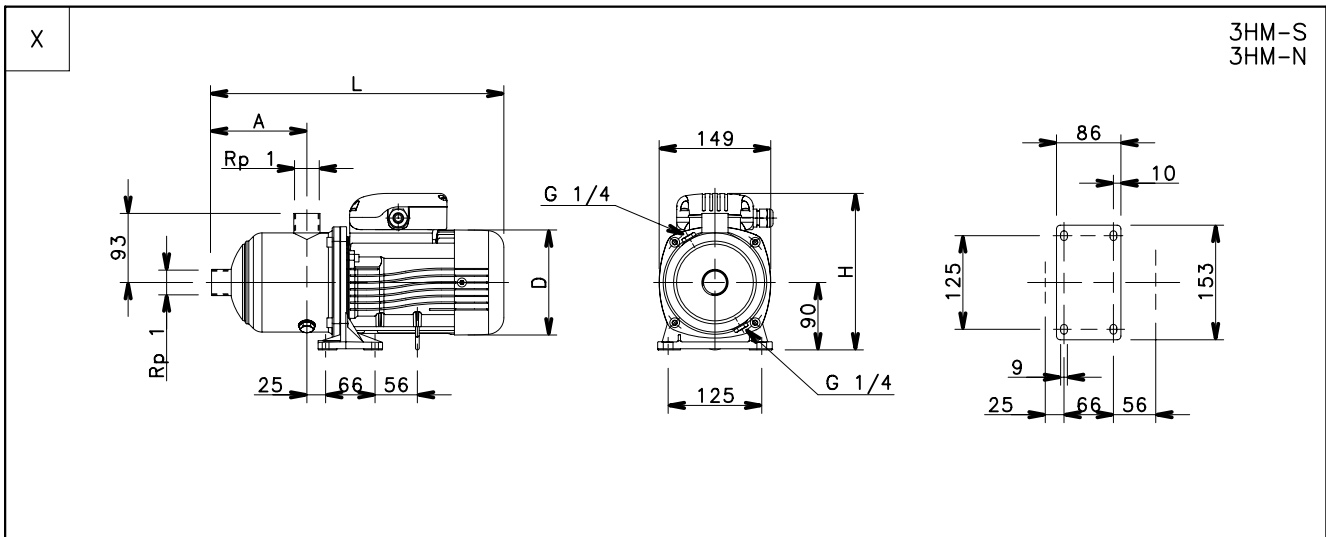
1HM11	THREE-PHASE	0,55	71	231	140	211	504	233	104	100	125	125	155	10	12
1HM12		0,55	71	251	140	211	524	253	104	100	125	125	155	10	12
1HM14		0,75	80	291	155	219	608	293	104	100	125	125	155	10	14
1HM16		0,75	80	331	155	219	648	333	104	100	125	125	155	10	14
1HM18		1,1	80	371	155	219	688	373	104	100	125	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 $\nu = 1 \text{ mm}^2/\text{sec}$.

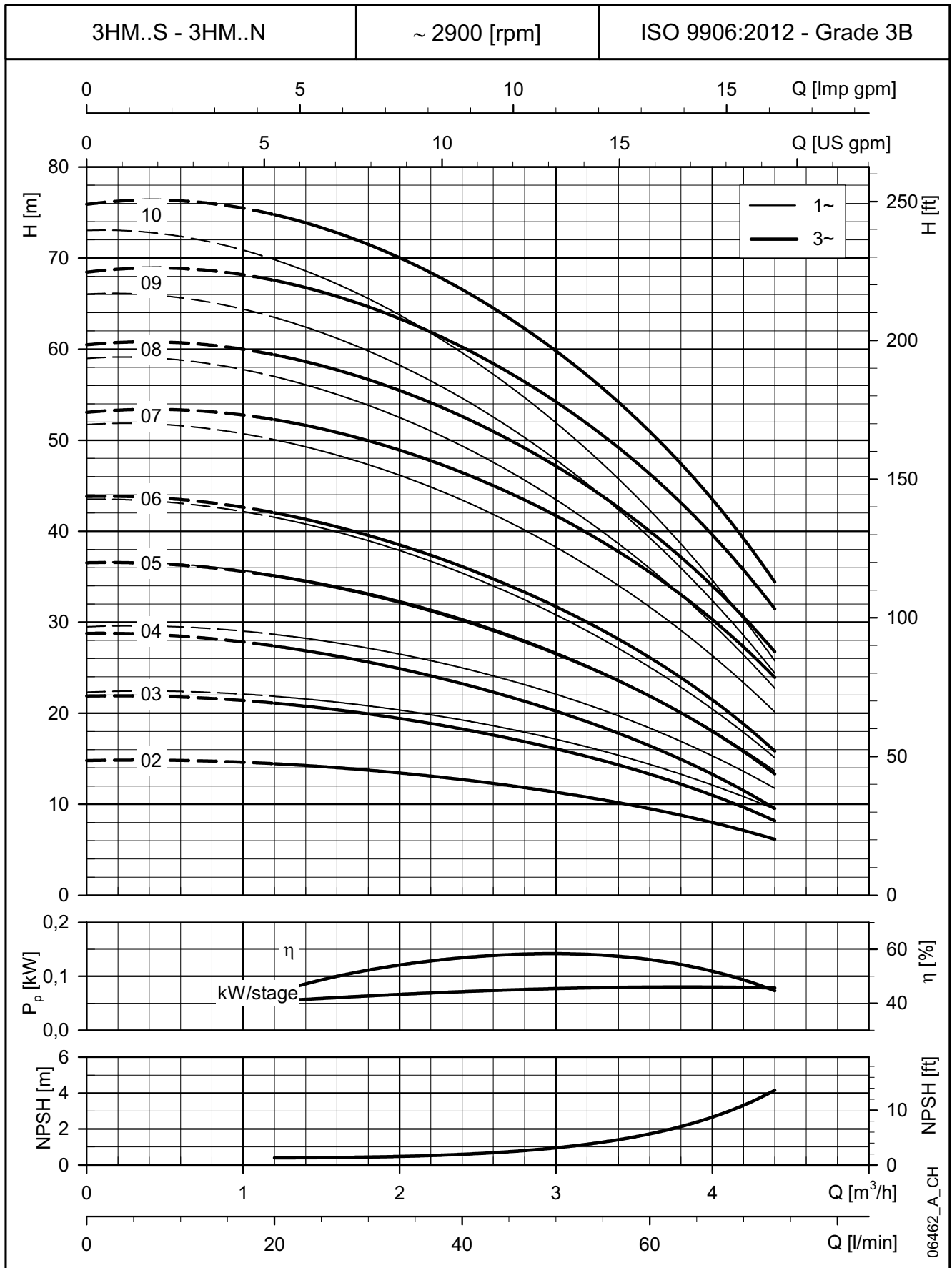
3HM..S - 3HM..N SERIES, (2 TO 10 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)														WEIGHT kg
		Ref.	MOTOR		A	D	H	L	L1	L2	M	M1	N	N1	PN	
			kW	SIZE												
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

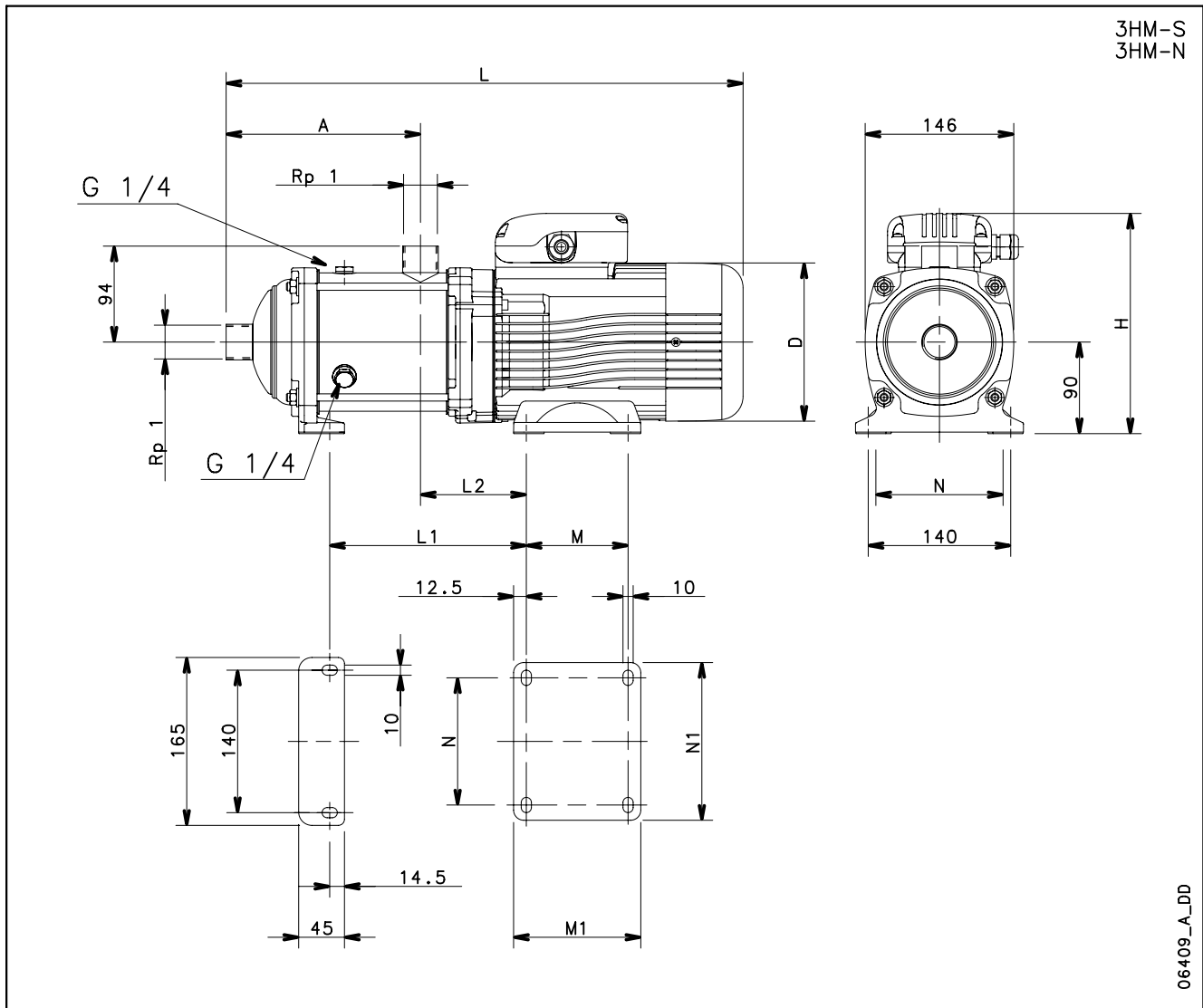
3HM02	THREE-PHASE	X	0,30	63	87	120	201	336	-	-	-	-	-	-	10	6
3HM03			0,30	63	87	120	201	336	-	-	-	-	-	-	10	6
3HM04			0,30	63	107	120	201	356	-	-	-	-	-	-	10	7
3HM05			0,40	63	127	120	201	376	-	-	-	-	-	-	10	7
3HM06		0,50	63	147	120	201	396	-	-	-	-	-	-	10	8	
3HM07		Z	0,75	80	151	155	219	468	153	104	100	125	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 $\nu = 1 \text{ mm}^2/\text{sec}$.

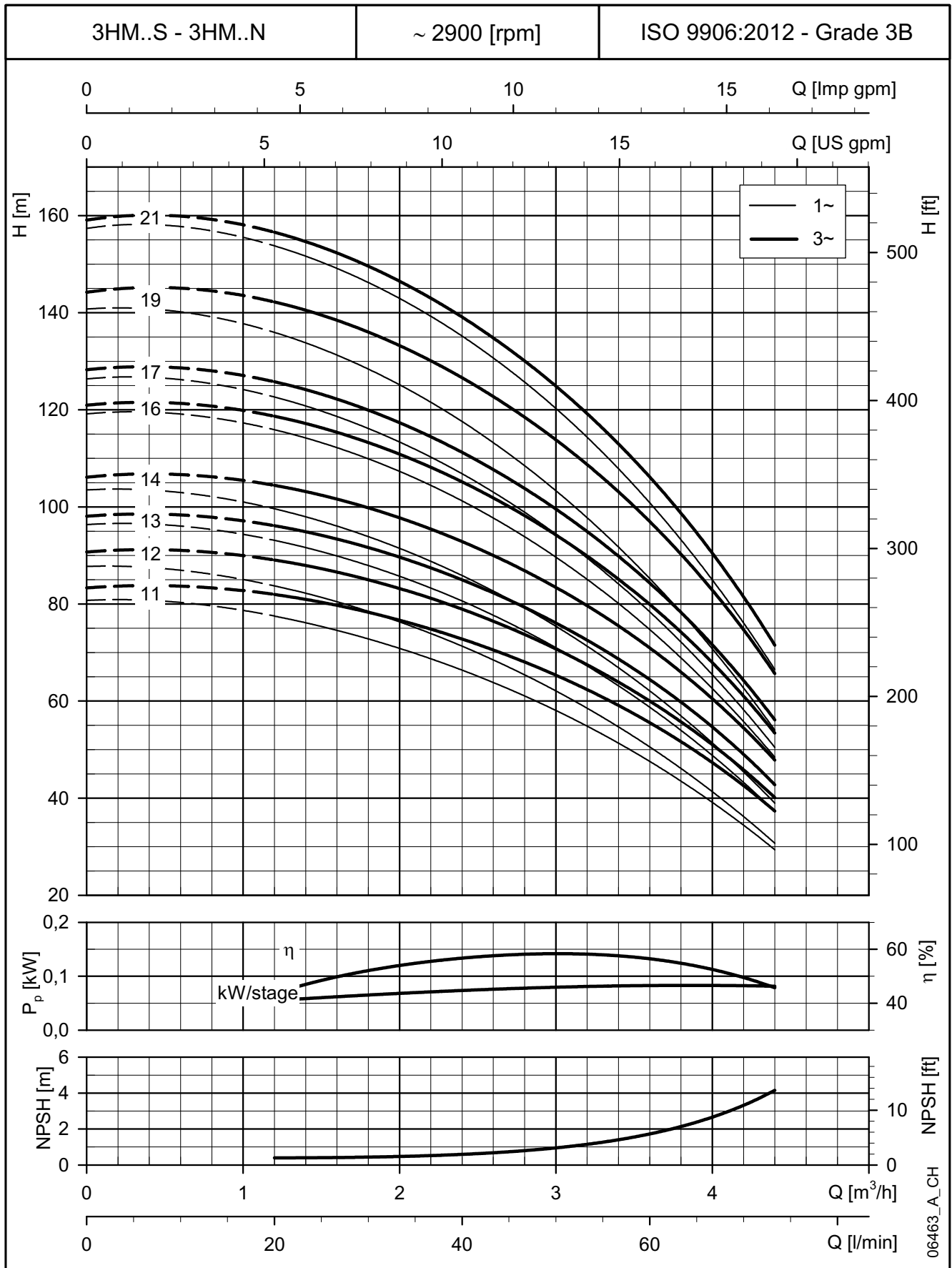
3HM..S - 3HM..N SERIES, (11 TO 21 STAGES) DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)													WEIGHT kg
		MOTOR		A	D	H	L	L1	L2	M	M1	N	N1	PN	
		KW	SIZE												
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

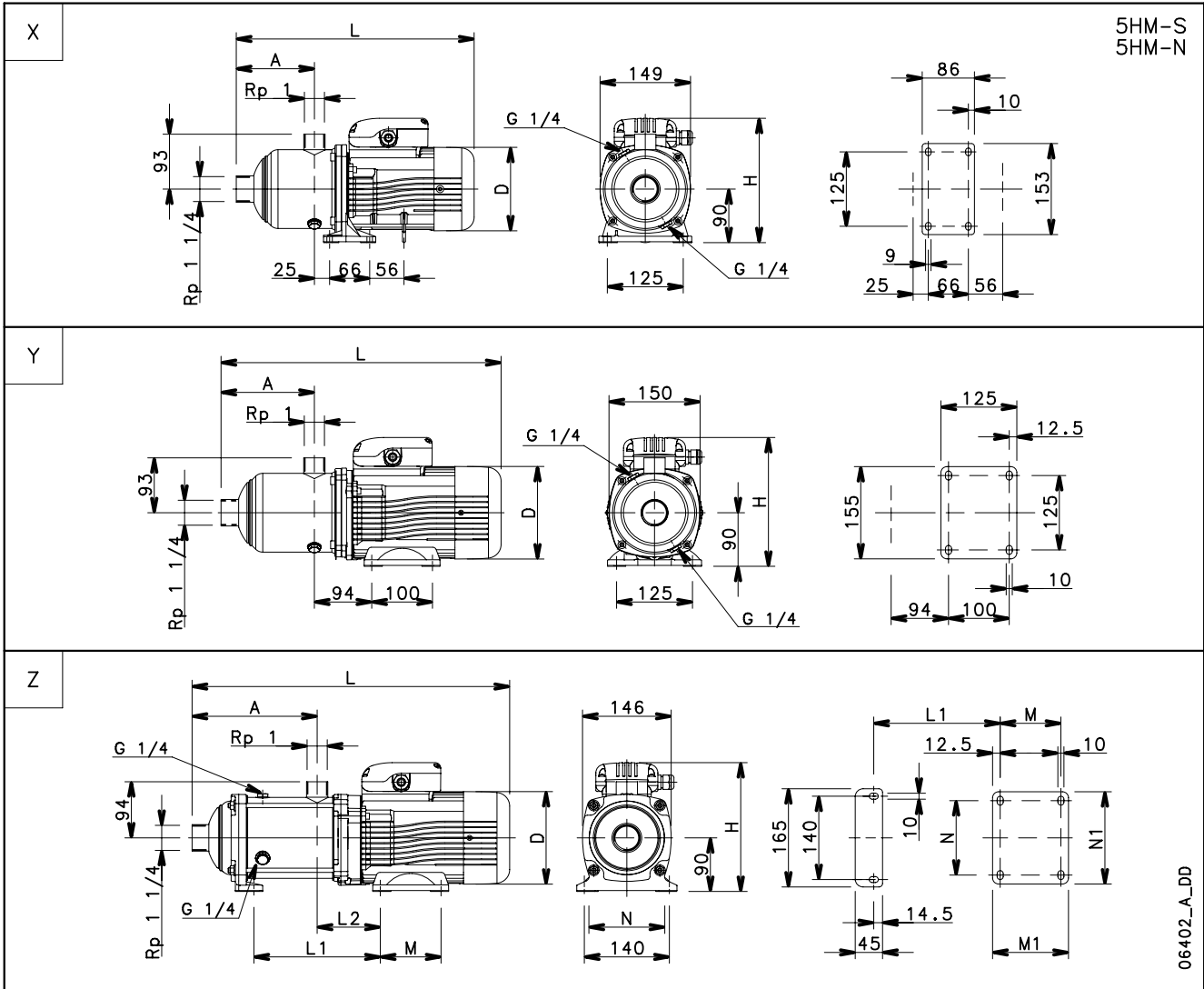
3HM11	TRIFASE	1,1	80	231	155	219	548	233	104	100	125	125	155	10	17
3HM12		1,1	80	251	155	219	568	253	104	100	125	125	155	10	17
3HM13		1,1	80	271	155	219	588	273	104	100	125	125	155	10	17
3HM14		1,5	80	291	155	219	608	293	104	100	125	125	155	16	19
3HM16		1,5	80	331	155	219	648	333	104	100	125	125	155	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



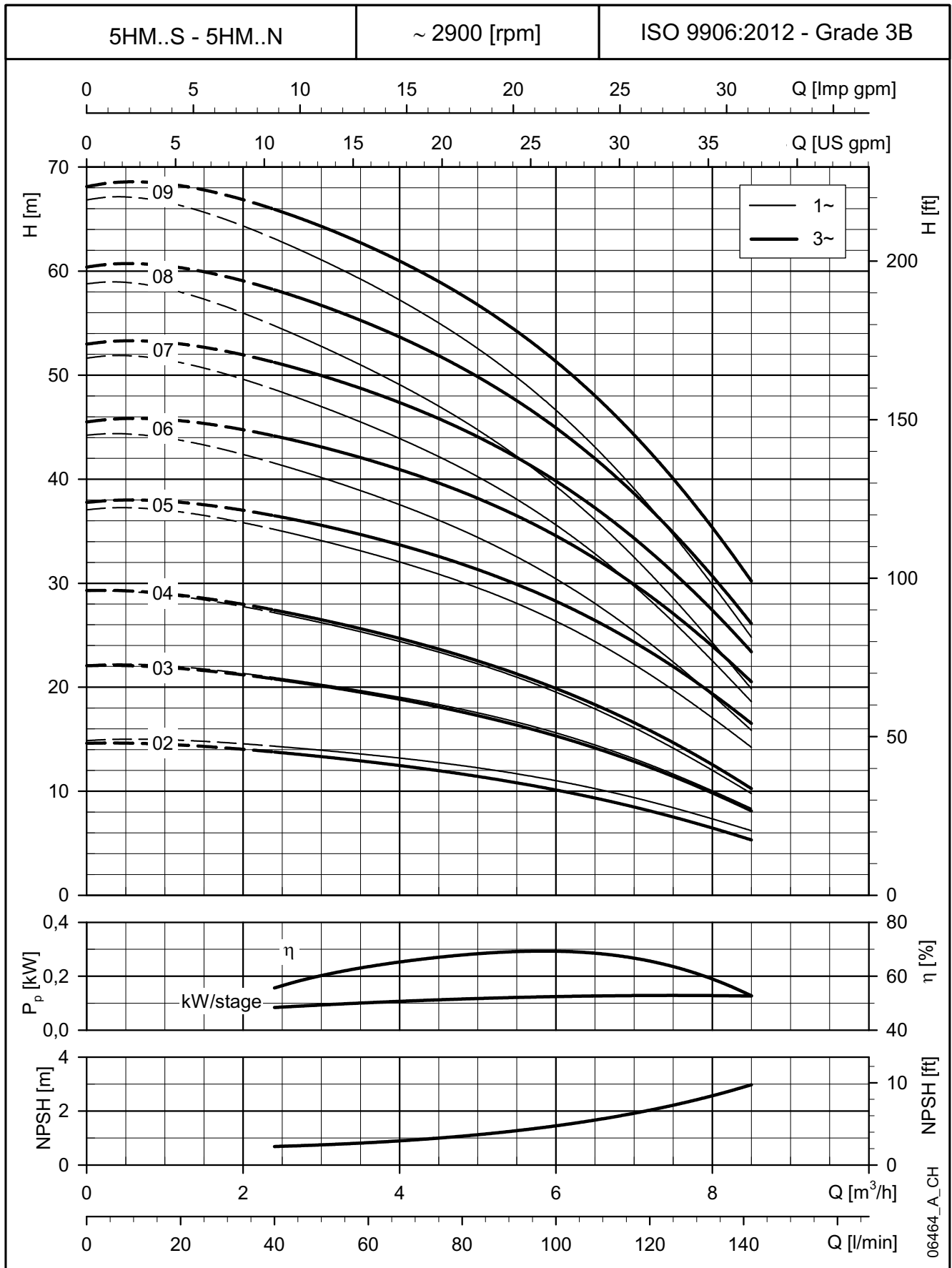
06402_A_DD

PUMP TYPE	VERSION	DIMENSIONS (mm)													WEIGHT kg	
		Ref.	MOTOR		A	D	H	L	L1	L2	M	M1	N	N1		PN
			kW	SIZE												
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

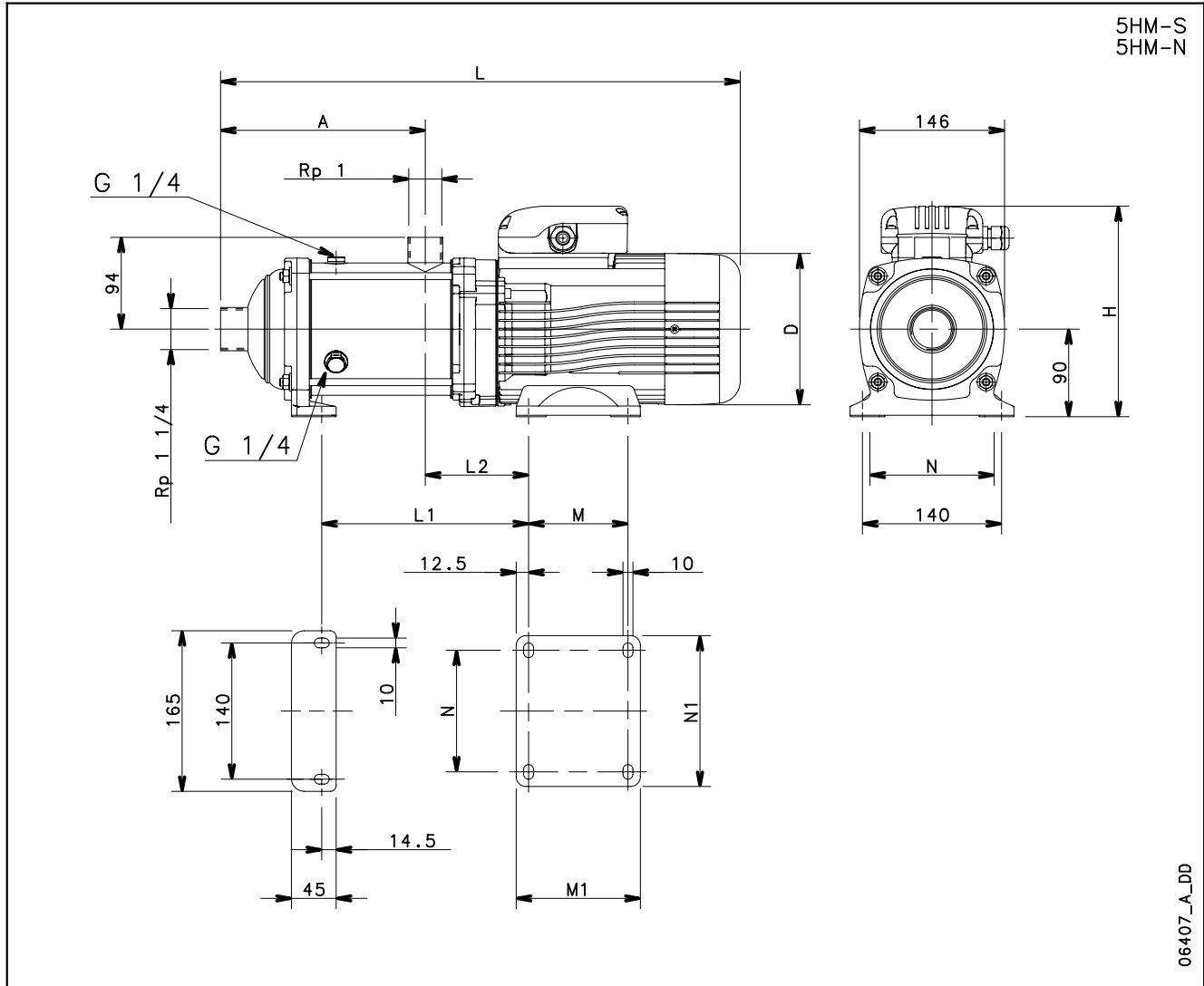
5hm-s-n-2p50-1-en_a_td

**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 $\nu = 1 \text{ mm}^2/\text{sec}$.

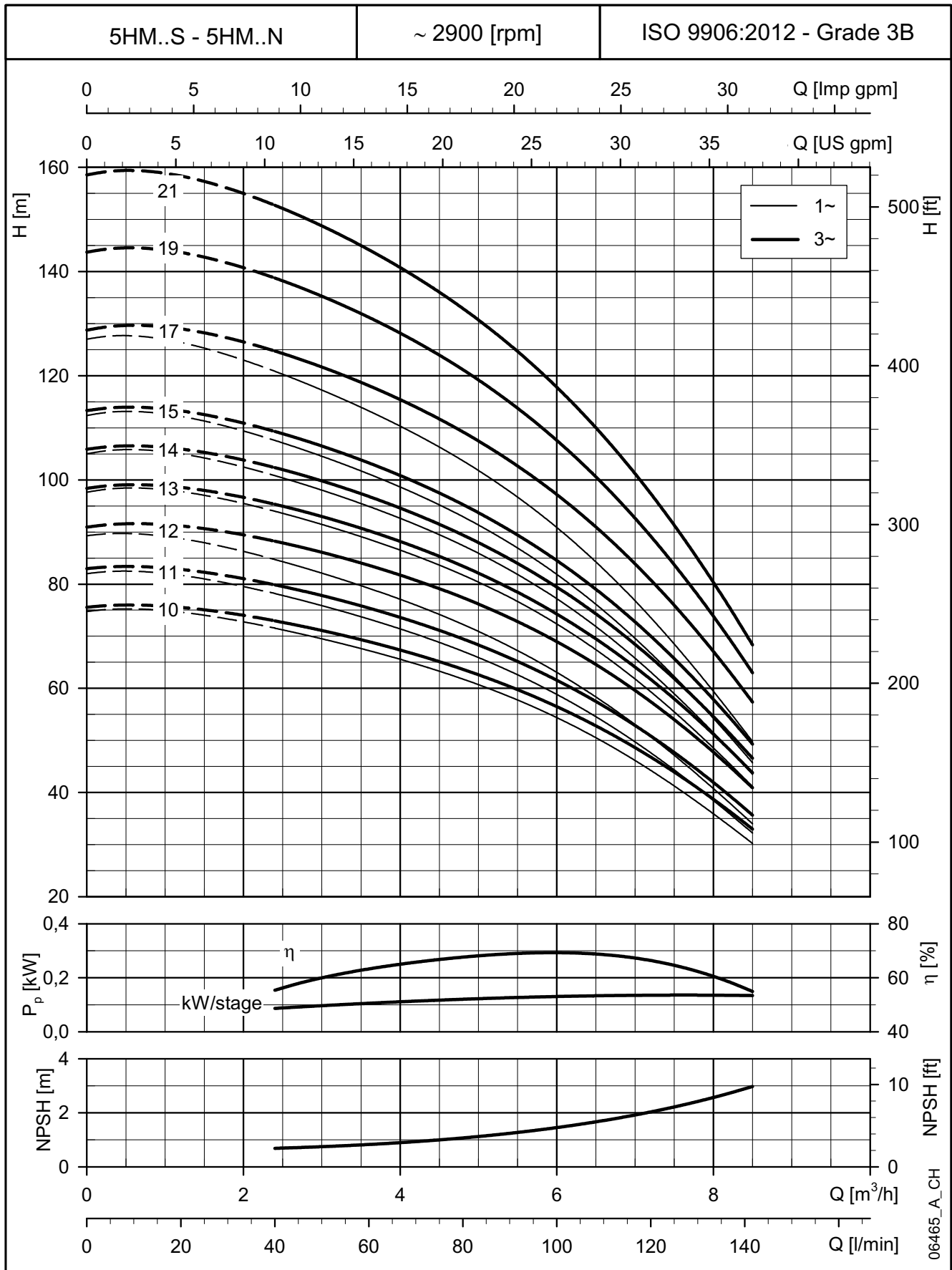
5HM..S - 5HM..N SERIES, (10 TO 21 STAGES)
DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)													
		MOTOR		A	D	H	L	L1	L2	M	M1	N	N1	PN	WEIGHT kg
		KW	SIZE												
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

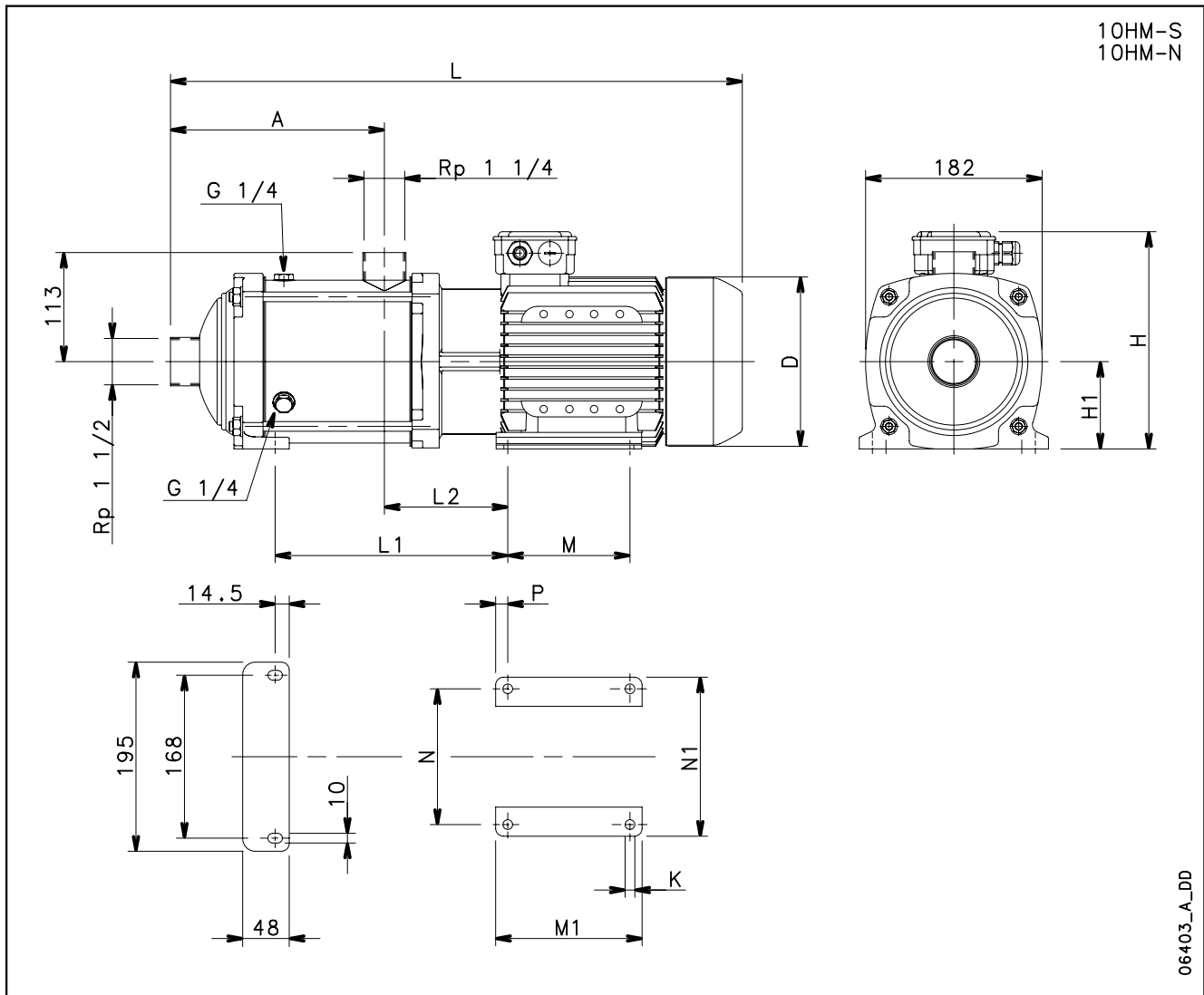
5HM10	THREE-PHASE	1,5	80	258	155	227	575	258	104	100	125	125	155	10	18
5HM11		1,5	80	283	155	227	600	283	104	100	125	125	155	10	19
5HM12		2,2	90	308	174	224	681	308	127	125	150	140	164	10	24
5HM13		2,2	90	333	174	224	706	356	127	125	150	140	164	10	24
5HM14		2,2	90	358	174	224	731	381	127	125	150	140	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

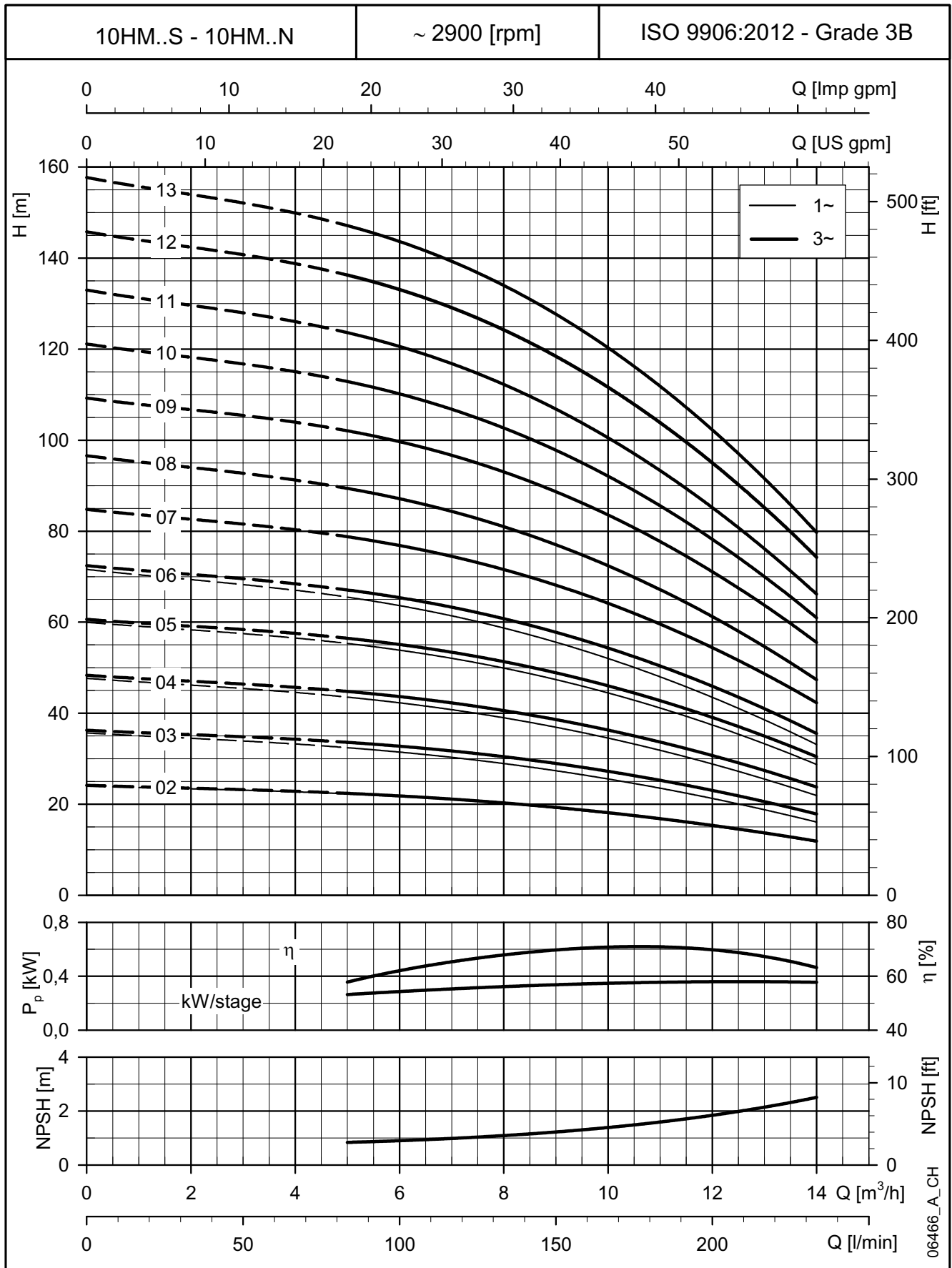


PUMP TYPE	VERSION	DIMENSIONS (mm)															WEIGHT kg	
		MOTOR		A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		PN
		kW	SIZE															
10HM02	SINGLE-PHASE	1,1	80	125	155	227	90	443	122	105	100	125	125	155	12,5	10	10	13
10HM03		1,1	80	125	155	227	90	443	122	105	100	125	125	155	12,5	10	10	17
10HM04		1,5	80	157	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

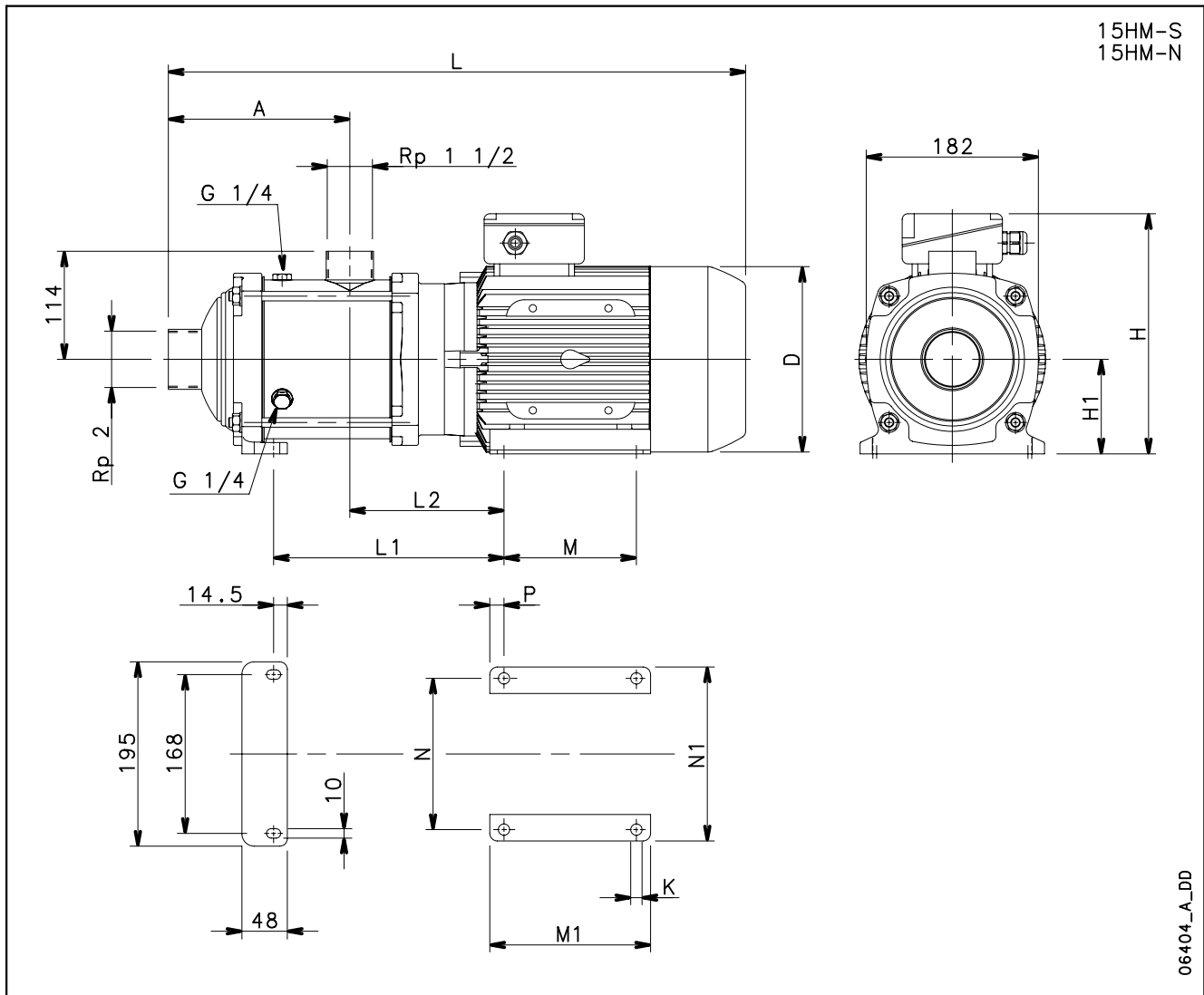
10HM..S - 10HM..N SERIES

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 $\nu = 1 \text{ mm}^2/\text{sec}$.

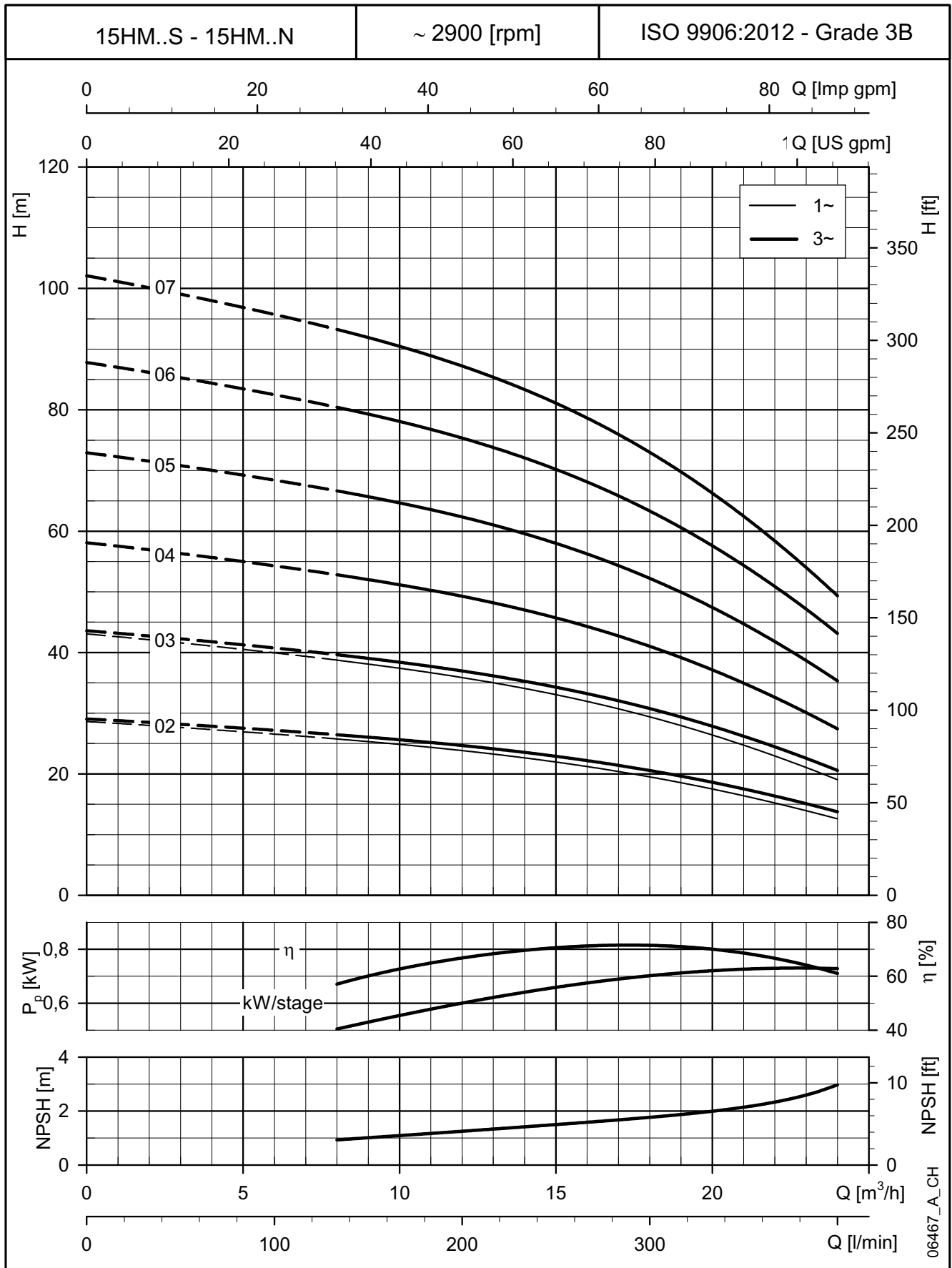
15HM..S - 15HM..N SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)															WEIGHT kg	
		kW	SIZE	A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		PN
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

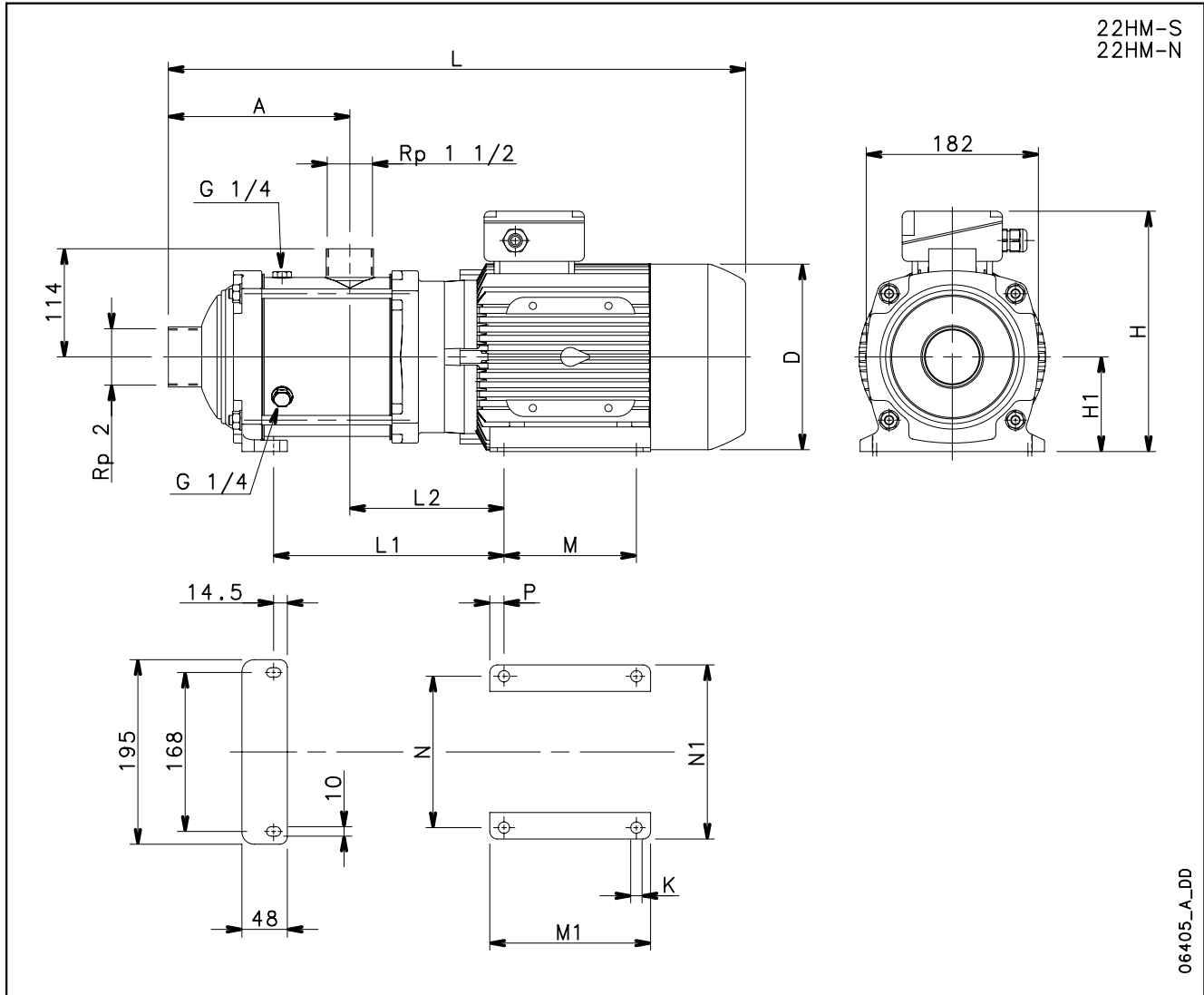
15HM02	THREE-PHASE	1,5	80	144	155	219	90	478	154	121	100	125	125	155	12,5	10	10	18
15HM03		2,2	90	144	174	224	90	534	176	144	125	150	140	164	12,5	10	10	23
15HM04		3	90	192	174	224	90	582	224	144	125	150	140	164	12,5	10	10	27
15HM05		4	100	240	197	254	100	659	292	163	140	170	160	184	15	12	10	35
15HM06		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 - 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 $\nu = 1 \text{ mm}^2/\text{sec}$.

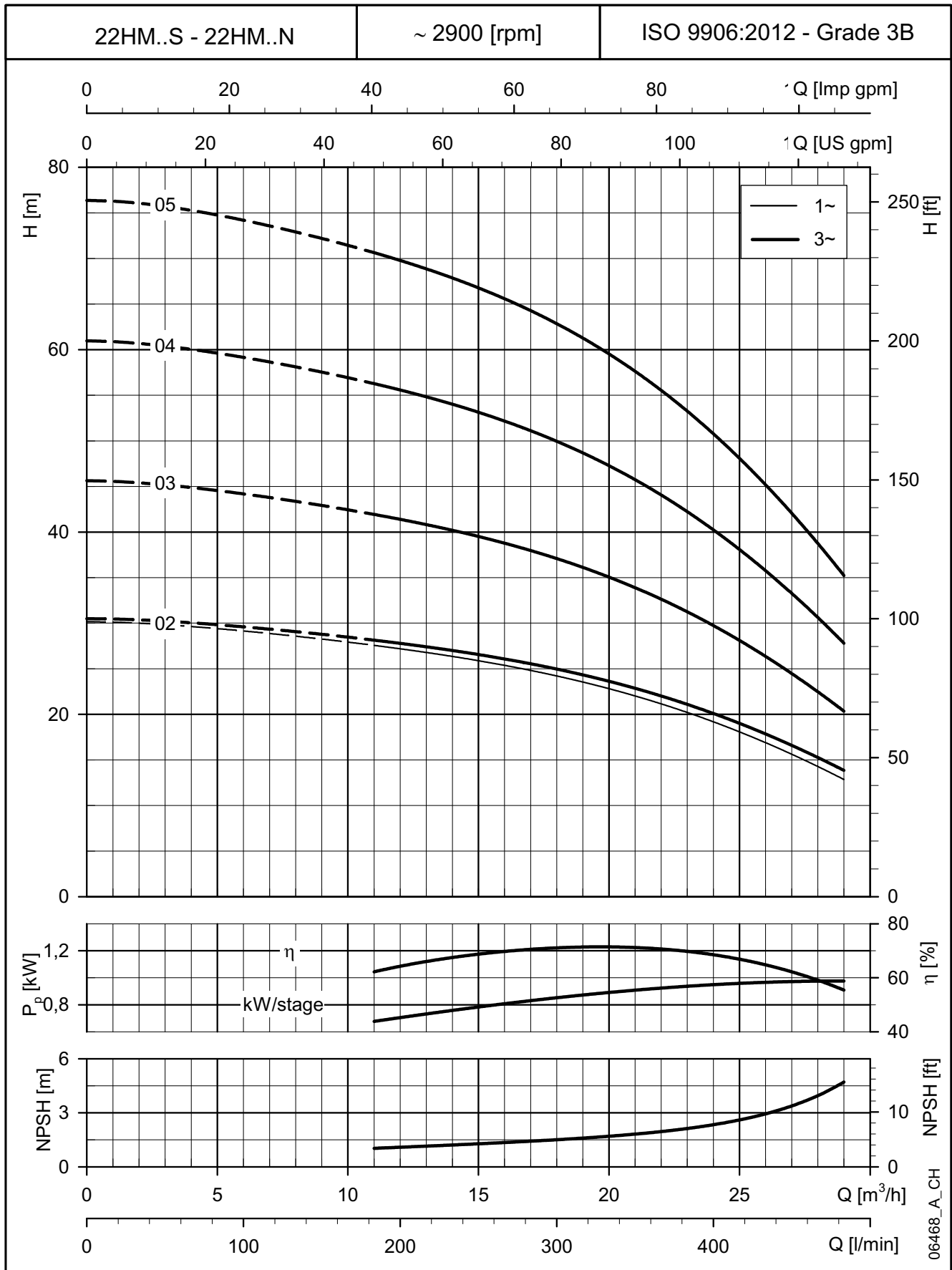
22HM..S - 22HM..N SERIES
DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



PUMP TYPE	VERSION	DIMENSIONS (mm)															WEIGHT kg		
		MOTOR		A	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		PN	
		kW	SIZE																
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/e-HM™ SERIES

**High efficiency
horizontal
multistage
pump**

**TKS
Teknospeed
variable speed
systems**

MARKET SECTORS

BUILDING SERVICES.
INDUSTRY.

APPLICATIONS

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

SPECIFICATIONS



TKS SYSTEM

- Single-phase power supply 230V +/- 10%, 50/60 Hz.
- Coupled to Lowara SM motors up to 1,1 kW three-phase.

PUMP

- Flow rate: up to 8,5 m³/h.
 - Head: up to 130 m.
 - Ambient temperature: from 0°C to +40°C.
 - Temperature of the pumped liquid up to 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 and Q1BEGG or Q1Q1EGG mechanical seal (maximum liquid temperature +90°C).
 - Connections: Rp threaded for both suction and discharge manifold.
 - Hydraulic performances compliant with ISO 9906:2012 - Grade 3B.
- 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 (compliant with Regulation (EC) n. 640/2009 and IEC 60034-30).
- Protection class IP55.
- Insulation class 155 (F).
- Performances according to EN 60034-1.
- Standard three-phase voltage: 220-240/380-415V, 50 Hz up to 3 kW.

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 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; positive logic operation (the contact is open if there are no alarm. 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 ²
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. It also guarantees a constant set outlet pressure if the input voltage varies (within the permitted range 230V +/- 10%).

MECHANICAL DATA

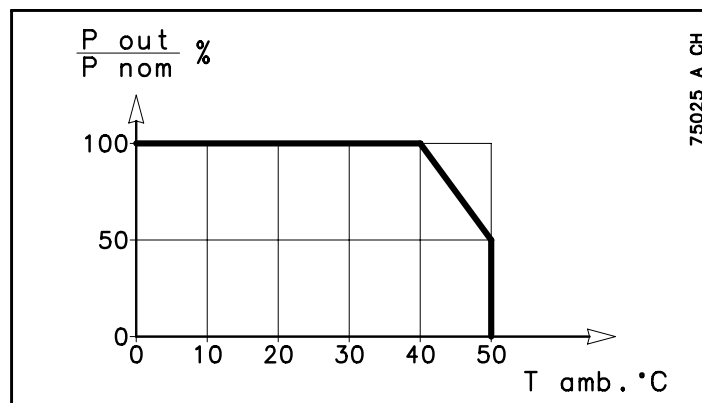
PROTECTION	IP55
RECOMMENDED MOTORS	Direct with standard Lowara SM motor terminal boards
RADIATOR MATERIAL	Die-cast aluminium
RADIATOR COLOUR	Black

OPERATING RANGE

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

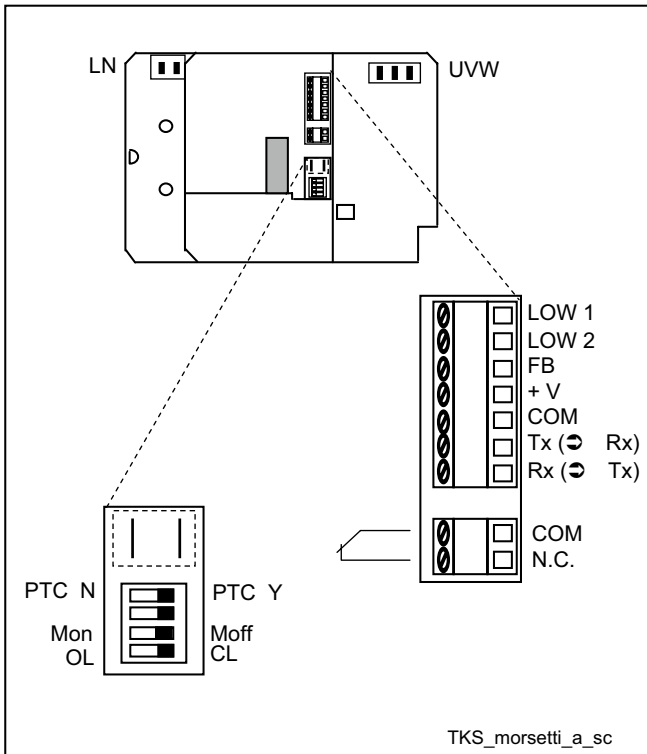
*For higher temperatures, please see derating curve

DERATING CURVE



TKS SERIES

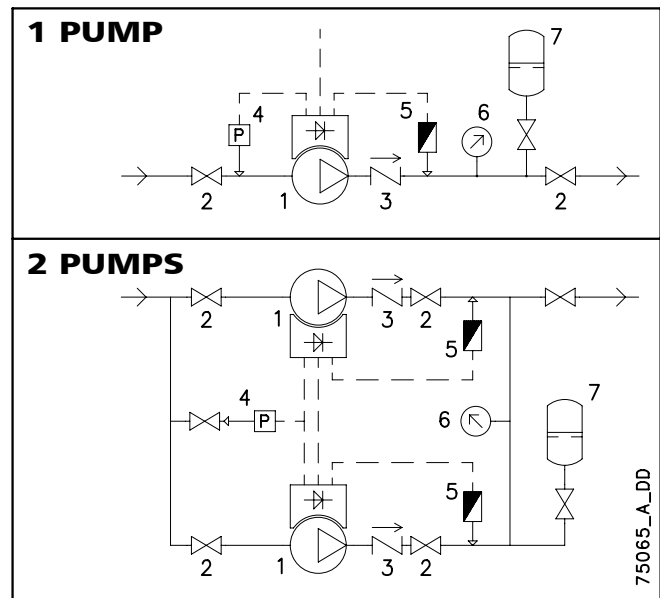
WIRING DIAGRAM



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/Moff	Main pump/Secondary pump
OL/CL	Motor speed adjustment (OL) Pressure control mode (CL)

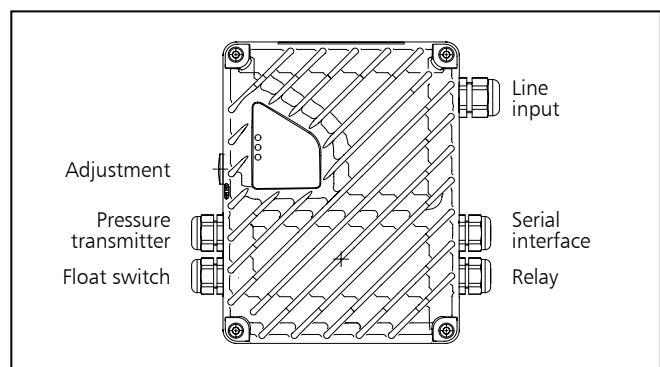
SYSTEM CONNECTION SCHEME



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



OPERATION:

Teknospeed can adjust motor speed in two ways:

1. **With a potentiometer**

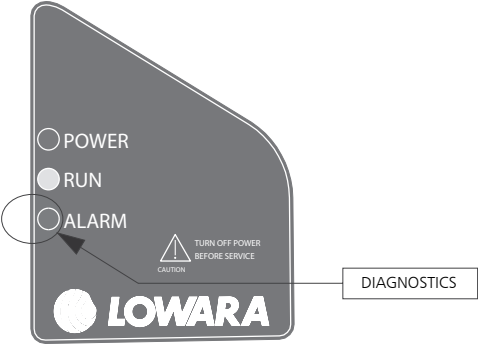
where the halfway position corresponds to a frequency of about 25 Hz (max frequency 50 Hz).

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 TYPE TKS/1HM..P	Power supply	MOTOR		TKS SET		Q = DELIVERY							
		P _N kW	TYPE 3x230 V	* P ₁ kW	* I 220-240 V A	l/min 0	11,7	16,0	21,0	26,0	31,0	36,0	40,0
						m ³ /h 0	0,7	1,0	1,3	1,6	1,9	2,2	2,4
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
TKS/1HM03	1 ~	0,30	SM63HM../303	0,57	2,61	32,4	28,7	27,1	24,9	22,4	19,6	16,5	14,0
TKS/1HM04		0,40	SM63HM../304	0,74	3,40	43,9	39,1	37,0	34,1	30,8	27,1	23,0	19,6
TKS/1HM05		0,50	SM63HM../305	0,88	4,03	54,6	48,5	45,8	42,2	38,0	33,4	28,3	24,0
TKS/1HM06		0,75	SM80HM../307 E3	1,07	4,90	69,3	63,0	60,1	56,1	51,4	45,9	39,8	34,5

PUMP TYPE TKS/3HM..P	Power supply	MOTOR		TKS SET		Q = DELIVERY							
		P _N kW	TYPE 3x230 V	* P ₁ kW	* I 220-240 V A	l/min 0	20,0	28,0	36,0	44,0	52,0	60,0	70,0
						m ³ /h 0	1,2	1,7	2,2	2,6	3,1	3,6	4,2
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
TKS/3HM02	1 ~	0,30	SM63HM../303	0,54	2,50	23,0	20,6	19,3	17,7	15,9	13,8	11,7	8,7
TKS/3HM03		0,40	SM63HM../304	0,65	3,00	34,7	31,1	29,2	26,8	24,0	21,0	17,7	13,2
TKS/3HM04		0,50	SM63HM../305	0,93	4,26	45,9	40,9	38,2	34,9	31,2	27,1	22,7	16,7
TKS/3HM05		0,75	SM80HM../307 E3	1,07	4,90	60,2	55,1	52,3	48,7	44,2	39,2	33,7	26,2
TKS/3HM06		1,1	SM80HM../311 E3	1,48	6,80	72,7	66,8	63,6	59,3	54,1	48,1	41,5	32,5

PUMP TYPE TKS5/HM..P	Power supply	MOTOR		TKS SET		Q = DELIVERY							
		P _N kW	TYPE 3x230 V	* P ₁ kW	* I 220-240 V A	l/min 0	40,0	53,0	66,0	79,0	92,0	105	120
						m ³ /h 0	2,4	3,2	4,0	4,7	5,5	6,3	7,2
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
TKS/5HM02	1 ~	0,40	SM63HM../304	0,75	3,40	23,8	20,0	18,6	17,1	15,3	13,2	10,5	6,8
TKS/5HM03		0,50	SM63HM../305	0,86	3,94	35,3	29,0	26,8	24,5	21,8	18,5	14,5	9,0
TKS/5HM05		1,1	SM80HM../311 E3	1,48	6,80	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)

tk5-1-5hmp-2p50-en_a_th

* Maximum value in specified range: P₁ = input power; I = input current.

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

PUMP TYPE TKS/HM..S	Power supply	MOTOR		TKS SET		Q = DELIVERY							
		P _N kW	TYPE 3x230 V	* P ₁ kW	* I 220-240 V A	l/min 0	11,7	16,0	21,0	26,0	31,0	36,0	40,0
						m ³ /h 0	0,7	1,0	1,3	1,6	1,9	2,2	2,4
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
TKS/1HM06	1 ~	0,30	SM63HM../303	0,51	2,34	34,6	33,5	32,4	30,3	27,3	23,3	18,5	
TKS/1HM12		0,55	SM71HM../305	0,88	4,05	71,1	69,5	67,7	63,9	58,1	50,4	40,8	
TKS/1HM16		0,75	SM80HM../307 E3	1,07	4,90	96,3	94,6	92,4	87,6	80,1	70,0	57,4	
TKS/1HM22		1,1	SM80HM../311 E3	1,48	6,80	132,8	130,7	127,7	121,2	111,0	97,2	79,9	

PUMP TYPE TKS/HM..S	Power supply	MOTOR		TKS SET		Q = DELIVERY							
		P _N kW	TYPE 3x230 V	* P ₁ kW	* I 220-240 V A	l/min 0	20,0	29,0	38,0	47,0	56,0	65,0	73,3
						m ³ /h 0	1,2	1,7	2,3	2,8	3,4	3,9	4,4
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
TKS/3HM04	1 ~	0,30	SM63HM../303	0,58	2,67	28,8	27,4	25,8	23,8	21,2	18,1	14,1	9,5
TKS/3HM05		0,40	SM63HM../304	0,71	3,25	36,5	35,1	33,3	30,8	27,7	23,9	19,0	13,3
TKS/3HM06		0,50	SM63HM../305	0,83	3,80	43,8	42,0	39,8	36,9	33,1	28,5	22,7	15,8
TKS/3HM08		0,75	SM80HM../307 E3	1,07	4,90	60,5	59,4	57,0	53,5	49,0	43,1	35,6	26,7
TKS/3HM13		1,1	SM80HM../311 E3	1,48	6,80	98,1	96,1	92,2	86,5	79,0	69,5	57,3	42,8

PUMP TYPE TKS/HM..S	Power supply	MOTOR		TKS SET		Q = DELIVERY							
		P _N kW	TYPE 3x230 V	* P ₁ kW	* I 220-240 V A	l/min 0	40,0	57,0	74,0	91,0	108	125	142
						m ³ /h 0	2,4	3,4	4,4	5,5	6,5	7,5	8,5
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
TKS/5HM02	1 ~	0,30	SM63HM../303	0,50	2,30	14,6	13,8	13,0	12,0	10,9	9,4	7,5	5,3
TKS/5HM03		0,40	SM63HM../304	0,70	3,20	22,1	20,8	19,6	18,2	16,4	14,2	11,4	8,0
TKS/5HM04		0,50	SM63HM../305	0,87	4,00	29,3	27,4	25,8	23,8	21,4	18,4	14,7	10,2
TKS/5HM05		0,75	SM80HM../307 E3	1,07	4,90	37,8	36,5	34,8	32,7	30,0	26,5	22,0	16,4
TKS/5HM08		1,1	SM80HM../311 E3	1,48	6,80	60,4	58,2	55,5	52,1	47,7	42,1	34,9	25,9

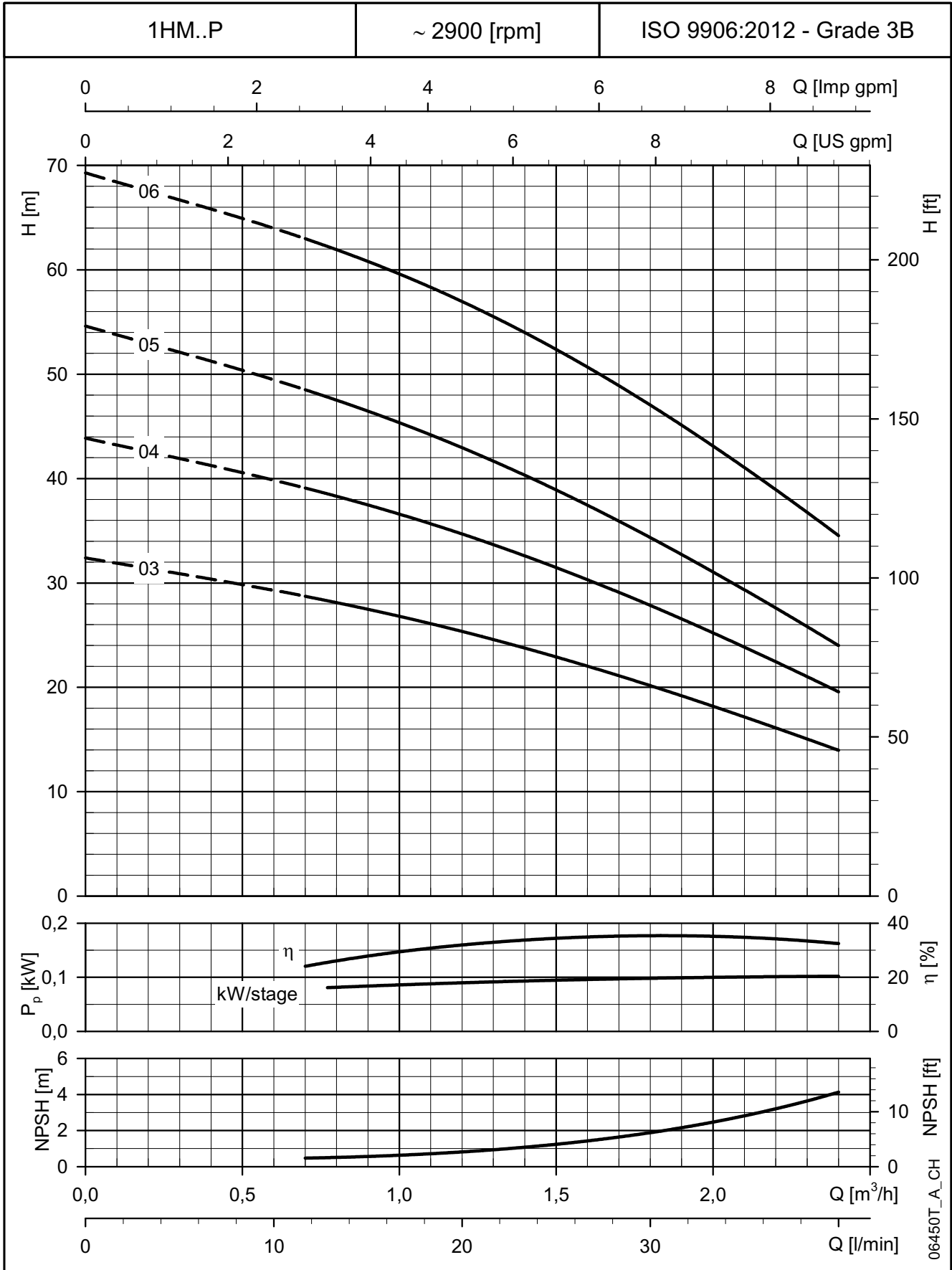
Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

tk5-1-5hms-2p50-en_a_th

* Maximum value in specified range: P₁ = input power; I = input current.

TKS/1HM..P SERIES

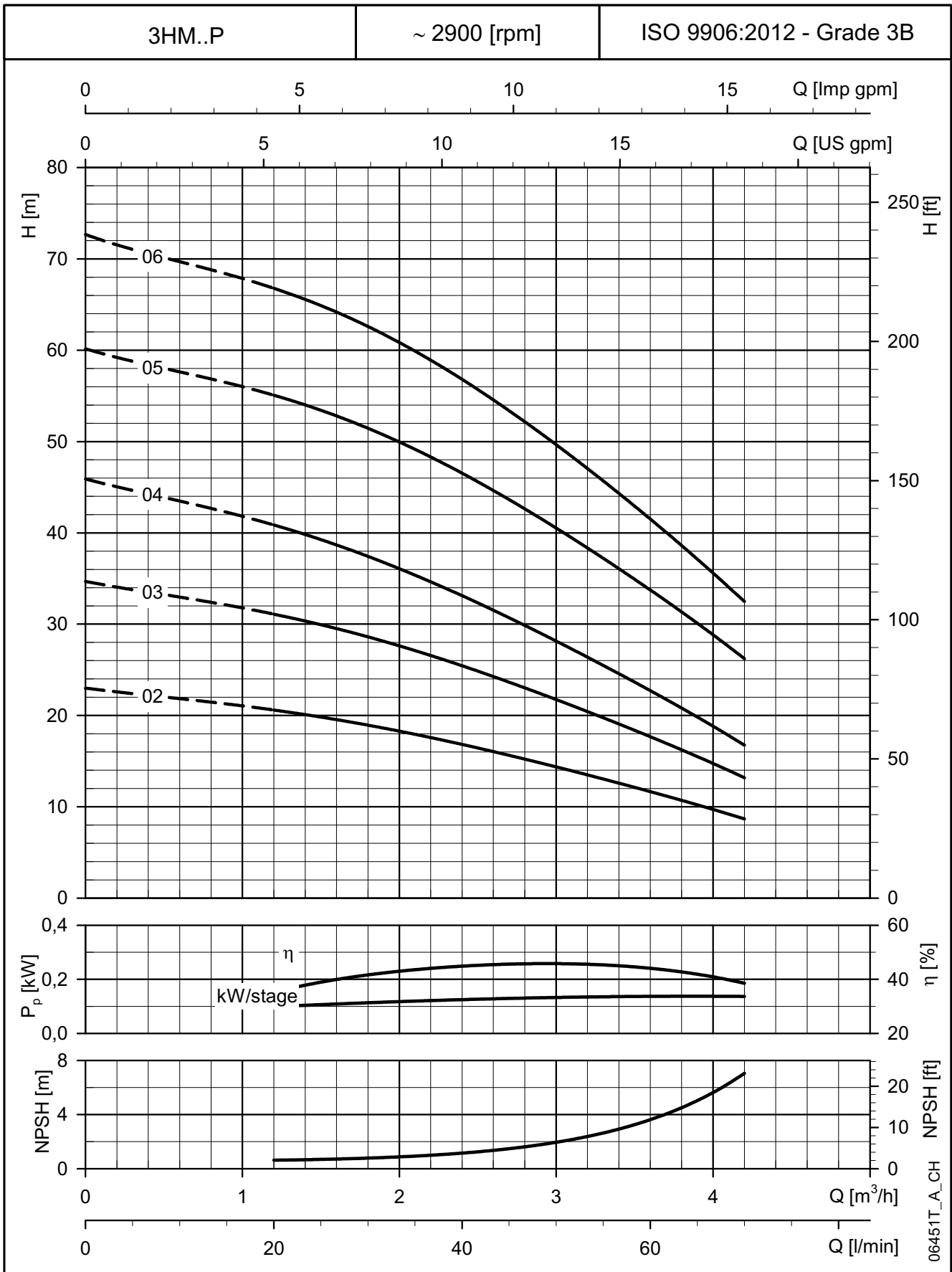
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

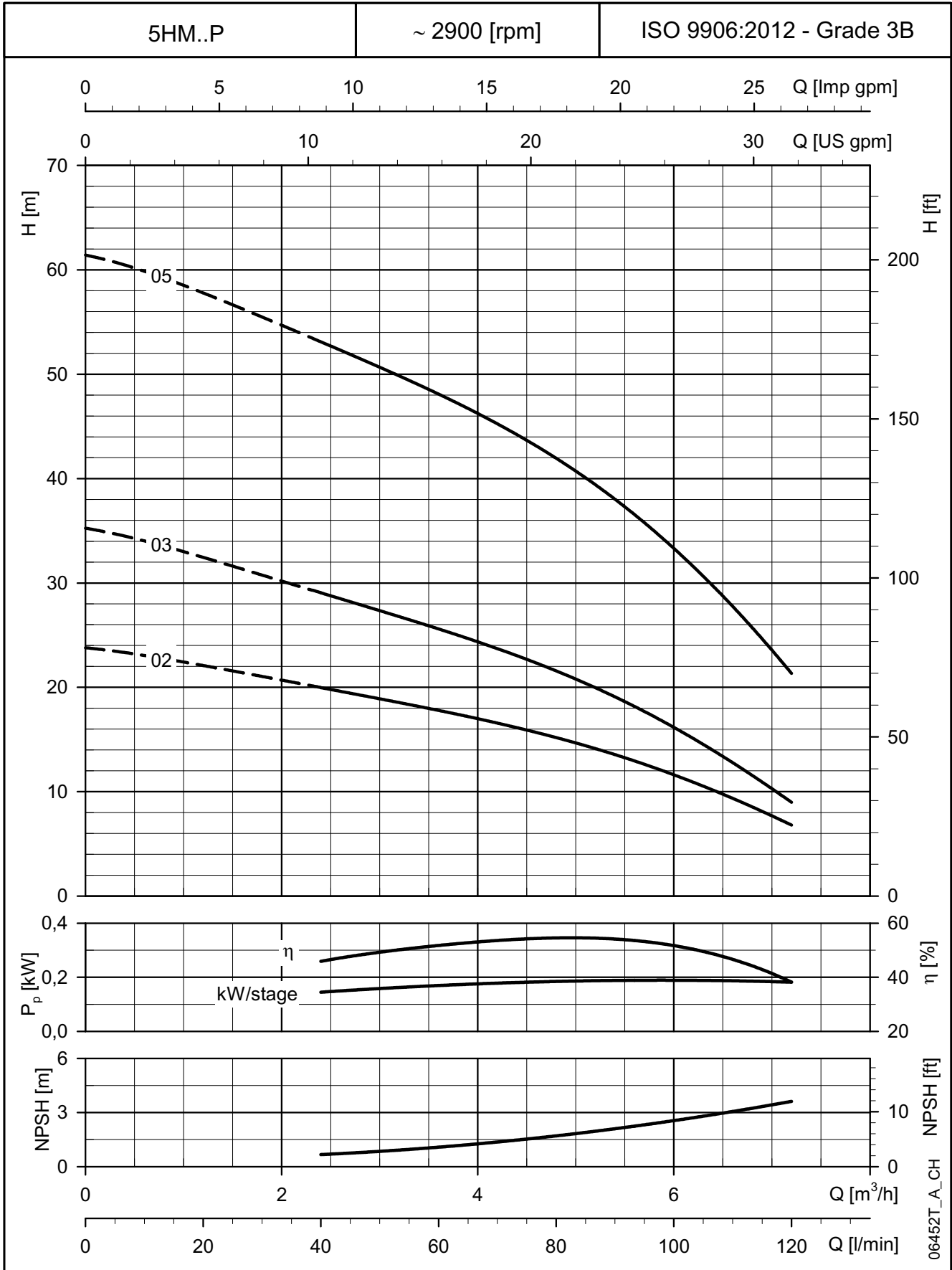
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

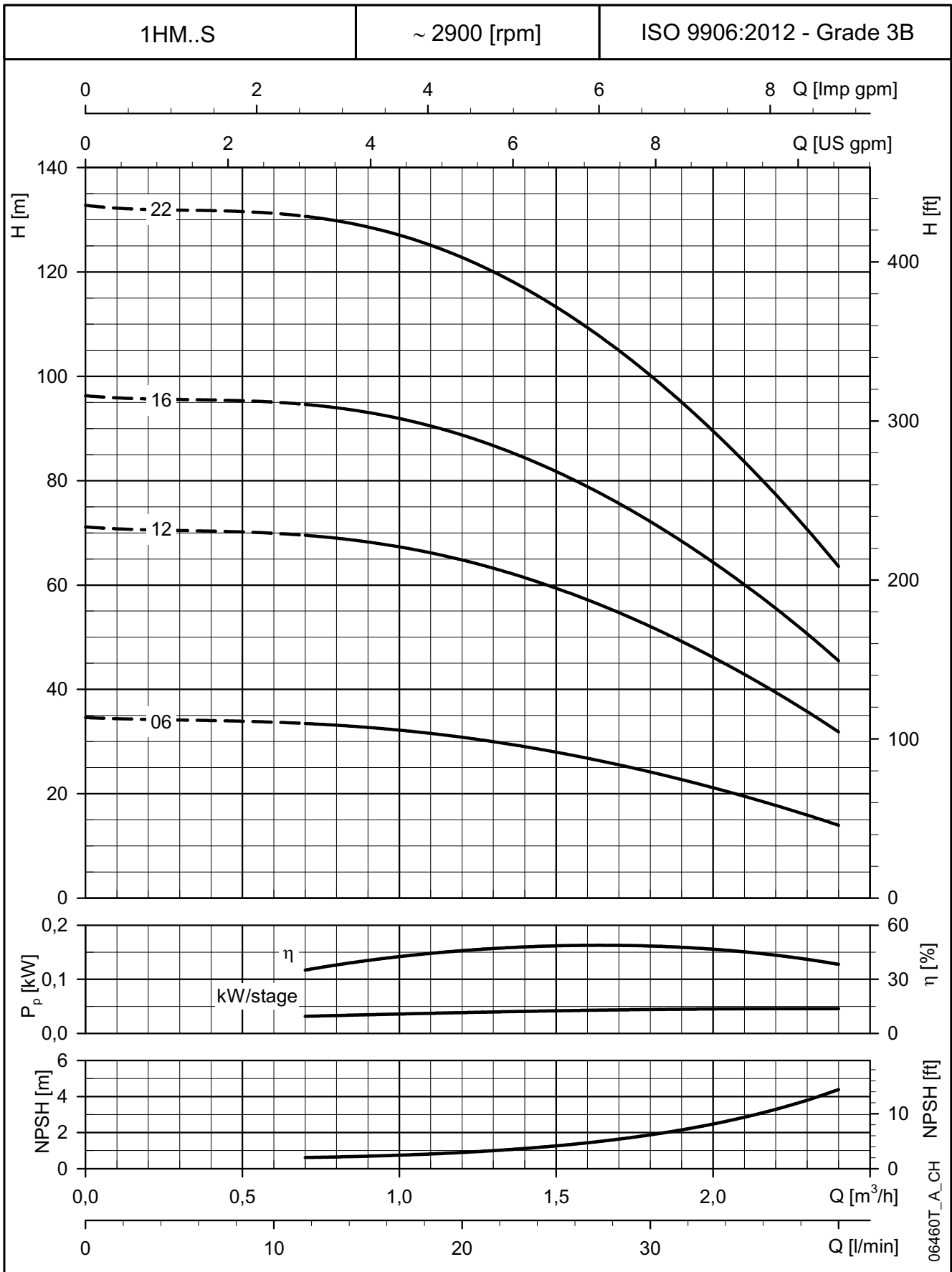
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

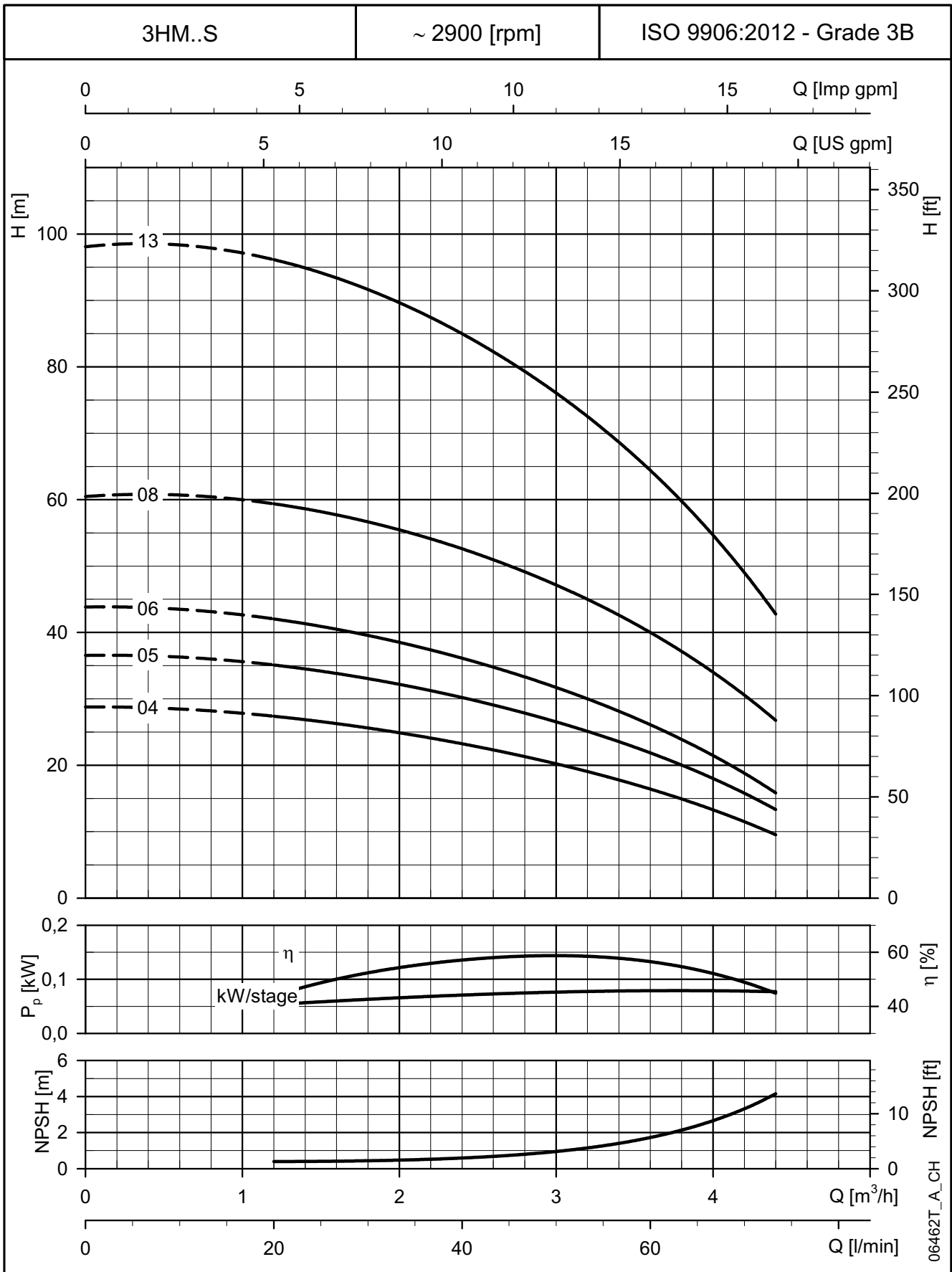
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

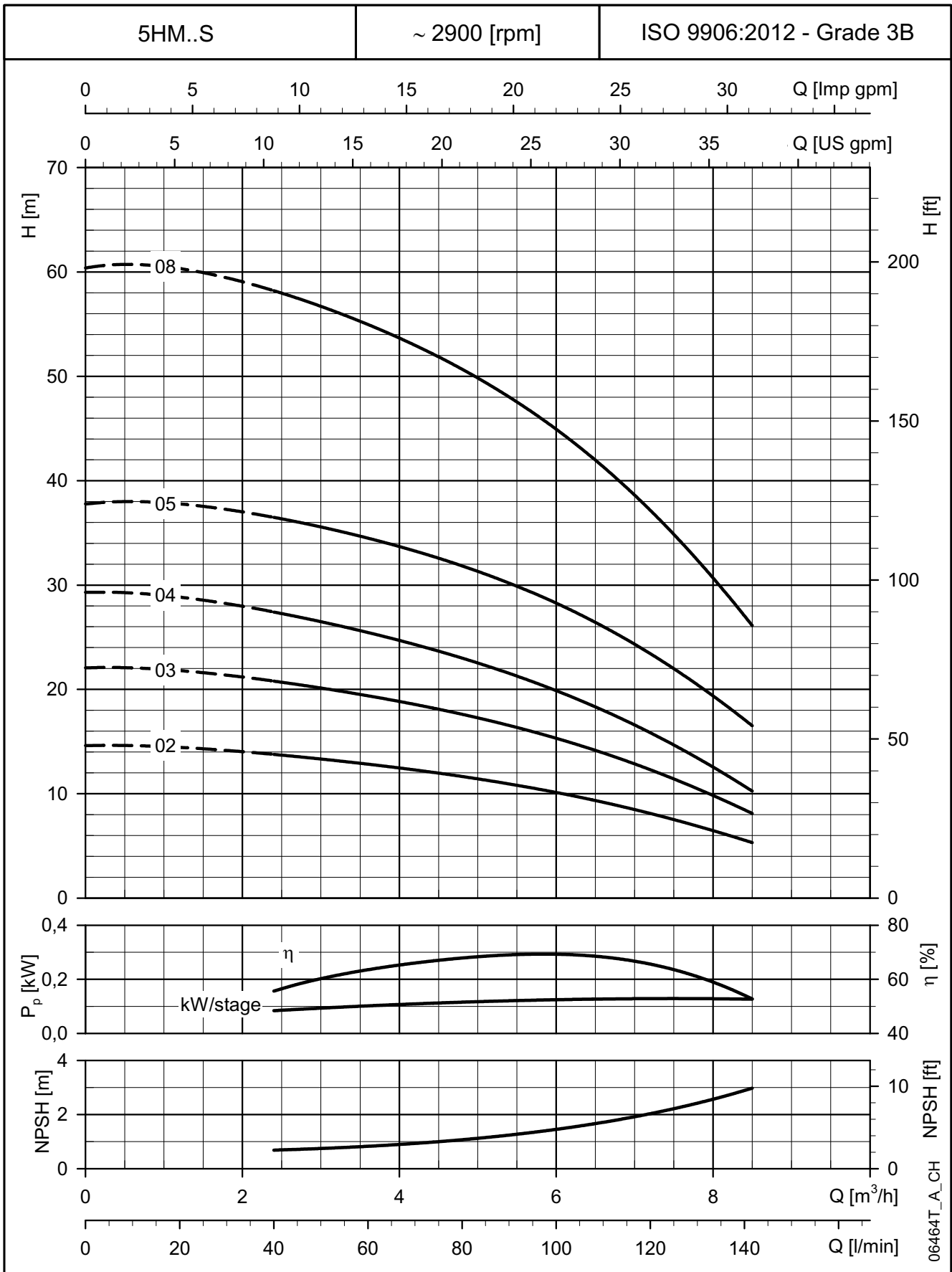
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

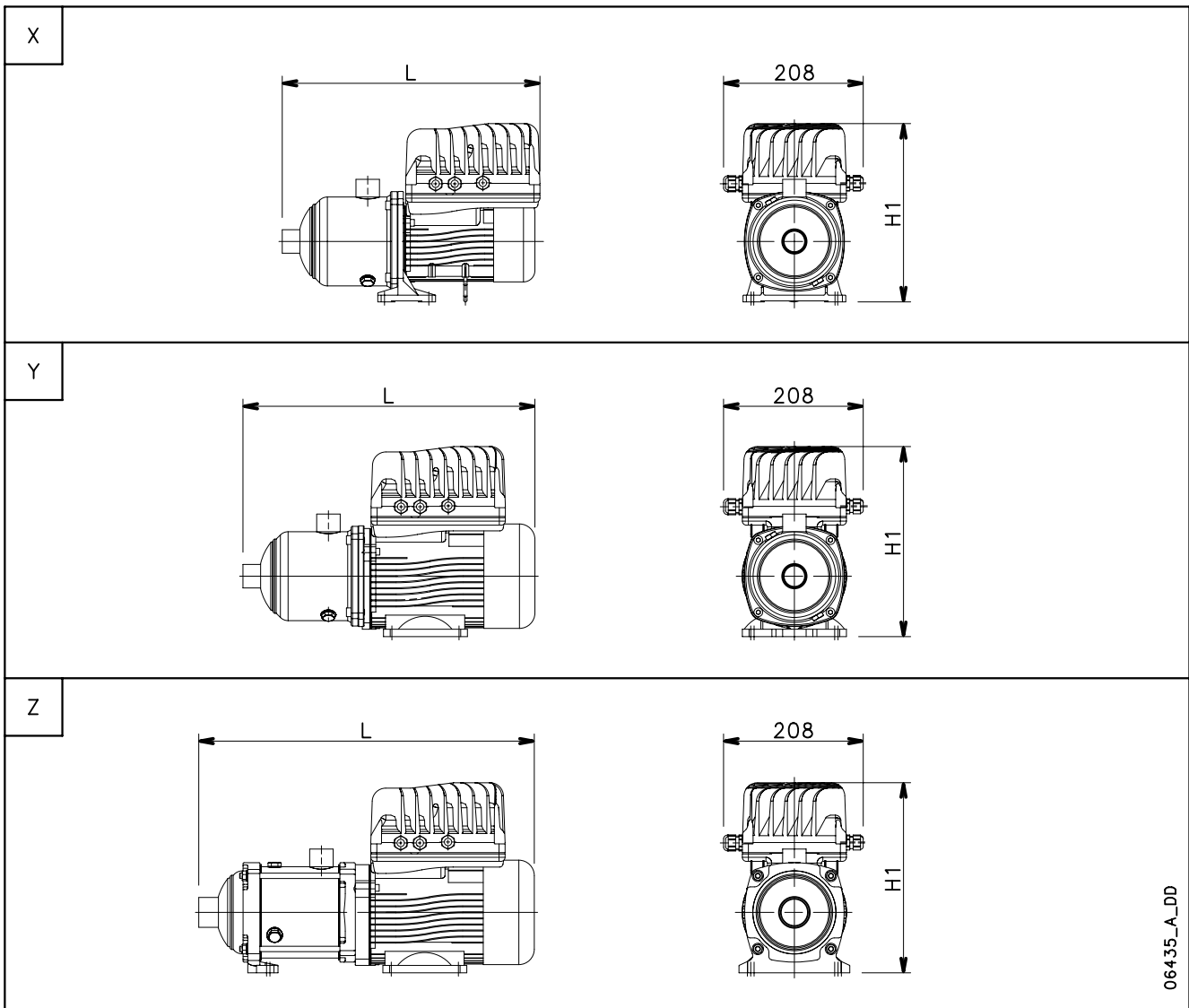
TKS/5HM..S SERIES

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 TKS/HM..P	Ref.	DIMENSIONS (mm)		
		H1	L	WEIGHT 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 TKS/HM..S	Ref.	DIMENSIONS (mm)		
		H1	L	WEIGHT kg
TKS/1HM06S03T	X	266	404	10
TKS/1HM12S05T		276	524	15
TKS/1HM16S07T		284	648	17
TKS/1HM22S11T	Z	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	Y	266	386	11
TKS/5HM05S07T	Z	284	462	16
TKS/5HM08S11T		284	525	19

For further dimensions refer to standard product.







tk-1-3-5hm-2p50-en_a_td

ACCESSORIES



ACCESSORIES

MODEL	REF.	CODE	DESCRIPTION
Ball valve 	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"	002675190	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 	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 	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 	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 	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 	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 	1/4"	002161101	SQUARE-D FSG2(1,4-4,6), Rp1/4" CONNECTION GLAVANISED STEEL
		002161200	SQUARE-D FYG22(2,8-7), Rp1/4" CONNECTION GLAVANISED STEEL
		002161201	SQUARE-D FYG32(5,6-10,5), Rp1/4" CONNECTION GLAVANISED STEEL
		002161336	ITALTECNICA PM/5(1-5), Rp1/4" CONNECTION GLAVANISED STEEL
		002161337	ITALTECNICA PM/12(2,5-12), Rp1/4" CONNECTION GLAVANISED STEEL
		002161338	ITALTECNICA PM/12S(1-8,5), Rp1/4" CONNECTION GLAVANISED STEEL
Pressure gauge with radial connection 	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 	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 	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     	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 	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 m³/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 m³/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 ρ DENSITY OF WATER TABLE

t °C	T K	p_s bar	ρ kg/dm ³	t °C	T K	p_s bar	ρ kg/dm ³	t °C	T K	p_s bar	ρ kg/dm ³
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				

G-at_npsb_sc

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

PRESSURE AND HEAD

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

LENGTH

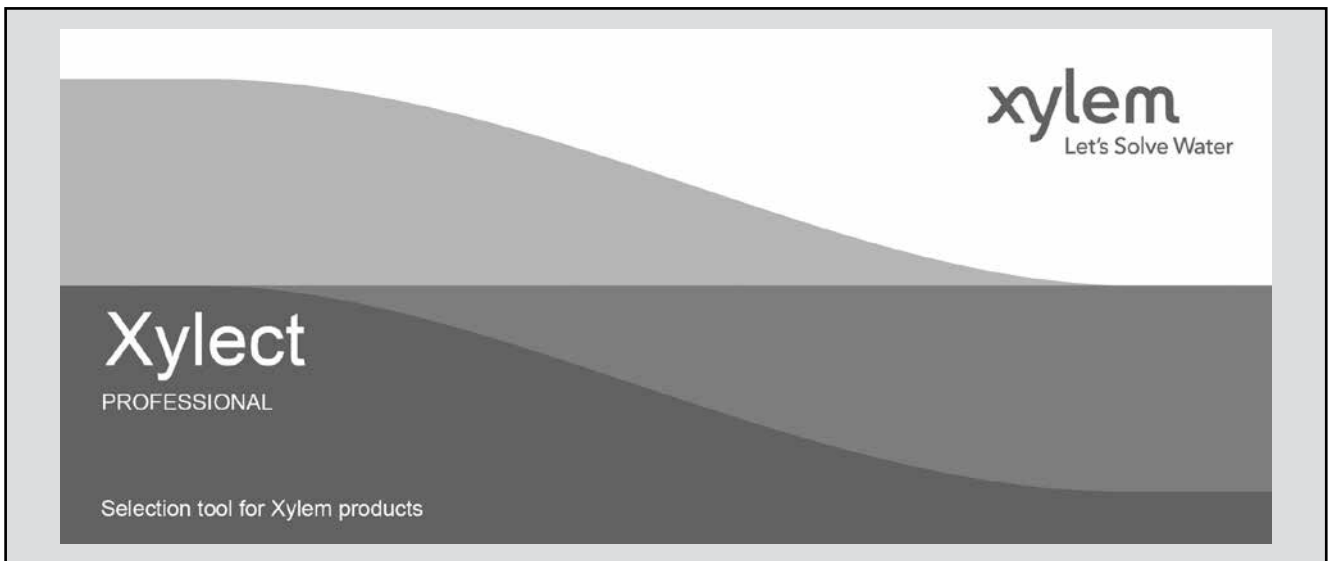
millimetre mm	centimetre cm	metre m	inch in	foot ft	yard yd
1,000	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	1,000	0,0100	0,3937	0,0328	0,0109
1000,0000	100,0000	1,000	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	1,000	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	1,000	0,3333
914,4000	91,4400	0,9144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

VOLUME

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

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.

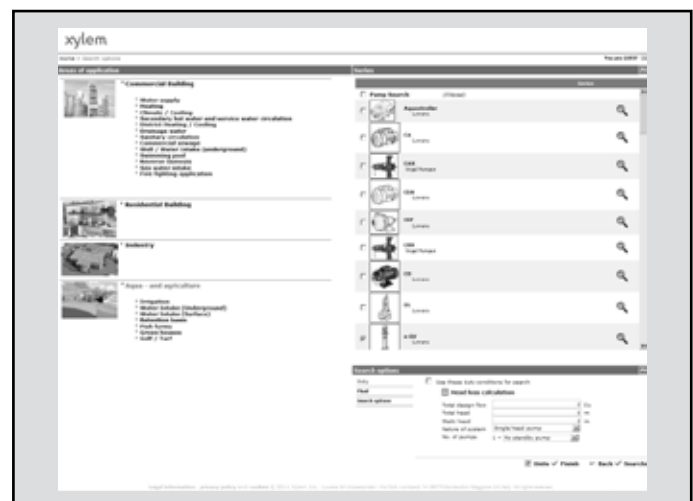
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara and Vogel products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect™ gives a detailed output:

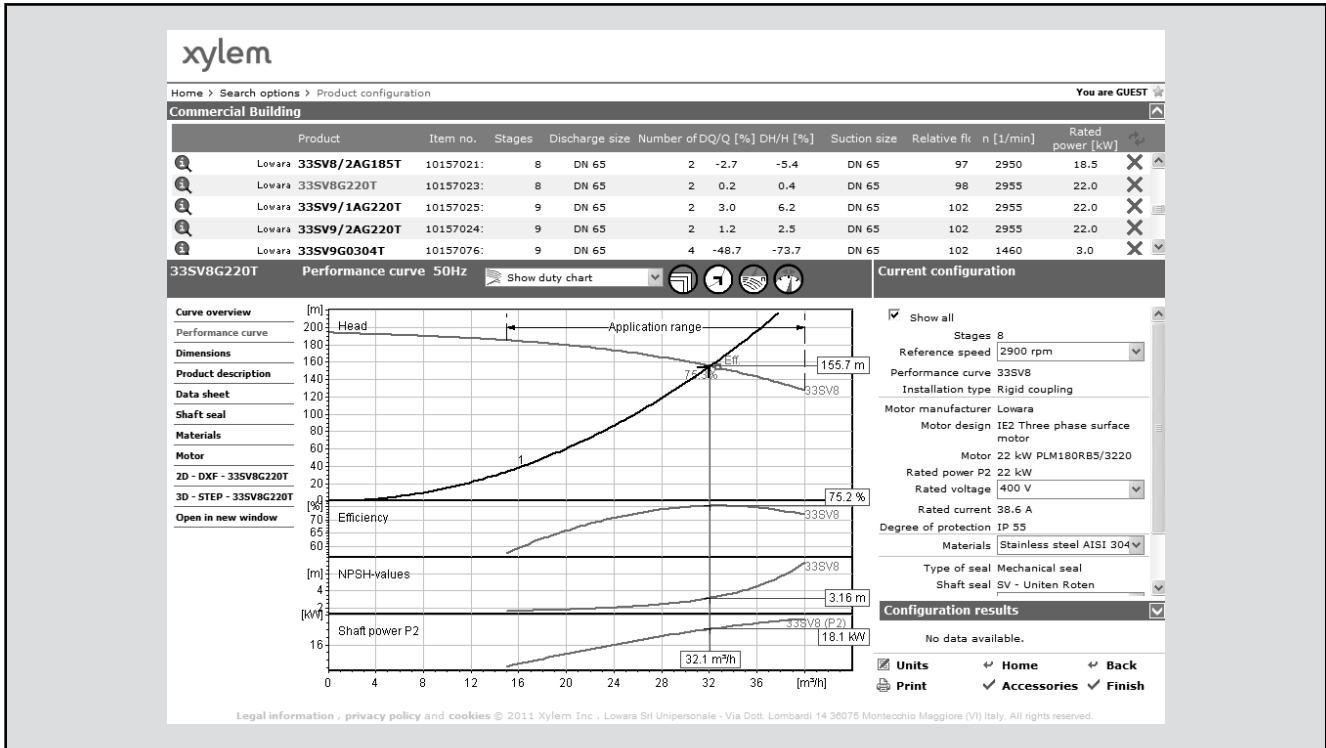
- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files



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

FURTHER PRODUCT SELECTION AND DOCUMENTATION

Xylect™



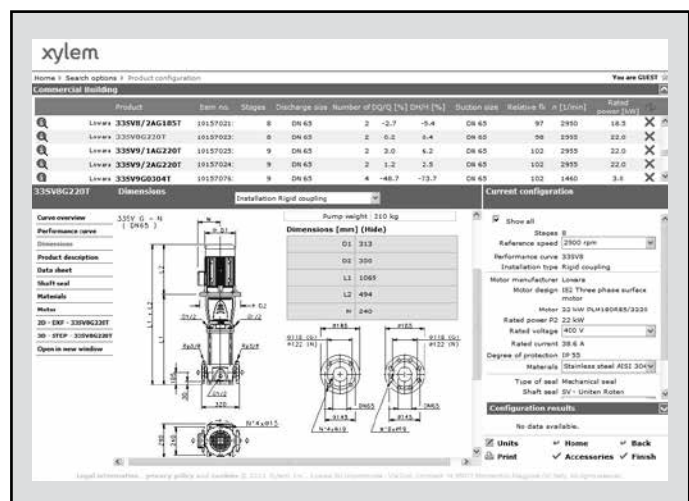
The detailed output makes it easy to select the optimal pump from the given alternatives.

The best way to work with Xylect™ is to create a personal account. This makes it possible to:

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

Every user has a My Xylect space, where all projects are saved.

For more information about Xylect™ please contact our sales network or visit www.xylect.com.



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

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

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