

50 Hz

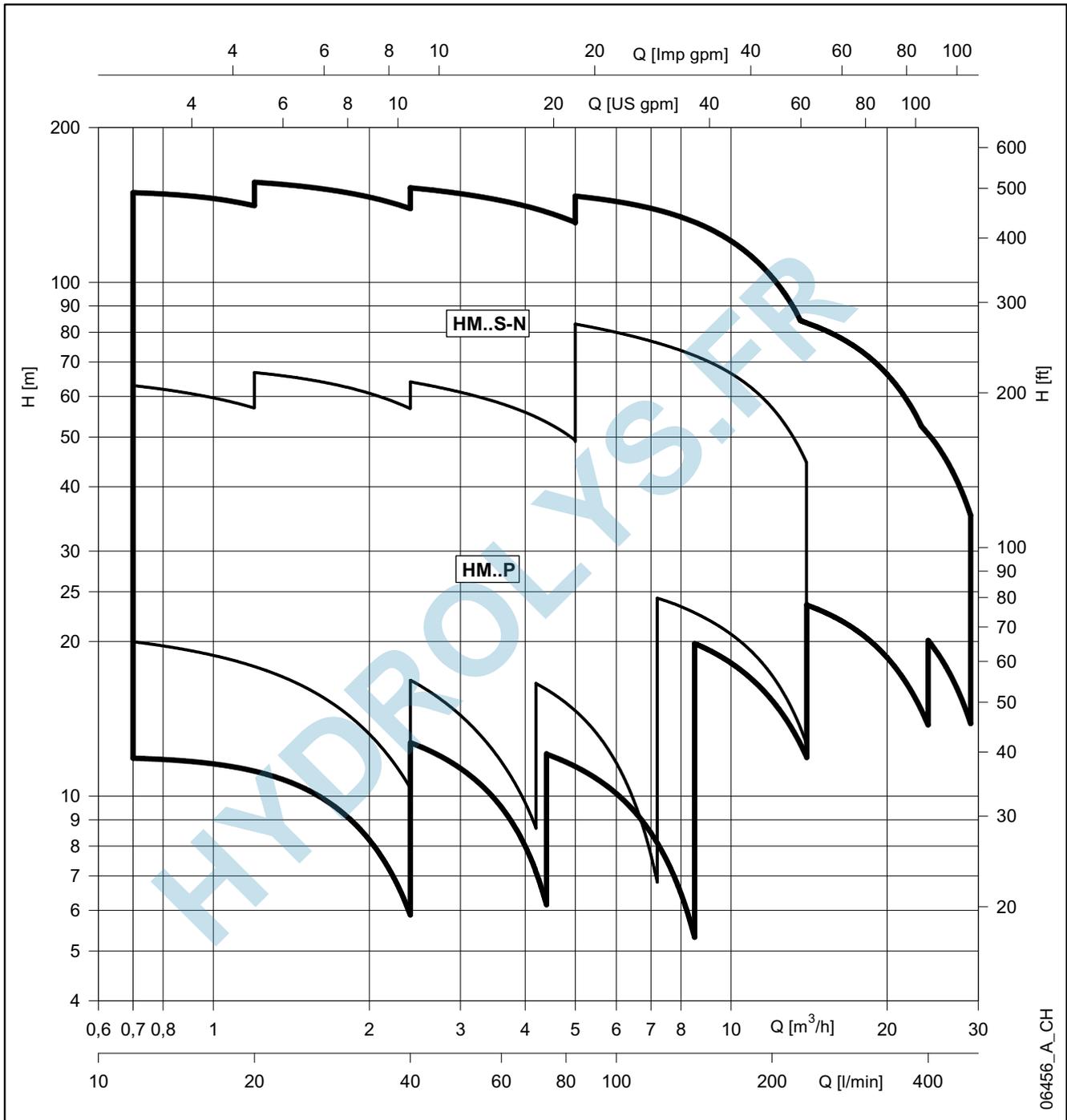


HM..P - HM..S - HM..N e-HM™ Series

THREADED HORIZONTAL MULTISTAGE CENTRIFUGAL ELECTRIC PUMPS
EQUIPPED WITH **IE3** MOTORS

ErP 2009/125/EC

e-HM™ SERIES
HYDRAULIC PERFORMANCE AT 50 Hz



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e-HM™ SERIES

GENERAL INTRODUCTION

Our customers are central to our business.

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

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



Pump design

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

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

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

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

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

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

ErP 2009/125/EC

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

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

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

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

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

Motor

The e-HM™ are equipped with surface motors designed and manufactured in accordance with EN standards. The e-HM™ series can be equipped as well with variable speed drivers such as the e-SM drive and the Hydrovar™.

Range declination

The e-HM™ are available as:

- Fix speed Electric pump.
- Variable speed system

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 e-SM Drive 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 e-SM Drive: 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 e-SM Drive will secure constant pressures at any points of water in your building and constant temperatures even when other taps are opened!



Features

- Compact design with best-in class performances.
- Wide range of performances with 6 sizes and flow up to 29 m³/h.
- Nominal pressure up to 10 bar with Noryl™ impellers and 16 bar with stainless steel impellers.
- Versatile design of the smaller sizes (up to 5HM).
 - Compact version with Noryl™ impellers for restricted space installation.
 - High efficiency version with stainless steel impellers when energy saving is a must.
- Robust and silent design of the larger sizes (from 10HM to 22HM) due the sleeve configuration.
- IE3 Lowara motors: high performances and silent operations.
- Stainless steel material for pump body and main components in contact with the pumped liquid.
- "Essential O-ring design" that highly reduces the sealing weaknesses (1 O-Ring for Compact, 2 for Sleeve).

e-HM™ SERIES APPLICATIONS, BENEFITS – INDUSTRY

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

Applications

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

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

Benefits

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

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

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

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



Features

- Wide range of performances with 6 sizes, flow up to 29 m³/h, pressure up to 159 meters.
- Nominal pressure up to 10 bar with Noryl™ impellers and 16 bar with stainless steel impellers.
- More than 85% of the range has the same suction height (90mm) for easy installation or system upgrade.
- Wide range of temperatures for pumped liquid: -30°C to +120°C (with stainless steel impellers).
- Wide range of voltages for worldwide applications.
- Availability of UL (cURus) motor version for North American market (three-phase motors at 60 Hz). The UL motors meet the requirements of the Premium Efficiency of US Department of Energy.
- "Essential O-ring design" that highly reduces the sealing weaknesses (1 O-Ring for Compact, 2 for Sleeve).
- IE3 Lowara motors: high performances and silent operations.

e-HM™ SERIES GENERAL CHARACTERISTICS

HM..P SERIES	1	3	5	10
Max efficiency flow (m 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
Temperature pumped liquid (°C)	-30... +60/90 (depending on the model)			

1-10hmp_2p50-en_b_tg

HM..S - HM..N SERIES	1	3	5	10	15	22
Max efficiency flow (m 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	159	159	158	102	76,4
Motor power (kW)	0,30 ÷ 1,5	0,30 ÷ 2,2	0,30 ÷ 3	0,75 ÷ 5,5	1,5 ÷ 5,5	2,2 ÷ 5,5
Max η (%) of pump	49	58	69	71	72	71
Temperature pumped liquid (°C)	-30... +60/90/120 (depending on the model)					

1-22hm_2p50-en_b_tc

CONNECTIONS

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

1-22hm_2p50-en_b_tc

ELECTRIC PUMP NOISE

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

1-22hm_mot_2p50-en_a_tr

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

STORAGE AND TRANSPORT TEMPERATURE

from -40°C to +60°C.

e-HM™ SERIES

High efficiency horizontal multistage pump

MARKET SECTORS

BUILDING SERVICES.
INDUSTRY.

APPLICATIONS

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

SPECIFICATIONS

PUMP

- Flow rate: up to 29 m³/h.
- Head: up to 159 m.
- Ambient temperature:
from -15°C to +50°C for three-phase version.
from -15°C to +45°C for single-phase version (from -15°C to +40°C for models 1HM06S/N, 3HM03S/N, 3HM02P, 5HM02S/N and for all models equipped with 0,95 kW motor).
- Temperature of the pumped liquid:
minimum from -10°C to -30°C according to gasket material.
maximum +90°C for three-phase version and uses according to EN 60335-2-41.
+120°C for three-phase version with stainless steel impellers (HM..S, HM..N) and uses other than EN 60335-2-41.
+60°C for single-phase version.
- Maximum operating pressure:
10 bar (PN 10) for pumps with Noryl™ impeller.
16 bar (PN 16) for pumps with stainless steel impeller.
- Connections: Rp threaded for both suction and discharge manifold.
- Hydraulic performances compliant with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A).

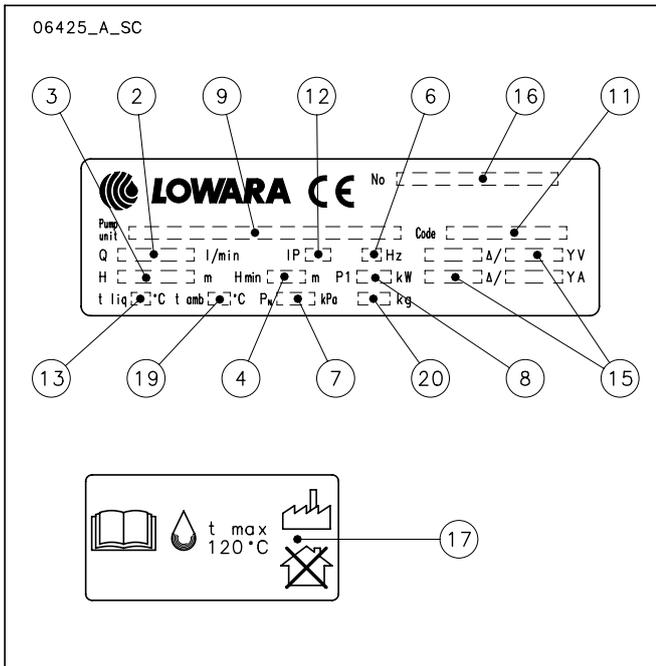
MOTOR

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

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

e-HM™ SERIES
ELECTRIC PUMP RATING PLATE

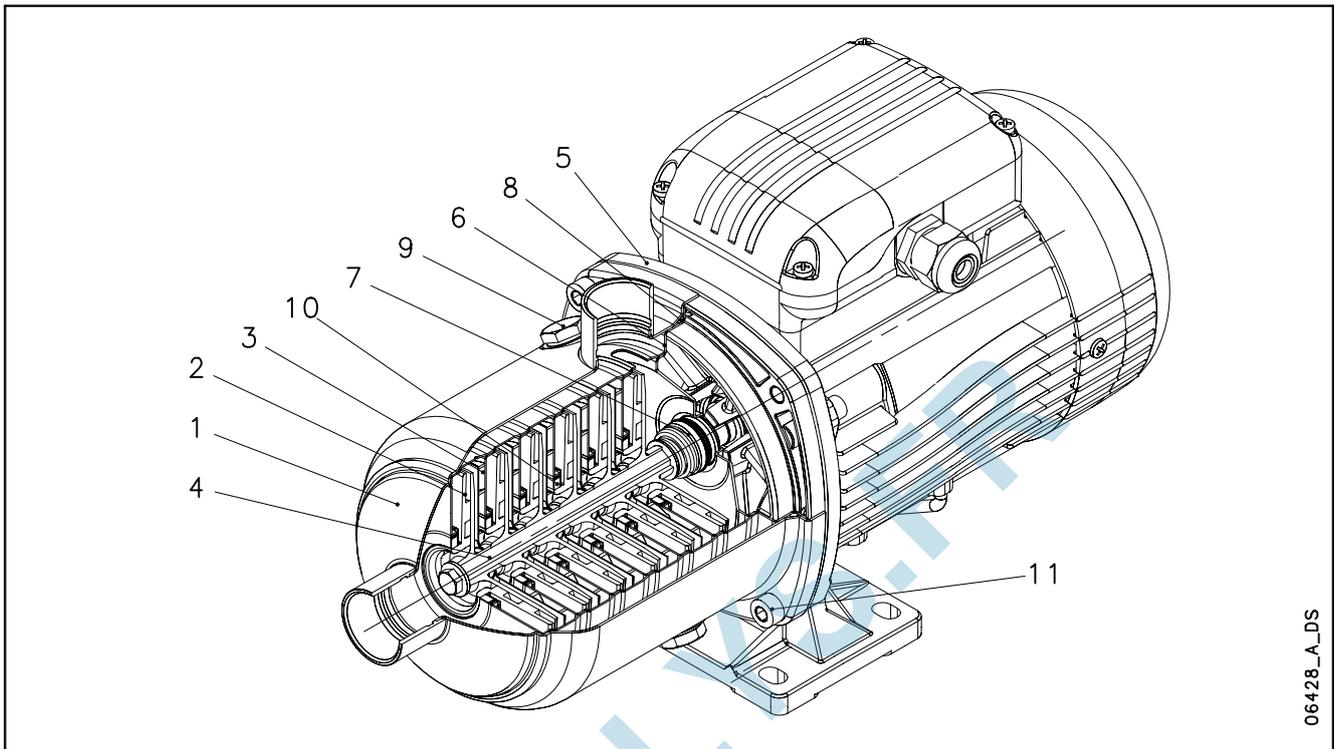
LEGEND



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

1, 3, 5 HM..P SERIES

ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



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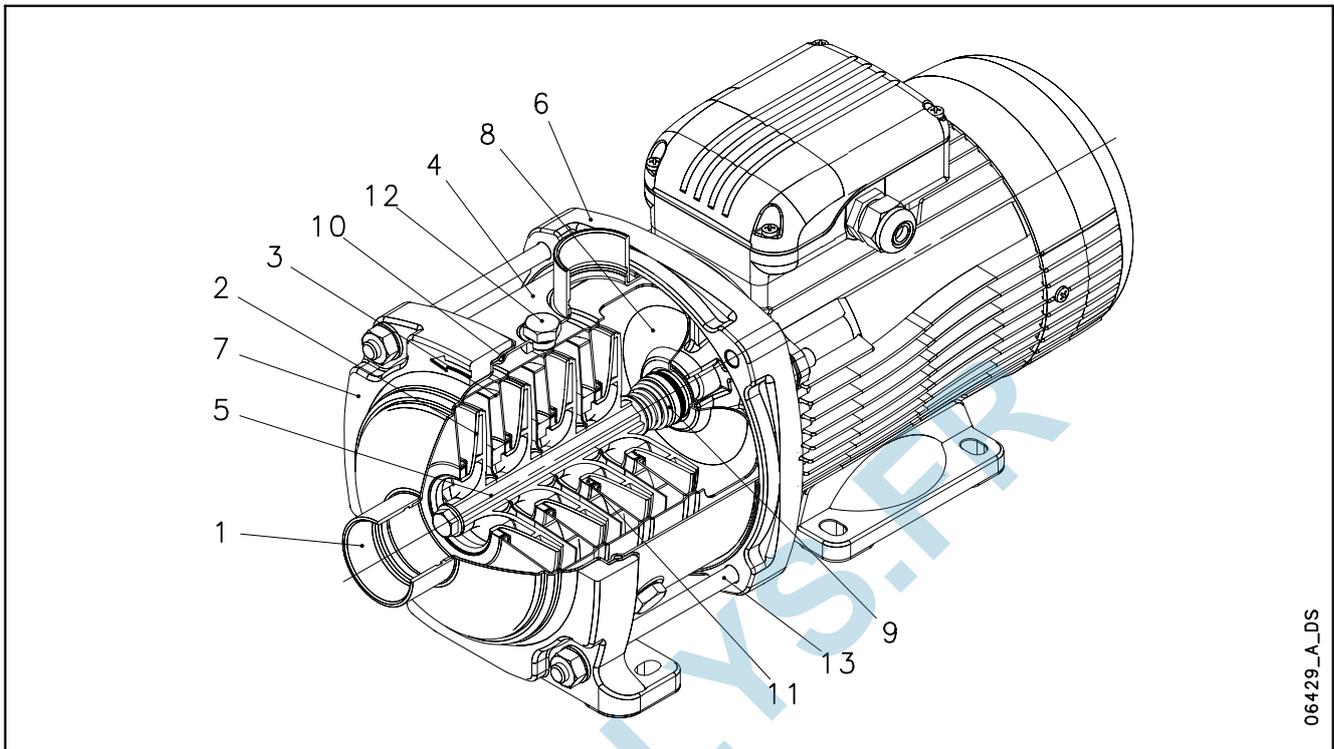
TABLE OF MATERIALS

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

1-3-5hm-p-en_a_tm

10 HM..P SERIES

ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



06429_A_DS

TABLE OF MATERIALS

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

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

ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS

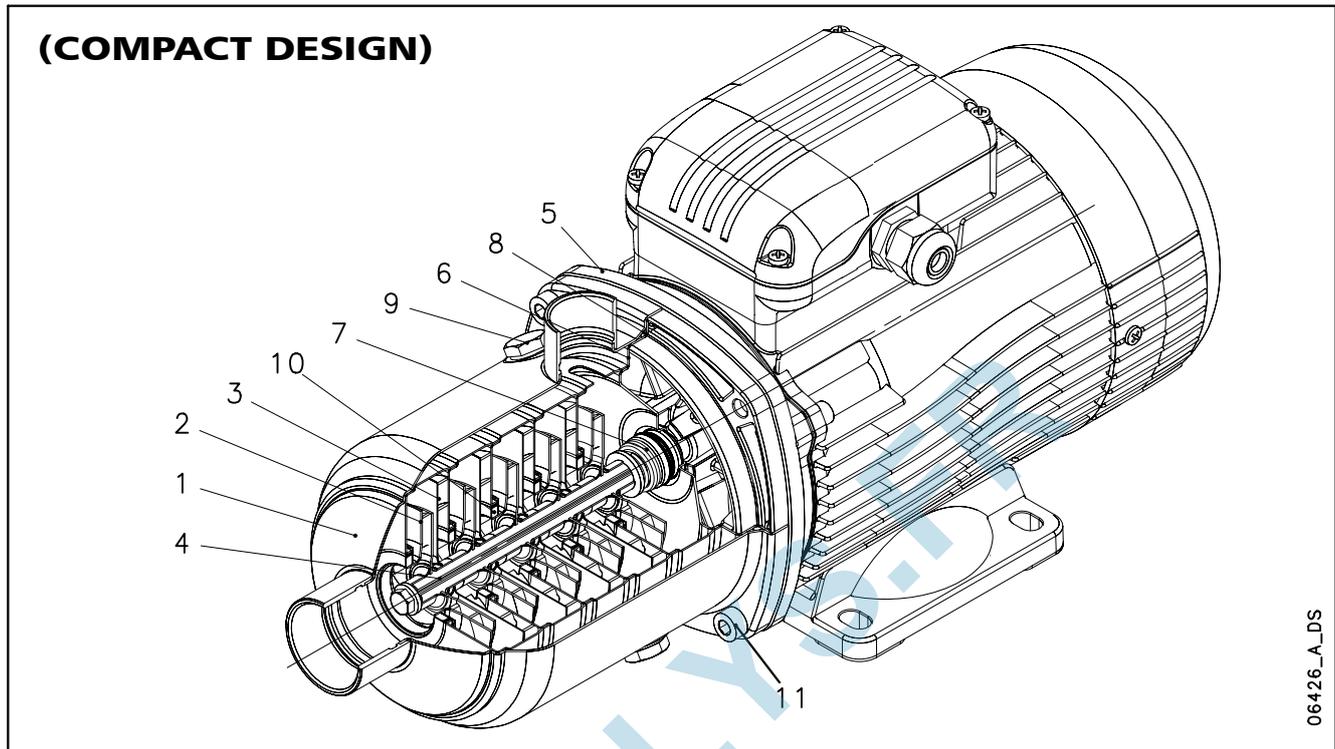


TABLE OF MATERIALS HM..S SERIES

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

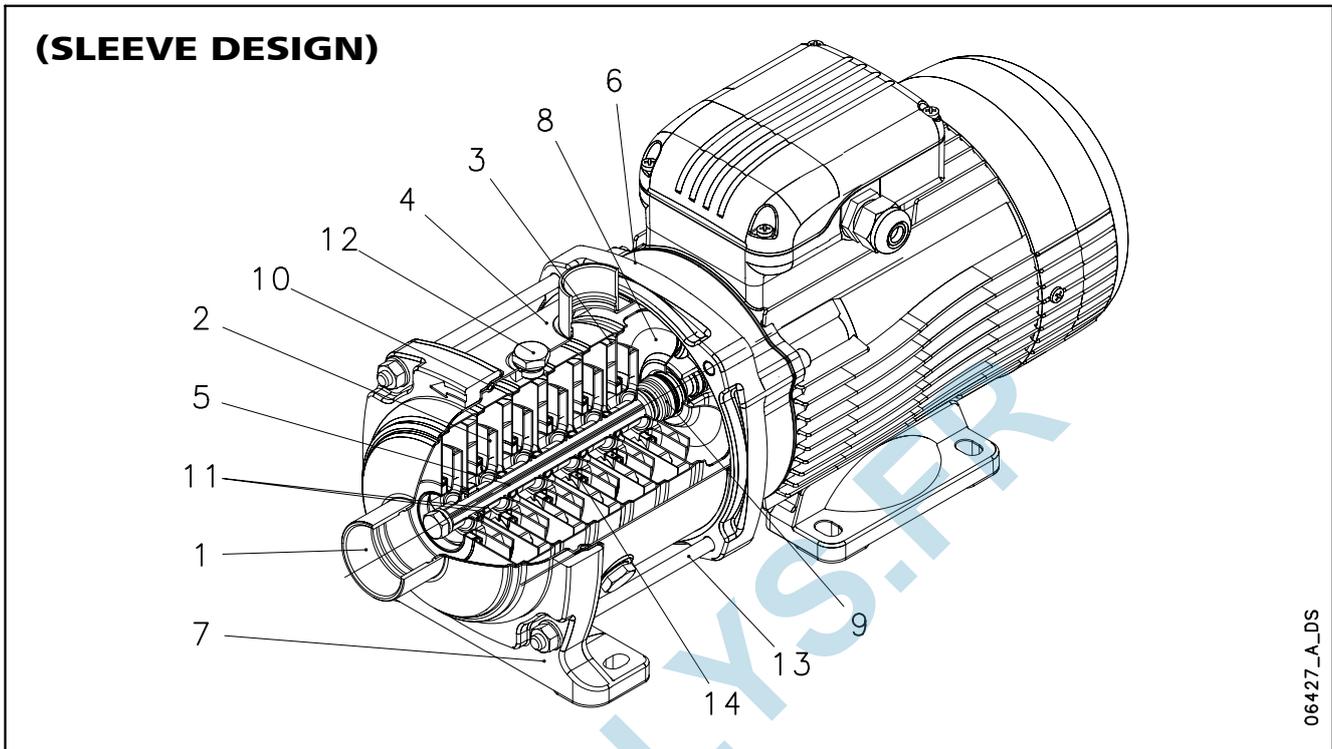


TABLE OF MATERIALS HM..S SERIES

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-AISI11Cu2 (Fe) (AC46100)	-
7	Ring with foot	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
8	Seal housing	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
9	Mechanical seal	Ceramic / Carbon / EPDM (PN10)	- Silicon Carbide/Carbon/EPDM (PN16)	
10	Elastomers	EPDM		
11	Shaft sleeve and bushing	Tungsten carbide		
12	Fill / drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
13	Tie rods	Stainless steel	EN 10088-1-X17CrNi16-2 (1.4057)	AISI 431
14	Wear ring	Technopolymer (PPS)		

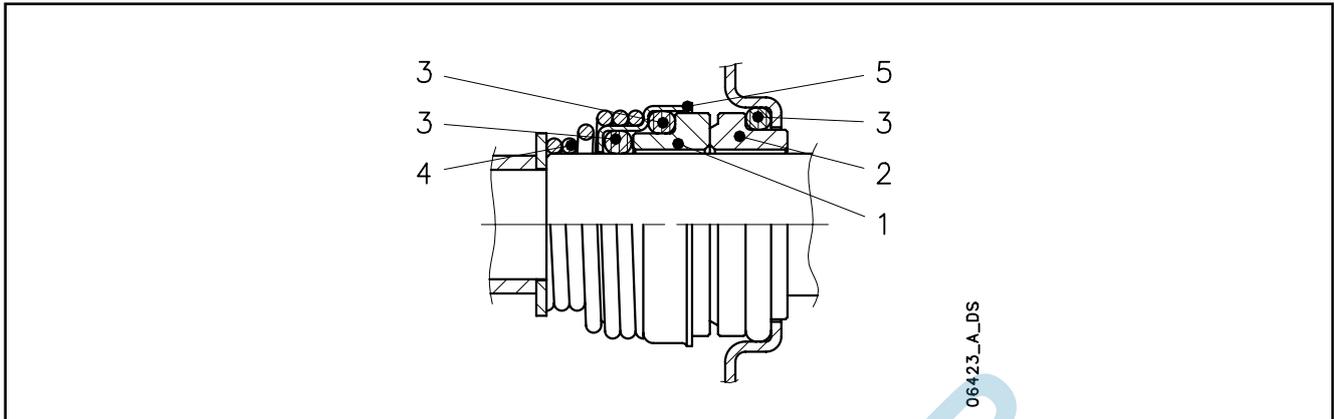
TABLE OF MATERIALS HM..N SERIES

1-22hm-cm-s_a_tm

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

1-22hm-cam-n-en_a_tm

**e-HM™ SERIES
MECHANICAL SEALS**



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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®)	

1-22hm_ten-mec-en_a_tm

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 - PN10							
VBEGG	V	B	E	G	G	-30 + 90	PN10
STANDARD MECHANICAL SEAL - PN16							
Q ₁ BEGG	Q ₁	B	E	G	G	-30 + 120	PN16
OTHER TYPES OF AVAILABLE MECHANICAL SEAL							
VBVGG	V	B	V	G	G	-10 + 90	PN10
Q ₁ Q ₁ VGG	Q ₁	Q ₁	V	G	G	-10 + 90 (+120)	PN16 (PN10)
Q ₁ Q ₁ KGG	Q ₁	Q ₁	K	G	G	-20 + 90 (+120)	PN16 (PN10)
Q ₁ Q ₁ EGG	Q ₁	Q ₁	E	G	G	-30 + 90 (+120)	PN16 (PN10)
Q ₁ BVGG	Q ₁	B	V	G	G	-10 + 120	PN16
Q ₁ BKGG	Q ₁	B	K	G	G	-20 + 120	PN16

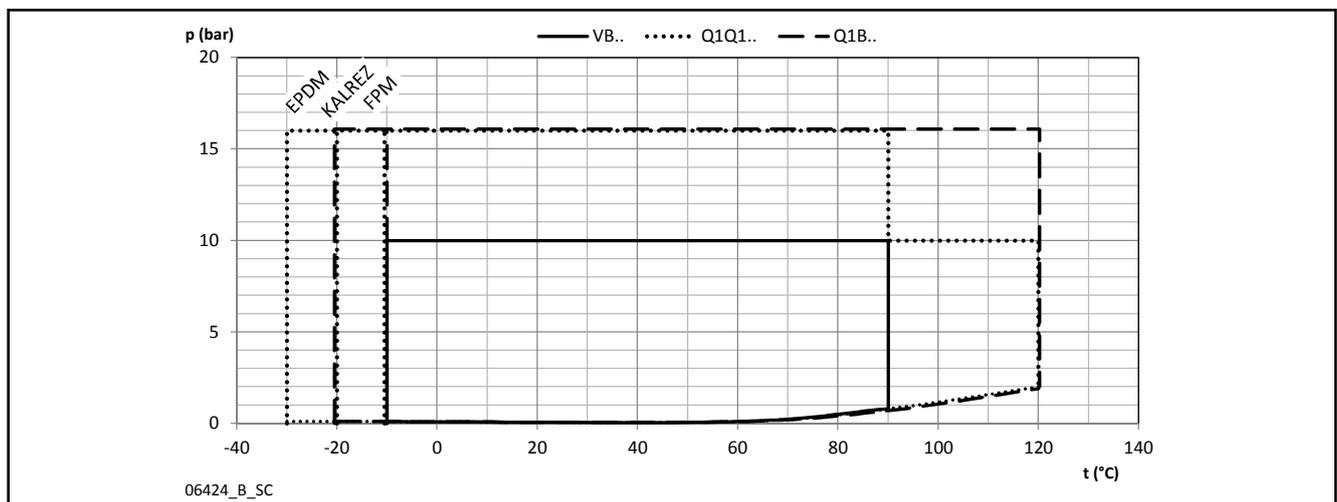
* For all single-phase versions limit the temperature to +60°C.
For three-phase HM..P limit the temperature to +90°C.

1-22hm_tipi-ten-mec-en_c_tc

PRESSURE/TEMPERATURE APPLICATION LIMITS FOR COMPLETE PUMP

The pressure limit could be different according to:

- stage number, please refer to the PN column of the DIMENSIONS AND WEIGHT tables;
- type of seal, please refer to the PN column of the TYPE OF SEAL table.



06424_B_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					Q1Q1VGG	V
Aluminium sulfate	30	-5 +50	2,71	•	•	•	Q1Q1EGG	E
Ammonia in water	25	-20 +50	0,99	•	•	•	Q1BEGG	E
Ammonium sulfate	10	-10 +60	1,77	•	•	•	Q1Q1EGG	E
Benzoic acid	70	0 +70	1,31		•	•	Q1BVGG	V
Boric acid	saturated	-10 +90	1,43		•	•	Q1Q1VGG	V
Butyl alcohol	100	-5 +80	0,81	•	•	•	Q1BEGG	E
Caustic soda	25	0 +70	2,13		•	•	Q1Q1EGG	E
Chloroform	100	-10 +30	1,48		•	•	Q1BVGG	V
Citric acid	5	-10 +70	1,54	•	•	•	Q1BEGG	E
Cleaning products	10	-5 +100			•	•	Q1Q1VGG	V
Copper sulfate	20	0 +30	2,28	•	•	•	Q1Q1VGG	V
Cutting fluid	100	-5 +110	0,90		•	•	Q1BVGG	V
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		•	•	Q1BVGG	V
Emulsion oil and water	any	-5 +90			•	•	Q1BVGG	V
Ethyl alcohol	100	-5 +40	0,81	•	•	•	Q1BEGG	E
Ethylene glycol	30	-30 +120		•	•	•	Q1BEGG	E
Formaldehyde	100	0 +30	1,13		•	•	Q1Q1KGG	K
Formic acid	5	-15 +25	1,22		•	•	Q1BKGG	K
Glycerine	100	+20 +90	1,26	•	•	•	Q1BEGG	E
Hydraulic oil	100	-5 +110			•	•	Q1BVGG	V
Hydrochloric acid	2	-5 +25	1,20	•	•	•	Q1Q1VGG	V
Hydroxide sodium	25	0 +70		•	•	•	Q1Q1EGG	E
Iron sulfate	10	-5 +30	2,09	•	•	•	Q1Q1EGG	E
Methyl alcohol	100	-5 +40	0,79	•	•	•	Q1BEGG	E
Mineral oil	100	-5 +110	0,94		•	•	Q1BVGG	V
Nitric acid	50	-5 +30	1,48	•	•	•	Q1Q1KGG	K
Perchloroethylene	100	-10 +30	1,60		•	•	Q1BKGG	K
Phosphates-polyphosphates	10	-5 +90		•	•	•	Q1Q1VGG	V
Phosphoric acid	1	-5 +30	1,33		•	•	Q1BVGG	V
Propyl alcohol (Propanol)	100	-5 +80	0,80	•	•	•	Q1BEGG	E
Propylene glycol	30	-30 +120		•	•	•	Q1BVGG	V
Sodium bicarbonate (Baking soda)	saturated			•	•	•	Q1BEGG	E
Sodium hypochlorite	1	-10 +25		•	•	•	Q1Q1VGG	V
Sodium nitrate	saturated	-10 +80	2,25		•	•	Q1BEGG	E
Sodium sulfate	15	-10 +40	2,60	•	•	•	Q1Q1EGG	E
Sulphuric acid	2	-10 +25	1,84		•	•	Q1BVGG	V
Tannic acid	20	0 +50		•	•	•	Q1BEGG	E
Tartaric acid	50	-10 +25	1,76		•	•	Q1Q1VGG	V
Trichloroethylene	100	-10 +40	1,46		•	•	Q1BKGG	K
Uric acid	80	-10 +80	1,89		•	•	Q1BEGG	E
Vegetable oil	100	-5 +110	0,95		•	•	Q1BVGG	V
Water	100	-5 +120		•	•	•	Q1BEGG	E
Water condensate	100	-5 +100	1	•	•	•	Q1BEGG	E
Water detergents, mineral oils mixture	10	-5 +80			•	•	Q1Q1VGG	V

tab-comp-hm-en_b_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 **Regulations (EC) No 640/2009** and **(EU) No 4/2014** implementing the requirements of the EuP and ErP Directives.

In accordance with regulations, the **three-phase 50 Hz surface motors with power outputs ranging from 0,75 to 375 kW** have IE3 as minimum level of efficiency or IE2 fitted with variable speed drive. IE2 motor can be supplied without frequency converter as the obligation to have that device is related to when the motor in working and not when placed on the market.

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

SINGLE-PHASE MOTORS AT 50 Hz, 2-POLE

P _N kW	MOTOR TYPE	IEC SIZE	Construction Design	INPUT	CAPACITOR		DATA FOR 230 V 50 Hz VOLTAGE						
				CURRENT I _n (A) 220-240 V	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

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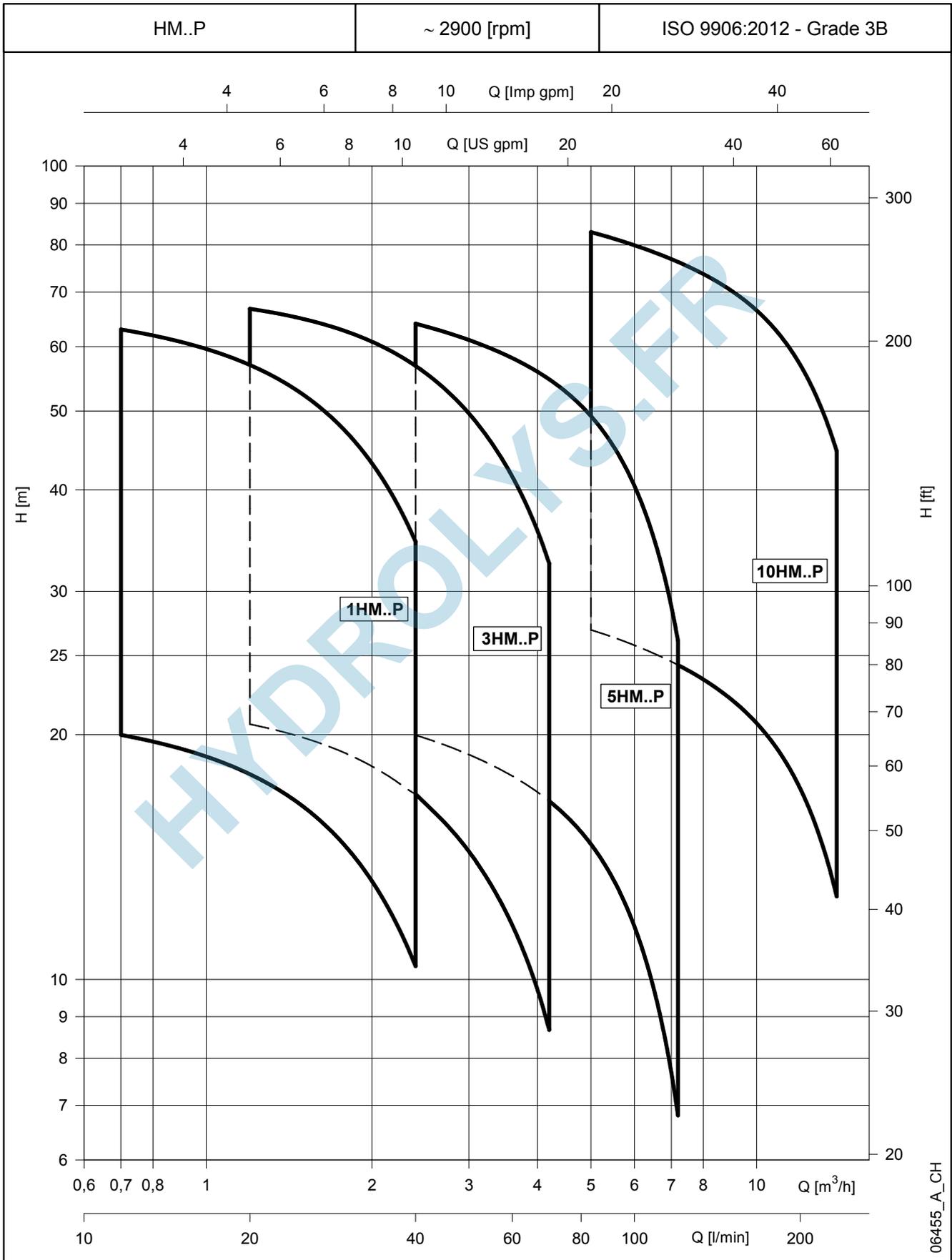
e-HM™ SERIES THREE-PHASE MOTORS AT 50 Hz, 2-POLE

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	65,1	64,4	59,3	65,2	62,1	54,7	62,8	58,5	50,1	-	-	-	-	-	-	-	-	-	-	
0,40	72,7	72,3	67,9	71,4	69,5	63,5	68,7	65,9	58,8	-	-	-	-	-	-	-	-	-	-	
0,50	72,9	73,5	70,3	72,3	71,5	66,7	71,1	69,1	63,0	-	-	-	-	-	-	-	-	-	-	
0,55	77,3	76,9	73,3	77,1	75,8	71,3	76,1	74,3	69,1	-	-	-	-	-	-	-	-	-	-	
0,75	82,5	83,1	81,3	82,8	82,7	80,1	82,6	82,0	78,9	82,5	82,0	78,9	82,5	82,0	78,9	82,5	82,0	78,9	-	
1,1	84,0	84,7	83,4	84,4	84,5	82,5	84,3	84,0	81,4	84,0	84,0	81,4	84,0	84,0	81,4	84,0	84,0	81,4	-	
1,5	85,6	86,5	85,8	85,9	86,4	84,9	86,0	86,0	84,0	85,6	86,0	84,0	85,6	86,0	84,0	85,6	86,0	84,0	-	
2,2	86,5	87,4	86,8	86,4	86,9	85,7	86,6	86,7	85,0	86,4	86,7	85,0	86,4	86,7	85,0	86,4	86,7	85,0	3	
3	87,2	88,5	88,3	87,5	88,2	87,5	87,5	87,8	86,4	87,2	87,8	86,4	87,2	87,8	86,4	87,2	87,8	86,4	-	
4	89,1	90,1	89,2	89,1	90,1	89,2	89,1	90,1	89,2	89,1	90,3	90,4	89,6	90,4	89,9	89,6	90,1	89,2	-	
5,5	89,5	89,6	88,0	89,5	89,6	88,0	89,5	89,6	88,0	89,5	90,3	89,9	89,7	90,0	89,0	89,6	89,6	88,0	-	

P _N kW	Manufacturer		IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Xylem Service Italia Srl Reg. No. 07520560967 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	0,63	4,20	1,04	4,18	4,12
0,40	SM63HM../304		63				0,64	4,35	1,37	4,14	4,10
0,50	SM63HM../305		63				0,69	4,72	1,75	4,08	4,00
0,55	SM71HM../305		71				0,71	6,25	1,84	3,96	3,97
0,75	SM80HM../307 E3		80				0,78	7,38	2,48	3,57	3,75
1,1	SM80HM../311 E3		80				0,79	8,31	3,63	3,95	3,95
1,5	SM80HM../315 E3		80				0,80	8,80	4,96	4,31	4,10
2,2	PLM90HM../322 E3		90				0,80	8,77	7,28	3,72	3,70
3	PLM90HM../330 E3		90				0,79	7,81	9,93	4,26	3,94
4	PLM100HM../340 E3		100				0,85	9,13	13,2	3,82	4,32
5,5	PLM112HM../355 E3		112				0,85	10,5	18,1	4,74	5,11

P _N kW	Voltage U _N V											n _N min ⁻¹	Observe the regulations and codes locally in force regarding sorted waste disposal.	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	1,66	1,82	1,96	0,96	1,05	1,13	-	-	-	-	-	2715 ÷ 2775	≤ 1000	-15 / 40	No	
0,40	2,03	2,18	2,32	1,17	1,26	1,34	-	-	-	-	-	2745 ÷ 2800				
0,50	2,42	2,51	2,65	1,40	1,45	1,53	-	-	-	-	-	2690 ÷ 2765				
0,55	2,46	2,49	2,56	1,42	1,44	1,48	-	-	-	-	-	2835 ÷ 2865				
0,75	2,96	2,94	2,96	1,71	1,70	1,71	1,70	1,69	1,70	0,98	0,98	2875 ÷ 2895				
1,1	4,19	4,14	4,16	2,42	2,39	2,40	2,41	2,38	2,38	1,39	1,37	2870 ÷ 2900				
1,5	5,56	5,49	5,51	3,21	3,17	3,18	3,21	3,18	3,19	1,85	1,84	2870 ÷ 2895				
2,2	7,97	7,90	7,98	4,60	4,56	4,61	4,57	4,54	4,57	2,64	2,62	2880 ÷ 2900				
3	11,0	11,0	11,2	6,35	6,33	6,44	6,29	6,27	6,34	3,63	3,62	2865 ÷ 2895				
4	13,6	13,4	13,4	7,87	7,75	7,74	7,80	7,62	7,61	4,50	4,40	2885 ÷ 2910				
5,5	18,1	17,9	18,1	10,4	10,4	10,4	10,6	10,5	10,7	6,10	6,05	2880 ÷ 2910				

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

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 _N kW	TYPE	* P ₁ kW	* I		V/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								
1HM03	1 ~	0,50	SM63HM../1055	0,56	2,62	-	33,6	30,3	28,8	26,7	24,3	21,5	18,5	15,9
1HM04		0,50	SM63HM../1055	0,65	2,90	-	44,0	39,3	37,2	34,4	31,1	27,4	23,3	19,9
1HM05		0,50	SM63HM../1055	0,74	3,22	-	54,0	47,8	45,1	41,4	37,2	32,4	27,3	23,1
1HM06		0,75	SM71HM../1075	0,94	4,33	-	67,1	60,1	57,0	52,8	48,0	42,4	36,3	31,1
1HM02	3 ~	0,30	SM63HM../303	0,36	1,89	1,09	22,5	20,2	19,2	17,9	16,2	14,4	12,4	10,6
1HM03		0,30	SM63HM../303	0,47	1,94	1,12	32,8	29,2	27,5	25,4	22,9	20,1	17,1	14,5
1HM04		0,40	SM63HM../304	0,58	2,34	1,35	44,1	39,3	37,2	34,3	31,0	27,3	23,2	19,8
1HM05		0,50	SM63HM../305	0,69	2,64	1,52	54,4	48,1	45,4	41,7	37,5	32,9	27,8	23,5
1HM06		0,75	SM80HM../307 E3	0,84	2,80	1,62	69,3	63,0	60,1	56,1	51,4	45,9	39,8	34,5

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

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

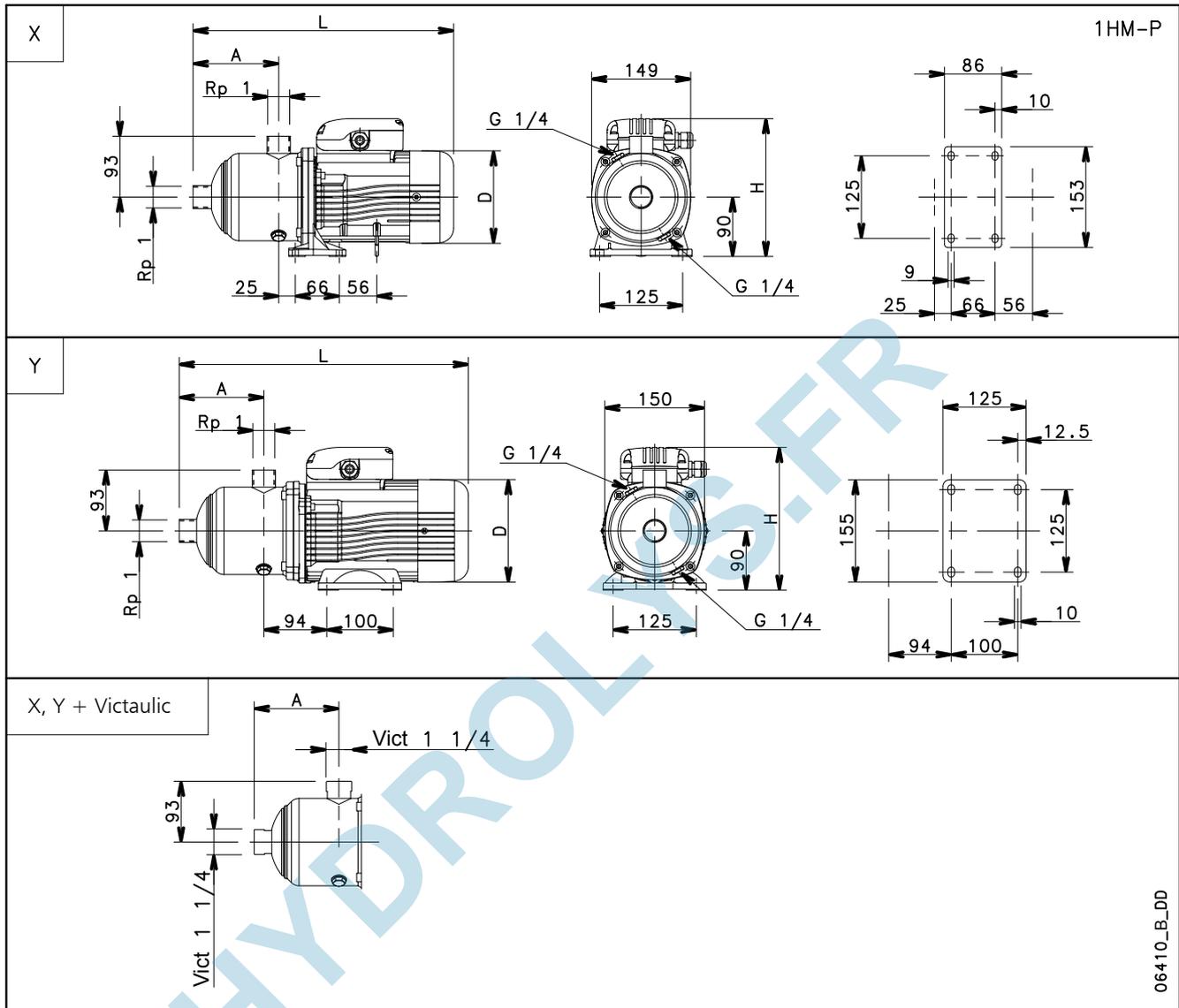
PUMP TYPE HM..P	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY							
		P _N kW	TYPE	* P ₁ kW	* I		V/min 0 m ³ /h 0	83,3 5,0	108 6,5	133 8,0	158 9,5	183 11,0	208 12,5	233 14,0
					220-240 V A	380-415 V A								
10HM02	1 ~	1,1	SM80HM../1115	1,33	6,06	-	30,6	26,9	25,2	23,4	21,4	19,1	16,2	12,6
10HM03		1,5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

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

1-10hm-p-2p50-en_b_th

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

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



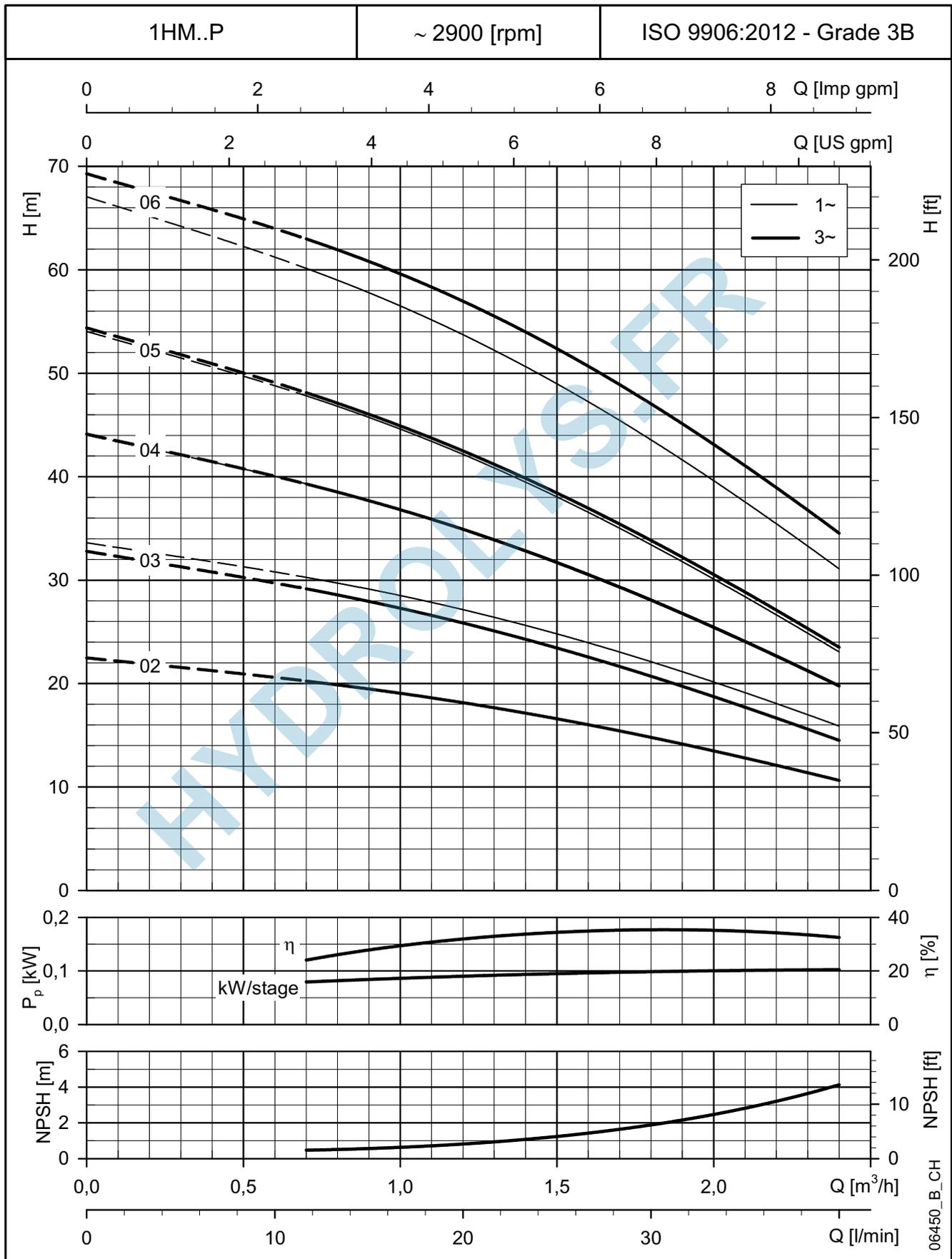
06410_B_DD

PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)				PN bar	WEIGHT kg
			kW	SIZE	A	D	H	L		
1HM03	SINGLE-PHASE	X	0,50	63	87	120	201	336	10	7
1HM04			0,50	63	107	120	201	356	10	7
1HM05			0,50	63	127	120	201	376	10	8
1HM06			0,75	71	147	140	211	410	10	9
1HM02	THREE-PHASE	X	0,30	63	87	120	201	336	10	6
1HM03			0,30	63	87	120	201	336	10	6
1HM04			0,40	63	107	120	201	356	10	7
1HM05			0,50	63	127	120	201	376	10	8
1HM06		Y	0,75	80	147	155	219	455	10	13

1hm-p-2p50-en_b_td

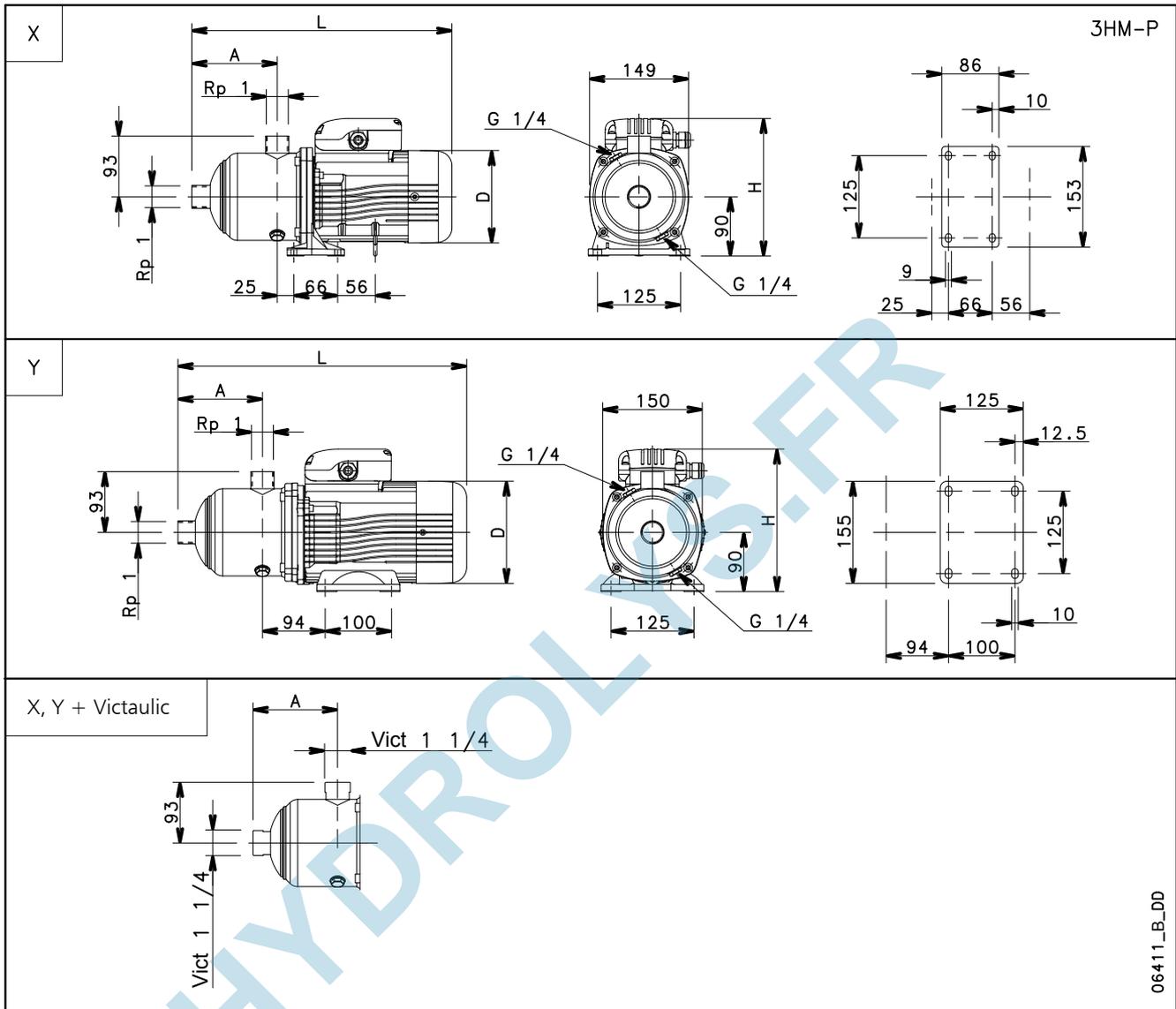
1HM..P SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

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



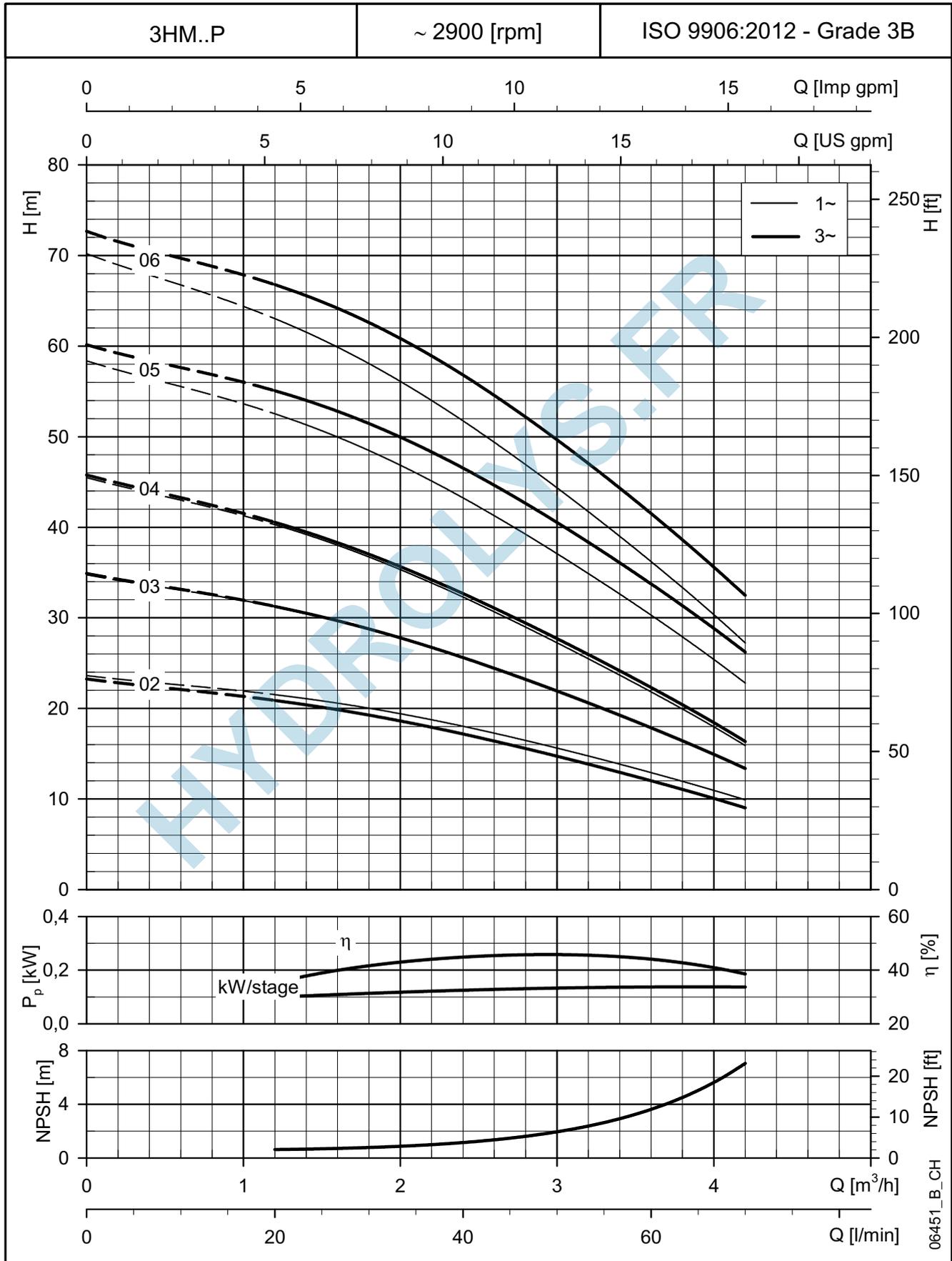
06411_B_DD

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

3hm-p-2p50-en_b_td

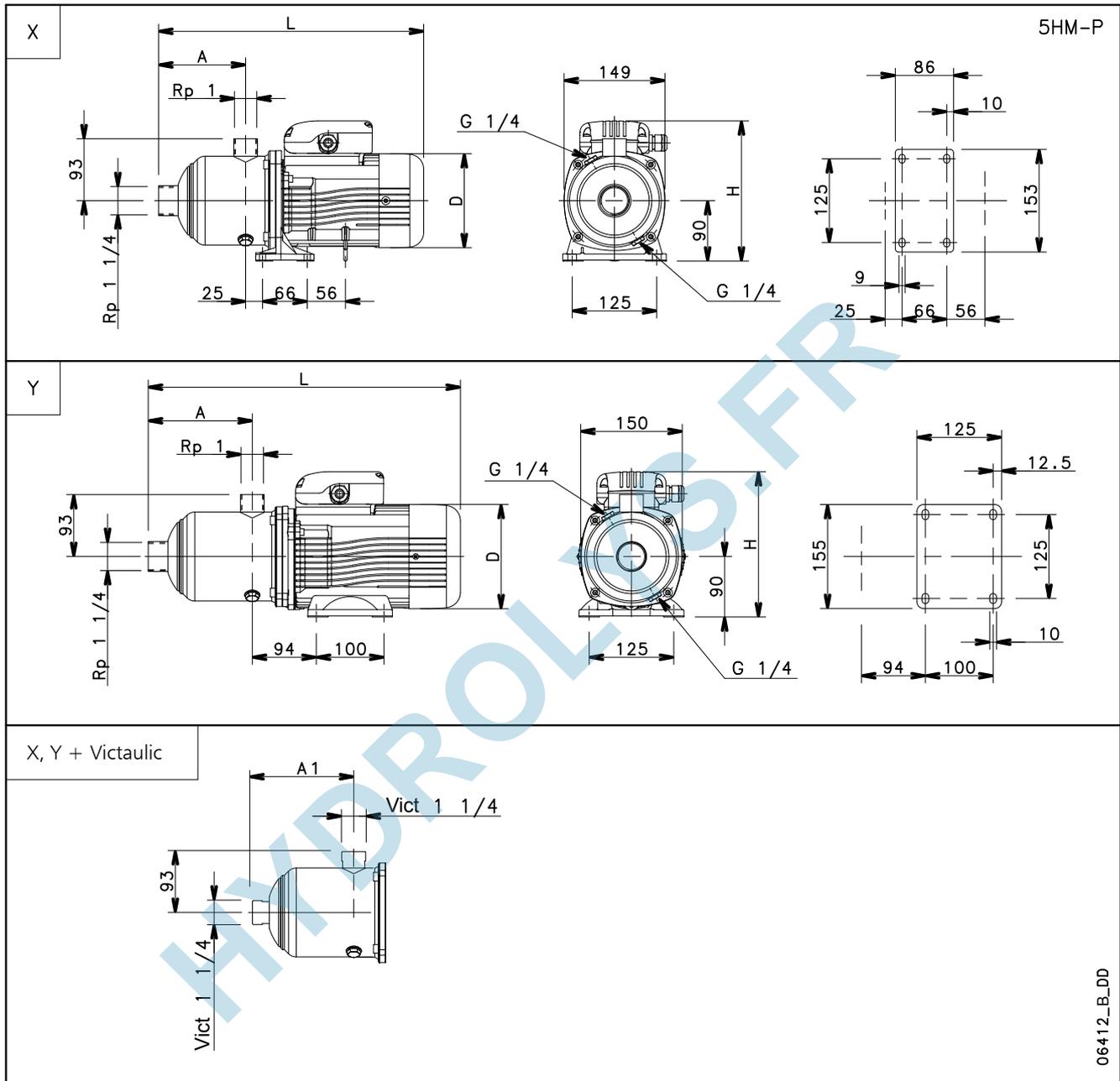
3HM..P SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

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



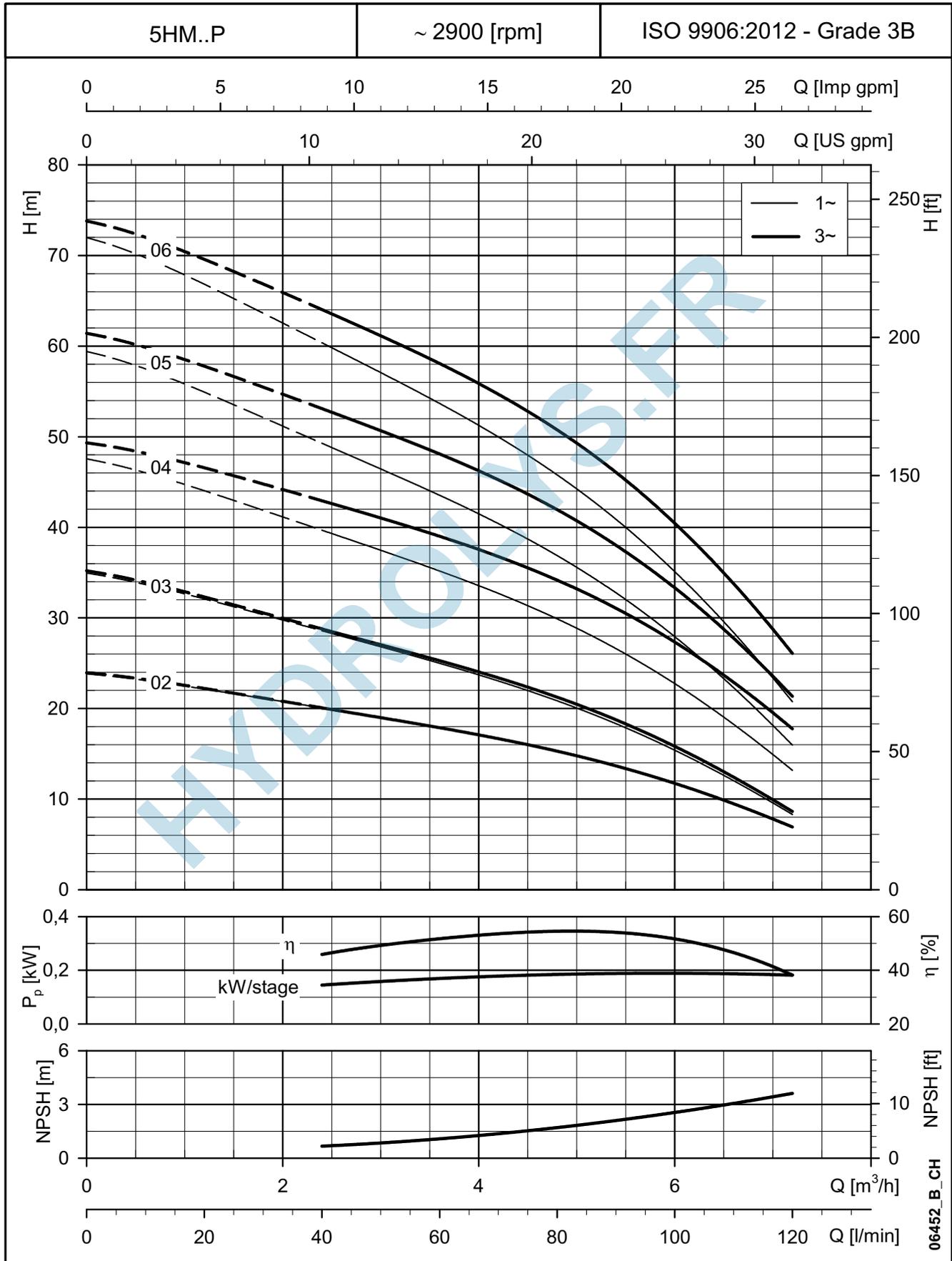
06412_B_DD

PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)					PN bar	WEIGHT kg
			kW	SIZE	A	A1	D	H	L		
5HM02	SINGLE-PHASE	X	0.50	63	89	-	120	201	338	10	7
5HM03			0.50	63	89	-	120	201	338	10	7
5HM04			0.75	71	109	-	140	211	372	10	10
5HM05			0.95	71	129	-	140	220	392	10	11
5HM06		1.1	80	149	147.3	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	107.3	155	219	417	10	13
5HM05			1.1	80	129	127.3	155	219	437	10	14
5HM06			1.5	80	149	147.3	155	219	457	10	15

5hm-p-2p50-en_c_td

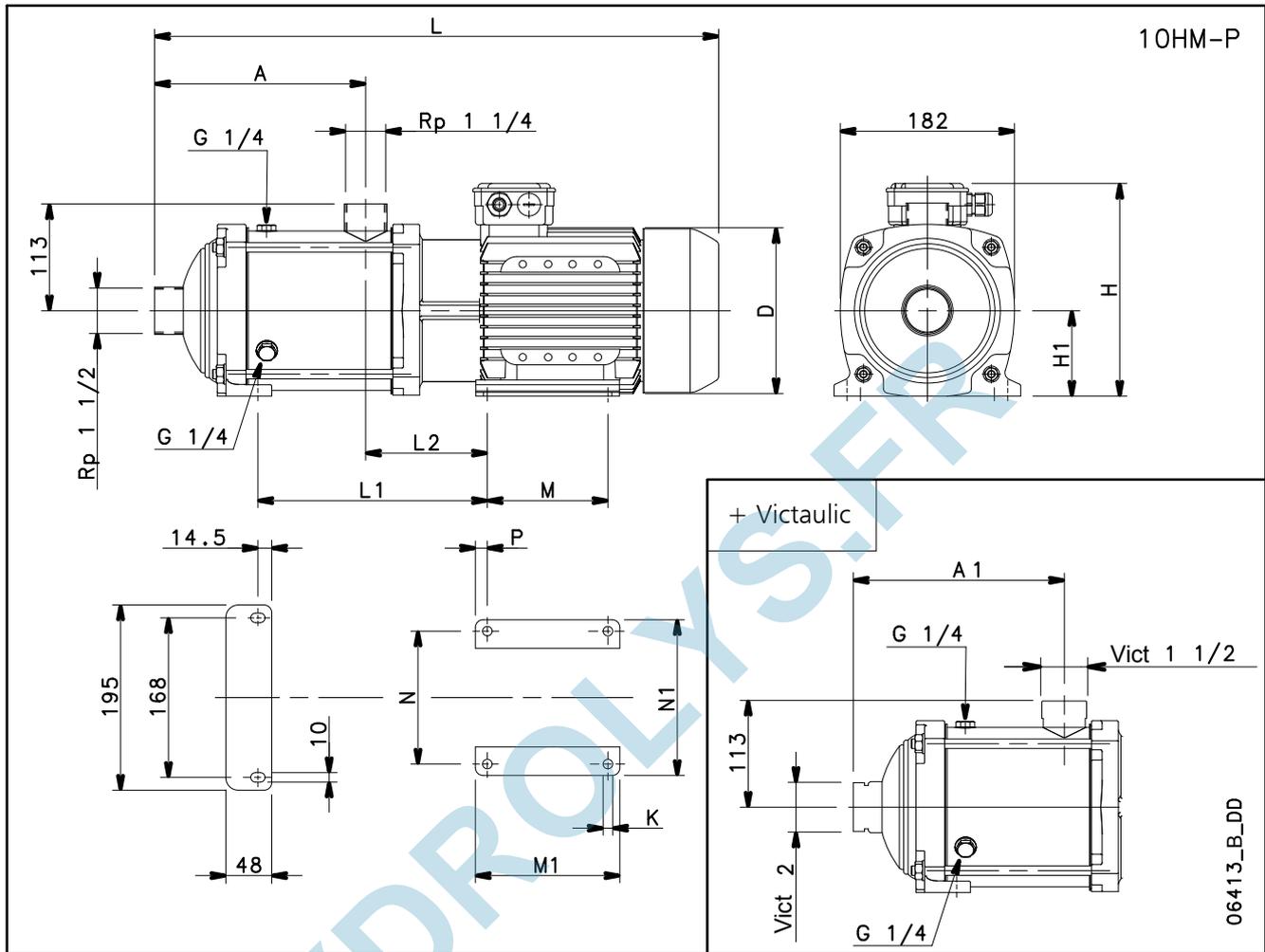
5HM..P SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

10HM..P SERIES DIMENSIONS AND WEIGHTS AT 50 HZ, 2 POLES



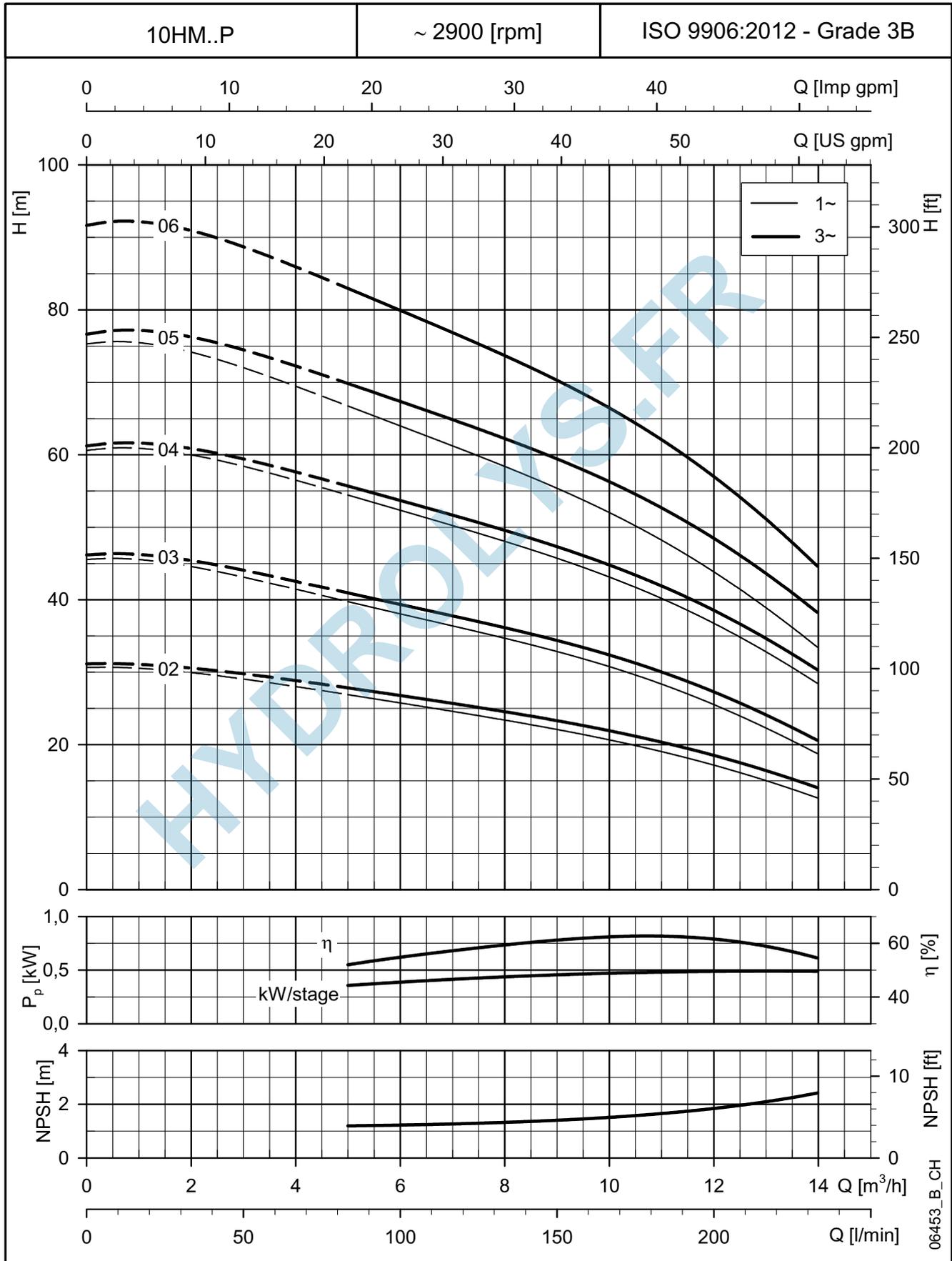
PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)														PN	WEIGHT
		kw	SIZE	A	A1	D	H	H1	L	L1	L2	M	M1	N	N1	P	K	bar	kg
10HM02	SINGLE-PHASE	1.1	80	125	137	155	227	90	443	122	105	100	125	125	155	12.5	10	10	16
10HM03		1.5	80	125	137	155	227	90	443	122	105	100	125	125	155	12.5	10	10	17
10HM04		2.2	90	157	169	174	249	90	531	176	128	125	150	140	164	12.5	10	10	26
10HM05		2.2	90	189	201	174	249	90	563	208	128	125	150	140	164	12.5	10	10	27

10HM02	THREE-PHASE	1.1	80	125	137	155	219	90	443	122	105	100	125	125	155	12.5	10	10	16
10HM03		1.5	80	125	137	155	219	90	443	122	105	100	125	125	155	12.5	10	10	17
10HM04		2.2	90	157	169	174	224	90	531	176	128	125	150	140	164	12.5	10	10	23
10HM05		3	90	189	201	174	224	90	563	208	128	125	150	140	164	12.5	10	10	27
10HM06		3	90	221	233	174	224	90	595	240	128	125	150	140	164	12.5	10	10	28

10hm-p-2p50-en_c_td

10HM..P SERIES

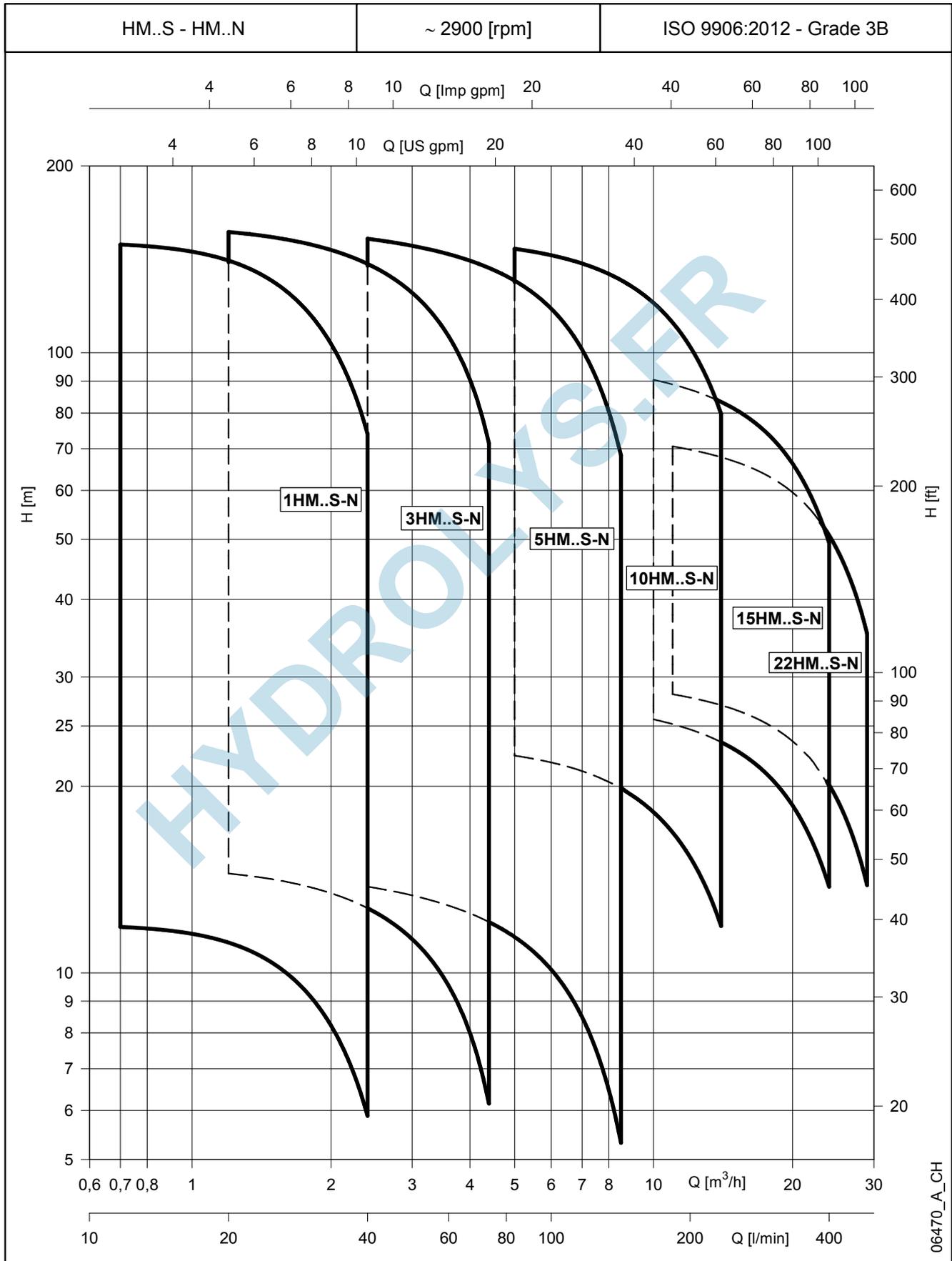
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



These performances are valid for liquids with density $\rho = 1 \text{ Kg/dm}^3$ 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../1075	0,93	4,31	-	82,3	80,0	77,7	73,1	66,2	57,0	45,8	35,3
1HM16		0,75	SM71HM../1075	1,02	4,60	-	93,4	90,4	87,6	82,1	74,0	63,4	50,5	38,5
1HM18		0,75	SM71HM../1075	1,10	4,90	-	104	101	97,2	90,7	81,3	69,2	54,6	41,1
1HM20		0,95	SM71HM../1095	1,24	5,45	-	117	113	109	102	91,5	78,2	62,1	47,0
1HM22		0,95	SM71HM../1095	1,32	5,76	-	128	122	118	110	98,7	83,9	66,0	49,5
1HM25		1,1	SM80HM../1115	1,49	6,66	-	147	142	138	130	117	100	80,2	61,5
1HM02		3 ~	0,30	SM63HM../303	0,24	1,89	1,09	12,1	12,0	11,7	11,2	10,3	9,1	7,5
1HM03	0,30		SM63HM../303	0,28	1,87	1,08	18,0	17,7	17,3	16,4	15,0	13,2	10,8	8,6
1HM04	0,30		SM63HM../303	0,33	1,87	1,08	23,7	23,3	22,7	21,5	19,5	17,0	13,8	10,9
1HM05	0,30		SM63HM../303	0,38	1,89	1,09	29,4	28,7	27,9	26,2	23,8	20,6	16,6	12,8
1HM06	0,30		SM63HM../303	0,42	1,91	1,10	35,0	33,9	32,9	30,8	27,8	23,9	19,1	14,6
1HM07	0,55		SM71HM../305	0,48	2,23	1,29	42,4	41,9	41,1	39,0	35,8	31,5	26,1	20,9
1HM08	0,55		SM71HM../305	0,53	2,29	1,32	48,3	47,7	46,6	44,3	40,6	35,6	29,3	23,4
1HM09	0,55		SM71HM../305	0,58	2,36	1,36	54,2	53,3	52,1	49,4	45,2	39,6	32,5	25,8
1HM11	0,55		SM71HM../305	0,68	2,49	1,44	65,8	64,5	62,9	59,5	54,2	47,2	38,5	30,3
1HM12	0,55		SM71HM../305	0,73	2,58	1,49	71,6	70,0	68,2	64,4	58,6	50,9	41,4	32,4
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	108	106	100	92,1	81,0	67,0	53,7
1HM20	1,1		SM80HM../311 E3	1,15	3,85	2,22	121	119	117	111	102	89,2	73,6	58,7
1HM22	1,1		SM80HM../311 E3	1,26	4,06	2,34	133	131	128	121	111	97,2	79,9	63,6
1HM25	1,5	SM80HM../315 E3	1,42	4,87	2,81	151	149	146	139	128	112	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../1075	0,95	4,38	-	59,0	57,0	54,2	50,4	45,4	39,2	31,4	22,7	
3HM09		0,75	SM71HM../1075	1,03	4,64	-	66,0	63,5	60,2	55,8	50,1	42,9	34,2	24,4	
3HM10		0,75	SM71HM../1075	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	-	104	99,6	94,6	87,7	78,8	67,8	54,2	39,0	
3HM16		1,5	SM80HM../1155	1,77	7,81	-	119	116	111	103	93,5	81,1	65,8	48,4	
3HM17		1,5	SM80HM../1155	1,85	8,20	-	126	123	117	109	98,5	85,3	68,8	50,4	
3HM19		1,5	SM80HM../1155	2,02	9,02	-	141	136	129	120	108	93,0	74,6	54,0	
3HM21		2,2	PLM90HM../1225	2,22	10,1	-	157	154	147	138	125	109	89,2	66,5	
3HM02		3 ~	0,30	SM63HM../303	0,31	1,87	1,08	14,9	14,6	14,0	13,1	12,0	10,5	8,6	6,4
3HM03			0,30	SM63HM../303	0,39	1,90	1,10	22,1	21,4	20,3	18,9	17,1	14,8	12,0	8,6
3HM04			0,30	SM63HM../303	0,47	1,95	1,13	29,1	27,8	26,3	24,3	21,7	18,6	14,8	10,2
3HM05	0,40		SM63HM../304	0,55	2,32	1,34	36,8	35,3	33,5	31,0	27,9	24,1	19,2	13,5	
3HM06	0,50		SM63HM../305	0,64	2,58	1,49	43,8	41,8	39,5	36,5	32,7	28,1	22,2	15,4	
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	104	100	94,4	86,5	76,3	63,3	47,8	
3HM16	1,5		SM80HM../315 E3	1,61	5,24	3,02	121	119	114	107	97,8	86,1	71,1	53,4	
3HM17	1,5		SM80HM../315 E3	1,71	5,43	3,13	128	126	121	113	103	90,9	75,0	56,1	
3HM19	2,2	PLM90HM../322 E3	1,94	6,78	3,91	144	142	137	129	118	104	86,7	65,6		
3HM21	2,2	PLM90HM../322 E3	2,12	7,15	4,13	159	157	150	141	130	114	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_b_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	10,0	-	97,7	94,0	89,5	84,0	77,0	67,6	55,5	40,8	
5HM14		2,2	PLM90HM../1225	2,34	10,6	-	105	101	95,9	89,9	82,2	72,1	58,9	43,2	
5HM15		2,2	PLM90HM../1225	2,47	11,1	-	112	108	102	95,7	87,3	76,4	62,3	45,3	
5HM17		2,2	PLM90HM../1225	2,72	12,2	-	127	121	114	107	97,2	84,6	68,5	49,4	
5HM02		3 ~	0,30	SM63HM../303	0,41	1,91	1,10	14,8	13,9	13,2	12,2	11,1	9,6	7,8	5,5
5HM03			0,40	SM63HM../304	0,54	2,30	1,33	22,2	20,9	19,7	18,3	16,5	14,3	11,5	8,2
5HM04	0,50		SM63HM../305	0,68	2,62	1,51	29,3	27,2	25,6	23,5	21,1	18,1	14,4	9,8	
5HM05	0,75		SM80HM../307 E3	0,85	2,83	1,64	37,8	36,5	34,8	32,7	30,0	26,5	22,0	16,4	
5HM06	1,1		SM80HM../311 E3	1,02	3,60	2,08	45,5	44,2	42,3	39,8	36,6	32,5	27,1	20,4	
5HM07	1,1		SM80HM../311 E3	1,17	3,88	2,24	53,0	51,2	48,9	46,0	42,3	37,4	31,0	23,2	
5HM08	1,1		SM80HM../311 E3	1,32	4,18	2,41	60,4	58,2	55,5	52,1	47,7	42,1	34,9	25,9	
5HM09	1,5		SM80HM../315 E3	1,48	4,97	2,87	68,1	65,9	63,0	59,2	54,4	48,2	40,1	30,0	
5HM10	1,5		SM80HM../315 E3	1,63	5,26	3,04	75,5	72,9	69,6	65,4	60,0	52,9	43,9	32,7	
5HM11	1,5		SM80HM../315 E3	1,78	5,55	3,21	83,0	79,9	76,1	71,4	65,4	57,6	47,7	35,4	
5HM12	2,2		PLM90HM../322 E3	1,97	6,83	3,94	91,0	88,3	84,4	79,5	73,1	64,7	54,0	40,6	
5HM13	2,2		PLM90HM../322 E3	2,12	7,13	4,12	98,4	95,3	91,1	85,7	78,8	69,7	58,0	43,5	
5HM14	2,2		PLM90HM../322 E3	2,27	7,42	4,28	106	102	97,8	91,9	84,3	74,5	61,9	46,2	
5HM15	2,2		PLM90HM../322 E3	2,42	7,73	4,46	113	109	104	97,9	89,8	79,2	65,7	48,9	
5HM17	3		PLM90HM../330 E3	2,77	9,77	5,64	129	125	119	112	103	91,2	75,9	56,9	
5HM19	3		PLM90HM../330 E3	3,06	10,3	5,97	144	139	132	124	114	101	83,7	62,5	
5HM21	3		PLM90HM../330 E3	3,36	10,9	6,31	159	153	146	137	125	110	91,3	67,8	

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

5-hm-s-n-2p50-en_b_th

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

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

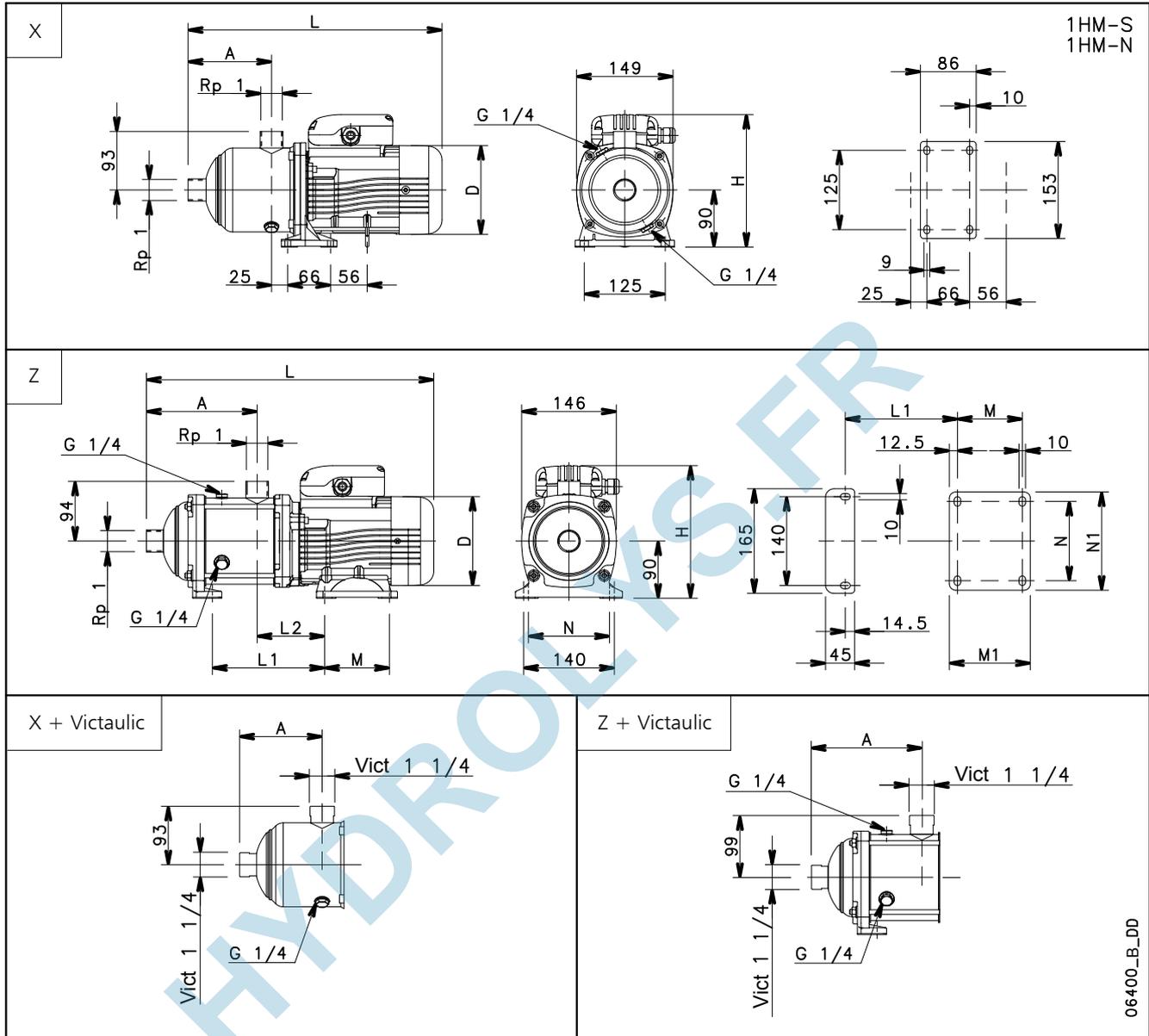
PUMP TYPE HM..S HM..N	VERSION	MOTOR		ELECTRIC PUMP			Q = DELIVERY								
				* P ₁ kW	* I			l/min 0 m ³ /h 0	183 11,0	233 14,0	283 17,0	333 20,0	383 23,0	433 26,0	483 29,0
					220-240 V A	380-415 V A	660-690 V A								
H = TOTAL HEAD IN METRES OF COLUMN OF WATER															
22HM02	1 ~	2,2	PLM90HM../1225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

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

10-22hm-s-n-2p50-en_b_th

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

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



06400_B_DD

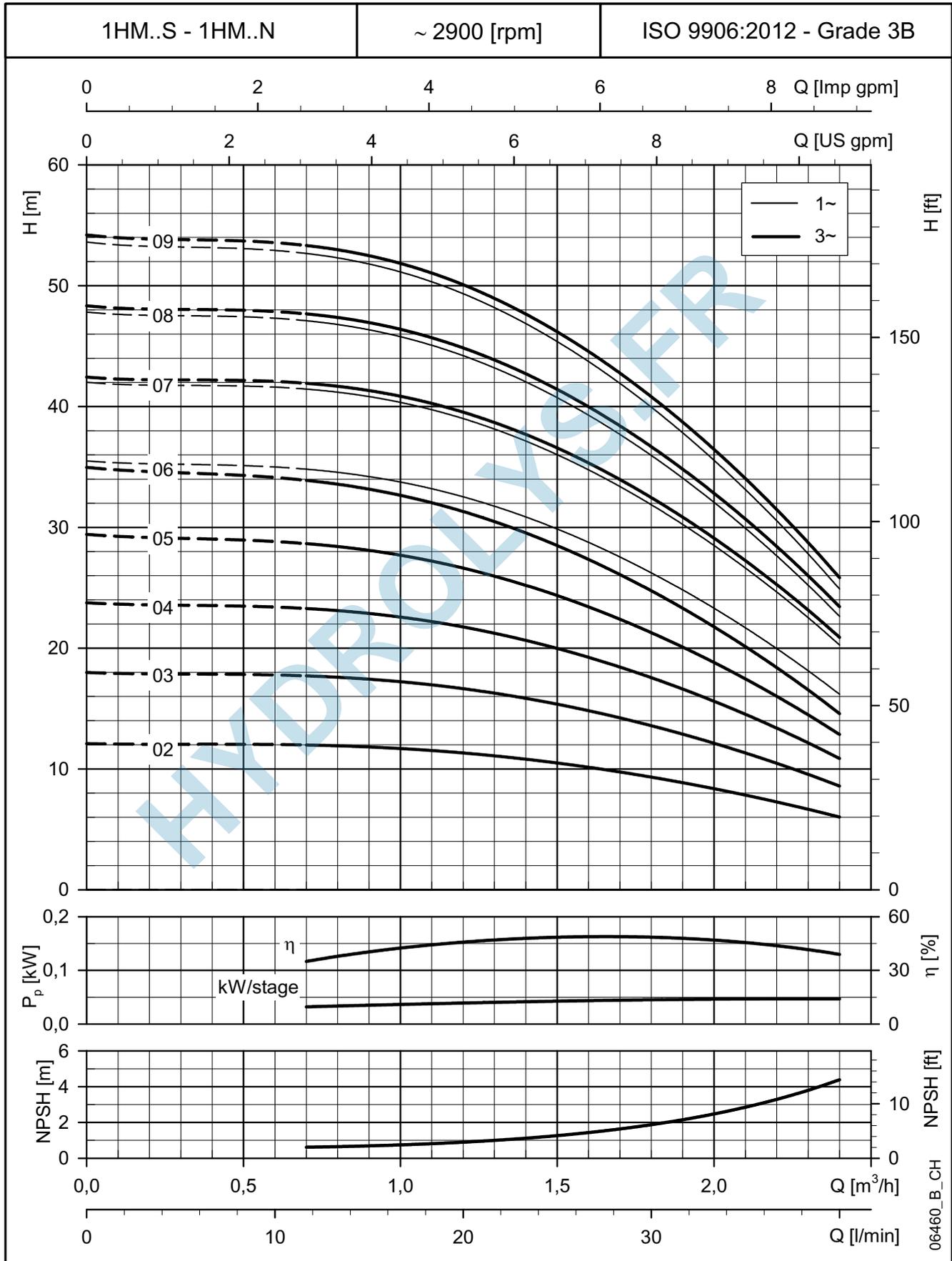
PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)										PN bar	WEIGHT kg
			kW	SIZE	A	D	H	L	L1	L2	M	M1	N	N1		
1HM06	SINGLE-PHASE	X	0.50	63	147	120	201	396	-	-	-	-	-	-	10	8
1HM07		Z	0.55	71	151	140	211	424	153	104	100	125	125	155	10	10
1HM08		Z	0.55	71	171	140	211	444	173	104	100	125	125	155	10	11
1HM09		Z	0.55	71	191	140	211	464	193	104	100	125	125	155	10	11

1HM02	THREE-PHASE	X	0.30	63	87	120	201	336	-	-	-	-	-	-	10	6
1HM03			0.30	63	87	120	201	336	-	-	-	-	-	-	10	6
1HM04			0.30	63	107	120	201	356	-	-	-	-	-	-	10	7
1HM05			0.30	63	127	120	201	376	-	-	-	-	-	-	10	7
1HM06			0.30	63	147	120	201	396	-	-	-	-	-	-	10	7
1HM07		Z	0.55	71	151	140	211	424	153	104	100	125	125	155	10	10
1HM08			0.55	71	171	140	211	444	173	104	100	125	125	155	10	11
1HM09			0.55	71	191	140	211	464	193	104	100	125	125	155	10	11

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

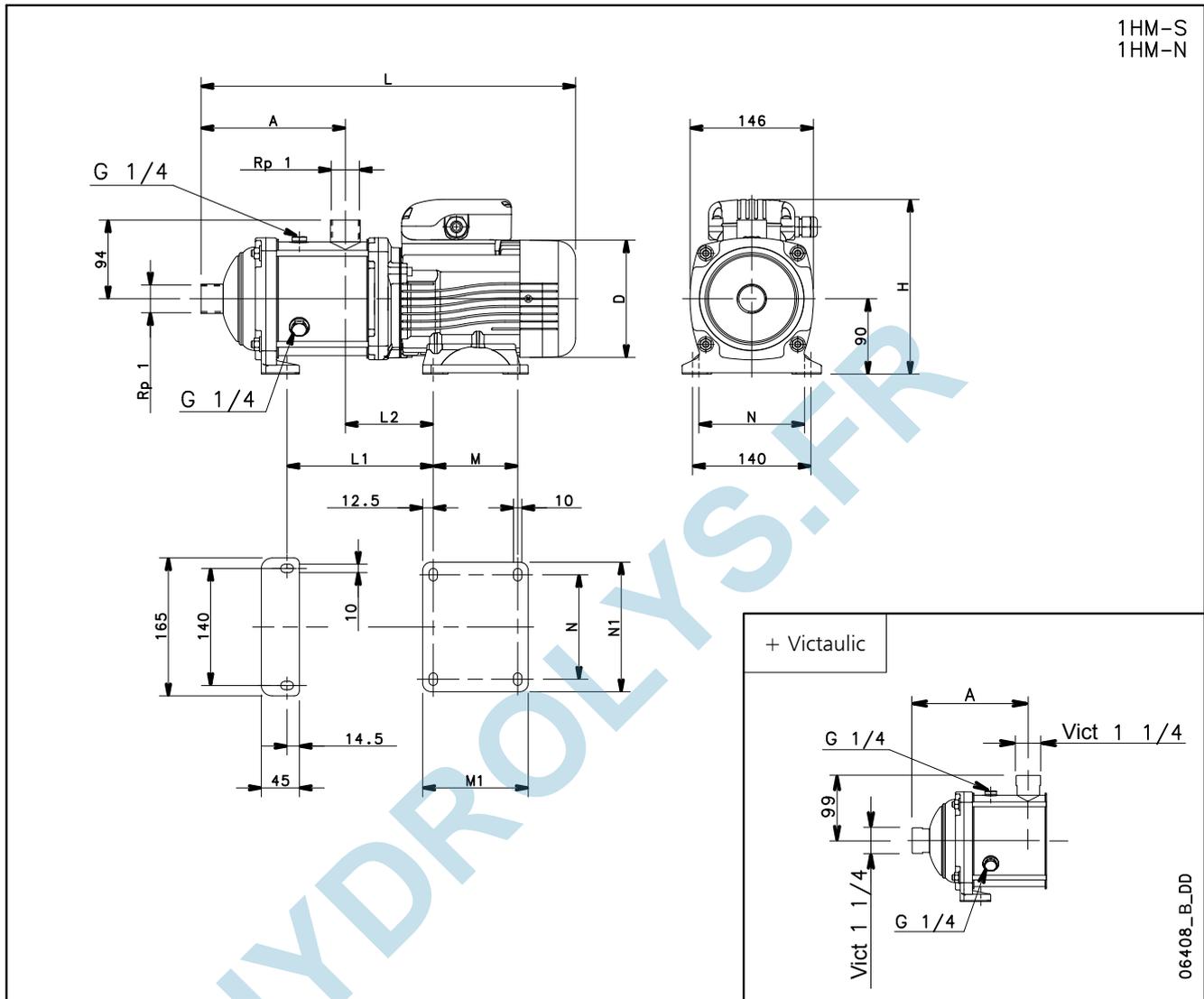
1hm-s-n-2p50-1-en_b_td

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



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

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



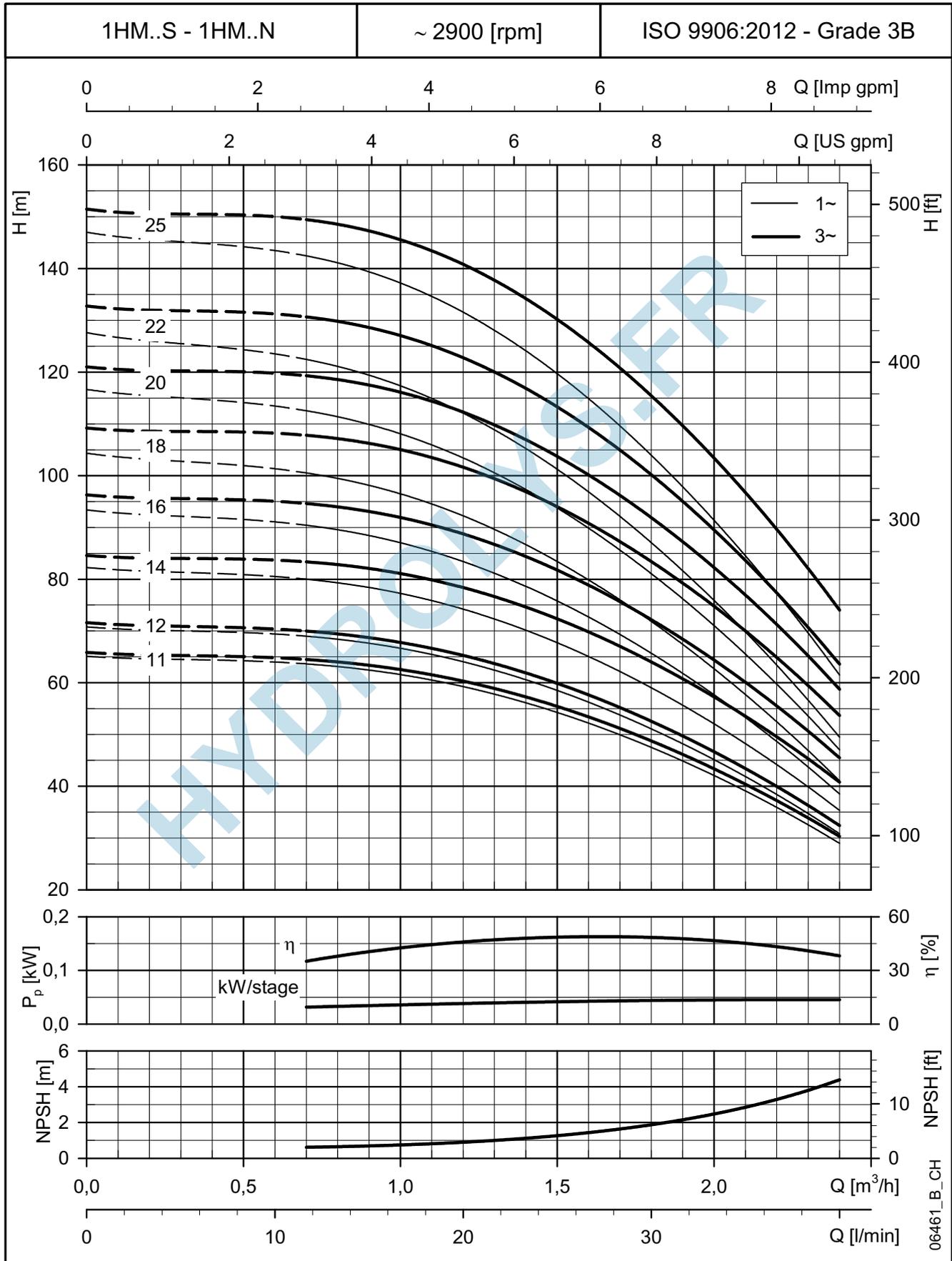
PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)										PN	WEIGHT
		KW	SIZE	A	D	H	L	L1	L2	M	M1	N	N1	bar	kg
1HM11	SINGLE-PHASE	0.55	71	231	140	211	504	233	104	100	125	125	155	10	12
1HM12		0.55	71	251	140	211	524	253	104	100	125	125	155	10	12
1HM14		0.75	71	291	140	211	564	293	104	100	125	125	155	10	14
1HM16		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

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

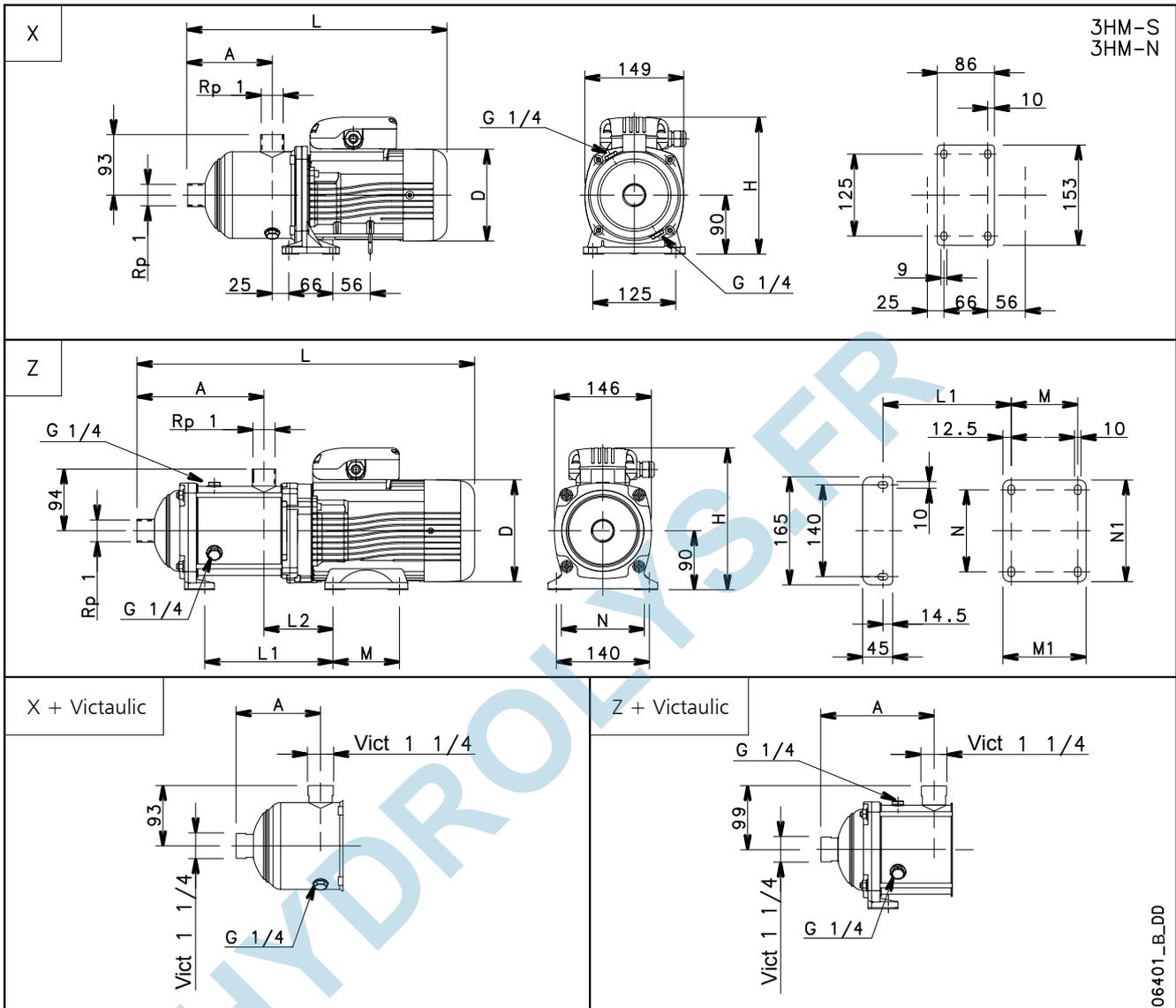
1hm-s-n-2p50-2-en_b_td

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



These performances are valid for liquids with density $\rho = 1 \text{ Kg/dm}^3$ 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



06401_B_DD

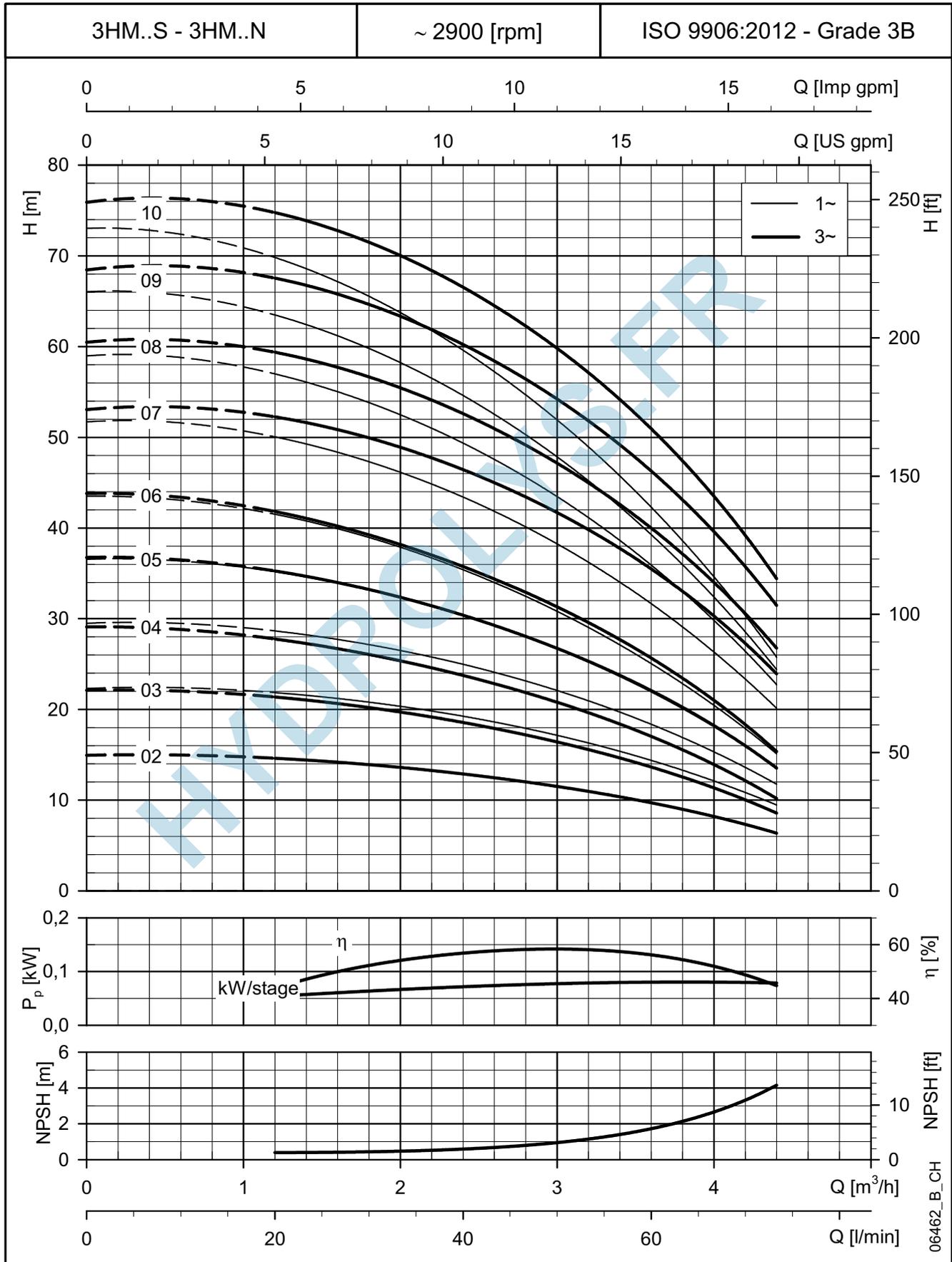
PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)										PN bar	WEIGHT kg
			kW	SIZE	A	D	H	L	L1	L2	M	M1	N	N1		
3HM03	SINGLE-PHASE	X	0.50	63	87	120	201	336	-	-	-	-	-	-	10	7
3HM04			0.50	63	107	120	201	356	-	-	-	-	-	-	10	8
3HM05			0.50	63	127	120	201	376	-	-	-	-	-	-	10	8
3HM06			0.50	63	147	120	201	396	-	-	-	-	-	-	10	8
3HM07		Z	0.55	71	151	140	211	424	153	104	100	125	125	155	10	10
3HM08			0.75	71	171	140	211	444	173	104	100	125	125	155	10	12
3HM09			0.75	71	191	140	211	464	193	104	100	125	125	155	10	12
3HM10			0.75	71	211	140	211	484	213	104	100	125	125	155	10	12

3HM02	THREE-PHASE	X	0.30	63	87	120	201	336	-	-	-	-	-	-	10	6
3HM03			0.30	63	87	120	201	336	-	-	-	-	-	-	10	6
3HM04			0.30	63	107	120	201	356	-	-	-	-	-	-	10	7
3HM05			0.40	63	127	120	201	376	-	-	-	-	-	-	10	7
3HM06		0.50	63	147	120	201	396	-	-	-	-	-	-	10	8	
3HM07		Z	0.75	80	151	155	219	468	153	104	100	125	125	155	10	14
3HM08			0.75	80	171	155	219	488	173	104	100	125	125	155	10	15
3HM09			1.1	80	191	155	219	508	193	104	100	125	125	155	10	16
3HM10			1.1	80	211	155	219	528	213	104	100	125	125	155	10	16

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

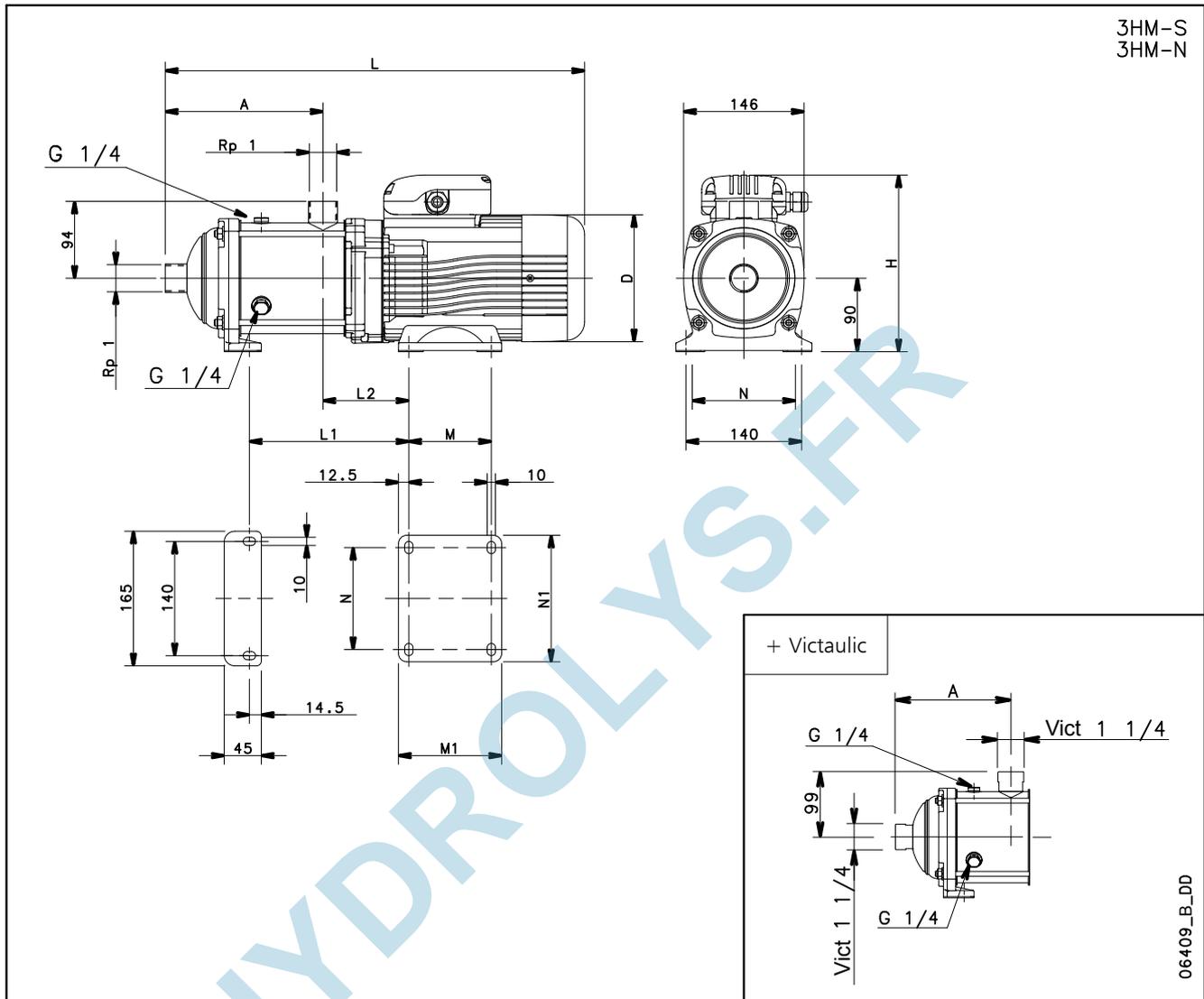
3hm-s-n-2p50-1-en_b_ttd

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



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

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



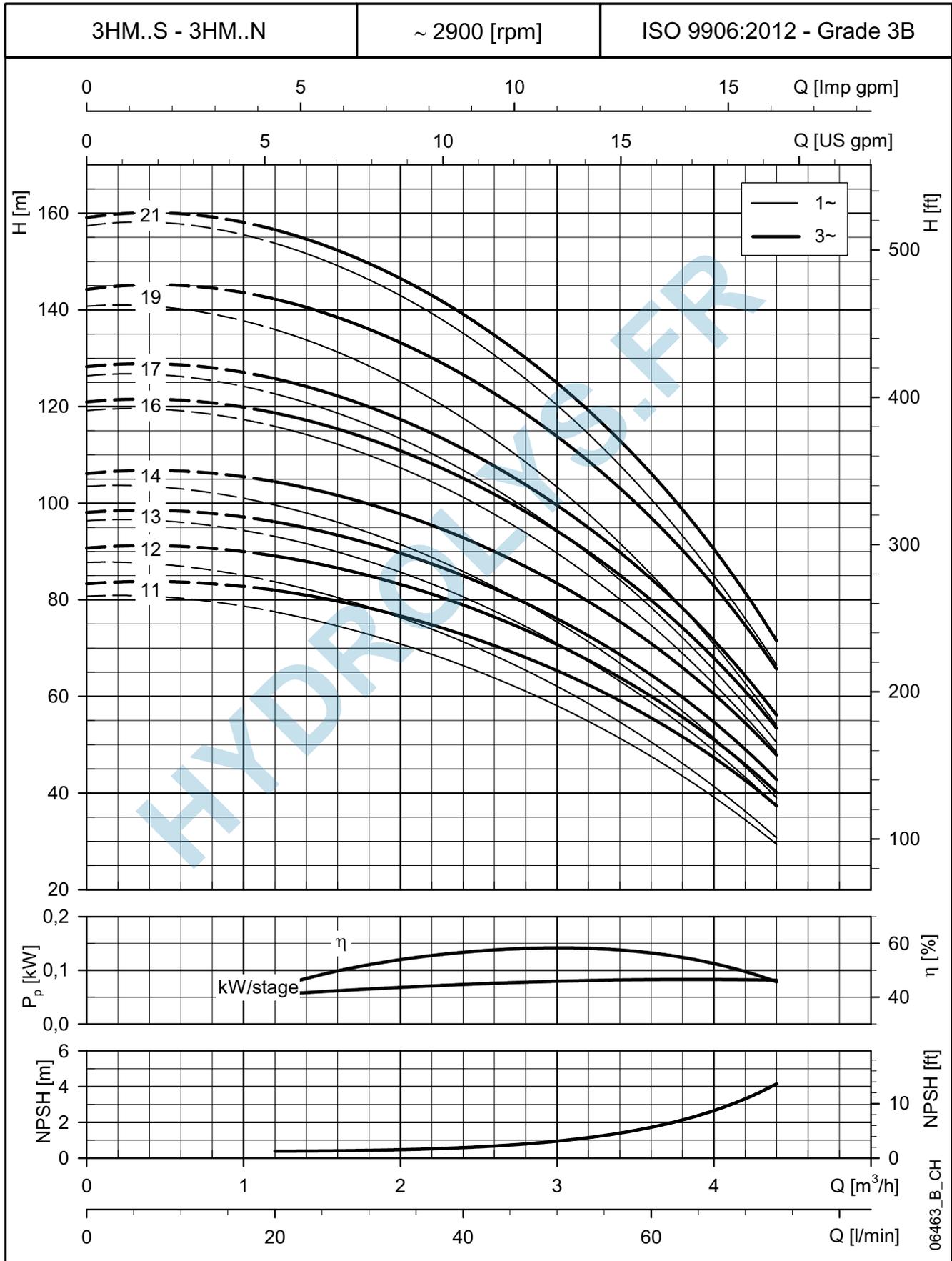
PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)										PN	WEIGHT
		kW	SIZE	A	D	H	L	L1	L2	M	M1	N	N1	bar	kg
3HM11	MONOPHASE	0.95	71	231	140	220	504	233	104	100	125	125	155	10	14
3HM12		0.95	71	251	140	220	524	253	104	100	125	125	155	10	14
3HM13		1.1	80	271	155	227	588	273	104	100	125	125	155	10	17
3HM14		1.1	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

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

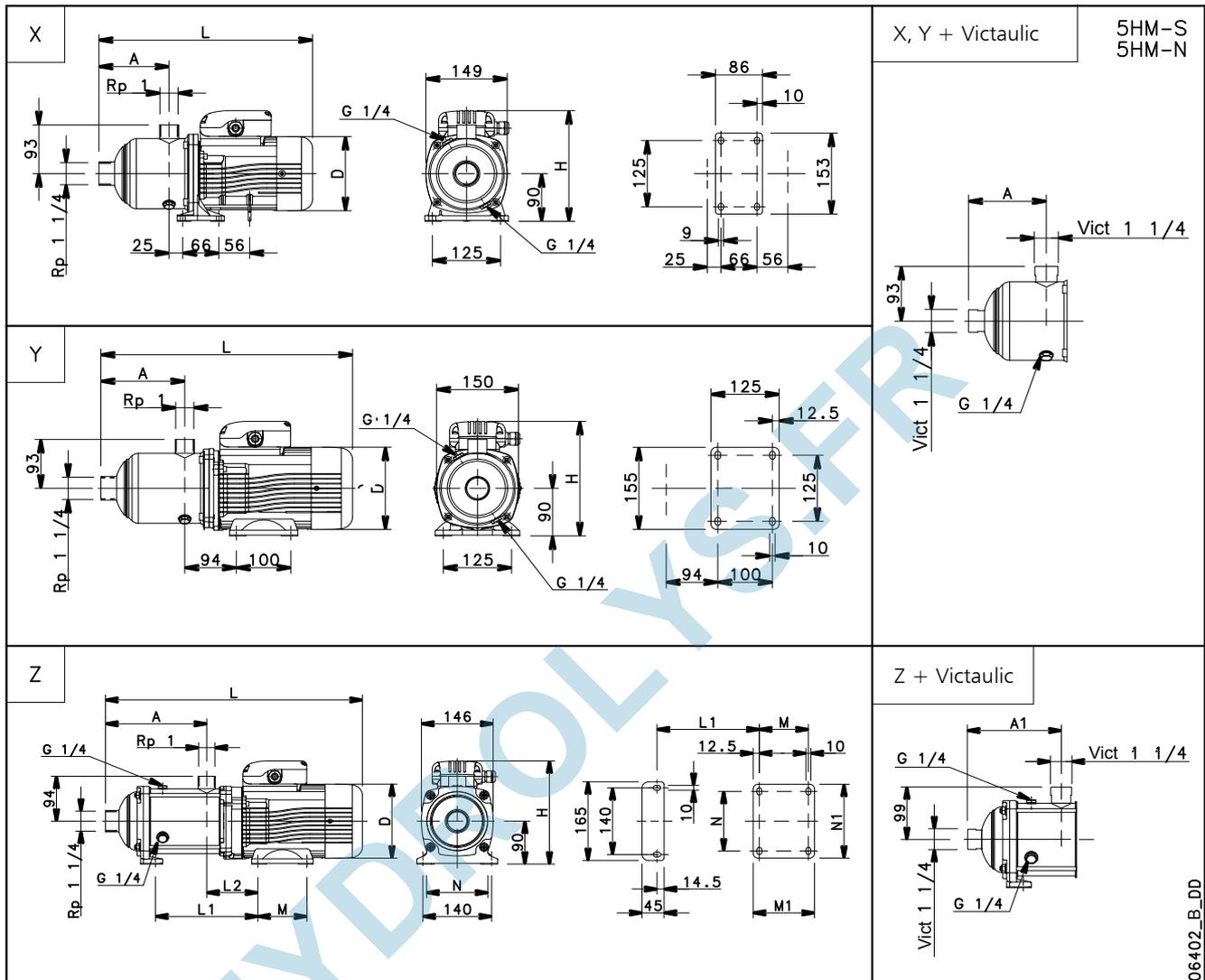
3hm-s-n-2p50-2-en_b_td

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



These performances are valid for liquids with density $\rho = 1 \text{ Kg/dm}^3$ 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



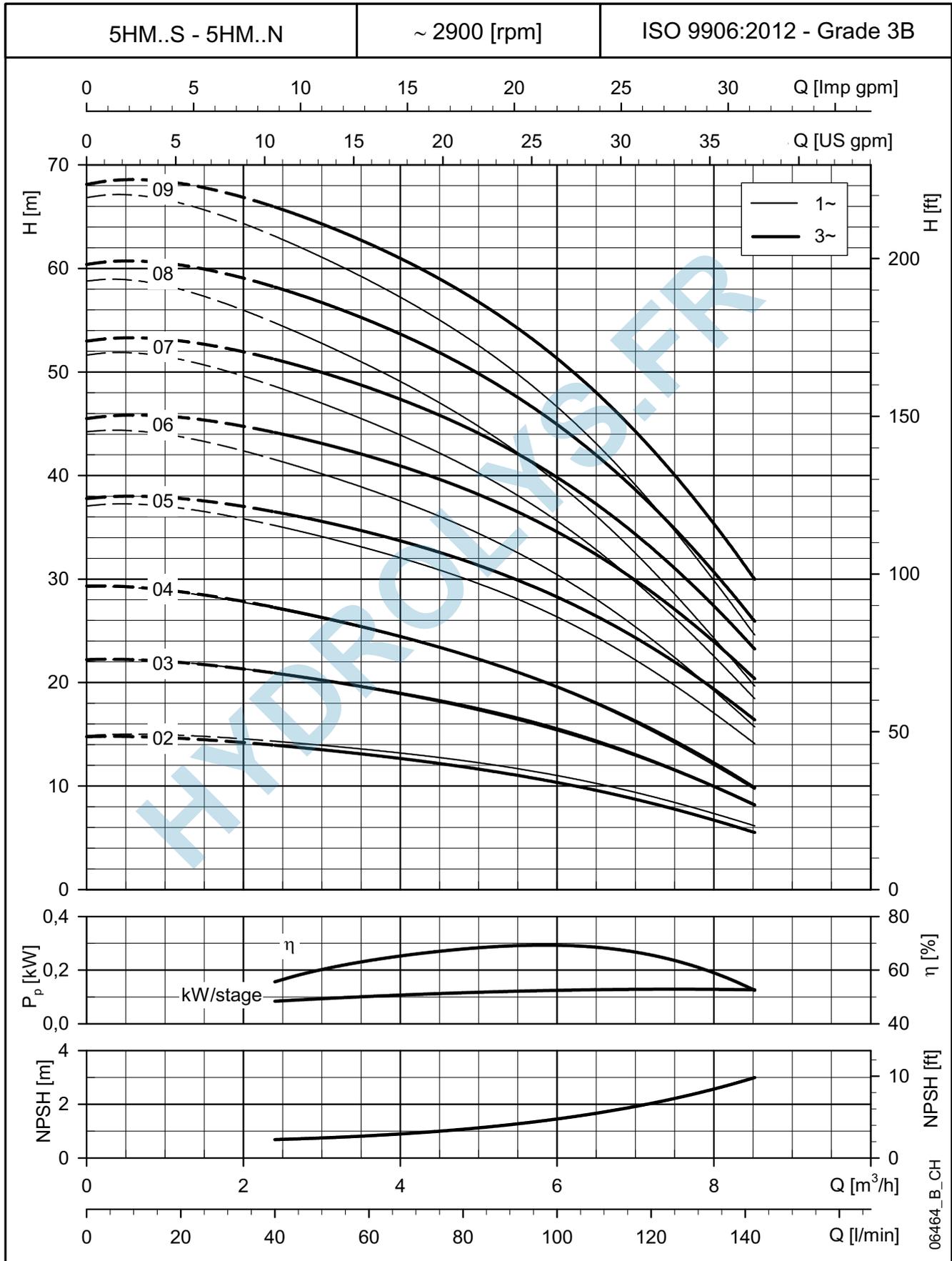
PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)											PN bar	WEIGHT kg	
			kW	SIZE	A	A1	D	H	L	L1	L2	M	M1	N	N1			
5HM02	SINGLE-PHASE	X	0.50	63	104	102	120	201	353	-	-	-	-	-	-	-	10	7
5HM03			0.50	63	104	102	120	201	353	-	-	-	-	-	-	-	10	7
5HM04			0.50	63	129	127	120	201	378	-	-	-	-	-	-	-	10	8
5HM05			0.75	71	154	152	140	211	417	-	-	-	-	-	-	-	10	10
5HM06		Z	0.75	71	158	156	140	211	430	158	104	100	125	125	155	10	11	
5HM07			0.95	71	183	181	140	220	455	183	104	100	125	125	155	10	13	
5HM08			0.95	71	208	206	140	220	480	208	104	100	125	125	155	10	13	
5HM09			1.1	80	233	231	155	227	550	233	104	100	125	125	155	10	17	

PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)											PN bar	WEIGHT kg	
			kW	SIZE	A	A1	D	H	L	L1	L2	M	M1	N	N1			
5HM02	THREE-PHASE	X	0.30	63	104	102	120	201	353	-	-	-	-	-	-	-	10	6
5HM03			0.40	63	104	102	120	201	353	-	-	-	-	-	-	-	10	7
5HM04			0.50	63	129	127	120	201	378	-	-	-	-	-	-	-	10	8
5HM05		Y	0.75	80	154	152	155	219	462	-	-	-	-	-	-	-	10	13
5HM06			Z	1.1	80	158	156	155	219	475	158	104	100	125	125	155	10	15
5HM07				1.1	80	183	181	155	219	500	183	104	100	125	125	155	10	16
5HM08		Z	1.1	80	208	206	155	219	525	208	104	100	125	125	155	10	16	
5HM09			1.5	80	233	231	155	219	550	233	104	100	125	125	155	10	18	

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

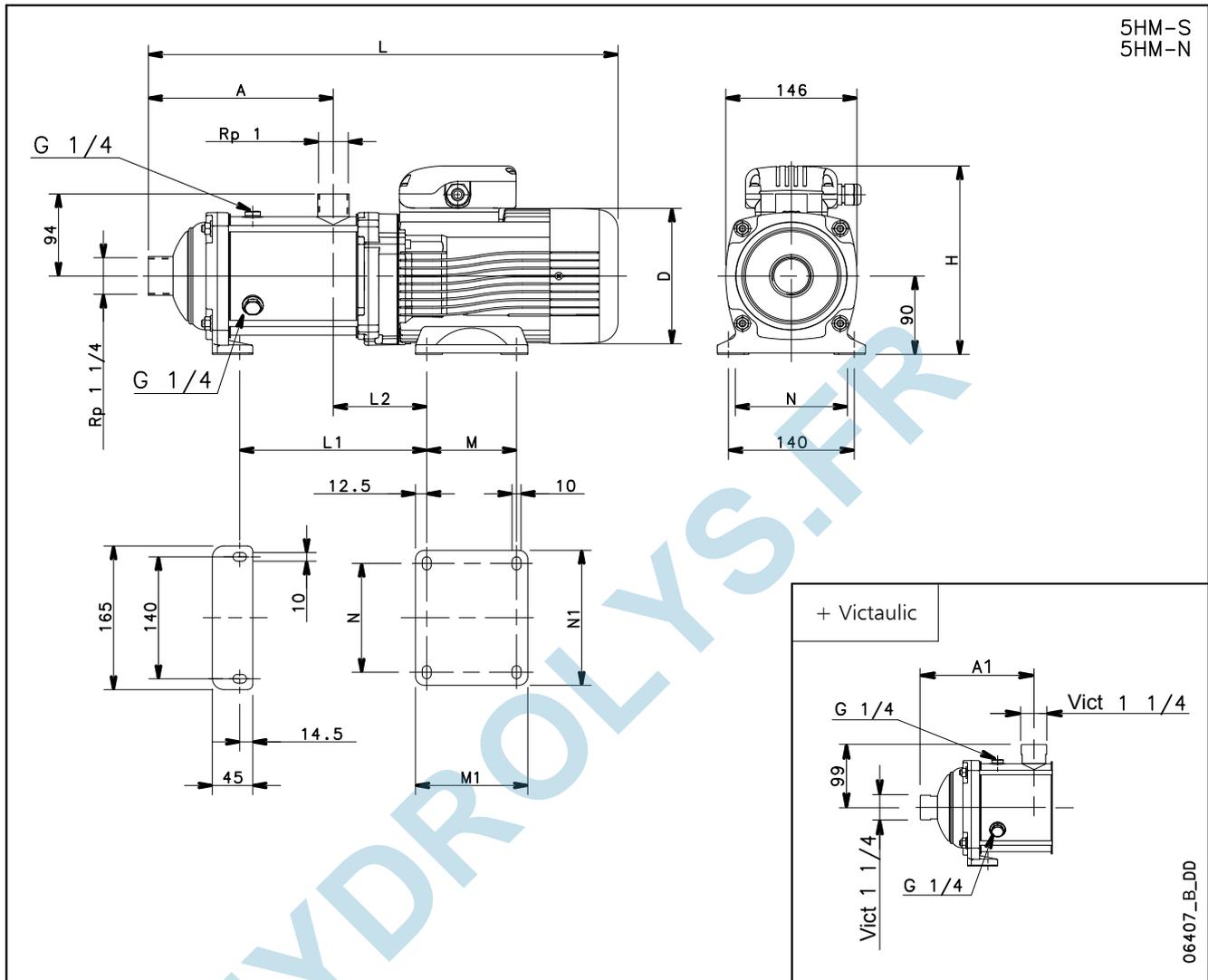
5hm-s-n-2p50-1-en_d_td

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



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

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



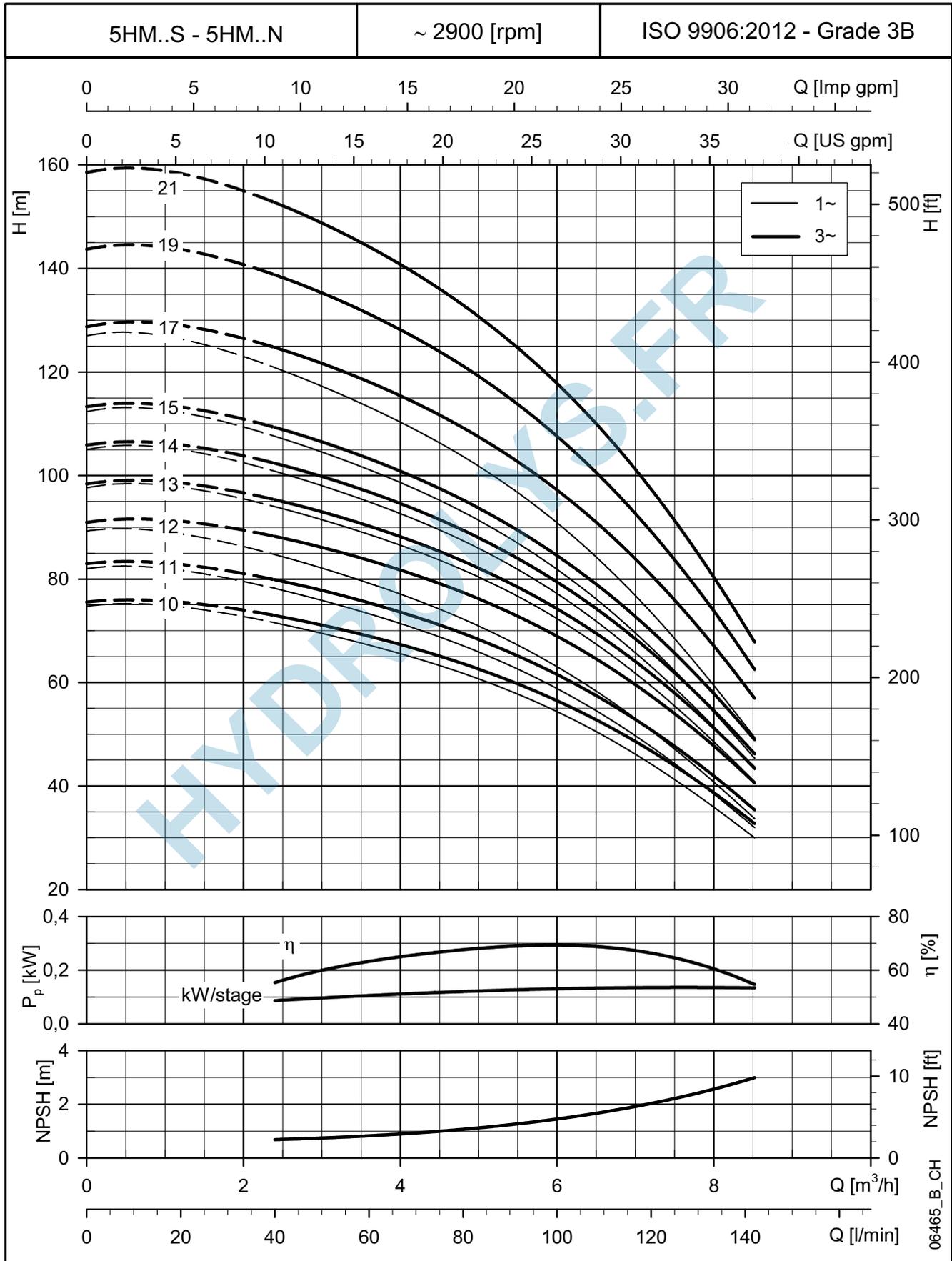
PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)											PN bar	WEIGHT kg
		kw	SIZE	A	A1	D	H	L	L1	L2	M	M1	N	N1		
5HM10	SINGLE-PHASE	1.5	80	258	256	155	227	575	258	104	100	125	125	155	10	18
5HM11		1.5	80	283	281	155	227	600	283	104	100	125	125	155	10	18
5HM12		1.5	80	308	306	155	227	625	308	104	100	125	125	155	10	19
5HM13		2.2	90	333	331	174	249	706	356	127	125	150	140	164	10	27
5HM14		2.2	90	358	356	174	249	731	381	127	125	150	140	164	16	28
5HM15		2.2	90	383	381	174	249	756	406	127	125	150	140	164	16	28
5HM17		2.2	90	433	431	174	249	806	456	127	125	150	140	164	16	29

5HM10	THREE-PHASE	1.5	80	258	256	155	227	575	258	104	100	125	125	155	10	18
5HM11		1.5	80	283	281	155	227	600	283	104	100	125	125	155	10	19
5HM12		2.2	90	308	306	174	224	681	308	127	125	150	140	164	10	24
5HM13		2.2	90	333	331	174	224	706	356	127	125	150	140	164	10	24
5HM14		2.2	90	358	356	174	224	731	381	127	125	150	140	164	16	25
5HM15		2.2	90	383	381	174	224	756	406	127	125	150	140	164	16	25
5HM17		3	90	433	431	174	224	806	456	127	125	150	140	164	16	29
5HM19		3	90	483	481	174	224	856	506	127	125	150	140	164	16	30
5HM21		3	90	533	531	174	224	906	556	127	125	150	140	164	16	31

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

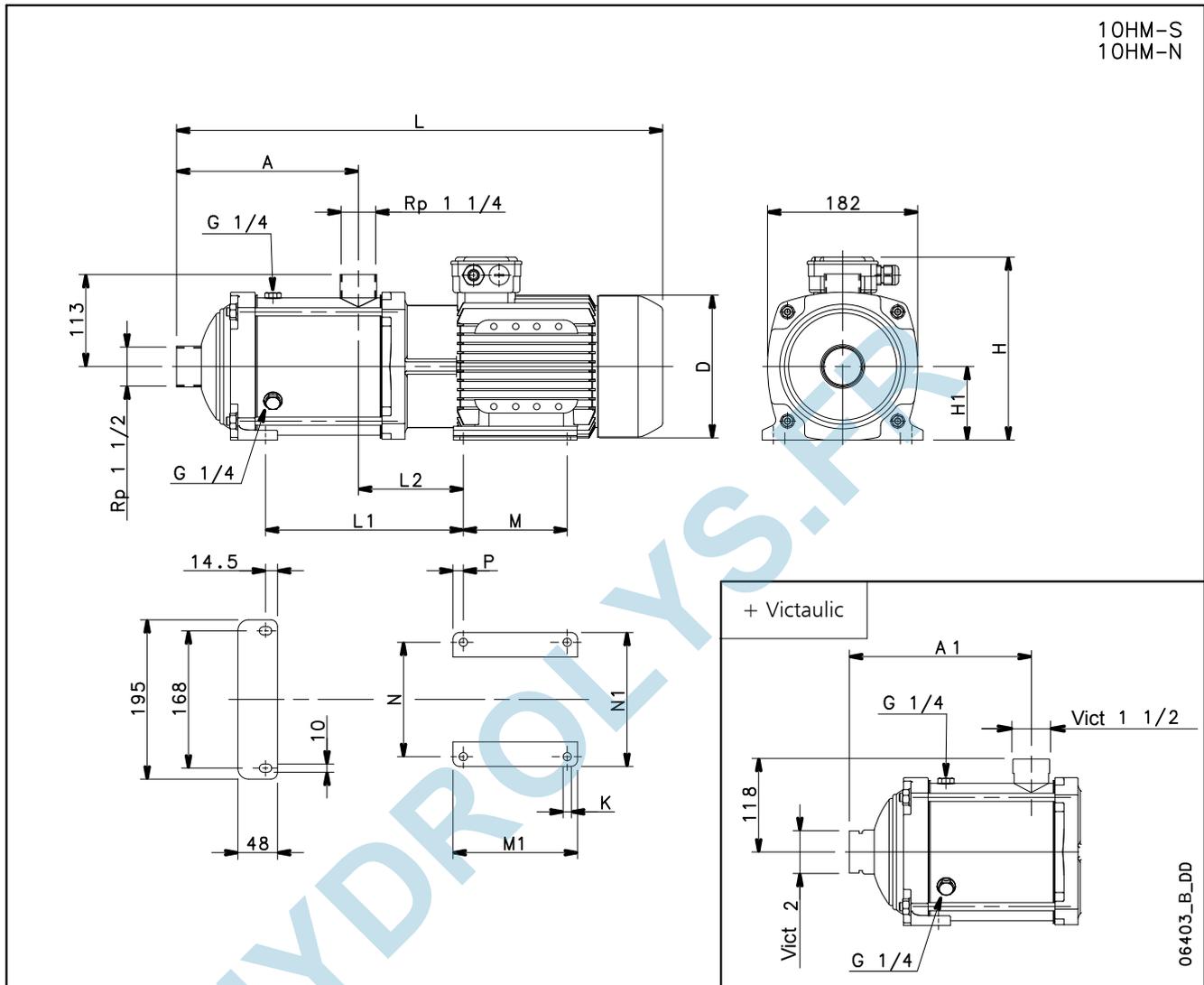
5hm-s-n-2p50-2-en_c_td

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



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

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



PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)														PN	WEIGHT
		kW	SIZE	A	A1	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		
10HM02	SINGLE-PHASE	1.1	80	125	137	155	227	90	443	122	105	100	125	125	155	12.5	10	10	13
10HM03		1.1	80	125	137	155	227	90	443	122	105	100	125	125	155	12.5	10	10	17
10HM04		1.5	80	157	169	155	227	90	475	154	105	100	125	125	155	12.5	10	10	19
10HM05		2.2	90	189	201	174	249	90	563	208	128	125	150	140	164	12.5	10	10	25
10HM06		2.2	90	221	233	174	249	90	595	240	128	125	150	140	164	12.5	10	10	26
				221	233	174	249	90	595	240	128	125	150	140	164	12.5	10	10	26

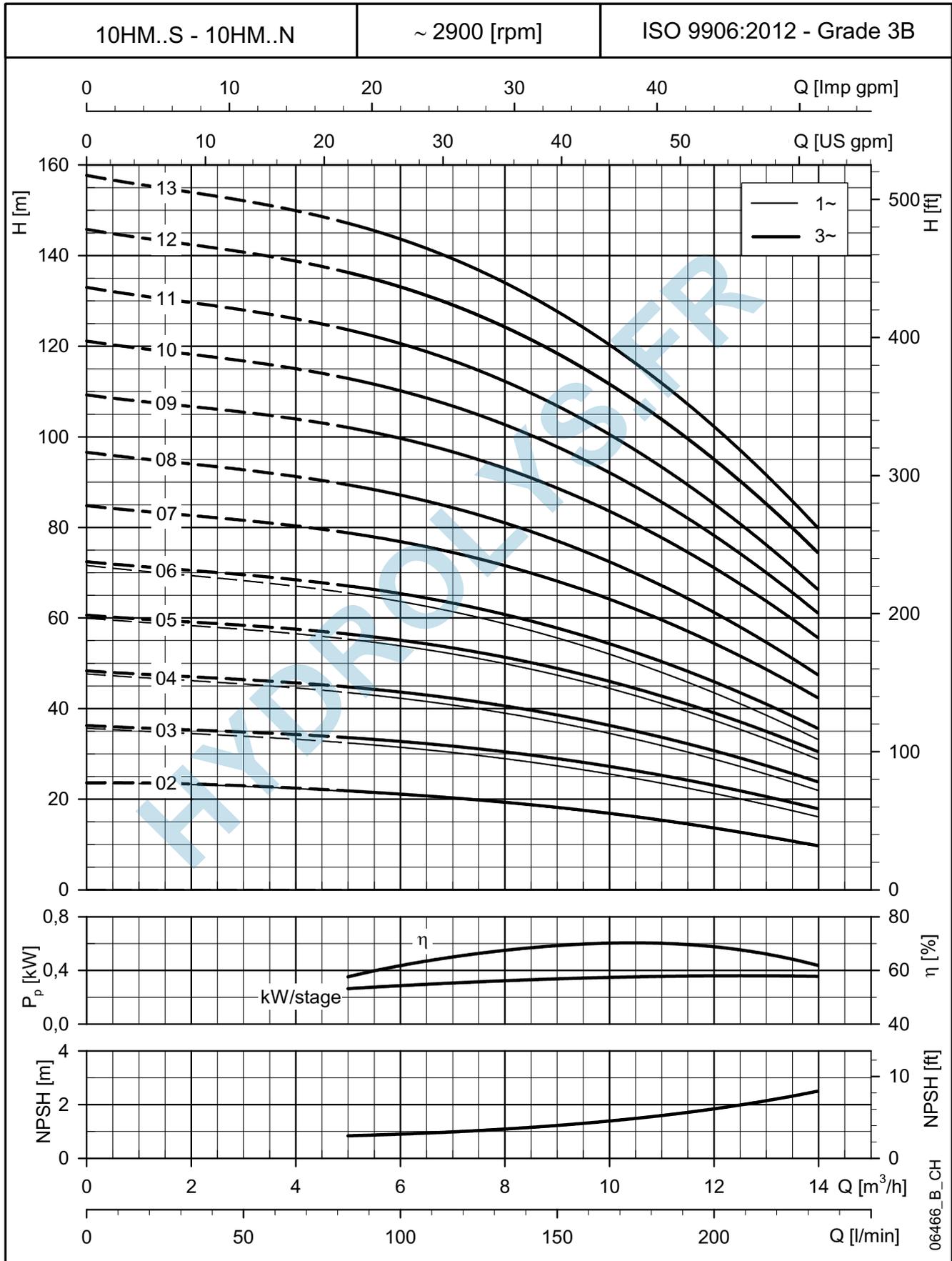
10HM02	THREE-PHASE	0.75	80	125	137	155	219	90	443	122	105	100	125	125	155	12.5	10	10	16
10HM03		1.1	80	125	137	155	219	90	443	122	105	100	125	125	155	12.5	10	10	17
10HM04		1.5	80	157	169	155	219	90	475	154	105	100	125	125	155	12.5	10	10	19
10HM05		2.2	90	189	201	174	224	90	563	208	128	125	150	140	164	12.5	10	10	25
10HM06		2.2	90	221	233	174	224	90	595	240	128	125	150	140	164	12.5	10	10	26
				221	233	174	224	90	595	240	128	125	150	140	164	12.5	10	10	26
10HM07		3	90	253	265	174	224	90	627	272	128	125	150	140	164	12.5	10	10	30
10HM08		3	90	285	297	174	224	90	659	304	128	125	150	140	164	12.5	10	10	31
10HM09		4	100	317	329	197	254	100	720	356	147	140	170	160	184	15	12	16	38
10HM10		4	100	349	361	197	254	100	752	388	147	140	170	160	184	15	12	16	39
10HM11		4	100	381	393	197	254	100	784	420	147	140	170	160	184	15	12	16	40
10HM12		5.5	112	413	425	214	280	112	850	459	154	140	170	190	219	15	12	16	48
10HM13		5.5	112	445	457	214	280	112	882	491	154	140	170	190	219	15	12	16	49

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

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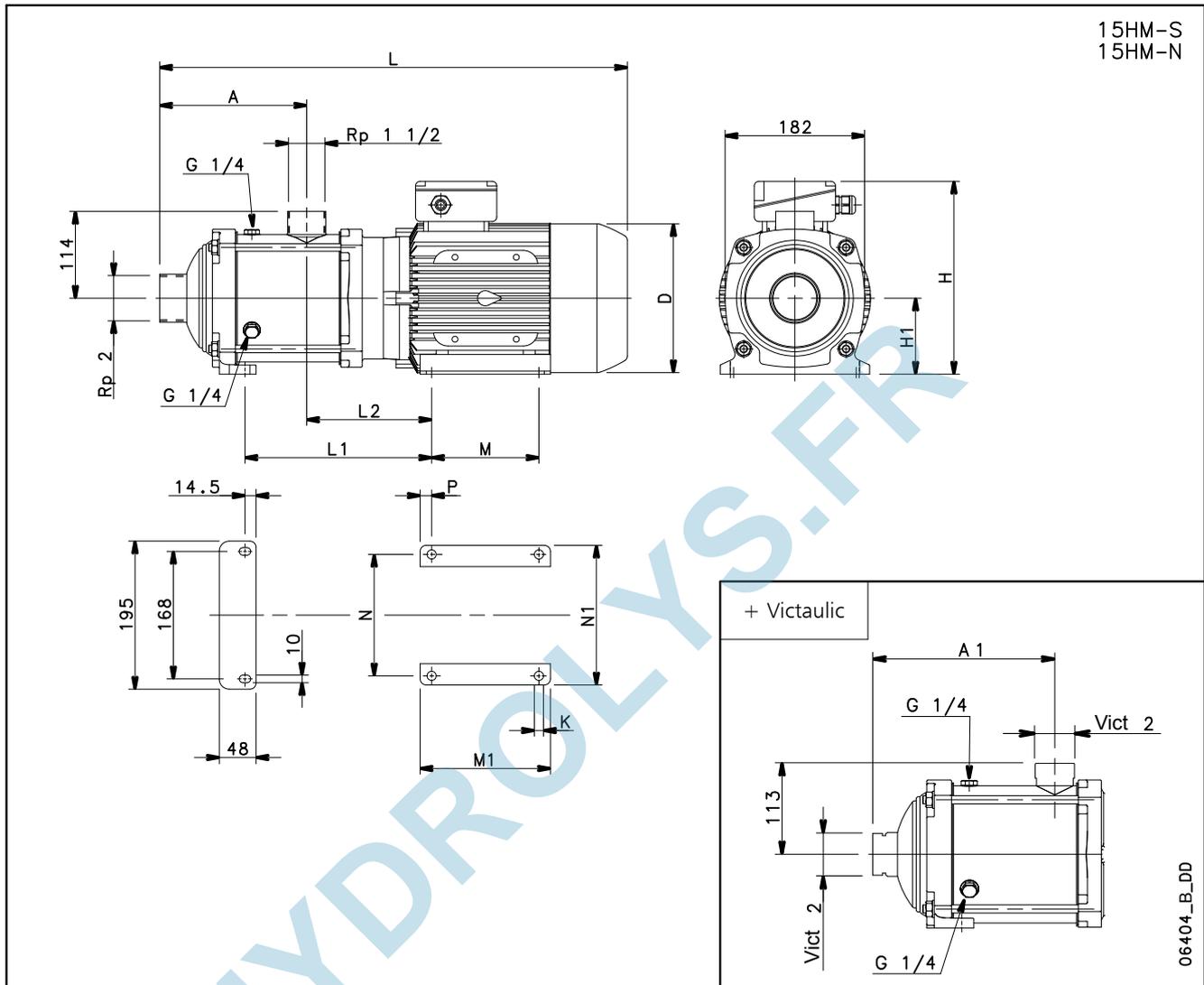
10HM..S - 10HM..N SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



These performances are valid for liquids with density $\rho = 1 \text{ Kg/dm}^3$ 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	MOTOR		DIMENSIONS (mm)														PN	WEIGHT
		kW	SIZE	A	A1	D	H	H1	L	L1	L2	M	M1	N	N1	P	K		
15HM02	SINGLE-PHASE	1.5	80	144	153	155	227	90	478	154	121	100	125	125	155	12.5	10	10	18
15HM03		2.2	90	144	153	174	249	90	534	176	144	125	150	140	164	12.5	10	10	26

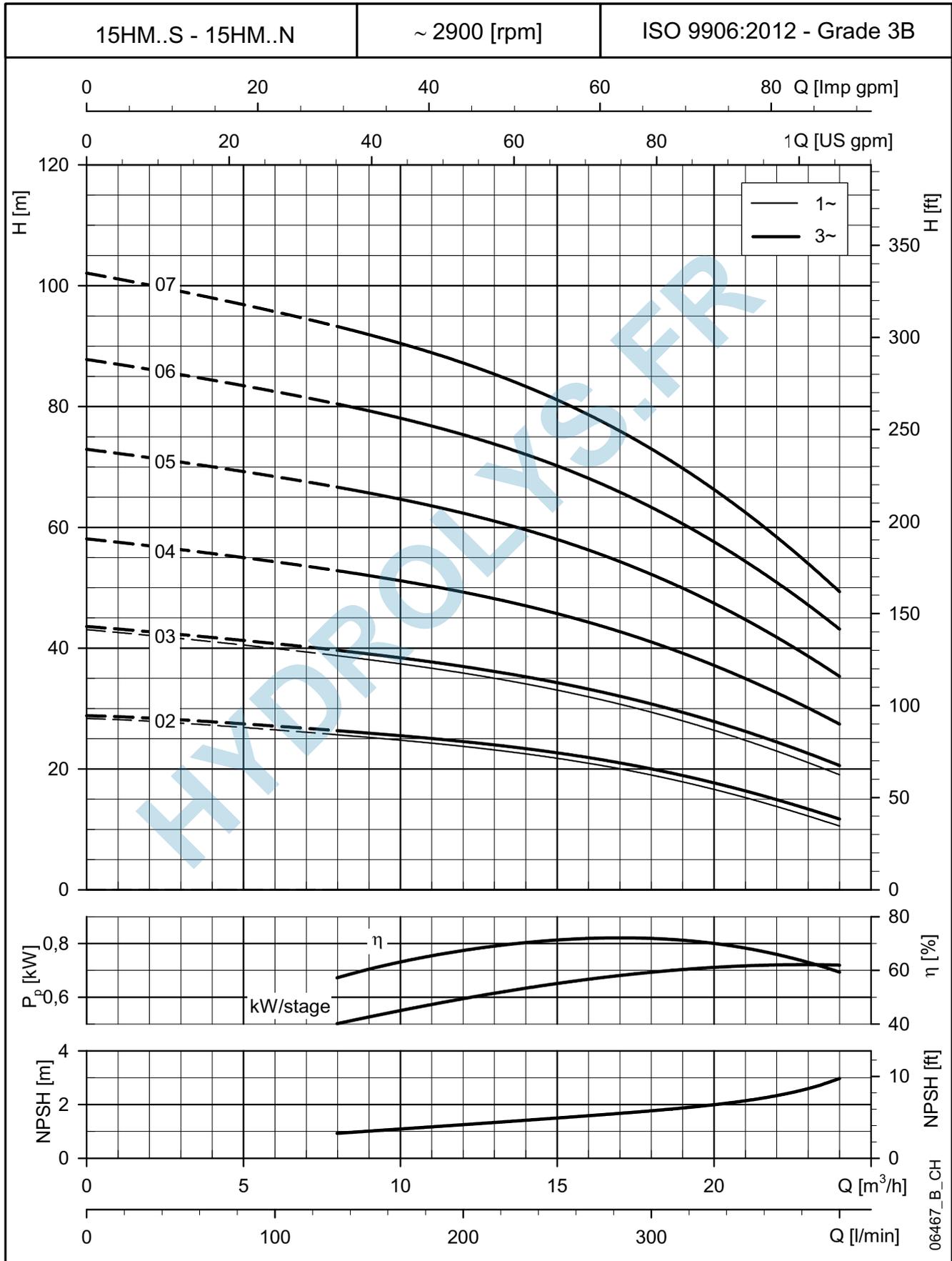
15HM02	THREE-PHASE	1.5	80	144	153	155	219	90	478	154	121	100	125	125	155	12.5	10	10	18
15HM03		2.2	90	144	153	174	224	90	534	176	144	125	150	140	164	12.5	10	10	23
15HM04		3	90	192	201	174	224	90	582	224	144	125	150	140	164	12.5	10	10	27
15HM05		4	100	240	249	197	254	100	659	292	163	140	170	160	184	15	12	10	35
15HM06		5.5	112	288	297	214	280	112	741	347	170	140	170	190	219	15	12	10	43
15HM07		5.5	112	336	345	214	280	112	789	395	170	140	170	190	219	15	12	10	44

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

15hm-s-n-2p50-en_c_td

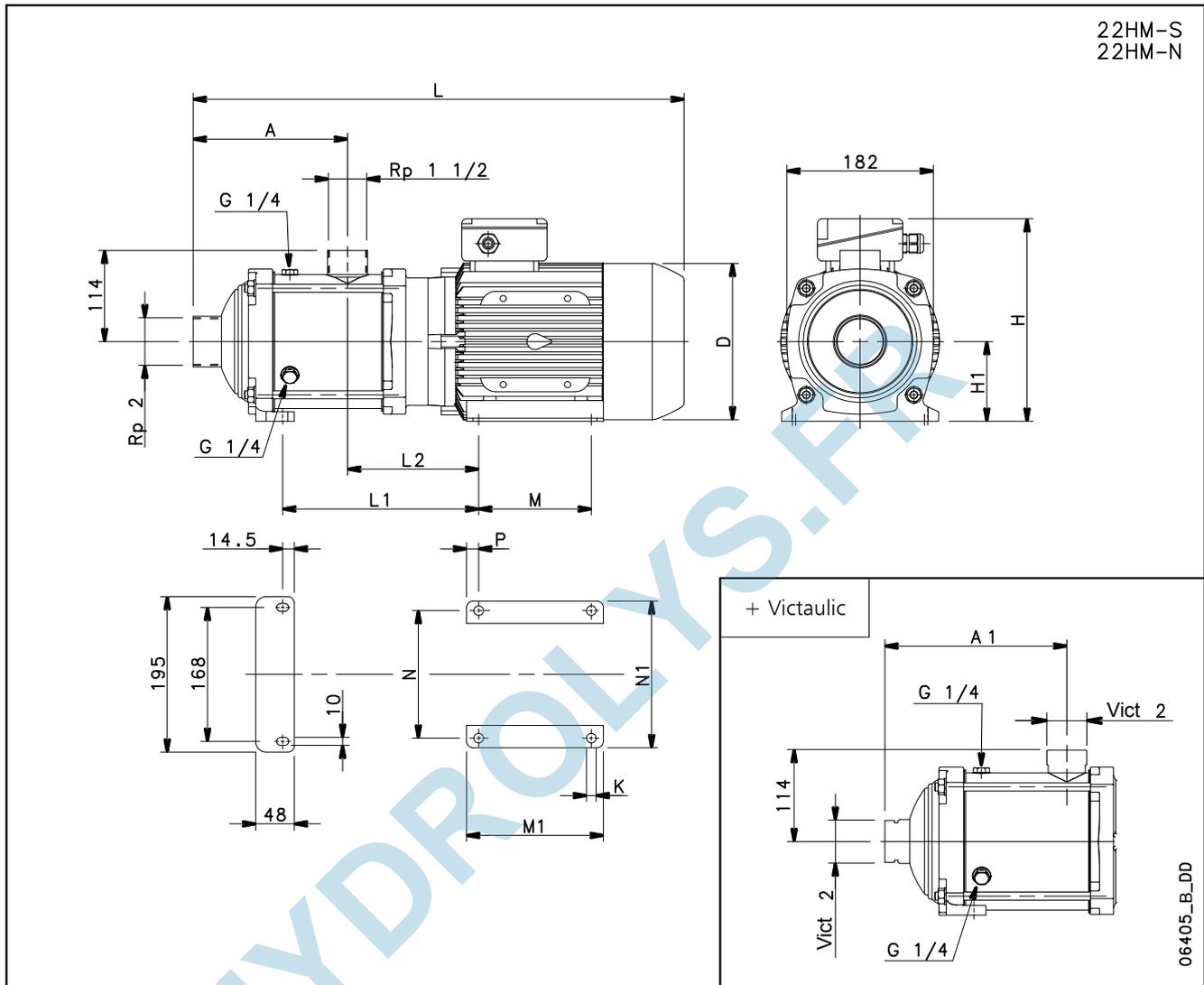
15HM..S - 15HM..N SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

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



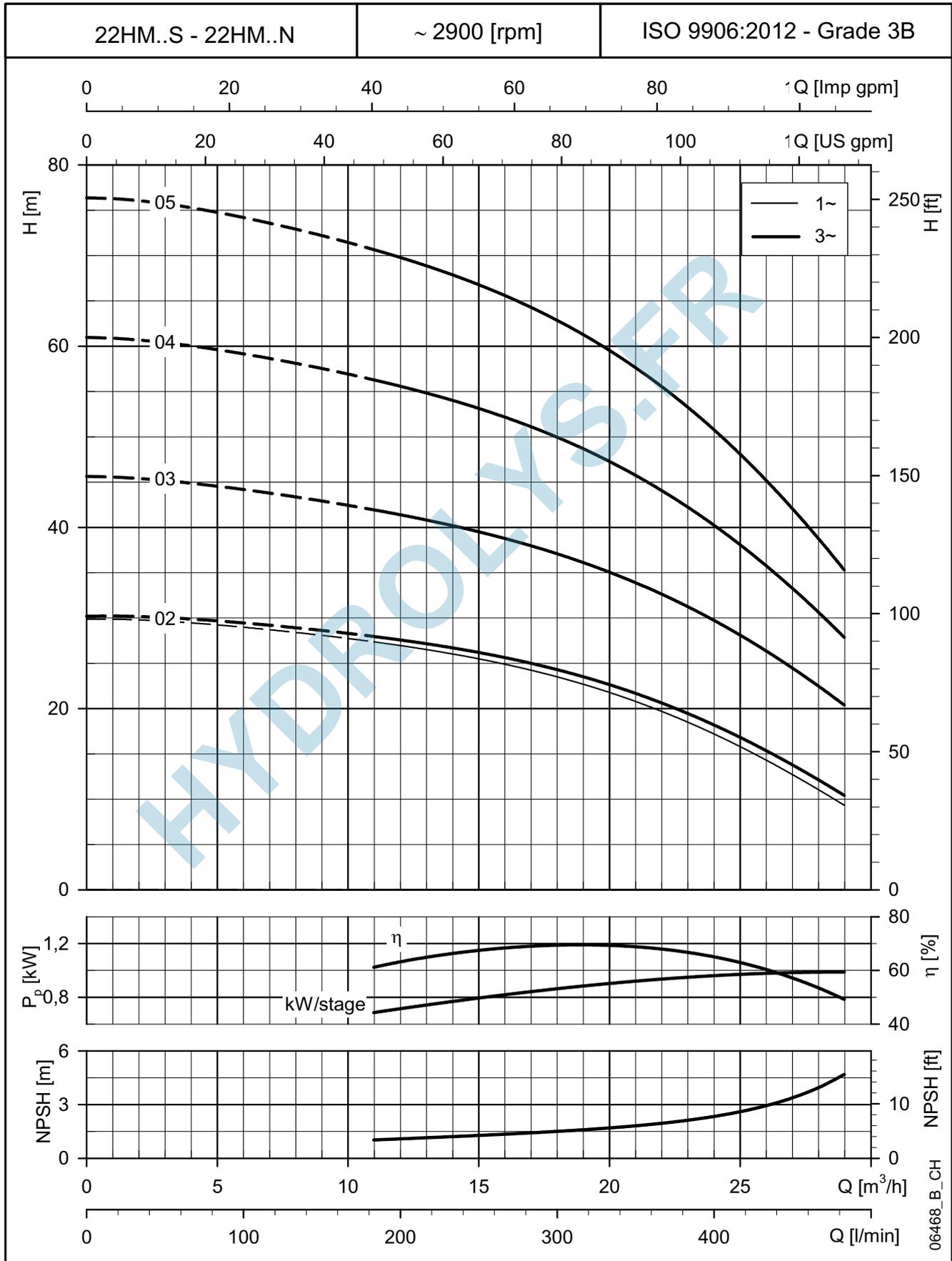
PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)														PN	WEIGHT	
		kW	SIZE	A	A1	D	H	H1	L	L1	L2	M	M1	N	N1	P	K			bar
22HM02	SINGLE-PHASE	2.2	90	144	153	174	249	90	534	176	144	125	150	140	164	12.5	10	10	26	
22HM02	THREE-PHASE	2.2	90	144	153	174	224	90	534	176	144	125	150	140	164	12.5	10	10	23	
22HM03		3	90	144	153	174	224	90	534	176	144	125	150	140	164	12.5	10	10	26	
22HM04		4	100	192	201	197	254	100	611	244	163	140	170	160	184	15	12	10	33	
22HM05		5.5	112	240	249	214	280	112	693	299	170	140	170	190	219	15	12	10	42	

You can use the pumps up to PN16 by mounting a mechanical seal PN16.
For mechanical seal, please refer to the TYPE OF SEAL table at page 16.

22hm-s-n-2p50-en_c_td

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

OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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

e-HM WITH VARIABLE FREQUENCY DRIVE

HYDROLASER

ECODESIGN DIRECTIVE (ErP)

The Ecodesign directive was put in place in 2011 and introduced minimum requirements for the efficiency of **AC motors and pumps**. Over the last few years, these requirements have been gradually intensified.

Motors are classified based on their mode of operation. Fixed speed motors are classified according to IEC 60034-30-1 and the minimum acceptable level of efficiency is IE3 since January 2017 for 0.75 to 375 kW rated powers 3 phase motors, according to the Directive 2009/125/EC.

Variable speed motors (not covered in IEC 60034-30-1), which are not designed to operate direct on-line, are classified according to the technical specification IEC/TS 60034-30-2. This Technical Specification introduced the “ultra-premium” **IE5 efficiency performance**, the best efficiency existing level for this kind of motors.

In 2014, with the standard EN 50598, there was a switch in the definition of efficiency class from an individual component approach towards an overall system one; which is the basic point for the “Extended product approach” (EPA).

Taking this concept further, the EN50598-2 introduced IES efficiency classes for frequency converters + motor systems (known as power drive systems-PDS) with power rating **from 0.12 kW to 1000kW and from 100V to 1000V**. For Power Drive System (PDS) the defined efficiency classes are IES0, IES1, IES2. If a PDS has 20% greater losses than the reference value of IES1 then it is classified as IES0; if it has 20% lower losses than the reference value of IES1 then it is classified as IES2.

- **With the HYDROVAR connected to a Lowara IE3 motor, the system achieves the highest IES class – IES2.**
- **With the eSM drive, which powers an IE5 permanent magnet motor, the system surpasses the highest IES class – IES2.**



The e-HM pump series is therefore already ready for the 2020 EU Ecodesign energy efficiency objectives.

e-HMMH

e-HM with HYDROVAR®

HYDROLYSIS

e-HMH SERIES (e-HM WITH HYDROVAR)

Background and context

For all pumping needs in commercial or residential building and in industry applications, the demand for intelligent pumping systems is constantly growing. Controlled systems offer many advantages: reduced operating costs for the lifetime of the pump, lower environmental impact, longer lifetime of piping systems and networks.

For this reason, Lowara has developed the HMH: an intelligent pumping system which assures high level performance with energy consumption tailored to the system's demand.

Benefits of e-HM with HYDROVAR

Saving: e-HMH transforms the e-HM pumps into variable speed intelligent pumping systems. Thanks to the HYDROVAR, the speed of each pump varies so as to maintain a constant flow, a constant pressure, or a differential pressure. In doing so, at any point in time, the pump only receives the energy required. This in turns allows for considerable savings, especially for systems that have varying loads throughout the day.

Easy installation and space-saving: e-HMH saves time and space during installation. The Hydrovar is delivered already mounted on the motor (for models up to 22kW). The hydrovar is kept cool by the motor fan and does not require a control panel. In order to function, only fuses on the supply line are needed (Check your local electrical installation regulations).

Identification code:

e-HMH models are identified by the letter "H" and the last two characters:

H = with integrated HYDROVAR

/2 = HYDROVAR HVL**2**.015 1~ 208-240 V (50/60 Hz)

/3 = HYDROVAR HVL**3**.015 3~ 208-240 V (50/60 Hz)

/4 = HYDROVAR HVL**4**.015 3~ 380-460 V (50/60 Hz).

Other options:

W = Wi-fi Card.

C = Premium Card.

X = Wi-fi Card and Premium Card.

Examples:

3HMH16S015T5RVBE/2

3HMH16S015T5RVBE/3X

3HMH16S015T5RVBE/4C

Key Features of the HYDROVAR

- **No need for additional pressure sensors:**

The e-HMH is fitted as standard with two pressure transmitters, normally are fitted on the flanges.

- **No need for special pumps or motors.**

- **e-HMH is already pre-wired.**

- **No need for bypass or safety systems:**

The e-HMH will immediately switch off when demand drops to zero or when it exceeds maximum pump capacity; thus making installation of additional safety devices unnecessary.

- **Anti-condensation device:**

The HYDROVAR is fitted with anti-condensation devices which switch on when the pump is in standby in order to prevent condensation forming in the unit.

e-HMH SERIES (e-HM WITH HYDROVAR)

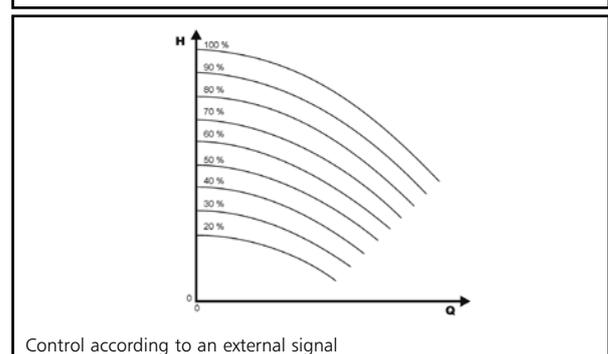
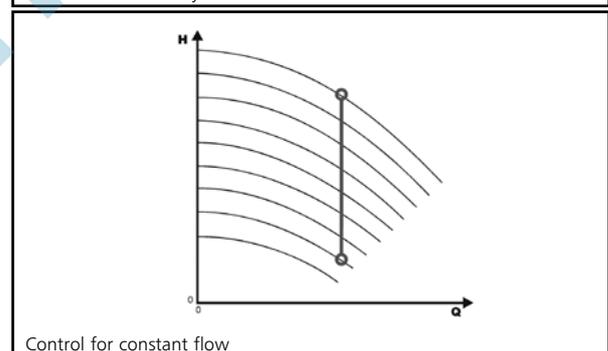
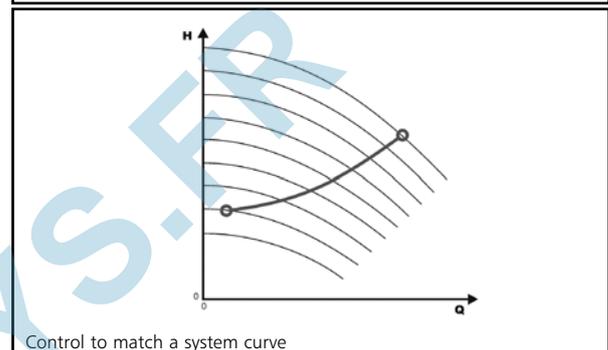
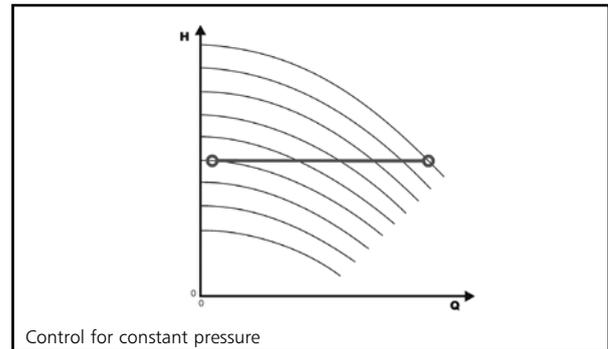
The basic function of the HYDROVAR device is to control the pump to meet the system demands.

HYDROVAR performs these functions by:

- 1) Measuring the system pressure or flow via a transmitter mounted on the pump's delivery side.
- 2) Calculating the motor speed to maintain the correct flow or pressure.
- 3) Sending out a signal to the pump to start the motor, increase speed, decrease speed or stop.
- 4) In the case of multiple pump installations, HYDROVAR will automatically provide for the cyclic changeover of the pumps' starting sequence.

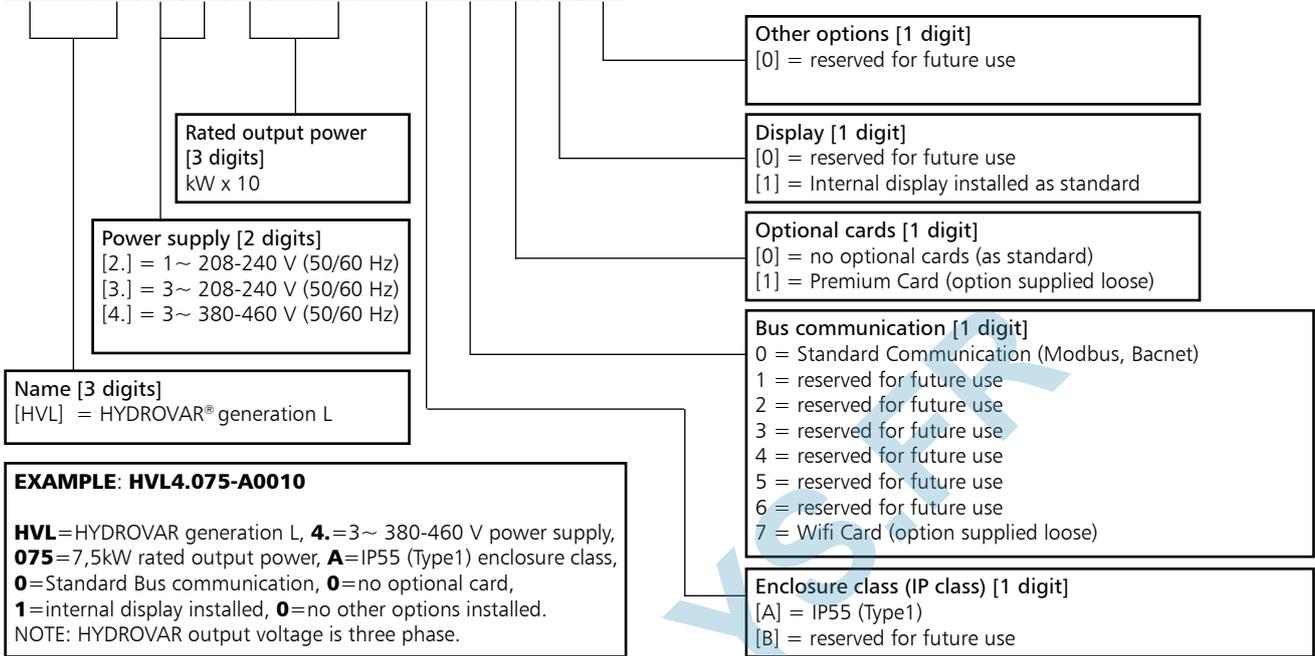
In addition to these basic functions, HYDROVAR can perform controls only manageable by the most advanced computerized control systems. Some examples are:

- Stop the pump(s) at zero demand.
- Stop the pump(s) in case of water failure on the suction side (protection against dry running).
- Stop the pump if the required delivery exceeds the pump's capacity (protection against cavitation caused by excessive demand), or automatically switch on the next pump in a multiple series.
- Protect the pump and motor from over-voltage, under-voltage, overload, and earth fault.
- Vary the pump speed: acceleration and deceleration time.
- Compensate for increased flow resistance at high flow rates.
- Conduct automatic tests at set intervals.
- Monitor the converter and motor operating hours.
- Display the energy consumption (kWh).
- Display all functions on an LCD in different languages (Italian, English, French, German, Spanish, Portuguese, Dutch, etc...).
- Send a signal to a remote control system which is proportional to the pressure and frequency.
- Communicate with external control system via Modbus (RS 485 interface) and Bacnet as standard.



HYDROVAR HVL IDENTIFICATION CODE

H V L 4 . 0 7 5 - A 0 0 1 0



DIMENSIONS AND WEIGHTS



TYPE	MODELS			DIMENSIONS (mm)				WEIGHT Kg
	/2	/3	/4	L	B	H	X	
SIZE A	HVL2.015 ÷ 2.022	HVL3.015 ÷ 3.022	HVL4.015 ÷ 4.040	216	205	170	243	5,6
SIZE B	HVL2.030 ÷ 2.040	HVL3.030 ÷ 3.055	HVL4.055 ÷ 4.110	276	265	185	305	10,5
SIZE C	-	HVL3.075 ÷ 3.110	HVL4.150 ÷ 4.220	366	337	200	407	15,6

HVL_dim-en_b_td

HYDROVAR HVL EMC COMPATIBILITY

EMC requirements

HYDROVAR fulfills the product standard EN61800-3:2004 + A1:2012, which defines categories (C1 to C4) for device application areas.

Depending on the motor cable length, a classification of HYDROVAR by category (based on EN61800-3) is reported in the following tables:

HVL	HYDROVAR classification by categories based on EN61800-3
2.015 ÷ 2.040	C1 (*)
3.015 ÷ 3.110	C2 (*)
4.015 ÷ 4.220	C2 (*)

(*) 0,75 motor cable length; contact Xylem for further information

En-Rev_A

CARD

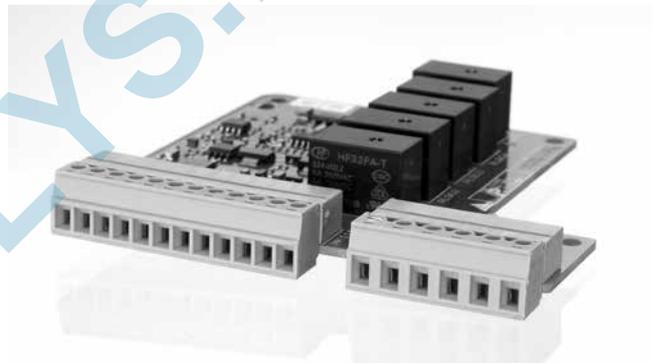
Premium Card HYDROVAR (optional)

For the e-HMH series, the Premium Card comes fitted as option on the standalone HYDROVAR.

This allows to control up to five fix speed pumps via an external panel.

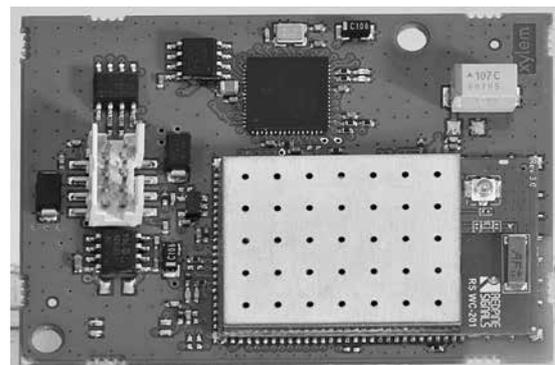
The Premium Card will allow additional features listed below:

- 2 additional Analog Inputs
- 2 Analog Outputs
- 1 additional digital input
- 5 relays.



Wi-Fi Card HYDROVAR (optional)

With the WiFi card fitted in the HYDROVAR, the unit can will allow you to be connected to a wireless network.



OPTIONAL COMPONENTS

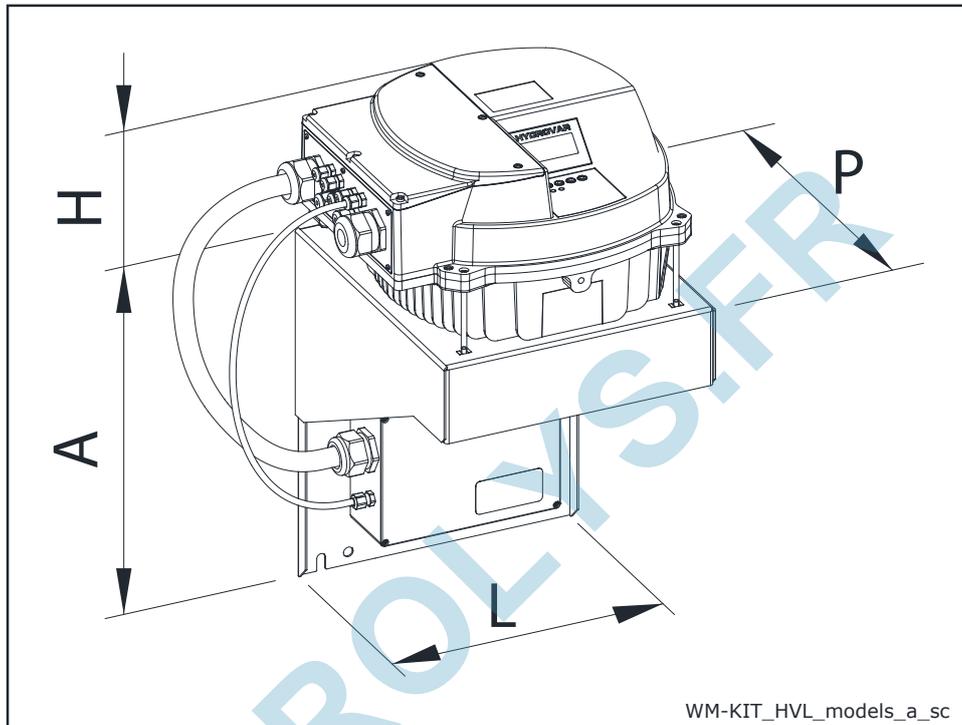
Sensors

The following sensors are available for HYDROVAR:

- a. Pressure-transducer
- b. Differential pressure-transducer
- c. Temperature-sensor
- d. Flow indicator (orifice plate, inductive flow meter)
- e. Level-sensor.

HYDROVAR HVL (WALL MOUNTING KIT) DIMENSIONS AND WEIGHTS

As an option a HYDROVAR wall mounting kit is also available. This is used where mounting on the pump unit is impossible or where you would like the controls in another location. These are available for the new generation HYDROVAR HVL 2.015-4.220 (22 kW). The speed of the cooling fan modulates with the HYDROVAR usage which optimizes energy consumption and also reduces noise.



WM KIT TYPE	kW	WM KIT POWER SUPPLY	HVL SIZE	DIMENSIONS (mm)				WEIGHT (kg)	
				A	H	L	P	HVL	WM KIT
WM KIT HVL 2.015	1,5	1~ 230V	A	220	170	202	232	5,6	2,6
WM KIT HVL 2.022	2,2			220	170	202	232	5,6	2,6
WM KIT HVL 2.030	3		B	240	175	258	290	10,5	8,2
WM KIT HVL 2.040	4			320	175	288	305	10,5	5,4
WM KIT HVL 3.015	1,5	3~ 230V	A	220	170	202	232	5,6	2,6
WM KIT HVL 3.022	2,2			220	170	202	232	5,6	2,6
WM KIT HVL 3.030	3		B	240	175	258	290	10,5	8,2
WM KIT HVL 3.040	4			240	175	258	290	10,5	8,2
WM KIT HVL 3.055	5,5		C	240	175	258	290	10,5	8,2
WM KIT HVL 3.075	7,5			400	200	325	365	15,6	11,6
WM KIT HVL 3.110	11		400	200	325	365	15,6	11,6	
WM KIT HVL 4.015	1,5		3~ 400V	A	240	170	258	290	5,6
WM KIT HVL 4.022	2,2	240			170	258	290	5,6	8,2
WM KIT HVL 4.030	3	240			170	258	290	5,6	8,2
WM KIT HVL 4.040	4	240			170	258	290	5,6	8,2
WM KIT HVL 4.055	5,5	B		240	175	258	290	10,5	8,2
WM KIT HVL 4.075	7,5			240	175	258	290	10,5	8,2
WM KIT HVL 4.110	11	C		320	175	288	305	10,5	5,4
WM KIT HVL 4.150	15			400	200	325	365	15,6	11,6
WM KIT HVL 4.185	18,5			400	200	325	365	15,6	11,6
WM KIT HVL 4.220	22			400	200	325	365	15,6	11,6

WM-KIT_HVL_models-EN_b_td

e-HME

Version with drive and permanent magnet motor (e-SM Drive)

HYDROLYSER

e-HME SERIES e-HM SMART SERIES

Background and context

In every sector, from construction and industry to agriculture and building services the need for intelligent, compact and high-efficiency pumping systems is constantly growing. That's why Lowara has developed the e-HME series: an integrated intelligent pumping system with electronically driven, permanent magnet motor (IE5 efficiency level). The integrated control system, combined with the high performance, power and efficiency from the motor and hydraulics, guarantees impressively low operating costs. You also benefit from flexibility, precision and its ultra-compact size.

Savings

The electronics and permanent magnet motor are highly efficient and minimize power losses while transferring maximum energy to the hydraulic parts of the pump.

The refined control system with integrated microprocessor adjusts the motor speed, matching the required operating point of the pump or system requirements.

This reduces demand on electricity according to the required working conditions.

This creates economies, especially in systems where pump demand varies over time.

Flexibility

The compact size, low loss and increased control make the e-HM Smart series a good choice in applications and systems where fixed speed pumps are commonly used. The e-HM Smart series is easy to integrate in control and regulation loops thanks to the wide availability of compatible communication protocols, including analog and digital inputs.

The pump is supplied with a pressure sensor.

Ease of use and commissioning

e-HM Smart has an intuitive interface that guides the user through the installation, and a practical area to assist with connections.

The control system is integrated and no additional external electrical panel is required.

Application sectors

- Water supply systems in residential buildings
- Air conditioning
- Water treatment plants
- Industrial installations



e-SM System

- 230V +/- 10% single phase power supply, 50/60 Hz
- Power up to 1,5 kW
- Protection class IP55
- Can be linked up to 3 e-HM Smart pumps

Pump

- Flow rate: up to 29 m³/h
- Head: up to 152 m
- Environment temperature: -20°C to +50°C with no performance derating
- Temperature of pumped liquid: up to +120°C for single-phase motor versions
- Maximum operating pressure 16 bar (PN 16)
- The hydraulic performances meet the tolerances specified in ISO 9906:2012

Motor

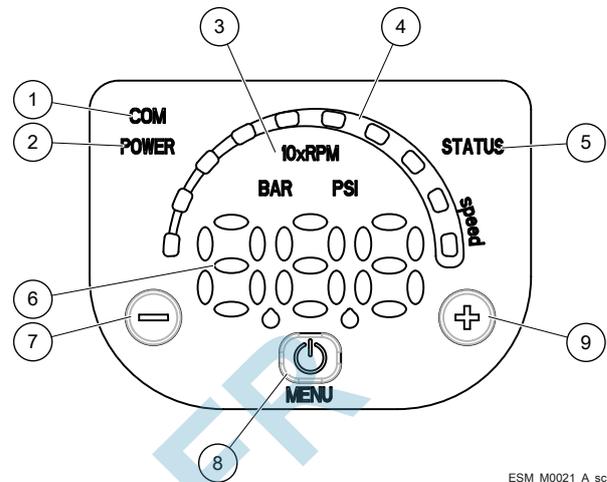
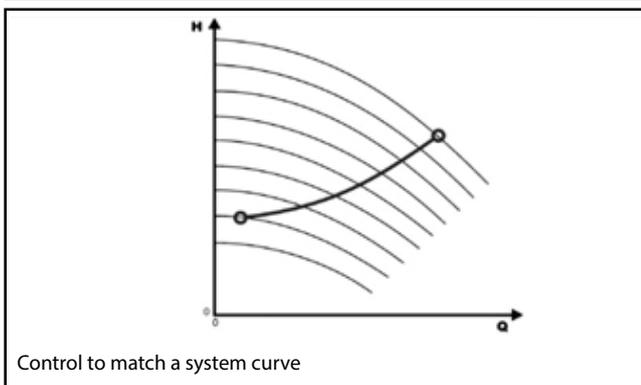
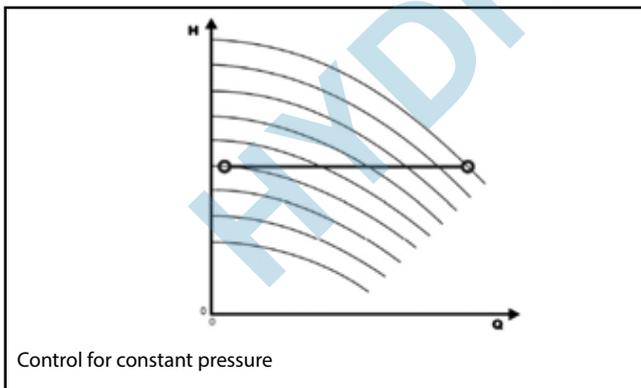
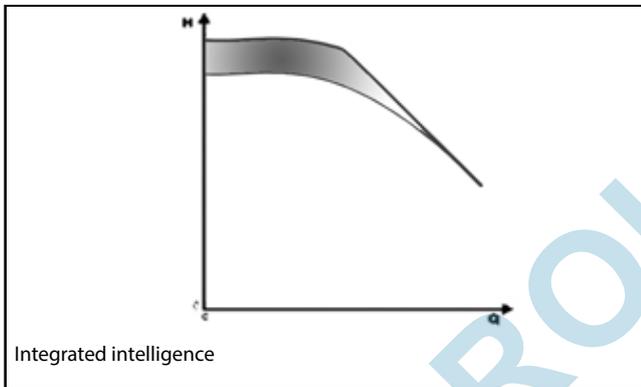
- IE5 efficiency level (IEC TS 60034-30-3:2016)
- Synchronous electric motor with permanent magnets, (TEFC), closed structure, air-cooled
- Insulation class 155 (F)
- Overload protection and locked rotor with automatic reset incorporated

e-HME SERIES e-HM SMART SERIES

e-HM Smart series is equipped with an intelligent control that optimizes hydraulic performance while minimizing waste.

Integrated intelligence: The electronic control of the motor enables a 20% increase in performance compared to an equivalent fixed speed pump (area highlighted in figure "Integrated intelligence").

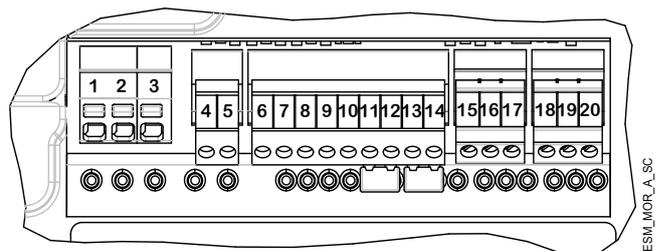
Adjustment: This is possible both at constant pressure and according to the characteristic curve of the system, based on the customer's preferences. Another option is according to an external signal or at a preset speed.



ESM_M0021_A_sc

Intuitive and simple interface: You can control the unit from just three buttons, with an easy to read display for parameters and alarms, designed for complete control of system operation.

- ① Communication LED
- ② Power on LED
- ③ Unit of measure LED
- ④ Speed LED bar
- ⑤ Status LED
- ⑥ Numeric display
- ⑦ - Decrease key
- ⑧ On/off and menu key
- ⑨ + Increase key



ESM_M0021_A_sc

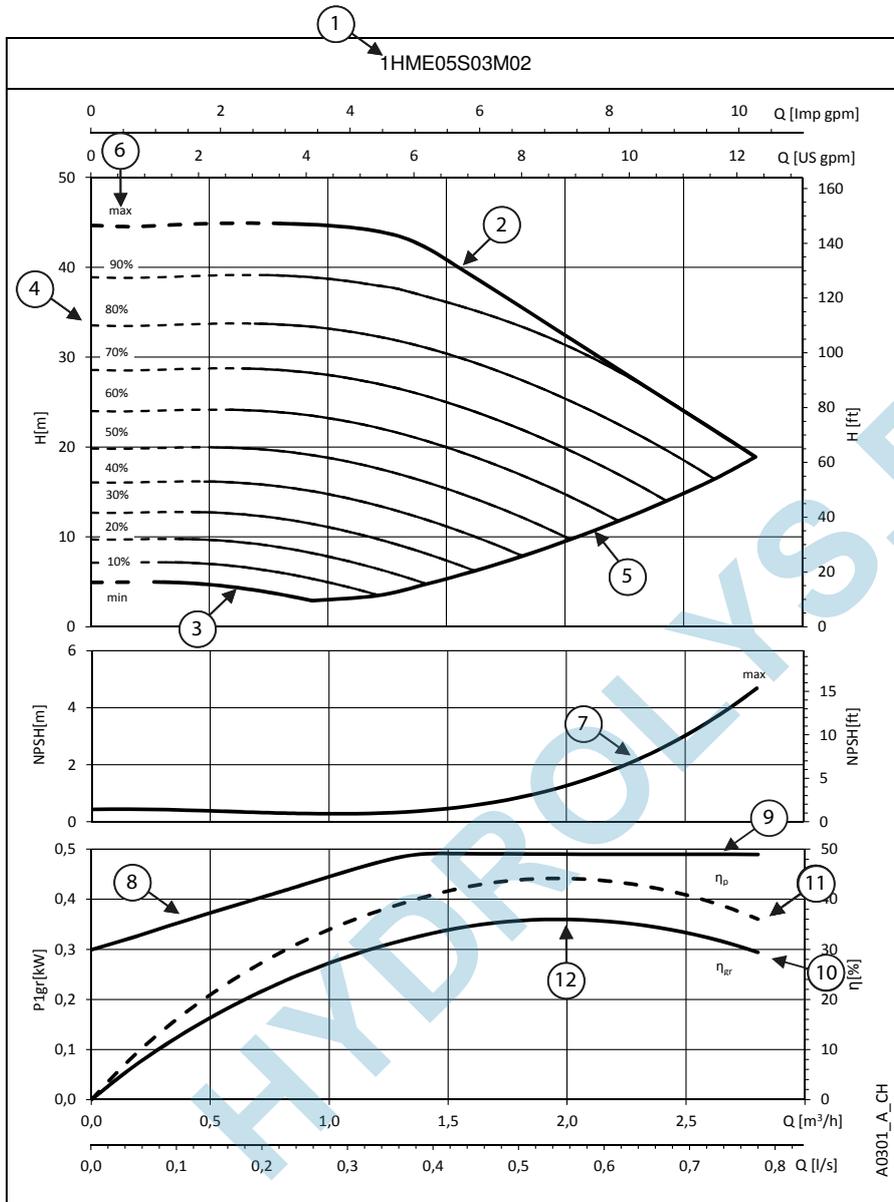
Terminal block

e-HM Smart has the following terminals:

- 1, 2, 3 = Power supply (\oplus , L, N)
- 4, 5 = Fault signal (NO) - (Ext $V_{max} < 250$ VAC - $I_{max} < 2$ A)
- 6 = Auxiliary voltage supply +15 VDC
- 7, 8 = Analog 0-10V
- 9 = Power supply external sensor +15 VDC
- 10 = External sensor 4-20 mA input
- 11, 12 = External start/stop
- 13, 14 = External lack of water
- 15, 16, 17 = Communication bus RS485, protocol Modbus and BACnet
- 18, 19, 20 = Communication bus RS485, enabled via dedicated module

e-HME SERIES
HOW TO READ SMART PUMP SERIES CURVES

To exploit to the maximum potential of Smart Pumps it's important to properly read working curves:



① **Pump model**

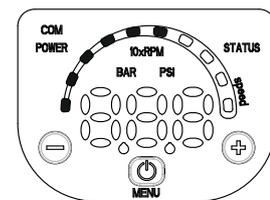
② **Maximum speed curve:** equal to 3600 rpm

③ **Minimum speed curve:** it refers to the minimum rpm level the motor can work at, it's calculated depending on the model of pump maximizing for each one the working area and allowing the highest system flexibility.

④ The **area with dotted lines** is where the pump can only operate intermittently for short periods of time.

⑤ Each **intermediate curve** between max and min speed shows the percentage of load the pump+motor+drive system is working at; it's easy to read also from the LED speed bar on the HMI keypad: at 90% there will be 9 led, at 80% there will be 8 and so on.

Example: at 60% there will be 6 lit led's



⑥ The **part load percentage** is calculated depending on maximum speed (*max*, 100%) and minimum speed (*min*, equal to 0%, which is the minimum part load step, below it the drive stays powered up but cannot work).

⑦ **NPSH**: is the net positive suction head of pump+motor+drive system working at maximum speed.

⑧ **P1_{gr}** is the power absorption in kW of pump+motor+drive system working at maximum speed.

⑨ **Load control**: the Smart Pump controls and limits power consumption at high flow/low head, in this way the motor stays protected from overload and ensure a longer life of pump+motor+drive system.

⑩ **η_{gr}** is the efficiency of pump+motor+drive system working at maximum speed.

⑪ **η_p** is the efficiency of the hydraulic part, working at maximum speed.

⑫ **Working point**: it's important to make sure the pump is working at the best working point, the one at highest efficiency. It's easy to find it: it's the highest point of the η_p pump efficiency curve; once you found it, you can learn also flow values from x-axis called Q and head values from y-axis called H which allow the system to work at the best working point.

1, 3, 5, 10, 15HME..S SERIES HYDRAULIC PERFORMANCE TABLE

PUMP TYPE HME..S, HME..N Single-phase	MOTOR		e-SM SET		Q = DELIVERY							
	P _N kW	TYPE 1x230 V	* P ₁ kW	* I 208-240 V A	l/min 0	6,7	13,3	20,0	26,7	33,3	40,0	46,7
					m ³ /h 0	0,4	0,8	1,2	1,6	2,0	2,4	2,8
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
1HME05S03M02	0,37	ESM80/103 HM..	0,49	2,24	44,7	44,8	44,9	44,1	39,2	32,5	25,7	
1HME08S05M02	0,55	ESM80/105 HM..	0,69	3,07	71,6	71,5	71,7	70,4	60,3	50,0	39,6	
1HME11S07M02	0,75	ESM80/107 HM..	0,91	4,04	98,5	98,5	98,8	94,3	80,7	66,8	52,9	
1HME15S11M02	1,1	ESM80/111 HM..	1,33	5,85	134,0	134,4	134,6	132,3	119,5	99,5	79,6	
1HME17S15M02	1,5	ESM80/115 HM..	1,77	7,77	151,8	152,2	152,7	149,6	141,6	128,6	110,7	

PUMP TYPE HME..S, HME..N Single-phase	MOTOR		e-SM SET		Q = DELIVERY							
	P _N kW	TYPE 1x230 V	* P ₁ kW	* I 208-240 V A	l/min 0	13,3	26,7	40,0	53,3	66,7	80,0	86,7
					m ³ /h 0	0,8	1,6	2,4	3,2	4,0	4,8	5,2
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
3HME03S03M02	0,37	ESM80/103 HM..	0,49	2,24	33,3	33,9	33,4	31,5	25,6	20,1	14,6	11,8
3HME05S05M02	0,55	ESM80/105 HM..	0,69	3,07	55,5	56,5	55,7	47,5	38,2	29,4	20,5	16,0
3HME07S07M02	0,75	ESM80/107 HM..	0,91	4,06	77,6	79,1	78,1	64,9	52,0	39,8	27,5	21,3
3HME09S11M02	1,1	ESM80/111 HM..	1,33	5,85	99,8	101,8	100,3	93,6	76,1	59,6	43,0	34,7
3HME12S15M02	1,5	ESM80/115 HM..	1,78	7,80	133,1	135,9	133,6	127,3	103,6	81,5	59,2	48,1

PUMP TYPE HME..S, HME..N Single-phase	MOTOR		e-SM SET		Q = DELIVERY							
	P _N kW	TYPE 1x230 V	* P ₁ kW	* I 208-240 V A	l/min 0	23,3	46,7	70,0	93,3	116,7	140,0	170,0
					m ³ /h 0	1,4	2,8	4,2	5,6	7,0	8,4	10,2
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
5HME02S03M02	0,37	ESM80/103 HM..	0,49	2,24	22,2	22,4	21,9	19,8	16,2	13,0	9,9	6,0
5HME03S05M02	0,55	ESM80/105 HM..	0,69	3,07	33,3	33,6	32,9	29,5	24,1	19,3	14,7	8,8
5HME04S07M02	0,75	ESM80/107 HM..	0,91	4,05	44,4	44,7	43,8	40,1	32,8	26,4	20,2	12,2
5HME06S11M02	1,1	ESM80/111 HM..	1,33	5,85	66,7	67,2	65,8	59,0	48,1	38,7	29,5	17,5
5HME08S15M02	1,5	ESM80/115 HM..	1,78	7,82	88,9	89,5	87,7	80,2	65,5	52,8	40,4	24,4

PUMP TYPE HME..S, HME..N Single-phase	MOTOR		e-SM SET		Q = DELIVERY							
	P _N kW	TYPE 1x230 V	* P ₁ kW	* I 208-240 V A	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	283,3
					m ³ /h 0	2,4	4,8	7,2	9,6	12,0	14,4	17,0
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
10HME01S07M02	0,75	ESM80/107 HM..	0,86	3,80	17,5	17,5	17,0	16,1	14,7	12,7	10,2	6,6
10HME02S11M02	1,1	ESM80/111 HM..	1,33	5,85	34,8	34,9	33,8	32,3	27,2	21,9	16,6	11,1
10HME03S15M02	1,5	ESM80/115 HM..	1,78	7,81	52,4	51,8	50,6	46,9	39,2	32,2	25,3	17,8

PUMP TYPE HME..S, HME..N Single-phase	MOTOR		e-SM SET		Q = DELIVERY							
	P _N kW	TYPE 1x230 V	* P ₁ kW	* I 208-240 V A	l/min 0	70,0	140,0	210,0	280,0	350,0	420,0	483,3
					m ³ /h 0	4,2	8,4	12,6	16,8	21,0	25,2	29,0
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
15HME01S11M02	1,1	ESM80/111 HM..	1,33	5,85	20,9	20,5	19,7	18,8	16,4	12,7	8,8	5,2
15HME02S15M02	1,5	ESM80/115 HM..	1,79	7,85	42,7	41,8	35,9	29,8	24,2	18,2	11,3	5,1

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

1-15hmes-esm-2p50-en_a_th

ELECTRICAL DATA TABLE

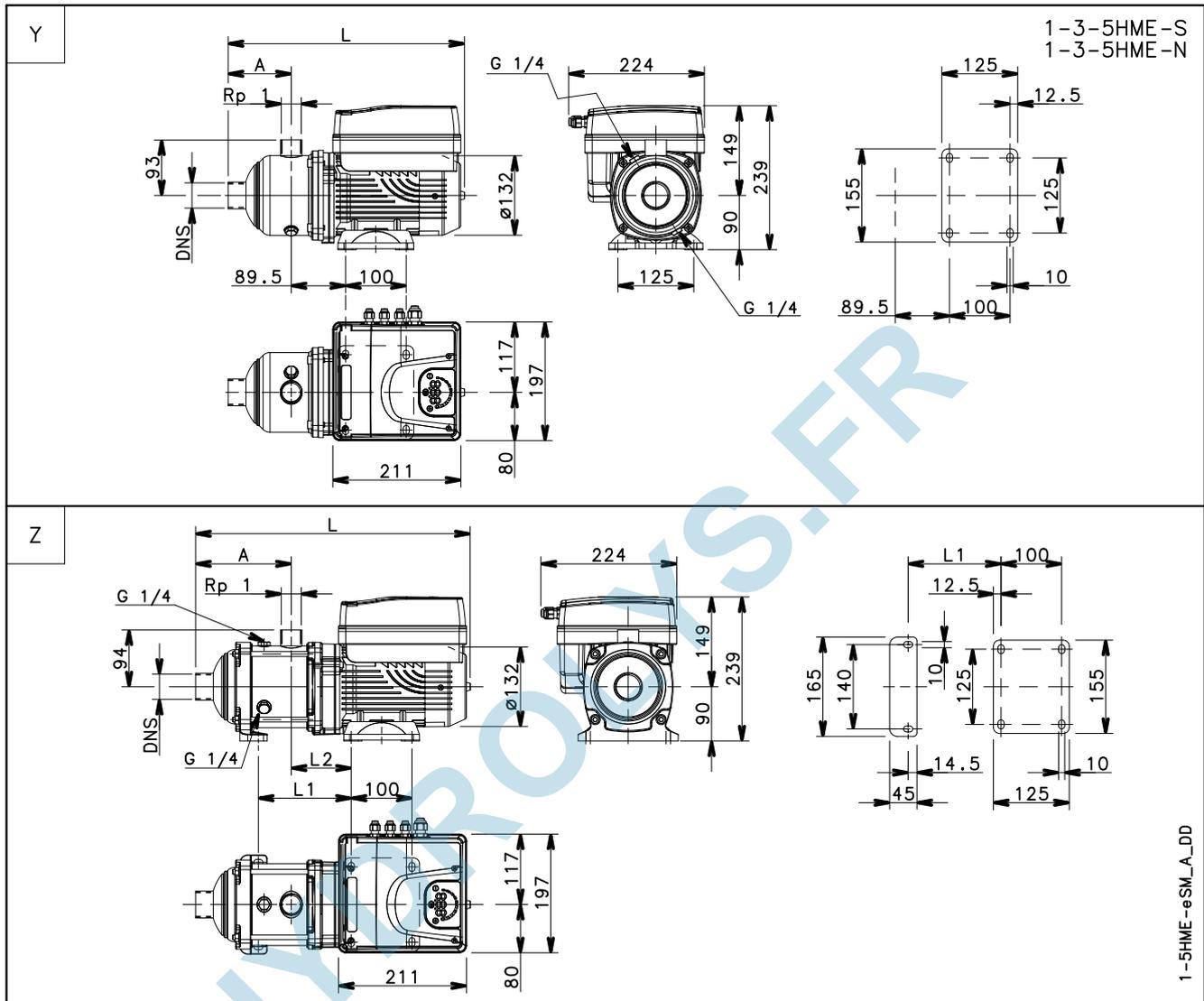
P _N kW	MOTOR TYPE	IEC SIZE	Construction Design	SPEED (RPM) min ⁻¹	INPUT CURRENT I (A) 208-240 V	DATA RELATED TO THE VOLTAGE OF 230V						
						In A	cosφ	Tn Nm	η %			IES
0,37	ESM80/103 HM..	80	SPECIAL	3000	2,28-1,99	2,08	0,95	1,18	81,3	79,1	74,3	2
				3600	2,30-2,02	2,10		0,98	80,6	77,5	72,0	
0,55	ESM80/105 HM..	80		3000	3,27-2,85	2,96	0,97	1,75	83,3	82,2	78,8	2
				3600	3,27-2,85	2,96		1,46	83,3	81,5	77,5	
0,75	ESM80/107 HM..	80		3000	4,43-3,84	4,00	0,98	2,39	83,3	83,3	81,5	2
				3600	4,38-3,79	3,94		1,99	84,5	83,5	80,6	
1,10	ESM80/111 HM..	80		3000	6,26-5,35	5,64	0,99	3,50	85,7	85,1	82,7	2
				3600	6,20-5,32	5,63		2,92	85,9	84,6	81,4	
1,50	ESM80/115 HM..	80		3000	8,57-7,32	7,69	0,99	4,77	85,6	85,7	84,7	2
				3600	8,42-7,25	7,62		3,98	86,3	85,9	84,0	

* The indicated rotational speed are representing the upper and lower limits of the rated power operational speed range.

eHM-eVM_Smart-motm_en_a_te

In the range 3000-3600 rpm the nominal motor power is guaranteed. Above 3600 rpm it isn't possible work and the motor is automatically limited; below 3000 rpm it works partially load.

1, 3, 5HME..S SERIES DIMENSIONS AND WEIGHTS

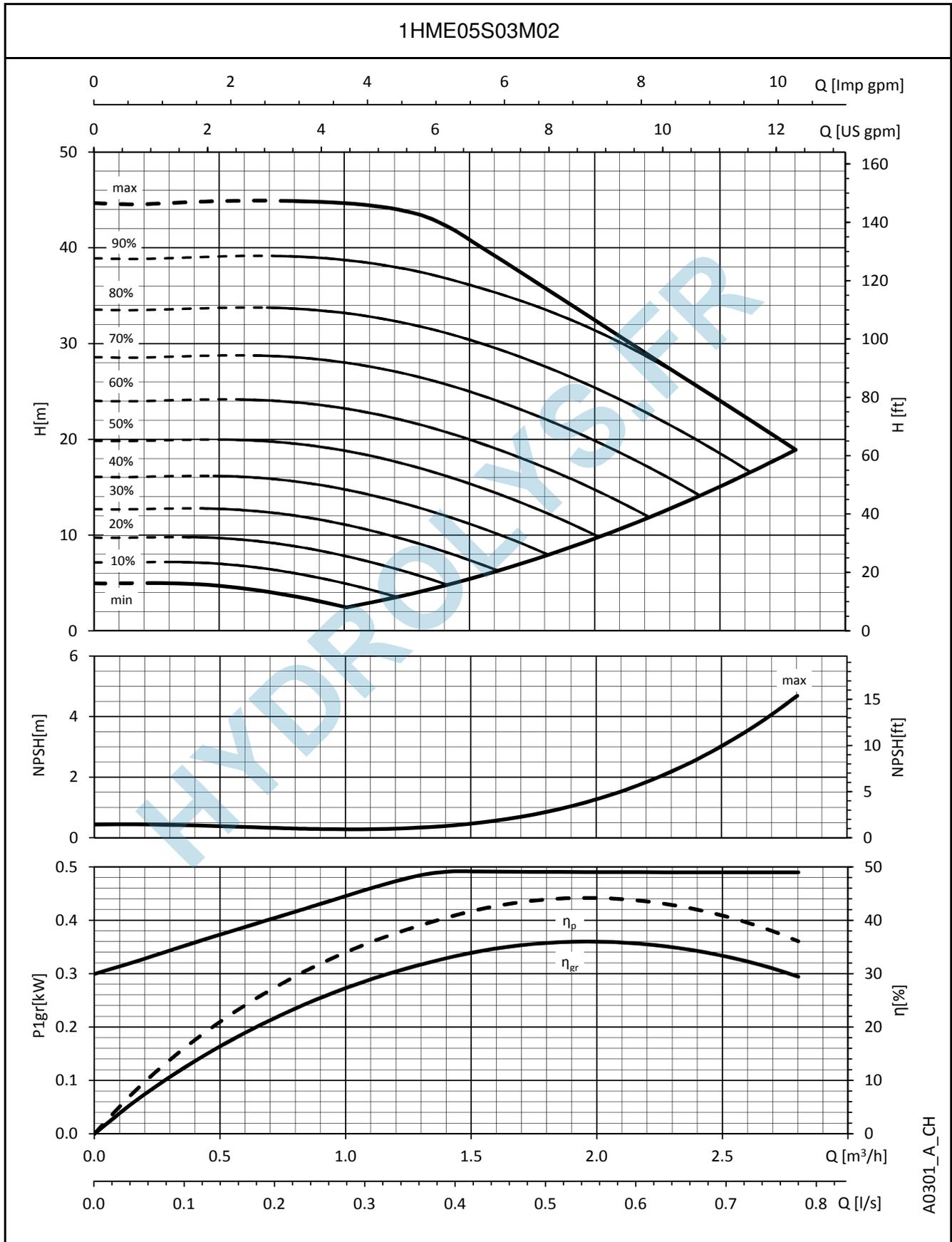


1-5HME-eSM_A_DD

PUMP TYPE	VERSION	Ref.	MOTOR		DIMENSIONS (mm)					PN	WEIGHT
			kW	SIZE	A	DNS	L	L1	L2		
1HME05S03M02	SINGLE-PHASE	Y	0,37	80	127	Rp 1	414	-	-	10	10
1HME08S05M02		Z	0,55	80	171	Rp 1	467	168	99	10	12
1HME11S07M02		Z	0,75	80	231	Rp 1	527	228	99	10	13
1HME15S11M02		Z	1,1	80	311	Rp 1	607	308	99	16	15
1HME17S15M02		Z	1,5	80	351	Rp 1	647	348	99	16	16
3HME03S03M02	SINGLE-PHASE	Y	0,37	80	87	Rp 1	374	-	-	10	9
3HME05S05M02		Z	0,55	80	127	Rp 1	414	-	-	10	10
3HME07S07M02		Z	0,75	80	151	Rp 1	447	148	99	10	11
3HME09S11M02		Z	1,1	80	191	Rp 1	487	188	99	16	14
3HME12S15M02		Z	1,5	80	251	Rp 1	547	248	99	16	15
5HME02S03M02	SINGLE-PHASE	Y	0,37	80	104	Rp 1 1/4	391	-	-	10	9
5HME03S05M02		Z	0,55	80	104	Rp 1 1/4	391	-	-	10	9
5HME04S07M02		Z	0,75	80	129	Rp 1 1/4	416	-	-	10	10
5HME06S11M02		Z	1,1	80	158	Rp 1 1/4	454	153	99	10	12
5HME08S15M02		Z	1,5	80	208	Rp 1 1/4	504	203	99	10	14

1-5hmes-esm-2p50-en_a_td

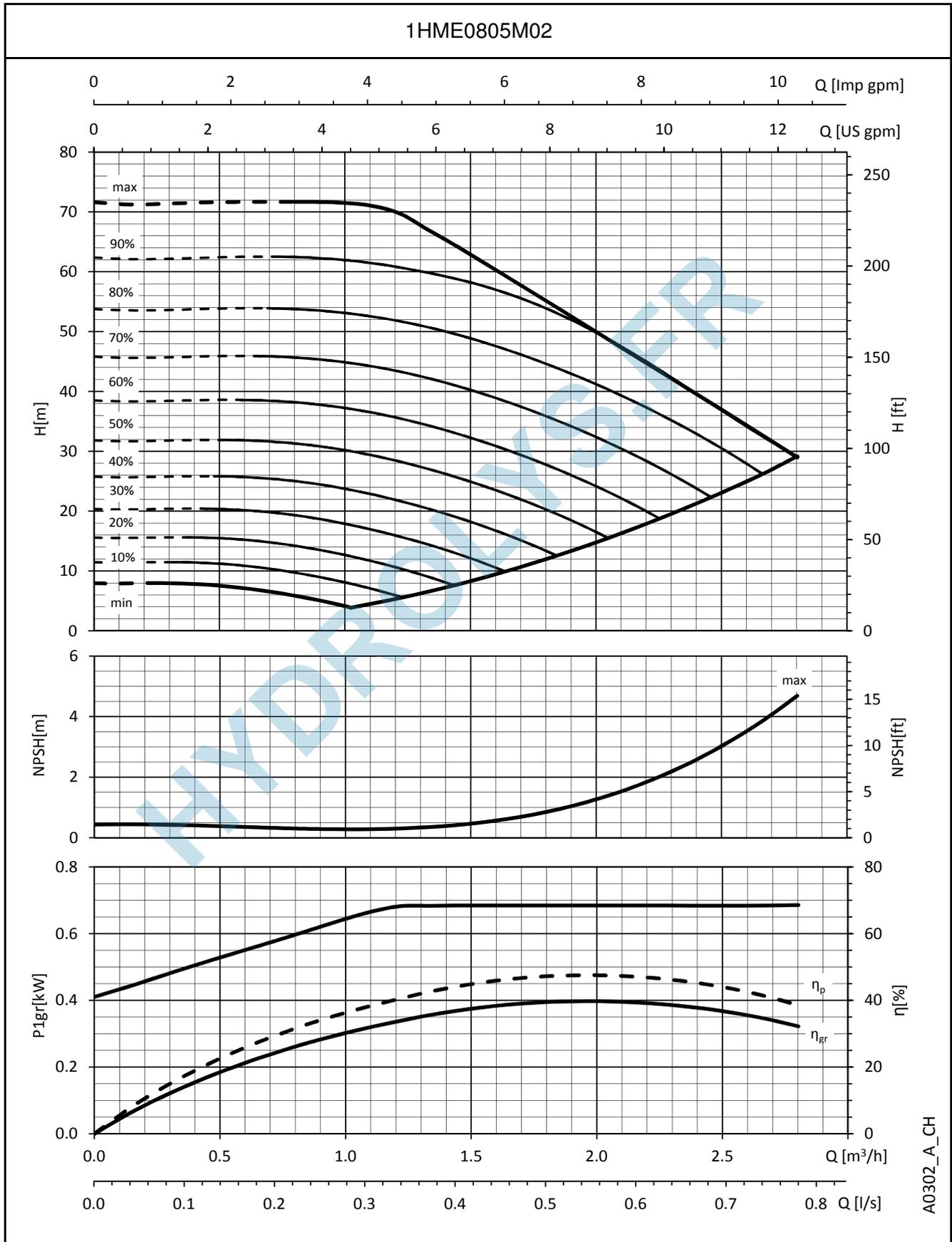
1HME..S SERIES OPERATING CHARACTERISTICS



A0301_A_CH

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

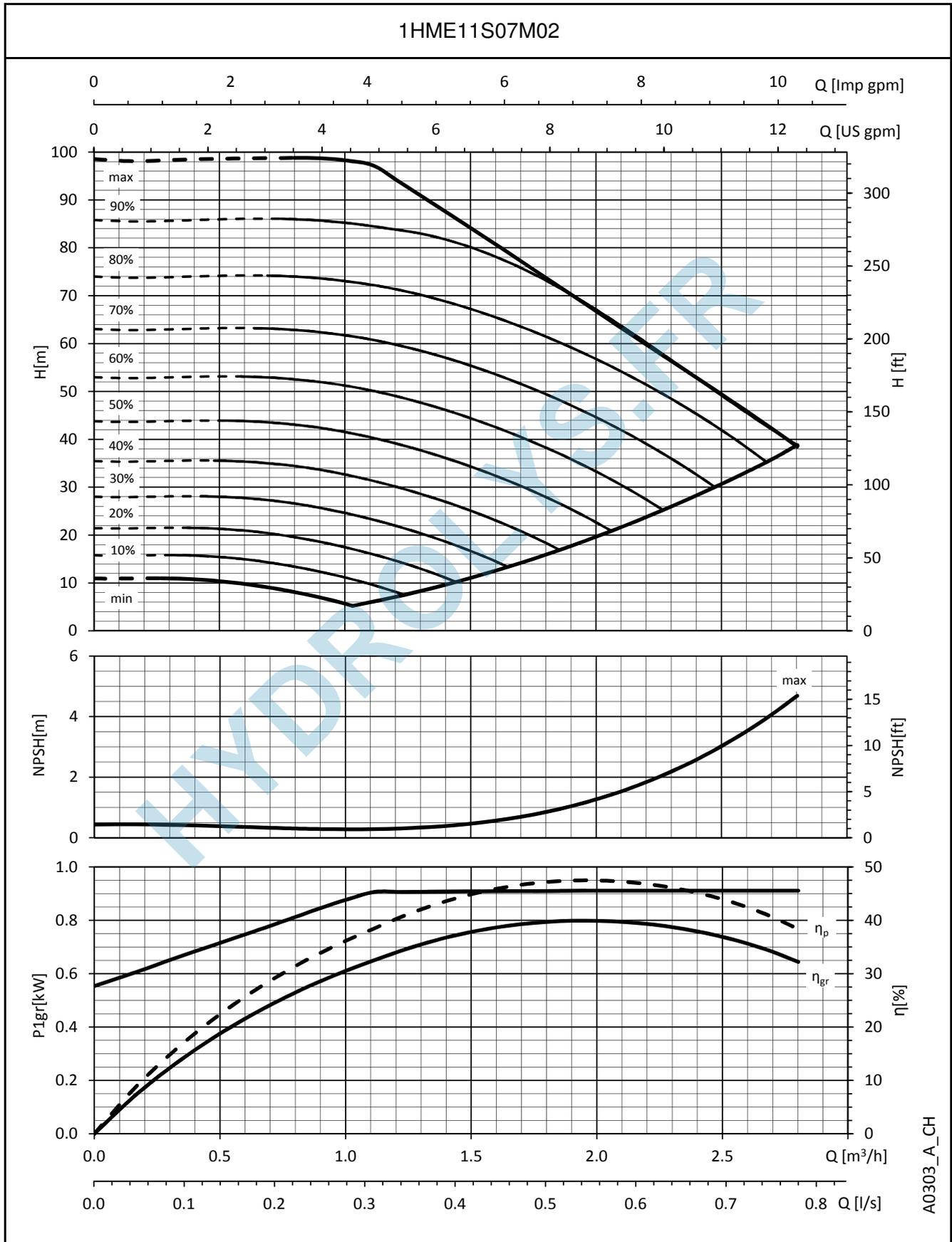
1HME..S SERIES OPERATING CHARACTERISTICS



A0302_A_CH

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

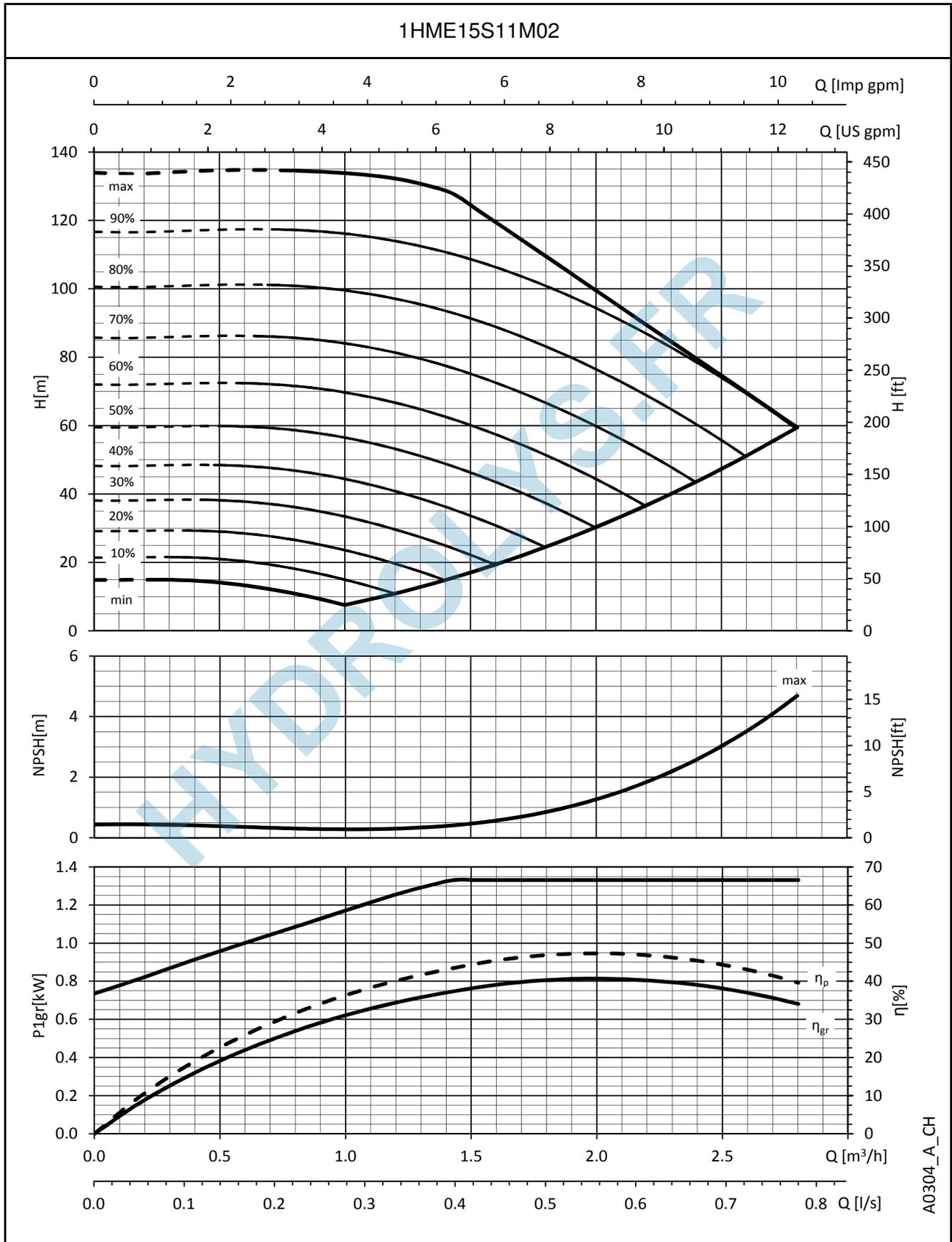
1HME..S SERIES OPERATING CHARACTERISTICS



A0303_A_CH

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

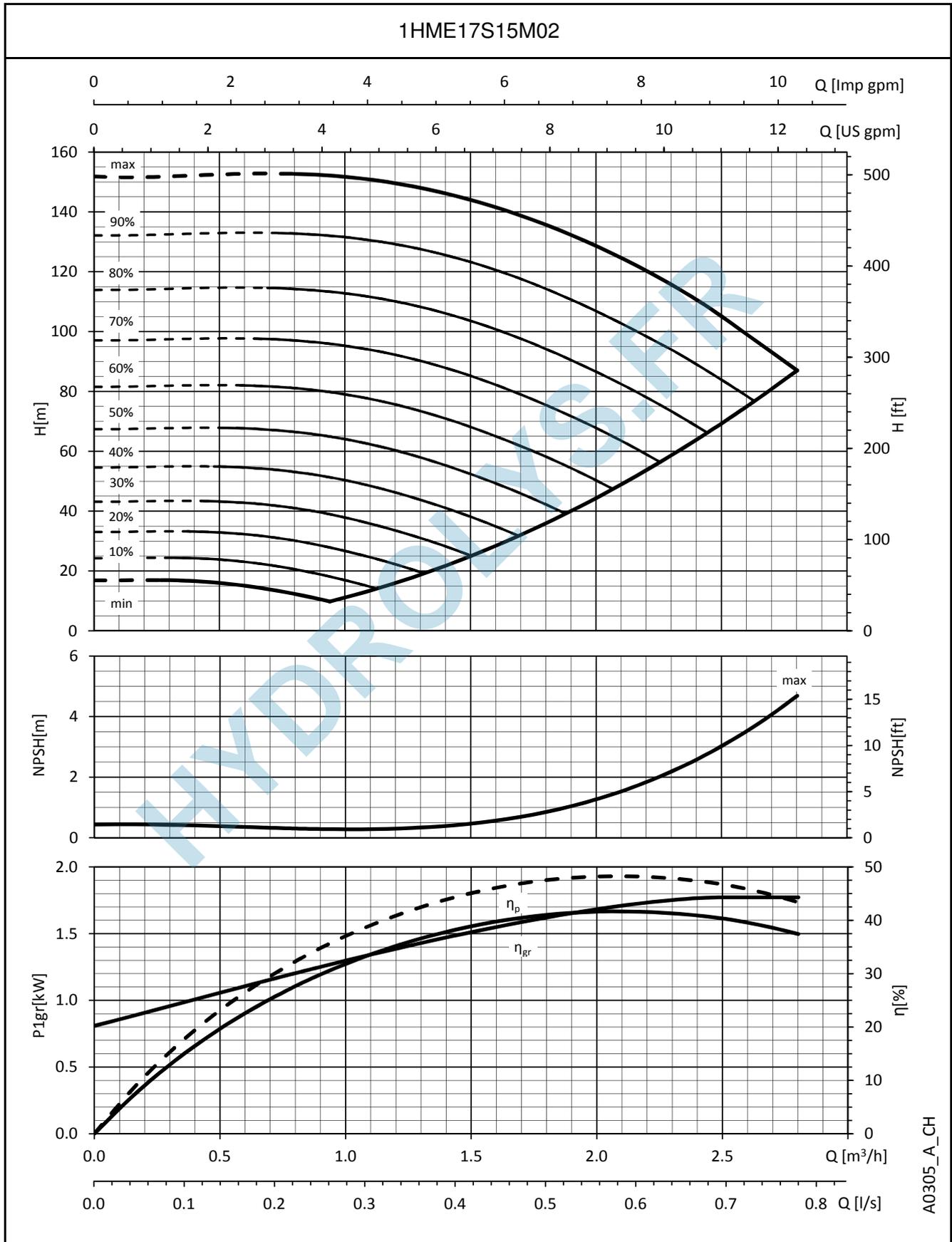
1HME..S SERIES OPERATING CHARACTERISTICS



A0304_A_CH

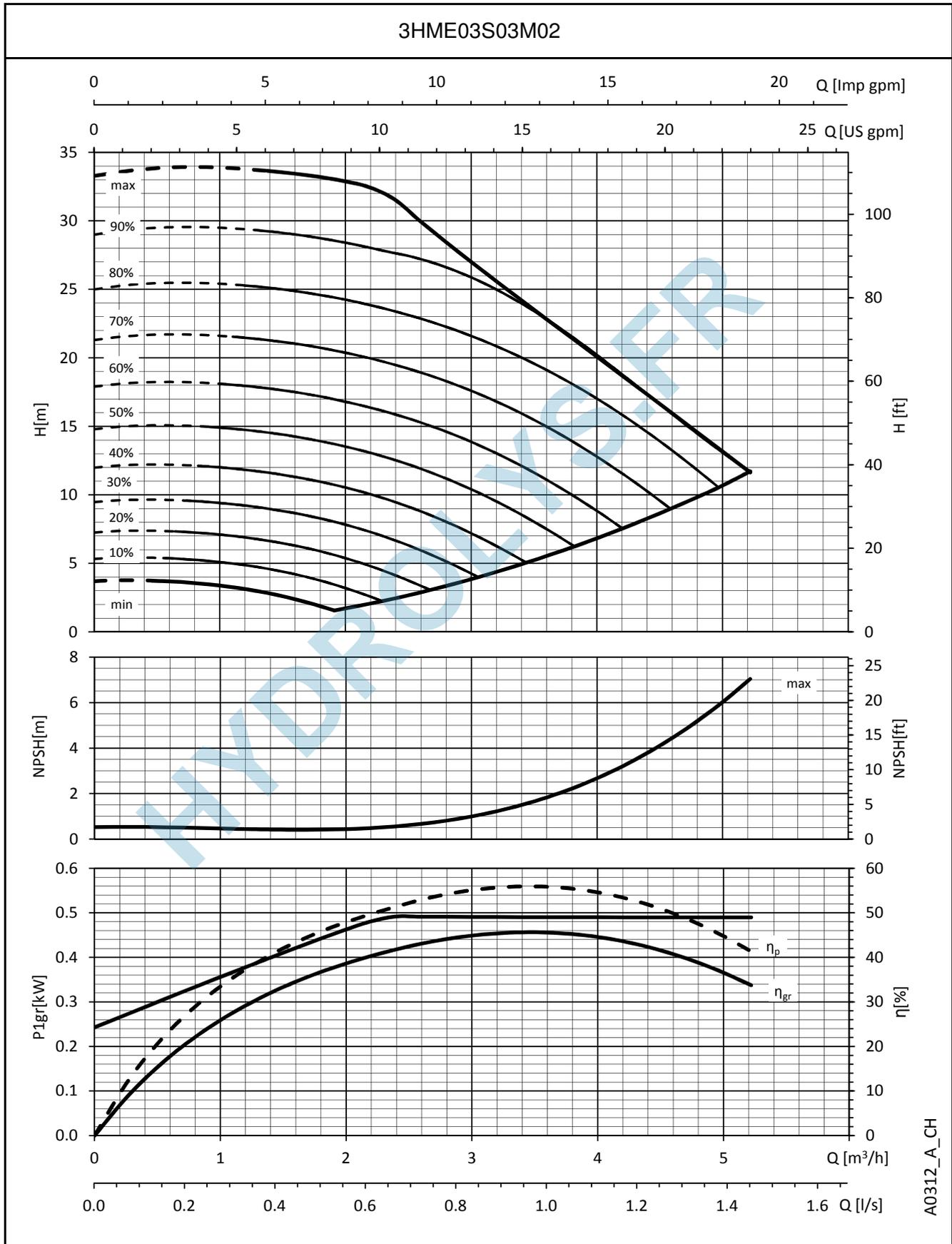
The performances are valid for liquid with density $\rho = 1 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.

1HME..S SERIES OPERATING CHARACTERISTICS



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

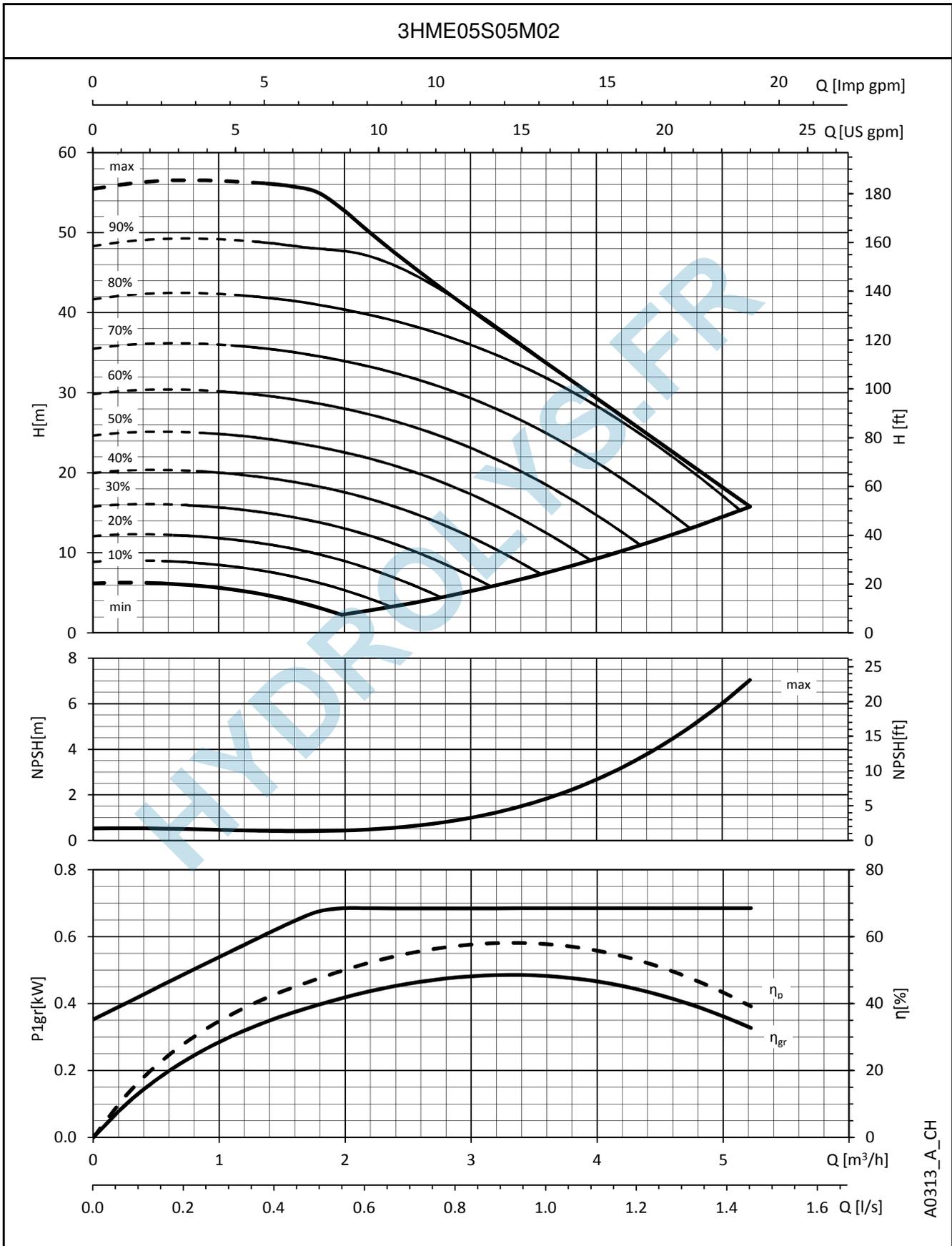
3HME..S SERIES OPERATING CHARACTERISTICS



A0312_A_CH

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

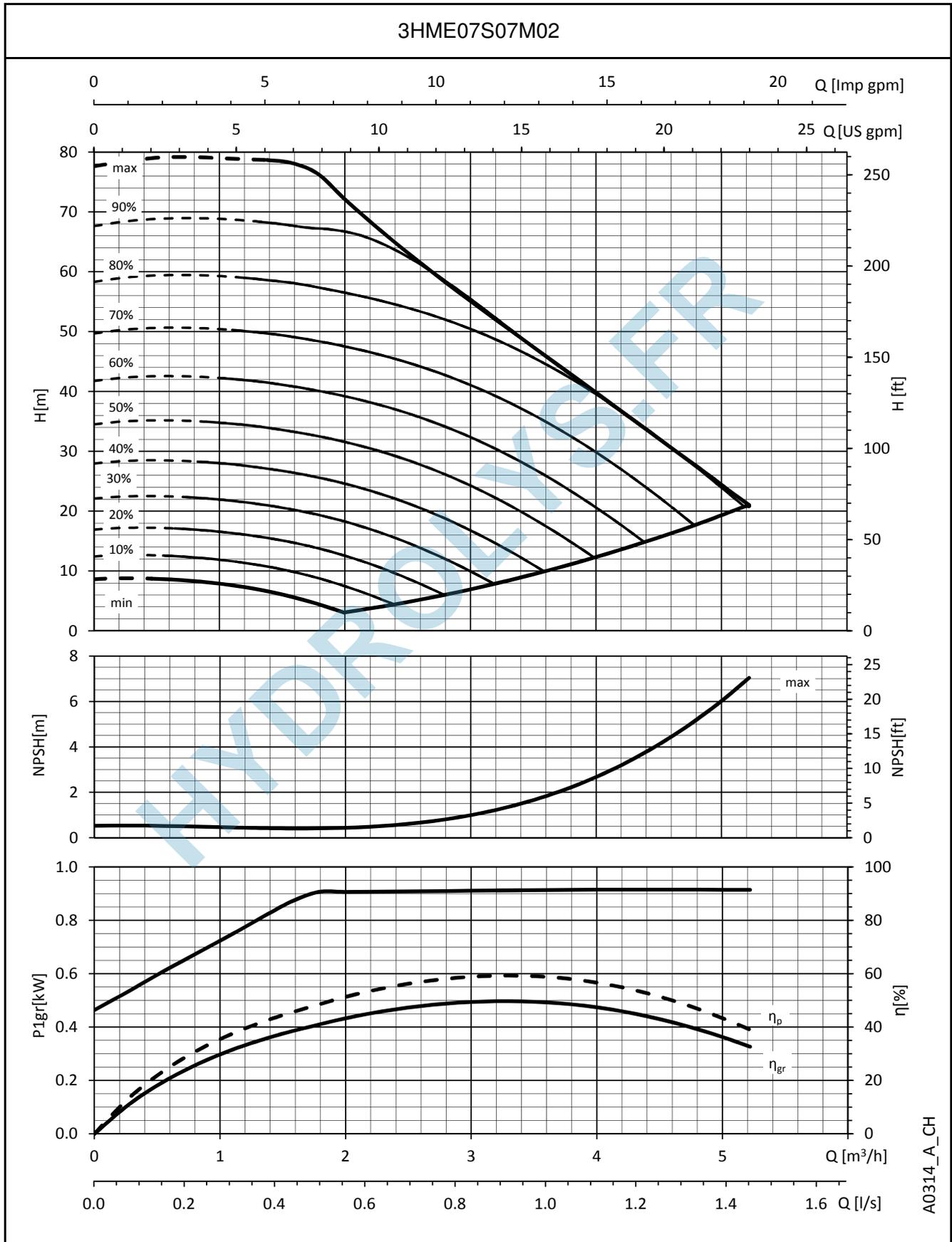
3HME..S SERIES OPERATING CHARACTERISTICS



A0313_A_CH

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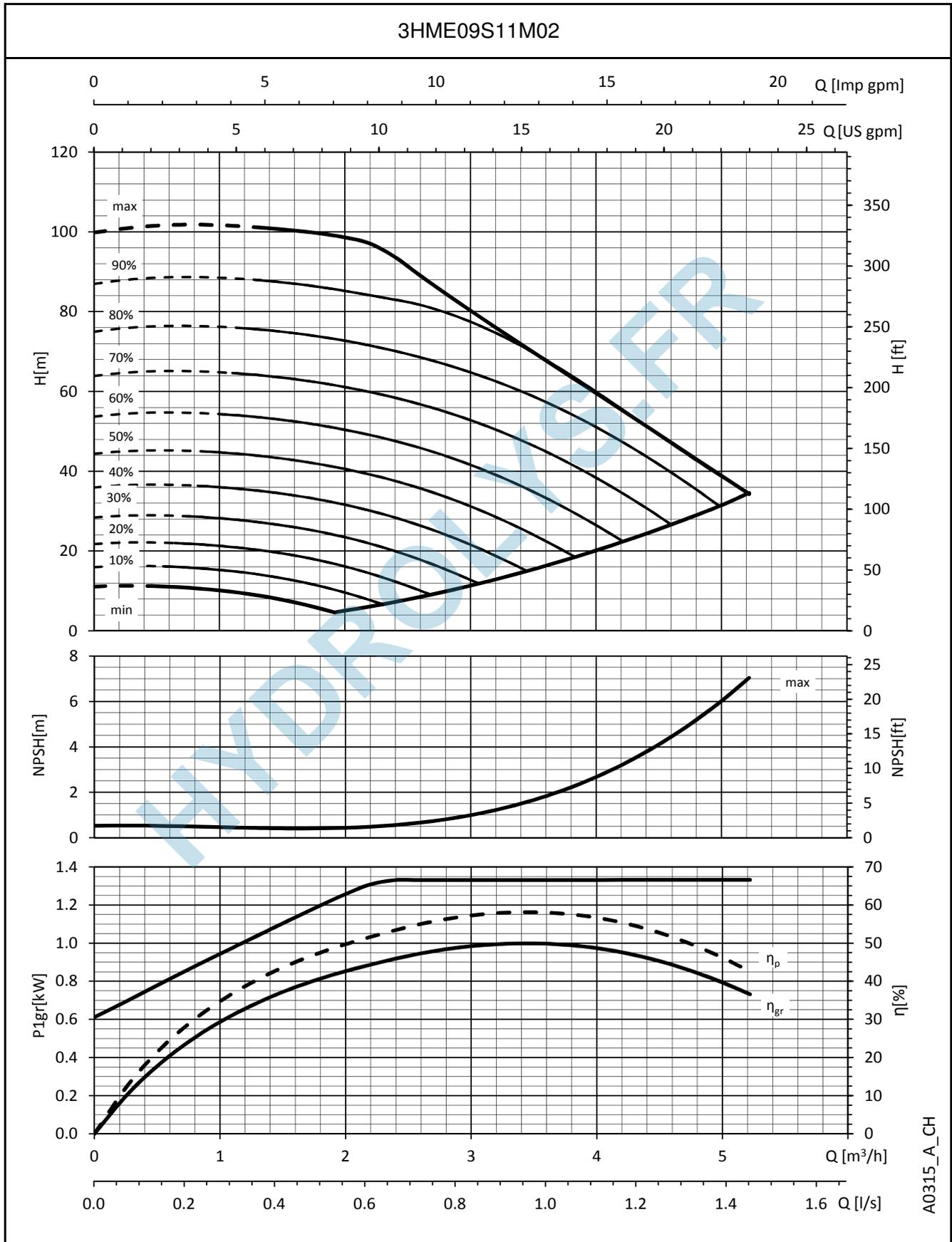
3HME..S SERIES OPERATING CHARACTERISTICS



A0314_A_CH

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

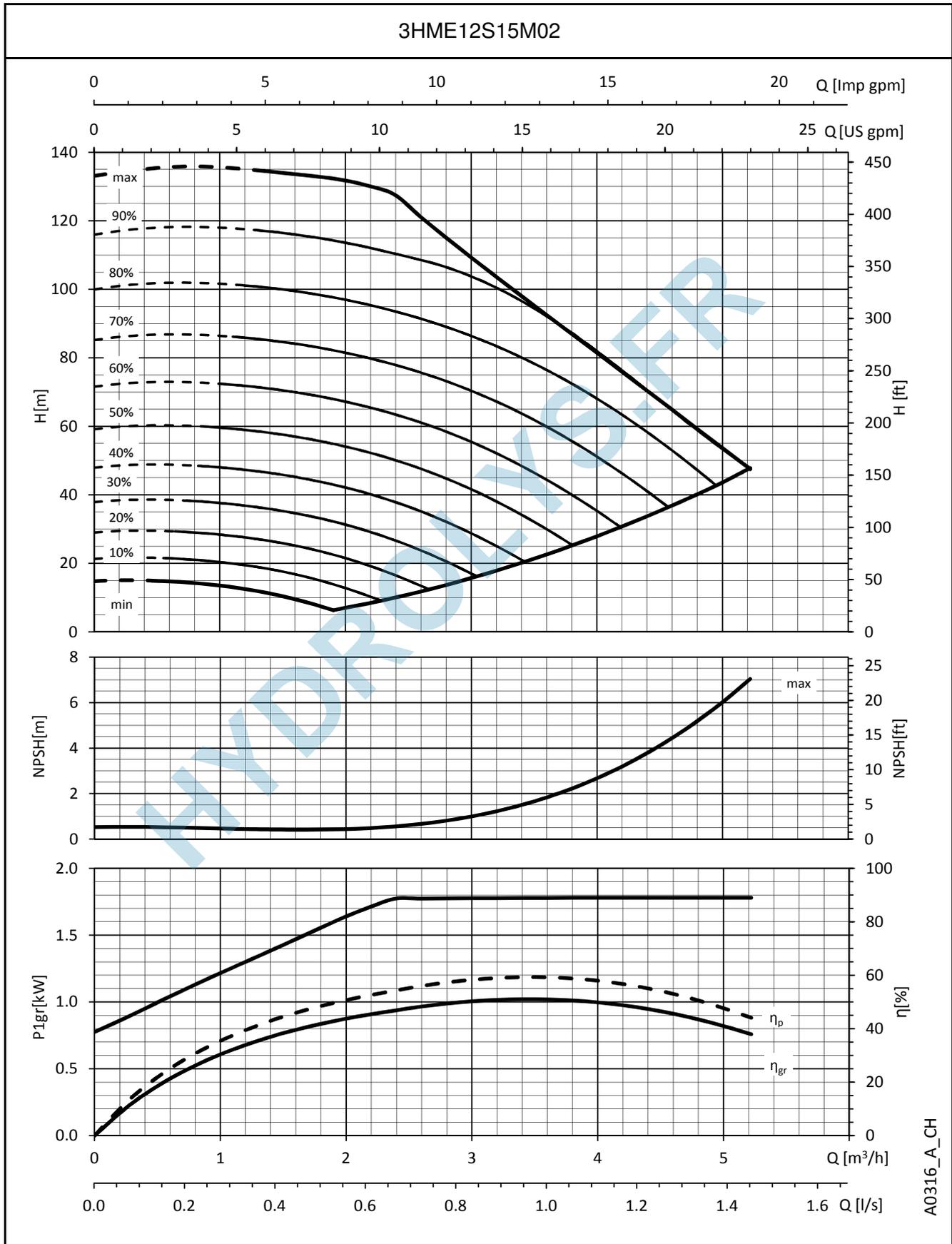
3HME..S SERIES OPERATING CHARACTERISTICS



A0315_A_CH

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

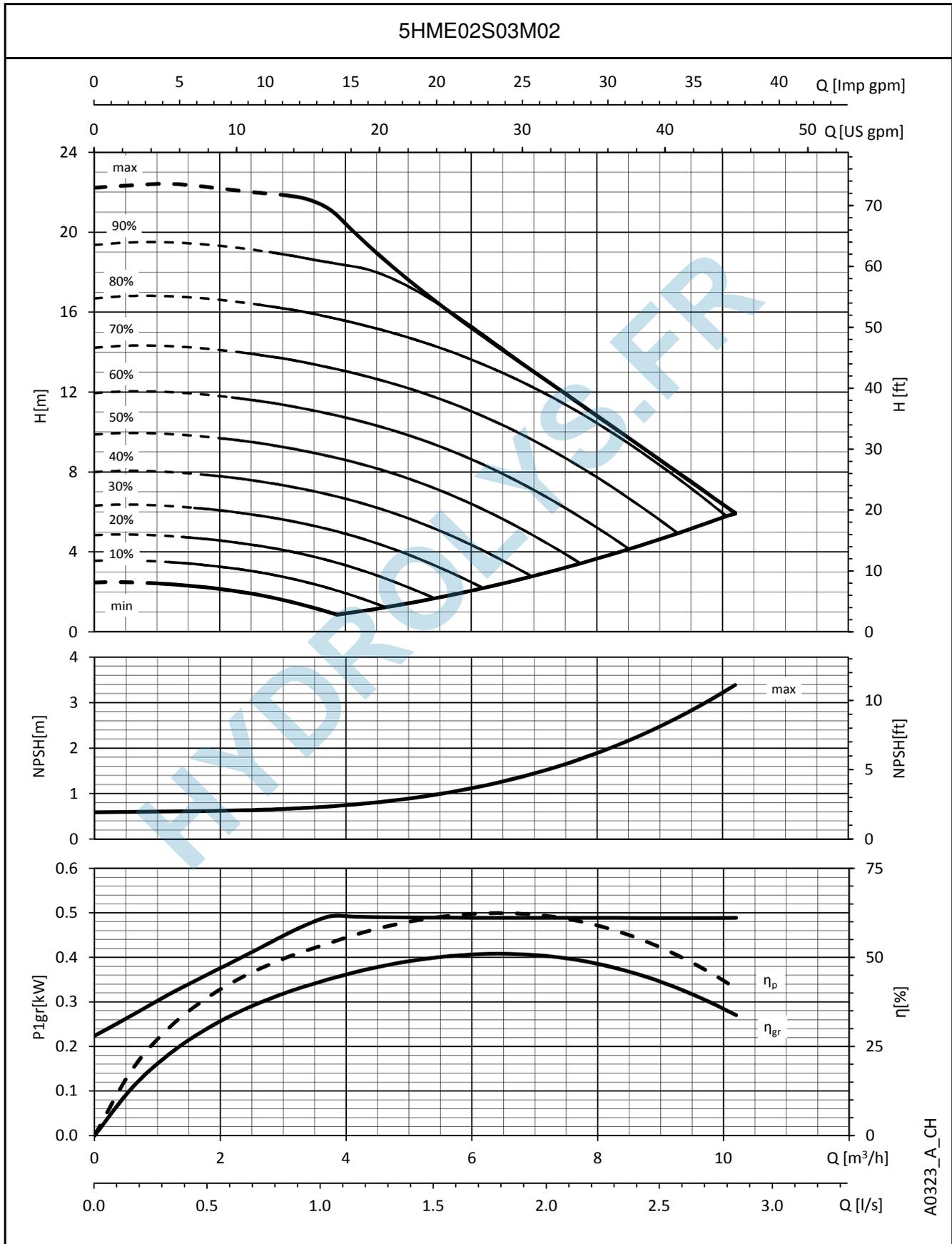
3HME..S SERIES OPERATING CHARACTERISTICS



A0316_A_CH

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

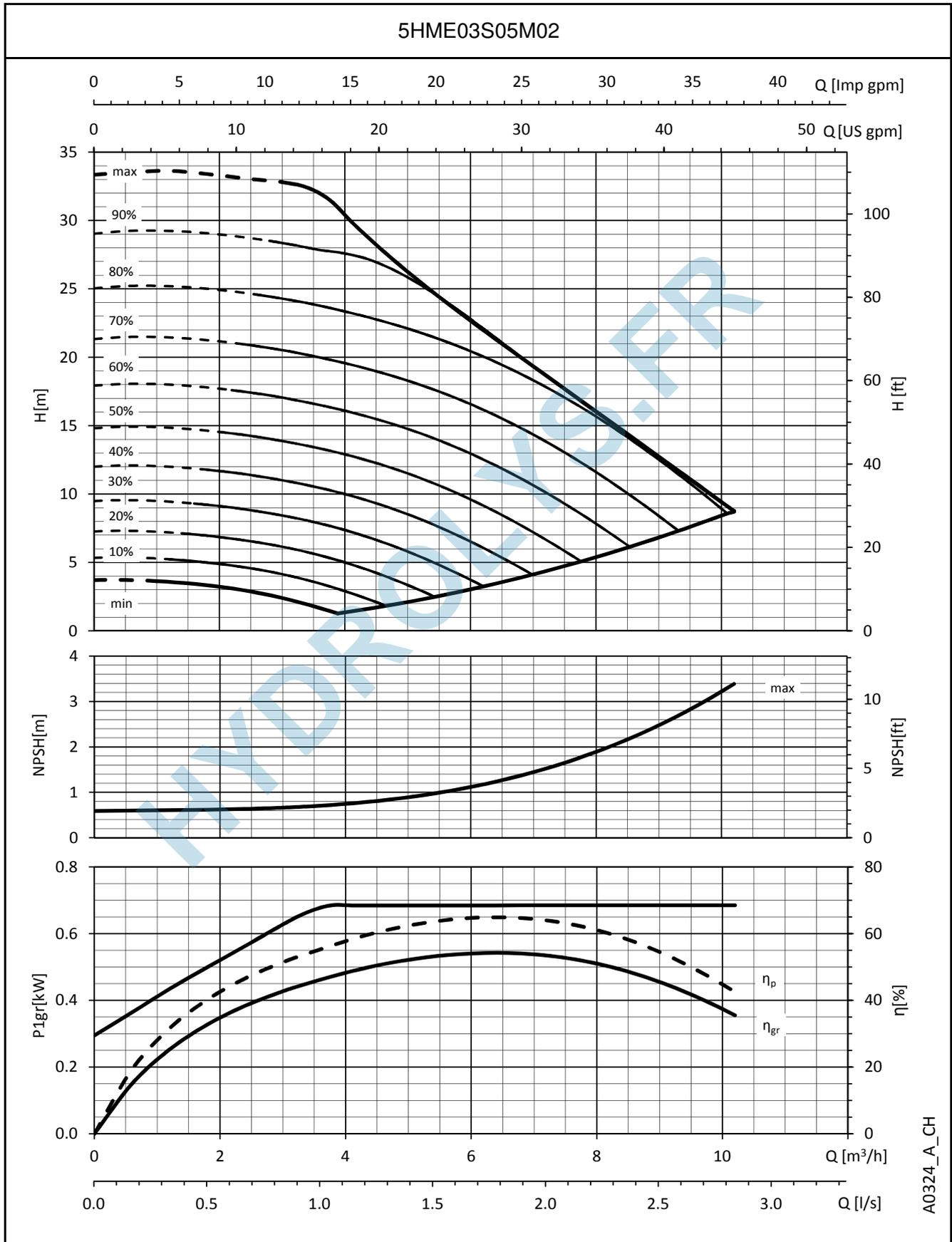
5HME..S SERIES OPERATING CHARACTERISTICS



A0323_A_CH

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

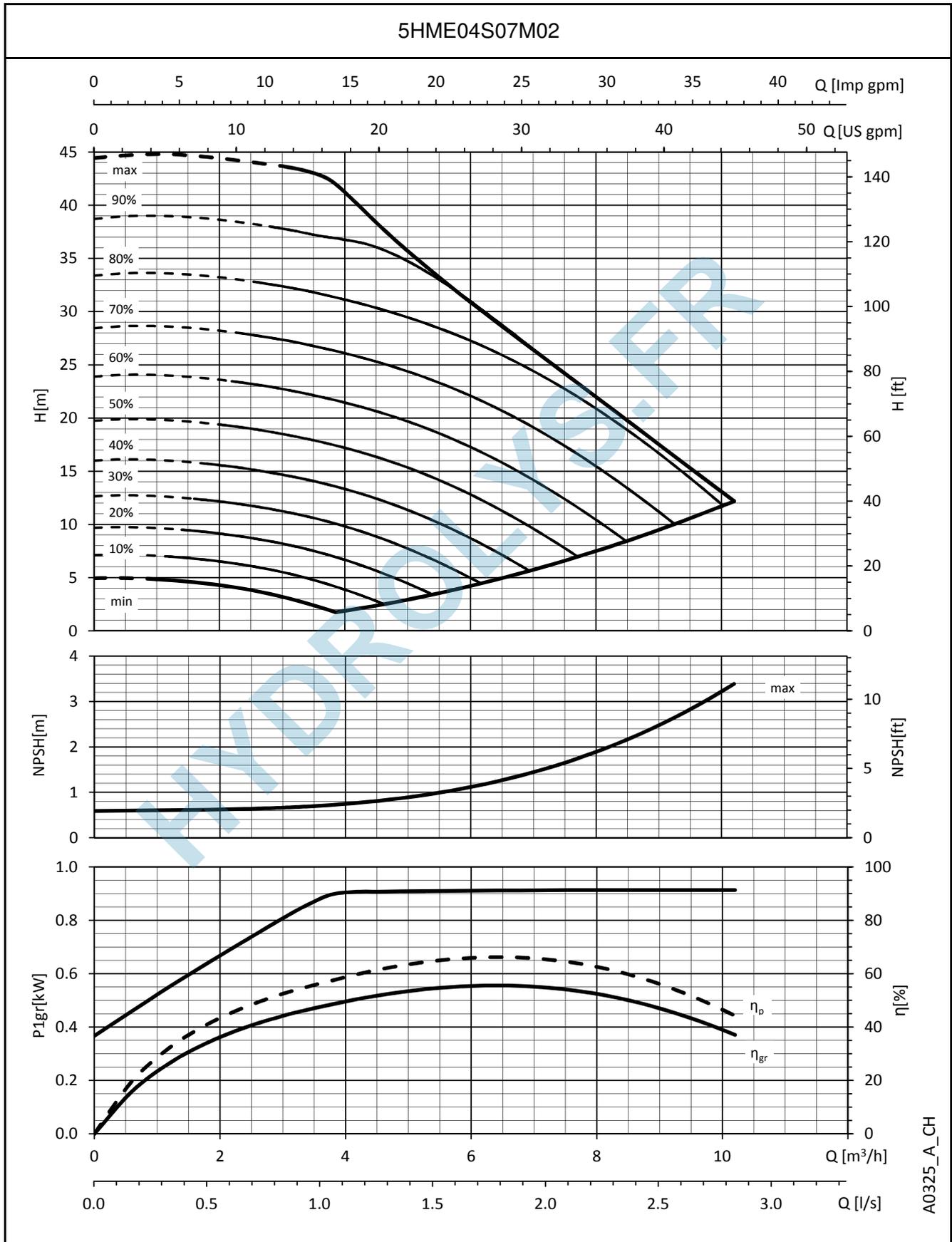
5HME..S SERIES OPERATING CHARACTERISTICS



A0324_A_CH

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

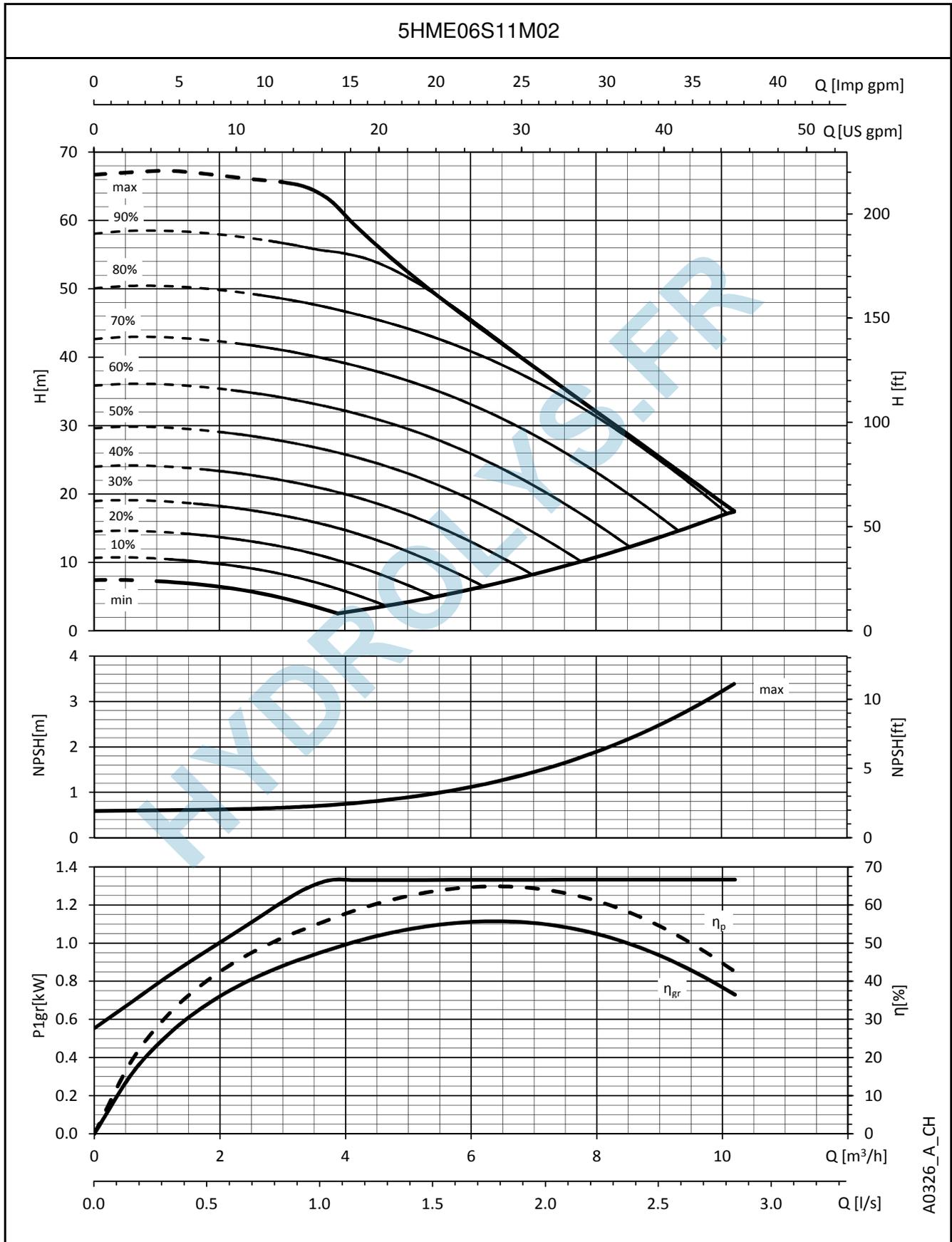
5HME..S SERIES OPERATING CHARACTERISTICS



A0325_A_CH

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

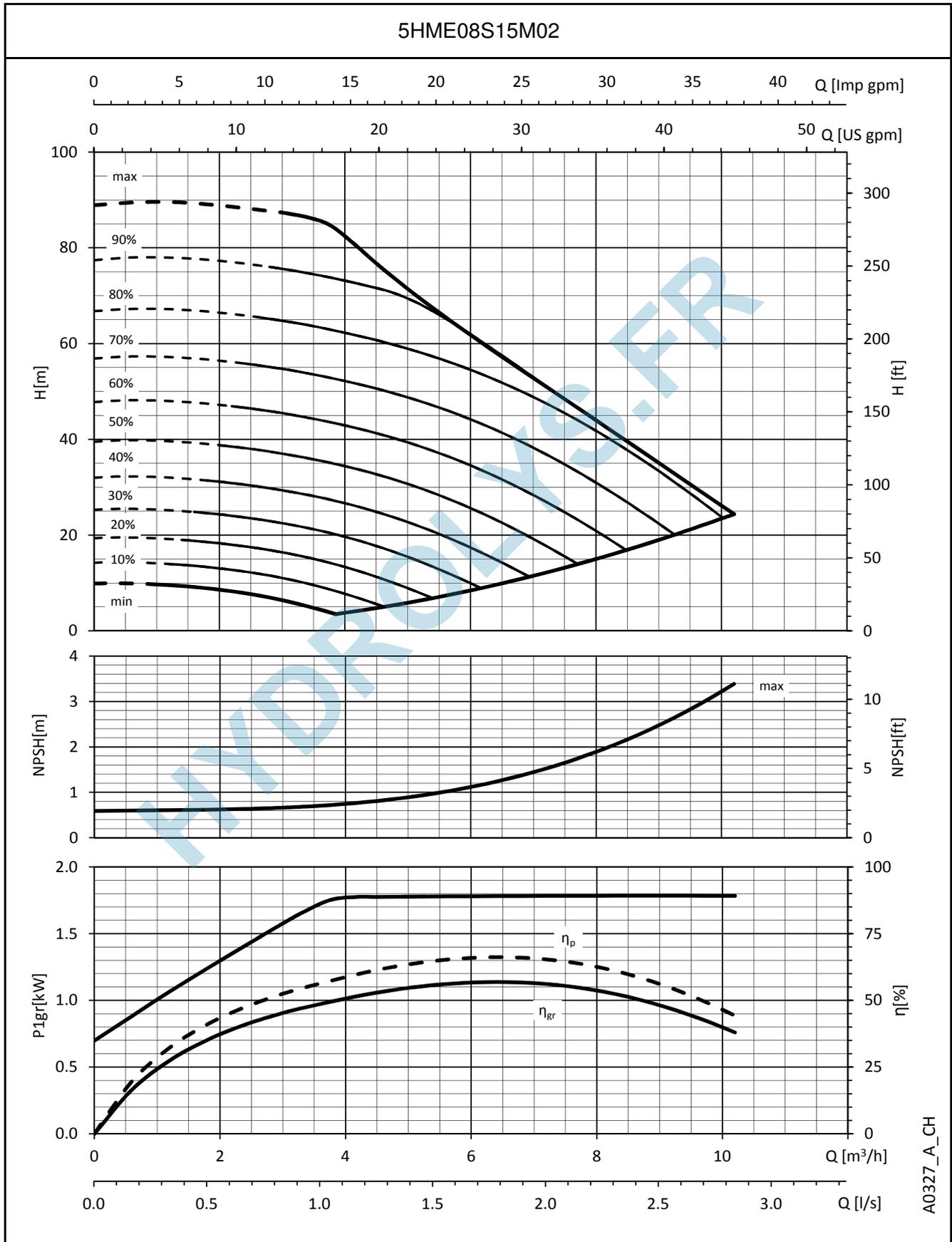
5HME..S SERIES OPERATING CHARACTERISTICS



A0326_A_CH

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

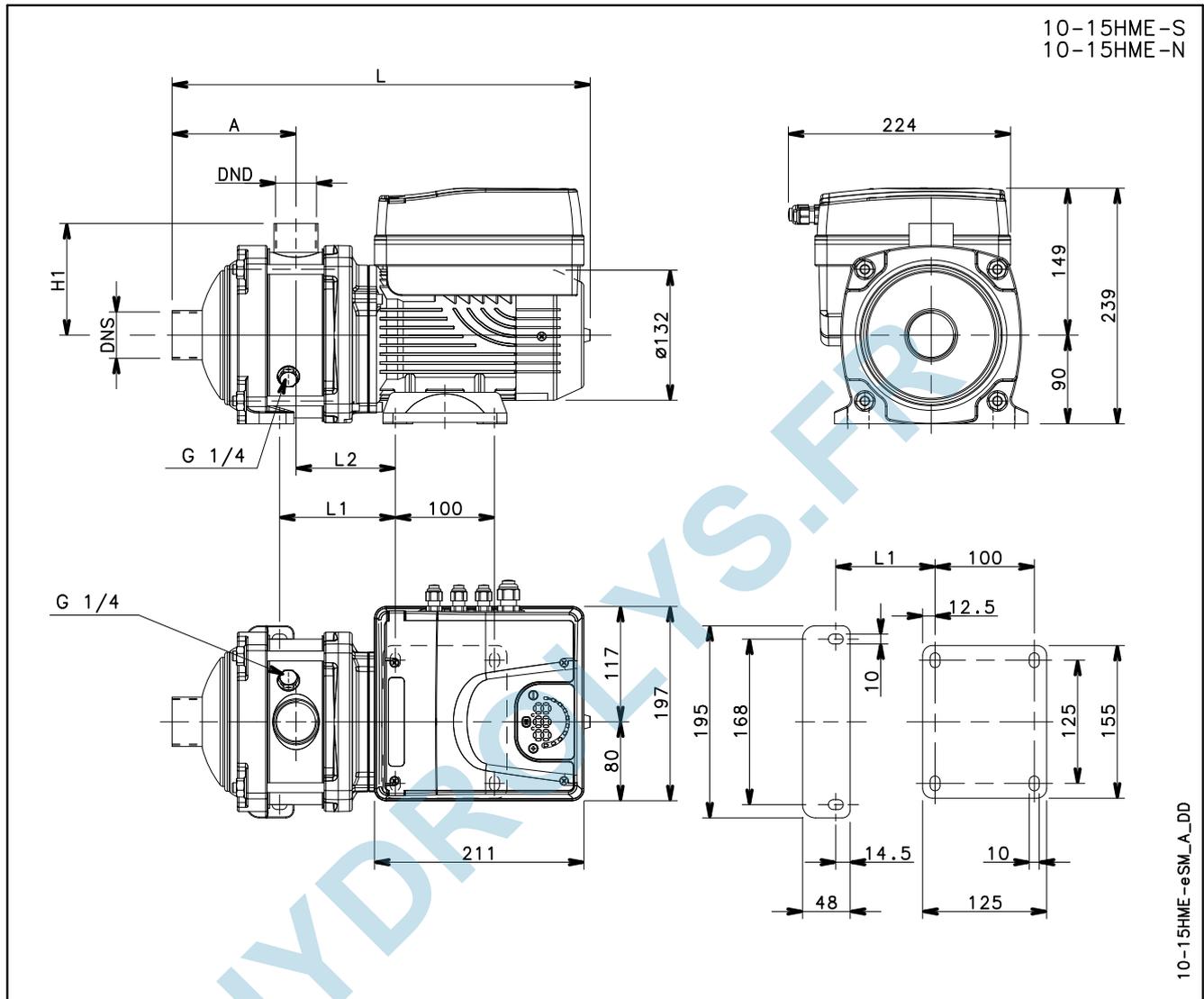
5HME..S SERIES OPERATING CHARACTERISTICS



A0327_A_CH

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

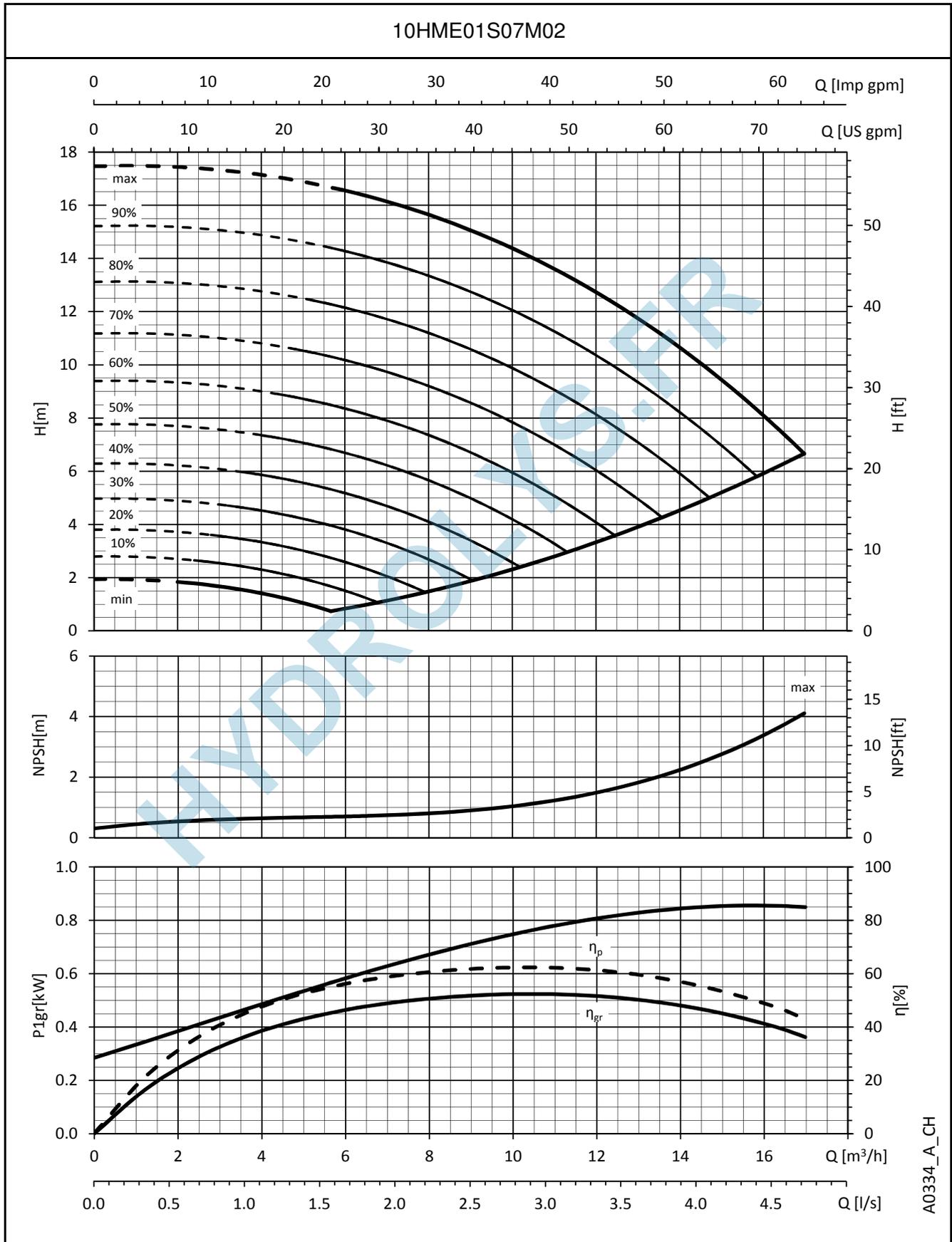
10, 15HME..S SERIES DIMENSIONS AND WEIGHTS



PUMP TYPE	VERSION	MOTOR		DIMENSIONS (mm)							PN	WEIGHT
		kw	SIZE	A	DND	DNS	H1	L	L1	L2		
10HME01S07M02	SINGLE-PHASE	0,75	80	125	Rp 1 1/4	Rp 1 1/2	113	422	116,5	100	10	12
10HME02S11M02		1,1	80	125	Rp 1 1/4	Rp 1 1/2	113	422	116,5	100	10	14
10HME03S15M02		1,5	80	125	Rp 1 1/4	Rp 1 1/2	113	422	116,5	100	10	14
15HME01S11M02		1,1	80	144	Rp 1 1/2	Rp 2	114	457	148,5	116	10	14
15HME02S15M02		1,5	80	144	Rp 1 1/2	Rp 2	114	457	148,5	116	10	14

10-15hmes-esm-2p50-en_a_td

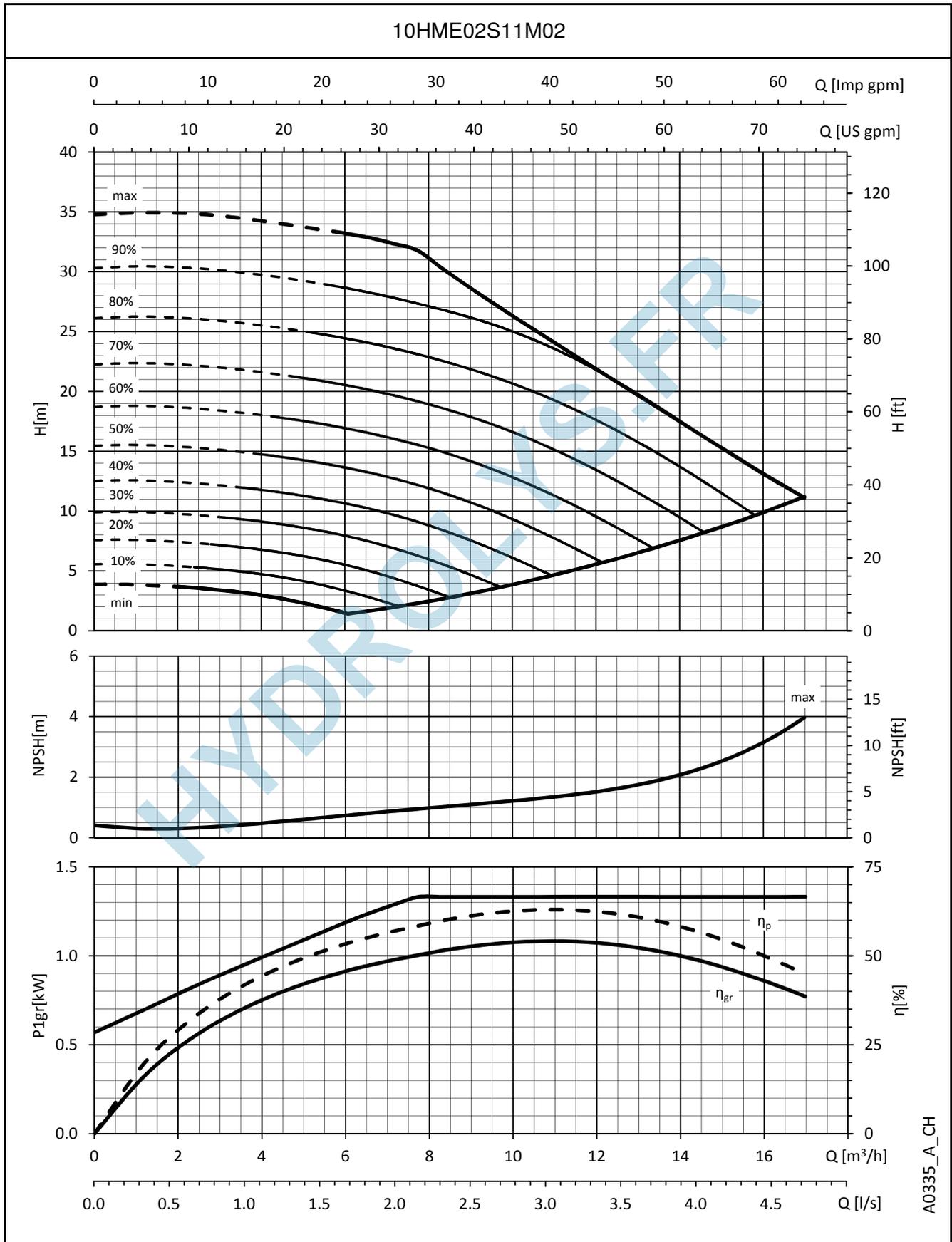
10HME..S SERIES OPERATING CHARACTERISTICS



A0334_A_CH

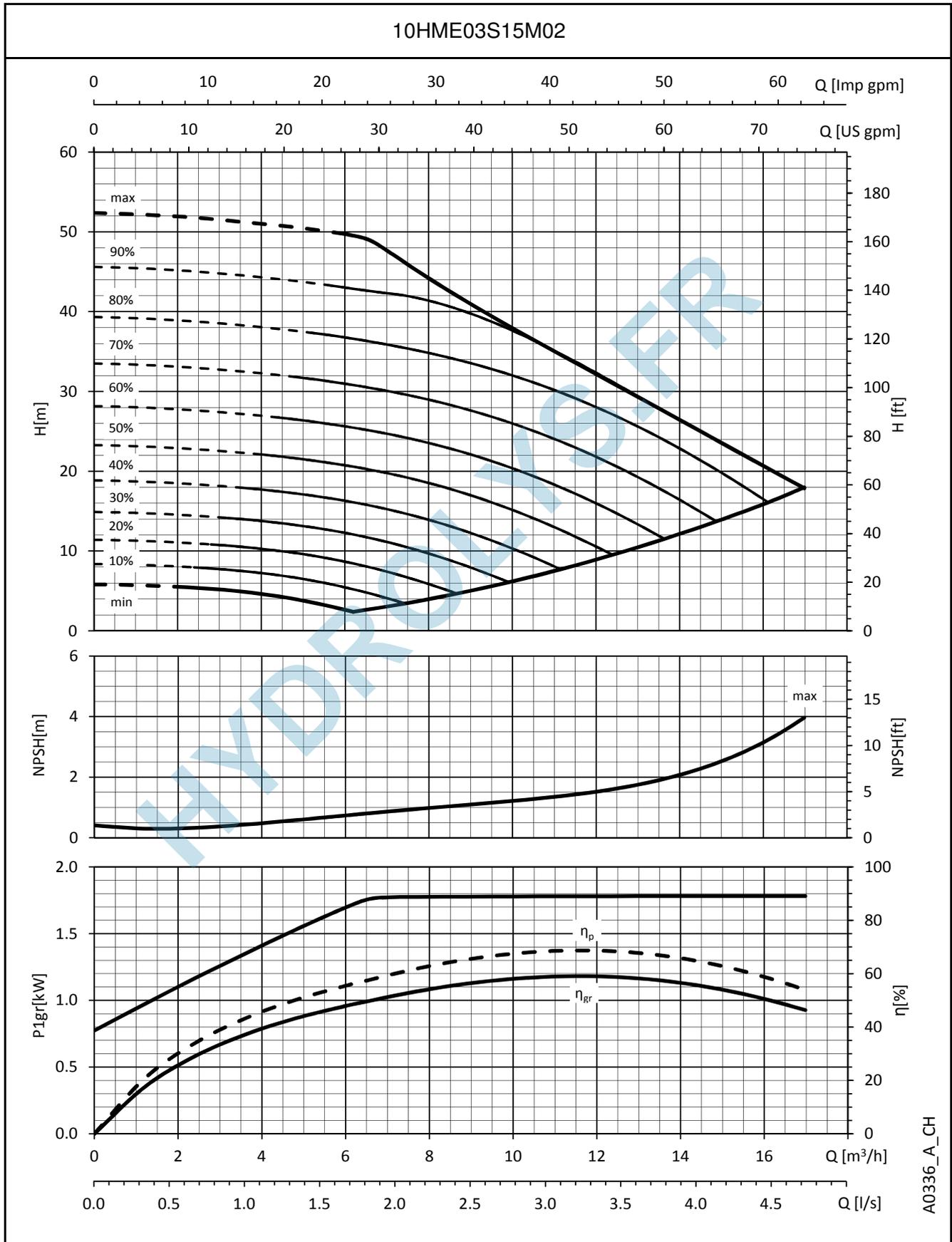
The performances are valid for liquid with density $\rho = 1 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.

10HME..S SERIES OPERATING CHARACTERISTICS



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

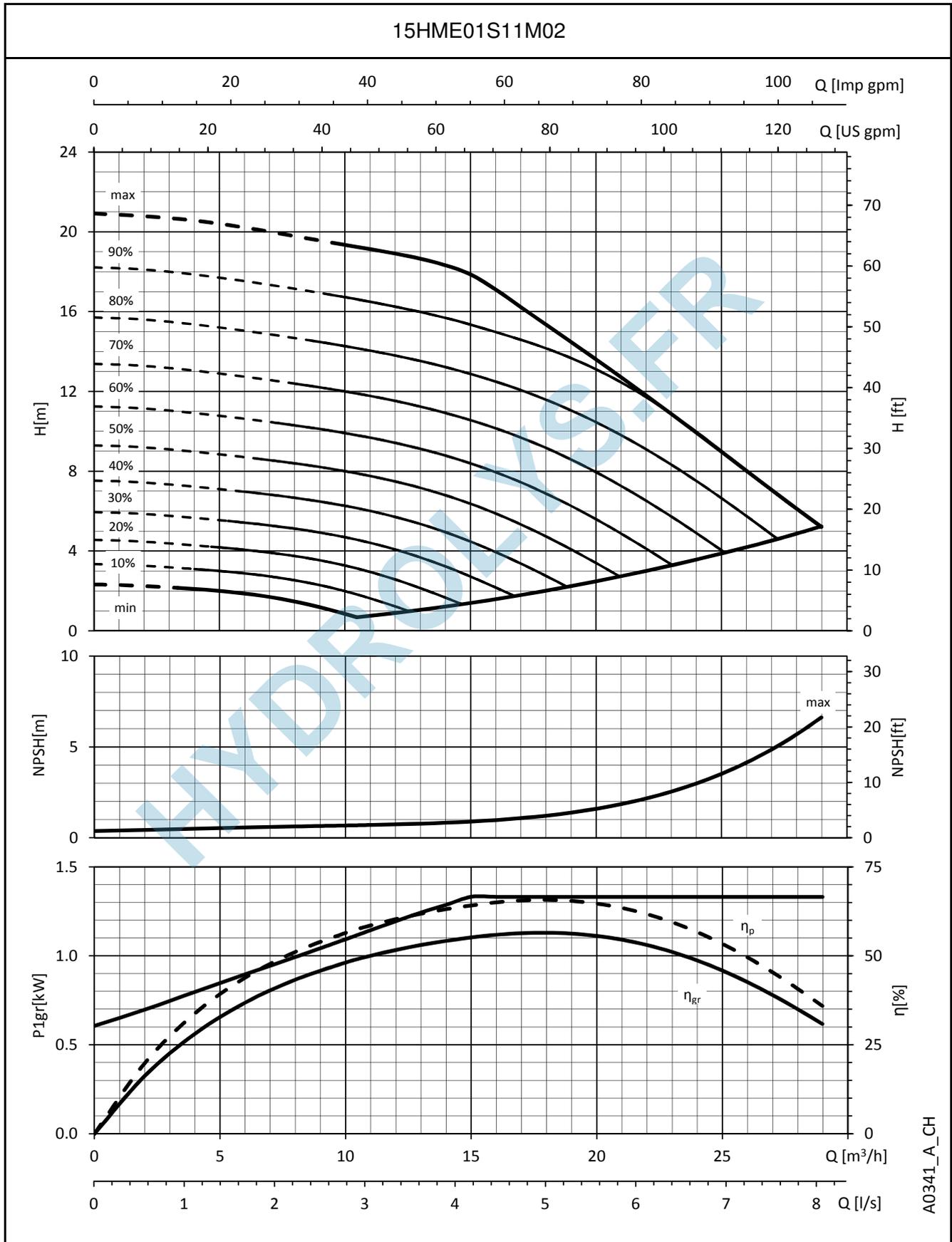
10HME..S SERIES OPERATING CHARACTERISTICS



A0336_A_CH

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

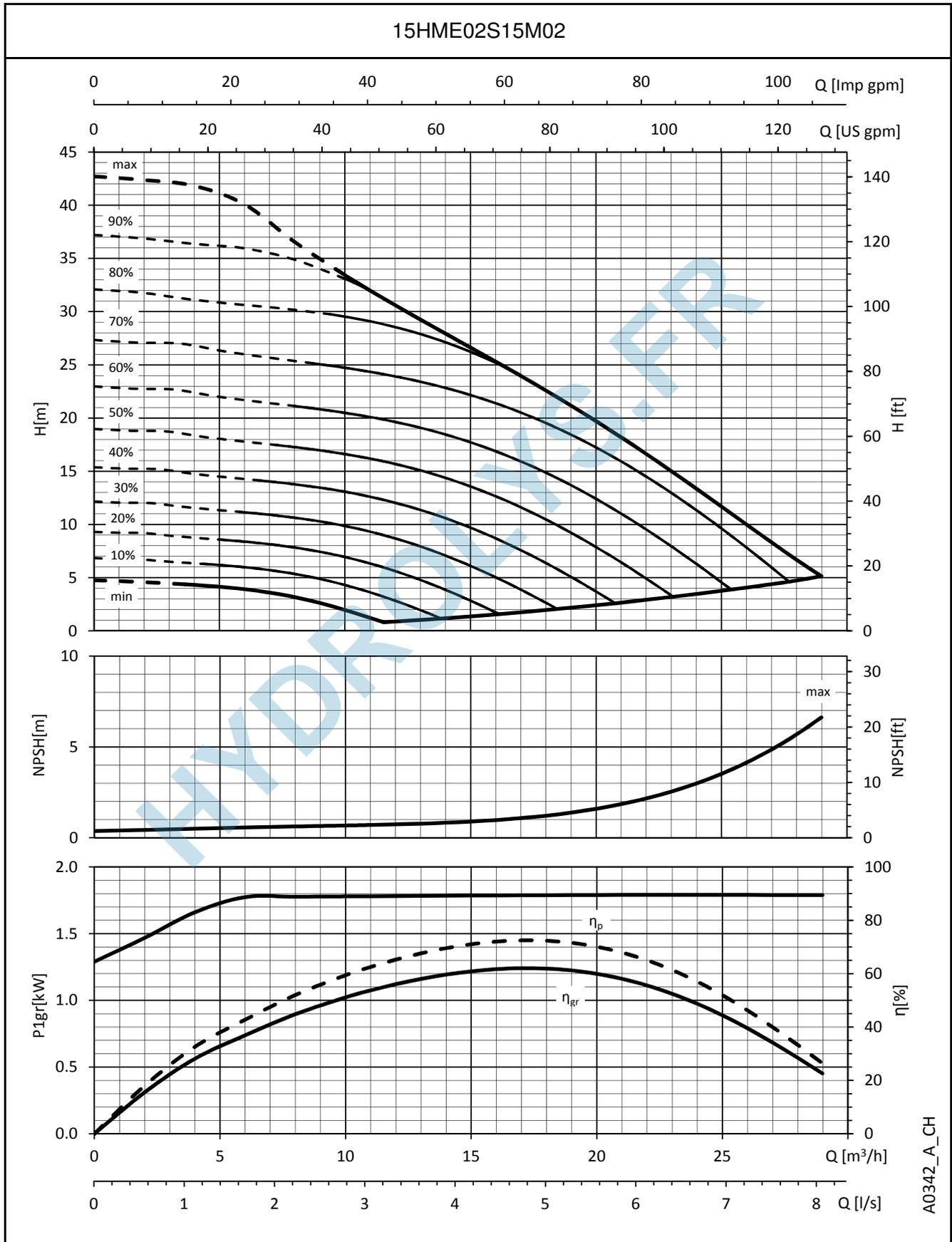
15HME..S SERIES OPERATING CHARACTERISTICS



A0341_A_CH

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

15HME..S SERIES OPERATING CHARACTERISTICS



A0342_A_CH

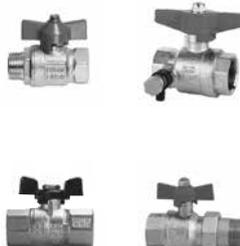
The performances are valid for liquid with density $\rho = 1 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.

HYDROLYS.FR

ACCESSORIES

HYDROLYS.FR

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"	R02661424	2" FF PN25, CHROME PLATED BRASS
	1"	002675155	1" MF PN40, CHROME PLATED BRASS
	1" 1/4	R02661318	1"1/4 MF PN30, CHROME PLATED BRASS
	1" 1/2	002675369	1"1/2 MF PN25, CHROME PLATED BRASS
	2"	002679408	2" MF PN25, CHROME PLATED BRASS
	1"	002679403	1" MF WITH UNION JOINT, CHROME PLATED BRASS
	1" 1/4	002679404	1"1/4 MF WITH UNION JOINT, CHROME PLATED BRASS
	1" 1/2	002676452	1"1/2 MF WITH UNION JOINT, CHROME PLATED BRASS
	2"	NO CODE	2" MF WITH UNION JOINT, CHROME PLATED BRASS
Non-return valve 	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 GALVANISED STEEL
		002161200	SQUARE-D FYG22(2,8-7), Rp1/4" CONNECTION GALVANISED STEEL
		002161201	SQUARE-D FYG32(5,6-10,5), Rp1/4" CONNECTION GALVANISED STEEL
		002161336	ITALTECNICA PM/5(1-5), Rp1/4" CONNECTION GALVANISED STEEL
		002161337	ITALTECNICA PM/12(2,5-12), Rp1/4" CONNECTION GALVANISED STEEL
		002161338	ITALTECNICA PM/12S(1-8,5), Rp1/4" CONNECTION GALVANISED STEEL
Pressure gauge with radial connection 	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

HYDROLYSIS

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: 1B / 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: 1B / 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.

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

HYDROLYSIS

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:

$$hp + h_z \geq (NPSHr + 0.5) + hf + hpv \quad \textcircled{1}$$

where:

- hp** is the absolute pressure applied to the free liquid surface in the suction tank, expressed in m. of liquid; hp is the quotient between the barometric pressure and the specific weight of the liquid.
- hz** 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.
- hf** 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

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

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

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

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

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 valve	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
Foot check 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
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

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

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
1,0000	0,0010	1×10^{-5}	$1,45 \times 10^{-4}$	$1,02 \times 10^{-4}$	0,0075
1 000,0000	1,0000	0,0100	0,1450	0,1020	7,5006
1×10^5	100,0000	1,0000	14,5038	10,1972	750,0638
6 894,7570	6,8948	0,0689	1,0000	0,7031	51,7151
9 806,6500	9,8067	0,0981	1,4223	1,0000	73,5561
133,3220	0,1333	0,0013	0,0193	0,0136	1,0000

LENGTH

Millimetre mm	Centimetre cm	Metre m	Inch in	Foot ft	Yard yd
1,0000	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	1,0000	0,0100	0,3937	0,0328	0,0109
1 000,0000	100,0000	1,0000	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	1,0000	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	1,0000	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	1,0000

VOLUME

Cubic metre m ³	Litre L	Millilitre ml	Imperial gallon imp. gal.	U.S. gallon US gal.	Cubic foot ft ³
1,0000	1 000,0000	1×10^6	219,9694	264,1720	35,3147
0,0010	1,0000	1 000,0000	0,2200	0,2642	0,0353
1×10^{-6}	0,0010	1,0000	$2,2 \times 10^{-4}$	$2,642 \times 10^{-4}$	$3,53 \times 10^{-5}$
0,0045	4,5461	4 546,0870	1,0000	1,2009	0,1605
0,0038	3,7854	3 785,4120	0,8327	1,0000	0,1337
0,0283	28,3168	28 316,8466	6,2288	7,4805	1,0000

TEMPERATURE

Water	Kelvin K	Celsius °C	Fahrenheit °F	$^{\circ}\text{F} = ^{\circ}\text{C} \times \frac{9}{5} + 32$ $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$
icing	273,1500	0,0000	32,0000	
boiling	373,1500	100,0000	212,0000	

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FURTHER PRODUCT SELECTION AND DOCUMENTATION Xylect™



Xylect™ is pump solution selection software with an extensive online database of product information across the entire Lowara 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.

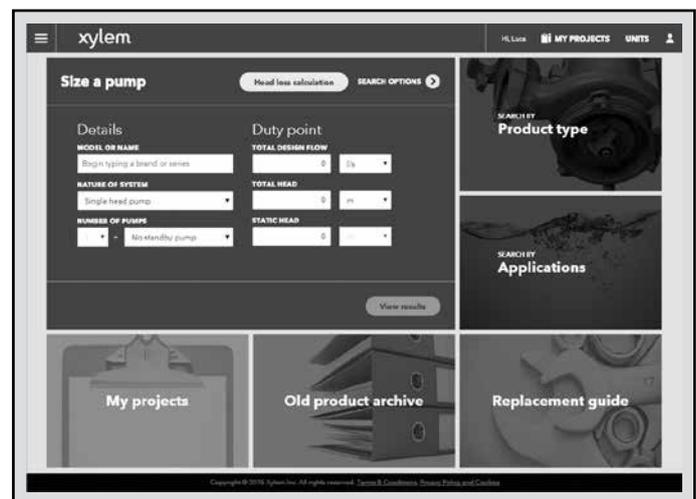
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara products.

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™



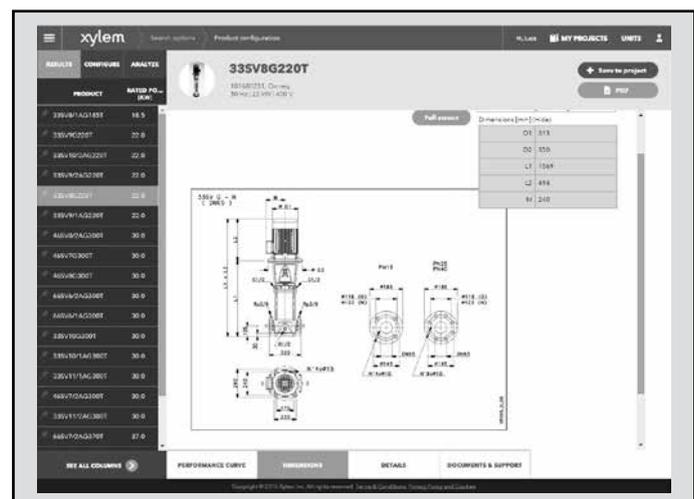
The detailed output makes it easy to select the optimal pump from the given alternatives.

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

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

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