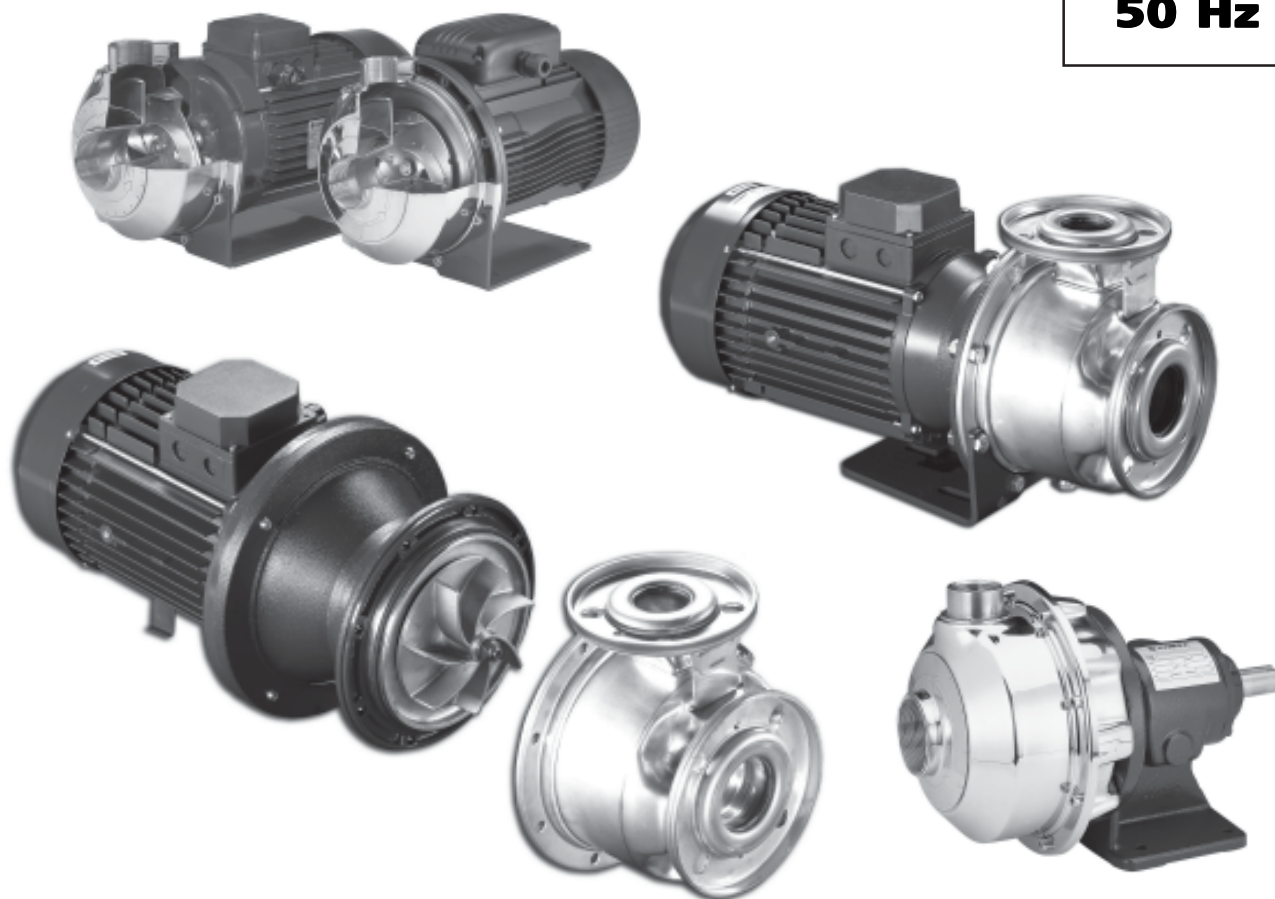


50 Hz



CO-SHO Series

CENTRIFUGAL PUMPS WITH OPEN IMPELLER EQUIPPED WITH
IE2/IE3 MOTORS COMPLYING WITH REGULATION (EC) no. 640/2009

COF-CEF Series

CENTRIFUGAL PUMPS BARE SHAFT

WDA Pompen BV

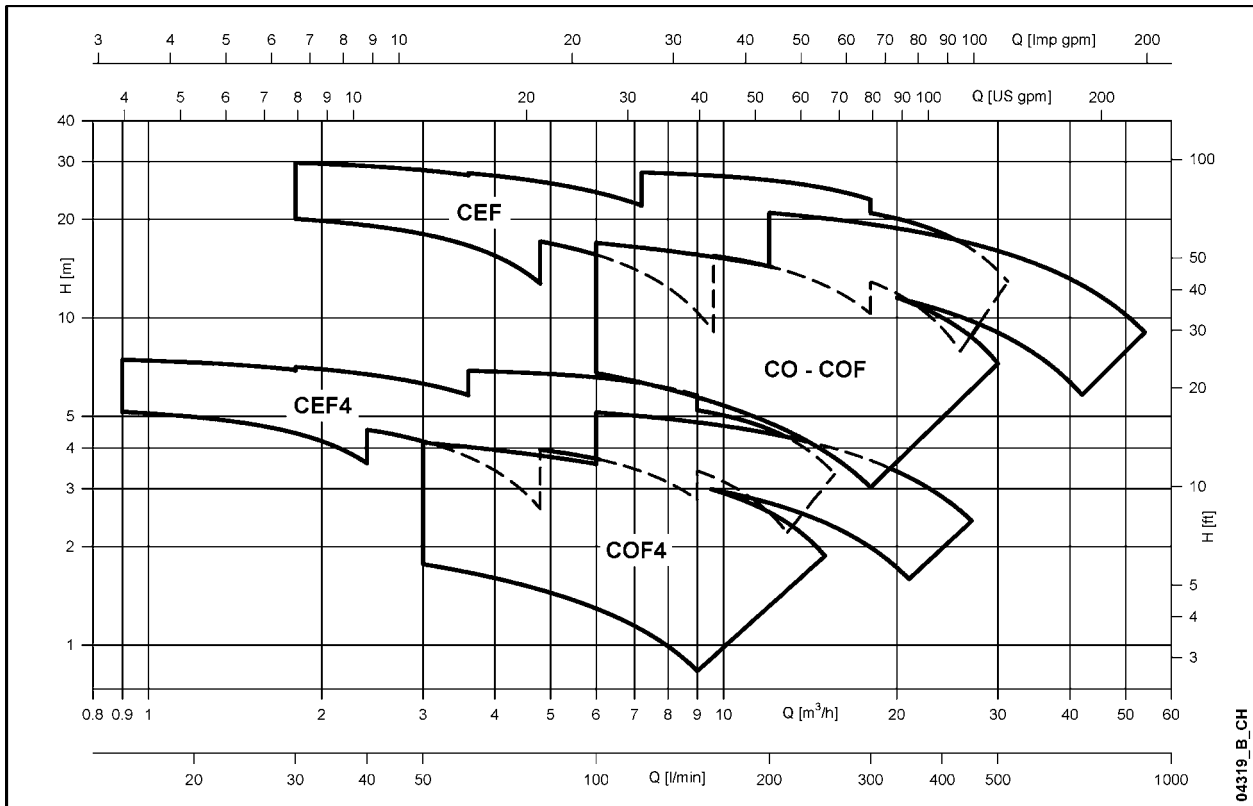
074-3490332 Werk
0683702404 Mobiel
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Nederland
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 **LOWARA**
a xylem brand

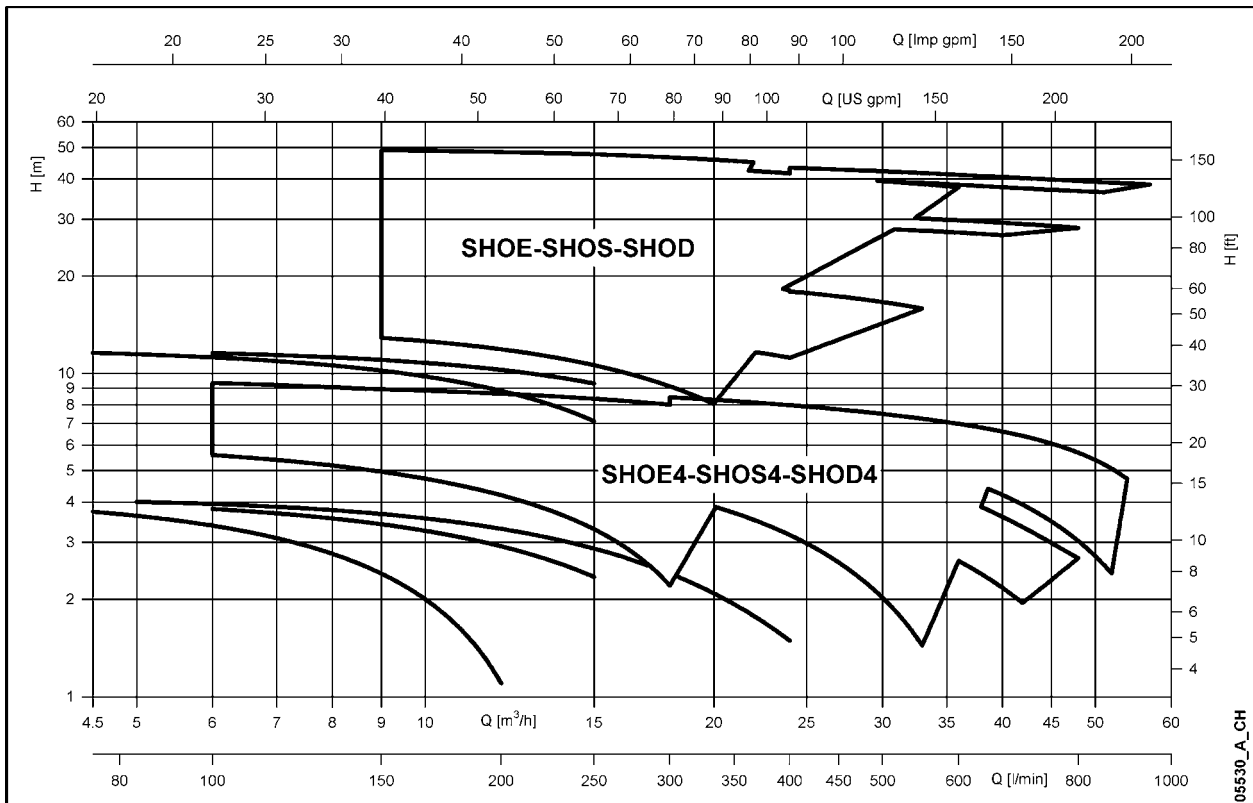
CO - COF - CEF SERIES

HYDRAULIC PERFORMANCE RANGE AT 50 Hz



SHO SERIES

HYDRAULIC PERFORMANCE RANGE AT 50 Hz



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Open impeller centrifugal electric pumps and threaded connections

CO-COM Series



MARKET SECTORS

CIVIL, INDUSTRIAL.

APPLICATIONS

- Washing of metal parts and/or surface treatment.
- Washing of produce in the packaging industry.
- Food industry washing equipment and systems.
- Dyeing plant and textile industry.
- Plants for the circulation and transfer of moderately viscous liquids, with light chemical aggressiveness.
- Industrial washing machines and commercial dishwashers.

CONSTRUCTION FEATURES

- Close-coupled, single-impeller centrifugal pump with axial suction and radial delivery.
- Threaded suction and delivery ports (Rp ISO 7).
- Compact construction; adaptor for motor/pump coupling; the impeller is keyed directly to the motor shaft extension.
- Back pull-out design; no need to disconnect the pump body from the system pipes.
- **AISI 316L** stainless steel open **impeller** with four pressed vanes welded onto base disk.
- Impeller's front **wear surface** consists of a sturdy **AISI 316L** stainless steel plate welded onto the suction port.
- **AISI 316L** stainless steel **pump body and seal housing disk**, with no diffusers or cavities for easier cleaning and maintenance.
- Pump body tightened by 8 screws allowing rotation of the discharge head.
- **Mechanical seal:**
Standard version: Carbon/ Ceramica faces, **FPM** elastomers. The other parts are made of AISI 316L stainless steel.
"K" version : faces are made of **Silicon Carbide and Tungsten Carbide**. **FPM** Elastomers. The other parts are made of AISI 316L stainless steel.
- **FPM O-Rings.**

SPECIFICATIONS

PUMP

- **Delivery** up to 900 l/min (54 m³/h).
- **Head** up to 24 m.
- **Temperature** of pumped liquid: -10°C to +110°C for standard version.
- Maximum working **pressure** : 8 bar (PN 8).
- **Suspended solids** handled up to: CO350: 11 mm. CO500: 20 mm.

MOTOR

- Asynchronous, squirrel cage rotor, enclosed construction in aluminium casing, external ventilation.
- **Protection:** IP55.
- Class 155 (F) **insulation**.
- Performances according to EN 60034-1.
- Maximum ambient **temperature:** 40°C.
- **Standard voltage:**
 - **Single-phase** version: 220-240 V 50 Hz, 2 poles with built-in automatic reset overload protection up to 1,5 kW. For higher powers the protection must be provided by the user.
 - **Three-phase** version: 220-240/380-415 V 50 Hz, 2 poles; overload protection to be provided by the user.
- Condensate drain plugs on all motors.

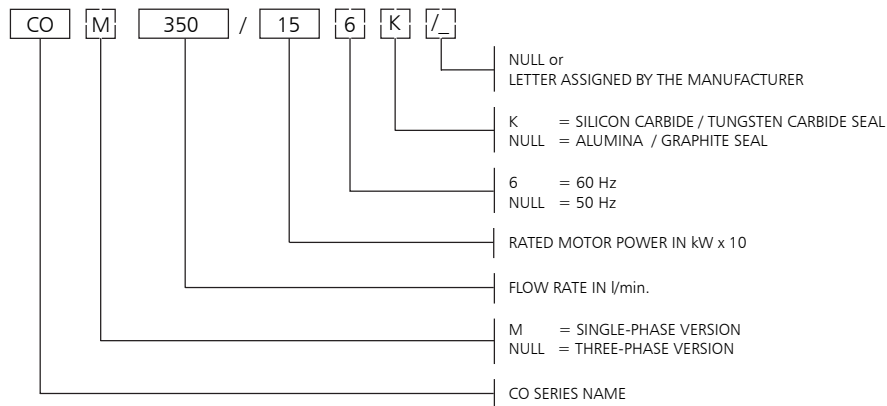
□ **All components in contact with pumped liquid are made of AISI 316L stainless steel**

□ **Mechanical seal made of Silicon carbide/tungsten carbide/FPM in the "K" version**

OPTIONAL FEATURES

- Different voltages and frequencies.
- Different materials for the mechanical seal and O-rings.

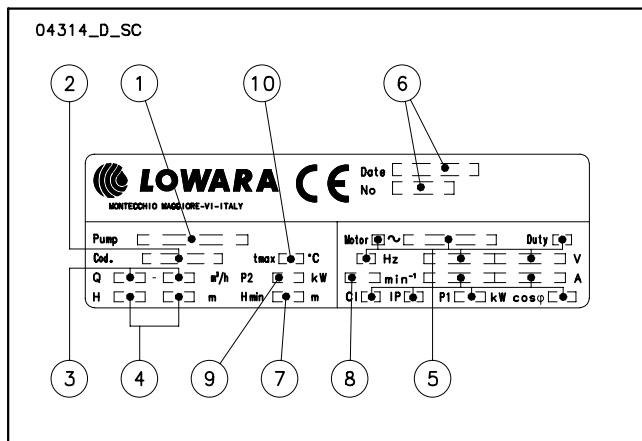
CO - COM SERIES IDENTIFICATION CODE



EXAMPLE : COM 350/156K

CO series electric pump, single-phase, flow rate 350 l/min,
rated power 1,5 kW, 60 Hz version, Silicon Carbide / Tungsten Carbide seal.

RATING PLATE



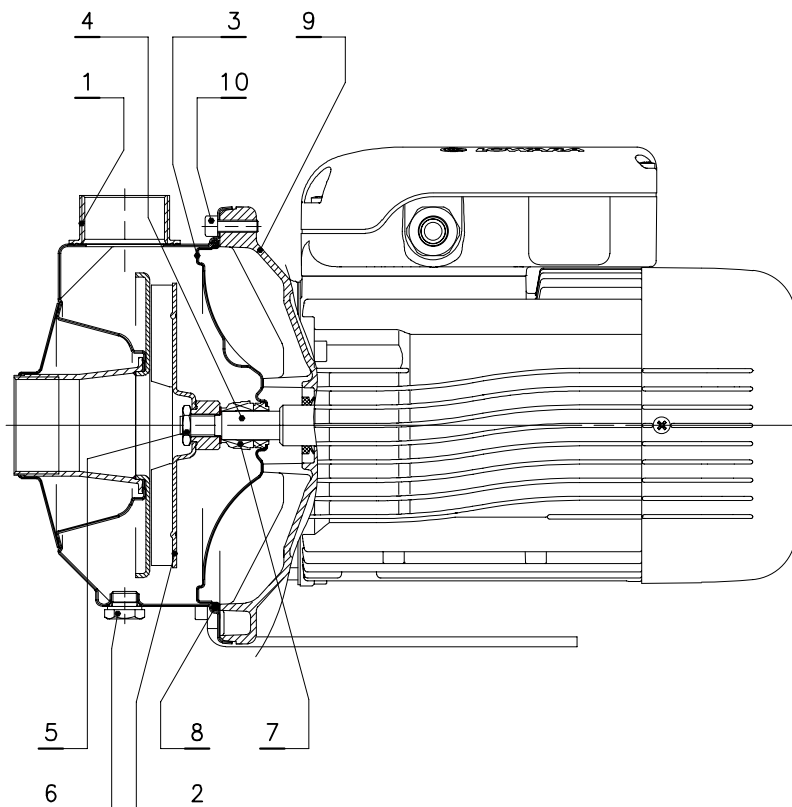
LEGEND

- 1 - Electric pump type
- 2 - Code
- 3 - Delivery range
- 4 - Head range
- 5 - Motor type
- 6 - Date of manufacture and serial number
- 7 - Minimum head
- 8 - Speed
- 9 - Rated output
- 10 - Maximum operating temperature

CO - COM SERIES

LIST OF MODELS AND TABLE OF MATERIALS

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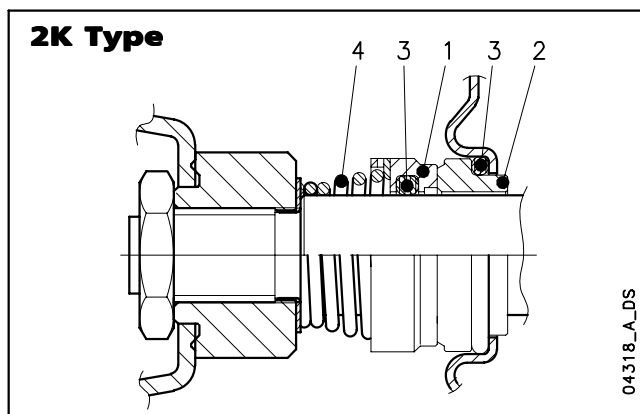
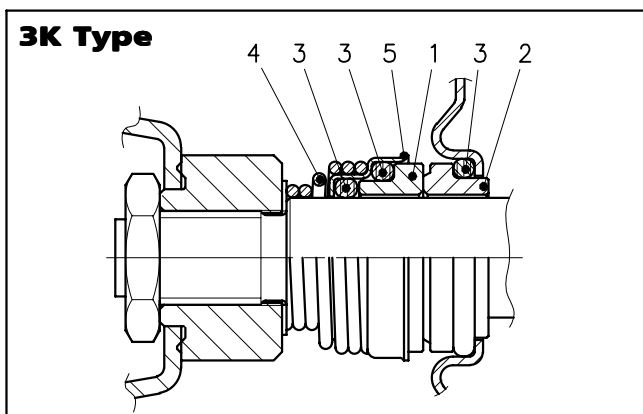
VERSIONS	
SINGLE-PHASE	THREE-PHASE
COM 350/03	CO 350/03
COM 350/05	CO 350/05
COM 350/07	CO 350/07
COM 350/09	CO 350/09
COM 350/11	CO 350/11
COM 350/15	CO 350/15
COM 500/15	CO 500/15
COM 500/22	CO 500/22
	CO 500/30

co-en_a_mo

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	Seal housing	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Shaft extension	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Mechanical seal	Ceramic / resin impregnated Carbon / FPM (standard version)		
8	Elastomers	FPM (standard version)		
9	Adapter	Aluminium	EN 1706-AC-ALSi11Cu2(Fe)DF	ASTM Class 25
10	Pump body fastening bolts & screws	Galvanized steel		

co-en_a_tm

CO - COM SERIES MECHANICAL SEAL



LIST OF MATERIALS

POSITION 1 - 2	POSITION 3	POSITION 4 - 5
B : Resin impregnated carbon	E : EPDM	G : AISI 316
C : Special resin impregnated carbon	V : FPM	
V : Ceramic		
Q ₁ : Silicon Carbide		
U ₃ : Tungsten Carbide		

co_ten-mec-3-en_a_tm

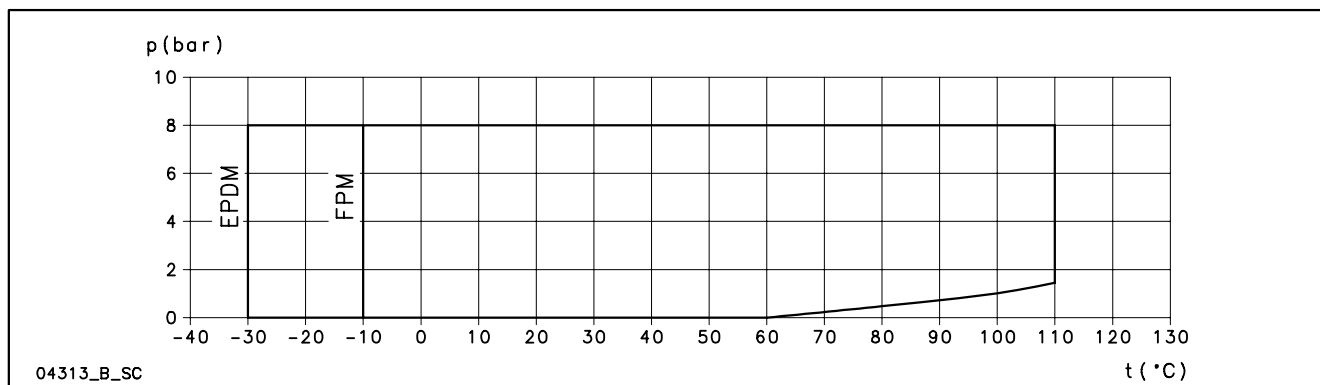
SEAL TYPES

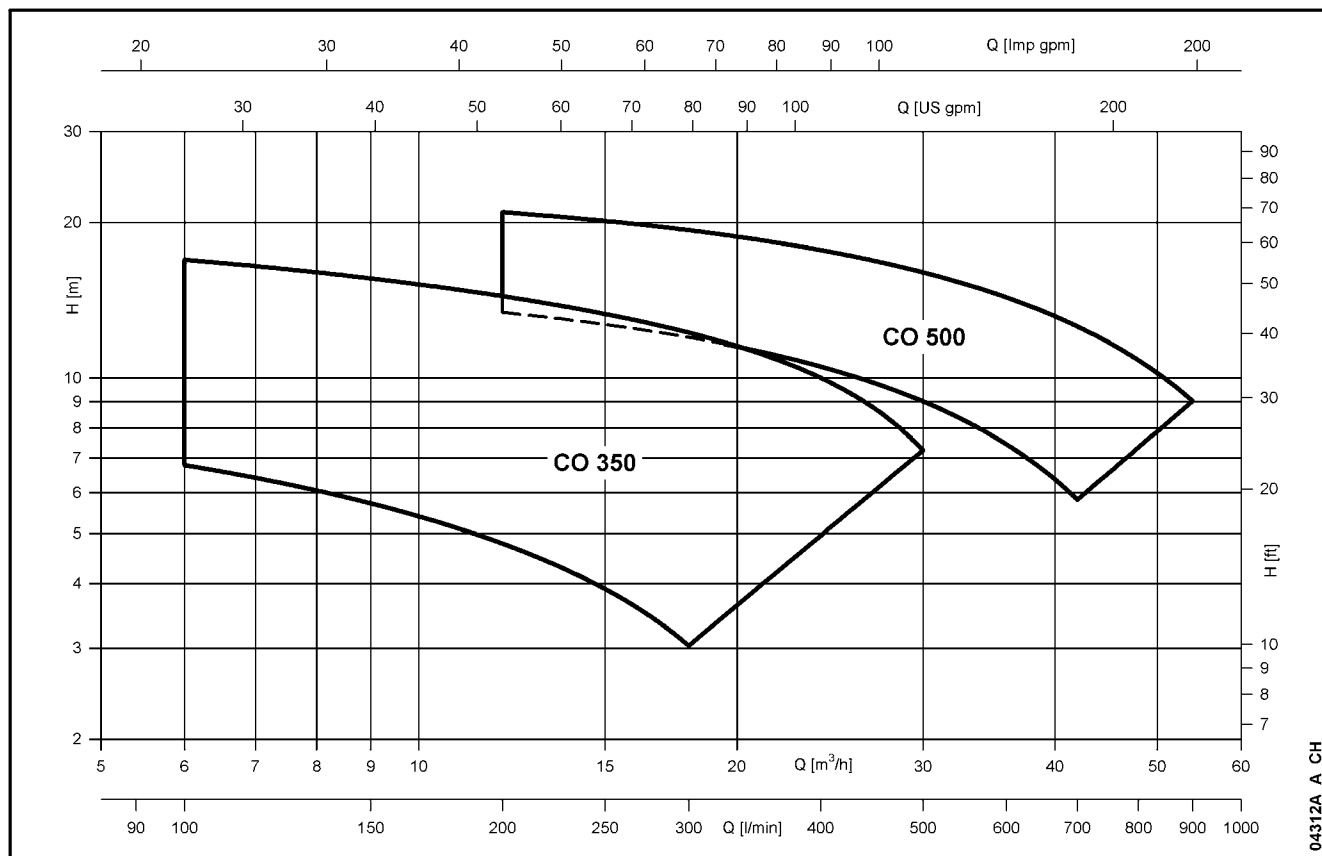
TYPE	POSITION					TEMPERATURE (°C)
	1 ROTATING ASSEMBLY	2 FIXED ASSEMBLY	3 ELASTOMERS	4 SPRINGS	5 OTHER COMPONENTS	
STANDARD MECHANICAL SEAL						
3K - V B V G G	V	B	V	G	G	-10 +110
OTHER MECHANICAL SEAL TYPES						
3K - V C V G G	V	C	V	G	G	-10 +110
3K - Q ₁ CVGG	Q ₁	C	V	G	G	-10 +110
3K - Q ₁ Q ₁ VGG	Q ₁	Q ₁	V	G	G	-10 +110
2K - U ₃ Q ₁ VGG	U ₃	Q ₁	V	G	G	-10 +110
2K - U ₃ U ₃ VGG *	U ₃	U ₃	V	G	G	-10 +110
3K - VBEGG	V	B	E	G	G	-30 +110
3K - VCEGG	V	C	E	G	G	-30 +110
3K - Q ₁ CEGG	Q ₁	C	E	G	G	-30 +110
3K - Q ₁ Q ₁ EGG	Q ₁	Q ₁	E	G	G	-30 +110
2K - U ₃ Q ₁ EGG	U ₃	Q ₁	E	G	G	-30 +110
2K - U ₃ U ₃ EGG *	U ₃	U ₃	E	G	G	-30 +110

* Version with anti-rotation lockpin available on request.

co_tipi-ten-mec-3-en_b_tc

COMPLETE PUMP PRESSURE / TEMPERATURE OPERATING LIMITS (WITH ANY OF THE SEALS LISTED ABOVE)



CO - COM SERIES**HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES****TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 2 POLES**

ELECTRIC PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min	0	100	120	160	200	240	280	300	350	375	400	450	500	600	650	700	800
	m³/h	0	6	7,2	9,6	12	14,4	16,8	18	21	22,5	24	27	30	36	39	42	48	54	
	kW		HP	H = TOTAL HEAD METRES COLUMN OF WATER																
CO(M) 350/03	0,37	0,5	9,5	6,8	6,3	5,5	4,8	4,1	3,4	3,0										
CO(M) 350/05	0,55	0,75	12,0	9,2	8,8	7,9	7,1	6,3	5,5	5,1	4,0									
CO(M) 350/07	0,75	1	13,7	11,2	10,8	9,9	9,1	8,2	7,4	6,9	5,8	5,3								
CO(M) 350/09	0,9	1,2	15,7	12,7	12,2	11,3	10,5	9,6	8,8	8,3	7,2	6,6	5,9							
CO(M) 350/11	1,1	1,5	17,3	14,3	13,8	12,9	12,0	11,2	10,5	10,1	9,1	8,6	8,0	6,8						
CO(M) 350/15	1,5	2	20,3	16,9	16,4	15,3	14,4	13,5	12,7	12,2	11,2	10,6	10,0	8,7	7,2					
CO(M) 500/15	1,5	2	16,0				13,4	12,8	12,3	12,0	11,3	10,9	10,5	9,8	9,0	7,4	6,6	5,8		
CO(M) 500/22	2,2	3	19,6				17,3	16,7	16,2	15,9	15,2	14,9	14,5	13,7	13,0	11,3	10,4	9,6	7,7	
CO 500/30	3	4	24,1				20,9	20,3	19,7	19,3	18,5	18,1	17,7	16,9	16,0	14,3	13,5	12,6	10,8	9,0

co-2p50-en_d_th

PUMP TYPE 1 ~	MOTOR TYPE	INPUT POWER*	INPUT CURRENT*	CAPACIT.	PUMP TYPE 3 ~	MOTOR TYPE	INPUT POWER*	INPUT CURRENT*	INPUT CURRENT*
		kW	220-240 V A	μF / 450 V			kW	220-240 V A	380-415 V A
COM350/03	SM63BG/1045	0,63	2,82	14	CO350/03	SM63BG/304	0,64	2,53	1,46
COM350/05	SM71BG/1055	0,88	4,25	16	CO350/05	SM71BG/305	0,79	2,70	1,56
COM350/07	SM71BG/1075	1,02	4,67	20	CO350/07	SM80BG/307PE	0,92	2,96	1,71
COM350/09	SM71BG/1095	1,21	5,46	25	CO350/09	SM80BG/311PE	1,08	3,72	2,15
COM350/11	SM80BG/1115	1,75	7,85	30	CO350/11	SM80BG/311PE	1,61	4,87	2,81
COM350/15	SM80BG/1155	2,04	9,21	40	CO350/15	SM80BG/315PE	1,87	5,75	3,32
COM500/15	SM80BG/1155	2,02	9,12	40	CO500/15	SM80BG/315PE	1,84	5,70	3,29
COM500/22	PLM90BG/1225	2,72	12,7	70	CO500/22	PLM90BG/322	2,66	8,27	4,78
-	-	-	-	-	CO500/30	PLM90BG/330	3,80	11,4	6,57

*Maximum value in specified range.

co-2p50-en_f_te

MOTORS FOR CO SERIES

Standard supplied IE2/IE3 three-phase surface motors $\geq 0,75$ kW are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.

Electrical performances according to EN 60034-1.

Insulation class 155 (F). IP55 protection. Condensate drain plugs on standard version.

Cooling by fan according to EN 60034-6.

Cable gland metric size according to EN 50262. Standard voltage:

- **Single-phase** version: 220-240 V 50 Hz (incorporated automatic-reset overload protection).
- **Three-phase** version: 220-240/380-415 V 50 Hz (overload protection to be provided by the user).

SINGLE-PHASE MOTORS AT 50 Hz, 2 POLES

P _N kW	MOTOR TYPE	IEC SIZE	Construction Design	INPUT	CAPACITOR		DATA FOR 230 V 50 Hz VOLTAGE						
				CURRENT	μ F	V	$\min^{-1}$	Is / In	η %	cos ϕ	T _N Nm	Ts/T _N	T _m /T _N
				In (A) 220-240 V									
0,4	SM63BG/1045	63	SPECIAL	2,79-2,85	14	450	2745	2,64	65,1	0,96	1,39	0,68	1,63
0,55	SM71BG/1055	71		3,76-3,99	16	450	2820	3,72	68,9	0,91	1,86	0,61	2,00
0,75	SM71BG/1075	71		4,90-4,85	20	450	2765	3,42	70,1	0,96	2,59	0,58	1,75
0,95	SM71BG/1095	71		6,25-5,89	25	450	2740	3,39	71,1	0,98	3,31	0,58	1,66
1,1	SM80BG/1115	80		6,88-6,65	30	450	2800	3,89	74,7	0,96	3,75	0,46	1,72
1,5	SM80BG/1155	80		9,21-8,58	40	450	2810	4,00	76,1	0,98	5,09	0,39	1,74
2,2	PLM80BG/1225	90		12,5-11,6	70	450	2825	4,47	82,4	0,97	7,43	0,53	1,87

co-motm-2p50-en_a_te

THREE-PHASE MOTORS AT 50 Hz, 2 POLES

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		
0,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	By June 2011
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0,75	82,5	83,1	81,3	82,8	82,7	80,1	82,6	82,0	78,9	82,5	82,0	78,9	82,5	82,0	78,9	82,5	82,0	78,9	-	
0,9	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	3	
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	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	2	
3	85,5	86,8	85,6	86,1	86,8	85,6	86,3	86,8	85,6	85,5	86,8	85,6	85,5	86,8	85,6	85,5	86,8	85,6		

P _N kW	Manufacturer		IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Lowara srl Unipersonale Reg. No. 341820260 Montecchio Maggiore Vicenza - Italia						cosφ	Is / I _N	T _N Nm	Ts/T _N	Tm/Tn
	Model										
0,4	SM63BG/304		63	SPECIAL	2	50	0,66	4,32	1,38	4,14	3,13
0,55	SM71BG/305		71				0,74	5,97	1,85	3,74	3,56
0,75	SM80BG/307PE		80				0,78	7,38	2,48	3,57	3,75
0,9	SM80BG/311PE		80				0,79	8,31	3,63	3,95	3,95
1,1	SM80BG/311PE		80				0,79	8,31	3,63	3,95	3,95
1,5	SM80BG/315PE		80				0,80	8,80	4,96	4,31	4,10
2,2	PLM90BG/322		90				0,80	8,63	7,25	3,74	3,71
3	PLM90BG/330		90				0,82	8,39	9,96	3,50	3,32

P _N kW	Voltage U _N V										n _N min ⁻¹	See note.	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
	I _N (A)															
0,4	2,20	2,34	2,51	1,27	1,35	1,45	-	-	-	-	-		2740 ÷ 2790	≤ 1000	-15 / 40	No
0,55	2,56	2,56	2,62	1,48	1,48	1,51	-	-	-	-	-		2825 ÷ 2850			
0,75	2,96	2,94	2,96	1,71	1,70	1,71	1,70	1,69	1,70	0,98	0,98		2875 ÷ 2895			
0,9	4,19	4,14	4,16	2,42	2,39	2,40	2,41	2,38	2,38	1,39	1,37		2870 ÷ 2900			
1,1	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	8,05	8,04	8,09	4,65	4,64	4,67	4,62	4,61	4,63	2,67	2,66	2885 ÷ 2900				
3	10,8	10,6	10,6	6,23	6,14	6,12	6,18	6,10	6,06	3,57	3,52	2850 ÷ 2885				

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

co-ie2-mott-2p50-en_b_te

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

AVAILABLE VOLTAGES MOTORS FOR CO SERIES

P _N kW	IEC SIZE	SINGLE-PHASE							
		50 Hz				60 Hz			
		1 x 220-240	1 x 100	1 x 110-120	1 x 220-230	1 x 100	1 x 110-115	1 x 120-127	1 x 200-210
0,4	63	s	o	o	s	-	o	-	-
0,55	71	s	o	o	s	o	o	o	o
0,75	71	s	o	o	s	o	o	o	o
0,95	71	s	o	o	s	o	o	o	o
1,1	80	s	-	o	s	-	o	-	o
1,5	80	s	-	-	s	-	o	-	o
2,2	90	s	-	-	s	-	-	-	-

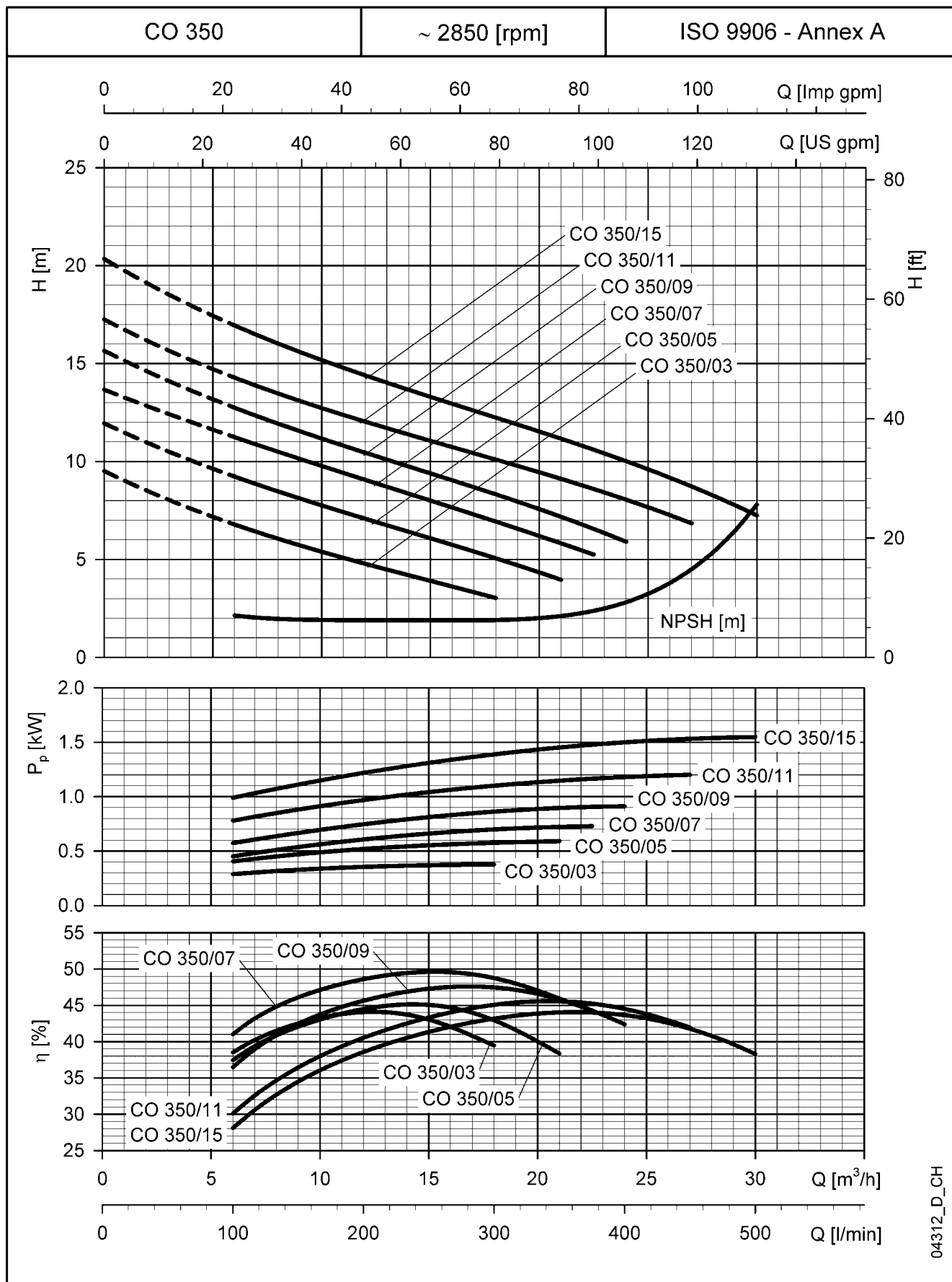
s = Standard voltage

o = Optional voltage

P _N kW	THREE-PHASE - 2 POLES															
	50 Hz								60 Hz							
	3 x 220-230-240/380-400-415	3 x 380-400-415/660-690	3 x 200-208/346-360	3 x 255-265/440-460	3 x 290-300/500-525	3 x 440-460/-	3 x 500-525/-	3 x 220-230/380-400	3 x 255-265-277/440-460-480	3 x 380-400/660-690	3 x 440-460-480/-	3 x 110-115/190-200	3 x 200-208/346-360	3 x 330-346/575-600	3 x 575/-	50/60 Hz
0,4	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
0,55	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
0,75	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
0,95	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
1,1	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
1,5	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
2,2	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o
3	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o

- = Not available

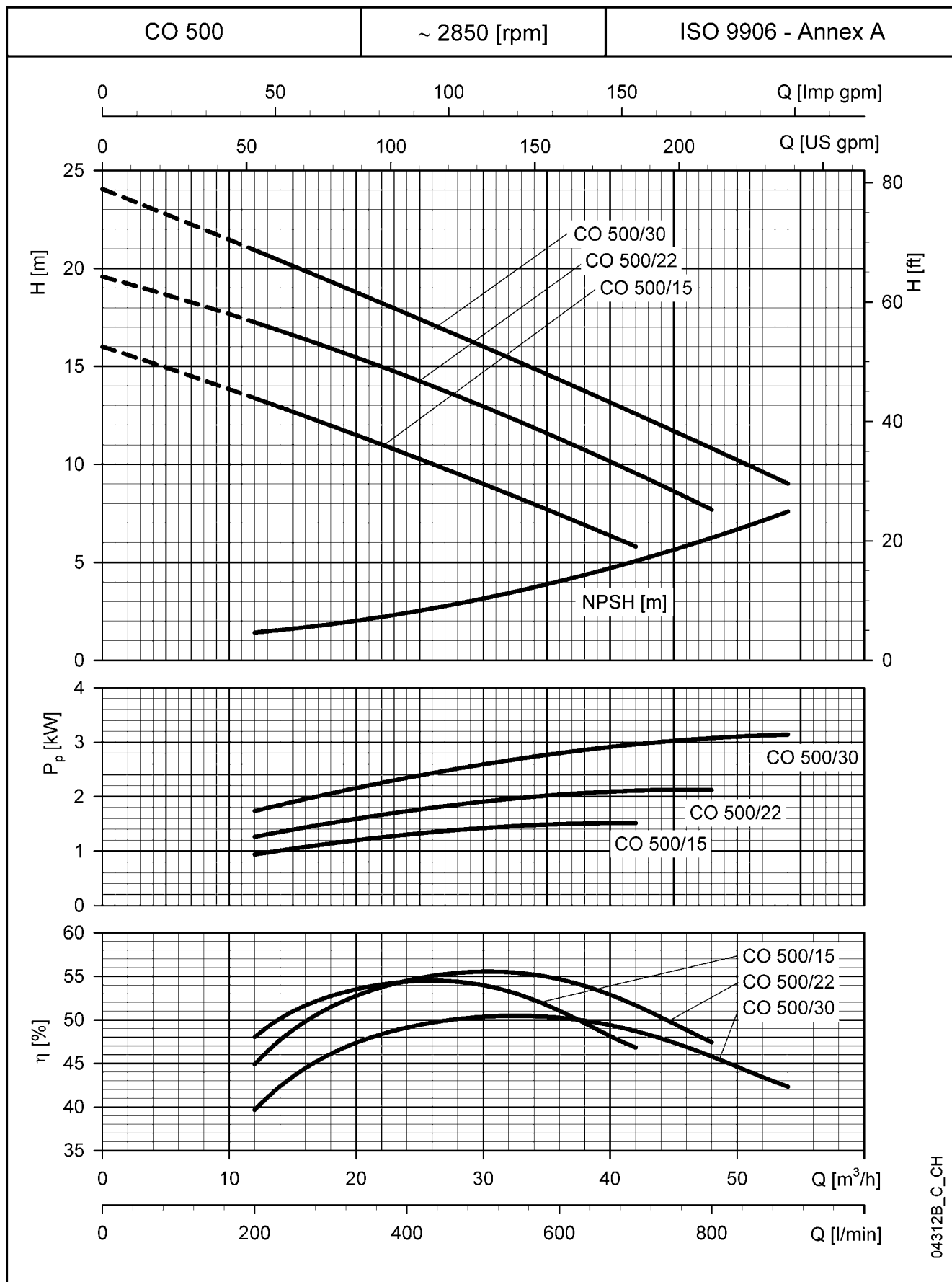
co-volt-low-a-en_a_te

CO350 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

www.wdapompen.nl - info@wdapompen.nl

CO500 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

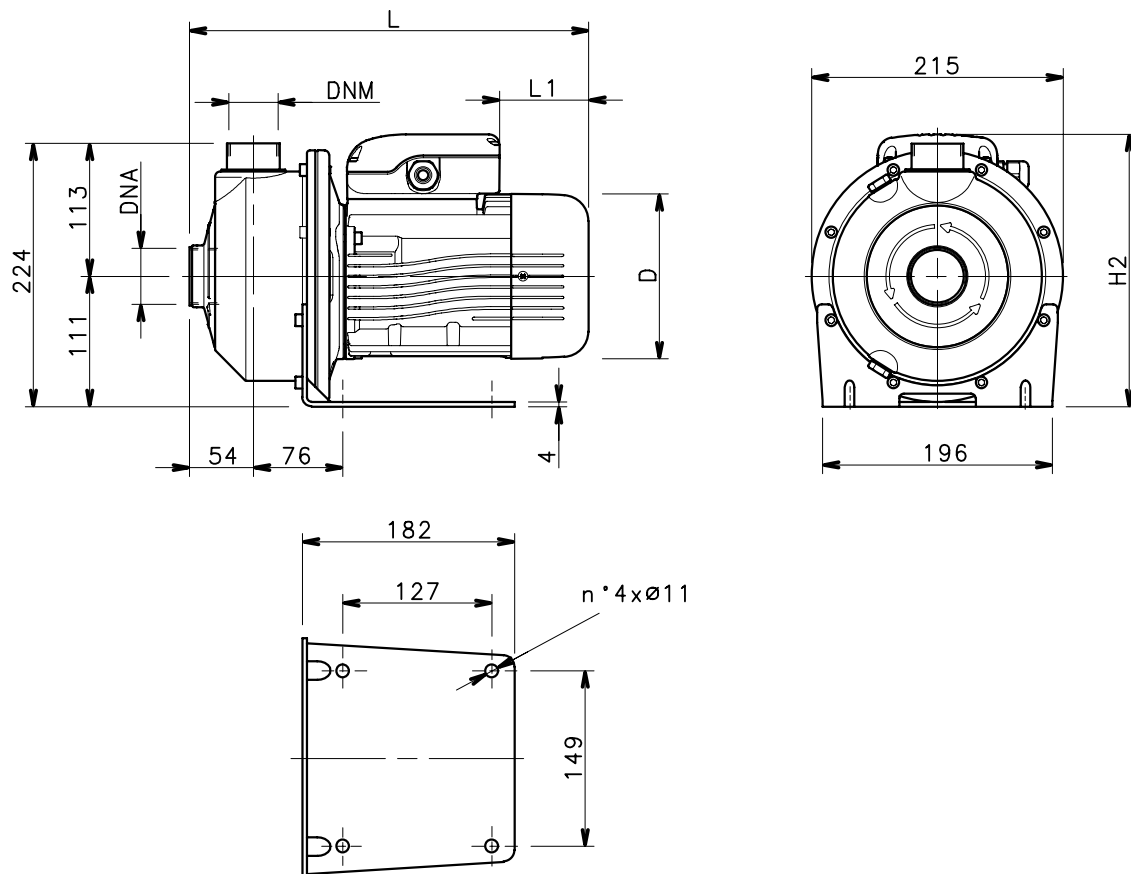
The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

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CO SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES



04311B_C_DD

PUMP TYPE	DIMENSIONS (mm)				DNA	DNM	WEIGHT kg
	D	H2	L	L1			
COM 350/03/A	120	222	325	62	Rp 1½	Rp 1¼	10
COM 350/05/A	140	232	339	76	Rp 1½	Rp 1¼	11,9
COM 350/07/A	140	232	339	76	Rp 1½	Rp 1¼	12,6
COM 350/09/A	140	241	339	31	Rp 1½	Rp 1¼	13,2
COM 350/11/A	156	248	385	69	Rp 1½	Rp 1¼	14,5
COM 350/15/A	156	248	385	69	Rp 1½	Rp 1¼	16,2
COM 500/15/A	156	248	385	69	Rp 2	Rp 1½	16,2
COM 500/22/P	174	262	429	84	Rp 2	Rp 1½	20
CO 350/03/A	120	222	325	62	Rp 1½	Rp 1¼	10
CO 350/05/A	140	232	339	76	Rp 1½	Rp 1¼	11,9
CO 350/07/D	155	240	385	114	Rp 1½	Rp 1¼	14,1
CO 350/09/D	155	240	385	114	Rp 1½	Rp 1¼	16
CO 350/11/D	155	240	385	114	Rp 1½	Rp 1¼	16,3
CO 350/15/D	155	240	385	114	Rp 1½	Rp 1¼	17,8
CO 500/15/D	155	240	385	114	Rp 2	Rp 1½	17,8
CO 500/22/C	174	245	429	172	Rp 2	Rp 1½	23
CO 500/30/P	174	245	429	172	Rp 2	Rp 1½	25

co-2p50-en_g_td

Bare shaft centrifugal pumps with closed impeller (CEF series) and open impeller (COF series)

MARKET SECTORS

CIVIL, AGRICULTURAL, INDUSTRIAL.

APPLICATIONS

- Pumping of moderately viscous water and liquids (COF series) with moderate chemical aggressiveness (CEF, COF series).
- Water supply.
- Irrigation.
- Water circulation (cold, hot, refrigerated).
- Washing in the packaging, textile and food industries (COF series).

* For aggressive liquids, please contact our sales network.

CEF-COF Series



- ☐ In the standard version, all parts in contact with pumped liquid are made of **AISI 316 stainless steel**
- ☐ Suspended solids handled up to **11 mm (COF350) and 20 mm (COF500)** in the open impeller version (COF)
- ☐ Sturdy support with permanently lubricated bearings
- ☐ Flexible couplings available for connection to motor shaft of various sizes

SPECIFICATIONS POMP

- **Delivery** up to 500 l/min (30 m³/h) at 2900 rpm (CEF series).
- **Delivery** up to 900 l/min (54 m³/h) at 2900 rpm (COF series).
- **Head** up to 29 m at 2900 rpm (CEF series).
- **Head** up to 24,5 m at 2900 rpm (COF series).
- **Temperature** of pumped liquid: -10°C to +110°C standard version.
- Maximum operating **pressure** : 8 bar (PN 8).
- Counterclockwise rotation facing the pump from the suction port.
- **Standard supplied IE2/IE3 motors are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.**

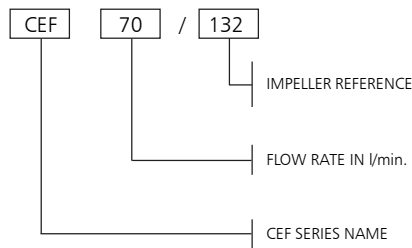
CONSTRUCTION FEATURES

- Close-coupled, single-impeller centrifugal pump featuring axial intake and radial discharge.
- Pump coupled by adapter to the bare shaft support; special shaft extension in common with pump are supported by ball bearing.
- Back pull-out design; no need to disconnect the pump body from the system pipes.
- Threaded suction and delivery ports (Rp ISO 7).
- High performance closed **impeller** made of **AISI 316** stainless steel (CEF series).
- High performance open **impeller** made of **AISI 316** stainless steel (COF series).
- **Mechanical seal** with **Ceramic/Carbon** faces, **FPM** elastomers, other parts are made of **AISI 316** stainless steel (CEF series).
- **Mechanical seal** with **Ceramic/Carbon** faces (**Silicon Carbide** and **Tungsten Carbide** in the "**K**" version), **FPM** elastomers, other parts are made of **AISI 316** stainless steel (COF series).
- **FPM O-rings.**

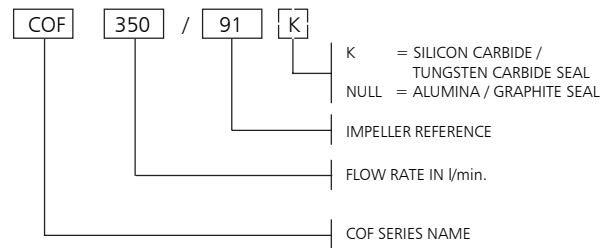
OPTIONAL FEATURES

- Different materials for the mechanical seal and O-rings.
- Electric pump unit (pump, motor, coupling, base).

CEF - COF SERIES IDENTIFICATION CODE (PUMP)

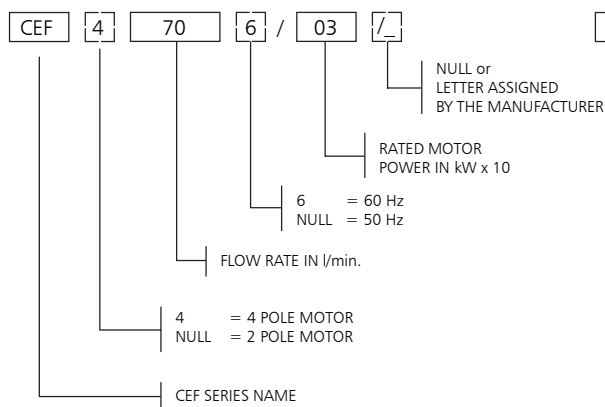


EXAMPLE : CEF 70/132
 CEF pump series, flow rate 70 l/min,
 impeller reference 132.

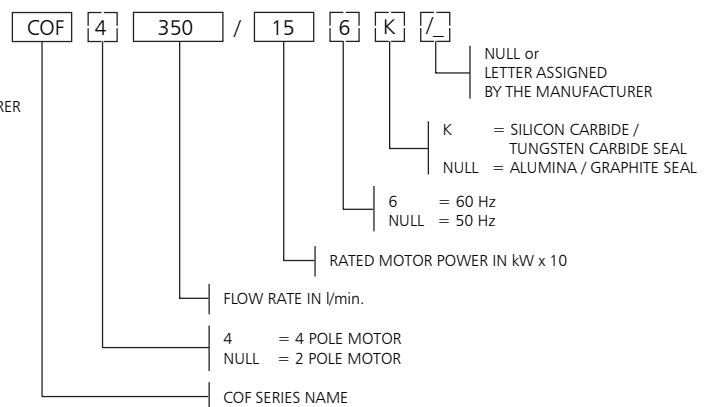


EXAMPLE : COF 350/91K
 COF pump series, flow rate 350 l/min,
 impeller reference 91, Silicon Carbide / Tungsten Carbide seal.

IDENTIFICATION CODE (ELECTRIC PUMP)

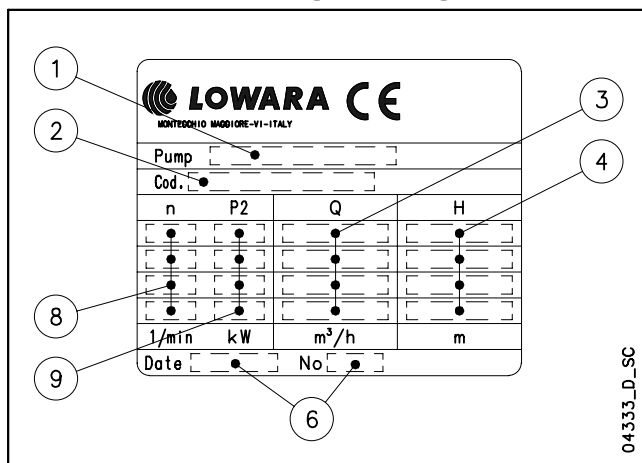


EXAMPLE : CEF 70/03
 CEF electric pump series, flow rate 70 l/min,
 0,37 kW rated motor power, 50 Hz version.

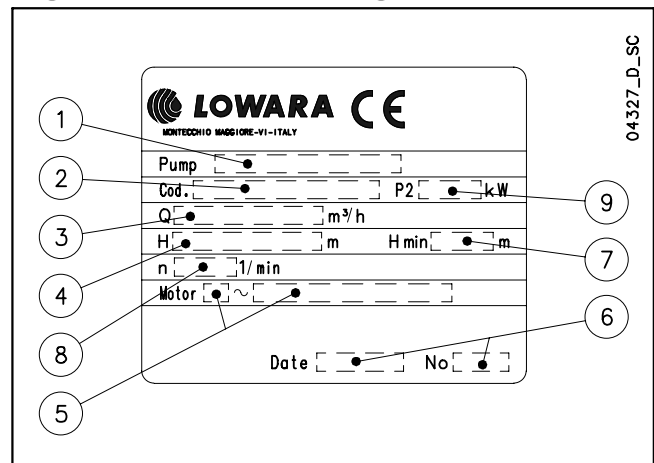


EXAMPLE : COF 350/15K
 COF electric pump series, flow rate 350 l/min, 1,5 kW rated
 motor power, 50 Hz version, Silicon Carbide / Tungsten Carbide seal.

RATING PLATE (PUMP)



(ELECTRIC PUMP)



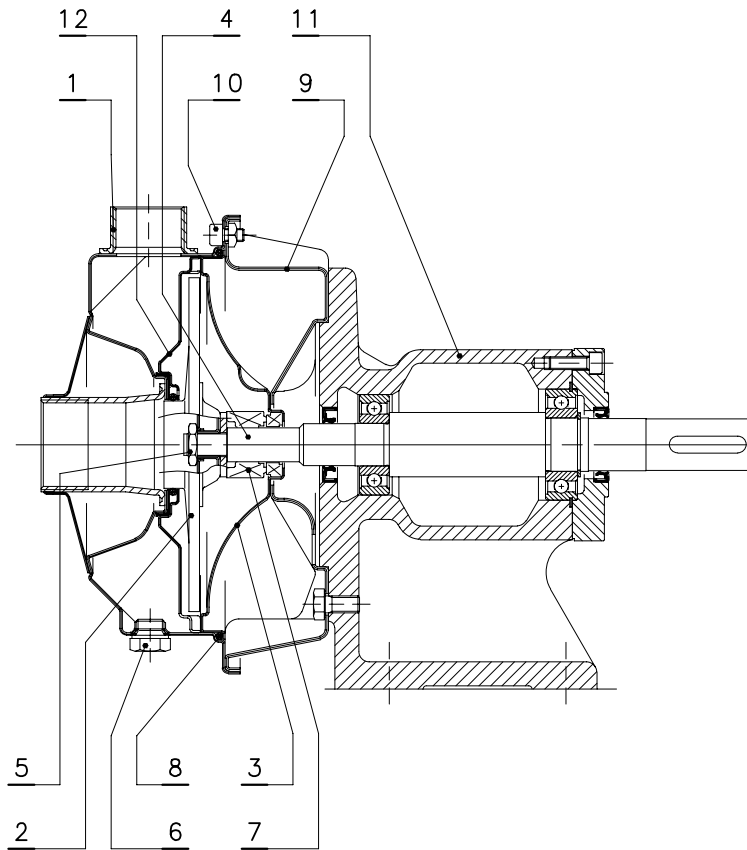
LEGEND

- | | |
|------------------------|---|
| 1 - Electric pump type | 6 - Date of manufacture and serial number |
| 2 - Code | 7 - Minimum head |
| 3 - Delivery range | 8 - Speed |
| 4 - Head range | 9 - Rated output |
| 5 - Motor type | 10 - Maximum operating temperature |

CEF SERIES

LIST OF MODELS AND TABLE OF MATERIALS

04329_A_DS



VERSIONS

CEF 70
CEF 80
CEF 120
CEF 210
CEF 370

cef-en_a_mo

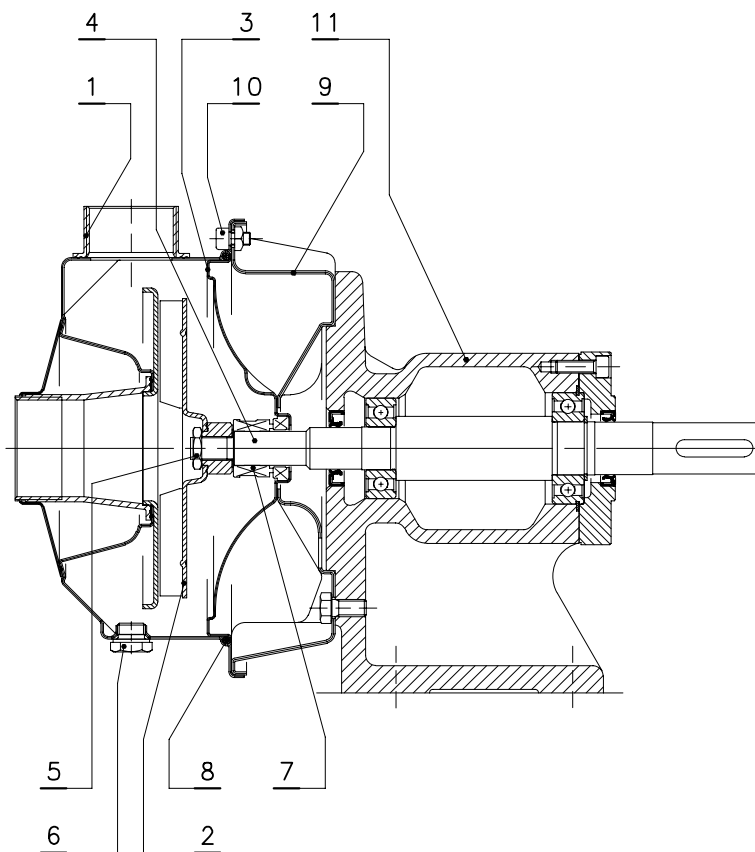
REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
2	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
3	Seal housing	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Shaft extension	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Mechanical seal	Ceramic / resin impregnated Carbon / FPM (standard version)		
8	Elastomers	FPM (standard version)		
9	Motor pump bracket	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
10	Pump body fastening bolts & screws	Galvanized steel		
11	Bracket casing	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
12	Diffuser	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L

cef-en_a_tm

COF SERIES

LIST OF MODELS AND TABLE OF MATERIALS

04323_A_DS



VERSIONS

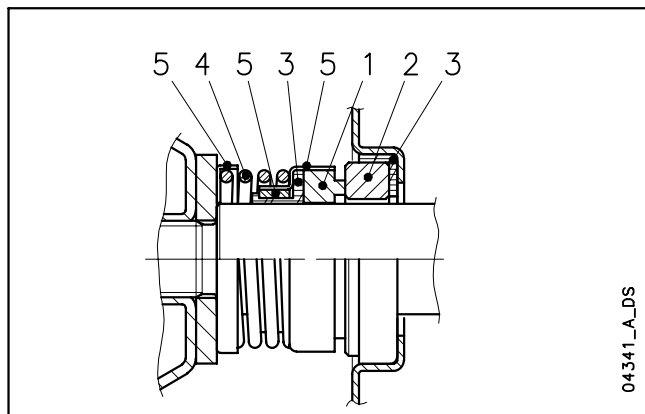
 COF 350
 COF 500

cof-en_a_mo

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	Seal housing	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Shaft extension	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Mechanical seal	Ceramic / resin impregnated Carbon / FPM (standard version)		
8	Elastomers	FPM (standard version)		
9	Motor pump bracket	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
10	Pump body fastening bolts & screws	Galvanized steel		
11	Bracket casing	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35

cof-en_a_tm

CEF - COF SERIES MECHANICAL SEAL



LIST OF MATERIALS

POSITION 1 - 2	POSITION 3	POSITION 4 - 5
B : Resin impregnated carbon	E : EPDM	G : AISI 316
V : Ceramic	V : FPM	
Q ₁ : Silicon Carbide		
U ₃ : Tungsten Carbide		

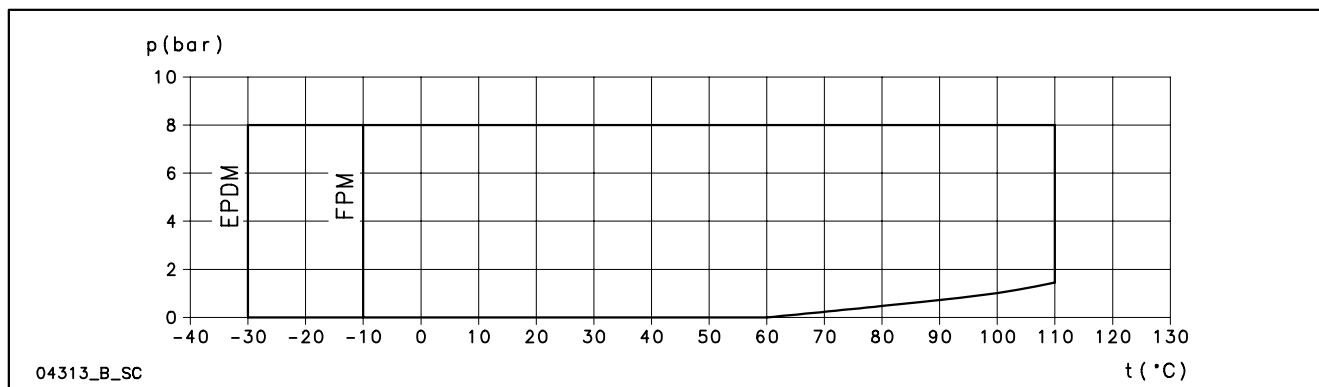
cof_ten-mec-j-c-21-en_a_tm

SEAL TYPES

TYPE	POSITION					TEMPERATURE (°C)
	1 ROTATING ASSEMBLY	2 FIXED ASSEMBLY	3 ELASTOMERS	4 SPRINGS	5 OTHER COMPONENTS	
STANDARD MECHANICAL SEAL						
VB V G G	V	B	V	G	G	-10 +110
OTHER MECHANICAL SEAL TYPES						
Q ₁ BEGG	Q ₁	B	E	G	G	-30 +110
Q ₁ Q ₁ EGG	Q ₁	Q ₁	E	G	G	-30 +110
U ₃ Q ₁ VGG	U ₃	Q ₁	V	G	G	-10 +110

cof_tipi-ten-mec-j-c-21-en_c_tc

COMPLETE PUMP PRESSURE / TEMPERATURE OPERATING LIMITS (WITH ANY OF THE SEALS LISTED ABOVE)



MOTORS FOR CEF - COF SERIES

Standard supplied IE2/IE3 three-phase surface motors $\geq 0,75$ kW are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.

Enclosed short circuit squirrel cage motor (TEFC), with external ventilation.

Electrical performances according to EN 60034-1.

Insulation class 155 (F).

IP55 protection.

Condensate drain plugs on standard version.

Cooling by fan according to EN 60034-6.

Cable gland metric size according to EN 50262.

Standard voltage:

- **Three-phase** version: 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. Overload protection to be provided by the user.

THREE-PHASE MOTORS AT 50 Hz, 2 POLES

P _N kW	Efficiency η _N %																		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				IE
	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4		
0,37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	By June 2011
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0,75	82,5	83,1	81,3	82,8	82,7	80,1	82,6	82,0	78,9	82,5	82,0	78,9	82,5	82,0	78,9	82,5	82,0	78,9	3	
0,9	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		
1,1	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	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	81,8	2	
1,85	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7		
2,2	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7		
3	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1	85,1		

P _N kW	Manufacturer		IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Lowara srl Unipersonale Reg. No. 341820260 Montecchio Maggiore Vicenza - Italia						cosφ	Is / I _N	T _N Nm	Ts/T _N	Tm/Tn
	Model										
0,37	SM71B3/304		71	B3	2	50	0,59	-	1,22	-	-
0,55	SM71B3/305		71				0,74	5,97	1,85	3,74	3,56
0,75	SM80B3/307 PE		80				0,78	7,38	2,48	3,57	3,75
0,9	SM80B3/311 PE		80				0,79	8,31	3,63	3,95	3,95
1,1	SM80B3/311 PE		80				0,79	8,31	3,63	3,95	3,95
1,5	PLM90B3/315		90				0,86	7,86	4,96	3,34	3,27
1,85	PLM90B3/322		90				0,80	8,63	7,25	3,74	3,71
2,2	PLM90B3/322		90				0,80	8,63	7,25	3,74	3,71
3	PLM100B3/330		100				0,84	9,45	9,83	3,59	4,27

P _N kW	Voltage U _N V											n _N min ⁻¹	See note.	Condizioni operative **		
	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					
	I _N (A)															
0,37	2,10	2,13	2,30	1,21	1,23	1,33	-	-	-	-	-	2885 ÷ 2900	≤ 1000	-15 / 40	No	
0,55	2,56	2,56	2,62	1,48	1,48	1,51	-	-	-	-	-	2825 ÷ 2850				
0,75	2,96	2,94	2,96	1,71	1,70	1,71	1,70	1,69	1,70	0,98	0,98	2875 ÷ 2895				
0,9	4,19	4,14	4,16	2,42	2,39	2,40	2,41	2,38	2,38	1,39	1,37	2870 ÷ 2900				
1,1	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	5,53	5,23	5,13	3,19	3,02	2,96	3,19	3,03	2,96	1,84	1,75	2865 ÷ 2895				
1,85	8,05	8,04	8,09	4,65	4,64	4,67	4,62	4,61	4,63	2,67	2,66	2885 ÷ 2900				
2,2	8,05	8,04	8,09	4,65	4,64	4,67	4,62	4,61	4,63	2,67	2,66	2885 ÷ 2900				
3	10,4	10,2	10,3	5,98	5,91	5,92	6,01	5,95	5,96	3,47	3,44	2905 ÷ 2920				

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

cef-cof-ie2-mott-2p50-en_c_te

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

MOTOR NOISE

The tables below show the mean sound pressure levels (Lp) measured at 1 meter's distance in a free field according to the A curve (ISO 1680 standard).

The noise values are measured with idling 50 Hz motor with a tolerance of 3 dB (A).

CEF - COF MOTORS 2-POLES 50 Hz

POWER kW	MOTOR TYPE IEC SIZE	NOISE LpA dB
0,37	71	<70
0,55	71	<70
0,75	80	<70
0,9	80	<70
1,1	80	<70
1,5	90	<70
1,85	90	<70
2,2	90	<70
3	100	<70

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AVAILABLE VOLTAGES MOTORS FOR CEF - COF SERIES

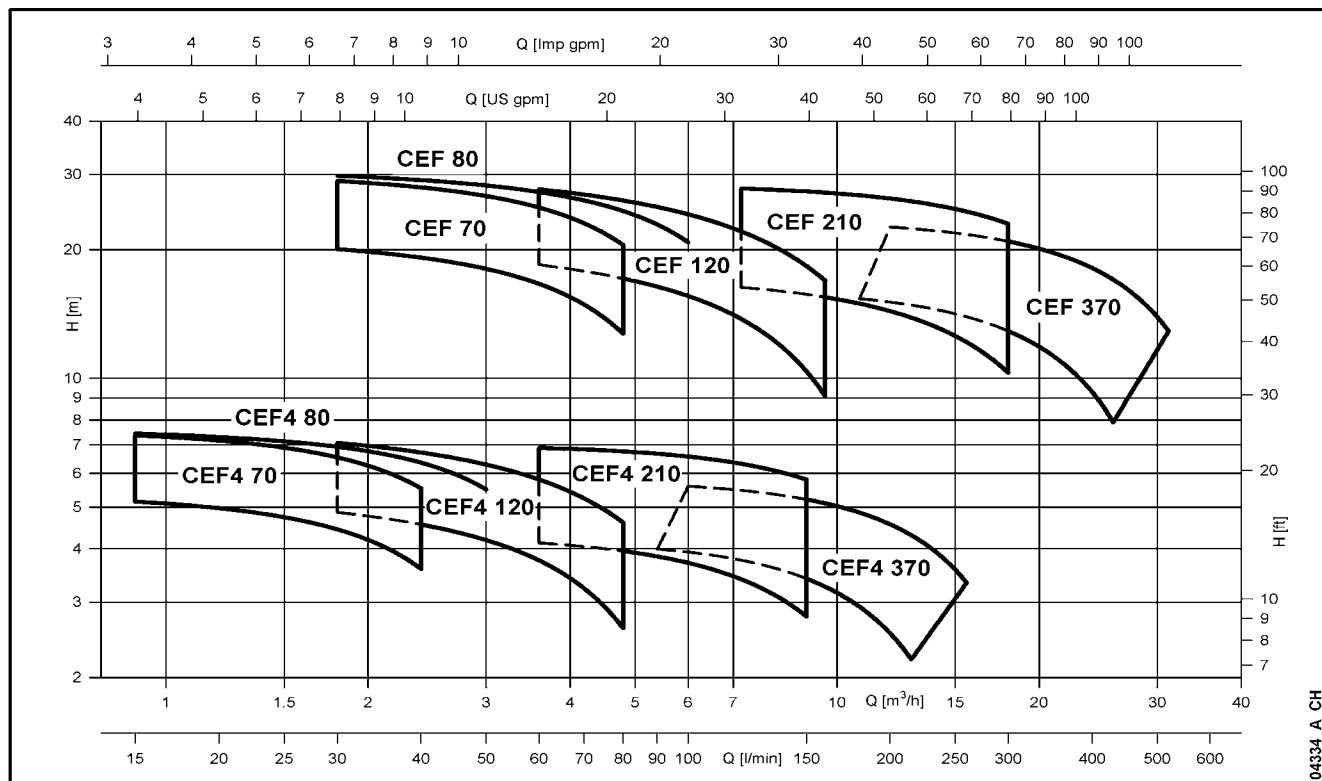
P _N kW	THREE-PHASE - 2 POLES																
	50 Hz							60 Hz							50/60 Hz		
	3 x 220-230-240/380-400-415	3 x 380-400-415/660-690	3 x 200-208/346-360	3 x 255-265/440-460	3 x 290-300/500-525	3 x 440-460/-	3 x 500-525/-	3 x 220-230/380-400	3 x 255-265-277/440-460-480	3 x 380-400/660-690	3 x 440-460-480/-	3 x 110-115/190-200	3 x 200-208/346-360	3 x 330-346/575-600	3 x 575/-	3 x 230/400 50 Hz 3 x 265/460 60 Hz	3 x 400/690 50 Hz 3 x 460/- 60 Hz
0,37	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
0,55	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
0,75	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
0,95	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
1,1	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
1,5	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
2,2	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
3	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o

s = Standard voltage

o = Optional voltage

- = Not available

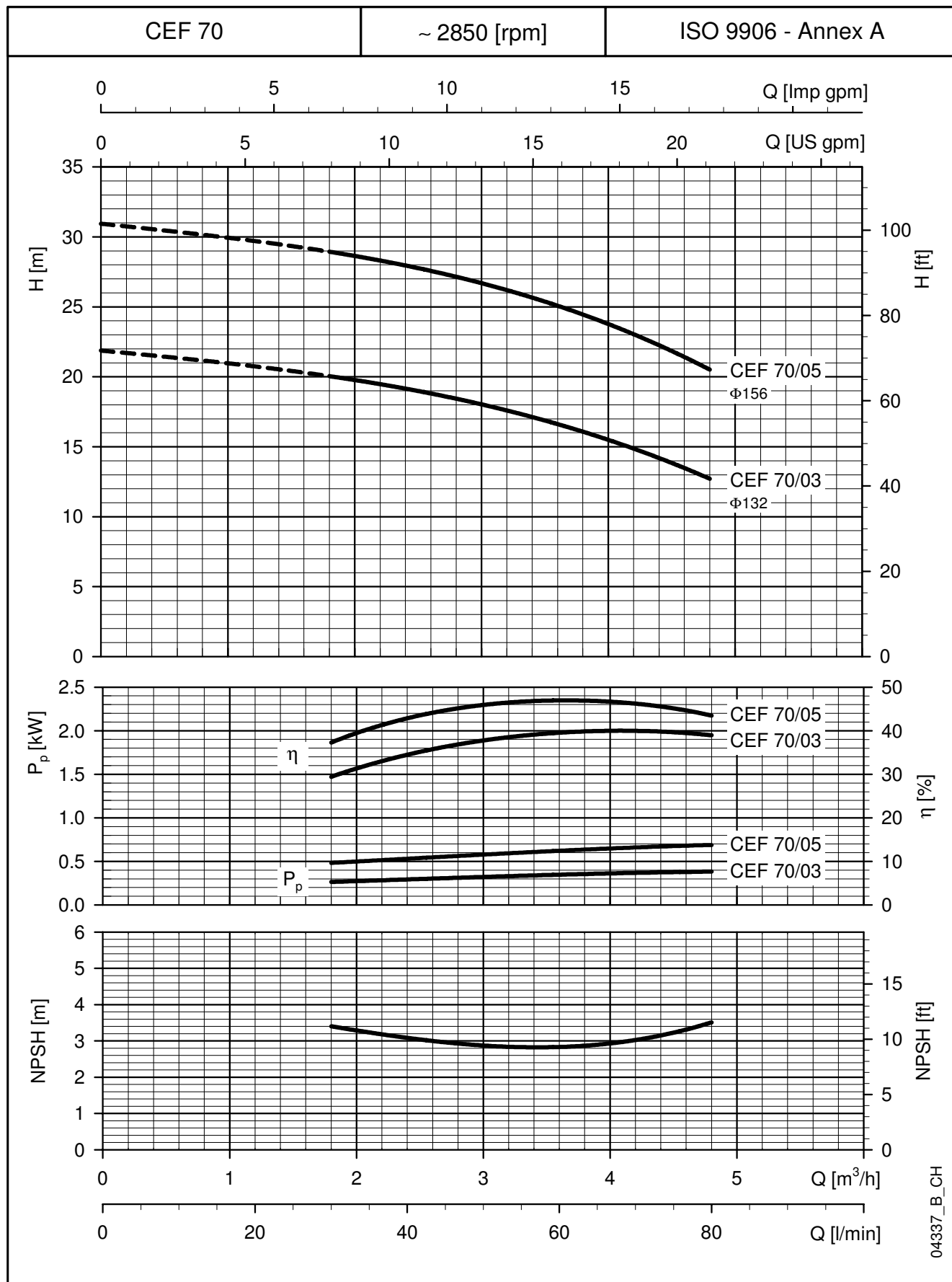
cef-volt-low-a-en_a_te

CEF SERIES**HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 and 4 POLES****TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 2 and 4 POLES**

ELECTRIC PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min 0	30	40	60	80	100	120	140	160	180	200	250	300	350	400	430	480	520
	m³/h 0	1,8	2,4	3,6	4,8	6	7,2	8,4	9,6	10,8	12	15	18	21	24	26	29	31		
	kW	HP	H = TOTAL HEAD METRES COLUMN OF WATER																	
CEF 70/03	0,37	0,5	21,9	20,0	19,2	16,6	12,7													
CEF 70/05	0,55	0,75	30,9	28,9	28,0	25,1	20,5													
CEF 80/07	0,75	1	31,4	29,8	29,1	27,3	24,6	20,8												
CEF 120/05	0,55	0,75	21,6			18,4	17,1	15,6	13,8	11,6	9,1									
CEF 120/09	0,9	1,2	31,0			27,7	26,1	24,2	22,1	19,6	16,9									
CEF 210/07	0,75	1	17,3						16,3	15,9	15,5	15,0	14,4	12,6	10,3					
CEF 210/11	1,1	1,5	20,3						19,4	19,1	18,7	18,3	17,8	16,3	14,2					
CEF 210/15	1,5	2,2	24,9						24,4	24,1	23,7	23,2	22,7	21,0	18,8					
CEF 210/18	1,85	2,5	28,4						27,8	27,5	27,2	26,8	26,3	24,9	23,0					
CEF 370/11	1,1	1,5	15,9									15,3	15,1	14,1	12,9	11,3	9,3	7,9		
CEF 370/15	1,5	2,2	19,9										18,8	18,0	16,9	15,6	13,9	12,7	10,5	
CEF 370/22	1,85	2,5	23,9										22,6	21,9	20,9	19,7	18,1	17,0	14,9	

cef-2p50-en_d_th

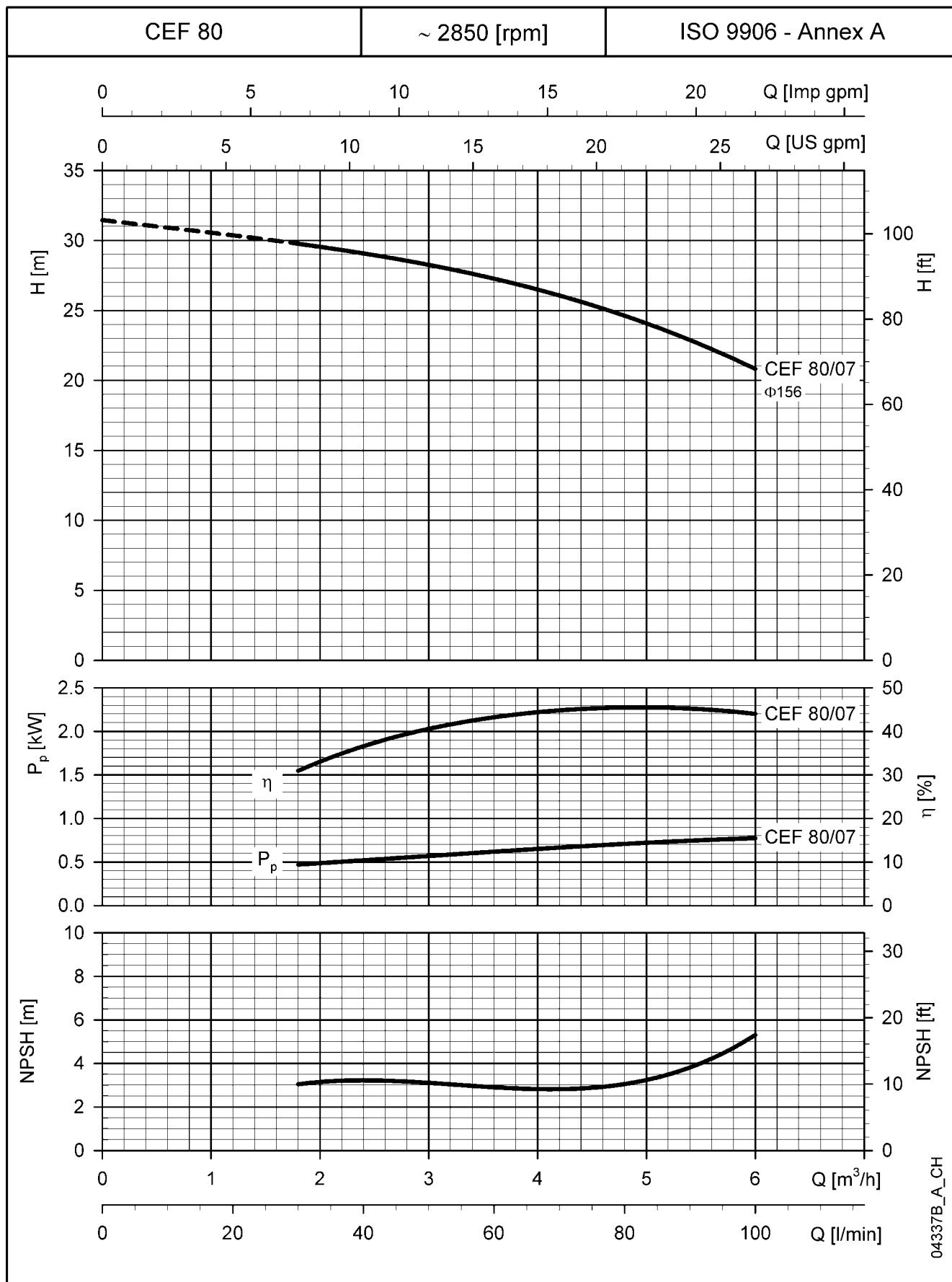
PUMP TYPE	PUMP MAX INPUT POWER kW	Q = DELIVERY																	
		l/min 0	15	20	25	30	40	50	60	70	80	90	100	130	150	190	215	240	260
		m³/h 0	0,9	1,2	1,5	1,8	2,4	3	3,6	4,2	4,8	5,4	6	7,8	9	11,4	13	14	16
H = TOTAL HEAD METRES COLUMN OF WATER																			
CEF4 70/132	0,05	5,5	5,2	5,0	4,7	4,4	3,6												
CEF4 70/156	0,09	7,8	7,4	7,2	6,9	6,5	5,5												
CEF4 80/156	0,10	7,8	7,4	7,3	7,1	6,9	6,4	5,5											
CEF4 120/132	0,08	5,6				4,9	4,6	4,2	3,8	3,2	2,6								
CEF4 120/156	0,13	7,8				7,1	6,7	6,3	5,8	5,2	4,6								
CEF4 210/121	0,11	4,3							4,1	4,0	3,9	3,8	3,7	3,2	2,8				
CEF4 210/130	0,14	5,0							4,9	4,8	4,7	4,6	4,5	4,1	3,7				
CEF4 210/148	0,19	6,1							6,1	6,0	5,9	5,8	5,7	5,2	4,8				
CEF4 210/156	0,23	7,0							6,9	6,8	6,8	6,7	6,6	6,2	5,8				
CEF4 370/121	0,15	4,0										4,0	3,9	3,7	3,4	2,7	2,2	1,6	
CEF4 370/130	0,21	5,0											4,8	4,6	4,4	3,8	3,4	2,9	
CEF4 370/134	0,26	5,8											5,6	5,4	5,2	4,7	4,3	3,8	3,3

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

The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

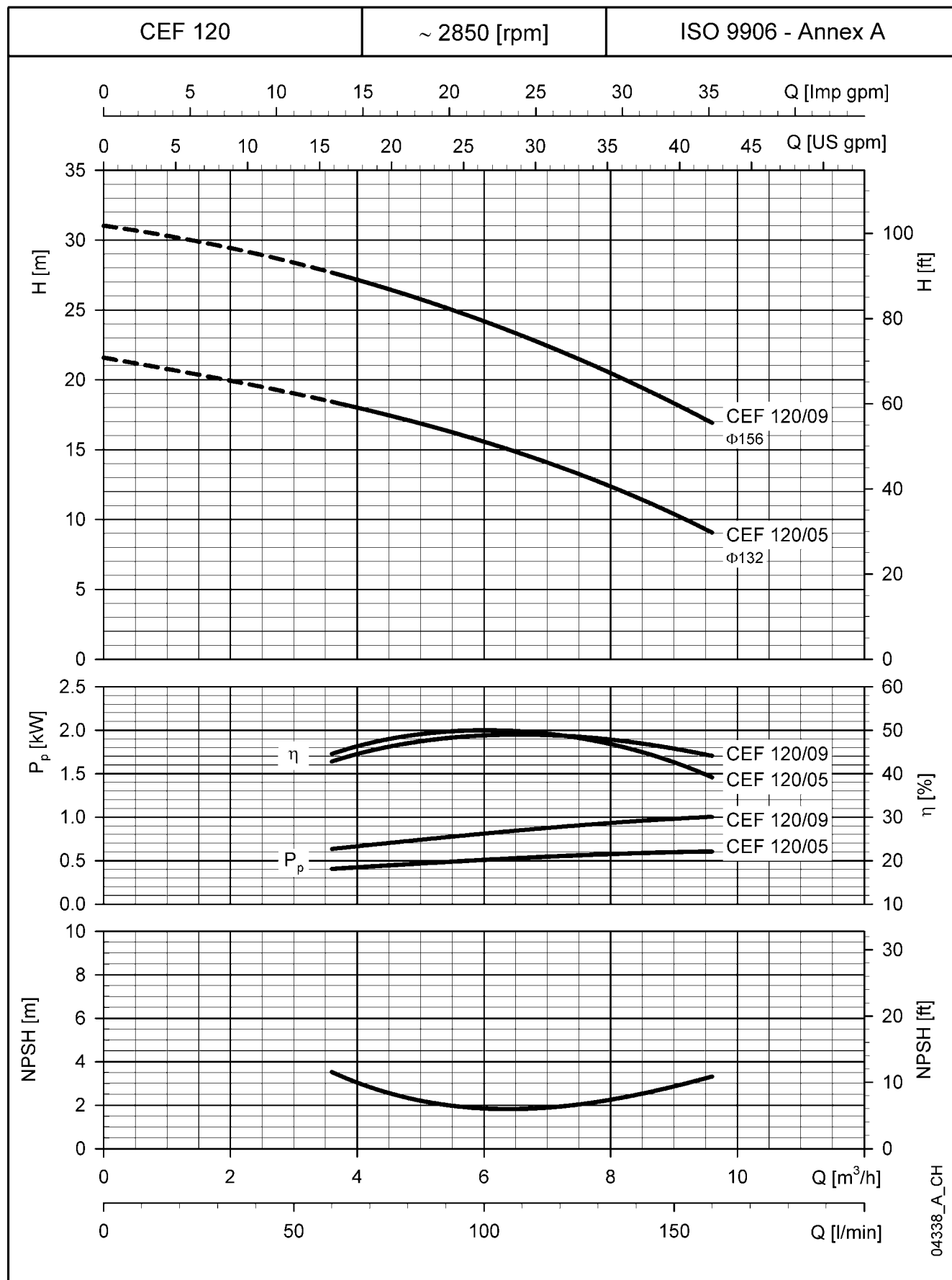
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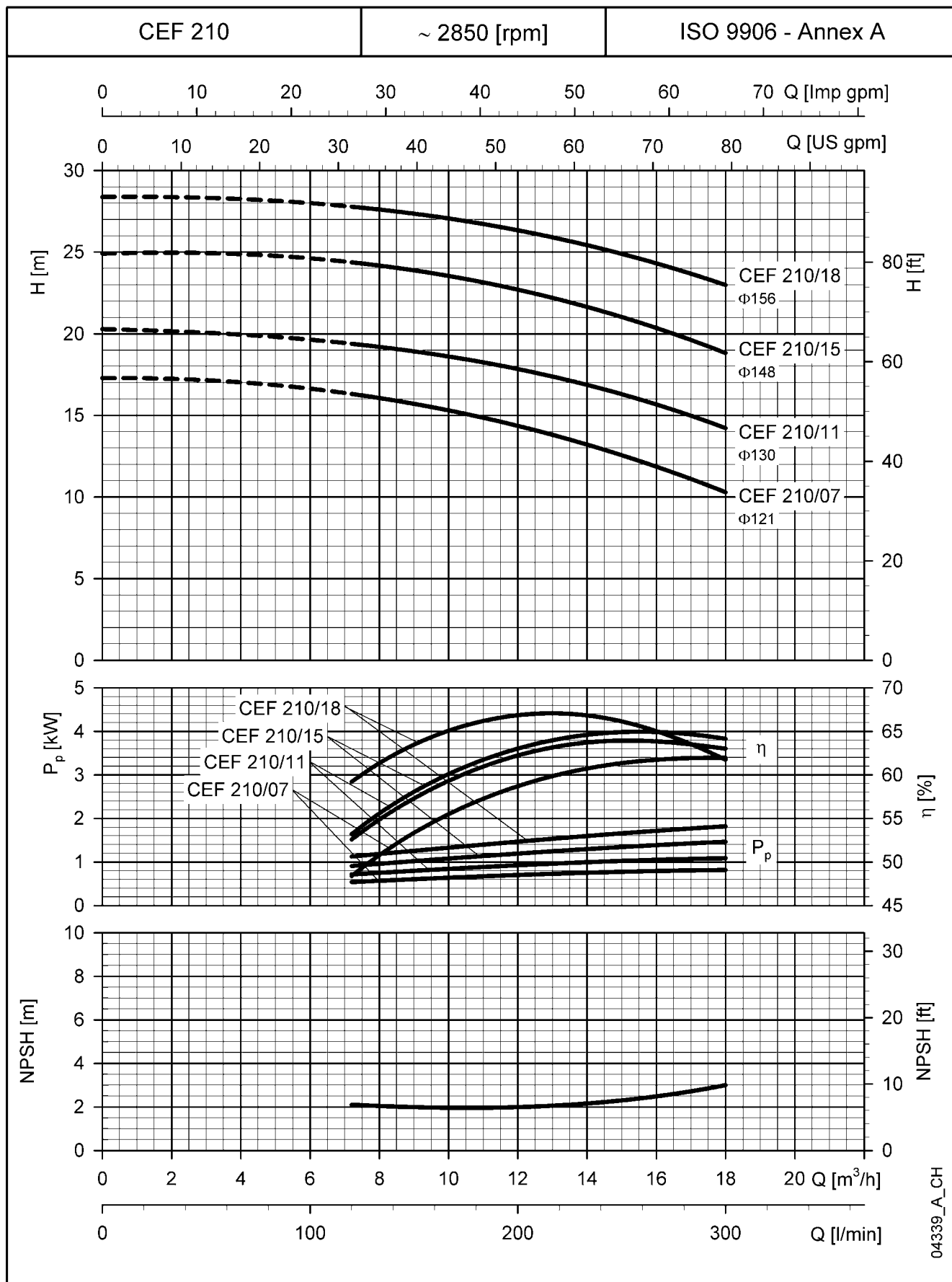
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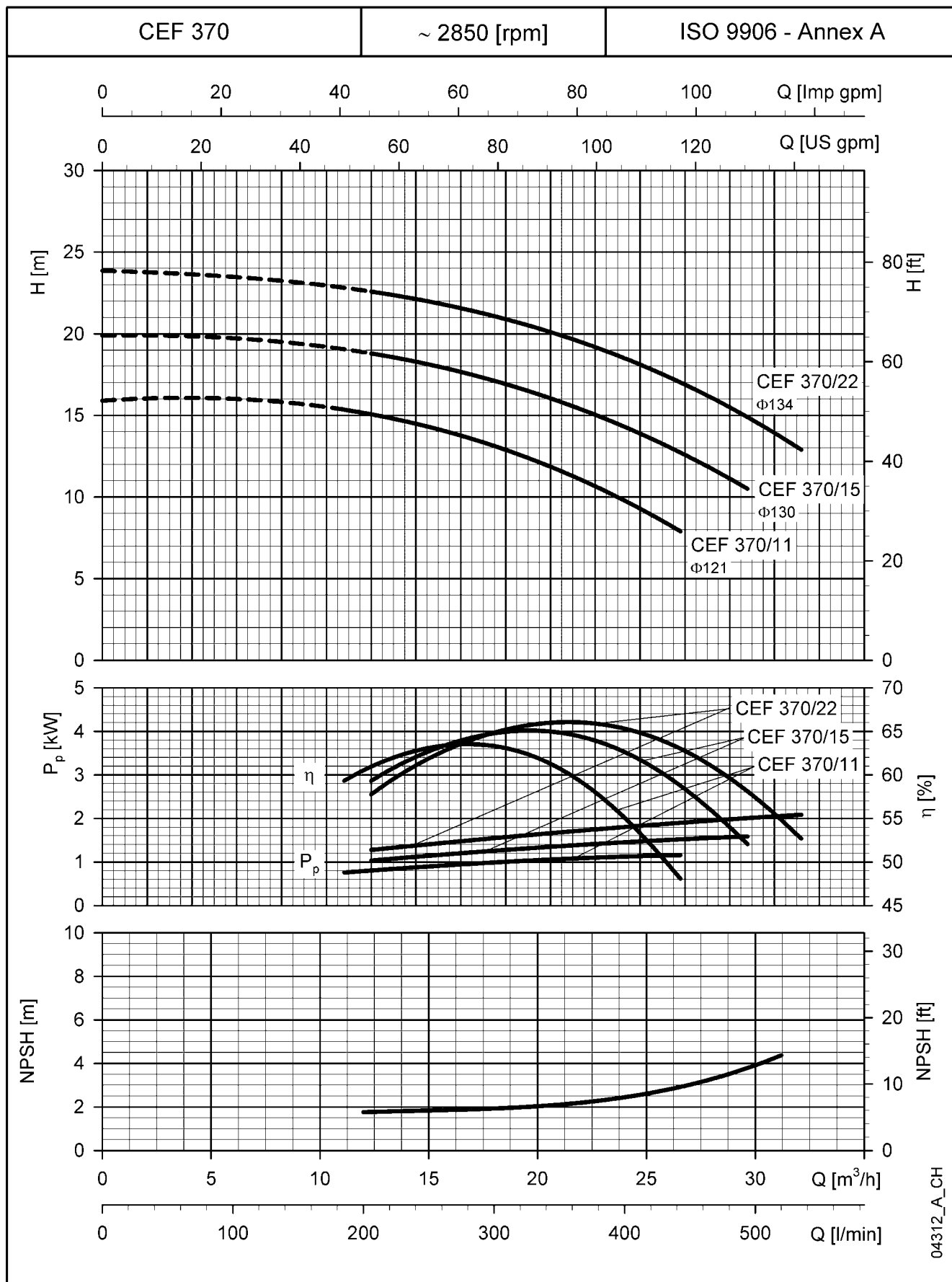
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CEF SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

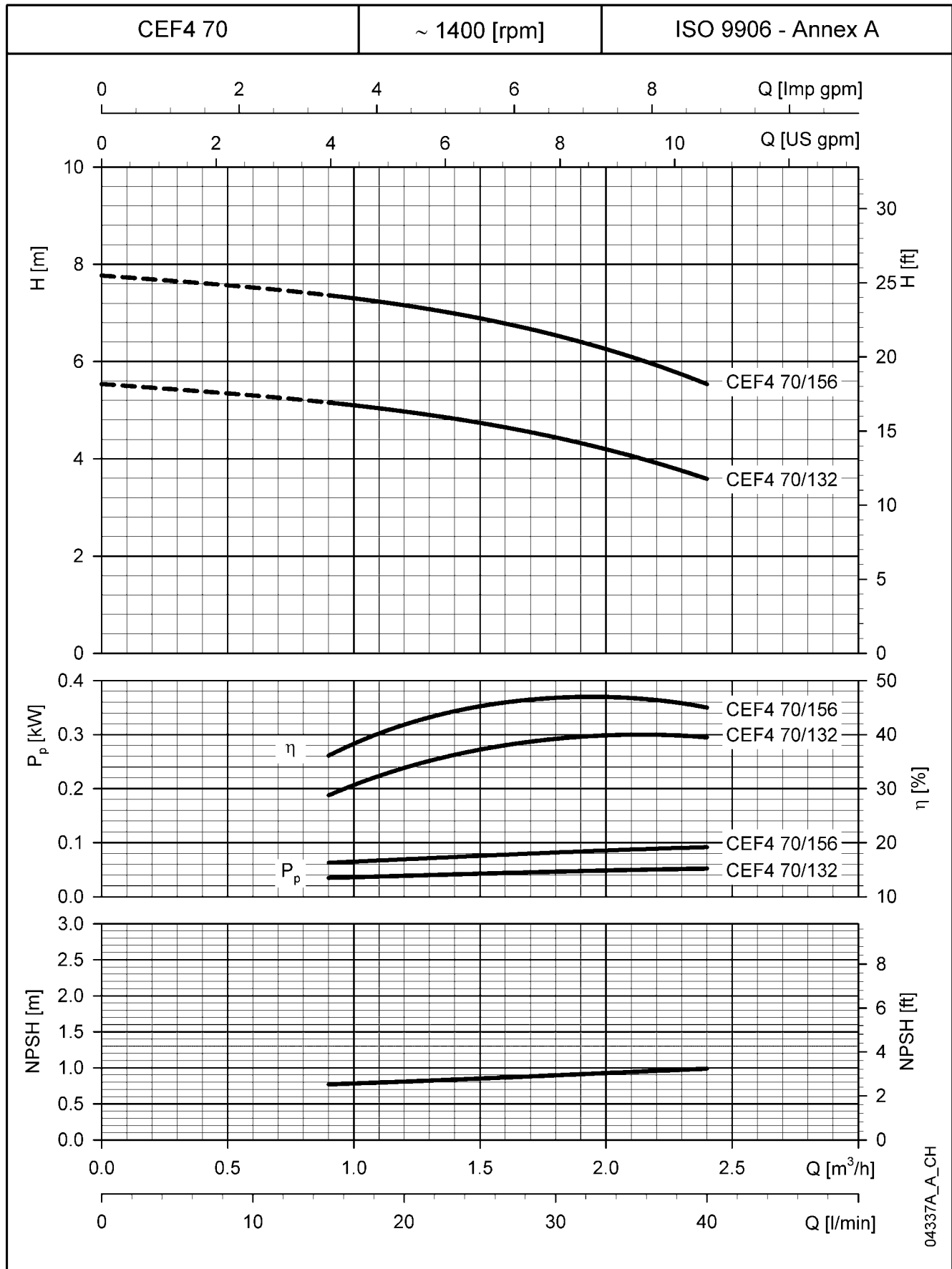
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CEF4 SERIES

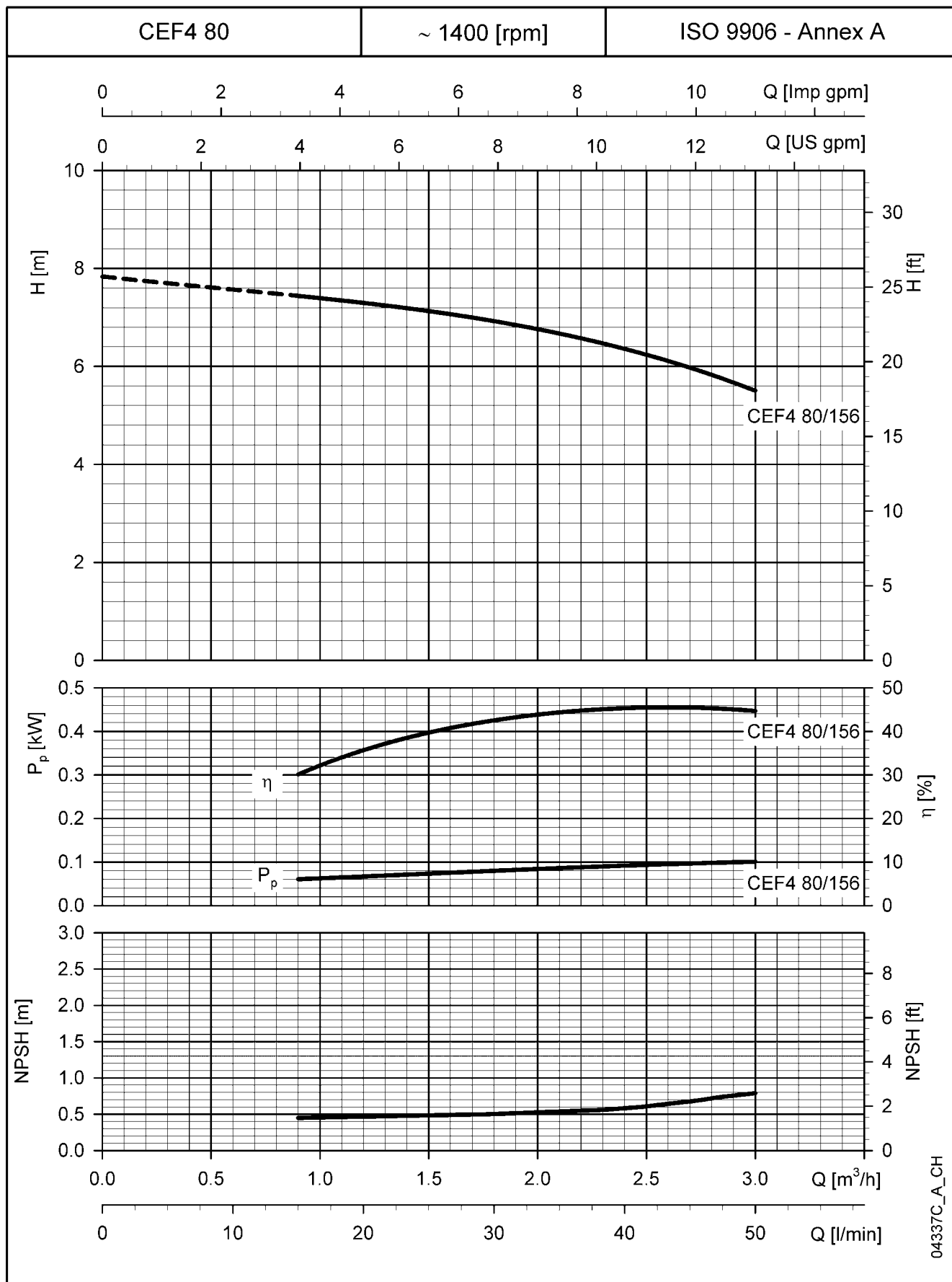
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

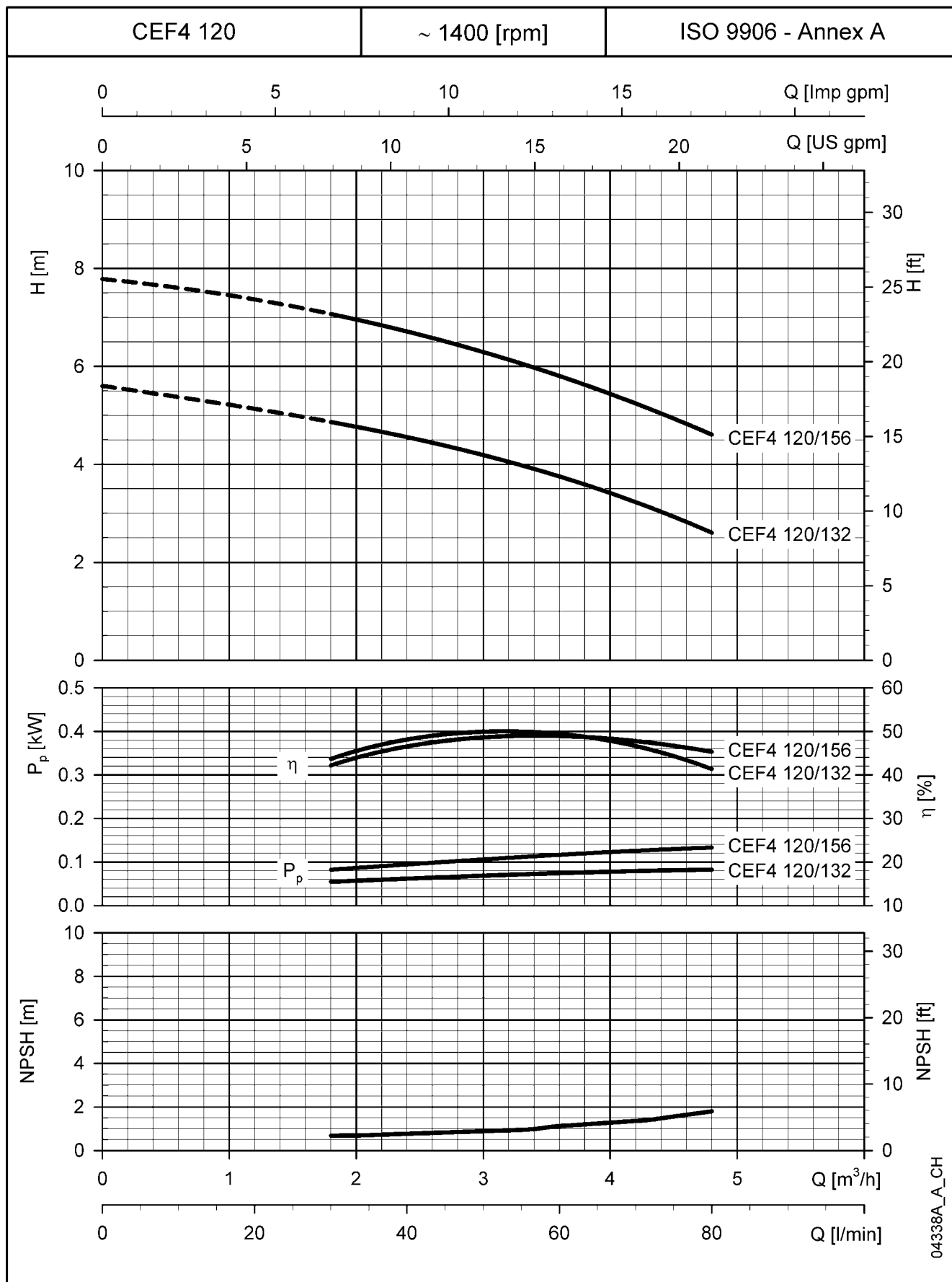
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CEF4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

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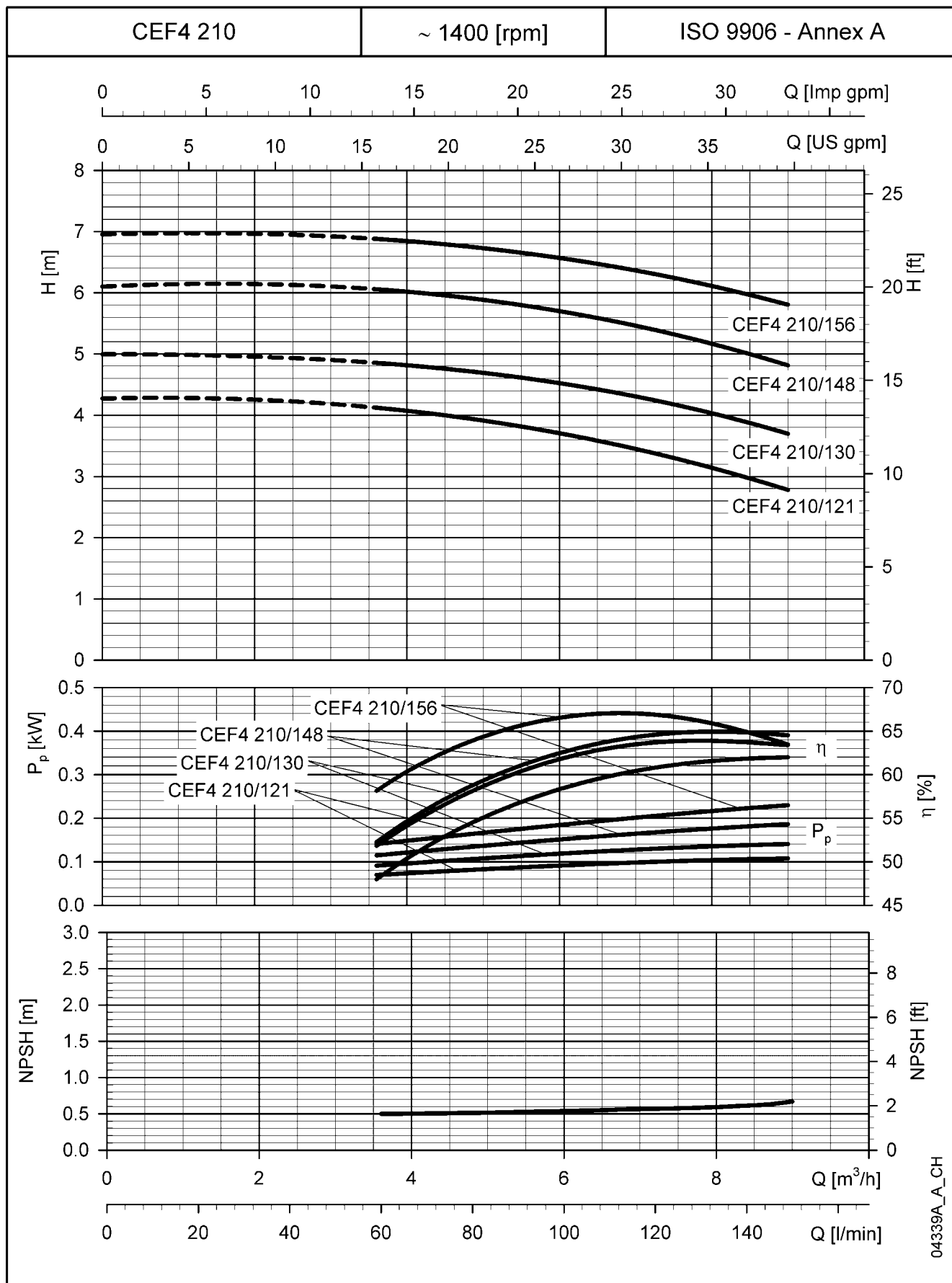
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CEF4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

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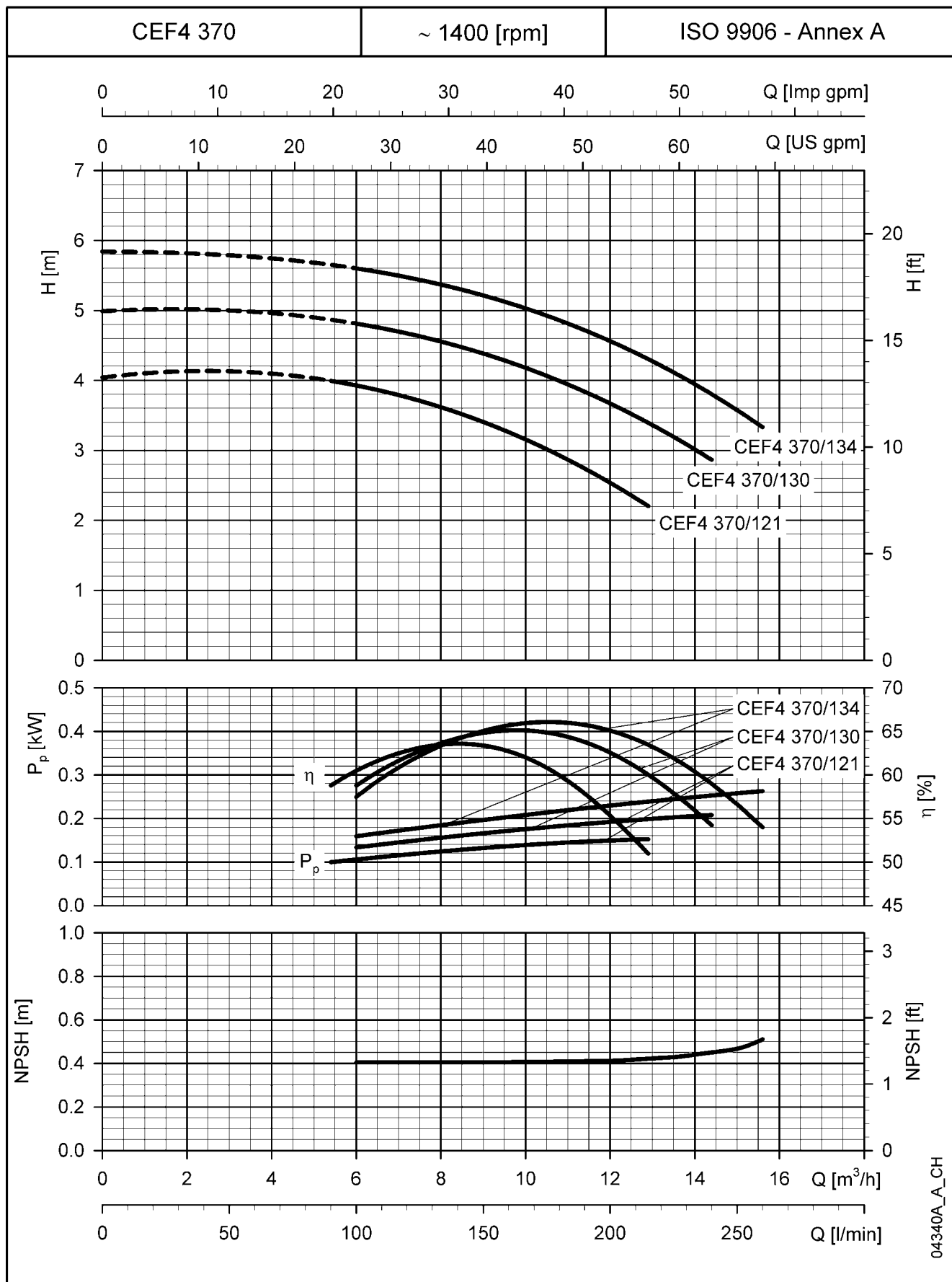
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CEF4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

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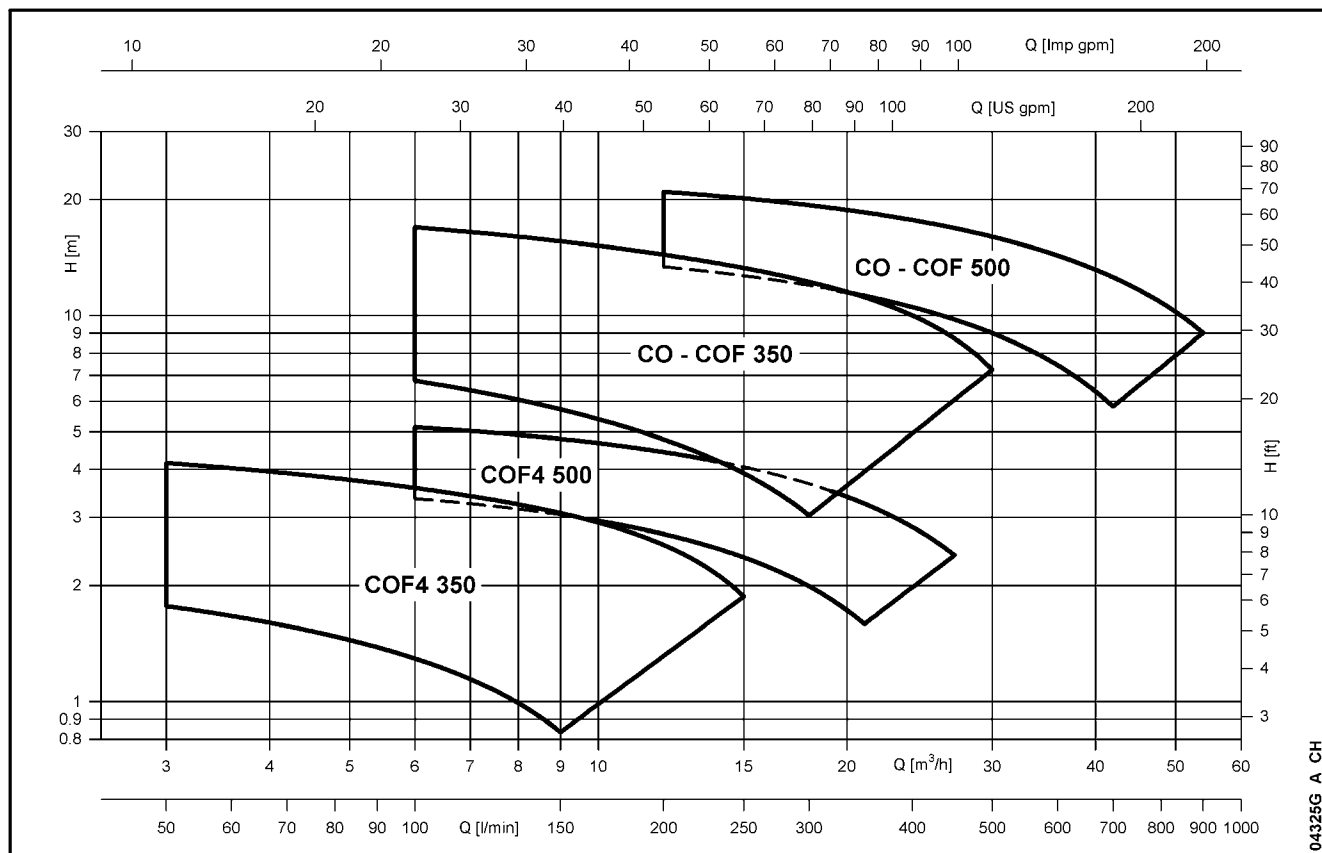
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CEF4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

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COF SERIES**HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 and 4 POLES****TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 2 POLES**

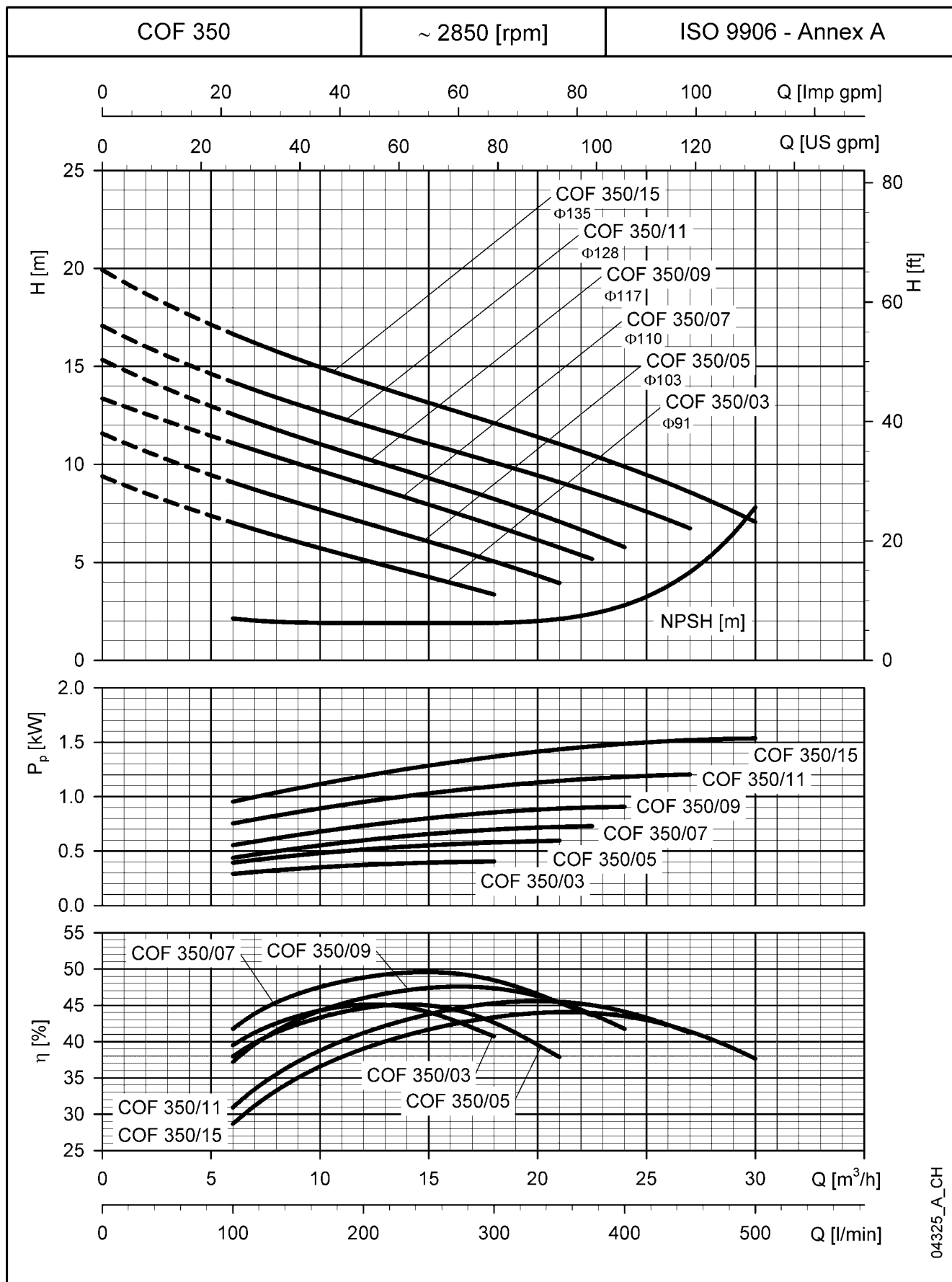
ELECTRIC PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min 0	100	120	160	200	240	280	300	350	375	400	450	500	600	650	700	800	900
	m³/h 0	6	7,2	9,6	12	14,4	16,8	18	21	22,5	24	27	30	36	39	42	48	54		
	kW	HP	H = TOTAL HEAD METRES COLUMN OF WATER																	
COF 350/03	0,37	0,5	9,4	7,0	6,6	5,8	5,1	4,4	3,7	3,4										
COF 350/05	0,55	0,75	11,6	9,1	8,6	7,8	7,0	6,3	5,5	5,0	3,9									
COF 350/07	0,75	1	13,4	11,1	10,7	9,8	9,0	8,2	7,3	6,9	5,8	5,2								
COF 350/09	0,9	1,2	15,3	12,6	12,1	11,2	10,3	9,5	8,7	8,2	7,1	6,4	5,8							
COF 350/11	1,1	1,5	17,1	14,2	13,7	12,8	12,0	11,2	10,5	10,1	9,1	8,6	8,0	6,7						
COF 350/15	1,5	2	19,9	16,7	16,1	15,1	14,2	13,4	12,5	12,1	11,0	10,5	9,9	8,6	7,1					
COF 500/15	1,5	2	15,9				13,5	13,0	12,4	12,2	11,5	11,1	10,8	10,0	9,3	7,7	6,9	6,1		
COF 500/22	2,2	3	19,1				17,0	16,5	16,0	15,7	15,1	14,7	14,4	13,6	12,8	11,2	10,3	9,4	7,6	
COF 500/30	3	4	23,5				20,6	20,0	19,4	19,1	18,3	17,9	17,5	16,7	15,9	14,2	13,3	12,5	10,7	

TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 4 POLES

cof_2p50-en_c_th

PUMP TYPE	PUMP MAX INPUT POWER kW	Q = DELIVERY														
		l/min 0	50	75	100	125	150	175	187	200	225	250	300	350	400	450
		m³/h 0	3	4,5	6	7,5	9	10,5	11,22	12	13,5	15	18	21	24	27
	H = TOTAL HEAD METRES COLUMN OF WATER															
COF4 350/91	0,05	2,4	1,8	1,5	1,3	1,1	0,8									
COF4 350/103	0,08	2,9	2,3	2,1	1,9	1,6	1,4	1,1								
COF4 350/110	0,09	3,3	2,8	2,5	2,3	2,0	1,8	1,5	1,4							
COF4 350/117	0,12	3,8	3,1	2,9	2,6	2,4	2,1	1,8	1,7	1,5						
COF4 350/128	0,17	4,6	3,8	3,6	3,3	3,1	2,8	2,6	2,4	2,3	2,0					
COF4 350/135	0,20	4,9	4,2	3,8	3,6	3,3	3,1	2,8	2,7	2,5	2,2	1,9				
COF4 500/113	0,19	3,9			3,4	3,2	3,0	2,9	2,8	2,7	2,5	2,4	2,0	1,6		
COF4 500/125	0,27	4,7			4,2	4,1	3,9	3,8	3,7	3,6	3,5	3,3	2,9	2,5	2,0	
COF4 500/138	0,41	5,8			5,1	5,0	4,8	4,6	4,5	4,4	4,2	4,1	3,7	3,3	2,8	2,4

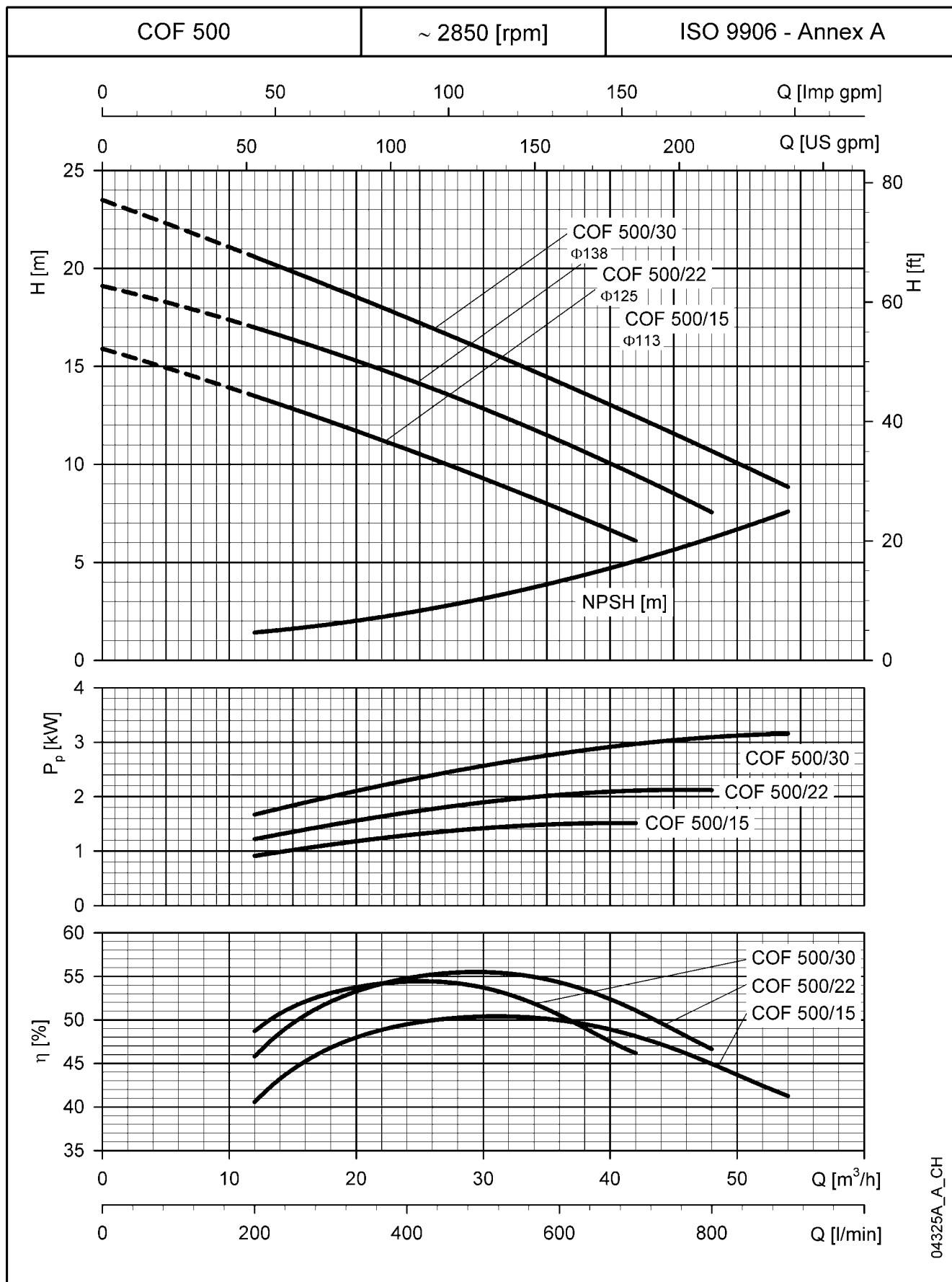
cof4_4p50-en_c_th

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

The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

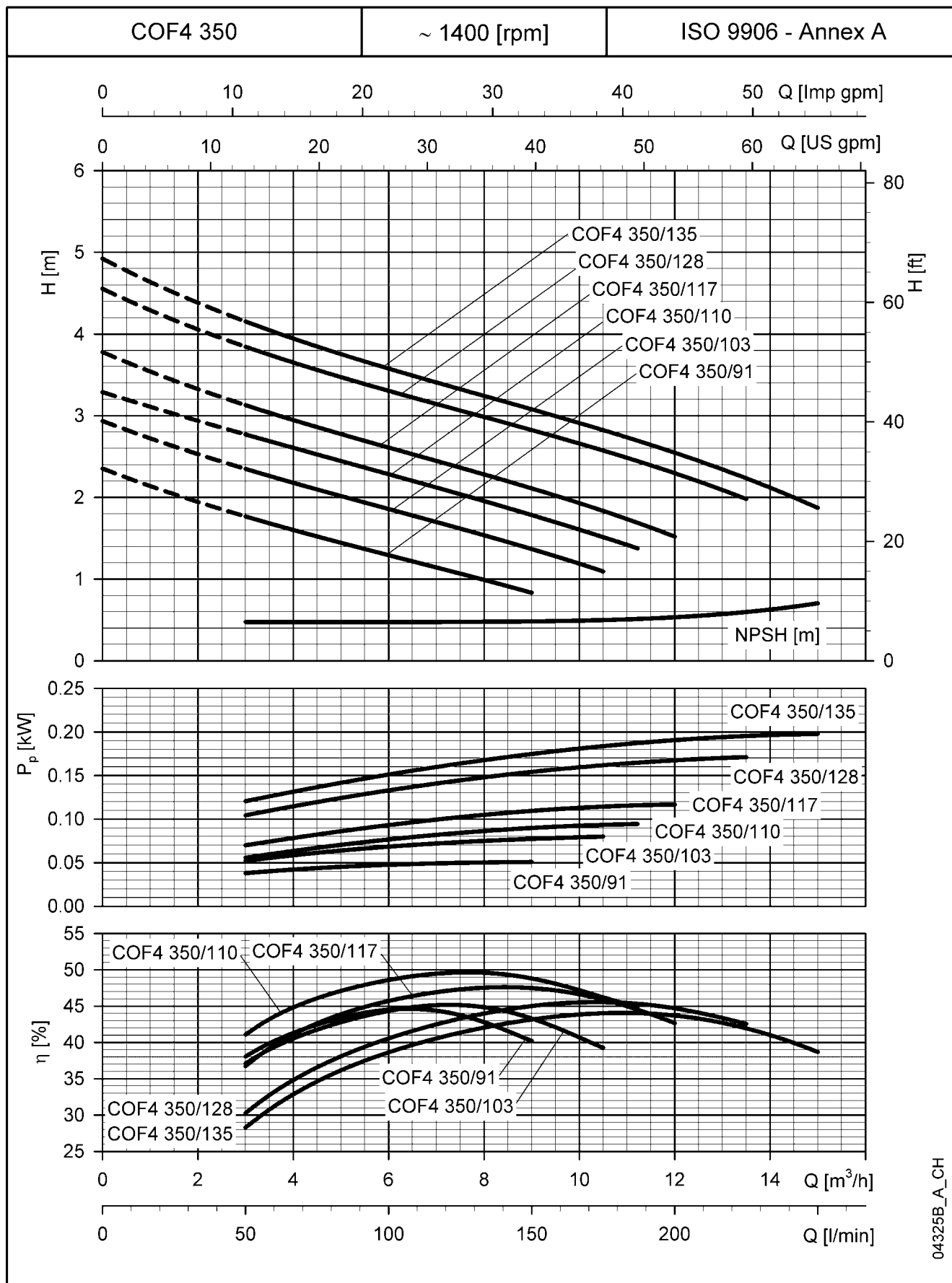
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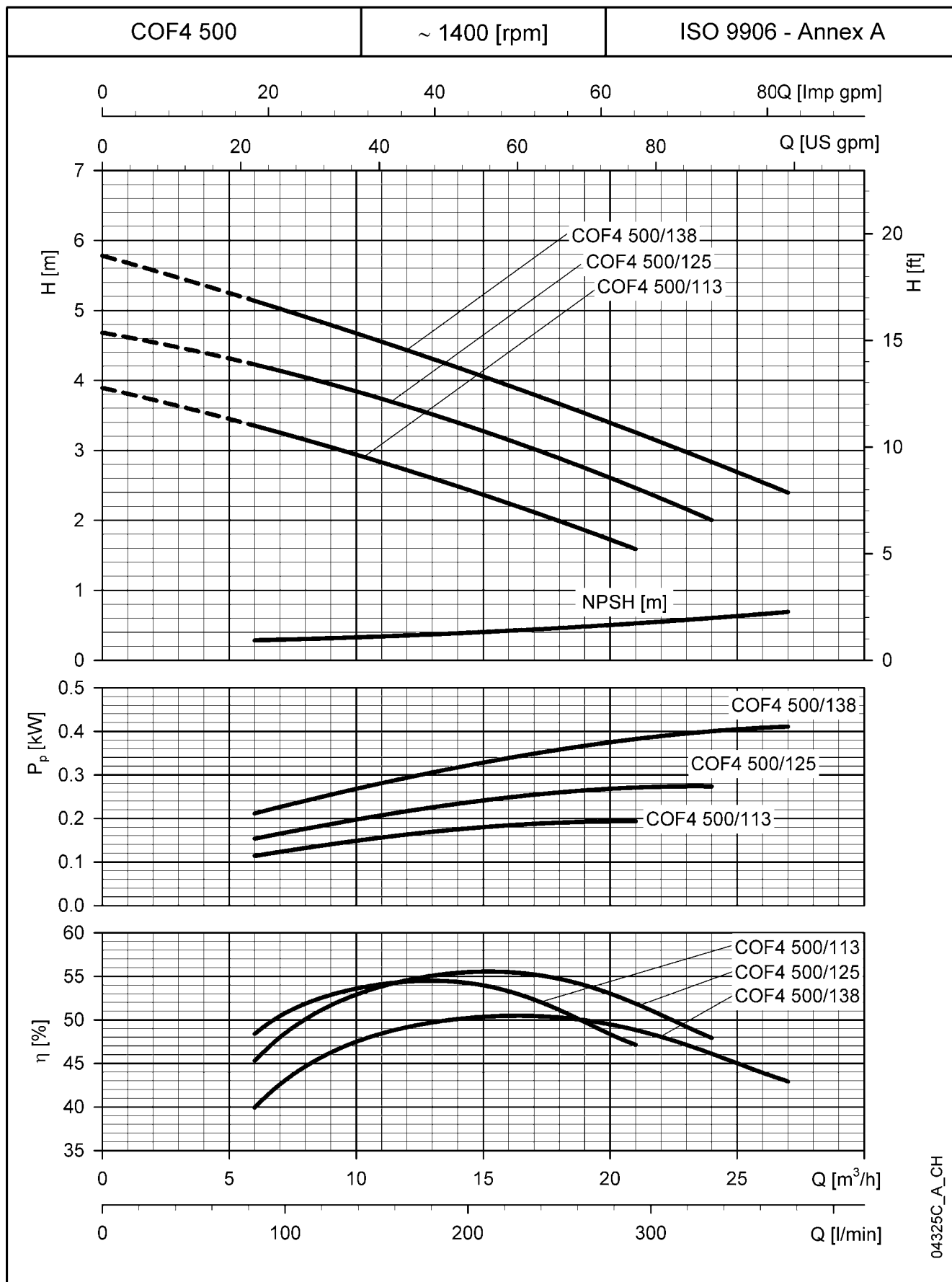
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COF4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

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

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COF4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

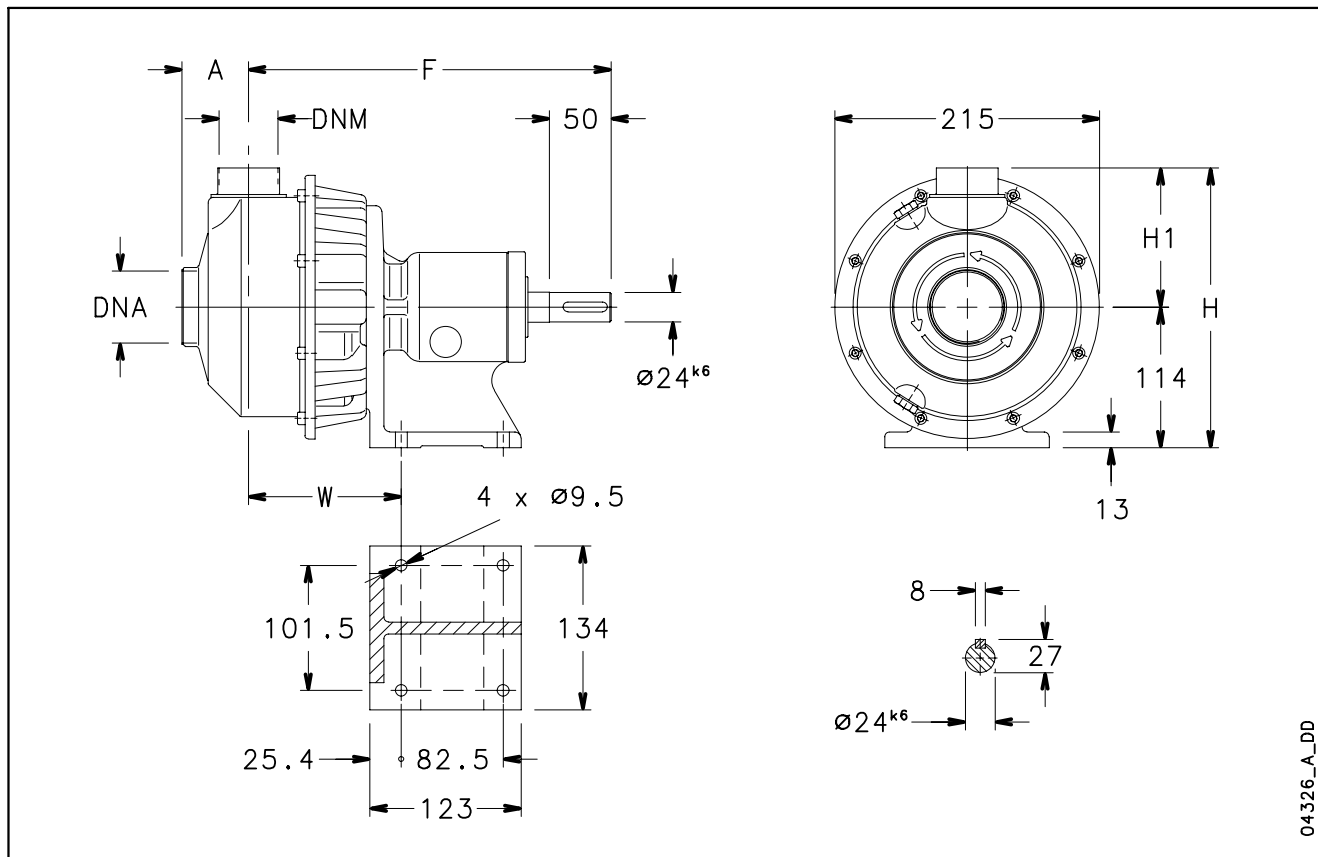
The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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CEF - COF BARE SHAFT SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz



04326_A_DD

PUMP TYPE	DIMENSIONS (mm)					DNA	DNM	WEIGHT kg
	A	F	H	H1	W			
CEF 70/132	51	282	225	111	112,5	Rp 1 1/4	Rp 1	11,5
CEF 70/156	51	282	225	111	112,5	Rp 1 1/4	Rp 1	11,5
CEF 80/156	51	282	225	111	112,5	Rp 1 1/4	Rp 1	11,5
CEF 120/132	51	282	225	111	112,5	Rp 1 1/4	Rp 1	11,5
CEF 120/156	51	282	225	111	112,5	Rp 1 1/4	Rp 1	11,5
CEF 210/121	54	293	227	113	123,7	Rp 1 1/2	Rp 1 1/4	12
CEF 210/130	54	293	227	113	123,7	Rp 1 1/2	Rp 1 1/4	12
CEF 210/148	54	293	227	113	123,7	Rp 1 1/2	Rp 1 1/4	12
CEF 210/156	54	293	227	113	123,7	Rp 1 1/2	Rp 1 1/4	12
CEF 370/121	54	293	227	113	123,7	Rp 2	Rp 1 1/4	12
CEF 370/130	54	293	227	113	123,7	Rp 2	Rp 1 1/4	12
CEF 370/134	54	293	227	113	123,7	Rp 2	Rp 1 1/4	12

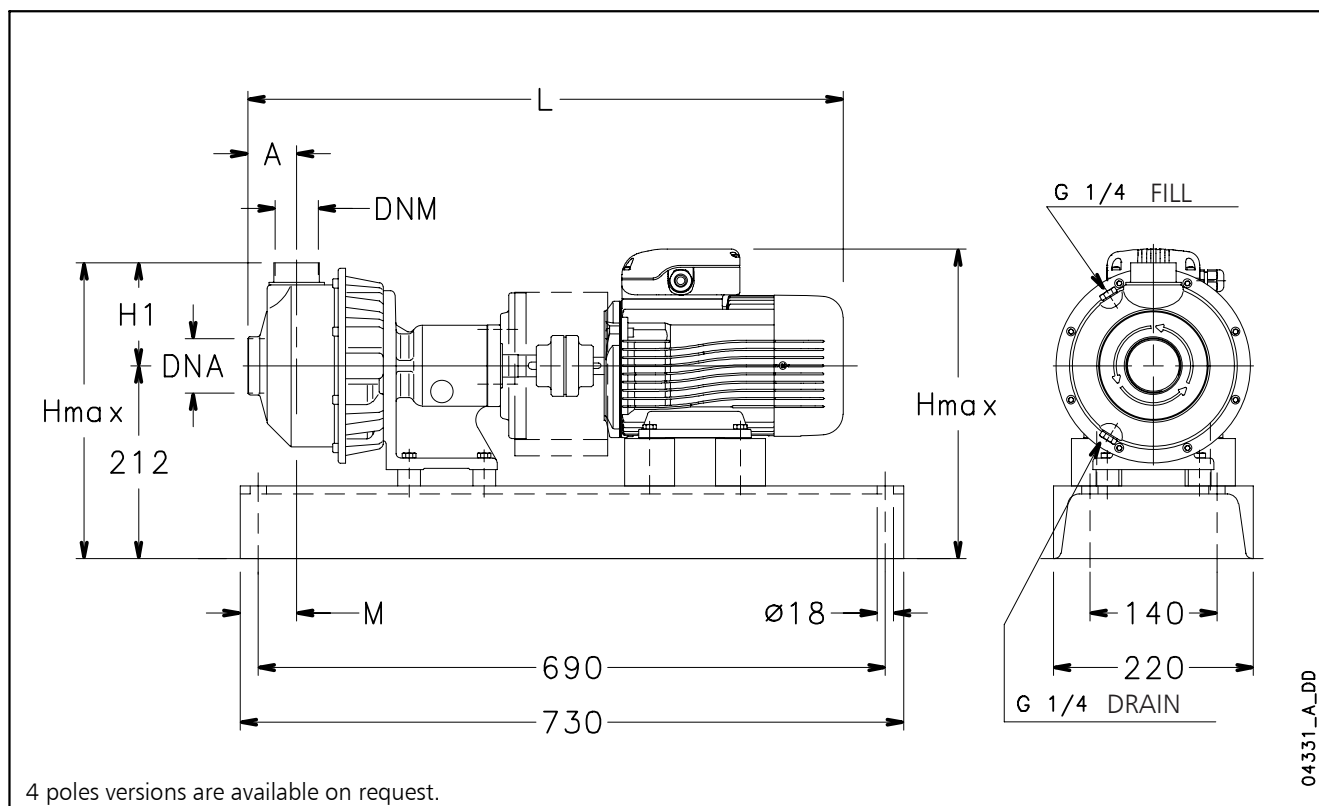
cef-pompa-en_a_td

PUMP TYPE	DIMENSIONS (mm)					DNA	DNM	WEIGHT kg
	A	F	H	H1	W			
COF 350/91	54	293	227	113	124	Rp 1 1/2	Rp 1 1/4	11
COF 350/103	54	293	227	113	124	Rp 1 1/2	Rp 1 1/4	11
COF 350/110	54	293	227	113	124	Rp 1 1/2	Rp 1 1/4	11
COF 350/117	54	293	227	113	124	Rp 1 1/2	Rp 1 1/4	11
COF 350/128	54	293	227	113	124	Rp 1 1/2	Rp 1 1/4	11
COF 350/135	54	293	227	113	124	Rp 1 1/2	Rp 1 1/4	11
COF 500/113	54	293	227	113	124	Rp 2	Rp 1 1/2	11,5
COF 500/125	54	293	227	113	124	Rp 2	Rp 1 1/2	11,5
COF 500/138	54	293	227	113	124	Rp 2	Rp 1 1/2	11,5

cof-pompa-en_a_td

CEF - COF BASE-MOUNTED SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES



4 poles versions are available on request.

ELECTRIC PUMP	DIMENSIONS (mm)					DNA	DNM	WEIGHT
TYPE	A	H max	H1	L	M			kg
CEF 70/03/A	51	333	111	600	73	Rp 1 1/4	Rp 1	41
CEF 70/05/A	51	333	111	600	73	Rp 1 1/4	Rp 1	42
CEF 80/07/D	51	341	111	642	73	Rp 1 1/4	Rp 1	46
CEF 120/05/A	51	333	111	600	73	Rp 1 1/4	Rp 1	42
CEF 120/09/D	51	341	111	642	73	Rp 1 1/4	Rp 1	47
CEF 210/07/D	54	341	113	656	62	Rp 1 1/2	Rp 1 1/4	46
CEF 210/11/D	54	341	113	656	62	Rp 1 1/2	Rp 1 1/4	48
CEF 210/15/P	54	346	113	700	62	Rp 1 1/2	Rp 1 1/4	53
CEF 210/18/P	54	346	113	700	62	Rp 1 1/2	Rp 1 1/4	54
CEF 370/11/D	54	341	113	656	62	Rp 2	Rp 1 1/4	48
CEF 370/15/P	54	346	113	700	62	Rp 2	Rp 1 1/4	53
CEF 370/22/P	54	346	113	700	62	Rp 2	Rp 1 1/4	54

cef-el-p-2p50-en_e_td

ELECTRIC PUMP	DIMENSIONS (mm)					DNA	DNM	WEIGHT
TYPE	A	H max	H1	L	M			kg
COF 350/03/A	54	333	113	612	62	Rp 1 1/2	Rp 1 1/4	57
COF 350/05/A	54	333	113	612	62	Rp 1 1/2	Rp 1 1/4	58
COF 350/07/D	54	341	113	654	62	Rp 1 1/2	Rp 1 1/4	61
COF 350/09/D	54	341	113	654	62	Rp 1 1/2	Rp 1 1/4	62
COF 350/11/D	54	341	113	654	62	Rp 1 1/2	Rp 1 1/4	62
COF 350/15/P	54	346	113	700	62	Rp 1 1/2	Rp 1 1/4	69
COF 500/15/P	54	346	113	700	62	Rp 2	Rp 1 1/2	71
COF 500/22/P	54	346	113	700	62	Rp 2	Rp 1 1/2	72
COF 500/30/P	54	366	113	731	62	Rp 2	Rp 1 1/2	73

cef-el-p-2p50-en_d_td

Centrifugal pumps with open impeller and flanged connections

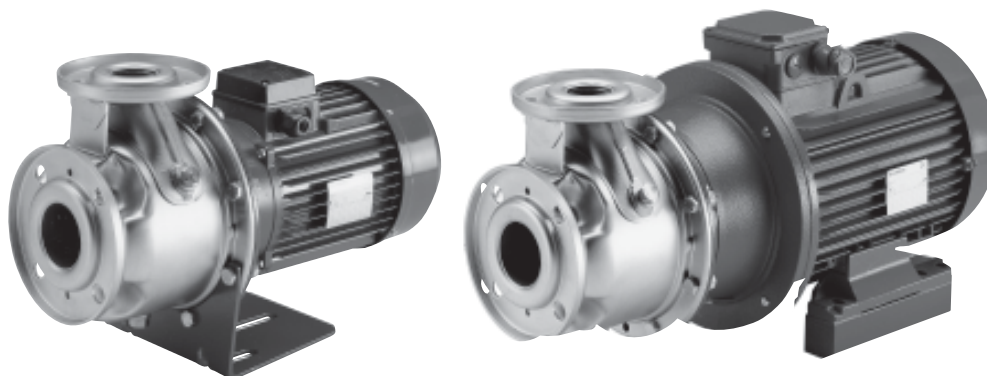
SHO Series

MARKET SECTORS

CIVIL, INDUSTRIAL.

APPLICATIONS

- Industrial washing machines.
- Commercial dishwashers.
- Washing of metal parts, surface treatment.
- Food industry washing equipment and systems.
- Dyeing plants and textile industry.
- Plants for the circulation and transfer of moderately viscous liquids, with light chemical aggressiveness.



SPECIFICATIONS

PUMP and

APPLICATION RANGE

- The SHO series consists of single stage centrifugal pumps made of pressed AISI 316 stainless steel with **open and recessed impeller made of AISI CF8M stainless steel (casted AISI 316)**.
- **Delivery** up to 56 m³/h 2 poles and up to 54 m³/h 4 poles.
- **Head** up to 50 m, 2 poles and up to 12 m, 4 poles.
- **Temperature** of pumped liquid: -10°C to +120°C for standard version.
- Maximum working **pressure**: 12 bar (PN 12).
- Available sizes: DN25 to DN50.
- **SHOD** execution with **double mechanical seal**.
- **Suspended solids** handled up to:
 - Ø **20-22 mm.** for models in DN25 and DN32 nominal sizes.
 - Ø **30 mm.** for models in DN40 nominal sizes.
 - Ø **40 mm.** for models in DN50 nominal sizes.

MOTOR

- Three-phase asynchronous, squirrel cage rotor, enclosed construction, external ventilation.
- Performances according to EN 60034-1.
- Lowara motors with condensation drain plugs.
- **Standard supplied IE2/IE3 motors are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.**
- **IP55 Protection.**
- Class 155 (F) **insulation.**
- Max. ambient **temperature** : 40°C. For different environmental conditions check the power.
- Overload protection to be provided by user.
- Standard voltage, three-phase version: 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;

CONSTRUCTION CHARACTERISTICS

- Stainless steel centrifugal pump with end suction and radial discharge ports.
- Pump body made of AISI 316L stainless steel.
- Open and recessed impeller in AISI CF8M stainless steel.
- Mechanical seal according to EN 12756 (ex DIN 24960).
- AISI 316L stainless steel fill & drain plugs.
- Flanges in compliance with EN 1092-1 (ex UNI 2236) and DIN 2532.

MOTOR-PUMP COUPLING

- **SHOE**: close-coupled by means of a bracket with impeller keyed directly to the motor shaft extension.
- **SHOS**: with a bracket, adaptor and rigid coupling keyed to the standard motor shaft extension.
- **SHOD**: execution with double mechanical seal. Bracket, adaptor and rigid coupling keyed to the standard motor shaft extension.

ACCESSORIES ON REQUEST

- AISI 316 stainless steel or galvanized iron counter-flanges.
- Intermediate flange with pressure gauge connection.
- Pump and motor shims.

DIMENSIONS OF DISPLACED SOLIDS

TYPE	SIZE	Ø SOLIDS (mm)
SHOE SHOS SHOD	25-32 / 200	20
	25-32 / 125 - 160	22
	40 / 125 - 160	30
	50 / 125 - 160	40

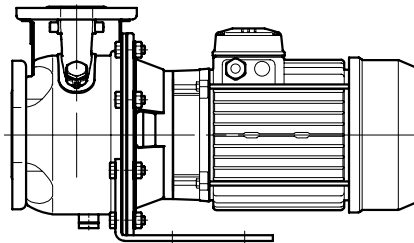
sho-pas-sol-en_a_ps

The SHO pumps are not drainage pumps, so can not be used for applications like waste water disposal or black waters. The SHO series can be used in washing systems or for clean water with small solid particles included.

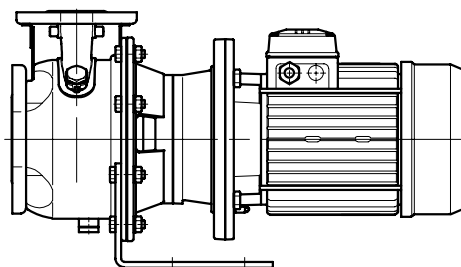
The recessed position of the impeller allows the pumping of liquids with small solid particles reducing the risk of clogging the pump.

The dimensions of the solids are indicated in the table.

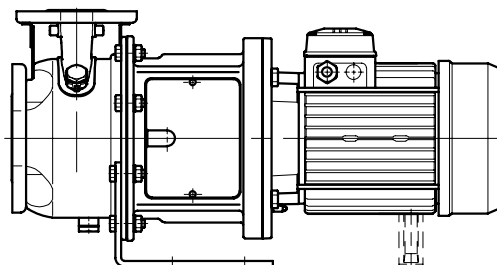
SHOE – SHOE4



SHOS – SHOS4

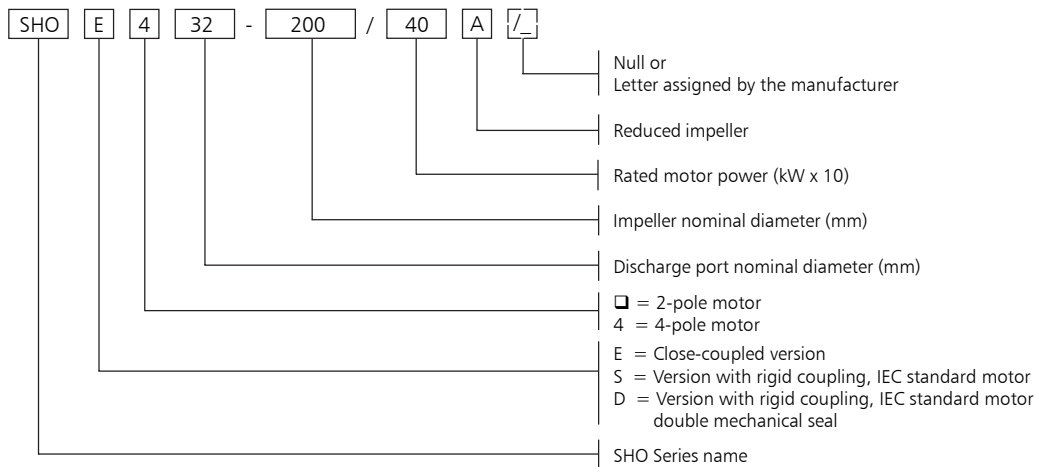


SHOD – SHOD4

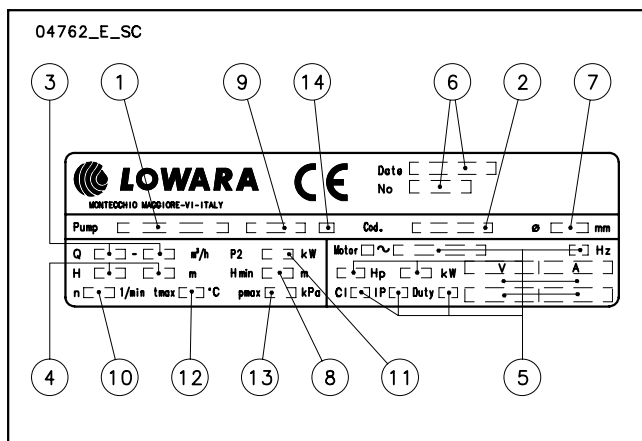


05502_A_SC

SHO SERIES IDENTIFICATION CODE



RATING PLATE



LEGEND

- 1 - Electric pump type
- 2 - Code
- 3 - Delivery range
- 4 - Head range
- 5 - Motor type
- 6 - Date of manufacture and serial number
- 7 - Impeller diameter
- 8 - Minimum head
- 9 - Mechanical seal material identification code
- 10 - Speed
- 11 - Rated output
- 12 - Maximum operating temperature
- 13 - Maximum operating pressure
- 14 - O-ring material identification code

LIST OF MODELS SHO SERIES 50 Hz
2 POLES

SIZE	kW	VERSIONS		
		SHOE	SHOS	SHOD
25-125/11	1,1	•	•	•
25-125/15	1,5	•	•	•
25-125/22	2,2	•	•	•
25-160/30	3	•	•	•
25-160/40	4	•	•	•
25-160/55	5,5	•	•	•
25-200/30	3	•	•	•
25-200/40	4	•	•	•
25-200/55	5,5	•	•	•
32-125/11	1,1	•	•	•
32-125/15	1,5	•	•	•
32-125/22	2,2	•	•	•
32-160/30	3	•	•	•
32-160/40	4	•	•	•
32-160/55	5,5	•	•	•
32-200/30	3	•	•	•
32-200/40	4	•	•	•
32-200/55	5,5	•	•	•
40-125/15	1,5	•	•	•
40-125/22	2,2	•	•	•
40-125/30	3	•	•	•
40-160/40	4	•	•	•
40-160/55	5,5	•	•	•
40-160/75	7,5	•	•	•
50-125/55	5,5	•	•	•
50-125/75	7,5	•	•	•
50-160/92	9,2	•	–	–
50-160/110A	11	–	•	•
50-160/110	11	•	•	•

• = Available

sho_2p50-en_a_tem

4 POLES

SIZE	kW	VERSIONS		
		SHOE4	SHOS4	SHOD4
25-125/03	0,37	•	•	•
25-160/03	0,37	•	•	•
25-160/05	0,55	•	•	•
25-160/07	0,75	•	•	•
25-200/07	0,75	•	•	•
32-125/03	0,37	•	•	•
32-160/03	0,37	•	•	•
32-160/05	0,55	•	•	•
32-160/07	0,75	•	•	•
32-200/07	0,75	•	•	•
40-125/03	0,37	•	•	•
40-160/05	0,55	•	•	•
40-160/07	0,75	•	•	•
40-160/11	1,1	•	•	•
50-125/07	0,75	•	•	•
50-125/11	1,1	•	•	•
50-160/11	1,1	•	•	•
50-160/15	1,5	•	•	•

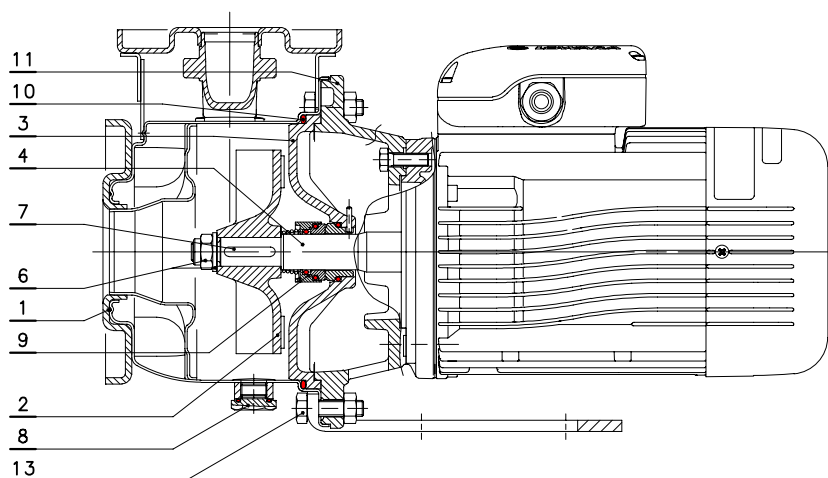
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sho4_4p50_a_tem

SHOE - SHOE4 SERIES

LIST OF MODELS AND TABLE OF MATERIALS

05505_A_DS



VERSIONS	
2 POLES	4 POLES
SHOE 25-125/11	SHOE4 25-160/05
SHOE 25-125/15	SHOE4 25-160/07
SHOE 25-125/22	SHOE4 25-200/07
SHOE 25-160/30	SHOE4 32-160/05
SHOE 25-160/40	SHOE4 32-160/07
SHOE 25-160/55	SHOE4 32-200/07
SHOE 25-200/30	SHOE4 40-160/05
SHOE 25-200/40	SHOE4 40-160/07
SHOE 25-200/55	SHOE4 40-160/11
SHOE 32-125/11	SHOE4 50-125/07
SHOE 32-125/15	SHOE4 50-125/11
SHOE 32-125/22	SHOE4 50-160/11
SHOE 32-160/30	SHOE4 50-160/15
SHOE 32-160/40	
SHOE 32-160/55	
SHOE 32-200/30	
SHOE 32-200/40	
SHOE 32-200/55	
SHOE 40-125/15	
SHOE 40-125/22	
SHOE 40-125/30	
SHOE 40-160/40	
SHOE 40-160/55	
SHOE 40-160/75	
SHOE 50-125/55	
SHOE 50-125/75	
SHOE 50-160/92	
SHOE 50-160/110	

shoe-shoe4-p-en_a_mo

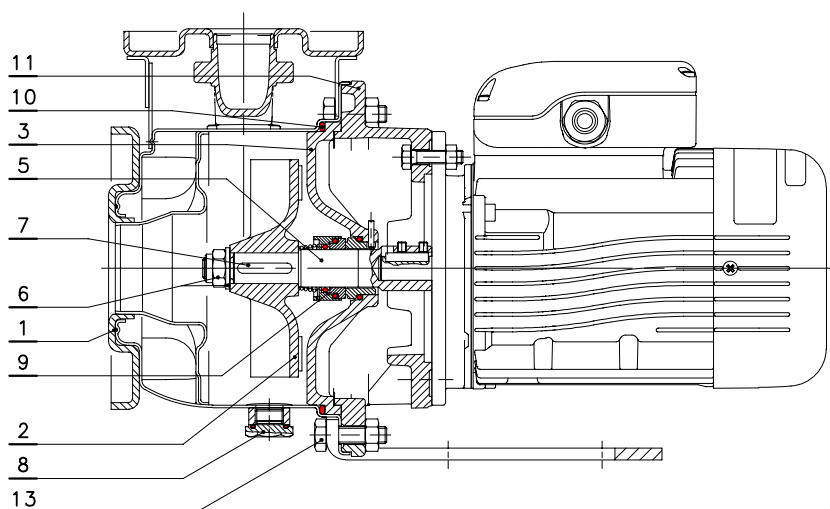
REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
2	Impeller	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
3	Seal housing	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
4	Shaft extension	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
5	Rigid shaft coupling	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Tab	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Mechanical seal	Silicon Carbide / Silicon Carbide / FPM (standard version)		
10	Elastomers	FPM (standard version)		
11	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
13	Pump body fastening bold & screws	Galvanized steel		

shoe-en_a_tm

SHOE4 SERIES

LIST OF MODELS AND TABLE OF MATERIALS

05506_A_DS

**VERSIONS****4 POLES**

SHOE4 25-125/03
SHOE4 25-160/03
SHOE4 25-200/03
SHOE4 32-125/03
SHOE4 32-160/03
SHOE4 40-125/03

shoe4-p-en_a_mo

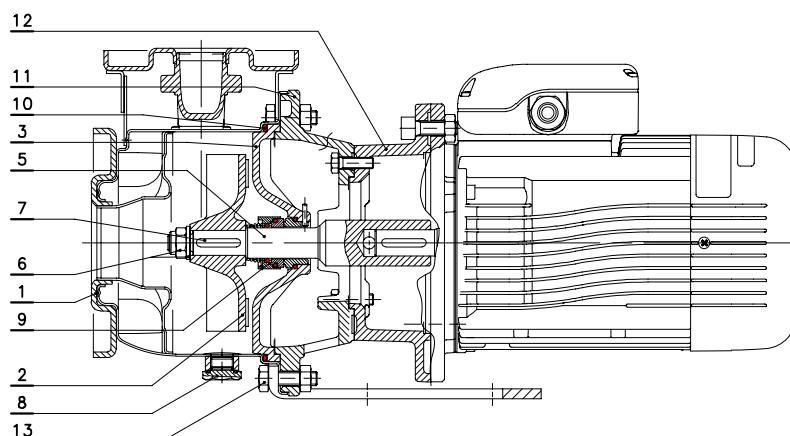
REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
2	Impeller	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
3	Seal housing	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
4	Shaft extension	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
5	Rigid shaft coupling	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Tab	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Mechanical seal	Silicon Carbide / Silicon Carbide / FPM (standard version)		
10	Elastomers	FPM (standard version)		
11	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
13	Pump body fastening bolt & screws	Galvanized steel		

shoe-en_a_tm

SHOS - SHOS4 SERIES

LIST OF MODELS AND TABLE OF MATERIALS

05555_A_DS



VERSIONS

2 POLES	4 POLES
SHOS 25-125/11	SHOS4 25-125/03
SHOS 25-125/15	SHOS4 25-160/03
SHOS 25-125/22	SHOS4 25-160/05
SHOS 25-160/30	SHOS4 25-160/07
SHOS 25-160/40	SHOS4 25-200/07
SHOS 25-160/55	SHOS4 32-125/03
SHOS 25-200/30	SHOS4 32-160/03
SHOS 25-200/40	SHOS4 32-160/05
SHOS 25-200/55	SHOS4 32-160/07
SHOS 32-125/11	SHOS4 32-200/07
SHOS 32-125/15	SHOS4 40-125/03
SHOS 32-125/22	SHOS4 40-160/05
SHOS 32-160/30	SHOS4 40-160/07
SHOS 32-160/40	SHOS4 40-160/11
SHOS 32-160/55	SHOS4 50-125/07
SHOS 32-200/30	SHOS4 50-125/11
SHOS 32-200/40	SHOS4 50-160/11
SHOS 32-200/55	SHOS4 50-160/15
SHOS 40-125/15	
SHOS 40-125/22	
SHOS 40-125/30	
SHOS 40-160/40	
SHOS 40-160/55	
SHOS 40-160/75	
SHOS 50-125/55	
SHOS 50-125/75	

shos-shos4-p-en_a_mo

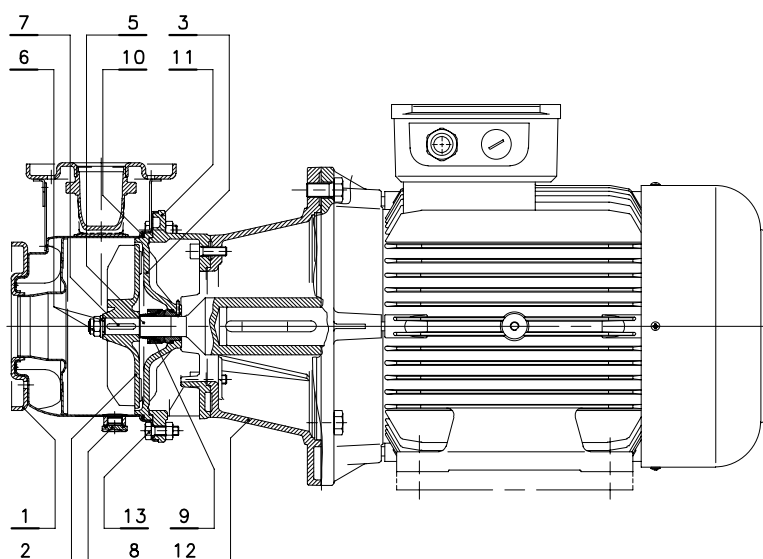
REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
2	Impeller 25-32-40-50-65(160)	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
3	Seal housing	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
5	Rigid shaft coupling	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Tab	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Mechanical seal	Silicon Carbide / Silicon Carbide / FPM (standard version)		
10	Elastomers	FPM (standard version)		
11	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
12	Adapter-motor coupling	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
13	Pump body fastening bolts & screws	Galvanized steel		

shos-en_a_tm

SHOS SERIES

LIST OF MODELS AND TABLE OF MATERIALS

05556_A_DS

**VERSIONS****2 POLES**

SHOS 50-160/110A

SHOS 50-160/110

shos-s-en_a_mo

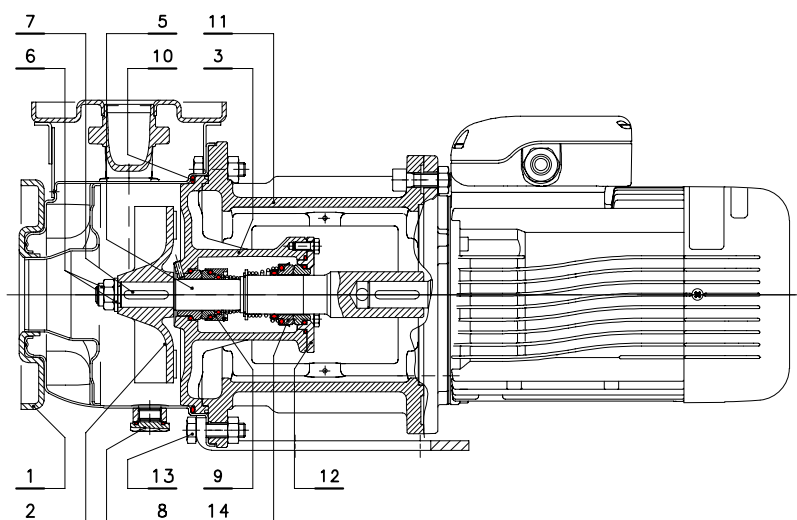
REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
2	Impeller 25-32-40-50-65(160)	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
3	Seal housing	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
5	Rigid shaft coupling	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Tab	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Mechanical seal	Silicon Carbide / Silicon Carbide / FPM (standard version)		
10	Elastomers	FPM (standard version)		
11	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
12	Adapter-motor coupling	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
13	Pump body fastening bolts & screws	Galvanized steel		

shos-en_a_tm

SHOD - SHOD4 SERIES (DOUBLE MECHANICAL SEAL)

LIST OF MODELS AND TABLE OF MATERIALS

05575_A_DS



VERSIONS	
2 POLES	4 POLES
SHOD 25-125/11	SHOD4 25-125/03
SHOD 25-125/15	SHOD4 25-160/03
SHOD 25-125/22	SHOD4 25-160/05
SHOD 25-160/30	SHOD4 25-160/07
SHOD 25-160/40	SHOD4 25-200/07
SHOD 25-160/55	SHOD4 32-125/03
SHOD 25-200/30	SHOD4 32-160/03
SHOD 25-200/40	SHOD4 32-160/05
SHOD 25-200/55	SHOD4 32-160/07
SHOD 32-125/11	SHOD4 32-200/07
SHOD 32-125/15	SHOD4 40-125/03
SHOD 32-125/22	SHOD4 40-160/05
SHOD 32-160/30	SHOD4 40-160/07
SHOD 32-160/40	SHOD4 40-160/11
SHOD 32-160/55	SHOD4 50-125/07
SHOD 32-200/30	SHOD4 50-125/11
SHOD 32-200/40	SHOD4 50-160/11
SHOD 32-200/55	SHOD4 50-160/15
SHOD 40-125/15	
SHOD 40-125/22	
SHOD 40-125/30	
SHOD 40-160/40	
SHOD 40-160/55	
SHOD 40-160/75	
SHOD 50-125/55	
SHOD 50-125/75	

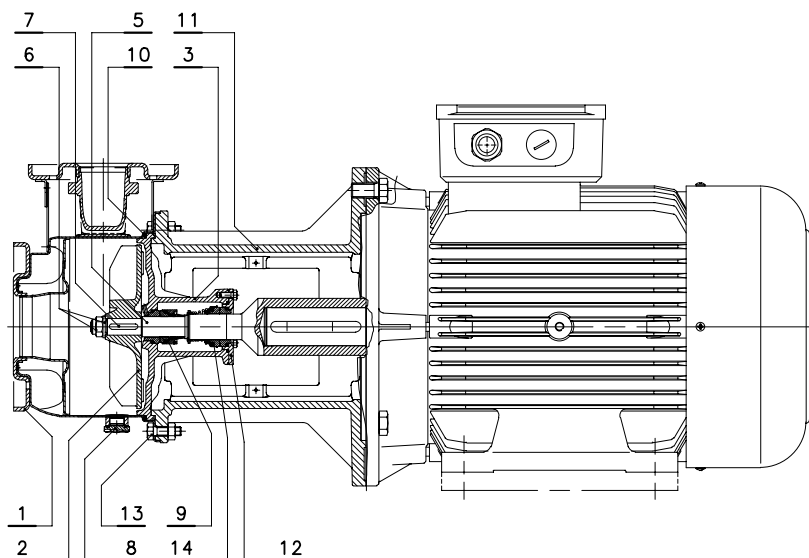
shod-shod4-p-en_a_mo

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 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
3	Seal housing	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
5	Rigid shaft coupling	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Tab	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	(front) Mechanical seal	Silicon Carbide / Silicon Carbide / FPM (standard version)		
10	Elastomers	FPM (standard version)		
11	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
12	Seal cover	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
13	Pump body fastening bolts & screws	Galvanized steel		
14	(back) Mechanical seal	Ceramic / Carbon / FPM (standard version)		

shod-en_a_tm

SHOD SERIES (DOUBLE MECHANICAL SEAL) LIST OF MODELS AND TABLE OF MATERIALS

05576_A_DS

**VERSIONS****2 POLES**

SHOD 50-160/110A

SHOD 50-160/110

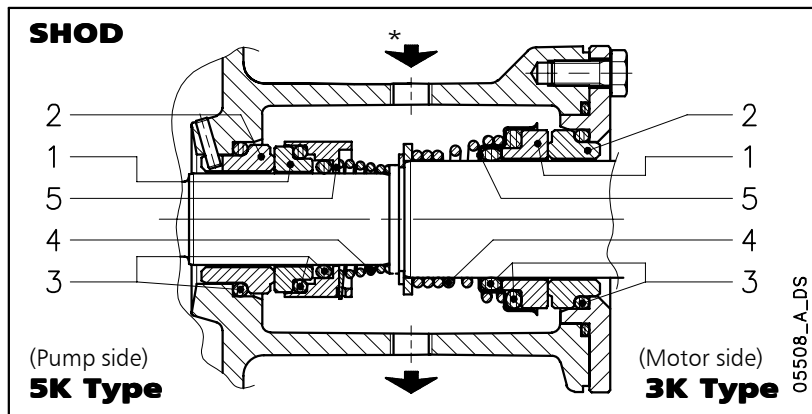
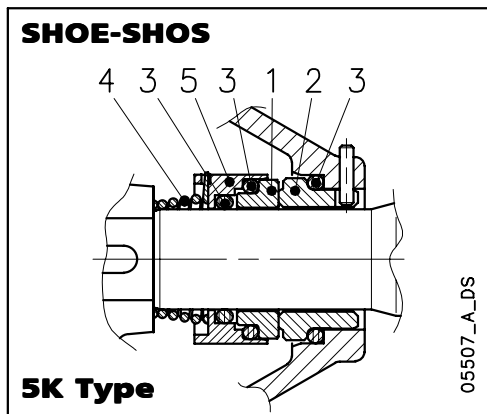
shod-s-en_a_mo

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 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
3	Seal housing	Stainless steel	EN 10213-4-GX5CrNiMo19-11-2 (1.4408)	ASTM CF8M (cast AISI 316)
5	Rigid shaft coupling	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Impeller locknut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
7	Tab	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Fill/drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	(front) Mechanical seal	Silicon Carbide / Silicon Carbide / FPM (standard version)		
10	Elastomers	FPM (standard version)		
11	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
12	Seal cover	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
13	Pump body fastening bolts & screws	Galvanized steel		
14	(back) Mechanical seal	Ceramic / Carbon / FPM (standard version)		

shod-en_a_tm

SHO MECHANICAL SEAL SERIES, ACCORDING TO EN 12756

Mechanical seal with mounting dimensions according to EN12756 (ex DIN 24960) and ISO 3069.



(*) Flushing of the seals has to be done with clean liquid and external flushing circuit. The liquid has to be compatible with the pumped liquid and with a pressure 0,5 bar higher than the pressure in the pump.
(Rp 1/4 connections).

LIST OF MATERIALS

POSITION 1 - 2	POSITION 3	POSITION 4 - 5
B : Resin impregnated carbon	E : EPDM	G : AISI 316
Q ₁ : Silicon carbide	V : FPM	
C : Special resin impregnated carbon	T : PTFE	
V : Ceramic		

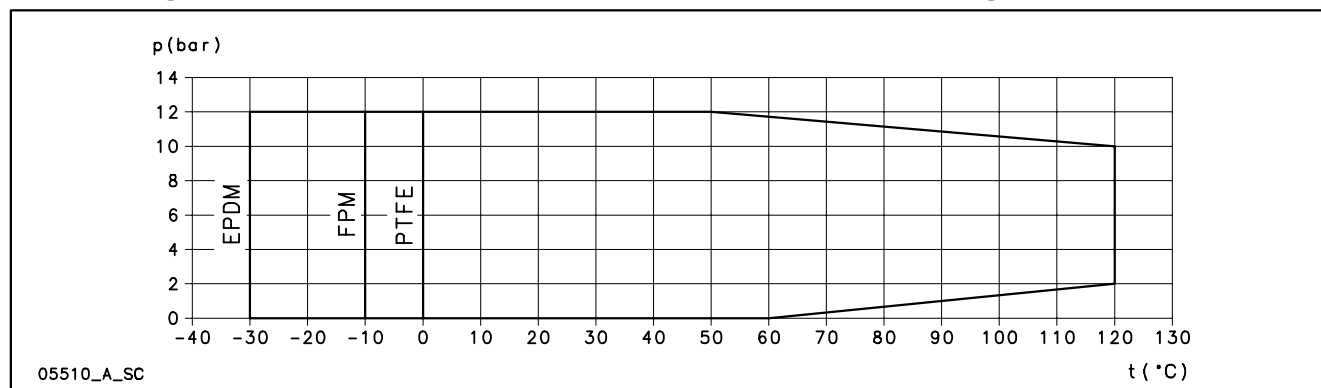
sho-shod_ten-mec-en_a_tm

SEAL TYPES

TYPE	POSITION					TEMPERATURE (°C)
	1 ROTATING ASSEMBLY	2 FIXED ASSEMBLY	3 ELASTOMERS	4 SPRINGS	5 OTHER COMPONENTS	
STANDARD MECHANICAL SEALS						
3K - V B V G G	V	B	V	G	G	-10 +120
5K - Q ₁ Q ₁ V G G	Q ₁	Q ₁	V	G	G	-10 +120
OTHER MECHANICAL SEAL TYPES						
3K - V B E G G	V	B	E	G	G	-30 +120
5K - Q ₁ B V G G	Q ₁	B	V	G	G	-10 +120
5K - Q ₁ Q ₁ E G G	Q ₁	Q ₁	E	G	G	-30 +120
5K - Q ₁ B E G G	Q ₁	B	E	G	G	-30 +120
5K - Q ₁ C T G G	Q ₁	C	T	G	G	0 +120
5K - Q ₁ Q ₁ T G G	Q ₁	Q ₁	T	G	G	0 +120

sho-shod_tipi-ten-mec-en_a_tc

COMPLETE PUMP PRESSURE / TEMPERATURE OPERATING LIMITS (WITH ANY OF THE SEALS LISTED ABOVE)



05510_A_SC

MOTORS FOR SHO SERIES

Standard supplied IE2/IE3 three-phase surface motors $\geq 0,75$ kW are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.

Enclosed short circuit squirrel cage motor (TEFC), with external ventilation.

Electrical performances according to EN 60034-1.

Insulation class 155 (F).

IP55 protection.

Condensate drain plugs on standard version.

Cooling by fan according to EN 60034-6.

Cable gland metric size according to EN 50262.

Standard voltage:

- **Three-phase** version: 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. Overload protection to be provided by the user.

SHOE SERIES

THREE-PHASE MOTORS AT 50 Hz, 2 POLES

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		
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	3	By June 2011
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	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	2	
3	85,5	86,8	85,6	86,1	86,8	85,6	86,3	86,8	85,6	85,5	86,8	85,6	85,5	86,8	85,6	85,5	86,8	85,6		
4	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3		
5,5	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6		
7,5	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1		
9,2	89,3	88,8	88,8	89,3	88,8	88,8	89,3	88,8	88,8	89,3	88,8	88,8	89,3	88,8	88,8	89,3	88,8	88,8		
11	90,3	91,1	90,3	90,3	91,1	90,3	90,3	91,1	90,3	90,3	91,1	90,3	90,8	91,1	90,3	91,0	91,1	90,3		

P _N kW	Manufacturer	IEC SIZE*	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Lowara srl Unipersonale Reg. No. 341820260 Montecchio Maggiore Vicenza - Italia					cosφ	Is / I _N	T _N Nm	Ts/T _N	Tm/Tn
	Model									
1,1	SM90RB14/311PE	90R	SPECIAL	2	50	0,79	8,31	3,63	3,95	3,95
1,5	SM90RB14/315PE	90R				0,80	8,80	4,96	4,31	4,10
2,2	PLM90B14/322	90				0,80	8,63	7,25	3,74	3,71
3	PLM90B14/330	90				0,82	8,39	9,96	3,50	3,32
4	PLM112RB14/340	112R				0,85	9,52	13,1	3,04	4,40
5,5	PLM112B14/355	112				0,87	10,3	18,1	4,43	5,80
7,5	PLM132B14/375	132				0,87	9,21	24,5	3,26	4,55
9,2	PLM132B14/392	132				0,88	9,66	30,3	3,17	4,54
11	PLM132B14/3110	132				0,87	9,72	36,0	3,46	4,56

P _N kW	Voltage U _N V											n _N min ⁻¹	See note.	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					
	I _N (A)															
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	≤ 1000	-15 / 40	No	
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	8,05	8,04	8,09	4,65	4,64	4,67	4,62	4,61	4,63	2,67	2,66	2885 ÷ 2900				
3	10,8	10,6	10,6	6,23	6,14	6,12	6,18	6,10	6,06	3,57	3,52	2850 ÷ 2885				
4	13,6	13,5	13,5	7,88	7,77	7,79	7,80	7,63	7,65	4,51	4,41	2895 ÷ 2920				
5,5	18,3	18,0	17,9	10,6	10,4	10,3	10,6	10,4	10,5	6,14	6,02	2885 ÷ 2905				
7,5	25,4	24,8	24,4	14,7	14,3	14,1	14,5	14,0	13,9	8,35	8,11	2920 ÷ 2935				
9,2	29,7	28,9	28,3	17,2	16,7	16,4	17,3	16,8	16,6	10,0	9,70	2910 ÷ 2930				
11	36,0	35,1	34,7	20,8	20,3	20,0	20,8	20,3	20,1	12,0	11,7	2910 ÷ 2925				

* R = Reduced size of motor casing as compared to shaft extension and flange.

shoe-ie2-mott-2p50-en_b_te

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

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

SHOS - SHOD SERIES

THREE-PHASE MOTORS AT 50 Hz, 2 POLES

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		
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	3	By June 2011
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	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	83,7	2	
3	85,5	86,8	85,6	86,1	86,8	85,6	86,3	86,8	85,6	85,5	86,8	85,6	85,5	86,8	85,6	85,5	86,8	85,6		
4	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3	86,3		
5,5	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6	87,6		
7,5	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1	88,6	88,1	88,1		
11	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8	89,8		

P _N kW	Manufacturer		IEC SIZE*	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Lowara srl Unipersonale Reg. No. 341820260 Montecchio Maggiore Vicenza - Italia						cosφ	Is / I _N	T _N Nm	Ts/T _N	Tm/T _N
	Model										
1,1	SM80B5/311PE		80	B5	2	50	0,79	8,31	3,63	3,95	3,95
1,5	SM90RB5/315PE		90R				0,80	8,80	4,96	4,31	4,10
2,2	PLM90B5/322		90				0,80	8,63	7,25	3,74	3,71
3	PLM100RB5/330		100R				0,82	8,39	9,96	3,50	3,32
4	PLM112RB5/340		112R				0,85	9,52	13,1	3,04	4,40
5,5	PLM132RB5/355		132R				0,87	10,3	18,1	4,43	5,80
7,5	PLM132B5/375		132				0,87	9,21	24,5	3,26	4,55
11	PLM160B35/3110		160	B35			0,88	8,14	35,6	2,22	4,00

P _N kW	Voltage U _N V											η _N min ⁻¹	See note.	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					
	I _N (A)															
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	≤ 1000	-15 / 40	No	
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	8,05	8,04	8,09	4,65	4,64	4,67	4,62	4,61	4,63	2,67	2,66	2885 ÷ 2900				
3	10,8	10,6	10,6	6,23	6,14	6,12	6,18	6,10	6,06	3,57	3,52	2850 ÷ 2885				
4	13,6	13,5	13,5	7,88	7,77	7,79	7,80	7,63	7,65	4,51	4,41	2895 ÷ 2920				
5,5	18,3	18,0	17,9	10,6	10,4	10,3	10,6	10,4	10,5	6,14	6,02	2885 ÷ 2905				
7,5	25,4	24,8	24,4	14,7	14,3	14,1	14,5	14,0	13,9	8,35	8,11	2920 ÷ 2935				
11	35,5	34,3	33,4	20,5	19,8	19,3	20,6	19,9	19,5	11,9	11,5	2940 ÷ 2950				

* R = Reduced size of motor casing as compared to shaft extension and flange.

shosshod-ie2-mott-2p50-en_b_te

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

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

SHOE4 - SHOS4 - SHOD4 SERIES

THREE-PHASE MOTORS AT 50 Hz, 4 POLES

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		
0,37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	By June 2011
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0,75	80,4	81,3	79,8	81,1	81,4	79,1	81,4	81,2	78,4	80,4	81,2	78,4	80,4	81,2	78,4	80,4	81,2	78,4	2	
1,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1		
1,5	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0		
0,37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0,75	80,4	81,3	79,8	81,1	81,4	79,1	81,4	81,2	78,4	80,4	81,2	78,4	80,4	81,2	78,4	80,4	81,2	78,4	2	
1,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1	81,4	81,4	81,1		
1,5	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0	83,1	83,1	82,0		

P _N kW	Manufacturer		IEC SIZE*	Construction Design	N. of Poles	f _N Hz	Data for 400 V / 50 Hz Voltage				
	Lowara srl Unipersonale Reg. No. 341820260 Montecchio Maggiore Vicenza - Italia						cosφ	Is / I _N	T _N Nm	Ts/T _N	Tm/T _N
	Model										
0,37	SM471B5/304	SHOE4	71	B5	4	50	0,60	3,39	2,57	3,40	2,47
0,55	SM490RB14S/305		90R	SPECIAL			0,67	3,95	3,77	2,45	2,38
0,75	LLM490RB14S/307		90				0,75	5,78	5,03	2,77	3,31
1,1	PLM490B5S/311		90				0,72	6,34	7,27	2,80	3,43
1,5	PLM490B5S/315		90				0,67	6,79	9,88	3,33	3,67
0,37	SM480B5/304	SHOS-SHOD	80	B5			0,60	3,39	2,57	3,40	2,47
0,55	SM480B5/305		80				0,67	3,95	3,77	2,45	2,38
0,75	LLM480B5/307		90				0,75	5,78	5,03	2,77	3,31
1,1	PLM490B5/311		90				0,72	6,34	7,27	2,80	3,43
1,5	PLM490B5/315		90				0,67	6,79	9,88	3,33	3,67

P _N kW	Voltage U _N V											n _N min ⁻¹	See note.	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					
	I _N (A)															
0,37	2,46	2,53	2,62	1,42	1,46	1,51	-	-	-	-	-	1355 ÷ 1380		≤ 1000	-15 / 40	No
0,55	2,98	3,03	3,1	1,72	1,75	1,79	-	-	-	-	-	1380 ÷ 1400				
0,75	3,08	3,03	3,01	1,78	1,75	1,74	1,78	1,75	1,74	1,03	1,01	1410 ÷ 1430				
1,1	4,64	4,61	4,61	2,68	2,66	2,66	2,66	2,64	2,64	1,54	1,53	1435 ÷ 1445				
1,5	6,50	6,51	6,62	3,75	3,76	3,82	3,74	3,75	3,80	2,16	2,16	1440 ÷ 1450				
0,37	2,46	2,53	2,62	1,42	1,46	1,51	-	-	-	-	-	1355 ÷ 1380				
0,55	2,98	3,03	3,1	1,72	1,75	1,79	-	-	-	-	-	1380 ÷ 1400				
0,75	3,08	3,03	3,01	1,78	1,75	1,74	1,78	1,75	1,74	1,03	1,01	1410 ÷ 1430				
1,1	4,64	4,61	4,61	2,68	2,66	2,66	2,66	2,64	2,64	1,54	1,53	1435 ÷ 1445				
1,5	6,50	6,51	6,62	3,75	3,76	3,82	3,74	3,75	3,80	2,16	2,16	1440 ÷ 1450				

* R = Reduced size of motor casing as compared to shaft extension and flange.

shoe4-ie2-mott-4p50-en_a_te

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

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

MOTOR NOISE

The tables below show the mean sound pressure levels (Lp) measured at 1 meter's distance in a free field according to the A curve (ISO 1680 standard).

The noise values are measured with idling 50 Hz motor with a tolerance of 3 dB (A).

SHOE 50 Hz 2-POLE MOTOR NOISE

POWER	MOTOR TYPE	NOISE
kW	SIZE IEC*	LpA dB
1,1	90R	<70
1,5	90R	<70
2,2	90R	<70
3	90	<70
4	112R	<70
5,5	112	<70
7,5	132	71
9,2	132	73
11	132	73

SHOS-SHOD 50 Hz 2-POLE MOTOR NOISE

POWER	MOTOR TYPE	NOISE
kW	SIZE IEC*	LpA dB
1,1	80	<70
1,5	90R	<70
2,2	90R	<70
3	100R	<70
4	112R	<70
5,5	132R	<70
7,5	132	71
11	160	71

SHOE4 50 Hz 4-POLE MOTOR NOISE

POWER	MOTOR TYPE	NOISE
kW	SIZE IEC*	LpA dB
0,37	71	<70
0,55	90R	<70
0,75	90R	<70
1,1	90	<70
1,5	90	<70

*R = Reduced size of motor casing as compared to shaft extension and flange.

SHOS4-SHOD4 50 Hz 4-POLE MOTOR NOISE

POWER	MOTOR TYPE	NOISE
kW	SIZE IEC	LpA dB
0,37	80	<70
0,55	80	<70
0,75	80	<70
1,1	90	<70
1,5	90	<70

sho_mott-en_b_tr

AVAILABLE VOLTAGES MOTORS FOR SHO SERIES

P _N kW	THREE-PHASE - 2 POLES																
	50 Hz							60 Hz									50/60 Hz
	3 x 220-230-240/380-400-415	3 x 380-400-415/660-690	3 x 200-208/346-360	3 x 255-265/440-460	3 x 290-300/500-525	3 x 440-460/-	3 x 500-525/-	3 x 220-230/380-400	3 x 255-265-277/440-460-480	3 x 380-400/660-690	3 x 440-460-480/-	3 x 110-115/190-200	3 x 200-208/346-360	3 x 330-346/575-600	3 x 575/-	3 x 230/400 50 Hz 3 x 265/460 60 Hz	3 x 400/690 50 Hz 3 x 460/- 60 Hz
1,1	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
1,5	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
2,2	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
3	s	o	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
4	o	s	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
5,5	o	s	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
7,5	o	s	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
9,2	o	s	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o
11	o	s	o	o	o	o	o	s	o	o	o	o	o	o	o	o	o

s = Standard voltage

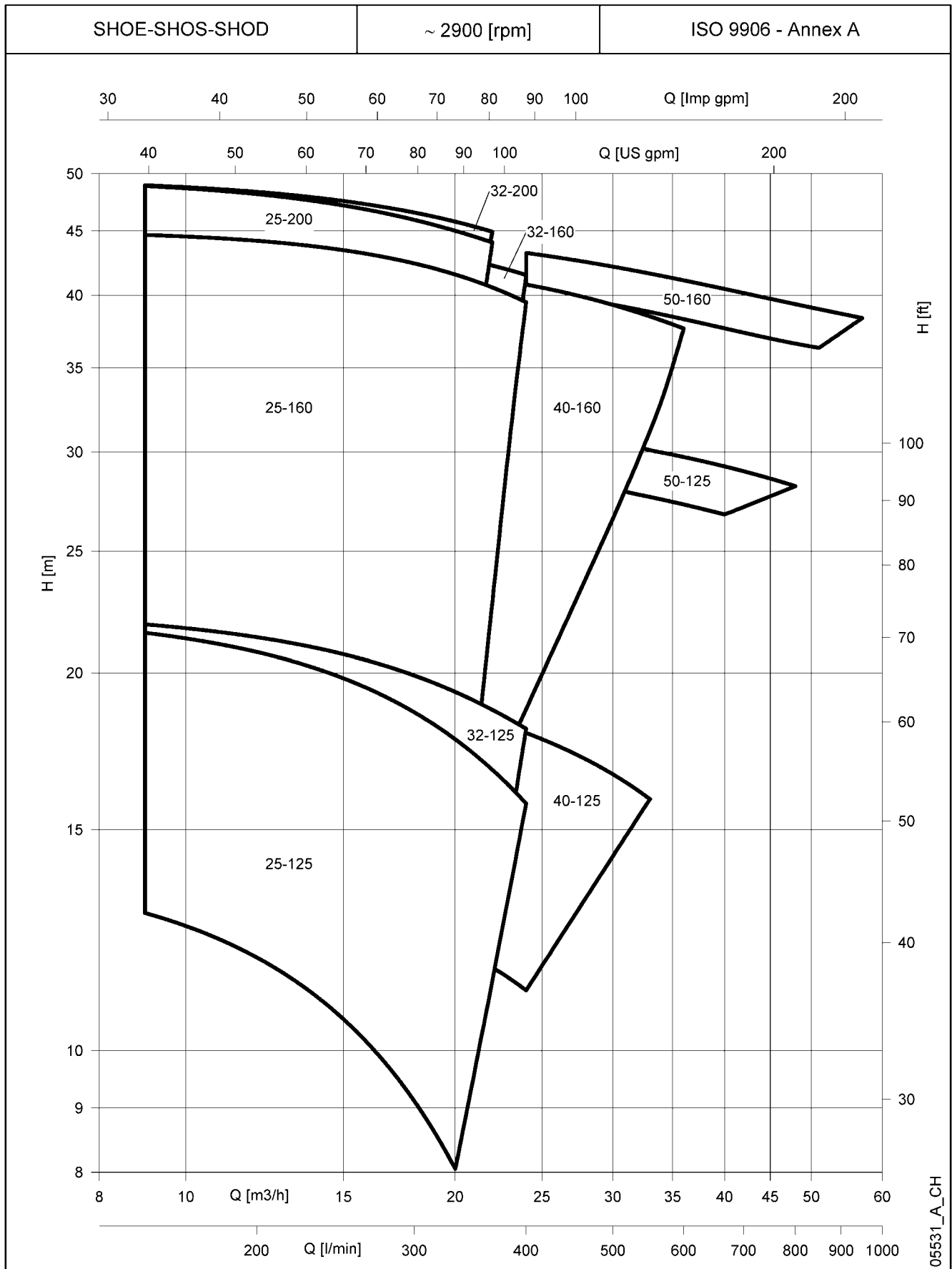
o = Optional voltage

- = Not available

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SHOE - SHOS - SHOD SERIES

HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES



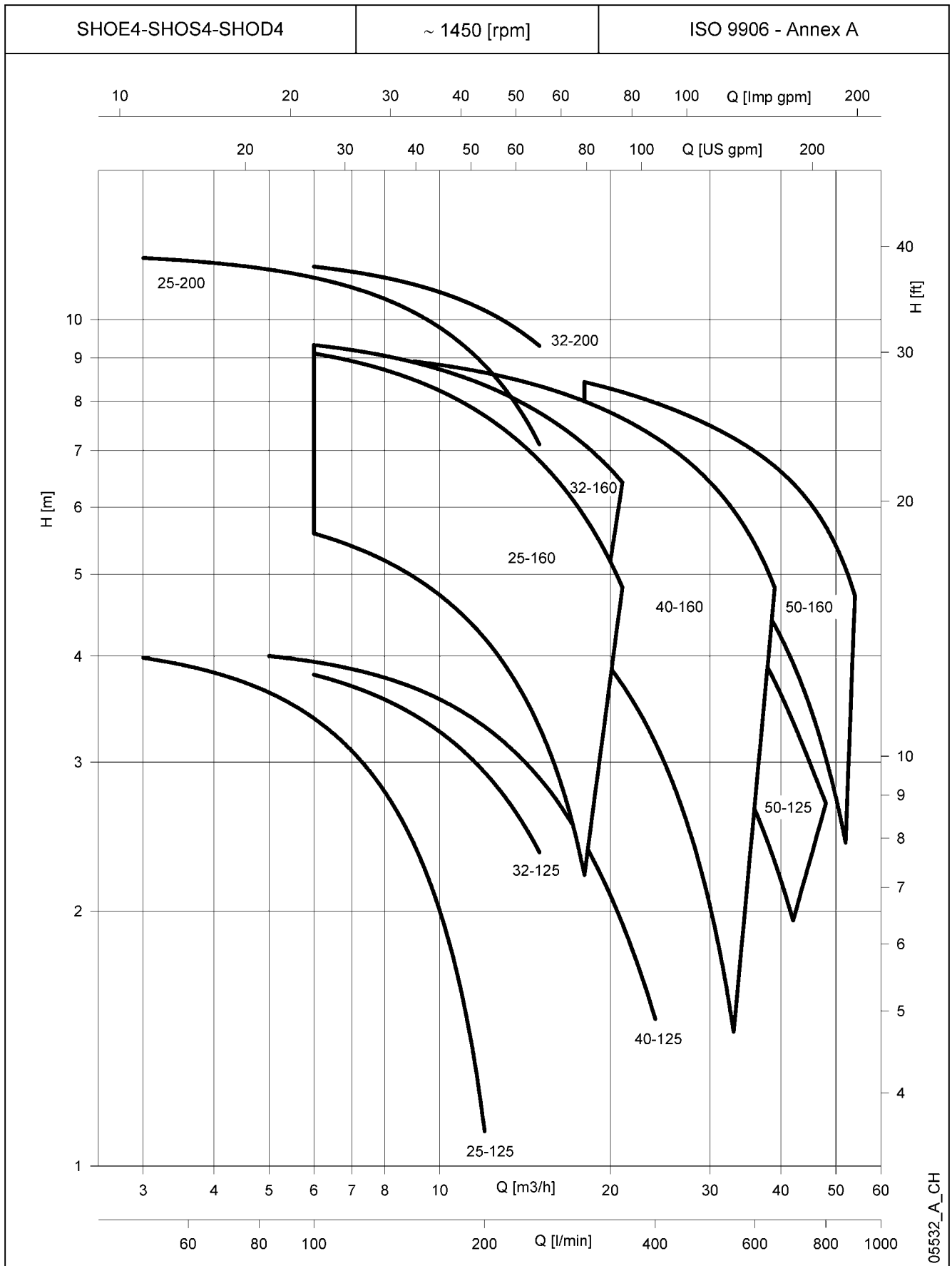
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$

SHOE - SHOS - SHOD SERIES**TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 2 POLES**

PUMP TYPE	RATED POWER		Q = DELIVERY																	Passes solids up to (mm)	
	kW	HP	l/min 0	150	200	250	300	333	350	367	383	400	500	550	567	600	667	800	950		
			m³/h 0	9	12	15	18	20	21	22	23	24	30	33	34	36	40	48	57		
H = TOTAL HEAD METRES COLUMN OF WATER																					
SHO.. 25-125/11	1,1	1,5	14,1	12,9	11,9	10,6	9,1	8,0												22	
SHO.. 25-125/15	1,5	2	17,6	16,6	15,7	14,6	13,4	12,4	11,9	11,4										22	
SHO.. 25-125/22	2,2	3	22,4	21,5	20,8	19,8	18,6	17,7	17,2	16,8	16,3	15,7								22	
SHO.. 25-160/30	3	4	29,3	28,3	27,4	26,2	24,9	23,9	23,4	22,9										22	
SHO.. 25-160/40	4	5,5	36,7	36,2	35,5	34,4	33,2	32,2	31,7	31,2	30,6									22	
SHO.. 25-160/55	5,5	7,5	44,8	44,7	44,2	43,5	42,4	41,6	41,1	40,6	40,1	39,5								22	
SHO.. 25-200/30	3	4	32,6	31,4	30,4	29,2	27,6	26,5												20	
SHO.. 25-200/40	4	5,5	40,7	40,0	39,2	38,1	36,8	35,8	35,2											20	
SHO.. 25-200/55	5,5	7,5	49,3	48,9	48,2	47,2	45,9	45,0	44,6	44,1										20	
SHO.. 32-125/11	1,1	1,5	14,0	13,2	12,4	11,5	10,4	9,6												22	
SHO.. 32-125/15	1,5	2	17,6	16,7	16,1	15,4	14,4	13,7	13,4	13,0										22	
SHO.. 32-125/22	2,2	3	22,7	21,9	21,4	20,7	19,9	19,3	19,0	18,7	18,4	18,1								22	
SHO.. 32-160/30	3	4	29,3	28,6	27,9	27,1	26,1	25,4	25,0	24,6										22	
SHO.. 32-160/40	4	5,5	36,8	36,4	36,0	35,3	34,4	33,7	33,3	32,9	32,5									22	
SHO.. 32-160/55	5,5	7,5	44,7	44,7	44,5	44,0	43,4	42,9	42,6	42,2	41,9	41,5								22	
SHO.. 32-200/30	3	4	32,6	31,4	30,6	29,5	28,1	27,0												20	
SHO.. 32-200/40	4	5,5	40,9	40,3	39,5	38,6	37,4	36,5	36,1											20	
SHO.. 32-200/55	5,5	7,5	49,5	49,0	48,4	47,6	46,6	45,8	45,4	45,0										20	
SHO.. 40-125/15	1,5	2	14,0		13,5	13,1	12,5	12,1	11,9	11,7	11,4	11,2								30	
SHO.. 40-125/22	2,2	3	18,6		17,8	17,3	16,8	16,4	16,2	16,0	15,9	15,7	14,3							30	
SHO.. 40-125/30	3	4	20,9		19,9	19,5	19,0	18,7	18,5	18,3	18,1	17,9	16,6	15,9						30	
SHO.. 40-160/40	4	5,5	31,3		30,7	30,2	29,5	29,1	28,8	28,6	28,3	28,1	26,6							30	
SHO.. 40-160/55	5,5	7,5	38,7		38,3	37,9	37,4	36,9	36,7	36,4	36,1	35,9	34,1	33,2	33,0					30	
SHO.. 40-160/75	7,5	10	42,9		42,8	42,4	42,0	41,6	41,4	41,2	41,0	40,8	39,3	38,5	38,2	37,6				30	
SHO.. 50-125/55	5,5	7,5	29,7				29,3	29,1	29,0	28,9	28,8	28,7	28,0	27,6	27,5	27,2	26,7			40	
SHO.. 50-125/75	7,5	10	32,0				31,7	31,6	31,5	31,4	31,3	31,2	30,5	30,1	30,0	29,7	29,2	28,2		40	
SHO.. 50-160/92	9,2	12,5	41,9										40,4	39,3	38,8	38,6	38,3	37,7	36,6	30	
SHO.. 50-160/110	11	15	45,1										43,2	42,2	41,6	41,5	41,1	40,5	39,4	38,4	30

Performances according to ISO standards 9906 - Annex A.

sho_2p50-en_c_th

SHOE4 - SHOS4 - SHOD4 SERIES
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES


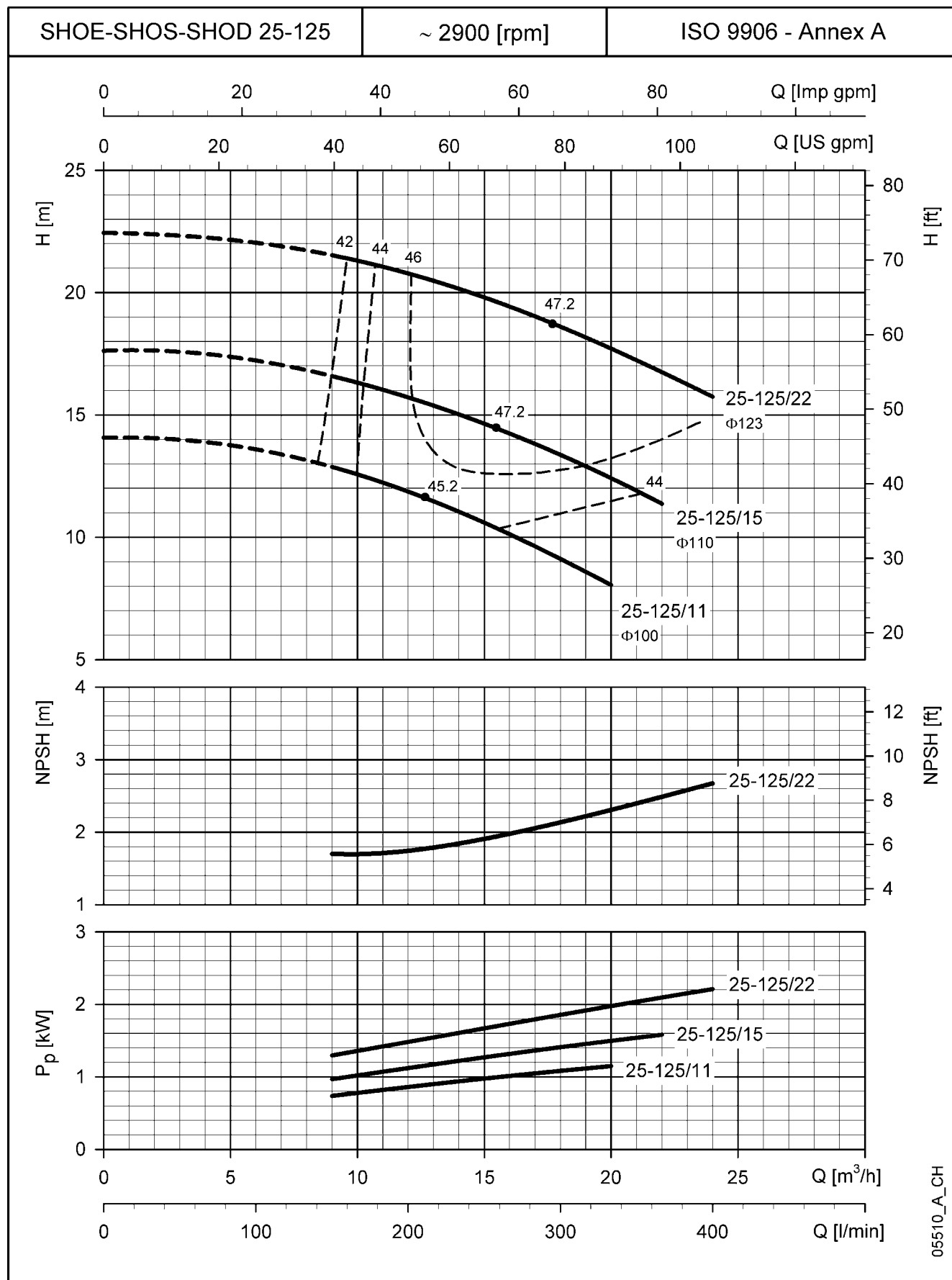
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$

SHOE4 - SHOS4 - SHOD4 SERIES**TABLE OF HYDRAULIC PERFORMANCES AT 50 Hz, 4 POLES**

PUMP TYPE	RATED POWER		Q = DELIVERY																	Passes solids up to (mm)
			l/min 0	50	100	150	200	250	300	350	400	500	550	600	650	700	800	867	900	
	kW	HP	m³/h 0	3	6	9	12	15	18	21	24	30	33	36	39	42	48	52	54	
H = TOTAL HEAD METRES COLUMN OF WATER																				
SHO..4 25-125/03	0,37	0,5	4,2	4,0	3,4	2,4	1,1													22
SHO..4 25-160/03	0,37	0,5	6,1		5,6	5,0	4,2	3,3	2,2											22
SHO..4 25-160/05	0,55	0,75	7,8		7,3	6,7	6,0	5,1	4,1											22
SHO..4 25-160/07	0,75	1	9,5		9,1	8,5	7,7	6,8	5,9	4,8										22
SHO..4 25-200/07	0,75	1	12,0	11,8	11,2	10,2	8,8	7,1												20
SHO..4 32-125/03	0,37	0,5	4,2		3,8	3,4	2,9	2,3												22
SHO..4 32-160/03	0,37	0,5	6,2		5,7	5,2	4,7	4,0	3,3											22
SHO..4 32-160/05	0,55	0,75	7,8		7,5	7,0	6,5	6,0	5,3											22
SHO..4 32-160/07	0,75	1	9,5		9,3	8,9	8,4	7,8	7,1	6,4										22
SHO..4 32-200/07	0,75	1	12,0		11,5	11,0	10,2	9,3												20
SHO..4 40-125/03	0,37	0,5	3,7			3,3	3,0	2,6	2,2	1,8	1,4									30
SHO..4 40-160/05	0,55	0,75	5,9			5,4	5,1	4,7	4,2	3,7	3,2	2,0	1,4							30
SHO..4 40-160/07	0,75	1	7,5			7,0	6,7	6,3	6,0	5,5	5,1	4,0	3,4	2,8						30
SHO..4 40-160/11	1,1	1,5	9,3			8,9	8,7	8,3	8,0	7,6	7,3	6,4	5,9	5,4	4,8					30
SHO..4 50-125/07	0,75	1	5,4					4,9	4,7	4,4	4,0	3,3	3,0	2,6	2,3	1,9				40
SHO..4 50-125/11	1,1	1,5	6,5					6,2	6,1	5,8	5,6	4,9	4,5	4,1	3,7	3,3	2,7			40
SHO..4 50-160/11	1,1	1,5	7,4					6,9	6,7	6,4	6,1	5,5	5,1	4,8	4,4	3,9	3,0	2,4		40
SHO..4 50-160/15	1,5	2	9,2					8,6	8,4	8,2	8,0	7,5	7,2	7,0	6,7	6,4	5,7	5,1	4,7	40

Performances according to ISO standards 9906 - Annex A.

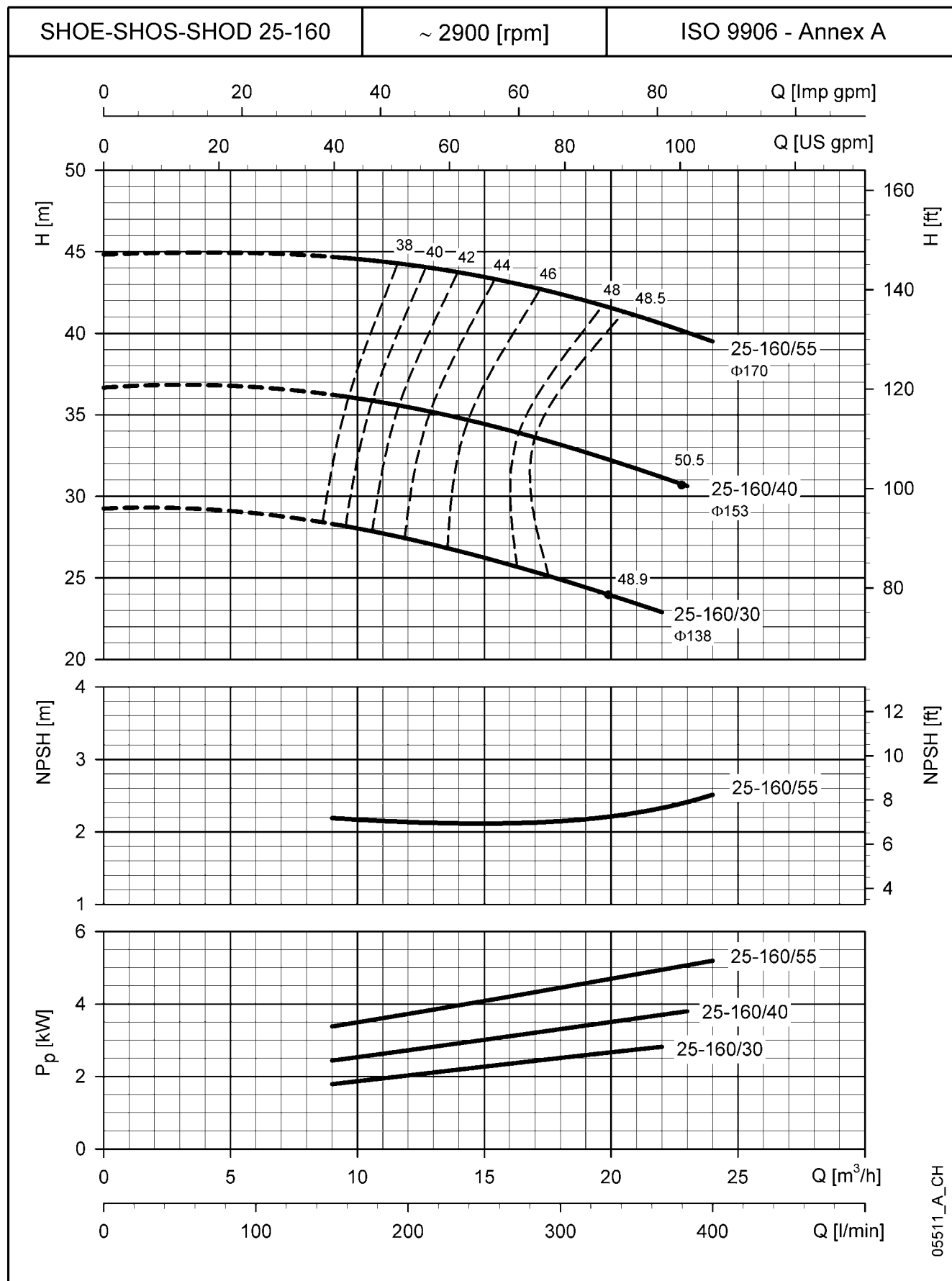
sho_4p50-en_c_th

SHOE - SHOS - SHOD SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

The NPSH values are laboratory values; for practical use we suggest increasing these values by 0,5 m.

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

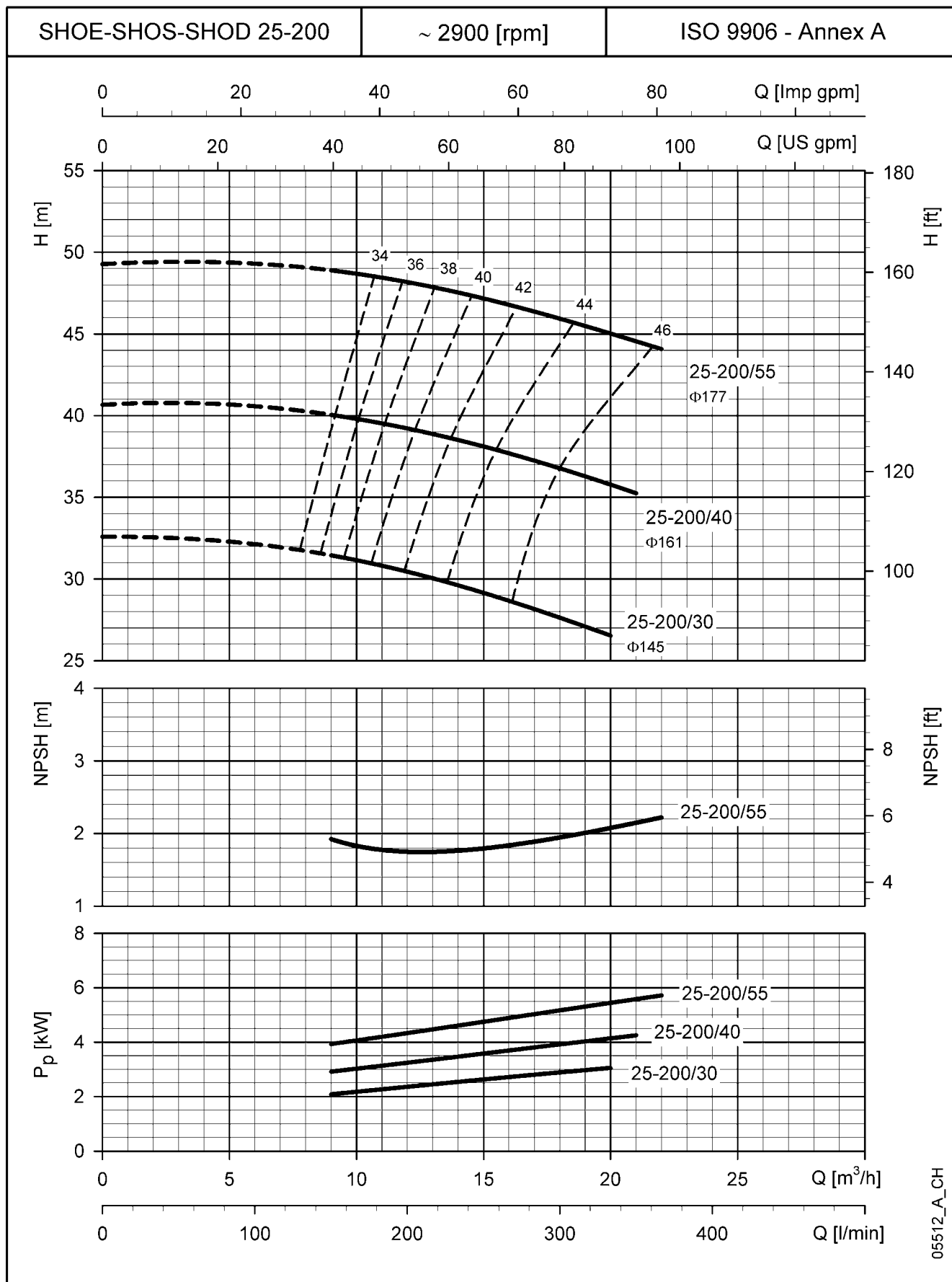
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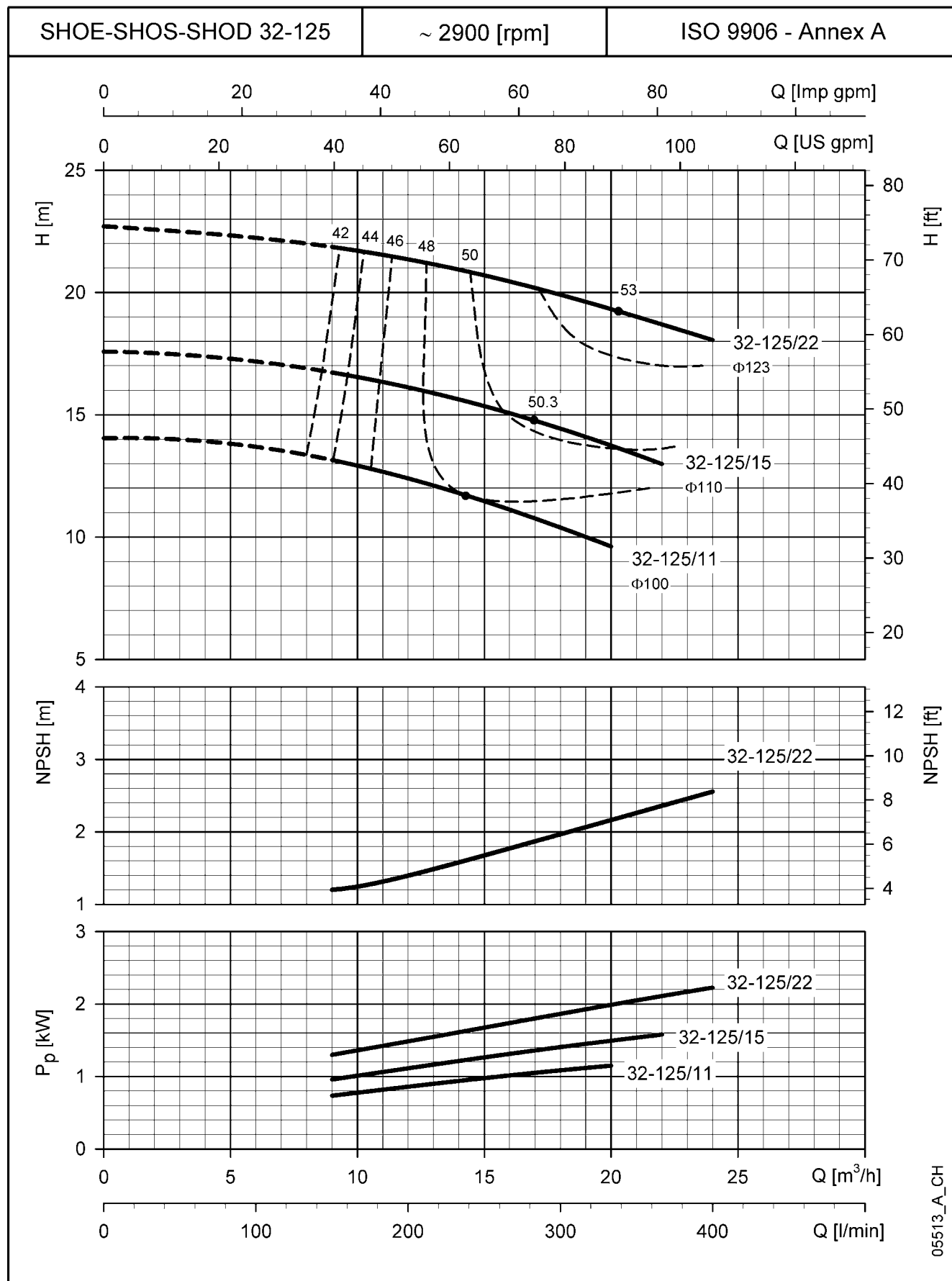
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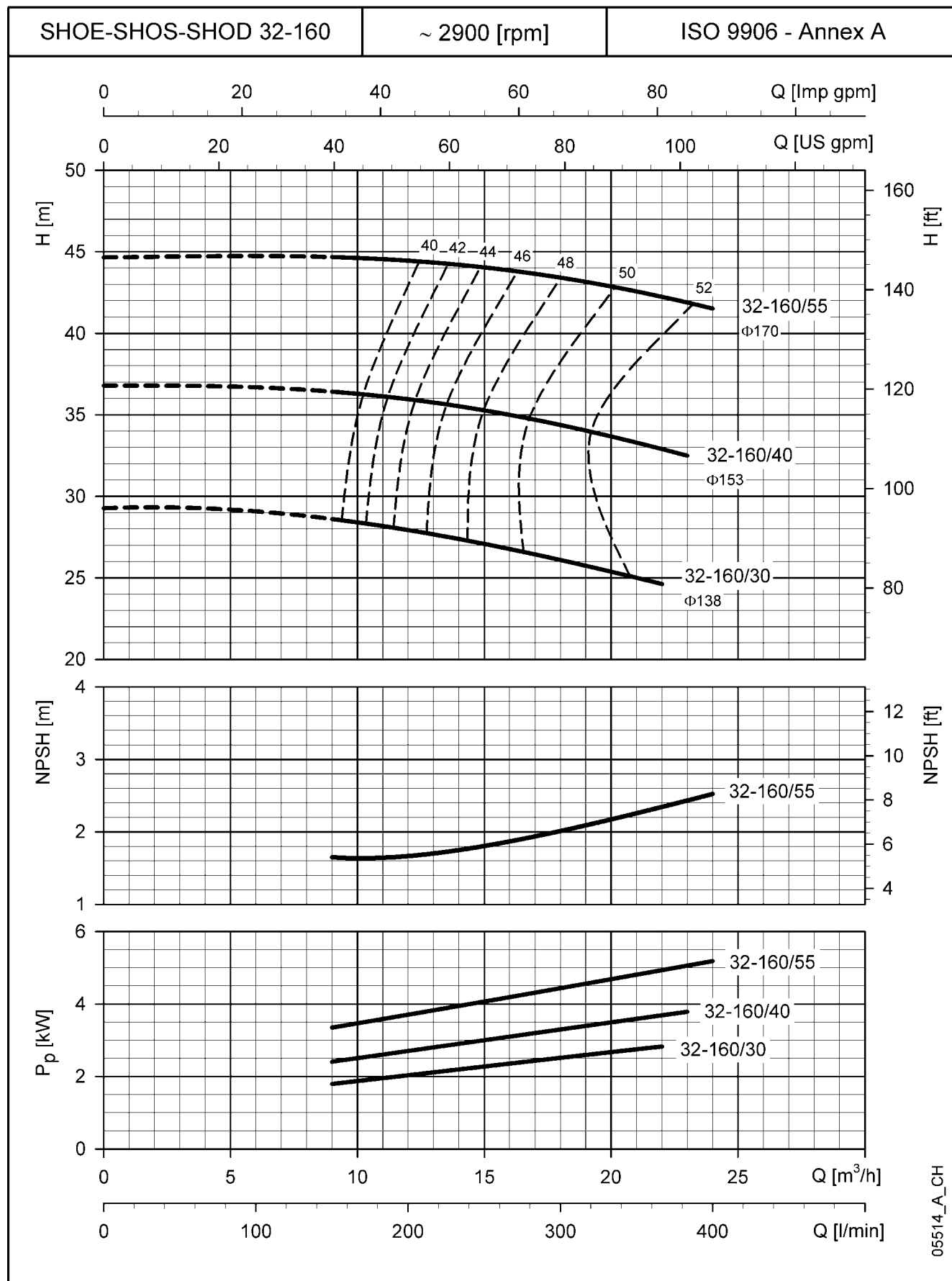
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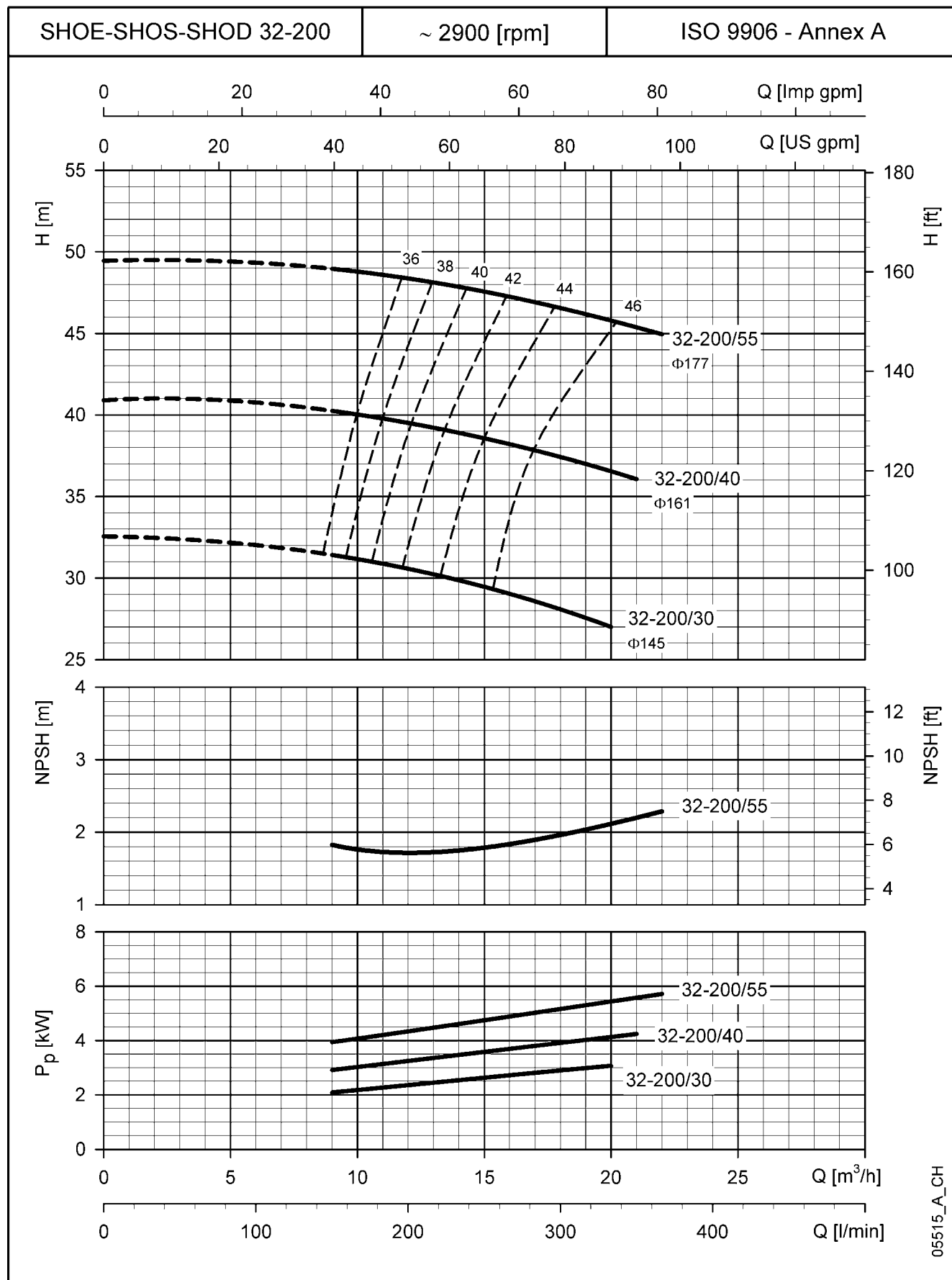
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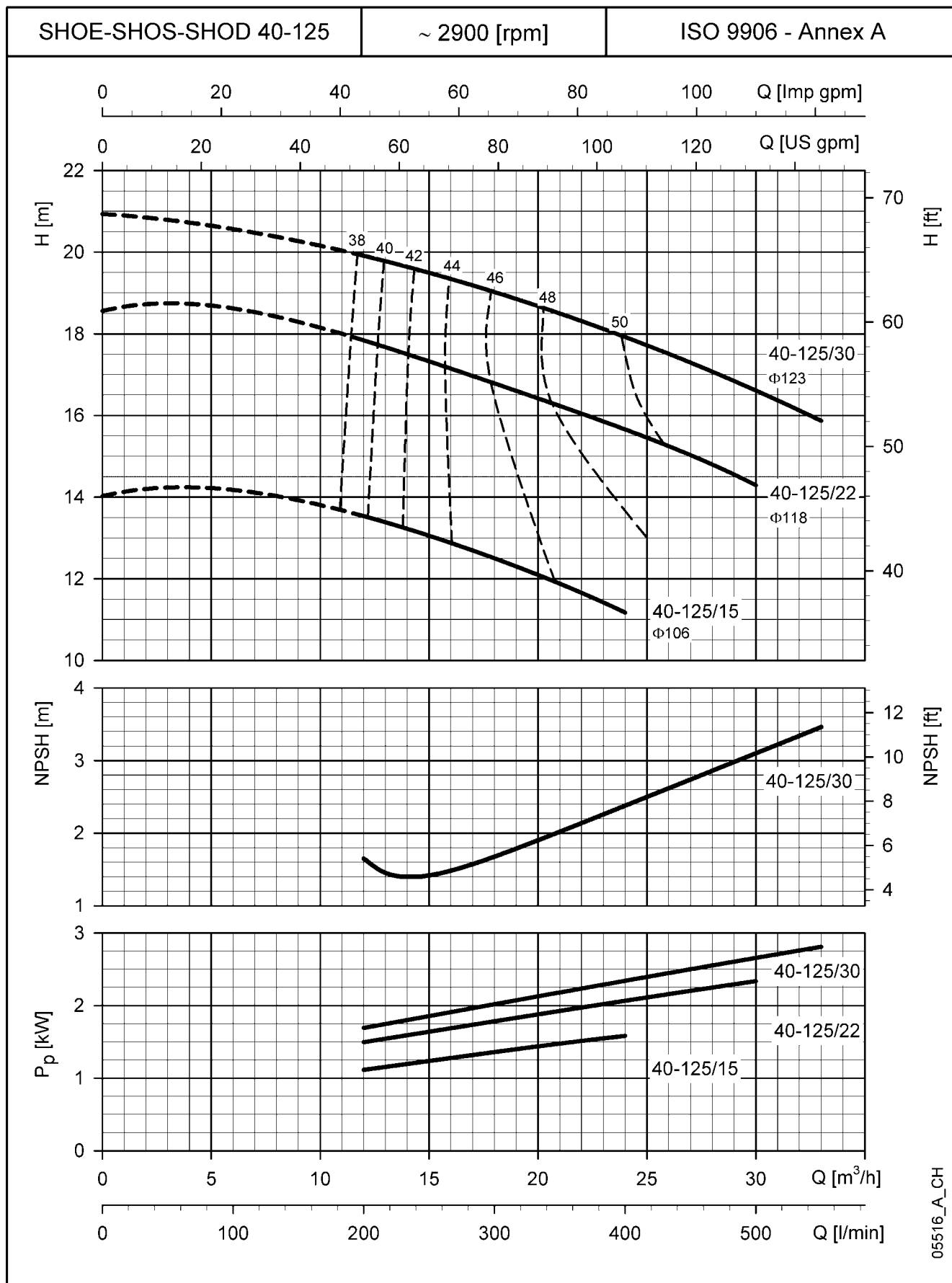
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SHOE - SHOS - SHOD SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**

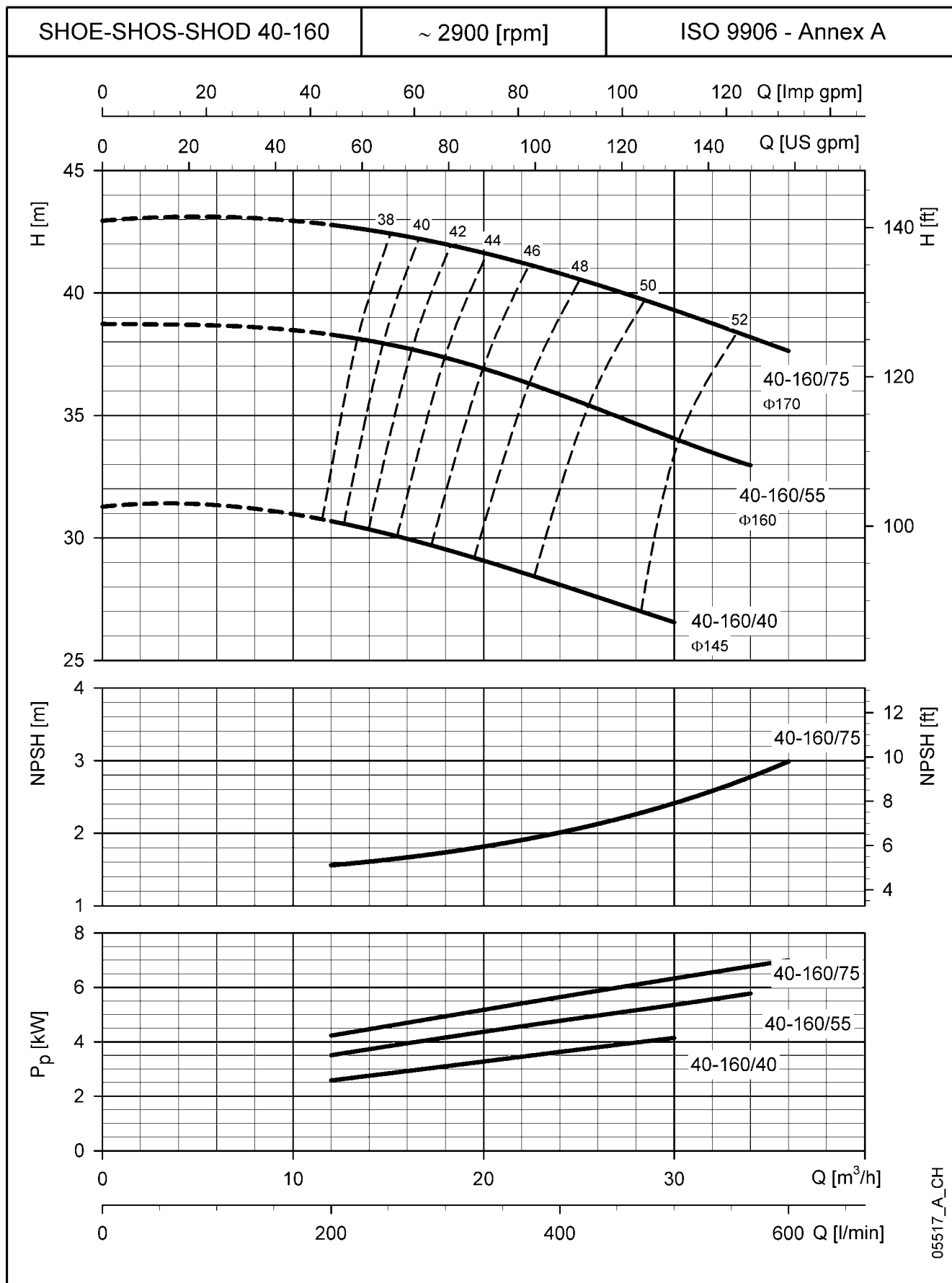
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SHOE - SHOS - SHOD SERIES

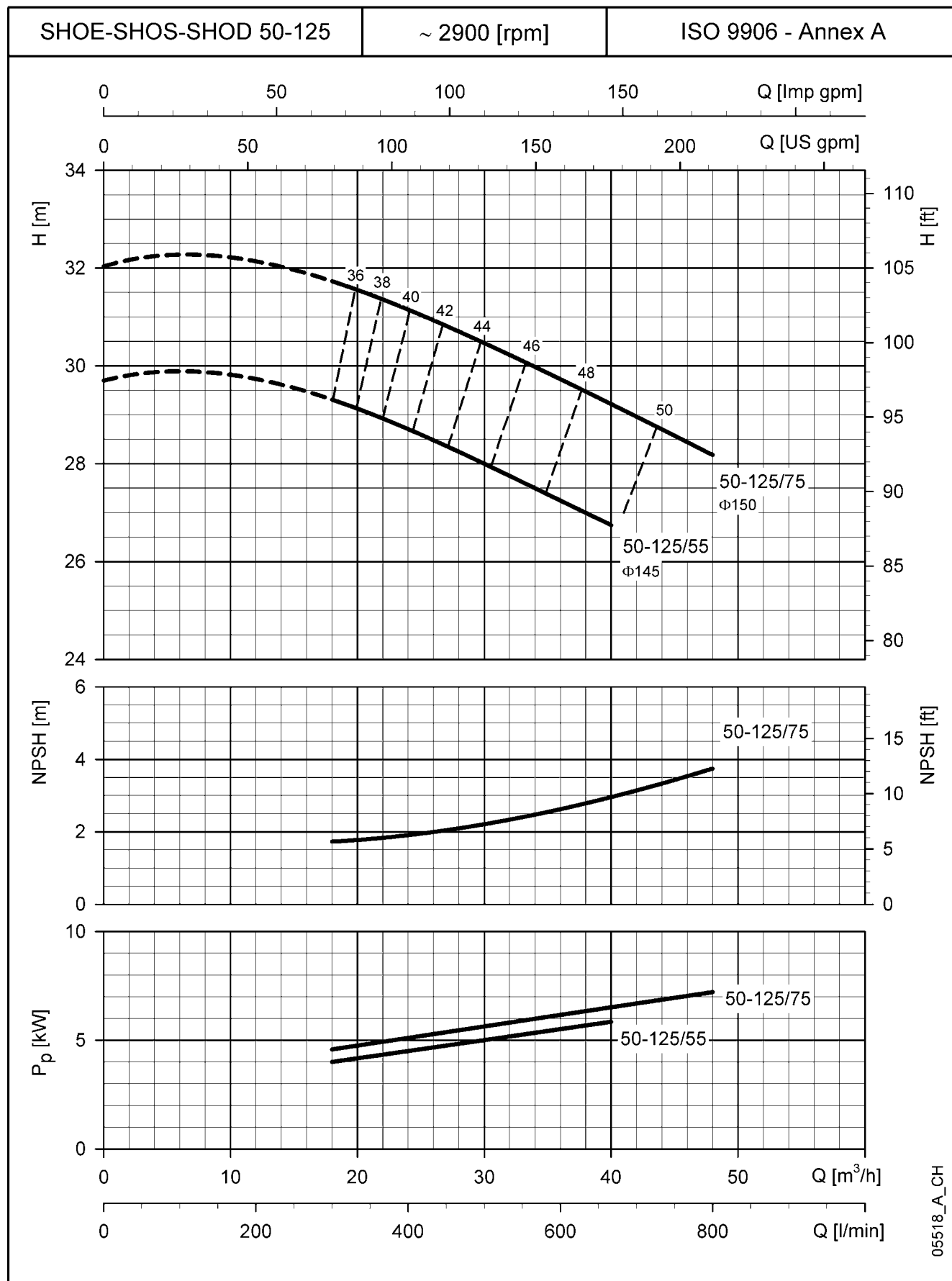
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES



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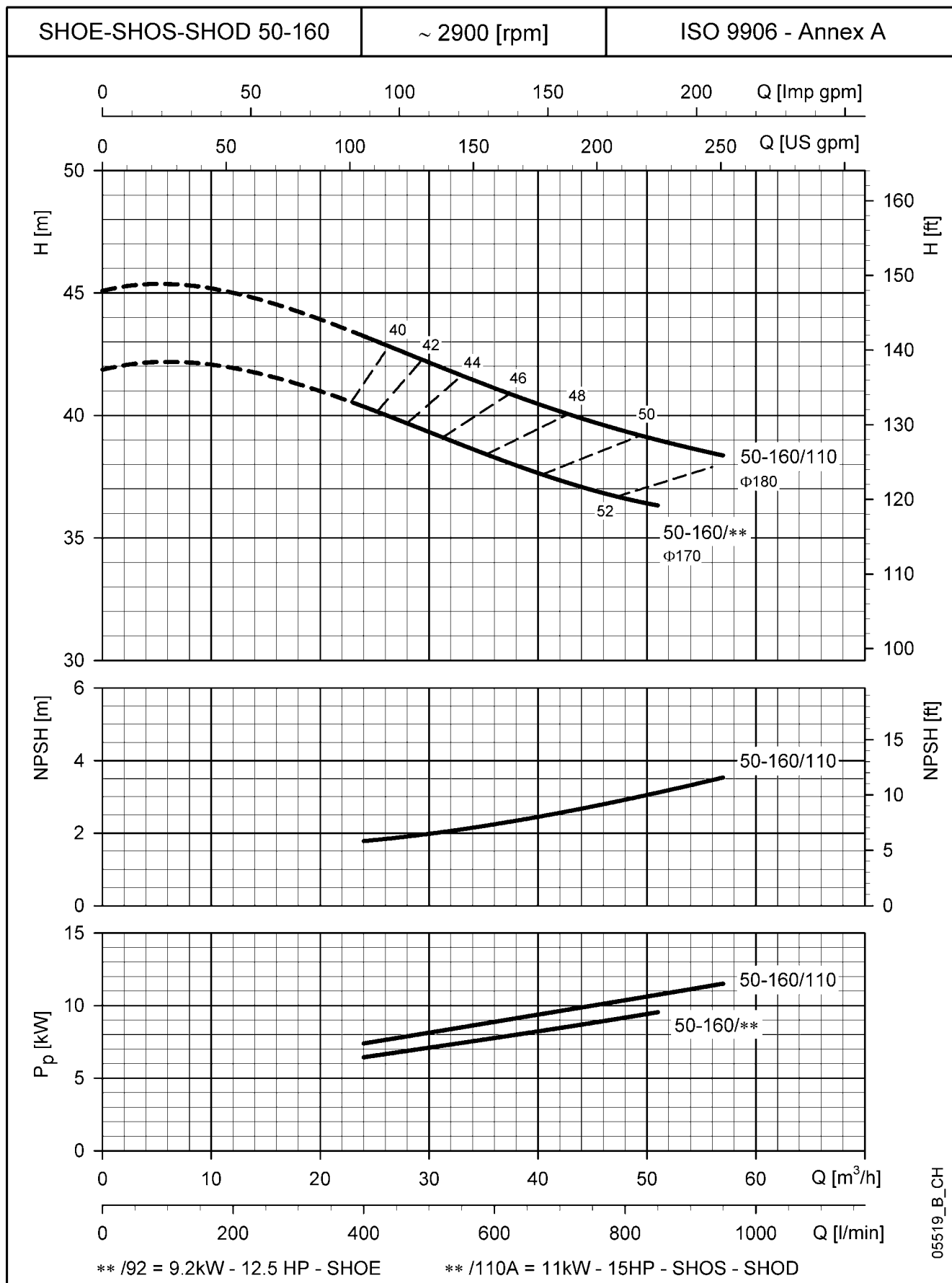
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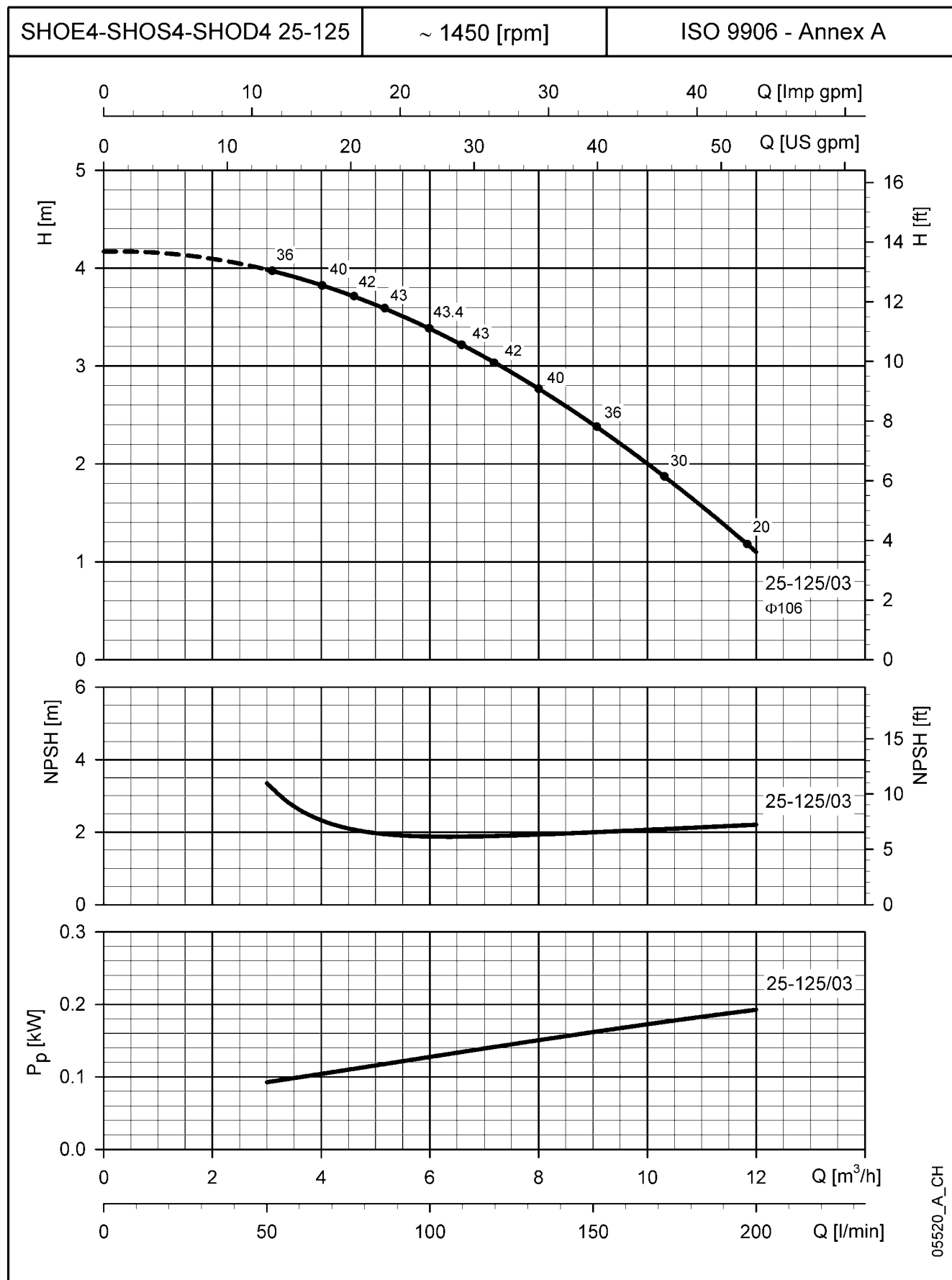
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SHOE4 - SHOS4 - SHOD4 SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



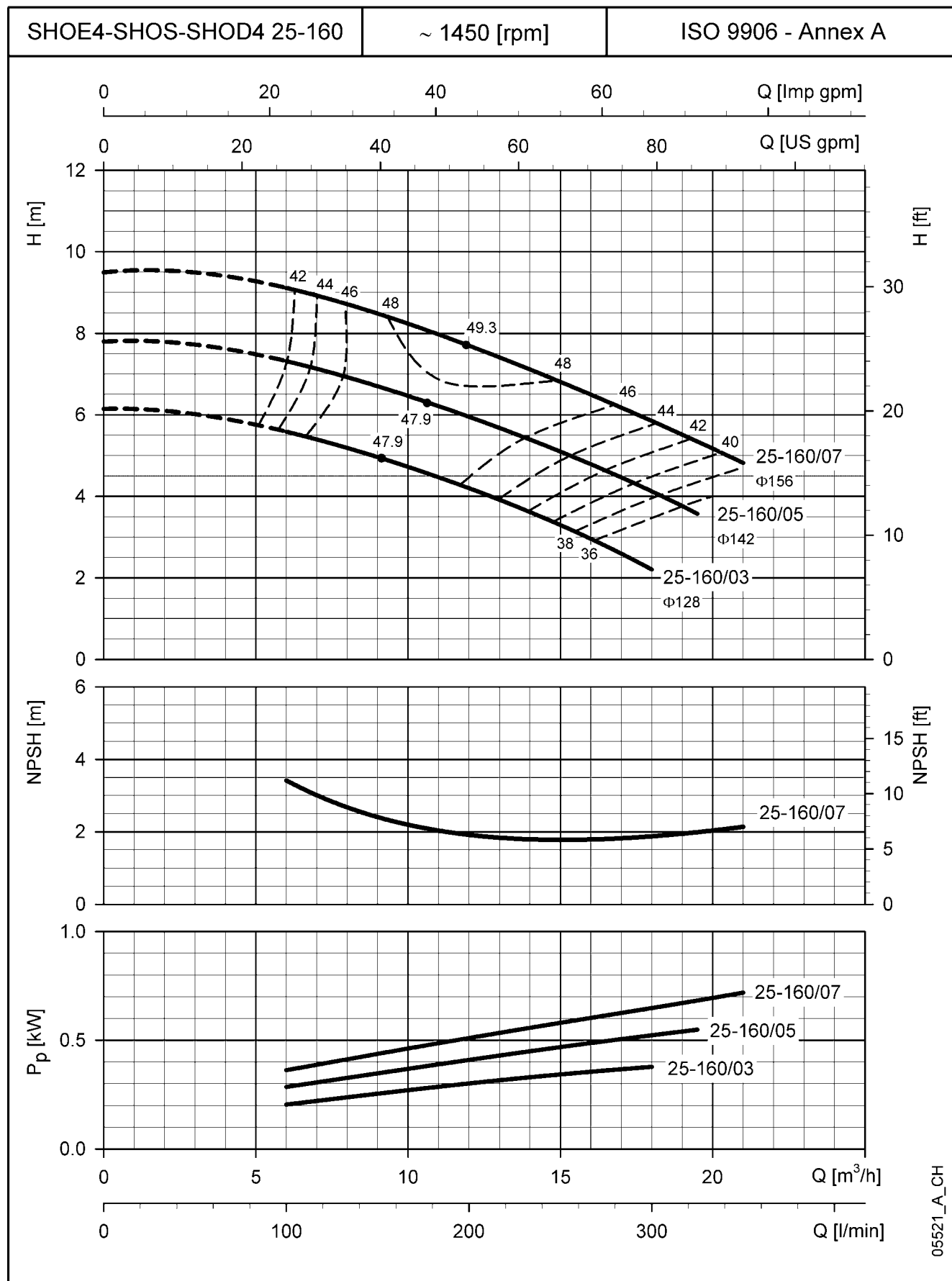
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SHOE4 - SHOS4 - SHOD4 SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



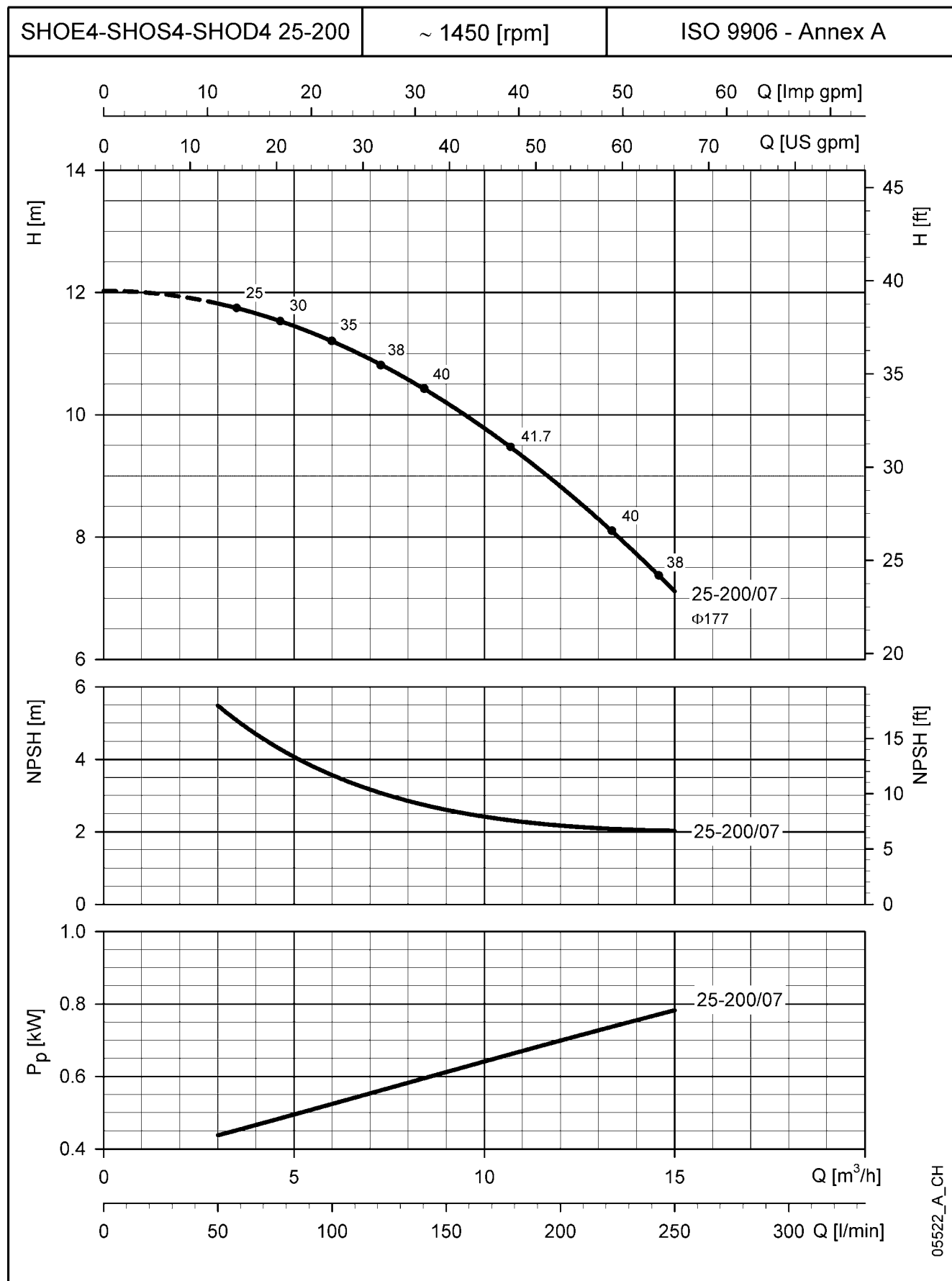
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SHOE4 - SHOS4 - SHOD4 SERIES

OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



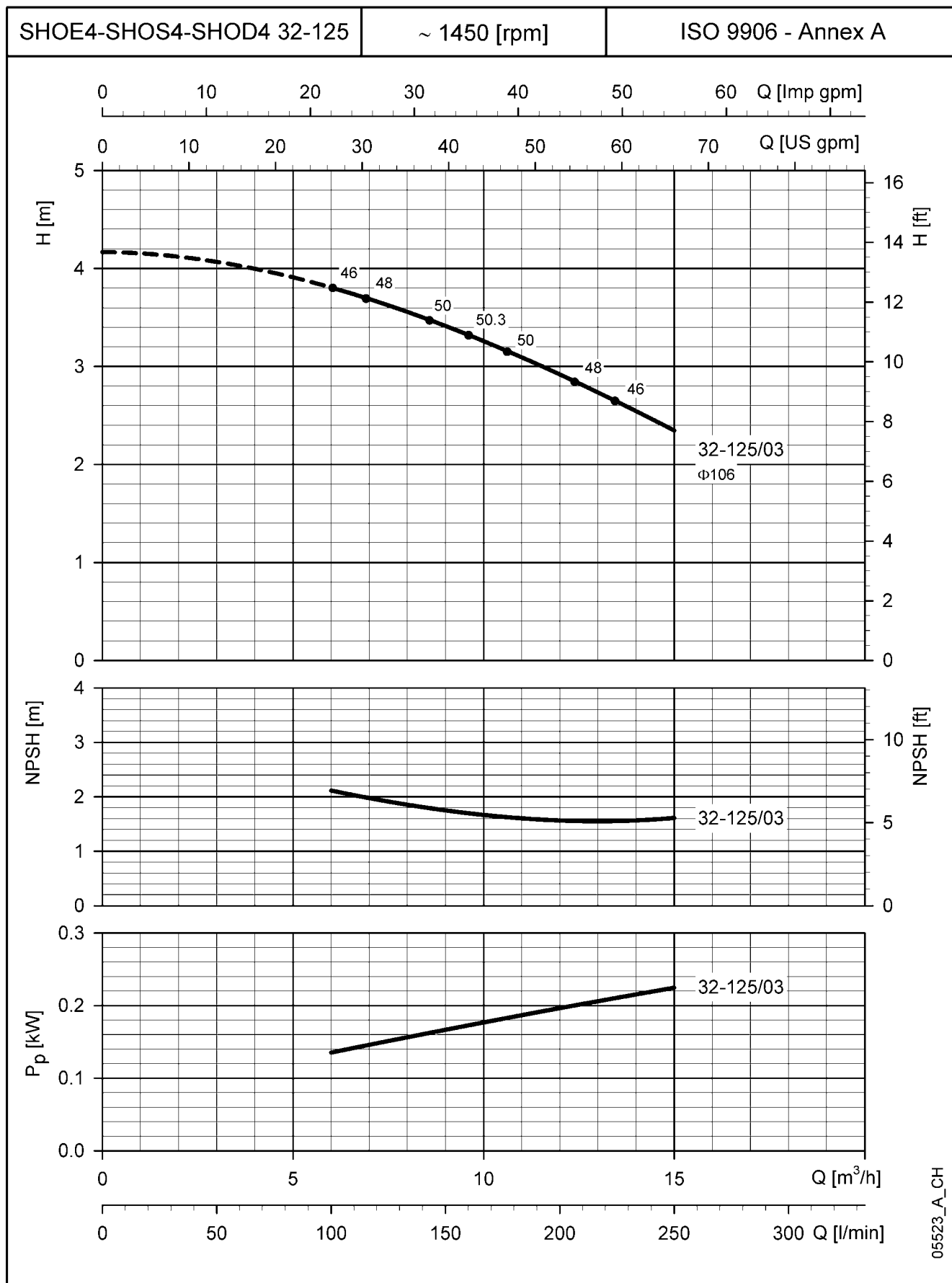
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SHOE4 - SHOS4 - SHOD4 SERIES

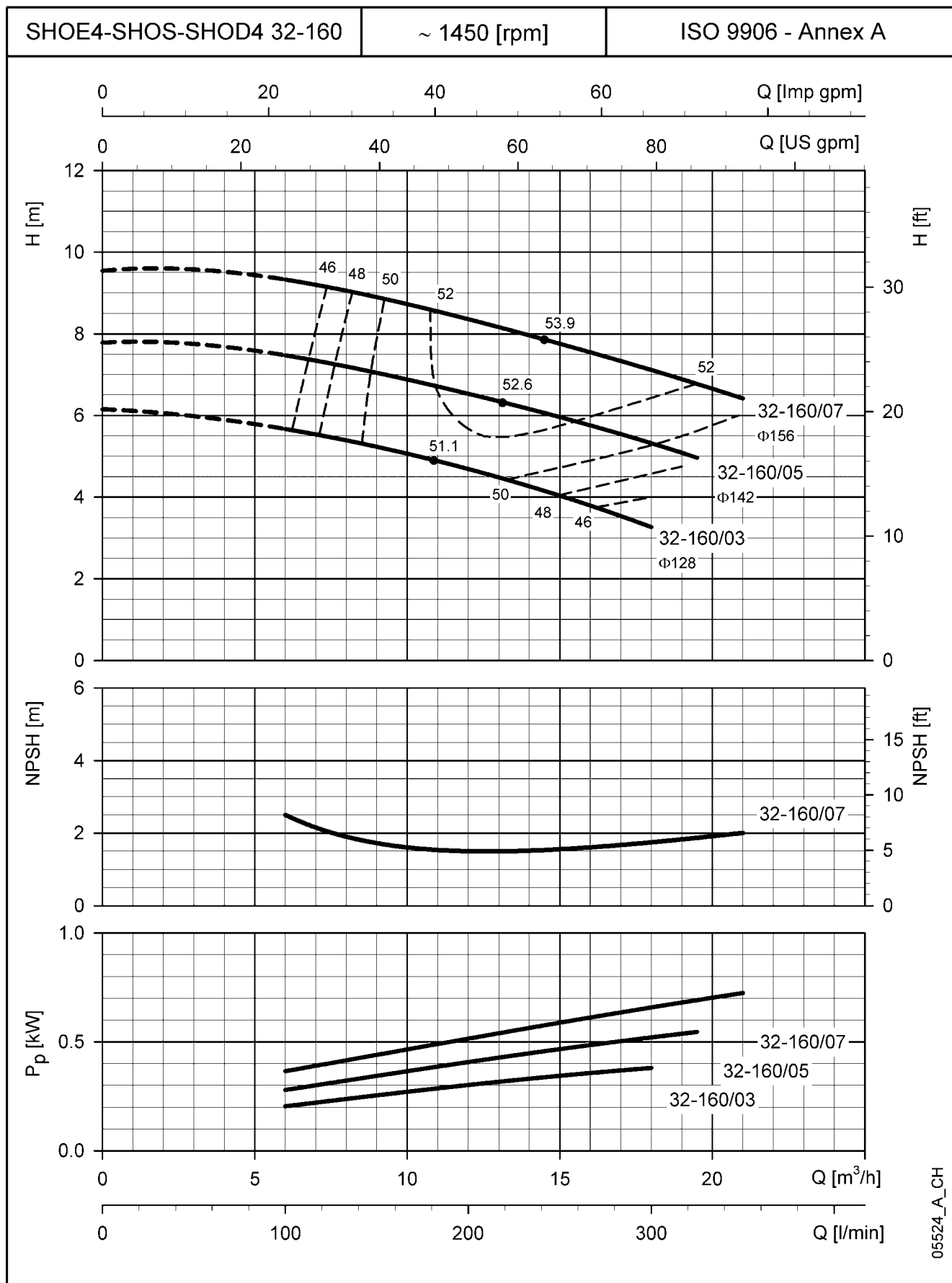
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



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SHOE4 - SHOS4 - SHOD4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

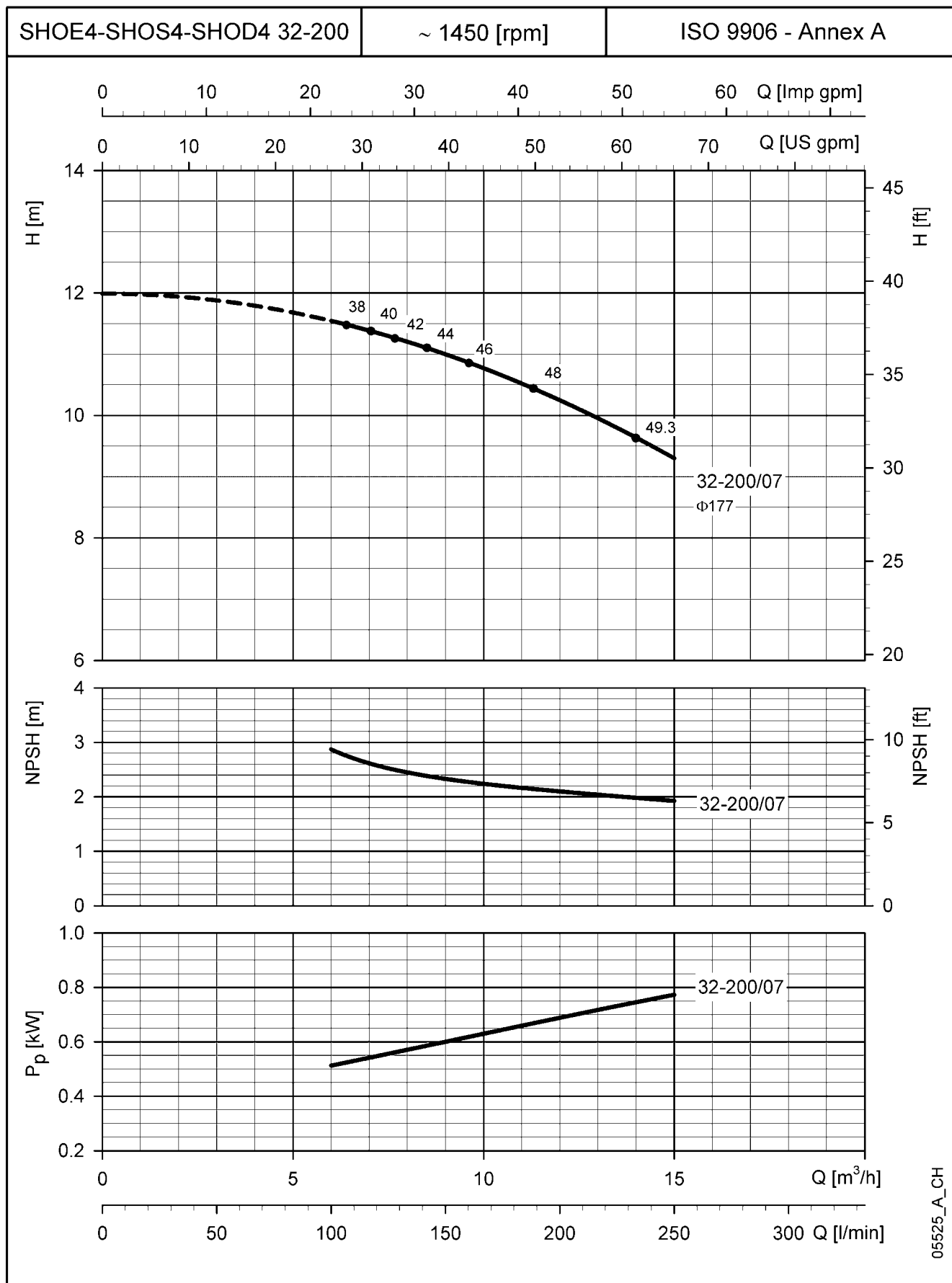
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SHOE4 - SHOS4 - SHOD4 SERIES

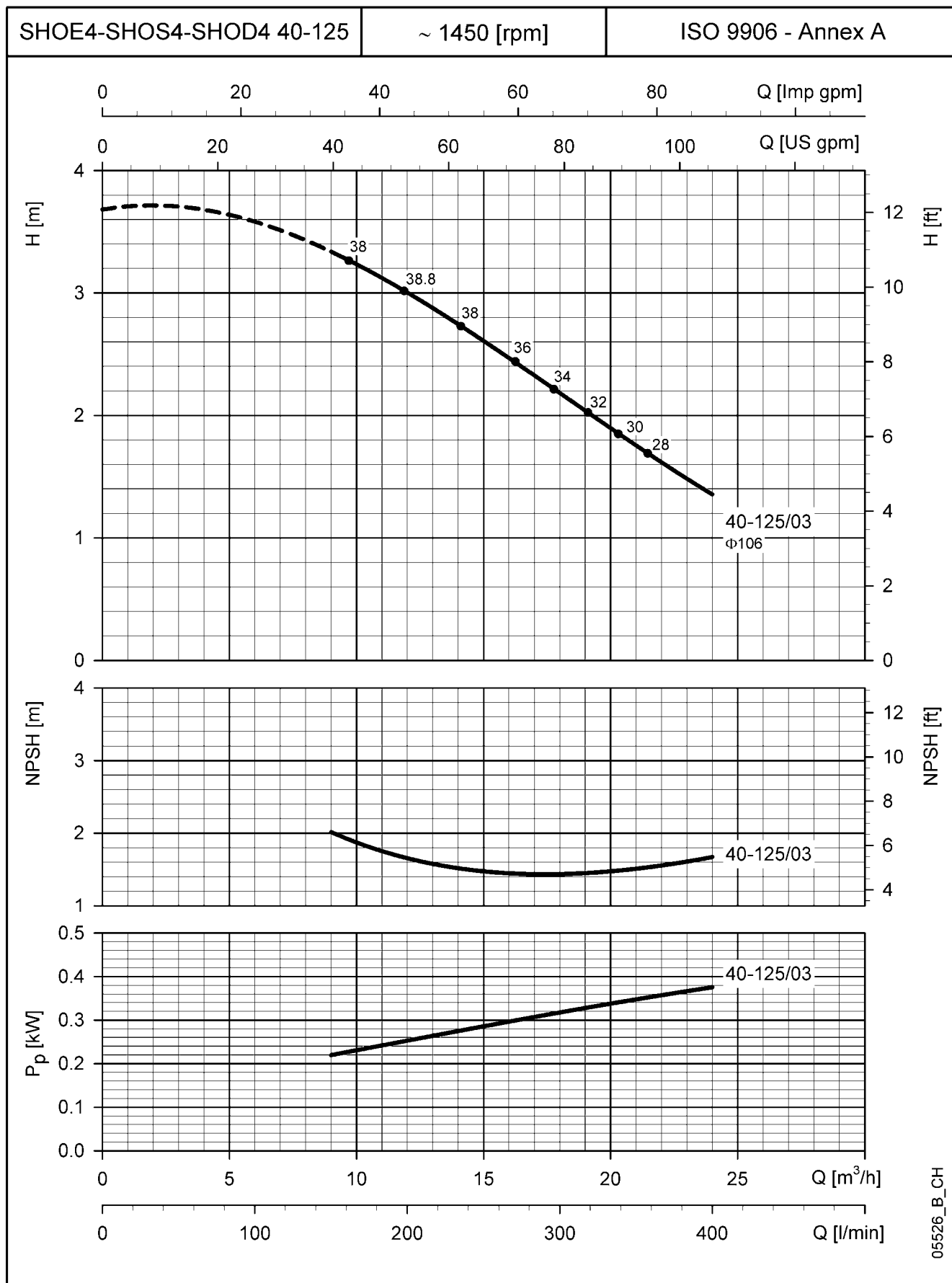
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



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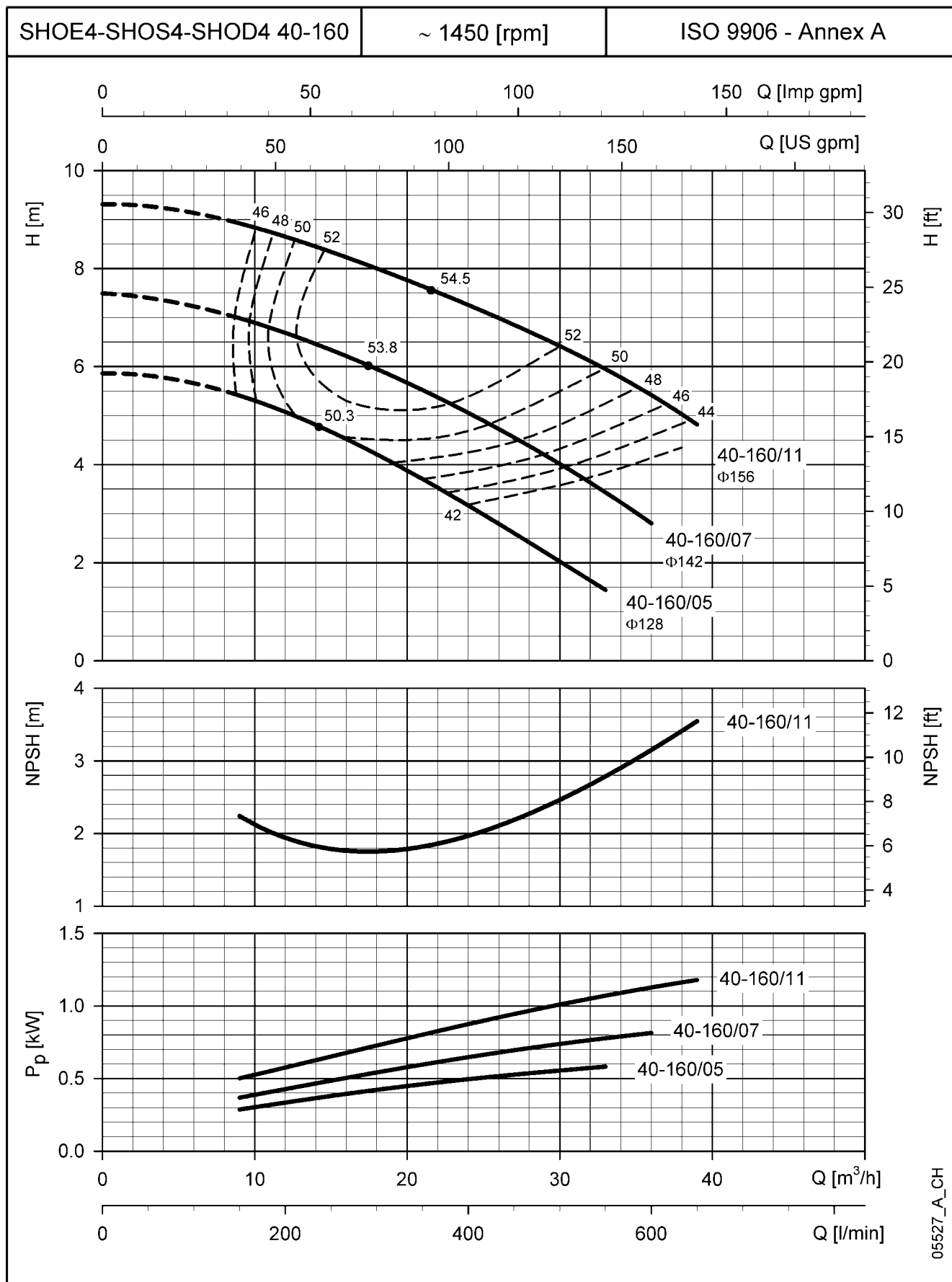
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SHOE4 - SHOS4 - SHOD4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

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SHOE4 - SHOS4 - SHOD4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES


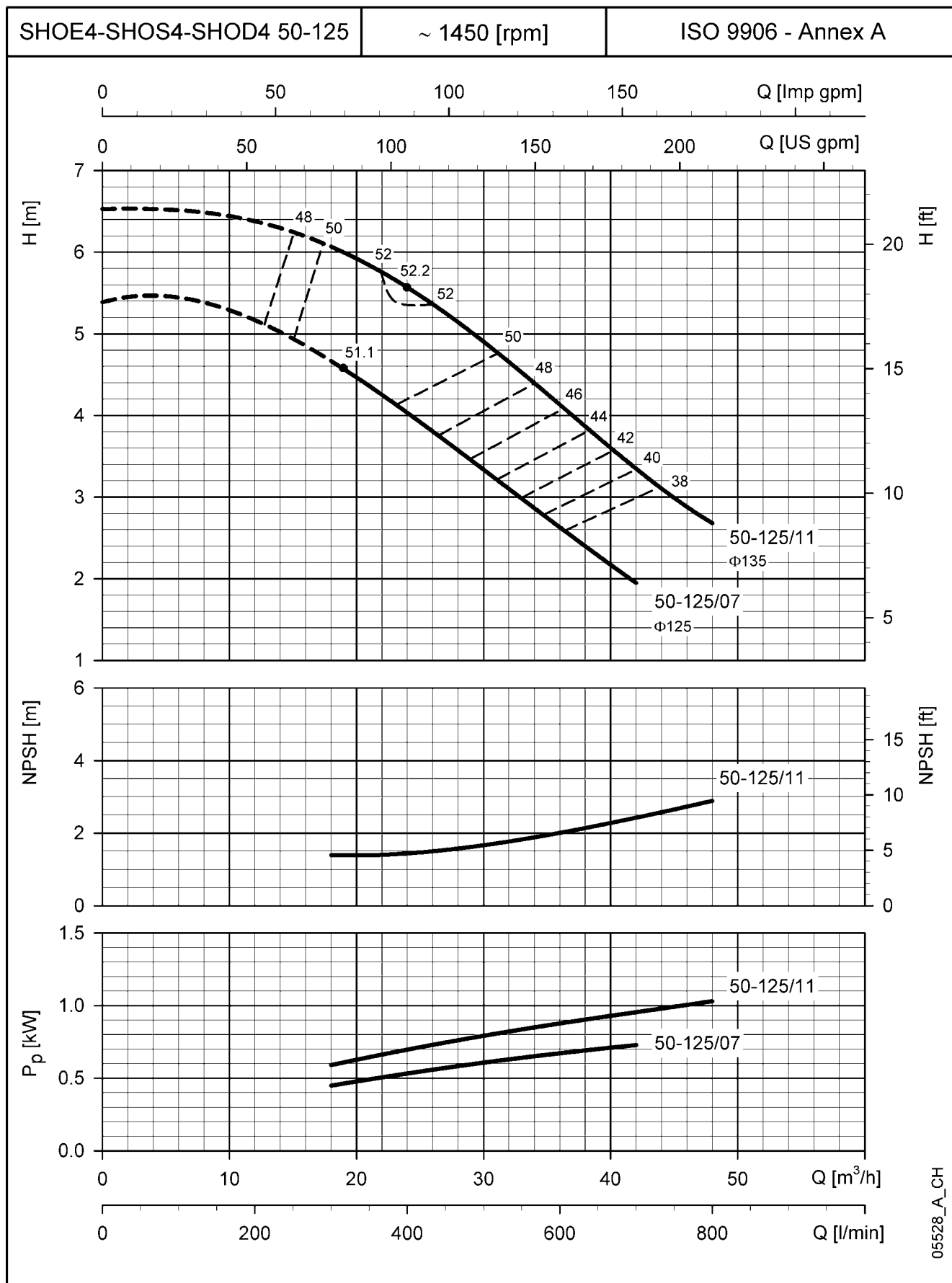
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SHOE4 - SHOS4 - SHOD4 SERIES

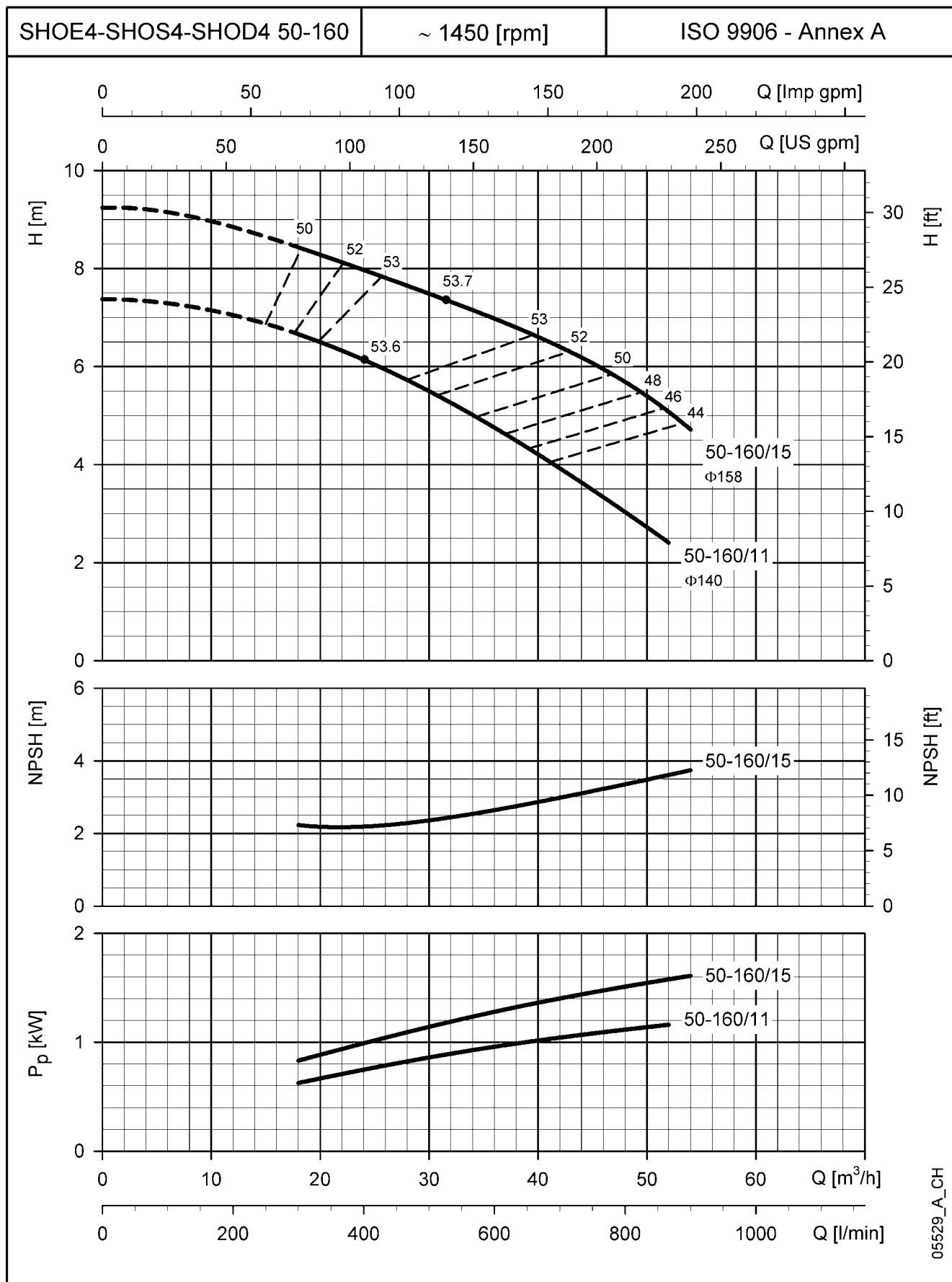
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES



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SHOE4 - SHOS4 - SHOD4 SERIES**OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**

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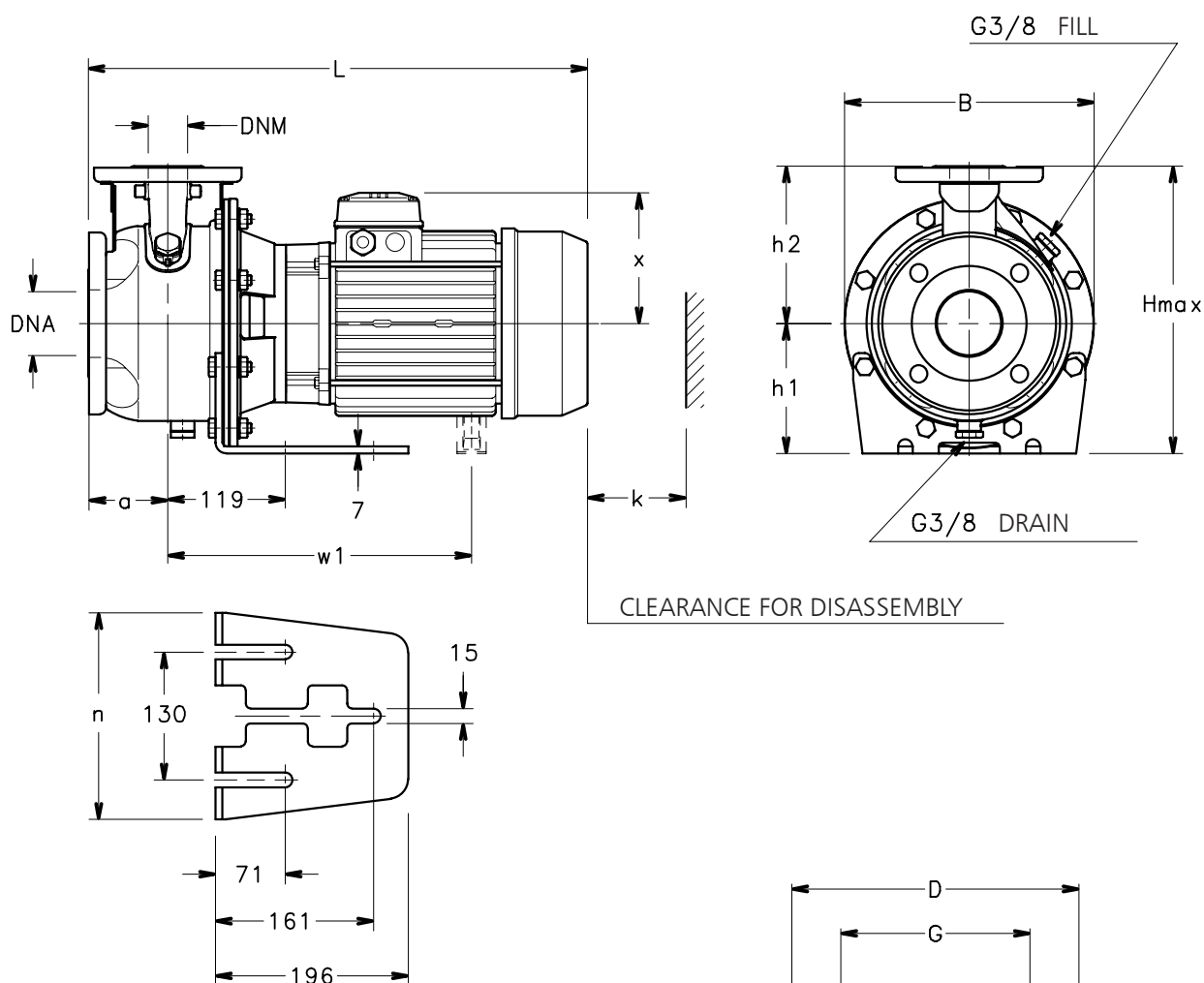
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SHO SERIES DIMENSIONS AND WEIGHTS

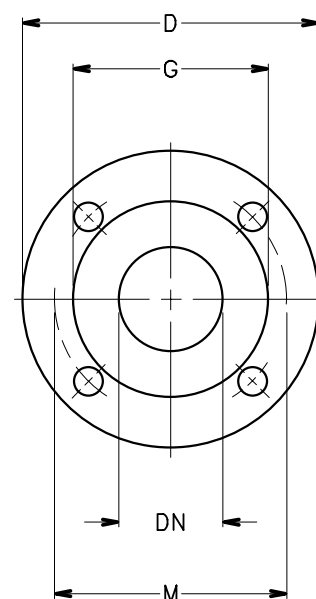
SHOE SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES



PUMP FLANGES

DN	D	M	G	HOLES		MAX THICK-NESS
				Nº	DIA.	
25	115	85	56	4	18	16
32	140	100	64	4	18	16
40	150	110	68	4	18	16
50	165	125	83	4	18	18
65	185	145	104	4	18	18



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SHOE SERIES

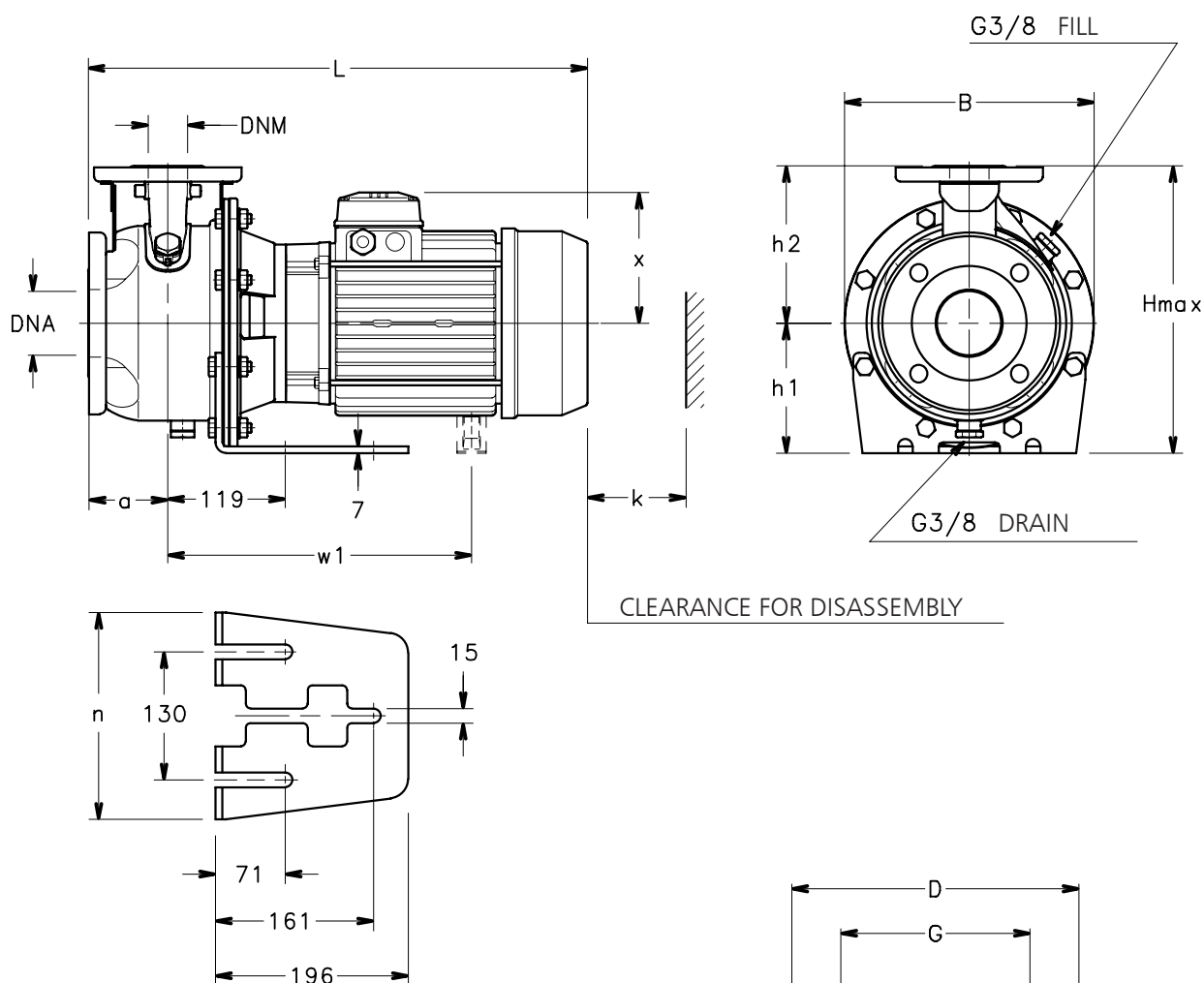
DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES

PUMP TYPE	DIMENSIONS (mm)								B	H	L	k	WEIGHT
	PUMP						SUPPORT						
	DNM	DNA	a	h2	w1	x	h1	n					
SHOE 25-125/11/D	25	50	80	140	-	129	112	190	219	252	453	98	22
SHOE 25-125/15/D	25	50	80	140	-	129	112	190	219	252	453	98	23
SHOE 25-125/22/P	25	50	80	140	-	134	112	190	219	252	488	98	28
SHOE 25-160/30/P	25	50	80	160	-	134	132	210	254	292	488	98	33
SHOE 25-160/40/P	25	50	80	160	-	154	132	210	254	292	509	98	40
SHOE 25-160/55/P	25	50	80	160	-	168	132	210	254	292	543	98	48
SHOE 25-200/30/P	25	50	80	180	-	134	160	230	284	340	488	98	36
SHOE 25-200/40/P	25	50	80	180	-	154	160	230	284	340	509	98	42
SHOE 25-200/55/P	25	50	80	180	-	168	160	230	284	340	543	98	51
SHOE 32-125/11/D	32	50	80	140	-	129	112	190	219	252	453	98	22
SHOE 32-125/15/D	32	50	80	140	-	129	112	190	219	252	453	98	23
SHOE 32-125/22/P	32	50	80	140	-	134	112	190	219	252	488	98	28
SHOE 32-160/30/P	32	50	80	160	-	134	132	210	254	292	488	98	33
SHOE 32-160/40/P	32	50	80	160	-	154	132	210	254	292	509	98	40
SHOE 32-160/55/P	32	50	80	160	-	168	132	210	254	292	543	98	48
SHOE 32-200/30/P	32	50	80	180	-	134	160	230	284	340	488	98	36
SHOE 32-200/40/P	32	50	80	180	-	154	160	230	284	340	509	98	42
SHOE 32-200/55/P	32	50	80	180	-	168	160	230	284	340	543	98	51
SHOE 40-125/15/D	40	65	80	140	-	129	112	190	219	252	463	100	24
SHOE 40-125/22/P	40	65	80	140	-	134	112	190	219	252	498	100	29
SHOE 40-125/30/P	40	65	80	140	-	134	112	190	219	252	498	100	32
SHOE 40-160/40/P	40	65	80	160	-	154	132	210	254	292	519	100	41
SHOE 40-160/55/P	40	65	80	160	-	168	132	210	254	300	553	100	49
SHOE 40-160/75/P	40	65	80	160	-	191	132	210	254	323	567	100	64
SHOE 50-125/55/P	50	65	100	160	-	168	132	210	254	300	573	104	49
SHOE 50-125/75/P	50	65	100	160	-	191	132	210	254	323	587	104	65
SHOE 50-160/92/P	50	65	100	180	363	191	160	210	254	351	625	104	60
SHOE 50-160/110/P	50	65	100	180	363	191	160	210	254	351	625	104	63

shoe-2p50-en_d_td

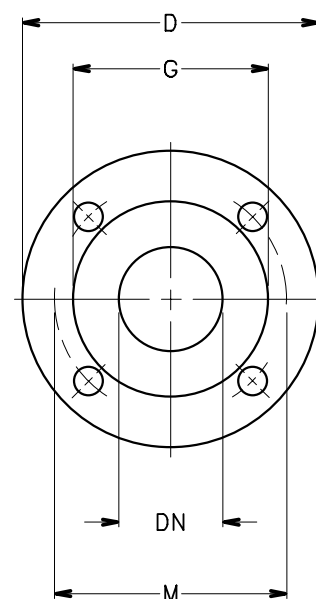
SHOE4 SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 4 POLES



PUMP FLANGES

DN	D	M	G	HOLES		MAX THICK-NESS
				Nº	DIA.	
25	115	85	56	4	18	16
32	140	100	64	4	18	16
40	150	110	68	4	18	16
50	165	125	83	4	18	18
65	185	145	104	4	18	18



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SHOE4 SERIES

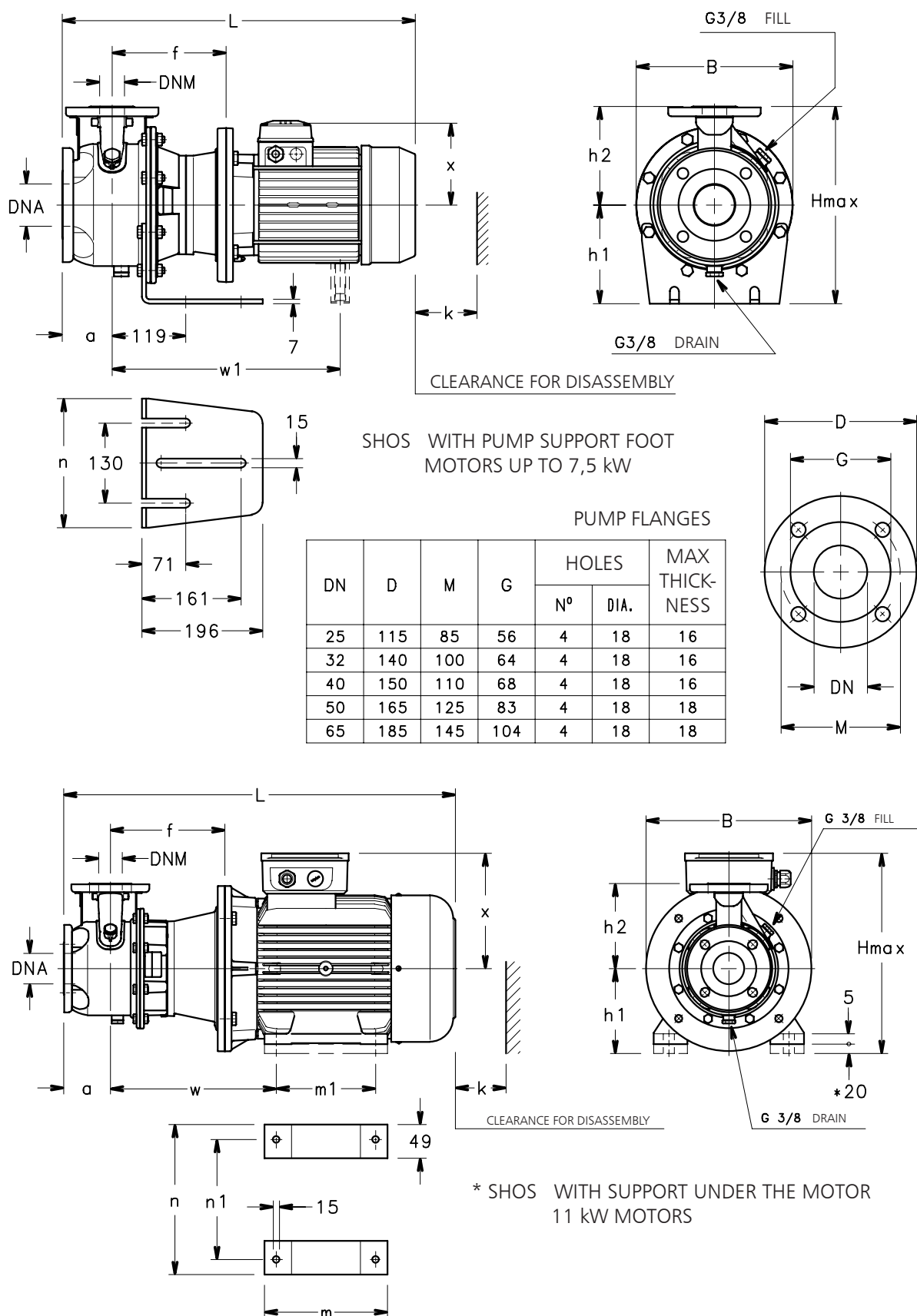
DIMENSIONS AND WEIGHTS AT 50 Hz, 4 POLES

PUMP TYPE	DIMENSIONS (mm)							B	H max	L	k	WEIGHT kg
	DNM	DNA	PUMP				n					
			a	h2	x	h1						
SHOE4 25-125/03	25	50	80	140	121	112	190	219	252	421	98	19
SHOE4 25-160/03	25	50	80	160	121	132	210	254	292	421	98	23
SHOE4 25-160/05	25	50	80	160	129	132	210	254	292	453	98	25
SHOE4 25-160/07/C	25	50	80	160	128	132	210	254	292	421	98	27
SHOE4 25-200/07/C	25	50	80	180	128	160	230	284	340	421	98	30
SHOE4 32-125/03	32	50	80	140	121	112	190	219	252	421	98	19
SHOE4 32-160/03	32	50	80	160	121	132	210	254	292	421	98	23
SHOE4 32-160/05	32	50	80	160	129	132	210	254	292	453	98	25
SHOE4 32-160/07/C	32	50	80	160	128	132	210	354	292	421	98	27
SHOE4 32-200/07/C	32	50	80	180	128	160	230	284	340	421	98	30
SHOE4 40-125/03	40	65	80	140	121	112	190	219	252	431	100	21
SHOE4 40-160/05	40	65	80	160	129	132	210	254	292	463	100	26
SHOE4 40-160/07/C	40	65	80	160	128	132	210	254	292	431	100	27
SHOE4 40-160/11/P	40	65	80	160	134	132	210	254	292	498	100	31
SHOE4 50-125/07/C	50	65	100	160	128	132	210	254	292	451	104	28
SHOE4 50-125/11/P	50	65	100	160	134	132	210	254	292	518	104	34
SHOE4 50-160/11/P	50	65	100	180	134	160	210	254	340	518	104	35
SHOE4 50-160/15/P	50	65	100	180	134	160	210	254	340	518	104	38

shoe4-4p50-en_d_td

SERIE SHOS

DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES



SERIE SHOS

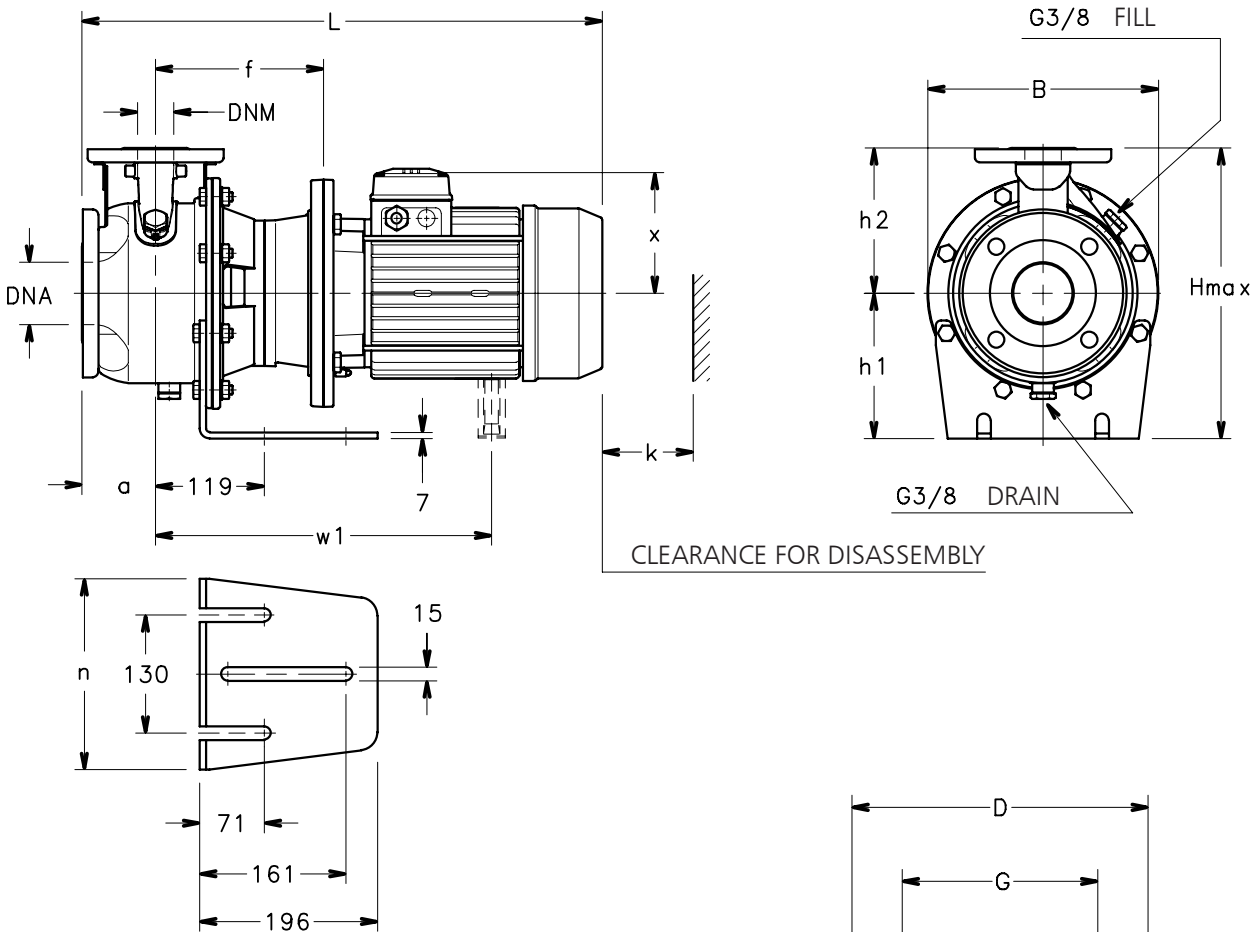
DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES

PUMP TYPE	DIMENSIONS (mm)													B	H	L	k	WEIGHT
	PUMP								SUPPORT									
	DNM	DNA	a	f	h2	w	w1	x	h1	m	m1	n	n1					
SHOS 25-125/11/D	25	50	80	165	140	-	-	129	112	-	-	190	-	219	252	508	98	26
SHOS 25-125/15/D	25	50	80	165	140	-	-	129	112	-	-	190	-	219	252	508	98	27
SHOS 25-125/22/P	25	50	80	165	140	-	-	134	112	-	-	190	-	219	252	543	98	33
SHOS 25-160/30/P	25	50	80	175	160	-	-	134	160	-	-	210	-	254	320	553	98	42
SHOS 25-160/40/P	25	50	80	175	160	-	-	154	160	-	-	210	-	254	320	574	98	47
SHOS 25-160/55/P	25	50	80	202	160	-	409	168	160	-	-	210	-	254	320	657	98	60
SHOS 25-200/30/P	25	50	80	175	180	-	-	134	160	-	-	230	-	284	340	553	98	44
SHOS 25-200/40/P	25	50	80	175	180	-	-	154	160	-	-	230	-	284	340	574	98	50
SHOS 25-200/55/P	25	50	80	202	180	-	409	168	160	-	-	230	-	284	340	657	98	63
SHOS 32-125/11/D	32	50	80	165	140	-	-	129	112	-	-	190	-	219	252	508	98	26
SHOS 32-125/15/D	32	50	80	165	140	-	-	129	112	-	-	190	-	219	252	508	98	27
SHOS 32-125/22/P	32	50	80	165	140	-	-	134	112	-	-	190	-	219	252	543	98	33
SHOS 32-160/30/P	32	50	80	175	160	-	-	134	160	-	-	210	-	254	320	553	98	42
SHOS 32-160/40/P	32	50	80	175	160	-	-	154	160	-	-	210	-	254	320	574	98	47
SHOS 32-160/55/P	32	50	80	202	160	-	409	168	160	-	-	210	-	254	320	657	98	60
SHOS 32-200/30/P	32	50	80	175	180	-	-	134	160	-	-	230	-	284	340	553	98	44
SHOS 32-200/40/P	32	50	80	175	180	-	-	154	160	-	-	230	-	284	340	574	98	50
SHOS 32-200/55/P	32	50	80	202	180	-	409	168	160	-	-	230	-	284	340	657	98	63
SHOS 40-125/15/D	40	65	80	175	140	-	-	129	112	-	-	190	-	219	252	518	100	28
SHOS 40-125/22/P	40	65	80	175	140	-	-	134	112	-	-	190	-	219	252	553	100	34
SHOS 40-125/30/P	40	65	80	185	140	-	-	134	160	-	-	190	-	219	300	563	100	40
SHOS 40-160/40/P	40	65	80	185	160	-	-	154	160	-	-	210	-	254	320	584	100	48
SHOS 40-160/55/P	40	65	80	212	160	-	419	168	160	-	-	210	-	254	328	667	100	61
SHOS 40-160/75/P	40	65	80	212	160	-	417	191	160	-	-	210	-	254	351	659	100	79
SHOS 50-125/55/P	50	65	100	212	160	-	419	168	160	-	-	210	-	254	328	687	104	61
SHOS 50-125/75/P	50	65	100	212	160	-	417	191	160	-	-	210	-	254	351	679	104	79
SHOS 50-160/110A/P	50	65	100	242	180	350	-	240	180	304	210	304	254	350	420	836	104	117
SHOS 50-160/110/P	50	65	100	242	180	350	-	240	180	304	210	304	254	350	420	836	104	117

* Motor shim (20 mm) on request

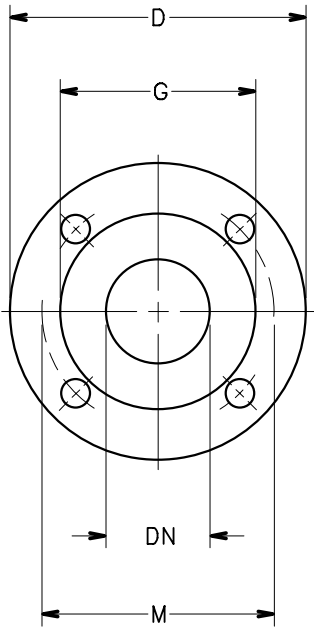
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SHOS4 SERIES
DIMENSIONS AND WEIGHTS AT 50 Hz, 4 POLES



PUMP FLANGES

DN	D	M	G	HOLES		MAX THICKNESS
				N°	DIA.	
25	115	85	56	4	18	16
32	140	100	64	4	18	16
40	150	110	68	4	18	16
50	165	125	83	4	18	18
65	185	145	104	4	18	18



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SHOS4 SERIES

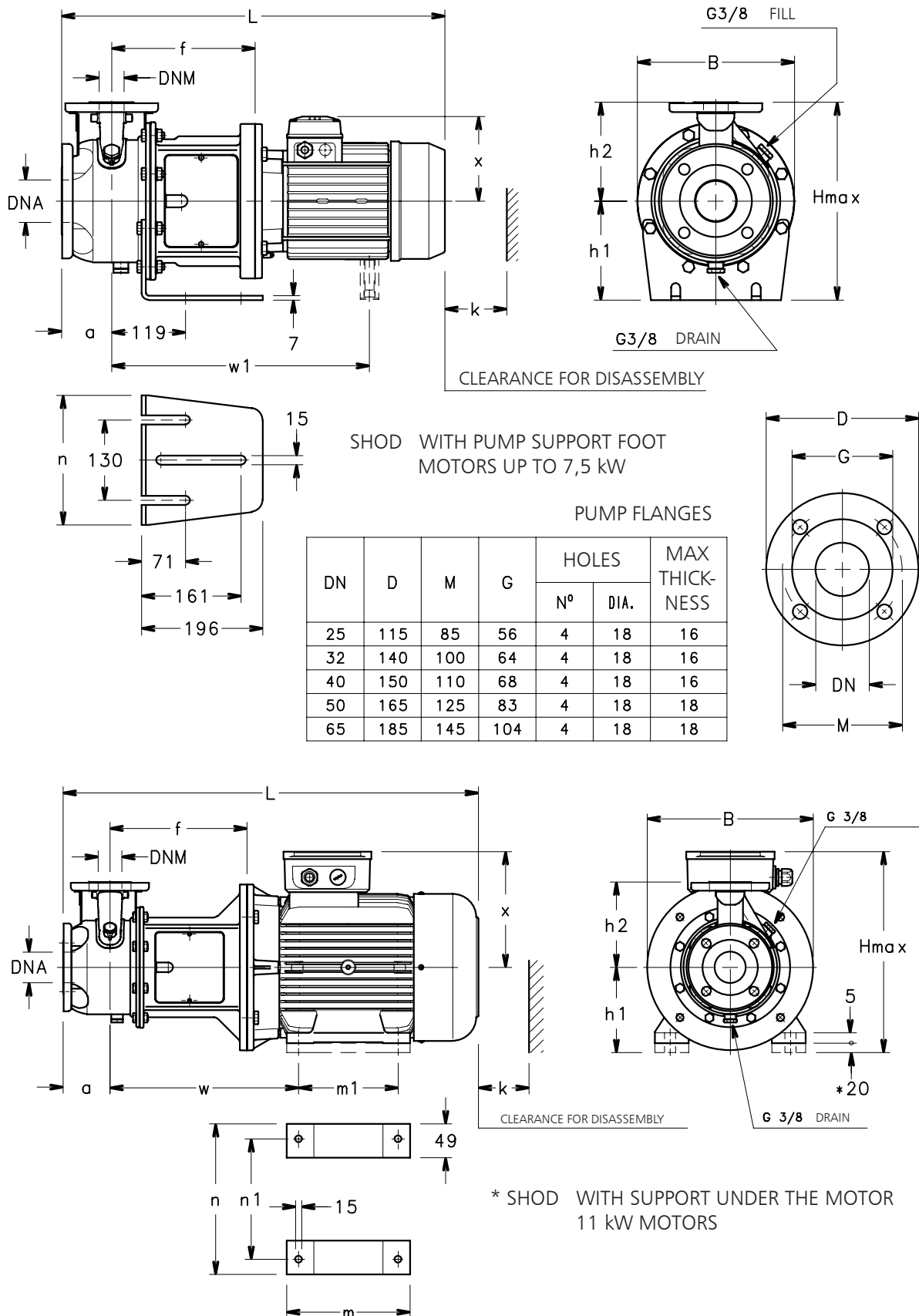
DIMENSIONS AND WEIGHTS AT 50 Hz, 4 POLES

PUMP TYPE	DIMENSIONS (mm)								B	H max	L	k	WEIGHT kg
	PUMP						SUPPORT						
	DNM	DNA	a	f	h2	x	h1	n					
SHOS4 25-125/03	25	50	80	165	140	129	112	190	219	252	508	98	24
SHOS4 25-160/03	25	50	80	165	160	129	132	210	254	292	508	98	27
SHOS4 25-160/05	25	50	80	165	160	129	132	210	254	292	508	98	27
SHOS4 25-160/07/C	25	50	80	165	160	128	132	210	254	292	476	98	29
SHOS4 25-200/07/C	25	50	80	165	180	128	160	230	284	340	476	98	33
SHOS4 32-125/03	32	50	80	165	140	129	112	190	219	252	508	98	24
SHOS4 32-160/03	32	50	80	165	160	129	132	210	254	292	508	98	27
SHOS4 32-160/05	32	50	80	165	160	129	132	210	254	292	508	98	27
SHOS4 32-160/07/C	32	50	80	165	160	128	132	210	254	292	476	98	29
SHOS4 32-200/07/C	32	50	80	165	180	128	160	230	284	340	476	98	33
SHOS4 40-125/03	40	65	80	175	140	129	112	190	219	252	518	100	25
SHOS4 40-160/05	40	65	80	175	160	129	132	210	254	292	518	100	29
SHOS4 40-160/07/C	40	65	80	175	160	128	132	210	254	292	486	100	31
SHOS4 40-160/11/P	40	65	80	175	160	134	132	210	254	292	553	100	37
SHOS4 50-125/07/C	50	65	100	175	160	128	132	210	254	292	506	104	31
SHOS4 50-125/11/P	50	65	100	175	160	134	132	210	254	292	573	104	38
SHOS4 50-160/11/P	50	65	100	175	180	134	160	230	254	340	573	104	39
SHOS4 50-160/15/P	50	65	100	175	180	134	160	230	254	340	573	104	41

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SHOD SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES



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SHOD SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES

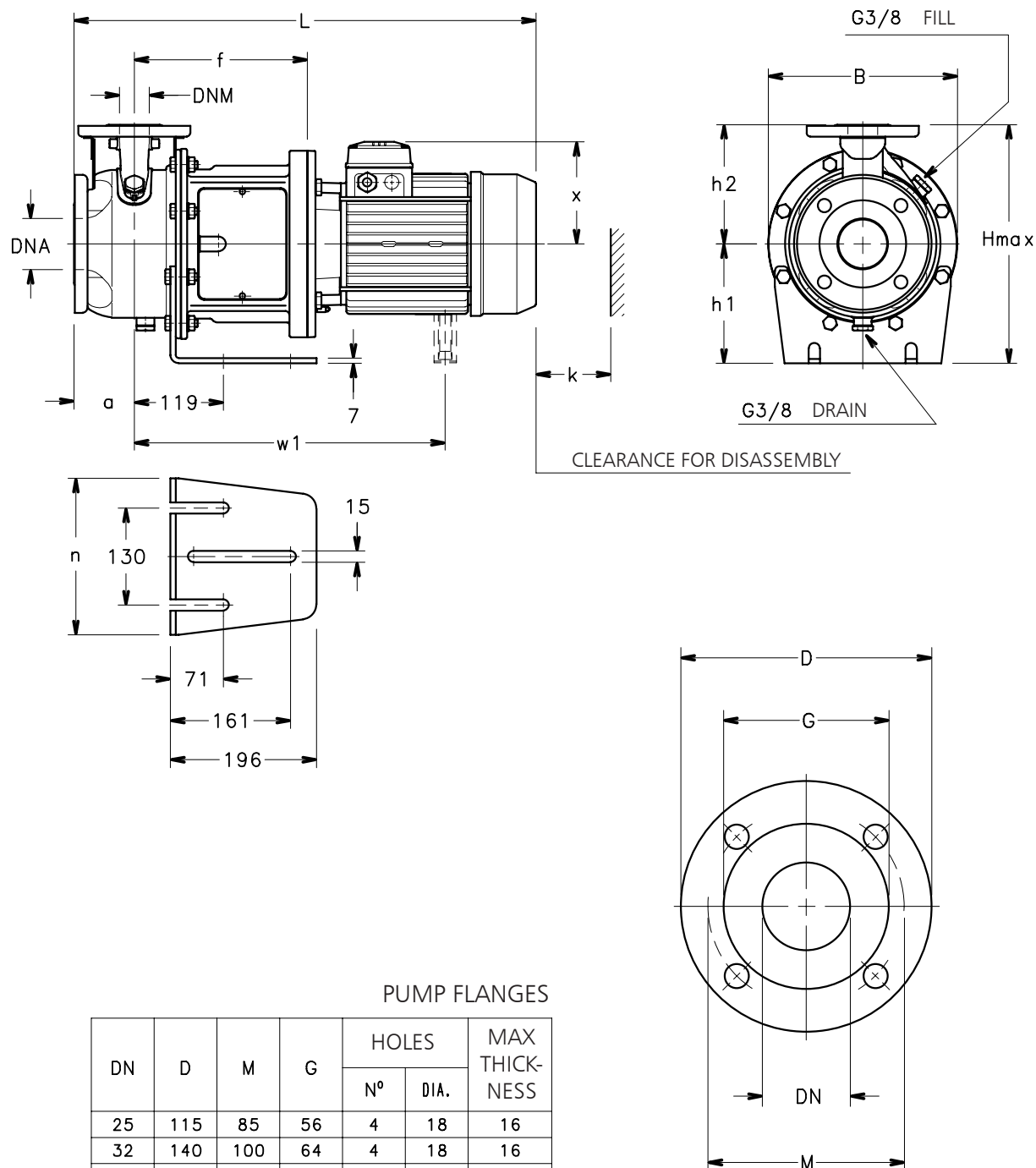
PUMP TYPE	DIMENSIONS (mm)													B	H	L	k	WEIGHT
	PUMP								SUPPORT									
	DNM	DNA	a	f	h2	w	w1	x	h1	m	m1	n	n1					
SHOD 25-125/11/D	25	50	80	212	140	-	-	129	112	-	-	190	-	219	252	555	98	28
SHOD 25-125/15/D	25	50	80	212	140	-	-	129	112	-	-	190	-	219	252	555	98	29
SHOD 25-125/22/P	25	50	80	212	140	-	-	134	112	-	-	190	-	219	252	590	98	35
SHOD 25-160/30/P	25	50	80	222	160	-	-	134	160	-	-	210	-	254	320	600	98	44
SHOD 25-160/40/P	25	50	80	222	160	-	-	154	160	-	-	210	-	254	320	621	98	49
SHOD 25-160/55/P	25	50	80	249	160	-	456	168	160	-	-	210	-	254	320	704	98	61
SHOD 25-200/30/P	25	50	80	222	180	-	-	134	160	-	-	230	-	284	340	600	98	46
SHOD 25-200/40/P	25	50	80	222	180	-	-	154	160	-	-	230	-	284	340	621	98	52
SHOD 25-200/55/P	25	50	80	249	180	-	456	168	160	-	-	230	-	284	340	704	98	65
SHOD 32-125/11/D	32	50	80	212	140	-	-	129	112	-	-	190	-	219	252	555	98	28
SHOD 32-125/15/D	32	50	80	212	140	-	-	129	112	-	-	190	-	219	252	555	98	29
SHOD 32-125/22/P	32	50	80	212	140	-	-	134	112	-	-	190	-	219	252	590	98	35
SHOD 32-160/30/P	32	50	80	222	160	-	-	134	160	-	-	210	-	254	320	600	98	44
SHOD 32-160/40/P	32	50	80	222	160	-	-	154	160	-	-	210	-	254	320	621	98	49
SHOD 32-160/55/P	32	50	80	249	160	-	456	168	160	-	-	210	-	254	320	704	98	61
SHOD 32-200/30/P	32	50	80	222	180	-	-	134	160	-	-	230	-	284	340	600	98	46
SHOD 32-200/40/P	32	50	80	222	180	-	-	154	160	-	-	230	-	284	340	621	98	52
SHOD 32-200/55/P	32	50	80	249	180	-	456	168	160	-	-	230	-	284	340	704	98	65
SHOD 40-125/15/D	40	65	80	222	140	-	-	129	112	-	-	190	-	219	252	565	100	29
SHOD 40-125/22/P	40	65	80	222	140	-	-	134	112	-	-	190	-	219	252	600	100	35
SHOD 40-125/30/P	40	65	80	232	140	-	-	134	160	-	-	190	-	219	300	610	100	41
SHOD 40-160/40/P	40	65	80	232	160	-	-	154	160	-	-	210	-	254	320	631	100	51
SHOD 40-160/55/P	40	65	80	259	160	-	466	168	160	-	-	210	-	254	328	714	100	65
SHOD 40-160/75/P	40	65	80	259	160	-	464	191	160	-	-	210	-	254	351	706	100	82
SHOD 50-125/55/P	50	65	100	259	160	-	466	168	160	-	-	210	-	254	328	734	104	65
SHOD 50-125/75/P	50	65	100	259	160	-	464	191	160	-	-	210	-	254	351	726	104	83
SHOD 50-160/110A/P	50	65	100	289	180	397	-	240	180	304	210	304	254	350	420	883	104	120
SHOD 50-160/110/P	50	65	100	289	180	397	-	240	180	304	210	304	254	350	420	883	104	120

* Motor shim (20 mm) on request

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SHOD4 SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 4 POLES



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SHOD4 SERIES

DIMENSIONS AND WEIGHTS AT 50 Hz, 4 POLES

PUMP TYPE	DIMENSIONS (mm)								B	H max	L	k	WEIGHT kg
	PUMP						SUPPORT						
	DNM	DNA	a	f	h2	x	h1	n					
SHOD4 25-125/03	25	50	80	212	140	129	112	190	219	252	555	98	26
SHOD4 25-160/03	25	50	80	212	160	129	132	210	254	292	555	98	29
SHOD4 25-160/05	25	50	80	212	160	129	132	210	254	292	555	98	29
SHOD4 25-160/07/C	25	50	80	212	160	128	132	210	254	292	523	98	31
SHOD4 25-200/07/C	25	50	80	212	180	128	160	230	284	340	523	98	34
SHOD4 32-125/03	32	50	80	212	140	129	112	190	219	252	555	98	26
SHOD4 32-160/03	32	50	80	212	160	129	132	210	254	292	555	98	29
SHOD4 32-160/05	32	50	80	212	160	129	132	210	254	292	555	98	29
SHOD4 32-160/07/C	32	50	80	212	160	128	132	210	254	292	523	98	31
SHOD4 32-200/07/C	32	50	80	212	180	128	160	230	284	340	523	98	34
SHOD4 40-125/03	40	65	80	222	140	129	112	190	219	252	565	100	26
SHOD4 40-160/05	40	65	80	222	160	129	132	210	254	292	565	100	29
SHOD4 40-160/07/C	40	65	80	222	160	128	132	210	254	292	533	100	31
SHOD4 40-160/11/P	40	65	80	222	160	134	132	210	254	292	600	100	38
SHOD4 50-125/07/C	50	65	100	222	160	128	132	210	254	292	553	104	32
SHOD4 50-125/11/P	50	65	100	222	160	134	132	210	254	292	620	104	38
SHOD4 50-160/11/P	50	65	100	222	180	134	160	230	254	340	620	104	39
SHOD4 50-160/15/P	50	65	100	222	180	134	160	230	254	340	620	104	41

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TECHNICAL APPENDIX

TYPICAL APPLICATIONS OF CO - SHO SERIES ELECTRIC PUMPS

Water Purification:

De-ionized water
 Water treatment
 Filtration
 Commercial pools

Food and Drink:

Food processing
 Bottle washing
 Citrus processing
 Dish washing
 Brewing
 Sanitary ware

Medical:

Laser cooling
 Medical chillers
 Sanitary equipment

Heating, Ventilating & Air Conditioning (HVAC)

Air scrubbers
 Water re-circulation
 Cooling towers
 Cooling systems
 Temperature control
 Chillers
 Induction heating
 Heat exchangers
 Water heating

Graphics:

Film washing
 Cooling

Plastics:

Extrusion machines
 Temperature control
 Manufacture of polymers

Waste Management:

Waste treatment

Machine Tool:

Degreasing
 Parts washing
 Chemical treatment
 Heat treatment

Laundry:

Industrial and Commercial washing

General Industry:

Spray Booths
 Light chemical transfer
 Booster systems
 Firefighting systems

NPSH

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

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

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

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

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

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

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

where:

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

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

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

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

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

Friction loss is shown in the tables at pages 100-101 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.

FLOW RESISTANCE

TABLE OF FLOW RESISTANCE IN 100 m OF A NEW AND STRAIGHT CAST IRON PIPELINE

FLOW RATE			NOMINAL DIAMETER IN mm AND INCHES																	
m³/h	l/min.		15 ½"	20 ¾"	25 1"	32 1 ¼"	40 1 ½"	50 2"	65 2 ½"	80 3"	100 4"	125 5"	150 6"	175 7"	200 8"	250 10"	300 12"	350 14"	400 16"	
0,6	10	V hr	0,94 11,8	0,53 2,82	0,34 1	0,21 0,25														
0,9	15	V hr	1,42 25,1	0,8 6,04	0,51 2,16	0,31 0,55														
1,2	20	V hr	1,89 43,1	1,06 10,4	0,68 3,72	0,41 0,95	0,27 0,31													
1,5	25	V hr	2,36 64,5	1,33 15,8	0,85 5,68	0,52 1,47	0,33 0,47													
1,8	30	V hr	2,83 92	1,59 22,3	1,02 8	0,62 2,09	0,4 0,66													
2,1	35	V hr	3,3 123	1,86 29,8	1,19 10,8	0,73 2,81	0,46 0,89	0,3												
2,4	40	V hr	3,77 164	2,12 38,2	1,36 13,8	0,83 2,65	0,53 1,15	0,34 0,4												
3	50	V hr	4,72 246	2,65 58,2	1,7 21,5	1,04 5,6	0,66 1,75	0,42 0,61												
3,6	60	V hr		3,18 82	2,04 30	1,24 8	0,8 2,48	0,51 0,86												
4,2	70	V hr		3,72 110	2,38 40	1,45 10,8	0,93 3,33	0,59 1,14												
4,8	80	V hr		4,25 141	2,72 51,5	1,66 13,9	1,06 4,3	0,68 1,46												
5,4	90	V hr			3,06 64	1,87 17,5	1,19 5,4	0,76 1,82	0,45 0,46											
6	100	V hr			3,4 79	2,07 21,4	1,33 6,6	0,85 2,22	0,5 0,56											
7,5	125	V hr			4,25 120	2,59 33	1,66 10	1,06 3,4	0,63 0,86											
9	150	V hr				3,11 47	1,99 14,2	1,27 4,74	0,75 1,21	0,5 0,43										
10,5	175	V hr				3,63 63	2,32 19	1,49 6,3	0,88 1,63	0,58 0,57										
12	200	V hr				4,15 82	2,65 24,5	1,7 8,1	1,01 2,1	0,66 0,74										
15	250	V hr				5,18 126	3,32 37,5	2,12 12,3	1,26 3,2	0,83 1,12	0,53 0,36									
18	300	V hr					3,98 53	2,55 17,3	1,51 4,5	1 1,58	0,64 0,51									
24	400	V hr					5,31 92	3,4 29,5	2,01 7,8	1,33 2,7	0,85 0,89									
30	500	V hr					6,63 140	4,25 44,8	2,51 12	1,66 4,13	1,06 1,36	0,68 0,48								
36	600	V hr						5,1 63	3,02 16,9	1,99 5,8	1,27 1,93	0,82 0,68								
42	700	V hr						5,94 84	3,52 22,6	2,32 7,8	1,49 2,6	0,95 0,9								
48	800	V hr						6,79 108	4,02 29	2,65 10	1,70 3,35	1,09 1,16	0,75 0,43							
54	900	V hr						7,64 134	4,52 36	2,99 12,5	1,91 4,2	1,22 1,45	0,85 0,54							
60	1000	V hr						5,03 44,5	3,32 15,2	2,12 5,14	1,36 1,76	0,94 0,66								
75	1250	V hr						6,28 68	4,15 23	2,65 7,9	1,70 2,68	1,18 1	0,87 0,48							
90	1500	V hr						7,54 96	4,98 32,6	3,18 11,2	2,04 3,77	1,42 1,42	1,04 0,68							
105	1750	V hr						8,79 129	5,81 43,5	3,72 15	2,38 5,04	1,65 1,9	1,21 0,91	0,93 0,45						
120	2000	V hr							6,63 56	4,25 19,4	2,72 6,5	1,89 2,43	1,39 1,18	1,06 0,58	0,68 0,16					
150	2500	V hr							8,29 85	5,31 30	3,40 9,8	2,36 3,75	1,73 1,79	1,33 0,89	0,85 0,25					
180	3000	V hr							9,95 120	6,37 42	4,08 13,8	2,83 5,3	2,08 2,53	1,59 1,25	1,02 0,35	0,71 0,15				
300	5000	V hr								10,62 124,9	6,79 41,3	4,72 16,74	3,47 7,81	2,65 4,03	1,70 0,54	1,18 0,25	0,87 0,13	0,66 0,13		
600	10000	V hr									13,59 161	9,44 65	6,93 30,2	5,31 15,6	3,4 5,16	2,36 2,09	1,73 0,97	1,33 0,5		
1200	20000	V hr													6,79 20,1	4,72 8,13	3,47 3,8	2,65 1,95		
1800	30000	V hr															7,7 18,07	5,2 8,39	4,0 4,32	
3000	50000	V hr															11,8 49,5	8,67 23	6,63 11,8	
4500	75000	V hr																17,7 110,5	13 51,3	9,9 26,4
6000	100000	V hr																	17,33 90,6	13,27 46,6

THE FLOW RESISTANCE MUST BE MULTIPLIED BY:

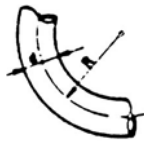
- 0.8 for stainless steel pipes
- 1.25 for slightly rusted steel pipes
- 1.7 for pipes with deposits that reduce the flow section
- 0.7 for aluminium pipes
- 1.3 for fibre-cement pipes

Hr = FLOW RESISTANCE (m/100 m OF PIPELINE)

V = WATER SPEED (m/sec)

FLOW RESISTANCE

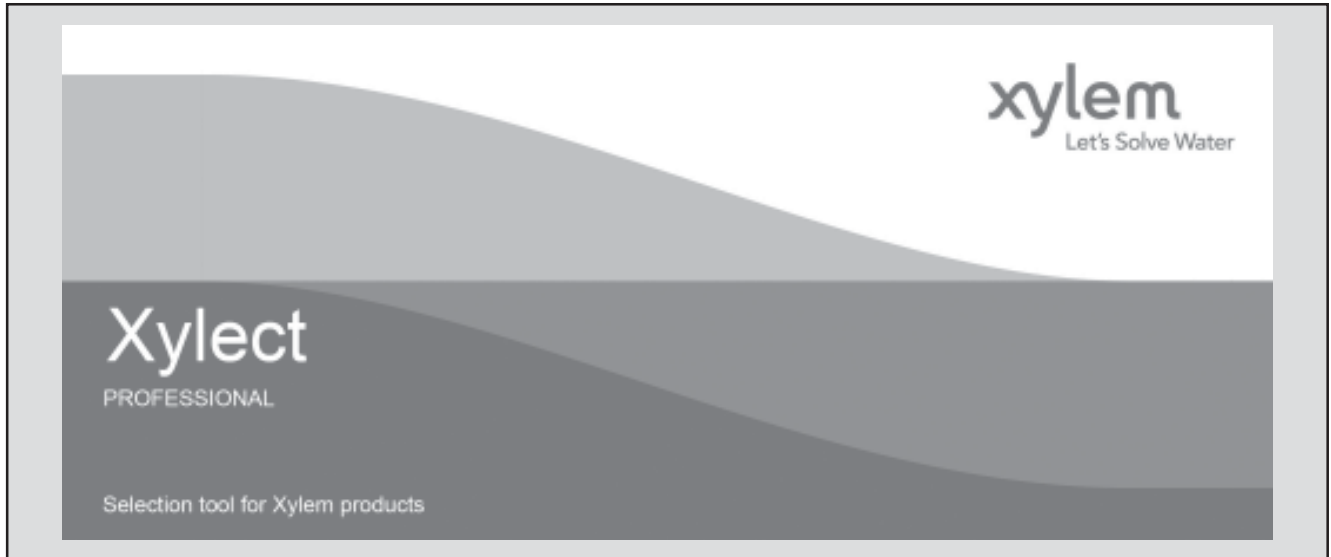
TABLE OF FLOW RESISTANCE OF BENDS AND VALVES IN cm OF COLUMN OF WATER

WATER SPEED m/ ec	SHARP BENDS 					SMOOTH BENDS 					STANDARD GATE VALVES	FOOT VALVES	CHECK VALVES
	a = 30°	a = 40°	a = 60°	a = 80°	a = 90°	$\frac{d}{R} = 0,4$	$\frac{d}{R} = 0,6$	$\frac{d}{R} = 0,8$	$\frac{d}{R} = 1$	$\frac{d}{R} = 1,5$			
0,10	0,03	0,04	0,05	0,07	0,08	0,007	0,008	0,01	0,0155	0,027	0,030	30	30
0,15	0,06	0,07	0,10	0,14	0,17	0,016	0,019	0,024	0,033	0,06	0,033	31	31
0,2	0,11	0,13	0,18	0,26	0,31	0,028	0,033	0,04	0,058	0,11	0,058	31	31
0,25	0,17	0,21	0,28	0,4	0,48	0,044	0,052	0,063	0,091	0,17	0,090	31	31
0,3	0,25	0,30	0,41	0,6	0,7	0,063	0,074	0,09	0,13	0,25	0,13	31	31
0,35	0,33	0,40	0,54	0,8	0,93	0,085	0,10	0,12	0,18	0,33	0,18	31	31
0,4	0,43	0,52	0,71	1,0	1,2	0,11	0,13	0,16	0,23	0,43	0,23	32	31
0,5	0,67	0,81	1,1	1,6	1,9	0,18	0,21	0,26	0,37	0,67	0,37	33	32
0,6	0,97	1,2	1,6	2,3	2,8	0,25	0,29	0,36	0,52	0,97	0,52	34	32
0,7	1,35	1,65	2,2	3,2	3,9	0,34	0,40	0,48	0,70	1,35	0,70	35	32
0,8	1,7	2,1	2,8	4,0	4,8	0,45	0,53	0,64	0,93	1,7	0,95	36	33
0,9	2,2	2,7	3,6	5,2	6,2	0,57	0,67	0,82	1,18	2,2	1,20	37	34
1,0	2,7	3,3	4,5	6,4	7,6	0,7	0,82	1,0	1,45	2,7	1,45	38	35
1,5	6,0	7,3	10	14	17	1,6	1,9	2,3	3,3	6	3,3	47	40
2,0	11	14	18	26	31	2,8	3,3	4,0	5,8	11	5,8	61	48
2,5	17	21	28	40	48	4,4	5,2	6,3	9,1	17	9,1	78	58
3,0	25	30	41	60	70	6,3	7,4	9	13	25	13	100	71
3,5	33	40	55	78	93	8,5	10	12	18	33	18	123	85
4,0	43	52	70	100	120	11	13	16	23	42	23	150	100
4,5	55	67	90	130	160	14	21	26	37	55	37	190	120
5,0	67	82	110	160	190	18	29	36	52	67	52	220	140

- 1) Flow resistance in bends is due to the contraction of the liquid threads resulting from the change of direction: the development of the bends must therefore be included in the length of the pipeline.
- 2) Flow resistance in valves and gates was determined on the basis of practical tests.

FURTHER PRODUCT SELECTION AND DOCUMENTATION

Xylect



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

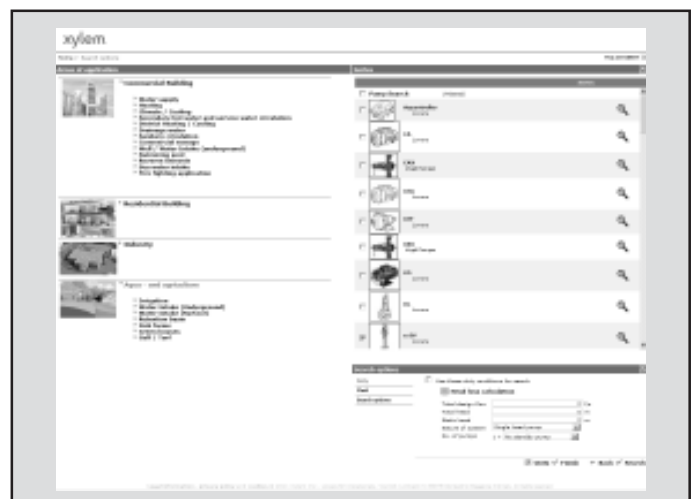
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara and Vogel products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect gives a detailed output:

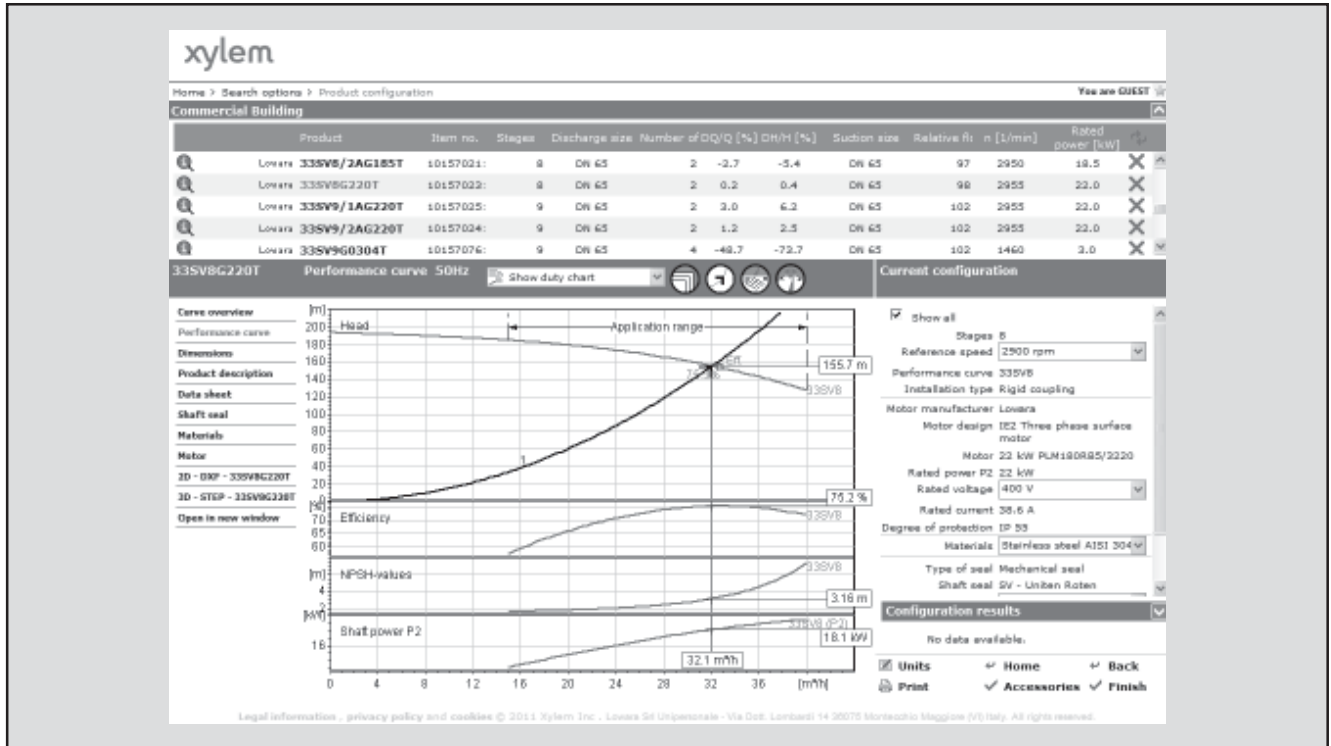
- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files



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

FURTHER PRODUCT SELECTION AND DOCUMENTATION

Xylect



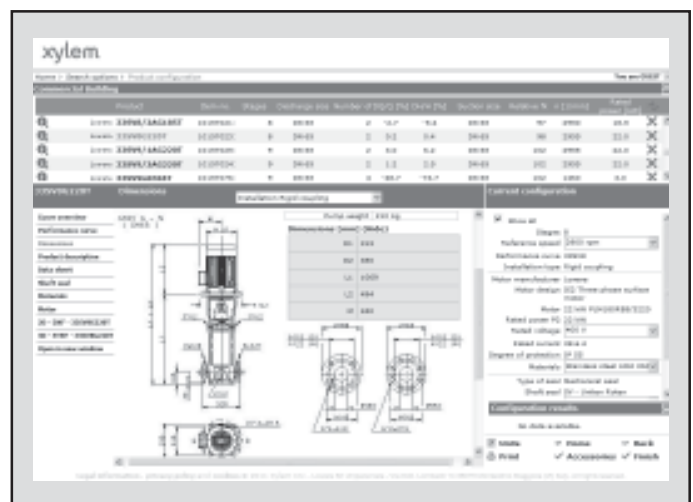
The detailed output makes it easy to select the optimal pump from the given alternatives.

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

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

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

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



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

Xylem |'zīləm|

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

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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