TECH-POMPES
Les pompes du process
et de l'assainissement

NOTICE TECHNIQUE

Pompes centrifuges LOWARA e-NSCEX Hydrovar X+

Pompes centrifuges horizontales avec variateur
Séries e-NSC..X et e-NSC..K, 50 Hz

Documentation constructeur Lowara (a Xylem brand).
Le contenu technique qui suit est celui du constructeur, reproduit sans modification.

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LOWARA
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e-NSC..X, e-NSC..K
VERSION WITH hydrovar X

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e-NSC..X, e-NSC..K SERIES
e-NSC WITH hydrovar X

Background and context

Xylem is a leading global water technology company committed to solving critical water and infrastructure challenges with innovation.
By providing smart and cutting-edge technology, we are reducing energy consumption to minimum possible levels and increasing sustainability.
There is one thing that Xylem shares with the greatest engineering innovators, that's the continuous investment into new products that reflects into outstanding solutions.
You can find all these features in **hydrovar X**, the answer to innovation, sustainability and easiness all-in-one.

hydrovar X also brings the best energy efficiency performances with its frequency converter coupled with the ultimate synchronous motor, manufactured by Xylem integrating decades of expertise and know-how in pumping solutions.

It's the right combination of motors, variable speed drive and pump ensuring great performance, maximum savings and a rapid return on investment.

Sustainability

hydrovar X brings green technology solution by providing best-in-class performance achievement
Rare earths? No thanks! Xylem accepted the challenge to fight price, availability and environmental concerns with a smarter technology that provides the best-in-class performance with a green heart.

Ease of use and commissioning

The built-in application software makes it the easiest drive to commission, program and operate, enabling virtually any configuration of pumps. Backward compatibility assures the **hydrovar X** will work seamlessly with existing systems.

Pump solution

Integrated pump functions provide protection for the pump solution, and improve the quality of energy from the grid. All of this means terrific energy savings from a compact, easy-to-use solution suited for nearly any application.

Application sectors

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



hydrovar X (e-NSC..K)
hydrovar X+ (e-NSC..X)

- IES2 efficiency level (IEC 61800-9-2:2017)
- Three-phase power supply:
  from 3 kW to 22 kW: 380-480 V +/- 10%, 50/60 Hz
  from 3 kW to 11 kW: 200-240 V +/- 10%, 50/60 Hz (on request)
- Power up to 22 kW
- Protection class IP 55
- Overload and locked rotor protection with automatic reset incorporated
- Can be linked up to 4 e-NSC hydrovar X, up to 8 e-NSC hydrovar X+ pumps
-

Pump

- Flow rate: up to 500 m^3/h
- Head: up to 115 m
- Temperature of pumped liquid: up to +140°C *
- Maximum operating pressure 16 bar (PN 16)
- The hydraulic performances meet the tolerances specified in ISO 9906:2012

Motor

- IE5 efficiency level (IEC TS 60034-30-2:2016)
- Synchronous electric motor with permanent magnet assisted reluctance technology, closed structure, air-cooled (TEFC)
- Insulation class 155 (F)
- Environment temperature: -20°C to +50°C * with no performance derating

Pressure transmitters

The e-NSC..X/K pumps are fitted as standard with two pressure transmitters. The pressure transmitters are supplied unassembled.

* for liquid temperatures above 120°C the maximum ambient temperature is +40°C.

Regulations (EU) 2019/1781 e 2021/34, Annex I – point 4 (Product information)

The requirements shall not apply to these variable speed drives, as they are integrated to motors that aren't covered by the same regulations.

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e-NSC..X, e-NSC..K SERIES
LIST OF MODELS

SIZE NSC..X, NSC..K	MOTOR PN [kW]	MOTOR SIZE	MOTOR SPEED	VERSION NSCE..	VERSION NSCS..
32-125	3	B	high (2)	•	•
32-125	4	B	high (2)	•	•
32-160	5,5	C	high (2)	•	•
32-200	7,5	C	high (2)	•	•
32-200	11	C	high (2)	•	•
40-125	3	B	high (2)	•	•
40-125	4	B	high (2)	•	•
40-160	5,5	C	high (2)	•	•
40-160	7,5	C	high (2)	•	•
40-200	11	C	high (2)	•	•
40-200	15	D	high (2)	-	•
40-200	18,5	D	high (2)	-	•
40-250	22	D	high (2)	•	•
50-125	3	B	high (2)	•	•
50-125	4	B	high (2)	•	•
50-125	5,5	C	high (2)	•	•
50-125	7,5	C	high (2)	•	•
50-160	11	C	high (2)	•	•
50-160	15	D	high (2)	-	•
50-200	18,5	D	high (2)	•	•
50-200	22	D	high (2)	•	•
65-125	4	B	high (2)	•	•
65-125	5,5	C	high (2)	•	•
65-125	7,5	C	high (2)	•	•
65-125	11	C	high (2)	•	•
65-160	15	D	high (2)	•	•
65-160	18,5	D	high (2)	•	•
65-160	22	D	high (2)	•	•

SIZE NSC..X, NSC..K	MOTOR PN [kW]	MOTOR SIZE	MOTOR SPEED	VERSION NSCE..	VERSION NSCS..
80-160	3	C	low (4)	•	•
80-160	4	C	low (4)	•	•
80-160	5,5	C	low (4)	•	•
80-160	7,5	C	high (2)	•	•
80-160	11	D	high (2)	•	•
80-160	15	D	high (2)	•	•
80-160	18,5	D	high (2)	•	•
80-160	22	D	high (2)	•	•
100-160	3	C	low (4)	-	•
100-160	4	C	low (4)	-	•
100-160	15	D	high (2)	-	•
100-160	18,5	D	high (2)	-	•
100-160	22	D	high (2)	-	•
100-200	5,5	C	low (4)	-	•
100-200	7,5	D	low (4)	-	•
100-250	11	D	low (4)	-	•
125-200	5,5	C	low (4)	-	•
125-200	7,5	D	low (4)	-	•
125-250	11	D	low (4)	-	•
150-200	11	D	low (4)	-	•

NSCX_models-en_b_sc

• = Available

LEGEND

NSCE : Extended shaft.
NSCS : Stub shaft.

e-NSC..X, e-NSC..K SERIES
e-NSC WITH hydrovar X

hydrovar X offers two different display configurations: LED display and graphical colored display, like in the below pictures:

hydrovar X (e-NSC..K)

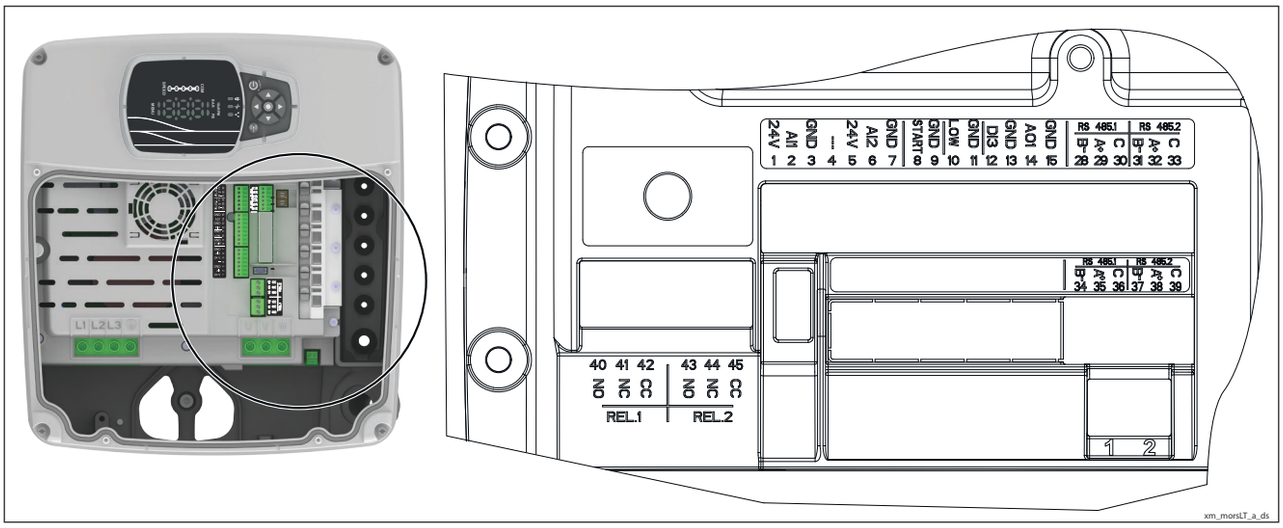


hydrovar X+ (e-NSC..X)



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e-NSC..K SERIES (hydrovar X)
TERMINAL BOARD

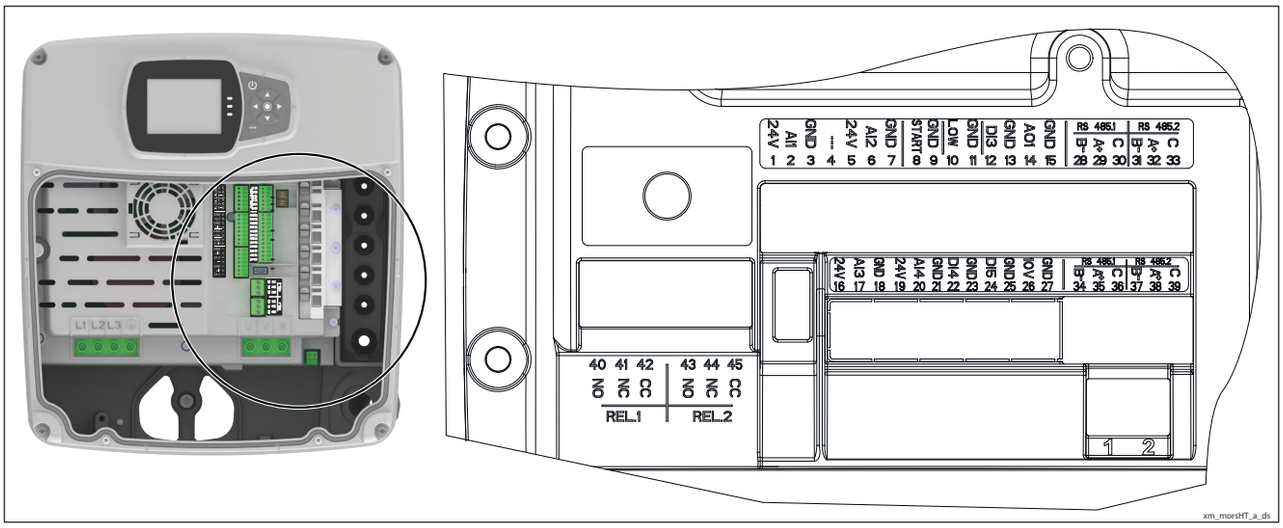


REF.	ITEM	DESCRIPTION	DEFAULT
1	Analog Input 1	Power supply +24 VDC, max. 60mA (total, terminals 1 + 5)	Pressure Sensor 1
2		Configurable Analog Input 1	
3		Electronic GND	
4	Not used	Internal use - Do not connect	
5	Analog Input 2	Power supply +24 VDC, max. 60mA (total, terminals 1 + 5)	Not used
6		Configurable Analog Input 2	
7		Electronic GND	
8	External Start/Stop	Start/Stop digital input, +24 VDC internal pull-up, 6mA contact current	-
9		Electronic GND	
10	External Lack of Water	Low water digital input, +24 VDC internal pull-up, 6mA contact current	-
11		Electronic GND	
12	Digital Input 3	Configurable Digital Input 3, +24 VDC internal pull-up, 6mA contact current	Solo Run
13		Electronic GND	
14	Analog Output	Configurable Analog Output	Motor Speed
15		Electronic GND	
28	Communication bus 1	RS485 port 1: RS485-1B N (-)	Multipump
29		RS485 port 1: RS485-1A P (+)	
30		RS485 port 1: RS485-COM	
31	Communication bus 2	RS485 port 2: RS485-2B N (-)	Modbus
32		RS485 port 2: RS485-2A P (+)	
33		RS485 port 2: RS485-COM	
34	Communication bus 1	RS485 port 1: RS485-1B N (-)	Multipump
35		RS485 port 1: RS485-1A P (+)	
36		RS485 port 1: RS485-COM	
37	Communication bus 2	RS485 port 2: RS485-2B N (-)	Modbus
38		RS485 port 2: RS485-2A P (+)	
39		RS485 port 2: RS485-COM	
40	Relay 1	Configurable relay 1: Normally Open	Error
41		Configurable relay 1: Normally Closed	
42		Configurable relay 1: Common Contact	
43	Relay 2	Configurable relay 2: Normally Open	Running
44		Configurable relay 2: Normally Closed	
45		Configurable relay 2: Common Contact	

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e-NSC..X SERIES (hydrovar X+)
TERMINAL BOARD



REF.	ITEM	DESCRIPTION	DEFAULT
1	Analog Input 1	Power supply +24 VDC, max. 60mA (total, terminals 1 + 5)	Pressure Sensor 1
2		Configurable Analog Input 1	
3		Electronic GND	
4	Not used	Internal use - Do not connect	
5	Analog Input 2	Power supply +24 VDC, max. 60mA (total, terminals 1 + 5)	Not used
6		Configurable Analog Input 2	
7		Electronic GND	
8	External Start/Stop	Start/Stop digital input, +24 VDC internal pull-up, 6mA contact current	-
9		Electronic GND	
10	External Lack of Water	Low water digital input, +24 VDC internal pull-up, 6mA contact current	-
11		Electronic GND	
12	Digital Input 3	Configurable Digital Input 3, +24 VDC internal pull-up, 6mA contact current	Solo Run
13		Electronic GND	
14	Analog Output	Configurable Analog Output	Motor Speed
15		Electronic GND	
16	Analog Input 3	Power supply +24 VDC, max. 60mA (total, terminals 16 and 19)	Not used
17		Configurable Analog Input 3	
18		Electronic GND	
19	Analog Input 4	Power supply +24 VDC, max. 60mA (total, terminals 16 and 19)	Not used
20		Configurable Analog Input 4	
21		Electronic GND	
22	Digital Input 4	Configurable Digital Input 4, +24 VDC internal pull-up, 6mA contact current	Not used
23		Electronic GND	
24	Digital Input 5	Configurable Digital Input 5, +24 VDC internal pull-up, 6mA contact current	Not used
25		Electronic GND	
26	10 VDC supply	Power supply +10 VDC, max. 3mA	-
27		Electronic GND	
28	Communication bus 1	RS485 port 1: RS485-1B N (-)	Multipump
29		RS485 port 1: RS485-1A P (+)	
30		RS485 port 1: RS485-COM	
31	Communication bus 2	RS485 port 2: RS485-2B N (-)	Modbus
32		RS485 port 2: RS485-2A P (+)	
33		RS485 port 2: RS485-COM	
34	Communication bus 1	RS485 port 1: RS485-1B N (-)	Multipump
35		RS485 port 1: RS485-1A P (+)	
36		RS485 port 1: RS485-COM	
37	Communication bus 2	RS485 port 2: RS485-2B N (-)	Modbus
38		RS485 port 2: RS485-2A P (+)	
39		RS485 port 2: RS485-COM	
40	Relay 1	Configurable relay 1: Normally Open	Running
41		Configurable relay 1: Normally Closed	
42		Configurable relay 1: Common Contact	
43	Relay 2	Configurable relay 2: Normally Open	Error
44		Configurable relay 2: Normally Closed	
45		Configurable relay 2: Common Contact	

xm_morsHT-en_a_sc

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e-NSC..X, e-NSC..K SERIES
HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	91,67	183,3	275	366,7	458,3	550	641,7	733,33	800
NSC..X	PN	TYPE	m3/h 0	5,5	11	16,5	22	27,5	33	38,5	44	48
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
32-125	3	EXM100../4.030BH2	40,6	41,8	42,5	39,7	33,4	28,2	23,1	17,4		
32-125	4	EXM112../4.040BH2	45,3	46,5	47,2	47,5	43,1	36,9	31,4	26,1	20,4	15,8
32-160	5,5	EXM132../4.055CH2	59,2	59,7	60,3	60,6	55,5	48,4	41,4	33,7	25,2	
32-200	7,5	EXM132../4.075CH2	81,2	81,5	81,3	81,3	72,4	60,7	49,8			
32-200	11	EXM132../4.110CH2	91,0	91,2	91,4	91,0	89,1	84,9	74,7	62,3		
		EXM160../4.110CH2										

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	141,7	283,3	425	566,7	708,3	850	991,7	1133,3	1250
NSC..X	PN	TYPE	m3/h 0	8,5	17	25,5	34	42,5	51	59,5	68	75
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
40-125	3	EXM100../4.030BH2	39,4	37,3	33,2	29,3	24,5	18,8	12,9			
40-125	4	EXM112../4.040BH2	43,9	44,0	41,1	36,6	32,4	28,1	23,0	16,9	10,2	
40-160	5,5	EXM132../4.055CH2	50,4	51,9	52,7	47,3	41,4	35,5	29,3	22,6	16,5	
40-160	7,5	EXM132../4.075CH2	59,5	59,8	60,4	60,7	54,4	47,6	41,0	34,1	26,9	22,0
40-200	11	EXM132../4.110CH2	72,8	73,9	74,4	74,7	72,4	63,3	53,9	42,3	26,2	
		EXM160../4.110CH2										
40-200	15	EXM160../4.150DH2	81,6	82,8	83,5	83,6	83,4	81,3	72,6	62,0	48,8	35,3
40-200	18,5	EXM160../4.185DH2	91,0	92,2	93,0	93,2	92,9	91,9	88,1	77,4	64,8	52,2
40-250	22	EXM180../4.220DH2	114,7	114,4	114,2	113,5	112,7	111,3	104,1	90,4	71,0	

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	250	500	750	1000	1250	1500	1750	2000	2200
NSC..X	PN	TYPE	m3/h 0	15	30	45	60	75	90	105	120	132
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
50-125	3	EXM100../4.030BH2	19,2	19,0	18,3	15,1	10,9	7,2				
50-125	4	EXM112../4.040BH2	27,5	27,2	24,9	21,4	17,3	12,8	8,7	5,1		
50-125	5,5	EXM132../4.055CH2	35,7	34,9	33,9	29,7	23,8	18,2	13,4	9,6		
50-125	7,5	EXM132../4.075CH2	38,0	37,1	36,2	34,9	33,0	27,8	22,6	17,6	12,7	
50-160	11	EXM132../4.110CH2	51,8	51,3	50,5	49,4	47,1	40,4	33,4	26,0	18,3	12,4
		EXM160../4.110CH2										
50-160	15	EXM160../4.150DH2	63,5	63,0	62,3	61,0	59,3	54,0	46,2	38,4	30,4	23,8
50-200	18,5	EXM160../4.185DH2	76,8	76,9	77,4	77,5	76,8	69,0	57,9	45,5	33,0	
50-200	22	EXM180../4.220DH2	81,5	81,6	82,1	82,3	81,6	79,2	69,1	57,1	45,2	36,2

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

NSCX-1-en_a_th

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e-NSC..X, e-NSC..K SERIES
HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	416,7	833,3	1250	1667	2083	2500	2917	3333,3	3750
NSC..X	PN	TYPE	m3/h 0	25	50	75	100	125	150	175	200	225
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
65-125	4	EXM112../4.040BH2	20,0	19,1	17,2	14,5	11,2	7,4				
65-125	5,5	EXM132../4.055CH2	25,8	26,3	24,3	20,4	16,1	11,8	8,0			
65-125	7,5	EXM132../4.075CH2	34,9	35,4	31,0	26,7	22,1	17,2	12,6			
65-125	11	EXM160../4.110CH2	46,7	46,8	43,7	37,4	31,7	26,6	21,6	16,7		
65-160	15	EXM160../4.150DH2	51,5	51,5	51,1	50,0	43,7	36,0	28,0	20,9	15,1	
65-160	18,5	EXM160../4.185DH2	56,4	56,4	56,0	55,2	52,4	45,0	37,9	30,6	23,5	
65-160	22	EXM180../4.220DH2	61,6	61,6	61,3	60,4	58,7	52,8	45,2	37,5	29,9	22,6

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	558,3	1117	1675	2233	2792	3350	3908	4466,7	5000
NSC..X	PN	TYPE	m3/h 0	33,5	67	100,5	134	167,5	201	234,5	268	300
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
80-160	3	EXM100../4.030CH4	9,6	9,5	8,5	6,5	3,9					
80-160	4	EXM112../4.040CH4	12,4	12,3	11,3	9,4	6,6					
80-160	5,5	EXM132../4.055CH4	17,2	17,0	16,2	14,4	11,5	8,1	4,9			
80-160	7,5	EXM132../4.075CH2	24,1	23,7	20,2	16,6	13,1	9,9	7,2	5,0		
80-160	11	EXM160../4.110DH2	31,8	31,7	30,9	26,1	20,9	16,1	11,9	8,8	6,6	
80-160	15	EXM160../4.150DH2	39,9	39,9	39,3	37,5	30,8	24,2	18,8	14,2	10,6	
80-160	18,5	EXM160../4.185DH2	42,6	42,5	41,9	40,5	38,0	32,5	26,7	21,2	16,3	
80-160	22	EXM180../4.220DH2	45,9	45,8	45,3	44,1	42,0	38,6	32,4	26,1	20,3	15,8

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	608,3	1217	1825	2433	3042	3650	4258	4866,7	5450
NSC..X	PN	TYPE	m3/h 0	36,5	73	109,5	146	182,5	219	255,5	292	327
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
100-160	3	EXM100../4.030CH4	12,6	11,7	10,1	7,9	5,6					
100-160	4	EXM112../4.040CH4	17,1	15,7	13,4	10,9	8,3	6,0				
100-160	15	EXM160../4.150DH2	29,1	28,9	28,1	26,9	25,0	22,3	18,9	15,2		
100-160	18,5	EXM160../4.185DH2	36,4	36,1	34,9	33,1	30,9	28,0	24,4	20,2	16,0	
100-160	22	EXM180../4.220DH2	47,0	44,6	42,1	39,4	36,5	33,1	29,4	25,3	21,1	17,1
100-200	5,5	EXM132../4.055CH4	24,6	21,7	18,5	15,0	11,3	7,6				
100-200	7,5	EXM132../4.075DH4	31,4	27,9	23,8	19,7	15,8	12,0				
100-250	11	EXM160../4.110DH4	40,7	40,8	34,6	28,5	23,0	18,2				

PUMP TYPE	MOTOR		Q = FLOW									
			l/min 0	925	1850	2775	3700	4625	5550	6475	7400	8300
NSC..X	PN	TYPE	m3/h 0	55,5	111	166,5	222	277,5	333	388,5	444	498
NSC..K	kW		H = TOTAL HEAD METRES COLUMN OF WATER									
125-200	5,5	EXM132../4.055CH4	11,8	11,3	10,3	9,0	7,3					
125-200	7,5	EXM132../4.075DH4	17,4	17,0	14,6	12,4	10,2	7,6				
125-250	11	EXM160../4.110DH4	29,0	26,4	22,6	19,2	15,6	11,5				
150-200	11	EXM160../4.110DH4	16,3	15,9	15,0	13,8	12,4	10,9	9,4	8,1	6,7	5,1

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

NSCX-2-en_b_th

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hydrovar X, hydrovar X+
TABELLA DEI DATI ELETTRICI

In the speed range indicated for each model in the table, the rated power is guaranteed. Above the maximum speed required by the pump model, the motor is automatically limited. Below the minimum full load rated speed, the motor works partially load.

P_N	MOTOR TYPE	IEC SIZE*	Construction Design	SPEED (RPM)**	INPUT CURRENT I (A)	DATA RELATED TO THE VOLTAGE OF 400V						IES
						In	cosφ	Tn	η %			
kW				min^{-1}	380-480 V	A		Nm	4/4	3/4	2/4	
3	EXM100../4.030BH2	100		3000	6,7-5,3	5,8	0,86	9,6	87,5	87,3	86,2	2
				3600		5,7		8,0	87,8	87,6	85,8	
				4000		5,7		7,2	87,7	87,4	85,5	
	EXM100../4.030CH4			1500	7,9-7,0	7,6	0,66	19,1	86,1	86,5	86,1	
				1800		7,5		15,9	86,7	87,3	87,0	
				2000		7,6		14,3	86,7	87,7	87,6	
4	EXM112../4.040BH2	112		3000	7,7-6,6	7,3	0,90	12,7	87,5	88,0	87,5	
				3600		7,2		10,6	88,5	88,6	87,3	
				4000		7,3		9,6	88,0	88,2	86,6	
	EXM112../4.040CH4			1500	9,2-8,5	8,9	0,72	25,5	89,6	89,8	89,4	
				1800		9,0		21,2	90,1	90,6	90,5	
				2000		9,0		19,1	90,3	91,0	91,1	
5,5	EXM132../4.055CH2	132		3000	11,4-11,0	11.2	0,80	17,5	90,8	90,3	89,2	
				3600		11.0		14,6	90,6	89,9	88,5	
				4000		11.1		13,1	90,1	89,8	88,2	
	EXM132../4.055CH4			1500	11,2-10,2	10,8	0,81	35,0	90,7	91,0	90,5	
				1800		10,8		29,2	91,0	91,5	91,3	
				2000		10,8		26,3	90,1	91,2	90,6	
7,5	EXM132../4.075CH2	132		3000	14,4-12,5	13,4	0,85	23,9	90,6	89,7	87,9	
				3600		14,0		19,9	90,8	90,1	88,4	
				4000		13,5		17,9	89,5	88,6	86,4	
	EXM132../4.075DH4			1500	18,7-17,4	18,4	0,66	47,8	89,9	90,2	89,9	
				1800		18,1		39,8	90,7	90,9	90,8	
				2000		18,0		35,8	90,6	91,1	90,3	
11	EXM132../4.110CH2 EXM160../4.110CH2	132 160		3000	20,3-16,5	18,9	0,93	35,0	91,0	90,9	90,0	
				3600		19,1		29,2	89,7	89,5	88,2	
				4000		19,3		26,3	89,7	89,7	88,7	
11	EXM160../4.110DH2	160		3000	24,5-22,8	22,0	0,79	35,0	91,7	91,4	90,5	
				3600		22,1		29,2	91,6	90,9	89,4	
				4000		21,7		26,3	91,8	91,2	89,9	
	EXM160../4.110DH4			1500	24,5-22,8	24,3	0,74	70,0	91,0	91,0	90,4	
				1800		23,4		58,4	92,1	91,9	91,2	
				2000		23,1		52,5	92,3	92,3	91,7	
15	EXM160../4.150DH4	160		3000	30,2-27,1	26,4	0,81	47,8	91,5	91,4	90,5	
				3600		29,1		39,8	91,7	91,4	90,5	
				4000		29,1		35,8	91,2	91,1	89,7	
18,5	EXM160../4.185DH2	160		3000	33,5-28,6	32,2	0,90	58,9	91,7	91,7	91,2	
				3600		32,1		49,1	91,9	91,7	90,9	
				4000		32,1		44,2	91,9	91,7	90,8	
22	EXM180../4.220DH2	180		3000	38,9-32,4	33,5	0,93	70,0	92,4	92,0	91,2	
				3600		33,3		58,4	92,6	92,1	91,0	
				4000		32,7		52,7	92,5	91,9	90,5	

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

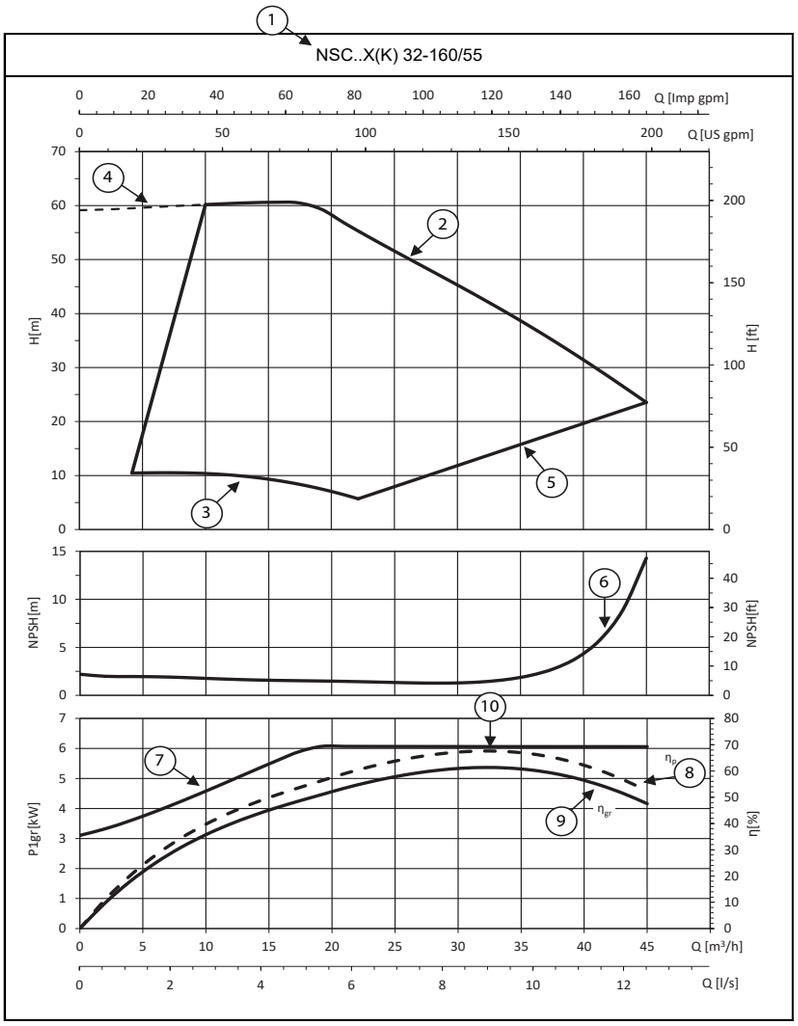
LNEX_mott-en_a_te

Note. **IES** refers to the efficiency class for frequency converter + motor systems (known as power drive system – PDS) with power between 0.12 kW and 1000 kW and between 100 V and 1000 V, according to the standard **IEC 61800-9-2:2017**.

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e-NSC..X, e-NSC..K SERIES
HOW TO READ e-NSC WITH hydrovar X CURVES

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



hydrovar X is equipped with a 5-LEDs "SPEED" bar. Each LED indicates a percentage of the system speed between minimum and maximum speed.



hydrovar X+
For maximum precision on the working point it is sufficient to read the display.



① **Pump model**

② **Maximum curve** (100%): pump running at the maximum set speed or nominal power.

③ **Minimum curve** (0%): it refers to the minimum rpm level the motor can work at, it's calculated depending on the model of pump maximizing for each one the working area and allowing the highest system flexibility.

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

⑤ The **allowable operating range** (AOR) of the pump is defined by the minimum and maximum head capacity curves as well as the minimum and maximum flow rates for a given speed.

⑥ **NPSH**: is the net positive suction head of pump+motor+drive system working at maximum speed.

⑦ **$P1_{gr}$** is the power absorption in kW of pump+motor+drive system working at maximum speed. The curve increases until the unit reaches the power limit.
hydrovar X controls power consumption (flat part of the curve) at high flow/ low head. In this way the motor stays protected from overload and ensure a longer life of pump+motor+drive system.

⑧ **η_p** is the efficiency of the hydraulic part, working at maximum speed.

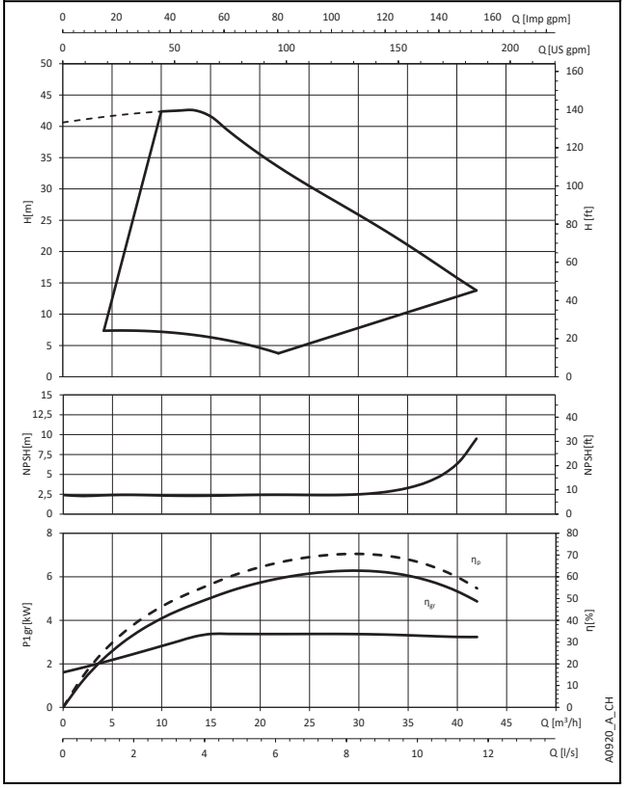
⑨ **η_{gr}** is the efficiency of pump+motor+drive system working at maximum speed.

⑩ **Working point**: it's important to make sure the pump is working at the best working point, the one at highest efficiency.
It's easy to find it: it's the highest point of the ηp pump efficiency curve; once you found it, you can learn also flow values from x-axis called Q and head values from y-axis called H which allow the system to work at the best working point.

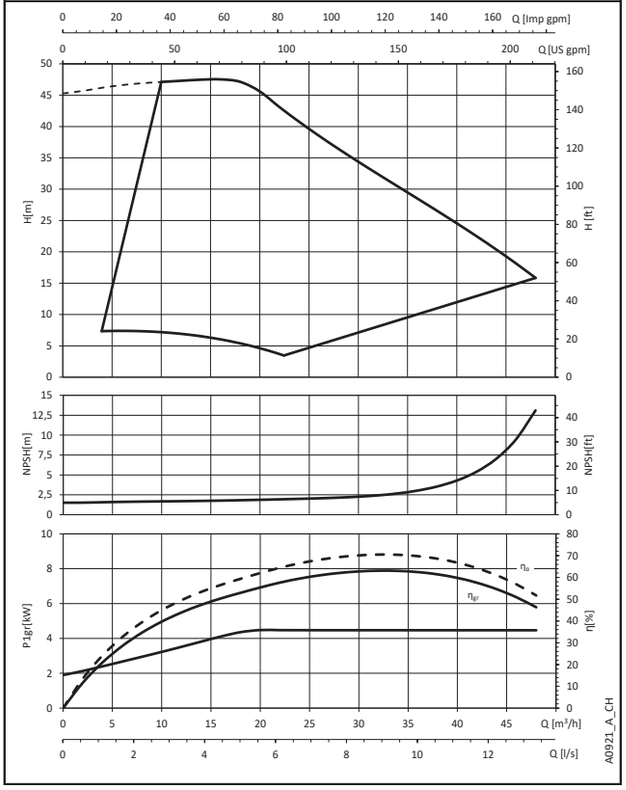
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

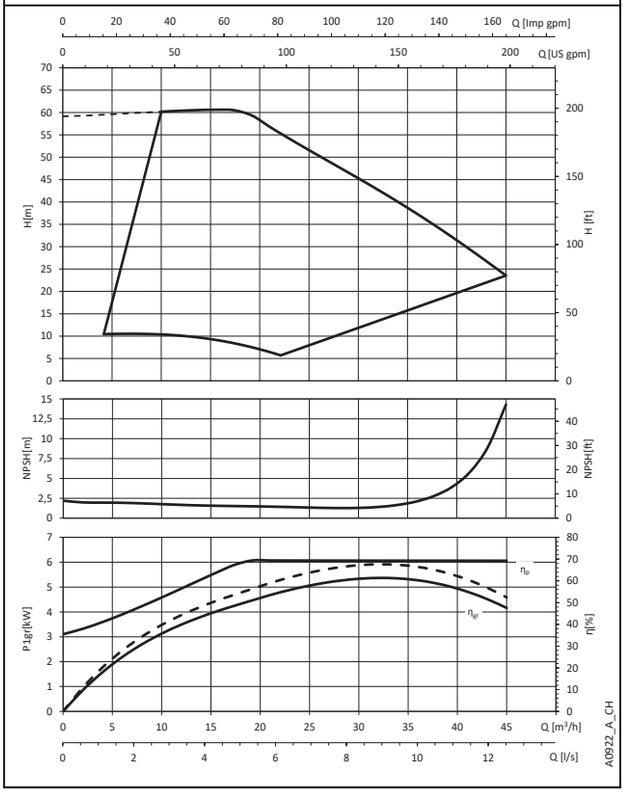
NSC..X(K) 32-125/30



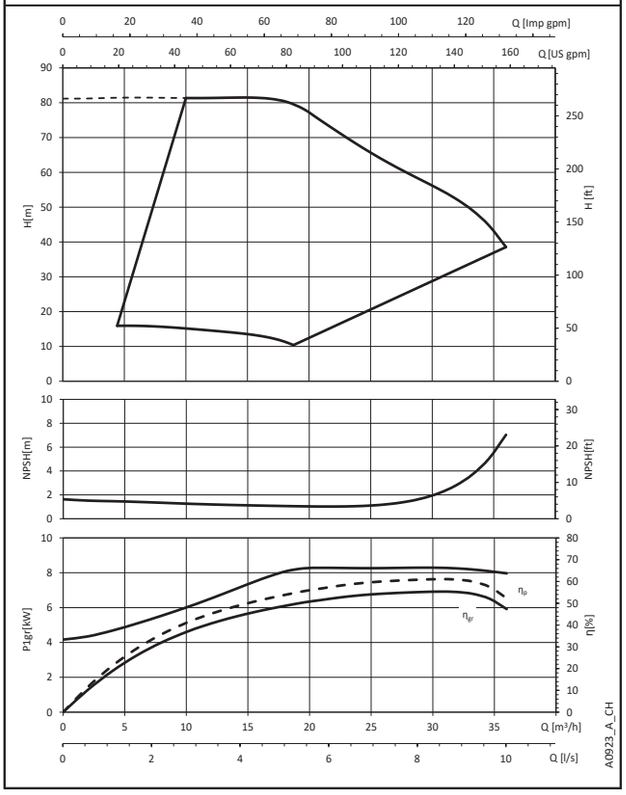
NSC..X(K) 32-125/40



NSC..X(K) 32-160/55



NSC..X(K) 32-200/75

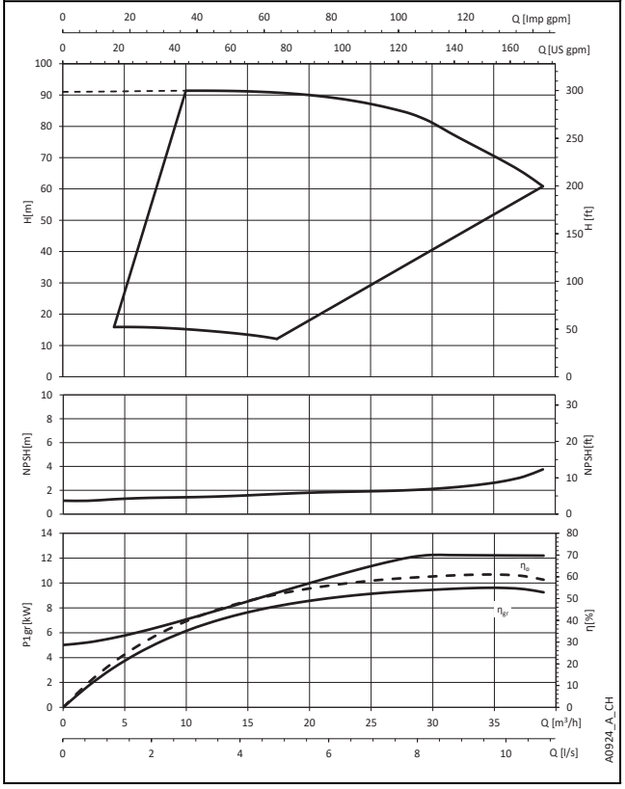


These performances are valid for liquids with density ρ = 1.0 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.

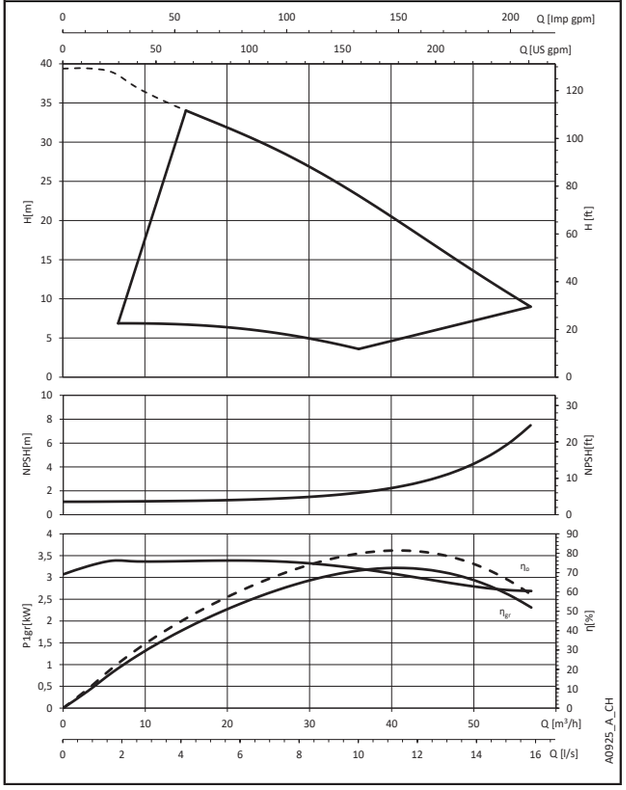
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

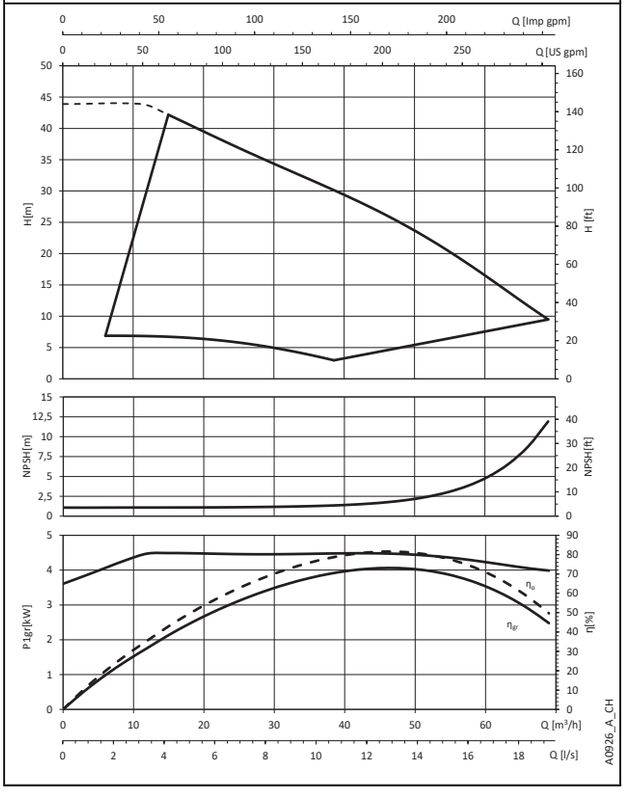
NSC..X(K) 32-200/110



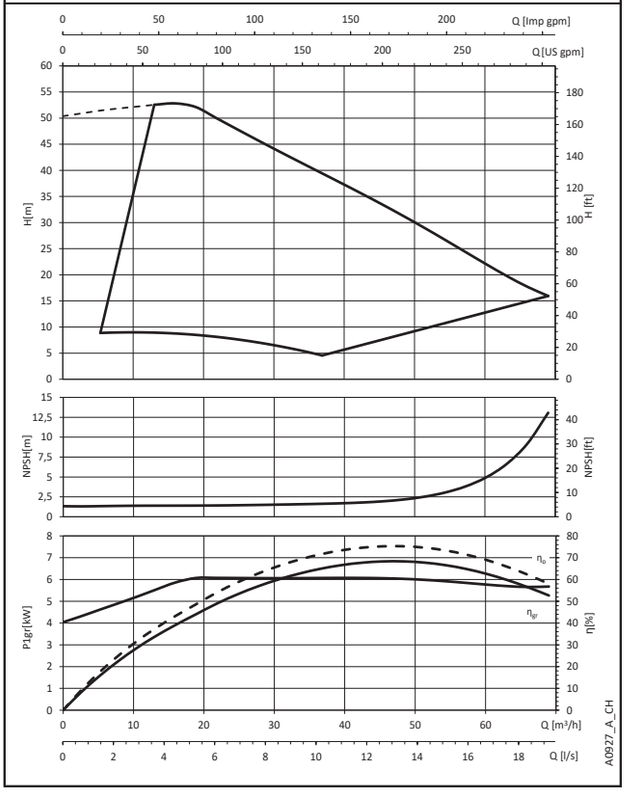
NSC..X(K) 40-125/30



NSC..X(K) 40-125/40



NSC..X(K) 40-160/55

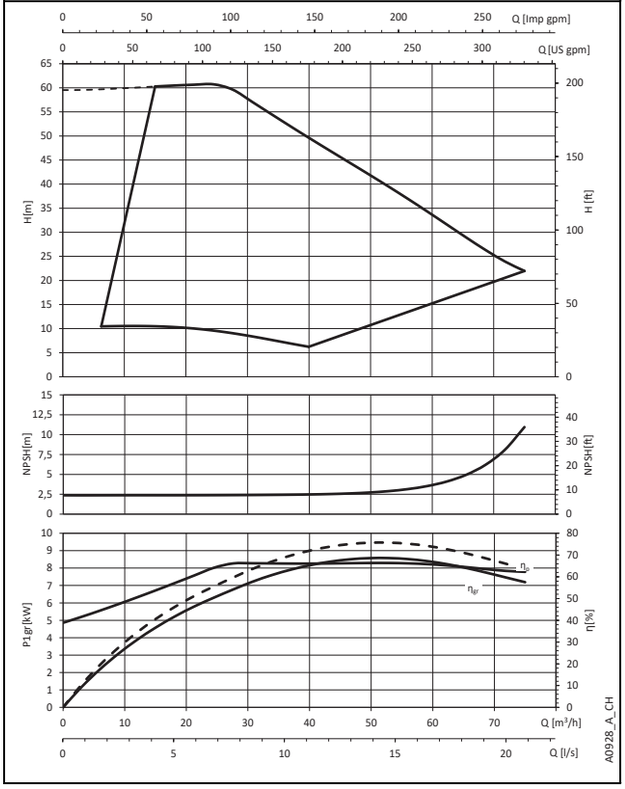


These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

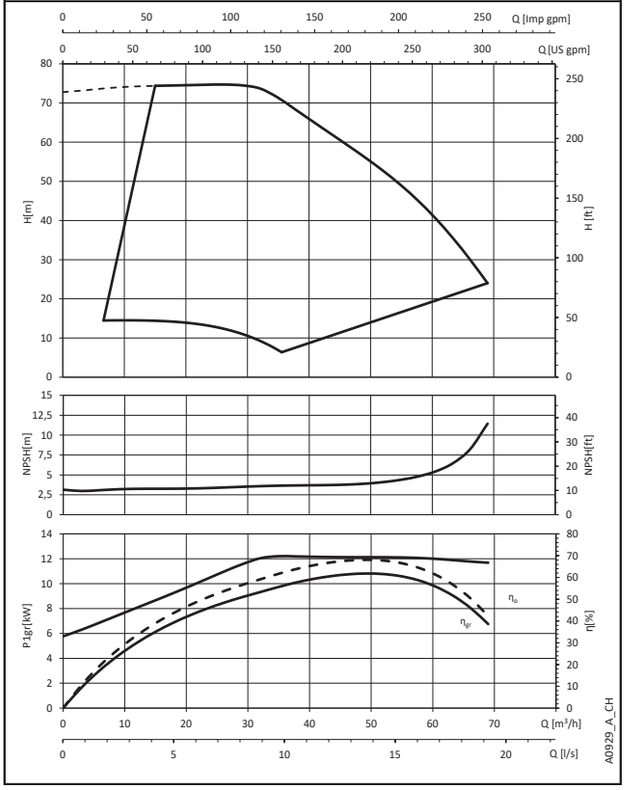
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

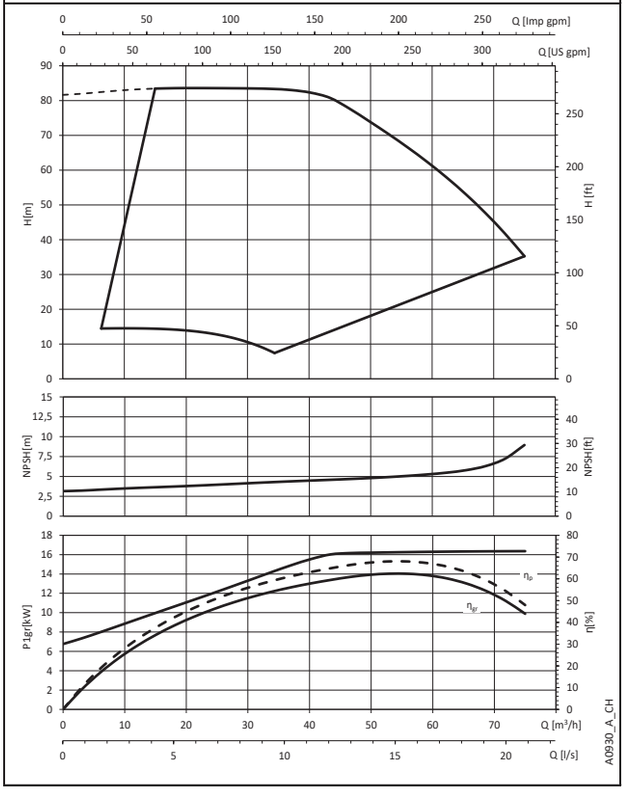
NSC..X(K) 40-160/75



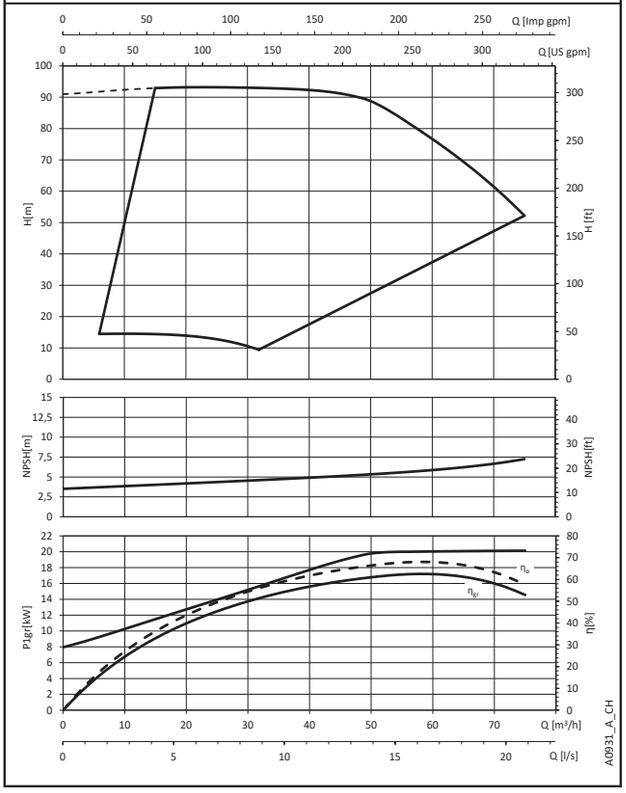
NSC..X(K) 40-200/110



NSC..X(K) 40-200/150



NSC..X(K) 40-200/185

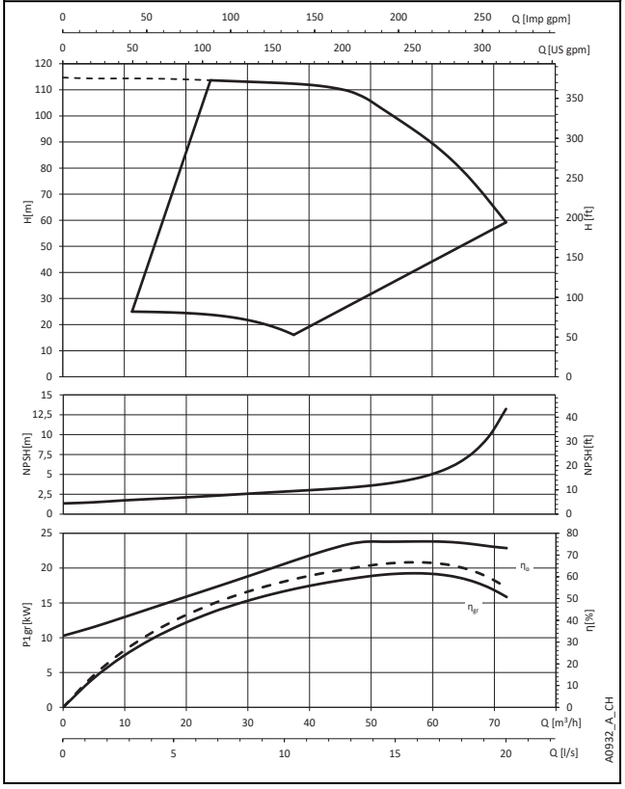


These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

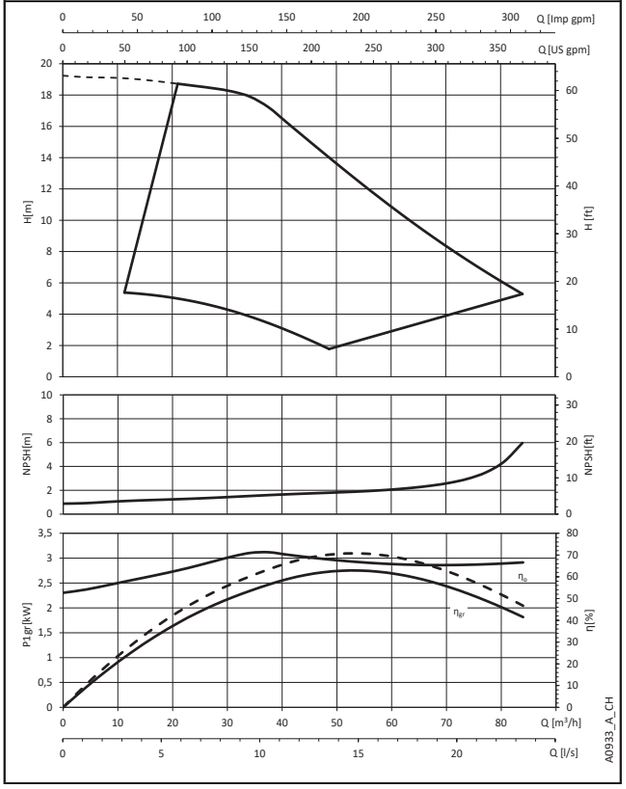
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

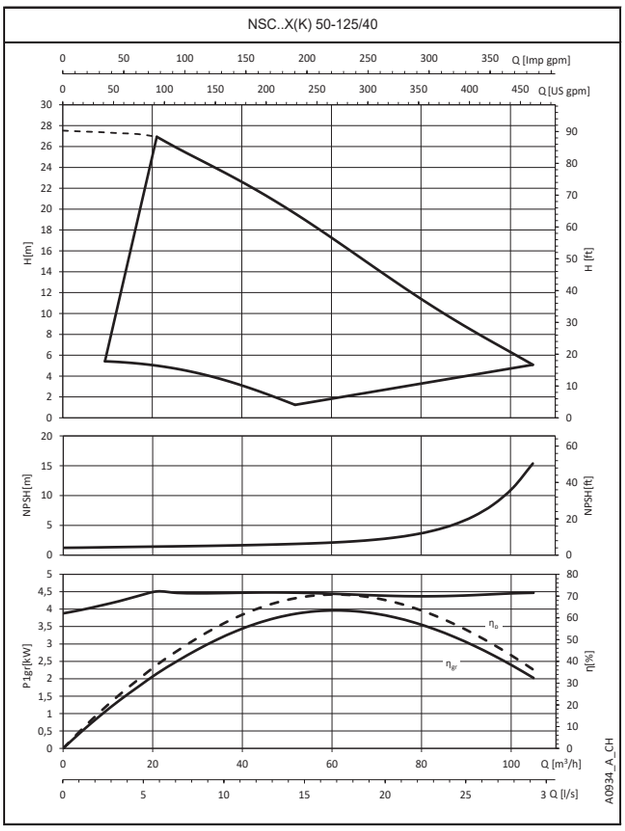
NSC..X(K) 40-250/220



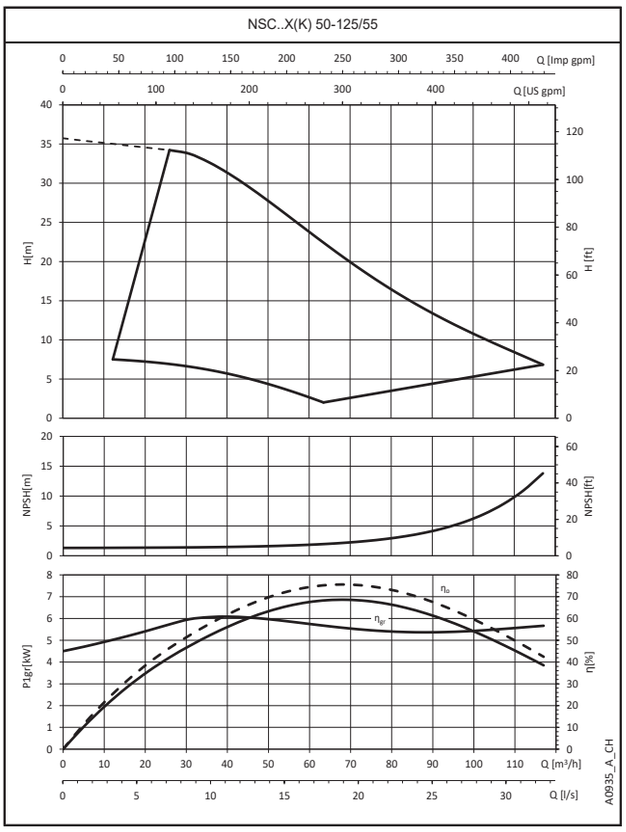
NSC..X(K) 50-125/30



NSC..X(K) 50-125/40



NSC..X(K) 50-125/55

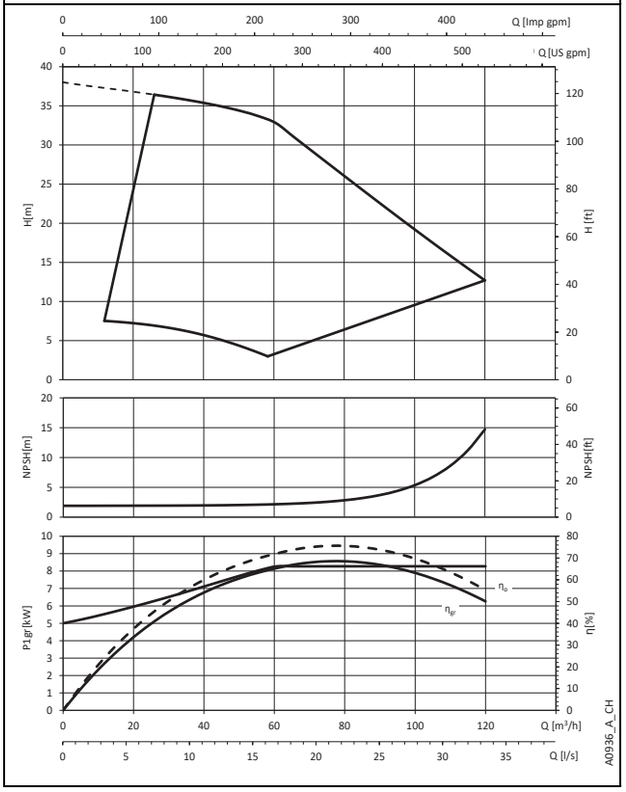


These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

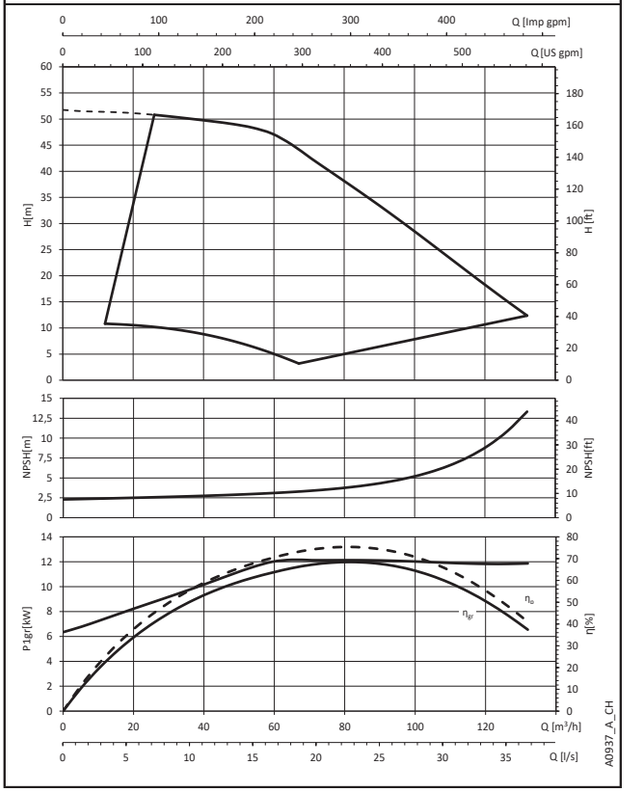
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

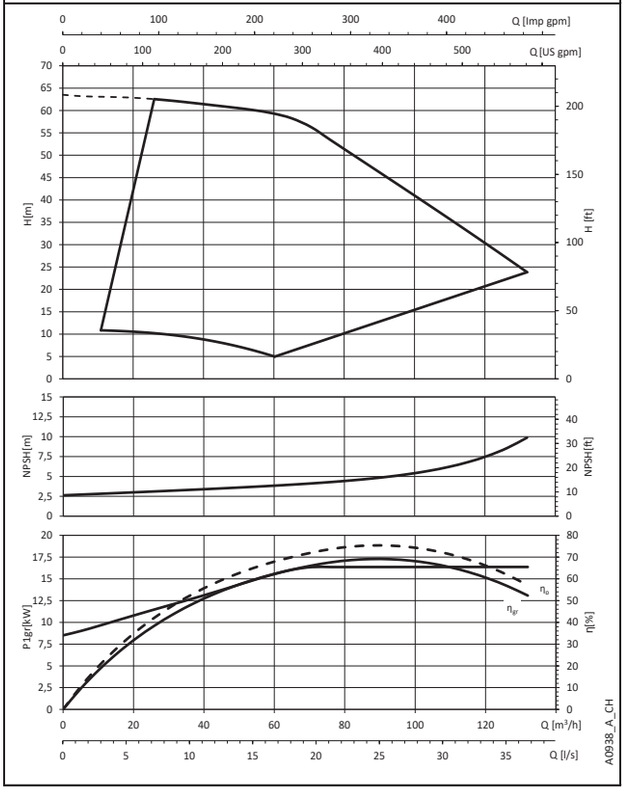
NSC..X(K) 50-125/75



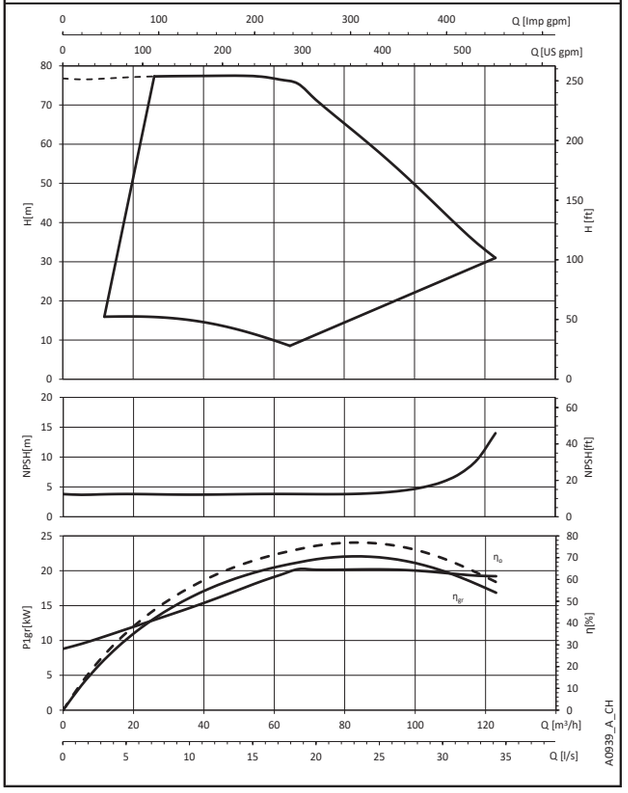
NSC..X(K) 50-160/110



NSC..X(K) 50-160/150



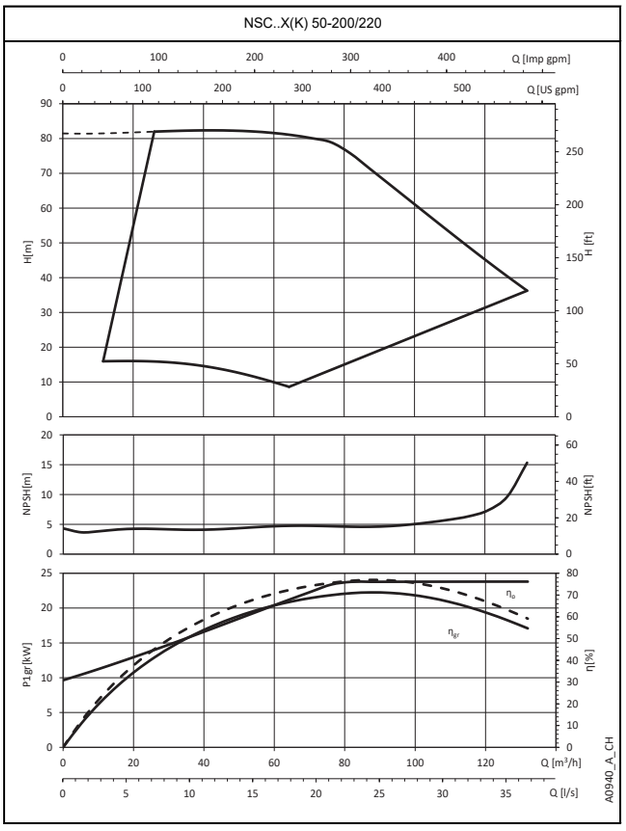
NSC..X(K) 50-200/185

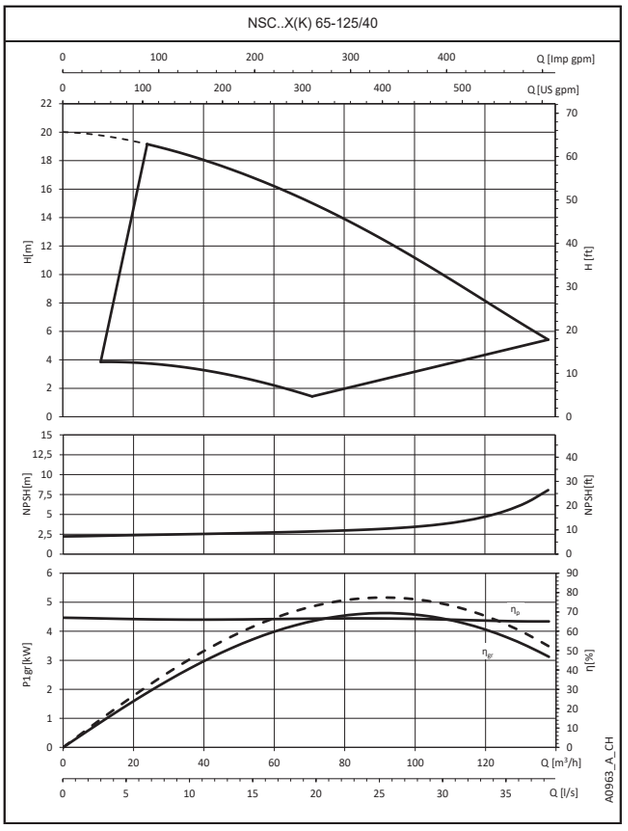


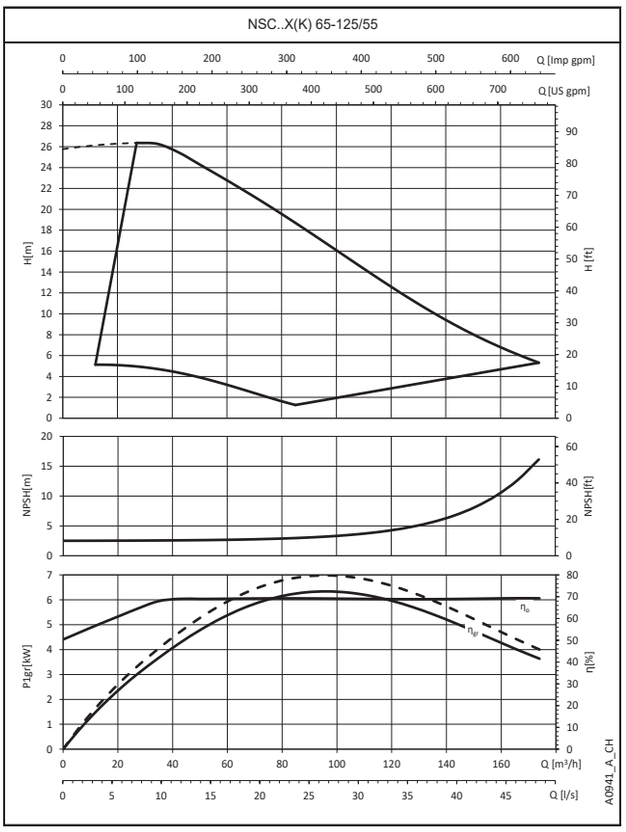
These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

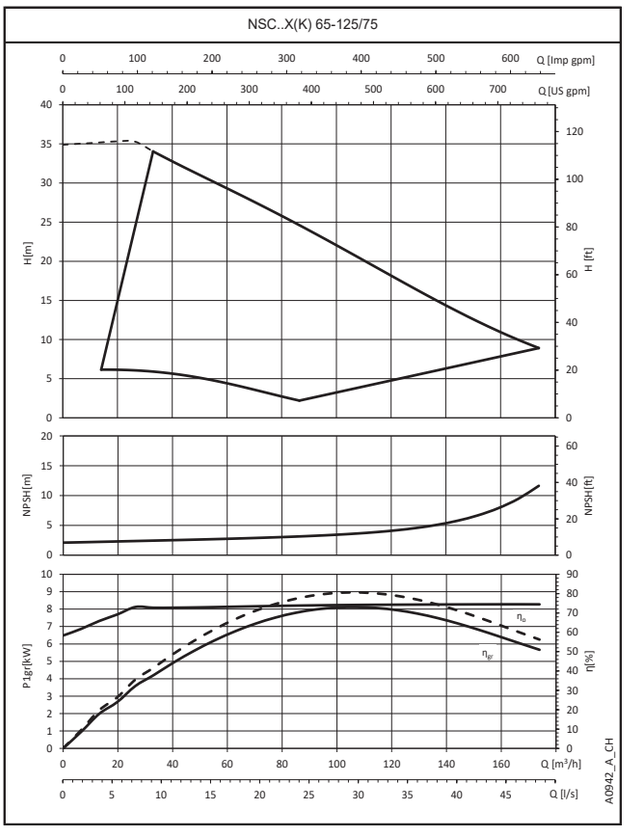
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS





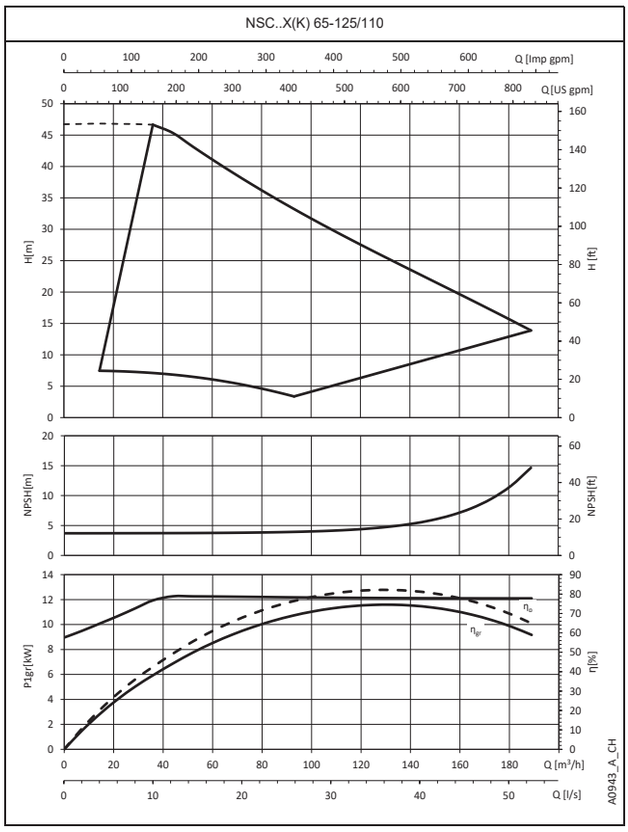


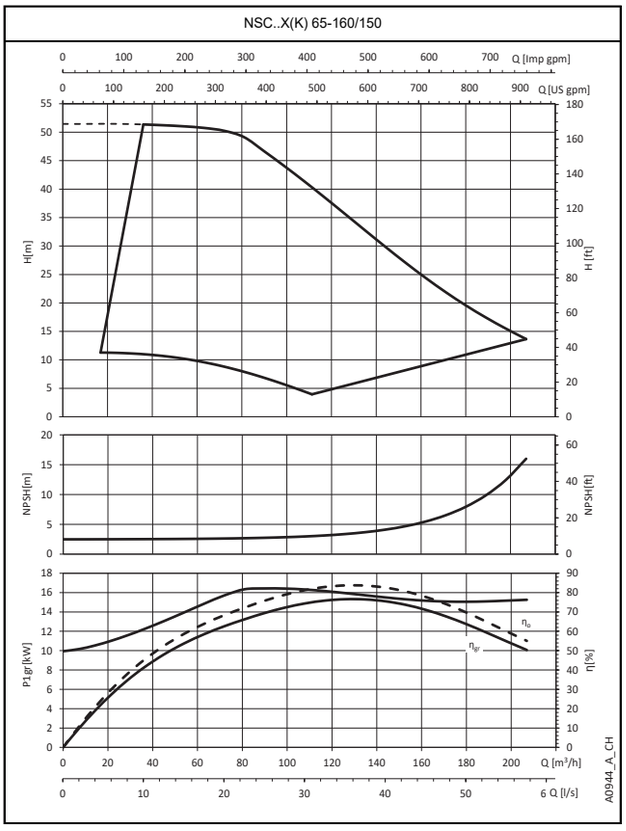


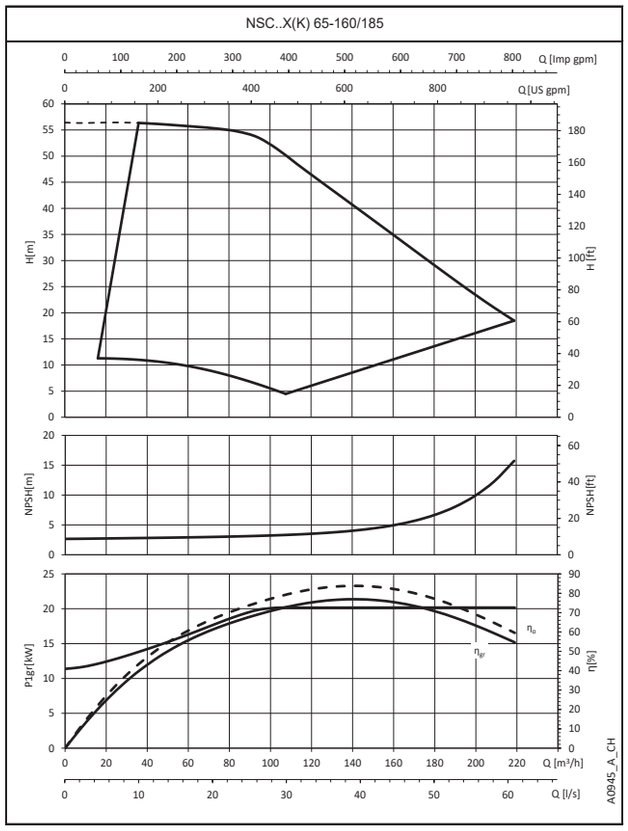
These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

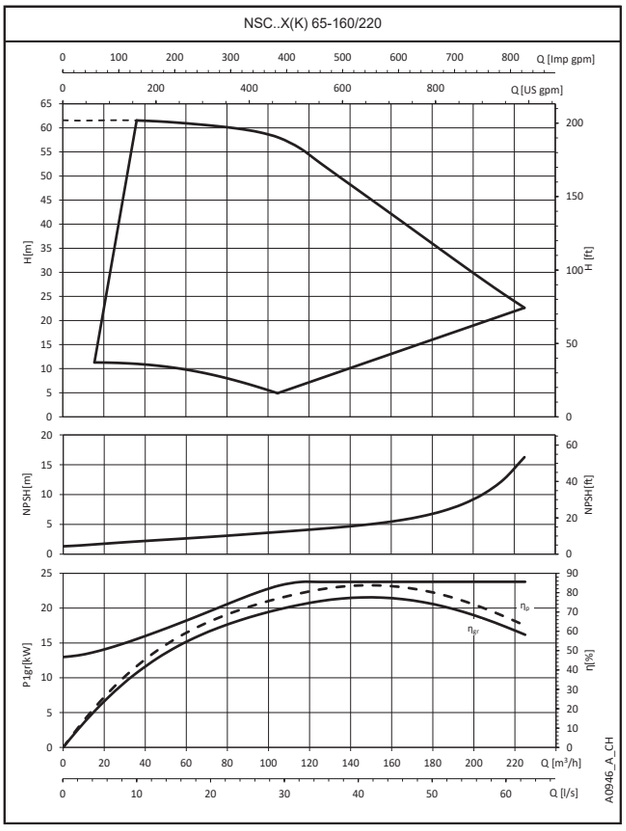
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS





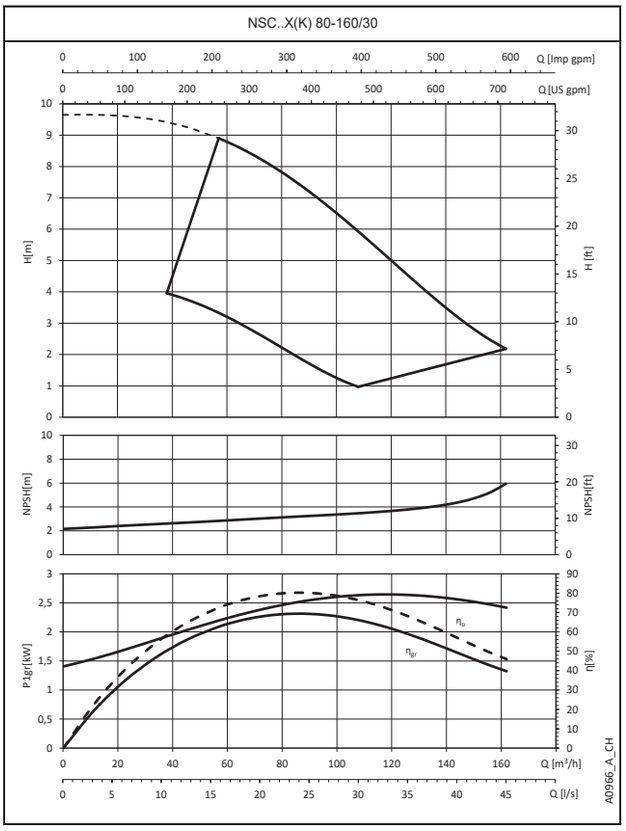


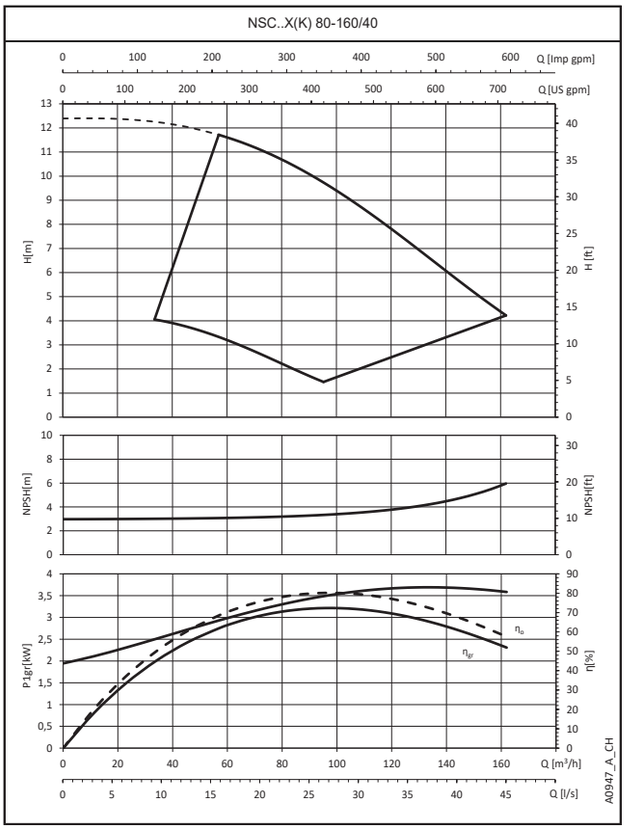


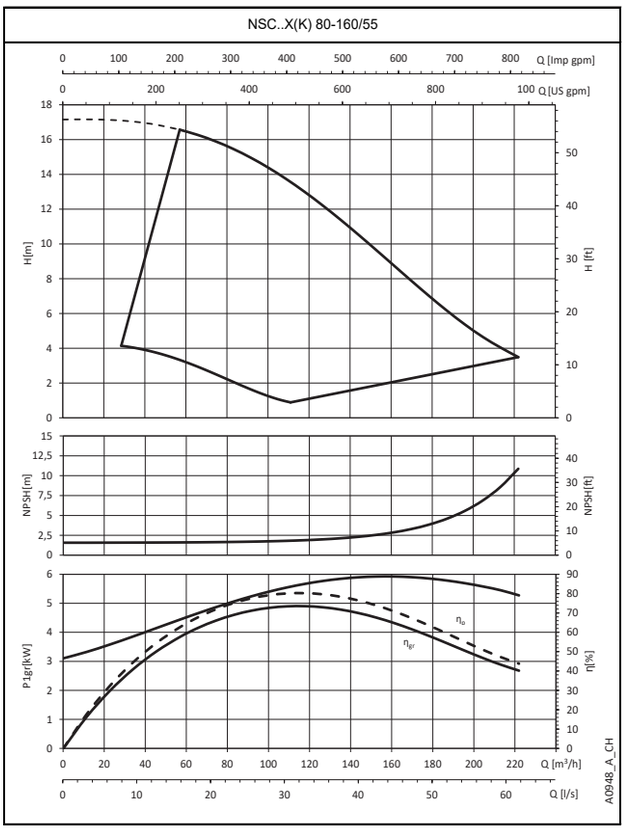
These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

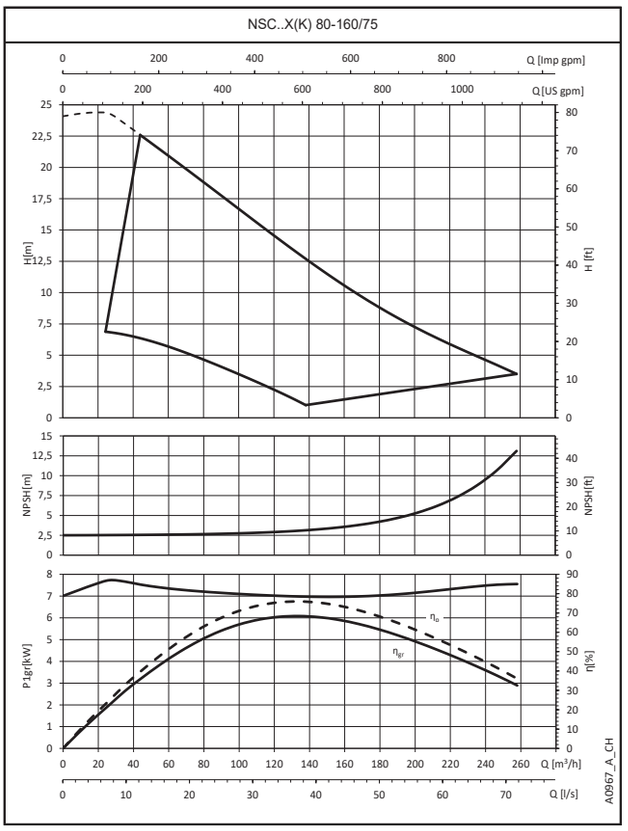
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS



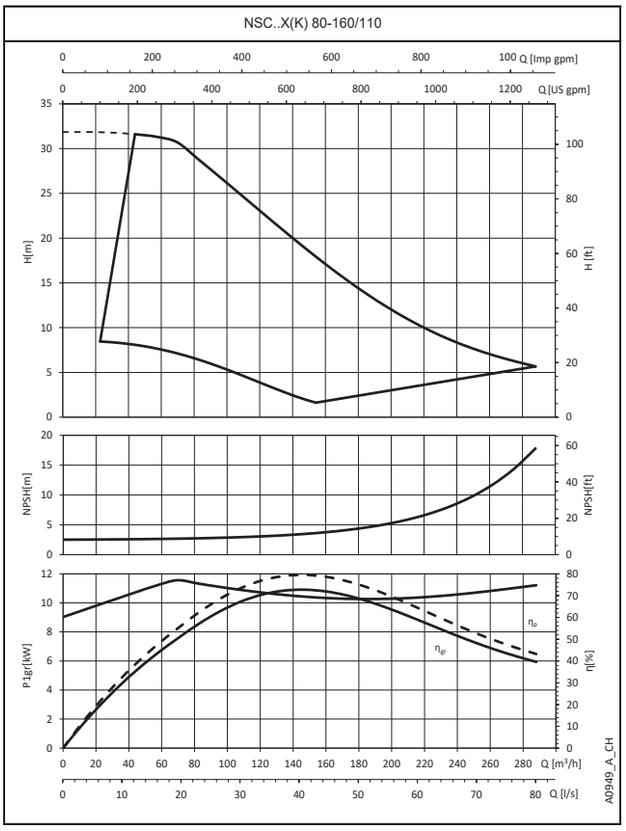


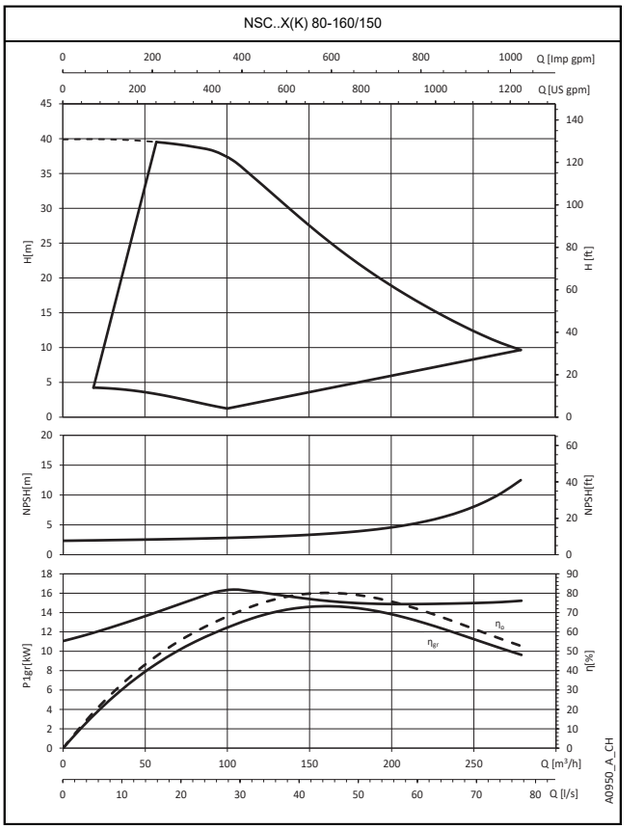


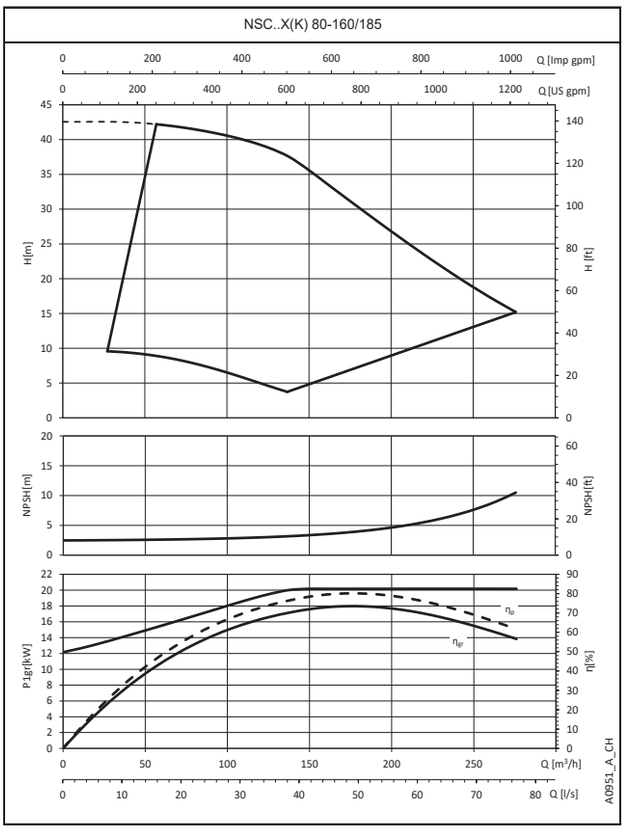


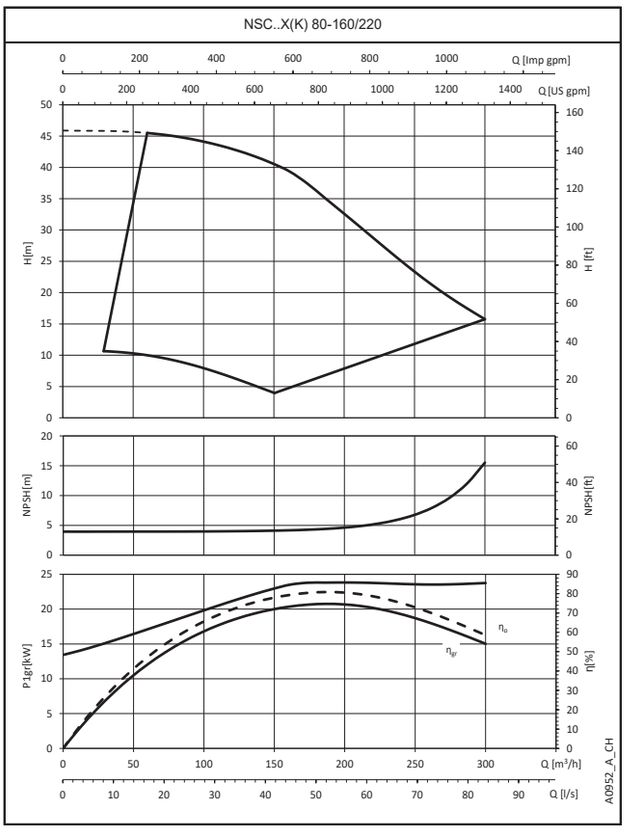
These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS





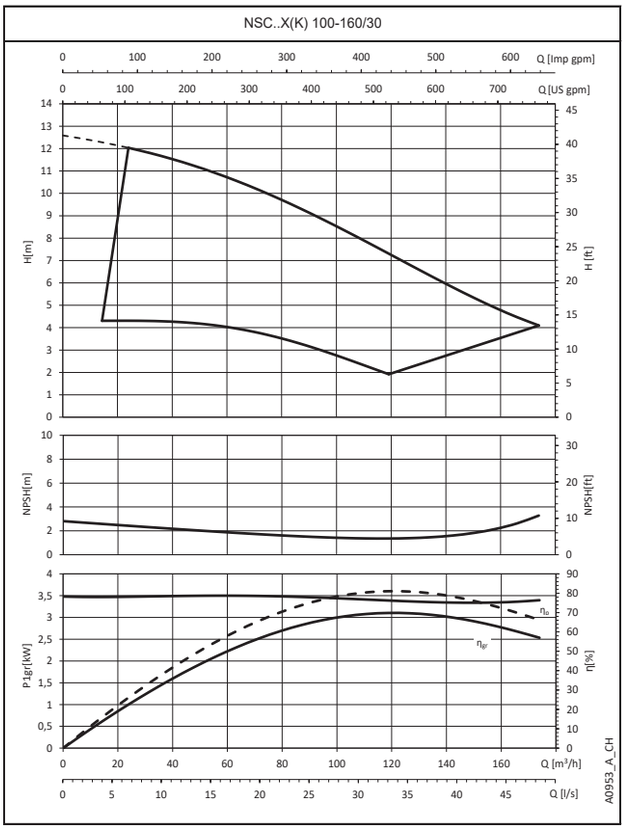


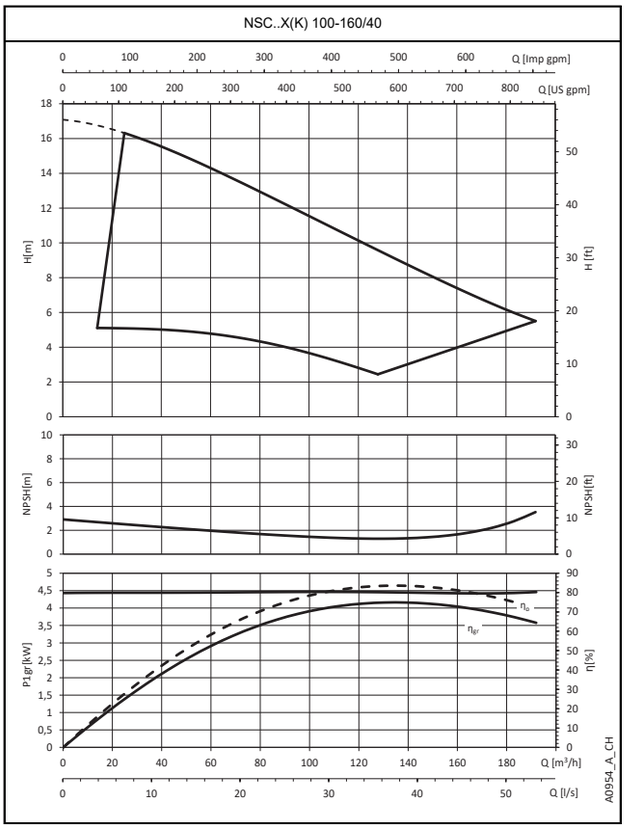


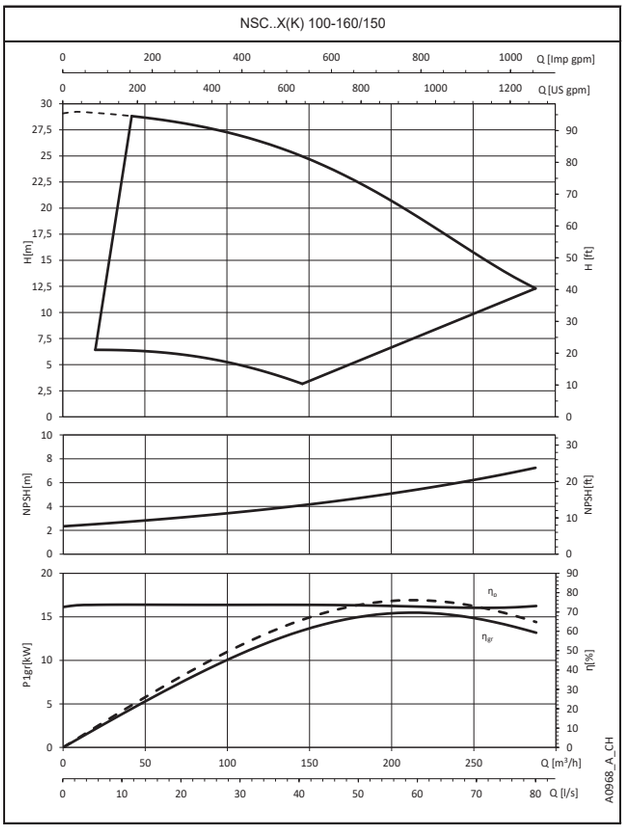
These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

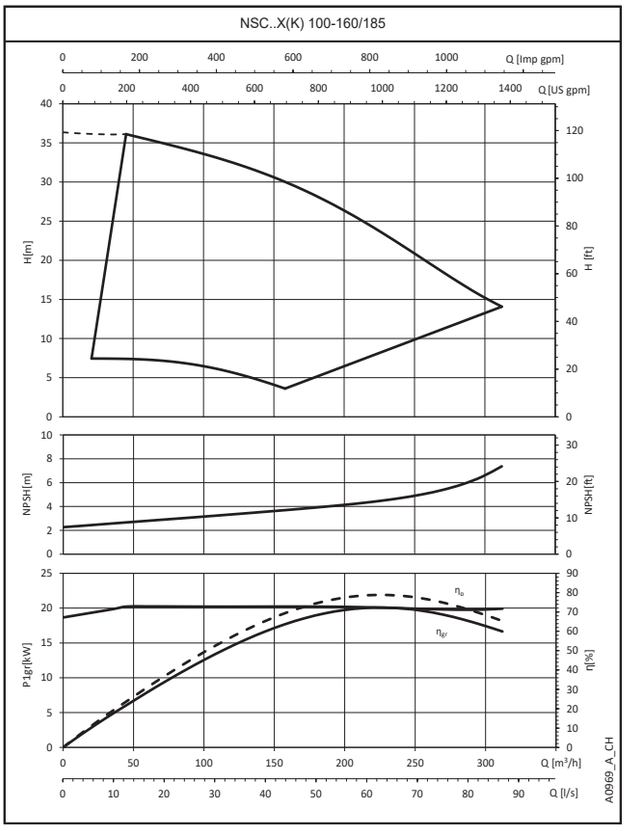
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS







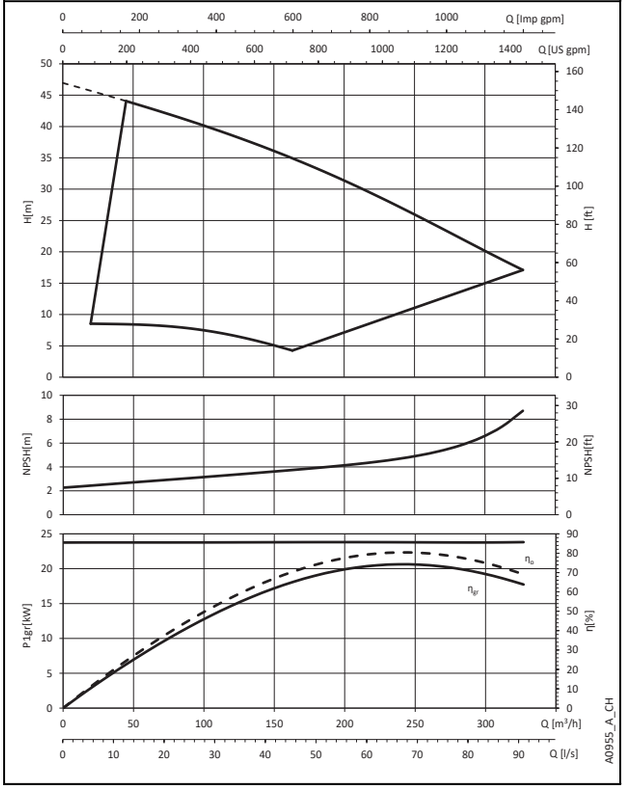


These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

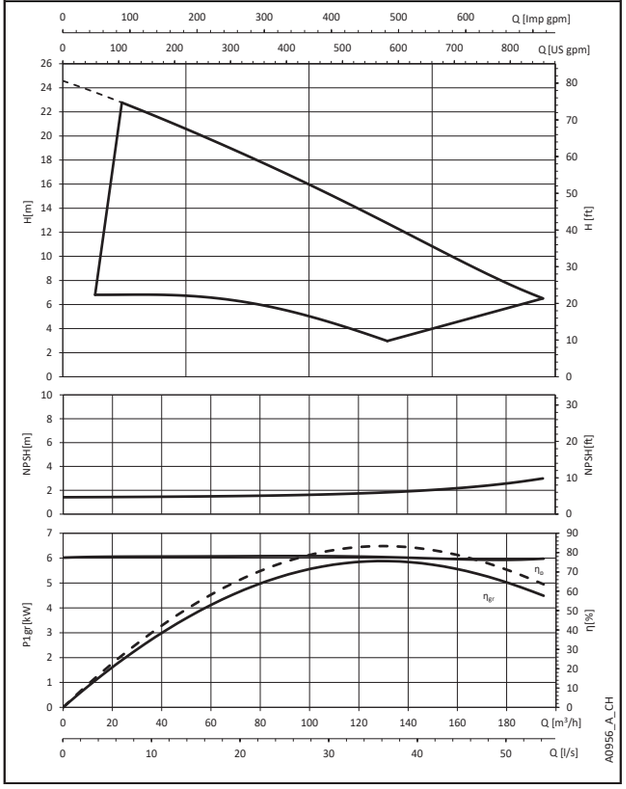
LOWARA
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

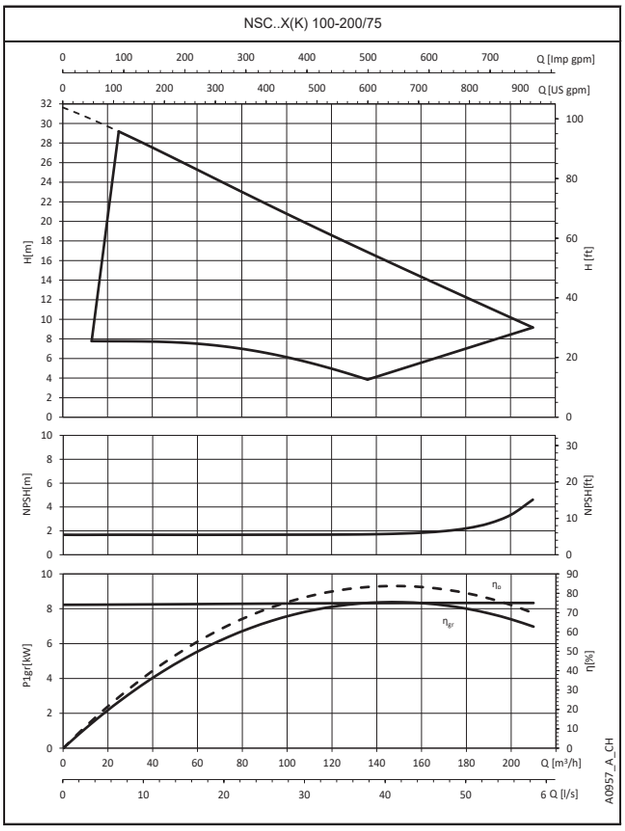
NSC..X(K) 100-160/220



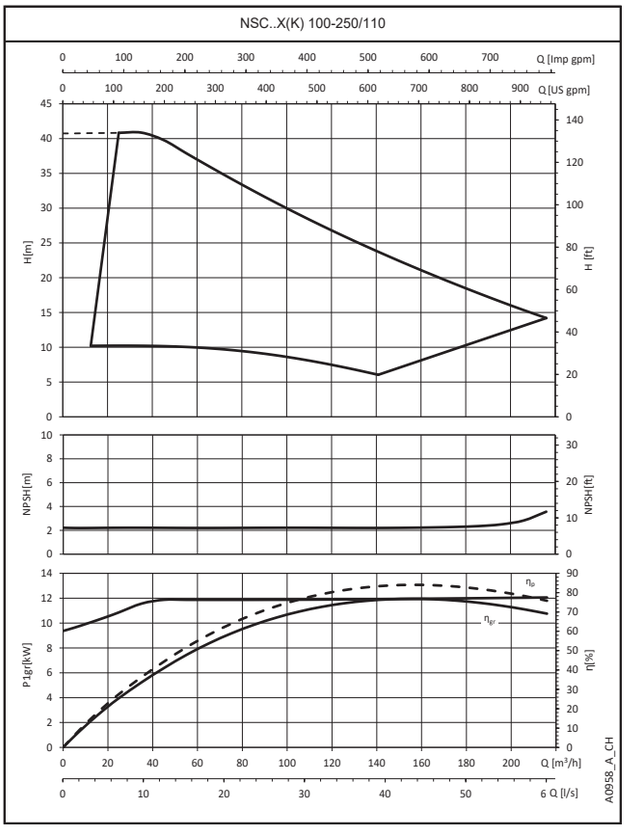
NSC..X(K) 100-200/55



NSC..X(K) 100-200/75



NSC..X(K) 100-250/110

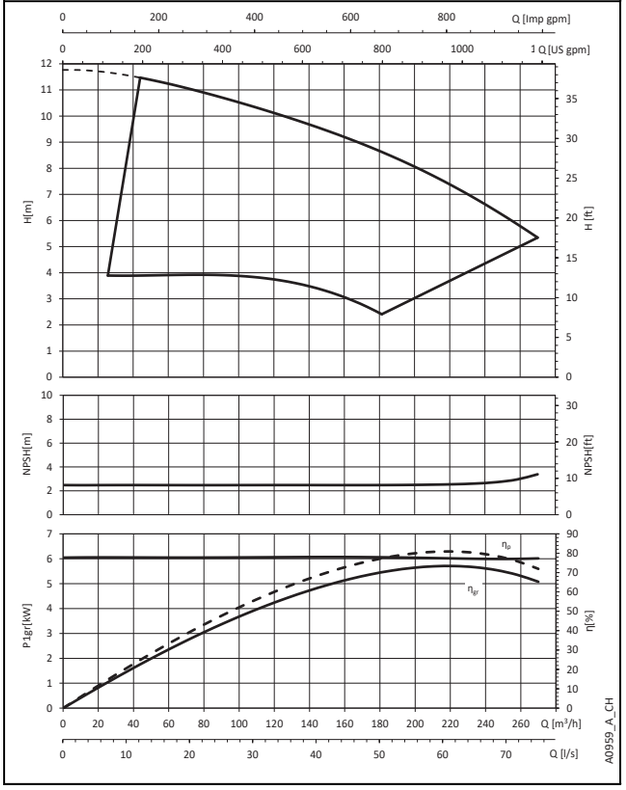


These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

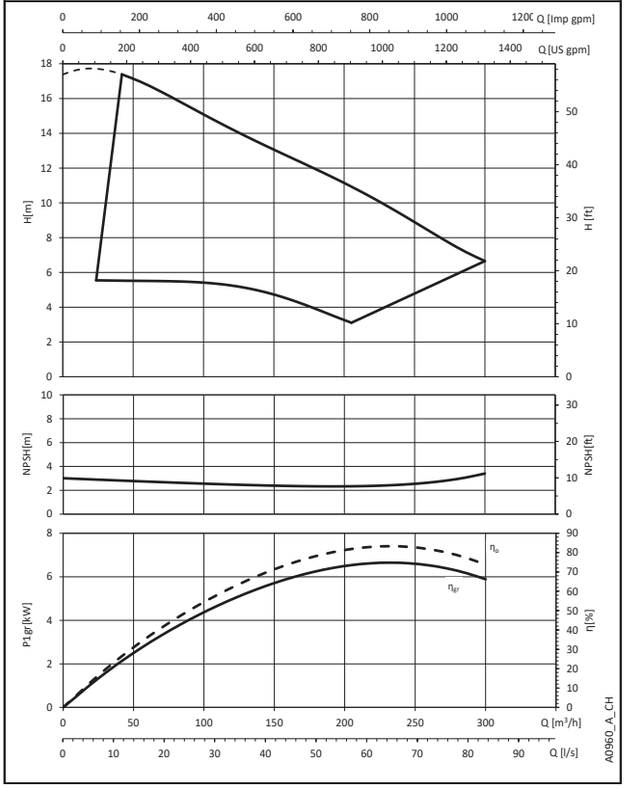
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e-NSC..X, e-NSC..K SERIES
OPERATING CHARACTERISTICS

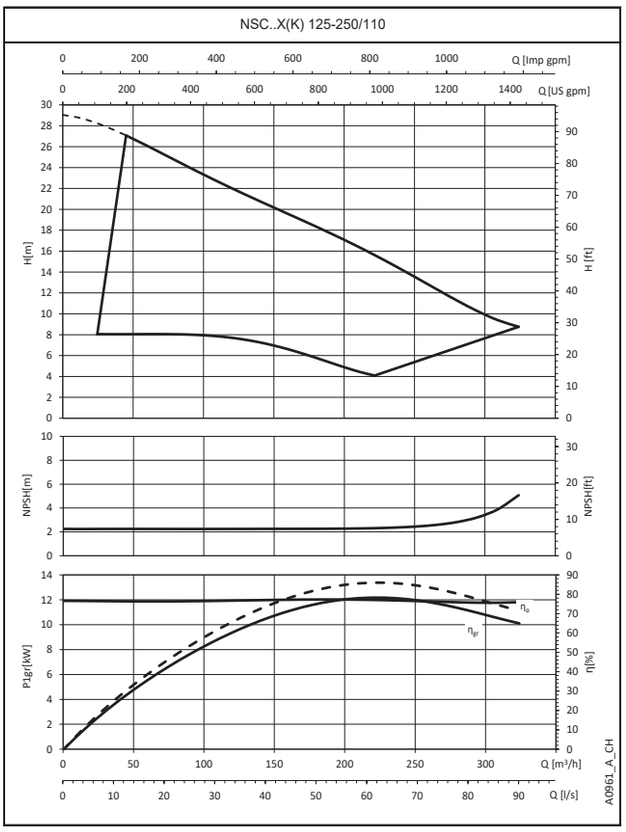
NSC..X(K) 125-200/55



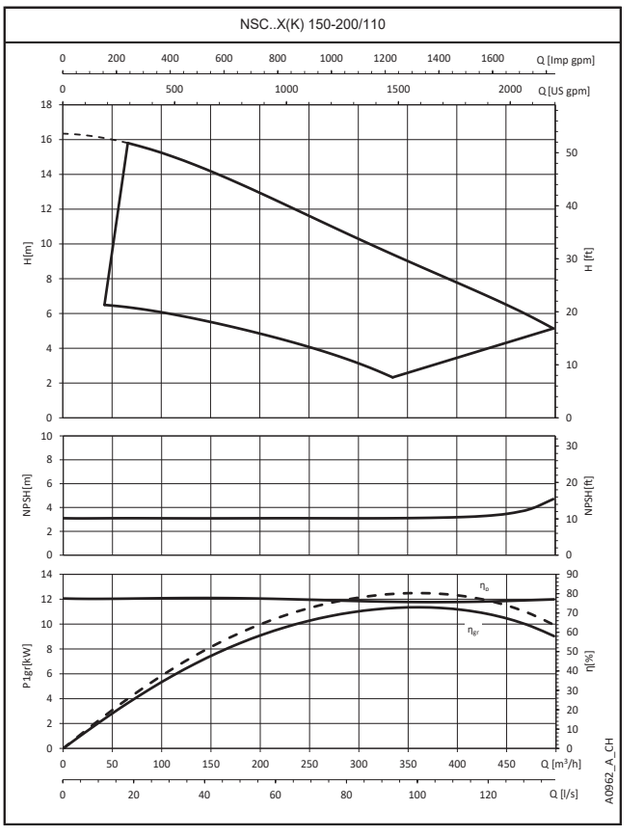
NSC..X(K) 125-200/75



NSC..X(K) 125-250/110



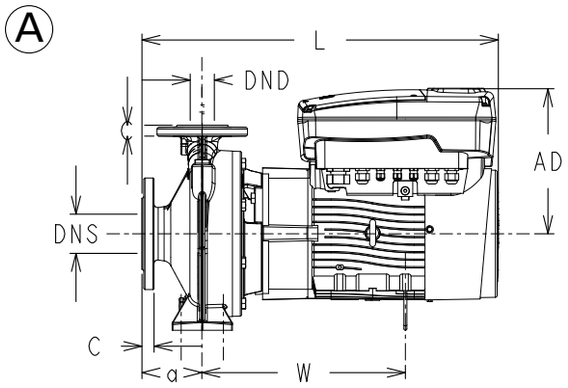
NSC..X(K) 150-200/110

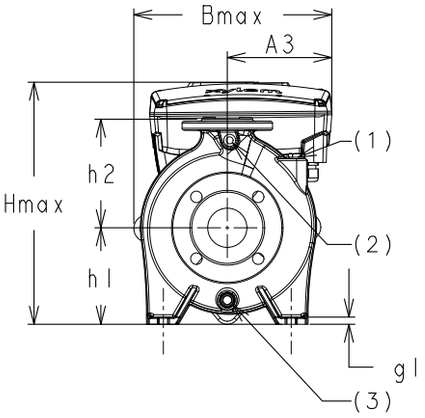


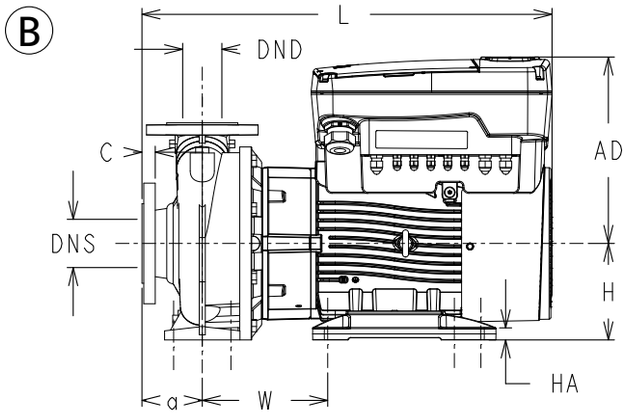
These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.

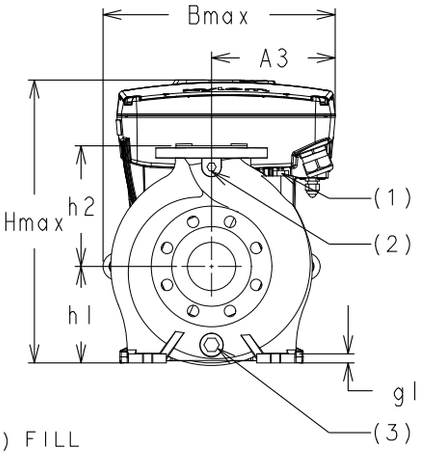
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e-NSCEX, e-NSCEK SERIES
DIMENSIONS AND WEIGHTS









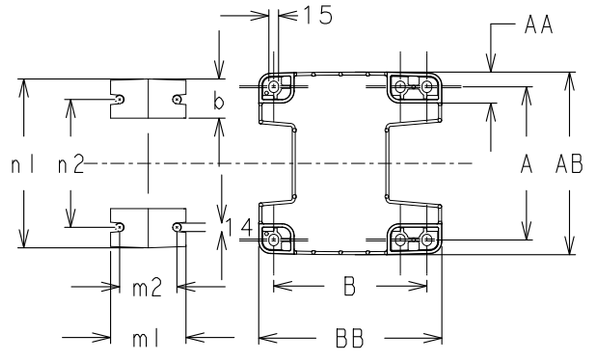
(1) FILL

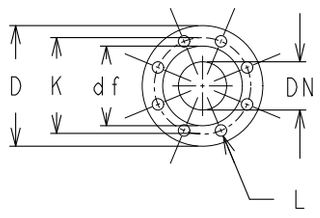
(2) PRESSURE GAUGE CONNECTOR

(3) DRAIN

CONNECTIONS

	DND≤100	DND≤150	DND≥200
1)	G 1/8	G 3/8	-
2)	G 1/4	G 1/4	G 1/2
3)	G 3/8	G 3/8	G 1/2





FLANGES

EN1092-2, PN 16 *)					
DN	D	K	C	df	Lf
32	140	100	18	76	4x19
40	150	110	18	84	4x19
50	165	125	20	99	4x19
65	185	145	20	118	4x19
80	200	160	22	132	8x19
100	230	180	24	157	8x19
125	255	210	26	184	8x19
150	285	240	26	211	8x23

*)...VALUE "C" AND "D" MAY VARY FROM STANDARD.

A0008-EXM-EN_A_DD

LOWARA
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e-NSCEX, e-NSCEK SERIES
DIMENSIONS AND WEIGHTS

PUMP TYPE	MOTOR		TIPO	DIMENSIONS (mm)																											WEIGHT
NSCEX..	TYPE			PUMP																MOTOR								B	H	L	x	
NSCEK..	kW	Size		DNS	DND	a	b	g1	h1	h2	m1	m2	n1	n2	W	A	AA	AB	A3	AD	B	BB	H	HA	max	max			kg
32-125/30	3	B	A	50	32	80	50	14	112	140	100	70	190	140	292	-	-	-	149	194	-	-	-	-	275	306	519	300	38
32-125/40	4	B	A	50	32	80	50	14	112	140	100	70	190	140	292	-	-	-	149	194	-	-	-	-	275	306	519	300	38
32-160/55	5,5	C	A	50	32	80	50	14	132	160	100	70	240	190	337	-	-	-	175	241	-	-	-	-	330	373	571	300	53
32-200/75	7,5	C	A	50	32	80	50	14	160	180	100	70	240	190	337	-	-	-	175	241	-	-	-	-	330	401	571	300	60
32-200/110	11	C	A	50	32	80	50	14	160	180	100	70	240	190	337	-	-	-	175	241	-	-	-	-	330	401	571	300	71
40-125/30	3	B	A	65	40	80	50	14	112	140	100	70	210	160	292	-	-	-	149	194	-	-	-	-	275	306	519	300	43
40-125/40	4	B	A	65	40	80	50	14	112	140	100	70	210	160	292	-	-	-	149	194	-	-	-	-	275	306	519	300	43
40-160/55	5,5	C	A	65	40	80	50	14	132	160	100	70	240	190	337	-	-	-	175	241	-	-	-	-	330	373	571	300	57
40-160/75	7,5	C	A	65	40	80	50	14	132	160	100	70	240	190	337	-	-	-	175	241	-	-	-	-	330	373	571	300	58
40-200/110	11	C	A	65	40	100	50	14	160	180	100	70	265	212	337	-	-	-	175	241	-	-	-	-	330	401	591	300	68
40-250/220	22	D	B	65	40	100	65	16	180	225	125	95	320	250	221	241	50	294	205	312	279	338	180	22	385	492	680	300	117
50-125/30	3	B	A	65	50	100	50	14	132	160	100	70	240	190	294	-	-	-	149	194	-	-	-	-	275	326	541	300	46
50-125/40	4	B	A	65	50	100	50	14	132	160	100	70	240	190	294	-	-	-	149	194	-	-	-	-	275	326	541	300	46
50-125/55	5,5	C	A	65	50	100	50	14	132	160	100	70	240	190	339	-	-	-	175	241	-	-	-	-	330	373	593	300	59
50-125/75	7,5	C	A	65	50	100	50	14	132	160	100	70	240	190	339	-	-	-	175	241	-	-	-	-	330	373	593	300	63
50-160/110	11	C	A	65	50	100	50	14	160	180	100	70	265	212	337	-	-	-	175	241	-	-	-	-	330	401	591	300	71
50-200/185	18,5	D	A	65	50	100	50	14	160	200	100	70	265	212	176	241	50	294	205	312	279	338	180	22	385	492	680	300	104
50-200/220	22	D	B	65	50	100	50	14	160	200	100	70	265	212	221	241	50	294	205	312	279	338	180	22	385	492	680	300	118
65-125/40	4	B	A	80	65	100	65	16	160	180	125	95	280	212	292	-	-	-	149	194	-	-	-	-	301	354	541	300	57
65-125/55	5,5	C	A	80	65	100	65	16	160	180	125	95	280	212	337	-	-	-	175	241	-	-	-	-	330	401	591	300	68
65-125/75	7,5	C	A	80	65	100	65	16	160	180	125	95	280	212	337	-	-	-	175	241	-	-	-	-	330	401	591	300	69
65-125/110	11	C	A	80	65	100	65	16	160	180	125	95	280	212	352	-	-	-	175	241	-	-	-	-	330	401	606	300	79
65-160/150	15	D	B	80	65	100	65	16	160	200	125	95	280	212	176	254	59	304	205	312	254	301	160	20	385	472	680	300	103
65-160/185	18,5	D	A	80	65	100	65	16	160	200	125	95	280	212	176	241	50	294	205	312	279	338	180	22	385	492	680	300	111
65-160/220	22	D	B	80	65	100	65	16	160	200	125	95	280	212	221	241	50	294	205	312	279	338	180	22	385	492	680	300	133
80-160/30	3	C	A	100	80	125	65	16	180	225	125	95	320	250	322	-	-	-	149	194	-	-	-	-	342	374	601	300	99
80-160/40	4	C	A	100	80	125	65	16	180	225	125	95	320	250	322	-	-	-	149	194	-	-	-	-	342	374	601	300	103
80-160/55	5,5	C	A	100	80	125	65	16	180	225	125	95	320	250	337	-	-	-	175	241	-	-	-	-	342	421	616	300	97
80-160/75	7,5	C	A	100	80	125	65	16	180	225	125	95	320	250	337	-	-	-	175	241	-	-	-	-	342	421	616	300	89
80-160/110	11	D	A	100	80	125	65	16	180	225	125	95	320	250	384	-	-	-	175	241	-	-	-	-	385	421	705	300	110
80-160/150	15	D	B	100	80	125	65	16	180	225	125	95	320	250	176	254	59	304	205	312	254	301	160	20	385	492	705	300	117
80-160/185	18,5	D	A	100	80	125	65	16	180	225	125	95	320	250	176	241	50	294	205	312	279	338	180	22	385	492	705	300	125
80-160/220	22	D	B	100	80	125	65	16	180	225	125	95	320	250	221	241	50	294	205	312	279	338	180	22	385	492	705	300	133

For shims and supports see accessories section.

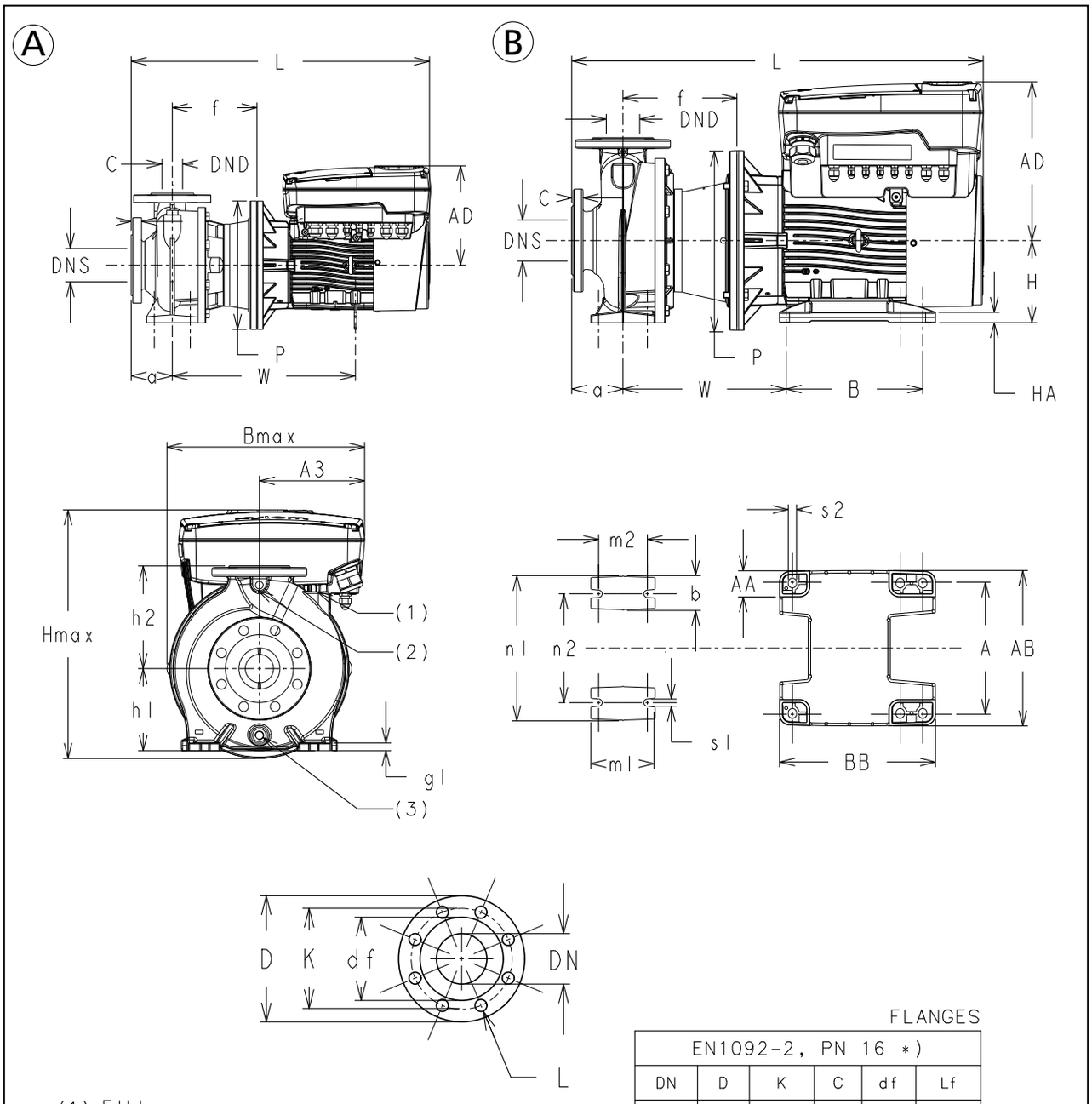
nscex-en_b_td

X = clearance for disassembly

NOTE: Pumps with flanges according to EN 1092-2 as standard; available ASME B16.5 version on request.

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e-NSCSX, e-NSCSK SERIES
DIMENSIONS AND WEIGHTS



(1) FILL

(2) PRESSURE GAUGE CONNECTOR

(3) DRAIN

CONNECTIONS

	DND≤100	DND≤150	DND≥200
1)	G 1/8	G 3/8	-
2)	G 1/4	G 1/4	G 1/2
3)	G 3/8	G 3/8	G 1/2

FLANGES

EN1092-2, PN 16 *)					
DN	D	K	C	df	Lf
32	140	100	18	76	4x19
40	150	110	18	84	4x19
50	165	125	20	99	4x19
65	185	145	20	118	4x19
80	200	160	22	132	8x19
100	230	180	24	157	8x19
125	255	210	26	184	8x19
150	285	240	26	211	8x23

*)...VALUE "C" AND "D" MAY VARY FROM STANDARD.

A0009-EXM-EN_A_DD

LOWARA
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e-NSCSX, e-NSCSK SERIES
DIMENSIONS AND WEIGHTS

PUMP TYPE NSCSX.. / NSCSK..	MOTOR TYPE kW	MOTOR TYPE Size	TYPE	DIMENSIONS (mm) PUMP DNS	DND	a	b	f	g1	h1	h2	m1	m2	n1	n2	P	s1	W	MOTOR A	AA	AB	AD	A3	B	BB	H	HA	B max	H max	L	x	WEIGHT kg
32-125/30	3	B	A	50	32	80	50	165	14	112	140	100	70	190	140	250	14	357	-	-	-	194	149	-	-	100	-	275	319	584	300	49
32-125/40	4	B	A	50	32	80	50	165	14	112	140	100	70	190	140	250	14	357	-	-	-	194	149	-	-	112	-	275	319	584	300	51
32-160/55	5,5	C	A	50	32	80	50	192	14	132	160	100	70	240	190	300	14	429	-	-	-	241	175	-	-	132	-	330	391	663	300	70
32-200/75	7,5	C	A	50	32	80	50	192	14	160	180	100	70	240	190	300	14	429	-	-	-	241	175	-	-	132	-	330	401	663	300	76
32-200/110	11	C	B	50	32	80	50	222	14	160	180	100	70	240	190	350	14	299	254	57	304	241	175	210	254	160	20	350	416	708	300	71
40-125/30	3	B	A	65	40	80	50	165	14	112	140	100	70	210	160	250	14	357	-	-	-	194	149	-	-	100	-	275	319	584	300	50
40-125/40	4	B	A	65	40	80	50	165	14	112	140	100	70	210	160	250	14	357	-	-	-	194	149	-	-	112	-	275	319	584	300	52
40-160/55	5,5	C	A	65	40	80	50	192	14	132	160	100	70	240	190	300	14	429	-	-	-	241	175	-	-	132	-	330	391	663	300	71
40-160/75	7,5	C	A	65	40	80	50	192	14	132	160	100	70	240	190	300	14	-	-	-	-	241	175	-	-	132	-	330	391	663	300	77
40-200/110	11	C	B	65	40	100	50	222	14	160	180	100	70	265	212	350	14	299	254	57	304	241	175	210	254	160	20	350	416	728	300	72
40-200/150	15	D	B	65	40	100	50	222	14	160	180	100	70	265	212	350	14	330	254	59	304	312	205	254	301	160	20	385	487	802	300	113
40-200/185	18,5	D	B	65	40	100	50	222	14	160	180	100	70	265	212	350	14	330	254	59	304	312	205	254	301	160	20	385	487	802	300	120
40-250/220	22	D	B	65	40	100	65	222	16	180	225	125	95	320	250	350	14	343	241	50	294	312	205	279	338	180	22	385	492	802	300	140
50-125/30	3	B	A	65	50	100	50	167	14	132	160	100	70	240	190	250	14	359	-	-	-	194	149	-	-	100	-	275	326	606	300	48
50-125/40	4	B	A	65	50	100	50	167	14	132	160	100	70	240	190	250	14	359	-	-	-	194	149	-	-	112	-	275	326	606	300	50
50-125/55	5,5	C	A	65	50	100	50	194	14	132	160	100	70	240	190	300	14	431	-	-	-	241	175	-	-	132	-	330	391	685	300	73
50-125/75	7,5	C	A	65	50	100	50	194	14	132	160	100	70	240	190	300	14	-	-	-	-	241	175	-	-	132	-	330	391	685	300	77
50-160/110	11	C	B	65	50	100	50	222	14	160	180	100	70	265	212	350	14	299	254	57	304	241	175	210	254	160	20	350	416	728	300	75
50-160/150	15	D	B	65	50	100	50	222	14	160	180	100	70	265	212	350	14	330	254	59	304	312	205	254	301	160	20	385	487	802	300	116
50-200/185	18,5	D	B	65	50	100	50	222	14	160	200	100	70	265	212	350	14	330	254	59	304	312	205	254	301	160	20	385	487	802	300	122
50-200/220	22	D	B	65	50	100	50	222	14	160	200	100	70	265	212	350	14	343	241	50	294	312	205	279	338	180	22	385	492	802	300	130
65-125/40	4	B	A	80	65	100	65	192	16	160	180	125	95	280	212	300	14	357	-	-	-	194	149	-	-	112	-	301	354	601	300	62
65-125/55	5,5	C	A	80	65	100	65	192	16	160	180	125	95	280	212	300	14	429	-	-	-	241	175	-	-	132	-	330	401	683	300	72
65-125/75	7,5	C	A	80	65	100	65	192	16	160	180	125	95	280	212	300	14	429	-	-	-	241	175	-	-	132	-	330	401	683	300	84
65-125/110	11	C	B	80	65	100	65	222	16	160	180	125	95	280	212	350	14	299	254	57	304	241	175	210	254	160	20	350	416	728	300	77
65-160/150	15	D	B	80	65	100	65	222	16	160	200	125	95	280	212	350	14	330	254	59	304	312	205	254	301	160	20	385	487	802	300	125
65-160/185	18,5	D	B	80	65	100	65	222	16	160	200	125	95	280	212	350	14	330	254	59	304	312	205	254	301	160	20	385	487	802	300	132
65-160/220	22	D	B	80	65	100	65	222	16	160	200	125	95	280	212	350	14	343	241	50	294	312	205	279	338	180	22	385	492	802	300	140
80-160/30	3	C	A	100	80	125	65	165	16	180	225	125	95	320	250	250	14	359	-	-	-	241	175	-	-	100	-	342	421	666	300	88
80-160/40	4	C	A	100	80	125	65	165	16	180	225	125	95	320	250	250	14	387	-	-	-	241	175	-	-	112	-	342	421	666	300	91
80-160/55	5,5	C	A	100	80	125	65	192	16	180	225	125	95	320	250	300	14	429	-	-	-	241	175	-	-	132	-	342	421	708	300	102
80-160/75	7,5	C	A	100	80	125	65	192	16	180	225	125	95	320	250	300	14	429	-	-	-	241	175	-	-	132	-	342	421	708	300	94
80-160/110	11	D	B	100	80	125	65	222	16	180	225	125	95	320	250	350	14	330	254	59	304	312	205	254	301	160	20	385	492	827	300	121
80-160/150	15	D	B	100	80	125	65	222	16	180	225	125	95	320	250	350	14	330	254	59	304	312	205	254	301	160	20	385	492	827	300	129
80-160/185	18,5	D	B	100	80	125	65	222	16	180	225	125	95	320	250	350	14	330	254	59	304	312	205	254	301	160	20	385	492	827	300	138
80-160/220	22	D	B	100	80	125	65	222	16	180	225	125	95	320	250	350	14	343	241	50	294	312	205	279	338	180	22	385	492	827	300	146
100-160/30	3	C	A	125	100	125	80	183	26	200	280	360	280	160	120	250	19	-	-	-	-	241	175	-	-	100	-	388	441	684	300	113
100-160/40	4	C	A	125	100	125	80	183	26	200	280	360	280	160	120	250	19	-	-	-	-	241	175	-	-	112	-	388	441	684	300	131
100-160/150	15	D	B	125	100	125	80	240	26	200	280	160	120	360	280	350	19	348	254	59	304	312	205	254	301	160	20	388	512	845	300	151
100-160/185	18,5	D	B	125	100	125	80	240	26	200	280	160	120	360	280	350	19	348	254	59	304	312	205	254	301	160	20	388	512	845	300	164
100-160/220	22	D	B	125	100	125	80	240	26	200	280	160	120	360	280	350	19	361	241	50	294	312	205	279	338	180	22	388	512	845	300	165
100-200/55	5,5	C	A	125	100	125	80	210	26	200	280	360	280	160	120	300	19	-	-	-	-	241	175	-	-	132	-	389	441	726	300	123
100-200/75	7,5	D	A	125	100	125	80	210	26	200	280	360	280	160	120	300	19	-	-	-	-	312	205	-	-	132	-	389	512	810	300	144
100-250/110	11	D	B	125	100	140	80	240	26	225	280	400	315	160	120	350	19	348	254	59	304	312	205	254	301	160	20	431	537	860	300	209
125-200/55	5,5	C	A	150	125	140	80	210	26	250	315	400	315	160	120	300	19	-	-	-	-	241	175	-	-	132	-	467	491	741	300	150
125-200/75	7,5	D	A	150	125	140	80	210	26	250	315	400	315	160	120	300	19	-	-	-	-	312	205	-	-	132	-	467	491	741	300	174
125-250/110	11	D	B	150	125	140	80	240	26	250	355	400	315	160	120	350	19	348	254	59	304	312	205	254	301	160	20	470	562	860	300	227
150-200/110	11	D	B	200	150	160	100	240	26	280	400	550	450	200	150	350	23	348	254	59	304	312	205	254	301	160	20	602	592	880	300	279

For shims and supports see accessories section.

nscsx_a_td

X = clearance for disassambly

NOTE: Pumps with flanges according to EN 1092-2 as standard; available ASME B16.5 version on request.