

OPERATING MANUAL

herborner.X-N



www.herborner-pumpen.com



Name: Herborner Pumps US, LP

10550 Plano Rd

Dallas, TX 75238, USA

Phone: +1 469 928 0838

Name: Herborner Pumpentechnik GmbH & Co KG

Littau 3-5

35745 Herborn, Germany

Phone: +49 2772 933 - 0 Fax: +49 2772 933 - 100

info@herborner-pumpen.com www.herborner-pumpen.com

Translation of the original operating manual

© Herborner Pumpentechnik 2014



Information about the operating manual

This manual enables the pump to be used safely and efficiently. The manual is a part of the pump and must be kept in the immediate vicinity of the pump to be accessible to the personnel at all times.

Before starting any work, personnel must have carefully read and understood this manual. It is a basic requirement for safe work that all safety instructions and all other instructions in this manual are obeyed.

In addition, local regulations on health & safety at work as well as general safety rules apply for the area where the pump is used.



 Depending on the type of pump, even if the size and capacity of the pumps differ, unless otherwise specified, all specifications in this operating manual apply for all types of pump.

Other applicable documents

In addition to this manual, the following documents must also be considered:

- The block motor's operating manual:
 - "Integral Horsepower AC Induction Motors (MN408), Baldor Electric Company" for herborner.X-N
 - "Operating Instructions for three-phase-motors with permanent magnets (12.13), EMOD MOTOREN" for herborner.X-N-PM
 - "Operating Instructions for water-cooled three-phasemotors (11.03), EMOD MOTOREN" for herborner.X-N-C
- Additional safety and maintenance instructions for the block motor "AC & DC Motor Installation - Maintenance Instructions" for herborner.X-N



Customer service

Phone number +49 2772 933 - 0 (reception)

E-mail info@herborner-pumps.com

Our reception will quickly connect you with the right person.



Table of contents

1	Over	view		16
2	Safe	ty		18
	2.1	Symbo	ls used in this manual	18
	2.2	Intende	ed use	21
	2.3	Danger	zone	23
	2.4	Safety	devices	23
		2.4.1	Existing safety devices	23
		2.4.2	Safety devices required in addition	24
	2.5	Safety	labels	25
	2.6		ng the unit to prevent it from being switched in	28
	2.7	Residu	al risks	29
		2.7.1	Dangers from electrical voltage	30
		2.7.2	Dangers from rotating parts	
		2.7.3	3	
		2.7.4	Dangers from high temperatures	
		2.7.5	Dangers at the installation site	
	2.8		o do in case of danger	
	2.9		ner's responsibility	
	2.10		cations of the personnel	
	2.11		al protective equipment	
			rs of damage to material	
			oarts	
	2.14	Protect	ing the environment	45
3	The	function	of the pump	47
	3.1	Overvie	ew	47
	3.2	Block n	notor	49
	3.3	Pump o	casing	53
	3.4	Filter ca	asing	54
	3.5	Connec	ctions	55
	3.6	Access	ories	56
		3.6.1	variable frequency drive	56
		3.6.2	Seal Guard system	57



		3.6.3	Analog pre-filter monitoring	58
		3.6.4	Digital pre-filter monitoring	58
		3.6.5	Long Life set	59
		3.6.6	Replacement filter strainer	59
		3.6.7	Analog pressure sensor unit	60
		3.6.8	Installation tool for mechanical seals	60
4	Tran	sport ar	nd storage	61
	4.1	Safety	instructions for transport and storage	61
	4.2	Deliver	y	63
		4.2.1	Type of delivery	63
		4.2.2	Symbols on the packaging	63
		4.2.3	Transporting the packed items	63
		4.2.4	Storing the packed items	64
	4.3	Transp	ort inspection	65
	4.4	Transp	orting the pump to its installation site	65
5	Insta	alling an	d connecting the pump	67
	5.1	Safety	instructions for assembly/installation	67
	5.2	Require	ements for installation	68
	5.3	Installir	ng and aligning	69
		5.3.1	Installing the pump	69
		5.3.2	Tightening the screw connections	70
		5.3.3	Assembling the screwed connection	71
		5.3.4	Installing the star handles	74
		5.3.5	Connecting to the pump's flanges	75
			5.3.5.1 Suction side	75
			5.3.5.2 Pressure side	77
	5.4	After in	stallation	79
6			and putting into operation for the first	81
	6.1	Safety	instructions for the installation and putting eration for the first time	
	6.2	•	ng the electrical installation in the building	
	6.3	•	cting the electrical power supply	
	•	6.3.1	Connecting the herborner.X-N without variable frequency drives	
		6.3.2	Connecting the herborner.X-N-C without	



			variable frequency drive	84
		6.3.3	Connecting the herborner.X-N with a valuable frequency drive	
		6.3.4	Connecting the herborner.X-N-PM with variable frequency drive	87
	6.4	Conne	cting the control system	89
	6.5	Filling	the pump	89
	6.6	Checki	ing the direction of rotation	90
	6.7		ne installation and putting into operation for time	
7	Ope	ration		94
	7.1	Warnir	gs during operation	94
	7.2		ng the pump in an emergency	
	7.3		ing on/off	
	7.5		ing on/on	
	7.4	Operat	ing the pump	97
	7.5	Adjusti	ng the pump parameters	97
	7.6		the pump has not been used for a longer	98
		7.6.1	Emptying and flushing the pump	98
		7.6.2	Checking that the pump's impeller turns easily	100
		7.6.3	Storing the pump	102
	7.7	Flood-	proof version (optional)	103
В	Mair	ntenanc	e	104
	8.1	Safety	instructions for maintenance	104
	8.2	Mainte	nance schedule	106
	8.3	Mainte	nance jobs	109
		8.3.1	Checking the pump for leaks	109
		8.3.2	Checking the filter strainer and cleaning necessary	
		8.3.3	Cleaning the block motor's casing	113
		8.3.4	Cleaning up any condensation water	114
		8.3.5	Checking the block motor	115
		8.3.6	Checking the electrical connections in the terminal box	
		8.3.7	Cleaning the pump casing	117



		8.3.8	Checking the screwed connections and tightening if necessary	117
		8.3.9	Checking the seal of the filter cover and replacing if necessary	118
		8.3.10	Checking the (optional) Seal Guard system for the correct fill level and for any substances	120
	8.4	After the	e maintenance	
9	Faul	t-fixing		122
	9.1	Warning	gs about fixing faults	122
	9.2	Table of	faults	124
		9.2.1	Unusual states	
	9.3	Jobs to	fix faults	132
		9.3.1	Disassembling and reassembling a pump	132
			9.3.1.1 Disassembly	133
			9.3.1.2 Assembly	154
		9.3.2	Checking the impeller and tightening	175
	9.4	After a f	ault has been fixed	176
10	Spar	e parts .		178
	10.1	Ordering	g spare parts	178
	10.2	List of s	pare parts	178
11	Spec	ial tools	, materials	183
	11.1	Special	tools	183
	11.2		s	
17	Dica			
12		ssembly	, disposal	186
12	12.1	ssembly Warning	gs for disassembly and disposal	186 186
12	12.1 12.2	ssembly Warning Disasse	gs for disassembly and disposal	186 186 187
	12.1 12.2 12.3	ssembly Warning Disasse Disposa	gs for disassembly and disposal mbly	186 186 187 190
12	12.1 12.2 12.3 Tech	ssembly Warning Disasse Disposa	gs for disassembly and disposal mbly	186 186 187 190
	12.1 12.2 12.3 Tech 13.1	ssembly Warning Disasse Disposa Inical dat	gs for disassembly and disposal	186 186 187 190 191
	12.1 12.2 12.3 Tech 13.1 13.2	ssembly Warning Disasse Disposa Inical dat Pump d Configu	tatation of motor	186 187 190 191 191 204
	12.1 12.2 12.3 Tech 13.1 13.2 13.3	ssembly Warning Disasse Disposa Inical dat Pump d Configu Electrica	taimensions and weight	186 187 190 191 191 204 206
	12.1 12.2 12.3 Tech 13.1 13.2 13.3 13.4	Ssembly Warning Disasse Disposa Inical dat Pump d Configu Electrica Operatir	taimensions and weightration of motoral power parameters	186 187 190 191 191 204 206



14	Inde	Y		229
	13.10)Torque	values	228
	13.9	Flange	position	226
	13.8	Name p	late	224
	13.7	Pump p	erformance	217
	13.6	Emissio	ns	215
		13.5.3	herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQI 72-102 (Klüber Lubrication)	
		13.5.2	herborner.X-N regreasing intervals with Polyrex EM	213
		13.5.1	Lubrication oil in intermediate casing on the version with Seal Guard system	210



Table of figures

Fig. 1	Modules overview (example: nerborner.X-N)	16
Fig. 2	Pump setup (example: herborner.X-N)	47
Fig. 3	Feed mode (example: herborner.X-N)	49
Fig. 4	Block motor (example: herborner.X-N)	49
Fig. 5	Numbering and wiring of the motor connection cables in wye connection (herborner.X-N)	50
Fig. 6	Numbering and wiring of the motor connection cables in delta connection (herborner.X-N)	51
Fig. 7	Wiring diagram version 1 (herborner.X-N-PM)	51
Fig. 8	Wiring diagram version 2 (herborner.X-N-PM)	51
Fig. 9	Wiring diagram temperature monitoring	52
Fig. 10	Wiring diagram(herborner.X-N-C, wye connection)	 52
Fig. 11	Wiring diagram (herborner.X-N-C, delta connecti	on)52
Fig. 12	Wiring diagram temperature monitoring	52
Fig. 13	Pump casing with attachments (example: herborner.X-N/ herborner.X-N-PM)	53
Fig. 14	Filter casing (example: herborner.X-N/ herborner.X-N-PM)	54
Fig. 15	Overview of connections (example: herborner.X-	N)55
Fig. 16	Seal Guard System (example: herborner.X-N)	57
Fig. 17	Analog pre-filter monitoring	58
Fig. 18	Digital pre-filter monitoring	58
Fig. 19	Long-life set	59
Fig. 20	Replacement filter strainer	
Fig. 21	Analog pressure gauge	60
Fig. 22	Transport using a fork-lift truck	64
Fig. 23	Lifting points on the pump (example: herborner.> N)	
Fig. 24	Pump setup (example: herborner.X-N)	69
Fig. 25	Screwing pump onto base (example: herborner.)	<-
Fig. 26	Tightening the screw connections (example: herborner.X-N)	71
Fig. 27	Screwed connection (example: herborner.X-N)	
Fig. 28	Options for screwed connections	
Fig. 29	Assembling the screwed connection	



Fig. 30	Screwed connection on the herborner.X-N-C	.74
Fig. 31	Assembling the star handles	.74
Fig. 32	Layout of the suction side (example: herborner.X-N)	. 75
Fig. 33	Reducing adapter	.76
Fig. 34	Layout of the pressure side (example: herborner.X-N)	77
Fig. 35	Filter casing open	.79
Fig. 36	Pump impeller (example: herborner.X-N)	.80
Fig. 37	Wiring the terminal box	84
Fig. 38	Wiring the terminal box (example: herborner.X-N-C)	85
Fig. 39	Wiring the terminal box	.86
Fig. 40	Wiring the terminal box (example: herborner.X-N).	.88
Fig. 41	Filling the pump (example: herborner.X-N)	.89
Fig. 42	Level of the pump	90
Fig. 43	Checking motor rotation direction (example: herborner.X-N)	91
Fig. 44	Opening the ball valve (example: herborner.X-N)	.98
Fig. 45	Draining the pump (example: herborner.X-N/herborner.X-N-PM)	99
Fig. 46	Filter casing open	101
Fig. 47	Pump impeller (example: X-N)	101
Fig. 48	Checking the shaft seal ring(example: herborner.X-N-C)	104
Fig. 49	Where to check if water is leaking from the pump (example: herborner.X-N)	110
Fig. 50	Filter casing open	113
Fig. 51	Block motor cover (example: herborner.X-N)	114
Fig. 52	Condensation water drain holes (example: herborner.X-N)	115
Fig. 53	Block motor terminal box (example: herborner.X-N)	117
Fig. 54	Filter casing open	120
Fig. 55	Filter casing profile sealing	
Fig. 56	Checking the Seal Guard system (example: herborner.X-N)	121
Fig. 57	Block motor terminal box (example: herborner.X-N)	136



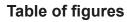
Fig.	58	Lifting points on the pump (example: herborner.X-N)1	137
Fig.	59	Opening the ball valve1	138
Fig.	60	Removing the return pipe	138
Fig.	61	Removing the cooling water pipe	139
Fig.	62	Nuts for fastening the pump hydraulics to the block motor (example: herborner.X-N)1	139
Fig.	63	Removing the pump hydraulics with block motor from the filter casing (example: herborner.X-N)1	140
Fig.	64	Nuts for fastening the casing cover (example: herborner.X-N)1	140
Fig.	65	Removing the casing cover (example: herborner.X-N)1	141
Fig.	66	Removing the impeller protector1	141
Fig.	67	Nuts for fastening the pump casing (example: herborner.X-N)1	142
Fig.	68	Removing the pump casing (example: herborner.X-N)1	143
Fig.	69	Nut for fastening the impeller (example: herborner.X-N)1	143
Fig.	70	Removing the impeller (example: herborner.X-N).1	144
Fig.	71	Key in the motor shaft (example: herborner.X-N)1	144
Fig.	72	Nuts for fastening the intermediate casing (example: herborner.X-N)	
Fig.	73	Removing the intermediate casing (example: herborner.X-N)	145
Fig.	74	Removing the mechanical seal (example: herborner.X-N)1	146
Fig.	75	Nuts for fastening the pump hydraulics with the block motor (example: herborner.X-N)1	147
Fig.	76	Removing the pump hydraulics with block motor from the filter casing (example: herborner.X-N)1	148
Fig.	77	Nuts for fastening the casing cover (example: herborner.X-N)1	149
Fig.	78	Removing the casing cover (example: herborner.X-N)1	149
Fig.	79	Removing the impeller protector1	150
Fig.	80	Nuts for fastening the pump casing (example: herborner.X-N)1	150
Fig.	81	Removing the pump casing (example: herborner.X-N)1	151



Fig. 82	Cap of Seal Guard system expansion tank (example: herborner.X-N)15	1
Fig. 83	Seal cover screw (example: herborner.X-N)152	
Fig. 84	Nut for fastening the impeller (example: herborner.X-N)152	2
Fig. 85	Removing the impeller (example: herborner.X-N).153	3
Fig. 86	Key in the motor shaft (example: herborner.X-N)153	3
Fig. 87	Nuts for fastening the intermediate casing (example: herborner.X-N)154	4
Fig. 88	Removing the intermediate casing (example: herborner.X-N)154	4
Fig. 89	Removing the mechanical seal (example: herborner.X-N)155	5
Fig. 90	Removing the O-ring (example: herborner.X-N)155	5
Fig. 91	Mechanical seal locking screw (example: herborner.X-N)156	3
Fig. 92	Removing the sliding ring (example: herborner.X-N)156	3
Fig. 93	Removing the seal cover (example: herborner.X-N)157	7
Fig. 94	Removing the stationary sealing ring and o-ring 157	7
Fig. 95	Placing the block motor on end (example: herborner.X-N)159	9
Fig. 96	Inserting the O-ring and counter ring into the intermediate casing (example: herborner.X-N)	9
Fig. 97	Attaching the intermediate casing (example: herborner.X-N)160)
Fig. 98	Pushing the sliding ring with spring into position (example: herborner.X-N)160)
Fig. 99	Fitting the key (example: herborner.X-N)16	1
Fig. 100	Impeller pushed on (example: herborner.X-N) 16	1
Fig. 101	Inserting the washer (example: herborner.X-N)162	2
Fig 102	Nut for fastening the impeller (example: herborner.X-N)162	2
Fig. 103	Installing pump casing (example: herborner.X-N) . 163	3
Fig. 104	Nuts for fastening the pump casing (example: herborner.X-N)163	3
Fig. 105	Inserting the impeller protector164	1
Fig. 106	Installing the casing cover (example: herborner.X-	
	N)164	1



Fig.	107	the filter casing (example: herborner.X-N)	
Fig.	108	Placing the block motor on end (example: herborner.X-N)	166
Fig.	109	Fitting the o-ring and the counter ring	166
Fig.	110	Attaching the seal cover (example: herborner.X-N)167
Fig.	111	Attaching the sliding ring (example: herborner.X-N)	167
Fig.	112	Tightening the mechanical seal locking screws (example: herborner.X-N)	168
Fig.	113	Inserting the O-ring and counter ring in the intermediate casing (example: herborner.X-N)	168
Fig.	114	Inserting the O-ring (example: herborner.X-N)	169
Fig.	115	Fitting the intermediate casing (example: herborner.X-N)	169
Fig.	116	Pushing the sliding ring with spring into position (example: herborner.X-N)	169
Fig.	117	Fitting the key (example: herborner.X-N)	170
Fig.	118	Impeller pushed on (example: herborner.X-N)	170
Fig.	119	Inserting the washer (example: herborner.X-N)	171
Fig.	. 120	Nut for fastening the impeller (example: herborner.X-N)	171
Fig.	121	Installing pump casing (example: herborner.X-N).	
Fig.	122	Nuts for fastening the pump casing (example: herborner.X-N)	172
Fig.	123	Inserting the impeller protector	173
Fig.	124	Installing the casing cover (example: herborner.X-N)	
Fig.	125	Installing the pump hydraulics with block motor onto the filter casing (example: herborner.X-N)	174
Fig.	126	Adding oil (example: herborner.X-N)	175
Fig.	127	Tightening the screw (example: herborner.X-N)	176
Fig.	128	Refilling the oil (example: herborner.X-N)	177
Fig.	129	Tightening the Seal Guard system compensation tank (example: herborner.X-N)	178
Fig.	130	Fastening the return pipe	178
Fig.		Fastening the cooling water pipe	179
•	132	Closing the ball valve	
Fig.	133	Filter casing open (example: herborner.X-N)	
Fig	134	Checking the pump impeller (example:	





	herborner.X-N)	.181
Fig. 135	Spare parts for herborner.X-N/herborner.X-N-PM pump (example: herborner.X-N)	. 184
Fig. 136	Spare parts for herborner.X-N-C pump	.186
Fig. 137	Block motor terminal box (example: herborner.X-N)	.194
Fig. 138	Lifting points on the pump (example: herborner.X N)	
Fig. 139	Dimensions of herborner.X-N pump	.197
Fig. 140	Dimensions of herborner.X-N-PM pump	.202
Fig. 141	Dimensions of herborner.X-N-C pump	.206
Fig. 142	Name plate	.231
Fig. 143	Type code	.232



1 Overview

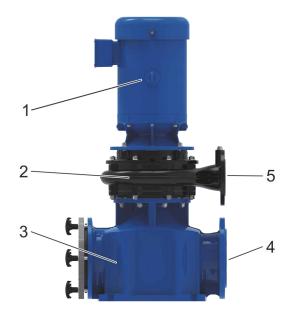


Fig. 1 Modules overview (example: herborner.X-N)

- 1 Block motor
- 2 Pump casing with impeller
- 3 Filter casing with filter strainer
- 4 Inlet/suction side flange
- 5 Outlet/pressure side flange

Brief description

The herborner.X-N is a pump for swimming pools which can be used to circulate and filter the water in the pool, either in feed mode. It is available in a variety of sizes with motors configured in a variety of ways (\$\infty\$Chapter ,, 13.2 Configuration of motor" on page 204). Depending on the requirements, a variable frequency drive may be used to control the pump.

This operating manual is valid for all herborner.X-N series pumps.



Scope of delivery

Quantity	Name
1	Ready assembled and configured pump with a block motor
1	Separate variable frequency drive (optional)
1	Seal Guard system (optional)
1	Separate analog pre-filter monitoring (optional)
1	Separate digital pre-filter monitoring (optional)
1	Separate Long-Life set (optional)
1	Separate replacement filter strainer (optional)
1	Separate analog pressure gage (optional)
1	Separate digital pressure sensor unit (optional)
1	Separate installation tool for mechanical seals (optional)



2 Safety

2.1 Symbols used in this manual

Safety instructions

Safety instructions in this manual are marked with symbols. The safety instructions are introduced with key words which are intended to express the extent of the risk.

ADANGER

This key word signals a situation which can be immediately hazardous, which will lead to death or serious injury if not avoided.

AWARNING

This key word signals a situation which might possibly be hazardous, which could lead to death or serious injury if not avoided.

ACAUTION

This key word signals a situation which might possibly be hazardous, which could lead to minor or light injuries if not avoided.

NOTICE

This key word signals a situation which might possibly be hazardous, which could lead to damage to property or to the environment if not avoided.



Safety instructions in the manual

Safety instructions can refer to certain, individual instructions to do something. Safety instructions like this are embedded in the general instructions so that they do not interrupt the smooth flow of reading the instructions, while carrying them out. The key words described above are used.

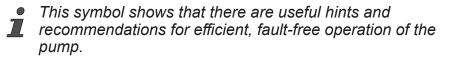
For example:

- **1.** Undo the screw.
- 2. A CAUTION, RISK OF ENTRAPMENT BY CO-VER!

Close the cover carefully.

3. Tighten the screws.

Hints and recommendations





Other conventions

The following symbols are used in this manual to emphasize instructions, results, lists, references and other items:

Marking	Explanation
1., 2., 3	Used for step by step instructions
\Rightarrow	The results of a step
₩,	References to other sections of this manual or to other applicable documents
	Lists in no particular order
[Pushbutton]	Controls (e.g. pushbuttons, switches), indicators (e.g. indicator lights)



2.2 Intended use

The herborner.X-N pump is only to be used to recirculate and filter the water from swimming pools in feed mode. It may only be operated vertically within its designed capacity (\$\infty\$ Chapter ,, 13 Technical data" on page 191) with the safety devices specified in this manual. The pump can be used in public or private swimming pools to maintain the water quality via circulation.

The herborner.X-N is not able to filter out viruses, bacteria, chemical pollutants, microorganisms or other materials injurious to health. Other preventive measures must be taken to ensure hygiene.

Intended use also includes complying with everything specified in this manual.

Any use which exceeds or deviates from the intended use is misuse.



AWARNING

Danger from misuse!

Never

- operate the pump in a potentially explosive environment.
- immerse or operate the pump in water.
- operate the pump if it is not upright.
- operate the pump with pipelines which exert forces on the connecting flanges.
- start the pump when empty.
- operate the pump without any liquid to pump.
- use the pump to pump chemicals or water containing chemicals.
- use the pump to pump liquids containing hydrogen sulfide (e.g. waste products, drainage water, clarified waste water, pond water) or other heavily polluted liquids.
- operate the pump with brine baths, the chloride content of which exceeds 0.13 oz/gal.
- fill the pump with additives (such as perfumes, cleaning tablets, soap, dyes etc.).
- operate the pump with the filter cover open.
- operate the pump with a pressure in the filter casing exceeding 25 psi.
- operate the pump for a longer period with the wrong direction of rotation.
- operate the pump outside of its specified operating limits.

Misuse of the herborner.X-N can lead to dangerous situations.



2.3 Danger zone



When operating, the danger zone is a zone with a $m{I}$ radius of 59 inches around the pump and the immediate environment of any connected variable frequency drive. Persons may only enter the danger zone when the pump is switched off.

2.4 Safety devices

2.4.1 Existing safety devices

Temperature monitor

All block motors have an integrated temperature monitor, which will turn the motor off, if it overheats, to prevent damage to components. As soon as the block motor has cooled down sufficiently, the temperature monitor will then automatically switch the block motor back on again.

NOTICE

Disabling the temperature monitor will result in a danger of overheating!

When starting up the pump, wire the temperature monitor so that it functions correctly (♥ *Chapter* "6.3 Connecting the electrical power supply" on page 83). If the temperature monitor is not correctly connected, overheating can damage the block motor.

Ball valve

The ball valve is used for draining air that has become entrapped in the pump to prevent damage to the mechanical seal due to dry running.



The ball valve cannot be used to vent an entire system!



2.4.2 Safety devices required in addition

Gate valve

A gate valve allows the water to be safely shut off for maintenance work. It must be fitted in the pressure pipe after the non-return valve.

When operating in feed mode, a gate valve must also be fitted in the supply pipe, immediately in front of the pump.



• To avoid losses due to friction and turbulent flows, the qate valves must not be used to control the flow rate and should always be fully open.

Electrical overcurrent protection

The circuit supplying the block motor must be separately fused or otherwise protected in accordance with the requlations applicable at the pump's location, so that, if there is an overload or a short circuit, the power supply will be interrupted. The power supply may only be restored by resetting the circuit breaker or replacing the fuse in the fuse box.

Air bleeding device

The air bleeding device serves to release air trapped in the system of pump and pipes. It must be used in the pressure pipe to avoid long term damage to the pump caused by air pockets.

Variable frequency drive (optional)

Variable frequency drives serve to adjust the speed of the pump when operating at its duty point and ensure that the block motor is always optimally driven. They provide protection from dangerous pressure surges, which can lead to damage to the system of pump and pipework.



• For systems which are not in constant operation, variable frequency drives help to avoid long-term damage to the system of pump and pipes.

Main switch with emergency stop function

It must be possible to switch the pump on and off via an easily accessible, separate switch with an emergency stop function, which immediately brings the pump to a standstill. The main switch must conform with the regulations applicable at its site of use.



Compensators (optional)

Compensators reduce the vibrations transmitted from the pump to the piping system and compensate for mechanical tension in the pipes.

Compensators should be used in the pressure pipe to avoid long term damage to the pipe system from material fatigue.

Non-return valve

The non-return valve prevents the water from flowing backwards. It thus prevents dangerous pressure surges, which can lead to damage to the system of pump and pipework.

A non-return valve should be used before the gate valve in the pressure pipe to avoid long term damage to the system of pump and pipes.

Vibration dampers

Vibration dampers between the pump and its foundations reduce the vibrations and thus the noise generated by the pump when it is operating.

Vibration dampers should be used to avoid long term damage through material fatigue and to minimize noise levels.

Seal Guard system (optional)

A fully functioning Seal Guard system uses a media reservoir to prevent the mechanical seal from dry running for approx. 2 minutes.

A Seal Guard system may be used to prevent damage to the mechanical seal by dry running.

2.5 Safety labels

The following symbols and signs are in the working area. They relate to the immediate vicinity where they are attached.



AWARNING

Illegible signs are a danger!

- Always keep all safety, warning and operating instructions in a good, legible condition.
- Immediately renew damaged signs or adhesive labels.

Over time, adhesive labels and signs can get dirty or become illegible in some other way, so that dangers cannot be recognized or necessary operating instructions cannot be followed. There is thus a risk of injury.

Electrical voltage



At the points labeled like this, there is a danger of a fatal electrical shock on contact. Only qualified electricians or electrical installers/electric motor technicians may work on electrical components and connection boxes.

Strong magnetic fields



Strong magnetic fields can cause injuries, even fatal ones. Persons with pacemakers or implants made from metal must not stand within the vicinity of the block motor.

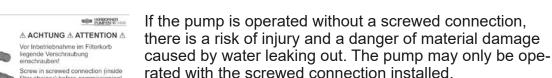
If the pump is operated with the ball valve open, there is a

risk of injury and a danger of material damage caused by

water leaking out. The pump may only be operated with

Danger of water leaking





the ball valve closed.





On opening the cover of the filter casing there is a danger of injury and a danger of material damage caused by water leaking out. The pump only be operated with the filter cover correctly hand-tightened.

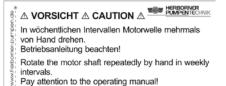


Direction of rotation



The rotation indicator arrow on the pump's name plate shows the direction that the pump should be turning. The pump may not be operated in the opposite direction for longer periods of time.

Unhindered operation of impeller



If the pump is not used for a longer period, its impeller must be checked once per week to see that it moves easily, to prevent it from jamming.



2.6 Securing the unit to prevent it from being switched on again

Personnel: Electrical installer/electric motor technician

▲WARNING!

- Before switching on again, ensure that all of the safety devices have been fitted and are in working order and that there is no danger to personnel.
- Always comply with the following procedure to secure the system to prevent it from being switched on again.

Someone switching the system on who is not authorized to do so or in an uncontrolled manner represents a danger to life! Someone switching the system on who is not authorized to do so or in an uncontrolled manner can lead to serious, even fatal injuries.

- 1. Switch the pump off at the main switch if this has not already been done.
- 2. Interrupt the electrical power supply by removing or switching off the fuse/circuit breaker in the fuse box.
- Attach a label to the fuse box containing the following details:
 - Date switched off:
 - Time switched off:
 - Switched off by:
 - Notice: Do not switch on!
 - Notice: Only switch on if you are sure that there is no danger to anyone in doing so.
- **4.** If necessary, notify the responsible person about work in a danger zone.
- **5.** After all of the work has been done, ensure that there is no danger for persons.
- **6.** Ensure that all of the safety and protective devices have been installed and are working correctly.
- **7.** Remove the label from the fuse box.



2.7 Residual risks

The pump was designed to the latest state of the art and to comply with current safety requirements. There are however residual risks, which require care to be exercised. The following lists the residual risks and the resulting procedures and measures to be taken to avoid them.



2.7.1 Dangers from electrical voltage

Electrical voltage

▲DANGER

Electrical voltage represents a possibly fatal danger!

- Never operate the pump if it is not connected to the protective earth.
- Only allow qualified electricians to work on the building's electrical installation.
- Only allow qualified electricians or electrical installers/electric motor technicians to work on the pump's block motor or on the variable frequency drive.
- During all installation work, comply with the valid state and local building regulations, the national electric code as well as any additional local regulations.
- If insulation becomes damaged, immediately disconnect the electrical power supply by removing/ switching off the fuse/circuit breaker and have the damage repaired.
- Before doing any work on the pump remove all live voltages from it and secure this state for the duration of the work. During this, conform with the following safety rules:
 - De-energize and secure against being switched on again (♥ Chapter "2.6 Securing the unit to prevent it from being switched on again" on page 28).
 - Check that there are no live voltages present.
- Never bridge or otherwise disable fuses/circuit breakers. When replacing fuses ensure that you use the same amperage.
- Keep moisture away from live parts. This can lead to a short circuit.

On contact with any live parts on the pump's block motor or on the variable frequency drive there is an immediate danger of death from an electric shock. Damage to the insulation or to individual components can represent a danger to life.



2.7.2 Dangers from rotating parts

Fan and impeller

AWARNING

There is a danger of injury from the rotating fan and the impeller!

- Before doing any work on the pump remove all live voltages from it and secure this state for the duration of the work. During this, conform with the following safety rules:
 - De-energize and secure against being switched on again (*⇔Chapter* "2.6 Securing the unit to prevent it from being switched on again" on page 28).
 - Check that there are no live voltages present.
- Take account of the run-on time. Before starting work make sure that nothing is moving.
- When the pump is operating, never reach into the pump, especially not into the filter casing and keep clear of the immediate vicinity of the block motor.
- During maintenance or commissioning work do not wear loose items of clothing, hanging jewelry (e.g. necklaces or bracelets) and if you have long hair do not wear it loose.
- Protective covers removed for maintenance work must always be replaced once the maintenance work is complete.
- Do not open the filter cover while in operation.

The impeller in the pump casing and the fan in the block motor turn very quickly when in operation. Contact with the rotating parts or them tangling/catching clothing, jewelry or long hair can lead to serious injuries.



2.7.3 Risk from magnetic fields

Strong magnetic fields

AWARNING

Risk of death from strong magnetic fields!

- Persons with pacemakers or implants made from metal must not stand within the vicinity of the block motor.
- Keep magnetic materials or those containing iron away from the block motor. Such materials may be attracted and cause injuries to persons.
- Remove any metallic items (jewelry, watches, pens, etc.) before performing maintenance.
- Keep electronic devices, data storage devices or credit cards, etc. away from the block motor. These may be damaged.

During operation, the block motor may build up a strong electromagnetic field. Strong magnetic fields may cause serious or even fatal injuries as well as considerable damage to equipment.

2.7.4 Dangers from high temperatures

Hot water being pumped

AWARNING

There is a danger of scalding if hot water is being pumped!

- Before doing any work, interrupt the flow of the water using the gate valve.
- Before doing any work, ensure that any liquid remaining in the pump and filter casings has cooled down to ambient temperature. Drain the pump if required (♥ Chapter "7.6.1 Emptying and flushing the pump" on page 98).

Depending on the application, the pumped medium can be hot. Skin contact with the pumped medium can cause burns to the skin.



Hot surfaces

AWARNING

There is a danger of burns from hot surfaces on the block motor!

- Before doing any work, ensure that all surfaces have cooled down to ambient temperature.

The block motor can heat up in operation. If the hot surfaces touch skin, burns may result.

2.7.5 Dangers at the installation site

Noise

ACAUTION

There is a danger of injury from noise!

- Depending on the power of the pump, use vibration dampers and compensators for assembly (♥ Chapter "5 Installing and connecting the pump" on page 67).
- Do not stand near the pump for longer periods while it is in operation. Wear hearing protection when working near the pump.

The level of noise which occurs in the working area can cause damage to your hearing after extended exposure.



Water leaking

ACAUTION

There is a danger of injury and of damage from leaking water!

- Regularly check the pump for leaks.
- Never open the filter cover or the screwed connections, the ball valve or the screwed plugs when the pump is in operation, and close them properly when the maintenance work is complete.
- If water comes out, immediately switch the pump off, close the gate valve, find what is causing it and fix it (\$Chapter ,9 Fault-fixing" on page 122).
- Wear non-slip safety shoes.
- Attach warning signs close to where puddles formed on the floor.
- Clean up puddles using suitable means.

If the pump or the piping system is not sealed properly then water may leak out. Slipping in puddles on the floor can lead to a fall. A fall may cause injuries.



2.8 What to do in case of danger



- In case of danger immediately switch off the pump via the main switch with an emergency stop function or interrupt the electrical power supply by removing or switching off the fuse/circuit breaker in the fuse box.
 - Get the dangerous situation under control and, before switching back on, ensure that there is no longer any danger.

AWARNING

Someone switching the system on who is not authorized to do so or in an uncontrolled manner represents a danger to life!

Before switching on again, ensure that the dangerous situation has been remedied, that all of the safety devices have been fitted and are in working order, and that there is no longer any danger to personnel.

Someone switching the pump on who is not authorized to do so or in an uncontrolled manner can lead to serious, even fatal injuries.

2.9 The owner's responsibility

The owner

The owner is the person or company who operates the pump or who allows it to be used by a third party and who bears the legal responsibility for the product for the protection of the user, the personnel and for third parties.

The owner's duties

If the pump is used in the commercial area, then its owner is subject to the legal duties regarding health & safety at work.

Apart from the safety instructions in this manual, the regulations on safety, on health & safety at work and on the protection of the environment must be complied with.



In particular, the owner must

- find out about the health & safety at work regulations which apply at the place where the pump is used and must then ensure compliance with these regulations.
- fit the necessary safety devices which are required for safe operation of the pump (\$\&Chapter_{,,2.4.2}\$ Safety devices required in addition" on page 24).
- clearly determine and specify who is responsible for the installation, operation, fault-fixing, maintenance and cleaning of the system.
- make sure that everyone who has to deal with the pump has read and understood this manual. In addition, the owner must also train the personnel how to deal with the pump and inform them of the dangers which it represents.
- provide all those who use the pump with the manual.
- provide the personnel with the necessary protective equipment and issue instructions that it is mandatory to wear it.
- take additional measures at the pump's location to maintain the water quality in the swimming pool in accordance with the legal requirements and specifications of the relevant institutions (for example WHO, CDC).

The owner is also responsible for ensuring that the pump is always in a technically faultless condition. This means that:

The owner must

- ensure compliance with the maintenance intervals described in this manual.
- have all safety devices regularly checked to see that they are both complete and in proper working order.
- ensure that the pump is only used within its permissible operating limits over its entire period of operation.



2.10 Qualifications of the personnel

AWARNING

There is a danger of injury if the personnel are inadequately qualified!

- Only have all jobs carried out by correspondingly qualified personnel.

If unqualified personnel work on the pump, dangers will arise which can cause serious injuries and significant damage.

Unauthorized persons

AWARNING

There is a risk of death to unauthorized persons from the hazards in the danger zone!

- Unauthorized persons must be kept out of the danger zone. In case of doubt, speak to the persons concerned and instruct them to leave the danger zone.
- Interrupt your work while unauthorized persons are within the danger zone.

Unauthorized persons who do not meet the requirements described here, do not know what the dangers are in the danger zone. For unauthorized persons there is thus a danger of serious injury and even death.



Qualifications of the personnel The following qualifications for the various areas of work are mentioned in this manual:

Crane and tower operator

Crane and tower operators have been trained to transport and handle heavy objects with the help of a crane and suitable lifting gear. They are able to safely operate a crane and to select suitable lifting gear for the object to be transported and to securely fasten it, taking account of the nature of the object.

They can prove their technical qualifications with a corresponding certificate.

Electrical installer/electric motor technician

Electrical installers/electric motor technicians have been trained to do installation, test, maintenance and repair work on complex electrical and electronic equipment. They are able to read instructions, circuit diagrams and technical specifications, to evaluate and make use of them to carry our work competently.

They can prove their technical qualifications with a corresponding certificate.

Electrician

Electricians have been trained to do installation, test, maintenance and repair work on electrical installations in buildings. They are able to read instructions, circuit diagrams and technical specifications, to evaluate and make use of them to carry our work competently. They do their work in compliance with state and local building regulations and the national electric code as well as other local regulations.

They can prove their technical qualifications with a corresponding certificate.



General maintenance and repair worker

The general maintenance and repair workers are qualified to carry out simple maintenance and repair work across different technical fields on technical equipment and building installations. They are able to do simple installation and dismantling jobs for the purpose of repairing and to read, evaluate and make use of instructions, circuit diagrams and technical specifications in order to carry out work competently.

They can prove their technical qualifications with a corresponding certificate.

Industrial truck and tractor operators

Industrial truck and tractor operators have been trained to transport and handle heavy objects with the help of a fork lift truck. They are able to safely operate a fork lift truck and to lift the object to be moved and transport it, taking account of its nature.

They can prove their technical qualifications with a corresponding certificate.

Manufacturer (Baldor Electric Company)

Some work on the pump's block motor requires a high level of specialized knowledge. For safety reasons, this work can and must only be carried out by personnel from the Baldor Electric Company.

Manufacturer (EMOD MOTOREN)

Some work on the pump's block motor requires a high level of specialized knowledge. For safety reasons, this work can and must only be carried out by personnel from EMOD MOTOREN.

Manufacturer (Herborner Pumpentechnik)

Some work on the pump requires a high level of specialist knowledge. For safety reasons, this work can and must only be carried out by personnel from Herborner Pumpenfabrik



Millwright

Millwrights have been trained to assemble, repair, move and disassemble complex machines and components. They are able to read instructions, circuit diagrams and technical specifications, to evaluate and make use of them to carry our work competently.

They can prove their technical qualifications with a corresponding certificate.

Plumber/Pipefitter

Plumbers/pipefitters have been trained to safely install & connect pipelines to carry water, and to do necessary maintenance and repair work. They are able to read instructions, flow diagrams and technical specifications, to evaluate and make use of them to carry our work competently and to choose pipes which correspond to the technical requirements and loads, to ensure safe & reliable operation of the system.

They can prove their technical qualifications with a corresponding certificate.

General requirements on personnel

Only persons who can be expected to do their work reliably are allowed. Persons whose ability to react is affected, for example through drugs, alcohol or medicines are not allowed to work on the pump.



 Please notice the regulations applicable on site specifically related to age and profession.



2.11 Personal protective equipment

Personal protective equipment serves to protect persons from impairments to their health & safety at work.

Persons who work on the pump must wear personal protective equipment, which will be explicitly pointed out in the individual sections of this manual.

Description of the personal protective equipment

The personal protective equipment is explained in the following:



Safety clothing

Safety clothing is close-fitting work clothing with low resistance to tearing, with close-fitting sleeves and without protruding parts.



Safety helmet

Safety helmets protect your head against falling objects, swinging loads and collisions with immobile objects.



Safety gloves

Safety gloves serve to protect your hands from abrasion, grazes, puncture wounds or deeper injuries as well as from contact with hot surfaces.



Safety shoes

Safety shoes protect your feet from being crushed, from falling parts and slipping on slippery surfaces.



2.12 Dangers of damage to material

Flooding danger

NOTICE

There is a danger of flooding due to mistakes!

- Never open the filter cover or the screwed connections, the ball valve or the screwed plugs when the pump is in operation, and close them properly when the maintenance work is complete.
- Switch off the pump, secure it against being switched on again (♥ Chapter "2.6 Securing the unit to prevent it from being switched on again" on page 28) and close the gate valve before performing any work on the pump.

By making a mistake water can escape in an uncontrolled manner and cause cause considerable damage.

Dry running

NOTICE

The pump can be damaged if it runs dry!

- Never operate the pump without any liquid to pump. Fill up the pump before starting it up (\$\infty\$ Chapter \$,6.5 Filling the pump" on page 89).
- Make sure that all of the gate valves are open during operation.

If the pump is operated without any liquid to pump, it will run dry and be damaged.



Insufficient cooling

NOTICE

The block motor can be damaged by insufficient cooling!

- Only operate the pump at a site with sufficient air exchange and with enough distance to the walls and other devices which radiate heat.
- Do not cover the block motor, do not put it in a housing or in any other way cut it off from the surrounding air.
- Do not paint the block motor again.

Insufficient cooling can overheat the block motor and damage it.

Frequent switching

NOTICE

The block motor can be damaged by frequent switching!

- Avoid frequent switching processes which are close together.
- Before switching the pump on again, allow the motor to cool down.
- When operating the pump via a control system, ensure that the control system cannot trigger frequent switching operations.

By frequently switching the pump on & off, the block motor can be overloaded.



High chlorine levels

NOTICE

The pump can be damaged by high levels of chlorine!

- Never chlorinate the water in the supply line directly in front of the pump.
- Do not dissolve chlorine tablets in the pump's filter casing.
- By taking suitable measures (regular checks, for example) ensure that the level of chlorine in the swimming pool is always within the standardized range, in accordance with the relevant specifications (issued for example by the WHO (World Health Organization) and the CDC (Centers for Disease Control and Prevention).
- For brine baths, check regularly to ensure that the fraction of chloride ions does not exceed 0.13 oz/ gal.

A permanently high level of chlorine may damage the pump.

Additives

NOTICE

The pump can be damaged by additives!

- Do not use cleaning agents, perfumes, dyes or similar substances with the pump.

Additives may damage the pump.



2.13 Spare parts

The wrong spare parts

AWARNING

There is a danger of injury if the wrong spare parts are used!

- Only use genuine spare parts made by Herborner Pumpentechnik (♥ Chapter "10 Spare parts" on page 178).
- Always contact our service if there are any questions.

If the wrong or faulty spare parts are used, dangers to persons can arise and damage may be caused, malfunctions or even total failure.

2.14 Protecting the environment

NOTICE

A danger to the environment can arise when environmentally hazardous substances are incorrectly used!

- Always follow the instructions given below on the use and disposal of environmentally hazardous substances.
- If environmentally hazardous substances are unintentionally released into the environment, immediately take suitable measures.

If environmentally hazardous substances are used improperly, especially if their disposal is inappropriate, significant damage to the environment can arise.



The following environmentally hazardous substances are

used:

Grease Greases contain poisonous substances. They must not get

into the environment. A specialist waste disposal company

must dispose of grease.

Electrical components Electrical components contain poisonous substances. They

require special waste disposal.



3 The function of the pump

3.1 Overview

Overview

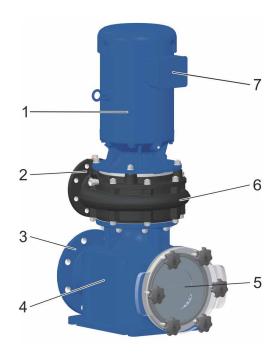


Fig. 2 Pump setup (example: herborner.X-N)

- 1 Block motor (♥ *Chapter* ,, 3.2 *Block motor* " *on page 49*)
- 2 Connection flange outlet/pressure side (\$\&\text{Chapter},,3.3 Pump casing "on page 53)
- 3 Connection flange inlet/suction side (♥ Chapter ,, 3.4 Filter casing "on page 54)
- 4 Filter casing (♥ *Chapter* ,, 3.4 Filter casing "on page 54)
- 5 Filter cover (♥ *Chapter*, 3.4 *Filter casing* "on page 54)
- 6 Pump casing (\$ Chapter ,, 3.3 Pump casing "on page 53)
- 7 Block motor terminal box (♥ Chapter ,, 3.2 Block motor "on page 49)
- Depending on the application, the block motor can be driven by a variable frequency drive, which can be wall-mounted or can be fitted in a switching cabinet (\$\infty\$ Chapter ,, 3.6.1 variable frequency drive" on page 56). The variable frequency drive is not shown here (Figure 2).



Functional description of the pump and its type

The herborner.X-N is a coated centrifugal pump. It is used to circulate and filter water which has been contaminated with solid matter from swimming pools.

The pump is available in a number of different sizes, with different drive outputs (\$\times\$ Chapter ,, 13 Technical data" on page 191). Standard motors, permanent magnet motors and heat exchanger motors are used as drives. The pump's exact version can be found on name plate (\$\times\$ Chapter ,, 13.8 Name plate" on page 224). The pump is delivered fully assembled and configured for the particular application specified in the purchase order. Depending on the requirements, a variable frequency drive will be supplied separately.

The water from the swimming pool enters the filter casing (fig. 2/3) via the inlet/suction side flange (fig. 2/4). Solid matter in the swimming pool water will remain in the filter strainer, and the filtered water will be pumped back to the swimming pool through the outlet/pressure side flange (Fig. 2/2). The flow rate is created in the pump casing (Fig. 2/6) by an impeller which is driven by an electric block motor (Fig. 2/1). The motor is connected to the electrical supply in a terminal box (Fig. 2/7) and optionally through a variable frequency drive (not shown).

Operating modes

The pump should be operated in feed mode. The pipelines need to be laid out accordingly (\$\&\text{Chapter}, 5 Installing and connecting the pump" on page 67).



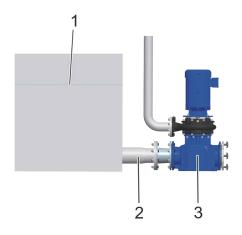


Fig. 3 Feed mode (example: herborner.X-N)

- 1 Water level
- 2 Feed pipe
- 3 Pump

In feed mode, the water head pressure pushes the water into the pump. The hydraulic part of the pump (pump casing and impeller) is located below the level of the water in the pool.

3.2 Block motor

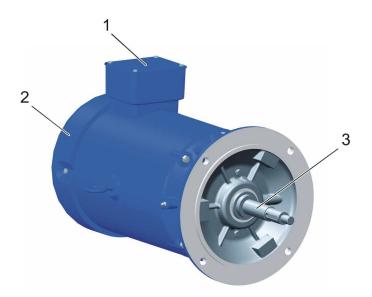


Fig. 4 Block motor (example: herborner.X-N)

- 1 Terminal box
- 2 Fan with fan hood (herborner.X-N and herborner.X-N-PM only)
- 3 Motor shaft

A standard motor (herborner.X-N), a permanent magnet motor (herborner.X-N-PM) or a heat exchanger motor (herborner.X-N-C) are used for the block motor. It drives the pump's impeller via a motor shaft. The motor is cooled via a fan on the rear of the block motor. On herborner.X-N-C pumps, the motor is cooled via the medium (not shown).

1

On the herborner.X-N-PM, the motor can only be started up using a suitable variable frequency drive. The motor cannot be operated directly via the mains.

The block motor can be adapted to the electrical supply available on site (low or high voltage) via the terminal box. The block motors have parallel windings for the various supply voltages. Depending on what is required, the connection can also be made via an upstream variable frequency drive (\$\times\$chapter "3.5 Variable frequency drive (optional)" on page).

7

The motor's power depends upon the type of pump (\$\times\$ Chapter ,, 13.2 Configuration of motor" on page 204).

Winding taps in the terminal box (herborner.X-N)

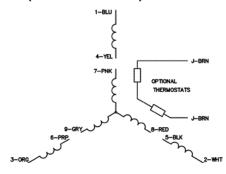


Fig. 5 Numbering and wiring of the motor connection cables in wye connection (herborner.X-N) The connecting wires in the terminal box are numbered as shown in the illustration and are taps from the motors parallel windings. Via corresponding wiring, the windings for the voltage concerned are used in a star connection.

The temperature monitor is connected via the additional lines (J).

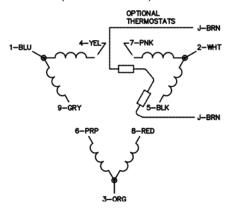


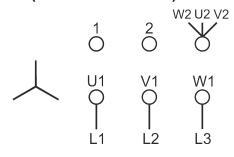
Fig. 6 Numbering and wiring of the motor connection cables in a delta connection (herborner.X-N)

The connecting wires in the terminal box are numbered as shown in the illustration and are taps from the motors parallel windings. Using corresponding wiring, the windings for the voltage concerned are used in a delta connection.

The temperature monitor is connected via the additional lines (J).



Winding taps in the terminal box (herborner.X-N-PM)



The motors on the herborner.X-N-PM are connected in a wye connection at the factory in versions 1) or 2). The variable frequency drive is connected via the terminals U1, V1 and W1.

Fig. 7 Wiring diagram version 1 (herborner.X-N-PM)

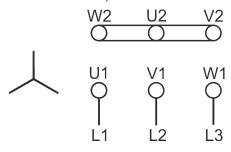


Fig. 8 Wiring diagram version 2 (herborner.X-N-PM)

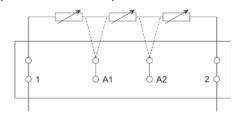
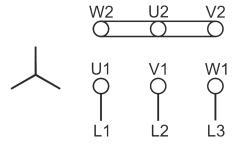


Fig. 9 Temperature monitor wiring diagram

The temperature monitor is connected via the additional lines (1 and 2) either to the motor terminal board .) or via a terminal strip).

Winding taps in the terminal box (herborner.X-N-C)

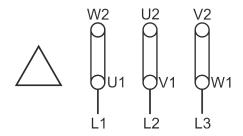


nected in a wye connection) at the factory. The 3 hp and 5 hp motors of the herborner. X-N-C are connected in a wye connection) at the factory. The power supply is connected at terminals U1, V1 and W1.

The 3 hp and 5 hp motors of the herborner.X-N-C are con-

Fig. 10 Wiring diagram (herborner.X-N-C, wye connection)





The motors of the herborner.X-N-C (except for 3 hp and 5 hp) are connected in a delta connection at the factory. The power supply is connected at terminals U1, V1 and W1.

Fig. 11 Terminal diagram (herborner.X-N-C, delta connection)

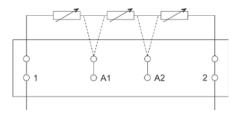


Fig. 12 Temperature monitor wiring diagram

The temperature monitor is connected via a terminal strip and using the additional lines (1 and 2).



3.3 Pump casing



Fig. 13 Pump casing with attachments (example: herborner.X-N/herborner.X-N-PM)

- 1 Intermediate casing
- 2 Impeller
- 3 Outlet/pressure side flange
- 4 Casing cover
- 5 Pump casing
- 6 Mechanical seal
- 7 Ball valve

The closed impeller (Fig. 13/2) rotates in the pump casing (Fig. 13/5), which is powered by the motor shaft. The joint to the block motor is sealed with a mechanical seal in the intermediate casing (Fig. 13/1). The filtered water is pumped through the outlet/pressure side flange (Fig. 13/3). The ball valve (Figure 13/7) is used to de-aerate the pump.

On the herborner.X-N-C, the ball valve is located on the motor's return pipe.



3.4 Filter casing

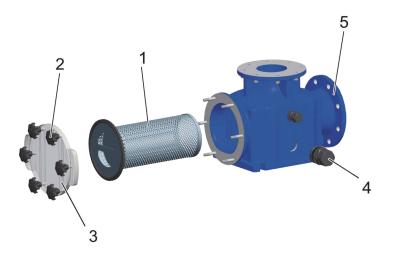


Fig. 14 Filter casing (example: herborner.X-N/ herborner.X-N-PM)

- 1 Filter strainer
- 2 Star handles
- 3 Filter cover
- 4 Screwed connection
- 5 Inlet/suction side flange

The filter casing is screwed into the base and retains the entire pump construction. The water from the swimming pool enters the pump via the inlet/suction side flange (Fig. 14/5) on the filter casing. The filter casing contains a filter strainer (Fig. 14/1) which collects the solid matter in the water. The filter strainer is to be cleaned at regular intervals. The degree of contamination can be displayed via an (optional) analog or digital prefilter monitor (not shown). The filter strainer can be removed for cleaning purposes. To do this, the pump needs to be drained via the lower screwed connection. After it has been fully drained and the star handles have been removed, the filter cover can be lifted off with both hands. This can then be removed from the filter casing by twisting the filter strainer slightly.



3.5 Connections

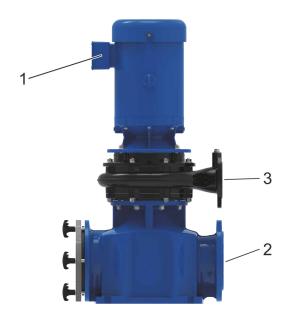


Fig. 15 Overview of connections (example: herborner.X-N)

- 1 Block motor terminal box
- 2 Inlet/suction side flange
- 3 Outlet/pressure side flange

The pump is connected electrically via the motor's terminal box (Fig. 15/1) corresponding to the type of mains power. The wiring for the different voltage levels (low/high voltage) is printed in the terminal box or on the block motor.

The suction side pipes are routed to the inlet/suction side flange (Fig. 15/2). The flange diameter depends on the type of pump (\$ Chapter ,, 13.1 Pump dimensions and weight" on page 191).

The pressure side pipes are routed to the outlet/pressure side flange (Fig. 15/3). The flange diameter depends on the type of pump (\$\&circ\$ Chapter ,, 13.1 Pump dimensions and weight" on page 191).



3.6 Accessories

3.6.1 Variable frequency drive

The variable frequency drive serves to adjust the speed of the pump when operating at its duty point and ensure that the block motor is always optimally driven. It provides protection from dangerous pressure surges, which can lead to damage to the system of pump and pipework. The variable frequency drive is connected between the block motor and the electrical power supply, on the block motor's terminals. It is installed externally in an electrical cabinet.

NOTICE

The use of unsuitable variable frequency drives can damage the pump!

 Only use the variable frequency drives supplied and configured by Herborner Pumpentechnik with the pump.

The use of unsuitable variable frequency drives can damage the pump.



3.6.2 Seal Guard system



Fig. 16 Seal-Guard system (example: herborner.X-N)

A fully-functioning Seal Guard system uses a media reservoir to prevent the mechanical seal from dry running for approx. two minutes. The media reservoir is automatically replenished by a supply container. This container can also be used to detect primary mechanical seal leakage.



3.6.3 Analog pre-filter monitoring



The analog pre-filter monitor indicates the degree of contamination of the filter strainer. This is a simple aid in determining filter strainer contamination.

Fig. 17 Analog pre-filter monitoring

3.6.4 Digital pre-filter monitoring



Fig. 18 Digital pre-filter monitoring

The digital pre-filter monitor indicates the degree of contamination of the filter strainer and helps clean the filter strainer when contaminated. The value is shown directly via the optional digital display.



3.6.5 Long Life set



The Long Life set consists of a grease gun with high-performance grease. Keeping the motor bearings lubricated increases their lifetime considerably and therefore improves the life cycle costs of the pump.

Fig. 19 Long Life set

3.6.6 Replacement filter strainer



Fig. 20 Replacement filter strainer

The replacement filter strainer reduces the downtime of the pump when cleaning the filter strainer. This helps keep the time it takes to clean the filter to an absolute minimum.



3.6.7 Analog pressure sensor unit



The analog pressure sensor unit is used to display the pressure on the pressure side of the pump. This makes it easy to check how the pump is functioning.

Fig. 21 Analog pressure sensor unit

3.6.8 Installation tool for mechanical seals

Using the installation tool, a new mechanical seal can be precisely pushed onto the motor shaft.



4 Transport and storage

4.1 Safety instructions for transport and storage

Offset center of gravity

AWARNING

There is a danger of injury from falling or toppling packages!

- When transporting with a crane, notice the correct lifting points and attach the crane's hook so that it is above the pump's center of gravity.
- Carefully lift the pump and check to see if it tilts.
 If necessary, correct the positioning of the lifting gear.
- Only set the pump down on a level surface capable of bearing its weight.

The pump may have a center of gravity that is not in the middle of the pump, depending on the pump model. If the lifting gear is incorrectly attached, the pump can tilt, drop down and cause serious injuries.



Loads held aloft

AWARNING

Loads held aloft represent a possibly fatal danger!

- Only use approved lifting gear with sufficient loadbearing capacity.
- Do not use torn or frayed lifting gear such as ropes or belts.
- Do not use lifting gear such as ropes or belts around sharp edges or corners, do not knot them and do not twist.
- Only move loads under supervision.
- During transport, ensure that there are no persons, objects or obstructions within the range that the pump can swing.
- Never go beneath or with the range that a load held aloft can swing.
- Before leaving the workplace, set the load down.

During lifting procedures, loads can swing out and drop. This can cause serious injuries which may even be fatal.

Improper transport

NOTICE

Improper transport can cause damage!

- Proceed with great care when setting the pump down on delivery as well as when transporting it to its installation site.
- Only use the intended lifting points.
- Only remove the packaging shortly before installation.

If transported improperly, the pump can fall or topple over. This can result in a considerable amount of damage.



4.2 Delivery

4.2.1 Type of delivery

The pump with the installed block motor is packed in a crate and is delivered on a pallet that is suitable for transport with a forklift truck.

The variable frequency drive (optional) is delivered together with the pump in the crate.

4.2.2 Symbols on the packaging

Center of gravity



This marks the center of gravity of packed items.

Please notice the center of gravity when lifting and transporting.

4.2.3 Transporting the packed items

Under the following circumstances, the pallet with the pump can be transported with a fork lift truck:

- The forklift truck must be rated to lift the weight of the items being transported (\$\ Chapter,,13.1 Pump dimensions and weight" on page 191). The total weight including packaging can be found in the freight order and in part on the packaging.
- Suitable equipment must be used (e.g., lashes) to secure the pump on the pallet to prevent it from tipping or falling over.
- The driver of the fork lift truck must be authorized to do so.



Transporting the equipment

Personnel: Industrial truck and tractor

operators

Personal protective

equipment:

Safety helmet

Safety clothing

Safety shoes

Special tool: ■ Fork lift truck

1. Drive the forks of the fork lift truck between or underneath the pallet's spars.

2. Introduce the forks so far that they protrude from the opposite side.

3. Ensure that the pallet cannot tip over.

4. Lift the pallet with its load and start the transport.

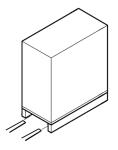


Fig. 22 Transport using a fork-lift truck

4.2.4 Storing the packed items

Store packed items under the following conditions:

- Do not store in the open air.
- Store in a dry and dust-free place.
- Do not expose to any aggressive media.
- Storage temperature: 41 to 104 °F.
- Relative humidity should be less than 60 % if possible.
- If storing for longer than 3 months, regularly check the general condition of all parts and packaging.



4.3 Transport inspection

On receipt, immediately check that the delivery is complete and undamaged.

If transport damage is found, proceed as follows:

- If the damage is discovered in the presence of the transport company, do not accept delivery or accept it conditionally and notice the transport damage on the transport documents or on the transport company's delivery notice.
- If the damage is only discovered when unpacking, report the damage to the transport company. Keep the pump's packaging to allow it to be inspected or for complaints.
- If the items are to be returned, use the original packaging or, if no longer available, have a packaging company securely package the pump for its return transport. If in doubt, please contact Herborner Pumpenfabrik.
- Report every problem as as soon as it is detected. Claims for damages can only be made within the applicable period.

4.4 Transporting the pump to its installation site

Under the following circumstances, the pallet with the pump can be transported with a crane:

- The crane and the lifting gear must be rated for the weight of the pump (\$ Chapter ,, 13.1 Pump dimensions and weight" on page 191).
- The packaging must be removed.
- The pump must be attached at the provided lifting points.
- The crane's hook must be attached over the pump's center of gravity.
- The crane driver must be authorized to operate the crane.
- Protect accessories like hoses, threaded fittings (herborner.X-N-C) and accessories during transport.



Attaching the lifting gear

Personal protective equipment:

Safety helmet

Safety clothing

Safety gloves

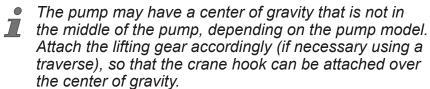
Safety shoes

Special tool: ■ Crane and lifting gear

1. Attach the ropes, lashes or multi-point slings according to (Fig. 23).



Fig. 23 Lifting points on the pump (example: herborner.X-N)



- **2.** Ensure that the pump is hanging straight, if necessary, reattach the crane hook further towards the center of gravity.
- **3.** Start the transport.



5 Installing and connecting the pump

5.1 Safety instructions for assembly/installation

Loads held aloft

AWARNING

Loads held aloft represent a possibly fatal danger!

- During transport, ensure that there are no persons, objects or obstructions within the range that the pump can swing.
- Never go beneath or with the range that a load held aloft can swing.
- Make sure that there is sufficient space to install the pump at its installation location.
- Remove obstructions and neighboring components from the working area.
- Handle the pump carefully.

During lifting procedures, the load can swing out and drop. This can cause serious injuries which may even be fatal, as well as significant damage at the installation site.

Pump casing

AWARNING

There is a danger of injury from the pump casing!

- Wear personal protective equipment during all installation work.
- Make sure the installation site meets the necessary requirements (\$ Chapter ,,5.2 Requirements for installation" on page 68) before setting the pump down.
- Handle the pump carefully and only set it down on a horizontal surface capable of bearing its weight.

When installing the pump, there is a danger of limbs being crushed between the pump casing, the foundations, the walls and adjacent components.



5.2 Requirements for installation

Before starting with the installation, ensure that the requirements listed below are met at the installation site.

- The installation site
 - must have the permissible ambient conditions (\diamondsuit Chapter ,, 13.4 Operating conditions "on page 209).
 - must be suitable for the pump's dimensions (♥ Chapter ,, 13.1 Pump dimensions and weight" on page 191). There must be sufficient free space for installation and the terminal box, the flange, and the filter casing must be easily accessible during operation.
 - There must be a gap of at least X between the block motor (♥ *Chapter ,, 13.4 Operating conditions* " on page 209) and the wall so that the motor can draw in enough cooling air.
 - must ensure that the pipes and cables can easily be routed to the installation site. Clarify the necessary requirements in advance if possible, with a plumber and an electrician.
- The foundations must
 - have a minimum compressive strength of 1200 lbs/sq in (characteristic cylinder strength) and allow a firm screwed connection for the pump.
 - have a waterproof, horizontal and flat surface.
 - have correspondingly prepared holes with thread inserts to bolt the pump in place.
 - enable the turning of the star handles on the filter cover by hand.

The installation requirements must be met by building work if necessary, or find some other suitable installation site which meets the necessary requirements.



Installing and aligning 5.3

5.3.1 Installing the pump

Personnel: Crane and tower operator

Millwright

Personal protective

equipment:

■ Safety helmet

Safety clothing

Safety gloves

Safety shoes

Special tool: Crane and lifting gear

Materials: Vibration dampers

■ 7/16" or 5/8" foundation bolts

Washers

When the installation site meets the requirements, position and install the pump as follows:

1. **AWARNING!** Risk of crushing from pump housing!

With the crane, carefully set the pump down vertically and align it at its installation site on the filter casing /1). If necessary, fit dampers to reduce noise and vibration between the foundation and the filter casing.



Fig. 24 Pump setup (example: herborner.X-N)





Fig. 25 Screwing pump onto base (example: herborner.X-N)

2. **AWARNING!** Risk of injury from the pump falling over if the lifting tackle is removed prematurely!

Tighten the pump on the base over the filter casing (Fig. 25/1) using four foundation screws with washers. Only remove the crane's separate lifting accessories afterward.

- ⇒ The pump is now standing safe & secure.
- **3.** Remove the lifting gear.

5.3.2 Tightening the screw connections

Personnel: Plumber/Pipefitter

Personal protective Safety clothing equipment: Safety shoes

= 00...019 0...000

Special tool: ■ Torque wrench

Tighten all screw connections between intermediate casing and pump casing and between pump casing and casing cover (3/6" - 16 UNC = 45 Nm, 7/16" - 14



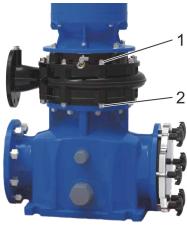


Fig. 26 Tightening the screw

connections (example: herborner.X-N)

- Screw connection between intermediate casing and pump casing
- 2 Screw connection between pump casing and casing cover

5.3.3 Assembling the screwed connection

Personnel: Plumber/Pipefitter

Personal protective equipment:

UNC = 70 Nm).

Safety helmet

Safety clothing

Safety gloves

Safety shoes

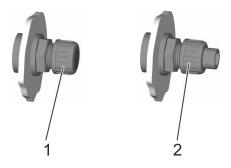




On delivery, the upper screwed connection and the lower screwed connection are located in the filter strainer in the filter casing.

Fig. 27 Screwed connection (example: herborner.X-N)

- 1 Upper screwed connection
- 2 Filter casing
- 3 Lower screwed connection



The screwed connection can be assembled with a cover or a connection for a pipeline .

Fig. 28 Options for screwed connections

- Screwed connection with cover
- 2 Screwed connection for pipeline



With the herborner.X-N-C, the upper screwed connection needs to be assembled with a connection for a pipeline.

Install the screwed connections as follows:

1. Remove the sticker from the opening of the lower screwed connection.



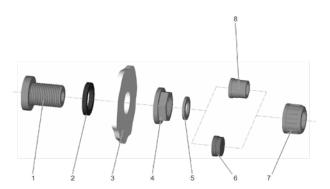


Fig. 29 Assembling the screwed connection

- 1 Tank connection
- 2 Joint ring
- 3 Wall of filter casing
- 4 Lock nut
- 5 Joint ring
- 6 Dummy insert
- 7 Union nut
- 8 Bonded socket joint
- **2.** Install the joint ring (Fig. 29/2) on the tank connection (Fig. 29/1).
- **3.** Insert the tank connection from the inside through the wall of the filter casing to the outside and tighten from the outside with the lock nut.

4. Screwed connection with cover

Set the dummy insert and the joint ring together into the union nut.

Screwed connection with a 1½" connection for a pipeline

Insert the adhesive seal and the joint ring into the union nut .

5. Tighten the union nut with individual parts on the tank connection .





6. On the herborner.X-N-C, screw the return pipe into the upper screwed connection .

Fig. 30 Screwed connection on the herborner.X-N-C

- 1 Return pipe
- 2 Upper screwed connection

5.3.4 Installing the star handles

Personnel: Plumber/Pipefitter

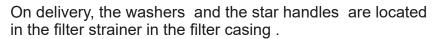
Personal protective equipment:

Safety helmet

Safety clothing

Safety gloves

Safety shoes



Install the star handles as follows:

- **1.** Loosen the existing nuts for fastening the filter cover and remove them.
- **2.** Hand tighten the filter cover using the star handles with the washers in a criss-cross pattern.

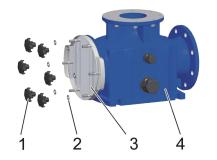


Fig. 31 Installing the star handles

- 1 Star handles
- 2 Washers
- 3 Filter cover
- 4 Filter casing



5.3.5 Connecting to the pump's flanges

5.3.5.1 Suction side

Personnel: Plumber/Pipefitter

Personal protective

Safety helmet

equipment:

Safety clothingSafety gloves

Safety shoes

Materials: ■ Pipes and reducing adapters

Gate valve

■ Pressure gage (optional)

When the pump is properly bolted to the foundations, the installation of the pipes can begin.

For feed mode, connect up the pump's suction-side flange as follows.

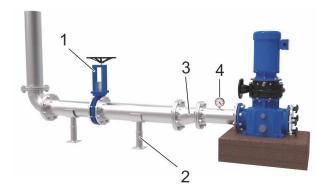


Fig. 32 Layout of the suction side (example: herborner.X-N)

- 1 Gate valve
- 2 Pipe support
- 3 Reducing adapter
- 4 Pressure gage
- **1.** Route the pipes from the swimming pool to the inlet/ suction side flange and evenly support all pipes (Fig. 32/2).
- To avoid cavitation, the pipe should be one size larger than diameter of the pump's flange.



- The feed line to the pump must always fall so as to avoid air pockets.
- If possible the piece of pipe connecting to the pump's flange should be straight.
- Install a gate valve at an easily accessible location upstream of the pump (Fig. 32/1).
- If the pump's flange is smaller than the pipe, put an eccentric reducing adapter upstream of the flange (Fig. 33/3).

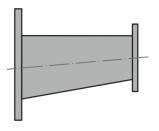


Fig. 33 Reducing adapter

- To avoid air pockets from reducing the pump's power, install the reducing adapter with its horizontal side at the top.
 - **4.** To read the pressure, it may be necessary to fit a pressure gage immediately upstream of the pump in a straight piece of pipe which is at least three times as long as the pipe's diameter.
 - 5. Bolt the pipe to the pump's flange, ensuring that it is aligned properly and not under stress and that it is airtight.
- Use washers for optimal handling when screwing the pump onto the pipeline.



5.3.5.2 Pressure side

Personnel: Plumber/Pipefitter

Personal protective equipment:

■ Safety helmet

Safety clothing

Safety gloves

Safety shoes

Materials: ■ Pipes and reducing adapters

Air bleeding device

Non-return valve (optional)

Compensators (optional)

When the pump is properly bolted to the foundations, the installation of the pipes can begin.

Whatever the operating mode, the pump's pressure side flange is connected up as follows.

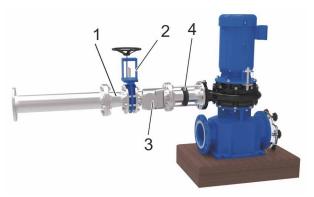


Fig. 34 Layout of the pressure side (example: herborner.X-N)

- 1 Reducing adapter
- 2 Gate valve
- 3 Non-return valve
- 4 Compensator
- **1.** Route the pipes from the swimming pool to the outlet/ pressure side flange and evenly support all pipes.
- To avoid flow losses, the pipe should be one size larger than the diameter of the pump's flange.



- To reduce noise transmitted through the structure of the building, use suitable damping on pipe fixings and when pipes are fed through walls.
- **2.** Fit an air bleeding device to the pressure pipe.
- **3.** If the pump's flange is smaller than the pipe, put a reducing adapter in the connection between the pipe and the flange (Fig. 34/1).
- To avoid air pockets from reducing the pump's power, install a concentric reducing adapter if possible.
 - **4.** Install a gate valve at an easily accessible location upstream of the pump (Fig. 34/2).
 - **5.** If necessary, also fit a non-return valve to avoid surges (Fig. 34/3).
 - **6.** If necessary, fit a compensator at a distance of 1 to 1.5 times the pipe's diameter downstream of the pump's flange to reduce vibrations (Fig. 34/4).
 - 7. Bolt the pipe to the pump's flange, ensuring that it is aligned properly and not under stress and that it is airtight.



5.4 After installation

Personnel: ■ Plumber/Pipefitter

Personal protective equipment:

Safety helmet

Safety clothing

Safety gloves

Safety shoes

After the installation, repeat the final check and make sure that the pump turns easily.

Again check that all bolted connections along the pipeline are firmly seated.

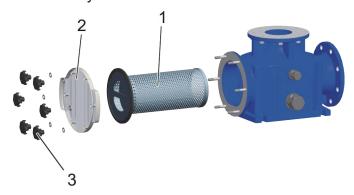


Fig. 35 Filter casing open

- Filter strainer
- 2 Filter cover
- Star handles
- 2. Remove the star handles and place to one side together with the washers.
- 3. Lift off the filter cover with both hands.
- Remove the filter strainer by turning slightly.





Fig. 36 Pump impeller (example: herborner.X-N)

5. **A** CAUTION! There is a danger of injury from the impeller!

Wearing safety gloves, reach into the filter casing in the direction of the block motor and touch the impeller (Fig. 36).

- **6.** Manually turn the impeller a few times until it can be smoothly turned.
- 7. Push the filter strainer with the opening pointing to the front into the filter casing as far as it will go.
- 8. Place the filter cover with both hands onto the stud bolts of the filter casing so it fits and hand tighten with star handles and washers in a criss-cross pattern.



6 Installation and putting into operation for the first time

6.1 Safety instructions for the installation and putting into operation for the first time

Electrical voltage

ADANGER

Electrical voltage represents a possibly fatal danger!

- Only allow qualified electricians to work on the building's electrical installation.
- Only allow qualified electricians or electrical installers/electric motor technicians to work on the pump's block motor or on the variable frequency drive.
- During all installation work, comply with the valid state and local building regulations, the national electric code as well as any additional local regulations.
- Before doing any work on the pump remove all live voltages from it and secure this state for the duration of the work. During this, conform with the following safety rules:
 - De-energize and secure against being switched on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).
 - Check that there are no live voltages present.

There is a danger of a fatal injury when touching live components. If an unauthorized person switches the electrical power supply on during the installation, there is a danger of serious injuries which can be fatal.



Water leaking

ACAUTION

There is a danger of injury and of damage from slipping in leaking water!

- Wear non-slip safety shoes.
- If water comes out, immediately switch the pump off, close the gate valve, find what is causing it and fix it (\$Chapter, 9 Fault-fixing" on page 122).
- Clean up puddles using suitable means.

If the connection flange does not seal properly, it may cause water leaks. Slipping in puddles on the floor can lead to a fall. A fall may cause injuries.

Improper installation

NOTICE

The pump can be damaged by improper installation!

- Make sure that the block motor and variable frequency drive are suitable for the supply voltage available on site (♥ *Chapter* "13 Technical data" on page 191).
- Carefully wire up the block motor and any variable frequency drive to the terminals in accordance with the supply voltage on site as shown on the wiring diagrams printed on the block motor.
- Fill up the pump before starting it up (\$ Chapter ,, 6.5 Filling the pump" on page 89).
- Check the pump for correct direction of rotation before regular operation (\$\&\text{Chapter}\$, 6.6 Checking the direction of rotation" on page 90).

Improper installation can damage the pump.



6.2 Preparing the electrical installation in the building

Personnel: Electrician

Personal protective ■ Safety shoes

equipment:

Before starting with the installation, the requirements listed below must be met at the installation site.

- Install the power supply company's electrical connection cables to the block motor at the pump's installation site in accordance with the applicable regulations.
- Separately fuse the electrical connections to the pump in accordance with the regulations which apply at the pump's installation site.
- Install a main switch with an emergency stop function, to switch the pump on and off at an easily accessible location near to the pump in accordance with the regulations which apply at the pump's installation site.

6.3 Connecting the electrical power supply

6.3.1 Connecting the herborner.X-N without a variable frequency drive

Personnel: Electrician

Electrical installer/electric motor

technician

Personal protective ■ Safety shoes

equipment:

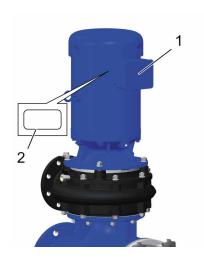
Materials: Screw terminals

Connect block motors without a variable frequency drive as follows, directly to the motor's terminal box:

▲DANGER! Electrical voltage represents a possibly fatal danger!

De-energize and secure against being switched on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).





Wiring the terminal box Fig. 37

- 1 Terminal box
- Connection diagram

- Unscrew the lid of the motor's terminal box (Fig. 37/1) and remove it.
- 3. NOTICE! The block motor can be damaged by the wrong voltage!

Wire the motor's electrical connection cables according to the supply voltage (low voltage or high voltage) with a screw terminal in accordance with the wiring diagram (Fig. 37/2) printed in the terminal box or on the block motor.

Connect the phase wires (L1 - L3) from the building's power supply to the connection cables 1, 2 and 3 on the block motor with the screw terminal.



If the motor turns in the wrong direction, it can be I reversed by exchanging two phase wires from the mains power supply.

- **5.** Connect the temperature monitor with the additional lines (J).
- **6.** Ground the block motor in accordance with the regulations which apply at the pump's installation site.
- Put the screw terminals into the terminal box and refit the lid on the terminal box.

6.3.2 Connecting the herborner.X-N-C without variable frequency drive

Personnel: Electrician

■ Electrical installer/electric motor

technician

Personal protective

equipment:

Safety shoes

Materials: Screw terminals

Connect block motors without a variable frequency drive as follows, directly to the motor's terminal box:



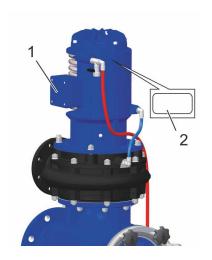
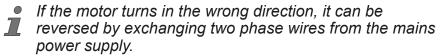


Fig. 38 Wiring the terminal box (example: herborner.X-N-C)

- 1 Terminal box
- 2 Connection diagram

▲DANGER! Electrical voltage represents a possibly fatal danger!

- **1.** De-energize and secure against being switched on again (♥ *Chapter*, ,2.6 *Securing the unit to prevent it from being switched on again" on page 28*).
- 2. Unscrew the lid of the motor's terminal box (Fig. 38/1) and remove it.
- 3. Connect the phase lines (L1 L3) of the building power supply according to the wiring diagram in the terminal box or printed on the block motor to terminals U1, V1 and W1 of the block motor.



- **4.** Connect the temperature monitor with the additional connection cables (1 and 2) according to the wiring diagram printed in the terminal box or on the block motor using a terminal strip.
- 5. **NOTICE!** Incorrect voltage may damage the temperature monitor!
 - Do not connect any voltage above 2.5 V.
 - To check the resistances, only use measuring bridges or ohmmeters.
- Only operate temperature monitors in conjunction with a tripping device.
 - Terminals A1 and A2 (if available) can be connected in case of a PTC thermistor failure.



- **6.** Ground the block motor in accordance with the regulations which apply at the pump's installation site.
- **7.** Reinstall the cover on the terminal box.

6.3.3 Connecting the herborner.X-N with a variable frequency drive

■ Electrical installer/electric motor

technician

Personal protective

equipment:

Safety shoes

Materials: ■ Screw terminals

Connect a variable frequency drive as follows to the motor's terminal box:

▲DANGER! Electrical voltage represents a possibly fatal danger!

- **1.** De-energize and secure against being switched on again (♥ *Chapter* ,, 2.6 *Securing the unit to prevent it from being switched on again "on page 28*).
- 2. Unscrew the lid of the motor's terminal box (Fig. 39/1) and remove it.

3. NOTICE! The block motor can be damaged by the wrong voltage!

Wire the motor's electrical connection cables according to the supply voltage (low voltage or high voltage) with a screw terminal in accordance with the wiring diagram (Fig. 39/2) printed in the terminal box or on the block motor.

- **4.** Ground the block motor in accordance with the regulations which apply at the pump's installation site.
- 5. Install and connect the variable frequency drive as specified in its operating manual externally, either wall-mounted or in a switching cabinet. Connect the temperature sensor to the corresponding terminals.

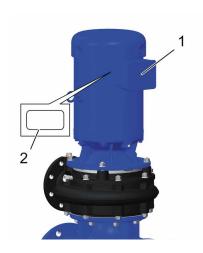


Fig. 39 Wiring the terminal box

- 1 Terminal box
- 2 Connection diagram



If the motor turns in the wrong direction, it can be reversed by exchanging two phase wires at the output of the variable frequency drive.

6. In case of wall-mounting/attachment to a control cabinet, reinstall the cover on the terminal box.

6.3.4 Connecting the herborner.X-N-PM with variable frequency drive

Electrical installer/electric motor

technician

Personal protective

Safety shoes

equipment:

Materials: ■ Screw terminals

Connect a variable frequency drive as follows to the motor's terminal box:

▲DANGER! Electrical voltage represents a possibly fatal danger!

1. De-energize and secure against being switched on again (\$\infty\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).



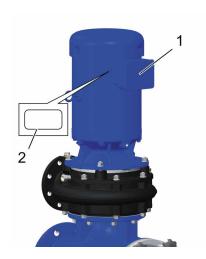


Fig. 40 Wiring the terminal box (example: herborner.X-N)

- 1 Terminal box
- 2 Connection diagram

- 2. Unscrew the lid of the motor's terminal box (Fig. 40/1) and remove it.
- **3.** Ground the block motor in accordance with the regulations which apply at the pump's installation site.
- **4.** Install and connect the variable frequency drive as specified in its operating manual externally, either wall-mounted or in a switching cabinet.

- If the motor turns in the wrong direction, it can be reversed by exchanging two phase wires at the output of the variable frequency drive.
 - **5.** Connect the temperature sensor to the corresponding terminals.
 - 6. NOTICE! Incorrect voltage may damage the temperature monitor!
 - Do not connect any voltage above 2.5 V.
 - To check the resistances, only use measuring bridges or ohmmeters.
- Only operate temperature monitors in conjunction with a tripping device.
 - Terminals A1 and A2 (if available) can be connected in case of a PTC thermistor failure.
 - 7. In case of wall-mounting/attachment to a control cabinet, reinstall the cover on the terminal box.



6.4 Connecting the control system

Pumps operated with a variable frequency drive can be connected to a controller.

7

To connect a pump to a control system, see the variable frequency drive's manual and get in touch with Herborner Pumpentechnik.

6.5 Filling the pump

Personnel: Electrical installer/electric motor

technician

General maintenance and repair worker

Personal protective

Safety clothing

equipment:

Safety shoes

Before putting the pump into operation, it must be completely filled with water to prevent the pump from running dry.



Fig. 41 Filling the pump (example: herborner.X-N)

- 1 Gate valve
- 2 Ball valve
- 1. Open the gate valve slowly and steadily.
- 2. Drain the pump via the ball valve.

On the herborner.X-N-C, the ball valve is located on the motor's return pipe.



System-side filling level of the pump

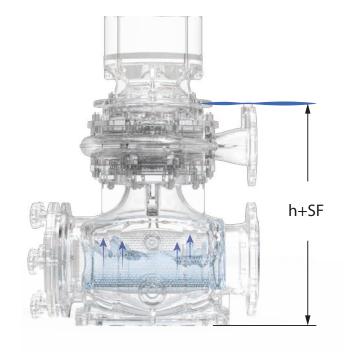


Fig. 42 System-side filling level of the pump

See *Chapter*, 13.1 Pump dimensions and weight on page 191 to determine the minimum height of the water column that should be placed before the pump.

6.6 Checking the direction of rotation

Fan and impeller

AWARNING

There is a danger of injury from the rotating fan and the impeller!

- When the pump is operating, never reach into the pump, especially not into the filter casing and keep clear of the immediate vicinity of the block motor.
- During maintenance or commissioning work do not wear loose items of clothing, hanging jewelry (e.g. necklaces or bracelets) and if you have long hair do not wear it loose.

The impeller in the pump casing and the fan in the block motor turn very quickly when in operation. Contact with the rotating parts or them tangling/catching clothing, jewelry or long hair can lead to serious injuries.



Strong magnetic fields

AWARNING

Risk of death from strong magnetic fields!

- Persons with pacemakers or implants made from metal must not stand within the vicinity of the block motor.
- Keep magnetic materials or those containing iron away from the block motor. Such materials may be attracted and cause injuries to persons.
- Keep electronic devices, data storage devices or credit cards, etc. away from the block motor. These may be damaged.

During operation, the block motor may build up a strong electromagnetic field. Strong magnetic fields may cause serious or even fatal injuries as well as considerable damage to equipment.

Personnel: Electrical installer/electric motor technician

Personal protective ■ Safety clothing

equipment: Safety shoes

Before starting routine operation, the pump's direction of rotation must be checked and corrected if necessary to avoid damage to the pump.



Fig. 43 Checking motor rotation direction (example: herborner.X-N)

- 1 The rotation indicator arrow on the pump's name plate
- 2 Fan



1. *NOTICE!* The pump can be damaged if its direction of rotation is wrong!

Briefly switch the pump (herborner.X-N and herborner.X-N-PM only) on at the main switch, and immediately switch it off again, then compare the fan's direction of rotation on the block motor as it slows down to the arrow marking the direction of rotation on the name plate.

- If the block motor's fan cannot be seen from the main switch, then two people will be needed for this task. One person to switch the pump on and the other to check the direction of rotation.
 - ⇒ The fan's direction of rotation must correspond to the marking arrow.
 - 2. If the direction of rotation does not match the arrow, then reverse the motor's rotation by exchanging two phase wires (\$Chapter ,, 6.3 Connecting the electrical power supply "on page 83).
- On the herborner.X-N-C the direction of rotation needs to be checked using the duty point.

6.7 After the installation and putting into operation for the first time

Personnel: Electrical installer/electric motor

technician

■ Plumber/Pipefitter

Personal protective Safety clothing equipment: Safety shoes

Do the following tests before starting routine operation of the pump:

- **1.** Make sure that all of the gate valves are open.
- **2.** Switch the pump on at the main switch.
- **3.** Bleed the system using the air bleeding device.
- **4.** Check the pipes, especially the flange connections, for leaks. If leaks are found, tighten the screw connections. If necessary repeat the installation steps to seal or replace components (\$ Chapter ,, 5.3 Installing and aligning on page 69).



- **5.** Check the Seal Guard system (optional) for the correct fill level and check if it contains any substances (Ä)
- **6.** Check the pump for loud noises and heavy vibrations. If it is making an unusual amount of noise, find out what is causing it and fix it (♥ Chapter ,, 9 Fault-fixing "on page 122).
- **7.** On the herborner.X-N-C, check the fluid flow in the return and cooling line.
- **8.** On the analog prefilter monitor (optional), adjust the pointer to the value shown.
- **9.** On the analog pressure gauge (optional), adjust the pointer to the value shown.



7 Operation

7.1 Warnings during operation

Strong magnetic fields

AWARNING

Risk of death from strong magnetic fields!

- Persons with pacemakers or implants made from metal must not stand within the vicinity of the block motor.
- Keep magnetic materials or those containing iron away from the block motor. Such materials may be attracted and cause injuries to persons.
- Keep electronic devices, data storage devices or credit cards, etc. away from the block motor. These may be damaged.

During operation, the block motor may build up a strong electromagnetic field. Strong magnetic fields may cause serious or even fatal injuries as well as considerable damage to equipment.

Noise

ACAUTION

There is a danger of injury from noise!

 Do not stand near the pump for longer periods while it is in operation. Wear hearing protection when working near the pump.

The level of noise which occurs in the working area can cause damage to your hearing after extended exposure.



Water leaking

ACAUTION

There is a danger of injury and of damage from leaking water!

- If water comes out, immediately switch the pump off, close the gate valve, find what is causing it and fix it (\$Chapter, 9 Fault-fixing" on page 122).
- Clean up puddles using suitable means.

If the pump or the piping system is not sealed properly then water may leak out. Slipping in puddles on the floor can lead to a fall. A fall may cause injuries.

Dry running

NOTICE

The pump can be damaged if it runs dry!

- Make sure that all of the gate valves are open during operation.

If the pump is operated without any liquid to pump, it will run dry and be damaged.



High chlorine levels

NOTICE

The pump can be damaged by high levels of chlorine!

- Do not dissolve chlorine tablets in the pump's filter casing.
- For brine baths, check regularly to ensure that the fraction of chloride ions does not exceed 0.13 oz/ gal.

A permanently high level of chlorine may damage the pump.

Frequent switching

NOTICE

The block motor can be damaged by frequent switching!

- Avoid frequent switching processes which are close together.
- Before switching the pump on again, allow the motor to cool down.
- When operating the pump via a control system, ensure that the control system cannot trigger frequent switching operations.

By frequently switching the pump on & off, the block motor can be overloaded.

7.2 Stopping the pump in an emergency

In an emergency, proceed as follows:

- Immediately trigger an emergency stop at the main switch.
- **2.** Switch off the pump and secure it against being switched on again (\$\infty\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).



7.3 Switching on/off

Switching on

1. *NOTICE!* There is a danger of the pump running dry!

Fill the pump (\$ Chapter ,, 6.5 Filling the pump " on page 89).

- 2. Switch the pump on at the main switch.
 - ⇒ The pump will start.

Switching off

- **1.** Switch the pump off at the main switch.
 - ⇒ The pump will stop.
- 2. NOTICE! There is a danger of flooding from leaking water!

Close all all gate valves.

7.4 Operating the pump



During routine operation there is no need to take any action to control the pump. The pump will work at the optimum duty point for the application specified when the pump was ordered.

7.5 Adjusting the pump parameters

The operating parameters can only be adjusted for pumps with a variable frequency drive. Pumps without a variable frequency drive always run at their specifically designed duty point.



7.6 When the pump has not been used for a longer period

7.6.1 Emptying and flushing the pump

worker

Materials: ■ Drain line or container for draining

Container (with a capacity of at

least 2 gal)

Water hose

When the pump has not been used for a longer period, it must be emptied and flushed out to prevent contamination.

1. *NOTICE!* There is a danger of flooding from leaking water!

Make sure that all of the gate valves are closed.

2. **AWARNING!** There is a danger of scalding if hot water is being pumped!

If the pump is operated with hot water, then it must be allowed to cool down for at least half an hour.

3. Open the ball valve /1).



Fig. 44 Opening the ball valve (example: herborner.X-N)

On the herborner.X-N-C, the ball valve is located on the motor's return pipe.



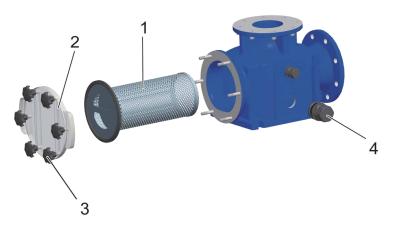


Fig. 45 Draining the pump (example: herborner.X-N/ herborner.X-N-PM)

- 1 Filter strainer
- 2 Filter cover
- 3 Star handles
- 4 Screwed connection

4. Draining with a drain line

Guide the drain line at the screwed connection directly into the drain and open it.

⇒ The water remaining in the pump and the pipelines will run out.

Draining with a container

Place the container under the screwed connection and unscrew the cover of the screwed connection.

- ⇒ The water remaining in the pump and the pipelines will run out.
- Depending on the size of the container, this will need to be emptied from time to time.
 - **5.** Wait until all of the water has run out. If a container was used, empty it.
 - **6.** Place the container for flushing under the screwed connection.
 - **7.** Remove the star handles (Fig. 45/3) and place to one side together with the washers.
 - **8.** Lift off the filter cover (Fig. 45/2) with both hands.
 - **9.** Remove the filter strainer (Fig. 45/1) by turning slightly.



10. NOTICE! The pump can be damaged if the wrong tools are used!

With a water hose, flush out the filter casing from inside. Do not use a high-pressure cleaner.

- **11.** Push the filter strainer with the opening pointing to the front into the filter casing as far as it will go.
- **12.** Place the filter cover with both hands onto the stud bolts of the filter casing so it fits and hand tighten with star handles and washers in a criss-cross pattern.
- **13.** Reinstall the lower screwed connection (♥ *Chapter* ,,5.3.3 *Assembling the screwed connection" on page 71*).
- **14.** Empty the container.

7.6.2 Checking that the pump's impeller turns easily

worker

Personal protective Safety gloves

equipment:

If the pump is not used for a longer period, its impeller must be checked once per week to see that it moves easily, to prevent it from jamming.

The pump must be drained (♥ Chapter ,, 7.6.1 Emptying and flushing the pump" on page 98).

1. **AWARNING!** Risk of injury due to pump starting unexpectedly!



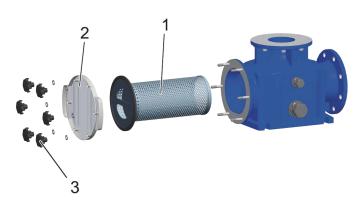


Fig. 46 Filter casing open

- 1 Filter strainer
- 2 Filter cover
- 3 Star handles
- **2.** Remove the star handles (Fig. 46/3) and place to one side together with the washers.
- 3. Lift off the filter cover with both hands.
- 4. Remove the filter strainer by turning slightly.

5. **A** CAUTION! There is a danger of injury from the impeller!

Wearing safety gloves, reach into the filter casing in the direction of the block motor and touch the impeller (Fig. 47/1).

- **6.** Manually turn the impeller a few times until it can be smoothly turned.
- 7. Push the filter strainer with the opening pointing to the front into the filter casing as far as it will go.
- **8.** Place the filter cover with both hands onto the stud bolts of the filter casing so it fits and hand tighten with star handles and washers in a criss-cross pattern.



Fig. 47 Pump impeller (example: herborner.X-N)

 For pump controllers, we recommended programming automatic startup of the pump every 48 hours for a maximum of 3 hours.

For operation with a variable frequency drive, a start-up frequency of approx. 5 Hz is advisable.



7.6.3 Storing the pump

Store the pump under the following conditions:

- Do not store in the open air.
- Store in a dry place away from dust and vibrations.
- Do not expose to any aggressive media.
- Storage temperature: 50 to 86 °F.
- Relative humidity should be less than 60 % if possible.
- Grease the block motor (\$ Chapter ,, 8.2 Maintenance schedule" on page 106).
- Check insulating resistance if stored longer than 6 months.
 - herborner.X-N (see the block motor's manual "Integral Horsepower AC Induction Motors (MN408), Baldor Electric Company", Chapter 1)
 - herborner.X-N-PM (see the block motor's manual "Operating Instructions for three-phase-motors with permanent magnets (12.13), EMOD MOTOREN," Chapter 2.3).
 - herborner.X-N-C (see block motor operating manual "Operating Instructions for water-cooled three-phase-motors (11.03), EMOD MOTOREN," Chapter 2.3)
- If anti-friction bearings are stored for longer than 4 years, they need to be regreased or replaced (\$\times\$ Chapter ,,9.3.1 Disassembling and reassembling a pump "on page 132).
 - herborner.X-N-PM (see additional block motor operating instructions "Operating Instructions for three-phase-motors with permanent magnets (12.13), EMOD MOTOREN," Chapter 4.3).



7.7 Flood-proof version (optional)

worker

Personal protective ■ Safety clothing

equipment:

Safety shoes

Special tool: ■ Screwdriver (flat)

Materials: ■ Shaft seal ring

Water hose

Bucket/can

Cloths

With the flood-proof version of the herborner.X-N-C, do not operate pump after flooding.

Inspect the shaft area and the shaft seal ring for cleanliness and solid particles as follows and clean it:

- **1.** Remove the motor (♥ *Chapter* ,, 9.3.1.1 *Disassembly* " *on page 133*).
- 2. Inspect the shaft area for cleanliness and any solid particles.
 - ⇒ If dirt is found in the shaft area, it needs to be cleaned off with water.
- **3.** Inspect the shaft seal ring (Fig. 48/1) for cleanliness and solid particles.
 - ⇒ If the shaft seal ring is contaminated, it will need to be replaced.
- **4.** Pry out the contaminated shaft seal ring using a flathead screwdriver.
- **5.** Insert a new shaft seal ring.
- **6.** Reassemble the pump (♥ *Chapter* ,, 9.3.1.2 *Assembly* " *on page 154*).



Fig. 48 Checking the shaft seal ring (example: herborner.X-N-C)



8 Maintenance

8.1 Safety instructions for maintenance

Electrical voltage

ADANGER

Electrical voltage represents a possibly fatal danger!

- Only allow qualified electricians to work on the building's electrical installation.
- Only allow qualified electricians or electrical installers/electric motor technicians to work on the pump's block motor or on the variable frequency drive.
- Before doing any work on the pump remove all live voltages from it and secure this state for the duration of the work. During this, conform with the following safety rules:
 - De-energize and secure against being switched on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).
 - Check that there are no live voltages present.
- Never bridge or otherwise disable fuses/circuit breakers. When replacing fuses ensure that you use the same amperage.
- Keep moisture away from live parts. This can lead to a short circuit.

On contact with any live parts on the pump's block motor or on the variable frequency drive there is an immediate danger of death from an electric shock. Damage to the insulation or to individual components can represent a danger to life.



Strong magnetic fields

AWARNING

Risk of death from strong magnetic fields!

- Persons with pacemakers or implants made from metal must not stand within the vicinity of the block motor.
- Keep magnetic materials or those containing iron away from the block motor. Such materials may be attracted and cause injuries to persons.
- Remove any metallic items (jewelry, watches, pens, etc.) before performing maintenance.
- Keep electronic devices, data storage devices or credit cards, etc. away from the block motor. These may be damaged.

During operation, the block motor may build up a strong electromagnetic field. Strong magnetic fields may cause serious or even fatal injuries as well as considerable damage to equipment.

Improperly done maintenance work

AWARNING

There is a danger of injury from improperly done maintenance work!

- Only use original spare parts.
- Completely carry out all maintenance work according to the specifications and instructions in this manual.
- If components have been removed, make sure that they are properly installed, re-tighten all fasteners and observe the specified torques (\$\&\times\$ Chapter \$,13.10 Torque values" on page 228).
- Before starting up again, make sure that all covers and safety devices have been installed and are in proper working order.

Improper maintenance can lead to serious injuries and significant damage.



Protecting the environment

Observe the following instructions on environmental protection during the maintenance work:

■ At all lubrication points, remove used and excess grease and any grease which comes out, and dispose of it in accordance with the valid local regulations.

8.2 Maintenance schedule

The following sections describe maintenance work which is required for optimal and fault-free operation.

Interval	Maintenance work	Personnel
	Clean the block motor's casing (\$\&\ Chapter ,, 8.3.3 \\ Cleaning the block motor's casing "on page 113)	General maintenance and repair worker
every 500 operating hours, no later than after 3 months	Clean any condensation drain holes on the block motor (\$\&Chapter_{,,} 8.3.4 Cleaning up any condensation water" on page 114)	General maintenance and repair worker
	Check the block motor for damaged windings (\$ Chapter ,, 8.3.5 Checking the block motor "on page 115)	Electrical installer/electric motor technician
	Check the electrical connections in the terminal box (\$\&Chapter_{,,} 8.3.6 Checking the electrical connections in the terminal box" on page 115)	Electrical installer/electric motor technician
every 3000 to 10000 operating hours, or no later than every 3 years	herborner.X-N-PM and herborner.X-N-C (2 hp to 100 hp): Grease the block motor while impeller is rotating (\$\times Chapter ,, 13.5.3 herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQH 72-102 (Klüber Lubrication) "on page 214)	General maintenance and repair worker
	NOTICE Anti-friction bearing can be damaged if lubrication is inadequate or excessive.	
	Klüberquiet BQH 72-102 lubricant (Klüber Lubrication)	
every 3500 operating hours, or no later than every	herborner.X-N (60 hp to 100 hp): Grease the block motor (\$\&Chapter_{,,}13.5.2\$ herborner.X-N regreasing intervals with Polyrex EM" on page 213).	General maintenance and repair worker
	NOTICE Anti-friction bearing can be damaged if lubrication is inadequate or excessive.	
	Grease: Polyrex EM (Exxon Mobil)	
every 4000 operating hours, no later than every 12 months	Oil change for version with Seal Guard system (optional) (\$\&chapter "9.4.1 Disassembling and reassembling a pump" on page 116)	General maintenance and repair worker



Interval	Maintenance work	Personnel
Every 7400 operating hours, or no later than every	herborner.X-N (25 hp to 50 hp): Grease the block motor (\$\times\$ Chapter ,, 13.5.2 herborner.X-N regreasing intervals with Polyrex EM" on page 213).	General maintenance and repair worker
	NOTICE Anti-friction bearing can be damaged if lubrication is inadequate or excessive.	
	Grease: Polyrex EM (Exxon Mobil)	
every 9500 operating hours, no later than every 6 months	herborner.X-N (7½ hp to 20 hp): Grease the block motor (\$ Chapter ,, 13.5.2 herborner.X-N regreasing intervals with Polyrex EM" on page 213).	General maintenance and repair worker
	NOTICE Anti-friction bearing can be damaged if lubrication is inadequate or excessive.	
	Grease: Polyrex EM (Exxon Mobil)	
every 12000 operating hours, no later than every 12 months	herborner.X-N (¾ hp to 5 hp): Grease the block motor (∜ <i>Chapter</i> ,, 13.5.2 herborner.X-N regreasing intervals with Polyrex <i>EM</i> " on page 213).	General maintenance and repair worker
	NOTICE Anti-friction bearing can be damaged if lubrication is inadequate or excessive.	
	Grease: Polyrex EM (Exxon Mobil)	
Every 20000 operating hours, or no later than every 3 years	herborner.X-N-PM (¾ hp, 1 hp and 1 ½ hp): Regrease the anti-friction bearing or replace if necessary (∜ <i>Chapter</i> ,, 9.3.1 <i>Disassembling and reassembling a pump" on page 132</i> and refer to the block motor operating manual "Operating Instructions for three-phasemotors with permanent magnets (12.13), EMOD MOTO-REN," Chapter 4.3)	General maintenance and repair worker
	CAUTION! Anti-friction bearing may be damaged if lubrication is inadequate or excessive.	
	Klüberquiet BQH 72-102 lubricant (Klüber Lubrication)	
every 6 months	Check the screwed connections and tighten if necessary (\$\times\$ Chapter ", 8.3.8 Checking the screwed connections and tightening if necessary" on page 117)	General maintenance and repair worker



Interval	Maintenance work	Personnel
	Check the seal of the filter strainer and replace if necessary (\$ Chapter ,, 8.3.9 Checking the seal of the filter cover and replacing if necessary" on page 118)	General maintenance and repair worker
monthly	Check if the pump casing is dirty and clean it if necessary (\Leftrightarrow Chapter "8.3.7 Cleaning the pump casing" on page 117)	General maintenance and repair worker
	Check the Seal Guard system (optional) for the correct fill level and check if it contains any substances (Chapter "8.3.10 Checking the (optional) Seal Guard system for the correct fill level and for any substances "on page 120)	General maintenance and repair worker
weekly	Check the pump for leaks (\$ Chapter ,, 8.3.1 Checking the pump for leaks" on page 109)	Plumber/Pipefitter General maintenance and repair worker
	Check the filter strainer and clean if necessary (\$\\$Chapter ,,8.3.2 Checking the filter strainer and cleaning if necessary" on page 111)	General maintenance and repair worker



Maintenance jobs 8.3

8.3.1 Checking the pump for leaks

Personnel: ■ Plumber/Pipefitter

General maintenance and repair

worker

Personal protective Safety clothing equipment: Safety shoes

Check the pump for leaks as follows and fix any leaks found:

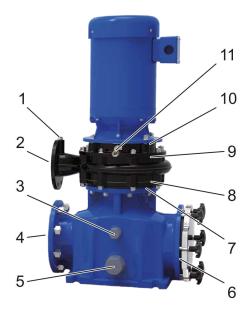


Fig. 49 Where to check if water is leaking from the pump (example: herborner.X-N)

- Screwed plug 1
- Flange 2
- Screwed connection
- 4 Flange
- 5 Screwed connection
- The joint between the filter cover and the filter casing
- 7 The joint between the filter casing and the casing cover
- 8 The joint between the casing cover and the pump casing
- The joint between the pump casing and the intermediate casing
- 10 The joint between the intermediate casing and the block motor
- 11 Ball valve



ACAUTION! There is a danger of slipping on leaking water!

Check the area of the pump for obvious leaks. If necessary clean away the leaked water and find the source of the leak.

Check the following locations with particular care:

- Screwed plug
- Flange
- Screwed connection
- Flange
- Screwed connection
- The joint between the filter cover and the filter casing
- The joint between the filter casing and the casing cover
- The joint between the casing cover and the pump casing
- The join between the intermediate casing and the pump casing
- The joint between the block motor only on the version with Seal Guard system)
- Ball valve
- In places where there is a water leakage, first tighten the corresponding screws/screw connections, if available.
- 3. If the leak persists, switch the pump off, secure it against being switched on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again on page 28) and replace the faulty pipe connections/components/seals.
- To identify faulty seals, depending on the location of the leak, see ♥ Chapter ,, 10.2 List of spare parts "on page 178.



8.3.2 Checking the filter strainer and cleaning if necessary

worker

Personal protective

equipment:

Safety clothing

Safety shoes

Materials: ■ Water hose

Bucket/can

Check as follows whether the filter strainer is clean and clean it if necessary:

AWARNING! Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).

2. NOTICE! There is a danger of flooding from leaking water!

Make sure that all of the gate valves are closed.

- **3.** Drain the pump (♥ *Chapter* ,, 7.6.1 *Emptying and flushing the pump* " *on page 98*).
- **4.** Clean the filter strainer each week or according to the respective conditions of the swimming pool.

When using an analog pre-filter monitor, dirt can be detected in the filter strainer due to the value shown no longer matching the pointer.

When using a digital pre-filter monitor with a digital display, dirt can be detected in the filter strainer due to the value shown being lower than the initial value.



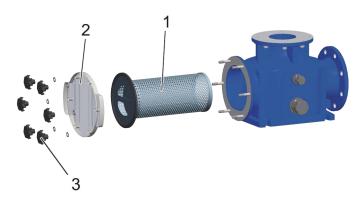


Fig. 50 Filter casing open

- 1 Filter strainer
- 2 Filter cover
- 3 Star handles
- **5.** Remove the star handles (Fig. 50/3) and place to one side together with the washers.
- **6.** Lift off the filter cover (Fig. 50/2) with both hands.
- 7. Remove the filter strainer (Fig. 50/3) by turning slightly.
- 8. *NOTICE!* Improper cleaning can damage the filter strainer!

Flush out the filter strainer with water. If necessary, pick out dirt which has stuck to the strainer manually. Only use a flame when cleaning the filter strainer if the profile seal has been removed beforehand (\$\infty\$ Chapter ,,8.3.9 Checking the seal of the filter cover and replacing if necessary" on page 118).

- **9.** If the profile sealing was removed, reinstall it (\$\infty\$ Chapter ,, 8.3.9 Checking the seal of the filter cover and replacing if necessary" on page 118).
- **10.** Insert the cleaned filter strainer with the opening pointing to the front into the filter casing as far as it will go.
- **11.** Place the filter cover with both hands onto the stud bolts of the filter casing so it fits and hand tighten with star handles and washers in a criss-cross pattern.



8.3.3 Cleaning the block motor's casing

Personnel: General maintenance and repair

worker

Personal protective Safety clothing

equipment: Safety shoes

Hand brush Special tool:

Materials: Cloths

Clean the block motor as follows:

1. **AWARNING!** Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (♥ Chapter "2.6 Securing the unit to prevent it from being switched on again" on page 28).

2. AWARNING! There is a danger of injury from hot surfaces!

Allow the motor to cool down.

- Brush out the ventilation opening in the block motor's cover (Fig. 51/1) with a hand brush.
 - ⇒ The ventilation openings must be clear.



Block motor cover (example: Fig. 51 herborner.X-N)



On the herborner.X-N-C, there are no ventilation openings. This step can therefore be ignored.

4. Wipe down the complete motor casing with a cloth.



8.3.4 Cleaning up any condensation water

worker

Personal protective

equipment:

Safety clothing

Safety shoes

Materials: ■ Cloths

Clean up any condensation water as follows:

AWARNING! Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).

2. **AWARNING!** There is a danger of injury from hot surfaces!

Allow the motor to cool down.

3. Open condensation water drain holes

Wipe any condensation water drain holes on the block motor using a cloth. The condensation water drain holes must be unobstructed.

Closed condensation water drain holes

Open the block motor's condensation water drain holes (Fig. 52/1), wipe using a cloth and close again.

⇒ The condensation water drain holes must be unobstructed.



Fig. 52 Condensation water drain holes (example: herborner.X-N)



8.3.5 Checking the block motor

Personnel: Electrical installer/electric motor

technician

Personal protective

equipment:

Safety clothing

Safety shoes

Special tool: ■ Motor test unit

ADANGER! Electrical voltage represents a possibly fatal danger!

Depending on the work being performed, make sure that the pump is switched off and is secured against being switched back on again. (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).

2. **AWARNING!** There is a danger of injury from hot surfaces!

Allow the motor to cool down.

3. Use the motor test unit to test the block motor for faulty windings.



Take notice of the motor test unit's operating manual!

⇒ Remove the block motor in case of any defects and replace it (\$\&\circ\$ Chapter ,, 9.3.1 Disassembling and reassembling a pump "on page 132).

8.3.6 Checking the electrical connections in the terminal box

Personnel: Electrical installer/electric motor

technician

Personal protective

equipment:

Safety clothing

Safety shoes



Check the terminals in the block motor's terminal box as follows:

1. ADANGER! Electrical voltage represents a possibly fatal danger!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).

AWARNING! There is a danger of injury from hot surfaces!

Allow the motor to cool down.

- If the block motor is used without a variable frequency drive or with a variable frequency drive which is wall-mounted or installed in an electrical cabinet, unscrew the lid of the motor's terminal box (Fig. 53/1) and remove it.
- 3. Make sure that all of the connecting wires are firmly seated in the screw terminals and that the insulation of the wires is undamaged. Replace any damaged insulation.
- 4. If a variable frequency drive is used for operation, make sure that the connecting wires on the adapter plate are also firmly screwed in place and are intact.
- **5.** Put the screw terminals into the terminal box.



Fig. 53 Block motor terminal box (example: herborner.X-N)

■ If the block motor is used without a variable frequency drive or with a variable frequency drive which is wall-mounted or installed in an electrical cabinet, refit the the lid of the motor's terminal box.



8.3.7 Cleaning the pump casing

worker

Personal protective ■ Safety clothing

equipment:

Safety shoes

Special tool: ■ Hand brush

Materials: ■ Cloths

Clean the pump casing as follows:

AWARNING! Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).

Allow the motor to cool down.

3. Brush down the complete pump casing with a hand brush and wipe it down with a cloth.

8.3.8 Checking the screwed connections and tightening if necessary

worker

Personal protective

Safety clothing

equipment:

Safety shoes

Special tool: ■ Torque wrench

1. **AWARNING!** Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).



Allow the motor to cool down.

3. Check all visible screwed connections (base, casings, screwed plugs, flanges) to see if they are firmly seated and tighten as necessary (\$\infty\$ Chapter ,, 13.10 Torque values" on page 228).

8.3.9 Checking the seal of the filter cover and replacing if necessary

worker

Personal protective ■ Sa

equipment:

Safety clothing

Safety shoes

Materials: ■ Profile sealing

Check the profile sealing of the filter strainer and replace if necessary:

1. **AWARNING!** Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$\&\text{Chapter}\$, 2.6 Securing the unit to prevent it from being switched on again" on page 28).

2. NOTICE! There is a danger of flooding from leaking water!

Make sure that all of the gate valves are closed.

3. Drain the pump (♥ chapter "7.6.1 Emptying and flushing the pump" on page).



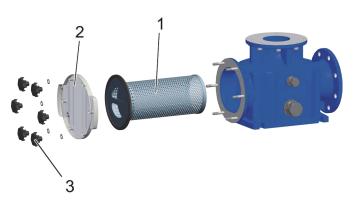
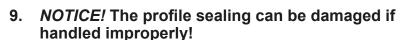


Fig. 54 Filter casing open

- 1 Filter strainer
- 2 Filter cover
- 3 Star handles
- **4.** Remove the star handles (Fig. 54/3) and place to one side together with the washers.
- **5.** Lift off the filter cover (Fig. 54/2) with both hands.
- **6.** Remove the filter strainer (Fig. 54/1) by turning slightly.
- 7. With your thumb, press in the filter casing's profile sealing all the way round 1) and check for apparent damage (tears, porosity).
 - ⇒ If there are signs of damage to the profile sealing, it must be replaced.
- **8.** Remove the defective profile sealing by hand from the edge of the filter strainer cover.



Press a new profile sealing all the way round onto the edge of the filter strainer cover. Make sure that the profile sealing does not get twisted or stretched. If necessary, carefully remove the profile sealing again manually, without pulling on it, and then refit it.

- **10.** Push the filter strainer with the opening pointing to the front into the filter casing as far as it will go.
- **11.** Place the filter cover with both hands onto the stud bolts of the filter casing so it fits and hand tighten with star handles and washers in a criss-cross pattern.



Fig. 55 Filter casing profile sealing



8.3.10 Checking the (optional) Seal Guard system for the correct fill level and for any substances

worker

Personal protective Safety clothing equipment: Safety shoes

Check the Seal Guard system for the correct fill level and for any substances and repair any leaks:

1. Check the fill level of the Seal Guard system compensation tank (Fig. 56/1).

This must be filled with Mobil SHC Cibus 46 with NSF H1 approval to the half-way mark.

- ⇒ Adverse operating conditions (e.g., dry running) may affect the fill level.
- 2. Check if the oil contains any substances.
 - ⇒ If the fill level visibly changes or substances are present in the oil, the mechanical seal (Fig. 56/2) needs to be inspected and replaced if necessary.



Fig. 56 Checking the Seal Guard system (example: herborner.X-N)

- 1 Seal Guard system compensation tank
- 2 Mechanical seal



8.4 After the maintenance

Personnel: Electrical installer/electric motor

technician

General maintenance and repair

worker

1. Clean up any water which leaked out.

- 2. Make sure that all of the jobs have been completed and all of the screwed connections have been properly tightened.
- **3.** Make sure that all of the safety devices have been refitted and are in working order and that there is no danger to personnel.
 - ⇒ The pump can be switched on again. (*♦ Chapter* ,, 7.3 Switching on/off" on page 97).



9 Fault-fixing

9.1 Warnings about fixing faults

Work carried out improperly to fix a fault

AWARNING

There is a danger of injury if faults are improperly fixed!

- Only fix faults which require work on the pump when you have ensured that the pump is at a standstill and has been secured against being switched on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again" on page 28).
- Only use original spare parts.
- Completely carry out all work according to the specifications and instructions in this manual.
- If components have been removed, make sure that they are properly installed, re-tighten all fasteners and observe the specified torques (\$\infty\$ Chapter ,,13.10 Torque values" on page 228).
- Before starting up again, make sure that all covers and safety devices have been installed and are in proper working order.

Fault-fixing work which is done improperly can lead to serious injuries and significant damage.



Securing the unit to prevent it from being switched on again

AWARNING

Someone switching the system on who is not authorized to do represents a possibly fatal danger!

- Before starting work, switch off all sources of electricity and secure them against being switched on again (\$Chapter , 2.6 Securing the unit to prevent it from being switched on again" on page 28).

If an unauthorized person switches the electrical power supply on during fault-fixing, for persons in the danger zone there is a danger of serious injuries, which can be fatal.

Hot water

AWARNING

There is a danger of scalding from hot water if the pump has heated up during operation!

- After a fault, always allow the pump to cool down before opening the filter cover or draining it.

When the pump has heated up in operation, the temperature of the water in the filter container can be significantly increased. Hot water touching the skin can result in scalding.

What to do if there is a dangerous fault

In general, the following applies:

- I. Switch off the pump immediately if a fault occurs that poses an immediate danger to persons or objects (♥ Chapter ,, 2.8 What to do in case of danger "on page 35).
- 2. Determine the cause of the fault.
- 3. If work in the danger zone is required to fix the fault, switch off the power supply and secure it against being switched on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).



4. Depending on the type of fault, have it fixed by appropriately qualified personnel.

The fault table helps to show who is authorized to fix a fault (\$ Chapter ,,9.2 Table of faults" on page 124).

9.2 Table of faults

If the pump is operated in combination with a variable frequency drive via a control system, other faults can arise from the connection to the control system (see the variable frequency drive's operating manual).

9.2.1 Unusual states

Faults on the pump

Description of the fault	Cause	Remedy	Personnel
The pump is not pumping any water NOTICE! There is a danger of the pump running dry. Immediately switch the pump off.	The block motor is not running	⋄ "Faults in the block motor" auf Seite 129	
	A gate valve is closed	Make sure that the gate valves in both the supply and the pressure pipes are fully open	General maintenance and repair worker
	Pump not filled	Make sure that the filter casing is completely full with water (\$\&\times\$ Chapter ,, 6.5 Filling the pump" on page 89)	General maintenance and repair worker
	The feed pipe is obstructed	Make sure that no foreign bodies have collected in the supply/feed pipe (leaves, clothes, etc.) and are obstructing it	General maintenance and repair worker
The pump's power is inadequate	A gate valve is not completely open	Make sure that the gate valves in both the supply and the pressure pipes are fully open	General maintenance and repair worker
	The pump's direction of rotation is wrong	Check the pump's direction of rotation and reverse it if necessary (\$ Chapter ,, 6.6 Checking the direction of rotation "on page 90)	Electrical installer/ electric motor tech- nician



Description of the fault	Cause	Remedy	Personnel
	Pipeline incorrectly installed	Check that the pipelines have been properly installed (Chapter ,, 5.3.5 Connecting to the pump's flanges on page 75) The diameter of the feed and pressure pipelines should be larger than the diameter of the pump's flanges Straight pipes must be used to connect to the pump's flanges A non-return valve must be fitted in the pressure pipe	Plumber/Pipefitter
	The system has not been bled	Bleed the system using the air bleeding device	Plumber/Pipefitter
	The speed is not set correctly/pump is running at reduced speed	Increase the pump's speed/power: using the variable frequency drive's controls if a variable frequency drive is in use (\$ Chapter ,, 7.5 Adjusting the pump parameters" on page 97)	General maintenance and repair worker Electrical installer/ electric motor tech- nician
	A pipeline is blocked	Make sure that no foreign bodies have collected in the supply/feed pipe (leaves, clothes, etc.) and are obstructing it	General maintenance and repair worker
	The pump is blo- cked	Clean the filter strainer (\$ Chapter ,,8.3.2 Checking the filter strainer and cleaning if necessary" on page 111), check for foreign bodies and rinse the filter casing if necessary (\$ Chapter ,,7.6.1 Emptying and flushing the pump" on page 98)	General maintenance and repair worker
	A phase is missing from the power supply	Make sure that all of the fuses in the fuse box are intact and correctly fitted Check the electrical connections in the terminal box (\$\infty\$ Chapter ,, 8.3.6 Chekking the electrical connections in the terminal box "on page 115) Check the on site electrical installation	Electrical installer/ electric motor tech- nician Electrician
	The water to be pumped is very dirty (muddy)	Check the supply pool for contamination and clean it if necessary. Next, clean the filter strainer (\$\&\text{Chapter}, 8.3.2 Checking the filter strainer and cleaning if necessary" on page 111) and flush the filter casing (\$\&\text{Chapter}, 7.6.1 Emptying and flushing the pump" on page 98).	General maintenance and repair worker



Description of the fault	Cause	Remedy	Personnel
	The impeller is worn or loose	Check the condition of the impeller (\$\&Chapter_{,,}9.3.2 Checking the impeller and tightening" on page 175) and, if necessary, replace the impeller/nut (\$\&Chapter_{,,}9.3.1 Disassembling and reassembling a pump" on page 132)	General maintenance and repair worker Electrical installer/ electric motor tech- nician
	Wrong size of pump	Compare the chosen pump with the actual requirements and if necessary, use a more powerful pump	Plumber/Pipefitter General maintenance and repair worker
The pump vibrates heavily	The pipes are under stress as installed	Check to see if the pipes are stressed and correct if necessary	Plumber/Pipefitter
	The system has not been bled	Bleed the system using the air bleeding device	Plumber/Pipefitter
	The feed pipe is obstructed	Make sure that no foreign bodies have collected in the supply/feed pipe (leaves, clothes, etc.) and are obstructing it	General maintenance and repair worker
	The pump is blo- cked	Clean the filter strainer (\$\&\circ\$ Chapter ,,8.3.2 Checking the filter strainer and cleaning if necessary" on page 111), check for foreign bodies and rinse the filter casing if necessary (\$\&\circ\$ Chapter ,,7.6.1 Emptying and flushing the pump" on page 98)	General maintenance and repair worker
	Pipeline incorrectly installed	Check that the pipelines have been properly installed (Chapter ,, 5.3.5 Connecting to the pump's flanges on page 75) The diameter of the feed and pressure pipelines should be larger than the diameter of the pump's flanges	Plumber/Pipefitter
		The pipes on the suction side should not rise too much	
		Straight pipes must be used to connect to the pump's flanges	
		A non-return valve must be fitted in the pressure pipe	
	The pump's direction of rotation is wrong	Check the pump's direction of rotation and reverse it if necessary (\$ Chapter ,, 6.6 Checking the direction of rotation" on page 90)	Electrical installer/ electric motor tech- nician



Description of the fault	Cause	Remedy	Personnel
	The impeller is worn or loose	Check the condition of the impeller (\$\&Chapter_{,,}9.3.2 Checking the impeller and tightening" on page 175) and, if necessary, replace the impeller/ nut (\$\&Chapter_{,,}9.3.1 Disassembling and reassembling a pump" on page 132)	General maintenance and repair worker Electrical installer/ electric motor tech- nician
	The pump is not working at its opti- mum speed/power	Change the pump's speed/power: using the variable frequency drive's controls if a variable frequency drive is in use (\$ Chapter ,, 7.5 Adjusting the pump parameters "on page 97)	General maintenance and repair worker Electrical installer/ electric motor tech- nician
	The block motor is inadequate or has been excessively greased	Using the maintenance records, check whether there has been an insufficient or, if applicable, excessive amount of greasing. Depending on the result: Grease the herborner.X-N (Ä Chapter "13.5.2 herborner.X-N regreasing intervals with Polyrex EM" on page 213). Grease the herborner.X-N-PM while the impeller is rotating (& Chapter "13.5.3 herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQH 72-102 (Klüber Lubrication)" on page 214)	General maintenance and repair worker Electrical installer/ electric motor tech- nician Manufacturer (Baldor Electric Company) Manufacturer (EMOD MOTOREN)
		Grease the herborner.X-N-C while the impeller is rotating (\$\infty\$ Chapter ,, 13.5.3 herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQH 72-102 (Klüber Lubrication) "on page 214)	
		Remove the anti-friction bearing, clean it and replace if necessary (\$ Chapter ,, 9.3.1 Disassembling and reassembling a pump "on page 132)	
		NOTICE! Anti-friction bearing may be damaged if lubrication is inadequate or excessive.	
	The block motor's anti-friction bearing is faulty	Replace the anti-friction bearing (\$\times\$ Chapter ,, 9.3.1 Disassembling and reassembling a pump" on page 132)	Electrical installer/ electric motor tech- nician Manufacturer (Baldor Electric Company) Manufacturer (EMOD MOTOREN)



Description of the fault	Cause	Remedy	Personnel
	The measures to reduce vibration are insufficient	Make sure that vibration dampers and compensators were inserted correctly when the pump was installed. If necessary, retrofit vibration-damping parts (\$ Chapter ,, 5 Installing and connecting the pump" on page 67)	Plumber/Pipefitter
The pump is making a lot of noise	The system has not been bled	Bleed the system using the air bleeding device	Plumber/Pipefitter
	There is no non-re- turn valve installed or it is faulty	Install a non-return valve in the pressure pipe or check that the existing non-return valve is working properly and replace if necessary (\$\&Chapter_{.,}5.3.5\$ Connecting to the pump's flanges" on page 75)	Plumber/Pipefitter
	The pump is blo- cked	Clean the filter strainer (\$ Chapter ,, 8.3.2 Checking the filter strainer and cleaning if necessary on page 111), check for foreign bodies and rinse the filter casing if necessary (\$ Chapter ,, 7.6.1 Emptying and flushing the pump" on page 98)	General maintenance and repair worker
	The block motor is running unevenly	\$,Faults in the block motor" auf Seite 129, block motor is running unevenly or is vibrating heavily	
The pump switches itself off	The block motor is overheated	\$,Faults in the block motor" auf Seite 129, block motor is overheated	
	The pump's direction of rotation is wrong	Check the pump's direction of rotation and reverse it if necessary (\$\infty\$ Chapter ,, 6.6 Checking the direction of rotation "on page 90)	Electrical installer/ electric motor tech- nician
	The variable frequency drive switches off due to excessive current consumption	Make sure the pump is moving smoothly (\$ Chapter ,, 7.6.2 Checking that the pump's impeller turns easily "on page 100)	General maintenance and repair worker
	The feed pipe is obstructed	Make sure that no foreign bodies have collected in the supply/feed pipe (leaves, clothes, etc.) and are obstructing it	General maintenance and repair worker
	The pump is blo- cked	Clean the filter strainer (\$ Chapter ,, 8.3.2 Checking the filter strainer and cleaning if necessary" on page 111), check for foreign bodies and rinse the filter casing if necessary (\$ Chapter ,, 7.6.1 Emptying and flushing the pump" on page 98)	General maintenance and repair worker



Description of the fault	Cause	Remedy	Personnel
	Too frequent swit- ching	Allow the block motor to cool down and avoid frequently switching on & off If operating the pump via a control system, ensure that the control system does not trigger frequent switching operations	General maintenance and repair worker Electrical installer/ electric motor tech- nician
	The block motor is incorrectly connected	Check the electrical connections in the terminal box and make sure that it has been wired according to the site power supply (\$ Chapter ,, 6.3 Connecting the electrical power supply" on page 83)	Electrical installer/ electric motor tech- nician
	The water to be pumped is very dirty (muddy)	Check the supply pool for contamination and clean it if necessary. Next, clean the filter strainer (\$ Chapter ,, 8.3.2 Checking the filter strainer and cleaning if necessary" on page 111) and flush the filter casing (\$ Chapter ,, 7.6.1 Emptying and flushing the pump" on page 98).	General maintenance and repair worker

Faults in the block motor

Description of the fault	Cause	Remedy	Personnel
The block motor is not running	Power failure / the mains voltage has been interrupted	If necessary, restore the power supply to the fuse box	Electrical installer/ electric motor tech- nician General maintenance and repair worker
	There is a short circuit between connecting wires in the terminal box	Check the electrical connections in the terminal box (\$ Chapter ,, 8.3.6 Checking the electrical connections in the terminal box" on page 115)	Electrical installer/ electric motor tech- nician
	There is a problem with the local power supply	Check the on site electrical installation	Electrician



Description of the fault	Cause	Remedy	Personnel
The block motor is humming loudly	Motor damage	Repair/replace the block motor	Manufacturer (Baldor Electric Company) Manufacturer (EMOD MOTOREN) Manufacturer (Her- borner Pumpentech- nik)
The block motor is overheated	Overload due to the operating conditions	♦ Chapter "Faults on the pump" on page 124, the pump switches itself off	
	There is a problem with the local power supply	Check the on site electrical installation	Electrician
	Motor damage	Repair/replace the block motor	Manufacturer (Baldor Electric Company) Manufacturer (EMOD MOTOREN) Manufacturer (Her- borner Pumpentech- nik)
	There is a problem with the connecting wires	Check the electrical connections in the terminal box (\$\&\circ\$ Chapter ,, 8.3.6 Checking the electrical connections in the terminal box" on page 115)	Electrical installer/ electric motor tech- nician
The block motor is running unevenly or is vibrating heavily	The block motor is not correctly fixed or aligned	Make sure the fasteners for the block motor are firmly seated (\$\&Chapter\$, 9.3.1 Disassembling and reassembling a pump" on page 132)	Electrical installer/ electric motor tech- nician
	Motor damage	Repair/replace the block motor	Manufacturer (Baldor Electric Company) Manufacturer (EMOD MOTOREN) Manufacturer (Her- borner Pumpentech- nik)
Loud or unusual noises from the block motor	Impeller fan shroud is dirty (herborner.X- N and herborner.X- N-PM only)	Clean the fan hood (\$ Chapter ,, 8.3.3 Cleaning the block motor's casing "on page 113)	General maintenance and repair worker



Description of the fault	Cause	Remedy	Personnel
	The block motor is inadequate or has been excessively greased	Using the maintenance records, check whether there has been an insufficient or, if applicable, excessive amount of greasing. Depending on the result: Grease the herborner.X-N (see the block motor operating manual "Integral Horsepower AC Induction Motors (MN408), Baldor Electric Company", Chapter 3)	General maintenance and repair worker Electrical installer/ electric motor tech- nician Manufacturer (Baldor
		Grease the herborner.X-N-PM while the impeller is rotating (\$\infty\$ Chapter ,, 13.5.3 herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQH 72-102 (Klüber Lubrication) "on page 214)	Electric Company) Manufacturer (EMOD MOTOREN)
		Grease the herborner.X-N-C while the impeller is rotating (\$\infty\$ Chapter ,, 13.5.3 herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQH 72-102 (Klüber Lubrication) "on page 214)	
		Remove the anti-friction bearing, clean it and replace if necessary (\$\&\times\$ Chapter ,,9.3.1 Disassembling and reassembling a pump "on page 132)	
		NOTICE! Anti-friction bearing may be damaged if lubrication is inadequate or excessive.	
	The block motor is not correctly fixed or aligned	Make sure the fasteners for the block motor are firmly seated (\$ Chapter ,, 9.3.1 Disassembling and reassembling a pump "on page 132)	Electrical installer/ electric motor tech- nician
	The anti-friction bearing is dirty or damaged	Remove the anti-friction bearing, clean/replace it (\$\infty\$ Chapter ,, 9.3.1 Disassembling and reassembling a pump "on page 132)	Electrical installer/ electric motor tech- nician Manufacturer (Baldor Electric Company) Manufacturer (EMOD MOTOREN) Manufacturer (Her- borner Pumpentech- nik)



9.3 Jobs to fix faults

9.3.1 Disassembling and reassembling a pump

Strong magnetic fields

AWARNING

Risk of death from strong magnetic fields!

- Persons with pacemakers or implants made from metal must not stand within the vicinity of the block motor.
- Keep magnetic materials or those containing iron away from the block motor. Such materials may be attracted and cause injuries to persons.
- Remove any metallic items (jewelry, watches, pens, etc.) prior to any disassembly work.
- Keep electronic devices, data storage devices or credit cards, etc. away from the block motor. These may be damaged.

During operation, the block motor may build up a strong electromagnetic field. Strong magnetic fields may cause serious or even fatal injuries as well as considerable damage to equipment.

Heavy weight

AWARNING

Risk of injury from heavy components!

- Wear personal protective equipment during all disassembly and installation work.
- Put removed components in a safe place where they cannot fall down.
- Handle the components carefully and give them suitable support if necessary.

Individual parts like the block motor and pump casing are very heavy. Disassembled components can fall and cause injuries or damage.



Sharp edges

ACAUTION

There is a danger of injury from sharp edges!

- Be careful when working near sharp edges.
- Wear safety gloves during all disassembly and installation work.

The block motor and the pump's impeller have sharp edges. Sharp edges can cause abrasions and cuts on the skin.

9.3.1.1 Disassembly

Personnel: Crane and tower operator

Electrical installer/electric motor technician

■ General maintenance and repair

worker

Personal protective

equipment:

Safety helmet

Safety clothing

Safety gloves

Safety shoes

> Socket wrench with a set of deep sockets

sockets

If components have to be replaced (seals, impeller, etc.), the pump will have to be removed and disassembled as follows:



The complete disassembly of the pump is described in the following. Depending upon which component is to be replaced, the disassembly can of course be stopped as soon as the component concerned has been removed.

 ADANGER! Risk of death from electric shock and risk of injury due to the pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).



WARNING! Risk of injury from hot surfaces and hot water!

Allow the motor to cool down.

AWARNING! Risk of death from strong magnetic fields!

When disassembling the block motor on the herborner.X-N-PM, refer to the operating manual "Operating Instructions for three-phase-motors with permanent magnets (12.13), EMOD MOTOREN," Chapter 4.3.

4. NOTICE! There is a danger of flooding from leaking water!

Make sure that all of the gate valves are closed

- **5.** Drain the pump (♥ *Chapter* ,, 7.6.1 *Emptying and flushing the pump* " *on page 98*).
- **6.** If a variable frequency drive is used, disconnect the mains connection cables from the variable frequency drive (see the variable frequency drive manual).
 - If no variable frequency drive is used, unscrew the cover of the motor's (Fig. 57/1) terminal box, remove it and disconnect the installation site's connection cables.
- **7.** Undo the flange connections to the pipes both on the suction and pressure sides.
- **8.** Undo the pump's foundation bolts.



Fig. 57 Block motor terminal box (example: herborner.X-N)





Fig. 58 Lifting points on the pump (example: herborner.X-N)

9. A WARNING! There is a danger of injury from falling or toppling packages!

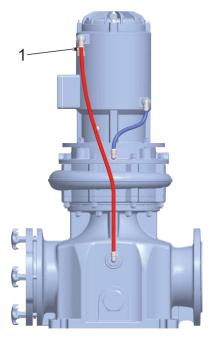
Attach the ropes, belts or multiple slings according to (Fig. 58) and fasten to the crane's hook.

- Depending on the version of the pump, its center of gravity will be towards the block motor. Attach the lifting gear accordingly (if necessary using a traverse), so that the crane hook can be attached over the center of gravity.
 - **10.** Transport the pump to the disassembly location (\$ Chapter ,, 4.4 Transporting the pump to its installation site" on page 65).
 - 11. **AWARNING!** Risk of injury from unsuitable surface!

Set the pump down vertically on the filter casing on a level surface which is capable of supporting the weight.



Draining the residue from the herborner.X-N-C pump



Materials:

- Container (with a capacity of at least 1/8 gal)
- **1.** Open the ball valve (Fig. 59/1).
 - ⇒ The pump is vented.

Fig. 59 Opening the ball valve

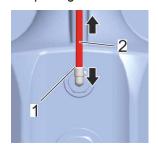


Fig. 60 Removing the return pipe

- 1 Pressure ring
- 2 Return pipe

- 2. Place the container under the return pipe.
- **3.** Press and hold down the (Fig. 60/1) pressure ring.
- **4.** Pull the return pipe (Fig. 60/2) out of the right-angle connector.
 - ⇒ The remaining water contained in the pipes is drained off.
- **5.** Release the pressure ring (Fig. 60/1) again.
- **6.** Wait until all of the water has run out. Then empty the container.



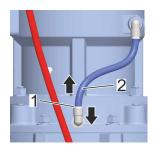


Fig. 61 Removing the cooling water pipe

- 1 Pressure ring
- 2 Cooling water pipe

- 7. Press and hold down the (Fig. 61/1) pressure ring.
- **8.** Pull the cooling water pipe out of the right-angle connector.
- **9.** Release the pressure ring (Fig. 61/1) again.
 - ⇒ The pump can be disassembled.

Disassembly of the standard version

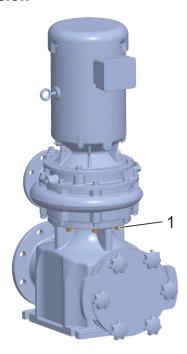
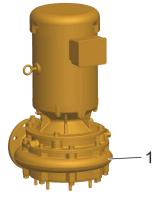
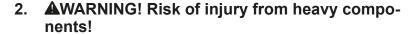


Fig. 62 Nuts for fastening the pump hydraulics with block motor (example: herborner.X-N)

1. Remove the nuts of the pump hydraulics with block motor (Fig. 62/1) on all sides and place them to one side for later assembly along with the washers.







Carefully lift the pump hydraulics with block motor (Fig. 63/1) off the filter casing.

3. Remove the gasket (Fig. 63/2) and place to one side for later assembly.

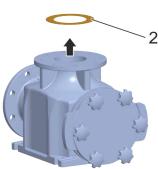


Fig. 63 Removing the pump hydraulics with block motor from the filter casing (example: herborner.X-N)

- Pump hydraulics with block motor
- 2 Gasket



If the gasket has visible damage (cracks, pores), it will need to be replaced.

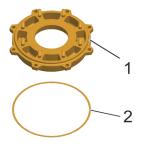
4. **AWARNING!** There is a danger of injury if the floor is unsuitable!

Set the pump down vertically on a level surface which is capable of supporting the weight, on the block motor (Fig. 64) and secure to prevent it from falling over.

5. Remove the nuts for fastening the casing cover (Fig. 64/1) on all sides and place them to one side for later assembly along with the washers.

Fig. 64 Nuts for fastening the casing cover (example: herborner.X-N)







6. **AWARNING!** Risk of injury from heavy components!

Remove the casing cover (Fig. 65/1).

7. Remove the gasket (Fig. 65/2) and place to one side for later assembly.

Fig. 65 Removing the casing cover (example: herborner.X-N)

- 1 Casing cover
- 2 Gasket

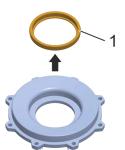
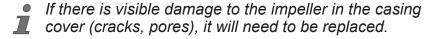


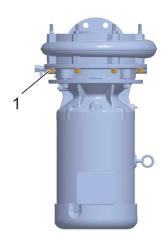
Fig. 66 Removing the impeller protector

If the gasket has visible damage (cracks, pores), it will need to be replaced.

8. Remove the impeller protector (Fig. 66/1) and place it to one side for later assembly.





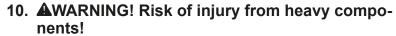


9. Remove the nuts for fastening the pump casing (Fig. 67/1) on all sides and place them to one side for later assembly along with the washers.

Fig. 67 Nuts for fastening the pump casing (example: herborner.X-N)



For correct assembly of the pump casing, make markings that do not damage the casing (e.g., chalk marks) on the pump casing and on the intermediate casing.



Carefully lift off the released pump casing from the intermediate casing (Fig. 68/1).

11. Remove the gasket and place to one side for later assembly.





Fig. 68 Removing the pump casing (example: herborner.X-N)

- 1 Pump casing
- 2 Gasket



If the gasket has visible damage (cracks, pores), it will need to be replaced.





12. A CAUTION! Risk of injury from impeller!

Remove the nut of the impeller (Fig. 69/1). Hold the impeller with a gloved hand when doing so.

Fig. 69 Nut for fastening the impeller (example: herborner.X-N)

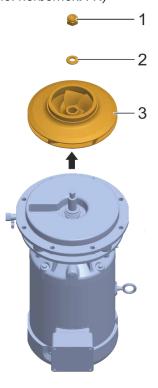


Fig. 70 Removing the impeller (example: herborner.X-N)

- 1 Nut for fastening
- 2 Washer
- 3 Impeller

- **13.** Remove the nut for fastening the impeller and the washer (Fig. 70/2) and place them to one side for later assembly.
- **14.** Remove the impeller (Fig. 70/3).





15. Remove the key (Fig. 71/1) from the motor shaft and put to one side for later assembly.

Fig. 71 Key in the motor shaft (example: herborner.X-N)

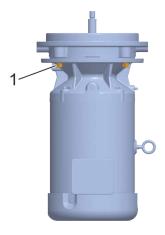
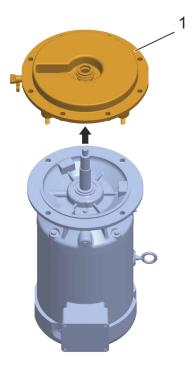


Fig. 72 Nuts for fastening the intermediate casing (example: herborner.X-N)

16. Remove the nuts for fastening the intermediate casing (Fig. 72/1) on all sides and place them to one side for later assembly along with the washers.

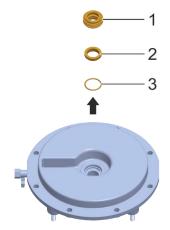




17. **AWARNING!** Risk of injury from heavy components!

Carefully lift off the loosened intermediate casing (Fig. 73/1).

Fig. 73 Removing the intermediate casing (example: herborner.X-N)



sion surfaces with tools!

18. NOTICE! There is a danger of damage to the preci-

Manually push the sliding ring with spring (Fig. 74/1), the counter ring (Fig. 74/2) and the O-ring (Fig. 74/3) out of the intermediate casing. Do not use any tools.

⇒ The pump is now completely disassembled.

Fig. 74 Removing the mechanical seal (example: herborner.X-N)

- 1 Sealing ring with spring
- 2 Counter ring
- 3 O-ring



The sliding ring with spring, the counter ring and the O-ring should be replaced with a new ones after removal regardless of their condition to avoid leaks and unnecessary work later on.



Disassembling the version with Seal Guard system

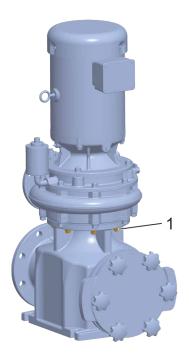


Fig. 75 Nuts for fastening the pump hydraulics with block motor (example: herborner.X-N)

Materials: Container (with a capacity of at least 3 gal)

1. Remove the nuts of the pump hydraulics with block motor (Fig. 75/1) on all sides and place them to one side for later assembly along with the washers.



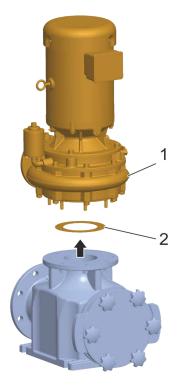
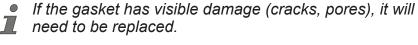
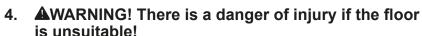


Fig. 76 Removing the pump hydraulics with block motor from the filter casing (example: herborner.X-N)

- Pump hydraulics with block motor
- 2 Gasket





▲WARNING! Risk of injury from heavy compo-

Carefully lift the pump hydraulics with block motor (Fig.

Remove the gasket (Fig. 76/2) and place to one side

nents!

76/1) off the filter casing.

for later assembly.

Set the pump down vertically on a level surface which is capable of supporting the weight, on the block motor (Fig. 77) and secure to prevent it from falling over.

5. Remove the nuts for fastening the casing cover (Fig. 77/1) on all sides and place them to one side for later assembly along with the washers.



Fig. 77 Nuts for fastening the casing cover (example: herborner.X-N)

HERBORNER.X-N . 145





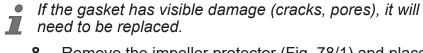
6. **AWARNING!** Risk of injury from heavy components!

Remove the casing cover (Fig. 78/1).

7. Remove the gasket (Fig. 78/2) and place to one side for later assembly.

Fig. 78 Removing the casing cover (example: herborner.X-N)

- 1 Casing cover
- 2 Gasket





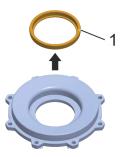
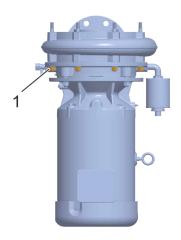


Fig. 79 Removing the impeller protector

 If there is visible damage to the impeller in the casing cover (cracks, pores), it will need to be replaced.



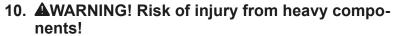


9. Remove the nuts for fastening the pump casing (Fig. 80/1) on all sides and place them to one side for later assembly along with the washers.

Fig. 80 Nuts for fastening the pump casing (example: herborner.X-N)



For correct assembly of the pump casing, make markings that do not damage the casing (e.g., chalk marks) on the pump casing and on the intermediate casing.



Carefully lift off the released pump casing (Fig. 81/1) from the intermediate casing.

11. Remove the gasket (Fig. 81/2) and place to one side for later assembly.

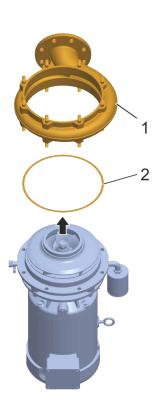


Fig. 81 Removing the pump casing (example: herborner.X-N)

- 1 Pump casing
- 2 Gasket



If the gasket has visible damage (cracks, pores), it will need to be replaced.



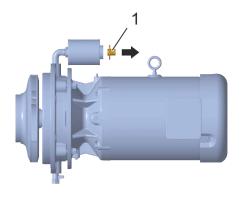


Fig. 82 Cap of the Seal Guard system compensation tank (example: herborner.X-N)

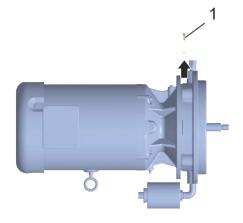


Fig. 83 Seal cover screw (example: herborner.X-N)

12. **AWARNING!** Risk of injury from heavy components!

Lay the rest of the disassembled pump down horizontally.

- **13.** Place the container under the Seal Guard system compensation tank.
- **14.** Remove the cap of the Seal Guard system compensation tank (Fig. 82/1) and place it to one side for later assembly.

15. **AWARNING!** Risk of injury from heavy components!

Turn the rest of the disassembled pump so that the Seal Guard system compensation tank is at the bottom (Fig. 83).

- **16.** Remove the screw in the seal cover (Fig. 83/1) and place to one side together with the sealing disk for later assembly.
 - ⇒ The oil in the intermediate casing drains off.
- The sealing disk should be replaced with a new one after being removed regardless of its condition to avoid leaks and unnecessary work later on.
 - **17.** Wait until all of the oil has run out. Then empty the container.





18. **AWARNING!** Risk of injury from unsuitable surface!

Stand the rest of the disassembled pump upright again on the block motor on a level surface which is capable of supporting the weight and secure against falling over.

19. ▲ CAUTION! Risk of injury from impeller!

Remove the nut of the impeller (Fig. 84/1). Hold the impeller with a gloved hand when doing so.

Fig. 84 Nut for fastening the impeller (example: herborner.X-N)

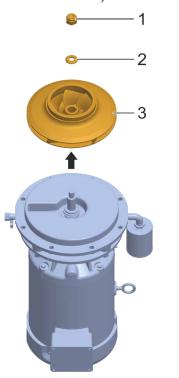


Fig. 85 Removing the impeller (example: herborner.X-N)

- 1 Nut for fastening
- 2 Washer
- 3 Impeller

- **20.** Remove the nut for fastening the impeller and the washer (Fig. 85/2) and place them to one side for later assembly.
- **21.** Remove the impeller (Fig. 85/3).





22. Remove the key (Fig. 86/1) from the motor shaft and put to one side for later assembly.

Fig. 86 Key in the motor shaft (example: herborner.X-N)

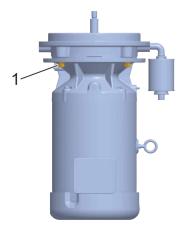


Fig. 87 Nuts for fastening the intermediate casing (example: herborner.X-N)

23. Remove the nuts for fastening the intermediate casing (Fig. 87/1) on all sides and place them to one side for later assembly along with the washers.





24. AWARNING! Risk of injury from heavy components!

Carefully lift off the loosened intermediate casing (Fig. 88/1).

Fig. 88 Removing the intermediate casing (example: herborner.X-N)

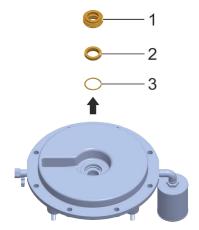


Fig. 89 Removing the mechanical seal (example: herborner.X-N)

- 1 Sealing ring with spring
- 2 Counter ring
- 3 O-ring



Manually push the sliding ring with spring (Fig. 89/1), the counter ring (Fig. 89/2) and the O-ring (Fig. 89/3) out of the intermediate casing. Do not use any tools.



The sliding ring with spring, the counter ring and the O-ring should be replaced with a new ones after removal regardless of their condition to avoid leaks and unnecessary work later on.





Fig. 90 Removing the O-ring (example: herborner.X-N)

26. Remove the O-ring (Fig. 90/1) and place it to one side for later assembly.



If the o-ring has visible damage (cracks, pores), it will need to be replaced.

27. Remove the mechanical seal locking screw (Fig. 91/1) and place it do one side for later assembly.



Fig. 91 Mechanical seal locking screw (example: herborner.X-N)



Fig. 92 Removing the sliding ring (example: herborner.X-N)

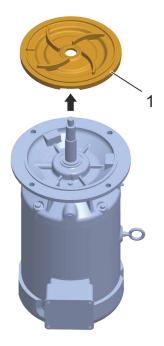


Remove the sliding ring (Fig. 92/1) manually from the seal cover. Do not use any tools.



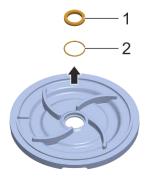
The sliding ring should be replaced with a new one when removed regardless of its condition to avoid leaks and unnecessary work later on.





29. Remove the seal cover (Fig. 93/1).

Fig. 93 Removing the seal cover (example: herborner.X-N)



30. NOTICE! There is a danger of damage to the precision surfaces with tools!

Manually push the counter ring (Fig. 94/1) and the Oring (Fig. 95/2) out of the seal cover. Do not use any tools.

⇒ The pump is now completely disassembled.

Fig. 94 Removing the stationary ring and o-ring

- 1 Counter ring
- 2 O-ring



When removing the counter ring and the o-ring, whatever their state, they should be replaced with a new one, to avoid leaks and unnecessary work later on.



9.3.1.2 Assembly

Personnel: ■ Electrical installer/electric motor

technician

General maintenance and repair

worker

Personal protective

equipment:

Safety clothing

Safety gloves

Safety shoes

Special tool: Crane and lifting gear

Socket wrench with a set of deep

sockets

Torque wrench

Assembly tool

Cellulose cloths

Materials: Ethyl alcohol

NOTICE

There is a danger of damage caused by incorrectly tightened screw connections!

- Tighten all bolts with a torque wrench to the required torques (\$ Chapter ,,13.10 Torque values" on page 228).

Screws tightened to the improper torque can result in damage to the pump and to leaks. Leaks can cause considerable damage.

If the pump had to be disassembled to remove parts, then it must be assembled as follows.



 Depending on how far the pump was disassembled, the assembly can start with a later step.

1. A WARNING! Risk of death from strong magnetic fields!

When assembling the block motor on the herborner.X-N-PM, refer to the operating manual for three-phase motors with permanent magnets, Chapter 4.3.



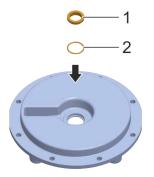
Assembling the standard version



1. A WARNING! Risk of injury from heavy components!

Place the block motor upright on the fan hood.

Fig. 95 Placing the block motor on end (example: herborner.X-N)



2. NOTICE! Risk of damage to counter ring and Oring!

Fit the o-ring (Fig. 96/1) on the counter ring (Fig. 96/2) and then manually press them together into the intermediate casing. Carefully slide both rings downwards evenly. Keep horizontal and do not use force to push down.

Fig. 96 Inserting the O-ring and counter ring in the intermediate casing (example: herborner.X-N)

- 1 O-ring
- 2 Counter ring



To make assembly easier, the o-ring and the counter ring can be lubricated with water containing some dishwashing liquid before pressing them on. Do not use oil or grease.



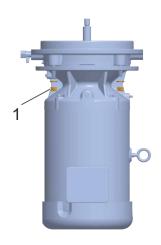


Fig. 97 Fitting the intermediate casing (example: herborner.X-N)

- 1 Intermediate casing
- 2 Fixing nuts with washers



Fig. 98 Pushing the sliding ring with the spring into position (example: herborner.X-N)

3. A WARNING! Risk of injury from heavy components!

NOTICE! There is a danger of damaging the counter ring!

Put the pump casing the right way around with its studs onto the intermediate casing (Fig. 97/1) and fasten it firmly in place with the nuts and washers (Fig. 97/2). Be careful when setting it down and make sure that the counter ring is not damaged by the shaft.

4. *NOTICE!* There is a danger of damaging the sealing ring with the its spring!

Use ethyl alcohol and cellulose cloths to degrease the motor shaft and slide the sealing ring with its spring (Fig. 98/1) onto the motor shaft by twisting it up until the counter ring. Do not use force.



- To make assembly easier, the sealing ring with its spring can be lubricated with water containing some dishwashing liquid before pressing them on. Do not use oil or grease.
- It is difficult to push the sealing ring with its spring onto the motor shaft. Use the Herborner Pumpentechnik assembly tool if necessary.
 - ⇒ The sealing ring with its spring must be pushed up to the counter ring. The spring can then be tensioned by installing the impeller.





5. Fit the key (Fig. 99/1) into the slot on the motor shaft and press it fully down.

Fig. 99 Inserting the key (example: herborner.X-N)



6. Push the impeller (Fig. 100/1) onto the motor shaft.

Fig. 100 Impeller pushed on (example: herborner.X-N)



Fig. 101 Inserting the washer (example: herborner.X-N)

7. Insert the (Fig. 101/1) washer.





8. **A** CAUTION! Risk of injury from impeller!

Tighten the impeller securely with its nut (Fig. 102/1). Hold the impeller with a gloved hand when doing so.

Fig. 102 Nut for fastening the impeller (example: herborner.X-N)

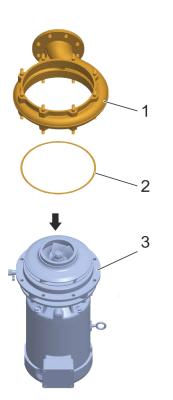


Fig. 103 Installing the pump casing (example: herborner.X-N)

- 1 Pump casing
- 2 Gasket
- 3 Intermediate casing

Use a new nut to avoid malfunctions.

- **9.** Place the seal (Fig. 103/2) on the intermediate casing (Fig. 103/3).
- 10. A WARNING! Risk of injury from heavy components!

Place the pump casing (Fig. 103/1) onto the intermediate casing with the studs so it fits the previously applied markings.





11. Tighten the nuts for fastening the pump casing together with the washers (Fig. 104/1).

Fig. 104 Tightening the nuts for fastening the pump casing (example: herborner.X-N)

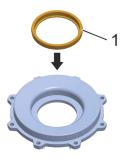


Fig. 105 Inserting the impeller protector

12. Insert the impeller protector (Fig. 105/1) with the chamfer pointing to the front into the casing cover.



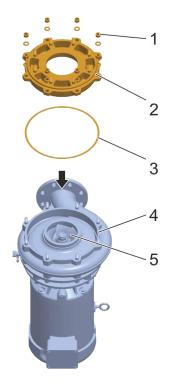


Fig. 106 Installing the casing cover (example: herborner.X-N)

- 1 Fixing nuts with washers
- 2 Casing cover
- 3 Gasket
- 4 Pump casing
- 5 Impeller

13. Place the gasket (Fig. 106/3) on the pump casing (Fig. 106/4).

14. A WARNING! Risk of injury from heavy components!

Put the casing cover (Fig. 106/2) the right way around with its studs onto the pump casing (Fig. 106/4) and tighten it with the nuts and washers (Fig. 106/1).

15. ▲ CAUTION! Risk of injury from impeller!

While wearing safety gloves, reach into the casing cover (Fig. 106/2) in the direction of the block motor and touch the impeller (Fig. 106/5).

- **16.** Check whether or not the impeller can be moved easily.
 - ⇒ If the impeller cannot be turned easily, the fastening nuts (Fig. 106/1) will have to be loosened again and then retightened.



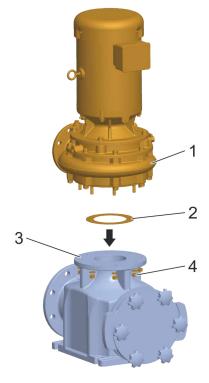


Fig. 107 Installing the pump hydraulics with block motor on the filter casing (example: herborner.X-N)

- 1 Casing cover
- 2 Gasket
- 3 Filter casing
- 4 Fixing nuts with washers

- **17.** Place the gasket (Fig. 107/2) on the filter casing (Fig. 107/3).

Put the pump hydraulics with block motor (Fig. 107/1) the right way around with its studs onto the filter casing (Fig. 107/2) and tighten it with the nuts and washers (Fig. 107/4).

- \Rightarrow The pump is mounted.
- **19.** Transport the pump to the installation site (♥ Chapter ,, 4.4 Transporting the pump to its installation site" on page 65), reinstall (♥ Chapter ,, 5.3 Installing and aligning" on page 69) and properly put it into operation (♥ Chapter ,, 6 Installation and putting into operation for the first time" on page 81).



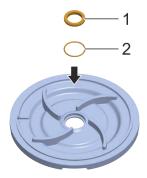
Assembling the version with Seal Guard system



1. A WARNING! Risk of injury from heavy components!

Place the block motor upright on the fan hood.

Fig. 108 Placing the block motor on end (example: herborner.X-N)



Fit the O-ring (Fig. 109/1) on the counter ring (Fig.

2. NOTICE! Risk of damage to counter ring and O-

109/2) and then manually press them together into the seal cover. Carefully slide both rings downwards evenly. Keep horizontal and do not use force to push down.

Fig. 109 Fitting the o-ring and the counter ring

- 1 O-ring
- Counter ring



ring!

To make assembly easier, the o-ring and the counter ring can be lubricated with water containing some dishwashing liquid before pressing them on. Do not use oil or grease.



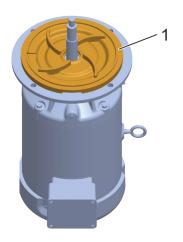


Fig. 110 Attaching the seal cover (example: herborner.X-N)



Fig. 111 Pushing the sliding ring into position (example: herborner.X-N)

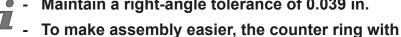
3. NOTICE! There is a danger of damaging the counter ring!

Place the seal cover (Fig. 110/1) on the block motor centering. Be careful when setting it down and make sure that the counter ring is not damaged by the shaft.

4. NOTICE! Risk of damage to the sliding ring!

Use ethyl alcohol and cellulose cloths to degrease the motor shaft and slide the sealing ring with its sliding ring (Fig. 111/1) onto the motor shaft by turning it up until the counter ring. When doing this both pins have to be located in center position on the sliding ring. Do not use force.





- its spring can be lubricated with water containing some dishwashing liquid before pressing them on. Do not use oil or grease.
- It is difficult to push the sliding ring onto the motor shaft. Use the Herborner Pumpentechnik assembly tool if necessary.





5. Tighten the locking screws of the mechanical seal (Fig. 112/1) evenly.

Fig. 112 Tightening the mechanical seal locking screws (example: herborner.X-N)

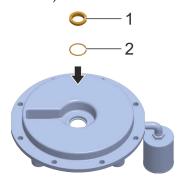


Fig. 113 Inserting the O-ring and counter ring in the intermediate casing (example: herborner.X-N)

- 1 O-ring
- 2 Counter ring



Fit the o-ring (Fig. 113/1) on the counter ring (Fig. 113/2) and then manually press them together into the intermediate casing. Carefully slide both rings downwards evenly. Keep horizontal and do not use force to push down.

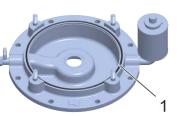


Fig. 114 Inserting the O-ring (example: herborner.X-N)

To make assembly easier, the o-ring and the counter ring can be lubricated with water containing some dishwashing liquid before pressing them on. Do not use oil or grease.

7. Put the O-ring (Fig. 114/1) into the depression in the intermediate casing.



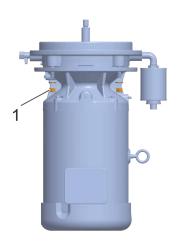


Fig. 115 Fitting the intermediate casing (example: herborner.X-N)

- 1 Intermediate casing
- 2 Fixing nuts with washers



Fig. 116 Pushing the sliding ring with the spring into position (example: herborner.X-N)

NOTICE! There is a danger of damaging the counter ring!

Put the pump casing the right way around with its studs onto the intermediate casing (Fig. 115/1) and fasten it firmly in place with the nuts and washers (Fig. 115/2). Be careful when setting it down and make sure that the counter ring is not damaged by the shaft.

9. *NOTICE!* There is a danger of damaging the sealing ring with the its spring!

Use ethyl alcohol and cellulose cloths to degrease the motor shaft and slide the sealing ring with its spring (Fig. 116/1) onto the motor shaft by twisting it up until the counter ring. Do not use force.



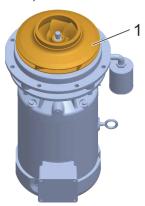
- To make assembly easier, the sealing ring with its spring can be lubricated with water containing some dishwashing liquid before pressing them on. Do not use oil or grease.
- It is difficult to push the sealing ring with its spring onto the motor shaft. Use the Herborner Pumpentechnik assembly tool if necessary.
 - ⇒ The sealing ring with its spring must be pushed up to the counter ring. The spring can then be tensioned by installing the impeller.



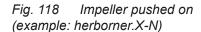


10. Fit the key (Fig. 117/1) into the slot on the motor shaft and press it fully down.

Fig. 117 Inserting the key (example: herborner.X-N)



11. Push the impeller (Fig. 118/1) onto the motor shaft.





12. Insert the (Fig. 119/1) washer.

Fig. 119 Inserting the washer (example: herborner.X-N)





Fig. 120 Nut for fastening the impeller (example: herborner.X-N)

13. A CAUTION! Risk of injury from impeller!

Tighten the impeller securely with its nut (Fig. 120/1). Hold the impeller with a gloved hand when doing so.

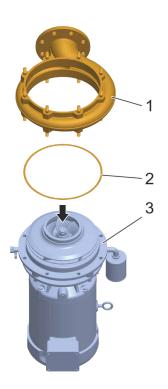


Fig. 121 Installing the pump casing (example: herborner.X-N)

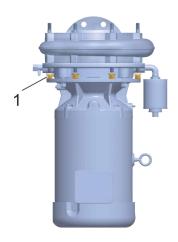
- 1 Pump casing
- 2 Gasket
- 3 Intermediate casing

Use a new nut to avoid malfunctions.

- **14.** Place the seal (Fig. 121/2) on the intermediate casing (Fig. 121/3).
- 15. ▲ WARNING! Risk of injury from heavy components!

Place the pump casing onto the intermediate casing with the studs so it fits the previously applied markings.





16. Tighten the nuts for fastening the pump casing together with the washers (Fig. 122/1).

Fig. 122 Tightening the nuts for fastening the pump casing (example: herborner.X-N)

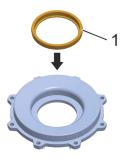


Fig. 123 Inserting the impeller protector

17. Insert the impeller protector (Fig. 123/1) with the chamfer pointing to the front into the casing cover.



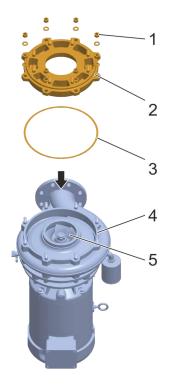


Fig. 124 Installing the casing cover (example: herborner.X-N)

- 1 Fixing nuts with washers
- 2 Casing cover
- 3 Gasket
- 4 Pump casing
- 5 Impeller

- **18.** Place the gasket (Fig. 124/3) on the pump casing (Fig. 124/4).

Put the casing cover (Fig. 124/2) the right way around with its studs onto the pump casing (Fig. 124/4) and tighten it with the nuts and washers (Fig. 124/1).

20. ▲ CAUTION! Risk of injury from impeller!

While wearing safety gloves, reach into the casing cover (Fig. 124/2) in the direction of the block motor and touch the impeller (Fig. 124/5).

- **21.** Check whether or not the impeller can be moved easily.
 - ⇒ If the impeller cannot be turned easily, the fastening nuts (Fig. 124/1) will have to be loosened again and then retightened.



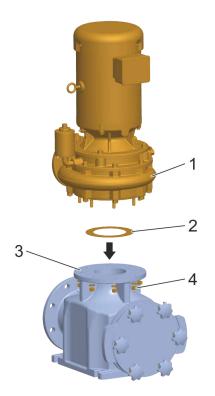


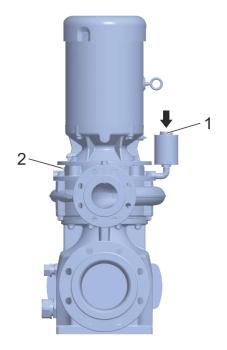
Fig. 125 Installing the pump hydraulics with block motor on the filter casing (example: herborner.X-N)

- 1 Casing cover
- 2 Gasket
- 3 Filter casing
- 4 Fixing nuts with washers

- **22.** Place the gasket (Fig. 125/2) on the filter casing (Fig. 125/3).
- 23. A WARNING! Risk of injury from heavy components!

Put the pump hydraulics with block motor (Fig. 125/1) the right way around with its studs onto the filter casing (Fig. 125/2) and tighten it with the nuts and washers (Fig. 125/4).

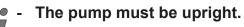




24. Add oil into the opening of the Seal Guard system compensation tank (Fig. 126/1) until the oil comes out from the opening of the screw (Fig. 126/2).

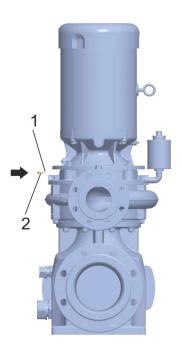
Fig. 126 Adding oil (example: herborner.X-N)

- Seal Guard system compensation tank
- 2 Screw



- Use the lubricant Mobil SHC Cibus 46 with NSF H1 approval.
- Do not mix different types of oil together.



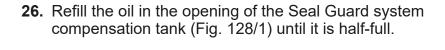


25. Insert the sealing disk (Fig. 127/1) and tighten using the screw (Fig. 127/2).

Fig. 127 Tightening the screw (example: herborner.X-N)

- 1 Sealing disk
- 2 Screw

Use a new sealing disk to avoid malfunctions.



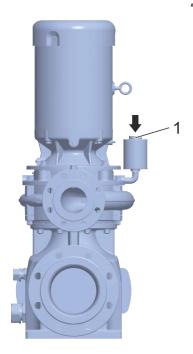


Fig. 128 Refilling the oil (example: herborner.X-N)



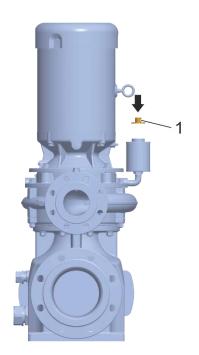


Fig. 129 Tightening the cap of the Seal Guard system compensation tank (example: herborner.X-N)

The pump must be upright.

- Use the lubricant Mobil SHC Cibus 46 with NSF H1 approval. (Chapter "13.5.1 Lubrication oil in intermediate casing on the version with Seal Guard system" on page 210).
- Do not mix different types of oil together.
- **27.** Tighten the cap of the Seal Guard system compensation tank (Fig. 129/1).
 - ⇒ The pump is mounted.
- **28.** Transport the pump to the installation site (♥ Chapter,,4.4 Transporting the pump to its installation site" on page 65), reinstall (♥ Chapter,,5.3 Installing and aligning" on page 69) and properly put it into operation (♥ Chapter,,6 Installation and putting into operation for the first time" on page 81).

Installing the pipes of the herborner.X-N-C pump

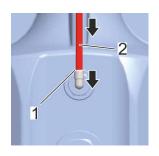
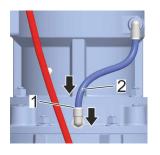


Fig. 130 Fastening the return pipe

- 1 Pressure ring
- 2 Return pipe

- 1. Press and hold down the (Fig. 130/1) pressure ring.
- 2. Push the return pipe (Fig. 130/2) into the right-angle connector.
- 3. Release the pressure ring (Fig. 130/1) again.



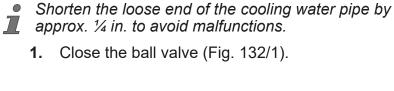


Shorten the loose end of the return pipe by approx. ¼ in. to avoid malfunctions.

- **1.** Press and hold down the (Fig. 131/1) pressure ring.
- **2.** Push the cooling water pipe (Fig. 131/2) into the right angle connector.
- 3. Release the pressure ring (Fig. 131/1) again.
 - ⇒ The pipelines are fitted.

Fig. 131 Fastening the cooling water pipe

- 1 Pressure ring
- 2 Cooling water pipe



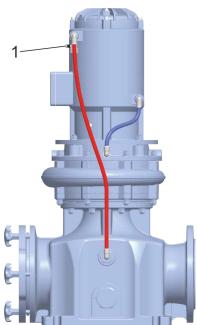


Fig. 132 Closing the ball valve



9.3.2 Checking the impeller and tightening

Personnel: General maintenance and repair

worker

Personal protective

equipment:

Safety clothing

Safety gloves

Safety shoes

Special tool: ■ Socket wrench with a set of deep

sockets

Check the state and firm seating of the impeller as follows.

MARNING! Risk of injury due to pump starting unexpectedly!

Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).

2. A WARNING! Risk of injury from hot surfaces and hot water!

Allow the motor to cool down.

3. NOTICE! There is a danger of flooding from leaking water!

Make sure that all of the gate valves are closed

4. Drain the pump (♥ *Chapter* ,, 7.6.1 *Emptying and flushing the pump* " *on page 98*).

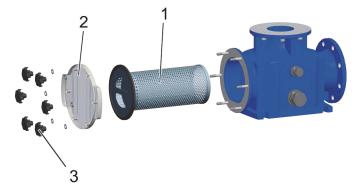


Fig. 133 Filter casing open (example: herborner.X-N)

- 1 Filter strainer
- 2 Filter cover
- 3 Star handles
- **5.** Remove the star handles (Fig. 133/3) and place to one side together with the washers.
- **6.** Lift off the filter cover with both hands.





Fig. 134 Checking the pump impeller (example: herborner.X-N)

- 1 Impeller
- 2 Nut for fastening

- **7.** Remove the filter strainer (Fig. 133/1) by turning slightly.
- 8. **A** CAUTION! There is a danger of injury from the impeller!

Wearing safety gloves, reach into the filter casing in the direction of the block motor and touch the impeller (Fig. 134/1).

- Feel the impeller all round to see if it is worn or deformed
 - ⇒ If its surface is very uneven or is damaged, then the impeller must be removed and replaced (⇔ *Chapter*, 9.3.1 *Disassembling and reassembling a pump* " on page 132).
- **10.** Check whether the impeller can be moved axially.
 - ⇒ If it can be moved, then it has come loose and must be tightened.
- **11.** Tighten the impeller securely with its nut (Fig. 134/1). Hold the impeller with a gloved hand when doing so.
- Observe the screw tightening torque (\$ Chapter ,, 13.10 Torque values" on page 228).
 - **12.** Push the filter strainer with the opening pointing to the front into the filter casing as far as it will go.
 - **13.** Place the filter cover with both hands onto the stud bolts of the filter casing so it fits and hand tighten with star handles and washers in a criss-cross pattern.
- If the impeller loosens again, the nut of the impeller will have to be replaced (\$ Chapter ,, 9.3.1 Disassembling and reassembling a pump" on page 132).

9.4 After a fault has been fixed

Personnel: Electrical installer/electric motor technician

General maintenance and repair worker

- 1. Clean up any water which leaked out.
- 2. Make sure that all of the jobs have been completed and all of the screwed connections which were undone have been properly retightened.



- **3.** Make sure that all of the safety devices have been refitted and are in working order and that there is no danger to personnel.
 - ⇒ The pump can be switched on again. (*⇔ Chapter* ,, 7.3 Switching on/off" on page 97).
- **4.** If the pump does not start, acknowledge the fault
 - \Rightarrow If the fault persists, repeat the error diagnosis.



10 Spare parts

10.1 Ordering spare parts

When ordering spare parts, specify the following:

- Pump designation (\$\times Chapter ,, 13.8 Name plate "on page 224)
- Order no. (\$\times Chapter ,, 13.8 Name plate" on page 224) or Serial Number (S/N) on the motor name plate
- The name of the spare part

10.2 List of spare parts

herborner.X-N/herborner.X-N-PM

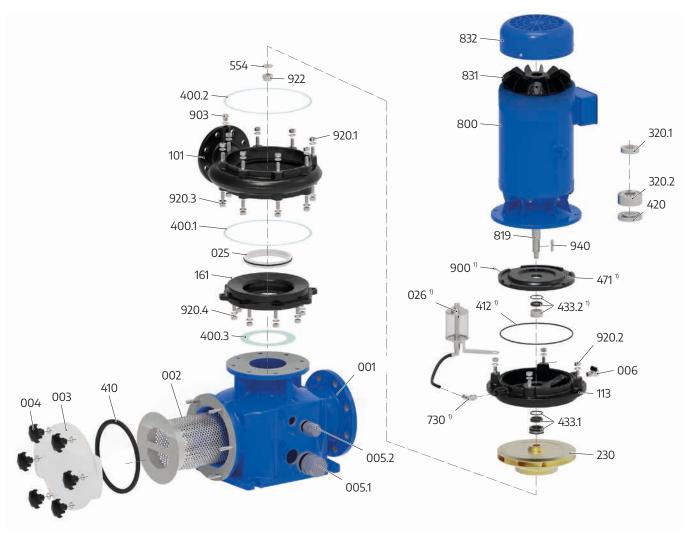


Fig. 135 Spare parts for the herborner.X-N/herborner.X-N-PM pump (example: herborner.X-N)



Order number	Name	Quantity
001	Filter casing	1
002	Filter strainer (contains part 410)	1
003	Filter cover	1
004	Star handle	6 or 8
005.1	Screwed connection	1
005.2	Screwed connection	1
006	Ball valve	1
025	Impeller protector	1
026 1)	Seal Guard system	1
101	Pump casing	1
113	Intermediate casing	1
161	Casing cover	1
230	Impeller	1
320.1	Anti-friction bearing (non drive side)	1
320.2	Anti-friction bearing (drive side)	1
400.1	Gasket	1
400.2	Gasket	1
400.3	Gasket	1
410	Profile sealing	1
412 1)	O-ring	1
420	Shaft seal ring	1
433.1	Mechanical seal	1
433.2 1)	Mechanical seal	1
471 1)	Seal cover	1
554	Washer	1
730 1)	Pipe connection	1
800	Block motor (contains parts 320.1, 320.2, 420, 819, 831, 832, 940)	1
819	Motor shaft	1
831	Fan	1
832	Fan hood	1

¹⁾ Special model/accessories



Order number	Name	Quantity
900 1)	Screw	1
903	Screwed plug	1
920.1	Nut	8-12
920.2	Nut	4
920.3	Nut	8-12
920.4	Nut	8
922	Impeller nut	1
940	Key	1

herborner.X-N-C



Fig. 136 Spare parts for herborner.X-N-C pump

1) Special model/accessories



Order number	Name	Quantity
001	Filter casing	1
002	Filter strainer (contains part 410)	1
003	Filter cover	1
004	Star handle	6 or 8
005.1	Screwed connection	1
005.2	Screwed connection	1
006	Ball valve	1
025	Impeller protector	1
026 1)	Seal Guard system	1
101	Pump casing	1
113	Intermediate casing	1
161	Casing cover	1
230	Impeller	1
320.1	Anti-friction bearing (non drive side)	1
320.2	Anti-friction bearing (drive side)	1
400.1	Gasket	1
400.2	Gasket	1
400.3	Gasket	1
410	Profile sealing	1
412 1)	O-ring	1
420	Shaft seal ring	1
433.1	Mechanical seal	1
433.2 1)	Mechanical seal	1
471 1)	Seal cover	1
554	Washer	1
702	Return pipe	1
704	Cooling water pipe	1
730 1)	Pipe connection	1
800	Block motor (contains parts 320.1, 320.2, 420, 819, 940)	1
819	Motor shaft	1

¹⁾ Special model/accessories



Order number	Name	Quantity
900 1)	Screw	1
903	Screwed plug	1
920.1	Nut	8-12
920.2	Nut	4
920.3	Nut	8-12
920.4	Nut	8
922	Impeller nut	1
940	Key	1

¹⁾ Special model/accessories



11 Special tools, materials

11.1 Special tools

The following special tools are needed for the work described in this operating manual:

Fork lift truck

To transport the packed pump on the pallet.

Hand brush

To remove collections of dust and coarse dirt.

Crane and lifting gear

To transport the unpacked pump.

Assembly tool

To help to fit the mechanical seal onto the motor shaft.

Motor test unit

To test the block motor for faulty windings.

Screwdriver (flat)

For prying out the shaft sealing ring on the motor on the flood-proof version.

Socket wrench with a set of deep sockets

To tighten and loosen hex. bolts in various sizes.

Torque wrench

To tighten screwed connections to a specified torque.

Cellulose cloths

To degrease the motor shaft.



11.2 Materials

The following materials are needed for the work described in the operating manual:

Drain line (optional)

For draining the pump directly into the drain.

Gate valve

To interrupt the pumped flow for maintenance work. A gate valve must be fitted in the pressure pipe after the non-return valve.

When operating in feed mode, a gate valve must also be fitted in the supply pipe.

Container (with a capacity of at least \(\frac{1}{2} \) gal)

For collecting water when draining the herborner.X-N-C.

Container (with a capacity of at least 2 gal)

For collecting water when rinsing and draining the pump.

Container (with a capacity of at least 3 gal)

For collecting oil when disassembling the pump with the Seal Guard system.

Bucket/can

For cleaning the pump with water.

Air bleeding device

To release air trapped in the system of pump and pipes. It must be used in the pressure pipe to avoid long term damage to the pump caused by air pockets.

Ethyl alcohol

To degrease the motor shaft.

Foundation bolts 7/16" or 5/8" with washers

To fix the pump at its installation site.

Compensators (optional)

To reduce the vibrations transmitted from the pump to the piping system and to compensate for mechanical stresses in the pipes.

Compensators should be used in the pressure pipe to avoid long term damage to the pipe system from material fatigue.



Cloths

To remove dirt such as grease and stubborn dirt residues.

Pressure gage (optional)

For reading the pressure on the pump's supply pipe.

Profile sealing

As a replacement in the pump's filter strainer.

Pipes and reducing adapters

To connect the pump with the swimming pool. Pipelines should be at least one size larger than the pump's flange.

Reducing adapters serve to adapt the diameter of the pipes to the pump's flange. They should be installed with the horizontal side at the top.

Non-return valve (optional)

To prevent the water from flowing backwards. The non-return valve thus prevents dangerous pressure surges, which can lead to damage to the system of pump and pipework.

A non-return valve should be used before the gate valve in the pressure pipe to avoid long term damage to the system of pump and pipes.

Vibration dampers

Vibration dampers between the pump and its foundations reduce the vibrations and thus the noise generated by the pump when it is operating.

Vibration dampers should be used to avoid long term damage through material fatigue and to minimize noise levels.

Screw terminals

To connect and bridge the block motor connection cables to the cables from the electrical supply system.

Water hose

For rinsing and cleaning the pump with water

Shaft seal ring

For replacement on the motor with the flood-proof version.



12 Disassembly, disposal

12.1 Warnings for disassembly and disposal

Electrical voltage

ADANGER

Electrical voltage represents a possibly fatal danger!

- Only allow qualified electricians to work on the building's electrical installation.
- Only allow qualified electricians or electrical installers/electric motor technicians to disconnect the pump from the power supply.
- Before doing any work on the pump remove all live voltages from it and secure this state for the duration of the work. During this, conform with the following safety rules:
 - De-energize and secure against being switched on again (\$Chapter, 2.6 Securing the unit to prevent it from being switched on again" on page 28).
 - Check that there are no live voltages present.

On contact with any live parts on the pump's block motor or on the variable frequency drive there is an immediate danger of death from an electric shock.



Improper disassembly

AWARNING

Danger of injury if disassembled incorrectly!

- Before starting work, make sure that there is enough space.
- Handle components with open, sharp edges carefully.
- Keep the working area clean and tidy! Loosely stacked parts & tools are a source of accidents as is leaving them lying around.
- Disassemble components properly. Notice that some of the parts are very heavy. If necessary, use lifting gear.
- Secure parts so that they cannot fall or topple over.
- If in doubt, please contact Herborner Pumpenfabrik.

Angular parts, sharp points and corners on or in the pump or on the tools needed can cause injuries.

12.2 Disassembly

Personnel:

Electrician

■ Electrical installer/electric motor technician

■ Plumber/Pipefitter

Millwright

Crane and tower operator

Personal protective equipment:

Safety helmet

Safety clothing

Safety gloves

Safety shoes

 ADANGER! Risk of death from electric shock and risk of injury due to the pump starting unexpectedly!



Make sure that the pump is switched off and is secured against being switched back on again (\$ Chapter ,, 2.6 Securing the unit to prevent it from being switched on again "on page 28).

WARNING! Risk of injury from hot surfaces and hot water!

Allow the motor to cool down.

3. *NOTICE!* There is a danger of flooding from leaking water!

Make sure that all of the gate valves are closed.

- **4.** Drain the pump (♥ *Chapter* ,, 7.6.1 *Emptying and flushing the pump* " *on page 98*).
- 5. If a variable frequency drive is used, disconnect the mains connection cables from the variable frequency drive (see the variable frequency drive's manual).
 - If no variable frequency drive is used, unscrew the cover of the motor's (Fig. 137/1) terminal box, remove it and disconnect the installation site's connection cables.
- **6.** Undo the flange connections to the pipes both on the suction and pressure sides.
- **7.** Undo the pump's foundation bolts.



Fig. 137 Block motor terminal box (example: herborner.X-N)





Fig. 138 Lifting points on the pump (example: herborner.X-N)

8. A WARNING! There is a danger of injury from falling or toppling packages!

Attach the ropes, belts or multiple slings according to (Fig. 138) and fasten to the crane's hook.

- Depending on the version of the pump, its center of gravity will be towards the block motor. Attach the lifting gear accordingly (if necessary using a traverse), so that the crane hook can be attached over the center of gravity.
 - **9.** Transport the pump to the disassembly location (\$ Chapter ,, 4.4 Transporting the pump to its installation site" on page 65).

10. A CAUTION! There is a danger of injury from sharp edges!

If necessary, completely disassemble the pump (Chapter "9.3.1.1 Disassembly" on page 133), clean the components properly, and then dispose of them according to applicable environmental protection regulations.



12.3 Disposal

If no agreement were made about returning the items or disposing of them, recycle the disassembled parts:

- Treat the metal parts as scrap metal.
- Recycle plastic parts.
- Dispose of the remaining components by material type.

NOTICE

There is a danger to the environment through incorrect disposal!

- Have electrical scrap, electronic components, grease and other substances disposed of by approved specialist companies.
- If in doubt, ask for information about environmentally compatible waste disposal from your local institutions or specialist waste disposal companies.

Dangers to the environment can arise through incorrect disposal.



13 Technical data

13.1 Pump dimensions and weight

herborner.X-N

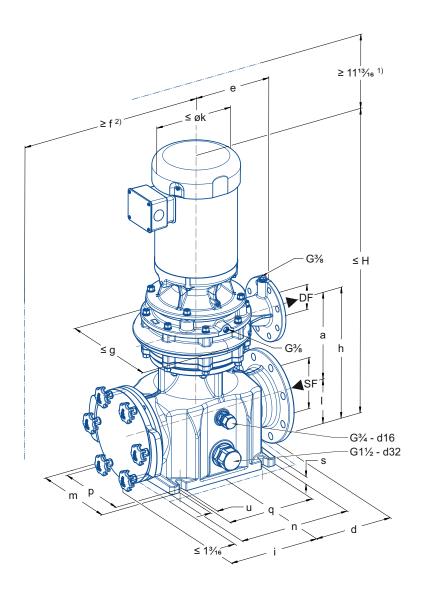


Fig. 139 herborner.X-N pump dimensions

- 1) To remove the motor, ensure sufficient space is available for the lifting device.
- 2) Filter strainer size when completed



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	I	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN040-220A-0204N	2	1.5 (40)	4 (100)	29.19 (742)	9.04 (230)	7.87 (200)	7.87 (200)	26.57 (675)	13.03 (331)	13.76 (350)	10.2 (259)	7.2 (183)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	214
XN040-220A-0304N	3	1.5 (40)	4 (100)	32.65 (830)	9.04 (230)	7.87 (200)	7.87 (200)	26.57 (675)	13.7 (348)	13.76 (350)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	343
XN040-270A-0504N	5	1.5 (40)	4 (100)	34.12 (867)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	13.94 (354)	14.15 (360)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	284
XN040-270A-0754N	7,5	1.5 (40)	4 (100)	35.22 (895)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	16.06 (408)	14.15 (360)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	314
XN040-270A-1004N	10	1.5 (40)	4 (100)	36.88 (937)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	16.06 (408)	14.15 (360)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	340
XN050-190A-0204N	2	2 (50)	4 (100)	30.8 (783)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.03 (331)	15.39 (391)	10.2 (259)	7.2 (183)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	207
XN050-190A-0304N	3	2 (50)	4 (100)	34.27 (871)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.7 (348)	15.39 (391)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	336
XN050-190A-0504N	5	2 (50)	4 (100)	35.21 (895)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.7 (348)	15.39 (391)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	265
XN050-190B-0504N	5	2 (50)	4 (100)	35.21 (895)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.7 (348)	15.39 (391)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	265
XN050-240A-0304N	3	2 (50)	4 (100)	32.56 (827)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	13.7 (348)	13.94 (354)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	342
XN050-240A-0504N	5	2 (50)	4 (100)	33.88 (861)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	13.7 (348)	13.94 (354)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	271
XN050-240A-0754N	7,5	2 (50)	4 (100)	34.98 (889)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	16.06 (408)	13.94 (354)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	300
XN065-200A-0204N	2	2.5 (65)	4 (100)	32.45 (825)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	13.03 (331)	16.35 (416)	10.2 (259)	7.2 (183)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	216
XN065-200A-0304N	3	2.5 (65)	4 (100)	35.91 (913)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	13.7 (348)	16.35 (416)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	345
XN065-200A-0504N	5	2.5 (65)	4 (100)	36.94 (939)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	13.7 (348)	16.35 (416)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	273
XN065-220A-0504N	5	2.5 (65)	4 (100)	33.74 (857)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	13.7 (348)	13.94 (354)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 (17)	269
XN065-220A-0754N	7,5	2.5 (65)	4 (100)	34.84 (885)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	16.06 (408)	13.94 (354)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	299
XN065-240A-0504N	5	2.5 (65)	4 (100)	34.11 (867)	9.33 (237)	7.87 (200)	9.84 (250)	26.57 (675)	14.41 (366)	14.06 (357)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	311
XN065-240A-0754N	7,5	2.5 (65)	4 (100)	35.22 (895)	9.33 (237)	7.87 (200)	9.84 (250)	26.57 (675)	16.06 (408)	14.06 (357)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	340
XN065-270A-0754N	7,5	2.5 (65)	4 (100)	35.22 (895)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	16.06 (408)	14.15 (360)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	329
XN065-270A-1004N	10	2.5 (65)	4 (100)	36.88 (937)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	16.06 (408)	14.15 (360)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	355
XN065-270A-1504N	15	2.5 (65)	4 (100)	40.26 (1023)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	20.08 (510)	14.15 (360)	10.2 (259)	12.95 (329)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	475
XN065-270C-1004N	10	2.5 (65)	4 (100)	37.15 (944)	9.57 (243)	7.87 (200)	9.84 (250)	26.57 (675)	16.06 (408)	14.29 (363)	10.2 (259)	10.28 (261)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	358
XN065-300B-1504N	15	2.5 (65)	4 (100)	40.98 (1041)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	20.08 (510)	14.42 (367)	10.2 (259)	12.95 (329)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	512
XN065-300B-2004N	20	2.5 (65)	4 (100)	45.2 (1148)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	26.22 (666)	14.42 (367)	10.2 (259)	15.31 (389)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 <i>(21)</i>	0.67 <i>(17)</i>	586

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	I	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN065-300B-2504N	25	2.5 (65)	4 (100)	45.16 (1147)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	26.22 (666)	14.42 (367)	10.2 (259)	14.76 (375)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	673
XN080-170A-0204N	2	3 (80)	6 (150)	34.6 (879)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	15.43 (392)	19.13 (486)	12.17 (309)	7.2 (183)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	284
XN080-170A-0304N	3	3 (80)	6 (150)	38.07 (967)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	15.43 (392)	19.13 (486)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	413
XN080-170A-0504N	5	3 (80)	6 (150)	40.15 (1020)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	15.43 (392)	19.13 (486)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	349
XN080-210A-0754N	7,5	3 (80)	6 (150)	40 (1016)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	16.06 (408)	18.88 (480)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	362
XN080-210A-1004N	10	3 (80)	6 (150)	41.65 (1058)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	16.06 (408)	18.88 (480)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	392
XN080-210A-1504N	15	3 (80)	6 (150)	45.03 (1144)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	20.08 (510)	18.88 (480)	12.17 (309)	12.95 (329)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	511
XN080-255A-0504N	5	3 (80)	6 (150)	37.17 (944)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	17.26 (439)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	372
XN080-255A-0754N	7,5	3 (80)	6 (150)	38.27 (972)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	16.06 (408)	17.26 (439)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	402
XN080-255A-1004N	10	3 (80)	6 (150)	39.92 (1014)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	16.06 (408)	17.26 (439)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	429
XN080-330A-2004N	20	3 (80)	6 (150)	48.64 (1236)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	17.46 <i>(444)</i>	12.17 (309)	15.31 (389)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	726
XN080-330A-2504N	25	3 (80)	6 (150)	48.6 (1235)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	17.46 <i>(444)</i>	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	813
XN080-330A-3004N	30	3 (80)	6 (150)	50.76 (1290)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	17.46 <i>(444)</i>	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	800
XN080-330A-4004N	40	3 (80)	6 (150)	50.76 (1290)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	17.46 <i>(444)</i>	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	882
XN100-180A-0504N	5	4 (100)	6 (150)	40.31 (1024)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	19.49 (495)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	384
XN100-180A-0754N	7,5	4 (100)	6 (150)	41.41 (1052)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	16.06 (408)	19.49 (495)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	414
XN100-210A-1004N	10	4 (100)	6 (150)	41.88 (1064)	13.09 (333)	10.24 (260)	11.02 (280)	30.91 (785)	16.06 (408)	19 (483)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	420
XN100-210A-1504N	15	4 (100)	6 (150)	45.27 (1150)	13.09 (333)	10.24 (260)	11.02 (280)	30.91 (785)	20.08 (510)	19 (483)	12.17 (309)	12.95 (329)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	540
XN100-240A-1004N	10	4 (100)	6 (150)	41.74 (1061)	13.13 (334)	10.24 (260)	11.02 (280)	30.91 (785)	16.06 (408)	19.03 (484)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	430
XN100-240A-1504N	15	4 (100)	6 (150)	45.13 (1147)	13.13 (334)	10.24 (260)	11.02 (280)	30.91 (785)	20.08 (510)	19.03 (484)	12.17 (309)	12.95 (329)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	549
XN100-270A-1004N	10	4 (100)	6 (150)	38.69 (983)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	16.06 (408)	16.07 (409)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	462
XN100-270A-1504N	15	4 (100)	6 (150)	42.07 (1069)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	20.08 (510)	16.07 (409)	12.17 (309)	12.95 (329)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	582
XN100-330A-3004N	30	4 (100)	6 (150)	51.54 (1309)	13.37 (340)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	19.27 (490)	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	782
XN100-330A-4004N	40	4 (100)	6 (150)	51.54 (1309)	13.37 (340)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	19.27 (490)	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	863
XN100-330C-2004N	20	4 (100)	6 (150)	47.77 (1214)	11.16 (284)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	17.07 (434)	12.17 (309)	15.31 (389)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	711

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



					а	d	е	≥ f ²⁾	≤g	h	i	k	'	m	n	р	q	S	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN100-330C-2504N	25	4 (100)	6 (150)	47.73 (1213)	11.16 (284)	10.24 (260)	12.4 (315)	30.91 (785)	26.22 (666)	17.07 (434)	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	798
XN125-250A-0504N	5	5 (125)	6 (150)	39.17 (995)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	418
XN125-250A-0754N	7,5	5 (125)	6 (150)	40.28 (1023)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	448
XN125-250A-1004N	10	5 (125)	6 (150)	41.93 (1065)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	10.28 (261)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	473
XN125-250A-1504N	15	5 (125)	6 (150)	45.31 (1151)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	12.95 (329)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	593
XN125-270A-1504N	15	5 (125)	6 (150)	43.71 (1111)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	20.08 (510)	17.34 (441)	12.17 (309)	12.95 (329)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	555
XN125-270A-2004N	20	5 (125)	6 (150)	48.07 (1221)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	26.22 (666)	17.34 (441)	12.17 (309)	15.31 (389)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	634
XN125-270A-2504N	25	5 (125)	6 (150)	48.03 (1220)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	26.22 (666)	17.34 (441)	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	726
XN125-270B-2004N	20	5 (125)	6 (150)	48.69 (1237)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	26.22 (666)	17.66 (449)	12.17 (309)	15.31 (389)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	666
XN125-270B-2504N	25	5 (125)	6 (150)	48.65 (1236)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	26.22 (666)	17.66 (449)	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	754
XN125-270B-3004N	30	5 (125)	6 (150)	49.08 (1247)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	26.22 (666)	17.66 (449)	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	730
XN125-270B-4004N	40	5 (125)	6 (150)	49.08 (1247)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	26.22 (666)	17.66 <i>(449)</i>	12.17 (309)	14.76 (375)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	812
XN125-330A-4004N	40	5 (125)	8 (200)	53.07 (1348)	20.51 (521)	12.2 (310)	13.19 (335)	34.65 (880)	26.22 (666)	27.6 (701)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	949
XN125-330A-5004N	50	5 (125)	8 (200)	54.89 (1395)	20.51 (521)	12.2 (310)	13.19 (335)	34.65 (880)	28.19 (716)	27.6 (701)	13.94 (354)	16.85 (428)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	897
XN150-250A-1004N	10	6 (150)	8 (200)	45.49 (1156)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	21.81 (554)	22.64 (575)	13.94 (354)	10.28 (261)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	562
XN150-250A-1504N	15	6 (150)	8 (200)	48.88 (1242)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	21.81 (554)	22.64 (575)	13.94 (354)	12.95 (329)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	682
XN150-250A-2004N	20	6 (150)	8 (200)	53.47 (1359)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	26.22 (666)	22.64 (575)	13.94 (354)	15.31 (389)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	768
XN150-270B-2504N	25	6 (150)	8 (200)	54.29 (1379)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	26.22 (666)	23.27 (591)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	862
XN150-270B-3004N	30	6 (150)	8 (200)	54.72 (1390)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	26.22 (666)	23.27 (591)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	844
XN150-270B-4004N	40	6 (150)	8 (200)	54.72 (1390)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	26.22 (666)	23.27 (591)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	925
XN150-300A-2504N	25	6 (150)	8 (200)	51.61 (1311)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	26.22 (666)	21 (534)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	892
XN150-300A-3004N	30	6 (150)	8 (200)	49.44 (1256)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	26.22 (666)	21 (534)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	885
XN150-300A-4004N	40	6 (150)	8 (200)	49.44 (1256)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	26.22 (666)	21 (534)	13.94 (354)	14.76 (375)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	967
XN150-400A-6004N	60	6 (150)	8 (200)	62 (1575)	15.19 (386)	12.2 (310)	17.72 (450)	34.65 (880)	36.22 (920)	22.28 (566)	13.94 (354)	19.72 (501)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	1588
XN150-400A-7504N	75	6 (150)	8 (200)	62 (1575)	15.19 (386)	12.2 (310)	17.72 (450)	34.65 (880)	36.22 (920)	22.28 (566)	13.94 (354)	19.72 (501)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	1643

- 1) To remove the motor, ensure sufficient space is available for the lifting device.
- 2) Filter strainer size when completed
- 3) Total weight of the pump



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	1	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN150-400A-10004N	100	6 (150)	8 (200)	65.23 (1657)	15.19 (386)	12.2 (310)	17.72 (450)	34.65 (880)	38.27 (972)	22.28 (566)	13.94 (354)	22.68 (576)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	2132
XN200-250A-1504N	15	8 (200)	10 (250)	53.23 (1352)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.18 (538)	26.42 (671)	15.51 (394)	12.95 (329)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	697
XN200-250A-2004N	20	8 (200)	10 (250)	57.82 (1469)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	26.22 (666)	26.42 (671)	15.51 (394)	15.31 (389)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	764
XN200-250A-2504N	25	8 (200)	10 (250)	57.78 (1468)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	26.22 (666)	26.42 (671)	15.51 (394)	14.76 (375)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	851
XN200-270B-2504N	25	8 (200)	10 (250)	58.2 (1479)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	26.22 (666)	26.08 (663)	15.51 (394)	14.76 (375)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	883
XN200-270B-3004N	30	8 (200)	10 (250)	59 (1499)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	26.22 (666)	26.08 (663)	15.51 (394)	14.76 (375)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	881
XN200-270B-4004N	40	8 (200)	10 (250)	59 (1499)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	26.22 (666)	26.08 (663)	15.51 (394)	14.76 (375)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	962
XN200-350A-5004N	50	8 (200)	10 (250)	59.78 (1519)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	28.19 (716)	24.72 (628)	15.51 (394)	16.85 (428)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	999
XN200-350A-6004N	60	8 (200)	10 (250)	63.08 (1603)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	36.22 (920)	24.72 (628)	15.51 (394)	19.72 (501)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	1505
XN200-350A-7504N	75	8 (200)	10 (250)	63.08 (1603)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	36.22 (920)	24.72 (628)	15.51 (394)	19.72 (501)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	1560
XN200-350A-10004N	100	8 (200)	10 (250)	66.31 (1685)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	38.27 (972)	24.72 (628)	15.51 (394)	22.68 (576)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	2050

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



herborner.X-N-PM

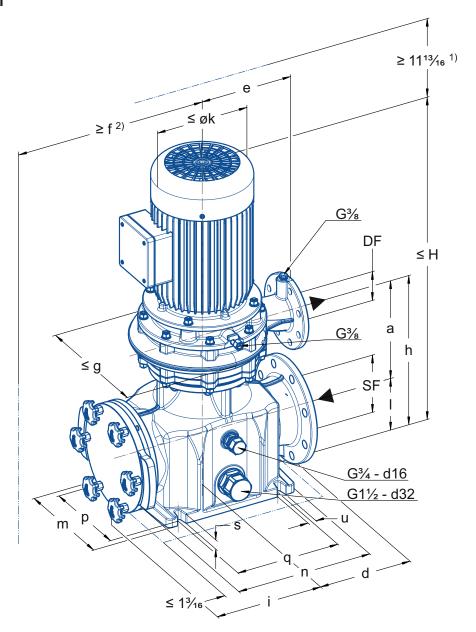


Fig. 140 herborner.X-N-PM pump dimensions

- 1) To remove the motor, ensure sufficient space is available for the lifting device.
- 2) Filter strainer size when completed



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	1	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN025-200A-0104P	1	1 (25)	4 (100)	28.48 (724)	11.14 (283)	7.87 (200)	7.09 (180)	26.57 (675)	13.03 (331)	15.87 (403)	10.2 (259)	6.14 (156)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	161
XN040-160A-0104P	1	1.5 (40)	4 (100)	28.31 (719)	10.89 (277)	7.87 (200)	6.3 (160)	26.57 (675)	13.03 (331)	15.61 (397)	10.2 (259)	6.14 (156)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	161
XN040-220A-0204P	2	1.5 (40)	4 (100)	29.34 (746)	9.04 (230)	7.87 (200)	7.87 (200)	26.57 (675)	13.03 (331)	13.76 (350)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	231
XN040-220A-0304P	3	1.5 (40)	4 (100)	31.31 (796)	9.04 (230)	7.87 (200)	7.87 (200)	26.57 (675)	13.03 (331)	13.76 (350)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	240
XN040-270A-0504P	5	1.5 (40)	4 (100)	30.66 (779)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	13.94 (354)	14.15 (360)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	270
XN040-270A-0754P	7,5	1.5 (40)	4 (100)	32.63 (829)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	13.94 (354)	14.15 (360)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	303
XN040-270B-0504P	5	1.5 (40)	4 (100)	30.66 (779)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	13.94 (354)	14.15 (360)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	270
XN050-190A-0204P	2	2 (50)	4 (100)	30.96 (787)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.03 (331)	15.39 (391)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	225
XN050-190A-0304P	3	2 (50)	4 (100)	32.93 (837)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.03 (331)	15.39 (391)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	233
XN050-190A-0504P	5	2 (50)	4 (100)	31.75 (807)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	13.31 (338)	15.39 (391)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	250
XN050-240A-0304P	3	2 (50)	4 (100)	31.22 (793)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	13.23 (336)	13.94 (354)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	239
XN050-240A-0504P	5	2 (50)	4 (100)	30.41 (773)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	13.31 (338)	13.94 (354)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	256
XN050-240B-0504P	5	2 (50)	4 (100)	30.41 (773)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	13.31 (338)	13.94 (354)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	256
XN065-200A-0204P	2	2.5 (65)	4 (100)	32.61 (829)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	13.03 (331)	16.35 (416)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	234
XN065-200A-0304P	3	2.5 (65)	4 (100)	34.57 (879)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	13.03 (331)	16.35 (416)	10.2 (259)	6.93 (176)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	243
XN065-200A-0504P	5	2.5 (65)	4 (100)	32.93 (837)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	13.31 (338)	16.35 (416)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	258
XN065-220A-0504P	5	2.5 (65)	4 (100)	30.28 (769)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	13.39 (340)	13.94 (354)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	255
XN065-220A-0754P	7,5	2.5 (65)	4 (100)	32.24 (819)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	13.39 (340)	13.94 (354)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	288
XN065-220B-0504P	5	2.5 (65)	4 (100)	30.28 (769)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	13.39 (340)	13.94 (354)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	255
XN065-240A-0504P	5	2.5 (65)	4 (100)	30.65 (779)	9.33 (237)	7.87 (200)	9.84 (250)	26.57 (675)	14.41 (366)	14.06 (357)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	297
XN065-240A-0754P	7,5	2.5 (65)	4 (100)	32.62 (829)	9.33 (237)	7.87 (200)	9.84 (250)	26.57 (675)	14.41 (366)	14.06 (357)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	330
XN065-270A-0754P	7,5	2.5 (65)	4 (100)	32.63 (829)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	14.49 (368)	14.15 (360)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	318
XN065-270A-1004P	10	2.5 (65)	4 (100)	36.44 (926)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	14.49 (368)	14.15 (360)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	336
XN065-270C-0754P	7,5	2.5 (65)	4 (100)	32.9 (836)	9.57 (243)	7.87 (200)	9.84 (250)	26.57 (675)	15.12 (384)	14.29 (363)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	319
XN065-270C-1004P	10	2.5 (65)	4 (100)	36.72 (933)	9.57 (243)	7.87 (200)	9.84 (250)	26.57 (675)	15.12 (384)	14.29 (363)	10.2 (259)	8.66 (220)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	338
XN065-300B-1504P	15	2.5 (65)	4 (100)	38.27 (972)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	16.54 (420)	14.42 (367)	10.2 (259)	10.24 (260)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	426

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	1	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN080-170A-0204P	2	3 (80)	6 (150)	34.76 (883)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	15.43 (392)	19.13 (486)	12.17 (309)	6.93 (176)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	302
XN080-170A-0304P	3	3 (80)	6 (150)	36.73 (933)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	15.43 (392)	19.13 (486)	12.17 (309)	6.93 (176)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	310
XN080-210A-0504P	5	3 (80)	6 (150)	35.43 (900)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	15.43 (392)	18.88 (480)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	318
XN080-210A-0754P	7,5	3 (80)	6 (150)	37.4 (950)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	15.43 (392)	18.88 (480)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	351
XN080-210A-1004P	10	3 (80)	6 (150)	41.21 (1047)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	15.43 (392)	18.88 (480)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	373
XN080-255A-0504P	5	3 (80)	6 (150)	33.7 (856)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	17.26 (439)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	357
XN080-255A-0754P	7,5	3 (80)	6 (150)	35.67 (906)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	17.26 (439)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	385
XN080-330A-2004P	20	3 (80)	6 (150)	41.79 (1062)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	19.53 (496)	17.46 (444)	12.17 (309)	10.24 (260)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	594
XN080-330A-2504P	25	3 (80)	6 (150)	43.72 (1111)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	19.84 <i>(504)</i>	17.46 (444)	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	726
XN080-330A-3004P	30	3 (80)	6 (150)	47.89 (1217)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	19.84 <i>(504)</i>	17.46 <i>(444)</i>	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	666
XN100-180A-0504P	5	4 (100)	6 (150)	36.84 (936)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	19.49 (495)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	370
XN100-180A-0754P	7,5	4 (100)	6 (150)	38.81 (986)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	19.49 (495)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	403
XN100-180B-0504P	5	4 (100)	6 (150)	36.84 (936)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	15.43 (392)	19.49 (495)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	370
XN100-210A-1004P	10	4 (100)	6 (150)	41.45 (1053)	13.09 (333)	10.24 (260)	11.02 (280)	30.91 (785)	15.51 (394)	19 (483)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	401
XN100-240A-1004P	10	4 (100)	6 (150)	41.31 (1050)	13.13 (334)	10.24 (260)	11.02 (280)	30.91 (785)	15.91 (404)	19.03 (484)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	410
XN100-270A-1004P	10	4 (100)	6 (150)	38.26 (972)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	15.51 (394)	16.07 (409)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	395
XN100-270A-1504P	15	4 (100)	6 (150)	39.36 (1000)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	15.51 (394)	16.07 (409)	12.17 (309)	10.24 (260)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	448
XN100-330A-3004P	30	4 (100)	6 (150)	48.66 (1236)	13.37 (340)	10.24 (260)	12.4 (315)	30.91 (785)	19.84 <i>(504)</i>	19.27 (490)	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	647
XN100-330C-2004P	20	4 (100)	6 (150)	40.92 (1040)	11.16 (284)	10.24 (260)	12.4 (315)	30.91 (785)	17.72 (450)	17.07 (434)	12.17 (309)	10.24 (260)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	579
XN100-330C-2504P	25	4 (100)	6 (150)	42.85 (1089)	11.16 (284)	10.24 (260)	12.4 (315)	30.91 (785)	19.84 <i>(504)</i>	17.07 (434)	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	711
XN125-250A-0504P	5	5 (125)	6 (150)	35.71 (907)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	404
XN125-250A-0754P	7,5	5 (125)	6 (150)	37.68 (957)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	437
XN125-250A-1004P	10	5 (125)	6 (150)	41.5 (1054)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	8.66 (220)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	454
XN125-270A-1504P	15	5 (125)	6 (150)	40.99 (1042)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	16.46 (418)	17.34 (441)	12.17 (309)	10.24 (260)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	469
XN125-270A-2004P	20	5 (125)	6 (150)	41.22 (1047)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	16.46 (418)	17.34 (441)	12.17 (309)	10.24 (260)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	502
XN125-270A-2504P	25	5 (125)	6 (150)	43.15 (1096)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	19.84 <i>(504)</i>	17.34 (441)	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	638

- 1) To remove the motor, ensure sufficient space is available for the lifting device.
- 2) Filter strainer size when completed
- 3) Total weight of the pump



	P_2	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	I	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN125-270B-2004P	20	5 (125)	6 (150)	41.83 (1063)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	20.47 (520)	17.66 (449)	12.17 (309)	10.24 (260)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	534
XN125-270B-2504P	25	5 (125)	6 (150)	43.76 (1112)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	20.47 (520)	17.66 (449)	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	666
XN125-270B-3004P	30	5 (125)	6 (150)	46.2 (1174)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	20.47 (520)	17.66 (449)	12.17 (309)	12.4 (315)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	595
XN125-330A-4004P	40	5 (125)	8 (200)	50.51 (1283)	20.51 (521)	12.2 (310)	13.19 (335)	34.65 (880)	21.26 (540)	27.6 (701)	13.94 (354)	13.78 (350)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	909
XN125-330A-5004P	50	5 (125)	8 (200)	49.81 (1266)	20.51 (521)	12.2 (310)	13.19 (335)	34.65 (880)	21.26 (540)	27.6 (701)	13.94 (354)	13.78 (350)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	934
XN150-250A-1004P	10	6 (150)	8 (200)	45.06 (1145)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	21.81 (554)	22.64 (575)	13.94 (354)	8.66 (220)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	543
XN150-270B-2004P	20	6 (150)	8 (200)	47.48 (1206)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 (354)	10.24 (260)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	643
XN150-270B-2504P	25	6 (150)	8 (200)	49.41 (1255)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 (354)	12.4 (315)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	775
XN150-270B-3004P	30	6 (150)	8 (200)	51.85 (1317)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 (354)	12.4 (315)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	709
XN150-270B-4004P	40	6 (150)	8 (200)	52.17 (1325)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 (354)	13.78 (350)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	886
XN150-300A-2504P	25	6 (150)	8 (200)	46.73 (1187)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	21.02 (534)	21 (534)	13.94 (354)	12.4 (315)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	793
XN150-300A-3004P	30	6 (150)	8 (200)	46.57 (1183)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	21.02 (534)	21 (534)	13.94 (354)	12.4 (315)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	719
XN150-300A-4004P	40	6 (150)	8 (200)	46.88 (1191)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	21.26 (540)	21 (534)	13.94 (354)	13.78 (350)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	895
XN150-400A-6004P	60	6 (150)	8 (200)	58.57 (1488)	15.19 (386)	12.2 (310)	17.72 (450)	34.65 (880)	24.17 (614)	22.28 (566)	13.94 (354)	15.28 (388)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	1339
XN200-250A-1004P	10	8 (200)	10 (250)	49.41 (1255)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.18 (538)	26.42 (671)	15.51 (394)	8.66 (220)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	544
XN200-250A-1504P	15	8 (200)	10 (250)	50.51 (1283)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.18 (538)	26.42 (671)	15.51 (394)	10.24 (260)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	605
XN200-250A-2004P	20	8 (200)	10 (250)	50.97 (1295)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.18 (538)	26.42 (671)	15.51 (394)	10.24 (260)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	627
XN200-270B-2004P	20	8 (200)	10 (250)	51.39 (1306)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	10.24 (260)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	647
XN200-270B-2504P	25	8 (200)	10 (250)	53.32 (1355)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	12.4 (315)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	780
XN200-270B-3004P	30	8 (200)	10 (250)	56.12 (1426)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	12.4 (315)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	730
XN200-270B-4004P	40	8 (200)	10 (250)	56.44 (1434)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	13.78 (350)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	906
XN200-350A-5004P	50	8 (200)	10 (250)	54.7 (1390)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	26.22 (666)	24.72 (628)	15.51 (394)	13.78 (350)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	1037
XN200-350A-6004P	60	8 (200)	10 (250)	59.66 (1516)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	26.22 (666)	24.72 (628)	15.51 (394)	15.28 (388)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	1256
XN200-350A-7504P	75	8 (200)	10 (250)	61.7 (1568)	16.25 (413)	13.78 (350)	15.75 (400)	37.8 (960)	26.22 (666)	24.72 (628)	15.51 (394)	15.28 (388)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	1300

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



herborner.X-N-C

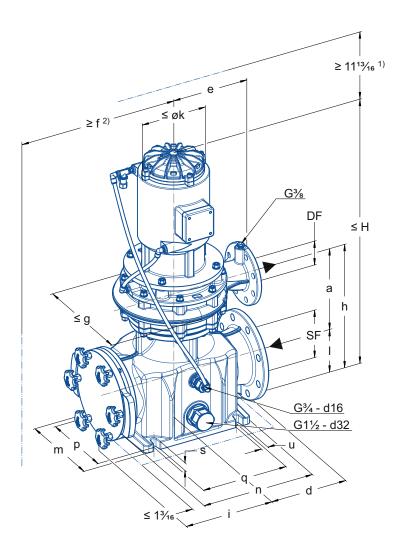


Fig. 141 herborner.X-N-C pump dimensions

- 1) To remove the motor, ensure sufficient space is available for the lifting device.
- 2) Filter strainer size when completed



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	I	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN040-220A-0304C	3	1.5 (40)	4 (100)	29.07 (739)	9.04 (230)	7.87 (200)	7.87 (200)	26.57 (675)	14.13 (359)	13.76 (350)	10.2 (259)	6.89 (175)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	215
XN040-270A-0504C	5	1.5 (40)	4 (100)	30.66 (779)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	14.13 (359)	14.15 (360)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	252
XN040-270A-0754C	7,5	1.5 (40)	4 (100)	31.92 (811)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	14.57 (370)	14.15 (360)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	261
XN040-270A-1004C	10	1.5 (40)	4 (100)	33.77 (858)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	14.57 (370)	14.15 (360)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	317
XN040-270B-0504C	5	1.5 (40)	4 (100)	30.66 (779)	9.43 (240)	7.87 (200)	9.19 (234)	26.57 (675)	14.13 (359)	14.15 (360)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	252
XN050-190A-0304C	3	2 (50)	4 (100)	30.69 (780)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	14.13 (359)	15.39 (391)	10.2 (259)	6.89 (175)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	208
XN050-190A-0504C	5	2 (50)	4 (100)	31.75 (807)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	14.13 (359)	15.39 (391)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	233
XN050-190B-0504C	5	2 (50)	4 (100)	31.75 (807)	10.67 (271)	7.87 (200)	7.87 (200)	26.57 (675)	14.13 (359)	15.39 (391)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	233
XN050-240A-0304C	3	2 (50)	4 (100)	28.98 (736)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	14.13 (359)	13.94 (354)	10.2 (259)	6.89 (175)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	214
XN050-240A-0504C	5	2 (50)	4 (100)	30.41 (773)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	14.13 (359)	13.94 (354)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	239
XN050-240A-0754C	7,5	2 (50)	4 (100)	31.67 (805)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	14.57 (370)	13.94 (354)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	247
XN050-240B-0504C	5	2 (50)	4 (100)	30.41 (773)	9.21 (234)	7.87 (200)	8.66 (220)	26.57 (675)	14.13 (359)	13.94 (354)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	239
XN065-200A-0304C	3	2.5 (65)	4 (100)	32.33 (822)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	14.13 (359)	16.35 (416)	10.2 (259)	6.89 (175)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	217
XN065-200A-0504C	5	2.5 (65)	4 (100)	32.93 (837)	11.63 (296)	7.87 (200)	8.86 (225)	26.57 (675)	14.13 (359)	16.35 (416)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	240
XN065-220A-0504C	5	2.5 (65)	4 (100)	30.28 (769)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	14.13 (359)	13.94 <i>(354)</i>	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	237
XN065-220A-0754C	7,5	2.5 (65)	4 (100)	31.54 (801)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	14.57 (370)	13.94 (354)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	246
XN065-220B-0504C	5	2.5 (65)	4 (100)	30.28 (769)	9.21 (234)	7.87 (200)	9.84 (250)	26.57 (675)	14.13 (359)	13.94 <i>(354)</i>	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	237
XN065-240A-0504C	5	2.5 (65)	4 (100)	30.65 (779)	9.33 (237)	7.87 (200)	9.84 (250)	26.57 (675)	14.41 (366)	14.06 (357)	10.2 (259)	7.56 (192)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	279
XN065-240A-0754C	7,5	2.5 (65)	4 (100)	31.91 (811)	9.33 (237)	7.87 (200)	9.84 (250)	26.57 (675)	14.57 (370)	14.06 (357)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	288
XN065-270A-0754C	7,5	2.5 (65)	4 (100)	31.92 (811)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	14.57 (370)	14.15 (360)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	276
XN065-270A-1004C	10	2.5 (65)	4 (100)	33.77 (858)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	14.57 (370)	14.15 (360)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	331
XN065-270A-1504C	15	2.5 (65)	4 (100)	36.01 (915)	9.43 (240)	7.87 (200)	9.45 (240)	26.57 (675)	16.38 (416)	14.15 (360)	10.2 (259)	9.92 (252)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	362
XN065-270C-1004C	10	2.5 (65)	4 (100)	34.04 (865)	9.57 (243)	7.87 (200)	9.84 (250)	26.57 (675)	15.12 (384)	14.29 (363)	10.2 (259)	8.58 (218)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	334
XN065-300B-1504C	15	2.5 (65)	4 (100)	36.73 (933)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	16.54 (420)	14.42 (367)	10.2 (259)	9.92 (252)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 <i>(17)</i>	399
XN065-300B-2004C	20	2.5 (65)	4 (100)	36.81 (935)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	16.54 (420)	14.42 (367)	10.2 (259)	9.92 (252)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	473
XN065-300B-2504C	25	2.5 (65)	4 (100)	39.29 (998)	9.7 (247)	7.87 (200)	10.83 (275)	26.57 (675)	20.63 (524)	14.42 (367)	10.2 (259)	12.01 (305)	4.72 (120)	9.21 (234)	11.69 (297)	8.07 (205)	8.86 (225)	0.83 (21)	0.67 (17)	715
XN080-170A-0304C	3	3 (80)	6 (150)	34.48 (876)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	16.54 (420)	19.13 (486)	12.17 (309)	6.89 (175)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	285

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	I	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN080-170A-0504C	5	3 (80)	6 (150)	36.13 (918)	13.23 (336)	10.24 (260)	8.86 (225)	30.91 (785)	16.54 (420)	19.13 (486)	12.17 (309)	7.56 (192)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	316
XN080-210A-0754C	7,5	3 (80)	6 (150)	36.69 (932)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	16.54 (420)	18.88 (480)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	309
XN080-210A-1004C	10	3 (80)	6 (150)	38.54 (979)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	16.54 (420)	18.88 (480)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	368
XN080-210A-1504C	15	3 (80)	6 (150)	40.78 (1036)	12.97 (330)	10.24 (260)	9.84 (250)	30.91 (785)	16.54 (420)	18.88 (480)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	399
XN080-255A-0504C	5	3 (80)	6 (150)	33.7 (856)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	17.26 (439)	12.17 (309)	7.56 (192)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	340
XN080-255A-0754C	7,5	3 (80)	6 (150)	34.96 (888)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	17.26 (439)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	343
XN080-255A-1004C	10	3 (80)	6 (150)	36.81 (935)	11.36 (289)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	17.26 (439)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	405
XN080-330A-2004C	20	3 (80)	6 (150)	40.25 (1023)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	19.53 (496)	17.46 <i>(444)</i>	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	594
XN080-330A-2504C	25	3 (80)	6 (150)	42.73 (1086)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	20.63 (524)	17.46 <i>(444)</i>	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	836
XN080-330A-3004C	30	3 (80)	6 (150)	46.91 (1192)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	20.63 (524)	17.46 <i>(444)</i>	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	732
XN080-330A-4004C	40	3 (80)	6 (150)	46.91 (1192)	11.56 (294)	10.24 (260)	12.4 (315)	30.91 (785)	20.63 (524)	17.46 <i>(444)</i>	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	897
XN100-180A-0504C	5	4 (100)	6 (150)	36.84 (936)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19.49 (495)	12.17 (309)	7.56 (192)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	352
XN100-180A-0754C	7,5	4 (100)	6 (150)	38.1 (968)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19.49 (495)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	361
XN100-180B-0504C	5	4 (100)	6 (150)	36.84 (936)	13.58 (345)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19.49 (495)	12.17 (309)	7.56 (192)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	352
XN100-210A-1004C	10	4 (100)	6 (150)	38.77 (985)	13.09 (333)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19 (483)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	396
XN100-210A-1504C	15	4 (100)	6 (150)	41.02 (1042)	13.09 (333)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19 (483)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	427
XN100-240A-1004C	10	4 (100)	6 (150)	38.63 (982)	13.13 (334)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19.03 (484)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	406
XN100-240A-1504C	15	4 (100)	6 (150)	40.88 (1039)	13.13 (334)	10.24 (260)	11.02 (280)	30.91 (785)	16.54 (420)	19.03 (484)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	437
XN100-270A-1004C	10	4 (100)	6 (150)	35.58 (904)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	16.54 (420)	16.07 (409)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	391
XN100-270A-1504C	15	4 (100)	6 (150)	37.82 (961)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	16.54 (420)	16.07 (409)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	422
XN100-270A-2004C	20	4 (100)	6 (150)	39.07 (993)	10.17 (259)	10.24 (260)	10.63 (270)	30.91 (785)	16.54 (420)	16.07 (409)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	509
XN100-330A-3004C	30	4 (100)	6 (150)	47.68 (1211)	13.37 (340)	10.24 (260)	12.4 (315)	30.91 (785)	20.63 (524)	19.27 (490)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	713
XN100-330A-4004C	40	4 (100)	6 (150)	47.68 (1211)	13.37 (340)	10.24 (260)	12.4 (315)	30.91 (785)	20.63 (524)	19.27 (490)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	879
XN100-330C-2004C	20	4 (100)	6 (150)	39.39 (1001)	11.16 (284)	10.24 (260)	12.4 (315)	30.91 (785)	17.72 (450)	17.07 (434)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	579
XN100-330C-2504C	25	4 (100)	6 (150)	41.87 (1064)	11.16 (284)	10.24 (260)	12.4 (315)	30.91 (785)	20.63 (524)	17.07 (434)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	821
XN125-250A-0504C	5	5 (125)	6 (150)	35.71 (907)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	7.56 (192)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	386

- 1) To remove the motor, ensure sufficient space is available for the lifting device.
- 2) Filter strainer size when completed
- 3) Total weight of the pump



	P ₂	DF	SF	≤H	а	d	е	≥ f ²⁾	≤g	h	i	≤Ø k	1	m	n	р	q	s	u	m ³⁾
	hp	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	in (mm)	lb
XN125-250A-0754C	7,5	5 (125)	6 (150)	36.97 (939)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	395
XN125-250A-1004C	10	5 (125)	6 (150)	38.82 (986)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	8.58 (218)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	449
XN125-250A-1504C	15	5 (125)	6 (150)	41.06 (1043)	13.31 (338)	10.24 (260)	13.98 (355)	30.91 (785)	20.39 (518)	19.21 (488)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	480
XN125-270A-1504C	15	5 (125)	6 (150)	39.46 (1003)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	16.54 (420)	17.34 (441)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	452
XN125-270A-2004C	20	5 (125)	6 (150)	39.69 (1008)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	16.54 (420)	17.34 (441)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	512
XN125-270A-2504C	25	5 (125)	6 (150)	42.17 (1071)	11.44 (291)	10.24 (260)	13.98 (355)	30.91 (785)	20.63 (524)	17.34 (441)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	759
XN125-270B-2004C	20	5 (125)	6 (150)	40.3 (1024)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	20.47 (520)	17.66 (449)	12.17 (309)	9.92 (252)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	534
XN125-270B-2504C	25	5 (125)	6 (150)	42.78 (1087)	11.76 (299)	10.24 (260)	13.98 <i>(355)</i>	30.91 (785)	20.63 (524)	17.66 (449)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 <i>(18)</i>	776
XN125-270B-3004C	30	5 (125)	6 (150)	45.22 (1149)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	20.63 (524)	17.66 (449)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	662
XN125-270B-4004C	40	5 (125)	6 (150)	45.22 (1149)	11.76 (299)	10.24 (260)	13.98 (355)	30.91 (785)	20.63 (524)	17.66 (449)	12.17 (309)	12.01 (305)	5.91 (150)	11.81 (300)	14.96 (380)	10.24 (260)	11.42 (290)	1.06 (27)	0.71 (18)	827
XN125-330A-4004C	40	5 (125)	8 (200)	49.21 (1250)	20.51 (521)	12.2 (310)	13.19 (335)	34.65 (880)	20.63 (524)	27.6 (701)	13.94 <i>(354)</i>	12.01 (305)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	964
XN150-250A-1004C	10	6 (150)	8 (200)	42.38 (1077)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	21.81 (554)	22.64 (575)	13.94 <i>(354)</i>	8.58 (218)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	539
XN150-250A-1504C	15	6 (150)	8 (200)	44.63 (1134)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	21.81 (554)	22.64 (575)	13.94 <i>(354)</i>	9.92 (252)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	570
XN150-250A-2004C	20	6 (150)	8 (200)	45.08 (1146)	15.55 (395)	12.2 (310)	14.76 (375)	34.65 (880)	21.81 (554)	22.64 (575)	13.94 (354)	9.92 (252)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	636
XN150-270B-2504C	25	6 (150)	8 (200)	48.43 (1230)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 <i>(354)</i>	12.01 (305)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	885
XN150-270B-3004C	30	6 (150)	8 (200)	50.87 (1292)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 <i>(354)</i>	12.01 (305)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	776
XN150-270B-4004C	40	6 (150)	8 (200)	50.87 (1292)	16.18 (411)	12.2 (310)	14.76 (375)	34.65 (880)	24.65 (626)	23.27 (591)	13.94 (354)	12.01 (305)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	941
XN150-300A-2504C	25	6 (150)	8 (200)	45.75 (1162)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	21.02 (534)	21 (534)	13.94 (354)	12.01 (305)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	903
XN150-300A-3004C	30	6 (150)	8 (200)	45.58 (1158)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	21.02 (534)	21 (534)	13.94 (354)	12.01 (305)	7.09 (180)	14.17 (360)	17.99 <i>(457)</i>	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	785
XN150-300A-4004C	40	6 (150)	8 (200)	45.58 (1158)	13.91 <i>(354)</i>	12.2 (310)	12.99 (330)	34.65 (880)	21.02 (534)	21 (534)	13.94 (354)	12.01 (305)	7.09 (180)	14.17 (360)	17.99 (457)	12.6 (320)	13.78 (350)	1.26 (32)	0.87 (22)	950
XN200-250A-1504C	15	8 (200)	10 (250)	48.98 (1244)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.22 (539)	26.42 (671)	15.51 (394)	9.92 (252)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	579
XN200-250A-2004C	20	8 (200)	10 (250)	49.43 (1256)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.22 (539)	26.42 (671)	15.51 (394)	9.92 (252)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	627
XN200-250A-2504C	25	8 (200)	10 (250)	51.91 (1319)	17.95 (456)	13.78 (350)	13.78 (350)	37.8 (960)	21.22 (539)	26.42 (671)	15.51 (394)	12.01 (305)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	870
XN200-270B-2504C	25	8 (200)	10 (250)	52.33 (1330)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	12.01 (305)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	890
XN200-270B-3004C	30	8 (200)	10 (250)	55.14 (1401)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	12.01 (305)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	796
XN200-270B-4004C	40	8 (200)	10 (250)	55.14 (1401)	17.62 (448)	13.78 (350)	14.57 (370)	37.8 (960)	22.44 (570)	26.08 (663)	15.51 (394)	12.01 (305)	8.46 (215)	16.89 (429)	21.06 (535)	14.96 (380)	16.14 (410)	1.26 (32)	0.79 (20)	961

¹⁾ To remove the motor, ensure sufficient space is available for the lifting device.

²⁾ Filter strainer size when completed

³⁾ Total weight of the pump



13.2 Configuration of motor

herborner.X-N

Motor power (HP)	Designation of motor	Manufacturer
2	35E1542P692H2	Baldor Electric Company
3	36N713X865H2	Baldor Electric Company
5	36N722T980H2	Baldor Electric Company
5	36N725T980H2	Baldor Electric Company
7.5	37M800S150H2	Baldor Electric Company
10	37M804S275H2	Baldor Electric Company
15	09J997X661H2	Baldor Electric Company
20	09J985X857H2	Baldor Electric Company
25	09J990Y900H2	Baldor Electric Company
30	10J190X259H2	Baldor Electric Company
40	10J212X908H2	Baldor Electric Company
50	12G69X270H2	Baldor Electric Company
60	A36-5974-1207	Baldor Electric Company
75	A36-5982-1512	Baldor Electric Company
100	A40-6370-0692	Baldor Electric Company

herborner.X-N-PM

Motor power (HP)	Designation of motor	Manufacturer
2	IPM 90S/42-80	EMOD MOTOREN
3	IPM 90LA/42-120	EMOD MOTOREN
5	IPM 112M/62-130	EMOD MOTOREN
7.5	IPM 112L/62-170	EMOD MOTOREN
10	IPM 112LB/62-240	EMOD MOTOREN
15	IPM 132L/62-210	EMOD MOTOREN
20	IPM 132L/62-240	EMOD MOTOREN
25	IPM 160L/62-220	EMOD MOTOREN
30	IPM 160L/62-250	EMOD MOTOREN
40	IPM 180L/82-230	EMOD MOTOREN
50	IPM 180L/82-290	EMOD MOTOREN
60	IPM 200L/82-310	EMOD MOTOREN
75	IPM 200L/82-360	EMOD MOTOREN



herborner.X-N-C

Motor power (HP)	Designation of motor	Manufacturer
2	WK90/4-75	EMOD MOTOREN
3	WK90/4-100	EMOD MOTOREN
5	WK100/4-120	EMOD MOTOREN
7.5	WK11/4-130	EMOD MOTOREN
10	WK11/4-165	EMOD MOTOREN
15	WK13/4-190	EMOD MOTOREN
20	WK13/4-230	EMOD MOTOREN
25	WK160/4-215	EMOD MOTOREN
30	WK160/4-250	EMOD MOTOREN
40	WK160/4-290	EMOD MOTOREN



13.3 Electrical power parameters

herborner.X-N

Motor power (HP)	Voltage (V)	Frequency (Hz)	Maximum current con- sumption (A) at 208–230 V	Maximum current con- sumption (A) at 460 V
1	230/460	60	3	1.5
1.5	230/460	60	4.4	2.2
2	230/460	60	5.8	2.9
3	230/460	60	8.4	4.2
5	230/460	60	5	2.5
5	230/460	60	5	2.5
7.5	208-230/460	60	20.8-21.4	10.7
10	208-230/460	60	25.4-24	12
15	208-230/460	60	38-36.8	18.4
20	230/460	60	48	24
25	230/460	60	60	30
30	208-230/460	60	78-76	38
40	230/460	60	96	48
50	208-230/460	60	126-122	61
60	230/460	60	136	68
75	230/460	60	171	85.9
100	230/460	60	224	112

herborner.X-N-PM

Motor power (HP)	Voltage (V)	Frequency (Hz)	Maximum current consumption (A)
1	450	50	1.39
1.5	450	50	2.04
2	450	50	2.8
3	450	50	4.1
5	450	75	6.6
7.5	450	75	9.7
10	450	75	13.4
15	450	75	20.2
20	450	75	27.2
25	450	75	34.0
30	450	75	40.0
40	450	100	54.0



Motor power (HP)	Voltage (V)	Frequency (Hz)	Maximum current consumption (A)
50	450	100	66.0
60	450	100	80.0
75	450	100	96.0

herborner.X-N-C

Motor power (HP)	Voltage (V)	Frequency (Hz)	Maximum current consumption (A) at 460 V	Maximum current consumption (A) at 575 V
3	460 / 575	60	4.6	3.7
5	460 / 575	60	7.1	5.7
7.5	460 / 575	60	10.3	8.2
10	460 / 575	60	14.2	11.4
15	460 / 575	60	20.1	16.1
20	460 / 575	60	27.0	21.5
25	460 / 575	60	32.0	25.5
30	460 / 575	60	37.8	30.5
40	460 / 575	60	50.0	40.0

Permissible variations in the mains supply

ltem	Value	Unit
Permissible voltage variations	± 10	%
Permissible frequency variations	± 5	%
Permissible total voltage/frequency variation (determination of amount)	± 10	%



Water to be pumped

Item	Value	Unit
Maximum density	8.35	lb/gal
Maximum viscosity	1.08 x 10-5	sq ft/s
Temperature range		
herborner.X-N	32 – 100	°F
herborner.X-N-PM	32 – 100	°F
herborner.X-N-C	59 – 100	°F
Maximum chlorine content	0.13	oz/gal



13.4 Operating conditions

Requirements for the foundations

Item	Value	Unit
Minimum compressive strength (characteristic compressive cylinder strength)	1200	lbf/sq in
Hole spacing for threaded fittings	Schapter ,, dimensions a on page 191	
Diameter of threaded fittings	Chapter ,, 13.1 Pump dimensions and weight " on page 191	

Environment

Item	Value	Unit
Temperature range	32 – 104	°F
Maximum height above sea level	0.62	miles

Operating period

Item	Value	Unit
Operating period	Designed for continuous operation	

13.5 Operating materials

Operating material	Туре
Intermediate casing lubrication oil	Lubricant Mobil SHC Cibus 46 with NSF H1 approval.
herborner.X-N grease	Polyrex EM (Exxon Mobil)
herborner.X-N-PM grease	Klüberquiet BQH 72-102 (Klüber Lubrication)
herborner.X-N-C grease	Klüberquiet BQH 72-102 (Klüber Lubrication)



13.5.1 Lubrication oil in intermediate casing on the version with Seal Guard system

Туре	Motor power (HP)	Oil volume (gal)
XN040-220A	2	0.2
XN040-220A	3	0.2
XN040-270A	5	0.4
XN040-270A	7.5	0.4
XN040-270A	10	0.7
XN050-190A	2	0.2
XN050-190A	3	0.2
XN050-190A	5	0.5
XN050-190B	5	0.5
XN050-240A	3	0.2
XN050-240A	5	0.4
XN050-240A	7.5	0.5
XN065-200A	2	0.6
XN065-200A	3	0.6
XN065-200A	5	1.7
XN065-220A	5	0.4
XN065-220A	7.5	0.4
XN065-240A	5	0.4
XN065-240A	7.5	0.5
XN065-270A	7.5	0.4
XN065-270A	10	0.7
XN065-270A	15	0.7
XN065-270C	7.5	0.4
XN065-270C	10	0.7
XN065-300B	15	0.6
XN065-300B	20	0.9
XN065-300B	25	0.9
XN080-170A	2	0.2
XN080-170A	3	0.2
XN080-170A	5	0.5
XN080-210A	7.5	0.4
XN080-210A	10	0.6



Туре	Motor power (HP)	Oil volume (gal)
XN080-210A	15	0.6
XN080-255A	5	0.3
XN080-255A	7.5	0.3
XN080-255A	10	0.6
XN080-330A	20	0.9
XN080-330A	25	0.9
XN080-330A	30	1.5
XN080-330A	40	1.5
XN100-180A	5	0.5
XN100-180A	7.5	0.5
XN100-210A	10	0.6
XN100-210A	15	0.6
XN100-240A	10	0.6
XN100-240A	15	0.6
XN100-270A	10	0.6
XN100-270A	15	0.6
XN100-330A	30	1.3
XN100-330A	40	1.3
XN100-330C	20	0.9
XN100-330C	25	0.9
XN125-250A	5	0.3
XN125-250A	7.5	0.3
XN125-250A	10	0.6
XN125-270A	15	0.6
XN125-270A	20	0.6
XN125-270A	25	0.6
XN125-270B	20	0.6
XN125-270B	25	0.6
XN125-270B	30	1.0
XN125-270B	40	1.0
XN125-330A	40	1.3
XN125-330A	50	1.5
XN150-250A	10	0.6



Туре	Motor power (HP)	Oil volume (gal)
XN150-250A	15	0.6
XN150-250A	20	1.0
XN150-270B	25	0.9
XN150-270B	30	1.0
XN150-270B	40	1.0
XN150-300A	25	0.9
XN150-300A	30	1.5
XN150-300A	40	1.5
XN150-400A	60	1.5
XN150-400A	75	1.5
XN150-400A	100	1.5
XN200-250A	15	0.6
XN200-250A	20	0.9
XN200-250A	25	0.9
XN200-270B	25	1.1
XN200-270B	30	1.4
XN200-270B	40	1.4
XN200-350A	50	1.5
XN200-350A	60	1.6
XN200-350A	75	1.6
XN200-350A	100	1.6



13.5.2 herborner.X-N regreasing intervals with Polyrex EM

Anti-friction beari		earing (drive side) Anti-friction bearing (non drive side)		ng (non drive side)
Motor power (HP)	Regreasing interval (h)	Quantity of grease (oz)	Regreasing interval (h)	Quantity of grease (oz)
2	12000	0.21	12000	0.11
3	12000	0.21	12000	0.11
5	12000	0.35	12000	0.11
7.5	12000	0.46	12000	0.18
10	12000	0.46	12000	0.18
15	9500	0.71	95000	0.25
20	9500	0.88	95000	0.25
25	9500	1.06	95000	0.25
30	9500	0.81	95000	0.46
40	9500	1.23	95000	0.46
50	7500	0.81	75000	0.60
60	7500	1.16	75000	0.81
75	7500	1.16	75000	0.81



13.5.3 herborner.X-N-PM and herborner.X-N-C regreasing intervals with Klüberquiet BQH 72-102 (Klüber Lubrication)

Anti-friction beari		aring (drive side) Anti-friction bearing (no		ng (non drive side)
Motor power (HP)	Regreasing interval (h)	Quantity of grease (oz)	Regreasing interval (h)	Quantity of grease (oz)
2	15000	0.21	20000	0.11
3	15000	0.21	20000	0.11
5	13000	0.32	20000	0.11
7.5	13000	0.32	18000	0.14
10	10000	0.71	16000	0.25
15	10000	0.71	16000	0.25
20	10000	0.71	14000	0.35
25	10000	0.71	14000	0.35
30	8000	0.99	12000	0.49
40	8000	0.99	12000	0.49
50	7000	1.16	10000	0.63
60	6000	1.34	10000	0.63
75	6000	1.34	10000	0.63



13.6 Emissions

herborner.X-N

	Motor power (HP)	Noise emission dB (A)
2		63
3		66
5		71
7.5		71
10		72
15		74
20		74
25		76
30		76
40		78
50		78
60		79
75		80
100		81

herborner.X-N-PM

Motor power (HP)	Noise emission dB (A)
1	53
2	55
3	55
5	55
7.5	59
10	59
15	63
20	63
25	63
30	63



	Motor power (HP)	Noise emission dB (A)
40		65
50		65
60		68
75		68

herborner.X-N-C

Motor power (HP)	Noise emission dB (A)
3	53
5	53
7.5	53
10	53
15	54
20	54
25	56
30	56
40	56



13.7 Pump performance

herborner.X-N

Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN040-220A-0204N-W2B	2	1,800	91,6	43,5
XN040-220A-0304N-W2B	3	1,800	108,4	53,8
XN040-270A-0504N-W2B	5	1,800	162,5	74,3
XN040-270A-0754N-W2B	7,5	1,800	233,3	88,9
XN040-270A-1004N-W2B	10	1,800	204	104,7
XN050-190A-0204N-W2B	2	1,800	124,8	36,9
XN050-190A-0304N-W2B	3	1,800	144,5	45,4
XN050-190A-0504N-W2B	5	1,800	213,7	60,7
XN050-190B-0504N-W2B	5	1,800	181,3	51,5
XN050-240A-0304N-W2B	3	1,800	102,2	53
XN050-240A-0504N-W2B	5	1,800	147,1	73,2
XN050-240A-0754N-W2B	7,5	1,800	183,4	91,2
XN065-200A-0204N-W2B	2	1,800	127,4	31,1
XN065-200A-0304N-W2B	3	1,800	139,8	40,7
XN065-200A-0504N-W2B	5	1,800	144,8	52,4
XN065-220A-0504N-W2B	5	1,800	225,4	51,4
XN065-220A-0754N-W2B	7,5	1,800	284,5	64,1
XN065-240A-0504N-W2B	5	1,800	179,9	58,8
XN065-240A-0754N-W2B	7,5	1,800	246,9	71,1
XN065-270A-0754N-W2B	7,5	1,800	192	77,8
XN065-270A-1004N-W2B	10	1,800	236,8	92,2
XN065-270A-1504N-W2B	15	1,800	292,6	113,9
XN065-270C-1004N-W2B	10	1,800	288	83,6
XN065-300B-1504N-W2B	15	1,800	348,4	103,2
XN065-300B-2004N-W2B	20	1,800	434,7	128,2
XN065-300B-2504N-W2B	25	1,800	465,3	137,2
XN080-170A-0204N-W2B	2	1,800	254,6	18,2
XN080-170A-0304N-W2B	3	1,800	298,3	25,7
XN080-170A-0504N-W2B	5	1,800	380,1	35,9
XN080-210A-0754N-W2B	7,5	1,800	400,6	50
XN080-210A-1004N-W2B	10	1,800	422,5	60,6
XN080-210A-1504N-W2B	15	1,800	485	69,6
XN080-255A-0504N-W2B	5	1,800	254,2	50,6
XN080-255A-0754N-W2B	7,5	1,800	304,2	62,8
XN080-255A-1004N-W2B	10	1,800	346,1	73,8
XN080-330A-2004N-W2B	20	1,800	585,1	82,1



Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN080-330A-2504N-W2B	25	1,800	594,9	105,6
XN080-330A-3004N-W2B	30	1,800	660,3	117,2
XN080-330A-4004N-W2B	40	1,800	826,3	146,7
XN100-180A-0504N-W2B	5	1,800	491,8	28,5
XN100-180A-0754N-W2B	7,5	1,800	606,9	34,6
XN100-210A-1004N-W2B	10	1,800	643,3	39,3
XN100-210A-1504N-W2B	15	1,800	775,6	53
XN100-240A-1004N-W2B	10	1,800	392,2	66,3
XN100-240A-1504N-W2B	15	1,800	494	79,1
XN100-270A-1004N-W2B	10	1,800	413,2	58,2
XN100-270A-1504N-W2B	15	1,800	484,2	74
XN100-330A-3004N-W2B	30	1,800	558,9	138,7
XN100-330A-4004N-W2B	40	1,800	560,7	165,8
XN100-330C-2004N-W2B	20	1,800	364,2	96,4
XN100-330C-2504N-W2B	25	1,800	386,6	118,8
XN125-250A-0504N-W2B	5	1,800	583,2	27,7
XN125-250A-0754N-W2B	7,5	1,800	691,8	34,3
XN125-250A-1004N-W2B	10	1,800	760,8	41,7
XN125-250A-1504N-W2B	15	1,800	898,5	49,3
XN125-270A-1504N-W2B	15	1,800	642,7	62,5
XN125-270A-2004N-W2B	20	1,800	653,7	78,8
XN125-270A-2504N-W2B	25	1,800	702,8	86
XN125-270B-2004N-W2B	20	1,800	960,2	55,8
XN125-270B-2504N-W2B	25	1,800	998,5	68,1
XN125-270B-3004N-W2B	30	1,800	1040,8	76,4
XN125-270B-4004N-W2B	40	1,800	1162,7	88,6
XN125-330A-4004N-W2B	40	1,800	848,3	104
XN125-330A-5004N-W2B	50	1,800	938,9	119,3
XN150-250A-1004N-W2B	10	1,800	761,4	40,1
XN150-250A-1504N-W2B	15	1,800	921,1	51,2
XN150-250A-2004N-W2B	20	1,800	952,6	64,2
XN150-270B-2504N-W2B	25	1,800	1498,6	41,5
XN150-270B-3004N-W2B	30	1,800	1558,4	53,9
XN150-270B-4004N-W2B	40	1,800	1735,7	64,3
XN150-300A-2504N-W2B	25	1,800	1023,4	75,6
XN150-300A-3004N-W2B	30	1,800	1071,7	80,7
XN150-300A-4004N-W2B	40	1,800	1220	87,5
XN150-400A-10004N-W2B	60	1,800	1020	241,2
XN150-400A-6004N-W2B	75	1,800	822,5	173,8
XN150-400A-7504N-W2B	100	1,800	950,6	198,7
XN200-250A-1504N-W2B	15	1,800	1103,1	29



Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN200-250A-2004N-W2B	20	1,800	1461,7	40,4
XN200-250A-2504N-W2B	25	1,800	1484,4	54,4
XN200-270B-2504N-W2B	25	1,800	1572	39,8
XN200-270B-3004N-W2B	30	1,800	1677,7	48,4
XN200-270B-4004N-W2B	40	1,800	1744,6	63,6
XN200-350A-10004N-W2B	50	1,800	2153,3	131,8
XN200-350A-5004N-W2B	60	1,800	1689,6	81,6
XN200-350A-6004N-W2B	75	1,800	1809,5	91,6
XN200-350A-7504N-W2B	100	1,800	2047,3	110

herborner.X-N-PM

Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN025-200A-0104P-W2B	1	1,500	52	36,9
XN040-160A-0104P-W2B	1	1,500	94,5	27,6
XN040-220A-0204P-W2B	2	1,500	68,1	53
XN040-220A-0304P-W2B	3	1,500	100,7	55,9
XN040-270A-0504P-W2B	5	1,500	146,1	76,9
XN040-270A-0754P-W2B	7,5	1,500	197,2	73,3
XN040-270B-0504P-W2B	5	1,500	123,9	65,2
XN050-190A-0204P-W2B	2	1,500	117,5	30,8
XN050-190A-0304P-W2B	3	1,500	141,7	43,3
XN050-190A-0504P-W2B	5	1,500	151	47,4
XN050-240A-0304P-W2B	3	1,500	111,7	49,7
XN050-240A-0504P-W2B	5	1,500	146,7	70,7
XN050-240B-0504P-W2B	5	1,500	131,9	61,4
XN065-200A-0204P-W2B	2	1,500	125,2	30,4
XN065-200A-0304P-W2B	3	1,500	145,3	36,4
XN065-200A-0504P-W2B	5	1,500	138,8	50
XN065-220A-0504P-W2B	5	1,500	222,8	47,1
XN065-220A-0754P-W2B	7,5	1,500	249,1	54,5
XN065-220B-0504P-W2B	5	1,500	197	42,6
XN065-240A-0504P-W2B	5	1,500	174,9	56
XN065-240A-0754P-W2B	7,5	1,500	245,2	64,1
XN065-270A-0754P-W2B	7,5	1,500	197,2	71,7
XN065-270A-1004P-W2B	10	1,500	195,7	87,2
XN065-270C-0754P-W2B	7,5	1,500	253,8	63,1
XN065-270C-1004P-W2B	10	1,500	301,8	80,8
XN065-300B-1504P-W2B	15	1,500	328,2	106,1
XN080-170A-0204P-W2B	2	1,500	230	20,4



Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN080-170A-0304P-W2B	3	1,500	296,8	23,9
XN080-210A-0504P-W2B	5	1,500	324,8	36
XN080-210A-0754P-W2B	7,5	1,500	399	44,3
XN080-210A-1004P-W2B	10	1,500	396,7	48,9
XN080-255A-0504P-W2B	5	1,500	267,6	46,9
XN080-255A-0754P-W2B	7,5	1,500	307,5	57,8
XN080-330A-2004P-W2B	20	1,500	599,2	83,9
XN080-330A-2504P-W2B	25	1,500	628,4	97,7
XN080-330A-3004P-W2B	30	1,500	657,3	104,6
XN100-180A-0504P-W2B	5	1,500	476,3	26,4
XN100-180A-0754P-W2B	7,5	1,500	518,3	32,3
XN100-180B-0504P-W2B	5	1,500	444,4	18,7
XN100-210A-1004P-W2B	10	1,500	607,2	44,5
XN100-240A-1004P-W2B	10	1,500	376,9	59,9
XN100-270A-1004P-W2B	10	1,500	404,1	59
XN100-270A-1504P-W2B	15	1,500	467,2	76,2
XN100-330A-3004P-W2B	30	1,500	600,6	127,4
XN100-330C-2004P-W2B	20	1,500	411	99,1
XN100-330C-2504P-W2B	25	1,500	407,3	115,9
XN125-250A-0504P-W2B	5	1,500	601,5	27,5
XN125-250A-0754P-W2B	7,5	1,500	689,9	34,4
XN125-250A-1004P-W2B	10	1,500	693,7	37,6
XN125-270A-1504P-W2B	15	1,500	658,4	59,1
XN125-270A-2004P-W2B	20	1,500	627,8	76,1
XN125-270A-2504P-W2B	25	1,500	666,8	80,8
XN125-270B-2004P-W2B	20	1,500	963,9	59,3
XN125-270B-2504P-W2B	25	1,500	1019,2	66,5
XN125-270B-3004P-W2B	30	1,500	1014,3	71,9
XN125-330A-4004P-W2B	40	1,500	902,7	98,1
XN125-330A-5004P-W2B	50	1,500	980,4	114,2
XN150-250A-1004P-W2B	10	1,500	839,9	40,6
XN150-270B-2004P-W2B	20	1,500	1353,1	43,5
XN150-270B-2504P-W2B	25	1,500	1510,4	48,6
XN150-270B-3004P-W2B	30	1,500	1650,2	53,1
XN150-270B-4004P-W2B	40	1,500	1821,3	63,3
XN150-300A-2504P-W2B	25	1,500	897,8	62,4
XN150-300A-3004P-W2B	30	1,500	1078,8	74,9
XN150-300A-4004P-W2B	40	1,500	1129,3	79,7
XN150-400A-6004P-W2B	60	1,500	931,3	177,8
XN200-250A-1004P-W2B	10	1,500	1016,1	34,1
XN200-250A-1504P-W2B	15	1,500	1231,5	41,3



Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN200-250A-2004P-W2B	20	1,500	1224,2	46,6
XN200-270B-2004P-W2B	20	1,500	1415	43,4
XN200-270B-2504P-W2B	25	1,500	1567,9	48,1
XN200-270B-3004P-W2B	30	1,500	1674,6	52,7
XN200-270B-4004P-W2B	40	1,500	1638,1	58,7
XN200-350A-5004P-W2B	50	1,500	1765,5	79,7
XN200-350A-6004P-W2B	60	1,500	1888,3	95,9
XN200-350A-7504P-W2B	75	1,500	1927,8	113

herborner.X-N-C

Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN040-220A-0304C-W2B	3	1,800	102,2	54,6
XN040-270A-0504C-W2B	5	1,800	142,2	69,5
XN040-270A-0754C-W2B	7,5	1,800	185,1	82,1
XN040-270A-1004C-W2B	10	1,800	202,8	92,7
XN040-270B-0504C-W2B	5	1,800	146,7	56,1
XN050-190A-0304C-W2B	3	1,800	128,4	44,6
XN050-190A-0504C-W2B	5	1,800	207,2	57,3
XN050-190B-0504C-W2B	5	1,800	173,5	54,4
XN050-240A-0304C-W2B	3	1,800	100,3	53,5
XN050-240A-0504C-W2B	5	1,800	144,2	75,9
XN050-240A-0754C-W2B	7,5	1,800	171,6	90,3
XN050-240B-0504C-W2B	5	1,800	122,8	63,3
XN065-200A-0304C-W2B	3	1,800	154,8	41,3
XN065-200A-0504C-W2B	5	1,800	147,2	51,4
XN065-220A-0504C-W2B	5	1,800	224	50,8
XN065-220A-0754C-W2B	7,5	1,800	273,2	65,3
XN065-220B-0504C-W2B	5	1,800	196,4	43,7
XN065-240A-0504C-W2B	5	1,800	176,6	58,7
XN065-240A-0754C-W2B	7,5	1,800	240,5	74
XN065-270A-0754C-W2B	7,5	1,800	196,6	75,7
XN065-270A-1004C-W2B	10	1,800	233,1	91,1
XN065-270A-1504C-W2B	15	1,800	285,4	111,5
XN065-270C-1004C-W2B	10	1,800	275	83,7
XN065-300B-1504C-W2B	15	1,800	339	101,1
XN065-300B-2004C-W2B	20	1,800	361,9	124,5
XN065-300B-2504C-W2B	25	1,800	406,6	139,9
XN080-170A-0304C-W2B	3	1,800	328,8	24,9



Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN080-170A-0504C-W2B	5	1,800	373,5	36
XN080-210A-0754C-W2B	7,5	1,800	395,7	48,8
XN080-210A-1004C-W2B	10	1,800	455,9	56,9
XN080-210A-1504C-W2B	15	1,800	502,6	62,7
XN080-255A-0504C-W2B	5	1,800	260,9	52
XN080-255A-0754C-W2B	7,5	1,800	319,5	64,8
XN080-255A-1004C-W2B	10	1,800	365,6	72,9
XN080-330A-2004C-W2B	20	1,800	535,8	82,6
XN080-330A-2504C-W2B	25	1,800	583,2	99,1
XN080-330A-3004C-W2B	30	1,800	612,9	117,3
XN080-330A-4004C-W2B	40	1,800	738,8	124,8
XN100-180A-0504C-W2B	5	1,800	489,1	28,4
XN100-180A-0754C-W2B	7,5	1,800	626,8	34,5
XN100-180B-0504C-W2B	5	1,800	422,5	24,5
XN100-210A-1004C-W2B	10	1,800	639,4	41,8
XN100-210A-1504C-W2B	15	1,800	808	54,5
XN100-240A-1004C-W2B	10	1,800	389,2	64,2
XN100-240A-1504C-W2B	15	1,800	459,3	78,8
XN100-270A-1004C-W2B	10	1,800	370,2	62,4
XN100-270A-1504C-W2B	15	1,800	448	79,8
XN100-270A-2004C-W2B	20	1,800	504,9	91,4
XN100-330A-3004C-W2B	30	1,800	604,6	138,7
XN100-330A-4004C-W2B	40	1,800	589,9	168,6
XN100-330C-2004C-W2B	20	1,800	366	96,7
XN100-330C-2504C-W2B	25	1,800	406	116,3
XN125-250A-0504C-W2B	5	1,800	532,9	28,6
XN125-250A-0754C-W2B	7,5	1,800	619,7	37,3
XN125-250A-1004C-W2B	10	1,800	693,1	44,4
XN125-250A-1504C-W2B	15	1,800	770,6	49,3
XN125-270A-1504C-W2B	15	1,800	553,8	66,3
XN125-270A-2004C-W2B	20	1,800	669,9	76,9
XN125-270A-2504C-W2B	25	1,800	704,1	88
XN125-270B-2004C-W2B	20	1,800	903,1	58,3
XN125-270B-2504C-W2B	25	1,800	996,5	68,5
XN125-270B-3004C-W2B	30	1,800	1077,3	81,4
XN125-270B-4004C-W2B	40	1,800	1127,1	91,4
XN125-330A-4004C-W2B	40	1,800	858,2	106,9
XN150-250A-1004C-W2B	10	1,800	773	40,7
XN150-250A-1504C-W2B	15	1,800	937,9	51,2
XN150-250A-2004C-W2B	20	1,800	1009,4	61,4
XN150-270B-2504C-W2B	25	1,800	1515,5	51



Pump name	Motor power [hp]	Speed [rpm]	Q _{BEP} [US g.p.m.]	H _{BEP} [ft]
XN150-270B-3004C-W2B	30	1,800	1657,7	55,8
XN150-270B-4004C-W2B	40	1,800	1783,5	66,1
XN150-300A-2504C-W2B	25	1,800	1020,2	75,7
XN150-300A-3004C-W2B	30	1,800	1113,4	83,6
XN150-300A-4004C-W2B	40	1,800	1194,4	92,8
XN200-250A-1504C-W2B	15	1,800	1122,9	43,1
XN200-250A-2004C-W2B	20	1,800	1298,7	49,8
XN200-250A-2504C-W2B	25	1,800	1451,1	55,7
XN200-270B-2504C-W2B	25	1,800	1411,8	50,6
XN200-270B-3004C-W2B	30	1,800	1549,5	55,5
XN200-270B-4004C-W2B	40	1,800	1783	63,9



13.8 Name plate

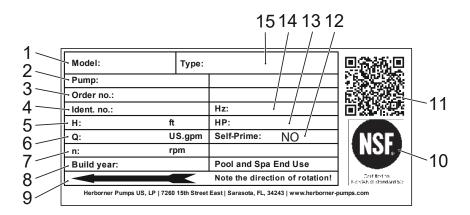


Fig. 142 Name plate

The name plate is located on the fan hood (herborner.X-N and herborner.X-N-PM) or the motor casing (herborner.X-N-C) and contains the following information:

- 1 Model designation
- 2 Pump designation
- 3 Order number
- 4 Article number
- 5 Nominal head [ft]
- 6 Nominal rate of flow [US.gpm]
- 7 Nominal speed [rpm]
- 8 Build year
- 9 Rotation indicator arrow
- 10 NSF logo
- 11 QR-code
- 12 Operating mode
- 13 Power output [hp]
- 14 Frequency [Hz]
- 15 Pump



Type code

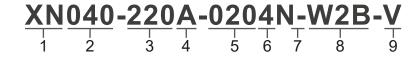


Fig. 143 Type code

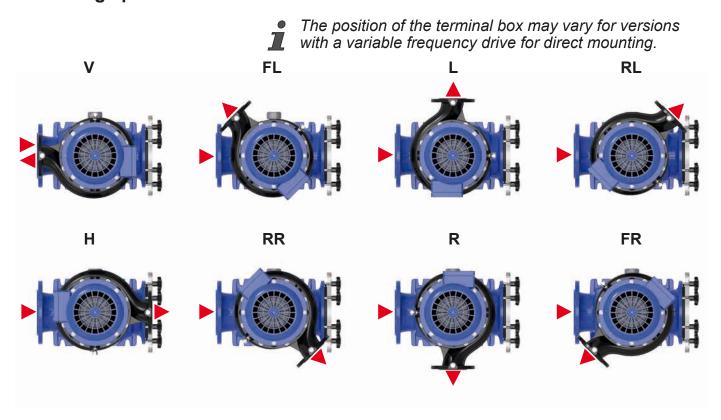
- 16 Design
- 17 Flange nominal diameter
- 18 Design dimensions
- 19 Version
- 20 Motor power
- 21 Speed
- 22 Motor type
- 23 Type of material
- 24 Flange position

Name	Type code identification	Meaning
Design	XN	herborner.X-N
Nominal diameter of outlet/ pressure side flange	040	Ø DF: 1 ½"
	050	Ø DF: 2"
	065	Ø DF: 2 ½"
	080	Ø DF: 3"
	100	Ø DF: 4"
	125	Ø DF: 5"
	150	Ø DF: 6"
	200	Ø DF: 8"
Design dimensions	220	Diameter centering
Version	A-Z	Design version [mm]
Motor power	020	2 HP
	030	3 HP
	050	5 HP
	075	7.5 hp
	100	10 HP
	150	15 HP
	200	20 HP
	250	25 HP
	300	30 HP
	400	40 HP
	500	50 HP
	600	60 HP
	750	75 HP
	1000	100 HP



Name	Type code identification	Meaning
Speed	4	1800 rpm
Motor type	N	Standard motor
	P	Permanent magnet motor
	C	Heat exchanger motor
Type of material	W2B	See type of material
	W30	See type of material
	W40	See type of material
	W60	See type of material
Flange position	V	Front
	FL	Center between front and left
	L	Left
	RL	Center between rear and left
	Н	Rear
	RR	Center between rear and right
	R	Right
	FR	Center between front and left

13.9 Flange position





Type of material

Individual parts	W2B	W30	W40	W60
Filter casing	AISI A48-40B 1)	AISI A48-40B 2)	AISI A48-40B 2)	AISI A48-40B 2)
Filter strainer	AISI 316Ti	AISI 316Ti	AISI 316Ti	AISI 316Ti
Filter cover	PMMA	PMMA	PMMA	PMMA
Impeller protector	POM/FKM	-	-	-
Pump casing	AISI A48-40B 3)	C90700	ASTM A351 CF8M	ASTM A890 Grade 1B
Intermediate casing	AISI A48-40B ³⁾	C90700	ASTM A351 CF8M	ASTM A890 Grade 1B
Casing cover	AISI A48-40B ³⁾	C90700	ASTM A351 CF8M	ASTM A890 Grade 1B
Impeller	C95800	C95800	ASTM A351 CF8M	ASTM A890 Grade 1B
Mechanical seal	SiC/SiC/FKM	SiC/SiC/FKM	SiC/SiC/FKM	SiC/SiC/FKM
Carbon mechanical seal	Chrome steel/carbon/NBR	Chrome steel/car- bon/NBR	Chrome steel/carbon/NBR	Chrome steel/carbon/NBR
Seal cover	AISI A48-40B	AISI A48-40B	ASTM A351 CF8M	ASTM A890 Grade 1B
Motor shaft	AISI 316Ti	AISI 316Ti	AISI 316Ti or 318LN	AISI 316Ti or 318LN
Mechanical seal protector	C95800	-	-	-

¹⁾ Interior with epoxy resin hot powder coating

²⁾ Medium-sided hardened rubber coating

⁴⁾ With thick-film coating



13.10 Torque values

Thread	Tightening torque (lbf/ft)
No. 8 - 32 UNC	1.3
3/8" - 16 UNC	22
7/16" - 14 UNC	37
5/8" - 11 UNC	89
3/4" - 10 UNC	165
7/8" - 9 UNC	336
1" - 8 UNC	406
1 1/2" - 12 UNF	1254
G 3/8"	30
G 1/2"	52



14 Index	Control systems89
A	D
Analog pre-filter monitoring58	Danger situation35, 96
Analog pressure sensor unit60	Danger zone23
Assembling the pump154	Delivery63
Assembly154	Digital pre-filter monitoring58
Installing the herborner.X-N-C pipes 173	Dimensions
Seal Guard system162	herborner.X-N191
Standard version155	herborner.X-N-C200
Assembly tool60	herborner.X-N-PM196
	Direction of rotation27, 90
B	Disassembly133, 187
Block motor terminal assignments	Draining the herborner.X-N-C136
herborner.X-N50	Seal Guard system144
herborner.X-N-C51	Standard version137
herborner.X-N-PM51	Disposal190
Brief description16	Draining98
С	E
Checking the block motor115	Ease of movement27, 100
Cleaning the block motor113	Electrical connection83, 84, 86, 87, 115
Cleaning the condensation water drain holes114	Electrical installation83
Cleaning the filter strainer111	Electrical power parameters
Cleaning the pump casing117	herborner.X-N206
Configuration97	herborner.X-N-C207
Connection diagram	herborner.X-N-PM206
herborner.X-N50	Water to be pumped208
herborner.X-N-C51	Electric shock
herborner.X-N-PM51	Emergency stop96
Connections	Emissions
Pumn 55	herborner.X-N215



herborner.X-N-C216	herborner.X-N-C	205
herborner.X-N-PM215	herborner.X-N-PM	204
Environment209	Motor wiring	
F	herborner.X-N	50
Filling up89	herborner.X-N-C	51
Flooding danger26	herborner.X-N-PM	51
Flood-proof version103	N	
Functional structure48	Name plate	224
	Noise	
n an emergency96	0	
n case of danger35, 96	Operating conditions	209
nstallation69	Operating materials	209
ntended use21	Operating modes	48
	Operating period	209
Labels25	Overview	16, 47
Leaks109, 118	Р	
Lifting points66	Personal protective equipment	41
List of spare parts	Personnel	37
herborner.X-N-C180	Pressure side	77
herborner.X-N/herborner.X-N-PM178	Protecting the environment	45, 106
Long Life set59	Lubricants	46
W	Pump disassembly	133, 187
Maintenance schedule106	Pump performance	
Marking25	herborner.X-N	217
Materials184	herborner.X-N-C	221
Misuse22	herborner.X-N-PM	219
Modules16	Pump weights	
Motor fault129	herborner.X-N	191
Motor type	herborner.X-N-C	200
herborner X-N 204	herborner.X-N-PM	196



R	Switching on again	.28, 123
Replacement filter strainer59	Safety devices	
Requirements at the installation site68	Air bleeding device	24
Requirements for the foundations 209	Ball valve	23
Residual risks	Compensators	25
S	Electrical overcurrent protection	
Safety	Gate valve	
Additives44	Main switch with emergency stop	
Collected water	Non-return valve	
Dry running42, 95	Seal Guard system	
Electrical voltage 26, 30, 81, 104, 186	Temperature monitor	
Fan and impeller31,90	variable frequency drive	
Flooding danger26,42	Vibration dampers	
Frequent switching43, 96	Safety labels	
Heavy weight132	Scope of delivery	
High chlorine levels44, 96	Screw connections70, 1	•
Hot surfaces33	Screwed connection	
Hot water 123	Seal Guard system57, 120, 1	44, 102
Improper disassembly187	Seal Guard system lubrication oil volume	210
Improper installation82	Spare parts	.45, 178
Improperly done maintenance jobs 105	Special tools	183
Improperly fixed faults122	Star handles	74
Improper transport62	Storage	.64, 102
Insufficient cooling43	Suction side	75
Loads held aloft62, 67	Switching off	97
Noise33, 94	Switching on	97
Offset center of gravity61	Symbols used in this manual	18
Pump casing67	Т	
Sharp edges 133	Table of faults	
Strong magnetic fields26, 32, 91, 94, 105, 132	Faults in the block motor	129



Faults on the pump	124
Terminal box	
herborner.X-N	50
herborner.X-N-C	51
herborner.X-N-PM	51
The installation site	68, 209
The owner	35
The owner's duties	35
Torque values	228
Transport	
Crane	65
Pallet	63
Pump	65
Transport inspection	65
Type code	225
U	
Unauthorized persons	37
Use	21
V	
Variable frequency drive	56











Herborner Pumps US, LP

10550 Plano Rd, Dallas, TX 75238, USA
Phone: +1 469 928 0838
info@herborner-pumpen.com
www.herborner-pumpen.com

