

Submersible Waste Water Pump

Ama-Drainer N 301/302/303

60 Hz

Type Series Booklet



Legal information/Copyright

Type Series Booklet Ama-Drainer N 301/302/303

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Building Services: Drainage

Drainage Pumps/Waste Water Pumps

Ama-Drainer N 301/302/303



Main applications

- Drainage
- Disposal
- Drainage systems
- Lowering groundwater levels
- Maintaining groundwater levels
- Drainage

Fluids handled

Pump for handling clean to turbid water not containing aggressive, abrasive or solid substances.

- Faecal-free waste water
- Grey water
- River, lake and groundwater

Ama-Drainer N C variant for aggressive water

- Seawater
- Brackish water
- Water containing salt

Operating data

Operating properties

| Characteristic | | Value |
|-----------------------|---|--------------------------------------|
| Flow rate | Q | Up to 14 m ³ /h (3.9 l/s) |
| Head | H | Up to 12 m |
| Operating temperature | t | Up to +50 °C |

Designation

Example: Ama-Drainer N 301 S E / C

Key to the designation

| Code | Description |
|-----------------|--------------------------------|
| Ama-Drainer N | Type series |
| 301 | Code |
| 301 | |
| 302 | |
| 303 | |
| S | Float switch |
| S | = With float switch |
| N | = Without float switch |
| E | Motor |
| E | = Single-phase AC motor |
| C | Material |
| C | = Variant for aggressive water |
| - ¹⁾ | = Version for waste water |

Design details

Design

All parts which will come into contact with the fluid handled are made of rust-proof materials.

- Fully floodable submersible motor pump
- Close-coupled design
- Vertical installation
- Single-stage
- Integrated swing check valve
- Pump controlled by integrated float switch
- Enclosure: IP68 (permanently submerged) to EN 60529 / IEC 529
- Max. immersion depth 2 m

Installation types

- Transportable models

Drive

- Jacket-cooled single-phase AC motor
- Integrated temperature switch
- With cable and shock-proof plug

Shaft seal

- Drive-end: 1 shaft seal ring
- Pump end: two shaft seal rings
- A lubricant reservoir in-between the seal elements ensures cooling and lubrication.

Bearings

- Enclosed bearings, grease-packed for life

¹⁾ Blank = version for waste water (standard)

Materials


Material variant Standard / C

| Pump section | Material variant Standard N 301/302/303 | Material variant C N 301/302/303 |
|-------------------------|--|---|
| Pump casing | Polypropylene, 30 % glass fibre reinforced | |
| Discharge casing | Polypropylene, 30 % glass fibre reinforced | |
| Casing cover | Noryl GNF3 | |
| Impeller | Noryl GNF2 | |
| Motor housing | Chrome nickel steel (1.4301) | Chrome nickel molybdenum steel (1.4571) |
| Shaft | 1.4028 | Chrome nickel molybdenum steel (1.4571) |
| Float switch (float) | Polypropylene | |

Product benefits

- Ready-to-connect, easy installation and commissioning
- Maintenance-free bearings grease-packed for life
- Low-weight, high-quality noise-absorbing plastic casing with sturdy handle, resistant to corrosion, impact and abrasion

Certification

| Certification | Effective in: | Comment |
|--|---------------|-----------|
|  | Europe | All sizes |

Selection table

The table listing fluids handled is a selection tool for drainage duties. It should be used for orientation and is based on KSB's many years of experience. The data are reference values and should not be considered to be generally binding recommendations. They shall not be the basis for warranty claims. Please contact your nearest KSB sales branch and/or our technical departments for in-depth advice.

Ama-Drainer N 301/302/303

| Fluids handled | Material variant | |
|--------------------------|------------------|---|
| | Standard | C |
| Antifrogen-water mixture | X | - |
| Cider | X | - |
| Ethylene glycol | X | - |
| Beer | X | - |
| Spirits | X | - |
| Buttermilk | X | - |
| Calcium acetate | X | - |
| Calcium hydroxide | X | - |
| Deionised water | X | - |
| Peanut oil | X | - |
| Vinegar | - | X |
| Liquid fertiliser | X | - |
| Antifreeze | X | - |
| Glycol | X | - |
| Glycerine | X | - |
| Grisiron | X | - |
| Uric acid | X | - |
| Potassium hydroxide | X | - |
| Calcium carbonate | X | - |

| Fluids handled | Material variant | |
|---|------------------|---|
| | Standard | C |
| Coconut oil | X | - |
| Evaporated milk | X | - |
| Lemonades | X | - |
| Corn oil | X | - |
| Milk | X | - |
| Whey | X | - |
| Sodium carbonate | X | - |
| Sodium chloride up to 3 % concentration | - | X |
| Sodium hydrogen phosphate | X | - |
| Sodium nitrate | X | - |
| Sodium perborate | X | - |
| Sodium sulphate | X | - |
| Polyglycols | X | - |
| Rapeseed oil | X | - |
| Castor oil | X | - |
| Silicone oil | X | - |
| Silo leachate | - | X |
| Soy-bean oil | X | - |
| Edible vinegar | - | X |
| Edible oil | X | - |
| Trisodium phosphate | X | - |
| Vaseline | X | - |
| Washing machine lye | X | - |
| Water | | |
| Drainage water | X | - |
| Fire-fighting water | X | - |
| Heating water | X | - |
| Lime water | - | X |
| Boiler water | X | - |
| Condensate | - | X |
| Cooling water | X | - |
| Seawater | - | X |
| Raw water | X | - |
| Swimming pool water (DIN 19 643) | - | X |
| Salt water | - | X |
| Partly desalinated water | X | - |
| Fully desalinated water | - | X |

Technical data

Material variant Standard

| Code | ISO 7/1 Rp | Free passage max. | P ₁ | P ₂ | ~ I _N | Power cable H 07 RN-F.G. | | Mat. No. | [kg] |
|-------------|---------------|----------------------|----------------|----------------|------------------|-----------------------------|------------------------|----------|------|
| | | [mm] | [kW] | [kW] | [A] | [m] | [mm ²] | | |
| N 301 SE | Rp 1 1/4 | 10 | 0,50 | 0,21 | 2,15 | 5 | 3 x 0.75 ²⁾ | 39300089 | 4.5 |
| N 302 SE | Rp 1 1/4 | 10 | 0,75 | 0,36 | 3,3 | 5 | 3 x 0.75 ²⁾ | 39300092 | 6 |
| N 303 SE | Rp 1 1/4 | 10 | 1,15 | 0,6 | 5,0 | 5 | 3 x 0.75 ²⁾ | 39300095 | 6.2 |
| N 301 SE/NE | Rp 1 1/4 | 10 | 0,50 | 0,21 | 2,15 | 10 | 3 x 1.0 | 39300090 | 5.2 |
| N 302 SE/NE | Rp 1 1/4 | 10 | 0,75 | 0,36 | 3,3 | 10 | 3 x 1.0 | 39300093 | 6.7 |
| N 303 SE/NE | Rp 1 1/4 | 10 | 1,15 | 0,6 | 5,0 | 10 | 3 x 1.0 | 39300096 | 6.9 |

Material variant C

| Code | ISO 7/1 Rp | Free passage max. | P ₁ | P ₂ | ~ I _N | Power cable H 07 RN8-F.G. | | Mat. No. | [kg] |
|---------------|---------------|----------------------|----------------|----------------|------------------|------------------------------|--------------------|----------|------|
| | | [mm] | [kW] | [kW] | [A] | [m] | [mm ²] | | |
| N 301 SE/NE/C | Rp 1 1/4 | 10 | 0,50 | 0,21 | 2,15 | 10 | 3 x 1.0 | 39300091 | 5.2 |
| N 302 SE/NE/C | Rp 1 1/4 | 10 | 0,75 | 0,36 | 3,3 | 10 | 3 x 1.0 | 39300094 | 6.7 |
| N 303 SE/NE/C | Rp 1 1/4 | 10 | 1,15 | 0,60 | 5,0 | 10 | 3 x 1.0 | 39300097 | 6.9 |

Operating limits

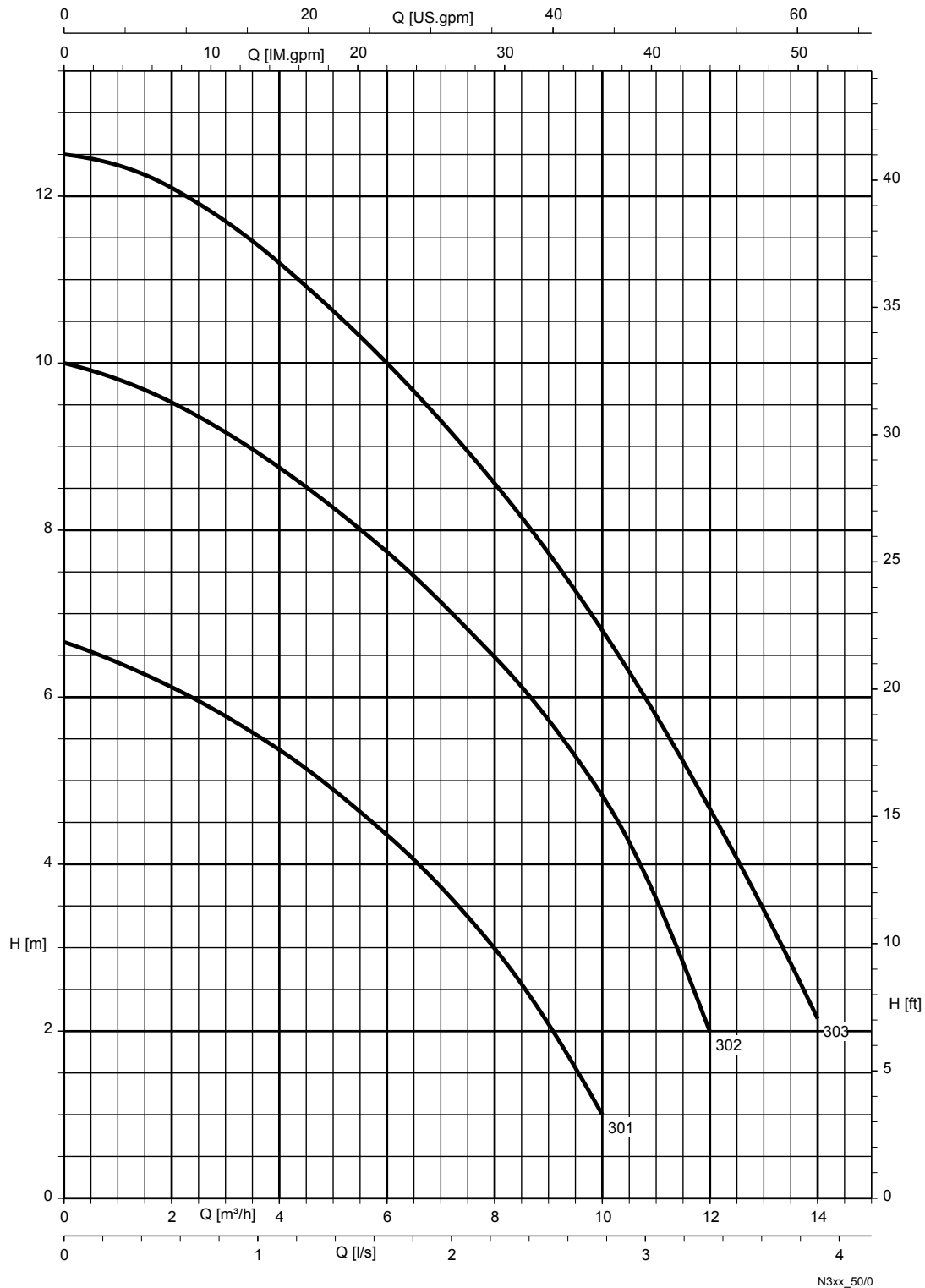
Operating limits

| Characteristic | | Ama-Drainer N 301 | Ama-Drainer N 302 | Ama-Drainer N 303 |
|--|------------|--------------------------------|--------------------------------|--------------------------------|
| Head | | 6.5 m max. | 10 m max. | 12.5 m max. |
| Flow rate | | 10 m ³ /h max. | 12 m ³ /h max. | 14 m ³ /h max. |
| Submergence | | 2 m max. | 2 m max. | 2 m max. |
| Voltage/frequency | | 230 V/60 Hz | 230 V/60 Hz | 230 V/60 Hz |
| Starting current | | 4.1 A | 9.5 A | 11.5 A |
| Max. temperature, continuous | | 0 to 50 °C | 0 to 50 °C | 0 to 50 °C |
| Particle size (max. diameter) | | 10 mm | 10 mm | 10 mm |
| Residual water level (Type NE for manual operation) | | 15 mm min. | 15 mm min. | 15 mm min. |
| Power input | | 500 W max. | 750 W max. | 1150 W max. |
| Enclosure | | IP68 | IP68 | IP68 |
| Power supply cable | | H07RN8-F 3 x 1 ² | H07RN8-F 3 x 1 ² | H07RN8-F 3 x 1 ² |
| | Type SE | H05RN8-F 3 x 0.75 ² | H05RN8-F 3 x 0.75 ² | H05RN8-F 3 x 0.75 ² |
| Frequency of starts [starts/hour] | | 30 maximum | | |

²⁾ Power cable H 05 RN8-F.G.

Characteristic curves

Ama-Drainer N 301, 302, 303; $n = 3500$ rpm, multi-vane impeller

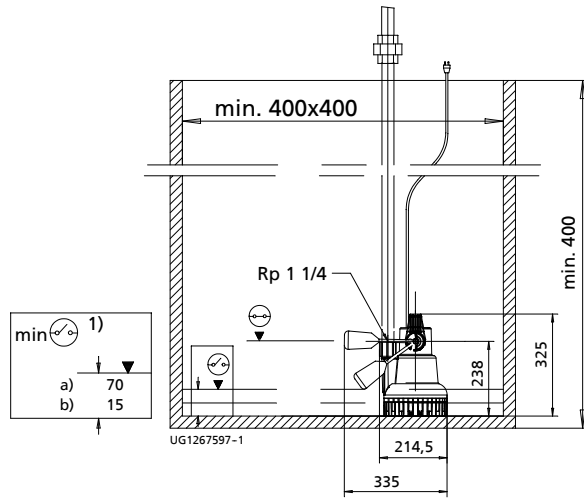


Free passage: 301/302/303 = 10 mm

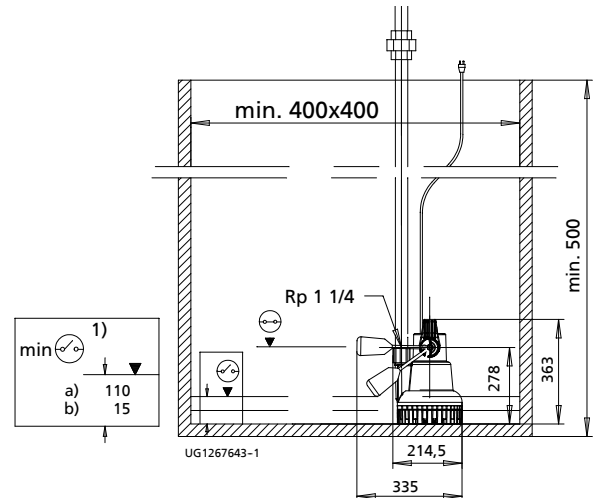
Dimensions

Outline drawings

N 301 SE



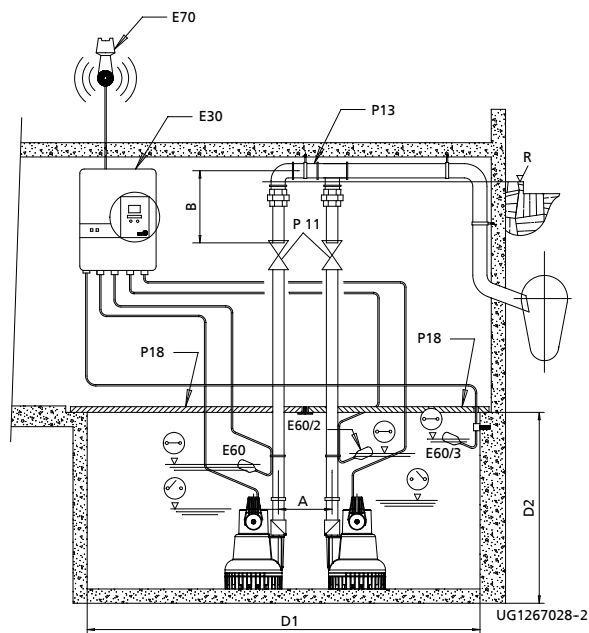
N 302 SE/303 SE



| | |
|----|----------------------|
| 1) | Residual water level |
| a) | Automatic |
| b) | Manual |

Typical arrangement of dual-pump station

N 301 NE/302 NE/303 NE



| | | | |
|-----|-------------|-------|-------------------------------|
| P11 | Gate valve | E30 | Control unit |
| P13 | Y-pipe | E60 | Float switch base load |
| P18 | Cover plate | E60/2 | Float switch peak load |
| R | Flood level | E60/3 | Float switch high water alert |
| | | E70 | Horn |










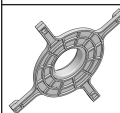

Dimensions [mm]

| Size | A | B | D ₁ | D ₂ |
|----------|-----|-----|----------------|----------------|
| 301 | 275 | 320 | 1060 (x500) | 400 |
| 302, 303 | 275 | 320 | 1060 (x500) | 500 |




Accessories

Pump accessories

Ama-Drainer N

| | Item | Description | Connection/ immersion depth | 301/ 302/ 303 | Mat. No. | [kg] |
|---|------|---|--------------------------------------|---------------------|----------|------|
|  | P10 | RK swing check valve Plastic, EN 12 050-4, with internal/internal thread ISO 7/1, full port and drain plug | Rp 1 1/4 | ✗ | 01009771 | 0.1 |
|  | | Lift check valve, stainless steel (1.4401) | Rp 1 1/4 | ✗ | 01084936 | 2.1 |
|  | P11 | Socket gate valve CuZn PN 16 with internal/internal thread and full port | Rp 1 1/4 | ✗ | 01014219 | 0.6 |
|  | P13 | Y-pipe for dual-pump sets, with external thread, galvanised steel | Rp 1 1/4 | ✗ | 18040311 | 4.1 |
|  | P18 | Cover plate, steel tread-proof, split, with profile joints and angle iron mounting frame (type A 560) for 500 x 500 mm pits (Dual-pump stations with P13 Y-pipe are equipped with 2 cover plates next to each other.) | Rp 1 1/4 | ✗ | 18075627 | 13 |
|  | P21 | A 25 B drain hose set (See P32) Comprising: rigid coupling with external thread, 6 m plastic hose DN 25, rapid-action hose coupling Rp 1 1/4, (free passage 21 mm) | Rp 1 1/4 | ✗ | 18079719 | 3 |
|  | P24 | Storz rigid coupling with internal thread to ISO 228/1 Aluminium alloy, for required piping components see P32 | C-G 1 1/2 | ✗ | 01002463 | 0.3 |
|  | P26 | Storz hose coupling, aluminium alloy Required counterpart see P24 | C 52 (DIN 14321) | ✗ | 00524551 | 0.3 |
|  | P28 | Plastic hose DN 40, with integrated C couplings, DIN 14811 | C 42-5 m | ✗ | 01062592 | 1.7 |
| | | | C 42-10 m | ✗ | 01062593 | 2.8 |
| | | | C 42-20 m | ✗ | 01062594 | 5 |
| | | Plastic hose DN 50, DIN 14811, with integrated C couplings Required piping components see P32 | C 52-5 m | ✗ | 00522262 | 2.3 |
| | | | C 52-10 m | ✗ | 00522263 | 4.2 |
| | | | C 52-20 m | ✗ | 00522264 | 5.7 |
|  | P31 | Bellmouth for draining residual water | | ✗ | 39300101 | 0.2 |
|  | P32 | Pipe extension for Storz rigid coupling C (P24) PVC hard, internal/external thread for use without swing check valve and union nut | IG Rp 1 1/4 / AG R 1 1/2 x 170 | ✗ | 11035587 | 0.2 |

Control units and switchgear

| | Item | Description | 230 V | Type | Current min - max [A] | Ama-Drainer N | | Mat. No. | [kg] |
|---|------|---|-------|---------------------------------------|--------------------------------|---------------|-------------|----------|------|
| | | | | | | 301 | 302/ 303 | | |
|  | E1 | MSE motor protection switchgear Float switch | ✗ | Back-up fuse max. 6 A MSE 25.1 | 1.8 - 2.6 | ✗ | - | 19070136 | 1 |
| | | | ✗ | Back-up fuse max. 10 A MSE 60.1 | 3.7 - 5.5 | - | ✗ | 19070138 | 1 |
|  | E10 | LevelControl Basic 2 control unit for single-pump station, IP54 For float switch or 4...20 mA sensor, optional master switch, 400 x 278 x 120 mm DOL starting, with manual-0-automatic selector switch, indicator lamps and control panel, high water alert, integrated alarm buzzer 85 dB(A), optional mains-independent alarm via rechargeable battery, operating hours counter/start-stop cycles per pump, voltage measurement, phase monitoring, pneumatic level measurement, indication of water level, volt-free contact for general fault message, motor temperature warning (thermal circuit breaker) – with automatic reset/re-start function, motor leakage/moisture monitoring | ✗ | BC1 230 ^{DFNO} 100 | up to 10 A | ✗ | ✗ | 19073760 | 4.5 |
|  | E30 | LevelControl Basic 2 control unit for dual-pump station, IP54 For float switch or 4...20 mA sensor, optional master switch, 400 x 278 x 120 mm Peak load operation function, stand-by pump, DOL starting, with manual-0-automatic selector switch, indicator lamps and control panel, high water alert, integrated alarm buzzer 85 dB(A), operating hours counter/start-stop cycles per pump, pneumatic: indication of water level, voltage measurement, phase monitoring, volt-free contact for general fault message, 230 V variant: with external socket, 400 V variant: with motor protection switch, mains-independent alarm via rechargeable battery optional | ✗ | BC2 230 ^{DFNO} 100 | up to 10 A | ✗ | ✗ | 19073774 | 4.7 |

Operation with mini control systems

For Ama-Drainer 301 SE/NE, 302 SE/NE and 303 SE/NE with 10 m power supply cable, the supplied locking disc must be mounted instead of the float switch (see operating instructions). Separate float switches are required for operation with mini control systems.

- at least 2 float switches for pump On/Off and high water alert

Two pumps:

- at least 2 float switches for pump On/Off
- at least 3 float switches for pump On/Off and high water alert

LevelControl with float switches

Single pump:

- at least 1 float switch for pump On/Off

Dual pump operation with two level switches at different levels

Two pumps installed in the same installation location should be operated via the LevelControl unit. This control unit enables automatic alternating, peak load and stand-by operation. An external alarm switchgear will not be required, as LevelControl features an integrated alarm function.

Connection to the control station

With the exception of MSE, each control unit features a volt-free contact for transmitting general fault messages to a control station.

LevelControl Basic 2 control units

| Feature | Single-pump station Float switch or 4...20 mA sensor | Dual-pump station Float switch or 4...20 mA sensor |
|---|--|--|
| 230 V: 6.0 - 10 A | BC1 230 ^{DFNO} 100 | BC2 230 ^{DFNO} 100 |
| Functions | | |
| Tank drainage | X | X |
| Tank filling via float switch | X | X |
| Stand-by pump: 1 pump redundant | - | X |
| Automatic pump changeover after every start | - | X |
| Automatic pump changeover in the case of a pump fault | - | X |
| Peak load operation function | - | X |
| Runtime limitation | X | X |
| OFF via after-run time | X | X |
| OFF via level | X | X |
| Operation check run after idle period | X | X |
| Alert memory | X | X |
| Display and operation | | |
| 7-segment display | X | X |
| Indication of water level | Switching points | Switching points |
| For each pump: operation/fault/pump running | Multicolour LED | Multicolour LED |
| General fault (traffic light) | LED | LED |
| High water | LED | LED |
| Mains voltage | X | X |
| Mains frequency | - | - |
| Motor current per pump | - | - |
| Operating hours of each pump | X | X |
| Operating hours of the system | - | - |
| Starts per pump | X | X |
| Effective power per pump | - | - |
| Phase monitoring | X | X |
| Change of switching level via control panel | X | X |
| Housing H x W x D, IP54 | | |
| Plastic 361 x 278 x 120 mm | X | X |
| Sheet steel 400 x 300 x 155 mm | - | - |
| Sheet steel 600 x 400 x 200 mm | - | - |
| Built-in components | | |
| Master switch (lockable) | o | o |
| Manual-0-automatic selector switch per pump | X | X |
| DOL starting | X | X |
| Star-delta starting | - | - |
| Shockproof socket 230 V | X | X |
| Motor protection | | |
| Fuse per pump | X | X |
| Motor protection switch per pump (overcurrent and short-circuit protection) | - | - |
| Motor temperature warning input - self-acknowledging | X | X |
| Motor temperature alert input - manual acknowledgement | X | X |
| Pump | | |
| Thermal circuit breaker (TCB) / bimetal switch per pump | Bimetal switch in the motor | Bimetal switch in the motor |
| Installation options | | |
| Rechargeable battery for powering the electronics, sensors, alarm equipment | o | o |




| Feature | Single-pump station Float switch or 4...20 mA sensor | Dual-pump station Float switch or 4...20 mA sensor |
|--|--|--|
| Alarm equipment | | |
| 1 free alarm input | X | X |
| 1 digital high water alert input (e.g. for float switch) | X | X |
| Volt-free contact (changeover contact) for general fault/operation message | X | X |
| Piezo buzzer 85 dB(A) | X | X |
| Horn 105 dB(A) / alarm combination / alarm strobe light 12 V DC | o | o |
| Inputs/outputs | | |
| Inputs for float switches | 4 | 4 |
| 4...20 mA analog input | X | X |
| Integrated pneumatic pressure sensor up to 3 metres of water; up to 10 metres on request | - | - |
| Bubbler system with compressor up to 2 metres of water | - | - |
| Remote acknowledgement | X | X |
| 12 V DC connection for horn, alarm combination, alarm strobe light | X | X |
| Sensors | | |
| Float switch (NO contact) | o | o |
| F1 moisture sensor | o | o |
| Tools | | |
| KSB ServiceTool for Windows XP | o | o |



Key to the symbols

| Symbol | Description |
|--------|---------------|
| o | Optional |
| X | Available |
| - | Not available |


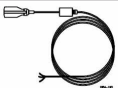





Alarm switchgears for pumps without ATEX

AS 0/AS 1/AS 2/AS 4/AS 5

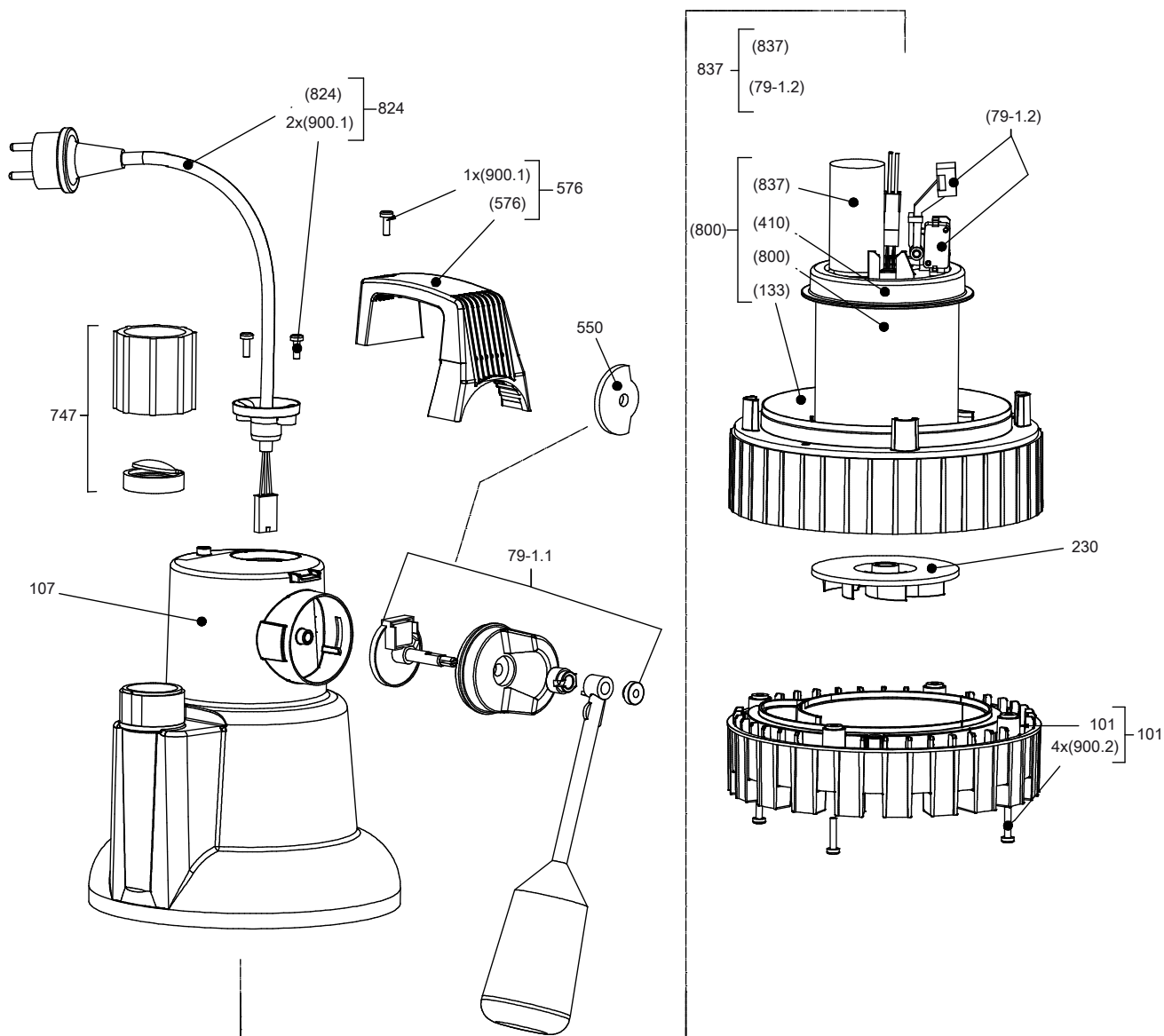
| | Item | Description | Mat. No. | [kg] |
|---|------|---|----------|------|
|  | E50 | Alarm switchgear AS 0 with circuit breaker, piezoceramic signal transmitter, 85 dB(A) at a distance of 1 m and 4.1 kHz, green equipment-on lamp Plastic housing IP20, 140 x 80 x 57 mm. Use float switch, F1 moisture sensor (item E64), M1 alarm contactor or signal relay of control unit as contactor. | 29128401 | 0.5 |
|  | E51 | Alarm switchgear AS 2 with circuit breaker, piezoceramic signal transmitter, 85 dBA at a distance of 1 m and 4.1 kHz, green equipment-on lamp, volt-free contact for hook-up to a control station. Plastic housing IP20, 140 x 80 x 57 mm. Use float switch, F1 moisture sensor (item E64) or signal relay of control unit as contactor. | 29128422 | 0.5 |
|  | E52 | Alarm switchgear AS 4 with circuit breaker, piezoceramic signal transmitter, 85 dB(A) at a distance of 1 m and 4.1 kHz, green equipment-on lamp, volt-free contact for hook-up to a control station, self-charging power supply unit for 5 hours' operation in the event of power failure Plastic housing IP20, 140 x 80 x 57 mm. Use float switch (E60), F1 moisture sensor (item E64) or signal relay of control unit as contactor. | 29128442 | 0.5 |

| | Item | Description | Mat. No. | [kg] |
|---|------|--|----------|------|
|  | E53 | Alarm switchgear AS 5 Mains-independent, with self-charging power supply unit for 10 hours' operation in the event of power failure, mains pilot LED, fault indicator light, horn-off push button, volt-free contact for hook-up to a control station, ready for connection with 1.8 m connection cable and plug. ISO housing IP41, 190 x 165 x 75 mm. Use float switch (E60) or signal relay of control unit as contactor. | 00530561 | 1.7 |
|  | E55 | Alarm switchgear AS 1 In ISO plug housing IP30, mains-independent, with self-charging power supply unit for 5 hours' operation in the event of a power failure, acoustic signal 70 dB(A) with circuit breaker and integrated signal transmitter with 3-metre connection cable, max. 60 °C, not suitable for steam and condensate. 1. High water alert by suspending the moisture sensor in a (pump) sump above the pump start-up point. 2. Water alarm signal at a water level of only 1 mm (!), by placing the contactor on the floor of rooms at risk of flooding, e.g. the cellar or next to the washing machine in the kitchen or bathroom. | 00533740 | 0.9 |

Control unit/switchgear accessories

| | Item | Description | | Ama-Drainer N | | | Mat. No. | [kg] |
|---|------|--|--|---------------|-----|-----|----------|------|
| | | | | 1 ~ | | | | |
| | | | | 301 | 302 | 303 | | |
|  | E60 | Float switch with free cable end (NO contact) | 3 m | X | X | X | 11037742 | 0.5 |
| | | | 5 m | X | X | X | 11037743 | 0.8 |
| | | | 10 m | X | X | X | 11037744 | 1.3 |
| | | | 15 m | X | X | X | 11037745 | 1.8 |
| | | | 20 m | X | X | X | 11037746 | 2.4 |
| | | | 25 m | X | X | X | 11037747 | 2.9 |
| | | | 30 m | X | X | X | 11037748 | 3.4 |
|  | E61 | Float switch with free cable end, oil resistant (NO contact) | 5 m | X | X | X | 11037753 | 0.8 |
| | | | 10 m | X | X | X | 11037754 | 1.2 |
| | | | 20 m | X | X | X | 11037755 | 2 |
|  | E62 | Float switch with free cable end (NC contact) | 5 m | X | X | X | 11037756 | 0.8 |
| | | | 10 m | X | X | X | 11037757 | 1.4 |
| | | | 20 m | X | X | X | 11037758 | 2.6 |
|  | E64 | Leakage sensor F 1 | 3 m | X | X | X | 19072366 | 0.2 |
|  | E70 | Horn, 12 V DC, 105 dB(A), 1.2 W | | X | X | X | 01086547 | 0.1 |
|  | E80 | Safety switch STECKMAT | | X | X | X | 00534217 | 0.5 |
|  | E90 | Rechargeable battery retrofit kit for LevelControl Basic 2, for powering the electronics, the float switches or internal pressure sensor and the alarm equipment (buzzer, horn, alarm combination), for single-pump and dual-pump stations | For type BC, includes 2 rechargeable batteries 6 V, 1.3 Ah and charging unit | X | X | X | 19074194 | 0.8 |

Exploded view and list of components



Exploded view

List of components

| Part No. | Description |
|----------|---------------------------------------|
| 101 | Pump casing |
| 107 | Discharge casing |
| 230 | Impeller |
| 550 | Locking disc for float |
| 576 | Handle |
| 747 | Swing check valve and inspection hole |
| 79-1.1 | Automatic switch (external) |
| 800 | Motor |
| 824 | Cable |



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