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Drum and Container pumps

Series 400 – for low-viscosity media

FLUX

More than just pumps



About FLUX

FLUX pump technology – the right solution even for demanding fluids



More than just pumps

One brand. One promise.

The FLUX name has been synonymous with pump technology for more than 60 years. It was the invention of the electric drum pump that sparked it all off. In the meantime, of course, the technology has become more sophisticated. FLUX company innovations have markedly improved working routines for filling and transferring fluids.

It is often said that medium-sized companies are the engines of progress. We would be pleased if our family business were able to substantiate this claim.

When you choose FLUX you are making a good decision for the long term. With our products we want to assist you to save time and money and by the way – spare your nerves as well. We are therefore delighted when you discuss your requirements with us.

Warmly,

Klaus Hahn,
CEO FLUX-GERÄTE GMBH

Pumping, emptying, mixing, filling and metering – when liquids are set in motion the requirements are very diverse. In any case the process must run smoothly. This is what the FLUX brand name stands for. It is recognised across the globe as a byword for quality, for safety and for solutions which are able to fulfil every single demand on a long-term basis.

Smooth-running processes – FLUX not only guarantees this for liquids which are easy to pump but also when the pumping medium is viscous or doesn't flow at all, when it is aggressive or used in processes which are common in the hygiene sector or sectors where there is an explosion hazard. To ensure that the tasks are solved in the best possible way for the customer FLUX has a huge range of expertise to offer. In other words, a lot more than just pumps. From a technical point of view this means a comprehensive product range of pumps, motors, flow meters, accessories and a whole lot more. From a project point of view, "More than just pumps", means accompanying our customers from the first telephone call through to the end solution – and if required beyond that.

This is how FLUX keeps processes moving. Long-term. Simple, complex or custom-made inclusive design assignments: FLUX is prepared for any request and in particular for the fact that our customers need more than just pumps.



The worldwide first electrical drum pump

Quality

The brand name FLUX is a quality promise to our customers. They rightly trust that they always receive the best quality from us.

- **Reliability.** In concrete terms: Every minute of downtime is a minute too much. FLUX strives to prevent downtimes in the best way possible.
- **Long service life.** The construction which has been thought through into every detail ensures long-term reliability even under the most severe operating conditions.
- **Made in Germany.** FLUX has its central production location in Maulbronn, Baden-Württemberg.
- **Awards.** Such as the iF Product Design award which FLUX brand products have won several times underline the unique claim of the FLUX brand.



Manufacture of the inner tube reinforced with metal core for plastic versions.



Each pump is checked.



Anchor test in the winding department.

Milestones of drum pump technology

As an undisputed pioneer, FLUX is always at the forefront when it comes to innovative product solutions.

- **1950:** The world's first electric drum pump is named FLUX.
- **1953:** The first explosion protected drum pump is a real revolution – it was approved by the Physical-Technical Federal Institution.
- **1997:** FLUX puts the world's first explosion-protected commutator motor on the market that was built in accordance with the ATEX directive 94/9/EC and approved by the Physical-Technical Federal Institution.
- **2003:** FLUX supplemented its range of explosion-protected motors by the world's first brushless drum pump motor.
- **2014:** With the FBM-B 3100 FLUX presents the world's first brushless battery motor for drum pumps.



The world's first electric drum pump in operation.



The hitherto most recent descendant of the world's first electric drum pump, the battery motor FBM-B 3100.

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FLUX drum and container pumps

For every application and industry the right solution

Ideal for mobile filling of liquid media

FLUX drum and container pumps are suitable for pumping various low-viscosity and also especially aggressive and highly-flammable fluids. The axial-impeller pumps provide a pulsation-free pumping action. Modular design allows different pumps to be driven by the same motor. As a result of their low weight, the pumps can be easily carried from container to container.

Easy handling of motor and pump keeps changeover times short. Pumps with and without mechanical seal are available, as well as versions for higher pumping heads and mixing pumps. FLUX drum and container pumps are available in versions with explosion protection, with 3A certification as well as FLUX FOOD pumps (Directive (EC) 1935/2004 and FDA CFR 21 compliant). Pre-configured pump sets for typical applications are available.

Customized tailor-made solutions

The FLUX product range goes from individual components, to pre-configured pump kits and accessories, to manual and semi-automatic filling systems as well as special solutions for demanding liquids. For special demands, FLUX can design and construct custom-made products.

Suitable motors for every requirement

For driving FLUX pumps, a wide range of electrical to pneumatic motors is available. Even if you work in hazardous areas or with flammable liquids. Depending on the application, FLUX drum and container pumps can be combined with different motors - commutator motors, brushless motors, three-phase motors and pneumatic motors.

Flow rate, delivery head – test bench value and individual practical value

The max. flow rate and max. delivery head stated for the individual pumps are test bench values. These are measured with water at 20 °C at the discharge connection of the pump, without attachments such as hose, nozzle, flow meter. The values for flow rate and delivery head that can be achieved in practice are lower and depend on the individual application, the media properties and the flow rate.
the individual application, the media properties and the pump configuration. See technical data sheets / performance charts.

FLUX has the right solution for every industry: Thus, an enormous range of different media is covered with application-specific products. Even when it comes to conveying demanding liquids – e.g. highly aggressive fluids.

Chemical | **Industry** | **Surface technology** | **Paints and lacquers** | **Petrochemicals** | **Foods** | **Cosmetics** | **Pharmacy** | **Water treatment** | **Agriculture**

FLUX products have been developed and certified for use around the world; they comply with the highest demands and safety standards. No matter if food, pharma or industry – if hygienic or hazardous areas: For every application we have the suitable pump model.

FLUX drum and container pumps

Good to know when selecting the pump type

The perfect duo

FLUX drum pumps operate on the principle of the axial-impeller pumps and provide a pulsation-free pumping action. The motor drives the drive shaft via a coupling. At the end of the drive shaft there is a propeller-like impeller. The impeller must be completely covered with the medium so the pump can work. With the rotation, the medium is axially transferred to the outlet, i.e. parallel to the pump shaft. All pump types can be temporarily operated against closed valve (hand nozzle, ball valve) up to the indicated max. operating temperature.

Are you looking for a suitable combination of motor and pump? The large FLUX product range provides a unique selection of pump types and motors. Furthermore, there are numerous materials for pumps and O-rings as well as different impellers for the requested delivery rate. The following explanations and our FLUX experts will help you to make the right choice.

You have the choice!

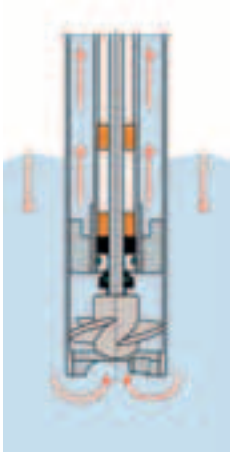
Mechanical seal or without seal

For standard applications, FLUX provides two high-quality pump types: pumps with mechanical seal or pumps without seal in the liquid area. Both pump types have an ingenious design.

Mechanical seal

Advantages

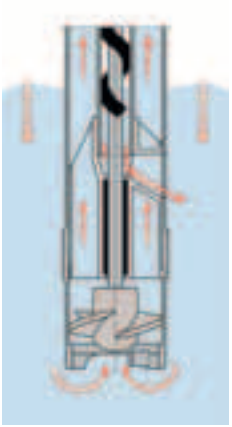
- **Ideal for frequent medium changes, hardening media, fast drying media, crystallizing media**
- **Can be taken apart into main components easily and quickly for cleaning**
- **Higher service life on abrasive media compared to sealless pumps**
- **High stability plastic pumps enable immersion lengths of up to 3.000 mm**
- **Versions in stainless steel and Hastelloy C can be used in hazardous areas***
- **FOOD version conforms EC 1935/2004 and FDA CFR 21 for contact with food**



Sealless

Advantages

- **No seal wear**
- **Optimal emptying of the inner tube**
- **High service life**
- **Low wear of guide bearing and shaft**
- **Long bearing life**
- **Particularly suited for hydrochloric acid and chromic acid**
- **Stainless steel version for use in hazardous areas***
- **Versions for use with AdBlue®** also available**

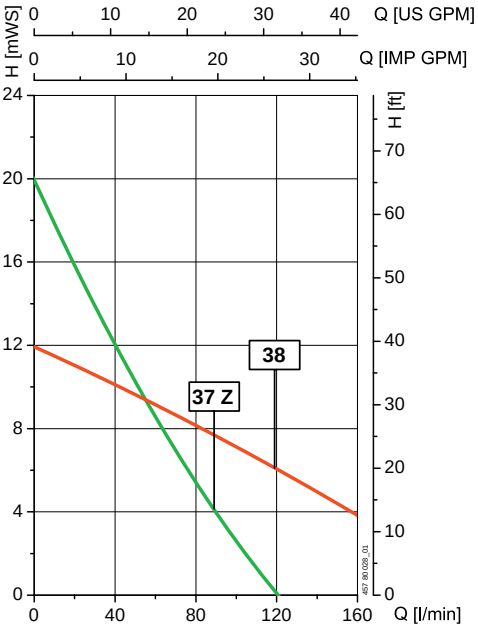


* according to EC Directive 2014/34/EU

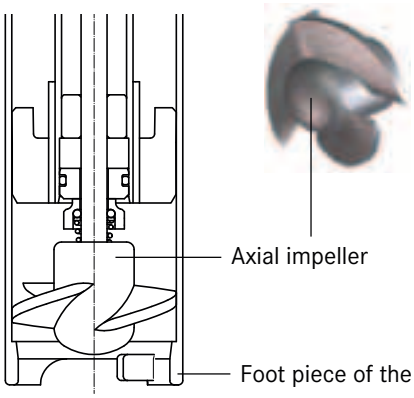
** AdBlue® is a registered trademark of: Verband der Automobilindustrie e.V. (VDA)

Impellers for the requested delivery rate

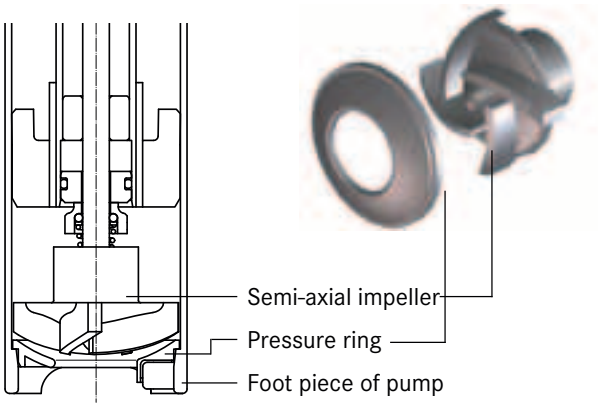
- FLUX offers two different types of impellers.
- The geometry of the axial impeller provides for small flow losses in circumferential direction, flow is almost completely axial. Used when high flow rates are required at low pressure requirements.
- The geometry of the semi-axial impellers (Z-version) provides mainly for a flow in circumferential direction. Combined with the pressure ring, the flow is redirected in axial direction. This provides a higher delivery pressure at a lower delivery rate. Semi-axial impellers are used in case of an increased pressure requirement.
- All impellers are in ethylene-tetrafluoroethylene (ETFE).
- Axial impeller with diameter 38 mm is also available in stainless steel.



Comparison of the characteristic curve of a drum pump F/FP 430 with motor F 457 with axial impeller 38 mm and semi-axial impeller (Z-version) 37 mm



F/FP 430 with mechanical seal and axial impeller



F/FP 430 with mechanical seal and semi-axial impeller (Z-version)

Use of axial impellers

- **For high delivery rates**
- **For light media (density up to1.3 kg/dm³)**
- **For short discharge lines**
- **For small differences in height**
- **For low pressure losses**

Use of semi-axial impellers (Z-version)

- **For high delivery heads**
- **For heavy media (density from 1.3 kg/dm³)**
- **For long discharge lines**
- **For big differences in height**
- **For pressure losses due to valves and fittings**

FLUX drum and container pumps

Good to know when selecting pump type

Outer diameter of different series 400 pump types and impeller diameter resp. geometries

Outer diameter of the pump (mm)	Pump type														
	F/FP 430					F/FP 424			F/FP 425			F 426		F/FP 427	MINIFLUX
Material pump	S	PP	PVDF	AL	HC	S	PP	PVDF	S	PP	HC	S	PP	S	S
40	–	33	33	–	38	–	–	–	–	–	–	–	–	–	–
	–	33 Z	33 Z	–	–	–	–	–	–	–	34	–	–	–	–
41	38	–	–	38	–	–	36	36	34	–	–	38	–	–	–
	37 Z	–	–	37 Z	–	–	35 Z	35 Z	34 Z	–	–	–	–	–	–
43	–	–	–	–	–	38	–	–	–	–	–	–	–	38	–
	–	–	–	–	–	37 Z	–	–	–	–	–	–	–	–	–
50	–	38	38	38	–	–	38	38	–	34	–	–	33	–	–
	45 Z	43 Z	43 Z	–	–	45 Z	43 Z	–	–	–	–	–	–	–	–
100	–	50*	–	–	–	–	–	–	–	–	–	–	–	–	–
Not specified	–	–	–	–	–	–	–	–	–	–	–	–	–	–	38

Materials of different series 400 pump types and standard combination with O-ring materials

		Pump type														
		F/FP 430					F/FP 424			F/FP 425			F 426		F/FP 427	MINIFLUX
Material pump		S	PP	PVDF	AL	HC	S	PP	PVDF	S	PP	HC	S	PP	S	S
Materi-als O-rings	**NBR**	–	–	–	x	–	–	–	–	–	–	–	–	–	–	–
	EPDM	o	o	–	–	–	–	–	–	–	–	–	–	–	–	–
	FKM	x	x	x	–	–	x	x	x	x	x	–	x	x	x	x
	FFKM	o	o	o	–	x	–	–	–	o	–	x	o	–	–	–

Other material combinations on request x = most common use o = optional

Connections

	Pump type						
	F/FP 430	**F/FP 424**	**F/FP 425**	**F 426**	**F/FP 427**	**F 430 TR**	**MINIFLUX**
Pressure joint	G 1 ¼ A FOOD: Clamp 1 ½"	G 1 ¼ A	G 1 ¼ A	G 1 ¼ A	G 1 ¼ A Rd 58x⅙ Clamp 1 ½"	G 1 ¼ A S: Clamp 1 ½" S: Clamp 1"	G 1 ¼ A
Inlet	–	–	–	–	–	G 2 A S: Clamp 2" S: Clamp 1½"	Union nut S60x6

Other connections on request

* Impeller used for special container pump F 430 PP 100/50 (see page 22)

Type designation Example

F 430 S- 41 / 38 - 1200

F 430: Type; S: Material; 41: Ø outer; 38: Ø impeller; 1200: Immersion depth

Construction materials

Material	Characteristics
Stainless steel (S)	▸ Alloys, 316 Ti resp. 316 L, with good corrosion resistance ▸ Used for shafts, pumps and hand nozzles ▸ For all neutral, not flammable media, as well as flammable media, acids and alkalis, solvents and typically for food, cosmetics and pharmacy ▸ Used in hazardous areas ▸ Operating temperature range up to approx. 100 °C, in hazardous areas max. 40 °C
Hastelloy C (HC)	▸ Nickel-Molybdenum-alloy with best corrosion resistance ▸ Used for shafts and pumps ▸ For highly flammable media, strong acids and alkalis as well as very aggressive media ▸ Used in hazardous areas if the chemical resistance of stainless steel is not sufficient ▸ Operating temperature range up to approx. 120 °C, in hazardous areas max. 40 °C
Aluminium (AL)	▸ Aluminium-alloy with 5 % magnesium (AlMg5) ▸ Used for pumps and hand nozzles ▸ Mostly for oils (diesel, hydraulic oil), drilling emulsions, but also for neutral, hardly flammable media ▸ Must not be used for highly flammable media as an electrically non-conductive oxide layer may form on the surface of the pump! ▸ Operating temperature range up to approx. 100 °C
Polypropylene (PP)	▸ Thermoplastic plastic with a very good chemical resistance range ▸ Used for pumps and hand nozzles ▸ For acids, alkalis and neutral, not flammable liquids ▸ Operating temperature range up to approx. 50 °C
Polyvinylidene fluoride (PVDF)	▸ Thermoplastic fluoroplastic with outstanding chemical resistance ▸ Used for pumps and hand nozzles ▸ For concentrated acids and neutral, non-flammable liquids ▸ Operating temperature range up to approx. 80 °C

O-ring materials

Material	Characteristics
NBR	▸ Nitrile Butadien Rubber ▸ Good resistance against fuels and oils ▸ Not resistant against solvents ▸ In combination with pumps in aluminium
EPDM	▸ Ethylene-Propylene-Diene-Monomer ▸ Good resistance against alkalis and some solvents ▸ Not resistant against fuels, oils or solvents ▸ In combination with pumps in PP and stainless steel
FKM	▸ Fluoroelastomer ▸ Good resistance against acids and alkalis as well as many solvents ▸ In combination with pumps in PP, PVDF and stainless steel
FFKM	▸ Perflurorubber type M ▸ Very good resistance against acids and alkalis as well as almost all solvents ▸ In combination with pumps in PVDF, stainless steel and HC

Overview of series 400 pump types

Quick and easy to select the right pump for your requirement

Pump type	For standard applications (vertical)		For special applications (ver		
	F/FP 430	F/FP 424	F/FP 425	F 426	
Description	With mechanical seal	In the liquid area sealless	For 99.98 % drum emptying	For mixing and/ or pumping	
					
Versions also in					
Typical application areas	Can be used universally, ideal for frequent medium changes	Can be used universally, especially for fast flowing media	Can be used universally, for almost complete emptying and for expensive fluids	Can be used universally, especially with inhomo-geneous media	
Seal type	With mechanical seal	Sealless In the liquid area	With mechanical seal	With mechanical seal	
Materials pump	Stainless steel, polypro-pylene, polyvinylidene fluoride, aluminium, Hastelloy C	Stainless steel, polypro-pylene, polyvinylidene fluoride	Stainless steel, polypro-pylene, Hastelloy C	Stainless steel, polypro-pylene	
Standard immersion depth (mm)	700/1.000/1.200	700/1.000/1.200	700/1.000/1.200	1.000/1.200	
Other immersion depths/ special lenghts (mm)	200 - 3.000	200 - 2.000	500 - 2.000	500 - 2.000	
Flow rate max.*	240 l/min*	240 l/min*	120 l/min*	240 l/min*	
Delivery head max.*	30 mwc*	30 mwc*	26 mwc*	13 mwc*	
Viscosity max.*	1.200 mPas*	1.200 mPas*	1.200 mPas*	1.200 mPas*	
Advantages	▸ Ideal for frequent medium changes, hardening media, fast drying media, crystallizing media ▸ Can be taken apart into main components easily and quickly for cleaning ▸ Compared to sealless pump higher service life on abrasive media ▸ High stability of the plastic pumps enables immersion lengths of up to 3 000 mm	▸ No seal wear ▸ Optimal emptying of the inner tube ▸ High service life ▸ Low wear of guide bearing and shaft ▸ Long bearing life ▸ Particularly suited for hydrochloric acid and chromic acid ▸ Stainless steel version for use in hazardous areas ▸ Versions for use with AdBlue®** also available	▸ Optimal residual emp-tying with e.g. less than 0.05 l residual amount left in 200 l drum ▸ No tilting to totally empty the drum ▸ Reduction of cleaning and waste disposal costs ▸ No loss of medium when taking the pump from drum to drum ▸ Optimal use of expensive fluids	▸ 3 operating modes in one pump: - Conveying - Conveying with simultaneous mixing - Mixing operation only ▸ Switching operating modes is possible even while operating ▸ Easy to dismantle for cleaning ▸ Distinct feature, **only at FLUX**: The inner tube is reinforced with a metal core on the PP model	
Detailed Information	Page 12 - 13	Page 14 - 15	Page 16 - 17	Page 18 - 19	

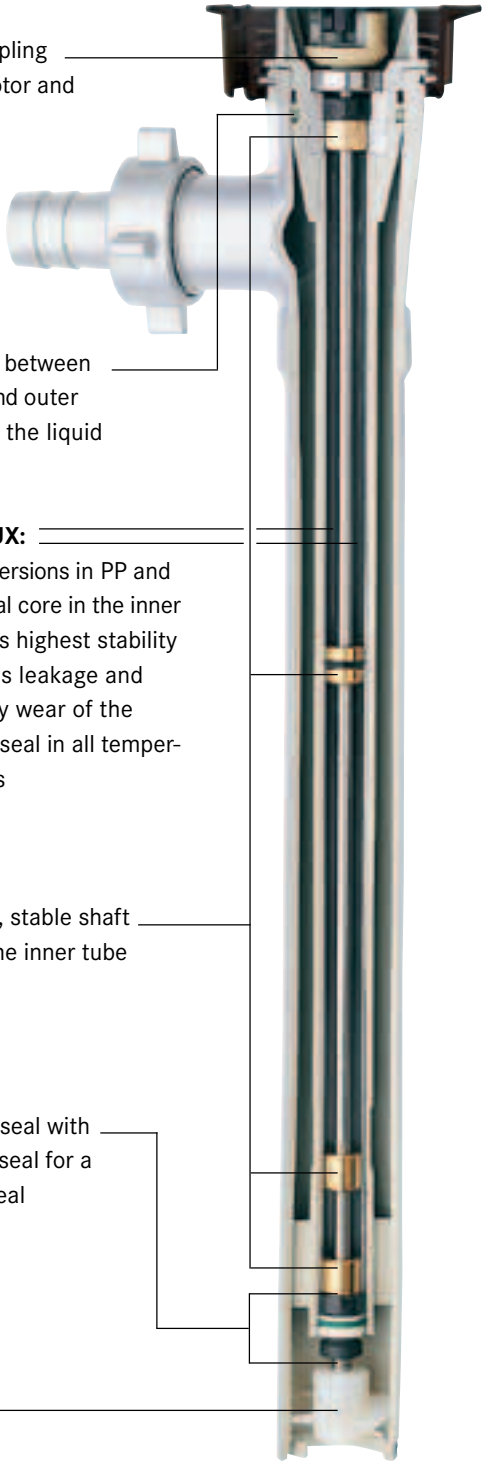
* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

tical)			For horizontale use	
	F/FP 427	**F 430 PP 100/50**	**F 430 TR**	**MINIFLUX**
	Can be taken apart completely	Special container pump for higher delivery heads	For dry installation / horizontal use	Container pump for dry installation / horizontal use on IBC
				
	High hygiene requirements in foods, cosmetics and pharmacy	Used as process pump in industry, surface technology and water treatment	Can be used universally, ideal for conveying out of containers with low level outlet in confined places	Especially for emptying IBCs in confined places
	Sealless in the liquid area	With mechanical seal	With mechanical seal	With mechanical seal
	Stainless steel	Polypropylene	Stainless steel, polypropylene	Stainless steel
	700/1.000/1.200	1.000/1.200/1.500	–	–
	200 - 2.000	500 - 1.500	–	–
	240 l/min*	105 l/min*	240 l/min*	240 l/min*
	13 mwc*	32 mwc*	13 mwc*	13 mwc*
	1.000 mPas*	150 mPas*	1.200 mPas*	1.000 mPas*
	▸ Ideal as hygienic pump ▸ Can be quickly and easily taken apart for cleaning ▸ All parts in contact with the medium can be sterilized ▸ Transfers fluids containing solids such as juices with pulp or soups with spices ▸ Available with different connections on pressure side (e. g. Clamp 1 ½" or Rd 58 x ⅙) ▸ Available with 3A Certificate	▸ The pump has a significantly higher delivery head up to 40 l/min compared to pumps with semi-axial rotor (Z-rotor) ▸ Allows conveying of media out of an IBC in the basement to higher floors ▸ Ideal for pumping media into a higher lying pipe system ▸ Unique, the inner tube reinforced with a metal core	▸ Provides highest flexibility in installation and mobility ▸ Can also be used at low ceiling heights ▸ Stainless steel version for use in hazardous areas ▸ Can also be integrated into pipe systems ▸ A horizontal centrifugal pump that can be used with different FLUX motors	▸ Can be used where ceilings are low ▸ Allows pumping directly from floor-level outlets, even when containers are stacked ▸ Significantly higher flow rate and pressure compared to draining by gravity via the hydrostatic pressure of the medium ▸ Minimal space requirement ▸ Simple disconnection from IBC with union nut
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** AdBlue® is a registered trademark of: Verband der Automobilindustrie e.V. (VDA)

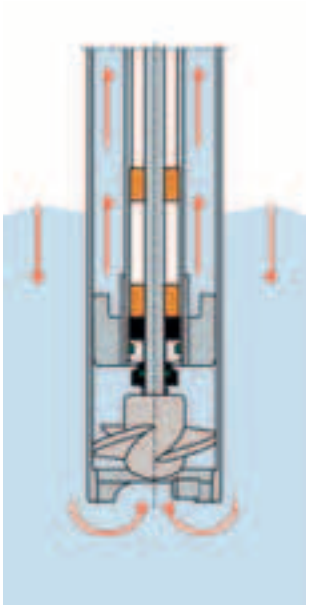
F/FP 430
With mechanical seal

The universal F/FP 430 pump can be used for various media and is suitable for conveying out of drums, IBCs or tanks. Due to the construction with mechanical seal, the pump can be easily and quickly taken apart into its two main components. This allows good cleanability. Distinct feature, only at FLUX: The inner tube is reinforced with a metal core on plastic models (PP and PVDF). This always allows full function of the mechanical seal. This way, leakage and unnecessary wear are prevented for the complete operating temperature range. Furthermore, it provides highest stability and makes immersion lengths of up to 3.000 mm possible. The versions in stainless steel and hastelloy C are ex-protected. The stainless steel version is also available as FOOD certified version.



Functional description

The mechanical seal seals the inner tube from the medium, preventing the medium from getting into the inner tube. The shaft is only in contact with the medium in the rotor area.



The mechanical seal prevents medium from getting into the inner tube while pumping.



With just three hand movements the pump can be disassembled into inner tube (complete) and outer tube.

Product characteristics

- With mechanical seal for sealing the inner tube
- Pump can be disassembled into two parts: inner tube cpl. and outer tube
- Inner tube with metal core on PP and PVDF
- Versions for use in hazardous areas and food sector available
- Grease-lubricated shaft bearing
- Can be combined with various motors as required

Advantages

- **Ideal for frequent medium changes, hardening media, fast drying media, crystallizing media**
- **Can be taken apart into main components easily and quickly for cleaning**
- **Compared to sealless pump higher service life on abrasive media**
- **The inner tube reinforced with metal core on plastic models prevents leakage and unnecessary wear of the mechanical seal in all operating temperature ranges**
- **High stability of the plastic pumps enables immersion lengths of up to 3.000 mm**
- **Temporary operation against closed valve (hand nozzle, ball valve etc.) is possible until max. indicated operating temperature**
- **Very quiet operation with low vibration**
- **Version in stainless steel and hastelloy C can be used in hazardous areas*****
- **FOOD version conforms to EC 1935/2004 and FDA CFR 21**

Technical data

Flow rate max.	240 l/min*
Delivery head max.	30 mwc*
Viscosity max.	1.200 mPas*
Materials pump	Stainless steel, polypropylene, polyvinylidene fluoride, aluminium, hastelloy C
Standard immersion depths (mm)	700/1.000/1.200
Other immersion depths/ special lenghts (mm)**	200 - 3.000

Note

Horizontal version for dry installation see page 23.

Examples of media

- Acids
- Alkalis
- Mineral oil products
- Highly flammable liquids
- Solvents
- Petroleum/Fuels
- Dilute solutions
- Paints and lacquers
- Flavours
- Spirits



Filling a system with hydraulic oil (F 430 AL).



Filling an essential oil (F 430 S).

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

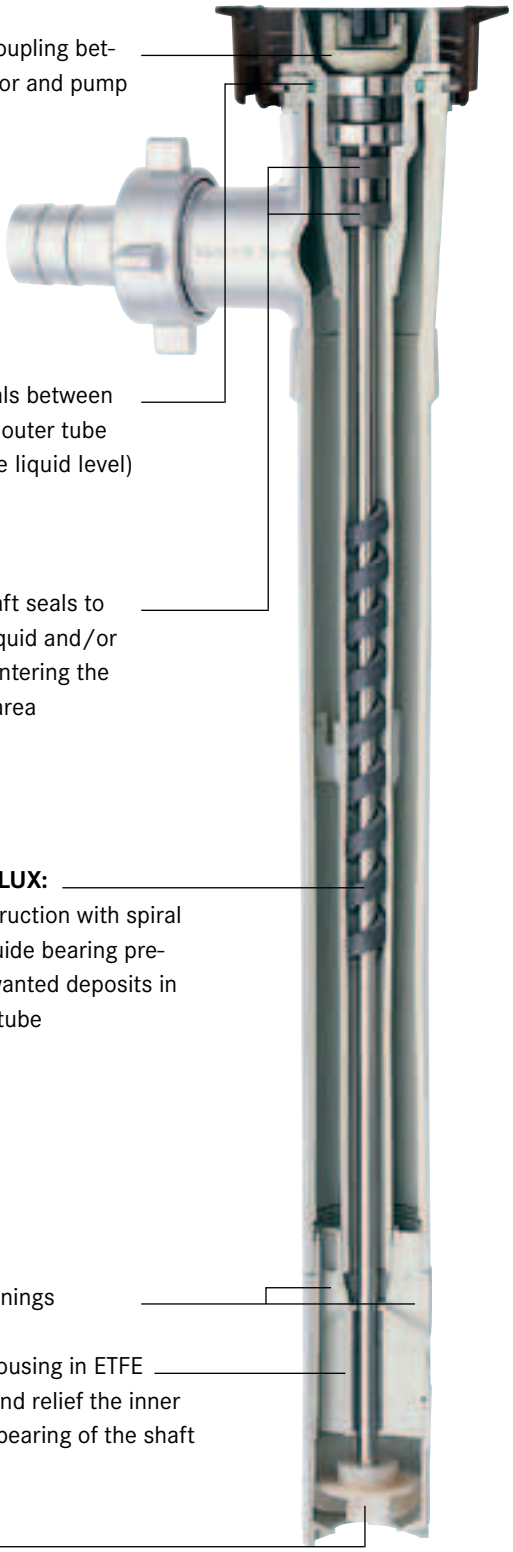
** dependent on material and diameter

*** conform EC Directive 2014/34/EU

F/FP 424

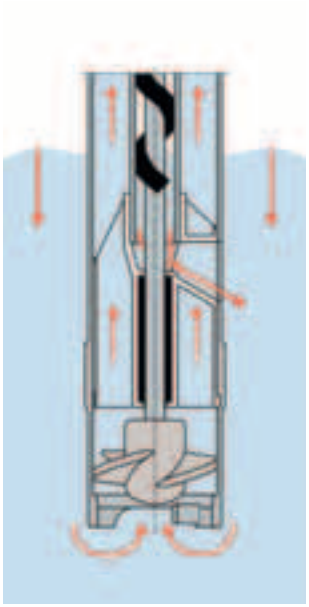
Sealless in the liquid area

The sealless pump F/FP 424 is ideal for transferring various low-viscosity, also aggressive media. It is suitable for media that flow quickly and neither bond, crystallize nor are abrasive. With this pump you can empty drums, IBCs and also basins. Distinct feature, only at FLUX: The specific construction with spiral-shaped guide bearing in the inner tube prevents unwanted deposits in the pump and increases the service life significantly. The pump is available in stainless steel, polypropylene or polyvinylidene fluoride. The F/FP 424 in stainless steel can also be used in hazardous areas.

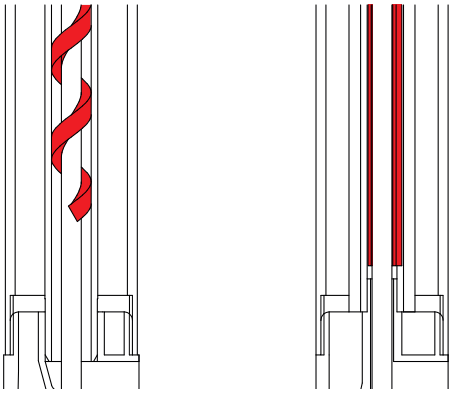


Functional description

With sealless drum pumps F/FP 424 the medium enters the inner tube along the shaft. There it has the same level as the liquid level in the drum. When emptying the drum, the medium level in the drum decreases. Accordingly the medium level in the inner tube also decreases. The fluid therein flows off through the relief openings.



Optimal flow of the medium in the inner tube due to spiral shaped guide bearing.



The spiral shaped guide bearing at FLUX (left) compared with a simple, tubular shaft bearing (right).

Product characteristics

- No seal in the liquid area
- Long spiral-shaped guide bearing
- Multiple bearings support drive shaft
- Radial shaft seals prevent the intrusion of vapours and liquid in the coupling area
- Versions for operation in hazardous area available***
- Version free of non-ferrous metal for transferring AdBlue® available
- Can be combined with various motors as required

Advantages

- **No seal wear**
- **Optimal emptying of the inner tube**
- **High service life**
- **Low wear of guide bearing and shaft**
- **Long bearing life**
- **Particularly suited for hydrochloric acid and chromic acid**
- **Can be temporarily operated against closed valve (hand nozzle, valves etc.) until the indicated temperature of the materials is reached**
- **Low vibration**
- **Stainless steel version for use in hazardous area*****
- **Versions for use with AdBlue®**** also available**

Technical data

Flow rate max.	240 l/min*
Delivery head max.	30 mwc*
Viscosity max.	1.200 mPas*
Materials pump	Stainless steel, polypropylene, polyvinylidene fluoride
Standard immersion depths (mm)	700/1.000/1.200
Other immersion depths/ special lengths (mm)**	200 - 2.000

Examples of media

- Acids (also chromic acid and hydrochloric acid)
- Alkalis
- Mineral oil product
- Highly flammable liquids
- Solvents
- Petroleum/fuels
- Dilute salt solutions



Emtpying of an electroplated sink (F 424 PP).



Disposal of mixed old chemicals (F 424 PP).

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

** dependent on material and diameter

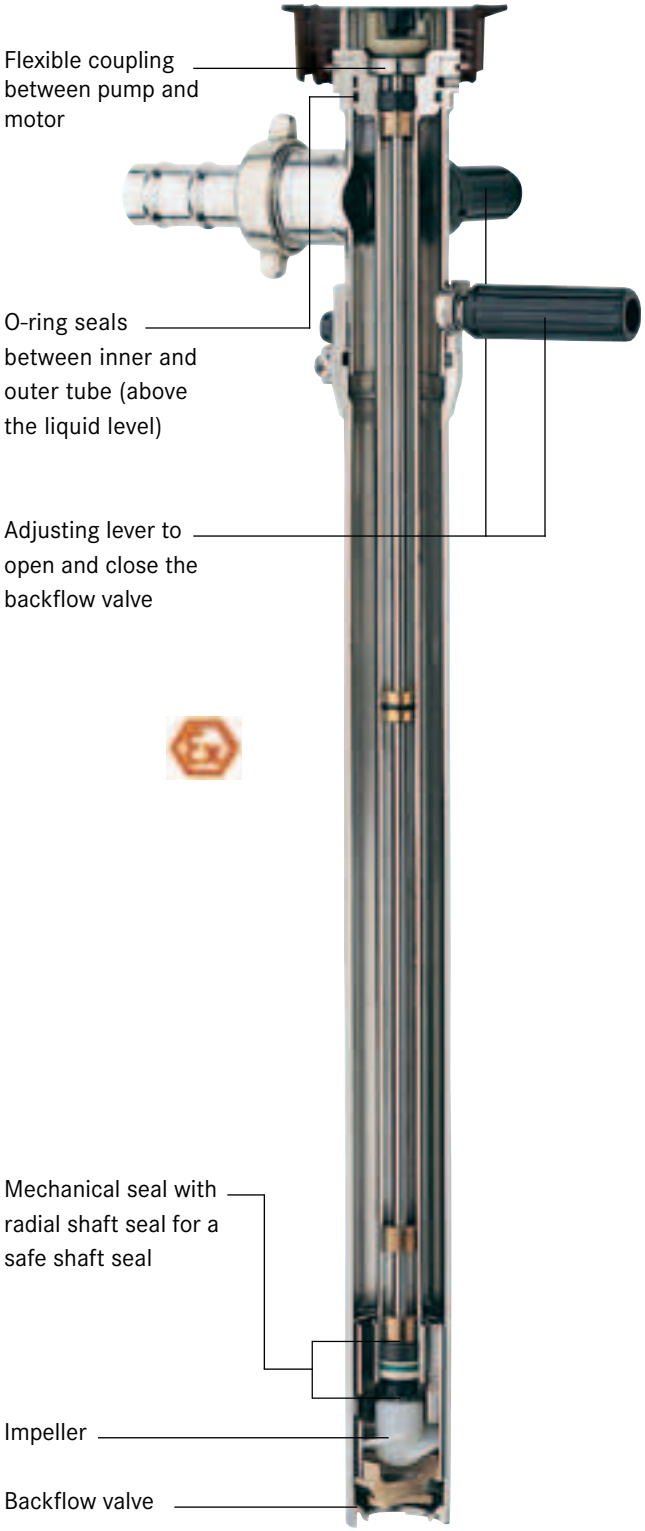
*** conform EC Directive 2014/34/EU

**** AdBlue® is a registered trademark of: Verband der Automobilindustrie e.V. (VDA)

F/FP 425

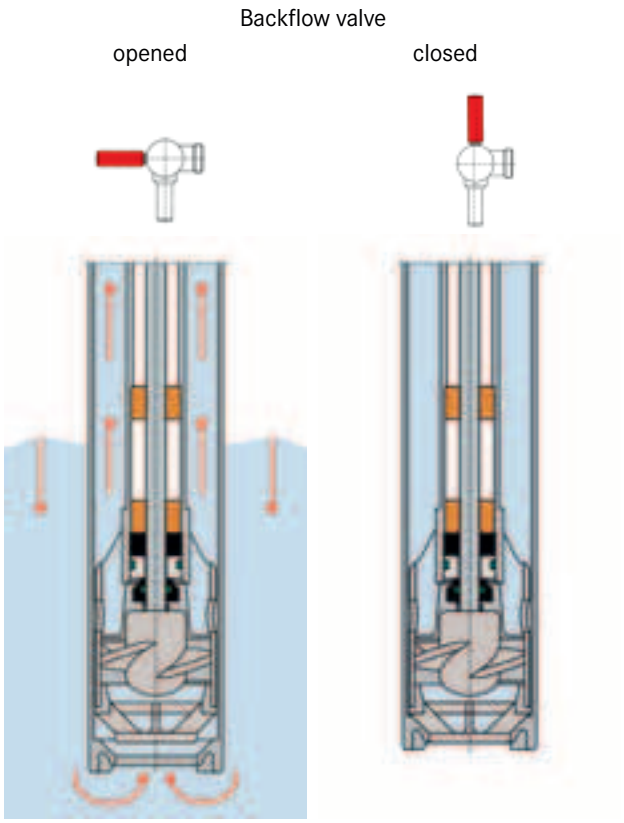
For 99.98 % drum emptying

With the F/FP 425 there is less than 0.05 l residual amount left in a 200 l drum, so maximum 0.02 %. The pump has an integrated backflow valve that is easy to close before taking the pump out of the container. Thus the backflow of the medium in the pump is prevented. This makes optimum use of especially expensive media possible and saves additional cleaning and disposal costs when handling problematic media. The pump is available in stainless steel, polypropylene and hastelloy C. In stainless steel and hastelloy C the pump F/FP 425 can also be used in hazardous areas.



Functional description

The F/FP 425 backflow valve is closed by twisting the adjusting lever - even while the motor is running. Thus the medium remains in the pump and does not flow back into the container.



After pumping (left) the backflow valve is closed to remove the pump. The medium remains in the pump (right).



Pump from below: opened (left) and closed (right).

Product characteristics

- Backflow valve
- Two adjusting levers to easily close the backflow valve
- With mechanical seal to seal inner tube
- Metal core in the inner tube of PP version
- Versions for use in hazardous areas available
- Grease-lubricated shaft bearing
- Can be combined with various motors as required

Technical data

Flow rate max.	120 l/min*
Delivery head max.	26 mwc*
Viscosity max.	1.200 mPas*
Materials pump	Stainless steel, polypropylene, hastelloy C
Standard immersion depths (mm)	700/1.000/1.200
Other immersion depths / special lengths (mm)**	500 - 2.000

Advantages

- **Optimal residual emptying with e.g. less than 0.05 l residual amount left in 200 l drum**
- **Reduction of cleaning and waste disposal costs**
- **No loss of medium when taking the pump from drum to drum**
- **Optimal use of expensive fluids**
- **Unique, only at FLUX: inner tube reinforced by a metal core in PP version. Prevents leakage and unnecessary wear of the mechanical seal in all operating temperature ranges**
- **Can be temporarily operated against closed valve (hand nozzle, valves etc.) until the indicated temperature of the material is reached**
- **Stainless steel and hastelloy C version can be used in hazardous areas*****

Examples of media

- Toxic media
- Environmentally harmful media
- Precious media
- Acids
- Alkalis
- Mineral oil products
- Highly flammable liquids
- Solvents
- Petroleum/fuels



The pump FP 425 S in operation for conveying a particularly high-quality lubricant.



The closing of the backflow valve prevents the lubricant from flowing back out of the pump into the drum.

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

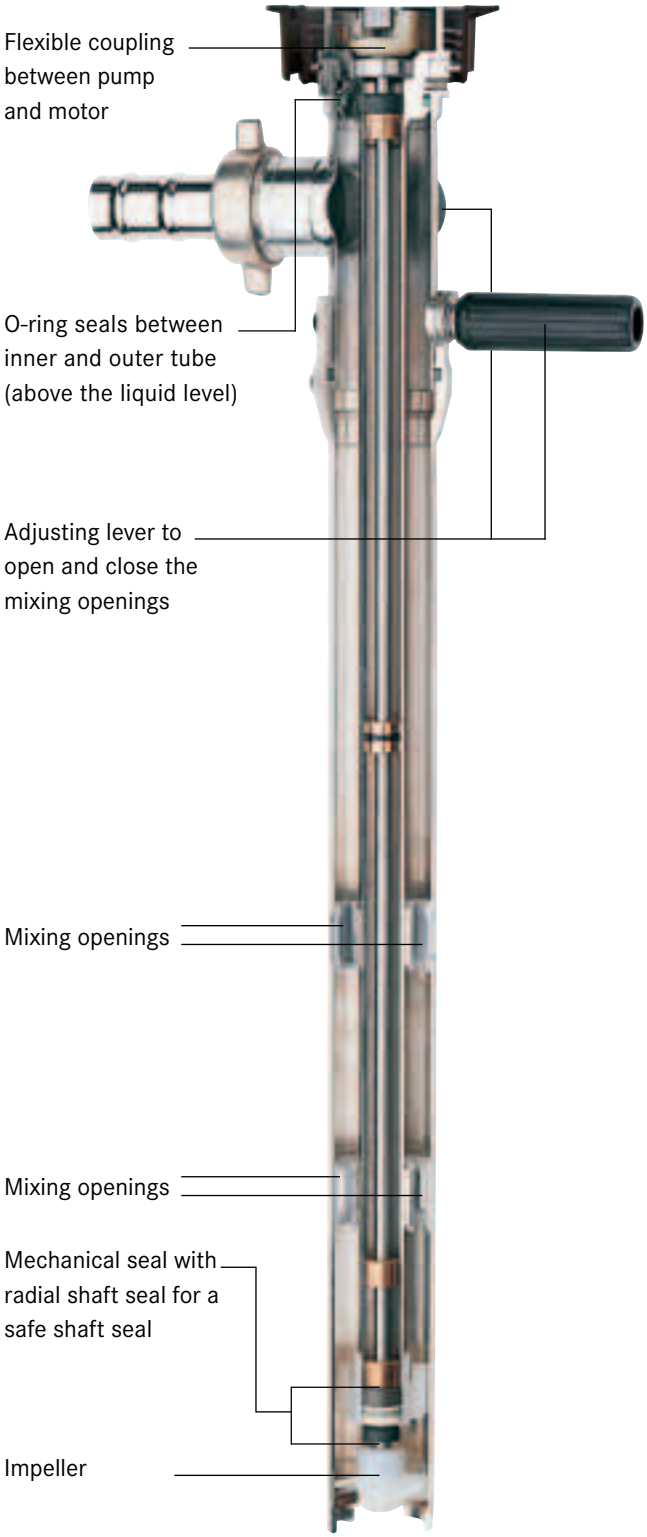
** dependent on material and diameter

*** conform EC Directive 2014/34/EU

F 426

For mixing and/or pumping

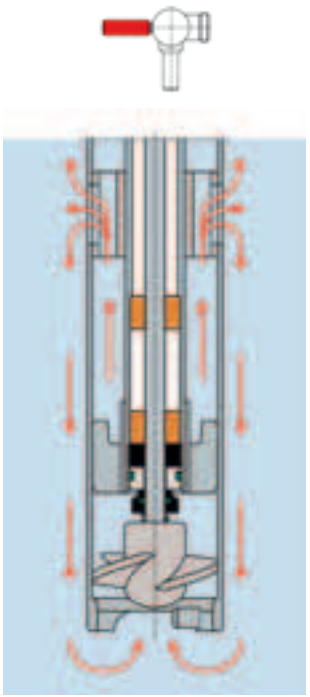
The F 426 is ideal for mixing and/or pumping inhomogeneous media. You can keep media moving that tend to segregate, even during pumping. With the outlet closed, e.g. via a hand nozzle, the F 426 can be temporarily operated as pure mixing pump. By turning the adjusting lever, the pump can be easily adjusted to "mixing" or "pumping". The pump is easy to dismantle for rapid cleaning. The pump is available in stainless steel and polypropylene. The stainless steel version can also be used in hazardous areas.



Functional description

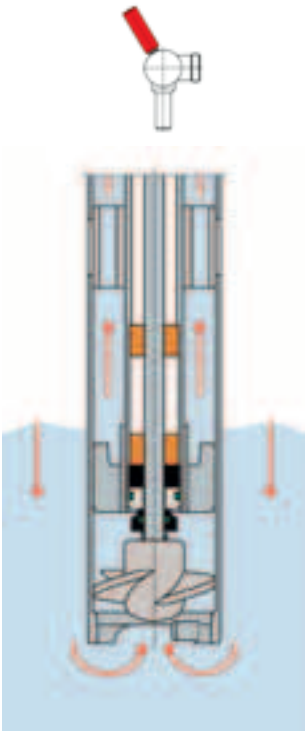
With the mixing pump F 426 the mixing openings can be opened or closed by turning the two adjusting levers. This way the mixing resp. the mixing/pumping process can be changed into a pumping process, even if the motor is running.

Example only mixing



Outlet closed,
mixing openings opened.

Example only pumping



Outlet opened,
mixing openings closed.



One of the 6 mixing openings opened (left) and closed (right).

Product characteristics

- For mixing and/or pumping inhomogeneous liquids
- Two adjusting levers to easily open/close the mixing openings
- Mixing openings allow backflow of medium for mixing back into the container
- With mechanical seal to seal inner tube
- Metal core in the inner tube of PP version
- Can be combined with various motors as required

Technical data

Flow rate max.	240 l/min*
Delivery head max.	13 mwc*
Viscosity max.	1.200 mPas*
Materials pump	Stainless steel, polypropylene
Standard immersion depths (mm)	1.000/1.200
Other immersion depths / special lengths (mm)**	500 - 2.000

Advantages

- **3 operation modes in one pump:**
  - **Conveying**
  - **Conveying with simultaneous mixing**
  - **Temporary mixing operation**
- **Switching operating modes possible even while operating**
- **Easy to dismantle for cleaning**
- **Distinct feature, only at FLUX: Inner tube is reinforced with a metal core on the PP model. Prevents leakage and unnecessary wear of the mechanical seal in all operating temperature ranges**
- **Temporary operation against closed valve (e.g. hand nozzle, ball valve) is possible until the indicated max. operating temperature has been reached**
- **Stainless steel version can be used in hazardous area*****

Examples of media

- Inhomogeneous liquids
- Emulsions
- 2-phase-mixtures
- Paints and lacquers
- Acids
- Alkalis
- Mineral oil products
- Highly flammable liquids
- Solvents



With the F 426 inhomogeneous media can be mixed before filling.



Simply move the adjusting levers and the medium can be conveyed quickly.

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

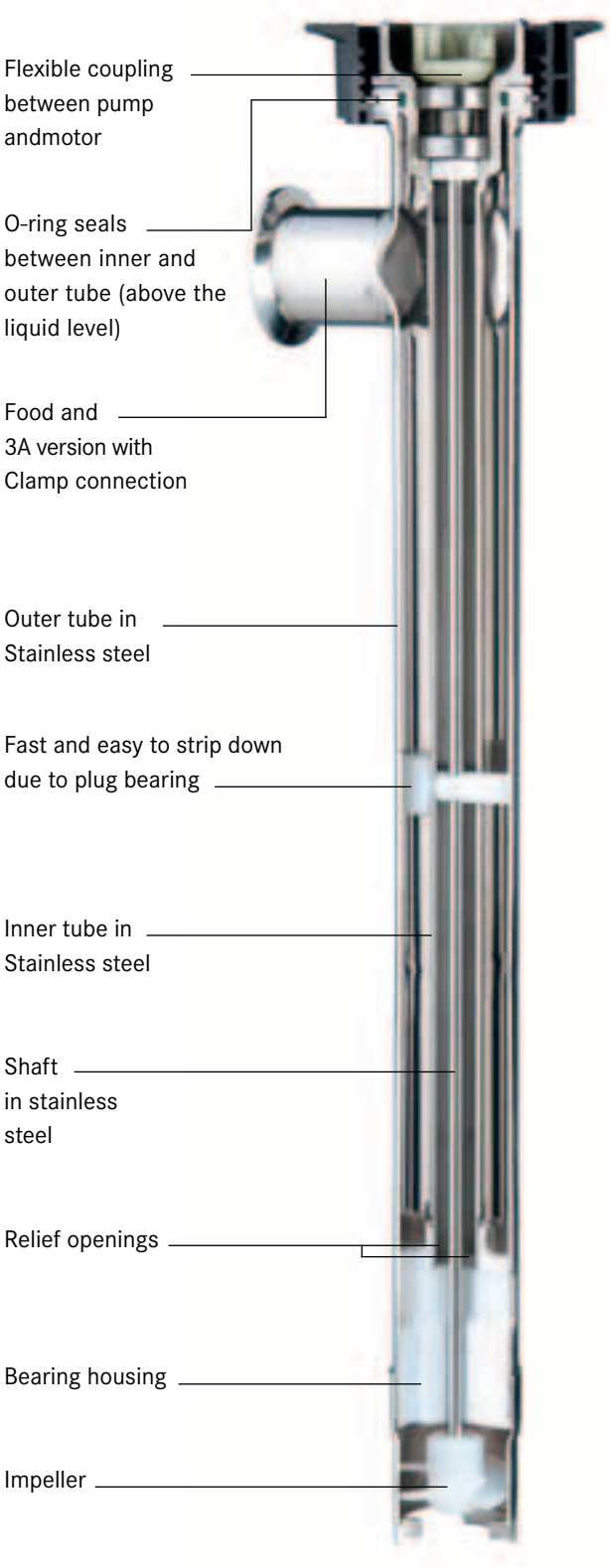
** dependent on material and diameter

*** conform EC Directive 2014/34/EU

F/FP 427

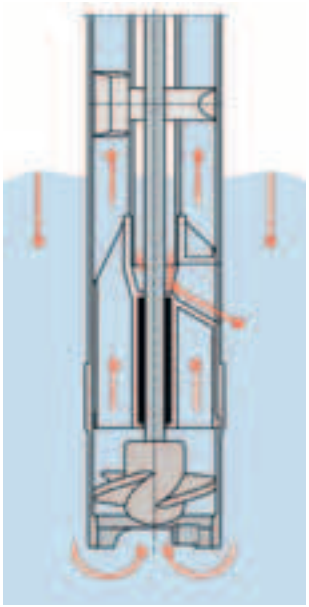
Can be taken apart completely

The pump F/FP 427 is ideal for hygienic applications and suitable for conveying media out of drums, IBCs and other containers. It can be easily and quickly disassembled for cleaning / sterilization and can be completely stripped down to individual parts. The pump has minimal dead spots. The drive shaft, the inner and the outer tube are made of stainless steel (316 Ti resp. 1.4581). The pump is also available as FOOD and 3A certified version and complies with international safety standards.



Functional description

With sealless drum pumps F/FP 427 the medium enters the inner tube along the shaft. There it has the same level as the liquid level in the drum. When emptying the drum, the medium level in the drum decreases. Accordingly the medium level in the inner tube also decreases. The fluid therein flows off through the relief openings.



Optimal flow of the medium in the inner tube due to relief openings in the bearing housing.



Ideal for food and other hygienic applications.

Product characteristics

- Sealless in the liquid area
- Minimal dead spots
- Can be taken apart completely in only a few steps
- Disassembly almost without tools possible
- Radial shaft seals prevent the intrusion of vapours and liquid in the coupling area
- Support of shaft and inner tube due to plug bearing
- Can be combined with various motors as required

Technical data

Flow rate max.	240 l/min*
Delivery head max.	13 mwc*
Viscosity max.	1.000 mPas*
Materials pump	Stainless steel
Standard immersion depths (mm)	700/1.000/1.200
Other immersion depths/ special lenghts (mm)**	200 - 2.000

Advantages

- **Ideal hygienic pump**
- **Can be quickly and easily taken apart for cleaning**
- **All parts in contact with the medium can be sterilized**
- **Transfers also fluids containing solids such as juices with pulp or soups with spices**
- **Available with different connection at the pressure side (e.g. Clamp 1½" or Rd 58 x ⅙)**
- **Available with 3A Certificate**
- **Available as FOOD version (appropriate for food contact acc. to EC 1935/2004 and FDA CFR 21)**

Examples of media

- Food
- Cosmetic products
- White oils
- Juices, also with pulps
- Flavours
- Edible oils



Can be completely taken apart for cleaning.



In the FOOD version ideal for use in the food sector.

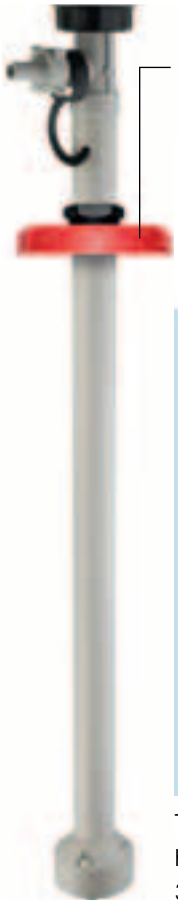
* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

** dependent on material and diameter

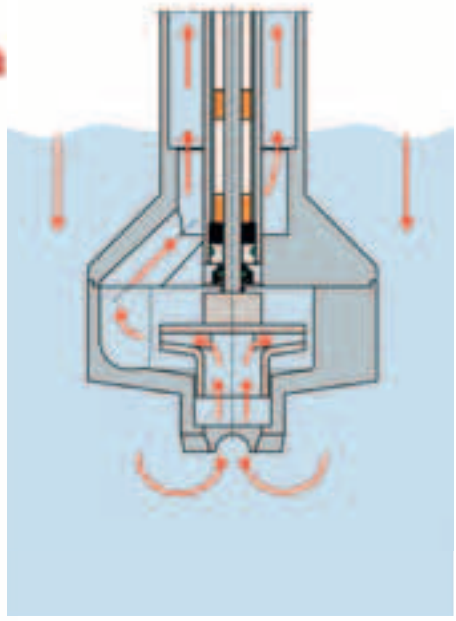
F 430 PP 100/50

Special container pump for higher delivery heads

Pump F 430 PP 100/50 in polypropylene was designed for higher delivery pressure. Instead of a rotor, it is equipped with an impeller in a pump housing. In connection with the powerful FLUX motors the pump delivers a far higher pressure of over 3 bar compared to pumps with semi-axial rotors. This makes it especially convenient for conveying media out of e.g. IBCs and other containers into higher lying pipe systems or out of an IBC in the basement to a higher floor.



IBC cap with bolting for safe fixing of the pump (optional ex works)



The special geometry of impeller and pump housing makes pressures up to more than 3 bar possible at high flow rates.

Technical data

Flow rate max.	105 l/min*
Delivery head max.	32 mwc*
Viscosity max.	150 mPas*
Materials pump	Polypropylene
Standard immersion depths (mm)	1.000/1.200/1.500
Other immersion depths/ special lengths (mm)	500 - 1.500

Functional description

The F 430 PP 100/50 works on the principle of a classical centrifugal immersion pump. The medium enters through the opening of the pump housing and is conveyed by the rotation of the impeller to the outlet of the pump.

Product characteristics

- For media such as acids and alkalis as well as for almost all low-viscosity, neutral liquids
- With mechanical seal to seal the inner tube
- Inner tube with metal core
- For IBCs, in connection with powerful motors
- When using in an IBC we recommend the IBC cap with bolting (see picture above left)



Conveying of galvanic wastewater into a higher disposal network.

Advantages

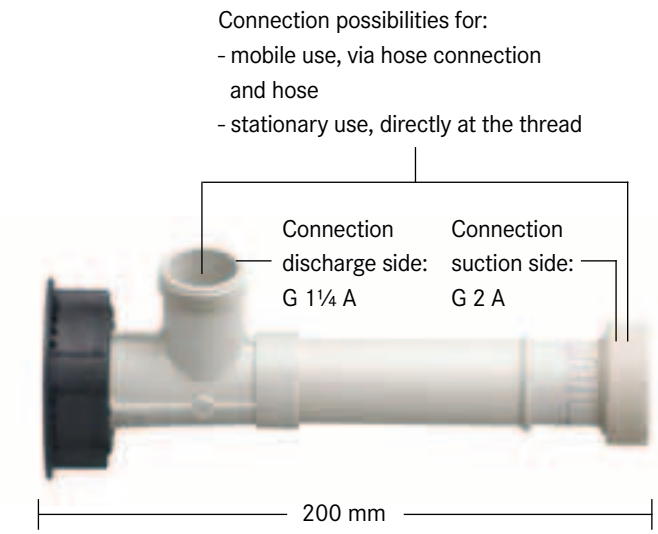
- **The pump has a significantly higher delivery head compared to pumps with semi-axial rotor (Z-rotor) (cf. table page 31)**
- **Allows the conveying of media out of an IBC in the basement to higher floors**
- **Ideal for pumping media into a higher lying pipe system**
- **Can be used to supply pipe line networks e.g. for feeding process water**
- **Unique, the inner tube reinforced with a metal core. It enables full function of the mechanical seal in all application temperature ranges and prevents leakage and unnecessary wear**

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

F 430 TR

For dry installation/horizontal use

Horizontal pump F 430 TR is ideal for conveying media from IBCs, tanks and other containers with low level outlet. E.g. if a tank is not accessible from the top, or if the spatial conditions do not allow use of a vertical pump. For cleaning, the pump can be easily and quickly taken apart in its two main components. The pump is available in stainless steel or polypropylene. The stainless steel version can also be used in hazardous areas.



Technical data

Flow rate max.	240 l/min*
Delivery head max.	13 mwc*
Viscosity max.	1.200 mPas*
Materials pump	Stainless steel, polypropylene
Installation	Horizontal mobile, stationary

Functional description

In the F 430 TR, the mechanical seal seals the inner tube from the medium. This prevents the medium from getting into the inner tube. The shaft only comes into contact with the medium in the impeller area.

Product characteristics

- Can be used for numerous media cf. F 430 on page 13
- For containers with low level outlet
- With mechanical seal to seal inner tube
- Connection options for mobile and stationary use
- Connections: Discharge side G 1¼ A, suction side G 2 A
- Pump can be disassembled into two parts: inner tube complete and outer tube
- 200 mm long
- Can be combined with various motors as required
- Temporary operation against closed valve (hand nozzle, vall valve) possible until max. operating temperature has been reached



Filling a detergent from a high tank in canisters.

Advantages

- **Provides greatest flexibility in installation and mobility**
- **Can be used at low ceiling heights**
- **Stainless steel version for use in hazardous areas****
- **Can also be integrated into pipe systems**
- **A horizontal centrifugal pump that can be used with different FLUX motors**

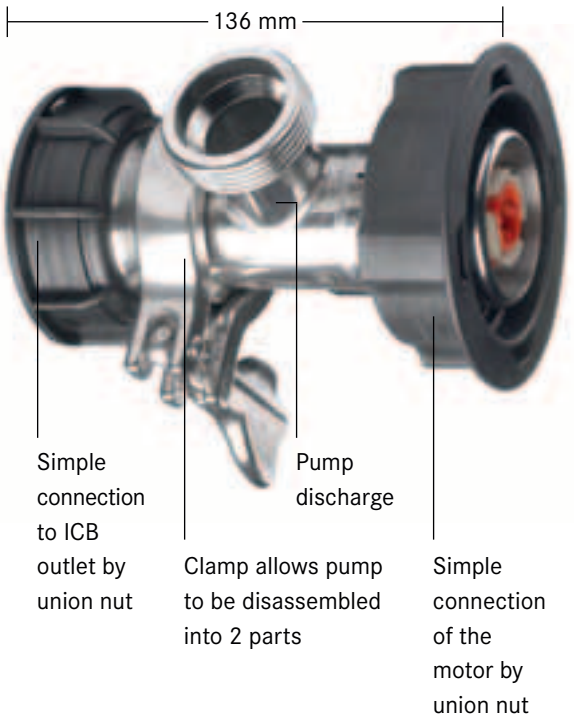
* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

** conform EC Directive 2014/34/EU

MINIFLUX

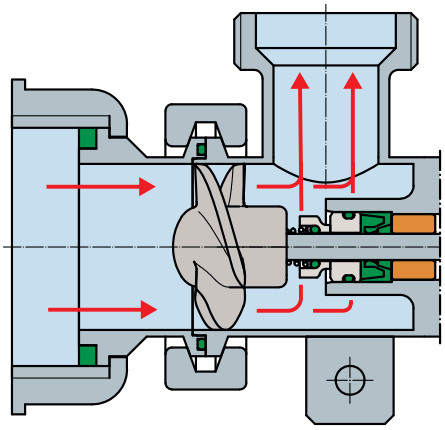
Container pump for dry installation/for horizontal use on IBC

The MINIFLUX horizontally installed container pump is designed for emptying IBCs via their floor-level outlet. Designed as an alternative to a vertical pump, the MINIFLUX can be used when an IBC is not accessible from the top. It is suitable for applications when gravity draining via the outlet tap is insufficient eg. rapid dispensing, long distance product transfer, or transfer to another container in a higher location. Power can ideally be provided by commutator or compressed air motor.



Functional description

The MINIFLUX works on the principle of an axial operating rotary pump. There are a mechanical seal and a radial shaft seal between the product and the driveshaft. This means the shaft only comes into contact with product in the rotor area.





Extremely compact and light.



Also suitable for use in explosion hazard areas of zone 1.**

** conform EC Directive 2014/34/EU

Product characteristics

- For pumping out IBCs directly from the outlet (with standard S60 x 6 thread)
- Simple connection of the pump to the outlet by union nut
- Compact design
- Can be dismantled into two parts via clamp
- Low overall weight of 1.2 kg
- No need to mount pump through top of container
- Does not require access to the container from above
- Use with commutator motor or compressed-air motor

Technical data

Flow rate max.	240 l/min*
Delivery head max.	13 mwc*
Viscosity max.	1.000 mPas*
Connection on IBC via	Union nut S60 x 6
Material pump	Stainless steel
Weight	1.2 kg
Installation	Dry installation/ horizontal

Advantages

- **Can be used where ceilings are low**
- **Allows pumping directly from floor-level outlets, even when containers are stacked**
- **Significantly higher flow rate and pressure compared to draining by gravity**
- **Minimal space requirement**
- **Simple disconnection from IBC using union nut**
- **Delivery against closed valve (e.g. hand nozzle, flap valve etc.) possible**
- **Suitable for use in explosion hazard areas zone 1****

Examples of media

- Acids
- Alkalis
- Mineral oil products
- Highly flammable liquids
- Solvents
- Petroleum/fuels
- Dilute solutions



Pumping upward into a mixing container from the IBC outlet.



Fast container filling from the IBC outlet.

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

** conform EC Directive 2014/34/EU

Overview pump motors

For series 400 FLUX pumps

Suitable motors type	Commutator			
Motor type	**FEM 4070**	**F 457**	**F 458 / F 458-1**	
Image				
Description	**The compact commutator motor** The FEM 4070 has a continuously variable speed for different flow rates and a capacity of 500 watts. It convinces with its compact design, low weight and mainly by its low noise level.	**The most powerful commutator motor** With 800 watts the motor F 457 is the most powerful commutator motor. The handy compact design has very good air cooling, a low noise level and is optionally available with an integrated no-volt release.	**The robust commutator motor** The F 458 is a compact commutator motor, with extremely tough double skin aluminium housing and is thus very quiet. The motor is completely enclosed and has a special corrosion-resistant paint. Therefore, it is suitable for use in extreme conditions, even areas with corrosive vapours.	
Protection class/ Operation mode	IP 24/S1	IP 24/S1	IP 55/S1	
Ex-marking	-	-	-	
Certificates	CE EAC	CE EAC	CE EAC	
Venting	Internal	Internal	External	
Voltage (Volt) Frequency	100/110/120/230/240 V 50 - 60 Hz	110/120/230/240 V 50 - 60 Hz	12/24 ▌42/110/120/230/240 V DC ▌50 - 60 Hz	
Power (watts)	500	800	12 V: 230/24 V: 410/460/700	
Speed setting	Infinitely	Optional	Optional	
Weight (kg)	2.6	4	5.1/5.9	
Low voltage protection	Optional	Optional	Optional	
Advantages/characteristics	▸ Commutator motor ▸ Low noise level ▸ With infinite speed adjustment ▸ Compact design ▸ Low weight ▸ Awarded the iF Design Award	▸ Most powerful commutator motor ▸ Low noise level ▸ F 457 EL: with infinite speed adjustment	▸ Commutator motor ▸ Very robust aluminium housing ▸ With special corrosion-resistant paint ▸ Very low noise level ▸ Motor is completely enclosed ▸ F 458: 460 Watt ▸ F 458-1: 700 Watt ▸ F 458 EL: with infinite speed adjustment	

Note on protection class acc. to DIN EN 60529 and operation mode acc. to EN 60034-1

IP 24: Protected against solid foreign objects with diameter > 12.5 mm and against access with one finger; protection against all-over spray water

IP 55: Protected against dust in a damaging quantity and complete protection against touch; protection against jet of water (nozzle) from any angle

S1: Continuous operation with constant load

EC Directive relating to equipment and protection systems intended for use in potentially explosive atmospheres 2014/34/EU, category 2

		Brushless	Compressed-air	Three-phase
	F 460 Ex / F 460-1 Ex	**FBM 4000 Ex**	**F 416 Ex**	**F 414**
				
	The ex-protected commutator motor F 460 Ex is a compact commutator motor, with extremely tough double skin aluminium housing and is thus very quiet. The motor is completely enclosed. Optimal air flow ensures very good cooling and thus extended service life of the carbon brushes.	**The world's first brushless drum pump motor** FBM 4000 Ex is a brushless drum pump motor, with extremely tough double skin aluminium housing and is thus very quiet. Soft-start and easy to handle speed control allow sensitive dosing. It is low-wear and maintenance-free.	**The lightweight and easy to handle compressed-air motor** Compressed-air motor F 416 Ex is very light and easy to handle and at the same time extremely powerful. Thanks to a silencer it is very quiet. Alternatively an exhaust hose can be used to guide the exhaust air to an oil separator. The speed is simply adjusted by varying the operating pressure or the amount of air.	**Three-phase motor for extreme operating conditions** With robust three-phase gearmotor F 414 an increased duty cycle is possible, so it can be used in extreme conditions. It convinces with a constant speed.
	IP 55/S1	IP 55/S1	-/-	IP 55/S1
	Yes	Yes	Yes	-
	CE EAC	CE EAC	CE EAC	CE EAC
	External	External	Compressed-air	External
	12/24 ▌42/110/120/230/240 V DC ▌50 - 60 Hz	230 V 50 - 60 Hz	6 bar	230/400 V 50 Hz
	12 V: 230/24 V: 410/460/700	600	470	550/750/1.100
	Optional	Infinitely	Optional	-
	5.1/5.9	6.2	0.9 - 1.4	8.8 - 12.8
	Optional	Yes	-	-
	▸ Commutator motor ▸ Very robust housing in aluminium ▸ Motor is completely closed ▸ F 460 Ex: 460 Watt ▸ F 460-1 Ex: 700 Watt ▸ F 460 Ex EL: 460 Watt, with infinite speed adjustment	▸ Brushless motor ▸ Increased run times ▸ Very low wear ▸ Maintenance-free ▸ Low life cycle costs ▸ With infinite speed adjustment ▸ Very low noise level ▸ Extremely tough double skin aluminium housing	▸ Compressed-air motor ▸ Very lightweight and easy to handle ▸ Extremely powerful ▸ Highest power of all drum pump motors ▸ F 416 Ex: with trigger valve ▸ F 416-1 Ex: without valve ▸ F 416-2 Ex: with ball valve	▸ Three-phase gearmotor ▸ Increased duty cycle possible ▸ The most powerful electric drum pump motor ▸ Available with motor protection switch or cable terminal box ▸ Constant speed

Note on motor power and undervoltage protection
Electrical power consumed is stated for electric motors, for a compressed-air motor, the output power is stated.
The compressed-air motor F 416 Ex (470 W) is more powerful than the commutator motor F 457 (800 W).
Undervoltage protection prevents the motor from starting unintentionally after a power failure. The motor must then be started manually. Motors with undervoltage protection are therefore not suitable for operation with switching amplifiers such as in semi-automatic filling systems (cf. page 36-37).

FLUX motors in detail

For safe, economic use

For driving FLUX pumps a wide range of electric and pneumatic motors is available. Even if you work in hazardous areas or with flammable liquids. Depending on the application, the same pumps can be driven by different motors. The output of a drum pump depends, among other things, on the power of the motor. Here you will find the most economical and safest drive solution for your application.

FEM 4070: The compact commutator motor

The FEM 4070 has a continuously variable speed for different flow rates and a capacity of 500 watts. The ergonomic handle ensures a safe one-handed operation. It offers optimal overload protection in all speed ranges and convinces with its compact design, low weight and mainly by its low noise level.

Advantages

- **Low noise level**
- **Infinite speed adjustment**
- **Compact design and low weight**
- **Awarded the iF Design Award**



FEM 4070

F 457: The most powerful commutator motor

With 800 watts, the motor F 457 is the most powerful commutator motor. The handy compact design has very good air cooling, a low noise level and is optionally available with an integrated no-volt release.

Advantages

- **Most powerful commutator motor**
- **Low noise level**
- **F 457 EL: with infinite speed adjustment**



F 457

F 458 / F 458-1: The robust commutator motor

The F 458 is a compact commutator motor, with extremely tough double skin aluminium housing and is thus very quiet. The motor is completely enclosed and has special corrosion-resistant paint. Therefore, it is suitable for use in extreme conditions, even areas with corrosive vapours.

Advantages

- **Very robust housing in aluminium**
- **With special corrosion-resistant paint**
- **Very low noise level**
- **Motor is completely enclosed**
- **F 458: 460 W / F 458-1: 700 W**
- **F 458 EL: with infinite speed adjustment**



F 458
F 458-1

F 460 Ex / F 460-1 Ex: The ex-protected commutator motor

The F 460 Ex is a compact commutator motor, with extremely tough double skin aluminium housing and is thus very quiet. The motor is completely enclosed. The optimal air flow ensures a very good cooling and thus a service life above average of the carbon brushes.

Advantages

- **Very robust aluminium housing**
- **Motor is completely enclosed**
- **F 460 Ex: 460 W / F 460-1 Ex: 700 W**
- **F 460 Ex EL: with infinite speed adjustment**



F 460 Ex
F 460-1 Ex

FBM 4000 Ex: The brushless motor

In contrast to commutator motors, this motor works without carbon brushes and thus maintenance-free. The FBM 4000 Ex is a brushless drum pump motor, with extremely tough double skin aluminium housing. The soft-start and easy to handle speed control allow a sensitive dosing. Integrated undervoltage protection prevents an uncontrolled start of the pump after a power failure and thus guarantees optimum safety.

Advantages

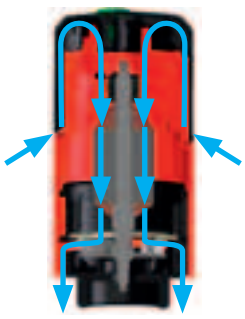
- **Very low wear**
- **Maintenance-free**
- **Low life cycle costs**
- **With infinite speed adjustment**
- **Very low noise level**
- **Very robust aluminium housing**



FBM 4000 Ex

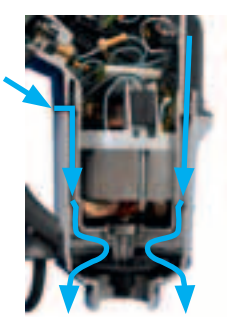
Note on the types of ventilation

Electric motors must be cooled to dissipate heat. With FLUX motors, this happens by air that is aspirated by a fan wheel in the motor. For internally ventilated motors, the cooling air flows directy through the interior of the motor.
With externally cooled motors, the cooling air flows through the chambers of the double housing. Thus the interior of the motor is completely protected against corrosion of electrical components, e.g. by vapours in surrounding air such as those found in electroplating.



internally ventilated

externally ventilated



The arrows show how the cooling air flows through the interior of the motor and the chambers of the double housing.

FLUX motors

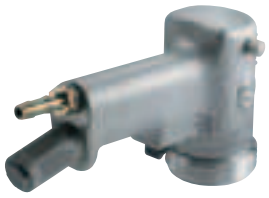
For safe, economic use

F 416 Ex: The light and easy to handle compressed-air motor

Compressed-air motor F 416 Ex is very light and easy to handle and at the same time extremely powerful. Thanks to a silencer it is very quiet. Alternatively an exhaust hose can be used to guide exhaust air to an oil separator. The speed is adjusted by varying the operating pressure or the amount of air. The motor is available in three versions:
F 416 Ex with trigger valve, F 416-1 Ex without valve,
F 416-2 Ex with ball valve.

Advantages

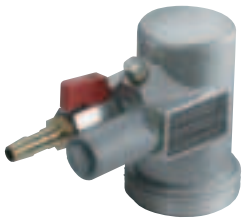
- **Very light and easy to handle**
- **Extremely powerful**
- **With adjustable trigger valve**
- **Highest power of all drum pump motors**
- **F 416 Ex: with trigger valve**
- **F 416-1 Ex: without valve**
- **F 416-2 Ex: with ball valve**



F 416 Ex
with trigger valve



F 416-1 Ex
without valve



F 416-2 Ex
with ball valve

F 414: The three-phase motor for extreme operating conditions

With robust three-phase gearmotor F 414 an increased duty cycle is possible, so it can be used in extreme conditions. It convinces with a constant speed and is available with motor protection switch or cable terminal box.

Advantages

- **Three-phase gear motor**
- **Increased duty cycle possible**
- **The most powerful electrical drum pump motor**
- **Available with motor protection switch or cable terminal box**
- **Constant speed**



F 414

The FLUX power range

Series 400 pump types with different impeller and motor combinations

		F/FP 430 / F/FP 424 / F 426 / F/FP 427							F/FP 425	
Motor type	**Impellers**	**33/36**	**38**	**50**	**33 Z / 35 Z**	**37 Z**	**43 Z / 45 Z**	**45 Z**	**34**	**34 Z**
FEM 4070	Max. flow rate l/min	165	215	–	85	105	100	–	105	60
	Max. delivery head mwc	9.5	10	–	18	16	26	–	7.5	16
	Max. viscosity mPas	600	600	–	800	800	800	–	600	800
F 457 / F 457 EL	Max. flow rate l/min	190	220	110	90	120	110	150	120	70
	Max. delivery head mwc	12	12	32	20	20	30	26	11	21
	Max. viscosity mPas	800	800	150	1.000	1.000	1.000	1.000	800	1.000
F 458 F 460 Ex F 458 EL F 460 Ex EL	Max. flow rate l/min	170	200	–	85	100	95	130	90	60
	Max. delivery head mwc	9.5	9.5	–	15	14	23	19	7	14
	Max. viscosity mPas	600	600	–	800	800	800	800	600	800
F 458-1 F 460-1 Ex	Max. flow rate l/min	190	220	105	90	115	110	145	110	70
	Max. delivery head mwc	12	12	29	20	19	28	25	10	20
	Max. viscosity mPas	800	800	150	900	900	900	900	800	900
FBM 4000 Ex	Max. flow rate l/min	160	220	–	85	110	105	120	110	65
	Max. delivery head mwc	10.5	11	–	15.5	17.5	30	23	8	15
	Max. viscosity mPas	700	700	–	900	900	900	900	700	900
F 416 Ex F 416-1 Ex F 416-2 Ex	Max. flow rate l/min	205	240	–	100	120	105	145	110	80
	Max. delivery head mwc	13	13	–	24	24	30	30	12	26
	Max. viscosity mPas	1.200	1.200	–	1.200	1.200	1.200	1.200	1.200	1.200
F 414	Max. flow rate l/min	145	185	110	90	115	105	160	90	67
	Max. delivery head mwc	10	11	25	11	12	21	21	8	11
	Max. viscosity mPas	1.000	900	150	1.000	1.000	1.000	1.000	1.000	1.000

Flow rate max. 70 l/min

When using a pump with hose (approx. 2 m long) and hand nozzle, the flow rate is max. 70 l/min.
Dependent on the motor, a 200 liter drum is emptied within approx. 3 - 4 minutes.

Note

- All measured values were determined with water (20 °C) and an operational voltage of 230 Volt.
- The maximum measurement error is ±10 %.
- The maximum flow rate was measured with open pump discharge.
- The maximum delivery head was measured with closed outlet.
- The outlet is where a hose is connected.



outlet of FP 427

Additional products and accessories

Comprehensive range of accessories for all FLUX pump models

To supplement the diverse range of pumps, FLUX has a wide range of accessories. FLUX accessories provide smooth, safe running and make work easier. For example, lift a FLUX pump out of the drum without any exertion thanks to the carrying handle and spring balancer. Space saving storage equipment allows pumps to be easily stored. Furthermore for every application there is the right hose - pre-configured and integrated in the required length. For typical drum pump applications there are pre-configured pump sets available. Whether for mobile or static deployment - with the FLUX range of accessories a FLUX pump can be turned into a custom-made pumping system for any application.

Hand nozzles:

FLUX hand nozzles offer a high level of operational safety in every situation thanks to their optimal sealing. The special swivel joint with ball bearings ensures a perfect fit even under pressure.
Thanks to the ergonomically shaped hand lever, little force is required during actuation.

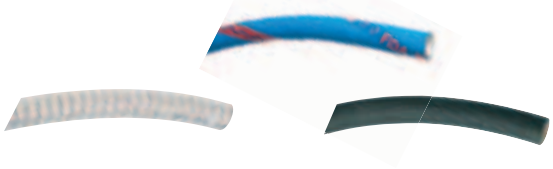


- Easy to operate
- Fine metering
- Ball-bearing mounted swivel joint
- Low pressure loss
- High flow rate
- Can be combined with stop valve, fume gland and various outlet nozzles
- Available in polypropylene, polyvinylidene fluoride and stainless steel (other types also in aluminium or brass)
- Stainless steel version also for use in hazardous areas* and with alcohols

Hoses:

There is a hose for every application – pre-configured and cut to the required length.

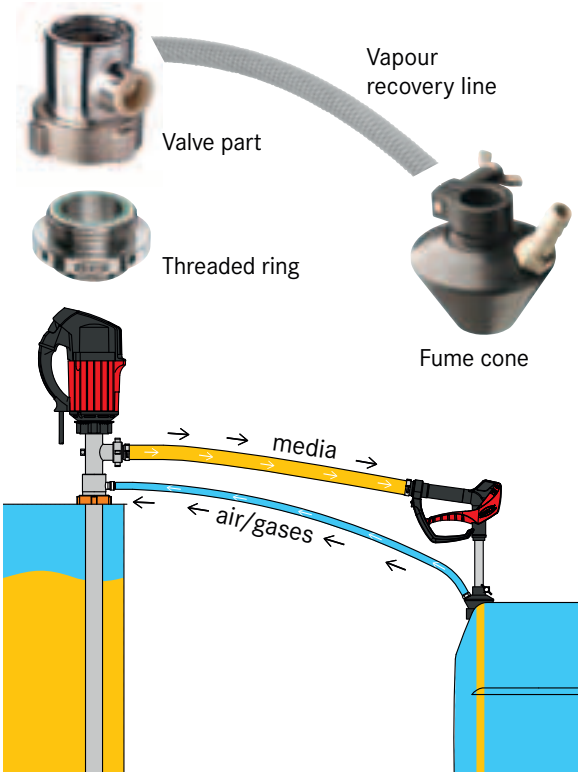
- The right hoses for all fluids
- Easy to assemble „plug & play“
- **Only at FLUX:** swaged hose fittings in PP/PVDF for hoses with thermoplastic inliner
- Tested/certified hose lines with serial numbers
- Also for use in hazardous areas * and for food, pharmacy and cosmetics
- Available from stock



Fume glands:

FLUX fume glands consist of valve part and threaded ring. They prevent corrosive vapours from escaping during the transport of, for example, concentrated acids and alkalis, which can cause damage to humans and the environment. For optimal vapour recovery use fume cone and recovery line.

- For aggressive and corrosive media
- Hermetically seals container
- Venting valve ensures that the tank pressure is compensated
- Optimum protection for operator and environment
- Where selected, the motor is protected from corrosive vapours
- Polypropylene and stainless steel versions available
- Stainless steel version also for use in hazardous areas*



* conform EC Directive 2014/34/EU

Suction strainer:

When using open containers impurities cannot always be excluded. Strainers mounted on the pump inlet help to protect the pump against damage.

- Keeps coarse impurities from the pump
- Protection of the pump against mechanical damage during handling
- Easy assembly
- In polypropylene, polyvinylidene fluoride and stainless steel
- Stainless steel version also for use in hazardous areas*



Handling:

For trouble-free and safe operation. E. g. a FLUX pump can be lifted out of the drum without any effort thanks to the carrying handle and spring balancer.

- Wall bracket
- Spring balancer
- Quick action coupling
- Attachment clamp
- Carring handle
- Compression gland



Solenoid valve and controlled valves:

With a suitable valve and additional accessories a FLUX pump becomes a tailor-made conveying system (cf. pages 36 and 37). Collaboration with different suppliers makes the best choice for each application.

- Used for semi-automatic filling
- High safety standard for controlled delivery
- Electrically or electropneumatically actuated
- Optimally tailored to the application

FDA



Flow meters:

Approved FLUX flow meters FMC and FMO provide, in combination with FLUX drum pump, pump motor, hose line and outlet fitting, everything you need for fast and safe emptying of containers (cf. pages 36 and 37).

- FMC constructed on the nutating disc principle or FMO constructed on the oval rotor principle
- FMC and FMO: as standard with FLUXTRONIC® evaluation unit or as impulse version
- FMC: in polypropylene, ethylene-tetrafluoroethylene and stainless steel
- FMO: dependent on size, in polyvinylidene fluoride, stainless steel or aluminium available
- FMJ: cost-effective version of the FMC in polypropylene with FLUXTRONIC® evalution unit for flow monitoring only
- Also for use in hazardous areas*

FLUXTRONIC®:

- Two operation modes: Normal mode to display quantity and flow rate, automatic mode for automatic filling of a pre-defined quantity at the push of a button
- Signal output, e. g. for opening/closing a valve, switching of pump motor and pulse redirection
- External mounting possible, e. g. on hand nozzle
- Also for use in hazardous areas*



Note

For further information see separate brochures „Accessories" and „Flow meters"

Series 400 pump kits

Pre-configured for typical applications

FLUX pump kits are pre-configured combinations of pump, motor, hose and hand nozzle for immediate commissioning. The components are selected for typical applications and the associated requirements in the field of manual filling.

Acids and alkalis		Pump **F 430 PP**, with mechanical seal, or pump **F 424 PP**, sealless in the liquid area, each in polypropylene (shaft Hastelloy C, O-rings FKM), commutator motor **FEM 4070** (230 V, 50 HZ, 500 Watt, speed adjustment, no-volt release), **PVC hose line** (DN 19, 2 m), **hanz nozzle PP**, compression gland, 1.000 mm for drum emptying or 1.200 mm for IBC emptying, viscosity max. 600 mPas, flow rate with hose and hand nozzle approx. 40 l/min
Concentrated acids		Pump **F 430 PVDF**, with mechanical seal, in polyvinylidene fluoride (shaft hastelloy C, O-rings FKM), commutator motor **F 458** (230 V, 50 Hz, 460 Watt, no-volt release), **chemistry hose line** (DN 19, 2 m), **hand nozzle PVDF**, compression gland, 1.000 mm for drum emptying or 1.200 mm for IBC emptying, viscosity max. 600 mPas, flow rate with hose and hand nozzle approx. 40 l/min
Mineral oil products		Pump **F 430 AL**, with mechanical seal, in aluminium (shaft stainless steel, O-rings NBR), commutator motor **FEM 4070** (230 V, 50 Hz, 500 Watt, speed adjustment, no-volt release) or commutator motor **F 457** (230 V, 50 Hz, 800 Watt, no-volt release), **mineral oil hose line** (DN 25, 2 m), **hand nozzle AL**, compression gland, 1.000 mm for drum emptying or 1.200 mm for IBC emptying, viscosity max. 800 mPas, flow rate with hose and hand nozzle approx. 65 l/min
AdBlue®* for IBC-Container emptying		Pump **F 424 PP**, sealless in the liquid area, in polypropylene (shaft stainless steel, O-rings FKM, Z-rotor), commutator motor **FEM 4070** (230 V, 50 Hz, 500 Watt, speed adjustment no-volt release), compression gland, optionally **PVC hose line** (DN 19, 3 m) with hand nozzle **PP** or **special hose line** (DN 16, 6 m) with **self-closing hand nozzle in aluminium**, 1.200 mm or IBC emptying, flow rate with hose and hand nozzle approx. 30 l/min
FES 800 for Cleaning agent and desinfectant		Pump **F 424 PP**, sealless in the liquid area, in polypropylene (shaft Hastelloy C, O-rings FKM), **fume gland FES**, commutator motor **FEM 4070** (230 V, 50 Hz, 500 Watt, speed adjustment, no-volt release), **PVC hose line** (DN 19, 2 m), **hand nozzle PP**, 800 mm for 60-liter-canister, viscosity max. 600 mPas, flow rate with hose and hand nozzle approx. 40 l/min
Universal use		Pump **F 430 S**, with mechanical seal, in stainless steel (shaft stainless steel, O-rings FKM), commutator motor **F 460 Ex** (230 V, 50 Hz, 460 Watt, no-volt release) or compressed-air motor **F 416 Ex** (470 Watt at 6 bar), **earth ground wire, universal hose line** (DN 21, 2 m), electrically conductive with swaged hose fittings and **hand nozzle in stainless steel**, compression gland (conductive), 1.000 mm for drum emptying or 1.200 mm for IBC emptying, viscosity max. 600 mPas (F 460 Ex) or 1.200 mPas (F 416 Ex), flow rate with hose and hand nozzle approx. 50 l/min
Highly flammable liquids		Pump **FP 424 Ex S**, in the liquid area sealless, in stainless steel (shaft stainless steel, O-rings FKM), commutator motor **F 460 Ex** (230 V, 50 Hz, 460 Watt, no-volt release) or compressed-air motor **F 416 Ex** (470 Watt at 6 bar), **earth ground wire, universal hose line** (DN 21, 2 m), electrically conductive with swaged hose fittings and **hand nozzle in brass**, compression gland (conductive), 1.000 mm for drum emptying or 1.200 mm for IBC emptying, viscosity max. 600 mPas (F 460 Ex) or 1.200 mPas (F 416 Ex), flow rate with hose and hand nozzle approx. 55 l/min
99.98 % Drum emptying		Pump **FP 425 Ex S**, with backflow valve and mechanical seal, in stainless steel (shaft stainless steel, O-rings FKM), commutator motor **F 460 Ex** (230 V, 50 Hz, 460 Watt, no-volt release), **earth ground wire, universal hose line** (DN 21, 2 m), electrically conductive, **hand nozzle stainless steel**, compression gland (conductive), 1.000 mm for drum emptying or 1.200 mm for IBC emptying, viscosity max. 600 mPas, flow rate with hose and hand nozzle approx. 35 l/min

Note
For further information see separate brochure „Pump Kits"

* AdBlue® is a registered trademark of: Verband der Automobilindustrie e.V. (VDA)

For smaller quantities

Series 300 drum and container pumps

Small series 300 drum pumps JUNIORFLUX and COMBIFLUX are particularly suitable for filling comparatively small quantities from containers such as cans up to IBCs. The small diameter outer tube makes it possible to pump out of tight openings. JUNIORFLUX motor and pump tube are fixed with screws. The COMBIFLUX pump can be operated either with quick release commutator motor or battery motor.



JUNIORFLUX (left) with fixed motor.
COMBIFLUX (right) with removable motor.

Special advantages of the COMBIFLUX with battery motor (IP 44)

- **Engine is externally ventilated and therefore protected from corrosion by aggressive vapours**
- **Motor protected by IP 44 against Splash water**
- **Can be used immediately and flexibly – without installing cables, independent of power outlets – also outdoors**
- **Last speed setting active when switched on again**
- **Seventeen 200 litre drums can be emptied on one battery charge (at 5.000 rpm)**
- **Battery runtime up to 200 min (at 5.000 rpm)**
- **Minimal interruption of work due to replaceable battery**
- **Replaceable Lithium Ion battery (recharged within 55 min)**

Note
For further information see separate brochure „JUNIORFLUX/COMBIFLUX"

Product characteristics

- Can pump out of narrow-necked containers
- Low overall weight – minimal amount of exertion necessary when changing drums

JUNIORFLUX

- Commutator motor and pump with fixed connection
- Mechanical seal and sealless versions available

COMBIFLUX

- Motor easy to remove via the quick action coupling
- Pump sealless in the liquid area
- Several pumps can be operated in series with one motor
- Can be combined with a commutator motor or a brushless battery motor

Technical data

	JUNIOR-FLUX	COMBI-FLUX
Flow rate max.	57 l/min*	60 l/min*
Delivery head max.	8.5 mwc*	
Viscosity max.	250 mPas*	
Materials pump outer tube	Polypropylene, polyvinylidene fluoride, stainless steel	
Standard immersion depths (mm)	500/700/1.000	500/700/1.000/1.200
Outer diameter (mm)	25, 28, 32	



COMBIFLUX with battery motor – the solution where cables are problematic or power supply is unavailable.

* The maximum flow rate is a test bench value, measured with water at 20 °C at the pressure port of the pump, without accessories (hose, nozzle, flow meter)

Semi-automatic filling systems

Based on the example of wired-in version

FLUX semi-automatic filling systems allow pre-set quantities to be quickly and safely metered at the touch of a button. They provide an economical alternative to conventional automatic filling systems and stations. The combination of pump, motor, flow meter and additional accessories is designed for the specific application, it can also be configured for ex-applications. In order to configure a semi-automatic filling system, it is essential to follow the correct procedure. The following instructions show the individual steps for an example in the non-ex-area (below) and an example in the ex-area (see following page).

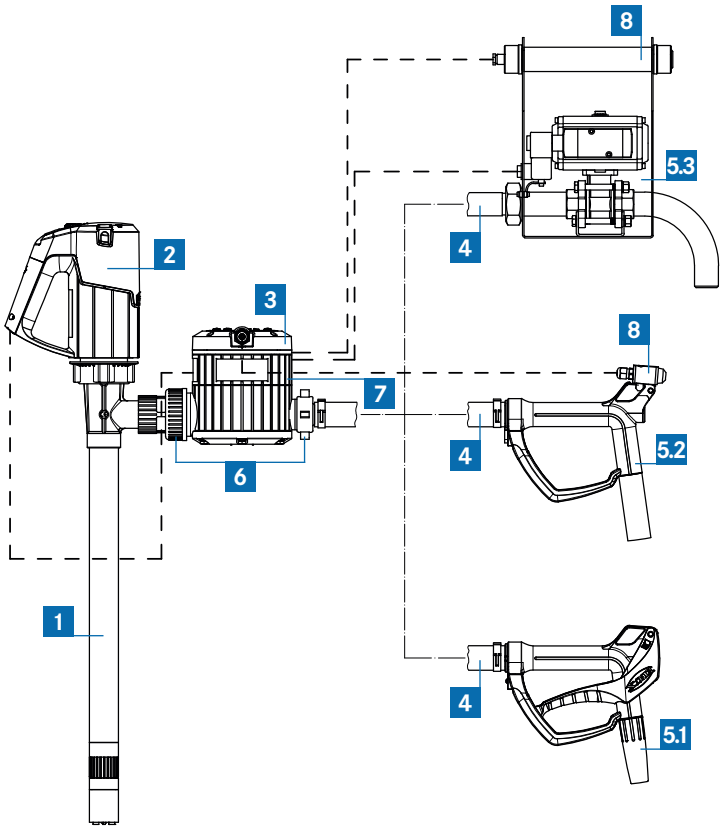
Systematic procedure for selecting the components:

1. Select the components following the flow path of the liquid from the container to the discharge fitting.	1 1 to 5 5
2. Find any missing connecting elements.	6 6
3. Decide on the electrical components to be used for the control system.	7 7 to 8 8
4. In the case of applications within the ex-area, check compliance with the ex-rules as specified by the operator.	9

Note
The designs shown in the following examples incorporate various FLUX discharge fittings. However, depending on the medium and application, other configurations may also be recommended which include a hand nozzle and integrated electronic display unit, or a discharge spout. Just contact your FLUX sales engineer for advice.

Configuration example showing a semi-automatic filling system for the non-ex-area

1. Pump (non-return valve recommended)
2. Motor without undervoltage protection
3. Flow meter with electronic display unit FLUXTRONIC®
4. Hose
5.1 FLUX hand nozzle
5.2 FLUX discharge unit with spring valve (FAE)
5.3 FLUX discharge fitting with externally controlled valve
6. Connecting elements
7. Integrated switching amplifier
8. External Start-Stop
9. Control and mains cable (– – – in figure)



Selection of the individual components and illustrative selection criteria

1 1 Pump
- Application (type, immersion depth, non-return valve yes/no, Ex yes/no)
- Medium (material)

2 2 Motor without undervoltage protection
- Type (electric, compressed-air, Ex yes/no)
- Desired flow rate (output)

3 3 Flow meter
- Application (type, Ex yes/no, with electronic display unit FLUXTRONIC® or external signal processing)
- Desired flow rate (design size)
- Medium (material)

4 4 Hose
- Application (Ex yes/no)
- Medium (material, resistance, FOOD)

5 5 FLUX discharge fitting
- Application
- Filling accuracy
- Ease of use
- Medium (material)

6 6 Any missing non-electrical connecting components
- Component fittings (any required hose connection)

7 7 Switching amplifier
- Non-ex application (integrated within flow meter or remote mounted)
- Ex-application (not integrated, placement within ex-area possible)

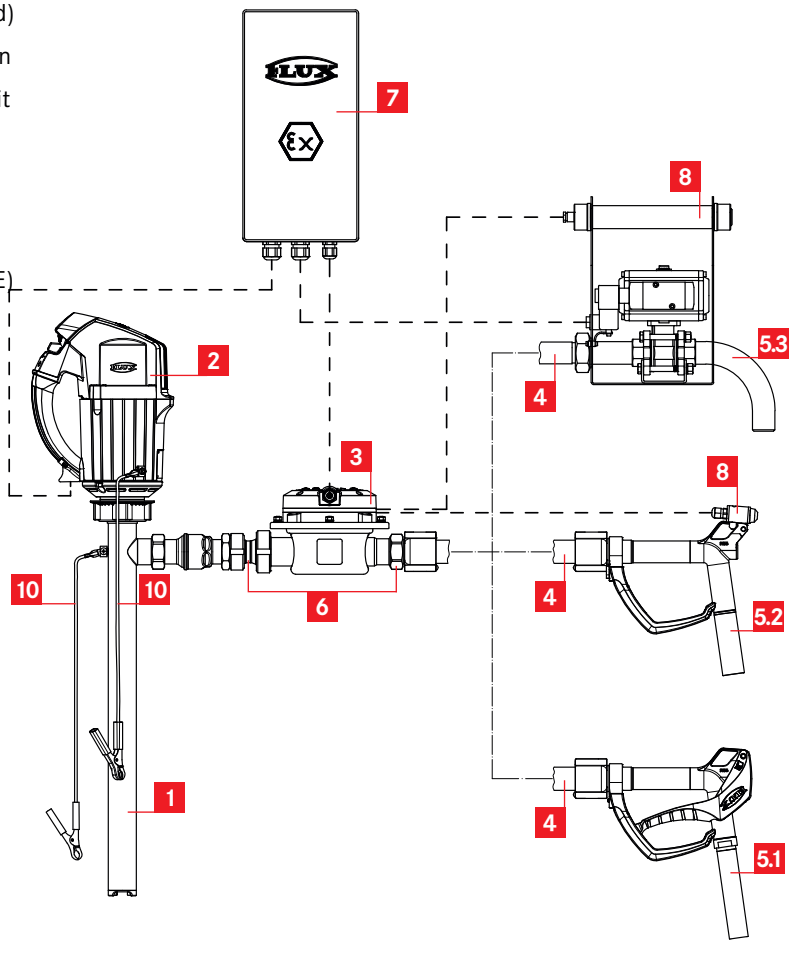
8 8 External start/stop control
- Wired-in

9 9 Control and mains cable
- Application (Ex yes/no)
- Positioning of the components

10 Earth cable for equipotential bonding
- For ex-applications

Configuration example showing a semi-automatic filling system for the ex-area

1 Pump (non-return valve recommended)
2 Motor without undervoltage protection
3 Flow meter with electronic display unit FLUXTRONIC®
4 Hose
5.1 FLUX hand nozzle
5.2 FLUX discharge unit with spring valve (FLUX filling unit FAE)
5.3 FLUX discharge fitting with externally controlled valve
6 Connecting elements
7 Switching amplifier
8 External start/stop control
9 Control/mains cable (– – – -in Figure)
10 Earth cable



Customized all-in solutions

From pump kits to comprehensive systems

FLUX offers more than just pumps. As well as a great diversity of pumps and suitable motors FLUX has an extensive range of ancillary products and accessories. After the analysis of the problem by FLUX consultant complete customized solutions are developed. These can extend from small-scale product configurations through to complex systems.

Task:

Filling of 10, 20 and 60 litre cans and 200 l drums from IBC stacked or on racking.
Material: Mineral oils and machining oils.



Solution features

- Quantity to be filled is pre-set via FLUXTRONIC®
- Filling is started by pressing a button on the discharge unit

Components

- Drum pump F 430 S TR
- Commutator motor F 457
- PVC hose
- Flow meter FMC 100 in stainless steel with electronic display unit FLUXTRONIC®
- 2-way valve
- Circuit amplifier FSV 100 for controlling the motor and 2-way valve
- Mineral oil hose integrated
- Wired in filling unit
- Stainless steel panel (mounted on the struts of the IBC)

Task:

Filling of highly toxic media.



Solution features

- Personnel and environment are protected from toxic vapours
- Almost no medium whatsoever is left in the drum

Components

- Drum pump FP 425 S in stainless steel for 99.98 % drum emptying
- Commutator motor F 457 EL
- Flow meter FMC 100 in stainless steel with electronic display unit FLUXTRONIC®
- Discharge unit with electro-pneumatic 2-way valve
- Circuit amplifier FSV 100 to control the motor and 2-way coaxial valve
- Emission protection valve for drum pump
- Emission protection cone for drum being filled

Custom made design

Special custom solutions from the house of FLUX

Solutions for some tasks require additional design measures. These can also be carried out by FLUX. The right specialists for dealing with the technical challenges are drawn from a large team. Whether the tasks to be undertaken are simple or complex, FLUX is your ideal partner for turning creative concepts into bespoke solutions.

Example of a mobile chemical dosing station

Task:

For a coating process, various additives have to be dosed into a chemical reactor. A mobile system is to be used to convey the hazardous fluids in 60-litre cans from the chemicals warehouse to the unit where they are to be directly dosed into the reactor.

- Media: highly concentrated acids, e.g. nitric acid 65 %
- Flow rate: 2-4 l/min

Special requirements::

- Maximum possible transportation and dosing safety in a mobile, closed system
- Leakage-, drip- and emission-free, even when containers are being changed
- Dosing accuracy +/- 1 %, even for initial filling of an almost empty container, and even if there are air bubbles in the medium
- Operating active indicator lamp, emergency shutdown device and external start/stop control
- Customer-specific material and component stipulations



Transportation and dosing of hazardous fluids: Maximum possible safety in a mobile system.

Features of the special solution

- The quantity to be dosed is pre-set using FLUXTRONIC® and high-accuracy dosing is started at the touch of a button in a mobile, closed system incorporating special emission protection.

Components

- Pump FP 424 Ex, sealless in the liquid area, in stainless steel
- Commutator motor FEM 4070
- Flow meter FMO 102 with electronic display unit FLUXTRONIC® and switching amplifier FSV 100

Special components

- Trolley for replacement containers, including integrated, container-specific catch basin with hose compartments
- Customer-specific gas separator with gas recovery and seal solutions
- Special fume gland for venting, gas recovery and short-circuit purging
- Drip-free hose connections with non-interchangeable quick action couplings
- Controlled monitoring of the dosing process
- Extra safety due to the indicator lamp
- Short-circuit purging option for filling the system prior to initial filling
- CE certification including documentation of the whole system



High dosing accuracy, even for initial filling thanks to short-circuit purging option.

More than just pumps

Today the FLUX name is recognised around the globe as the trademark for top standards in pump technology. Everything started with the invention of the electric drum pump in 1950. Nowadays FLUX has an extensive range of products each of which can be customized. FLUX pumps are used for example in the chemical and pharmaceutical industries; in machinery and plant engineering as well as companies in electroplating, wastewater treatment and the food sector.

Whether single-product or system solution – FLUX quality is synonymous with a long service life, excellent economy and maximum safety.

In addition to the excellent product quality FLUX customers appreciate the superb level of expertise our staff has to offer as well as their genuine customer focus.

These days FLUX-GERÄTE GMBH supplies pumps to almost 100 countries around the globe.

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FLUX-GERÄTE GMBH
Talweg 12 · D-75433 Maulbronn
Tel +49 7043 101-0 · Fax +49 7043 101-444
info@flux-pumpen.de · www.flux-pumps.com