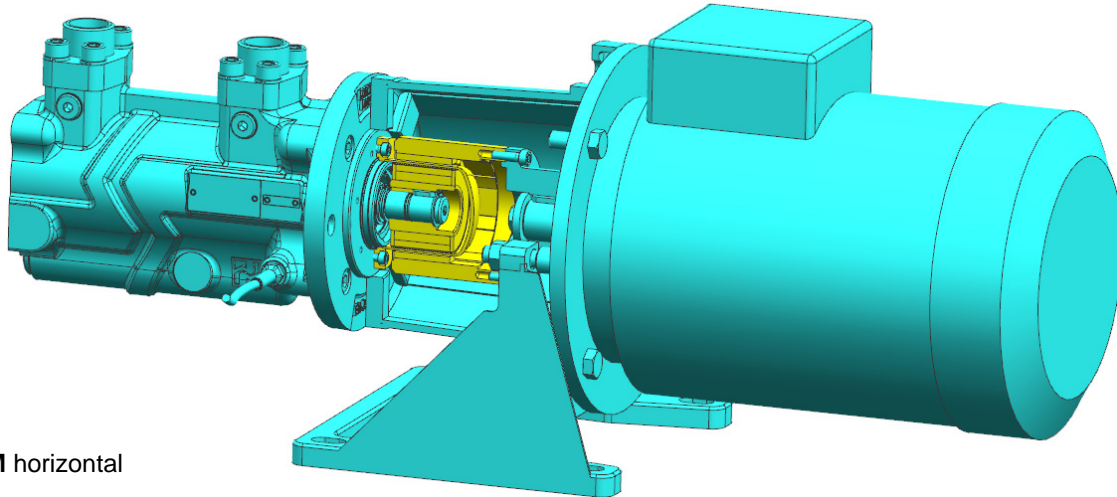


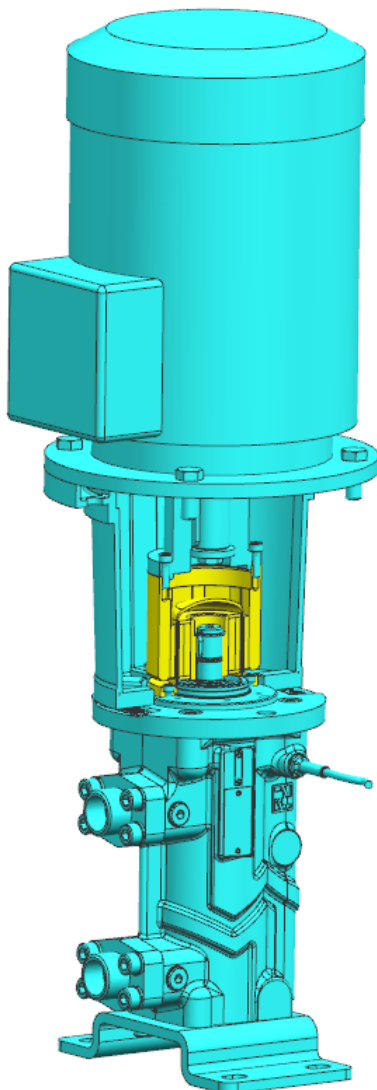
ALLFUEL®

Magdrive AFM SERIES

Screw Pump



AFM horizontal



AFM vertical

Use

For pumping heating oils, fuels (including low-sulfur ship fuel and marine diesel), lubrication oils, hydraulic oils, or other lubricating liquids and chemicals such as Polyols and isocyanates. The pumped liquids may not contain any abrasive components nor chemically attack the pump material.

Main fields of application

ALLFUEL Magdrive-(AFM)-pumps are used as transfer, booster, and burner operation pumps in oil-fired systems, as transfer pumps in (marine) fuel systems, as feeder and filling pumps in tank systems, and as lube-oil pumps in virtually all areas of industry. They are also used in plants for production of polyurethanes as a transfer pump based media.

Design

Compact, single pump/motor assembly; vertical and horizontal configuration; without integrated filter.

Model Code

	AFM	10	60/7	R	38	U	W226	E	V	F
Series (Magdrive)	_____									
Size ①	_____									
Magnetic coupling ②	_____									
Spindel pitch direction (R = right)	_____									
Spindel pitch angel (degrees)	_____									
Bearing type ③	_____									
Material code	_____									
Heating ④	_____									
Type of installation ⑤	_____									
Flanges ⑥	_____									

① Theoretical capacity Q [l/min] at 1450 1/min and 46° pitch angle.

② Short designation

60/7

60/14

60/22

- ③ U = internal antifriction bearing.
- ④ A version is available with optional electric heating of the magnetic coupling.
- ⑤ V = vertical; H = horizontal.
- ⑥ F = counter flange; A = adapter flange.

Structural design

Internal-bearing, three-screw, self-priming screw pump with magnetic coupling and without a shaft seal. The magnetic coupling's containment can hermetically seals the pump. Together with the rotor housing, bearing and pump cover, the hardened and polished screws form an insert unit that can be exchanged quickly and easily.

The drive screw is hydraulically balanced. A special screw design absorbs the axial thrust of the idler screws. It is hydraulically driven. Only the torque resulting from liquid friction is transferred over the thread flanks. The thread flanks are therefore virtually free of loads and are not subject to wear. The pumped liquid lubricates all sliding parts and can be categorized as full fluid friction.

The radial and axial bearing of the drive screw is provided by a groove ball bearing.

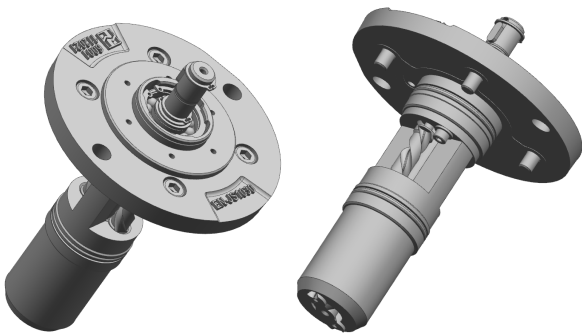
A return bore connects the magnetic coupling and the pump's suction area to each other. This facilitates circulation of the liquid throughout the coupling, thereby forcing heat generated by the eddy current to dissipate out from the coupling.

Three sizes and various screw pitches ensure fine gradation of the entire flow rate range.

The ALLFUEL family is designed with an insert unit consisting of a pre-assembled unit with liner, spindle set, bearing and cover.

In case of changing operation condition which request a different material combination or in case of replacement this insert unit can be implemented quickly and easily without dismantling the pump housing from the pipe works (process design).

The insert unit fits into all existing ALLFUEL pump-housings as well as into pump-housings of the predecessor SPF/M- and SPZ/M-series.



Function

Specially shaped thread flanks cause the three screws to form sealed chambers; rotation of the screws then causes the contents of the chambers to move continuously in the axial direction from the pump's suction side to its pressure side. Despite rotation of the screws, no turbulence results. The uniform chamber volumes eliminate crushing forces.

Performance data

Capacity ①	Q	up to	112 l/min
Inlet pressure	p _s	up to	25 bar
Discharge pressure ②	p _d	up to	40 bar
Temperature of pumped liquid ③	t	up to	150 °C
Viscosity range	ν	1 up to	3000 mm ² /s

- ① at n = 2900 1/min and ν = 750 mm²/s
- ② Refer to the individual curves for the achievable pump pressure in relation to viscosity and rotational speed. Pressure specifications are applicable only to nearly static pressure loads. Consultation required for dynamically alternating pressure loads.
- ③ Consultation required for higher temperatures.

Filter

A separate system filter is essential when operating these AFM pumps without an integrated filter element. However, these pumps are also available with an integrated radial screen filter (AFM-F version) for protection against contamination. Filter mesh size 0.4 mm. Refer to technical document 488110 for more information. Twin units (version AFM-T) are provided when a reserve pump is required. Refer to technical document 488110 for more information.

Heating

The pumps can be equipped with optional electric heating cartridges for the magnetic coupling.

Pump size	Connection for	Output of heating cartridge (pressure side)
10	230 V	200 W
20	230 V	200 W
40	230 V	300 W

Heating capacity is dimensioned so that when outlet temperature is 20 °C heating time of 60 minutes will be adequate for highly viscous liquid. When temperatures are lower, a correspondingly longer heat-up time will be required. Heating is not designed to achieve noticeably higher liquid temperatures during operation. To avoid potential damage to the bearing, do not exceed the permissible temperature of the pumped liquid.

Flanges and connections

Feed and discharge branches as counter flanges based on SAE (SAE J518C, hole pattern 3000 PSI).

- Existing connections:
- E7 Venting of pump
 - H7 Heating cartridge
 - M1, M2 Pressure gauge
 - Temperature gauge

Noise and pulsation

The design and operation of the screw pump enable a very low noise level and virtually pulsation-free pumping.

Overload protection

A pressure-relief valve is integrated into each pump as a means of overload protection. Its standard trigger pressure is set to approximately 10 % above the working pressure. Please make sure your order specifies if a different trigger pressure is desired.

Installation

To avoid air trapped inside the pump, the pump may not be installed with the flanges pointing down. When installed vertically, a "motor down" arrangement is not permitted for safety reasons. In addition, it is not permissible to install the pump with the vent screw pointing down.

Drive

A motor bracket facilitates connection of a wide variety of electric motors. The following motor type is intended for normal conditions:

Surface-cooled three-phase squirrel-cage motors, IMV 1 design type, IP 55 protection class according to IEC

standard, Insulation Class F utilized according to B, output and main dimensions according to DIN EN 50347.

Motors configured for 50 Hz may also be operated in 60 Hz networks.

Magnetic coupling

The magnetic coupling, located in the pump bracket, provides contactless power transmission between the drive and the pump. Magnetic couplings consist of an outer and an inner drive. Counteracting force fields from the individual permanent magnets act between the two rotating parts. The static containment can provides for hermetic separation. A driveshaft connects the outer drive (outer rotor) directly to the motor. The internal rotor forwards the torque to the pump's drive screw.

Explosion protection



Fulfillment of requirements according to EU explosion protection directive 2014/34/EU (ATEX 100a) for devices in Device Class II,

Category 2 G. Division into temperature classes according to DIN EN 13463-1 based on the temperature of the pumped liquid. Refer to the quotation/order documentation for the maximum permissible pumped-liquid temperature for each temperature class.

Note: Adequate steps must be taken to prevent impermissible warming of the pump surface when operated in Category 2.

Materials

Denomination	Material design			
	W226 ①	W226E ①	W228 ②	W228E ②
Pump casing	EN-GJS-400-15		EN-GJS-400-15	
Casing insert	Aluminium	Aluminium	EN-GJL-250	EN-GJL-250
Pump cover end drive	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15
Drive screw	Steel	Steel	Steel	Steel
Idler screw				

① Recommended material for all liquids incl. HFO up to 40 bar (except: Low Sulphur MGO / MDO)

② Recommended material for critical liquids up to 40 bar (e.g. HFO, Low Sulphur MGO / MDO)

NPSH - values [m]

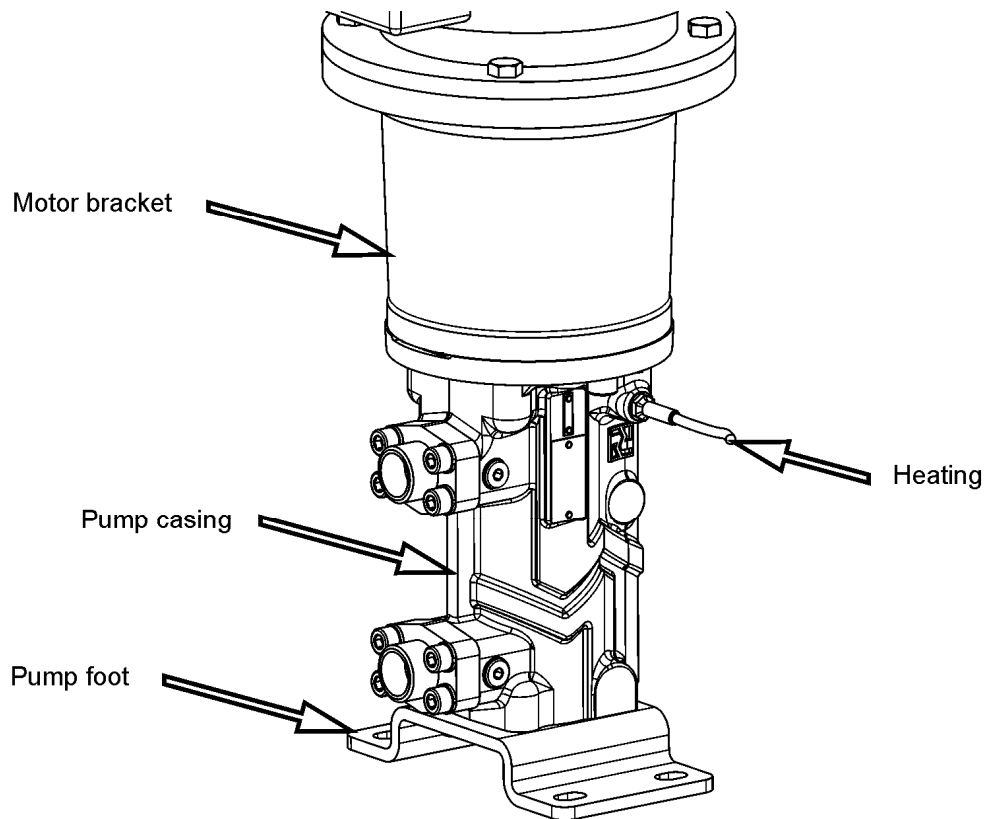
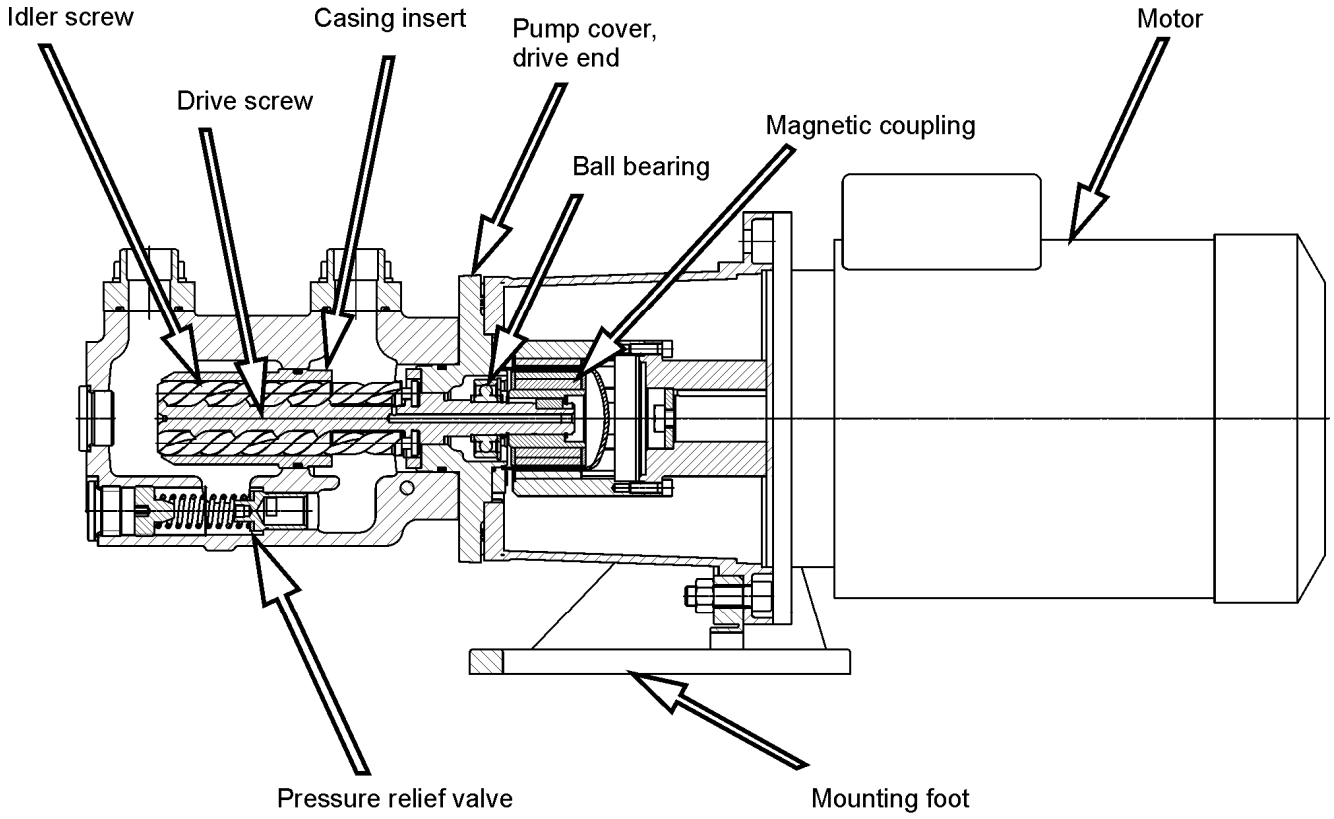
NPSH fulfilled for pump without filter

AFM	Speed 1/min											
	950 / 1.140			1.450 / 1.750			2.900			3.500		
	Kinematic viscosity mm²/s											
	3-40	150	750	3-40	150	750	3-40	150	750	3-40	150	750
10-28	2,5	2,8	3,2	2,5	2,9	3,6	2,5	2,9	4,2	2,6	3,1	4,3
10-38	2,5	2,8	3,6	2,5	2,9	3,9	2,5	3,1	4,6	2,6	3,3	5,1
10-46	2,5	2,9	3,9	2,5	3,0	4,2	2,6	3,3	5,1	2,8	3,5	6,6
10-56	2,5	2,9	4,3	2,5	3,1	4,5	2,8	3,7	7,3	3,1	4,1	7,0
20-38	2,5	2,9	3,9	2,5	2,9	4,1	2,5	3,2	5,0	2,7	3,5	5,6
20-46	2,5	2,9	4,2	2,5	3,1	4,4	2,7	3,5	6,2	3,0	3,9	7,0
20-56	2,5	3,0	4,5	2,5	3,3	5,1	3,2	4,1	7,2	3,6	4,6	9,1
40-38	2,5	2,9	3,8	2,5	3,1	4,3	2,7	3,5	5,6	2,9	3,8	6,3
40-46	2,5	3,0	4,2	2,6	3,3	4,8	3,0	4,0	6,8	3,4	4,4	7,8
40-54	2,5	3,2	4,8	2,7	3,6	5,4	3,6	4,7	8,2	4,2	5,5	9,7

Performance table (speed n = 1.450 1/min und 3.500 1/min)

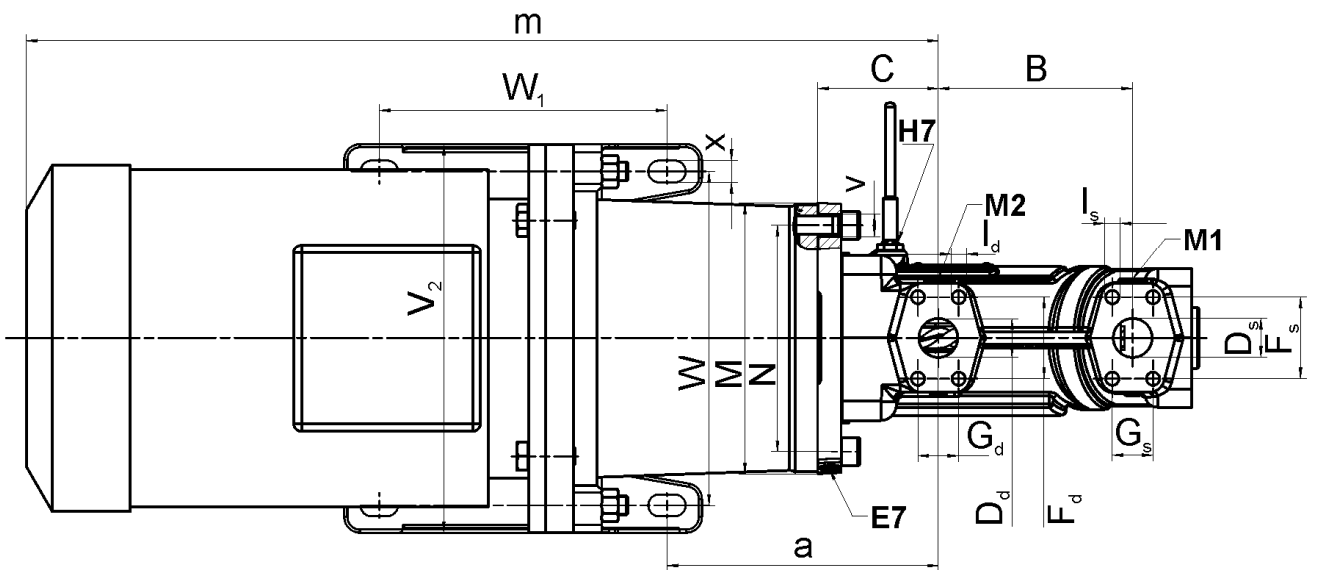
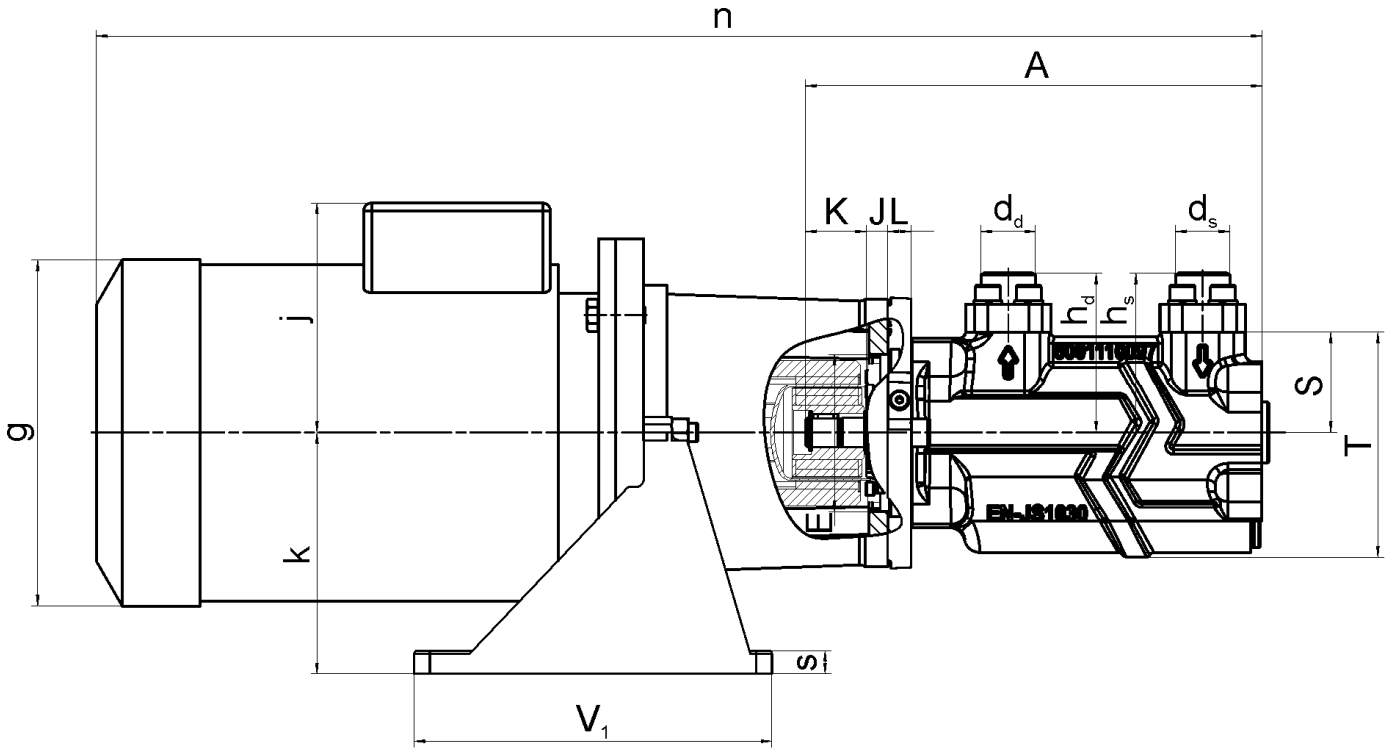
Frequency		50 Hz										60 Hz							
Speed		1.450 min ⁻¹										3.500 min ⁻¹							
Pump size	Discharge pressure	Kinematic viscosity mm ² /s										Kinematic viscosity mm ² /s							
		3		12		150		750		3		12		150		750			
AFM	bar	Q l/min	P kW	Q l/min	P kW	Q l/min	P kW	Q l/min	P kW	Q l/min	P kW	Q l/min	P kW	Q l/min	P kW	Q l/min	P kW		
10-28	5	2,02	0,14	2,95	0,14	3,96	0,21	4,38	0,41	9,48	0,89	10,40	0,90	11,37	1,26	11,78	2,44		
	10	0,22	0,18	1,97	0,18	3,39	0,25	4,02	0,46	7,73	0,99	9,27	1,00	10,83	1,36	11,43	2,54		
	15	-	-	0,81	0,22	2,94	0,29	3,73	0,50	6,23	1,10	8,33	1,21	10,40	1,47	11,15	2,65		
	20	-	-	-	-	2,54	0,34	3,48	0,54	4,86	1,20	7,49	1,16	10,02	1,57	10,91	2,75		
	25	-	-	-	-	2,18	0,38	3,25	0,59	3,59	1,31	6,71	1,32	9,67	1,68	10,70	2,86		
	30	-	-	-	-	1,86	0,42	3,05	0,63	2,38	1,41	5,98	1,42	9,36	1,78	10,50	2,96		
	35	-	-	-	-	1,55	0,47	2,86	0,67	1,23	1,52	5,29	1,53	9,06	1,89	10,31	3,06		
40	-	-	-	-	1,26	0,51	2,67	0,72	0,12	1,62	4,62	1,63	8,78	1,99	10,15	3,17			
10-38	5	4,21	0,16	5,36	0,16	6,48	0,23	6,96	0,43	15,35	0,95	16,48	0,95	17,57	1,31	18,03	2,49		
	10	2,96	0,22	4,04	0,22	5,84	0,29	6,57	0,50	13,27	1,10	15,19	1,11	16,96	1,47	17,65	2,65		
	15	0,25	0,29	2,92	0,29	5,32	0,36	6,26	0,56	11,47	1,26	14,11	1,27	16,46	1,63	17,36	2,80		
	20	-	-	1,92	0,35	4,87	0,42	5,99	0,63	9,82	1,41	13,13	1,42	16,02	1,78	17,10	2,96		
	25	-	-	0,99	0,42	4,46	0,49	5,75	0,69	6,45	1,57	12,22	1,58	15,62	1,94	16,87	3,82		
	30	-	-	0,11	0,48	4,07	0,55	5,52	0,76	7,53	1,73	11,37	1,74	15,25	2,10	16,65	3,12		
	35	-	-	-	-	3,71	0,62	5,31	0,82	8,58	1,88	10,55	1,89	14,90	2,25	16,45	3,43		
40	-	-	-	-	3,37	0,68	5,11	0,89	9,62	2,04	9,76	2,05	14,57	2,41	16,26	3,59			
10-46	5	6,41	0,18	7,76	0,18	9,02	0,25	9,52	0,46	21,10	0,99	22,45	1,01	19,80	1,39	24,21	2,66		
	10	3,98	0,27	6,29	0,27	8,34	0,34	9,11	0,54	18,67	1,20	20,97	1,22	19,58	1,60	23,80	2,62		
	15	1,86	0,35	5,03	0,35	7,79	0,42	8,79	0,63	16,54	1,41	19,72	1,42	19,37	1,80	23,48	3,07		
	20	-	-	3,89	0,44	7,30	0,51	8,50	0,72	14,59	1,62	18,58	1,63	19,18	2,01	23,19	3,28		
	25	-	-	2,84	0,53	6,85	0,60	8,24	0,80	12,76	1,83	17,53	1,84	18,99	2,22	22,93	3,46		
	30	-	-	1,83	0,61	6,44	0,68	8,00	0,89	11,00	2,04	16,52	2,05	18,81	2,43	22,69	3,70		
	35	-	-	0,88	0,70	6,04	0,77	7,78	0,98	10,62	2,25	15,57	2,26	18,63	2,64	22,47	3,91		
40	-	-	-	-	5,67	0,86	7,56	1,06	7,69	2,46	14,65	2,47	18,45	2,85	22,25	4,12			
10-56	5	9,99	0,21	11,63	0,21	13,09	0,29	13,64	0,49	27,50	1,08	28,84	1,09	29,76	1,47	29,96	2,74		
	10	7,08	0,33	9,93	0,34	12,35	0,41	13,20	0,61	25,40	1,37	27,82	1,38	29,47	1,76	29,83	3,03		
	15	4,52	0,46	8,46	0,46	11,74	0,53	12,85	0,73	23,46	1,66	26,87	1,68	29,20	2,06	29,71	3,33		
	20	2,15	0,58	7,12	0,58	11,19	0,65	12,53	0,85	21,61	1,96	25,97	1,97	28,95	2,35	29,59	3,62		
	25	-	-	5,85	0,70	10,68	0,77	12,25	0,98	19,84	2,25	25,11	2,26	28,70	2,64	29,48	3,91		
	30	-	-	4,67	0,82	10,21	0,89	11,73	1,22	18,11	2,54	24,27	2,55	28,47	2,93	29,38	4,20		
	35	-	-	3,53	0,94	9,77	1,01	11,73	1,22	16,43	2,83	23,45	2,85	28,24	3,23	29,27	4,50		
40	-	-	2,43	1,06	9,34	1,13	11,49	1,34	14,79	3,13	22,65	3,14	28,01	3,52	29,17	4,79			
20-38	5	11,05	0,32	12,60	0,32	14,00	0,43	14,53	0,72	32,97	1,17	34,15	1,18	35,88	1,78	32,09	3,09		
	10	8,29	0,45	10,97	0,45	13,28	0,56	14,11	0,84	30,26	1,48	32,91	1,49	35,18	2,09	31,97	3,40		
	15	5,86	0,58	9,56	0,58	12,69	0,69	13,76	0,97	27,87	1,79	31,54	1,80	34,61	2,40	31,86	3,71		
	20	3,63	0,71	8,28	0,71	12,16	0,82	13,45	1,10	25,66	2,10	30,29	2,11	34,10	2,71	31,76	4,02		
	25	2,67	0,84	7,09	0,84	11,67	0,95	13,17	1,23	23,58	2,41	29,11	2,42	33,63	3,02	31,33	4,33		
	30	-	-	5,96	0,97	11,22	1,08	12,92	1,36	21,58	2,72	28,00	2,73	33,19	3,33	31,56	4,64		
	35	-	-	4,87	1,10	10,79	1,21	12,67	1,49	19,55	3,89	26,93	3,05	32,77	3,64	31,46	4,95		
40	-	-	3,83	1,22	10,38	1,33	12,44	1,62	17,79	3,34	25,91	3,36	31,13	3,69	31,37	5,26			
20-46	5	15,37	0,31	17,20	0,37	18,79	0,47	19,37	0,76	44,18	1,27	46,00	1,28	47,56	1,77	48,11	3,18		
	10	12,17	0,48	15,36	0,53	18,01	0,64	18,92	0,93	41,03	1,68	44,19	1,69	46,80	2,18	47,68	3,59		
	15	9,34	0,84	13,75	0,70	17,36	0,81	18,55	1,09	38,23	2,09	42,62	2,10	46,17	2,59	47,32	4,00		
	20	6,71	0,82	12,29	0,87	16,78	0,98	18,22	1,26	35,63	2,49	41,18	2,51	45,60	3,00	47,00	4,41		
	25	4,23	0,99	10,92	1,04	16,24	1,15	17,92	1,43	33,17	2,90	39,82	2,91	45,08	3,41	46,71	4,82		
	30	1,85	1,16	9,61	1,21	15,73	1,32	17,64	1,60	30,82	3,31	38,54	3,32	44,59	3,81	44,94	4,91		
	35	-	-	8,35	1,38	15,26	1,49	17,38	1,77	28,54	3,72	37,30	3,73	44,12	4,22	46,19	5,63		
40	-	-	7,14	1,55	14,80	1,66	17,13	1,94	26,33	4,13	36,10	4,14	43,67	4,63	45,95	6,04			
20-56	5	22,63	0,41	24,90	0,41	26,79	0,54	27,43	0,82	62,90	1,43	65,16	1,44	67,02	1,94	67,64	3,35		
	10	18,74	0,65	22,72	0,65	25,91	0,78	26,94	1,06	59,06	2,00	63,01	2,02	66,16	2,51	67,16	3,92		
	15	15,27	0,89	20,81	0,89	25,17	1,02	26,53	1,30	55,63	2,57	61,13	2,59	65,45	3,08	66,76	4,49		
	20	12,05	1,12	19,05	1,12	24,51	1,25	26,16	1,53	52,43	3,15	59,40	3,16	64,80	3,65	66,41	5,06		
	25	8,98	1,36	17,39	1,36	23,89	1,49	25,83	1,77	49,39	3,72	57,77	3,73	64,20	4,22	66,09	5,63		
	30	6,04	1,60	18,81	1,60	23,31	1,73	25,52	2,01	46,48	4,29	56,20	4,30	63,63	4,79	65,78	6,21		
	35	3,19	1,83	14,29	1,84	22,76	1,96	25,22	2,24	43,65	4,86	54,70	4,87	63,09	5,37	65,50	6,78		
40	0,43	2,07	12,81	2,07	22,23	2,20	24,94	2,48	40,90	5,43	53,24	5,44	62,57	5,94	65,22	7,35			
40-38	5	26,29	0,44	28,68	0,44	30,33	0,56	30,96	0,89	71,54	1,61	73,72	1,62	75,53	2,19	76,14	3,83		
	10	22,52	0,70	26,37	0,71	29,47	0,83	30,47	1,16	67,82	2,26	71,65	2,27	74,70	2,84	75,67	4,48		
	15	19,16	0,97	24,51	0,97	28,75	1,10	30,07	1,42	64,49	2,90	69,81	2,91	74,00	3,48	75,28	5,13		
	20	16,04	1,24	22,80	1,24	28,10	1,36	29,71	1,69	61,40	3,54	68,13	3,55	73,37	4,12	74,93	5,77		
	25	13,07	1,50	21,19	1,50	27,50	1,63	29,38	1,95	58,46	4,18	66,54	4,20	72,78	4,76	74,62	6,41		
	30	10,22	1,77	19,66	1,77	26,93	2,16	29,07	2,22	55,63	4,83	65,03	4,84	72,23	5,41	74,32	7,05		
	35	7,47	2,03	18,18	2,02	26,39	2,16	28,78	2,49	52,90	5,47	63,57	5,48	71,70	6,05	74,03	7,70		
40	4,79	2,30	16,75	2,30	25,88	2,43	28,50	2,75	50,24	6,11	62,16	6,12	71,19	6,69	73,76	8,34			
40-46	5	36,08	0,53	38,71	0,53	40,85	0,65	41,55	0,98	96,37	1,83	98,99	1,84	101,10	2,41	101,78	4,06		
	10	31,62	0,88	36,26	0,88	39,90	1,01	41,02	1,33	91,96	2,69	96,57	2,70	100,17	3,26	101,26	4,91		
	15	27,63	1,24	34,09	1,24	39,09	1,36	40,58	1,69	88,00	3,54	94,44	3,55	99,38	4,12	100,83	5,77		
	20	23,90	1,59	32,09	1,59	38,36	1,72	40,18	2,04	84,30	4,40	92,46	4,41	98,67	4,98	100,45	6,63		
	25	20,35	1,95	30,20	1,95	37,68	2,07	39,82	2,40	80,78	5,25	90,59	5,27	98,00	5,83	100,10	7,48		
	30	16,94	2,30	28,39	2,30	37,04	2,43	39,48	2,75	77,40	6,11	88,81	6,12	97,37	6,69	99,76	8,34		
	35	13,64	2,65	26,56	2,66	36,42	2,78	39,15	3,11	74,12	6,97	87,08	6,98	96,77	7,55	99,45	9,19		
40	10,43	3,01	24,96	3,01	35,83	3,14	38,84	3,52	70,92	7,82	85,41	7,84	96,16	8,40	99,15	10,05			
40-54	5	49,56	0,65	52,79	0,65	55,33	0,77	56,12	1,16	130,56	2,12	133,76	2,14	136,28	2,70	137,04	4,35		
	10	44,18	1,1																

Assembly AFM

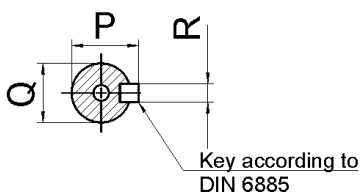


AFM main dimensions

AFM horizontal

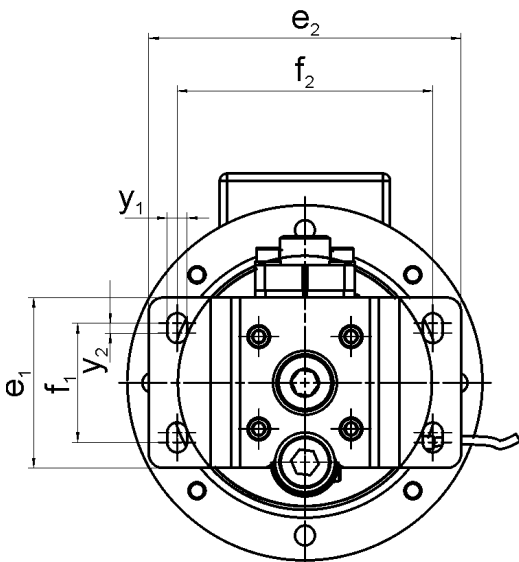
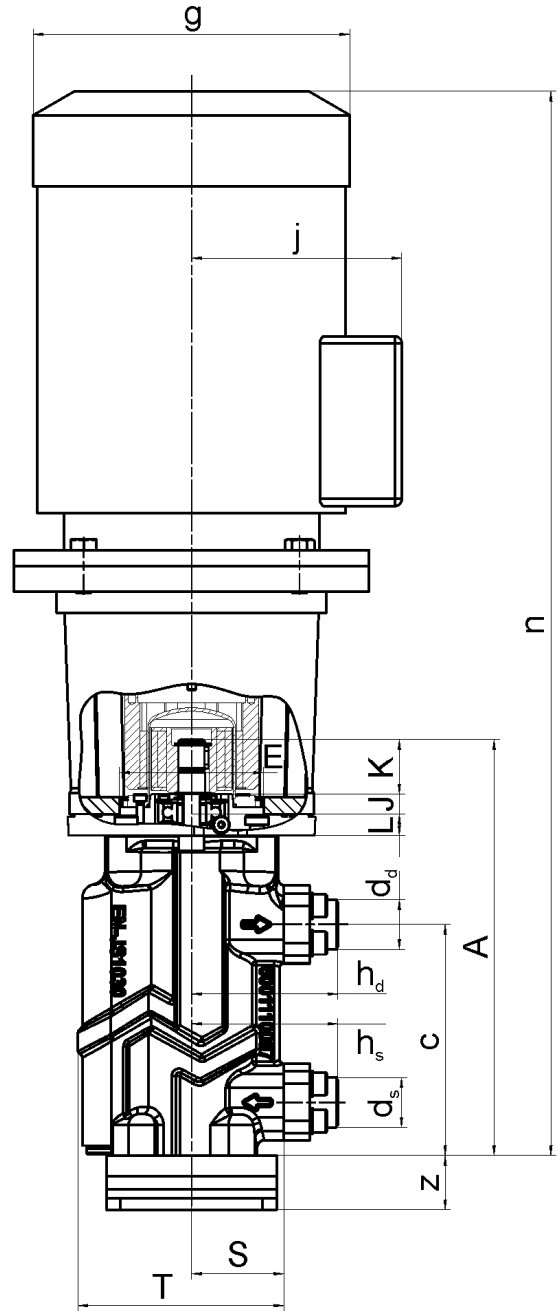
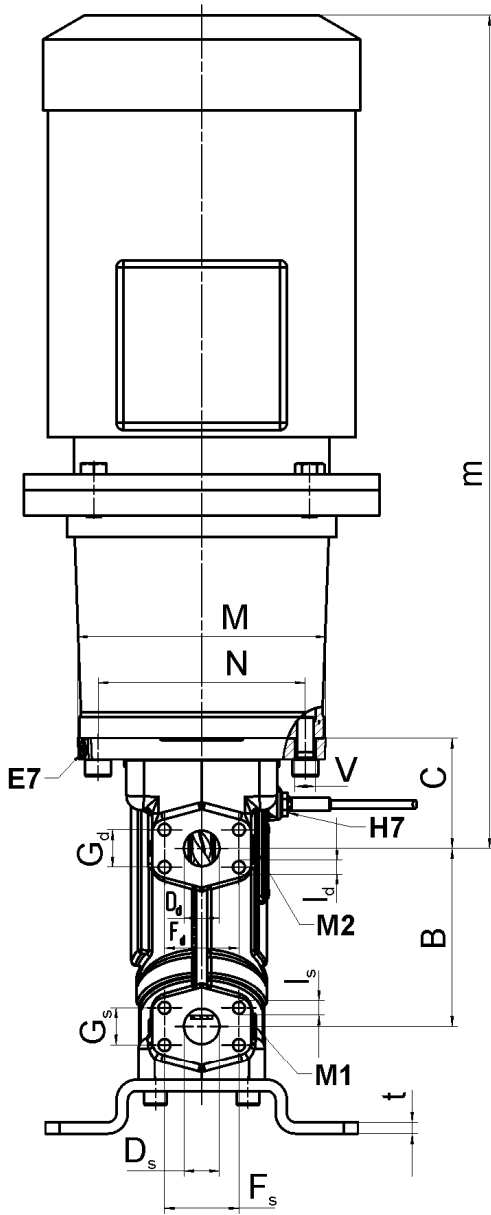


Shaft end



AFM main dimensions

AFM vertical



Pump foot

AFM main dimensions

AFM size	Pump dimensions														
	A	B	C	E	J	K	L	M	N	P	Q	R	S	T	V
10	247	110	55,5	95	13,5	27,5	13	132	111	16	14 _{j6}	5	60	132	11
20	293,5	125	77,5	101,6	14	39	15	175	146	21,5	19 _{j6}	6	65	145	14
40	342,5	135					17						80		

AFM size	Motor size	Dimensions of pump/motor assembly											
		a	c	e ₁	e ₂	f ₁	f ₂	g ^②	j ^②	k	m ^②		
10	80	115,5	150,5	200	84	160	162	209	112	492			
	90S						181	218			536		
	90L						202	223				155	
	100L												
	112M						227	570					
20	90S	137,5	163	120	220	84	180	181	218	112	558		
	90L							202	223			155	619
	100L												
	112M							266	278			185	735
	132S												
40	90L	137,5	212	240	200	200	181	218	112	558			
	100L						202	223			155	619	
	112M												227
	132S						266	278			185	735	
	132M												

AFM size	Motor size	Dimensions of pump/motor assembly															
		n ^②	s	v ₁	v ₂	w	w ₁	x	y ₁	y ₂	z						
10	80	642	12	90	210	180	60	11	14	7	38						
	90S	686										15	230	250	215	185	14
	90L																
	100L	720										15	230	250	215	185	14
	112M																
20	90S	721	12	90	210	180	60	11	14	7	38						
	90L																
	100L	782	15	230	250	215	185	14									
	112M											789					
	132S	898	18	270	300	265	225										
40	90L	770	12	90	210	180	60	11	14	7	38						
	100L											831	15	230	250	215	185
	112M	838															
	132S	947	18	270	300	265	225										
	132M																

Connections			
AFM size	Venting	Heating cartridge	Pressure gauge
	10	E7	H7
20 and 40	M8x1	M12x1	G 1/8
			G 1/4

Dimensions in mm,
Direction of rotation:
clockwise, viewed from
drive side

- ① SAE J518C, hole pattern 3000 PSI.
- ② Dimensions are for reference only and may deviate depending on motor manufacturer.

AFM size	Connection dimensions													
	SAE-suction flange ①							SAE-discharge flange ①						
	Inch	D _s	F _s	G _s	l _s	d _s	h _s	Inch	D _d	F _d	G _d	l _d	d _d	h _d
10	¾	22	47,63	22,23	4 x M10	28	96	¾	22	47,63	22,23	4 x M10	28	96
20	1	25	52,37	26,19	4 x M10	35	103	1	25	52,37	26,19	4 x M10	35	103
40	1 ¼	32	58,72	30,18	4 x M12	43	121	1	25	52,37	26,19	4 x M10	35	118

Benefits

▶ **Versatile and adaptable**

The ability to install the pump horizontally or vertically lets the operator adapt to even small spaces.

▶ **Economical use of space**

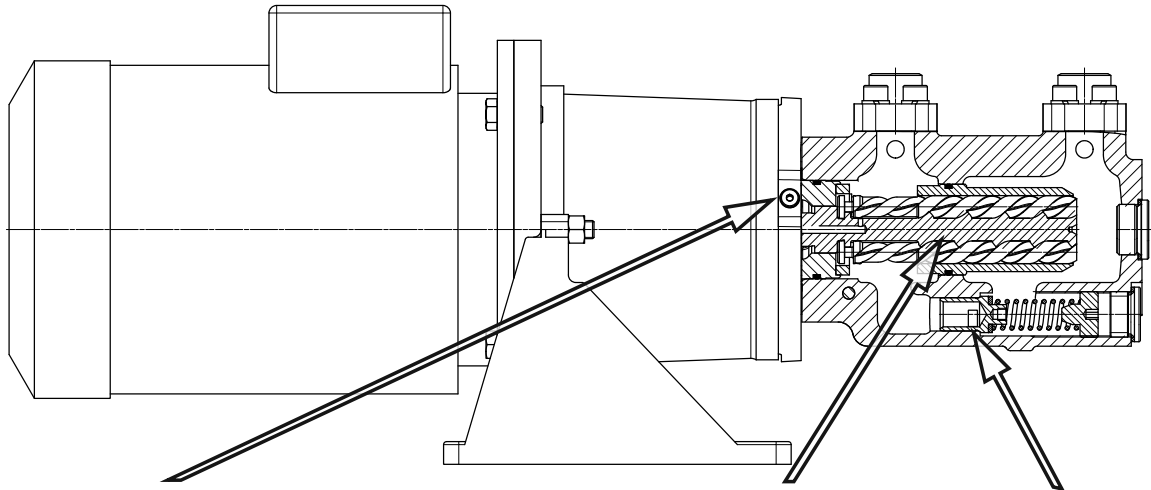
The small size saves space.

▶ **Extraordinary flexibility**

A wide range of available materials and sizes makes it possible to adapt to special operating conditions and a variety of liquids.

▶ **Impressive service life**

Hydrodynamic axial thrust compensation minimizes loads on the screws and extends service life.



▶ **Optimized start-up**

The vent screw ensures the best possible venting of the pump before each start, even when installed vertically.

▶ **Reliable process stability**

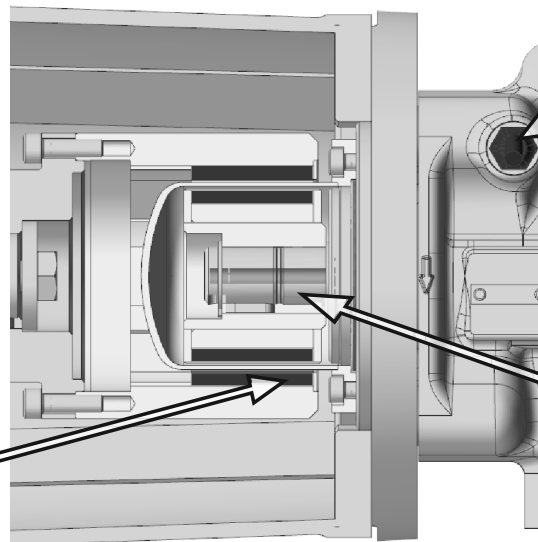
Specially-shaped thread flanks produce virtually pulsation-free, low-noise pumping action.

▶ **Outstanding operational safety**

The conical valve provides integrated overload protection.

▶ **“ZERO” leakage**

Contactless transmission of torque with a magnetic coupling eliminates the need to seal rotating parts on the shaft and provides 100% protection against leakage.



▶ **Easy pump starting**

The heating cartridge near the containment can prevent the magnetic coupling from disengaging when pumping highly viscous liquids.

▶ **Extremely durable**

Strong samarium cobalt magnets will not demagnetize under excessive loads and transfer torque smoothly even under very high operating temperatures.

▶ **Automatic cooling**

The return bore in the drive screw ensures effective dissipation of heat and eliminates the need for external cooling.

Subject to technical alteration
