



10" High Efficiency System





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10" HIGH EFFICIENCY SYSTEM (HES) PACKAGED DEAL

PACKAGED DEAL



- 10" synchronous submersible motor
- 10" submersible pump VSC10
- Variable frequency drive
- Matching output filter
- Flow switch (Solar systems)

ISO 9001

All motors are manufactured in ISO 9001 certified plants and 100% tested



10" double flange mounting design

SandFighter® sealing system

SandFighter® sealing system with SiC mechanical seal and sand slinger



Best class winding wires

Permanent Magnet Technology

Motor rotors are equipped with permanent magnets that eliminate rotor losses thus significantly reducing motor current and heat rise.

Franklin FES motor fill solution

frost protection to -15 °C storage temp.
Drinking water approvals

Hydrodynamic liquid lubricated radial bearings

100 % maintenance free operation

High capacity Kingsbury type thrust bearing

for 100 % maintenance free operation

Pressure-equalizing diaphragm

spring pre-loaded



10" HIGH EFFICIENCY SYSTEM (HES) OVERVIEW - UP TO 250 KW

Packaged Submersible Borehole System with energy savings up to 7 %*



SUPERIOR EFFICIENCY

- Up to 7 % improved motor efficiency* with excellent partial load behaviour (SKU reduction)*
- One-stop shop and perfectly matching components guarantee first-class performance/efficiency
- Power factor corrected input (No power compensation needed)
- Significant lower motor heat rise (Increased lifetime)
- Easy system set-up due tailored pre-settings, user interface and own Franklin Electric software
- Communication ModBus (RS485 and Ethernet)

INCREASED LIFETIME

- Incorporated Soft start and protection features (no additional investment)
- Speed control (Optimum aggregate operation - pump matches system any time)

FULLY SUPPORTED

- Easy system commissioning due to integrated start-up wizard with tailored pre settings.
- Fully supported by the Technical Support Professionals and Field Service Engineers



SPECIFICATION

- Motor range: 200 kW & 250 kW (100 Hz - 3000 rpm) and 315 & 390 HP (120 Hz - 3600 rpm)
- System Power Supply: 400 V / 460 V ± 10 %
- Frequency: 50 Hz - 60 Hz ± 2 %
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- 200 kW horizontal motor operation
- Protection: motor: IP68, insulation class Y
 drive: IP00
 filter: IP00



OPTIONS

- Special Voltages
- IP 54 electronics
- Higher-graded material: 316SS, 904L
- Retrofittable PT 100 temperature sensor
- Sinus output filters
- Plug-in card 6x DI/DO (order no. 308 170 201)
- Plug-in card PT100 (order no. 308 170 202)
- Plug-in card 1x AI & 2x AO (order no. 308 170 206)
- Plug-in card Profibus (order no. 308 170 203)

APPLICATIONS



AGRICULTURE



INDUSTRIAL



MINING

* in comparison to asynchronous technology

MODEL NUMBERS 400 V (WW SYNCRONOUS MOTOR, FVD & FILTER IP00)

P_N [kW]	For panel mount	
	VFD IP00 & dV/dt IP00 filter	VFD IP00 & Sinus IP00 filter
190	308 028 002	308 028 102
200	308 028 001	308 028 101
250	308 029 001	308 029 101

PERFORMANCE DATA 400 V

	P_N [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_N [A]	I_A/I_N^* [A]	η [%]	$\cos \varphi$	T_N [Nm]	T_A/T_N^* [Nm]
308 029 ***	250	60	3000	497	1	93,8	0,96	796	1
	220	60	3000	423	1	94,3	0,96	701	1
	200	60	3000	377	1	94,5	0,95	637	1
308 028 ***	200	60	3000	389	1	93,8	0,96	637	1
	185	60	3000	354	1	94,1	0,96	589	1
	150	60	3000	284	1	94,3	0,95	478	1

PERFORMANCE DATA 460 V

	P_N [kW]	$P_{max.}$ [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_{MAX} [A]	I_A/I_{MAX}^* [A]	η [%]	$\cos \varphi$	T_N [Nm]	T_A/T_N^* [Nm]
308 029 ***	250	287	60	3600	497	1	93,6	0,96	796	1
	220	253	60	3600	423	1	94,3	0,96	701	1
	200	230	60	3600	377	1	94,5	0,95	637	1
308 028 ***	200	230	60	3600	389	1	93,6	0,96	637	1
	185	213	60	3600	354	1	94,1	0,96	589	1
	150	173	60	3600	284	1	94,3	0,95	478	1

Performance data are based on measurements with Franklin Electric original equipment.

*Since this is an integrated system (motor plus electronics) these figures relate to VFD input.

CONTROL MODES AND NECESSARY SENSOR TECHNOLOGIES

Process reference	Control reference	Flow sensor	Pressure sensor	Level sensor	PT100 sensor & Drive slot card
Q - Flow	No (Optional)	mandatory			Optional
	P	mandatory	mandatory		
	H	mandatory		mandatory	
P - pressure	No (Optional)	Yes*	mandatory		Optional
	Q	mandatory	mandatory		
	H		mandatory	mandatory	
H - level	No (Optional)	Yes*		mandatory	Optional
	Q	mandatory		mandatory	
	P		mandatory	mandatory	
Direct Mode	No	Yes**	No	No	Optional
Manual Mode	No				Yes*

*please consult Franklin Electric, **must be verified according to PLC requirement





10" HIGH EFFICIENCY SOLAR SYSTEM (HES) OVERVIEW - UP TO 250 kW

Packaged Submersible Borehole Solar System with energy savings up to 7%* up to 250 kW



SUPERIOR EFFICIENCY IN SOLAR APPLICATIONS

- One-stop shop and perfectly matching components guarantee first-class performance/efficiency
Less panels, more water respectively
- Solar drive available in IP00 enclosure rating
- AC and DC power source compatible
- MVPT algorithm maximizes system performance

SPECIFICATION

- Motor range: 150 - 250 kW (100 Hz - 3000 rpm) and 200 - 390 HP (120 Hz - 3600 rpm)
- System Power Supply: 400 - 800 V (min. starting voltage 440 V)
- Frequency: 30 - f_N
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Vertical and horizontal motor operation (horizontal operation for 200 kW)
- Protection: motor: IP68, insulation class Y
 drive: IP00
 filter: IP00

FULLY SUPPORTED

- Fully supported by the Technical Support Professionals and Field Service Engineers



OPTIONS



- Special Voltages
- IP 54 electronics
- Higher-graded material: 316SS, 904L
- Retrofittable PT 100 temperature sensor
- Sinus output filters
- Plug-in card 6x DI/DO (order no. 308 170 201)
- Plug-in card PT100 (order no. 308 170 202)
- Plug-in card 1x AI & 2x AO (order no. 308 170 206)
- Plug-in card Profibus (order no. 308 170 203)

APPLICATIONS



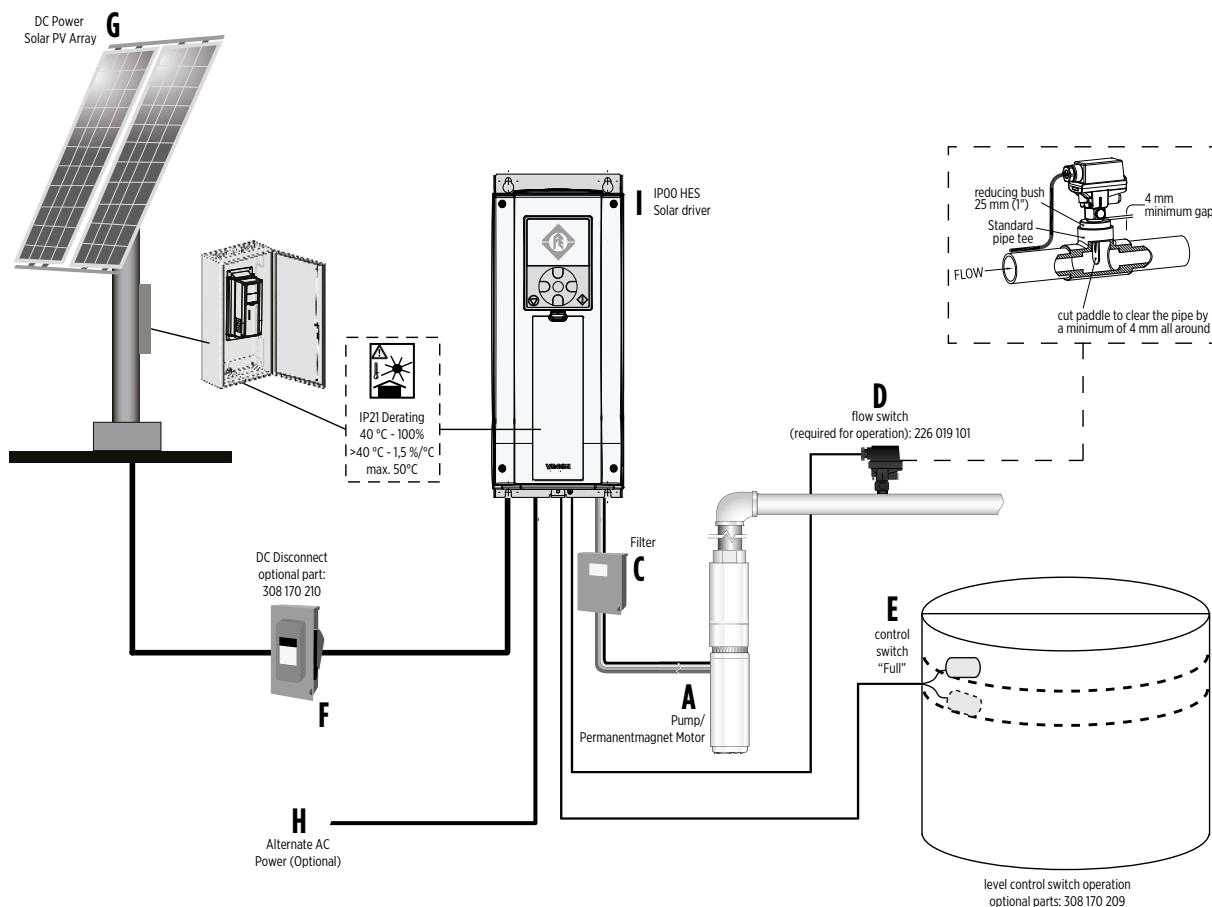
* in comparison to asynchronous technology

MODEL NUMBERS 400 V

P_N [kW]	For panel mount	
	VFD IP00 & dV/dt IP00 filter	VFD IP00 & Sinus IP00 filter
190	308 028 002S	308 028 102S
200	308 028 001S	308 028 101S
250	308 029 001S	308 029 101S

PERFORMANCE DATA 400 V

► see table page 6



- A. High Efficiency Motor and Pump
- B. OutputFilter
- C. Flow Switch (226 019 101)
- D. Level Control Switch (not included- separate order 308 170 209)
- E. DC Disconnect (not included/separate order)
- G. Solar Array (not included)
- H. AC Alternative Power supply (not included)
- I. HES Drive Solar

CONTROL MODES AND NECESSARY SENSOR TECHNOLOGIES

process reference	control reference	flow meter	pressure sensor	level sensor	PT100 sensor & slot card	Flow switch (digital)
Solar					Yes*	mandatory

* please consult Franklin Electric



10" REWINDABLE PERMANENT MAGNET MOTOR

Rewindable motors with best class winding wires

FEATURES & BENEFITS

- 10" double flange mounting design
- Factory filled with Franklin's FES93 motor fill solution, FES93 for frost protection down to -15 °C storage temperature
- High capacity Kingsbury type liquid lubricated 60 kN thrust bearing and radial bearings for 100 % maintenance free operation
- Pressure-equalizing diaphragm, spring pre-loaded
- Stainless Steel keyed shaft
- SandFighter™ sealing system with SIC mechanical seal and sand slinger
- High efficiency electrical design for low operation costs
- Drinking water approvals

**SAND
FIGHTER**

WATER WELL
WW
CI PC / 304SS

STAINLESS STEEL
316

STAINLESS STEEL
904L

OPTIONS

- Higher-graded materials: 316SS and 904L
- Special voltages
- Retrofittable PT 100 temperature sensor



STANDARD SPECIFICATION

- Ratings: 200 & 250 kW (100 Hz - 3000 rpm) and 315 - 390 HP (120 Hz - 3600 rpm)
- Max. storage temperature - 15 °C to + 60 °C
- Standard motor with PE2/PA winding insulation
- Nominal ambient temperature: 30 °C with 0.5 m/s cooling flow
- Standard Voltage: 400 V - 100Hz / 460 V - 120 Hz
- Voltage Tolerance: $\pm 10\% U_N$
- Protection IP68
- Motor protection: DIN 61947-4-1
- Frequency of starts: 10 starts/ hour (with min. 3 minutes resting time), equally distributed
- Motor lead length: 6 m
- 200 kW horizontal operation, shaft upwards
- Rotation counter clock wise facing shaft end (rotation reversible)
- All motors with factory installed leads



MOTOR MODEL NUMBERS

P _N [kW]	U _N [V]	motor model number (WW)	motor model number (316SS)	motor model number (904L)
200	400	264 028 5311	264 028 6311	264 028 7311
250	400	264 029 5311	264 029 6311	264 029 7311

LEAD LENGTHS 10" REWINDABLE PERMANENT MAGNET MOTORS

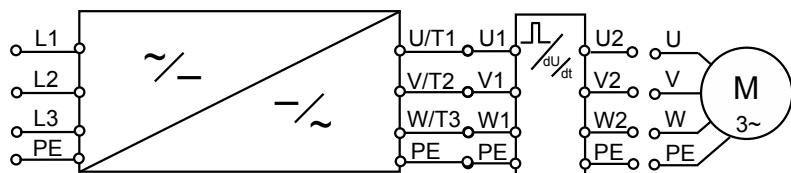
lead	P _N [kW]	U _N [V]	ø [mm ²]	D [mm]	lengths [m]	qty.	lead set model no. (3 single wire lead)	lead seal kit model no.
	all Ratings	400	3 x 1x70	20,7	6	1	308 711 100	308 660 740

For PE2/PA motors additionally the special tape 700 541 688 is absolutely necessary

ground lead (optional)	ø [mm ²]	D [mm]	lengths [m]	qty.	lead model no.
	1G35	15,3	6	1	308 056 506

ELECTRICAL CONNECTION

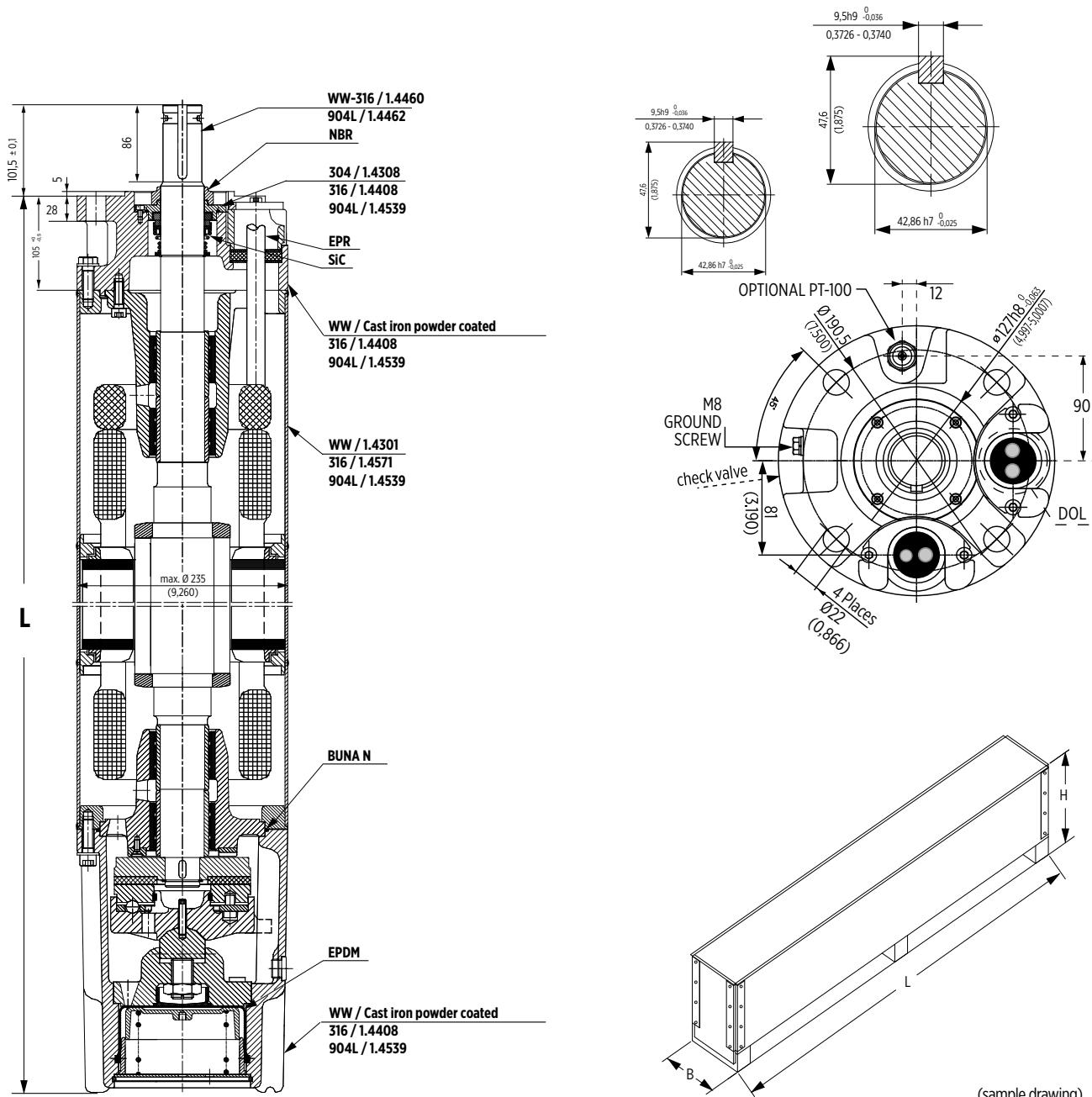
DOL



U	V	W	PE
brown	grey	black	yellow/green



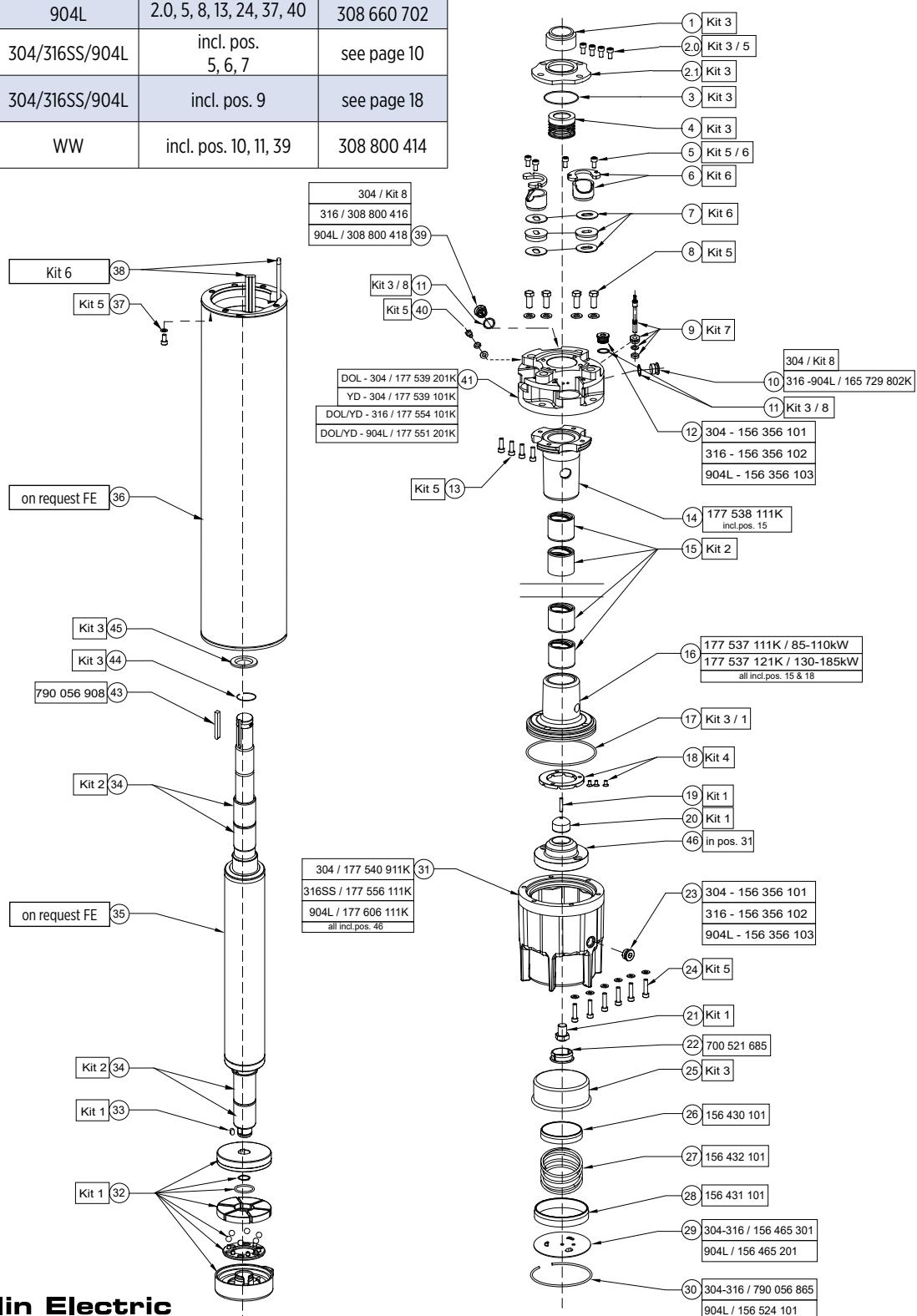
10" REWINDABLE PM MOTORS DIMENSION AND MATERIALS



P _N [kW]	Motor lengths L [mm]	Motor weights [kg]	Motor weights incl. Box [kg]	Motor shipping size		
				B	H	L
200	1659	299	349	341	562	2296
250	1769	350	400	341	562	2296

10" REWINDABLE PERMANENT MAGNET MOTORS SPARE PARTS

Kit 1 Thrust bearing kit	304/316SS/904L	incl. pos. 17, 19, 20, 21, 32, 33	308 750 701
Kit 2 Radial bearing kit	304/316SS/904L	incl. pos. 15, 34	308 751 701
Kit 3 Seal kit	304/316SS 904L	incl. pos. 1-4, 11, 17, 25	308 800 703 308 800 704
Kit 4 Up-Thrust kit	304/316SS/904L	incl. pos. 18	308 751 702
Kit 5 Screw kit	304/316SS 904L	incl. pos. 2.0, 5, 8, 13, 24, 37, 40	308 660 701 308 660 702
Kit 6 Lead seal kit	304/316SS/904L	incl. pos. 5, 6, 7	see page 10
Kit 7 PT100 Kit	304/316SS/904L	incl. pos. 9	see page 18
Kit 8 Valve kit	WW	incl. pos. 10, 11, 39	308 800 414



MODEL NUMBERS 400V STATOR AND ROTOR - WW/316SS

P _N [kW]	U _N [V]	Stator (incl. winding and 6m motor lead)	Rotor
200	400	327 640 931	10000005599K
250	400	327 641 931	10000005857K

WINDING DATA 400 V

P _N [kW]	U _N [V]	Mod.-No. Winding kit	Turns per coil	Wire diameter [mm]	Type of Isolation	Groups connection	Total wire length [m]	Resistance coil [Ω]	Resistance Dol (U ₁ -V ₁ [Ω])
200	400	327 640 999	7 - 7	2,4 / 3,7 / 3,9	PE2/PA	Parallel Star	780	0,0305	0,0305
250	400	327 641 999	6 - 6	3,0 / 4,5 / 4,8	PE2/PA	Parallel Star	560	0,0265	0,0265

INSULATION RESISTANCE (20 °C / 500 V DC)

New motor without drop cable	400 >	MΩ
Used motor without drop cable	20 >	MΩ
New motor with drop cable	4 >	MΩ
Used motor with drop cable	1	MΩ

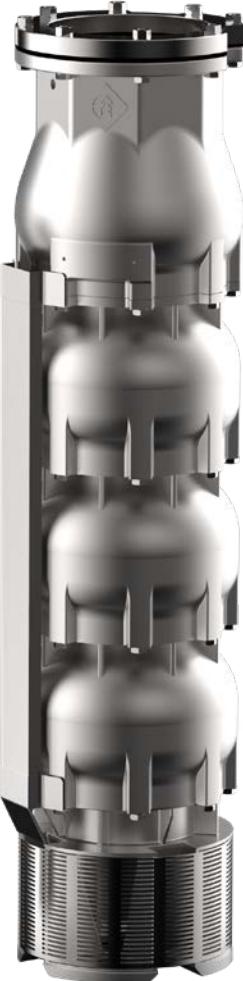
MOTOR REPAIR INSTRUCTION

Pictured repair instruction	Model number	10000006792
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10" SUBMERSIBLE PUMP VSC/VS



For any pump support please refer to franklinwater.eu



VARIABLE SPEED DRIVE (VFD)

First class performance and control with Variable Frequency Drive for permanent magnet motors

FEATURES & BENEFITS

- Energy saving due to variable speed control
- Soft start and soft stop
- Extended system life and reliability
- Simplified installation on motor or wall
- Easy and fast commissioning due to initial configuration wizard
- High thermal and mechanical performance thanks to aluminum case and independent ventilation

Power Supply	Input Voltage U_{IN}	380 - 500 V ± 10 %
	Input frequency f_{IN}	47 - 65 Hz
	Starts per hour	50 - 60 Hz (+/- 2%)
Motor connection	Output voltage	20; with min. 3 min rest period
	Output current	0 - I_N
	Output frequency	I_N at rated ambient temperature (40 °C), overload: 1.1 x I_N
Performance	Efficiency	0 - f_N resolution 0.01 Hz
Enclosure	Protection Degree	97.5 %
Control characteristics	Switching frequency	IP 54/21
Ambient conditions	Operation temperature	3.6 - 6 kHz, default setting 4 kHz
	Storage temperature	-10 - 50 °C (40 °C with derating)
	Altitude	-40 - 70 °C
EMC	Immunity & Emissions	Max. altitude at rated current: 3000 m (> 1000 m with derating)
Communication	RS 485	Complies with EN61800-3, Category C2 - first and second environment
	Ethernet	Standard: ModBus
I/O connections	Digital Input (DI)	Standard: TCP / IP
	Analog Input (AI)	6 x
	Analog Output (AO)	2 x
	Relay Output (RO)	1x
		2x (change-over contact)

For further details please see separate Franklin Electric Quick Installation guide and VFD literature.

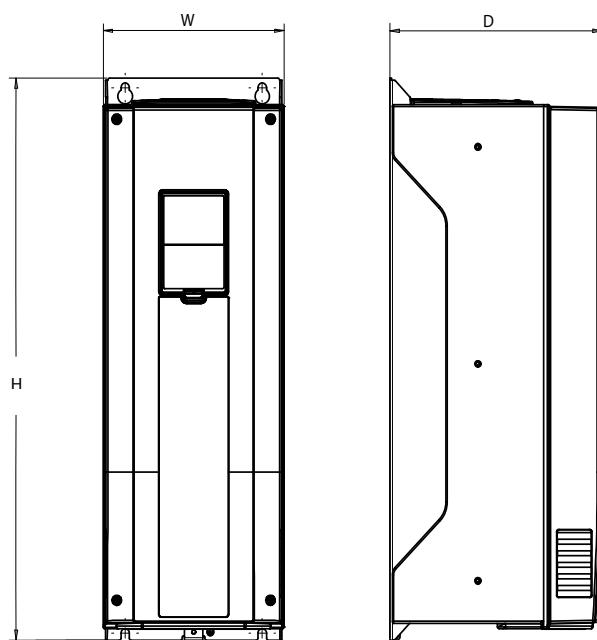
OPTIONS

- Plug-in card 6x DI/DO (order no. 308 170 201)
- Plug-in card PT100 (order no. 308 170 202)
- Plug-in card 1x AI & 2x AO (order no. 308 170 206)
- Plug-in card Profibus (order no. 308 170 203)



MODEL NUMBERS AND DIMENSION

system model numbers	AC Drive Type	IP Type	I_N [A]	Dimensions W x H x D [mm]	Weight [kg]
308 028 001 / 101	314 000 203	00	460	508 x 980 x 525	205
308 028 002 / 102	314 000 202	00	385	480 x 840 x 365	104
308 029 001 / 101	314 000 204	00	520	508 x 980 x 525	205



OUTPUT FILTER

FEATURES & BENEFITS

- dV/dt filter for lead lengths up to 120m, for lead lengths > 120m please consult Franklin Electric
- filter available in IP00
- Optimized for submersible permanent magnet motor feeding
- Voltage: 380 - 500V
- Frequency: 0 - 120Hz
- Switching frequency: 4kHz
- Ambient temperature: < 40°C

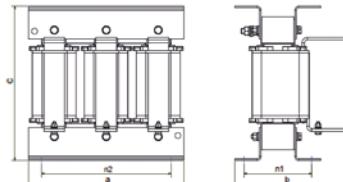
OPTIONS

- Other voltages
- Sinus filter IP00 for length >120 m and/ or special application
- IP 54



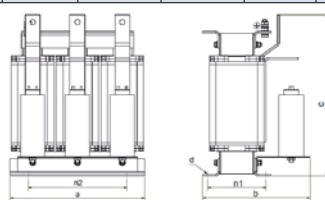
MODEL NUMBERS AND DIMENSION DV/DT FILTER - IP00

System model number	Filter order code	I_N [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main	PE	main	PE
										[mm ²]		[Nm]	
308 028 001	314 005 166	460											
308 029 001	314 005 167	650											

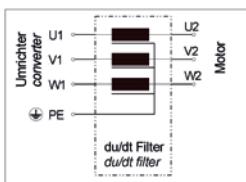


MODEL NUMBERS AND DIMENSION SINUS FILTER - IP00

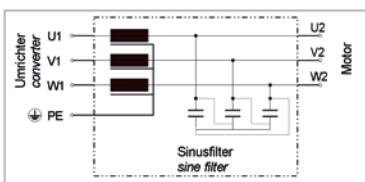
System model number	Filter order code	I_N [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main	PE	main	PE
										[mm ²]		[Nm]	
308 028 101	314 005 168	460											
308 029 101	314 005 169	590											



dV/dt Filter - Connection Plan



Sinus Filter - Connection Plan



ACCESSORIES

SPLICING KIT 1,5 - 95 MM²

Model no.	Description	for cross-sections up to [mm ²]	L [mm]	Ø [mm]	H [mm]	Max. cable Ø [mm]
308 090 932	Splicing Kit 50	25 - 50	360	55	75	43
308 090 933	Splicing Kit 95	50 - 95	400	70	95	48

- 4-wire, up to 1,2 kV
- Connection kits for cable extensions with cable connection sleeves for cable cross-sections up to 95 mm².
- Suitable for all common cable materials
- Long durability
- High electrical insulation values and mechanical strength
- Quick and easy assembly
- Components:
Transparent plastic shell, Ready-to-mix cast resin, insulation tape, assembly instruction



MOTOR FILLING KIT

- This kit contains all necessary tools to check and replenish Franklin Electric submersible motors with FES91, FES92 or FES93 filling liquid. (fill solution/concentrate must be ordered separately).
- Part number: 308 726 103

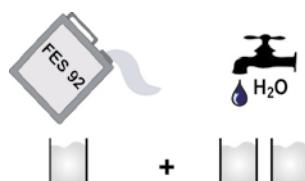


MOTOR FILLING LIQUID

Filling liquid 5l FES92

6" / 8" / 10" Rew PM Motors → FES93

Part number: 308 353 941



FLOW PADDLE SWITCH

- The flow switch utilizes the force of liquid flow to propel its paddle and to detect the incoming flow or movement of the existing liquid in the pipe.
- Part number: 226 019 101

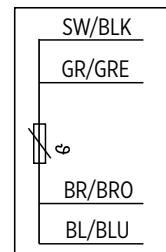


PT 100 SENSOR

- Fitted into the upper end bell flange
- PT100 sensor can be retrofitted with rewirable 6", 8", 10" and 12" motors Measurement of the temperature of the filling liquid
- Conductor with a resistance proportional to the temperature
- Allows continuous monitoring of the temperature
- PT100 sensor retrofit kits from Franklin Electric come with complete instructions and allow an easy field installation.
- The PT100 sensor is not a motor overload protection, so the warranty does not expire if a separate motor protection is installed (as required in the installation instructions).
- The above-ground equipment is not available from Franklin Electric and is typically part of a custom panel or data acquisition system.



	Ø [mm ²]	D [mm]	lead lengths [m]	10" Rew	
				304/316	904L
PT 100	4X0,5	8	10	Mod.- No.:	308 016 401
PT 100	4X0,5	8	20	Mod.- No.:	308 016 402
PT 100	4X0,5	8	30	Mod.- No.:	308 016 403
PT 100	4X0,5	8	50	Mod.- No.:	308 016 405
					308 016 422



Trip Points:
PVC = 55°C
PE2/PA = 75°C

DC DISCONNECT

- To disconnect the drive even under load safely from the solar generator, Franklin Electric offers suitable DC disconnect switches for different power ratings.

0 - 11A/800V DC - 308 170 313
12 - 22A/800V DC - 308 170 325



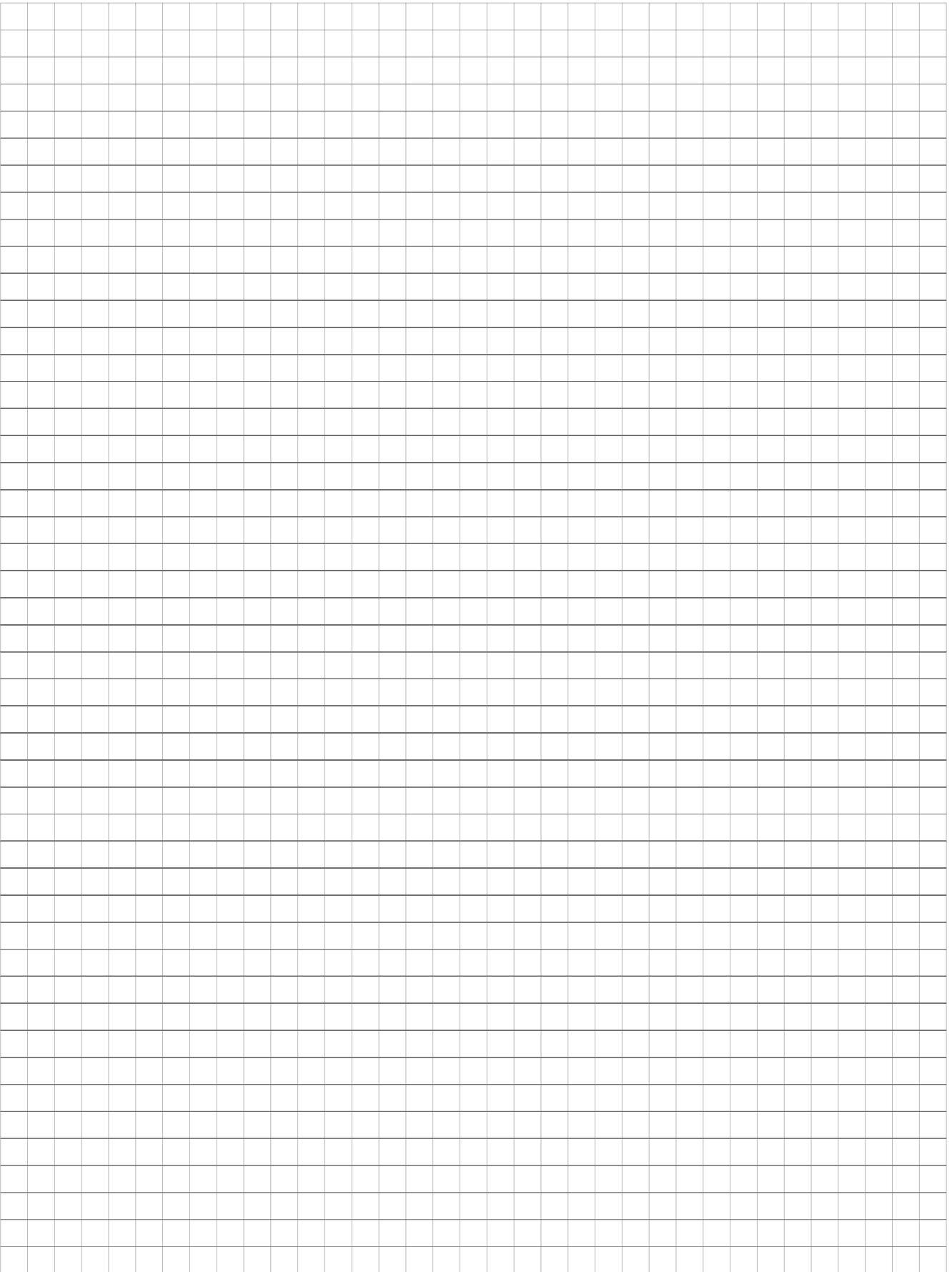
FLOAT SWITCH

- A float switch is a device used to detect the level of liquid within a tank.
- Part number: 308 170 209





NOTES



CATALOG REVISION CHANGE NOTICE

Rev. No.	Changes	Page



≡ MENU



Franklin Electric



Franklin Electric

Franklin Electric Europa GmbH
Rudolf-Diesel-Str. 20 - 54516 Wittlich
GERMANY
Phone: +49 (0) 6571 - 105-0
Fax: +49 (0) 6571 - 105-510
Email: info@franklin-electric.de



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