

ACTIVE DRIVER



GENERAL DATA

Applications

Active Driver is an innovative integrated system for controlling variable-speed electric pumps by keeping pressure constant at variable flow rates. The user-friendly interface makes it quick and easy to calibrate pressure set points and view settings and error messages.

Constructional features of the pump

Active Driver comprises:

- an inverter
- a pressure sensor
- a flow sensor

It has 3 inputs and 2 outputs so as to be able to realise certain interface solutions with more complex installations.

Cooling: water flow through the whole device and cools down the components.

Advantages of Active Driver:

- enhanced comfort
- energy saving
- silent-running
- compact
- overpressures eliminated
- extended pump lifetime
- trouble-free installation
- compatible with a large number of pump types

The ACTIVE DRIVER is supplied already set up for installation in the following models:

ACTIVE DRIVER M/T:

fed with a single-phase line, controls electropumps with a 230V standard three-phase asynchronous motor.

ACTIVE DRIVER M/M:

fed with a single-phase line, controls electropumps with a 230V standard single-phase asynchronous motor.

ACTIVE DRIVER T/T:

fed with a three-phase line, controls electropumps with a 400V standard three-phase asynchronous motor.

ENERGY SAVING:

Test performed with a 1.1kW pump with head set to 30 mca.

FLOW (l/min.)	STATISTIC FLOW OPERATION	DIRECT CONNECTION CONSUMPTION kW	CONSUMPTION WITH ACTIVE DRIVER kW	POWER DIFFERENCE	ENERGY SAVED IN A YEAR (8760 hours) kW
5	20%	1,295	0,185	1,110	1.945
10	40%	1,388	0,555	0,833	2.917
20	20%	1,480	0,740	0,740	1.296
40	9%	1,573	1,110	0,463	365
70	6%	1,794	1,570	0,224	118
100	5%	1,850	1,850	0,000	0
TOTAL ANNUAL SAVING kW					6.641

PROTECTIONS:

Active Driver features a malfunction protection system. Any fault is indicated on the display and, depending on the type of error, the pump may switch off. The application provides:

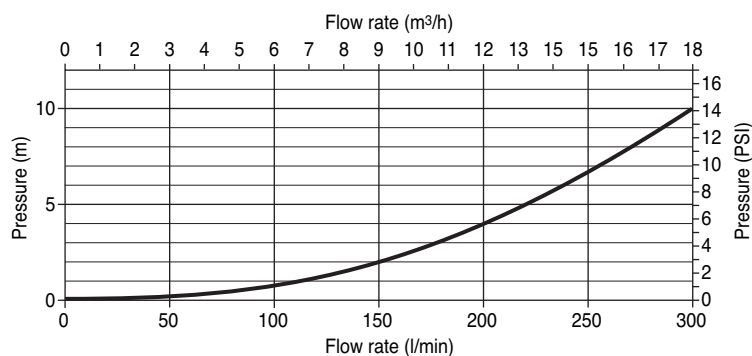
- dry running
- overload
- excess temperature of the electronics
- abnormal feeding voltages (excluding A.D. M/M and A.D. M/T 1.0)
- direct short-circuit between the output phases

ELECTRICAL DATA

MODEL	MAX CURRENT OF MOTOR A	MAX MOTOR POWER kW	MAIN SUPPLY VOLTAGE 50-60 Hz	PUMP SUPPLY VOLTAGE	Ø DNA	Ø DNM	CONNECTIVITY FOR PARALLEL WORKING	TO BE USED WITH PUMPS TYPE	OVERALL DIMENSIONS			WEIGHT Kg
ACTIVE DRIVER M/M 1.1	8,5	1,1	Single-Phase 1x230	Single-Phase 1x230	1 1/4" M	1 1/2" F	NO	All surface pumps, submersible pumps and Pulsar 5" with Single Phase motor with 8,5 Ampere Max Input Current	22	28	18	3,650
ACTIVE DRIVER M/T 1.0	4,7	1,0	Single-Phase 1x230	Three-Phase 3x230	1 1/4" M	1 1/2" F	YES	All surface pumps, submersible pumps and Pulsar 5" with 230 V Three Phase motor with 4,7 Ampere Max Input Current				
ACTIVE DRIVER M/T 2.2	9,3	2,2	Single-Phase 1x230	Three-Phase 3x230	1 1/4" M	1 1/2" F	YES	All surface pumps, submersible pumps and Pulsar 5" with 230 V Three Phase motor with 9,3 Ampere Max Input Current				
ACTIVE DRIVER T/T 3.0	7,5	3,0	Three-Phase 3x400	Three-Phase 3x400	1 1/4" M	1 1/2" F	YES	All surface pumps, submersible pumps and Pulsar 5" with 400 V Three Phase motor with 7,5 Ampere Max Input Current				
ACTIVE DRIVER T/T 5.5	13,3	5,5	Three-Phase 3x400	Three-Phase 3x400	1 1/4" M	1 1/2" F	YES	All surface pumps, submersible pumps and Pulsar 5" with 400 V Three Phase motor with 13,3 Ampere Max Input Current				

MODEL	WEIGHT (Kg)	INSTALLATION	MAX FLUID TEMPERATURE	MAX WORKING TEMPERATURE	MAX PRESSURE (bar)	REGULATING RANGE (bar)	FLUID INPUT HYDRAULIC COUPLING	FLUID OUTPUT HYDRAULIC COUPLING	DEGREE OF PROTECTION
ACTIVE DRIVER M/M 1.1	4	ANY POSITION	50°C	60°C	16	from 1 to 6	1 1/4" male	1 1/2" female	IP 55
ACTIVE DRIVER M/T 1.0	3,8	ANY POSITION	50°C	60°C	16	from 1 to 9	1 1/4" male	1 1/2" female	IP 55
ACTIVE DRIVER M/T 2.2	3,8	ANY POSITION	50°C	60°C	16	from 1 to 15	1 1/4" male	1 1/2" female	IP 55
ACTIVE DRIVER T/T 3.0	5	FACING UPWARD	50°C	60°C	16	from 1 to 15	1 1/4" male	1 1/2" female	IP 55
ACTIVE DRIVER T/T 5.5	5	FACING UPWARD	50°C	60°C	16	from 1 to 15	1 1/4" male	1 1/2" femmina female	IP 55

DIAGRAM OF PRESSURE LOSSES



OPERATION DATA

PARALLEL INSTALLATION

Operation logic:

The parallel installation operation logic is that of supplying **Constant Pressure to the varying flow rate of the water** required by the system: this is made possible by the Active Driver which is applied to each pump. Each pump should ideally be set at the same desired pressure value.

The first pump is started when the pressure in the system drops for the first time, due to the drawing of water. The second and/or third pump start **in cascade** as the flow rate increases. As the flow rate of the water decreases, the pumps turn off in reverse order to which they were started.

Thanks to an **alternating** system in which the pumps are started, the **second pump** is started when the pressure in the system drops for a second time. The first and/or third pump start **in cascade** as the flow rate increases. As the flow rate of the water decreases, the pumps turn off in reverse order to which they were started.

PARAMETERS FOR THE USER

Setting the set point pressure (in bar):

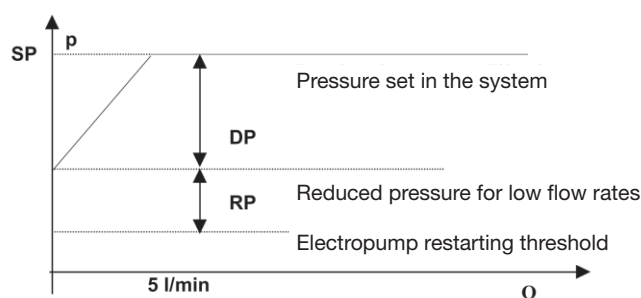
From normal operating status, hold down the MODE and SET keys simultaneously until the letters SP appear on the display. In these conditions the + and – keys allow you respectively to increase and decrease the desired pressure value. The regulating range is from 1,0 to 9,0 bar. Press SET to return to normal operating status.

SP is related to 2 parameters (already set but modifiable by the user)

RP: expresses in metres the decrease in pressure that makes the pump start.

DP: expresses in metres the desired decrease in pressure at low flow rates.

Diagram for regulating pressure according flow rate



PARAMETERS FOR THE INSTALLER

From normal operating status, hold down the MODE & SET & - keys simultaneously until the letters “rC” appear on the display. In these conditions the + and – keys allow you respectively to increase and decrease the value of the parameter while the MODE key allows you to move on to the next parameter in cyclic mode. Press SET to return to normal operating status.

rC: Setting the rated current of the electropump.

This parameter must be set the same as the current on the motor data plate in the configuration in which it is used, with power supply 230V.

rt: Setting the direction of rotation.

Possible values: 0 and 1. If the direction of rotation of the electropump is not correct, it is possible to invert the direction of rotation by changing this parameter.

RESETTING ERROR CONDITIONS

For some malfunctions and shutdowns, the system makes a certain number of attempts to automatically reset the pump.

The following table shows the sequences of the operations performed by Active Driver for the various kinds of shutdown:

AUTOMATIC RESETS OF ERROR CONDITIONS		
DISPLAY INDICATION	DESCRIPTION	SEQUENCE OF AUTOMATIC RESET
bL	Blockage due to water lack	- An attempt every 10 minutes for a total of 6 attempts - An attempt every 1 hour for a total of 24 attempts - An attempt every 24 hours for a total of 30 attempts
bP	Blockage due to fault of the pressure sensor	- Reset 10 seconds after correct conditions return
LP	Blockage due to low supply voltage	- Reset when voltage returns to a value in the range 220V - 20% + 10%
HP	Blockage due to high voltage	- Reset when the internal voltage returns in acceptable conditions
Ot	Blockage due to overheating of the power stages	- Reset when the temperature of the power stages falls below 70°C again
OC	Blockage due to current overload	- An attempt every 10 minutes for a total of 6 attempts
oF	Blockage due to current overload in the output stages	- An attempt every 10 minutes for a total of 6 attempts
oF/ot	Blockage due to current overload in the output stages with temperature of the stages higher than 45°C	- An attempt every 10 minutes or when the temperature has fallen by 10°C

INDICATIONS ON THE DISPLAY

Identifying s.	Description	Factory parameters				
		A.D. M/M 1.1	A.D. M/T 1.0	A.D. M/T 2.2	A.D. T/T 3.0	A.D. T/T 5.5
Go	Electropump operating					
Sb	Electropump waiting					
	User displays and settings (keys MODE and SET 2 seconds)					
SP	Setting the set-point pressure (in bar). Default t: 3 bar	3.0 bar	3.0 bar	3.0 bar	3.0 bar	3.0 bar
	Installer displays and settings (keys MODE and SET and – 5 seconds)					
rC	Setting the rated current of the electropump (in A)		0.0 A	0.0 A	0.0 A	0.0 A
rt	Setting the direction of rotation		00	00	00	00
Fn	Setting the rated rotation frequency of the electropump. (in Hz)	50	50	50	50	50
od	Setting the operating mode	01	01	01	01	01
rP	Setting the pressure drop for restarting (in bar)	0.5 bar	0.5 bar	0.5 bar	0.5 bar	0.5 bar
Ad	Setting the interconnection address (necessary on sets of several electropumps with exchange)		“_ _”	“_ _”	“_ _”	“_ _”
Eb	Enabling the booster		02	02	02	02
	Technical assistance displays and settings (keys MODE and SET and + 5 seconds)					
tb	Setting the reaction time of the water lack blockage (in s.)	10 s	10 s	10 s	10 s	10 s
GP	Setting the gain of the proportional coefficient of the PI	1.0	1.0	1.0	1.0	1.0
GI	Setting the gain of the integral coefficient of the PI	1.0	1.0	1.0	1.0	1.0
FS	Setting the maximum rotation frequency of the electropump (in Hz)	50	50	50	50	50
FL	Setting the minimum rotation frequency of the electropump. (in Hz)	0	0	0	0	0
Ft	Setting the low flow rate threshold	15	15	15	15	15
CM	Exchange method on sets of 2 electropumps		01	01	01	01
AE	Setting the enabling of the anti-block/anti-frost function	01	01	01	01	01
SF	Setting the starting frequency	45				
St	Setting the starting time	1.0				
i 1	Setting the function of input 1 (float)			01	01	01
i 2	Setting the function of input 2 (set point selection)			01	01	01
i 3	Setting the function of input 3 (enable)			01	01	01
P1	Setting the auxiliary setpoint pressure (in bar) - in function of input 2 -			2.5 bar	2.5 bar	2.5 bar
o1	Setting the function of output 1 (default value: 2; function: ON alarm)			02	02	02
o2	Setting the function of output 2 (default value: 2; function: ON operating)			02	02	02
	Displays of the main values (MODE key)					
Fr	Display of the current rotation frequency (in Hz)					
UP	Display of pressure (in bar)					
C1	Display of the phase current of the electropump (in A)					
UE	Display of the version of the software with which the appliance is equipped					
	DISPLAY (keys SET and – for 2 seconds)					
UF	Display of the flow					
ZF	Display of zero flow					
FM	Display of the maximum rotation frequency (in Hz)					
tE	Display of the temperature of the power stages (in °C)					
bt	Display of the temperature of the electronic card (in °C)					
GS	Display of running status					
FF	Display of the log of errors and blockages					
	Access to manual mode (keys SET and + and – 5 seconds)					
FP	Setting the test frequency in manual mode (in Hz) ≤ the set value FS	40	40	40	40	40
UP	Pressure display (in bar)					
C1	Display of electropump phase current (in A)					
rt	Setting the direction of rotation					
UF	Display of flow					
ZF	Display of zero flow					
	System reset (keys MODE and SET and + and –)					
ZF	General reset (ZF appears when leaving reset and restarting)					




Identifying s.	Description	Factory parameters				
		A.D. M/M 1.1	A.D. M/T 1.0	A.D. M/T 2.2	A.D. T/T 3.0	A.D. T/T 5.5
	Restoring the factory settings (keys SET and + for 2 seconds when switching on)					
EE	Saving and reading the factory settings on the EEPROM					
	Error and status conditions					
bL	Blockage due to water lack					
bP	Blockage due to absence of pressure sensor					
LP	Blockage due to low supply voltage					
HP	Blockage due to high supply voltage					
ot	Blockage due to overheating of the power stages					
oC	Blockage due to current overload in the electropump motor					
oF	Blockage due to current overload in the output stages					
oF/ot	Blockage due to current overload in the output stages with temperature of the stages higher than 45°C					
SC	Blockage due to short circuit in the output stages					
EC	Blockage due to non setting of the rated current (rC) or of the rated frequency (Fn)					
E0...E7	Internal error 0...7					
F1	Status / Alarm input 1					
F3	Status / Alarm input 3					

SYNTHETIC START-UP PROCEDURE

- Setting the pump current:

To set the current, enter the installer menu by pressing the following key for 5 seconds:   





The text rC is displayed 

The value rC is read on the dataplate of the electric pump as the rated current in Ampere (A) and is entered using the keys  and . Press the  key.

- Setting the direction of rotation:

The text rt , is displayed, after which use keys  and  to invert the direction of pump rotation. Press the  key.

- Setting the nominal frequency:


The text Fn , is displayed, after which use keys  and  to set the nominal frequency of the pump in Hz according to the pump dataplate specifications; e.g. 50Hz for the European market. Press the  key.

- Setting the pressure Setpoint:

The factory-set value is 3.0 bar.

To change it, press the buttons   at the same time for 2 seconds.

 appears on the display. Set the desired pressure in bar by pressing the buttons  and .

Press the  button to confirm and exit the menu.