

## Key Features

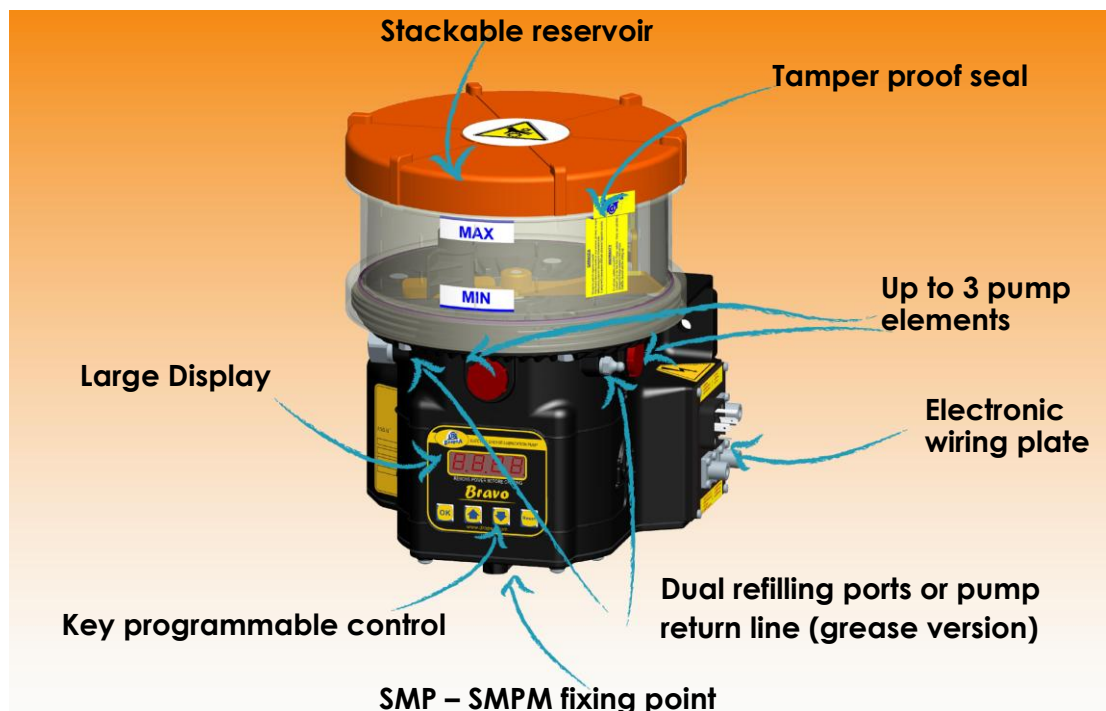
- **Modular stackable reservoirs & Minimum level** as standard
- **Voltages available:**  
12V AC/DC  
24V AC/DC  
110V/230V 50/60 Hz, as standard
- **Nominal output per pump element:**  
2,8cm<sup>3</sup>/min (0.17in<sup>3</sup>/min) a 20 RPM
- **Working pressure:**  
280bar (4061psi)
- **Integrated fixture:** for SMP and SMPM distributors
- **VARIO-Drive:** allows electronic variation of pump motor 50-100% of nominal output
- **Diagnostic and event logging.**
- **Multi Lube cycle:** multiple sensor counts and selectable pre-lube function
- **Multi connector system:** allow many electrical connector types to be applied to the standard product to suit varied OEM and end user requirements
- **Dual access ports:** for convenient refilling and grease return line
- **Minimum level** as standard

## Applications

- **Mobile plant and vehicle lubrication**
- **Machine tools:** like glass working machines or wood-working machines.
- **Heavy vehicles:** like earth moving machines, harvesters and other uses for special machines or vehicles.
- **Heavy industries:** like mining or construction.
- **Chain & gear lubrication.**

# Bravo

The small pump package with big features.



**Grease and Oil lubrication for industry and mobile plant.**

### DESIGN AND ADVANCED SOLUTIONS

This small pump package contains many innovative features exclusive to DropsA that allow fresh possibilities in lubrication systems engineering.

It is suited not only for indoor industrial applications but also mobile plant and vehicle lubrication systems.

### VARIO-DRIVE

VARIO-Drive is a new power management system for the pump motor that protects and adjusts the pumping system electronically. That means increased reliability and greater lifespan of the pump motor as well as the ability to electronically adjust the pump output from 50% to 100% of its nominal value.

You will find that you are able to precisely control and engineer systems like never before.

Bravo Controller also has built in Diagnostic logging features as standard.

### NEW GENERATION CONTROLLER

The integrated next generation control system is central to delivering new solutions to the customer.

It allows numerous ways to trigger and control the lubrication event in a system:

1. **Cycle Mode:** allows pause to be determined by timer or a number of external impulses. These can be in any combination.  
The lubrication cycle can be set to operate on time basis or on completion of a user settable number of cycle sensor inputs.
2. **Pulse mode:** pause and lubrication cycles are determined by external impulses. Additionally, during the lubrication cycles, the cycle sensor can be monitored to ensure correct operation of the system. The pump can suspend the lubrication cycle if external impulses not detected.
3. **Off Mode:** pump sets as slave to host machine.

## Operation examples

### Cycle mode

Pump stand by



[P.Hou]  
[P.Cou]

Pump working



[C.Min]



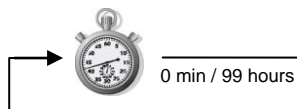
Cycle sensor

[C.Cou]

ALARM  
(TIMEOUT)

Example 1) Timer based pause and lubrication cycle

[P.Hou ≥ 1; P.Cou = 0; C.Min ≥ 1; C.Cou = 0;]



1 sec. - 99 min.



X

X  
Only low level

Example 2) Timer based pause. Lubrication cycle with monitoring of cycle sensor

[P.Hou ≥ 1; P.Cou = 0; C.Min ≥ 1; C.Cou ≥ 1;]



Ok ?

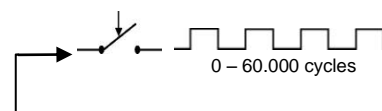
No



yes

Example 3) Pause cycle determined by external impulse. Lubrication cycle monitors cycle sensor

[P.Hou = 0; P.Cou ≥ 1; C.Min ≥ 1; C.Cou ≥ 1;]



Ok ?

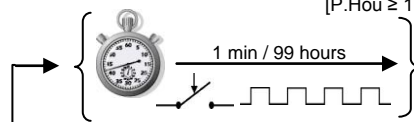
No



yes

Example 4) Pause determined by either time or extend impulse

[P.Hou ≥ 1; P.Cou ≥ 1; C.Min ≥ 1; C.Cou ≥ 1; PTOA=OFF]



Whichever first  
0 - 60.000 cycles



Ok ?

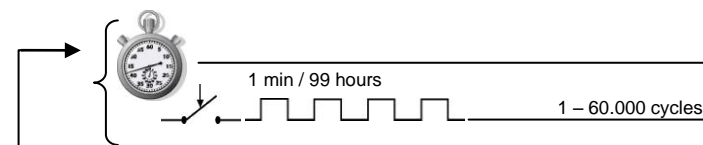
No



yes

Example 5) Pause determined by extend impulse, pause time generates alarm if impulses not received

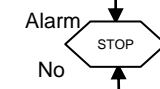
[P.Hou ≥ 1; P.Cou ≥ 1; C.Min ≥ 1; C.Cou ≥ 1; PTOA=ON]



Ok ?

No

Pause time  
overrun



yes

Pump stand by



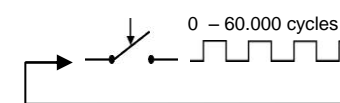
Pump working



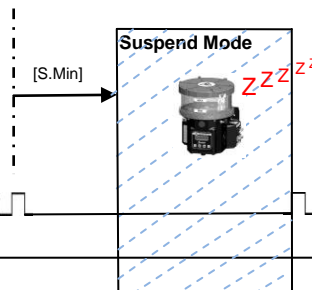
ALARM  
(TIMEOUT)

### Pulse mode

- Pause and lubrication cycle determined by external impulse [P.Cou ≥ 0; C.Cou ≥ 1]
- During lubrication, cycle sensor monitored to confirm correct lubrication [C.Min ≥ 1]
- C.Min determines how many min. seconds to allow for the cycle sensor.
- Lubrication cycle is suspended if external impulse not detected within user preset time [S.Min ≥ 1]



1 - 60.000 cycles



Cycle  
Sensor



[C.Min] Ok ?

yes

No

STOP

### Off mode

Pump operates when external signal is given. No monitoring

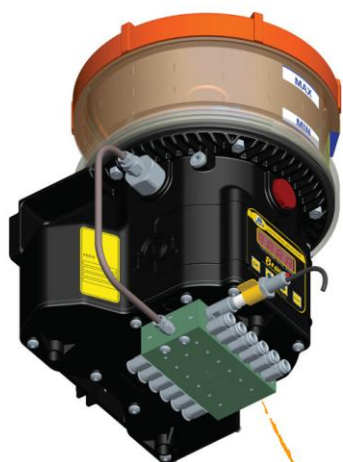
## Application example: vehicles and heavy vehicles

Bravo is the cost effective solution for many type of vehicles like: trucks, trailers, tractors, earth moving equipment, harvesters and other special vehicles. The complete lubrication system typically comprises:

1. Bravo pump
2. SMP – SMPM distributors
3. Remote status lamp with button

With just a status lamp & button placed in the vehicle cabin, the driver always knows the status of the lubrication system

Whenever needed an extra lubrication cycle, is just a push of a button.



1

Bravo is outfitted with a fixing point for integration SMP – SMPM distributors directly under the pump.

2

SMP – SMPM distributors can also be mounted on crucial point of the chassis in order to easily reach the lubrication pints.

Status Lamp & Remote Button

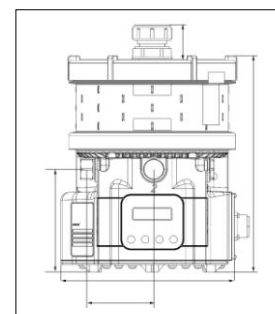
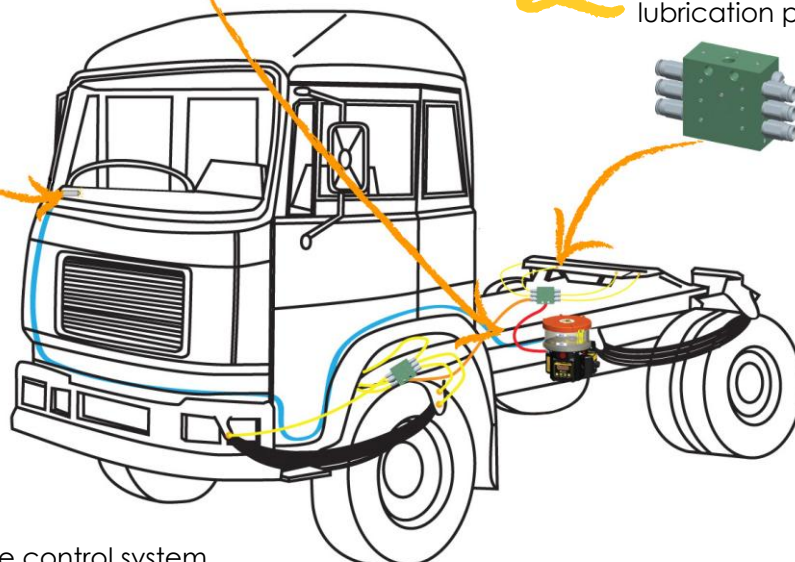


3

Remote control system. To have full control of the lubrication system.

The button light has three status:

- Blinking light: the pump is in alarm state. The Number of blinks represents the type of alarm indicates type of alarm
- No light: the pump is in standby
- Fixed light: pump is in lubrication cycle
- Press for extra lube cycle/s.



### DIMENSIONS MM (INCHES)

	284 (11"), 1 reservoir
A	380 (15"), 2 reservoirs
	476 (19"), 3 reservoirs

(\*) = Oil version only add 40 mm (1,57 inches) to "A" dimension

## Order Information

### Step 1 – Choose your Bravo version

#### Contacts

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#### ITALY

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#### BRAZIL

Dropsa do Brazil  
t. +55 (0)11-563-10007  
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AUTOMATIC VERSION						
Operating Voltage	GREASE			OIL		
	Reservoir 2Lt. (0.53gal)	Reservoir 5Lt. (1.32gal)	Reservoir 8Lt. (2.11gal)	Reservoir 2Lt. (0.53gal)	Reservoir 5Lt. (1.32gal)	Reservoir 8Lt. (2.11gal)
110V/230V	0888400	0888401	0888402	0888415	0888416	0888417
12V/24V	0888403	0888404	0888405	0888418	0888419	0888420
MANUAL VERSION						
Operating Voltage	GREASE			OIL		
	Reservoir 2Lt. (0.53gal)	Reservoir 5Lt. (1.32gal)	Reservoir 8Lt. (2.11gal)	Reservoir 2Lt. (0.53gal)	Reservoir 5Lt. (1.32gal)	Reservoir 8Lt. (2.11gal)
110V/230V	0888406	0888407	0888408	0888421	0888422	0888423
12V	0888409	0888410	0888411	0888424	0888425	0888426
24V	0888412	0888413	0888414	0888427	0888428	0888429

### Step 2 – Choose the connector system

AUTOMATIC VERSION 12V/24V							
CONNECTION		FEMALE CONNECTOR (optional)		POWER	ALARM CONTACT	CYCLE SENSOR	EXTERNAL SWITCH
Part No.	Description	Part No.	Description				
0888102	Base Connector "Amphenol"	0039828	Connector "Amphenol"	•	•	•	•
0888059	Base Connector "MPM x 4"	0039976	Connector "MPM"	•	•	•	•
0888141	Base Connector "MPM x 2"	0039976	Connector "MPM"	•	•		
0888139	Base Connector "MPM x 1 + M12 x 3"	0039976 0039999	Connector "MPM" Connector "M12"	•	•	•	•
0888142	Base Connector "MPM x 1 + M12 x 1"	0039976 0039999	Connector "MPM" Connector "M12"	•	•		
0888437	IP69K - 12V/24V	0038963 0039835	3 pin IP69K Connector 4 pin IP69K Connector	•	•	•	•
AUTOMATIC VERSION 110V/230V							
CONNECTION		FEMALE CONNECTOR (optional)		POWER	ALARM CONTACT	CYCLE SENSOR	EXTERNAL SWITCH
Part No.	Description	Part No.	Description				
0888134	Base Connector "MPM x 4"	0039976	Connector "MPM"	•	•	•	•
0888138	Base Connector "MPM x 2"	0039976	Connector "MPM"	•	•		
0888136	Base Connector "MPM x 1 + M12 x 3"	0039976 0039999	Connector "MPM" Connector "M12"	•	•	•	•
0888137	Base Connector "MPM x 1 + M12 x 1"	0039976 0039999	Connector "MPM" Connector "M12"	•	•		
0888472	IP69K - 110V	0038963	3 pin IP69K Connector	•	•	•	•
0888474	IP69K - 230V	0039835	4 pin IP69K Connector	•	•	•	•
MANUAL VERSION 12V/24V							
CONNECTION		FEMALE CONNECTOR (optional)		POWER	ALARM CONTACT	CYCLE SENSOR	EXTERNAL SWITCH
Part No.	Description	Part No.	Description				
0888141	Base Connector "MPM x 2"	0039976	Connector "MPM"	•	•		
0888142	Base Connector "MPM x 1 + M12 x 1"	0039976 0039999	Connector "MPM" Connector "M12"	•	•		
MANUAL VERSION 110V/230V							
CONNECTION		FEMALE CONNECTOR (optional)		POWER	ALARM CONTACT	CYCLE SENSOR	EXTERNAL SWITCH
Part No.	Description	Part No.	Description				
0888138	Base Connector "MPM x 2"	0039976	Connector "MPM"	•	•		
0888137	Base Connector "MPM x 1 + M12 x 1"	0039976 0039999	Connector "MPM" Connector "M12"	•	•		

### Step 3 – Optional

Part No.	Description	CODICE	Description
0039433	Remote control switch and lamp	0888058	Pump element Ø6mm with integrated PSV
0039434	Remote control switch and lamp	0010509	Screws for SMP-SMPM base installation
0888038	Grease cartridge filling kit	0888470	IP69K Protection kit
0038966	IP69K protection plug connector		